RHEIN TECH LABORATORIES, INC.

Engineering Solutions & Electromagnetic Compatibility Services

FCC Certification Report

Saankhya Labs Pvt Ltd
Embassy Icon, Third Floor & Ground Floor, #3, Infantry Road
Bengaluru, India

Model: YOGA40W00

FCC ID: 2AUUC-YOGA40W00

January 26, 2024

Standards Referenced for this Report	
Part 2: 2019	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 74: 2023	Experimental Radio, Auxiliary, Special Broadcast and Other Program Distributional Services
ANSI C63.26-2017	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

Report Prepared By: Daniel W. Baltzell

Document Number: 2023088

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from the standards referenced above.

Signature: _____ Date: January 26, 2024

Typed/Printed Name: Desmond A. Fraser Position: President

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Replaces Report R1.2.

These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANAB.
Refer to certificate and scope of accreditation AT-1445.

FCC Equipment Class TBC

Frequency Range (MHz)	Rated Average Conducted Output Power (W)	Frequency Tolerance (kHz)	Emission Designator
470 – 608	40	0.1	5M79W7D

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1 Test Summary

Test	FCC Reference	Result
RF Power Output	2.1046(a), 74.735	Complies
Spurious Emissions at Antenna Terminals	2.1051, 74.794	Complies
Field Strength of Spurious Radiation	2.1053(a), 74.794	Complies
Occupied Bandwidth/Emission Masks	2.1049, 74.794(a)(2)(i)	Complies
Frequency Stability vs. Temperature and Voltage	2.1055, 74.795	Complies

2 General Information

The following certification report is prepared on behalf of **Saankhya Labs Pvt Ltd** in accordance with the Federal Communications Commission. The Equipment Under Test (EUT) was Model: YOGA40W00**,** FCC ID: 2AUUC-YOGA40W00.

All measurements contained in this application were conducted in accordance with the applicable sections of FCC Rules and Regulations CFR 47 Parts 2 and 74. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier, and cables.

2.1 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170.

2.2 Tested System Details

The test sample(s) was/were received on October 24, 2023. The FCC identifiers for all applicable equipment and cable descriptions used in the tested system, are identified in the following table.

Table 2-1: Equipment Under Test

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Barcode
ATSC 3.0 Radio	Saankhya Labs Pvt. Ltd.	YOGA40W00	SLBRH40WA-TX470608-11-B-000001	2AUUC-YOGA40W00	Unshielded	21815
ATSC 3.0 Radio	Saankhya Labs Pvt. Ltd.	YOGA40W00	SLBRH40WA-TX470608-11-B-000002	2AUUC-YOGA40W00	Unshielded	21819

Table 2-2: Auxiliary Equipment

Part	Manufacturer	Model	Serial Number	Cable Description	RTL Barcode
Access Point	TP-Link	TL-MR3420	SL-BLR-00291	Unshielded ethernet	21820
Laptop	Dell	DELL Vostro 14 3000	SL-BLR-10338 SN: HCDXK73	Unshielded	21816
Access Point	N/A	N/A	N/A	Unshielded ethernet	21817
GPS Antenna	OEM	N/A	N/A	3m Unshielded	21812

2.3 Test Configuration

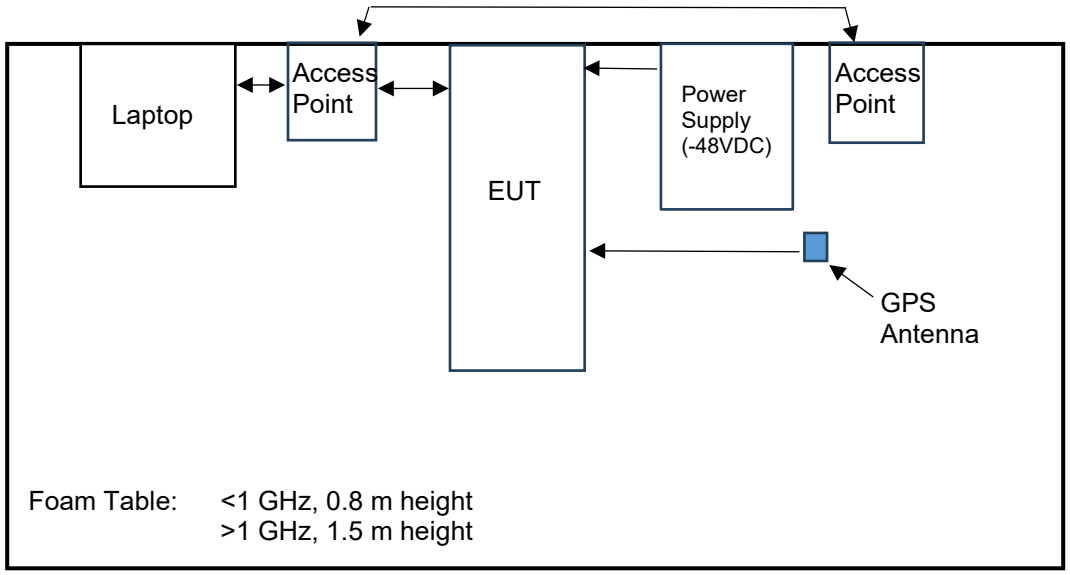


Figure 2-1: Configuration of Tested System, Radiated Emissions

2.4 Modulation Signal

The equipment under test supports all modulation and code rates (mod-cods) in the ASTC 3.0 standard as follows:

1. Code rate 64000 bits: Modulation Type: QSPK, 16QAM, 64QAM, and 256QAM
2. Code rate 16000 bits: Modulation Type: QSPK, 16QAM, 64QAM, and 256QAM

However, since the highest code rate and modulation type are considered the worst case from an emissions aspect, only the 64000 bit code rate and the 256QAM modulation type were used to modulate the EUT during testing.

3 FCC Part 2.1033(C)(8): Voltages and Currents through the Final Amplifying Stage

- 48 VDC / 6.2 A
- Tune-up procedure over the power range, or at specific operating power levels. Refer to the tune up procedure exhibit.

4 FCC Part 2.1046(a): RF Power Output: Conducted; Part 74.735: Power Limitations

4.1 Test Procedure

- ANSI C63-26, section 5.2
- KDB 971168 D01 Power Meas License Digital Systems v03r01, Power Measurements

The EUT was connected to a coaxial attenuator having a 50 Ω load impedance.

Manufacturer's Rated Power: 40.0 W

§74.735 Power limitations. (b) The maximum ERP of a digital low power TV, TV translator, or TV booster station (average power) shall not exceed: (1) 3 kW for VHF channels 2–13; and (2) 15 kW for UHF channels 14–69. Therefore, the maximum power rating as defined above for transmitter use is defined by ERP and not transmitter output rating.

4.2 Test Data

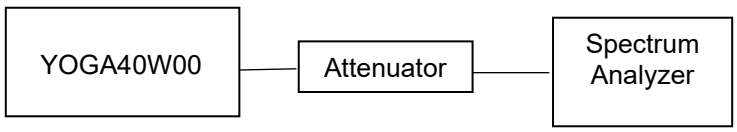
Table 4-1: Conducted Antenna Port Measurement Environmental Conditions

Date	Temperature (°C)	Humidity (%)	Pressure (kPa)
10/24/2023	21.7	31	101.6

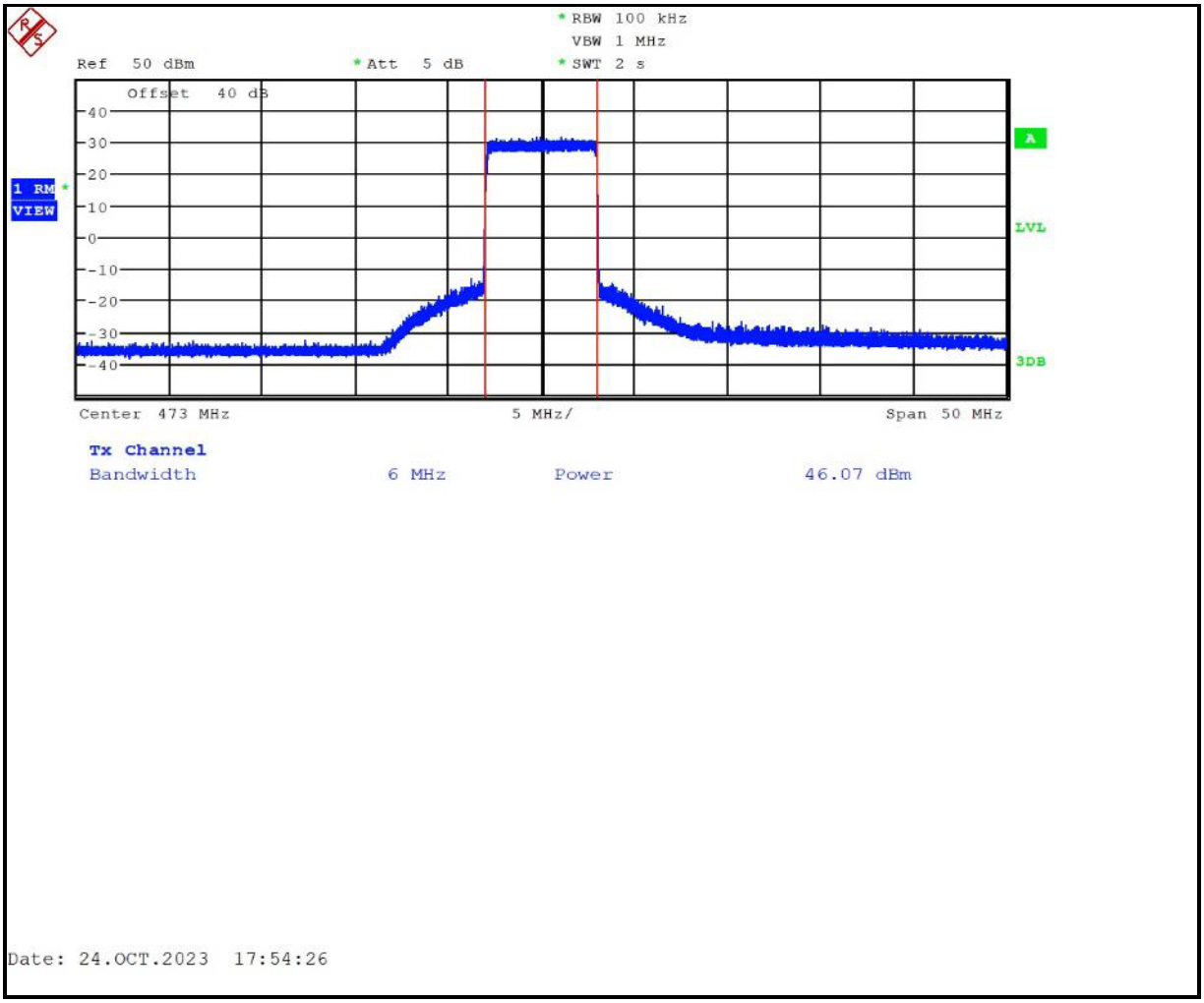
Table 4-2: RF Conducted Output Power - Measured

Channel Number	Frequency (MHz)	Power (dBm)	Power (W)
14	473	46.07	40.5
25	539	46.09	40.6
36	605	46.02	40.0

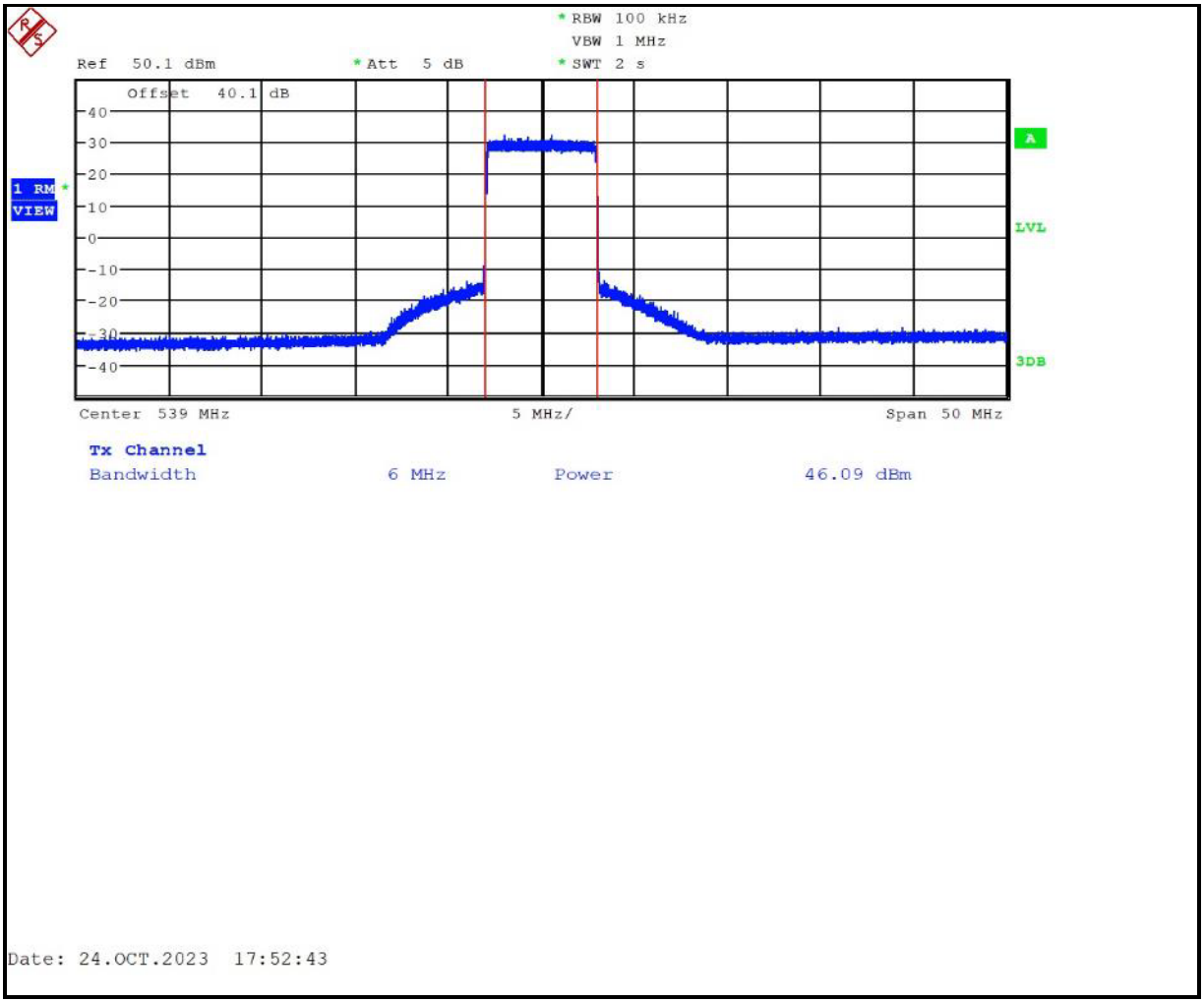
Figure 4-1: Configuration of Tested System, Conducted Tests



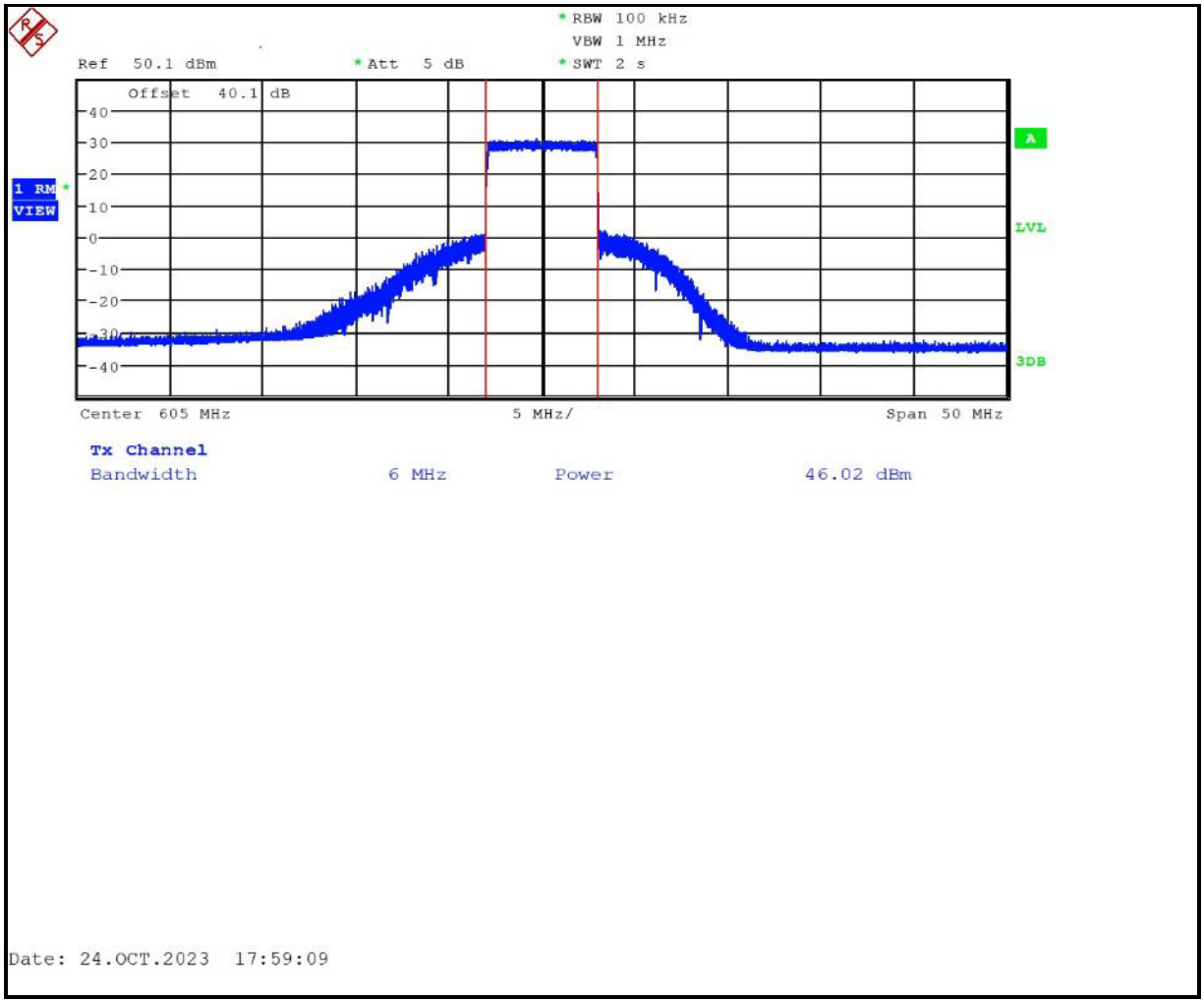
Plot 4-1: RF Conducted Average Output Power – 473.0 MHz



Plot 4-2: RF Conducted Average Output Power – 539.0 MHz



Plot 4-3: RF Conducted Average Output Power – 605.0 MHz



Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 Hz/±0.5 dB

Results: Pass

Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	October 24, 2023
EMC Test Engineer	Signature	Date of Test

Table 4-3: Test Equipment Used For Testing RF Power Output - Conducted

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	12/01/2024
901724	API Weinschel, Inc.	48-40-34	40 dB 100W Attenuator	CJ8921	11/22/2023
901727	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	11/30/2023
901773	Rohde & Schwarz	FSW50	Analyzer	101021	02/02/2025

5 FCC Part 2.1051: Spurious Emissions at Antenna Terminals; Part 74.794(a)(2)(i): Simple Mask

5.1 Test Procedure

ANSI C63-26, section 5.7

The transmitter is terminated with a 50 Ω load and interfaced with a spectrum analyzer. Device with digital modulation: Modulated to its maximum extent using a pseudo-random data sequence.

5.2 Test Data

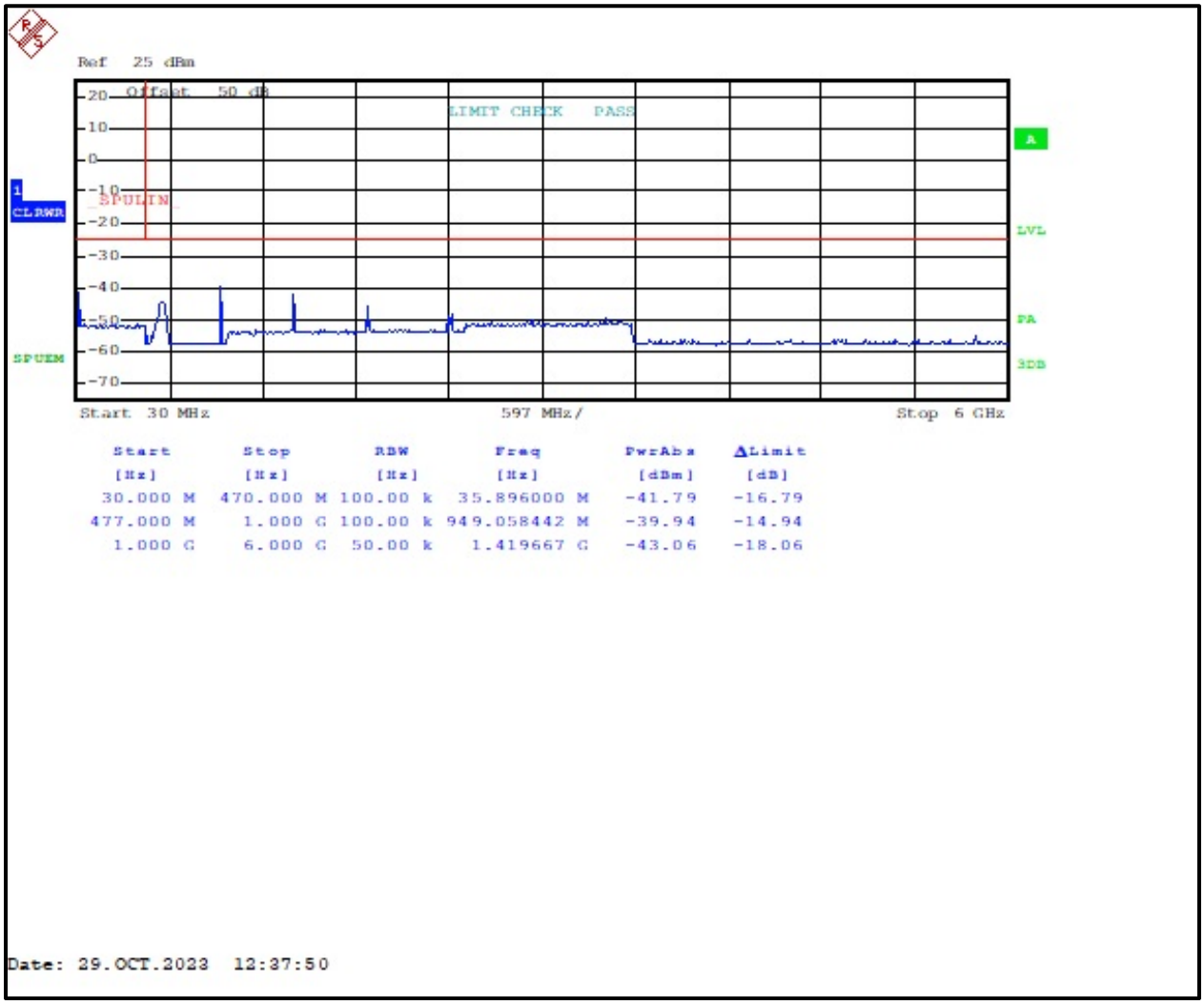
Frequency range of measurement: 30 MHz to 10 x Fc Limits: -71 dBc (-25 dBm)

The following channels (in MHz) were investigated: 473 MHz, 539 MHz, 605 MHz

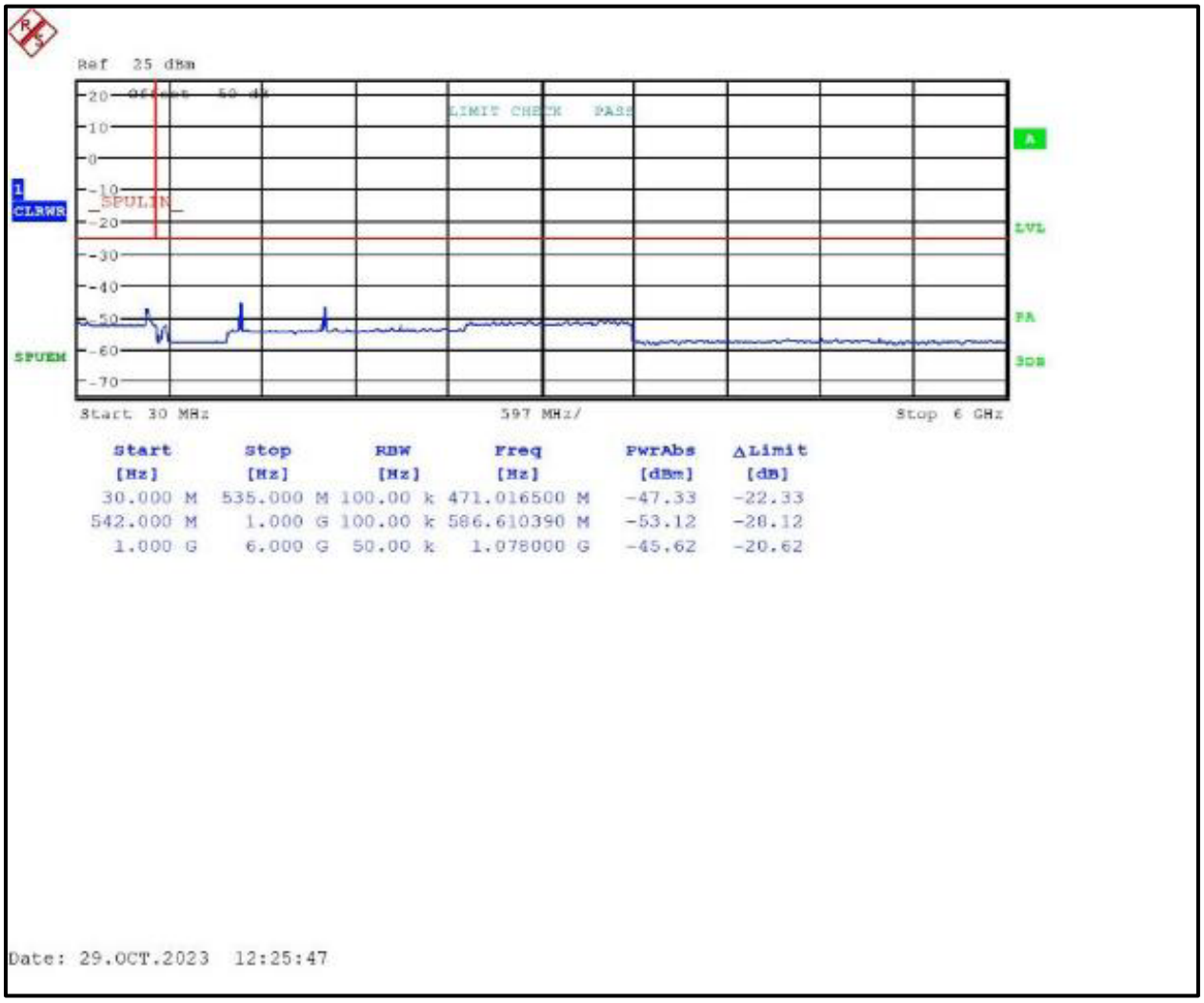
Table 5-1: Spurious Emissions at Antenna Terminals Environmental Conditions

Date	Temperature (°C)	Humidity (%)	Pressure (kPa)
10/29/2023	22.8	43	100.3

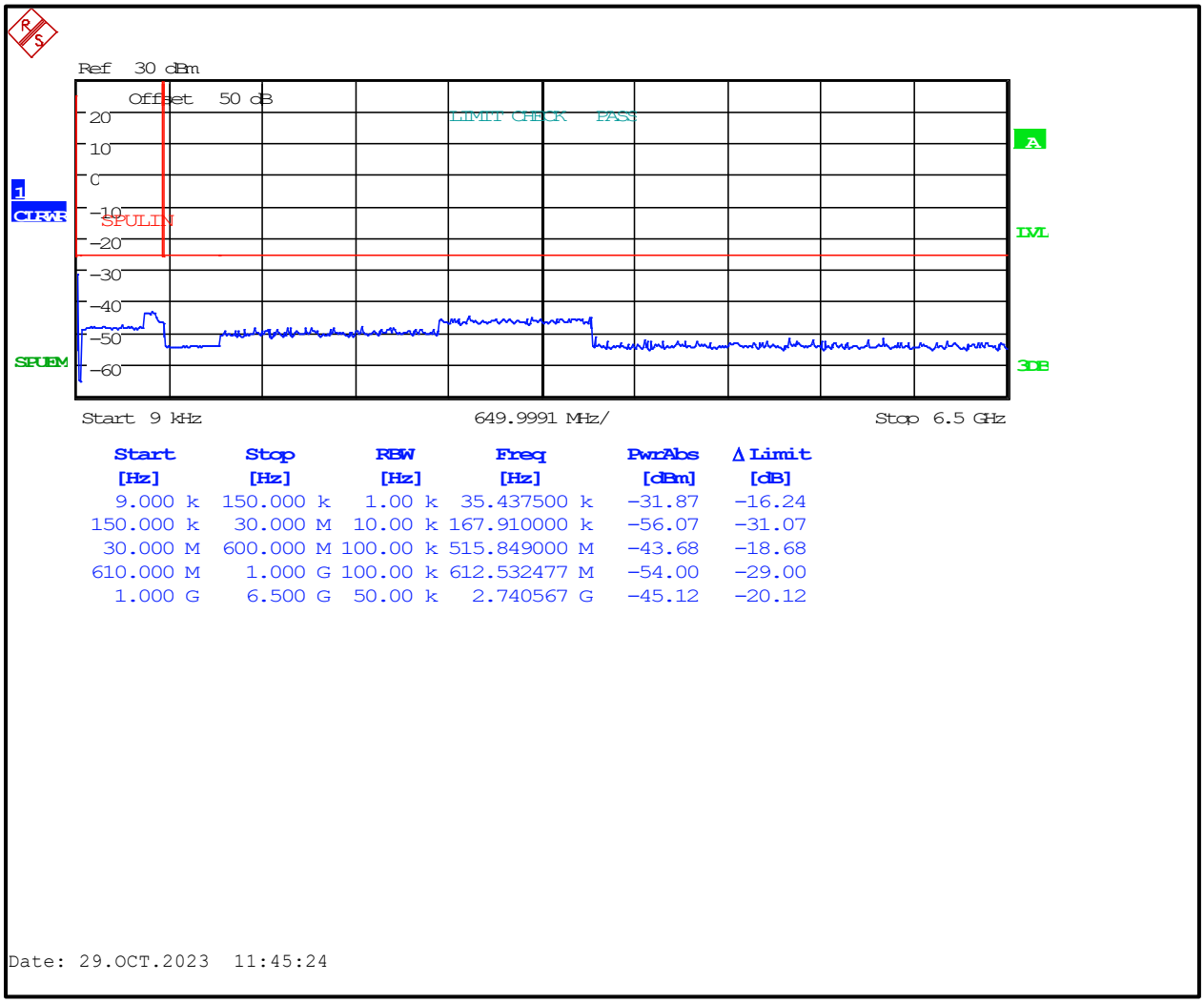
Plot 5-1: Spurious Emissions at Antenna Terminals – 473.0 MHz



Plot 5-2: Spurious Emissions at Antenna Terminals – 539.0 MHz



Plot 5-3: Spurious Emissions at Antenna Terminals – 605.0 MHz



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	1.00 k	35.437500 k	-31.87	-16.24
150.000 k	30.000 M	10.00 k	167.910000 k	-56.07	-31.07
30.000 M	600.000 M	100.00 k	515.849000 M	-43.68	-18.68
610.000 M	1.000 G	100.00 k	612.532477 M	-54.00	-29.00
1.000 G	6.500 G	50.00 k	2.740567 G	-45.12	-20.12

Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 dB

Results: Pass

Test Personnel:

Daniel W. Baltzell		October 29, 2023
EMC Test Engineer	Signature	Date of Test

Table 5-2: Test Equipment Used For Testing Spurious Emissions

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	12/01/2024
901724	API Weinschel, Inc.	48-40-34	40 dB 100W Attenuator	CJ8921	11/22/2024
900948	Weinschel Corporation	47-10-43	Attenuator DC-18 GHz 10 dB 50W	BH1487	12/02/2023
901135	Par Electronics	400-512 (25W)	UHF Notch Filter	N/A	11/28/2024
901133	Par Electronics	400-512 (25W)	UHF Notch Filter	N/A	11/28/2024

6 FCC §2.1053(a): Field Strength of Spurious Radiation, FCC §74.794(a)(2)(i) Simple Mask

6.1 Test Procedure

Modulated to its maximum extent using a pseudo-random data sequence.

FCC 2.1053 - ANSI C63.26-2015 section 5.5.4

No non-compliances were found.

6.2 Test Data

Limit: -71 dBc = -25 dBm converted to dBuV/m = -25 +104.77- 20log(3) = 70.3 dBuV/m

Table 6-1: Field Strength of Spurious Radiation Environmental Conditions

Date	Temperature (°C)	Humidity (%)	Pressure (kPa)
11/1/2023	8.3	42	101.1

Table 6-2: Field Strength of Spurious Radiation – 473.0 MHz

Frequency (MHz)	Analyzer Level (dBuV)	Site Correction Factor (dB/m)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
946.0	30.9	33.4	64.3	70.3	-6.0
1419.0	22.8	36.3	59.1	70.3	-11.2
1892.0	22.4	39.5	61.9	70.3	-8.4
2365.0	22.1	29.6	51.7	70.3	-18.6
2838.0	22.9	13.8	36.7	70.3	-33.6
3311.0	63.8	-5.7	59.4	70.3	-10.9
3784.0	56.3	-4.9	50.2	70.3	-20.1
4257.0	45.3	1.8	47.1	70.3	-23.2
4730.0	51.5	2.5	54.0	70.3	-16.3

Table 6-3: Field Strength of Spurious Radiation – 539.0 MHz

Frequency (MHz)	Analyzer Level (dBuV)	Site Correction Factor (dB/m)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1078.0	32.4	34.3	66.7	70.3	-3.6
1617.0	22.0	36.8	58.8	70.3	-11.5
2156.0	23.2	29.1	52.3	70.3	-18.0
2695.0	22.9	30.5	53.4	70.3	-16.9
3234.0	61.5	-5.8	55.7	70.3	-14.6
3773.0	50.5	-4.9	45.6	70.3	-24.7
4312.0	46.9	1.9	48.8	70.3	-21.5
4851.0	44.5	2.7	47.2	70.3	-23.1
5390.0	39.5	3.5	43.0	70.3	-27.3

Table 6-4: Field Strength of Spurious Radiation – 605.0 MHz

Frequency (MHz)	Analyzer Level (dBuV)	Site Correction Factor (dB/m)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1210.0	26.6	34.8	61.4	70.3	-8.9
1815.0	22.3	38.9	61.2	70.3	-9.1
2420.0	25.2	29.7	54.9	70.3	-15.4
3025.0	23.2	29.7	52.9	70.3	-17.4
3630.0	22.1	32.0	54.1	70.3	-16.2
4235.0	52.4	1.7	54.1	70.3	-16.2
4840.0	50.0	2.7	52.7	70.3	-17.6
5445.0	39.1	3.5	42.6	70.3	-27.7
6050.0	42.2	4.0	46.2	70.3	-24.1

Notes: Tested at 3 meters to the tenth harmonic.

Measurement uncertainties shown for these tests are expanded uncertainties expressed at 95% confidence level using a coverage factor k = 2. Radiated Emissions: ±4.6 dB

Results: Pass

Test Personnel:

Daniel W. Baltzell		November 1-3, 2023
Test Engineer	Signature	Dates of Tests

Table 6-5: Test Equipment Used for Testing Field Strength of Spurious Radiation

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Laboratories	AM3-1197-0005	3-meter antenna mast, polarizing	OATS1	N/A
901729	Insulated Wire Inc.	KPS-1503-3150-KPR	SMK RF Cables 20’	NA	12/29/2023
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	N/A
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	12/01/2024
901669	ETS-Lindgren	3142E	Biconilog Antenna (30 MHz – 6000 MHz)	00166065	07/11/2025
900321	EMCO	3161-03	Horn Antennas (4 – 8 GHz)	9508-1020	08/05/2024
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	08/05/2024

7 FCC Part 2.1049(c)(1): Occupied Bandwidth; Part 74.794(a)(2)(i) and (b): Digital Emissions

§74.736(c) Any emissions appearing on frequencies more than 3 MHz above or below the upper and lower edges, respectively, of the assigned channel shall be attenuated no less than: (1) 30 dB for transmitters rated at no more than 1 watt power output. (2) 50 dB for transmitters rated at more than 1 watt power output. (3) 60 dB for transmitters rated at more than 100 watts power output. (d) Greater attenuation than that specified in paragraph (c) of this section may be required if interference results from emissions outside the assigned channel.

§74.794(a)(2) The power level of emissions on frequencies outside the authorized channel of operation must be attenuated no less than following amounts below the average transmitted power within the authorized 6 MHz channel. In the mask specifications listed in §74.794(a)(2) and (a)(3), A is the attenuation in dB and Df is the frequency difference in MHz from the edge of the channel.

(i) Simple mask. At the channel edges, emissions must be attenuated no less than 46 dB. More than 6 MHz from the channel edges, emissions must be attenuated no less than 71 dB. At any frequency between 0 and 6 MHz from the channel edges, emissions must be attenuated no less than the value determined by the following formula: $A(dB) = 46 + (\Delta f^2/1.44)$. Where: Δf = frequency difference in MHz from the edge of the channel.

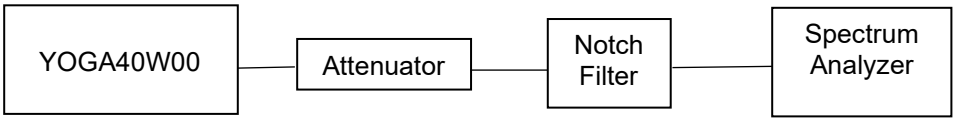
(3) The attenuation values for the simple and stringent emission masks are based on a measurement bandwidth of 500 kHz. Other measurement bandwidths may be used and converted to the reference 500 kHz value by the following formula: $A(dB) = A_{alternate} + 10 \log (BW_{alternate} / 500)$ where A(dB) is the measured or calculated attenuation value for the reference 500 kHz bandwidth, and $A_{alternate}$ is the measured or calculated attenuation for a bandwidth $BW_{alternate}$. Emissions include sidebands, spurious emissions, and radio harmonics. Attenuation is to be measured at the output terminals of the transmitter (including any filters that may be employed). In the event of interference caused to any service by out-of-channel emissions, greater attenuation may be required.

(b) In addition to meeting the emission attenuation requirements of the simple or stringent mask (including attenuation of radio frequency harmonics), digital low power TV and TV translator stations authorized to operate on TV channels 22–24, (518–536 MHz), 32–36 (578–608 MHz), 38 (614–620 MHz), and 65–69 (776–806 MHz) must provide specific ‘‘out of band’’ protection to Radio Navigation Satellite Services in the bands: L5 (1164–1215 MHz); L2 (1215–1240 MHz) and L1 (1559–1610 MHz).
(1) An FCC-certificated transmitter specifically certified for use on one or more of the above channels must include filtering with an attenuation of not less than 85 dB in the GPS bands, which will have the effect of reducing harmonics in the GPS bands from what is produced by the digital transmitter, and this attenuation must be demonstrated as part of the certification application to the Commission.
(2) For an installation on one of the above channels with a digital transmitter not specifically FCC-certificated for the channel, a low pass filter or equivalent device rated by its manufacturer to have an attenuation of at least 85 dB in the GPS bands, which will have the effect of reducing harmonics in the GPS bands from what is produced by the digital transmitter, and must be installed in a manner that will prevent the harmonic emission content from reaching the antenna. A description of the low pass filter or equivalent device with the manufacturer’s rating or a report of measurements by a qualified individual shall be retained with the station license. Field measurements of the second or third harmonic output of a transmitter so equipped are not required.

7.1 Test Procedure

- Test Method: The IEEE 2008-1631 Recommended Practice On 8-VSB Digital Television Transmission Compliance Measurement.
- ANSI C63.26 sections 5.4, and 6.5.2.7.4.
- Device was modulated using cloud-based ATSC 3.0 signal.

Figure 7-1: Configuration of Tested System, Simple Mask



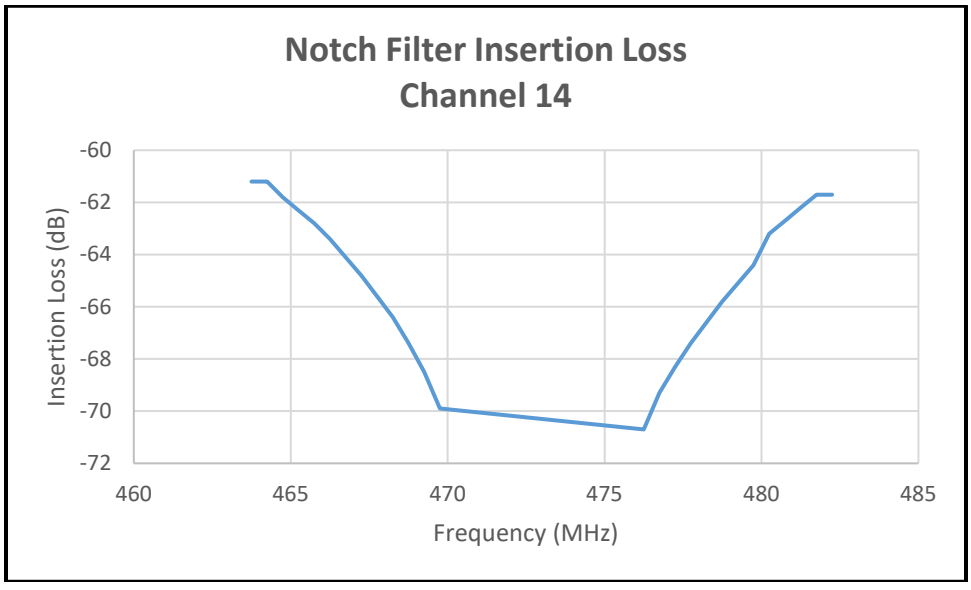
To determine conducted radiation emission mask compliance, the test equipment configuration shown in Figure 7-1 was used. A spectrum analyzer was used in conjunction with the notch filter.

The transmitter was tested for compliance with the simple emission mask as specified in FCC rule 74.794(a)(2)(i). The IEEE 2008-1631 Recommended Practice On 8-VSB Digital Television Transmission Compliance Measurement was used as the test measurement guide.

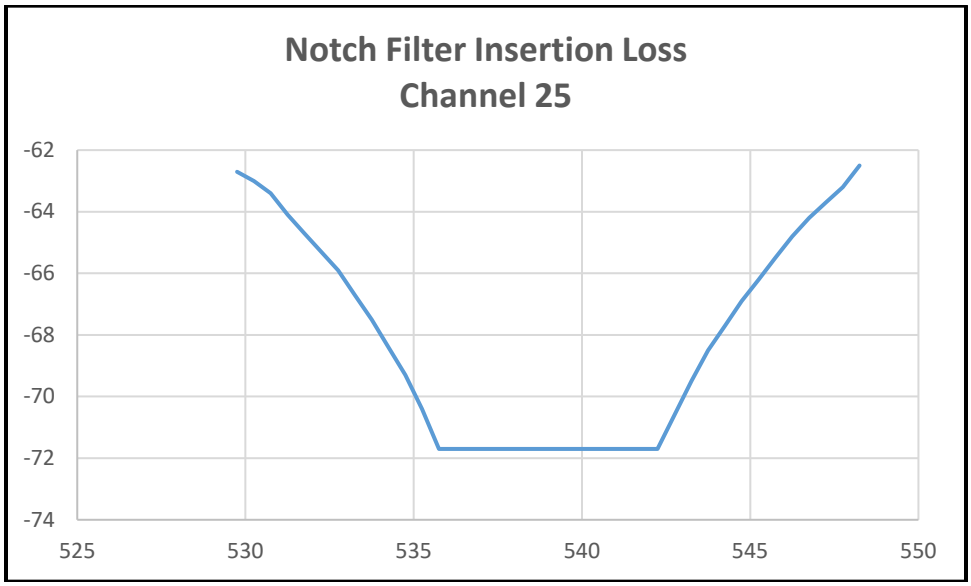
The transmitter was energized at 40 watts on Channels 14, 25, and 36 (center frequencies) and were measured at the output of notch filter using the Spectrum Analyzer's integrated power in each 500 kHz segment. The notch filter insertion loss (including attenuator and cable losses) versus frequency response was previously determined using the spectrum analyzer and signal generator. A plot of the losses is shown below as reference. The insertion loss at the center of each of the twelve 500 kHz segments either side of the main channel is plotted and tabulated.

Each 500 kHz segment was measured, and the results corrected and recorded for the notch filter and cable losses.

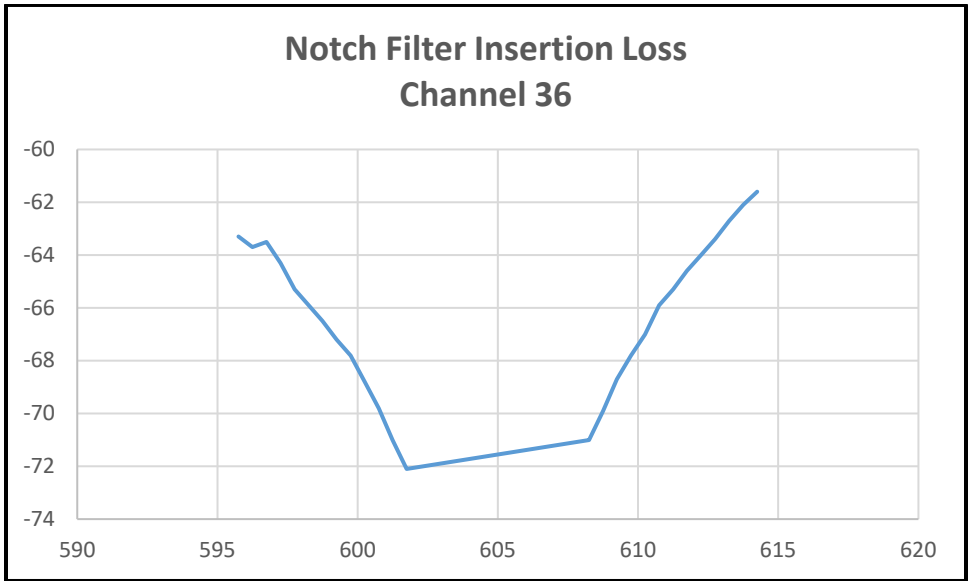
Plot 7-1: Insertion Losses - Channel 14



Plot 7-2: Insertion Losses - Channel 25



Plot 7-3: Insertion Losses - Channel 36



Displayed average noise level -158 dBm (1 Hz)

Maximum dynamic range: 1 dB compression to DANL (1Hz) 170 dBm

7.2 Test Data

Table 7-1: Occupied Bandwidth Environmental Conditions

Date	Temperature (°C)	Humidity (%)	Pressure (kPa)
10/25/2023	23.9	33	101.4

Table 7-2: 500 kHz Simple Mask Segment Measurements, 473.0 MHz – Channel 14

Delta Frequency (MHz)	Center Frequency (MHz)	Measured Amplitude (dBm)	Converted Amplitude (dBc)	Notch Filter Loss (dB)	Corrected Amplitude (dBc)	FCC Limit (dBc)	Margin (dB)	Pass/ Fail
3.25	476.25	-84.4	-130.4	70.7	-59.7	-46.0	-13.6	Pass
3.75	476.75	-86.2	-132.2	69.3	-62.9	-46.4	-16.5	Pass
4.25	477.25	-87.2	-133.2	68.3	-64.9	-47.1	-17.8	Pass
4.75	477.75	-87.3	-133.3	67.4	-65.9	-48.1	-17.8	Pass
5.25	478.25	-87.3	-133.3	66.6	-66.7	-49.5	-17.2	Pass
5.75	478.75	-87.3	-133.3	65.8	-67.5	-51.3	-16.3	Pass
6.25	479.25	-86.1	-132.1	65.1	-67.1	-53.3	-13.7	Pass
6.75	479.75	-87.1	-133.1	64.4	-68.6	-55.8	-12.9	Pass
7.25	480.25	-86.9	-132.9	63.2	-69.7	-58.5	-11.1	Pass
7.75	480.75	-87.5	-133.5	62.7	-70.9	-61.7	-9.2	Pass
8.25	481.25	-88.0	-134.0	62.2	-71.9	-65.1	-6.7	Pass
8.75	481.75	-89.1	-135.1	61.7	-73.4	-69.0	-4.4	Pass
9.25	482.25	-90.8	-136.8	61.7	-75.1	-71.0	-4.1	Pass
-3.25	469.75	-86.4	-132.4	69.9	-62.6	-46.0	-16.6	Pass
-3.75	469.25	-87.2	-133.2	68.5	-64.7	-46.4	-18.3	Pass
-4.25	468.75	-86.9	-132.9	67.4	-65.5	-47.1	-18.4	Pass
-4.75	468.25	-87.5	-133.5	66.4	-67.1	-48.1	-19.0	Pass
-5.25	467.75	-88.4	-134.4	65.6	-68.8	-49.5	-19.3	Pass
-5.75	467.25	-87.1	-133.1	64.8	-68.4	-51.3	-17.1	Pass
-6.25	466.75	-89.6	-135.6	64.1	-71.5	-53.3	-18.2	Pass
-6.75	466.25	-89.7	-135.7	63.4	-72.3	-55.8	-16.5	Pass
-7.25	465.75	-90.4	-136.4	62.8	-73.6	-58.5	-15.1	Pass
-7.75	465.25	-90.9	-136.9	62.3	-74.6	-61.7	-13.0	Pass
-8.25	464.75	-91.1	-137.1	61.8	-75.4	-65.1	-10.2	Pass
-8.75	464.25	-91.2	-137.2	61.2	-76.0	-69.0	-7.0	Pass
-9.25	463.75	-91.3	-137.3	61.2	-76.1	-71.0	-5.1	Pass

Table 7-3: 500 kHz Simple Mask Segment Measurements, 539.0 MHz – Channel 25

Delta Frequency (MHz)	Center Frequency (MHz)	Measured Amplitude (dBm)	Converted Amplitude (dBc)	Notch Filter (dB)	Corrected Amplitude (dBc)	FCC Limit (dBc)	Margin (dB)	Pass/ Fail
3.25	542.25	-87.9	-133.9	71.7	-62.1	-46.0	-16.1	Pass
3.75	542.75	-87.9	-133.9	70.6	-63.3	-46.4	-16.9	Pass
4.25	543.25	-87.6	-133.6	69.5	-64.1	-47.1	-17.0	Pass
4.75	543.75	-87.6	-133.6	68.5	-65.1	-48.1	-16.9	Pass
5.25	544.25	-87.9	-133.9	67.7	-66.3	-49.5	-16.7	Pass
5.75	544.75	-87.6	-133.6	66.9	-66.7	-51.3	-15.4	Pass
6.25	545.25	-97.3	-143.3	66.2	-67.1	-53.3	-23.8	Pass
6.75	545.75	-87.6	-133.6	65.5	-68.1	-55.8	-12.4	Pass
7.25	546.25	-87.8	-133.8	64.8	-68.9	-58.5	-10.4	Pass
7.75	546.75	-87.9	-133.9	64.2	-69.7	-61.7	-8.0	Pass
8.25	547.25	-88.2	-134.2	63.7	-70.5	-65.1	-5.4	Pass
8.75	547.75	-90.8	-136.8	63.2	-73.7	-69.0	-4.7	Pass
9.25	548.25	-88.1	-134.1	62.5	-71.6	-71.0	-0.6	Pass

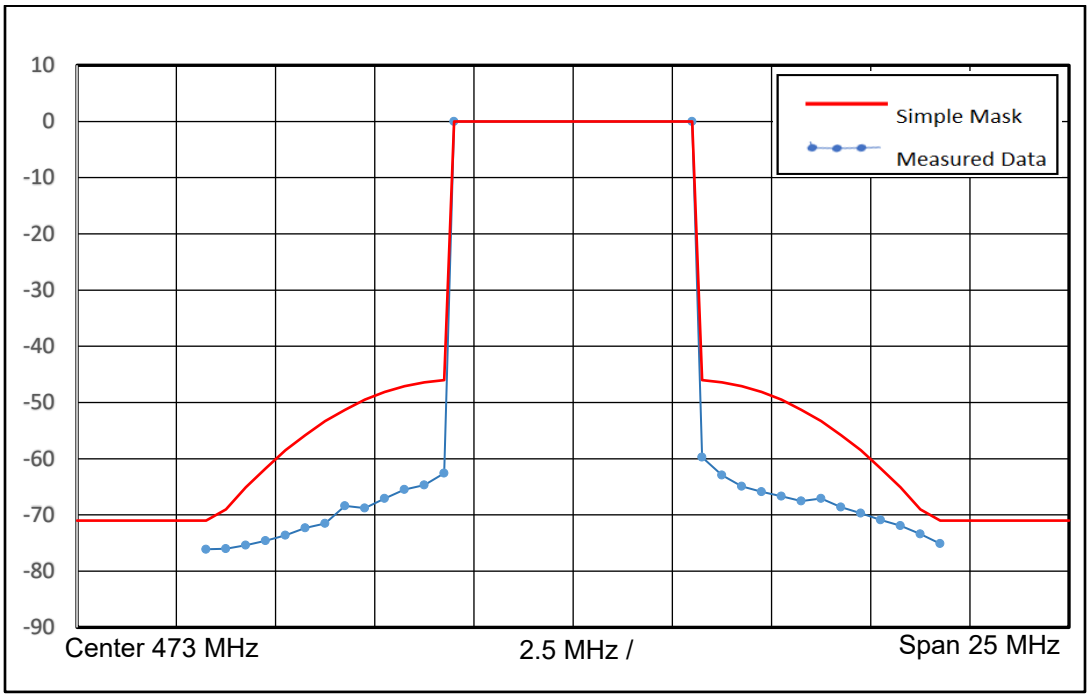
-3.25	535.75	-87.3	-133.3	71.7	-61.6	-46.0	-15.6	Pass
-3.75	535.25	-86.9	-132.9	70.4	-62.5	-46.4	-16.1	Pass
-4.25	534.75	-87.1	-133.1	69.3	-63.8	-47.1	-16.7	Pass
-4.75	534.25	-87.0	-133.0	68.4	-64.6	-48.1	-16.5	Pass
-5.25	533.75	-86.3	-132.3	67.5	-64.8	-49.5	-15.3	Pass
-5.75	533.25	-86.2	-132.2	66.7	-65.5	-51.3	-14.3	Pass
-6.25	532.75	-86.3	-132.3	65.9	-66.4	-53.3	-13.1	Pass
-6.75	532.25	-86.8	-132.8	65.3	-67.5	-55.8	-11.7	Pass
-7.25	531.75	-87.2	-133.2	64.7	-68.6	-58.5	-10.0	Pass
-7.75	531.25	-87.9	-133.9	64.1	-69.8	-61.7	-8.1	Pass
-8.25	530.75	-88.6	-134.6	63.4	-71.2	-65.1	-6.0	Pass
-8.75	530.25	-91.5	-137.5	63.0	-74.5	-69.0	-5.5	Pass
-9.25	529.75	-88.5	-134.5	62.7	-71.8	-71.0	-0.8	Pass

Table 7-4: 500 kHz Simple Mask Segment Measurements, 605.0 MHz – Channel 36

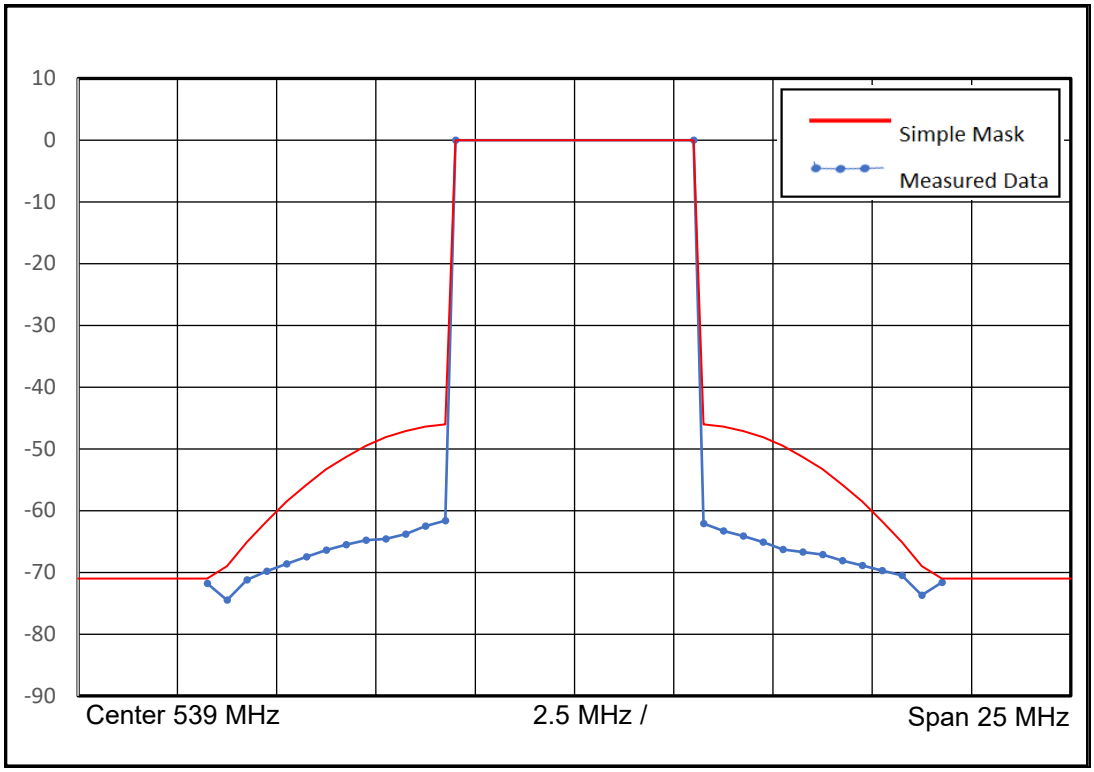
Delta Frequency (MHz)	Center Frequency (MHz)	Measured Amplitude (dBm)	Converted Amplitude (dBc)	Notch Filter (dB)	Corrected Amplitude (dBc)	FCC Limit (dBc)	Margin (dB)	Pass/ Fail
3.25	608.25	-87.3	-133.3	71.0	-62.3	-46.0	-16.2	Pass
3.75	608.75	-87.4	-133.4	69.9	-63.5	-46.4	-17.1	Pass
4.25	609.25	-86.6	-132.6	68.7	-63.9	-47.1	-16.8	Pass
4.75	609.75	-86.6	-132.6	67.8	-64.8	-48.1	-16.7	Pass
5.25	610.25	-86.4	-132.4	67.0	-65.4	-49.5	-15.9	Pass
5.75	610.75	-86.6	-132.6	65.9	-66.8	-51.3	-15.5	Pass
6.25	611.25	-86.7	-132.7	65.3	-67.4	-53.3	-14.0	Pass
6.75	611.75	-87.1	-133.1	64.6	-68.5	-55.8	-12.7	Pass
7.25	612.25	-87.9	-133.9	64.0	-69.9	-58.5	-11.4	Pass
7.75	612.75	-88.7	-134.7	63.4	-71.3	-61.7	-9.7	Pass
8.25	613.25	-89.6	-135.6	62.7	-72.9	-65.1	-7.8	Pass
8.75	613.75	-90.2	-136.2	62.1	-74.1	-69.0	-5.1	Pass
9.25	614.25	-90.1	-136.1	61.6	-74.6	-71.0	-3.6	Pass
-3.25	601.75	-86.7	-132.7	72.1	-60.5	-46.0	-14.5	Pass
-3.75	601.25	-86.3	-132.3	71.0	-61.3	-46.4	-14.9	Pass
-4.25	600.75	-85.7	-131.7	69.8	-61.9	-47.1	-14.8	Pass
-4.75	600.25	-85.6	-131.6	68.8	-62.8	-48.1	-14.7	Pass
-5.25	599.75	-85.6	-131.6	67.8	-63.8	-49.5	-14.3	Pass
-5.75	599.25	-85.7	-131.7	67.2	-64.6	-51.3	-13.3	Pass
-6.25	598.75	-86.1	-132.1	66.5	-65.7	-53.3	-12.3	Pass
-6.75	598.25	-86.5	-132.5	65.9	-66.7	-55.8	-10.9	Pass
-7.25	597.75	-87.4	-133.4	65.3	-68.1	-58.5	-9.6	Pass
-7.75	597.25	-88.1	-134.1	64.3	-69.8	-61.7	-8.1	Pass
-8.25	596.75	-88.4	-134.4	63.5	-70.8	-65.1	-5.7	Pass
-8.75	596.25	-90.4	-136.4	63.7	-72.7	-69.0	-3.7	Pass
-9.25	595.75	-89.2	-135.2	63.3	-71.9	-71.0	-0.9	Pass

Note: The mask data measurements in Tables 7-2, 7-3 and 7-4 are plotted in Plots 7-1, 7-2, and 7-3 respectively.

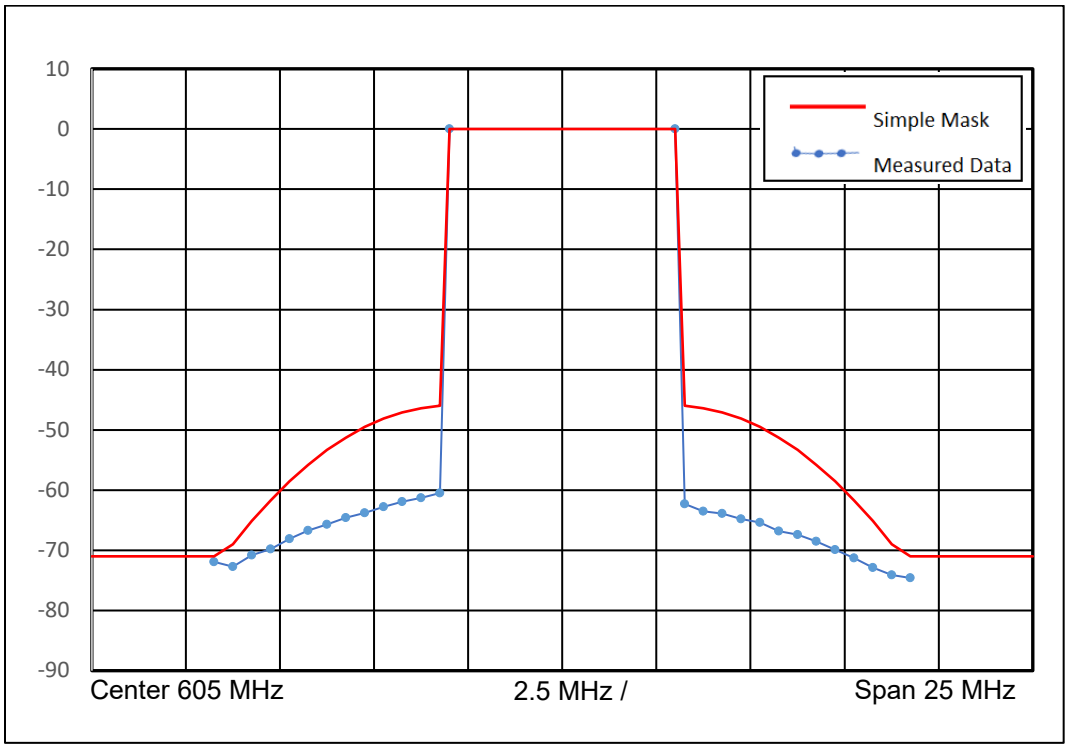
Plot 7-4: Simple Mask 473 MHz



Plot 7-5: Simple Mask 539 MHz



Plot 7-6: Simple Mask 605 MHz



7.3 FCC Part 74.794(b)(1); Out of Band Protection to Radio Navigation Satellite Services

An FCC-certificated transmitter specifically certified for use on one or more of the above channels must include filtering with an attenuation of not less than 85 dB in the GPS bands, which will have the effect of reducing harmonics in the GPS bands from what is produced by the digital transmitter, and this attenuation must be demonstrated as part of the certification application to the Commission.

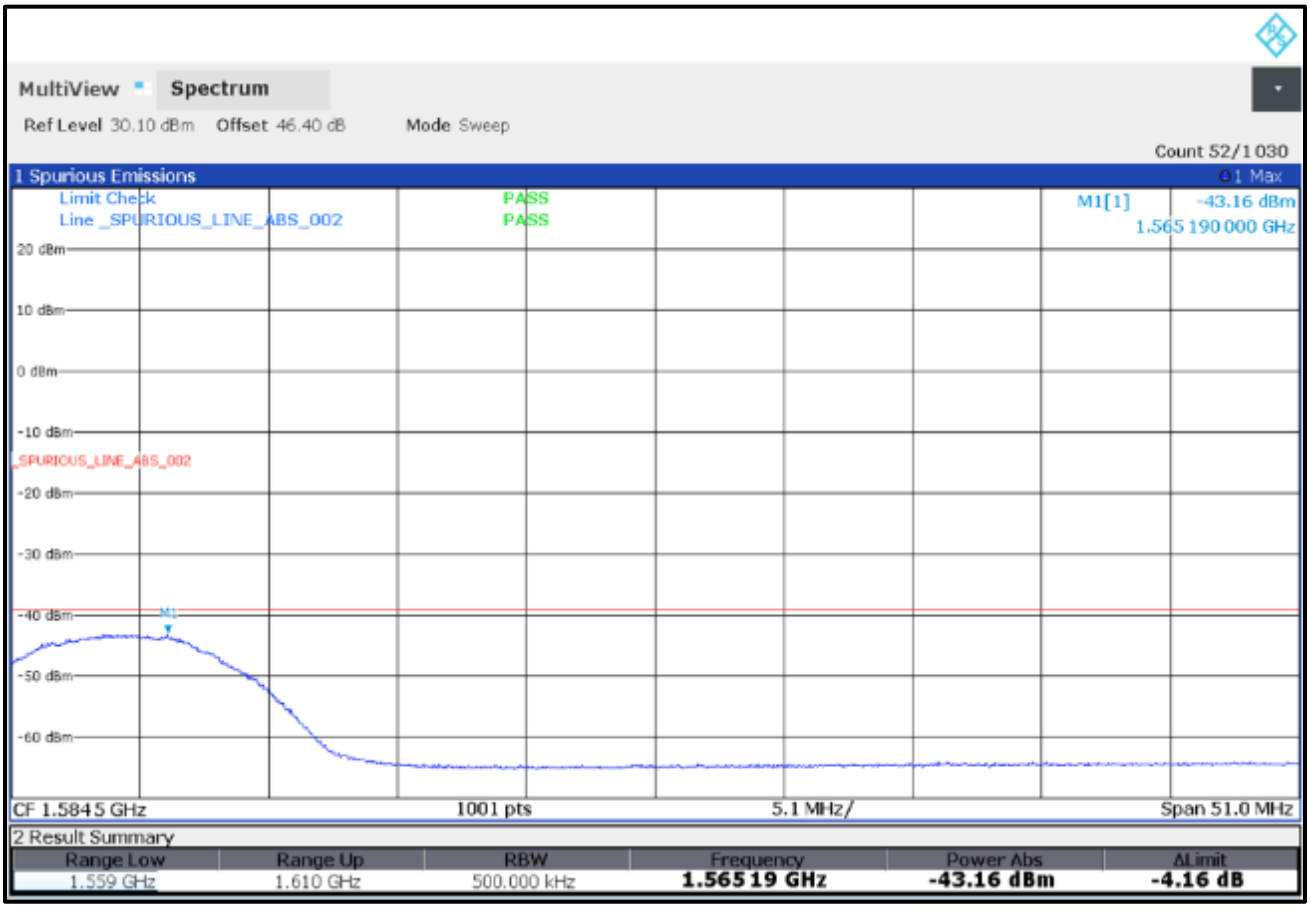
The limit is derived from the average power of 46 dBm -85 dB = -39 dBm.

Table 7-5: Protection to Radio Navigation Satellite Services

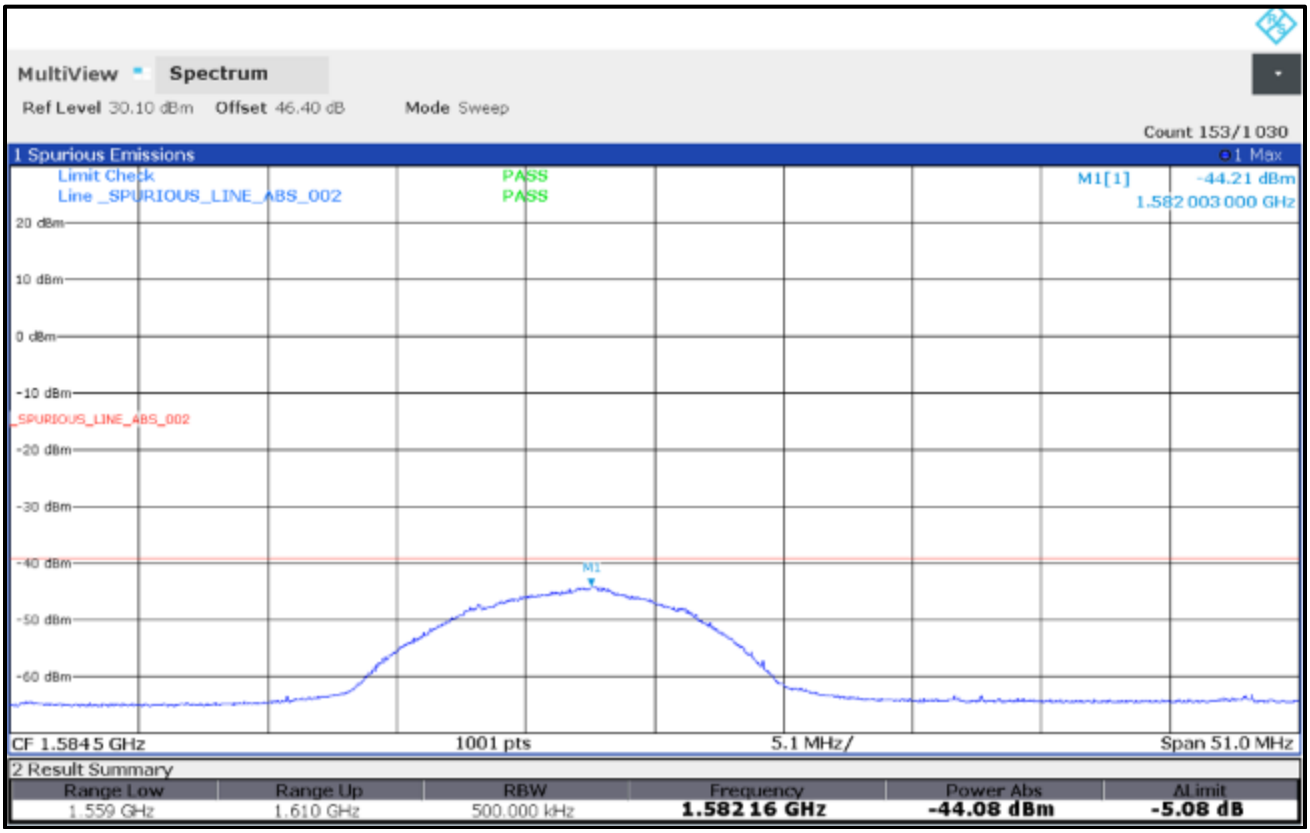
Fundamental (MHz)	Harmonic Measured (MHz)	Level Measured (dBm)	Limit (dBm)	Margin (dB)
521	1565.190	-43.2	-39.0	-4.2
527	1582.003	-45.1	-39.0	-6.1
533	1598.307	-41.3	-39.0	-2.3
581	1164.000	-64.6	-39.0	-25.6
587	1174.419	-59.4	-39.0	-20.4
593	1186.698	-53.3	-39.0	-14.3
599	1197.856	-44.5	-39.0	-5.5
605	1209.856	-42.3	-39.0	-3.3

Note: Attenuation of not less than 85 dB in the GPS bands: 46 dBm – 85 dBc = -39 dBm limit.

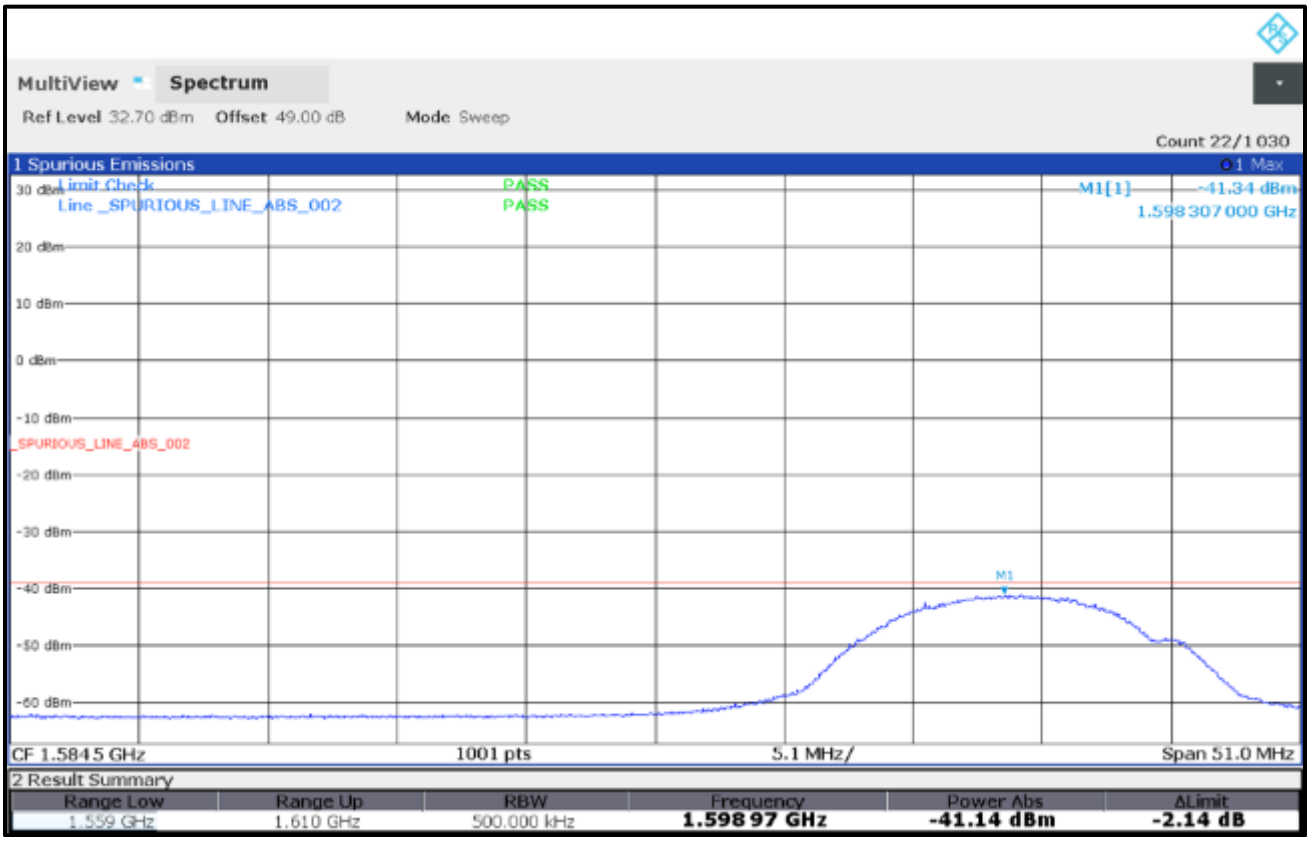
Plot 7-7: Radio Navigation Satellite Services Emissions – 521.0 MHz (1565.190 MHz); 1559-1610 Band



Plot 7-8: Radio Navigation Satellite Services Emissions – 527.0 MHz (1582.003 MHz); 1559-1610 Band



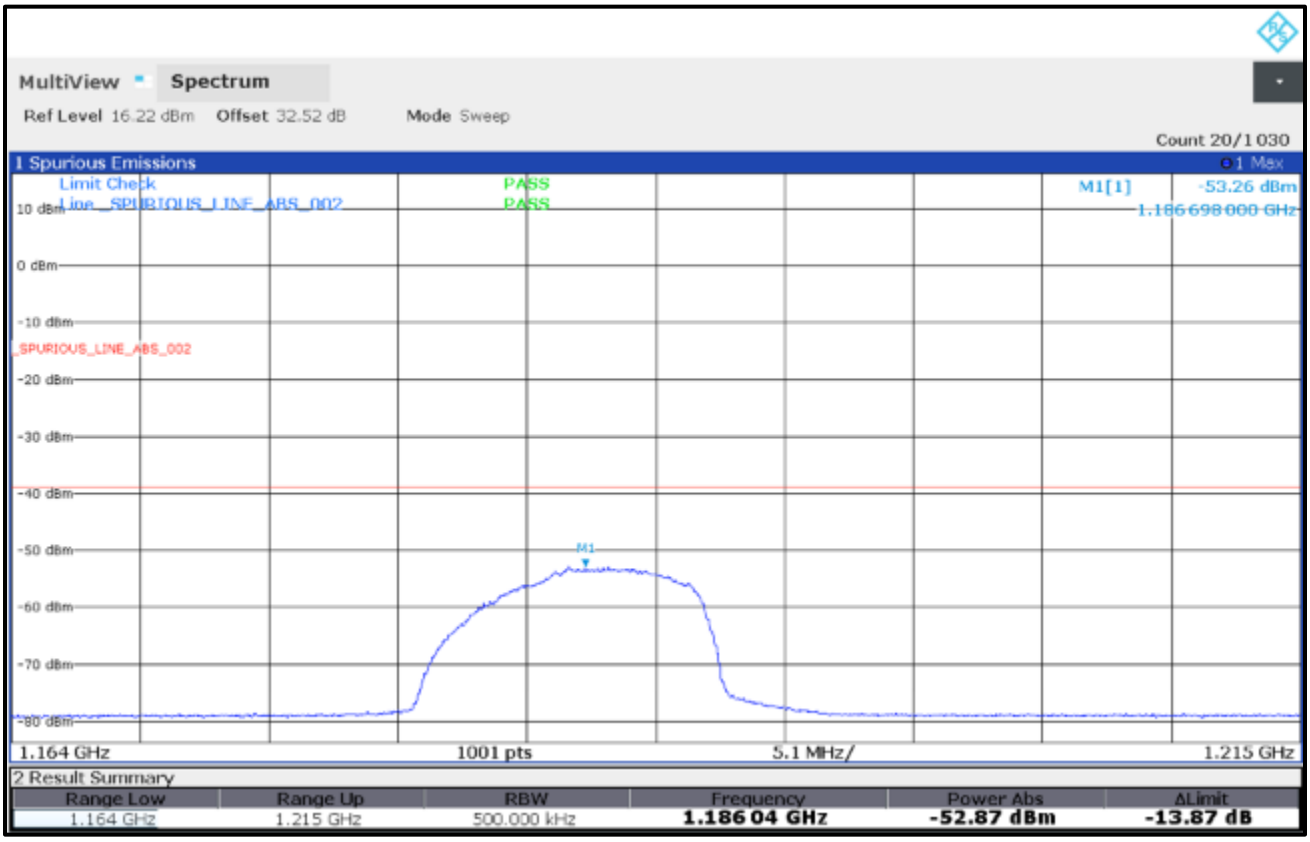
Plot 7-9: Radio Navigation Satellite Services Emissions – 533.0 MHz (1598.307 MHz); 1559-1610 Band



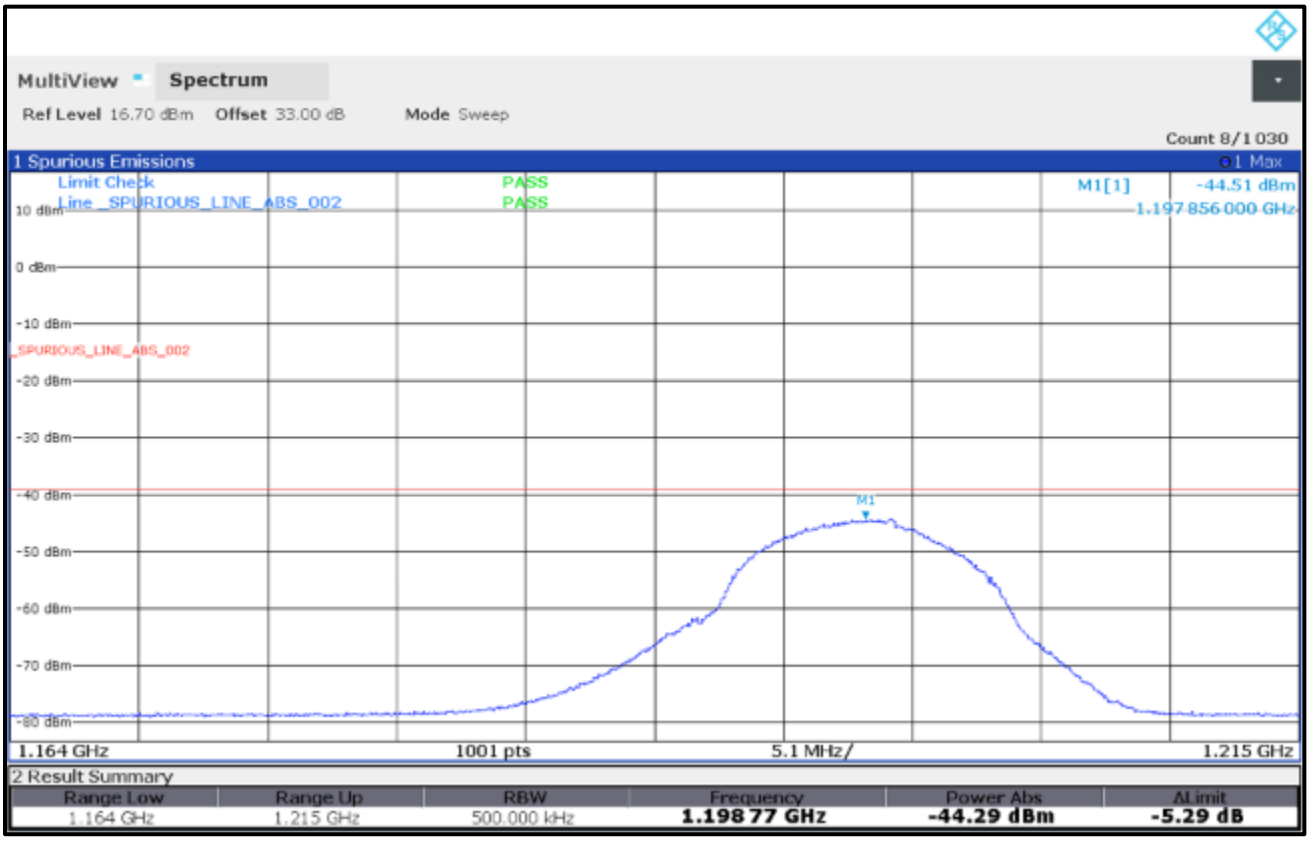
Plot 7-10: Radio Navigation Satellite Services Emissions – 581.0 MHz (1164 MHz); 1164-1215 Band

Plot 7-11: Radio Navigation Satellite Services Emissions – 587.0 MHz (1174.419 MHz); 1164-1215 Band

Plot 7-12: Radio Navigation Satellite Services Emissions – 593.0 MHz (1186.698 MHz); 1164-1215 Band



Plot 7-13: Radio Navigation Satellite Services Emissions – 599.0 MHz (1197.856 MHz); 1164-1215 Band



Plot 7-14: Radio Navigation Satellite Services Emissions – 605.0 MHz (1209.856 MHz); 1164-1215 Band

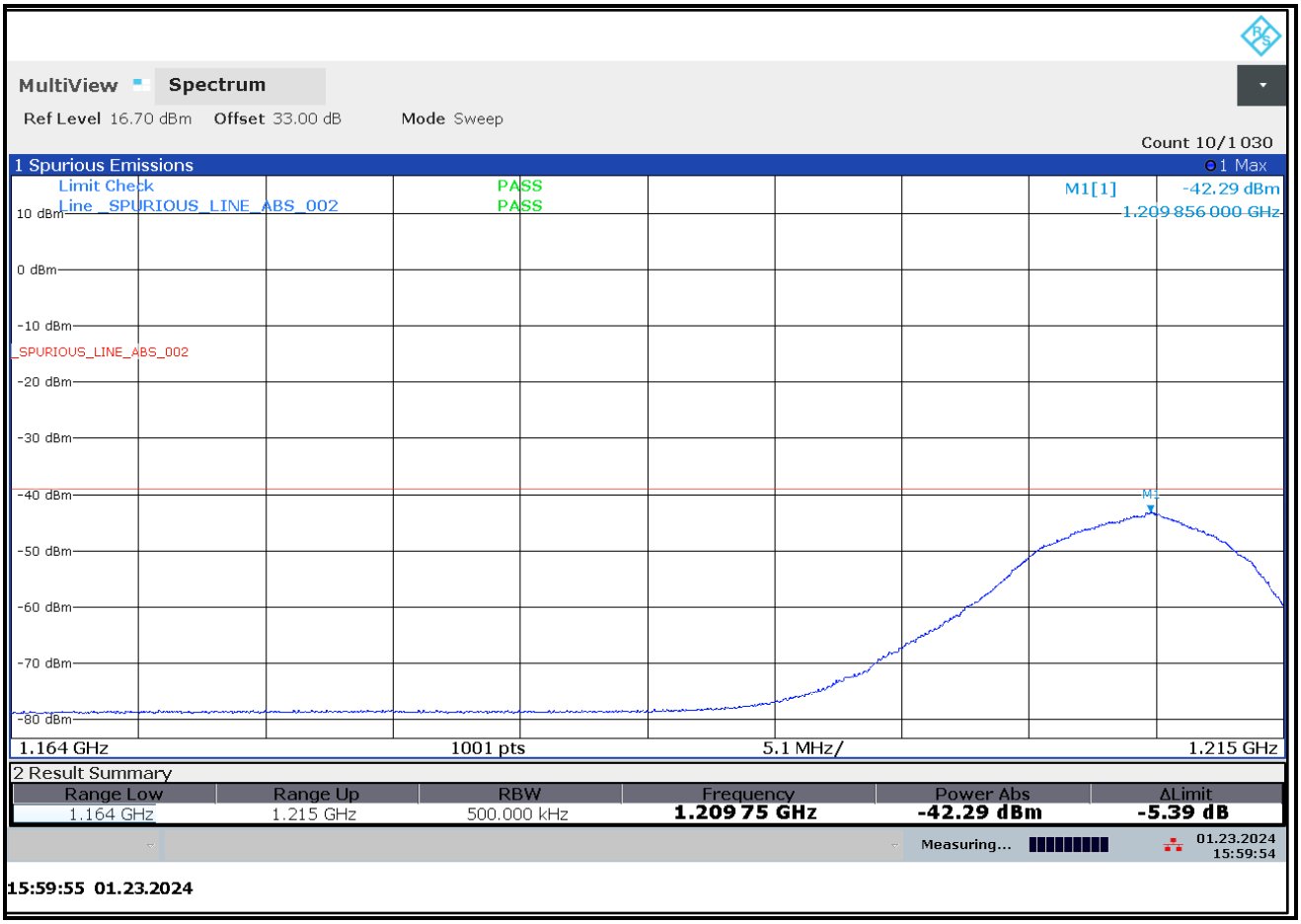
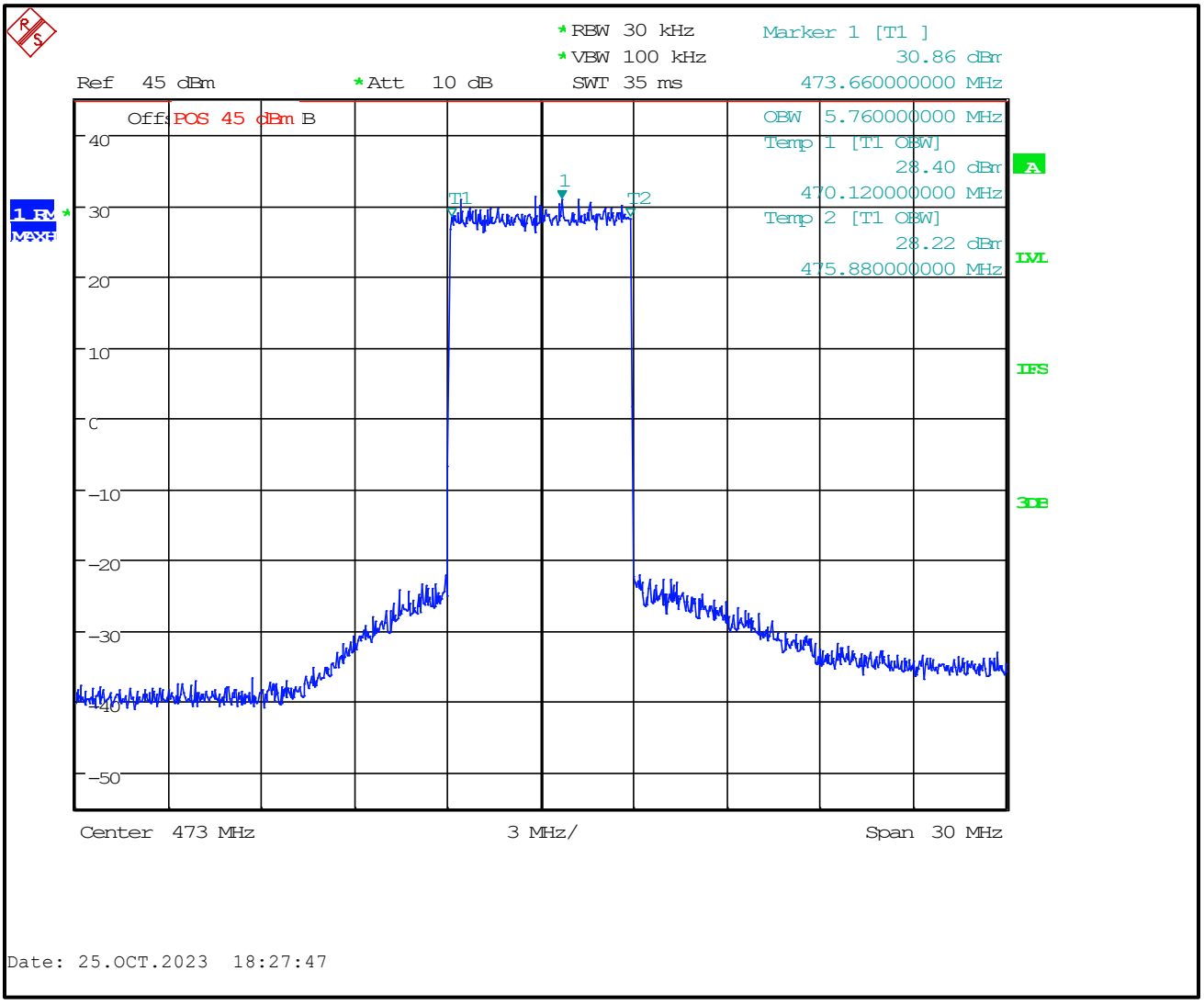


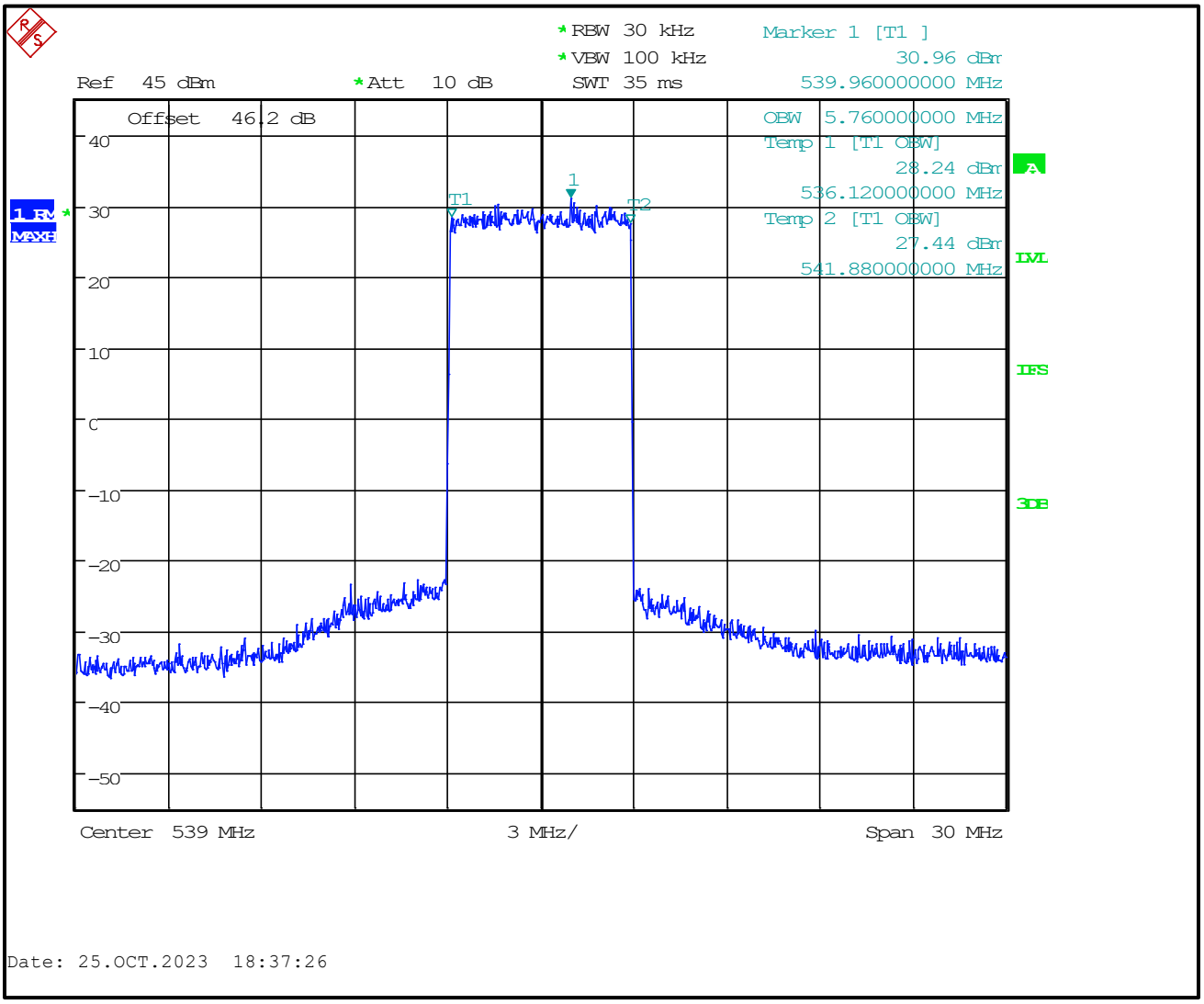
Table 7-6: 99% Occupied Bandwidth

Frequency (MHz)	99% Occupied Bandwidth (MHz)
473.0	5.76
539.0	5.76
605.0	5.79

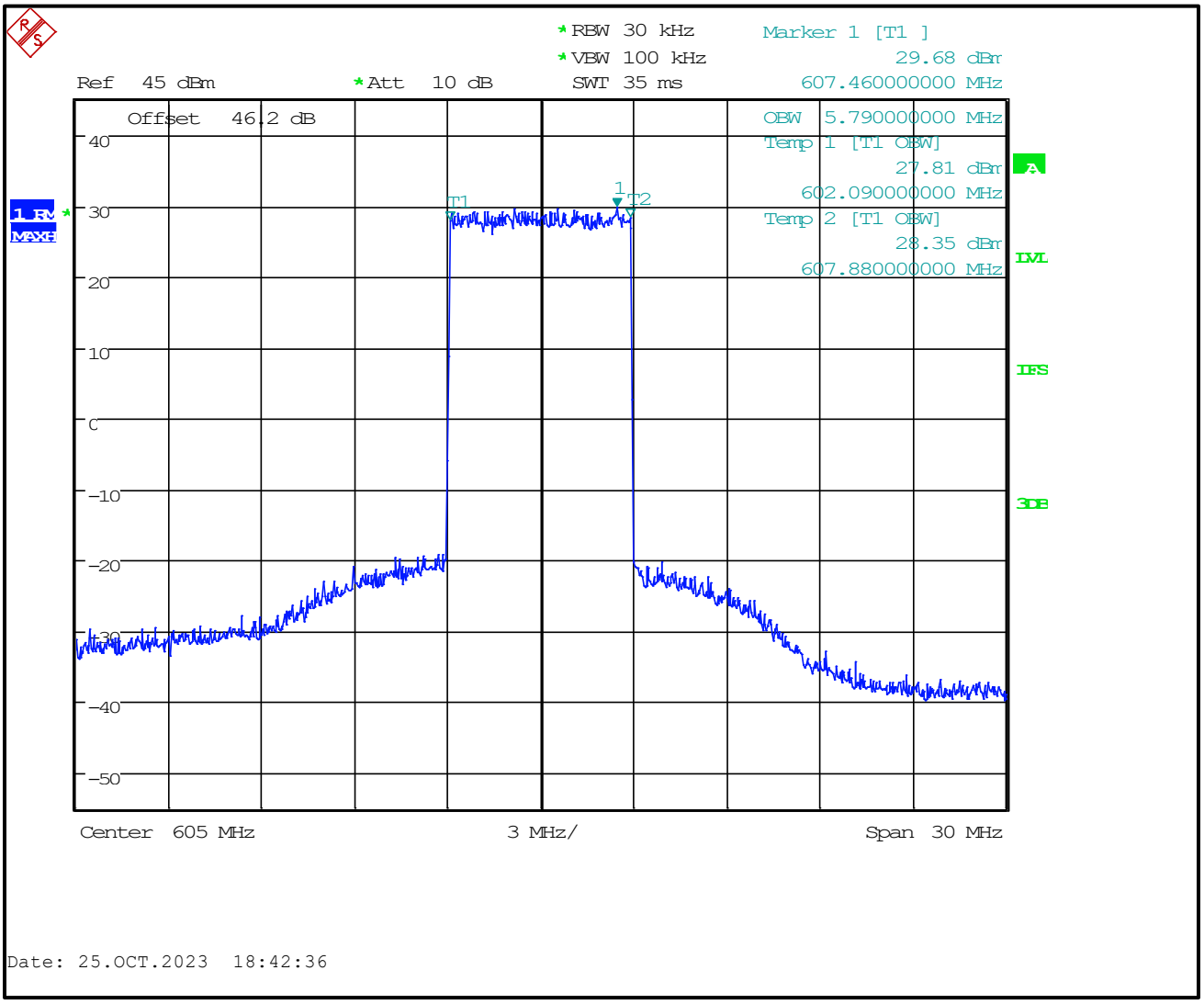
Plot 7-15: 99% Occupied Bandwidth – 473.0 MHz



Plot 7-16: 99% Occupied Bandwidth – 539.0 MHz



Plot 7-17: 99% Occupied Bandwidth – 605.0 MHz



Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 Hz

Results: Pass

Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	January 24, 2024
Test Engineer	Signature	Date of Tests

Table 7-7: Test Equipment Used For Testing Occupied Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	12/01/2024
901133	Par Electronics	400-512 (25W)	UHF Notch Filter	N/A	11/28/2024
901135	Par Electronics	400-512 (25W)	UHF Notch Filter	N/A	11/28/2024
901338	Weinschel Corp.	46-40-34	Attenuator (DC-18GHz, 40 dB, 25W)	BM0556	02/07/2024
900948	Weinschel Corporation	47-10-43	Attenuator DC-18 GHz 10 dB 50W	BH1487	12/02/2023
900957	Weinschel Corp	68-20-43	100W Attenuator 20 dB	LT394	05/11/2024
901727	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	11/30/2024
901773	Rohde & Schwarz	FSW50	Analyzer	101021	02/02/2025

8 FCC Part 2.1055: Frequency Stability; Part 74.795(b)(4) Digital Low Power TV

8.1 Test Procedure

ANSI C63.26, section 5.6

The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.

The EUT was evaluated over the temperature range 0°C to +40°C.

The temperature was initially set to 0°C and a 1-hour period was observed for stabilization of the EUT. The frequency stability was measured within one minute after application of primary power to the transmitter. The temperature was raised at intervals of 10 degrees centigrade through the range. A ½-hour period was observed to stabilize the EUT at each measurement step and the frequency stability was measured within one minute after application of primary power to the transmitter. Additionally, the power supply voltage of the EUT was varied +/-15% nominal input voltage.

§74.795(b)(4) When subjected to variations in ambient temperature between 0 and 40 degrees Centigrade and variations in power main voltage between 85% and 115% of the rated power supply voltage, the frequency stability of the local oscillator in the RF channel upconverter shall be maintained within 10 kHz of the nominal value.

8.2 Test Data

Table 8-1: Frequency Stability Environmental Conditions

Date	Temperature (°C)	Humidity (%)	Pressure (kPa)
10/30/2023	20.8	42	99.6

Table 8-2: Temperature Frequency Stability – 473.0 MHz

Temperature (°C)	Measured Frequency (MHz)	Limit (kHz)	Margin (kHz)
0	472.9998861	10.0	-9.9
10	472.9998861	10.0	-9.9
20 (reference)	472.9998861	10.0	-9.9
30	472.9998861	10.0	-9.9
40	472.9998861	10.0	-9.9

Table 8-3: Temperature Frequency Stability – 539.0 MHz

Temperature (°C)	Measured Frequency (MHz)	Limit (kHz)	Margin (kHz)
0	538.999870	10.0	-9.9
10	538.999870	10.0	-9.9
20 (reference)	538.999869	10.0	-9.9
30	538.999869	10.0	-9.9
40	538.999870	10.0	-9.9

Table 8-4: Temperature Frequency Stability – 605.0 MHz

Temperature (°C)	Measured Frequency (MHz)	Limit (kHz)	Margin (kHz)
0	604.999852	10.0	-9.9
10	604.999853	10.0	-9.9
20 (reference)	604.999853	10.0	-9.9
30	604.999853	10.0	-9.9
40	604.999853	10.0	-9.9

Table 8-5: Frequency Stability/Voltage Variation – 473.0 MHz

Voltage (VDC)	Measured Frequency (Hz)	Limit (kHz)	Margin (kHz)
40.8	472.999886	10.0	-9.9
48.0 (reference)	472.999886	10.0	-9.9
55.2	472.999886	10.0	-9.9

Table 8-6: Frequency Stability/Voltage Variation – 539.0 MHz

Voltage (VDC)	Measured Frequency (Hz)	Limit (kHz)	Margin (kHz)
40.8	538.999869	10.0	-9.9
48.0 (reference)	538.999869	10.0	-9.9
55.2	538.999869	10.0	-9.9

Table 8-7: Frequency Stability/Voltage Variation – 605.0 MHz

Voltage (VDC)	Measured Frequency (Hz)	Limit (kHz)	Margin (kHz)
40.8	604.999857	10.0	-9.9
48.0 (reference)	604.999853	10.0	-9.9
55.2	604.999853	10.0	-9.9

Measurement uncertainties shown for these tests are expanded uncertainties expressed at the 95% confidence level using a coverage factor K=2. Measurement uncertainty: ±0.5 Hz

Results: Pass

Test Personnel:

Daniel W. Baltzell		October 30, 2023
EMC Test Engineer	Signature	Date of Test

Table 8-8: Test Equipment Used For Testing Temperature Frequency Stability

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901350	Meterman	33XR	Multimeter	040402802	10/18/2024
901672	Rohde & Schwarz	FSEM30	Spectrum Analyzer	FSEM30	04/25/2024
901338	Weinschel Corp.	46-40-34	Attenuator (DC-18GHz, 40 dB, 25W)	BM0556	02/07/2024
901014	Kikusui	PCR4000L	Power Supply	DB001921	Not Required
901727	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36”	NA	11/30/2024
900946	Tenney Engineering, Inc	TH65	Temperature Chamber with Humidity	11380	06/23/2025

9 FCC 2.202: Necessary Bandwidth and Emission Bandwidth

Per Max Measured Occupied Bandwidth: 5M79W7D

10 Conclusion

The data in this measurement report shows that the Saankhya Labs Pvt Ltd, Model YOGA40W00 Radio; FCC ID: 2AUUC-YOGA40W00, complies with the applicable requirements of Parts 2 and 74 of the FCC Rules.