
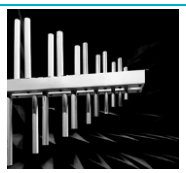
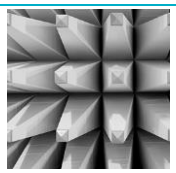

cetecom advanced

Bundesnetzagentur

BNetzA-CAB-02/21-102

TEST REPORT

Test report no.: 1-6942/23-01-03

DAkkS Deutsche Akkreditierungsstelle D-PL-12047-01-00

Testing laboratory

cetecom advanced GmbH
Untertuerkheimer Strasse 6 – 10
66117 Saarbruecken / Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
Internet: https://www.cetecomadvanced.com
e-mail: mail@cetecomadvanced.com

Accredited Testing Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2018-03) by the Deutsche Akkreditierungsstelle GmbH (DAkkS).
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate starting with the registration number: D-PL-12047-01-00.
ISED Testing Laboratory Recognized Listing Number: DE0001

FCC designation number: DE0002

Applicant

ADC Automotive Distance Control Systems GmbH
Peter-Dornier-Str. 10
88131 Lindau / GERMANY
Phone: 08382 9699 - 0
Contact: Thomas Reitmayer
e-mail: Thomas.Reitmayer@continental-corporation.com

Manufacturer

ADC Automotive Distance Control Systems GmbH
Peter-Dornier-Str. 10
88131 Lindau / GERMANY

Test standard/s

FCC - Title 47 CFR Part 95	FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 95 - Personal Radio Services
FCC - Title 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item:	**SRD for RTTT and other vehicle or fixed installation**
Model name:	**ARS6-A**
FCC ID:	**OAYARS6A**
Frequency:	76.0 – 77.0 GHz
Antenna:	Integrated 3D antenna
Power supply:	6.5 V to 19.0 V DC by external power supply
Temperature range:	-40°C to +85°C

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorized:

M. Walla

cn=Meheza Walla, o=cetecom advanced GmbH, ou=WAL-230706, email=Meheza.Walla@cetecomadvanced.com, c=DE
2024.01.05 13:15:50 +01'00'

Meheza Walla
Lab Manager
Radio Labs

Test performed:

Thomas Vogler

cn=Thomas Vogler, o=cetecom advanced GmbH, ou=VOG-230609, email=thomas.vogler@cetecomadvanced.com, c=DE
2024.01.05 12:52:54 +01'00'

Thomas Vogler
Lab Manager
Radio Labs

1 Table of contents

2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CTC advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.
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This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

2.2 Application details

Date of receipt of order:	2023-12-01
Date of receipt of test item:	2023-11-20
Start of test:*	2023-11-20
End of test:*	2024-01-03
Person(s) present during the test:	Mr. Dirk Voellmecke (during set-up)

*Date of each measurement, if not shown in the plot, can be requested. Dates are stored in the measurement software.

2.3 Test laboratories sub-contracted

None

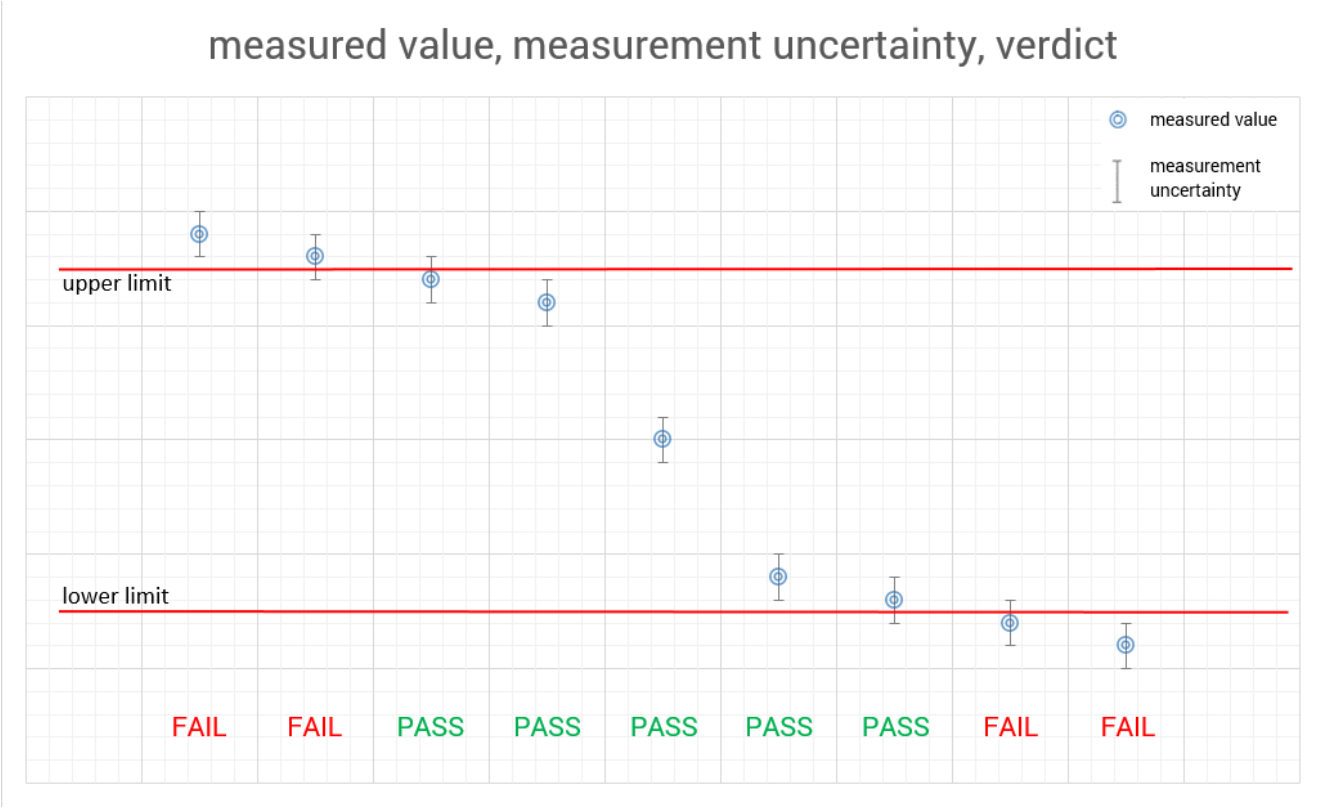
3 Test standard/s, references and accreditations

Test standard	Date	Description
FCC - Title 47 CFR Part 95	-/-	FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 95 - Personal Radio Services
FCC - Title 47 CFR Part 2	-/-	Frequency allocations and radio treaty matters; general rules and regulations

Guidance	Version	Description
ANSI C63.4-2014	-/-	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10-2013	-/-	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.26-2015	-/-	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
KDB 653005 D01	v01r01 2019-04	Equipment Authorization Guidance for 76-81 GHz Radar Devices

4 Reporting statements of conformity – decision rule

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3.
The measurement uncertainty is mentioned in this test report, see chapter 9, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong."



5 Test environment

Temperature	:	T_{nom} T_{max} T_{min}	+22 °C during room temperature tests +85 °C during high temperature tests -40 °C during low temperature tests
Relative humidity content	:		55 %
Barometric pressure	:		1021 hpa
Power supply	:	V_{nom} V_{max} V_{min}	12.0 V DC by external power supply 19.0 V 6.5 V

6 Test item

6.1 General description

Kind of test item	:	SRD for RTTT and other vehicle or fixed installation
Model name	:	ARS6-A
S/N serial number	:	A2C782601090000G23A0400009 (DUT_43)
Hardware status	:	C1
Software status	:	23.41.101
Frequency band	:	76.0 – 77.0 GHz
Type of modulation	:	FMCW
Antenna	:	Integrated 3D antenna
Power supply	:	6.5 to 19.0 V DC by external power supply
Temperature range	:	-40°C to +85°C

6.2 Additional information

Operating modes as declared by the manufacturer:

HVM_mode_ID	Fcenter [GHz]	Info	Bandwidth [MHz]
03	76.492	Operation	917.7
09		Operation	912.3
15		Operation	733.4
21		Operation	829.9
27		Operation	917.7
39		Operation	912.3
51		Operation	733.4
63		Operation	829.9
80		EoL/Service	801.0

Tests were performed on all modulations

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup and EUT photos are included in test report: 1-6942/23-01-01_AnnexA
1-6942/23-01-01_AnnexB
1-6942/23-01-01_AnnexD

7 Description of the test setup

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, RF generating and signaling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

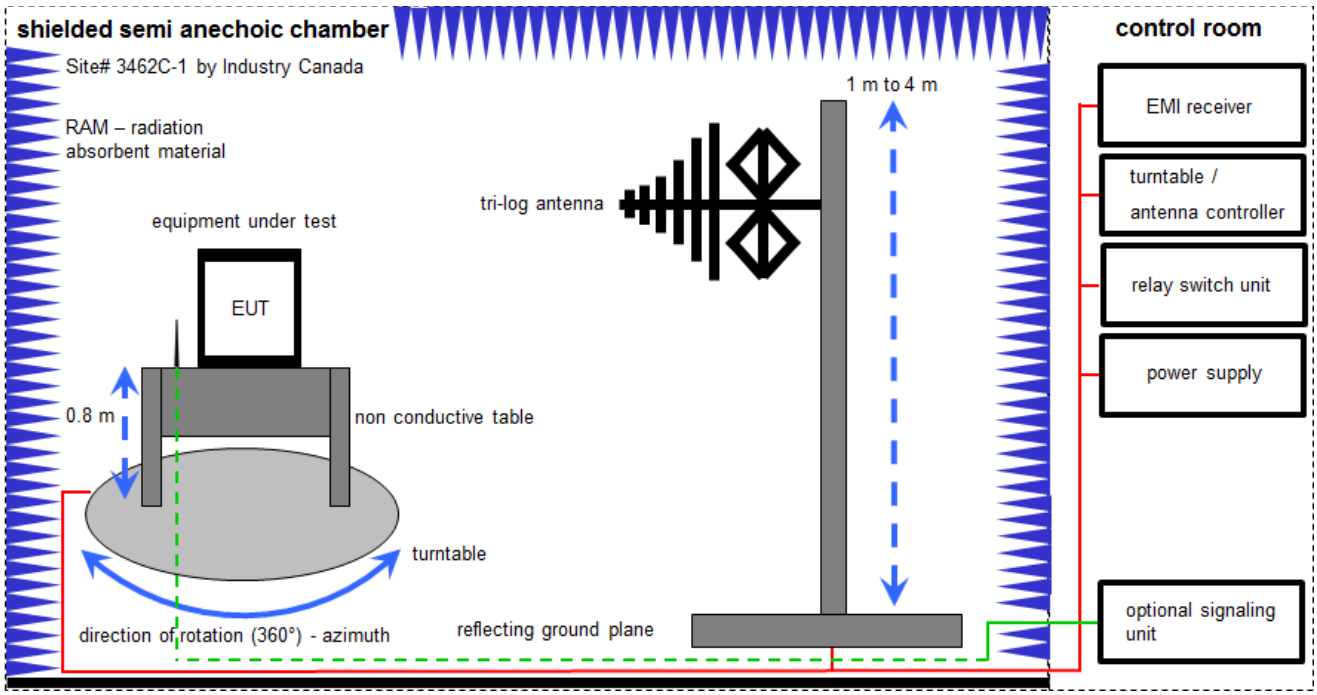
In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

Agenda: Kind of Calibration

k	calibration / calibrated		EK	limited calibration
ne	not required (k, ev, izw, zw not required)		zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification		izw	internal cyclical maintenance
Ve	long-term stability recognized		g	blocked for accredited testing
vlkl!	Attention: extended calibration interval			
NK!	Attention: not calibrated		*)	next calibration ordered / currently in progress

7.1 Shielded semi anechoic chamber

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 30 MHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are conform to specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Measurement distance: tri-log antenna 10 meter

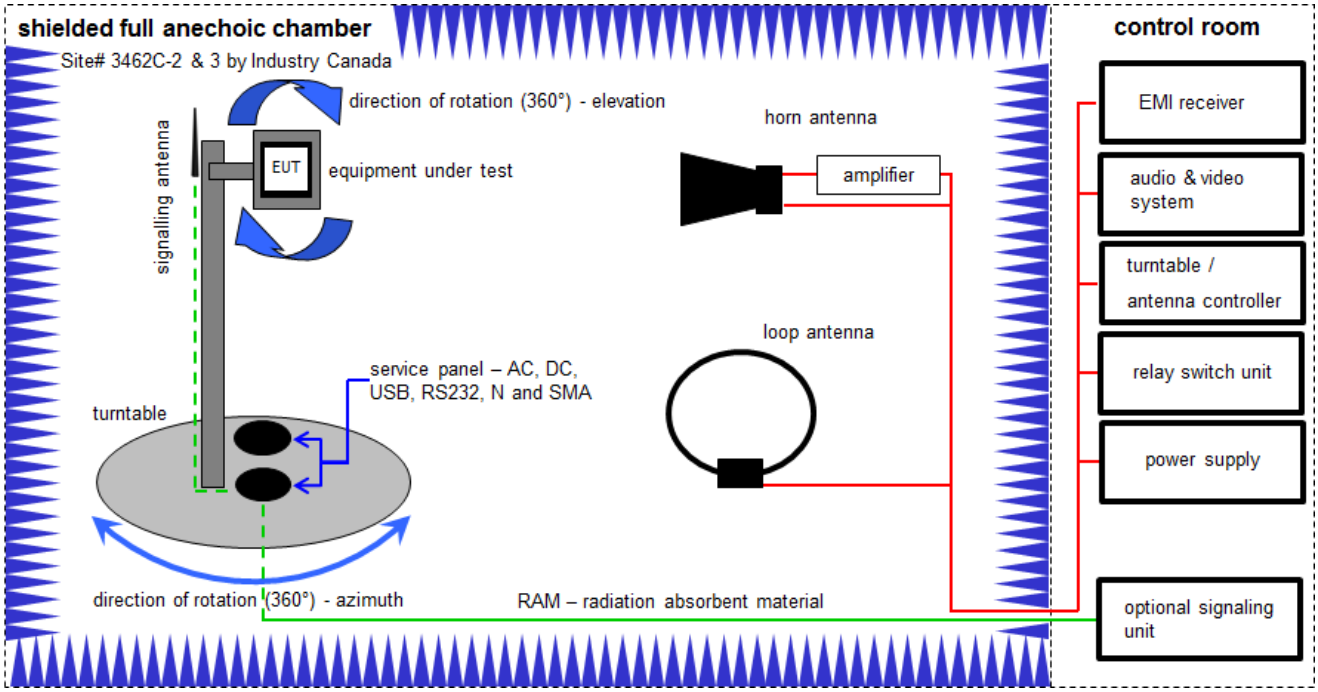
FS = UR + CL + AF
(FS-field strength; UR-voltage at the receiver; CL-loss of the cable; AF-antenna factor)

Example calculation:
FS [dBµV/m] = 12.35 [dBµV/m] + 1.90 [dB] + 16.80 [dB/m] = 31.05 [dBµV/m] (35.69 µV/m)

Equipment table:

No.	Lab / Item	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	Switch-Unit	3488A	HP	2719A14505	300000368	ev	-/-	-/-
2	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP	2920A04466	300000580	ne	-/-	-/-
3	n. a.	Meßkabine 1	HF-Absorberhalle	MWB AG 300023		300000551	ne	-/-	-/-
4	n. a.	EMI Test Receiver	ESCI 3	R&S	101240	300003312	k	14.12.2022	31.12.2023
5	n. a.	Antenna Tower	Model 2175	ETS-Lindgren	64762	300003745	izw	-/-	-/-
6	n. a.	Positioning Controller	Model 2090	ETS-Lindgren	64672	300003746	izw	-/-	-/-
7	n. a.	Turntable Interface-Box	Model 105637	ETS-Lindgren	44583	300003747	izw	-/-	-/-
8	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck Mess - Elektronik	216	300003288	vIKI!	31.08.2023	31.08.2025
9	n. a.	Switch-Unit	3488A	HP	2719A14505	300000368	ev	-/-	-/-
10	n. a.	EMI Test Receiver	ESR3	Rohde & Schwarz	102587	300005771	k	20.05.2022	31.12.2023

7.2 Shielded fully anechoic chamber



Measurement distance: horn antenna 3 meter; loop antenna 3 meter / 1 meter

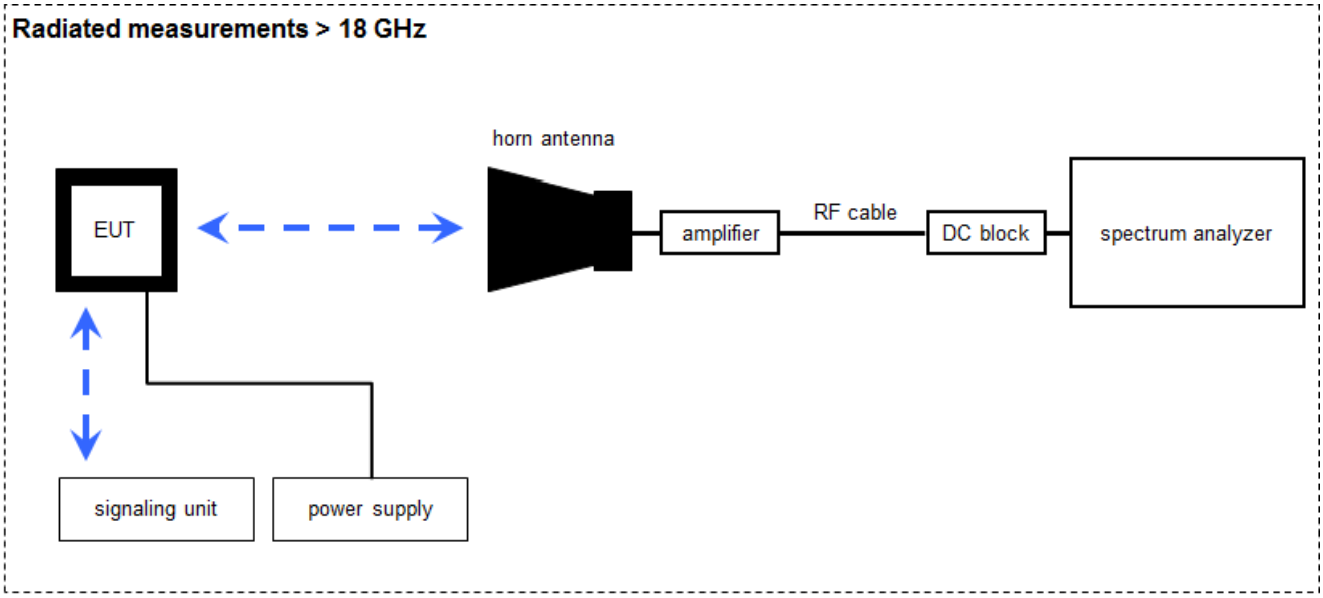
FS = UR + CA + AF
(FS-field strength; UR-voltage at the receiver; CA-loss of the signal path; AF-antenna factor)

Example calculation:
FS [dBµV/m] = 40.0 [dBµV/m] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dBµV/m] (71.61 µV/m)

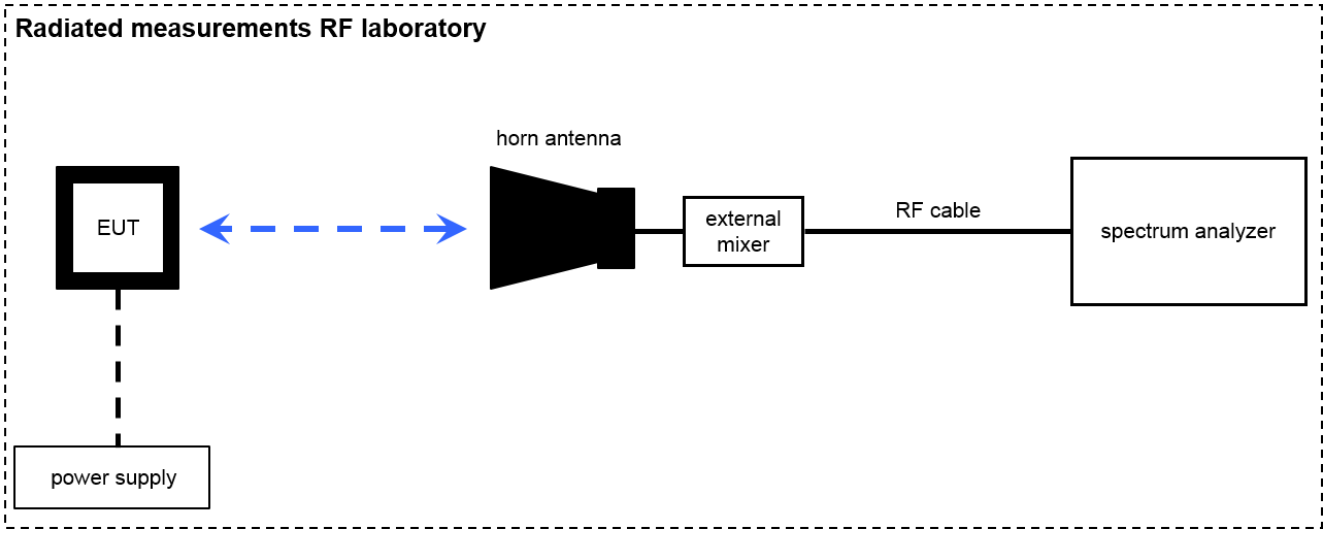
Equipment table:

No.	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	9107-3696	300001604	vIKI!	20.03.2023	19.03.2025
2	Highpass Filter	WHK1.1/15G-10SS	Wainwright	37	400000148	ne	-/-	-/-
3	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne	-/-	-/-
4	Band Reject Filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	26	300003792	ne	-/-	-/-
5	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck Mess - Elektronik	295	300003787	vIKI!	23.05.2023	31.05.2025
6	Broadband Amplifier 0.5-18 GHz	CBLU5184540	CERNEX	22051	300004483	ev	-/-	-/-
7	4U RF Switch Platform	L4491A	Agilent Technologies	MY50000032	300004510	ne	-/-	-/-
8	NEXIO EMV-Software	BAT EMC V2022.0.22.0	Nexio	-/-	300004682	ne	-/-	-/-
9	Anechoic chamber	-/-	TDK	-/-	300003726	ne	-/-	-/-
10	EMI Test Receiver 9kHz-26,5GHz	ESR26	Rohde & Schwarz	101376	300005063	k	13.12.2022	31.12.2023

7.3 Radiated measurements > 18 GHz



7.4 Radiated measurements > 50/85 GHz



OP = AV + D - G
(OP-rad. output power; AV-analyzer value; D-free field attenuation of measurement distance; G-antenna gain)

Example calculation:
OP [dBm] = -54.0 [dBm] + 64.0 [dB] - 20.0 [dBi] = -10 [dBm] (100 µW)

Note: conversion loss of mixer is already included in analyzer value.

Equipment table:

No.	Lab / Item	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	n.a.	Horn Antenna 18,0-40,0 GHz	LHAF180	Microw.Devel	39180-103-021	300001747	vlKl!	17.01.2022	31.01.2024
2	n. a.	Std. Gain Horn Antenna 18.0-26.5 GHz	638	Narda		300000486	vlKl!	17.01.2022	31.01.2024
3	n. a.	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	82-16	300000510	vlKl!	17.01.2022	31.01.2024
4	n.a.	Std. Gain Horn Antenna 40-60 GHz	2424-20	Flann	76	400001981	ne	-/-	-/-
5	n. a.	Std. Gain Horn Antenna 49.9-75.8 GHz	2524-20	Flann	*	300001983	ne	-/-	-/-
6	n. a.	Std. Gain Horn Antenna 60-90 GHz	COR 60_90	Thomson CSF		300000814	ev	-/-	-/-
7	n. a.	Std. Gain Horn Antenna 73.8-112 GHz	2724-20	Flann	*	300001988	ne	-/-	-/-
8	n.a.	Std. Gain Horn Antenna 92.3-140 GHz	2824-20	Flann		300001993	ne	-/-	-/-
9	n. a.	Std. Gain Horn Antenna 114-173 GHz	2924-20	Flann	*	300001999	ne	-/-	-/-
10	n. a.	Std. Gain Horn Antenna 145-220 GHz	3024-20	Flann	*	300002000	ne	-/-	-/-
11	n. a.	Std. Gain Horn Antenna 217-330 GHz	32240-20	Flann	233278	300004960	ne	-/-	-/-
12	n. a.	Broadband LNA 18-50 GHz	CBL18503070PN	CERNEX	25240	300004948	ev	09.03.2022	08.03.2024
13	n. a.	Harmonic Mixer 3-Port, 50-75 GHz	FS-Z75	Rohde & Schwarz	101578	300005788	k	19.07.2023	31.07.2024
14	n. a.	Harmonic Mixer 3-Port, 60-90 GHz	FS-Z90	R&S	101555	300004691	k	25.08.2023	31.08.2024
15	n. a.	Harmonic Mixer 3-Port, 75-110 GHz	FS-Z110	R&S	101411	300004959	k	21.07.2023	31.07.2024
16	n.a.	Harmonic Mixer 3-port, 90-140 GHz	FS-Z140	Rohde & Schwarz	101119	300005581	k	03.08.2023	31.08.2024
17	n. a.	Harmonic Mixer 3-Port, 110-170 GHz	FS-Z170	Radiometer Physics GmbH	100014	300004156	k	21.07.2023	31.07.2024
18	n. a.	Harmonic Mixer 3-Port, 140-220 GHz	SAM-220	Radiometer Physics GmbH	200001	300004157	k	02.08.2023	31.08.2024
19	n. a.	Harmonic Mixer 3-Port, 220-325 GHz	SAM-325	Radiometer Physics GmbH	100002	300004158	k	02.08.2023	31.08.2024
20	n. a.	Spectrum Analyzer 2 Hz - 50 GHz	FSW50	R&S	101332	300005935	k	23.03.2023	31.03.2024
20	n. a.	Spectrum Analyzer 2 Hz - 85 GHz	FSW85	R&S	101333	300005568	k	02.08.2023	31.08.2024
21	n.a.	Power Supply	E3632A	Agilent Technologies	MY40001320	400000396	ev	14.12.2021	31.12.2024
22	n. a.	Temperature Test Chamber	T-40/50	CTS GmbH	064023	300003540	ev	09.05.2022	31.05.2024

8 Sequence of testing

8.1 Sequence of testing radiated spurious 9 kHz to 30 MHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, it is placed on a table with 0.8 m height.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

Premeasurement*

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1 m.
- At each turntable position the analyzer sweeps with positive-peak detector to find the maximum of all emissions.

Final measurement

- Identified emissions during the pre-measurement are maximized by the software by rotating the turntable from 0° to 360°.
- Loop antenna is rotated about its vertical axis for maximum response at each azimuth about the EUT. (For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT)
- The final measurement is done in the position (turntable and elevation) causing the highest emissions with quasi-peak (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. A plot with the graph of the premeasurement and the limit is stored.

*)Note: The sequence will be repeated three times with different EUT orientations.

8.2 Sequence of testing radiated spurious 30 MHz to 1 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 10 m or 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 m to 3 m.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximize the peaks by changing turntable position ± 45° and antenna height between 1 and 4 m.
- The final measurement is done with quasi-peak detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

8.3 Sequence of testing radiated spurious 1 GHz to 18 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a 2-axis positioner with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 m.
- At each turntable position and antenna polarization the analyzer sweeps with positive peak detector to find the maximum of all emissions.

Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximizes the peaks by rotating the turntable from 0° to 360°. This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps) and for both antenna polarizations.
- The final measurement is done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

8.4 Sequence of testing radiated spurious above 18 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet.
- The measurement distance is as appropriate (e.g. 0.5 m).
- The EUT is set into operation.

Premeasurement

- The test antenna is handheld and moved carefully over the EUT to cover the EUT's whole sphere and different polarizations of the antenna.

Final measurement

- The final measurement is performed at the position and antenna orientation causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement and the limit is stored.

8.5 Sequence of testing radiated spurious above 50/85 GHz with external mixers

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet.
- The measurement distance is as appropriate for far field (e.g. 0.25 m).
- The EUT is set into operation.

Premeasurement

- The test antenna with external mixer is handheld and moved carefully over the EUT to cover the EUT's whole sphere and different polarizations of the antenna.
- Caution is taken to reduce the possible overloading of the external mixer.

Final measurement

- The final measurement is performed at the position and antenna orientation causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- As external mixers may generate false images care is taken to ensure that any emission measured by the spectrum analyzer does indeed originate in the EUT. Signal identification feature of spectrum analyzer is used to eliminate false mixer images (i.e., it is not the fundamental emission or a harmonic falling precisely at the measured frequency).
- Final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement and the limit is stored.

9 Measurement uncertainty

Test case	Uncertainty
Equivalent isotropically radiated power (e.i.r.p.)	Conducted value ± 1 dB Radiated value ± 3 dB
Permitted range of operating frequencies	± 100 kHz
Conducted unwanted emissions in the spurious domain (up to 40 GHz)	± 1 dB
Radiated unwanted emissions in the spurious domain (up to 40 GHz)	± 3 dB
Conducted unwanted emissions in the spurious domain (40 to 50 GHz)	± 4 dB
Radiated unwanted emissions in the spurious domain (40 to 50 GHz)	± 4 dB
Conducted unwanted emissions in the spurious domain (50 to 300 GHz)	± 5 dB
Radiated unwanted emissions in the spurious domain (50 to 300 GHz)	± 5 dB
DC and low frequency voltages	± 3 %
Temperature	± 1 °C
Humidity	± 3 %

10 Far field consideration for measurements above 18 GHz

Far field distance calculation:

$D_{ff} = 2 \times D^2 / \lambda$

with
D_{ff} Far field distance
D Antenna dimension
λ wavelength

Spurious emission measurements:

Antenna frequency Range in GHz	Highest measured frequency in GHz	D in cm	λ in cm	D_{ff} in cm
18-26	26	3.4	1.15	20.04
26-40	40	2.2	0.75	12.91
40-50	50	2.77	0.60	25.58
50-75	75	1.85	0.40	17.11
75-110	110	1.24	0.27	11.28
90-140	140	1.02	0.22	9.72
110-170	170	0.85	0.18	8.19
140-220	220	0.68	0.14	6.78
220-325	325	0.43	0.09	4.01
325-500	500	0.26	0.06	2.22

11 Summary of measurement results

11.1 Summary

☒	**No deviations from the technical specifications were ascertained**
☐	There were deviations from the technical specifications ascertained
☐	This test report is only a partial test report. The content and verdict of the performed test cases are listed below.

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	47 CFR Part 95 Subpart M	see below	2024-01-05	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	Pass	Fail	NA	NP	Remark
§2.1046 §95.3367 (a) / (b)	Radiated power	Nominal	Nominal	☒	☐	☐	☐	complies
§2.1047	Modulation characteristics	-/-	-/-	☒	☐	☐	☐	complies
§2.1049	Occupied bandwidth (99% bandwidth)	Nominal	Nominal	☒	☐	☐	☐	complies
§2.1051	Spurious emissions at antenna terminals	Nominal	Nominal	☒	☐	☐	☐	See note
§2.1053 §95.3379 (a)(1) §95.3379 (a)(2) §95.3379 (a)(3)	Field strength of emissions (radiated spurious)	Nominal	Nominal	☒	☐	☐	☐	complies
§2.1055 §95.3379 (b)	Frequency stability	Nominal and Extreme	Nominal and Extreme	☒	☐	☐	☐	complies

Note: C = Compliant; NC = Not compliant; NA = Not applicable; NP = Not performed

See FCC's Millimeter Wave Test Procedures:
I. A radiated method of measurements in order to demonstrate compliance with the various regulatory requirements has been chosen in consideration of test equipment availability and the limitations of many external harmonic mixers. A conducted method of measurement could be employed if EUT and mixer waveguides both are accessible and of the same type (WG number) and if waveguide sections and transitions can be found. Another potential problem is that the peak power output of devices operating under Sections 15.253 and 15.255 may exceed the +20 dBm input power limit of many commercially available mixers. For these reasons a radiated method is preferred.

12 Measurement results

12.1 Radiated power

Description:

§95.3367:
The fundamental radiated emission limits within the 76-81 GHz band are expressed in terms of Equivalent Isotropically Radiated Power (EIRP) and are as shown below.

Limits: **FCC §95.3367 (a) (b)/ RSS-251 (5.2.2)**

Frequency	Limit (eirp)
76.0 - 81.0 GHz	50 dBm (Average)
	55 dBm/MHz (PEAK)

Measurement: Average Power

Measurement parameter	
Detector:	RMS
Sweep time:	120 s
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Trace-Mode:	Clear Write
Measurement distance:	2 m

Measurement: **Peak Power**

Measurement parameter	
Detector:	Pos-Peak
Sweep time:	120 s
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Trace-Mode:	Max Hold
Measurement distance:	2 m

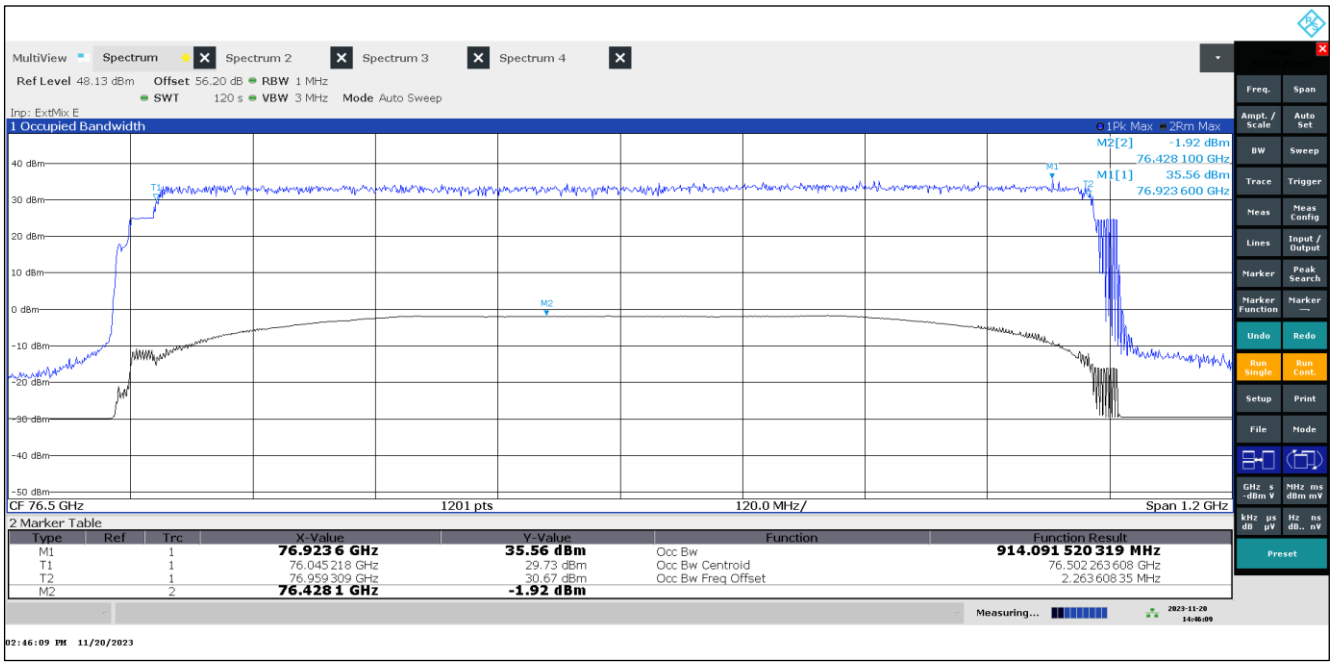
Measurement results:

Modulations / Test conditions		Radiated Peak Power (eirp) [dBm]	Radiated Mean Power (eirp) / Channel power [dBm]
03	T_{nom} / $V_{min-max}$	35.56	26.16
	T_{min} / $V_{min-max}$	35.80	26.86
	T_{max} / $V_{min-max}$	32.54	24.94
09	T_{nom} / $V_{min-max}$	35.49	26.20
	T_{min} / $V_{min-max}$	36.13	26.89
	T_{max} / $V_{min-max}$	34.35	24.93
15	T_{nom} / $V_{min-max}$	35.67	26.19
	T_{min} / $V_{min-max}$	36.58	26.91
	T_{max} / $V_{min-max}$	36.28	24.95
21	T_{nom} / $V_{min-max}$	35.47	26.20
	T_{min} / $V_{min-max}$	36.43	26.89
	T_{max} / $V_{min-max}$	34.35	24.93
27	T_{nom} / $V_{min-max}$	32.56	22.99
	T_{min} / $V_{min-max}$	31.72	23.31
	T_{max} / $V_{min-max}$	29.40	20.51
39	T_{nom} / $V_{min-max}$	32.79	23.01
	T_{min} / $V_{min-max}$	32.65	23.32
	T_{max} / $V_{min-max}$	29.59	20.51
51	T_{nom} / $V_{min-max}$	32.37	22.99
	T_{min} / $V_{min-max}$	32.83	23.33
	T_{max} / $V_{min-max}$	30.12	20.55
63	T_{nom} / $V_{min-max}$	32.37	23.01
	T_{min} / $V_{min-max}$	32.85	23.31
	T_{max} / $V_{min-max}$	29.88	20.55
80	T_{nom} / $V_{min-max}$	31.73	23.02
	T_{min} / $V_{min-max}$	31.60	23.28
	T_{max} / $V_{min-max}$	29.96	20.57

Note: Voltage variation does not affect the radiated signal

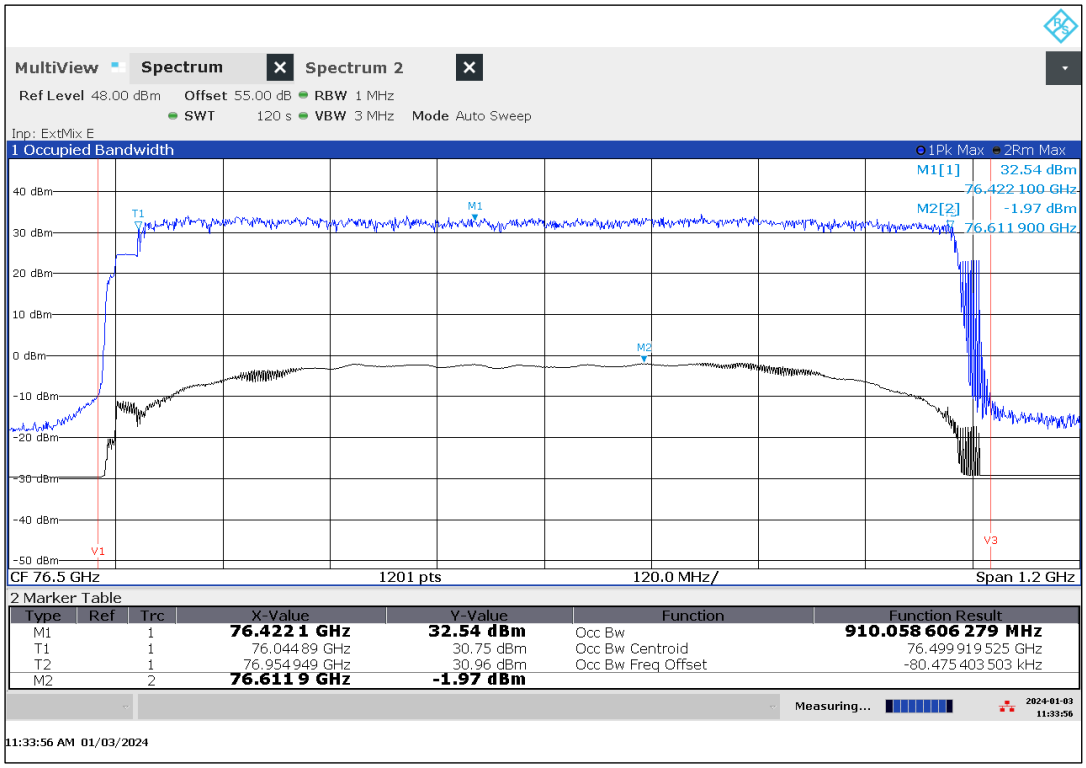
Verdict: **Compliant**

Plot 1: OBW, Mode 03, T_{nom} / $V_{min-max}$

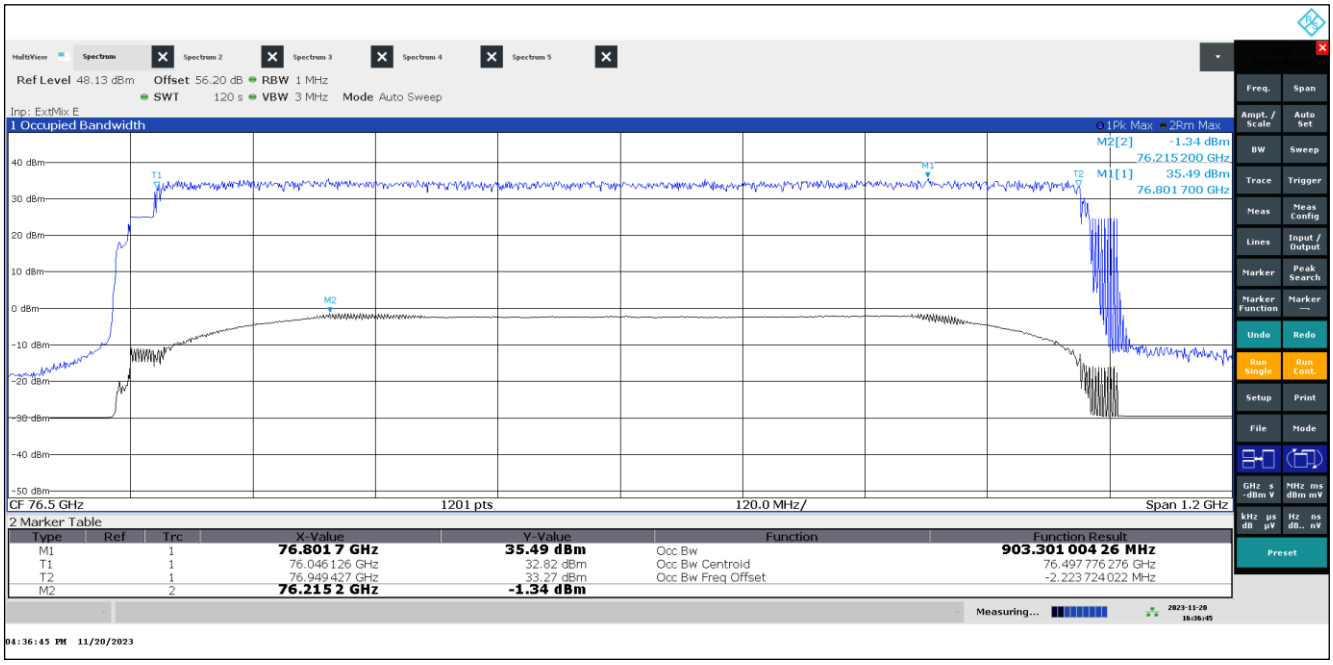


Plot 2: OBW, Mode 03, T_{min} / $V_{min-max}$

Plot 3: OBW, Mode 03, T_{max} / $V_{min-max}$



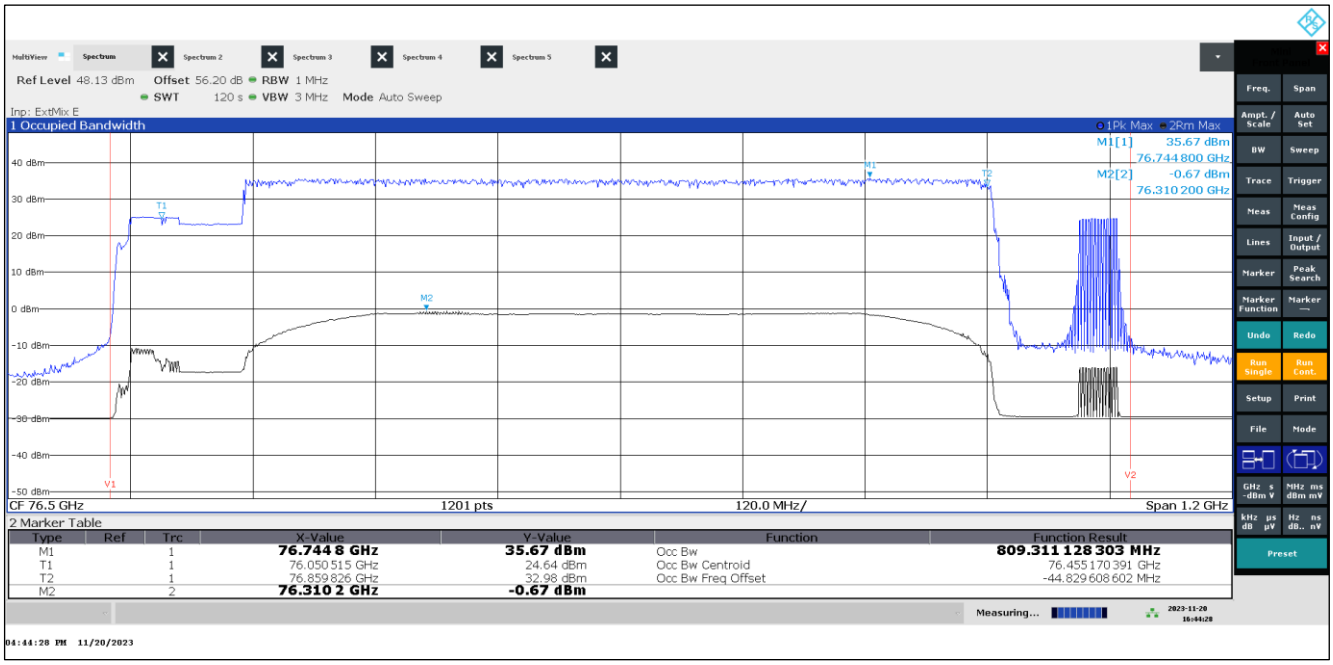
Plot 4: OBW, Mode 09, T_{nom} / $V_{min-max}$



Plot 5: OBW, Mode 09, T_{min} / $V_{min-max}$

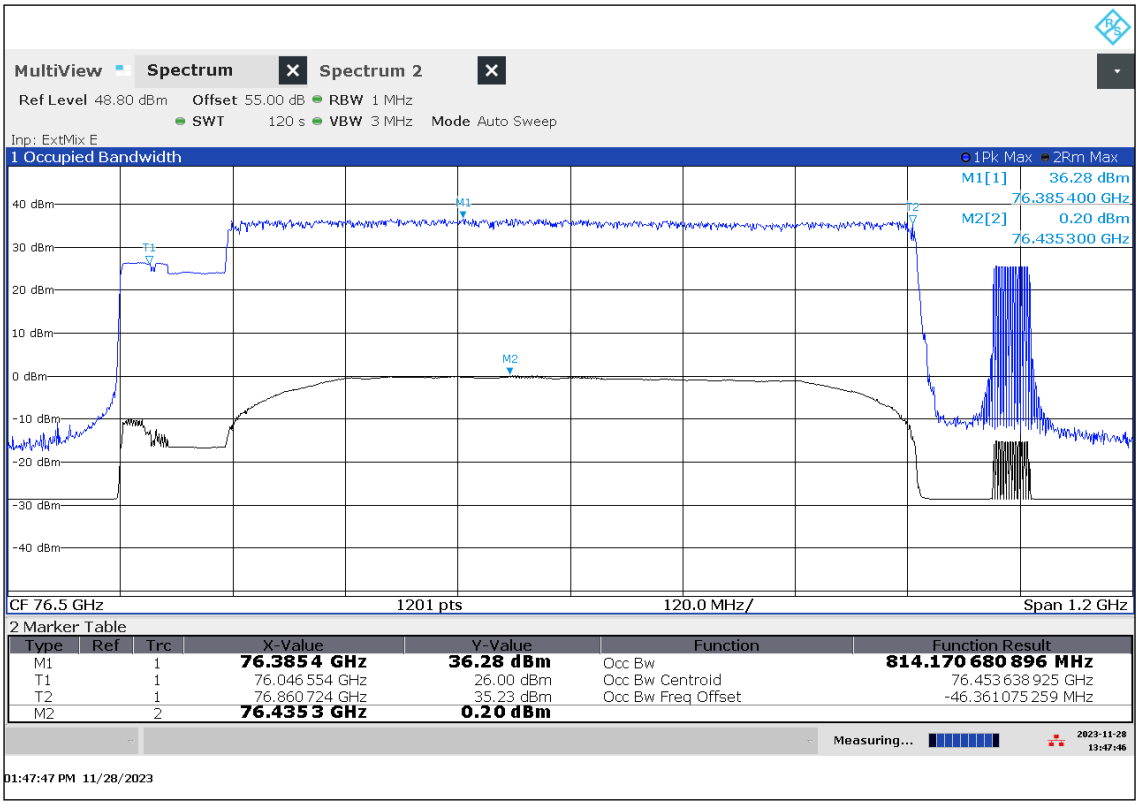
Plot 6: OBW, Mode 09, T_{max} / $V_{min-max}$

Plot 7: OBW, Mode 15, T_{nom} / $V_{min-max}$

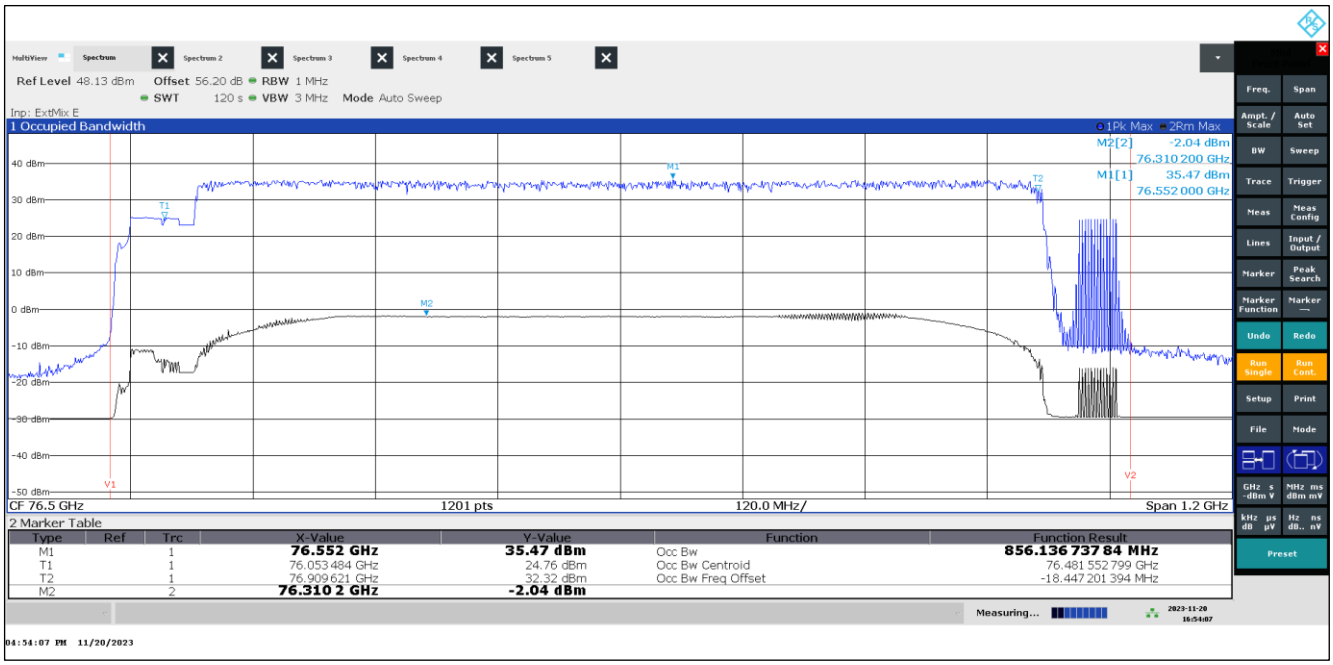


Plot 8: OBW, Mode 15, T_{min} / $V_{min-max}$

Plot 9: OBW, Mode 15, T_{max} / $V_{min-max}$

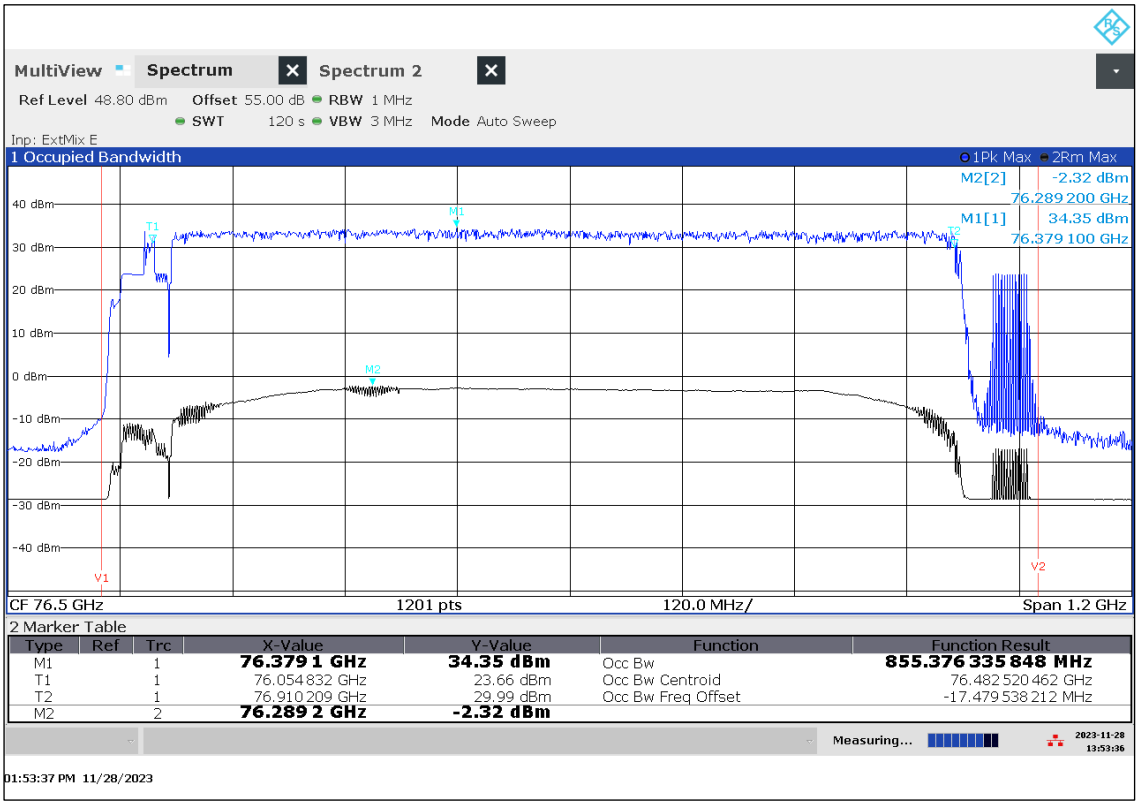


Plot 10: OBW, Mode 21, T_{nom} / $V_{min-max}$

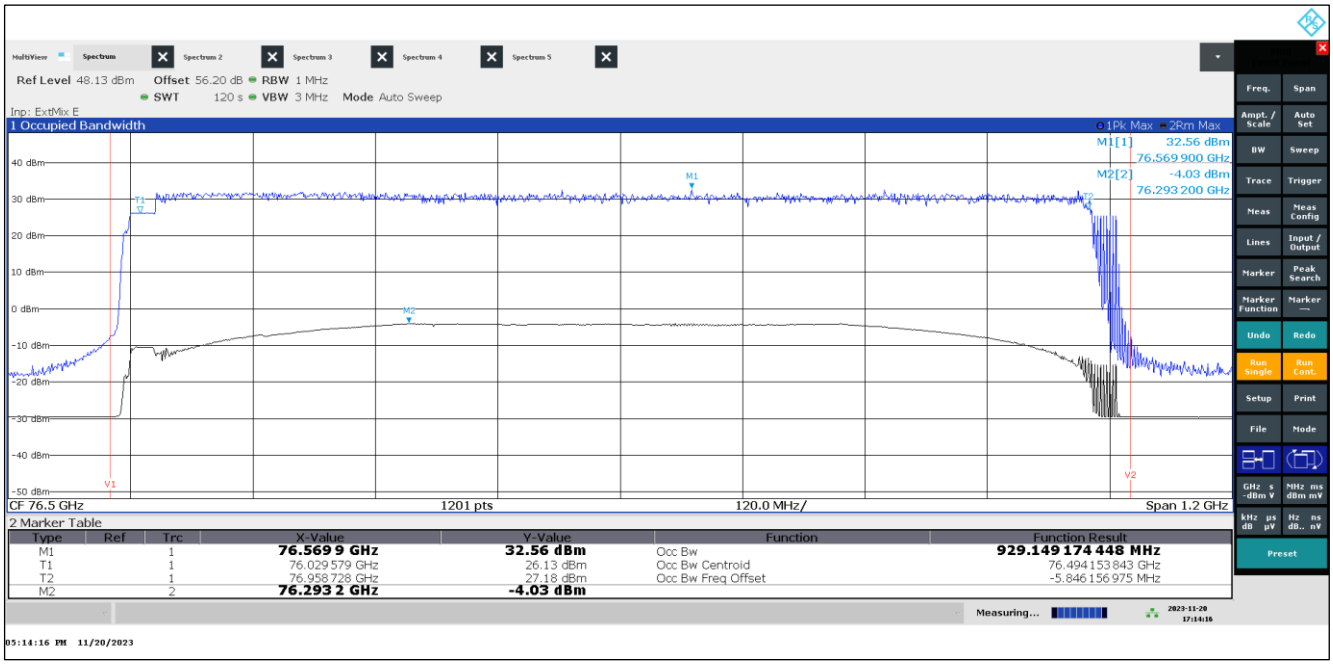


Plot 11: OBW, Mode 21, T_{min} / $V_{min-max}$

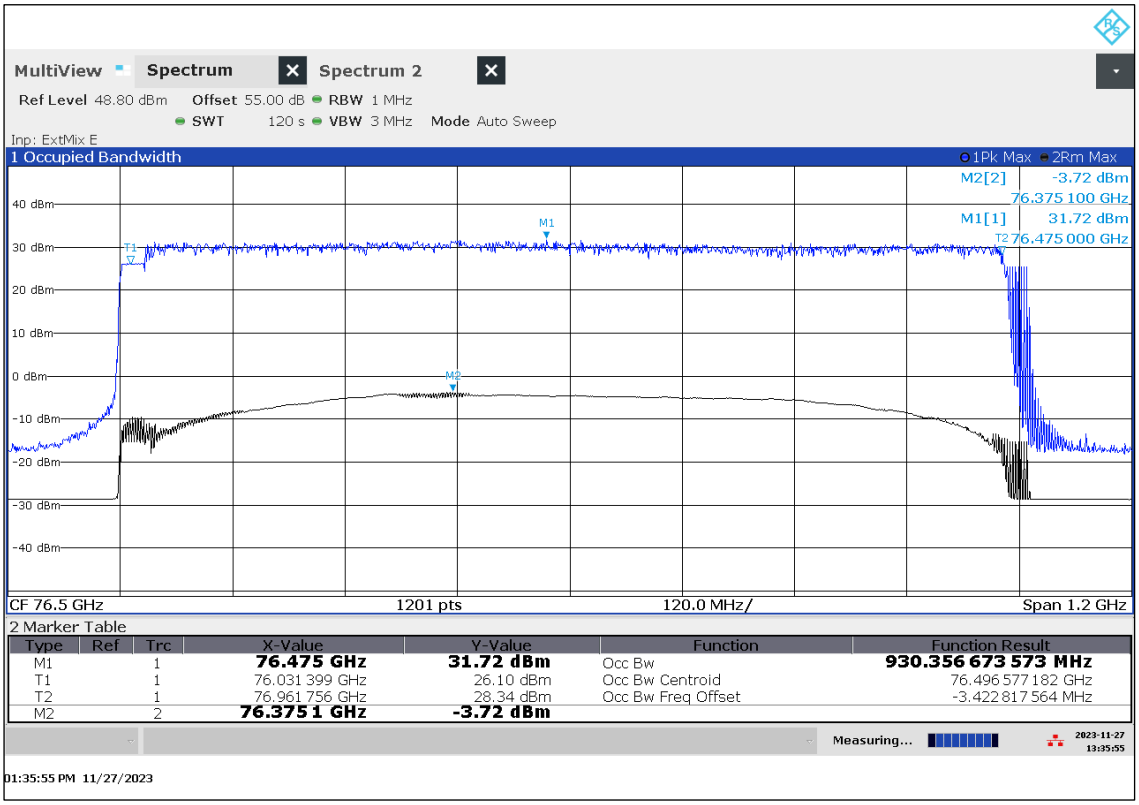
Plot 12: OBW, Mode 21, T_{max} / $V_{min-max}$



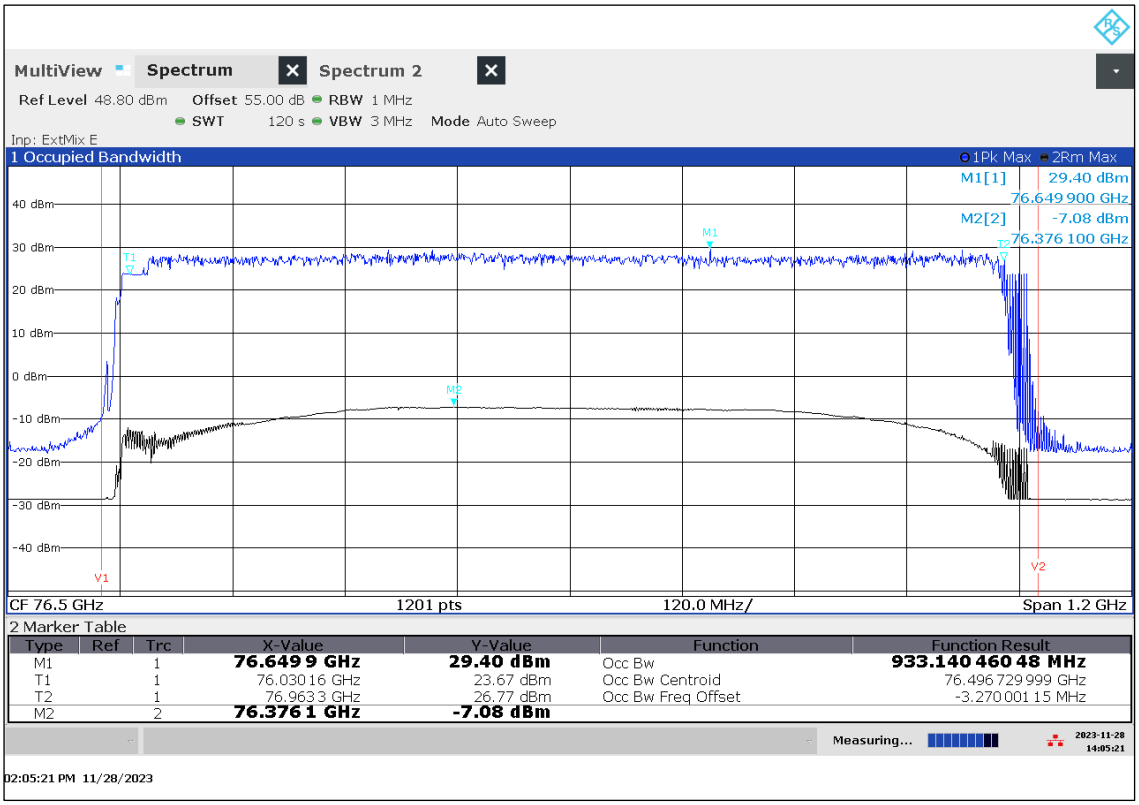
Plot 13: OBW, Mode 27, T_{nom} / $V_{min-max}$



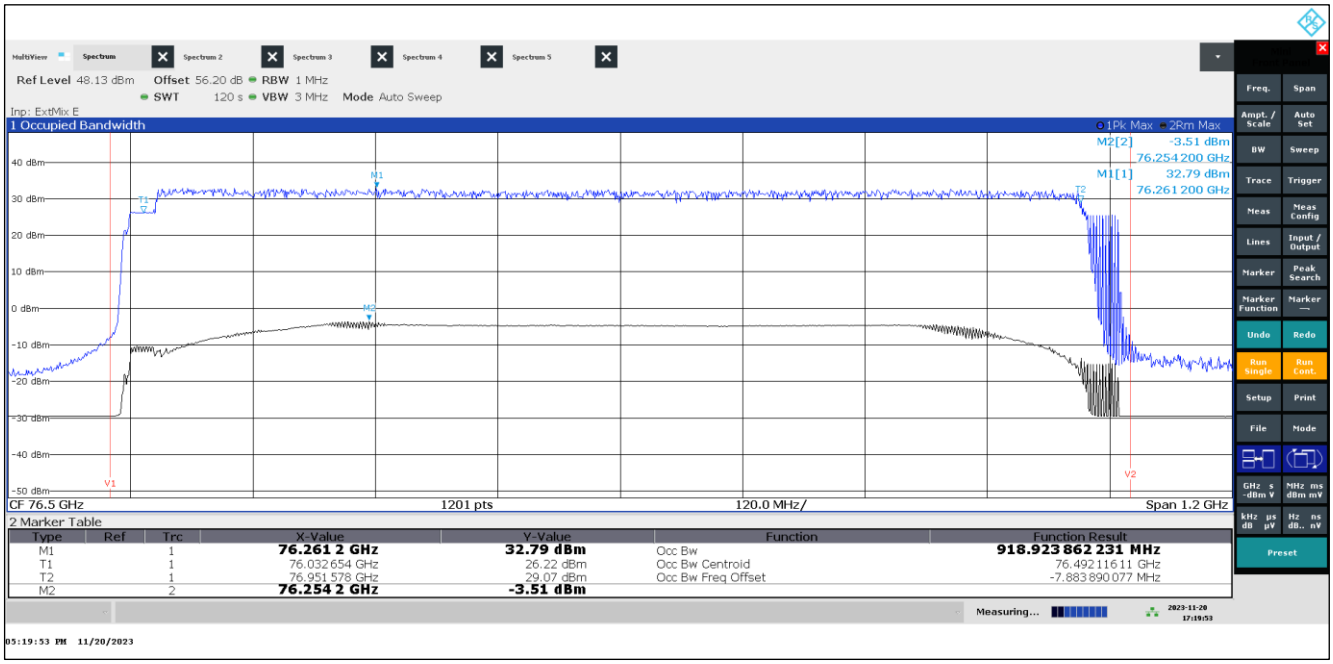
Plot 14: OBW, T_{min} / $V_{min-max}$



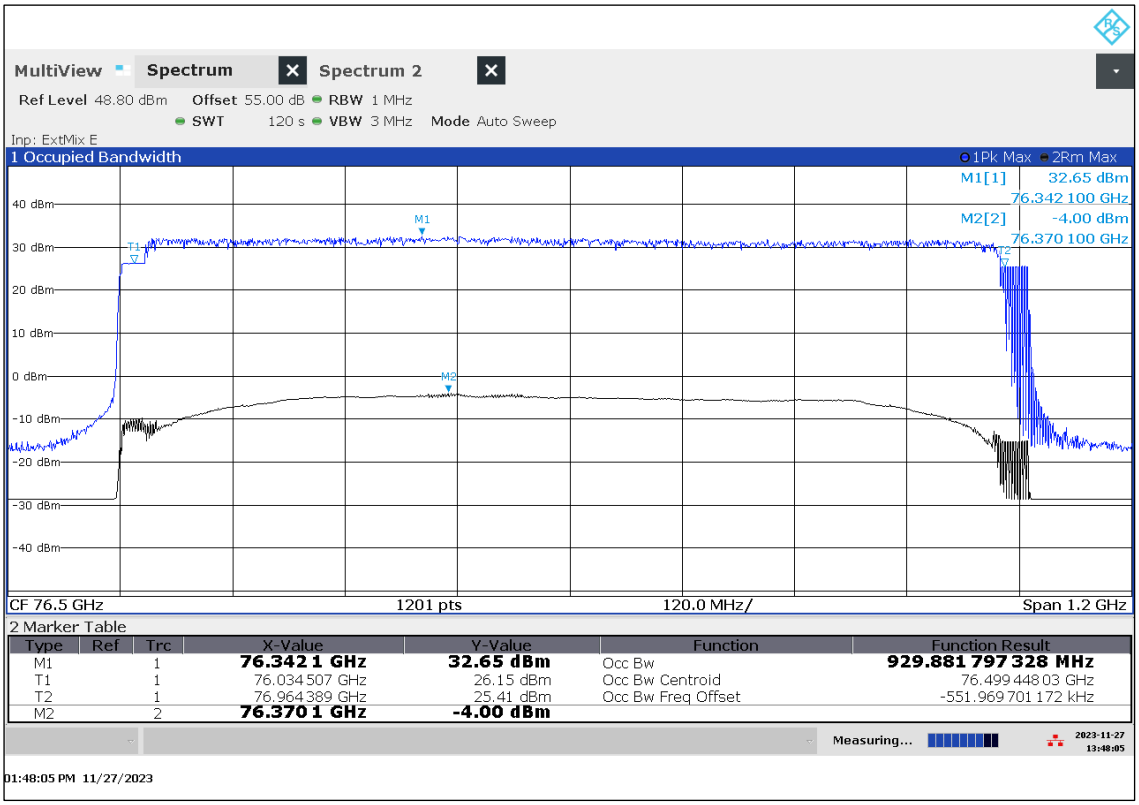
Plot 15: OBW, Mode 27, T_{max} / $V_{min-max}$



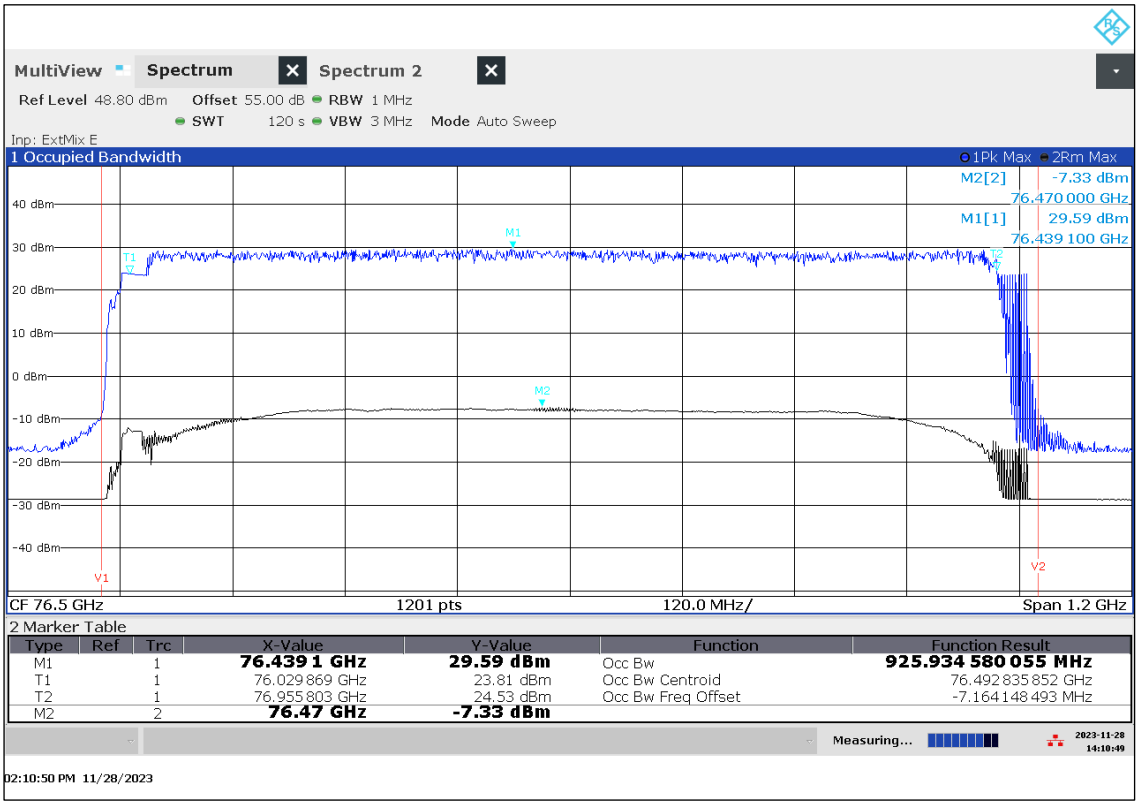
Plot 16: OBW, Mode 39, T_{nom} / $V_{min-max}$



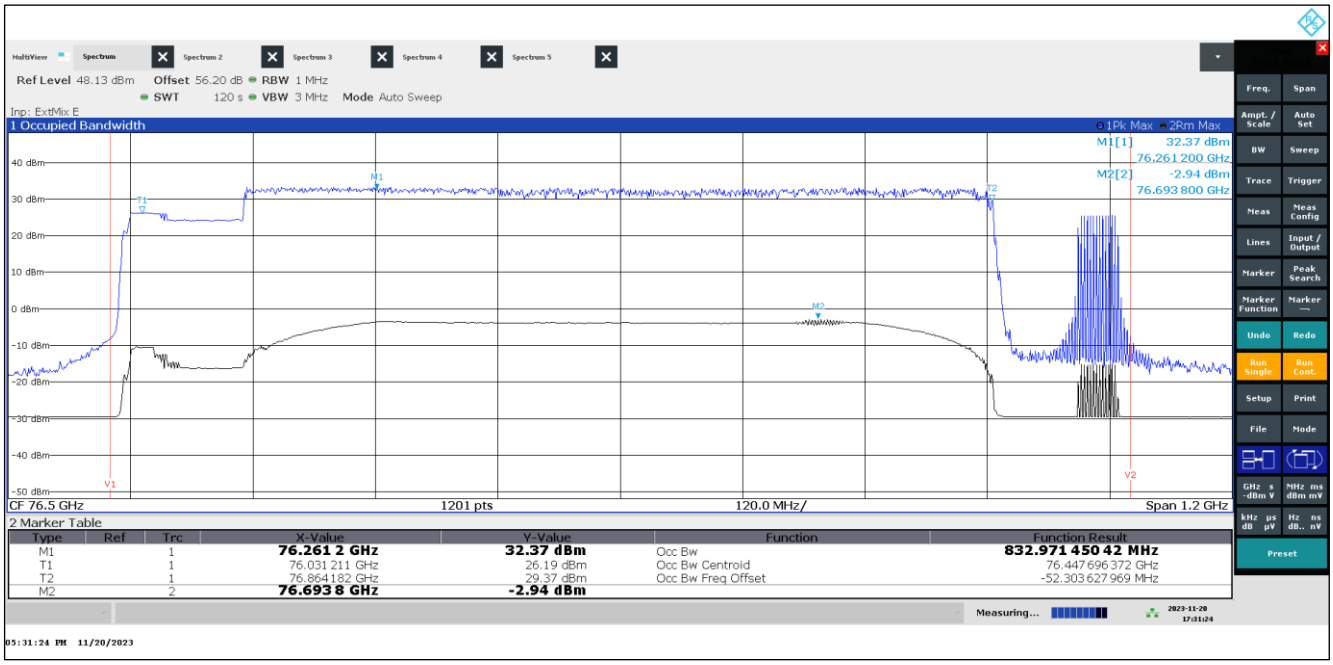
Plot 17: OBW, Mode 39, T_{min} / $V_{min-max}$



Plot 18: OBW, Mode 39, T_{max} / $V_{min-max}$

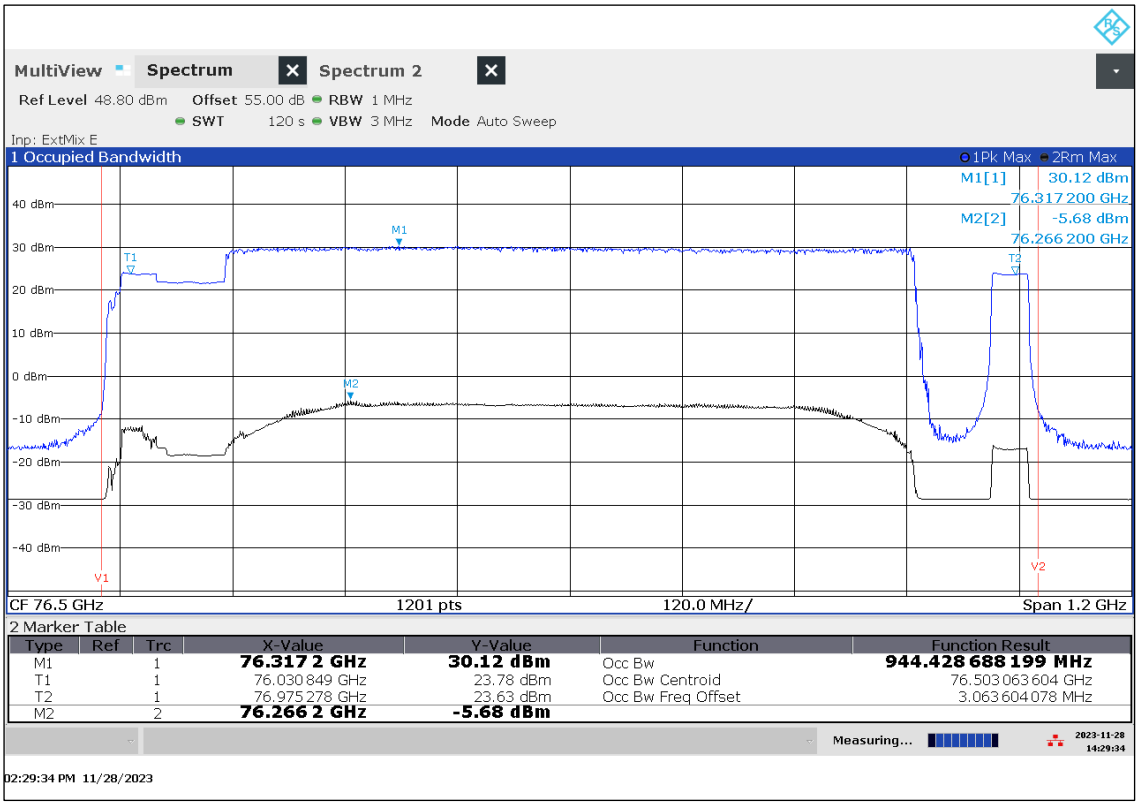


Plot 19: OBW, Mode 51, T_{nom} / $V_{min-max}$

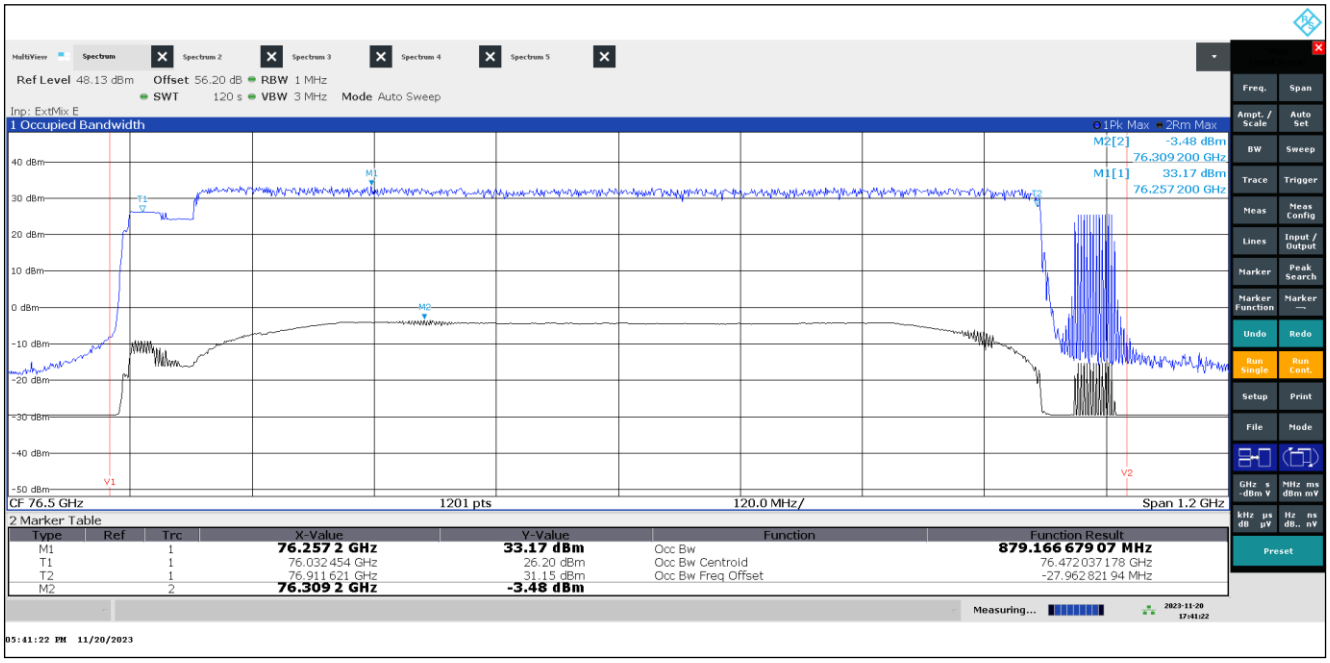


Plot 20: OBW, Mode 51, T_{min} / $V_{min-max}$

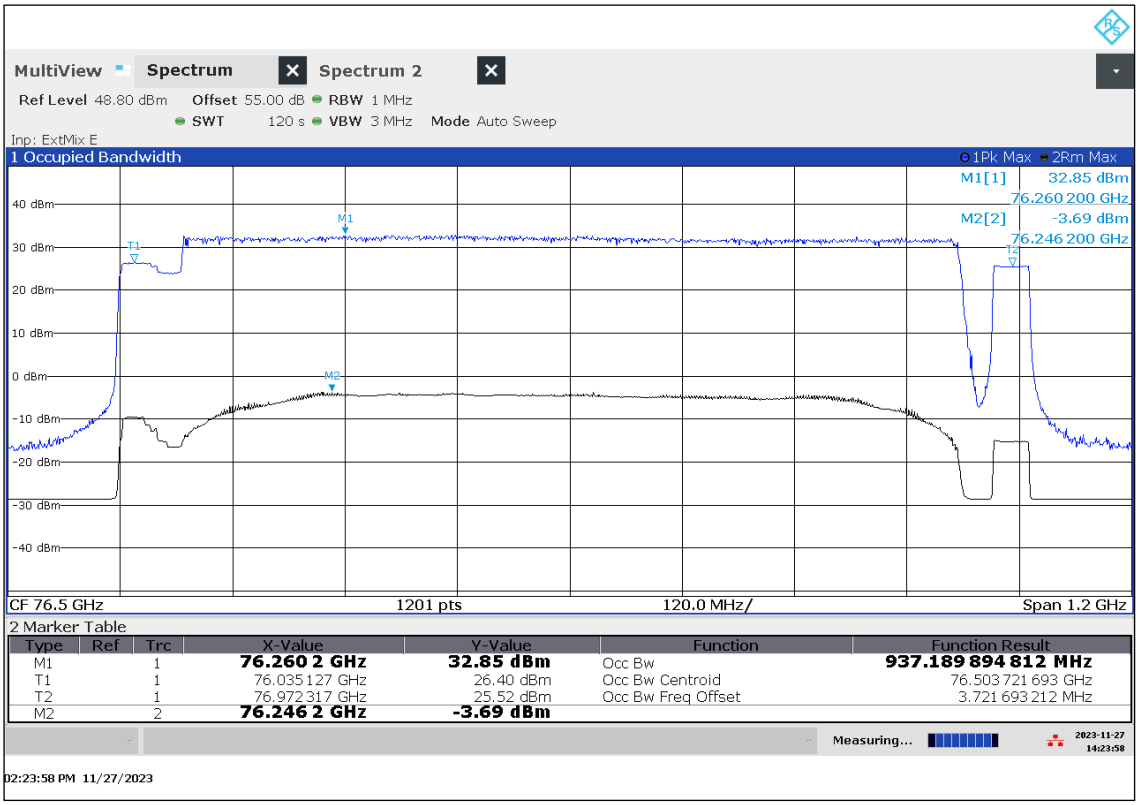
Plot 21: OBW, Mode 51, T_{max} / $V_{min-max}$



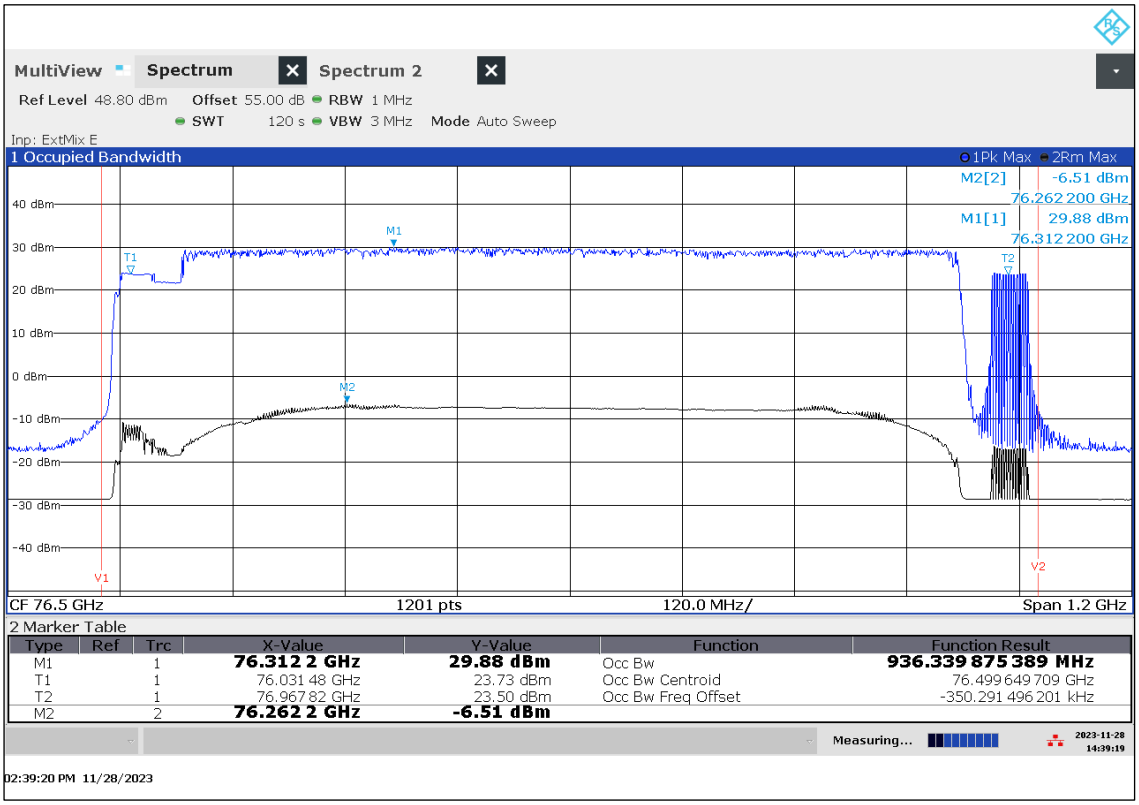
Plot 22: OBW, Mode 63, T_{nom} / $V_{min-max}$



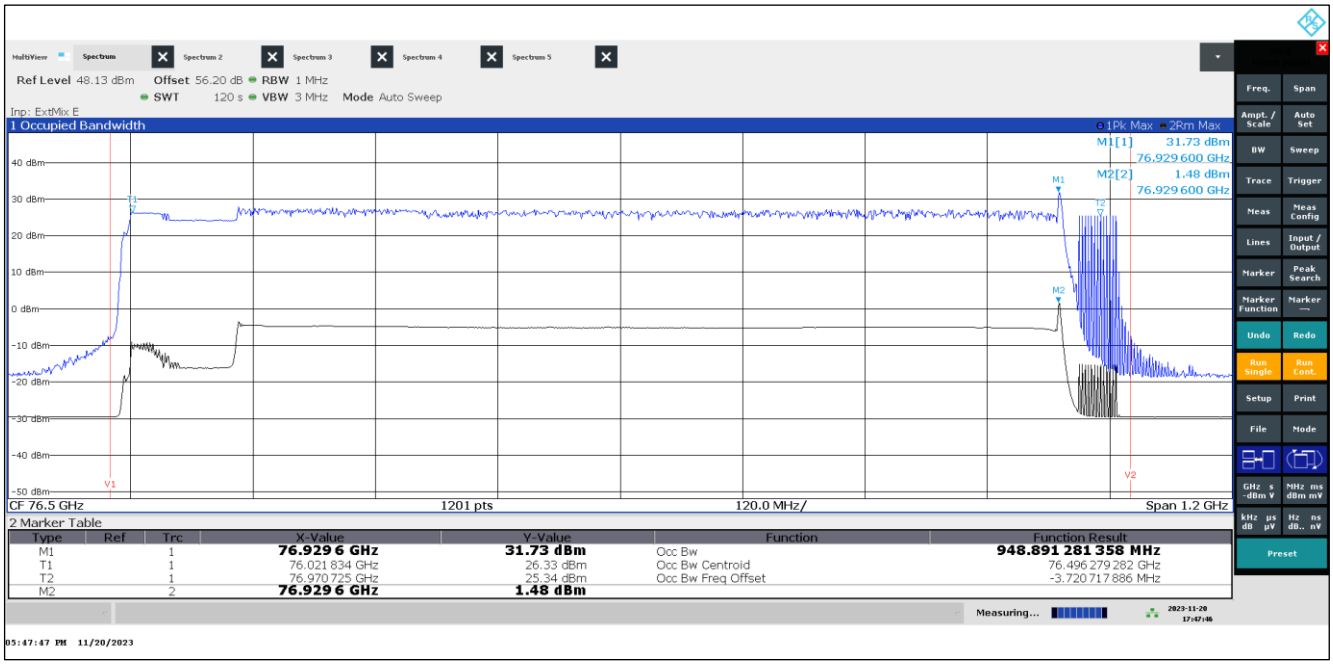
Plot 23: OBW, Mode 63, T_{min} / $V_{min-max}$



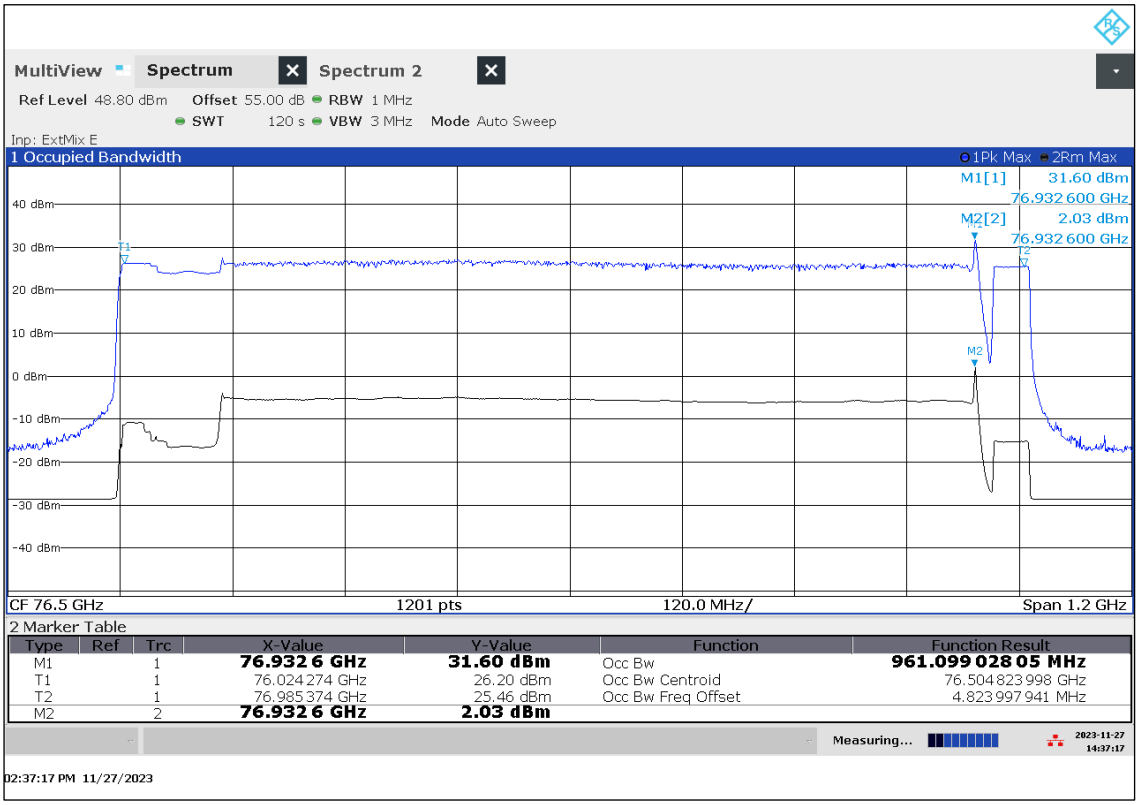
Plot 24: OBW, Mode 63, T_{max} / $V_{min-max}$



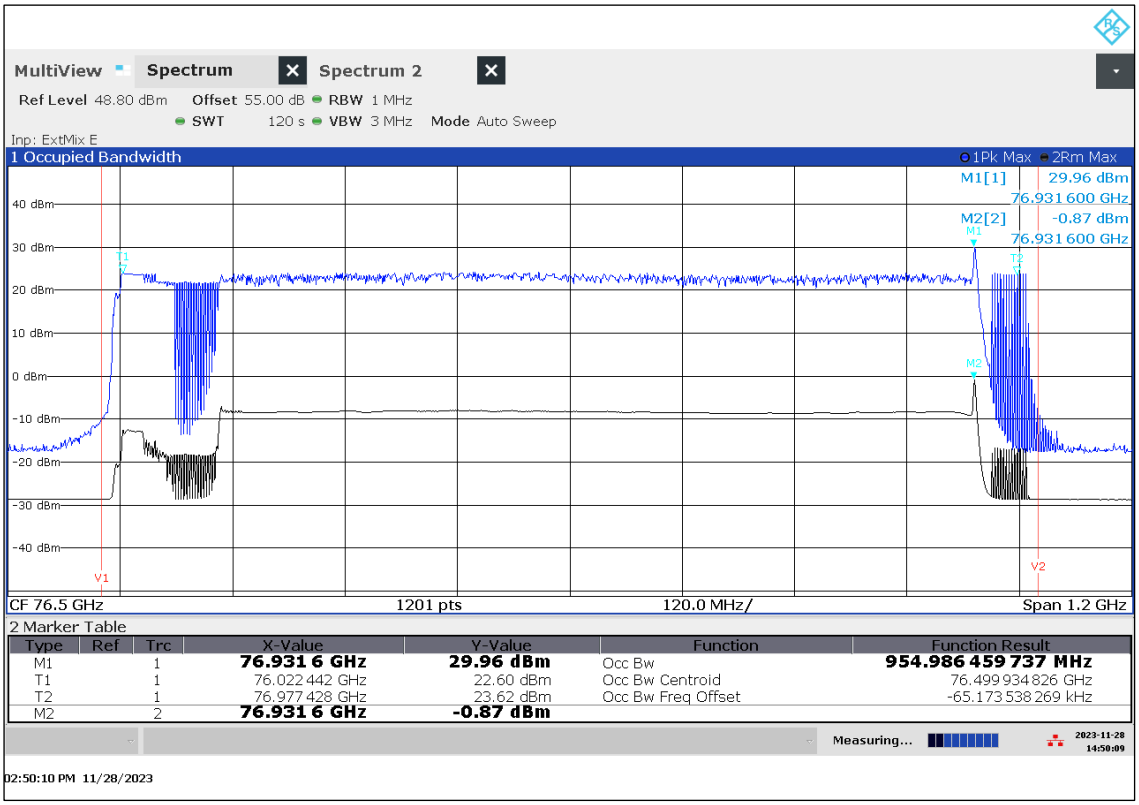
Plot 25: OBW, Mode 80, T_{nom} / $V_{min-max}$



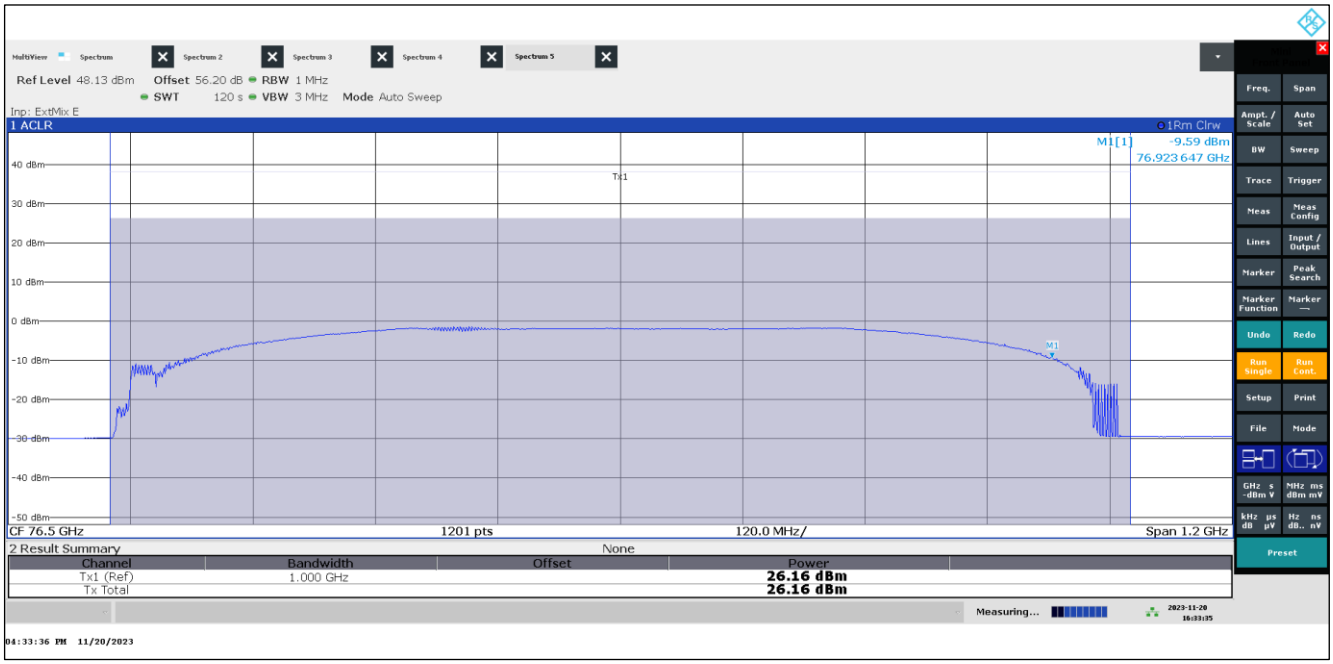
Plot 26: OBW, Mode 80, T_{min} / $V_{min-max}$



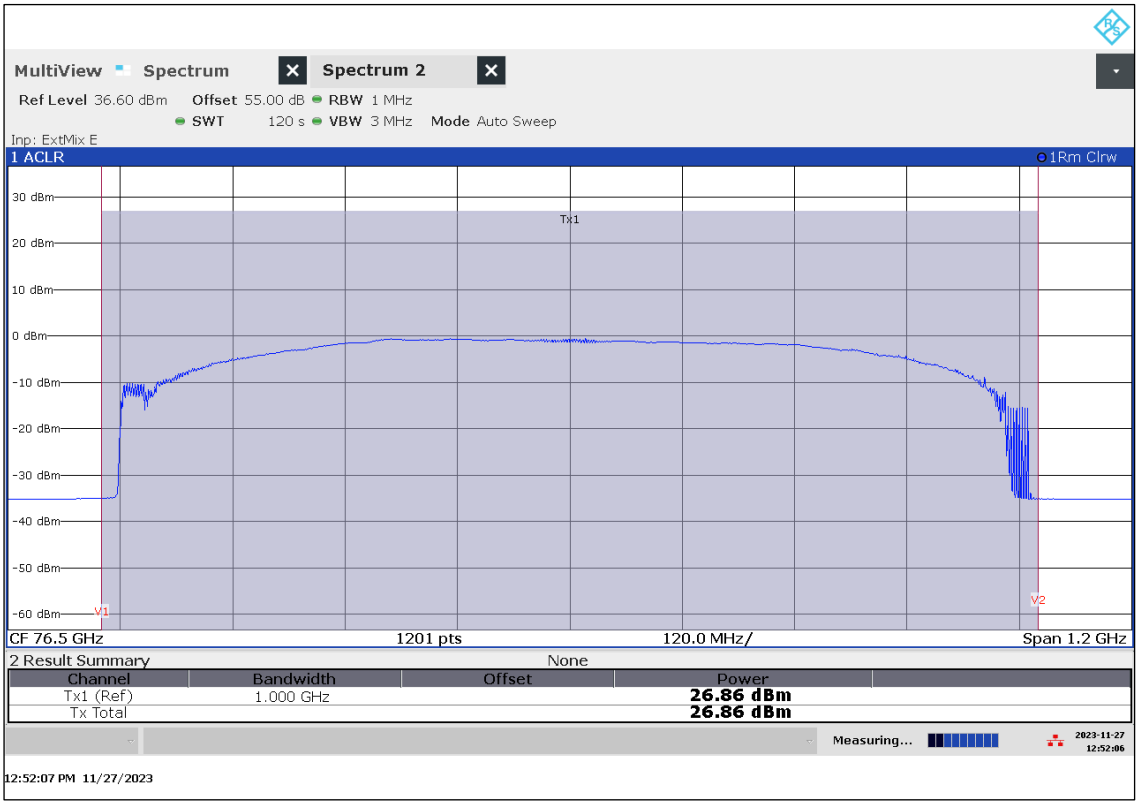
Plot 27: OBW, Mode 80, T_{max} / $V_{min-max}$



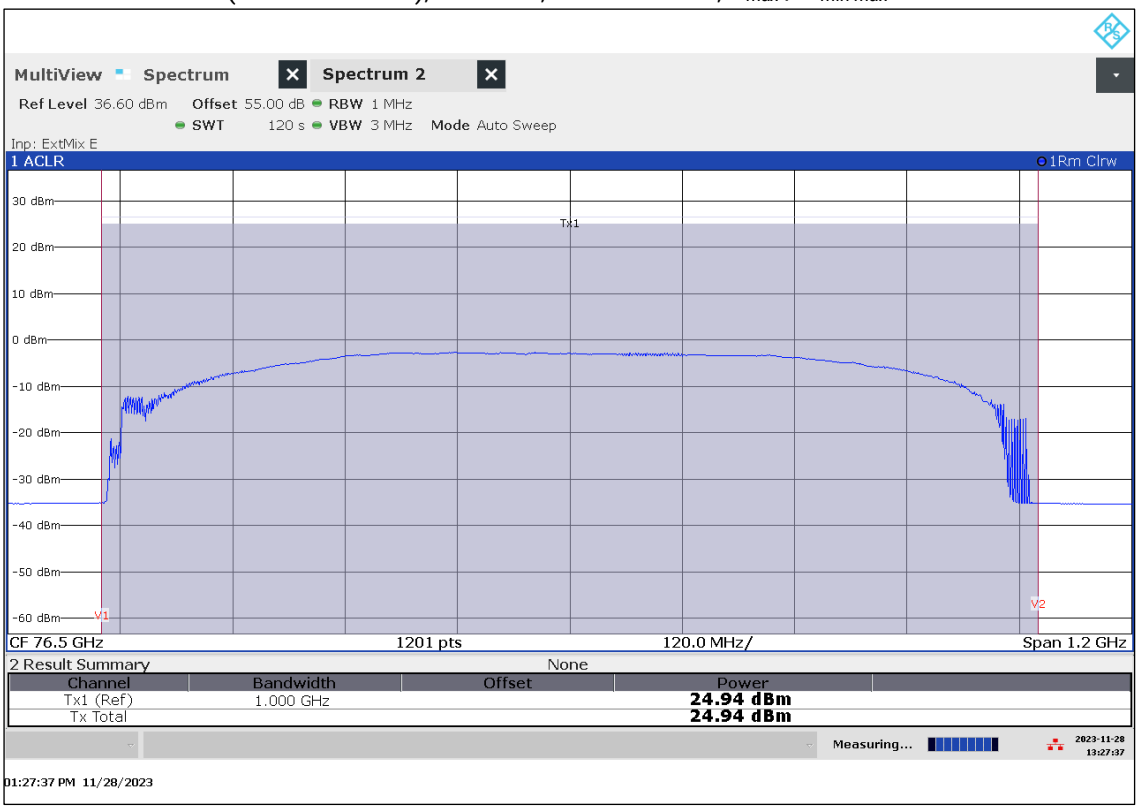
Plot 28: EIRP Mean Power (Channel Power), Mode 03, RMS detector, T_{nom} / $V_{min-max}$



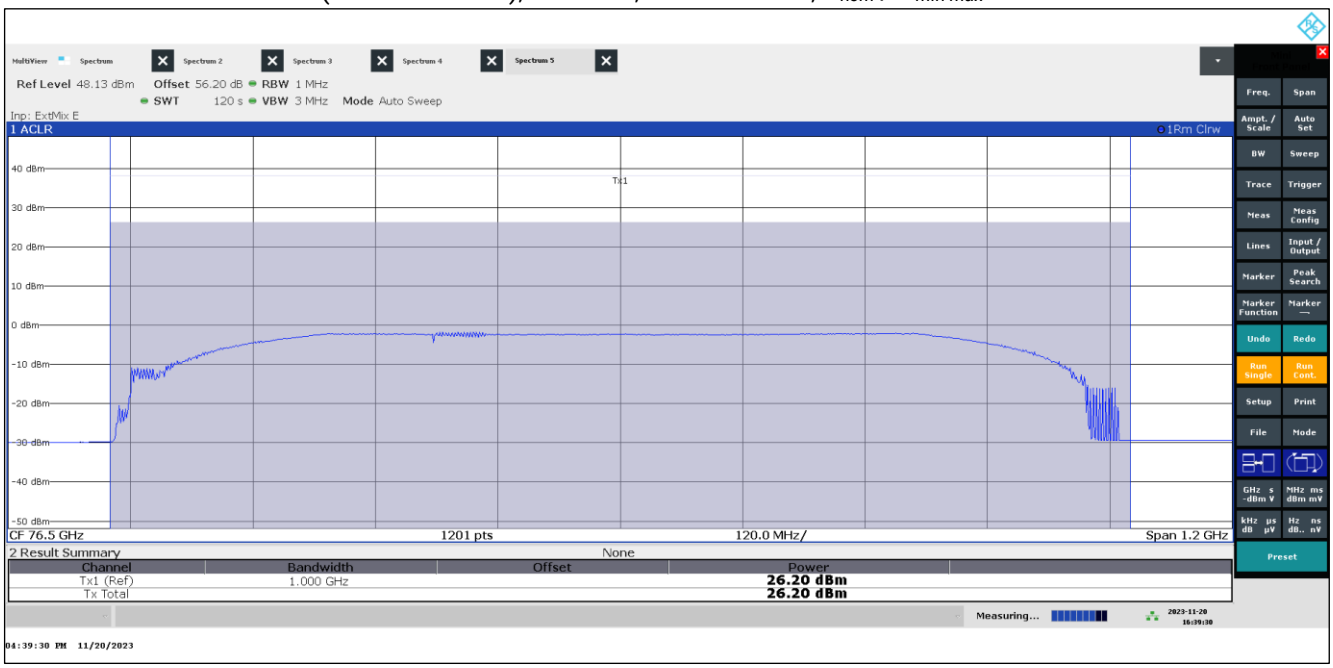
Plot 29: EIRP Mean Power (Channel Power), Mode 03, RMS detector, T_{min} / $V_{min-max}$



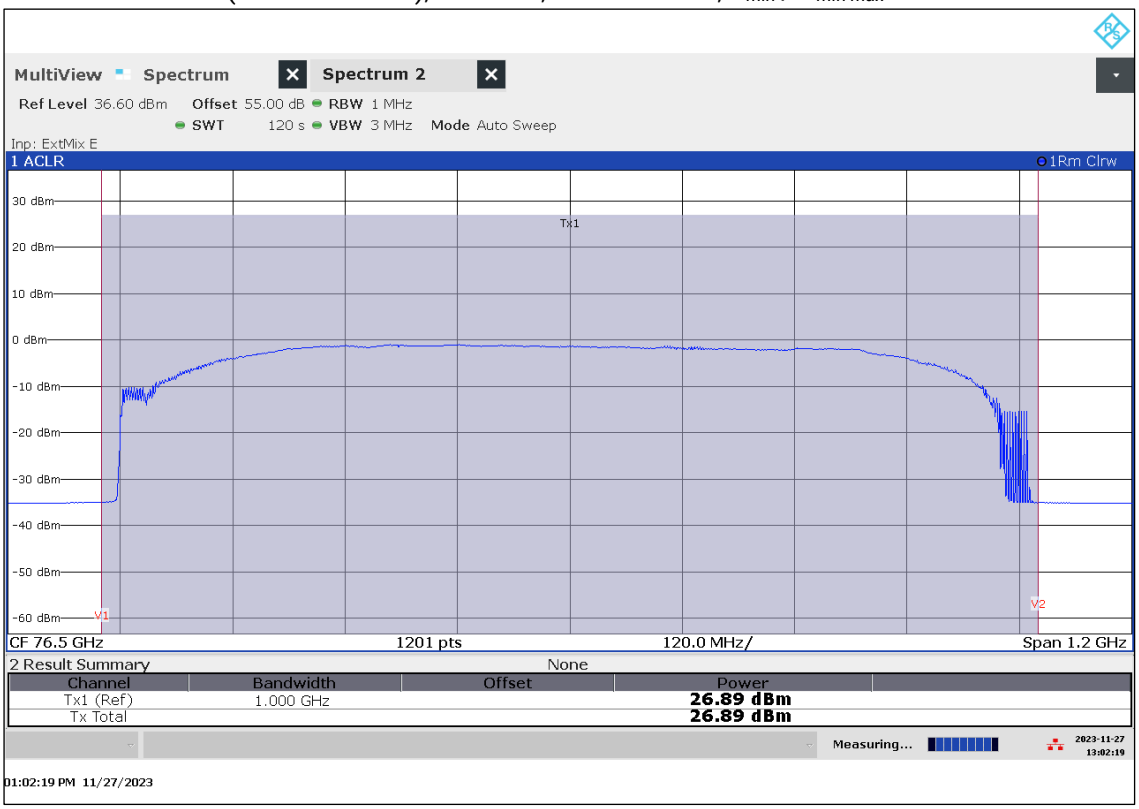
Plot 30: EIRP Mean Power (Channel Power), Mode 03, RMS detector, T_{max} / $V_{min-max}$



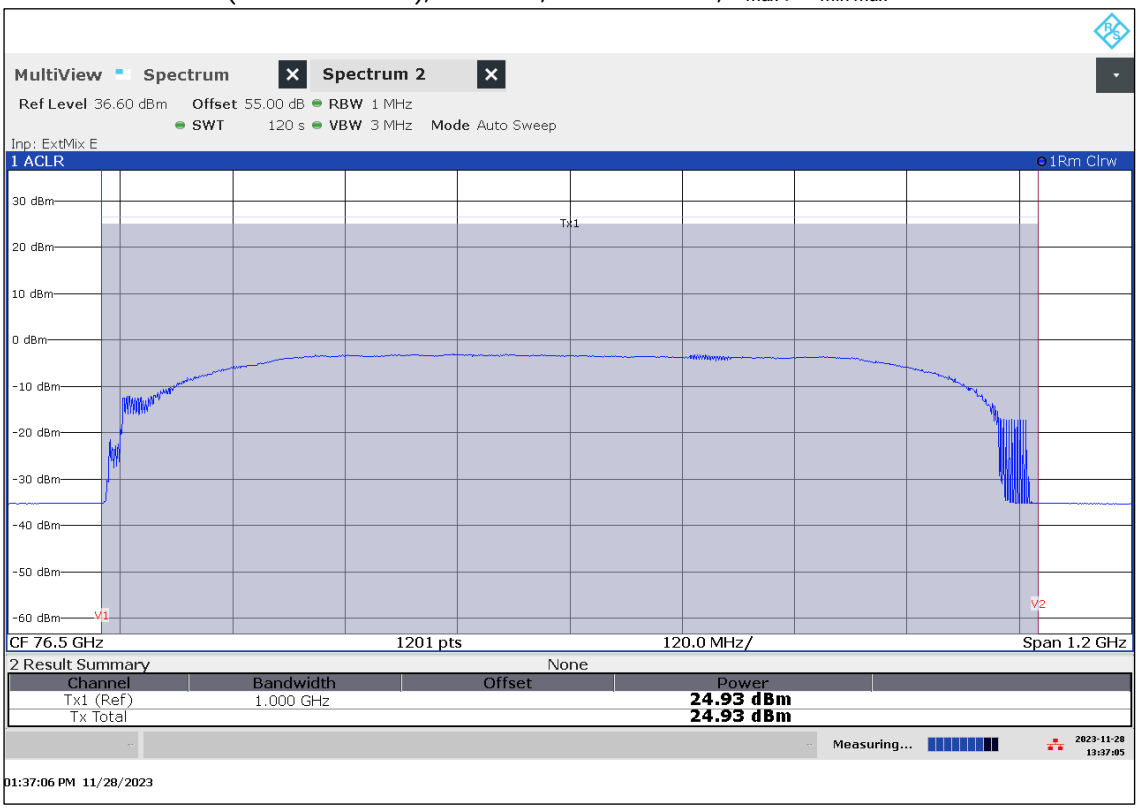
Plot 31: EIRP Mean Power (Channel Power), Mode 09, RMS detector, T_{nom} / $V_{min-max}$



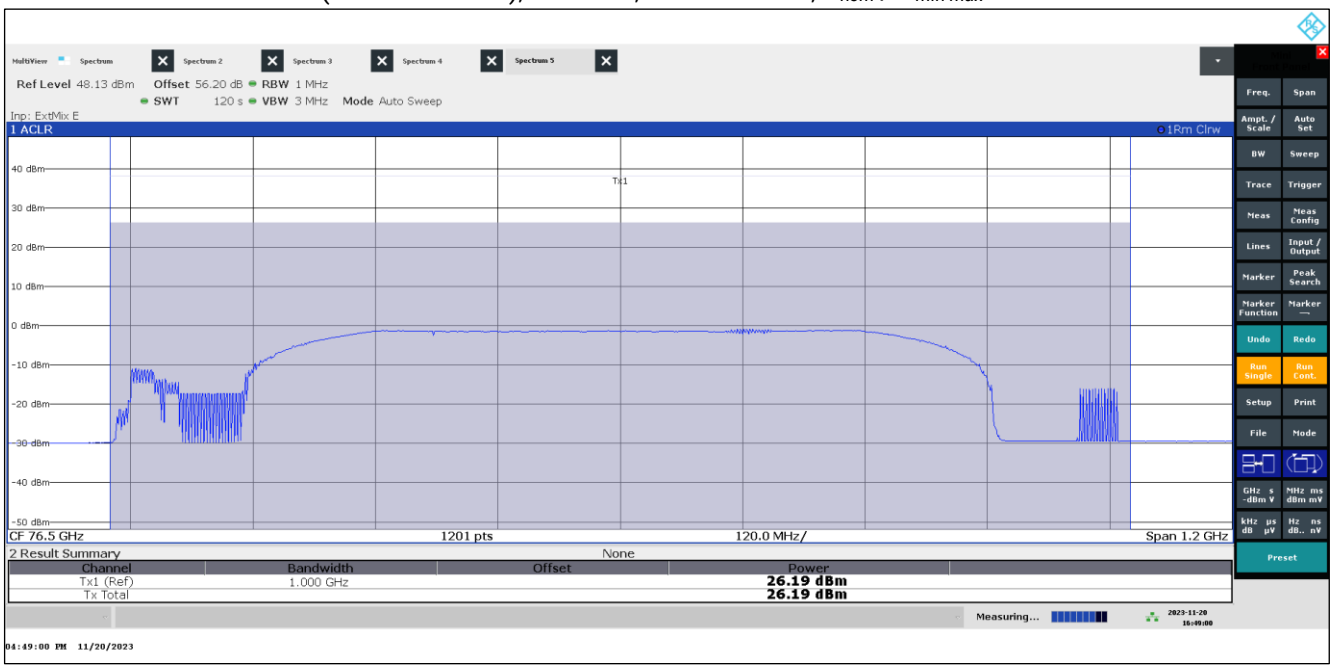
Plot 32: EIRP Mean Power (Channel Power), Mode 09, RMS detector, T_{min} / $V_{min-max}$



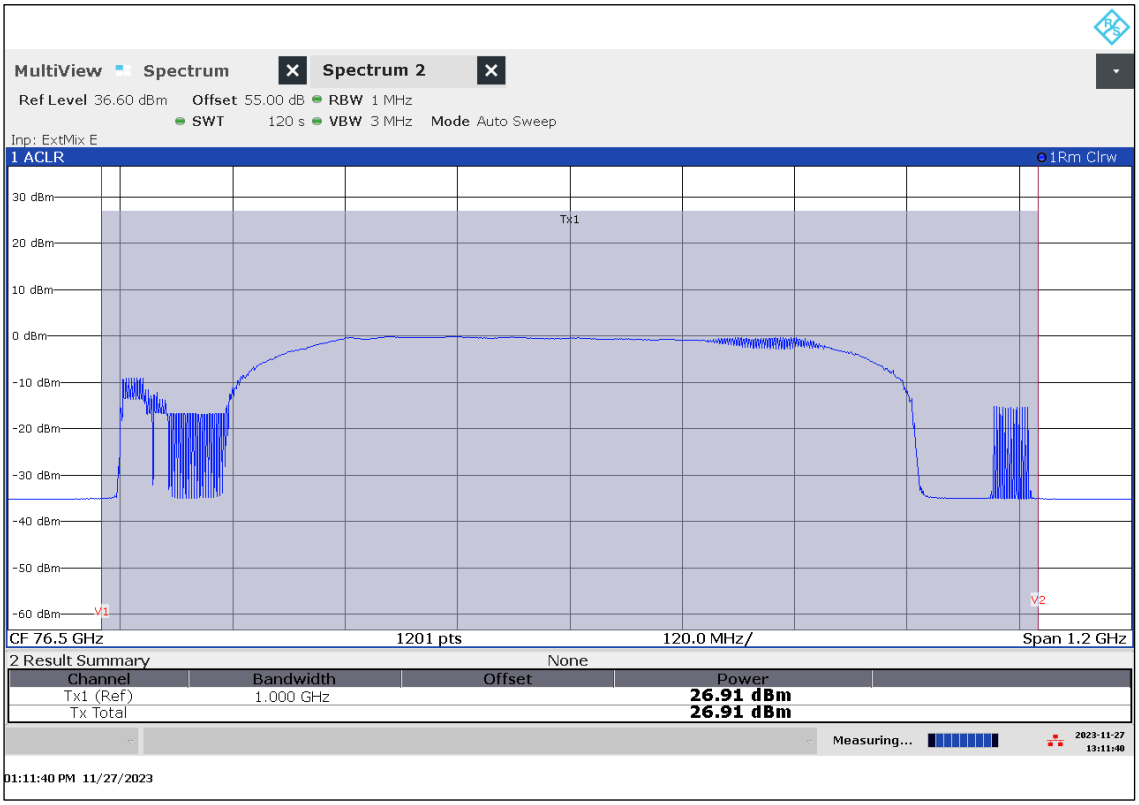
Plot 33: EIRP Mean Power (Channel Power), Mode 09, RMS detector, T_{max} / $V_{min-max}$



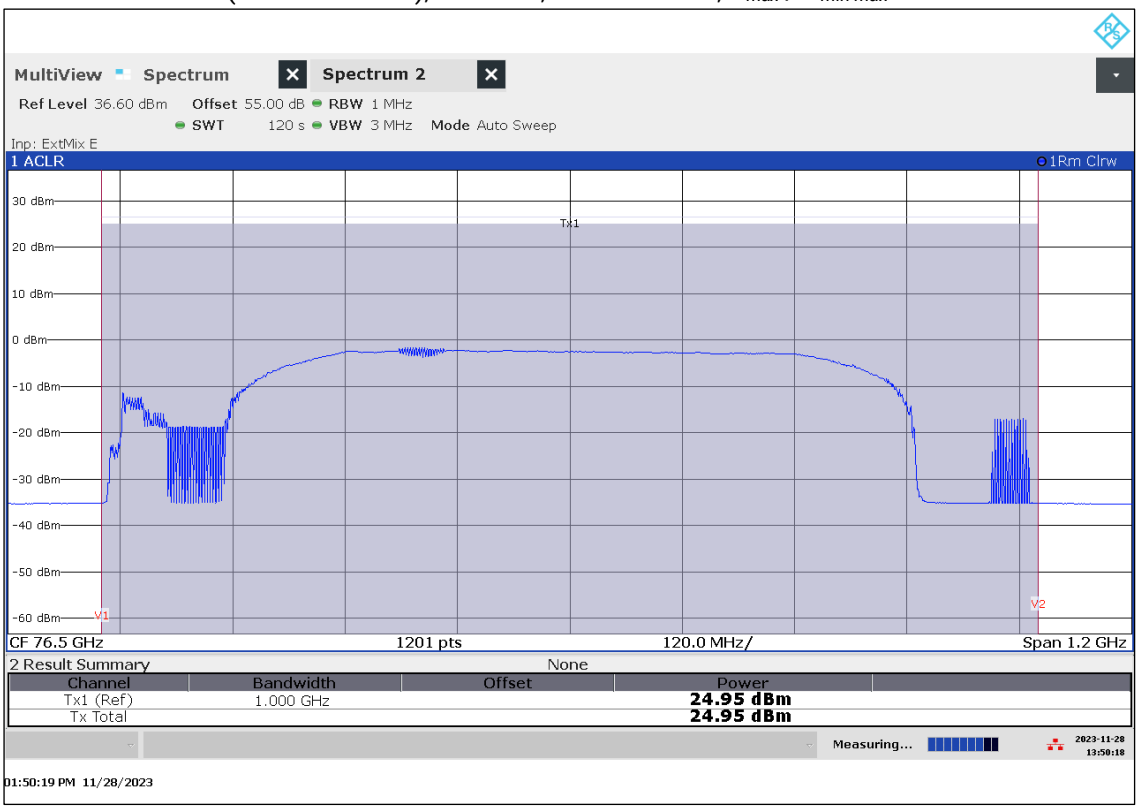
Plot 34: EIRP Mean Power (Channel Power), Mode 15, RMS detector, T_{nom} / $V_{min-max}$



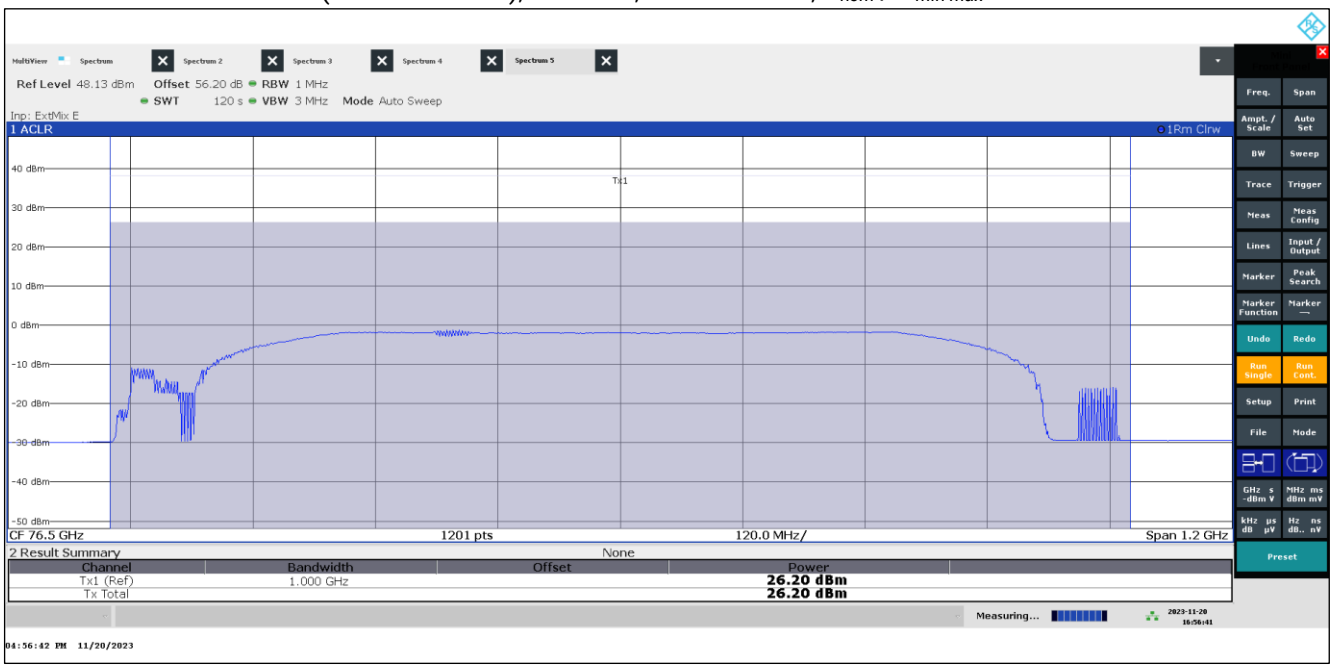
Plot 35: EIRP Mean Power (Channel Power), Mode 15, RMS detector, T_{min} / $V_{min-max}$



Plot 36: EIRP Mean Power (Channel Power), Mode 15, RMS detector, T_{max} / $V_{min-max}$

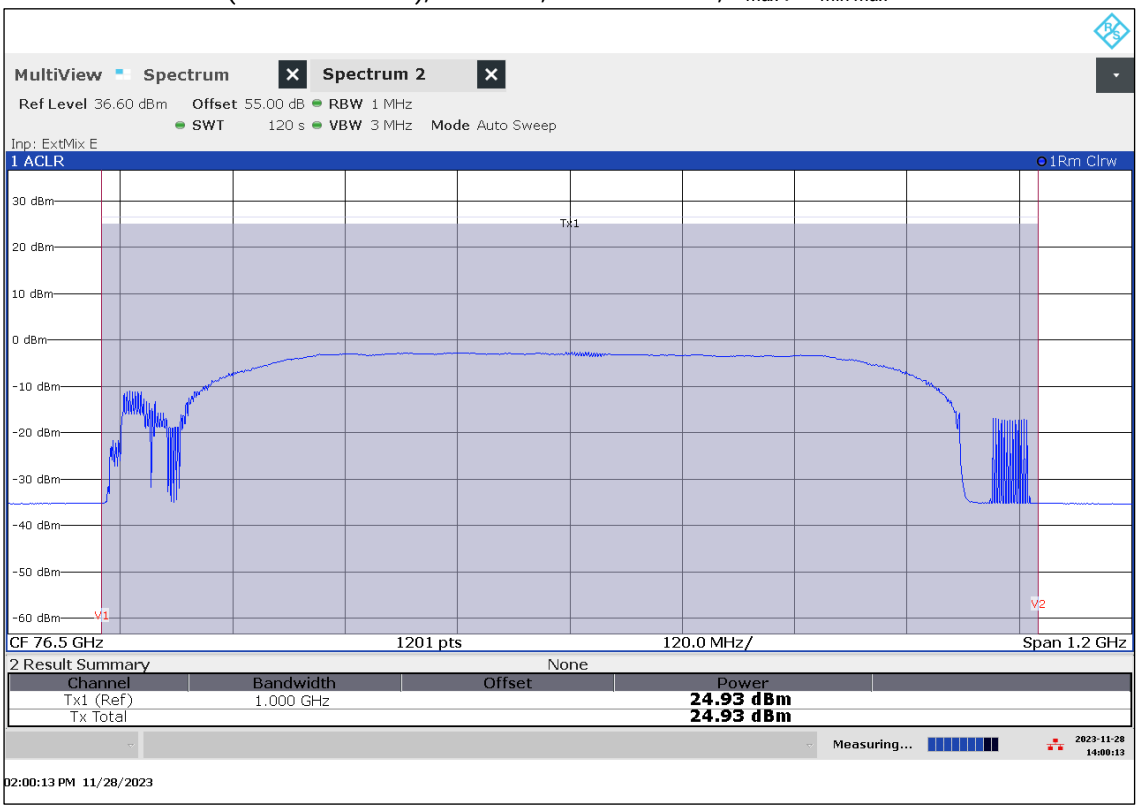


Plot 37: EIRP Mean Power (Channel Power), Mode 21, RMS detector, T_{nom} / $V_{min-max}$

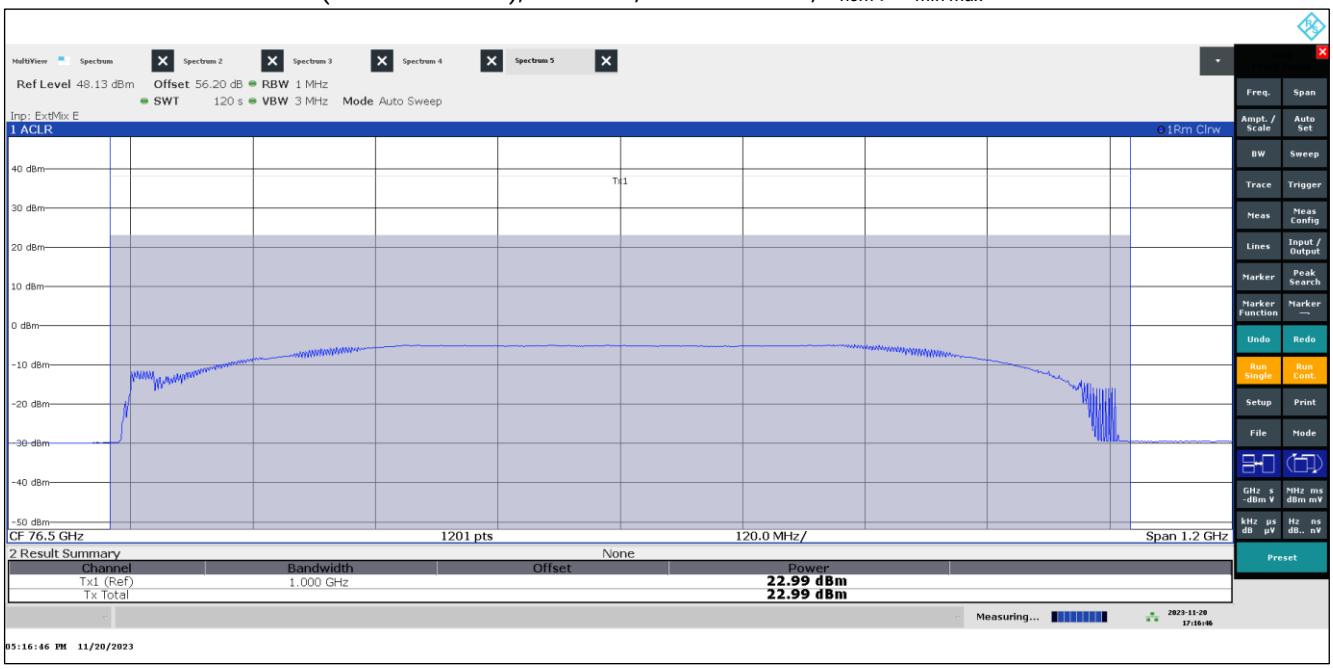


Plot 38: EIRP Mean Power (Channel Power), Mode 21, RMS detector, T_{min} / $V_{min-max}$

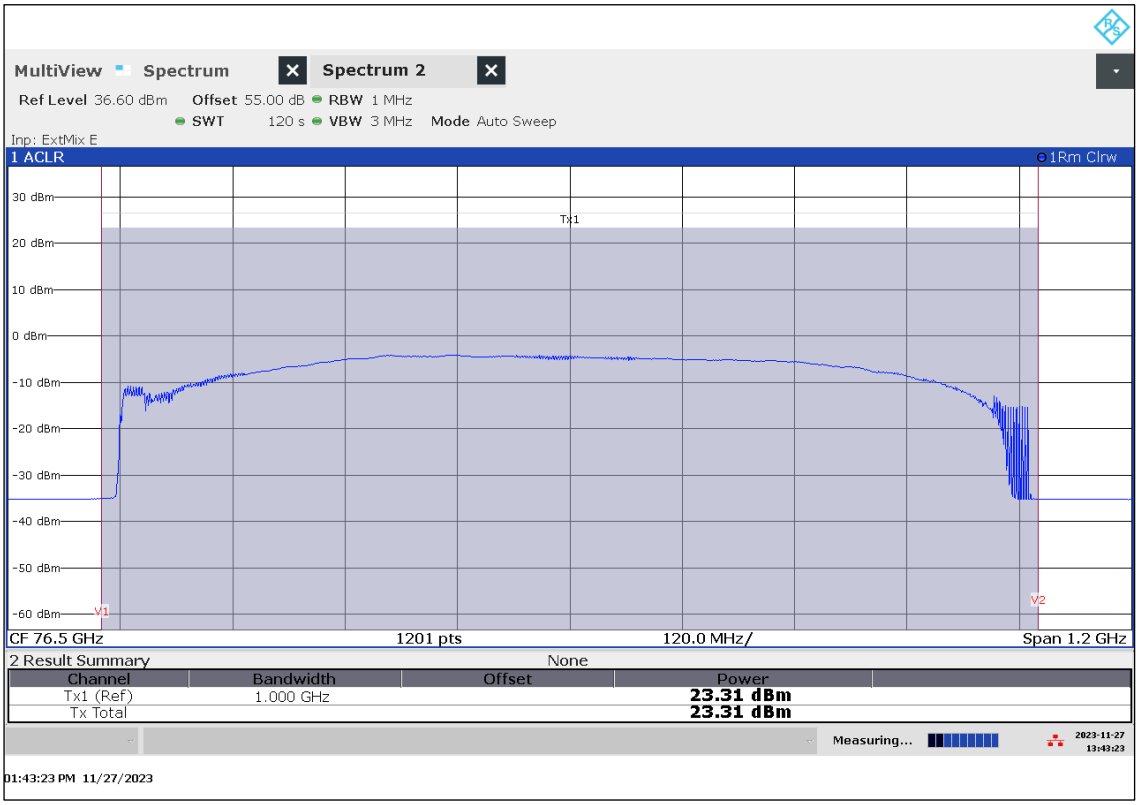
Plot 39: EIRP Mean Power (Channel Power), Mode 21, RMS detector, T_{max} / $V_{min-max}$



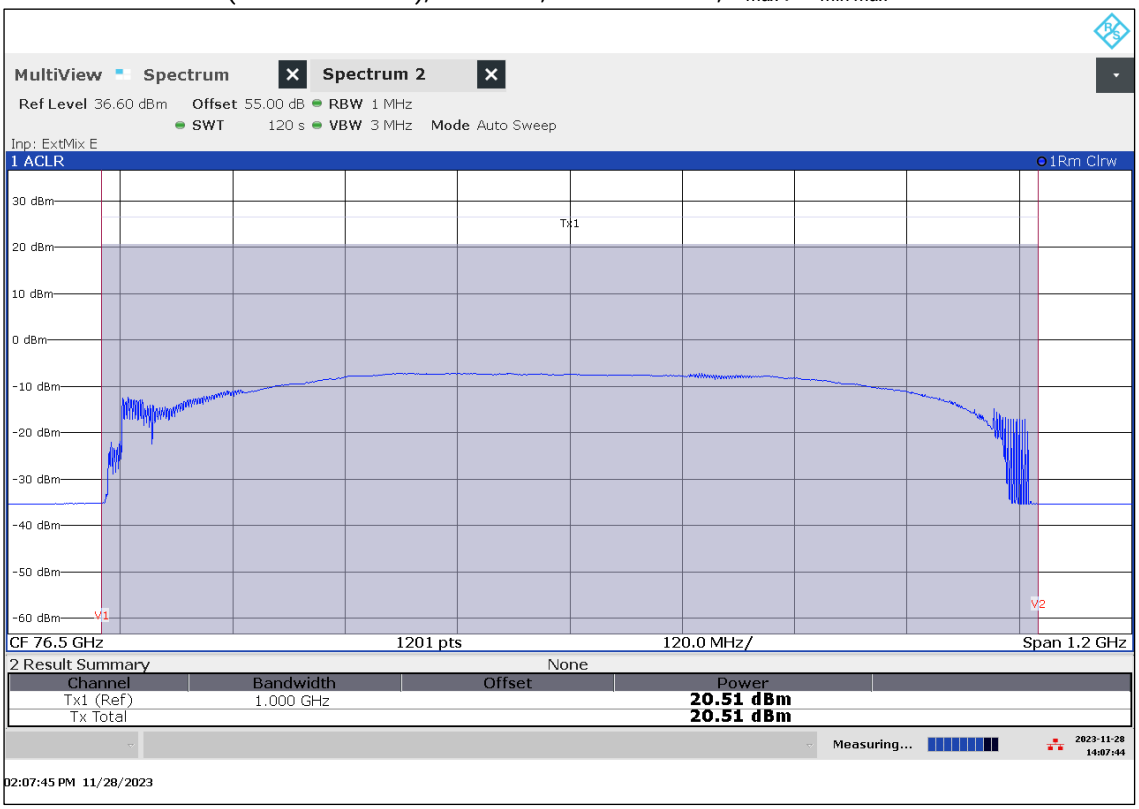
Plot 40: EIRP Mean Power (Channel Power), Mode 27, RMS detector, T_{nom} / $V_{min-max}$



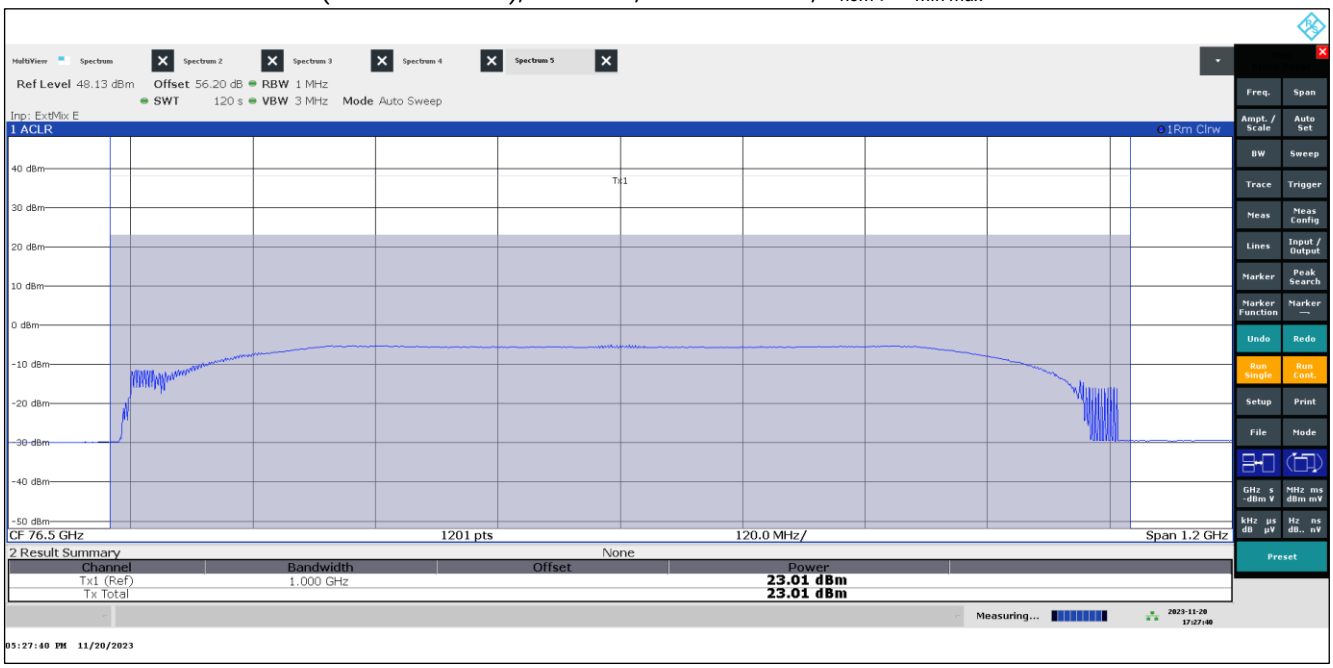
Plot 41: EIRP Mean Power (Channel Power), Mode 27, RMS detector, T_{min} / $V_{min-max}$



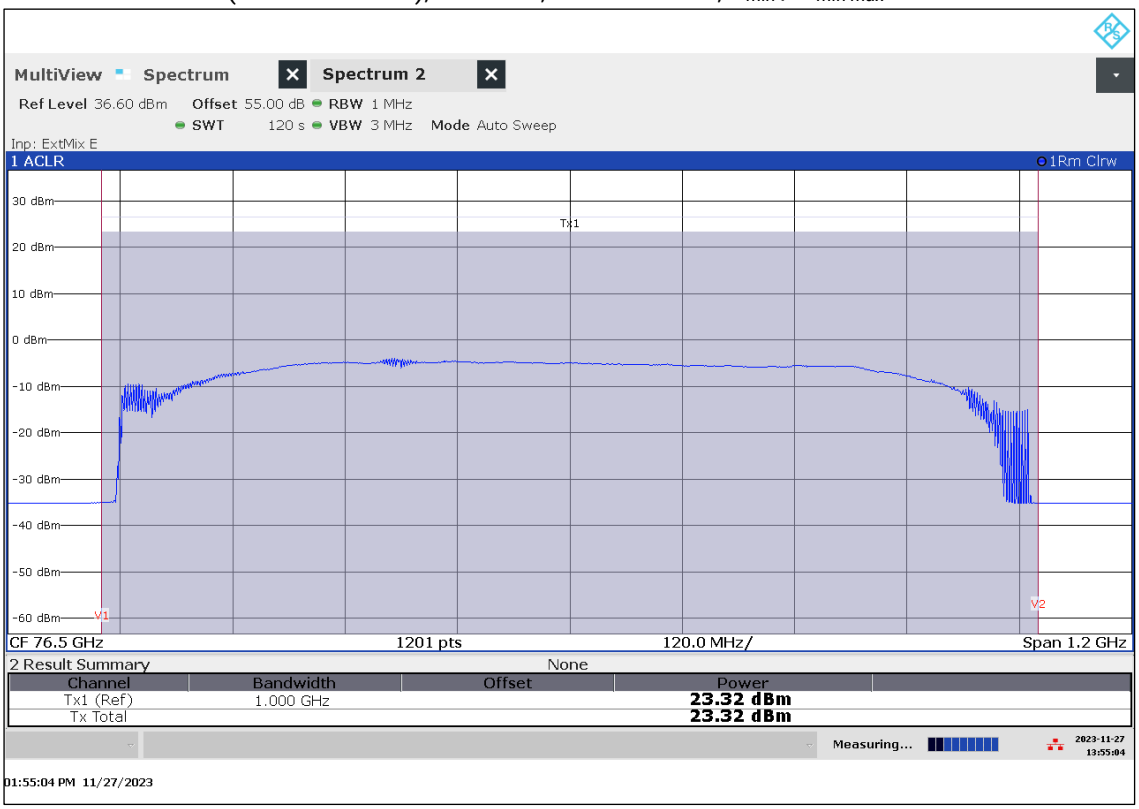
Plot 42: EIRP Mean Power (Channel Power), Mode 27, RMS detector, T_{max} / $V_{min-max}$



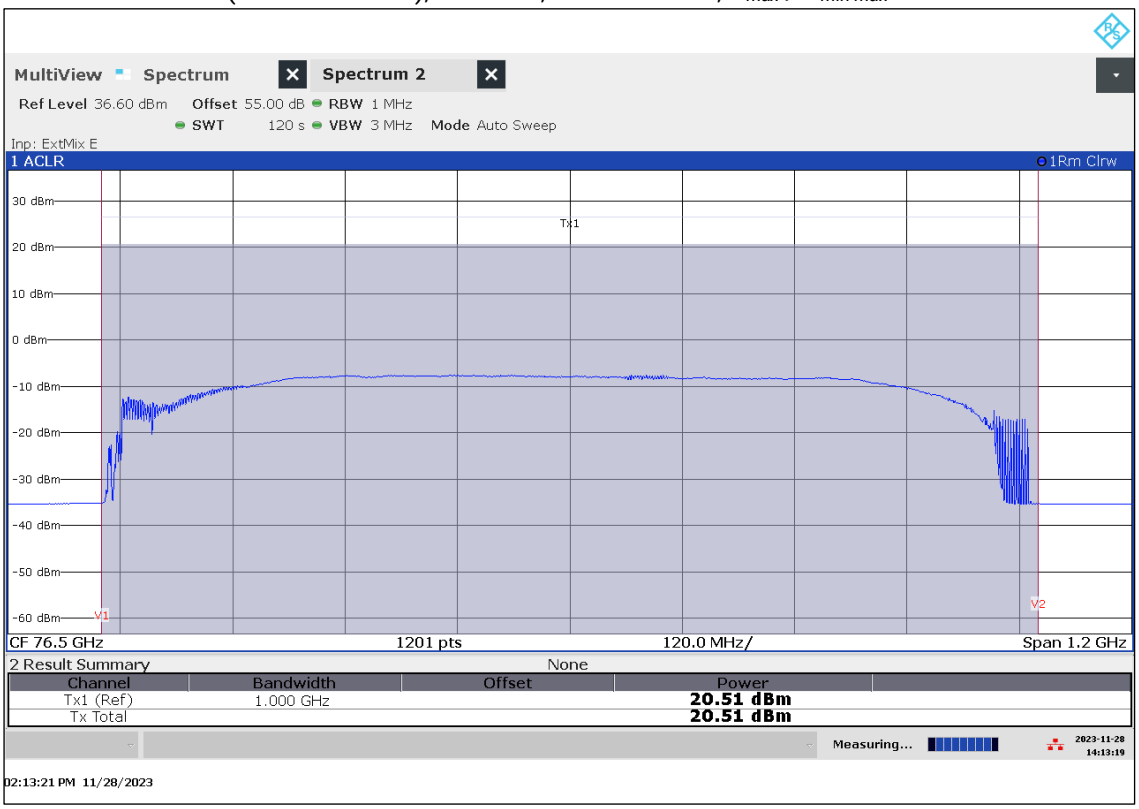
Plot 43: EIRP Mean Power (Channel Power), Mode 39, RMS detector, T_{nom} / $V_{min-max}$



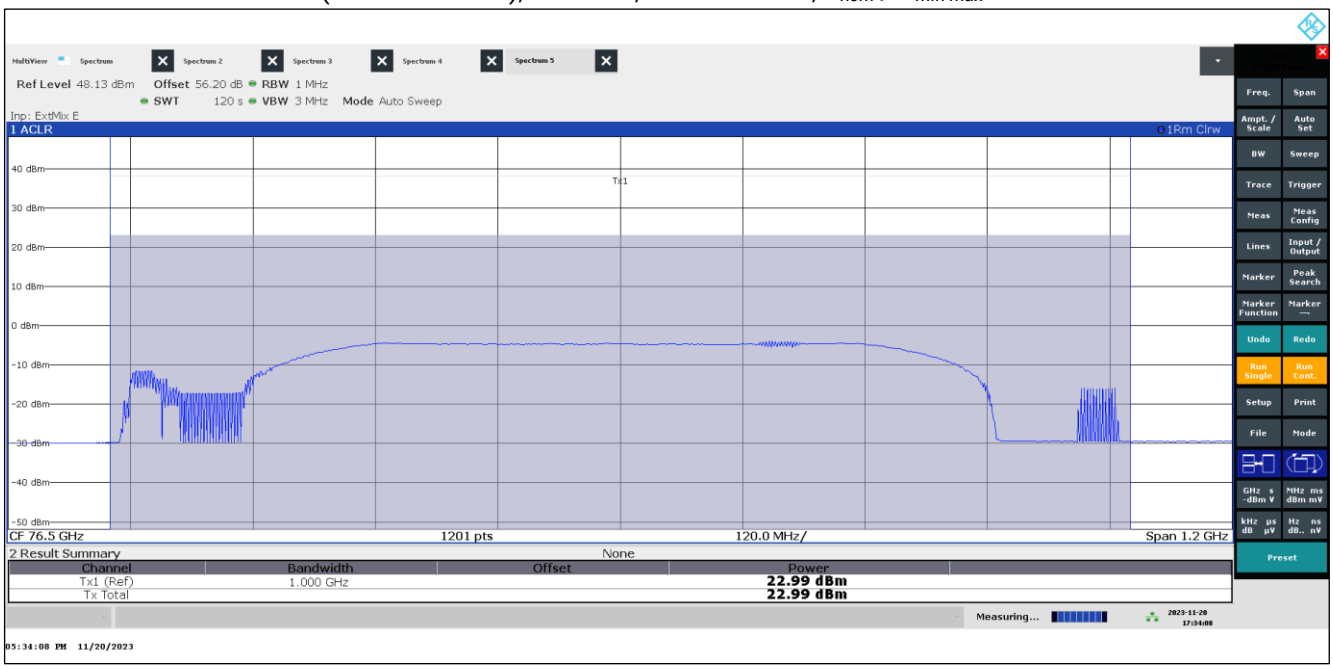
Plot 44: EIRP Mean Power (Channel Power), Mode 39, RMS detector, T_{min} / $V_{min-max}$



Plot 45: EIRP Mean Power (Channel Power), Mode 39, RMS detector, T_{max} / $V_{min-max}$

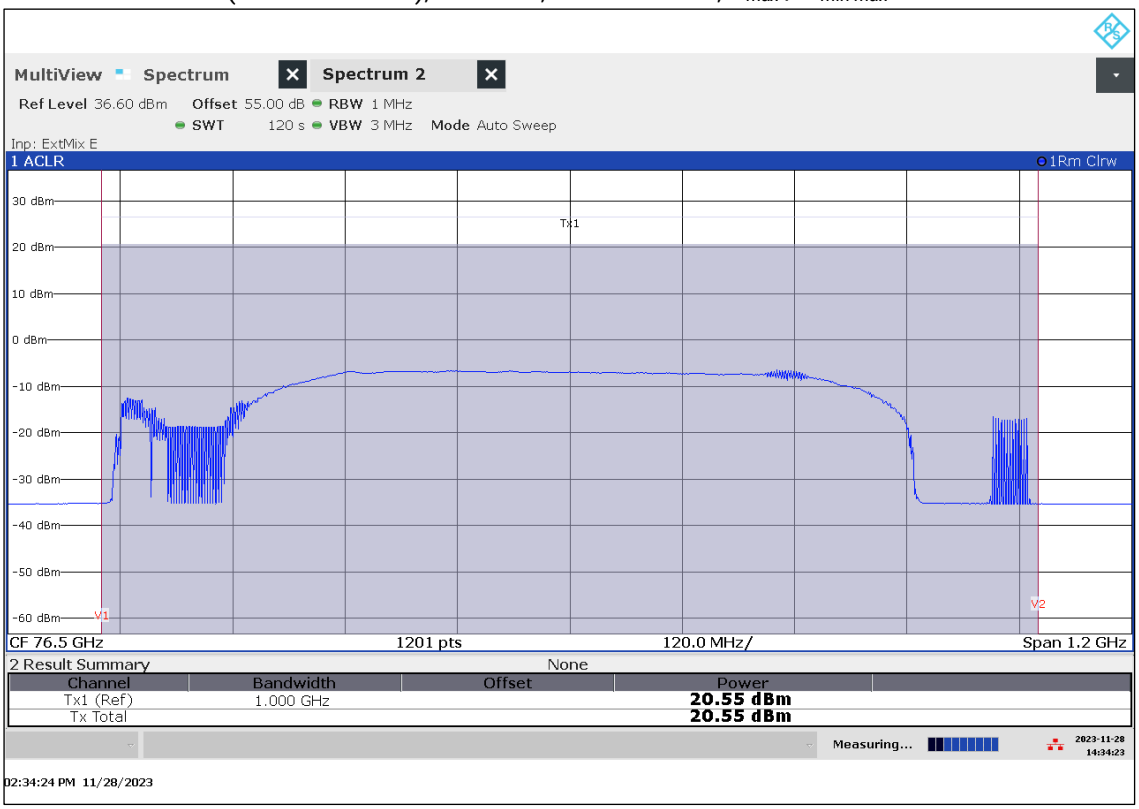


Plot 46: EIRP Mean Power (Channel Power), Mode 51, RMS detector, T_{nom} / $V_{min-max}$

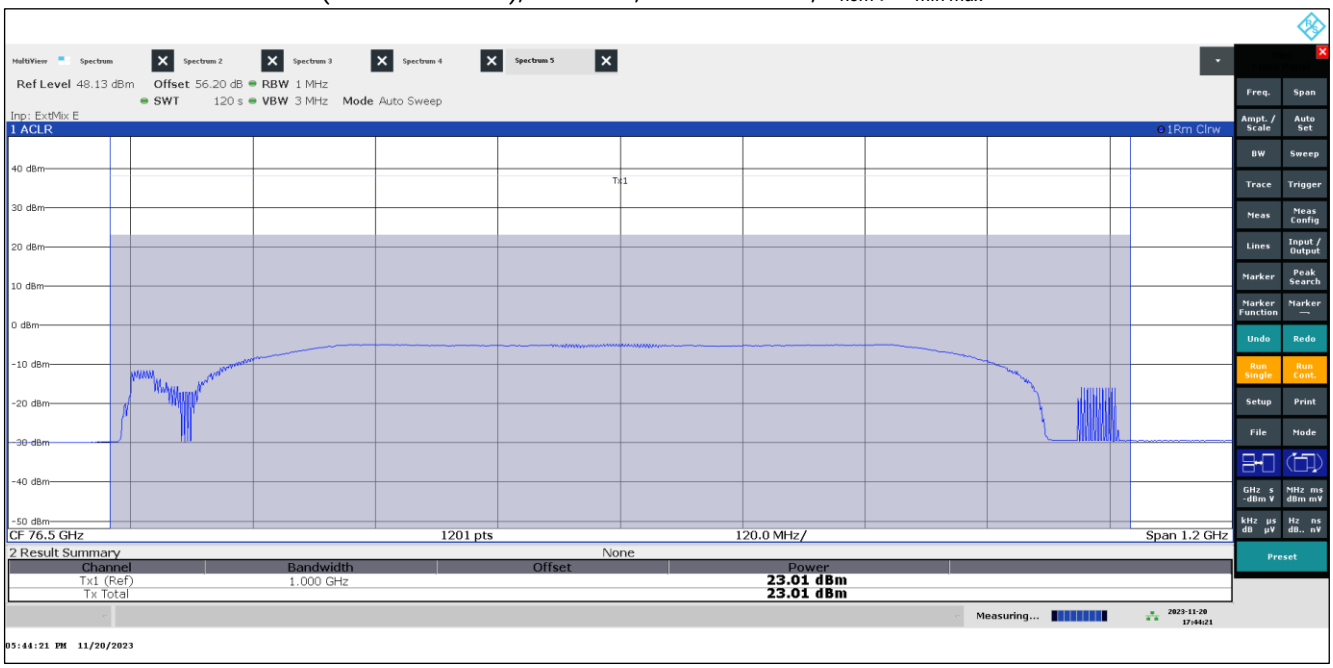


Plot 47: EIRP Mean Power (Channel Power), Mode 51, RMS detector, T_{min} / $V_{min-max}$

Plot 48: EIRP Mean Power (Channel Power), Mode 51, RMS detector, T_{max} / $V_{min-max}$

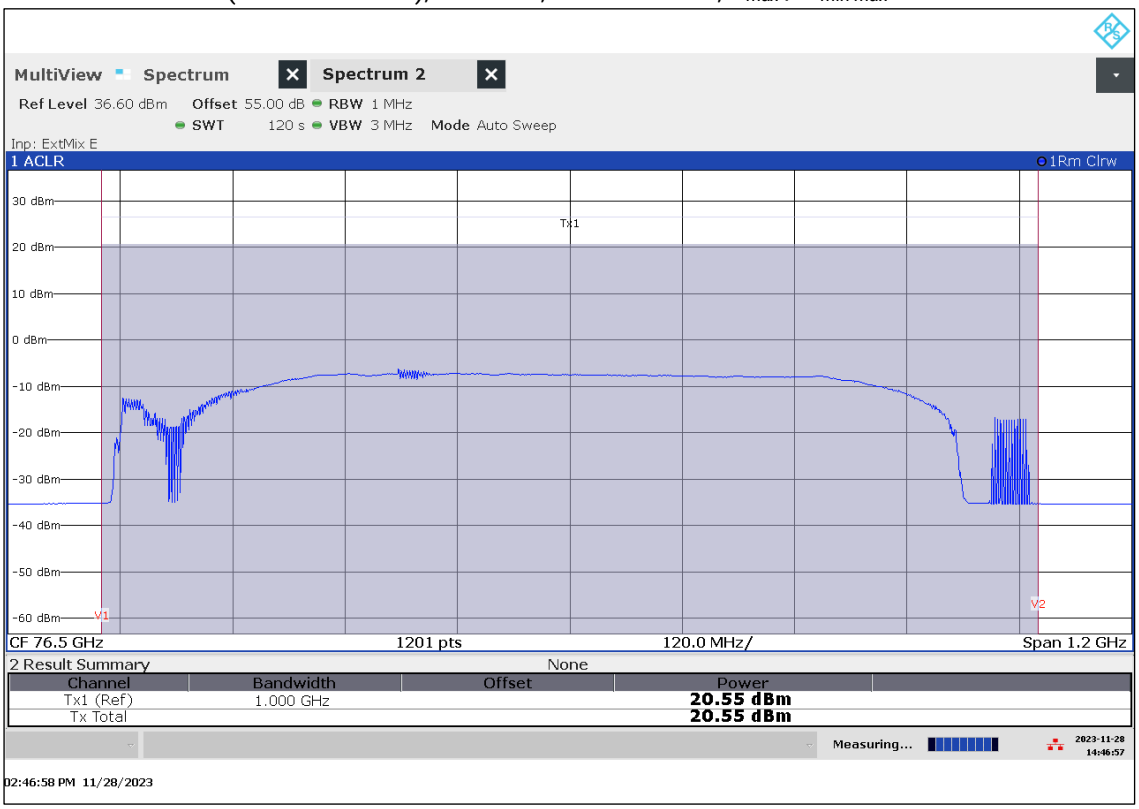


Plot 49: EIRP Mean Power (Channel Power), Mode 63, RMS detector, T_{nom} / $V_{min-max}$

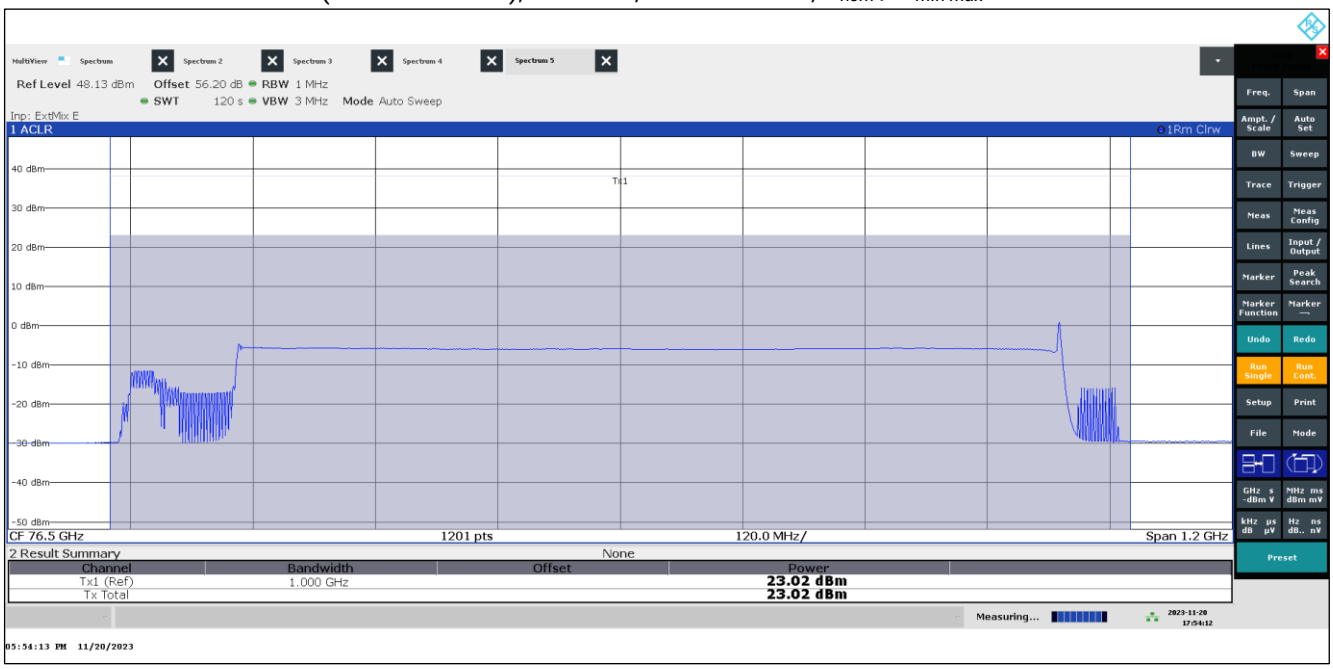


Plot 50: EIRP Mean Power (Channel Power), Mode 63, RMS detector, T_{min} / $V_{min-max}$

Plot 51: EIRP Mean Power (Channel Power), Mode 63, RMS detector, T_{max} / $V_{min-max}$

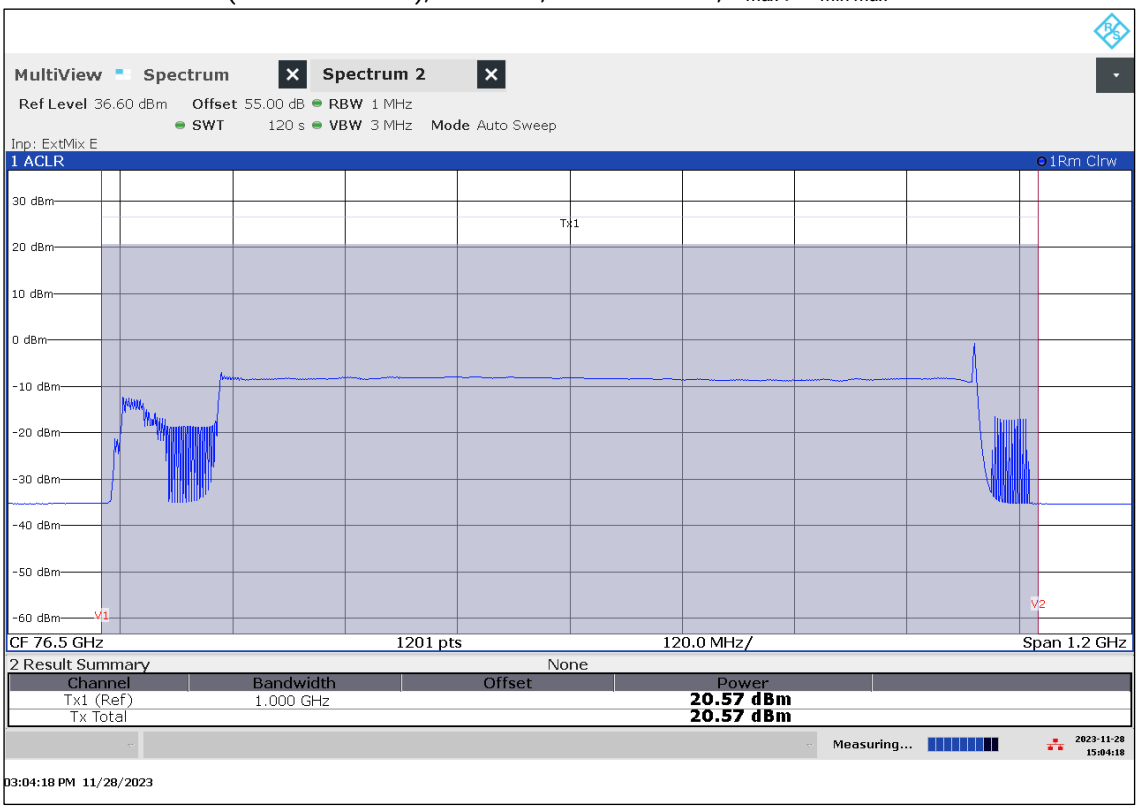


Plot 52: EIRP Mean Power (Channel Power), Mode 80, RMS detector, T_{nom} / $V_{min-max}$



Plot 53: EIRP Mean Power (Channel Power), Mode 80, RMS detector, T_{min} / $V_{min-max}$

Plot 54: EIRP Mean Power (Channel Power), Mode 80, RMS detector, T_{max} / $V_{min-max}$



12.2 Modulation characteristics

Description:

§2.1047 (d) *Other types of equipment.* A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

Comments from manufacturer on modulation characteristics according to KDB 653005 3.(g):

Parameter	ARS6-A
Duty Cycle	Typical 46 %
Timing	Typical Cycle Time: 50 ms RF on 23.09 ms (256 Ramps + Monitoring)
Modulation	FM- chirps, negative Sawtooth with linear change of center frequency over sweep bandwidth or single chirps
Sweep Bandwidth	Mode dependent: 817 / 912 / 733 /829 /801 MHz
Sweep rate	Max 13 MHz/ µs
Power	Power constant during RF on
Steepness of Ramps	Steepness varies for scans and monitoring.
Calibration	No calibration routines applied
Antenna Beam Steering (Tx)	No beam steering

12.3 Occupied bandwidth

Description:

§2.1049 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.

Limits: **FCC §95.3379 (b)**

The occupied bandwidth from intentional radiators operated within the specified frequency band shall comply with the following: 76 GHz – 81 GHz

Measurement:

Parameters	
Detector:	Pos. Peak
Sweep time:	120 s
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Trace-Mode:	Max Hold
Measurement distance:	2 m

Measurement results:

Modulations / Test conditions		Operating Frequency Range		
		f_L [GHz]	f_H [GHz]	OBW [MHz]
03	T_{nom} / $V_{min-max}$	76.045 218	76.959 309	914.1
	T_{min} / $V_{min-max}$	76.045 548	76.959 262	913.7
	T_{max} / $V_{min-max}$	76.044 890	76.954 949	910.1
09	T_{nom} / $V_{min-max}$	76.046 126	76.949 427	903.3
	T_{min} / $V_{min-max}$	76.047 164	76.953 848	906.7
	T_{max} / $V_{min-max}$	76.046 695	76.954 040	907.3
15	T_{nom} / $V_{min-max}$	76.050 515	76.859 826	809.3
	T_{min} / $V_{min-max}$	76.051 092	76.864 849	813.8
	T_{max} / $V_{min-max}$	76.046 554	76.860 724	814.2
21	T_{nom} / $V_{min-max}$	76.053 484	76.909 621	856.1
	T_{min} / $V_{min-max}$	76.056 006	76.917 993	862.0
	T_{max} / $V_{min-max}$	76.054 832	76.910 209	855.3
27	T_{nom} / $V_{min-max}$	76.029 579	76.958 728	929.1
	T_{min} / $V_{min-max}$	76.031 399	76.961 756	930.4
	T_{max} / $V_{min-max}$	76.030 160	76.963 300	933.1
39	T_{nom} / $V_{min-max}$	76.032 654	76.951 578	918.9
	T_{min} / $V_{min-max}$	76.034 507	76.964 389	929.9
	T_{max} / $V_{min-max}$	76.029 869	76.955 803	925.9
51	T_{nom} / $V_{min-max}$	76.031 211	76.864 182	833.0
	T_{min} / $V_{min-max}$	76.033 794	76.966 323	932.5
	T_{max} / $V_{min-max}$	76.030 849	76.975 278	944.4
63	T_{nom} / $V_{min-max}$	76.032 454	76.911 621	879.1
	T_{min} / $V_{min-max}$	76.035 127	76.972 317	937.2
	T_{max} / $V_{min-max}$	76.031 480	76.967 820	936.3
80	T_{nom} / $V_{min-max}$	76.021 834	76.970 725	948.9
	T_{min} / $V_{min-max}$	76.024 274	76.985 374	961.1
	T_{max} / $V_{min-max}$	76.022 442	76.977 428	955.0

Note: Voltage variation does not affect the radiated signal

Verdict: **Compliant**

12.4 Band edge compliance

Description:

Investigation of the emission limits at the band edge.

Limits: **FCC §95.3379 (a) (2) (i) + (ii) / ANSI C63.10-2013 / 6.10**

Frequency Range [GHz]	Measurement distance	Power Density
40 – 76 and 81 – 200	3.0 m	600 pW/cm^2 → -1.7 dBm

Limits: **FCC §95.3367 (a) (b)**

Frequency Range [GHz]	Power Density
76 - 81	50 dBm/MHz (e.i.r.p)

Measurement:

Parameters	
Detector:	RMS
Sweep time:	See plots
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Trace-Mode:	Max Hold

Measurement results:

- Results are part of chapter 12.5

Verdict: **Compliant**

12.5 Field strength of spurious emissions

Description:

The power density of any emissions outside the 76-81 GHz band shall consist solely of spurious emissions and shall not exceed the following:

Limits:

FCC		
CFR Part 95.3379 (a) (1) / CFR Part 95.3379 (a) (3)		
Radiated Spurious Emissions		
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.		
Frequency [MHz]	Field Strength [dBµV/m]	Measurement distance
0.009 – 0.490	2400/F[kHz]	300
0.490 – 1.705	24000/F[kHz]	30
1.705 – 30.0	30	30
30 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
960 – 40 000	54.0	3

Limits: **FCC §95.3379 (a) (2) (i) + (ii)**

Frequency Range [GHz]	Measurement distance	Power Density
40 – 200	3.0 m	600 pW/cm^2 → -1.7 dBm
200 – 231	3.0 m	1000 pW/cm^2 → +0.5 dBm

Measurement:

Measurement parameter	
Detector:	Quasi Peak / Pos-Peak / LinAV / RMS
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Video bandwidth:	F < 1 GHz: 300 kHz F > 1 GHz: 3 MHz
Trace-Mode:	Max Hold

Measurement:

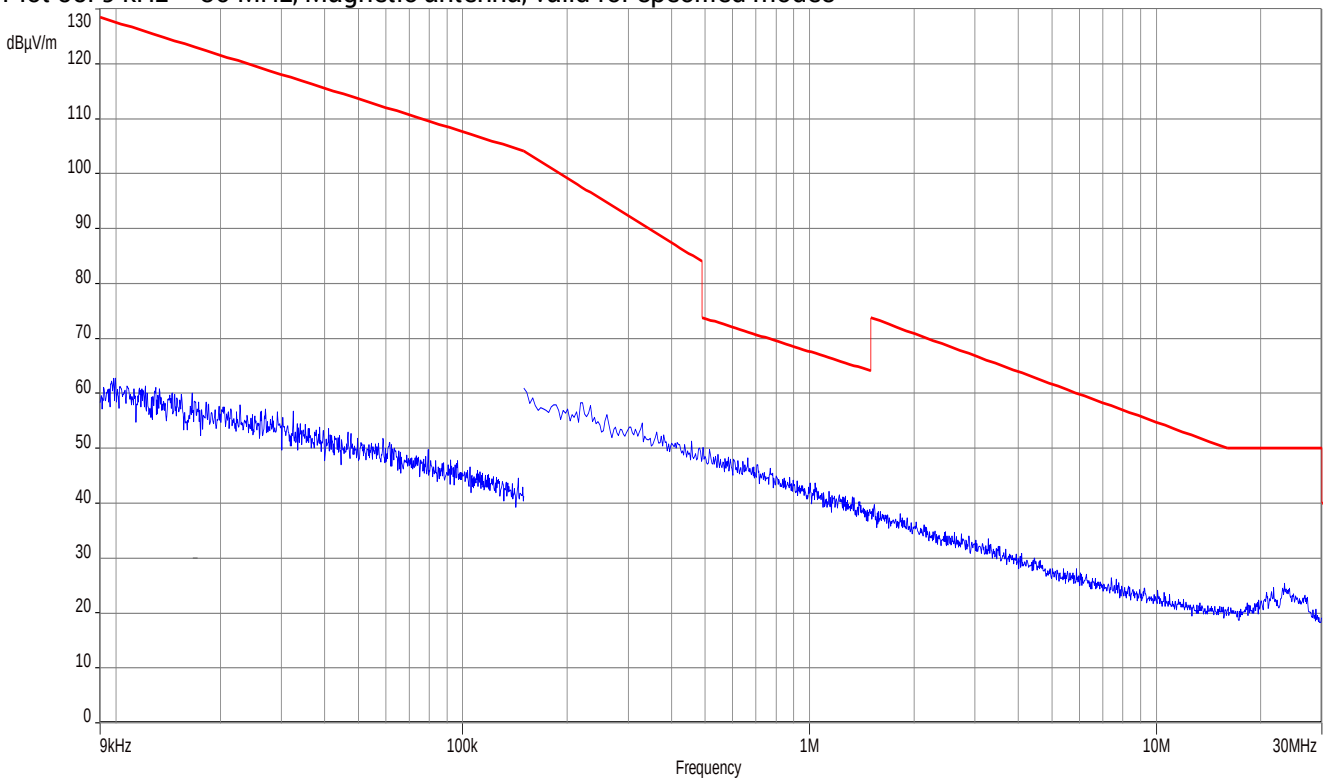
Measurement parameter	
Detector:	Quasi Peak / Pos-Peak / LinAV / RMS
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Video bandwidth:	F < 1 GHz: 300 kHz F > 1 GHz: 3 MHz
Trace-Mode:	Max Hold

Measurement results:

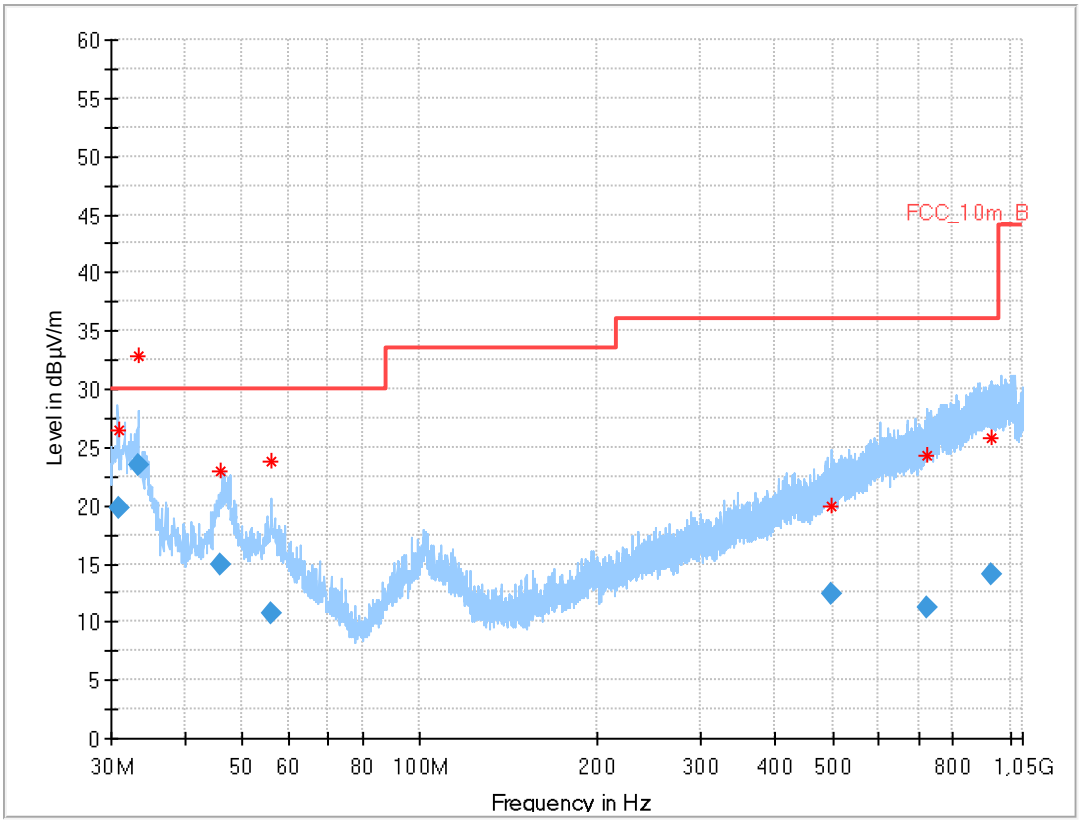
Frequency [GHz]	Detector	Bandwidth [MHz]	Level	Limit	Margin [dB]
-/-	-/-	-/-	-/-	-/-	-/-
No critical spurious emission levels					

Verdict: **Compliant**

Plot 55: 9 kHz – 30 MHz, Magnetic antenna, valid for specified modes



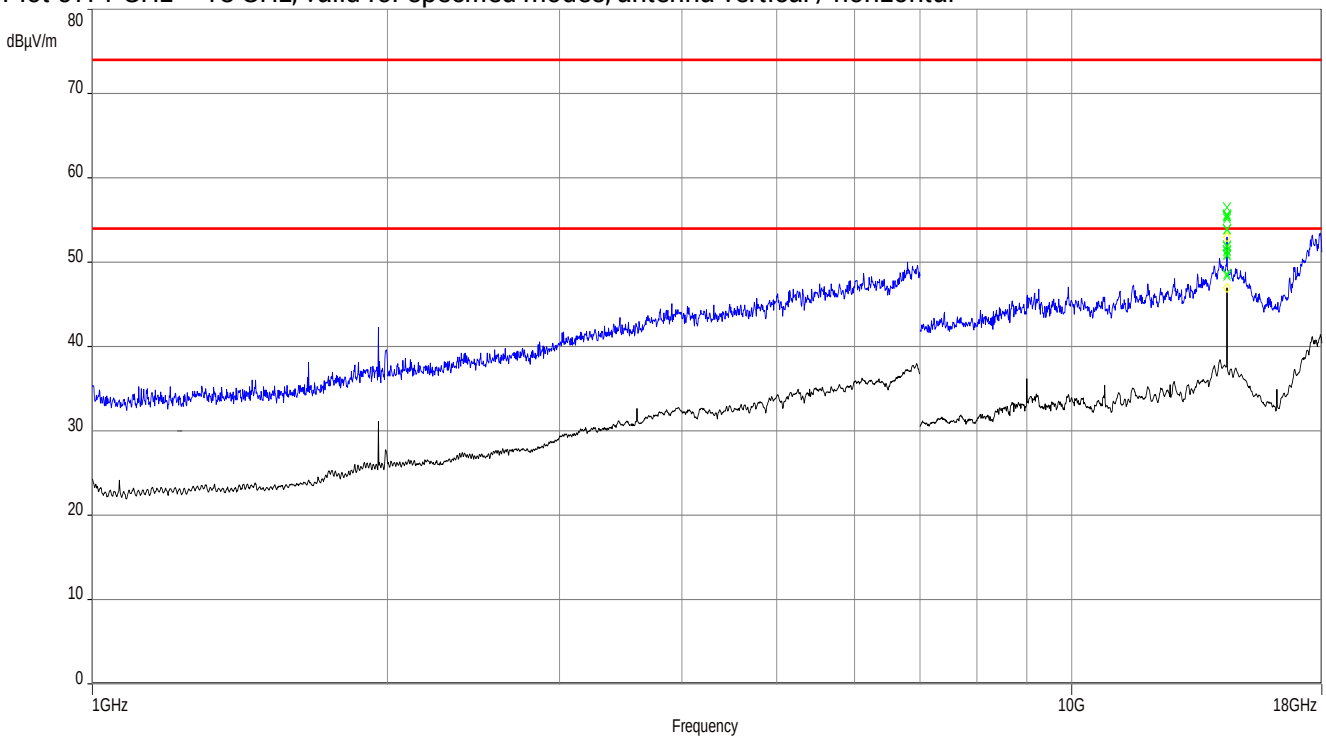
Plot 56: 30 MHz – 1 GHz, valid for specified modes, antenna vertical / horizontal



Final_Result

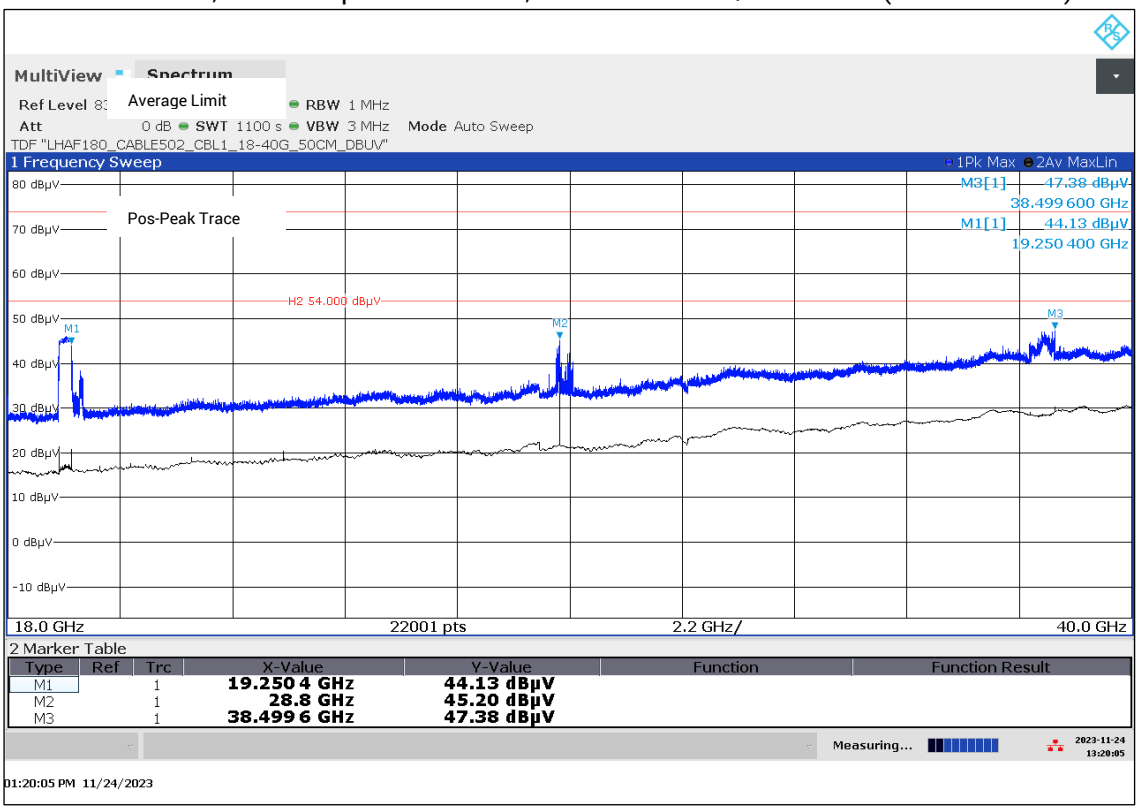
Frequency (MHz)	QuasiPeak (dBµV/m	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.825	19.73	30.0	10.3	1000	120.0	104.0	V	63	13
33.294	23.39	30.0	6.6	1000	120.0	128.0	V	20	13
46.056	14.91	30.0	15.1	1000	120.0	157.0	V	185	15
56.172	10.79	30.0	19.2	1000	120.0	103.0	V	57	16
497.332	12.34	36.0	23.7	1000	120.0	400.0	V	135	20
724.273	11.22	36.0	24.8	1000	120.0	108.0	V	28	23
926.958	14.02	36.0	22.0	1000	120.0	200.0	V	180	26

Plot 57: 1 GHz – 18 GHz, valid for specified modes, antenna vertical / horizontal



Peak Value: 56.51 dBµV/m (Limit 74 dBµV/m) / Average 51.95 dBµV/m (Limit 54 dBµV/m)

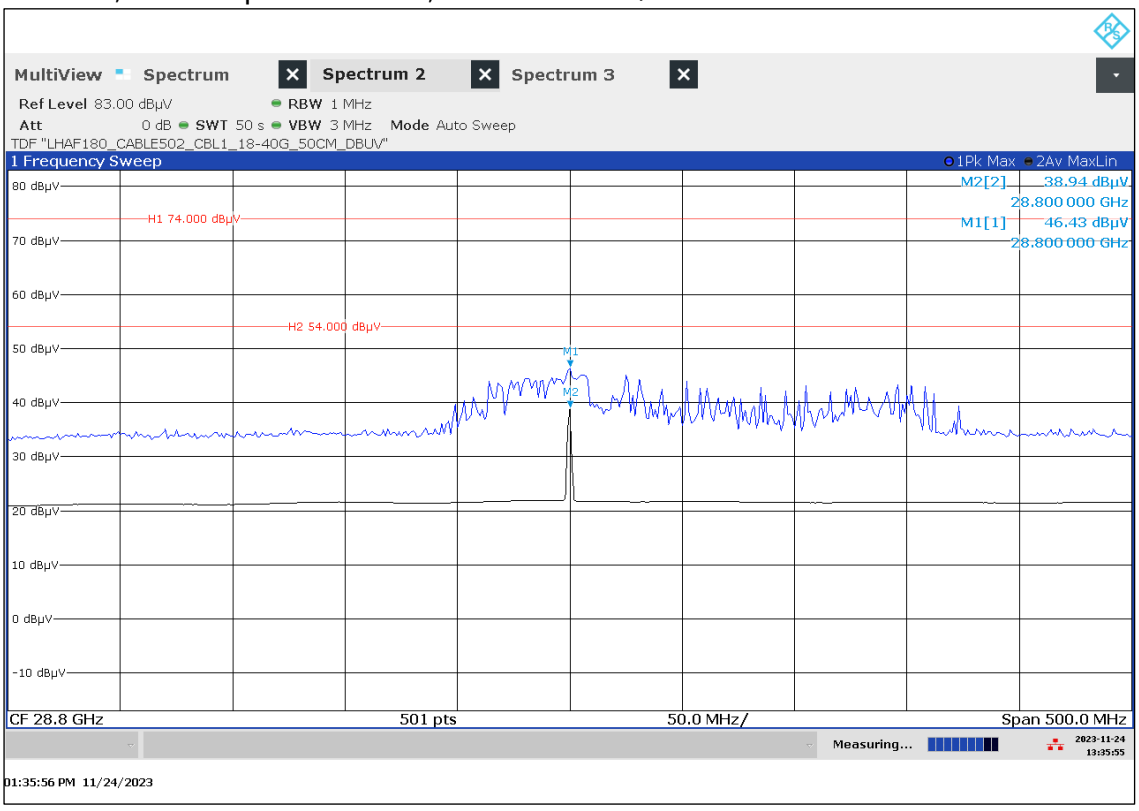
Plot 58: 18 GHz – 40 GHz, valid for specified modes, antenna vertical / horizontal (PEAK detector)



Plot 59: 19 GHz, valid for specified modes, antenna vertical / horizontal (Average detector)

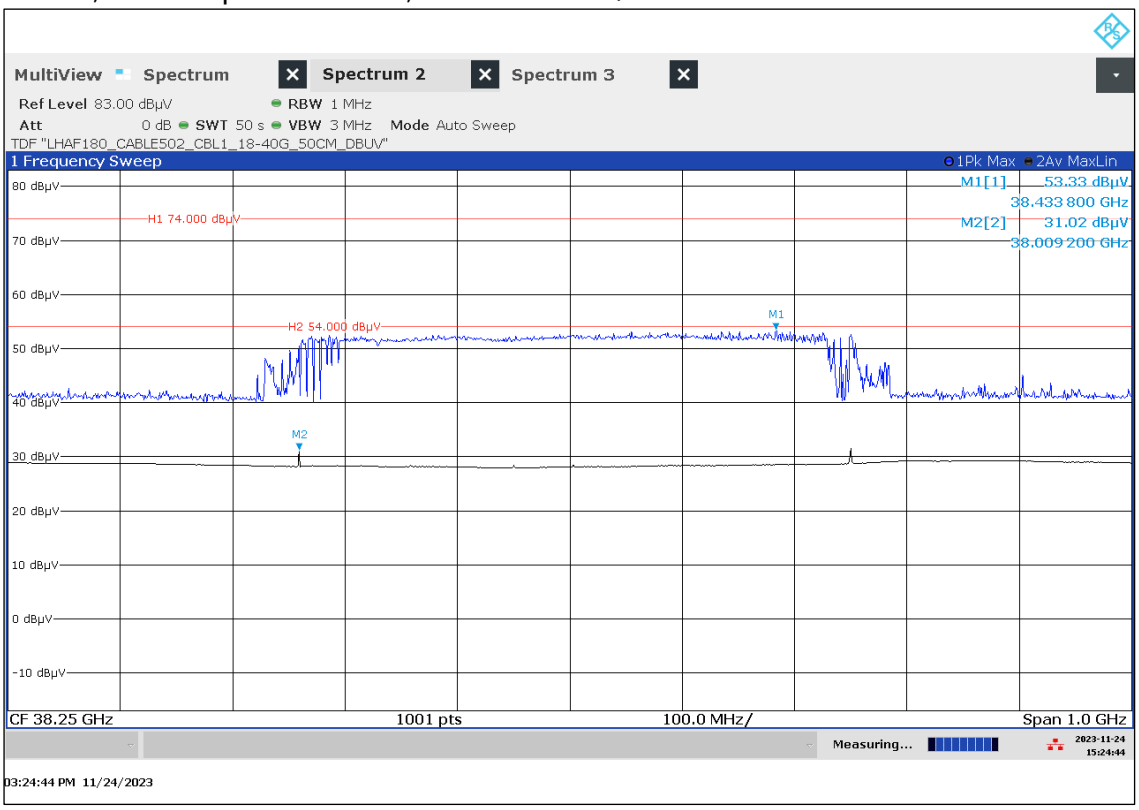
Peak Value: 46.70 dBµV/m (Limit 74 dBµV/m) / Average 21.47 dBµV/m (Limit 54 dBµV/m)

Plot 60: 28.8 GHz, valid for specified modes, antenna vertical / horizontal



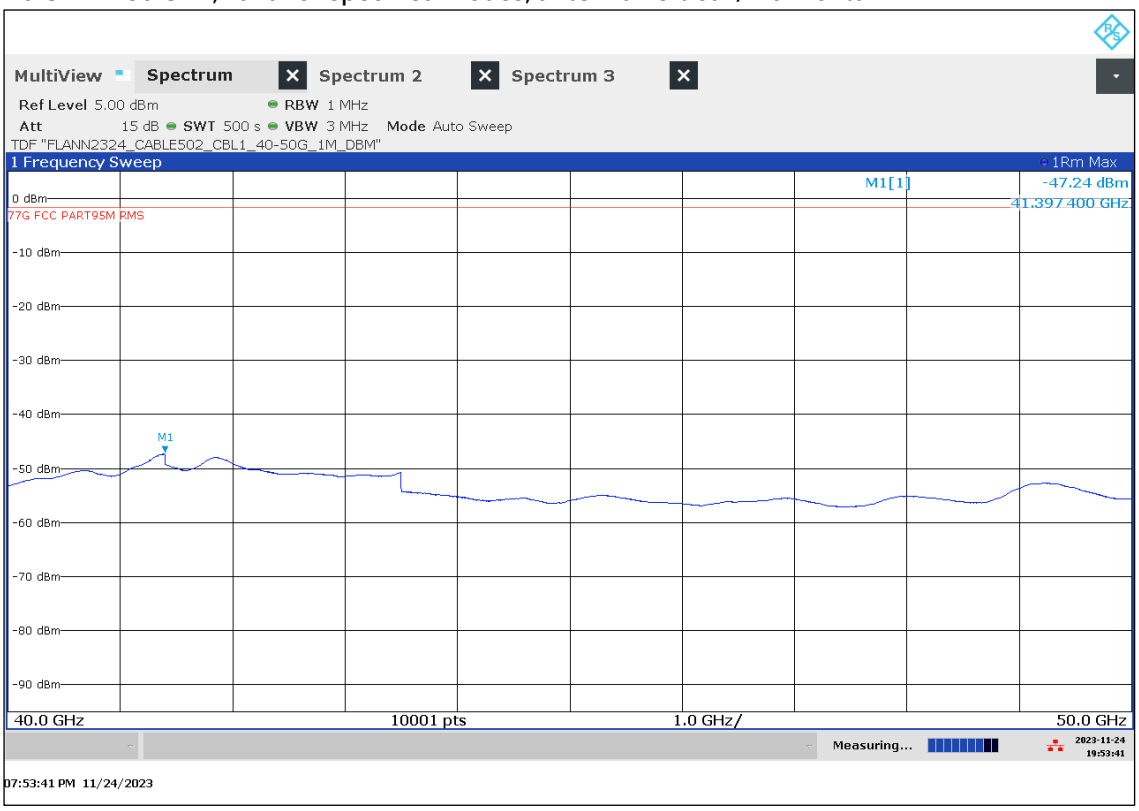
Peak Value: 46.43 dBµV/m (Limit 74 dBµV/m) / Average 38.94 dBµV/m (Limit 54 dBµV/m)

Plot 61: 38 GHz, valid for specified modes, antenna vertical / horizontal

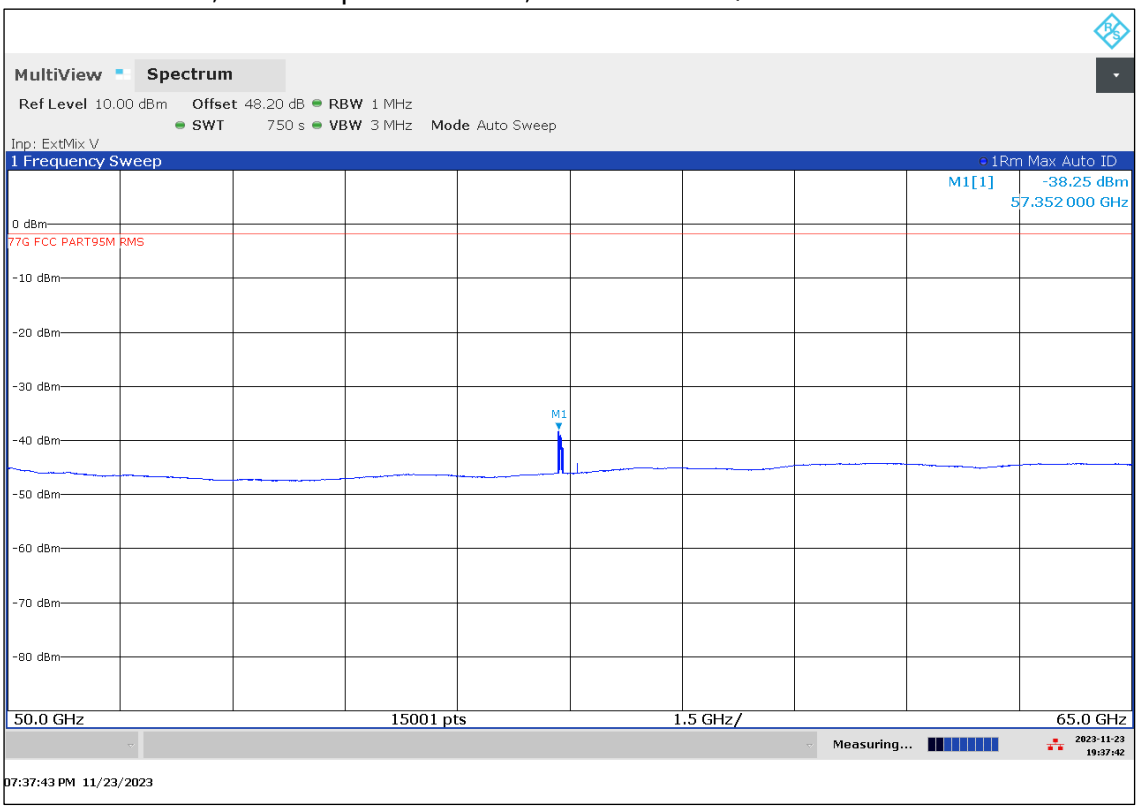


Peak Value: 53.33 dBµV/m (Limit 74 dBµV/m) / Average 31.02 dBµV/m (Limit 54 dBµV/m)

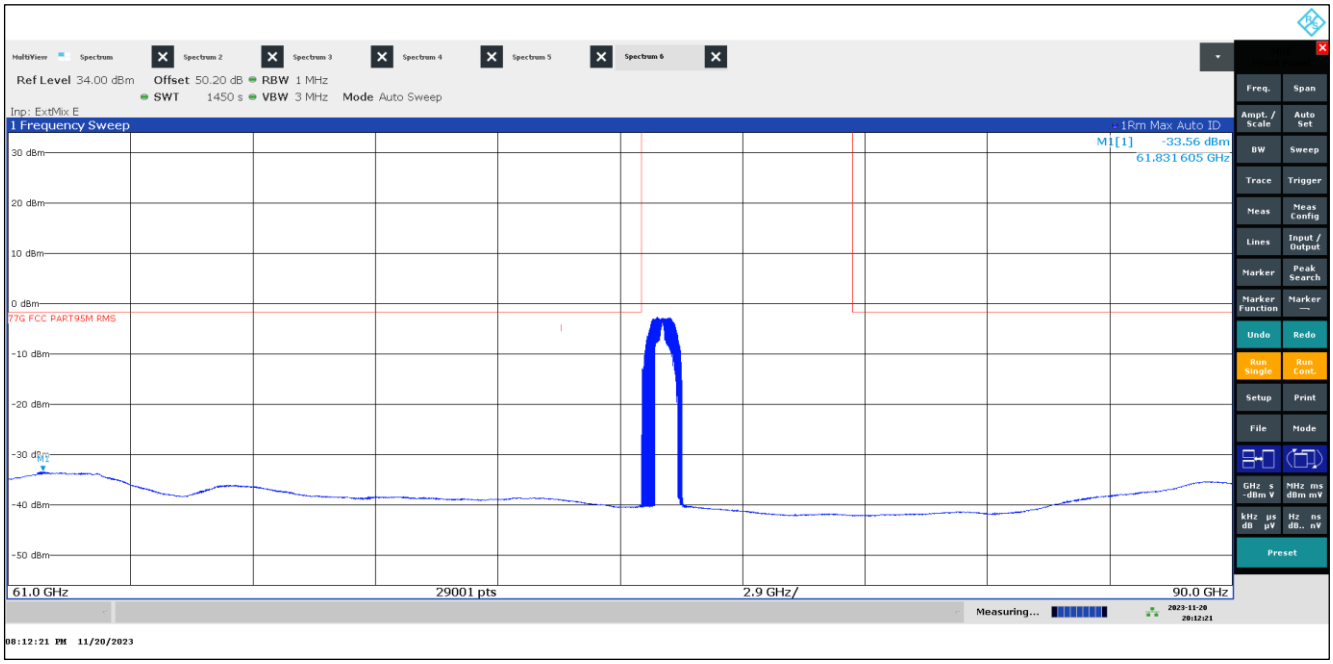
Plot 62: 40 GHz – 50 GHz, valid for specified modes, antenna vertical / horizontal



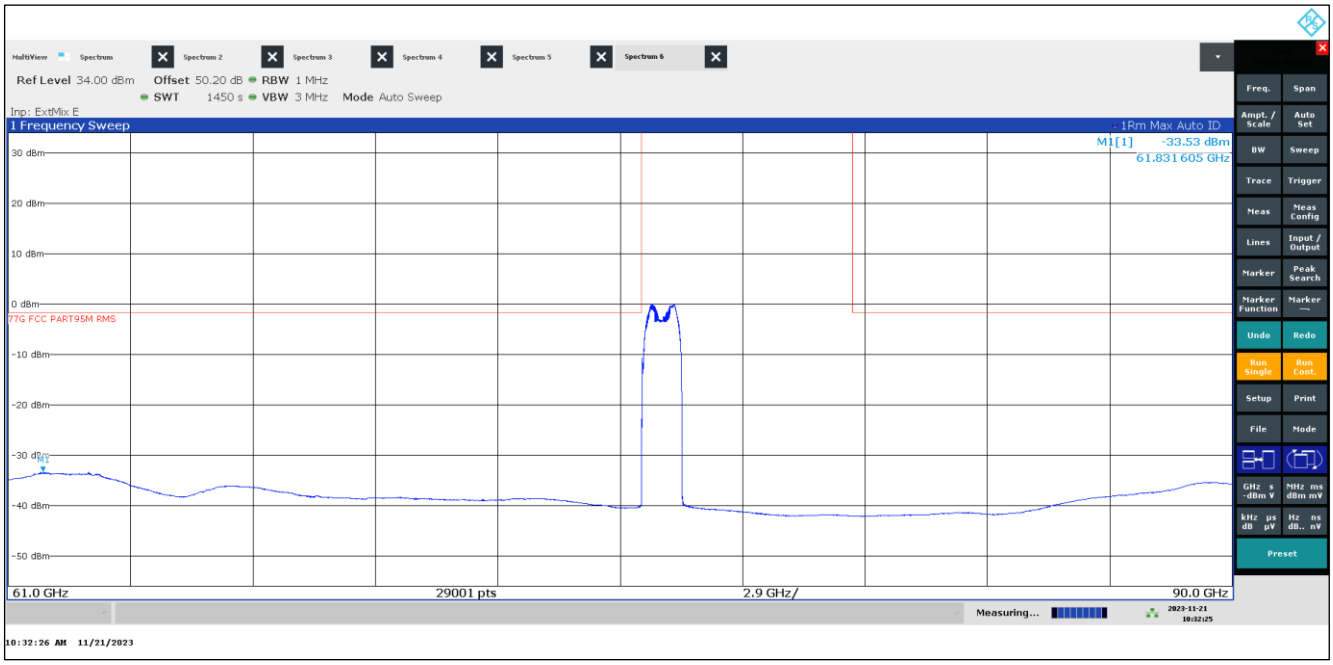
Plot 63: 50 GHz – 65 GHz, valid for specified modes, antenna vertical / horizontal



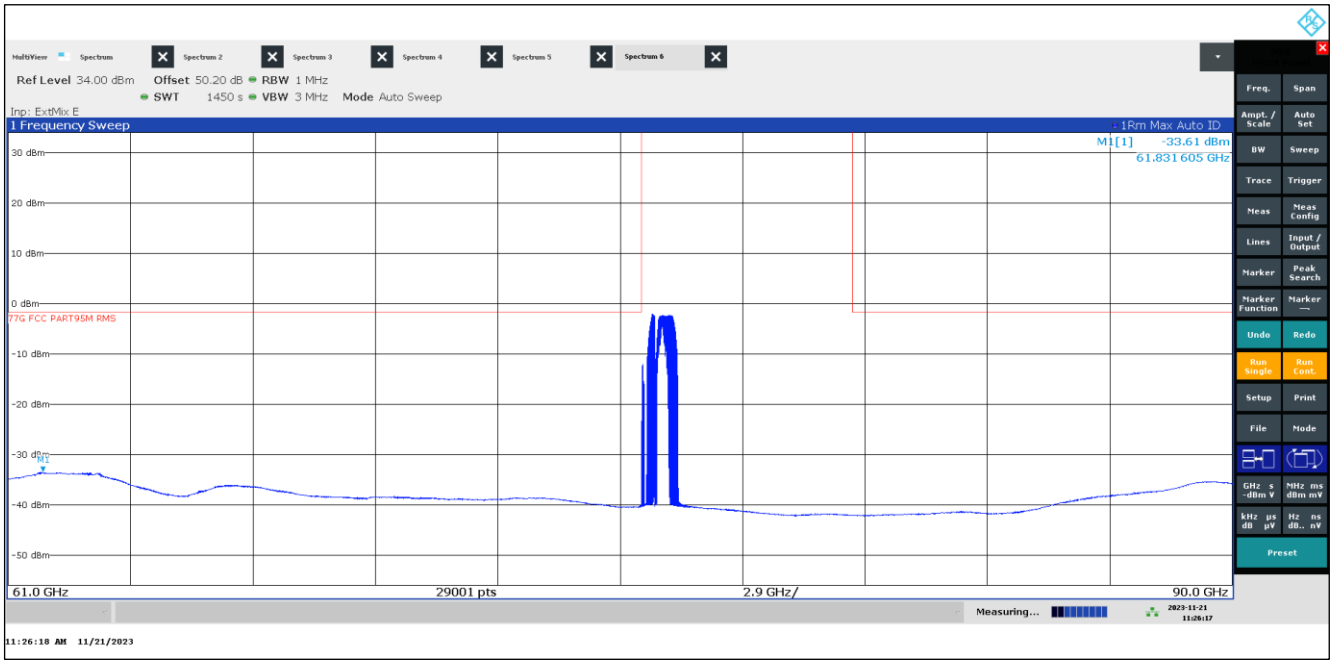
Plot 64: 61 GHz – 90 GHz, Mode 03, antenna vertical / horizontal



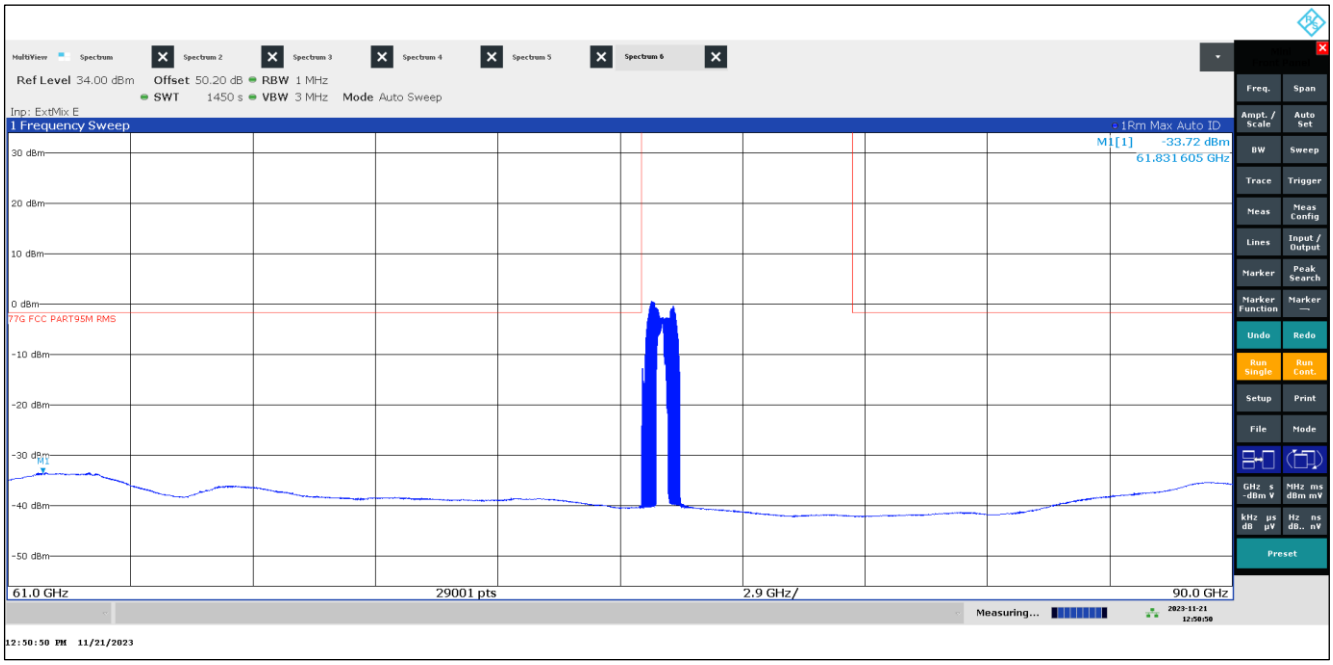
Plot 65: 61 GHz – 90 GHz, Mode 09, antenna vertical / horizontal



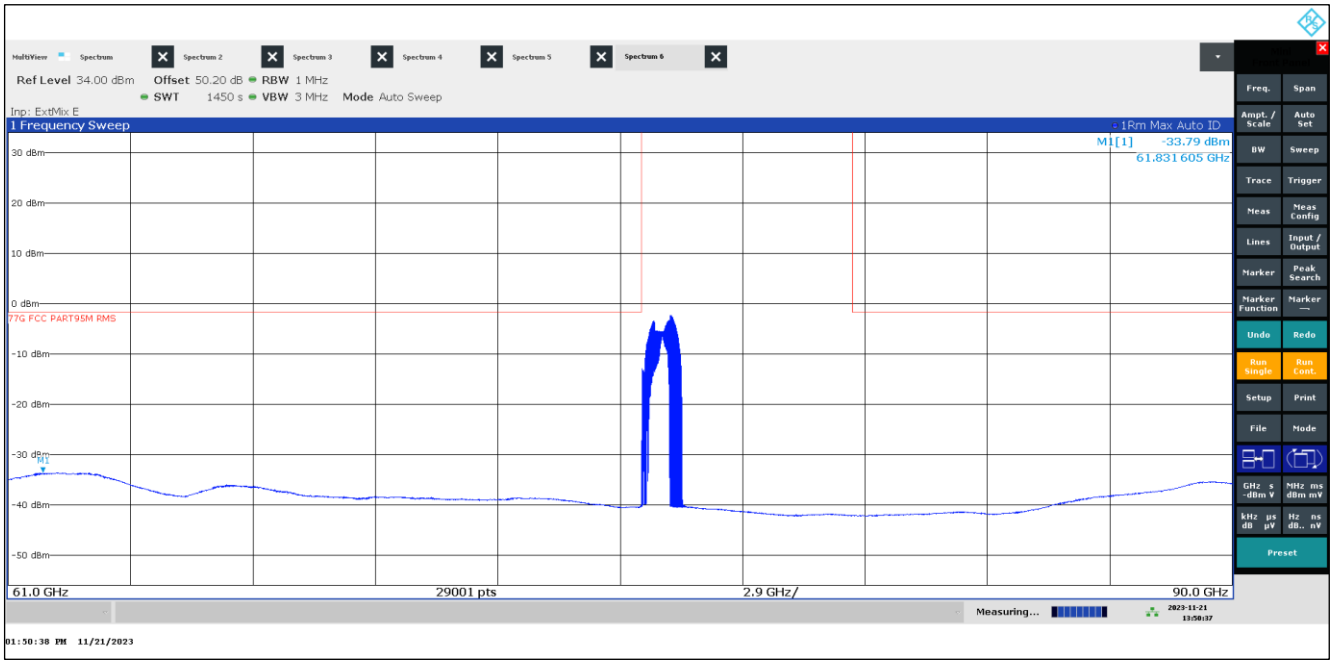
Plot 66: 61 GHz – 90 GHz, Mode 15, antenna vertical / horizontal



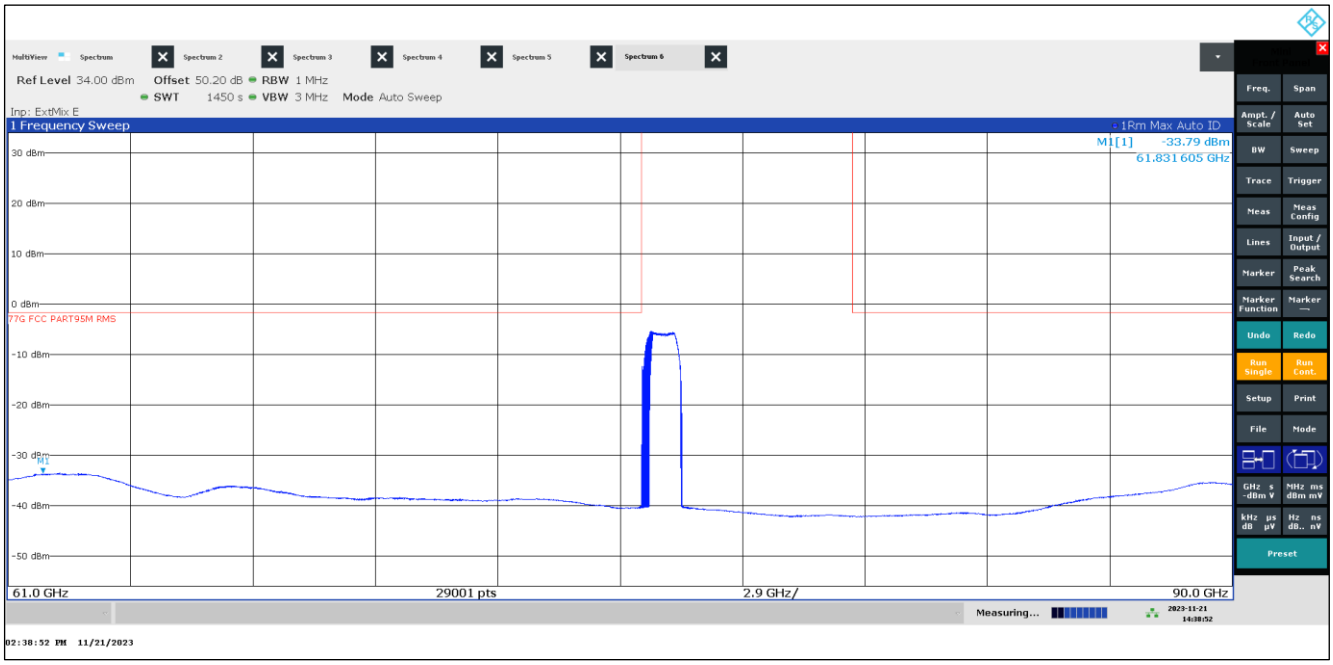
Plot 67: 61 GHz – 90 GHz, Mode 21, antenna vertical / horizontal



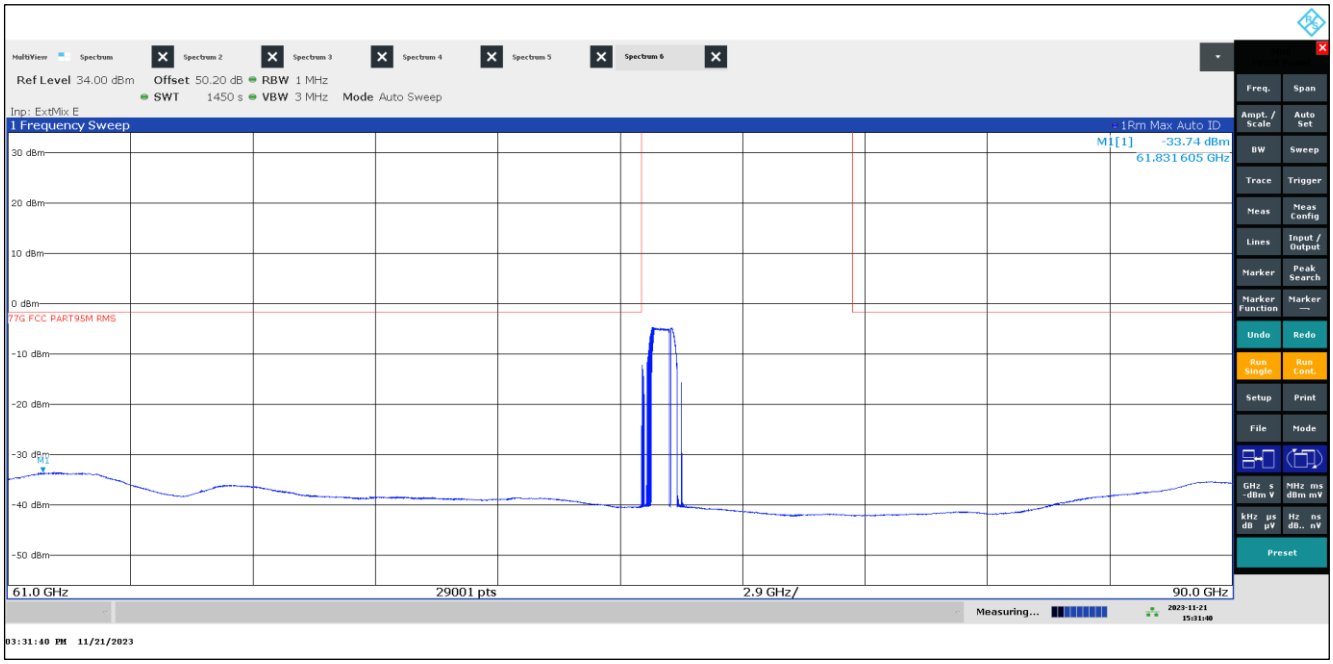
Plot 68: 61 GHz – 90 GHz, Mode 27, antenna vertical / horizontal



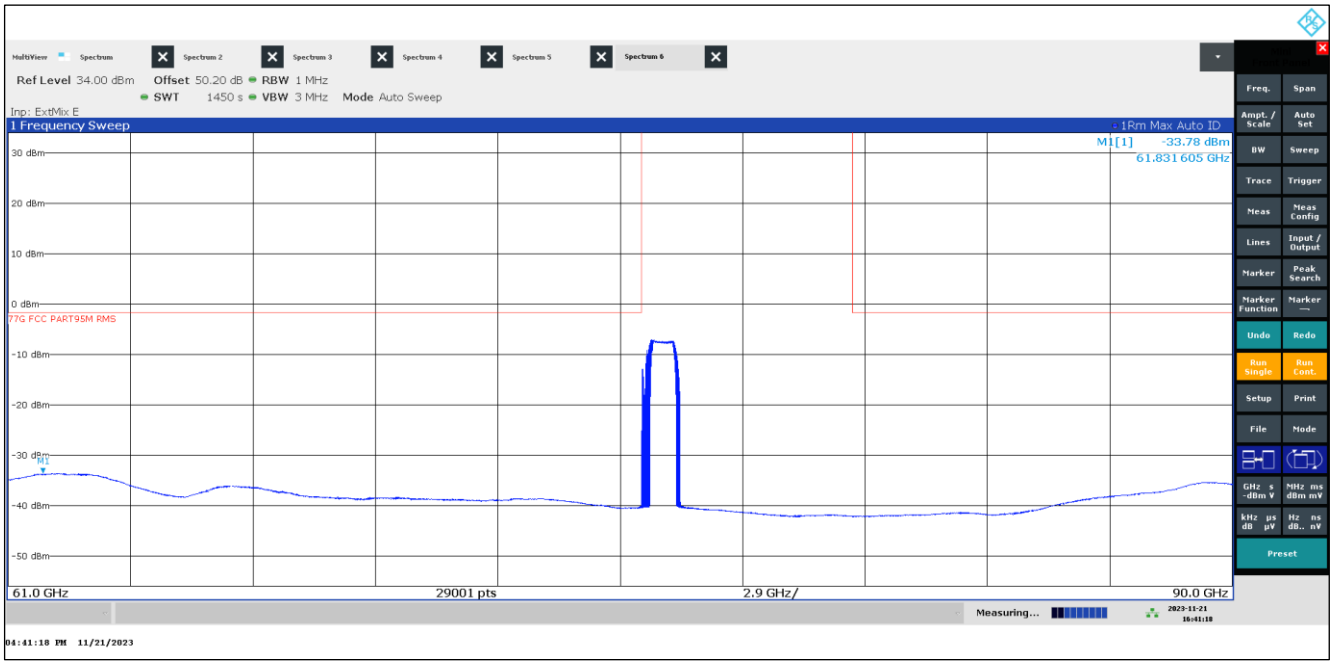
Plot 69: 61 GHz – 90 GHz, Mode 39, antenna vertical / horizontal



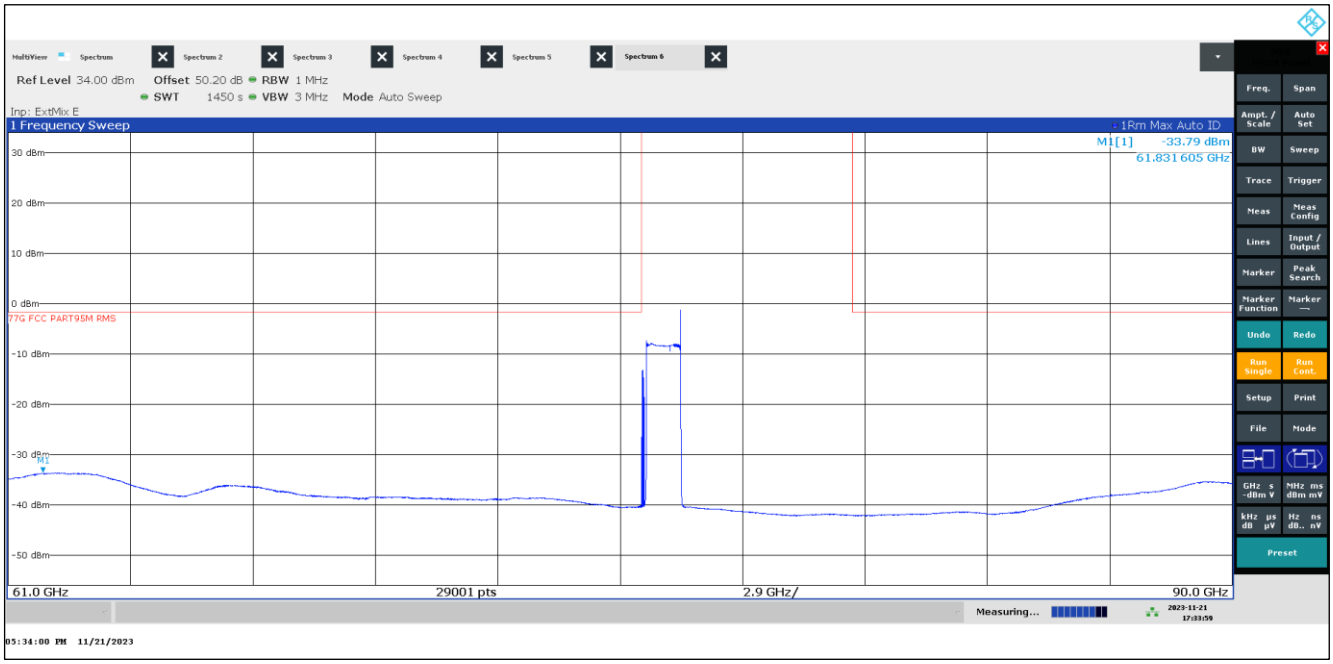
Plot 70: 61 GHz – 90 GHz, Mode 51, antenna vertical / horizontal



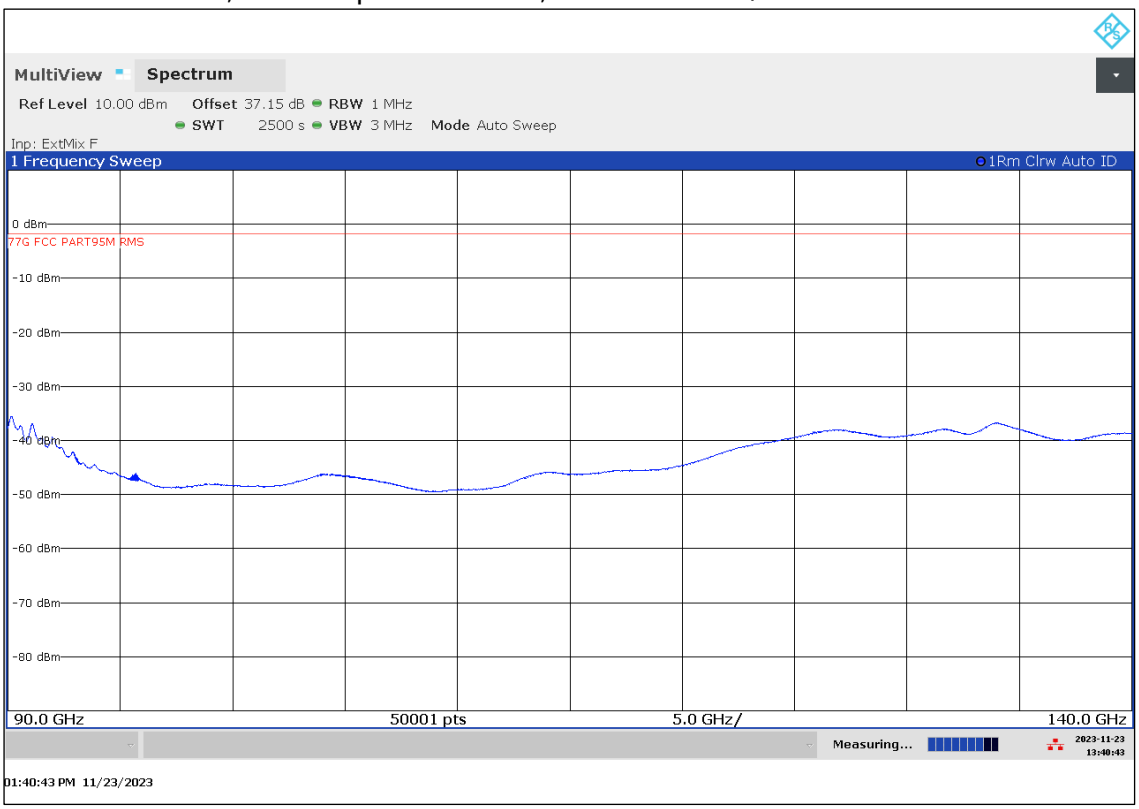
Plot 71: 61 GHz – 90 GHz, Mode 63, antenna vertical / horizontal



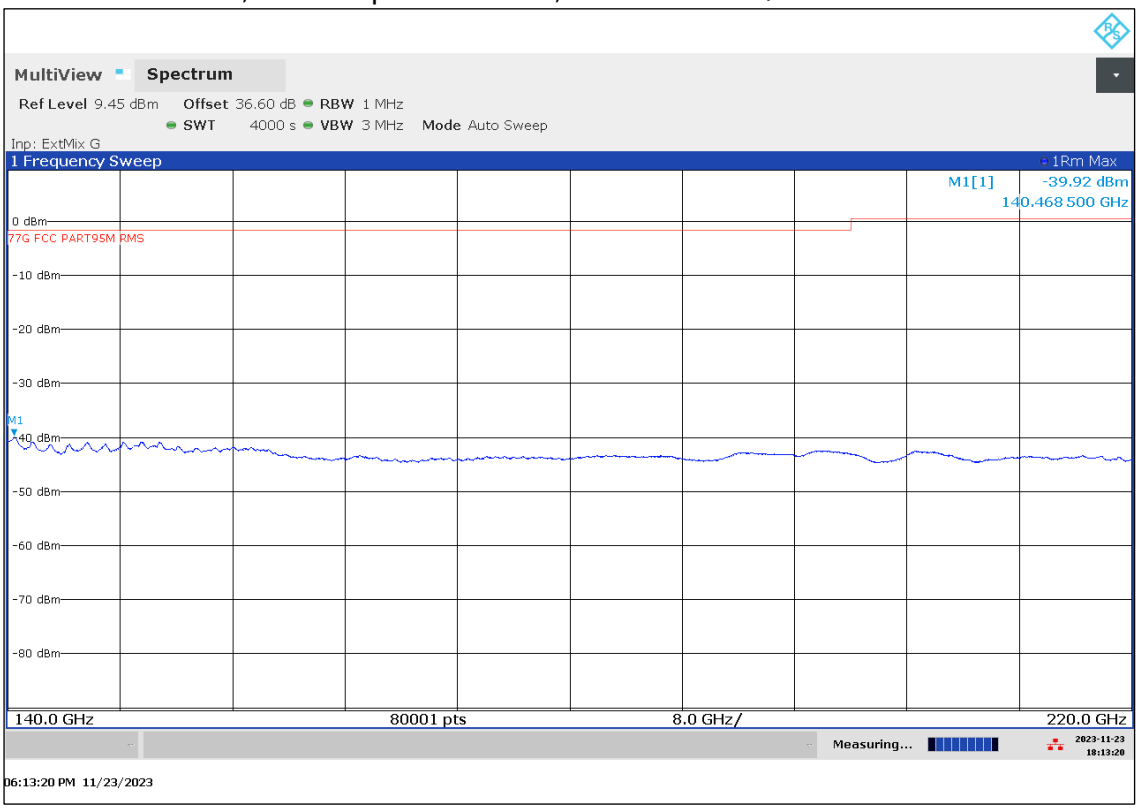
Plot 72: 61 GHz – 90 GHz, Mode 80, antenna vertical / horizontal



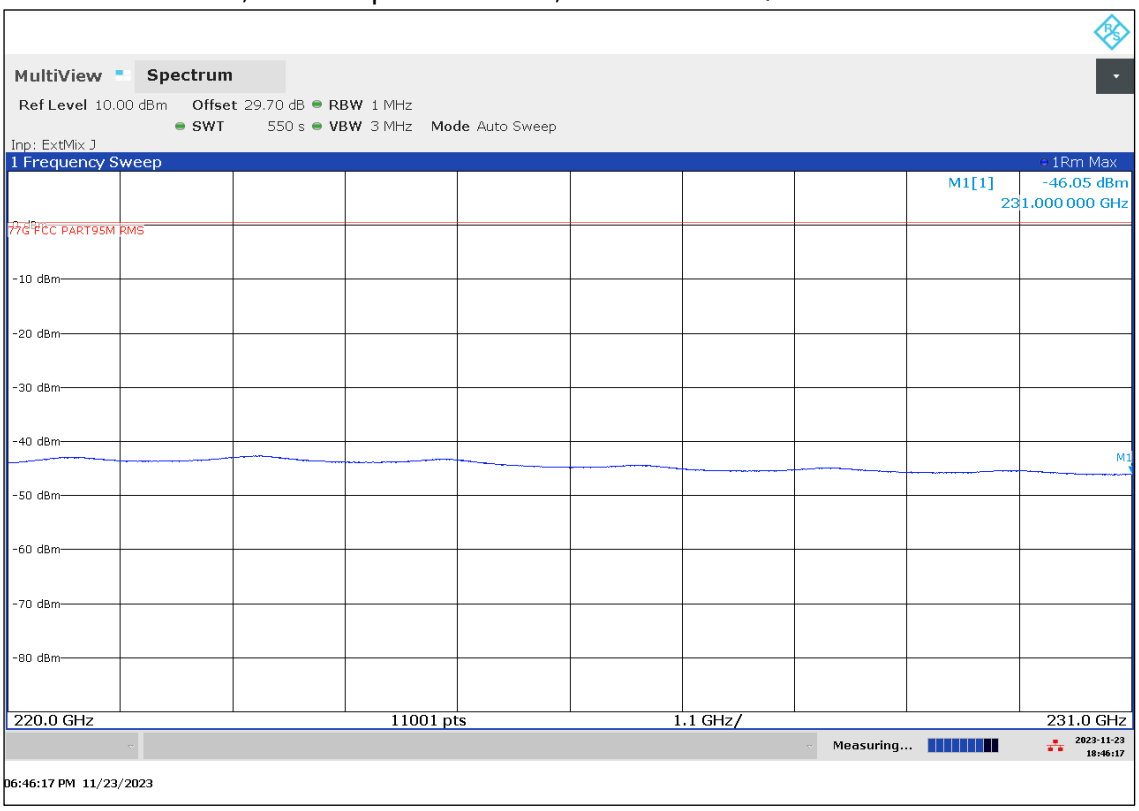
Plot 73: 90 GHz – 140 GHz, valid for specified modes, antenna vertical / horizontal



Plot 74: 140 GHz – 220 GHz, valid for specified modes, antenna vertical / horizontal



Plot 75: 220 GHz – 231 GHz, valid for specified modes, antenna vertical / horizontal



12.6 Frequency stability

Description:

§95.3379 (b) Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

Limits: **FCC §95.3379 (b)**

The occupied bandwidth from intentional radiators operated within the specified frequency band shall comply with the following: 76 GHz – 81 GHz

Measurement results:

Temperature variation

Mode	Temperature in °C	f_L in GHz	f_H in GHz	Bandwidth [MHz]
Mode 09 (Worst case)	-40 °C / V_{nom}	76.044 661	76.959 925	915.3
	-20 °C / V_{nom}	76.046 161	76.961 189	915.0
	-10 °C / V_{nom}	76.046 046	76.960 382	914.3
	0 °C / V_{nom}	76.046 904	76.956 451	909.5
	10 °C / V_{nom}	76.046 255	76.960 689	914.4
	20 °C / V_{nom}	76.047 941	76.962 115	914.2
	30 °C / V_{nom}	76.045 361	76.960 585	915.2
	40 °C / V_{nom}	76.045 351	76.960 782	915.4
	50 °C / V_{nom}	76.045 229	76.959 433	914.2
	85 °C / V_{nom}	76.046 126	76.949 427	903.3

Voltage variation

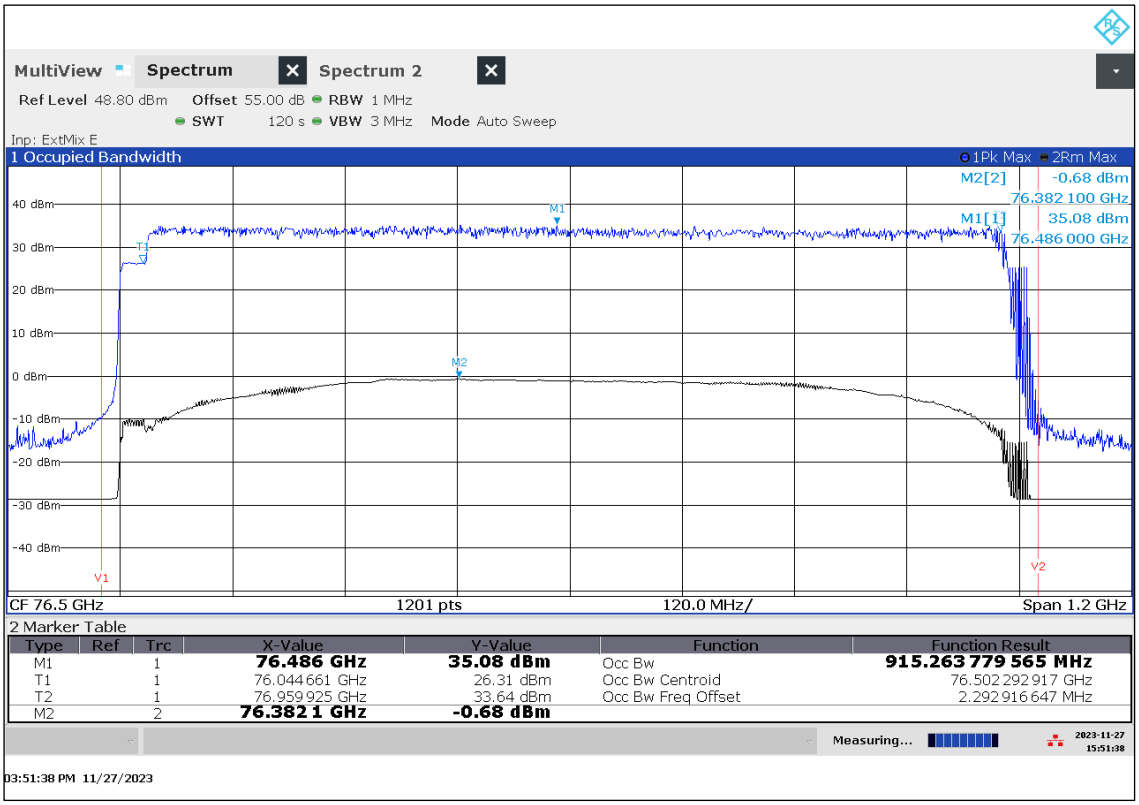
Voltage variation of rated input voltage	f_L in GHz	f_H in GHz
< 85 % of U	Voltage variation does not affect the radiated signal	
> 115 % of U		

Note:

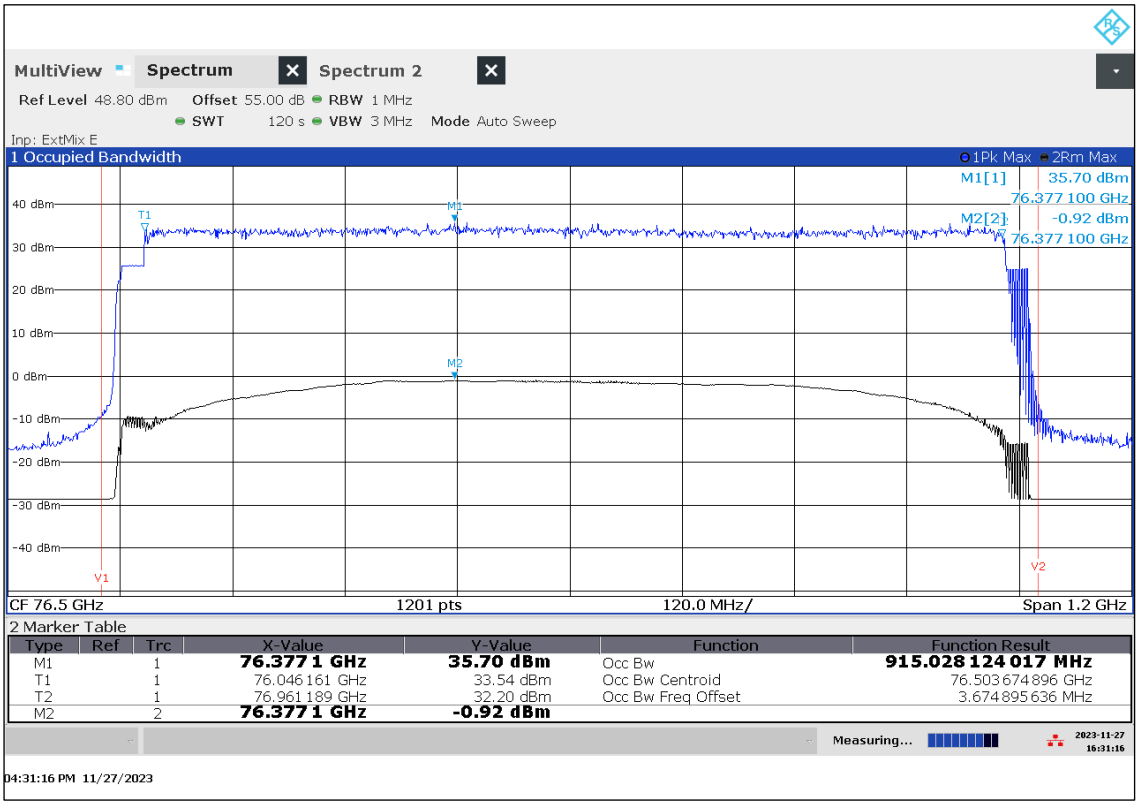
- The EUT is measured in the temperature range from -20°C to 50°C specified by §95.3379 (b)
- If the customer declared a wider temperature range, the customer take care about the proper functionality of the EUT.

Verdict: **Compliant**

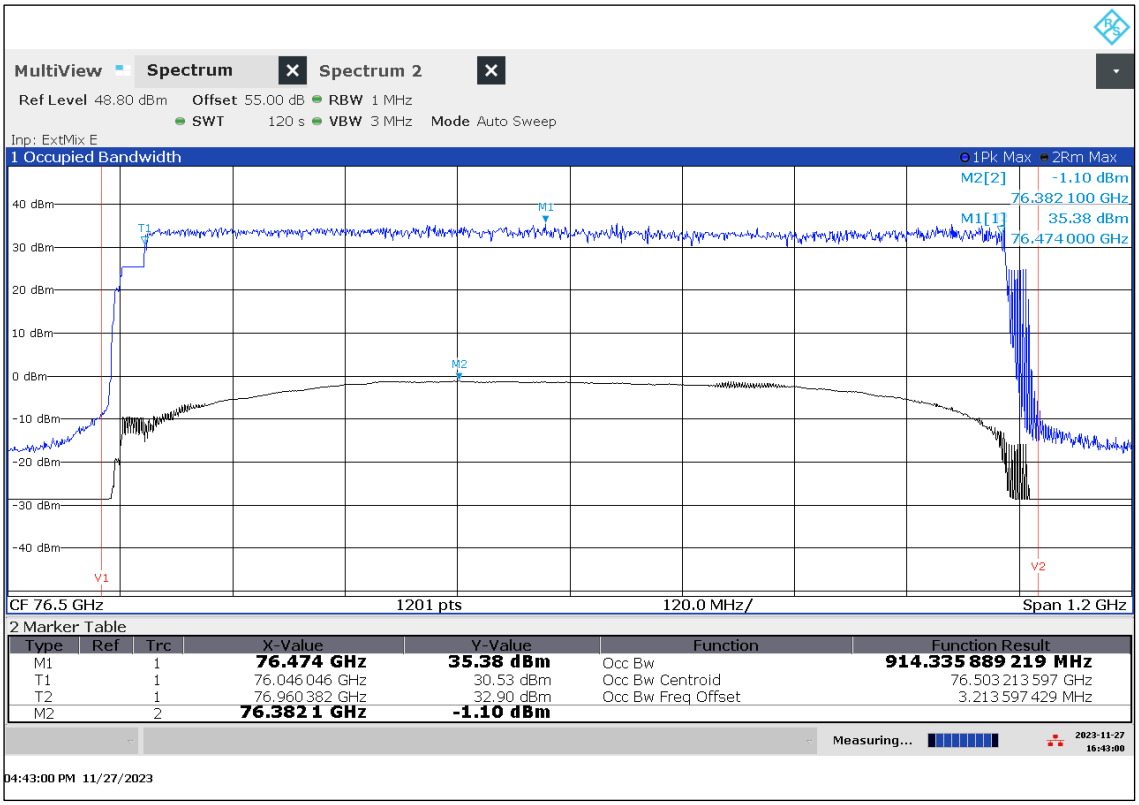
Plot 76: Mode 09, OBW, -40 °C / $V_{min-max}$



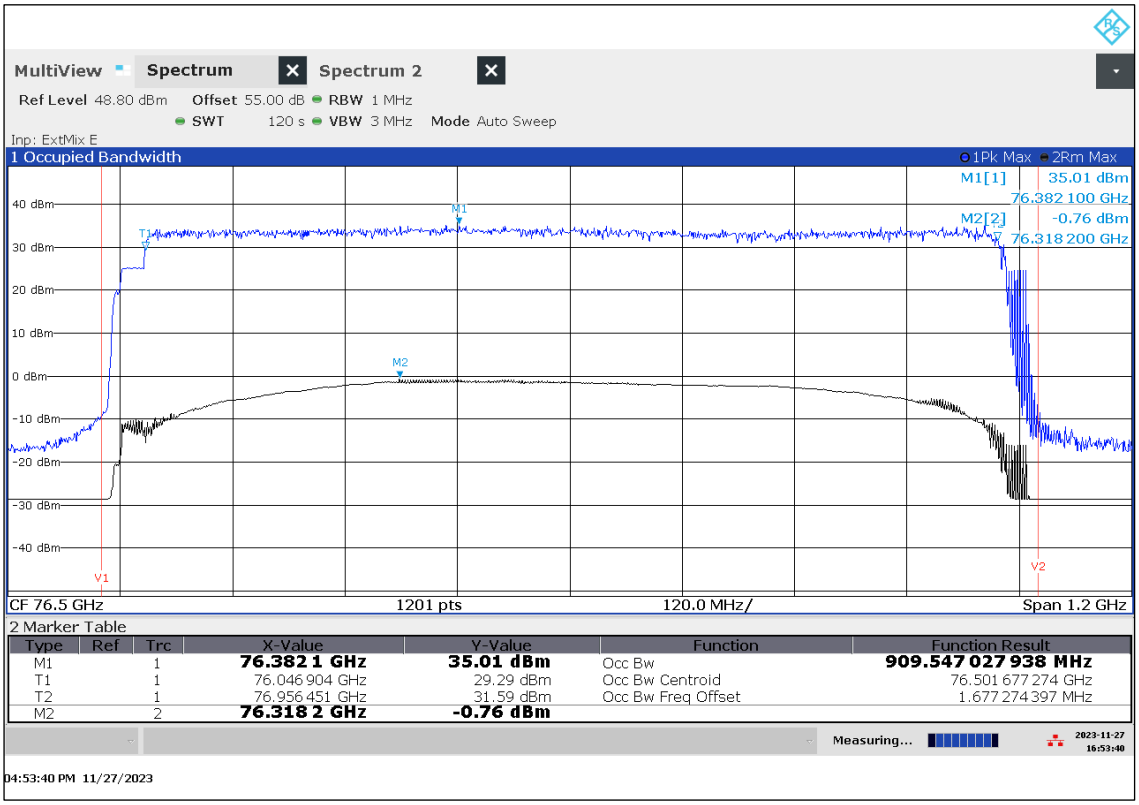
Plot 77: Mode 09, OBW, -20 °C / $V_{min-max}$



Plot 78: Mode 09, OBW, -10 °C / $V_{min-max}$

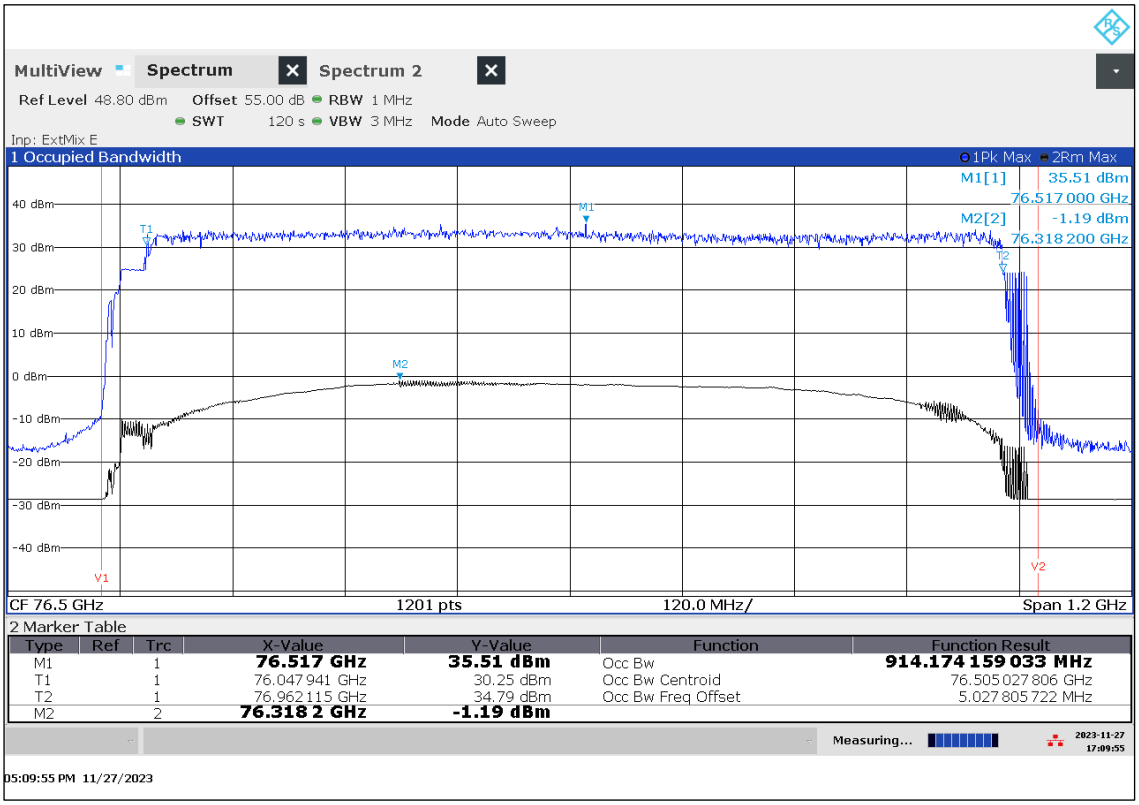


Plot 79: Mode 09, OBW, 0 °C / $V_{min-max}$

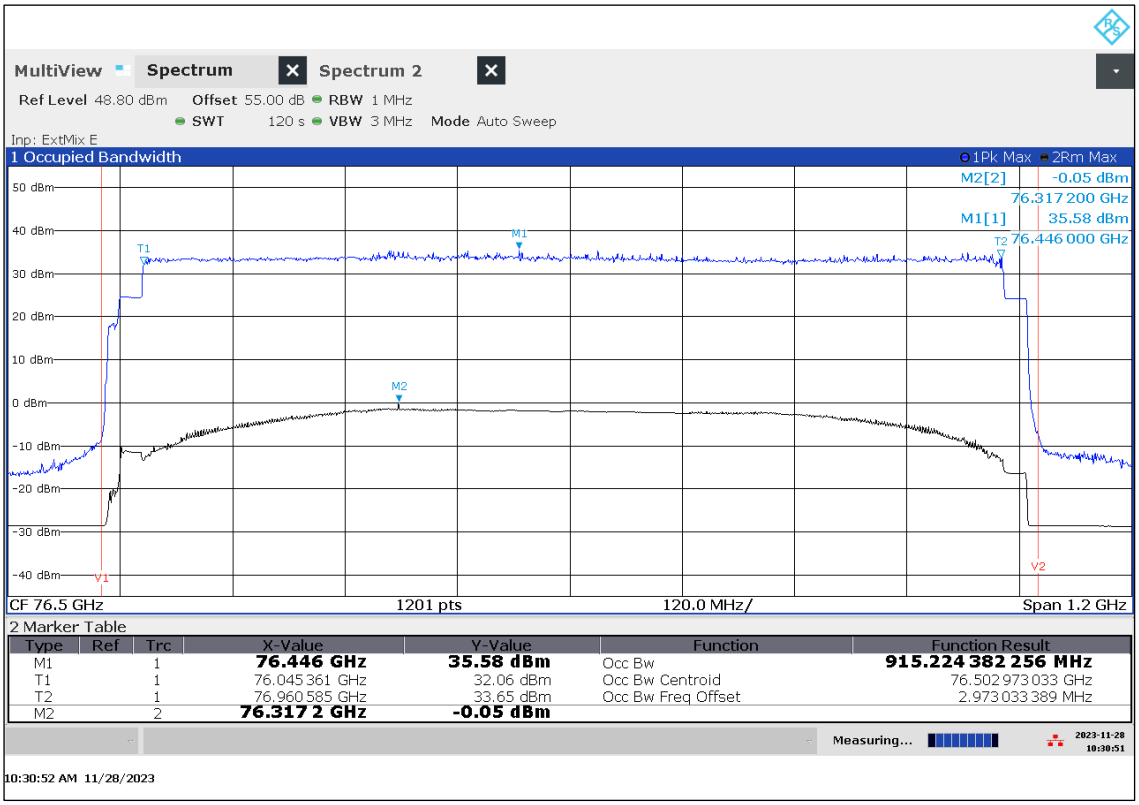


Plot 80: Mode 09, OBW, 10 °C / $V_{min-max}$

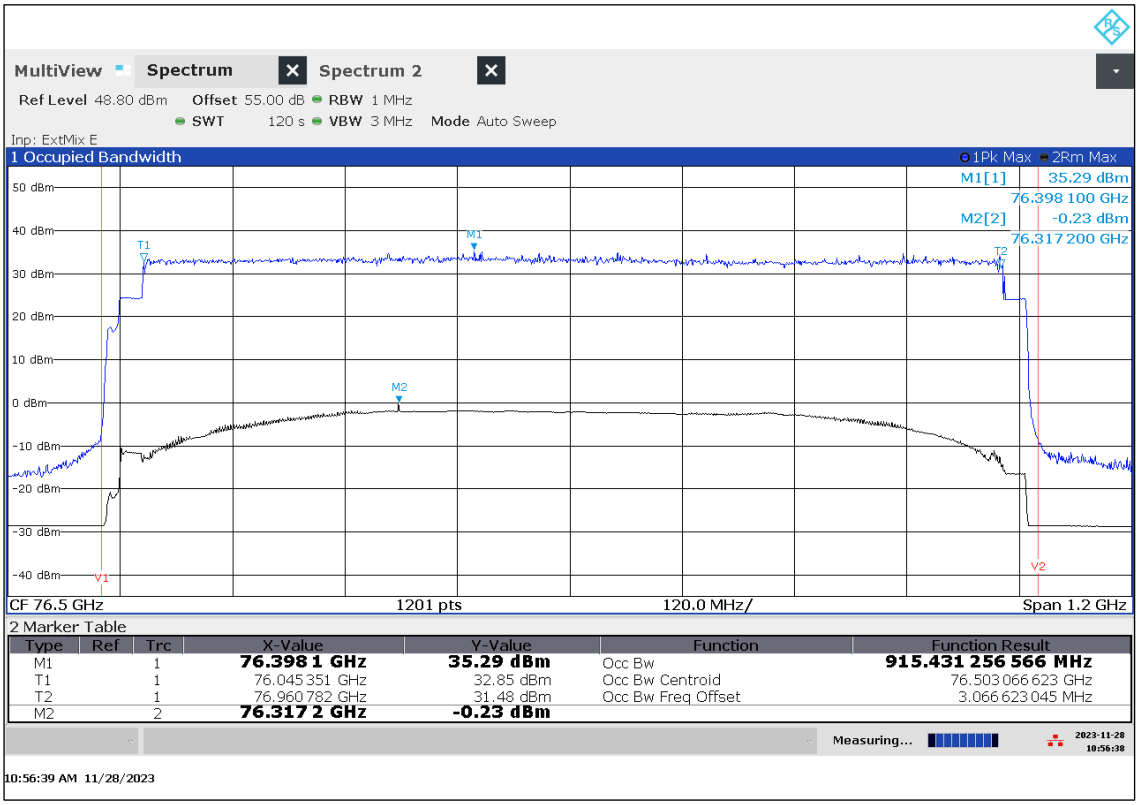
Plot 81: Mode 09, OBW, 20 °C / $V_{min-max}$



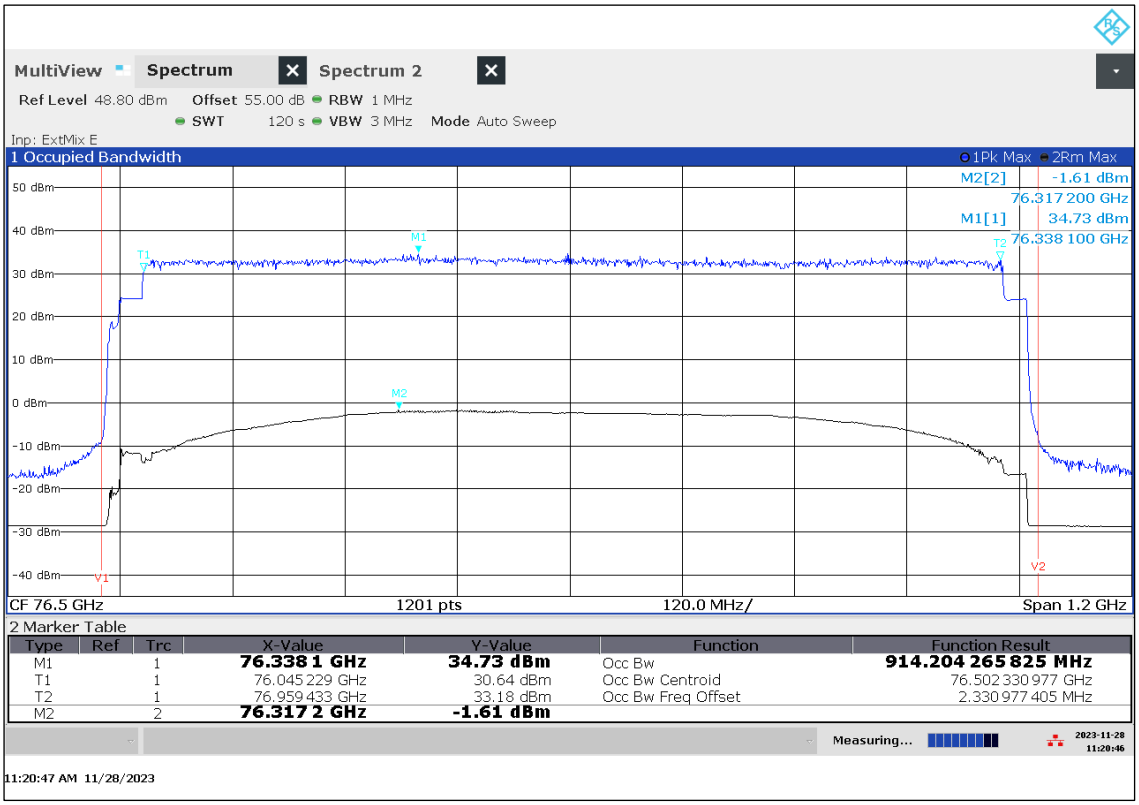
Plot 82: Mode 09, OBW, 30 °C / $V_{min-max}$



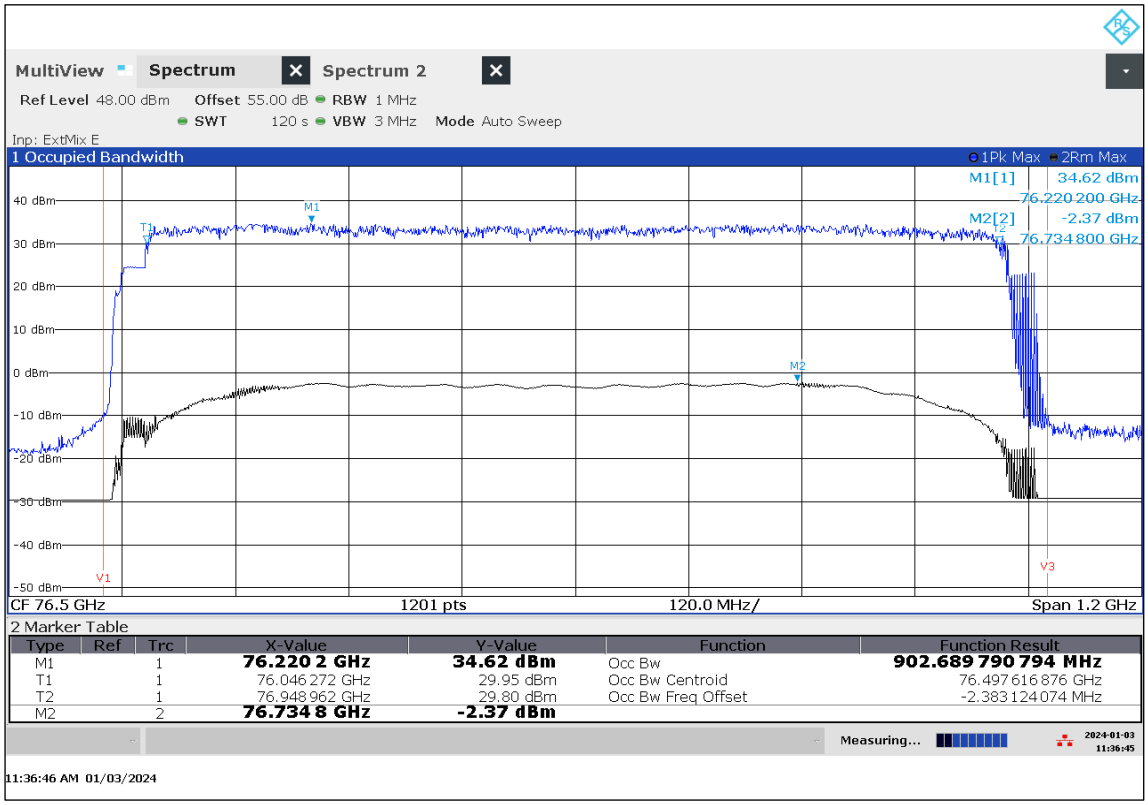
Plot 83: Mode 09, OBW, 40 °C / $V_{min-max}$



Plot 84: Mode 09, OBW, 50 °C / $V_{min-max}$



Plot 85: Mode 09, OBW, 85 °C / $V_{min-max}$



13 Glossary

EUT	Equipment under test
DUT	Device under test
UUT	Unit under test
GUE	GNSS User Equipment
ETSI	European Telecommunications Standards Institute
EN	European Standard
FCC	Federal Communications Commission
FCC ID	Company Identifier at FCC
IC	Industry Canada
PMN	Product marketing name
HMN	Host marketing name
HVIN	Hardware version identification number
FVIN	Firmware version identification number
EMC	Electromagnetic Compatibility
HW	Hardware
SW	Software
Inv. No.	Inventory number
S/N or SN	Serial number
C	Compliant
NC	Not compliant
NA	Not applicable
NP	Not performed
PP	Positive peak
QP	Quasi peak
AVG	Average
OC	Operating channel
OCW	Operating channel bandwidth
OBW	Occupied bandwidth
OOB	Out of band
DFS	Dynamic frequency selection
CAC	Channel availability check
OP	Occupancy period
NOP	Non occupancy period
DC	Duty cycle
PER	Packet error rate
CW	Clean wave
MC	Modulated carrier
WLAN	Wireless local area network
RLAN	Radio local area network
DSSS	Dynamic sequence spread spectrum
OFDM	Orthogonal frequency division multiplexing
FHSS	Frequency hopping spread spectrum
GNSS	Global Navigation Satellite System
C/N_0	Carrier to noise-density ratio, expressed in dB-Hz

14 Document history

Version	Applied changes	Date of release
-/-	Initial release - DRAFT	2023-12-12
-/-	Initial release	2024-01-05

################################ END OF TEST REPORT ################################