RHEIN TECH LABORATORIES, INC.

Engineering Solutions & Electromagnetic Compatibility Services

FCC & ISED Class 2 Permissive Change Report

L3Harris Technologies
221 Jefferson Ridge Parkway
Lynchburg, VA 24501

Model: XL-90D 7/8/900 MHz

FCC ID: OWDTR-0167-E
IC: 3636B-0167

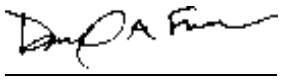
Standards Referenced for this Report	
Part 2: 2021	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 90: 2021	Private Land Mobile Radio Services
RSS-119 Issue 12 2015	Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz
RSS-Gen Issue 5 2018	General Requirements for Compliance of Radio Apparatus
ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

Frequency Range (MHz)	Rated Transmit Power (W) (Conducted)	Frequency Tolerance (ppm)	Emission Designator
806-816; 851-862	3.2	0.3	18K5F1W
806-816; 851-862	3.2	0.3	12K9F1W

Report Prepared By: Daniel Baltzell

Document Number: 2023006

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: February 17, 2023

Typed/Printed Name: Desmond A. Fraser

Position: President

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.

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1 Test Result Summary

Test	FCC Reference	ISED Reference	Result
Spurious Emissions at Antenna Terminals	2.1051	RSS-119 5.8	Compliant
Occupied Bandwidth/Emission Masks	2.1049, 90.210	RSS-119 5.5	Compliant

2 General Information

The following Class 2 Permissive Change Report is prepared on behalf of L3Harris Technologies in accordance with the Federal Communications Commission and ISED rules and regulations. The Equipment Under Test (EUT) was the XL-90D; FCC ID: OWDTR-0167-E, IC: 3636B-0167.

The purpose of this Class 2 Permissive Change is to add emission designators 18K5F1W (HVD-TDMA SMR) and 12K9F1W (HVD-TDMA NPSPAC).

All measurements contained in this application were conducted in accordance with the applicable sections of FCC Rules and Regulations CFR 47 Parts 2 and 90. 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.

ISED CAB ID: US0079, Company Number: 2956A

2.2 Related Submittal(s)/Grant(s)

The original FCC and ISED certifications were granted December 14, 2022.

2.3 Tested System Details

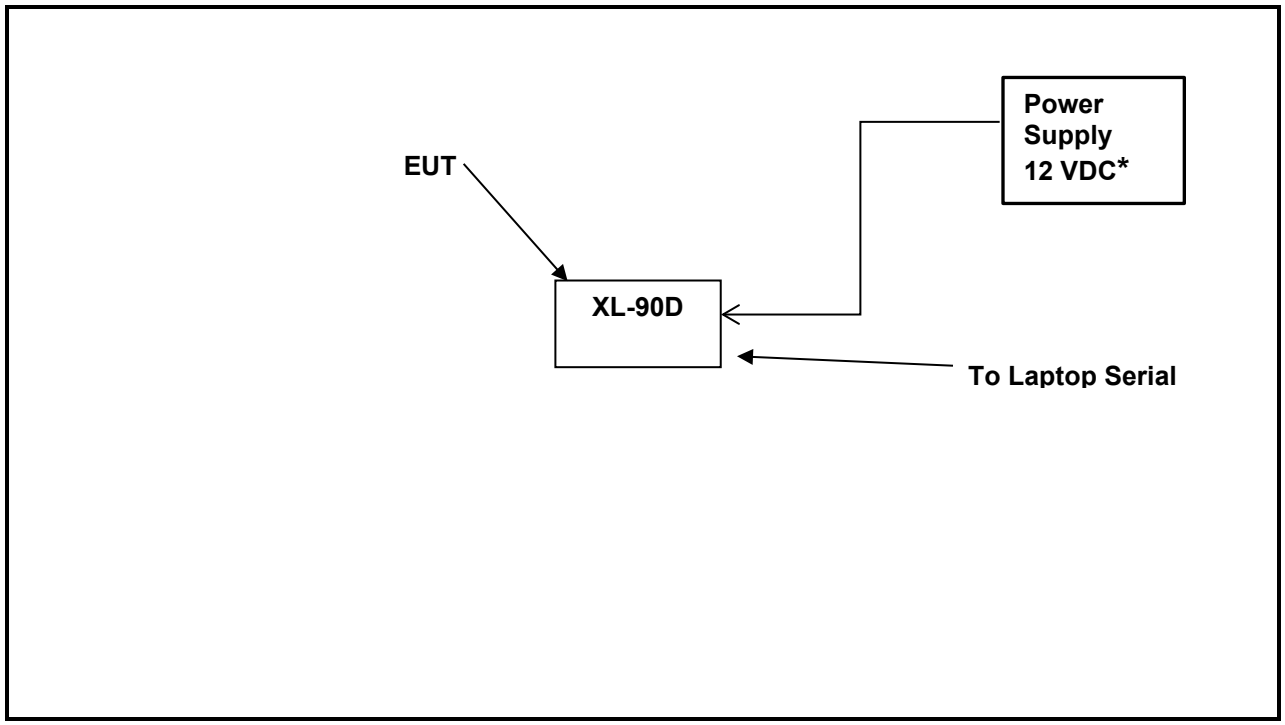
The test sample was received on February 3, 2023. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

The device was programmed for multiple test patterns, commands using the HVD-TDMA and HVD-SMR modes were used.

Table 2-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	PN/SN	FCC ID	ISED ID	RTL Bar Code
Modem	L3Harris Technologies	XL-90D	A40333E2B008	OWDTR-0167-E	3636B-0167	24261

Figure 2-1: Configuration of Tested System



* EUT power input range is 9 to 57 VDC. 12 VDC was used for all testing presented in this report.

3 FCC Rules and Regulations §2.1051: Spurious Emissions at Antenna Terminals; §90.210: Emissions Masks; RSS-119 §4.2: Transmitter Unwanted Emissions

3.1 Test Procedure

The transmitter is terminated with a 50 Ω load and interfaced with a signal analyzer. The device uses digital modulation modulated to its maximum extent using a pseudo random data sequence.

3.2 Test Data

Frequency range of measurement per Part 2.1057: 9 kHz to 10xFc.

Limit: P(dBm) – (43 + 10xLOG P(W))

The worst case (unwanted emissions) channels are shown. The magnitude of emissions attenuated more than 20 dB below the FCC limit need not be recorded.

No Emissions were found greater than 20 dB below the limit.

Table 3-1: 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	Weinschel Corp	48-40-34	Attenuator, 40 dB, 100W	CJ8921	11/22/2023
901128	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	11/28/2023

Test Personnel:

Daniel W. Baltzell		February 3, 2023
EMC Test Engineer	Signature	Date of Test

4 FCC Rules and Regulations §2.1049(c)(1); §90.210; RSS-119 §5.8: Occupied Bandwidth

4.1 Test Procedure

Notes: FCC 90.210 specifies masks G and H for the 800 MHz band operation of this equipment; RSS-119 specifies Mask G; all data is presented on the following pages.

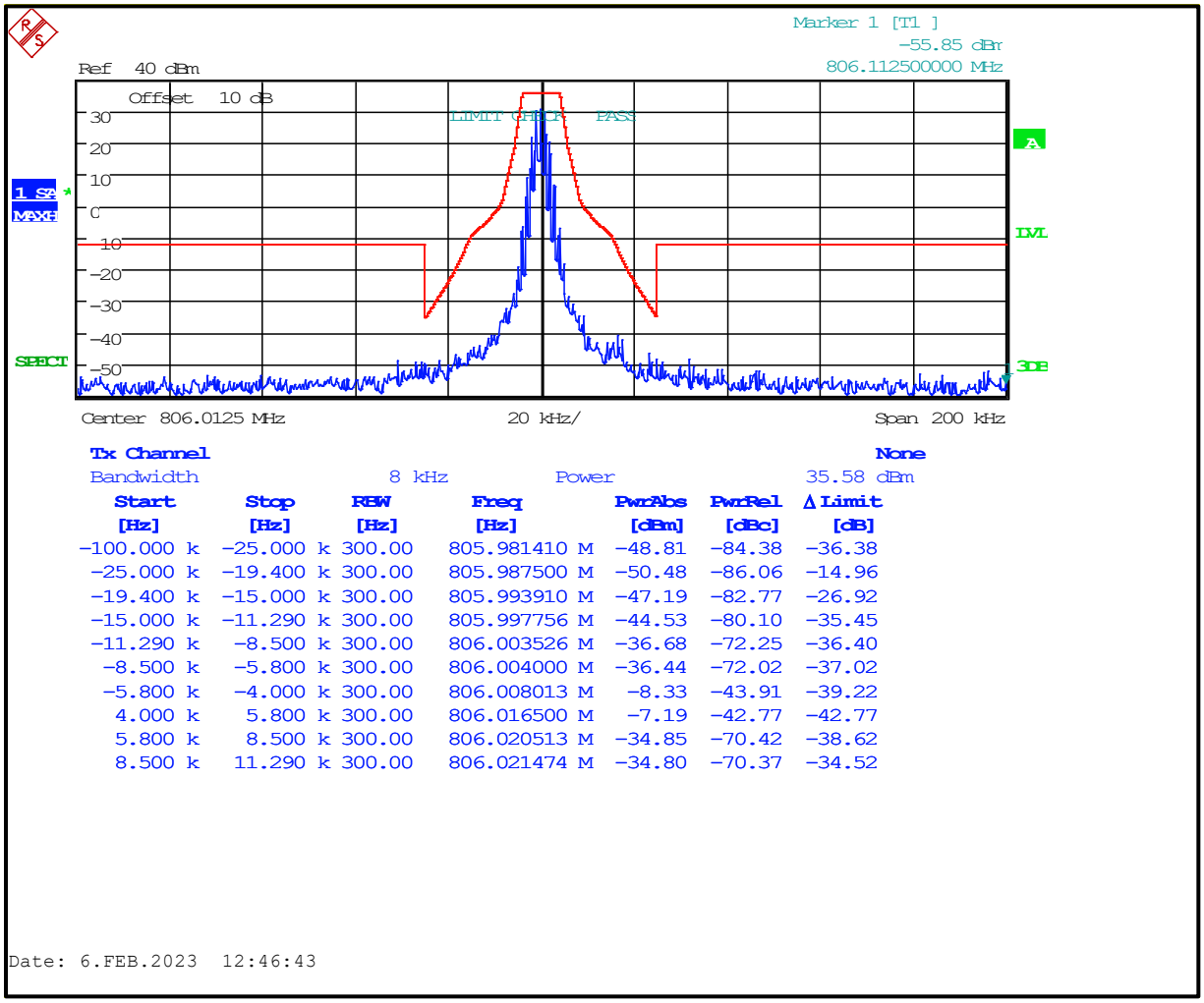
FCC §90.210

Applicable Emission Masks		
Frequency Band (MHz)	**Mask for Equipment with Audio Low Pass Filter**	**Mask for Equipment without Audio Low Pass Filter**
Below 25 [1]	A or B	A or C
25–50	B	C
72–76	B	C
150–174 [2]	B, D, or E	C, D, or E
150 Paging-only	B	C
220–222	F	F
421–512 [2]	B, D, or E	C, D, or E
450 Paging-only	B	G
806–809/851–854	B	H
809–824/854–869 [3]	B	G
896–901/935–940	I	J
902–928	K	K
929–930	B	G
4940–4990 MHz	L or M	L or M
5850–5925 [4]		
All other bands	B	C

[1] Equipment using single sideband J3E emission must meet the requirements of Emission Mask A. Equipment using other emissions must meet the requirements of Emission Mask B or C, as applicable.
[2] Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask B or C, as applicable. Equipment designed to operate with a 12.5 kHz channel bandwidth must meet the requirements of Emission Mask D, and equipment designed to operate with a 6.25 kHz channel bandwidth must meet the requirements of Emission Mask E.
[3] Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of §90.691.
[4] DSRCS Roadside Unit equipment in the 5850–5925 MHz band is governed under subpart M of this part.

4.2 Test Data

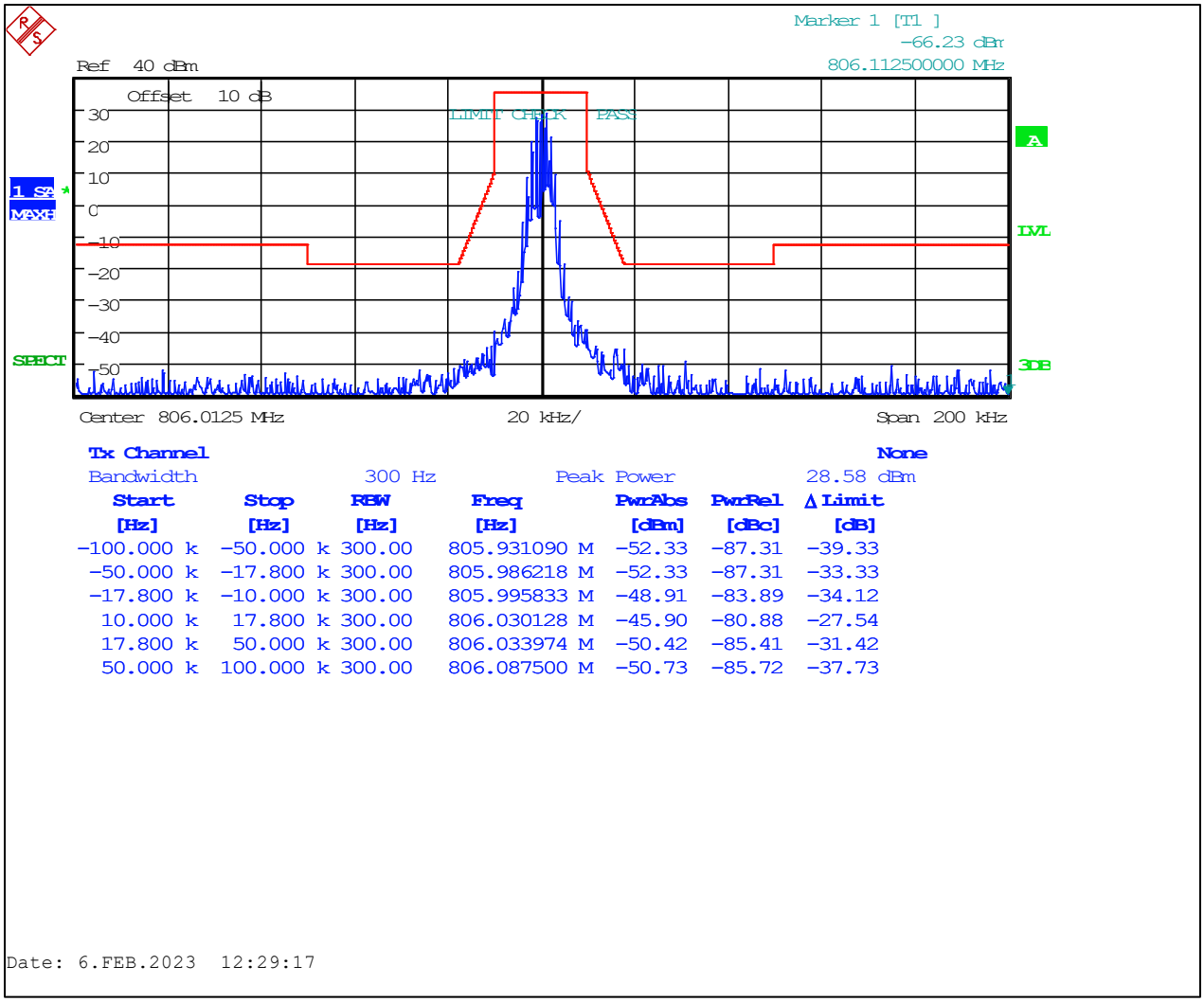
Plot 4-1: Occupied Bandwidth – HVD-NPSPAC; 806.0125 MHz; Mask H (FCC)



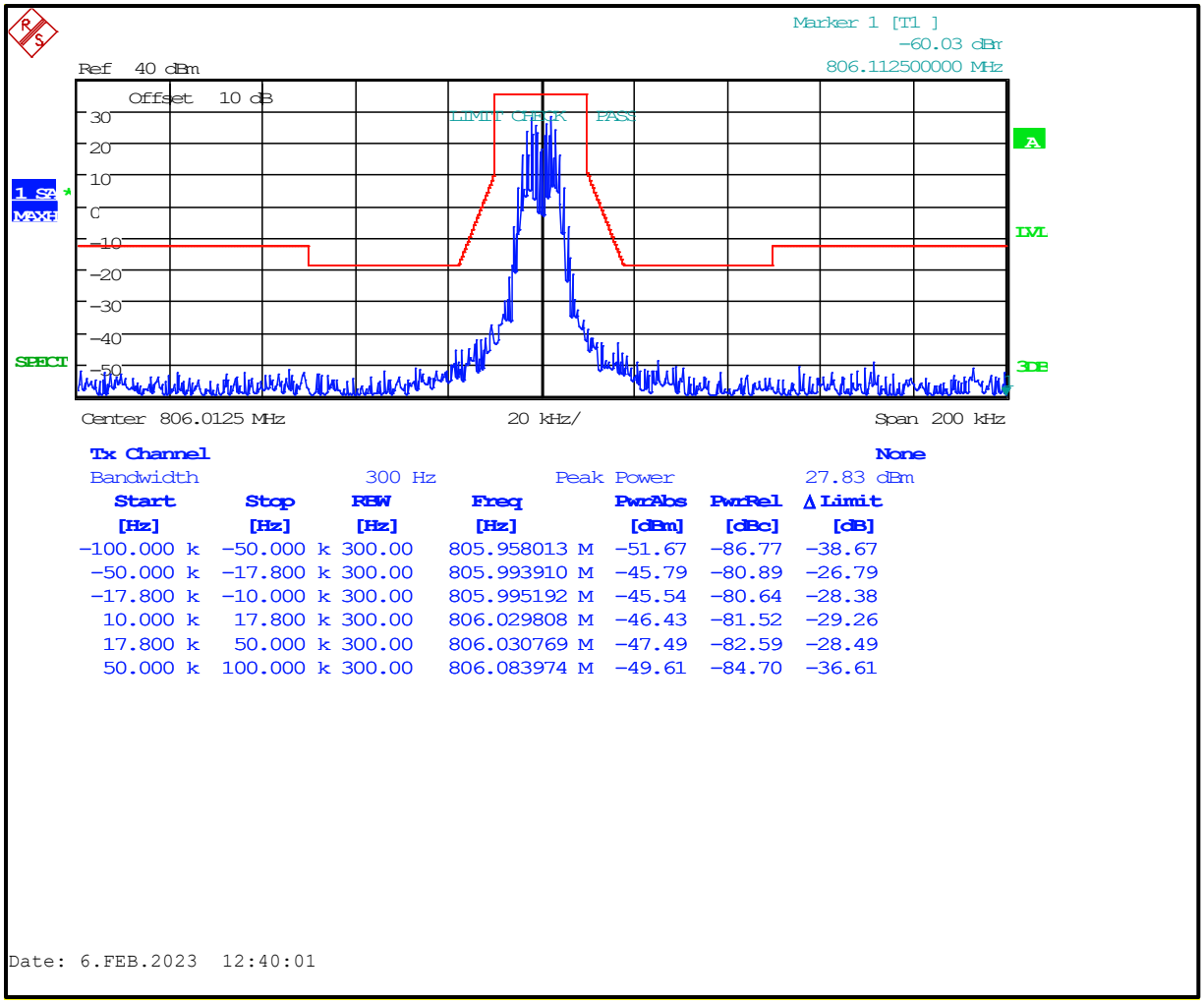
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	PwrRel [dBc]	Δ Limit [dB]
-100.000 k	-25.000 k	300.00	805.981410 M	-48.81	-84.38	-36.38
-25.000 k	-19.400 k	300.00	805.987500 M	-50.48	-86.06	-14.96
-19.400 k	-15.000 k	300.00	805.993910 M	-47.19	-82.77	-26.92
-15.000 k	-11.290 k	300.00	805.997756 M	-44.53	-80.10	-35.45
-11.290 k	-8.500 k	300.00	806.003526 M	-36.68	-72.25	-36.40
-8.500 k	-5.800 k	300.00	806.004000 M	-36.44	-72.02	-37.02
-5.800 k	-4.000 k	300.00	806.008013 M	-8.33	-43.91	-39.22
4.000 k	5.800 k	300.00	806.016500 M	-7.19	-42.77	-42.77
5.800 k	8.500 k	300.00	806.020513 M	-34.85	-70.42	-38.62
8.500 k	11.290 k	300.00	806.021474 M	-34.80	-70.37	-34.52

Date: 6.FEB.2023 12:46:43

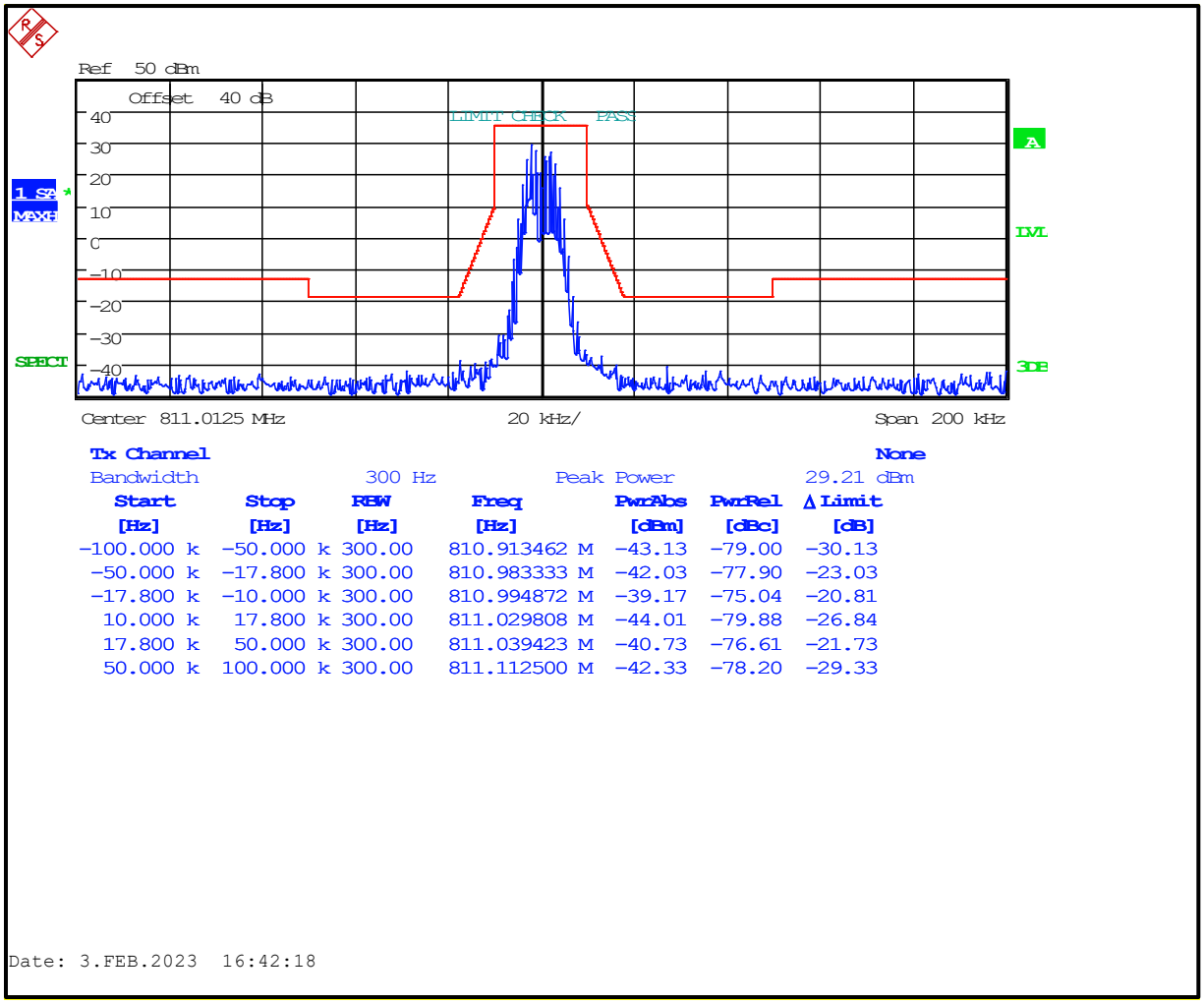
Plot 4-2: Occupied Bandwidth – HVD-NPSPAC; 806.0125 MHz; Mask G (ISED)



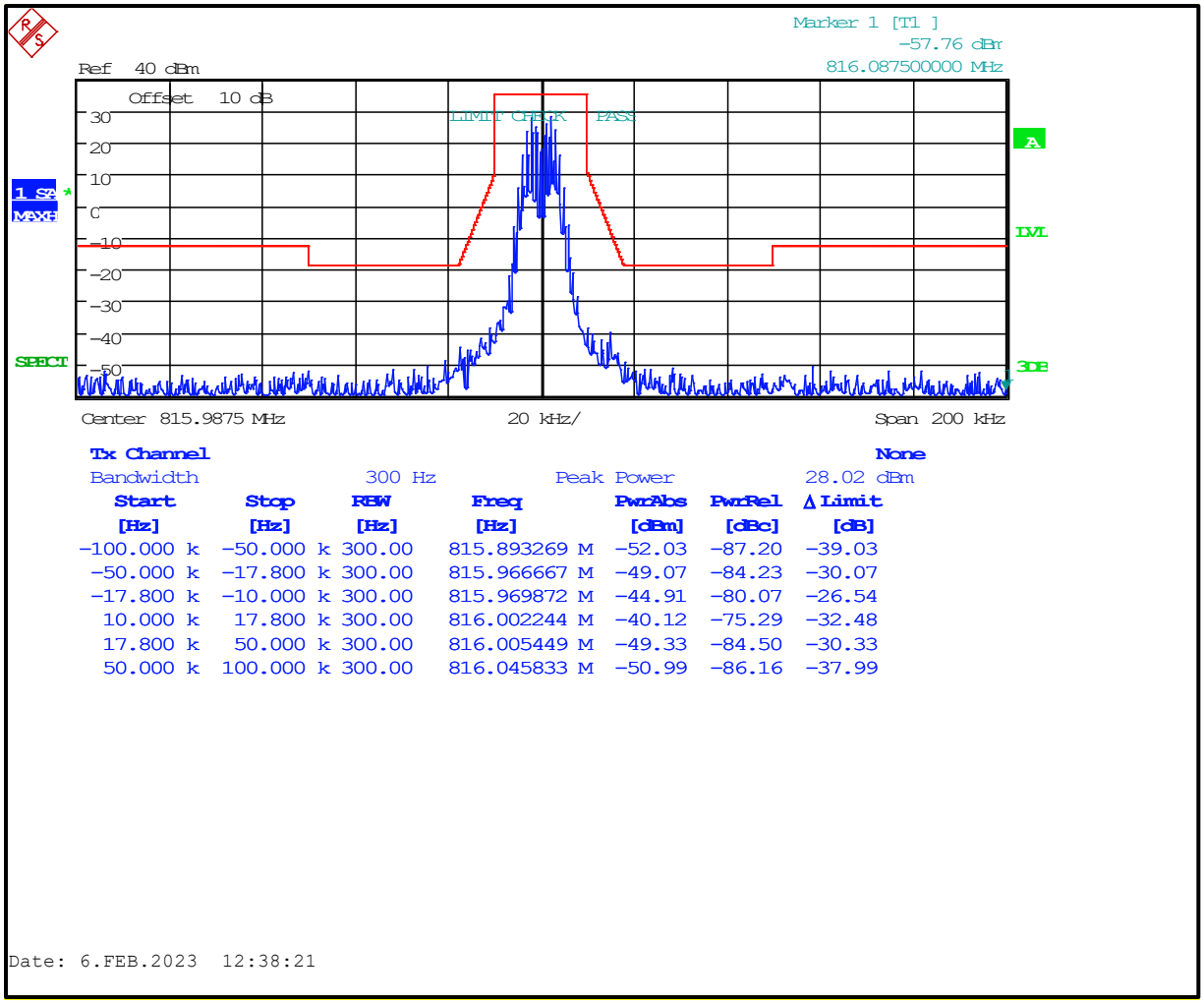
Plot 4-3: Occupied Bandwidth – HVD-SMR; 806.0125 MHz; Mask G (ISED)



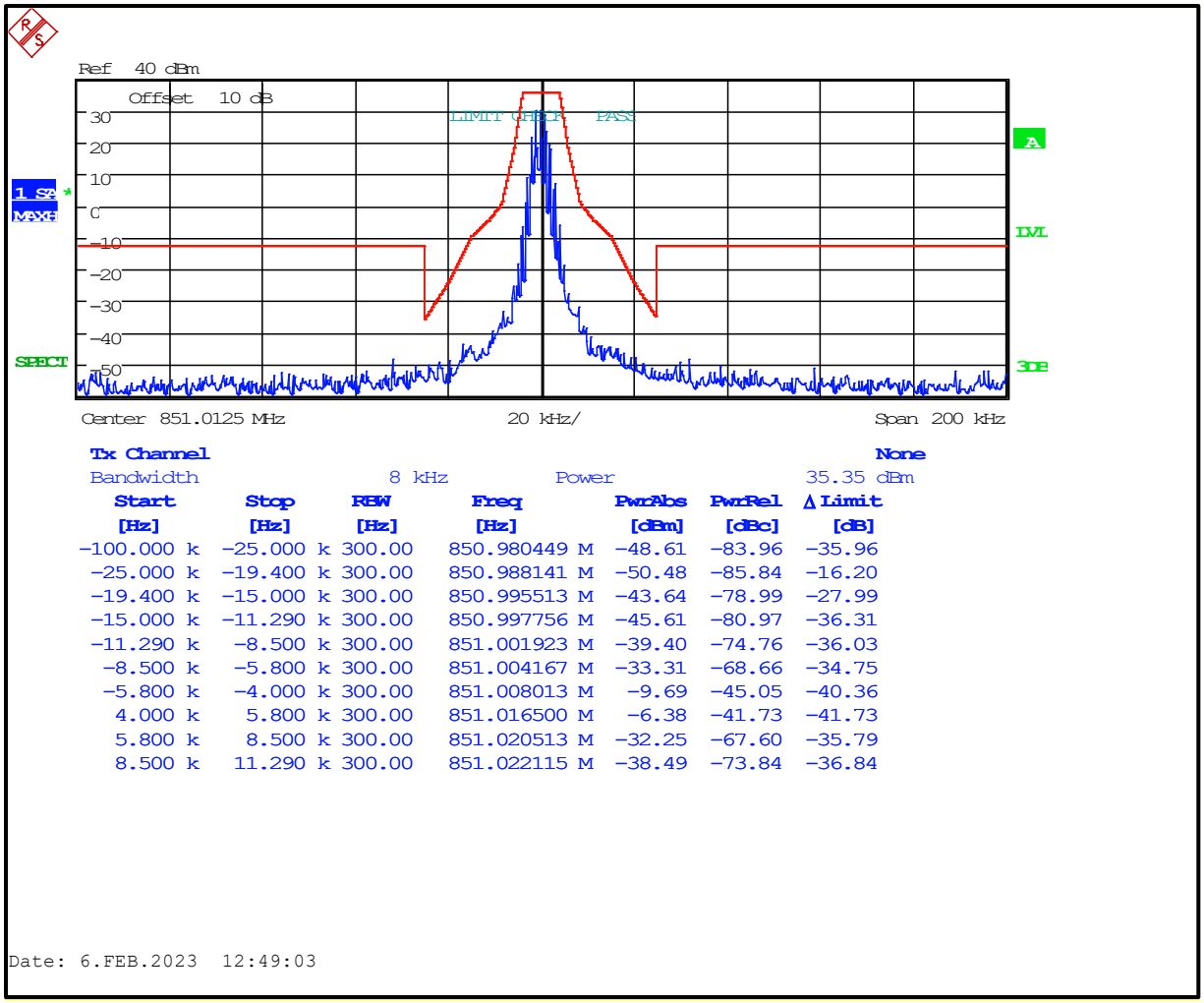
Plot 4-4: Occupied Bandwidth – HVD-SMR; 811.0125 MHz; Mask G (FCC/ISED)



Plot 4-5: Occupied Bandwidth – HVD-SMR; 815.9875 MHz; Mask G (FCC/ISED)



Plot 4-6: Occupied Bandwidth – HVD-NPSPAC; 851.0125 MHz; Mask H (FCC)

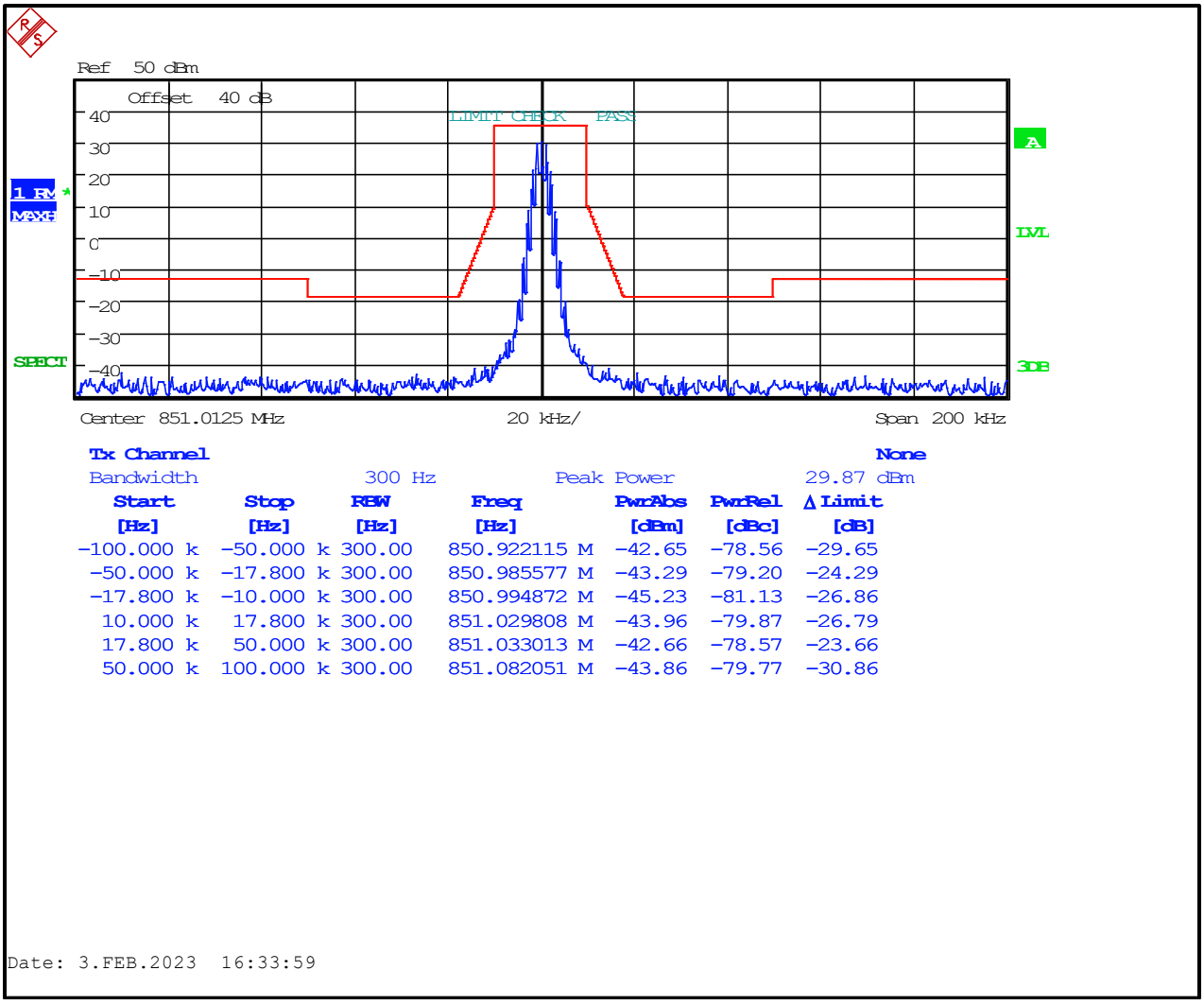


Tx Channel: None
Bandwidth: 8 kHz Power: 35.35 dBm

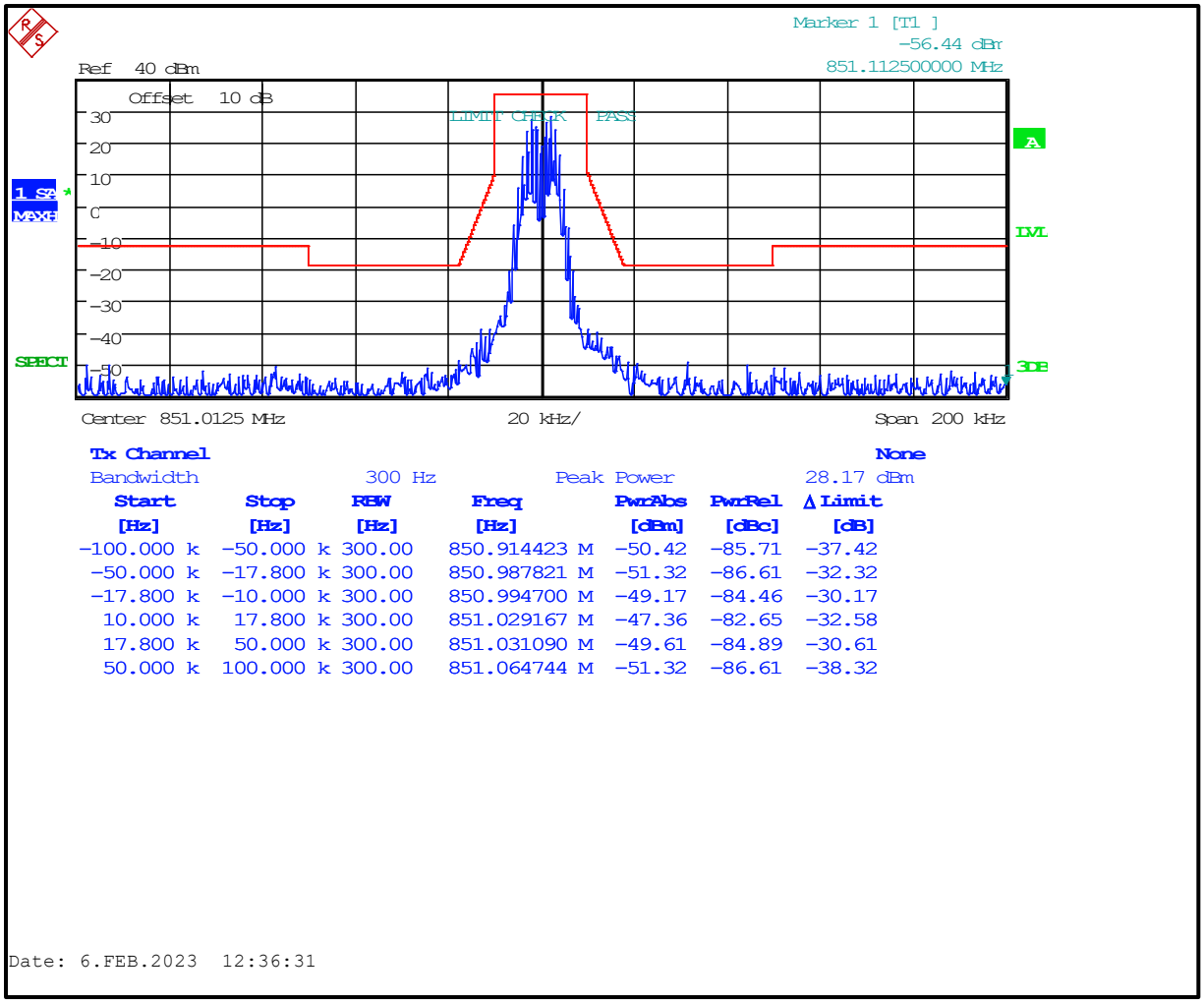
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	PwrRel [dBc]	Δ Limit [dB]
-100.000 k	-25.000 k	300.00	850.980449 M	-48.61	-83.96	-35.96
-25.000 k	-19.400 k	300.00	850.988141 M	-50.48	-85.84	-16.20
-19.400 k	-15.000 k	300.00	850.995513 M	-43.64	-78.99	-27.99
-15.000 k	-11.290 k	300.00	850.997756 M	-45.61	-80.97	-36.31
-11.290 k	-8.500 k	300.00	851.001923 M	-39.40	-74.76	-36.03
-8.500 k	-5.800 k	300.00	851.004167 M	-33.31	-68.66	-34.75
-5.800 k	-4.000 k	300.00	851.008013 M	-9.69	-45.05	-40.36
4.000 k	5.800 k	300.00	851.016500 M	-6.38	-41.73	-41.73
5.800 k	8.500 k	300.00	851.020513 M	-32.25	-67.60	-35.79
8.500 k	11.290 k	300.00	851.022115 M	-38.49	-73.84	-36.84

Date: 6.FEB.2023 12:49:03

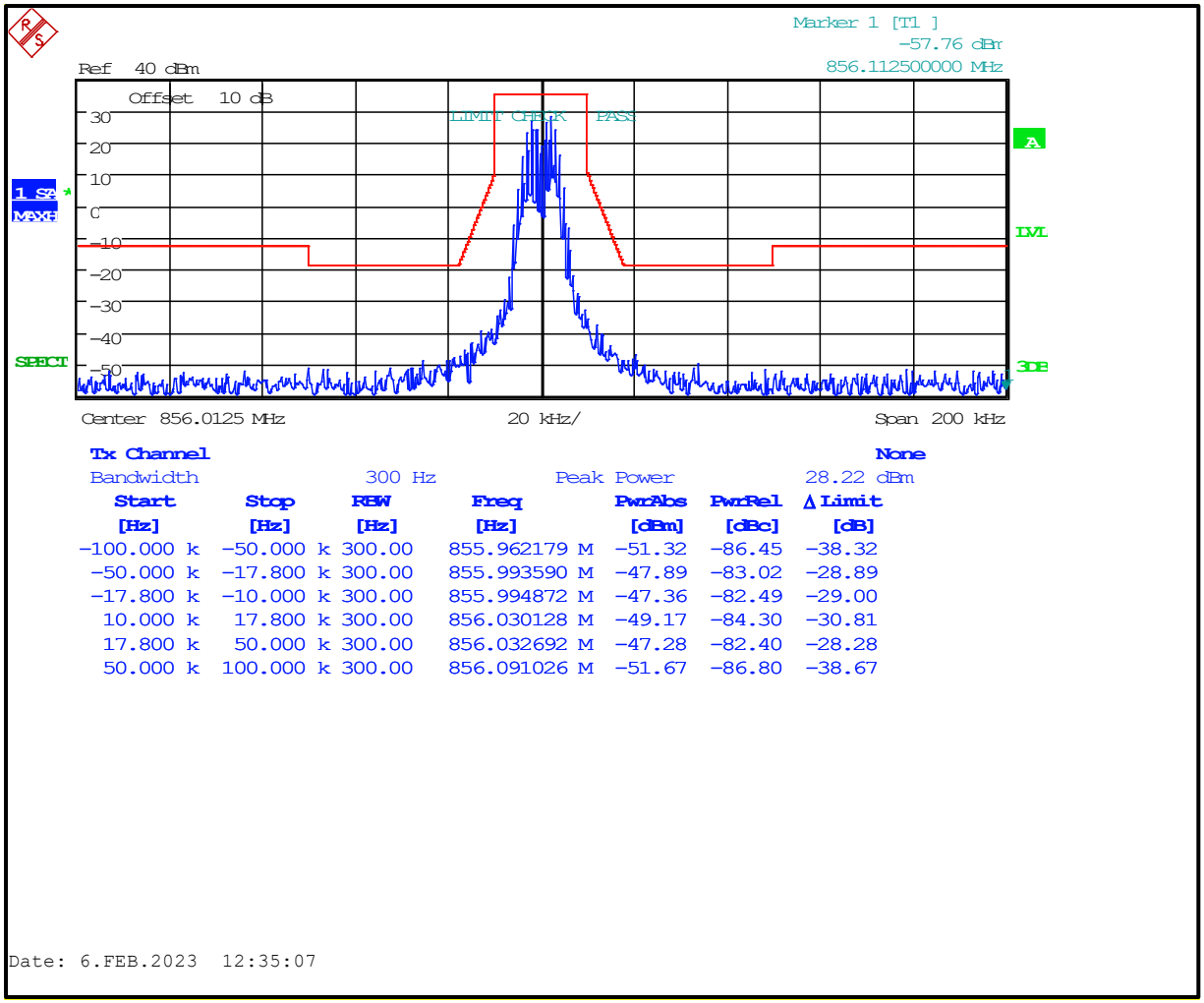
Plot 4-7: Occupied Bandwidth – HVD-NSPPAC; 851.0125 MHz; Mask G (ISED)



Plot 4-8: Occupied Bandwidth – HVD-SMR; 851.0125 MHz; Mask G (ISED)



Plot 4-9: Occupied Bandwidth – HVD-SMR; 856.0125 MHz; Mask G (FCC/ISED)



Plot 4-10: Occupied Bandwidth – HVD-SMR; 861.9875 MHz; Mask G (FCC/ISED)

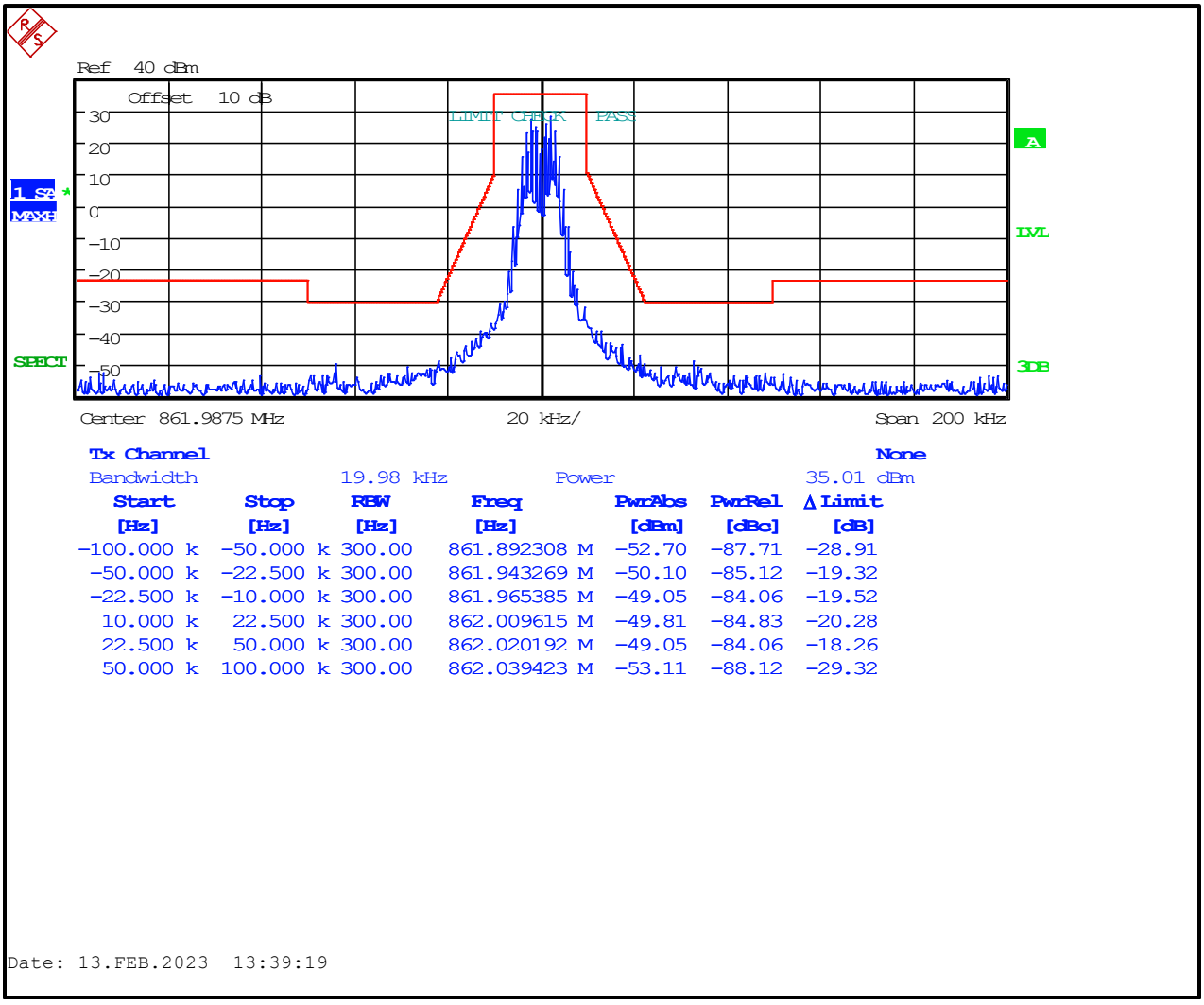


Table 4-1: Test Equipment Used for Testing Occupied Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	12/01/2024
901724	Weinschel Corp	48-40-34	Attenuator, 40 dB, 100W	CJ8921	11/22/2023
900948	Weinschel Corp	47-10-43	Attenuator DC-18 GHz 10 dB 50W	BH1487	12/02/2023

Test Personnel:

Daniel W. Baltzell		February 3-6, 2023
Test Engineer	Signature	Dates of Test

5 Conclusion

The data in this Class 2 measurement report shows that the L3Harris Technologies XL-90D; FCC ID: OWDTR-0167-E, IC: 3636B-0167, complies with the applicable requirements of FCC Parts 90 and 2, and ISED RSS-119 for a Class 2 permissive change.