Test Report Serial Number:	**45461997 r1.0**
Test Report Date:	**24 February 2025**
Project Number:	**1675**

EMC Test Report - C2PC

Applicant:

4RF Limited
PO Box 13-506
Wellington 6440
New Zealand

FCC ID: **UIPSQ928M141**

Product Model Number / HVIN	Product Name / PMN
SQ928M141	**Aprisa SR+ 928**

In Accordance With:

FCC 47 CFR Part 24, Subpart D
Narrow Band PCS

Approved By:

Ben Hewson, President
Celltech Labs Inc.
21-364 Lougheed Rd.
Kelowna, BC, V1X 7R8
Canada

Test Lab Certificate: 2470.01

IC Registration 3874A

FCC Registration: CA3874

Table of Contents

1.0 REVISION HISTORY 5
2.0 CLIENT AND DUT INFORMATION 6
3.0 SCOPE 7
4.0 TEST RESULT SUMMARY 8
5.0 NORMATIVE REFERENCES 9
6.0 FACILITIES AND ACCREDITATIONS 10
7.0 CONDUCTED OUTPUT POWER 11
8.0 OCCUPIED BANDWIDTH 18
9.0 CONDUCTED SPURIOUS EMISSIONS – EMISSIONS MASK 36
10.0 CONDUCTED SPURIOUS EMISSIONS TO 10TH HARMONIC 54
11.0 RADIATED TX SPURIOUS EMISSIONS 63
12.0 RADIATED RX SPURIOUS EMISSIONS 83
APPENDIX A – TEST SETUP DRAWINGS AND EQUIPMENT 99
APPENDIX B – EQUIPMENT LIST AND CALIBRATION 102
APPENDIX C – MEASUREMENT INSTRUMENT UNCERTAINTY 103
END OF REPORT 103

Table of Plots

Plot 7.1 – Conducted Power – 901.5MHz 12
Plot 7.2 – Conducted Power – 930.5MHz 13
Plot 7.3 – Conducted Power – 940.5MHz 14
Plot 8.1 – Occupied Bandwidth – 930.5MHz, 12.5kHz BW, QPSK 19
Plot 8.2 – Occupied Bandwidth – 930.5MHz, 12.5kHz BW, 16QAM 20
Plot 8.3 – Occupied Bandwidth – 930.5MHz, 12.5kHz BW, 64QAM 21
Plot 8.4 – Occupied Bandwidth – 930.5MHz, 12.5kHz BW, 256QAM 22
Plot 8.5 – Occupied Bandwidth – 930.5MHz, 25Hz BW, QPSK 23
Plot 8.6 – Occupied Bandwidth – 930.5MHz, 25Hz BW, 16QAM 24
Plot 8.7 – Occupied Bandwidth – 930.5MHz, 25Hz BW, 64QAM 25
Plot 8.8 – Occupied Bandwidth – 930.5MHz, 25Hz BW, 256QAM 26
Plot 8.9 – Occupied Bandwidth – 930.5MHz, 50Hz BW, QPSK 27
Plot 8.10 – Occupied Bandwidth – 930.5MHz, 50Hz BW, 16QAM 28
Plot 8.11 – Occupied Bandwidth – 930.5MHz, 50Hz BW, 64QAM 29
Plot 8.12 – Occupied Bandwidth – 930.5MHz, 50Hz BW, 256QAM 30
Plot 8.13 – Occupied Bandwidth – 930.5MHz, 100Hz BW, QPSK 31
Plot 8.14 – Occupied Bandwidth – 930.5MHz, 100Hz BW, 16QAM 32
Plot 8.15 – Occupied Bandwidth – 930.5MHz, 100Hz BW, 64QAM 33
Plot 8.16 – Occupied Bandwidth – 930.5MHz, 100Hz BW, 256QAM 34
Plot 9.1 – Emissions Mask – 929.5, 12.5kHz BW, QPSK 37
Plot 9.2 – Emissions Mask – 929.5, 12.5kHz BW, 16QAM 38
Plot 9.3 – Emissions Mask – 929.5, 12.5kHz BW, 64QAM 39
Plot 9.4 – Emissions Mask – 929.5, 12.5kHz BW, 256QAM 40
Plot 9.5 – Emissions Mask – 929.5, 25kHz BW, QPSK 41
Plot 9.6 – Emissions Mask – 929.5, 25kHz BW, 16QAM 42
Plot 9.7 – Emissions Mask – 929.5, 25kHz BW, 64QAM 43
Plot 9.8 – Emissions Mask – 929.5, 25kHz BW, 256QAM 44
Plot 9.9 – Emissions Mask – 929.5, 50kHz BW, QPSK 45
Plot 9.10 – Emissions Mask – 929.5, 50kHz BW, 16QAM 46
Plot 9.11 – Emissions Mask – 929.5, 50kHz BW, 64QAM 47
Plot 9.12 – Emissions Mask – 929.5, 50kHz BW, 256QAM 48
Plot 9.13 – Emissions Mask – 929.5, 100kHz BW, QPSK 49
Plot 9.14 – Emissions Mask – 929.5, 100kHz BW, 16QAM 50
Plot 9.15 – Emissions Mask – 929.5, 100kHz BW, 64QAM 51
Plot 9.16 – Emissions Mask – 929.5, 100kHz BW, 256QAM 52
Plot 10.1 – Conducted Spurious Emissions 925.5MHz Channel, 30 – 200MHz 55
Plot 10.2 – Conducted Spurious Emissions 925.5MHz Channel, 200 – 400MHz 56
Plot 10.3 – Conducted Spurious Emissions 925.5MHz Channel, 400 – 600MHz 57
Plot 10.4 – Conducted Spurious Emissions 925.5MHz Channel, 600 – 800MHz 58
Plot 10.5 – Conducted Spurious Emissions 925.5MHz Channel, 800 – 1000MHz 59
Plot 10.6 – Conducted Spurious Emissions 925.5MHz Channel, 1 – 3GHz 60
Plot 10.7 – Conducted Spurious Emissions 925.5MHz Channel, 3 – 10GHz 61

Plot 11.1 – Radiated Tx Emissions, 929.5MHz, Horizontal, 30-200MHz 64
Plot 11.2 – Radiated Tx Emissions, 929.5MHz, Horizontal, 200-400MHz 65
Plot 11.3 – Radiated Tx Emissions, 929.5MHz, Horizontal, 400-600MHz 66
Plot 11.4 – Radiated Tx Emissions, 929.5MHz, Horizontal, 600-800MHz 67
Plot 11.5 – Radiated Tx Emissions, 929.5MHz, Horizontal, 800-1000MHz 68
Plot 11.6 – Radiated Tx Emissions, 929.5MHz, Horizontal, 1-3GHz 69
Plot 11.7 – Radiated Tx Emissions, 929.5MHz, Horizontal, 3-10GHz 70
Plot 11.8 – Radiated Tx Emissions, 929.5MHz, Horizontal, 2nd Harmonic 71
Plot 11.9 – Radiated Tx Emissions, 929.5MHz, Horizontal, 3rd Harmonic 72
Plot 11.10 – Radiated Tx Emissions, 929.5MHz, Vertical, 30-200MHz 73
Plot 11.11 – Radiated Tx Emissions, 929.5MHz, Vertical, 200-400MHz 74
Plot 11.12 – Radiated Tx Emissions, 929.5MHz, Vertical, 400-600MHz 75
Plot 11.13 – Radiated Tx Emissions, 929.5MHz, Vertical, 600-800MHz 76
Plot 11.14 – Radiated Tx Emissions, 929.5MHz, Vertical, 800-1000MHz 77
Plot 11.15 – Radiated Tx Emissions, 929.5MHz, Vertical, 1-3GHz 78
Plot 11.16 – Radiated Tx Emissions, 929.5MHz, Vertical, 3-10GHz 79
Plot 11.17 – Radiated Tx Emissions, 929.5MHz, Vertical, 2nd Harmonic 80
Plot 11.18 – Radiated Tx Emissions, 929.5MHz, Vertical, 3rd Harmonic 81
Plot 12.1 – Radiated Rx Emissions, Horizontal, 30-200MHz 84
Plot 12.2 – Radiated Rx Emissions, Horizontal, 200-400MHz 85
Plot 12.3 – Radiated Rx Emissions, Horizontal, 400-600MHz 86
Plot 12.4 – Radiated Rx Emissions, Horizontal, 600-800MHz 87
Plot 12.5 – Radiated Rx Emissions, Horizontal, 800-1000MHz 88
Plot 12.6 – Radiated Rx Emissions, Horizontal, 1-3GHz 89
Plot 12.7 – Radiated Rx Emissions, Horizontal, 3-10GHz 90
Plot 12.8 – Radiated Rx Emissions, Vertical, 30-200MHz 91
Plot 12.9 – Radiated Rx Emissions, Vertical, 200-400MHz 92
Plot 12.10 – Radiated Rx Emissions, Vertical, 400-600MHz 93
Plot 12.11 – Radiated Rx Emissions, Vertical, 600-800MHz 94
Plot 12.12 – Radiated Rx Emissions, Vertical, 800-1000MHz 95
Plot 12.13 – Radiated Rx Emissions, Vertical, 1-3GHz 96
Plot 12.14 – Radiated Rx Emissions, Vertical, 3-10GHz 97

Table of Tables

Table 7.1 - Summary of Conduct Power Measurements 15
Table 7.2 – Maximum Permissible Antenna Gain at Maximum Output Power 16
Table 7.3 – Maximum Permissible Output Power at Maximum Antenna Gain 17
Table 8.1 - Summary of Occupied Bandwidth Measurements 35
Table 9.1 - Summary of Emissions Mask Measurements 53
Table 10.1 - Summary of Conducted Spurious Measurements 62
Table 11.1 – Summary of Radiated Tx Emissions Measurements 82
Table 12.1 – Summary of Radiated Rx Emissions Measurements 98
Table A.1 – Setup - Conducted Measurements Equipment 99
Table A.2 – Setup - Radiated Emissions Equipment 100

Table of Figures

Figure A.1 – Test Setup Conducted Measurements 99
Figure A.2 – Test Setup Radiated Measurements 30MHz – 1GHz 100
Figure A.3 – Test Setup Radiated Measurements 30MHz – 1GHz, Signal Substitution 101
Figure A.4 – Test Setup Radiated Measurements 1 – 18GHz, ... 101

1.0 REVISION HISTORY

Revision History					
Samples Tested By:	Art Voss, P.Eng.		**Date(s) of Evaluation:**	3 Dec 2024 - 26 Feb 2025	
Report Prepared By:	Art Voss, P.Eng.		**Report Reviewed By:**	Ben Hewson	
Report Revision	**Description of Revision**		**Revised Section**	**Revised By**	**Revision Date**
0.1	Draft		n/a	Art Voss	30 January 2025
0.2	Revised Draft		n/a	Art Voss	12 February 2025
1.0	Initial Release		n/a	Art Voss	24 February 2025

2.0 CLIENT AND DUT INFORMATION

Client Information	
Applicant Name (FCC)	**4RF Limited**
Applicant Address (FCC)	PO Box 13-506
	Wellington 6440,
	New Zealand
DUT Information	
Device Identifier(s):	**FCC ID:** **UIPSQ928M141**
Device Type:	Digital Transceiver
Device Model(s) / HVIN:	SQ928M141
Device Marketing Name / PMN:	Aprisa SR+ 928
Test Sample Serial No.:	R5310007031
Equipment Class (FCC):	TNB - Licensed Non-Broadcast Station Transmitter
Transmit Frequency Range:	Part 24: 901-902MHz, 930-931MHz, 940-941MHz
	Part 90: 896-901MHz, 929-930MHz, 935-940MHz
	Part 101: 928-929MHz, 932-932.5MHz, 932.5-940MHz
	Part 101: 941-941.5MHz, 941.5-944MHz, 952-960MHz
Test Channels:	Programmable
Manuf. Max. Rated Output Power:	10dBm (10mW) to 37dBm (5W), Field-Programmable
Manuf. Max. Rated BW:	Part 24. 12.5kHz, 25kHz, 50kHz, 100kHz
	Part 90. 12.5kHz, 25kHz
	Part 101. 12.5kHz, 25kHz, 50kHz
Antenna Type and Gain:	Max: 28dB (25.85dBd)
Modulation:	QPSK, 16QAM, 64QAM, 256QAM
Mode:	Half Duplex
DUT Power Source:	10 - 30VDC
DUT Dimensions [HxWxD] (mm)	H x W x D: 40mm x 140mm x 210mm.
Deviation(s) from standard/procedure:	None
Modification of DUT:	None

***** NOTE *****

The Aprisa SR+ must be professionally installed by trained and qualified installers. The installer must ensure regulatory compliance to the requirements and standards cited herein and to the local requirements in place at the time of installation. When the maximum permissible Effective Radiated Power (ERP) or Equivalent Isotropic Radiated Power (EIPR) is regulated, knowledge of the regulation, antenna gain and feeder cable loss must be known by the installer prior to adjusting the Maximum Transmit Output Power of the Aprisa SR+.

3.0 SCOPE

Preface:

This Certification Report was prepared on behalf of:

4RF Limited

,(the '*Applicant*"), in accordance with the applicable Federal Communications Commission (FCC) CFR 47 and Innovation, Scientific and Economic Development (ISED) Canada rules parts and regulations (the '*Rules*'). The scope of this investigation was limited to only the equipment, devices and accessories (the '*Equipment*') supplied by the *Applicant*. The tests and measurements performed on this *Equipment* were only those set forth in the applicable *Rules* and/or the Test and Measurement Standards they reference. The *Rules* applied and the Test and Measurement Standards used during this evaluation appear in the Normative References section of this report. The limits set forth in the technical requirements of the applicable *Rules* were applied to the measurement results obtained during this evaluation and ,unless otherwise noted, these limits were used as the Pass/Fail criteria. The Pass/Fail statements made in this report apply to only the tests and measurements performed on only the *Equipment* tested during this evaluation. Where applicable and permissible, information including test and measurement data and/or results from previous evaluations of same or similar equipment, devices and/or accessories may be cited in this report.

Device:

The Aprisa SR+ 928, FCC ID: UIPSQ928M141, is a digital Land Mobile and PCS trasceiver. The transceiver sysnthesizers are being replaced and are not pin-to-pin compatible. All other aspects of the transmitter with regards to output power, bands of operation, bandwidths and modulations have not been changed from those in the previous filings.

Requirement:

As per FCC KDB 388624 D02v18r07, a C2PC (C2PCPX) using the procedures of FCC KDB 178919 (Notificationb 202109-001) is being sought.

Application:

This is an application for a C2PC.

Scope:

The scope of this investigation is limited to the evaluation and reporting of the wanted and spurious emissions in accordance with the rule parts cited in Normative References section of this report.

4.0 TEST RESULT SUMMARY

TEST SUMMARY

Section	Description of Test	Procedure Reference	Applicable Rule Part(s) FCC	Test Date	Result
7.0	Conducted Power (Fundamental)	ANSI C63.26-2015	§24.132	3 Dec 2024	Pass
8.0	Occupied Bandwidth	ANSI C63.26-2015	§24.131	4,5 Dec 2024	Pass
9.0	Emissions Mask	ANSI C63.26-2015	§24.133	6 Dec 2024 6 Feb 2025	Pass
10.0	Antenna Port Conducted Spurious	ANSI C63.26-2015	§24.133	11 Dec 2024	Pass
11.0	Radiated Tx Spurious Emissions	ANSI C63.26-2015	§24.133	29 Jan 2025	Pass
12.0	Radiated Rx Spurious Emissions	ANSI C63.4-2014	§15B	29 Jan 2025	Pass

Test Station Day Log

Date	Ambient Temp (°C)	Relative Humidity (%)	Barometric Pressure (kPa)	Test Station	Tests Performed Section(s)
3 Dec 2024	23.0	23	103.4	**EMC**	**7**
4 Dec 2024	23.6	25	103.3	**EMC**	**8**
5 Dec 2024	21.6	27	103.2	**EMC**	**8**
6 Dec 2024	22.5	25	103.2	**EMC**	**9**
7 Dec 2024	22.8	26	103.3	**EMC**	**9**
8 Dec 2024	22.1	26	103.1	**EMC**	**9**
11 Dec 2024	22.8	26	102.8	**EMC**	**10**
29 Jan 2025	-3.0	68	102.3	**OATS**	**11, 12**
6 Feb 2025	22.1	18	102.2	**EMC**	**9**

EMC - EMC Test Bench
SAC - Semi-Anechoic Chamber
OATS - Open Area Test Site
TC - Temperature Chamber
LISN - LISN Test Area
ESD - ESD Test Bench
IMM - Immunity Test Area
RI - Radiated Immunity Chamber

I attest that the data reported herein is true and accurate within the tolerance of the Measurement Instrument Uncertainty; that all tests and measurements were performed in accordance with accepted practices or procedures; and that all tests and measurements were performed by me or by trained personnel under my direct supervision. The results of this investigation are based solely on the test sample(s) provided by the client which were not adjusted, modified or altered in any manner whatsoever, except as required to carry out specific tests or measurements. This test report has been completed in accordance with ISO/IEC 17025.

Art Voss, P.Eng.
Technical Manager
Celltech Labs Inc.

28 January 2025
Date

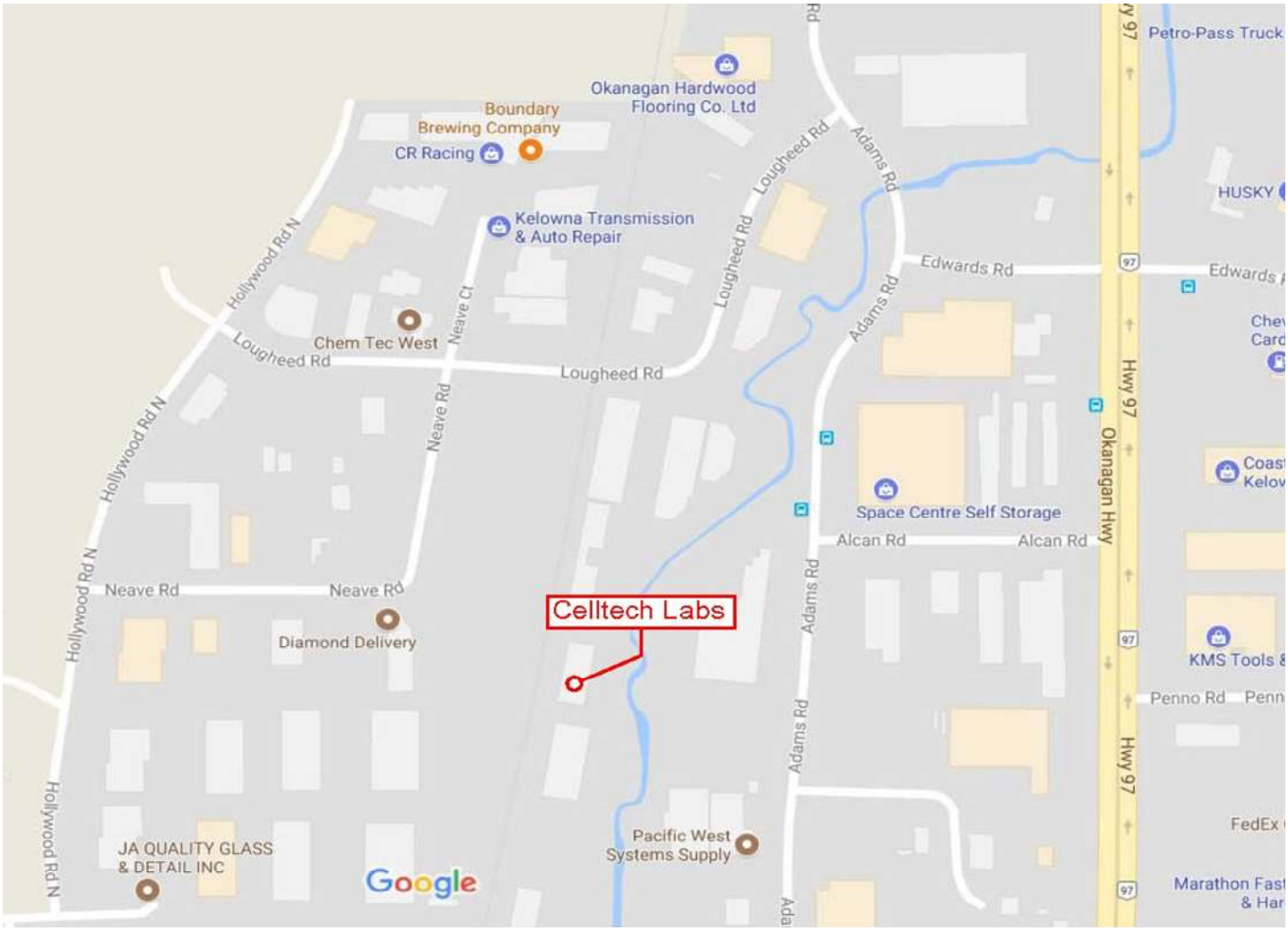
5.0 NORMATIVE REFERENCES

Normative References	
ISO/IEC 17025:2017	General requirements for the competence of testing and calibration laboratories
ANSI C63.4-2014	American National Standard of Procedures for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electric and Electronic Equipment in the Range of 9kHz to 40GHz
ANSI C63.4A-2017	American National Standard of Procedures for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electric and Electronic Equipment in the Range of 9kHz to 40GHz Amendment 1: Test Site Validation
ANSI C63.26-2015	American National Standard of Procedures for Compliance Testing of Transmitters Used in Licensed Radio Services
CFR	Code of Federal Regulations
Title 47:	Telecommunication
Part 2:	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR	Code of Federal Regulations
Title 47:	Telecommunication
Part 15:	Radio Frequency Devices
Subpart B:	Unintentional Radiators
CFR	Code of Federal Regulations
Title 47:	Telecommunication
Part 24:	Personal Communications Services
Sub Part D:	Narrowband PCS

6.0 FACILITIES AND ACCREDITATIONS

Facility and Accreditation:

The facilities used to evaluate this device outlined in this report are located at 21-364 Lougheed Road, Kelowna, British Columbia, Canada V1X 7R8. The radiated emissions site (OATS) conforms to the requirements set forth in ANSI C63.4 and is filed and listed with the FCC under Test Firm Registration Number CA3874 and Industry Canada under Test Site File Number IC 3874A. Celltech is accredited to ISO 17025, through accrediting body A2LA and with certificate 2470.01.



7.0 CONDUCTED OUTPUT POWER

Test Procedure	
Normative References	FCC 47 CFR §24.132
	ANSI C63.26

Requirement / Limits	
47 CFR §24.132	§24.132 Power and Antenna Height Limits
	(a) Stations transmitting in the 901-902 MHz band are limited to 7 watts e.r.p.
	(c) Base stations transmitting in the 930-931 MHz and 940-941 MHz bands are limited to 3500 watts e.r.p. per authorized channel

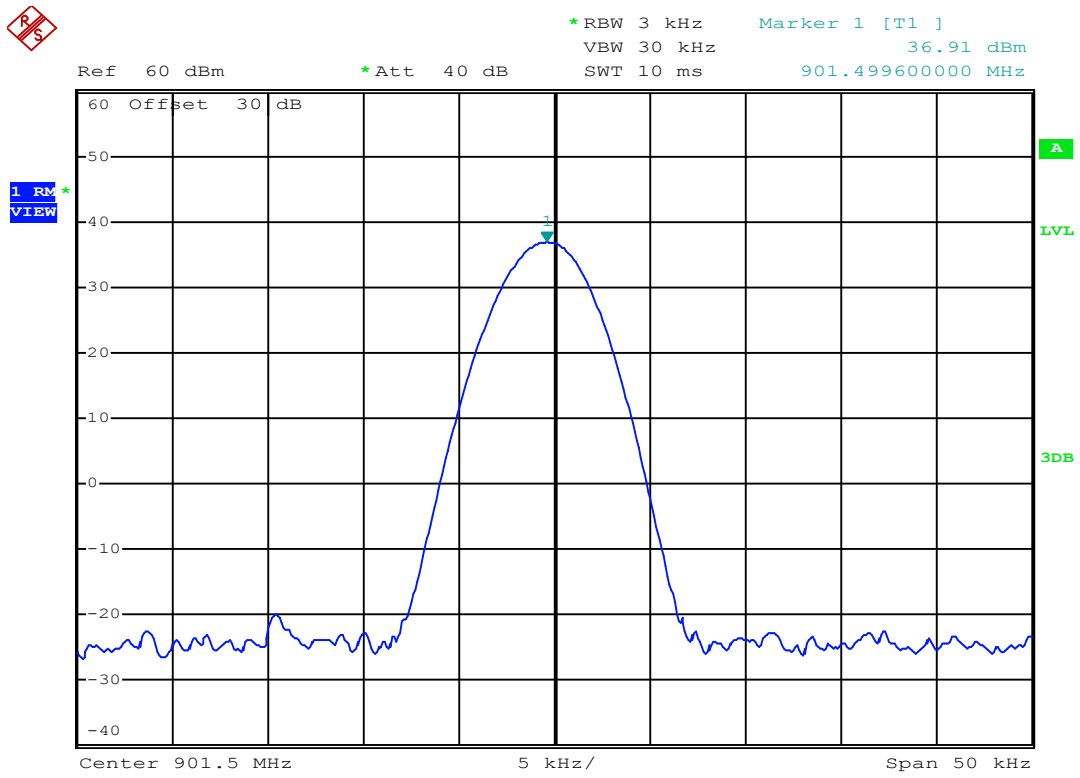
Test Setup	Appendix A - Figure A.1

Measurement Procedure

The DUT was connected to the SA as specified above via a 30dB attenuator. The DUT was configured to transmit unmodulated at its highest output power. The Conducted Power was measured using the instrument's Marker Peak function and recorded.

Plot 7.1 – Conducted Power – 901.5MHz

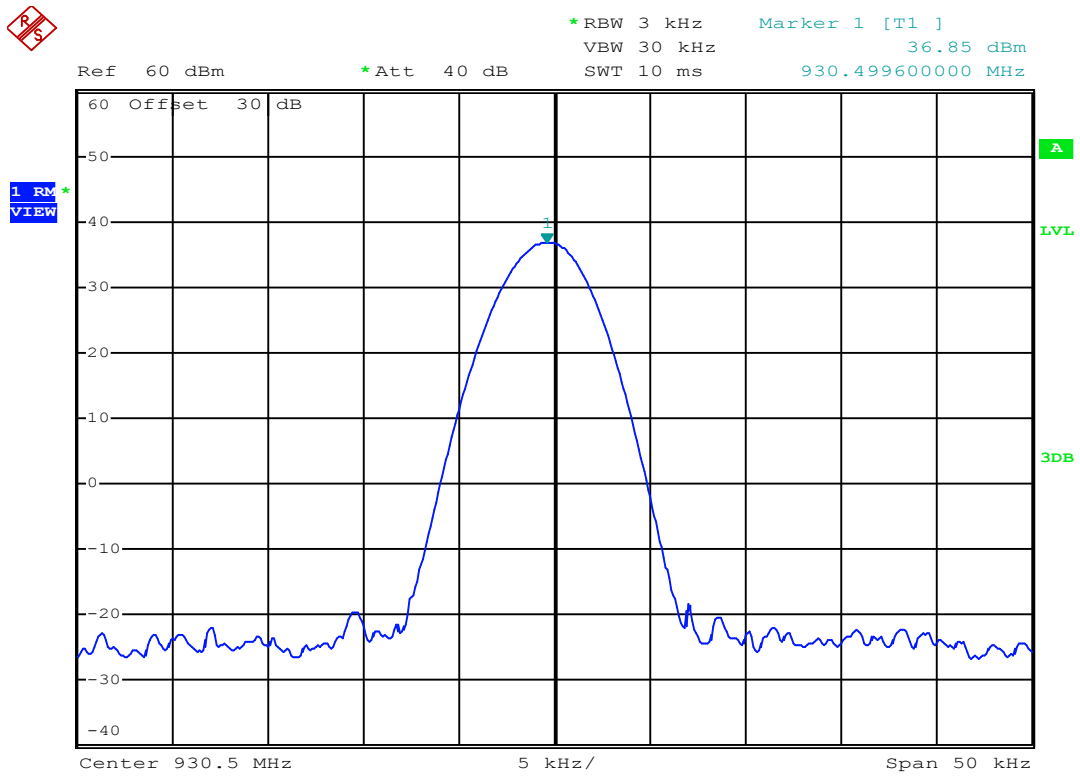
Conducted Power:



Channel Frequency:	**901.5**	**MHz**
Modulation:	**CW**	
Measured Channel Power:	**36.91**	**dBm**

Plot 7.2 – Conducted Power – 930.5MHz

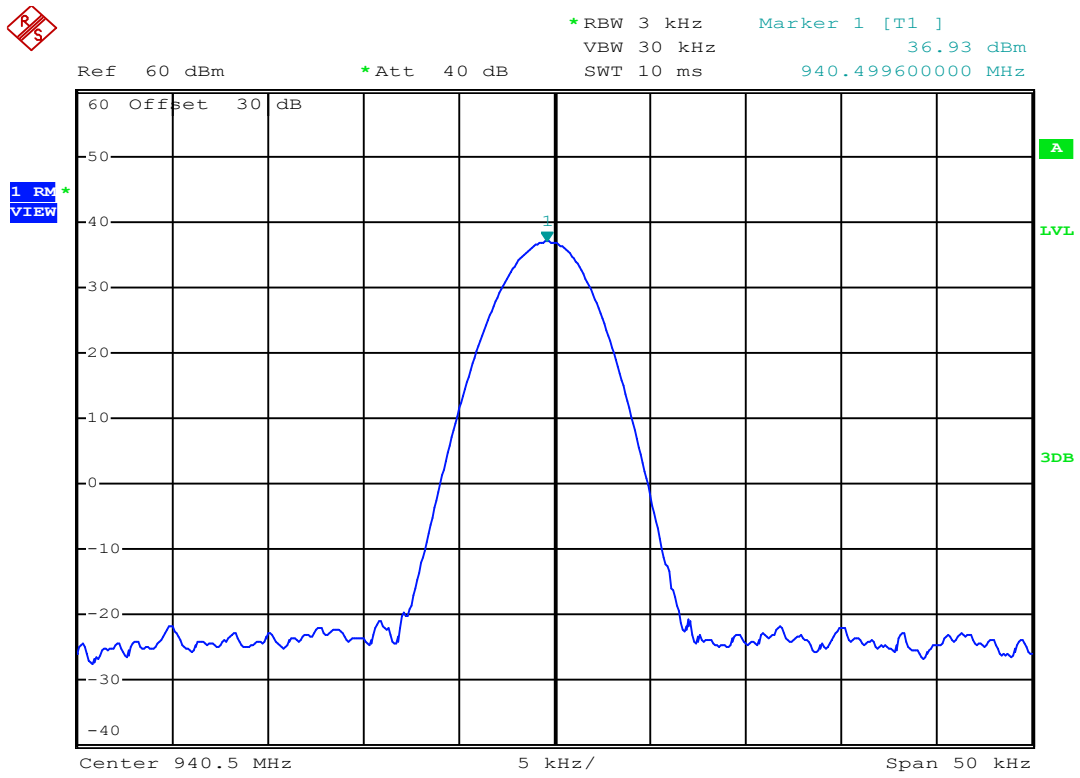
Conducted Power:



Channel Frequency:	**930.5**	**MHz**
Modulation:	**CW**	
Measured Channel Power:	**36.85**	**dBm**

Plot 7.3 – Conducted Power – 940.5MHz

Conducted Power:



Channel Frequency:	**940.5**	**MHz**
Modulation:	**CW**	
Measured Channel Power:	**36.93**	**dBm**

Table 7.1 - Summary of Conduct Power Measurements

Conducted Power Measurement Results: FCC Part 24							
Channel Frequency (MHz)	Channel Bandwidth (kHz)	Modulation	Measured Power [P_{meas}] (dBm)	Antenna Gain [G] (dBd)	ERP Power [P_{erp}] (dBm)	ERP Limit [P_{lim}] (dBm)	Margin (dB)
901.5	n/a	CW	36.91	0.85	37.76	38.5	0.7
930.5	n/a	CW	36.85		37.70	65.4	27.7
940.5	n/a	CW	36.93		37.78	65.4	27.6
						Result:	Complies

ERP $P_{erp} = P_{meas} + G(dBd)$

Conducted Margin = $P_{lim} - P_{erp}$

Conducted Power Measurement Results: ISED RSS-134							
Channel Frequency (MHz)	Channel Bandwidth (kHz)	Modulation	Measured Power [P_{Meas}] (dBm)	Antenna Gain [G] (dBd)	ERP Power [P_{erp}] (dBm)	Limit [P_{Lim}] (dBm)	Margin (dB)
901.5	n/a	CW	36.91	0.85	37.76	38.5	0.7
930.5	n/a	CW	36.85		37.70	62	24.3
940.5	n/a	CW	36.93		37.78	62	24.2
						Result:	Complies

ERP $P_{erp} = P_{meas} + G(dBd)$

Conducted Margin = $P_{lim} - P_{erp}$

***** NOTE *****

The Aprisa SR+ must be professionally installed by trained and qualified installers. The installer must ensure regulatory compliance to the requirements and standards cited herein and to the local requirements in place at the time of installation. When the maximum permissible Effective Radiated Power (ERP) or Equivalent Isotropic Radiated Power (EIPR) is regulated, knowledge of the regulation, antenna gain and feeder cable loss must be known by the installer prior to adjusting the Maximum Transmit Output Power of the Aprisa SR+.

Table 7.2 – Maximum Permissible Antenna Gain at Maximum Output Power

FCC Part 24: Maximum Permissible Antenna Gain at Maximum Output Power							
Channel Frequency (MHz)	Channel Bandwidth (kHz)	Modulation	Max Power [P_{meas}] (dBm)	Max Gain [G] (dBd)	ERP Power [P_{erp}] (dBm)	ERP Limit [P_{lim}] (dBm)	Margin (dB)
901.5	n/a	CW	36.91	1.59	38.50	38.5	0.0
930.5	n/a	CW	36.85	28.55	65.40	65.4	0.0
940.5	n/a	CW	36.93	28.47	65.40	65.4	0.0
						Result:	Complies

ERP $P_{erp} = P_{meas} + G(dBd)$

Conducted Margin = $P_{lim} - P_{erp}$

ISED RSS-134: Maximum Permissible Antenna Gain at Maximum Output Power							
Channel Frequency (MHz)	Channel Bandwidth (kHz)	Modulation	Max Power [P_{Meas}] (dBm)	Max Gain [G] (dBd)	ERP Power [P_{erp}] (dBm)	Limit [P_{Lim}] (dBm)	Margin (dB)
901.5	n/a	CW	36.91	1.59	38.50	38.5	0.0
930.5	n/a	CW	36.85	25.15	62.00	62	0.0
940.5	n/a	CW	36.93	25.07	62.00	62	0.0
						Result:	Complies

ERP $P_{erp} = P_{meas} + G(dBd)$

Conducted Margin = $P_{lim} - P_{erp}$

Table 7.3 – Maximum Permissible Output Power at Maximum Antenna Gain

FCC Part 24: Maximum Permissible Output Power at Maximum Antenna Gain							
Channel Frequency (MHz)	Channel Bandwidth (kHz)	Modulation	Max Power [P_{meas}] (dBm)	Max Gain [G] (dBd)	ERP Power [P_{erp}] (dBm)	ERP Limit [P_{lim}] (dBm)	Margin (dB)
901.5	n/a	CW	12.65	25.85	38.50	38.5	0.0
930.5	n/a	CW	39.55	25.85	65.40	65.4	0.0
940.5	n/a	CW	39.55	25.85	65.40	65.4	0.0
						Result:	Complies

ERP $P_{erp} = P_{meas} + G(dBd)$

Conducted Margin = $P_{lim} - P_{erp}$

ISED RSS-134: Maximum Permissible Output Power at Maximum Antenna Gain							
Channel Frequency (MHz)	Channel Bandwidth (kHz)	Modulation	Max Power [P_{Meas}] (dBm)	Max Gain [G] (dBd)	ERP Power [P_{erp}] (dBm)	Limit [P_{Lim}] (dBm)	Margin (dB)
901.5	n/a	CW	12.65	25.85	38.50	38.5	0.0
930.5	n/a	CW	36.15	25.85	62.00	62	0.0
940.5	n/a	CW	36.15	25.85	62.00	62	0.0
						Result:	Complies

ERP $P_{erp} = P_{meas} + G(dBd)$

Conducted Margin = $P_{lim} - P_{erp}$

Note: The manufacturer's maximum specified antenna gain = 28dBi
Antenna Gain (dBd) = Antenna Gain (dBi) - 2.15 = 28dBi - 2.15 = 25.85dBd
Note: Maximum Output Power is field-programable.

8.0 OCCUPIED BANDWIDTH

Test Procedure	
Normative References	FCC 47 CFR §24.131
	ANSI C63.26

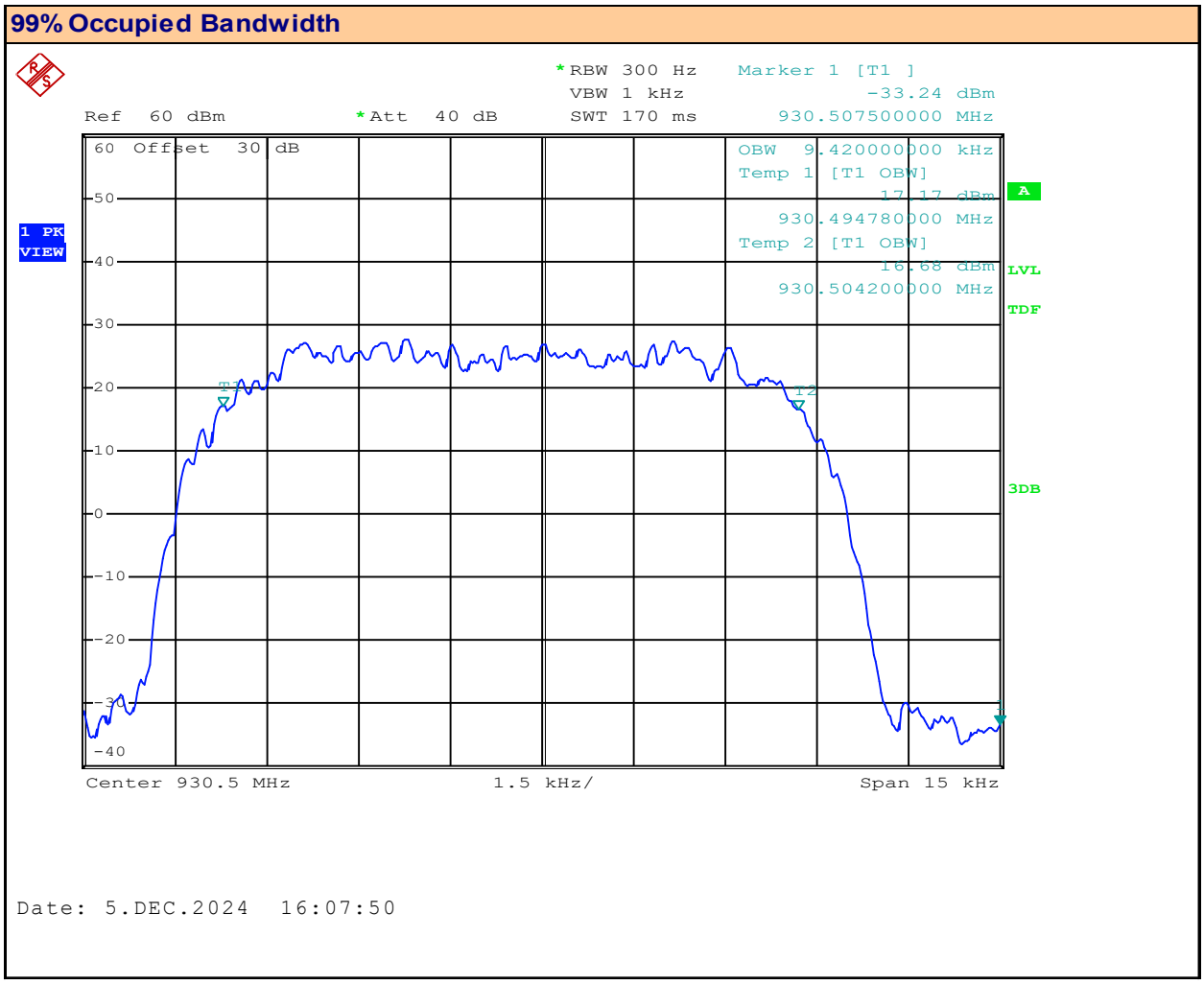
Requirement / Limits	
47 CFR §24.131	**§24.131 Authorized Bandwidth**
	The authorized bandwidth of narrowband PCS channels will be 10 kHz for 12.5 kHz channels and 45 kHz for 50 kHz channels. For aggregated adjacent channels, a maximum authorized bandwidth of 5 kHz less than the total aggregated channel width is permitted.

Test Setup	Appendix A - Figure A.1

Measurement Procedure

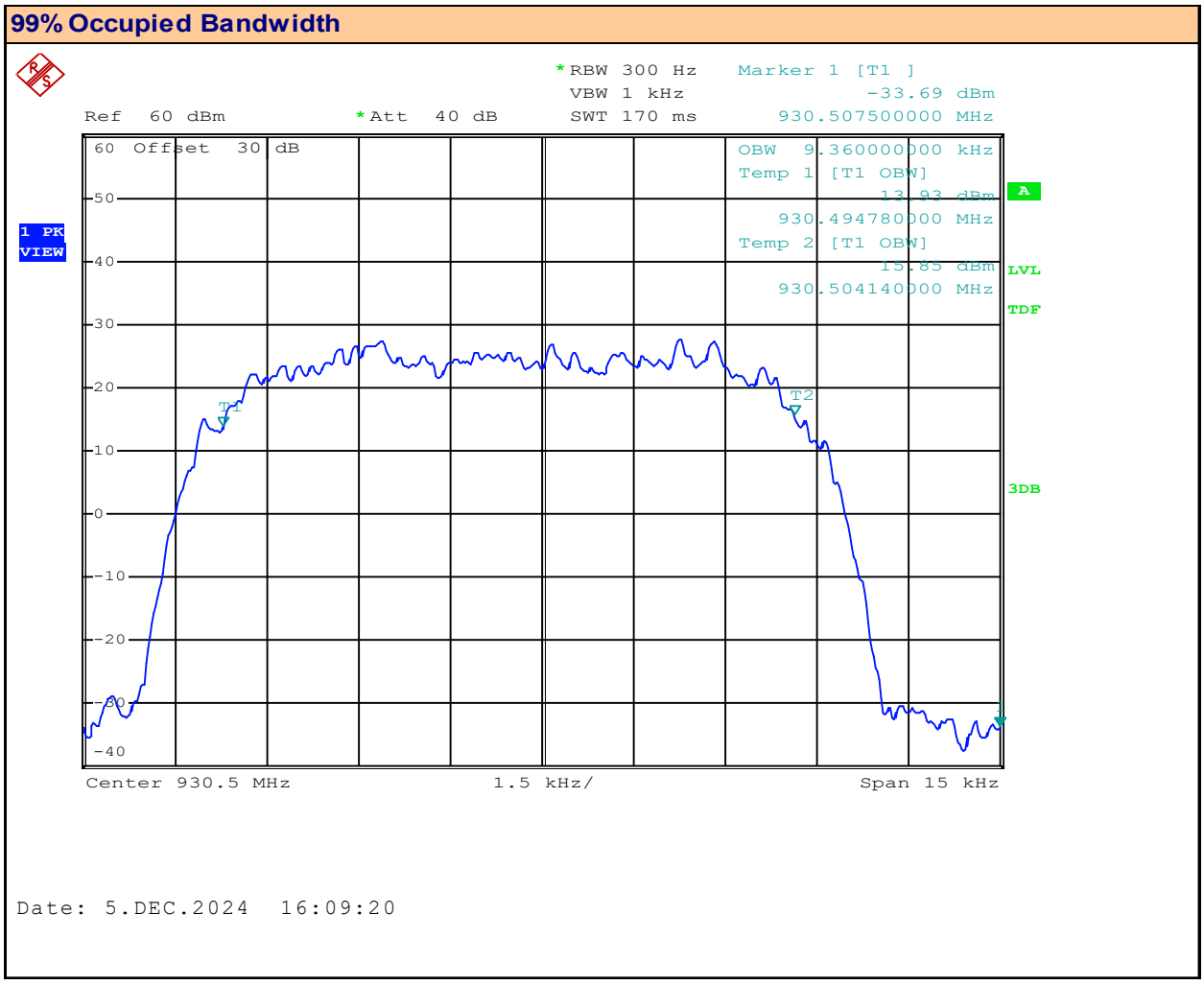
The DUT was connected to a Spectrum Analyzer via a 30dB attenuator. The DUT was configured to transmit modulated at its highest output power. The Occupied Bandwidth was measured using the instrument's 99% Bandwidth function and recorded for each applicable bandwidth and modulation.

Plot 8.1 – Occupied Bandwidth – 930.5MHz, 12.5kHz BW, QPSK



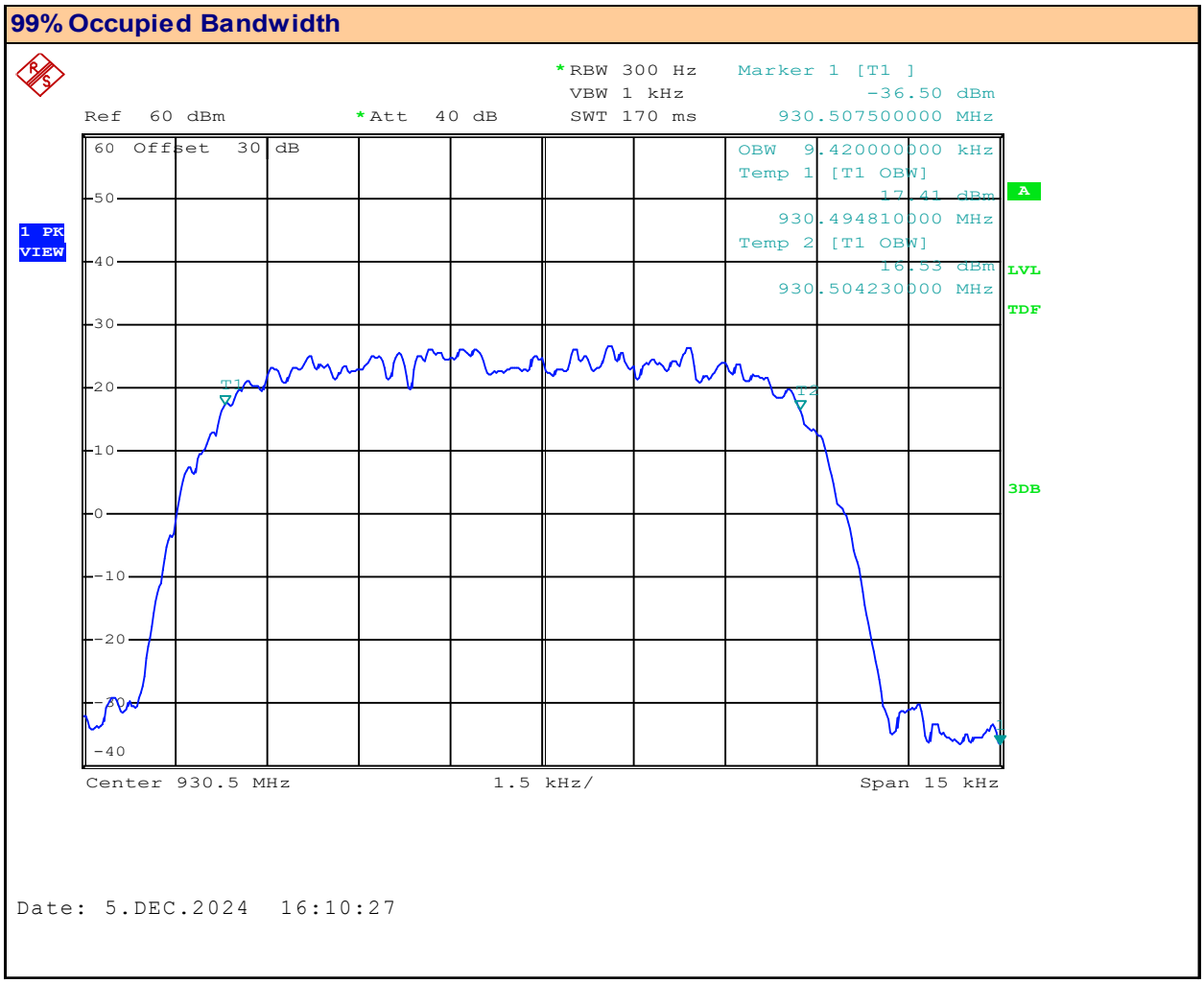
Channel Frequency:	930.5	MHz	**Channel Bandwidth:**	12.5	kHz
Designator:	G1D		**Modulation:**	QPSK	
			Measured Occupied Bandwidth:	9.42	kHz

Plot 8.2 – Occupied Bandwidth – 930.5MHz, 12.5kHz BW, 16QAM



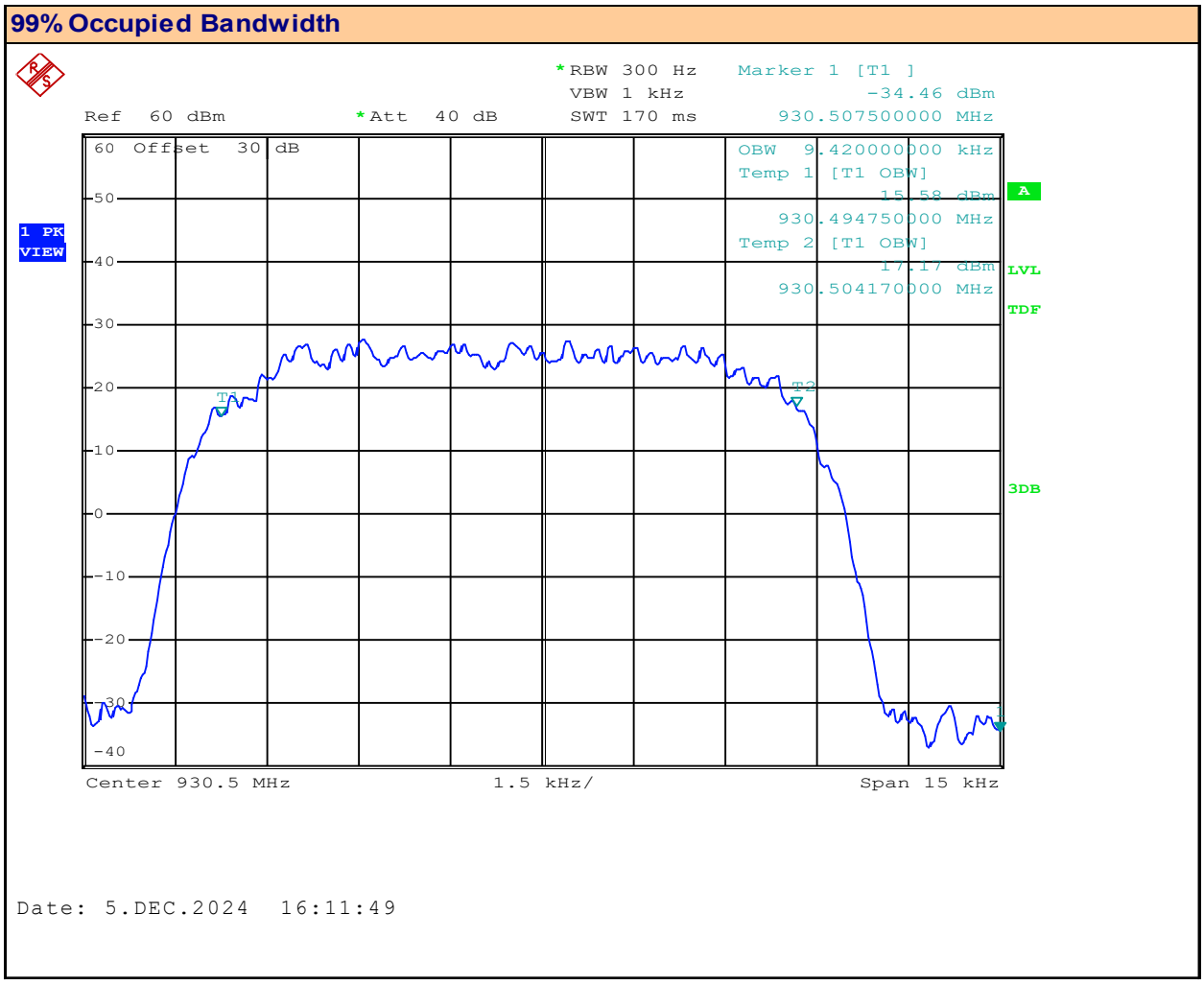
Channel Frequency:	930.5	MHz	**Channel Bandwidth:**	12.5	kHz
Designator:	D1D		**Modulation:**	16QAM	
			Measured Occupied Bandwidth:	9.36	kHz

Plot 8.3 – Occupied Bandwidth – 930.5MHz, 12.5kHz BW, 64QAM



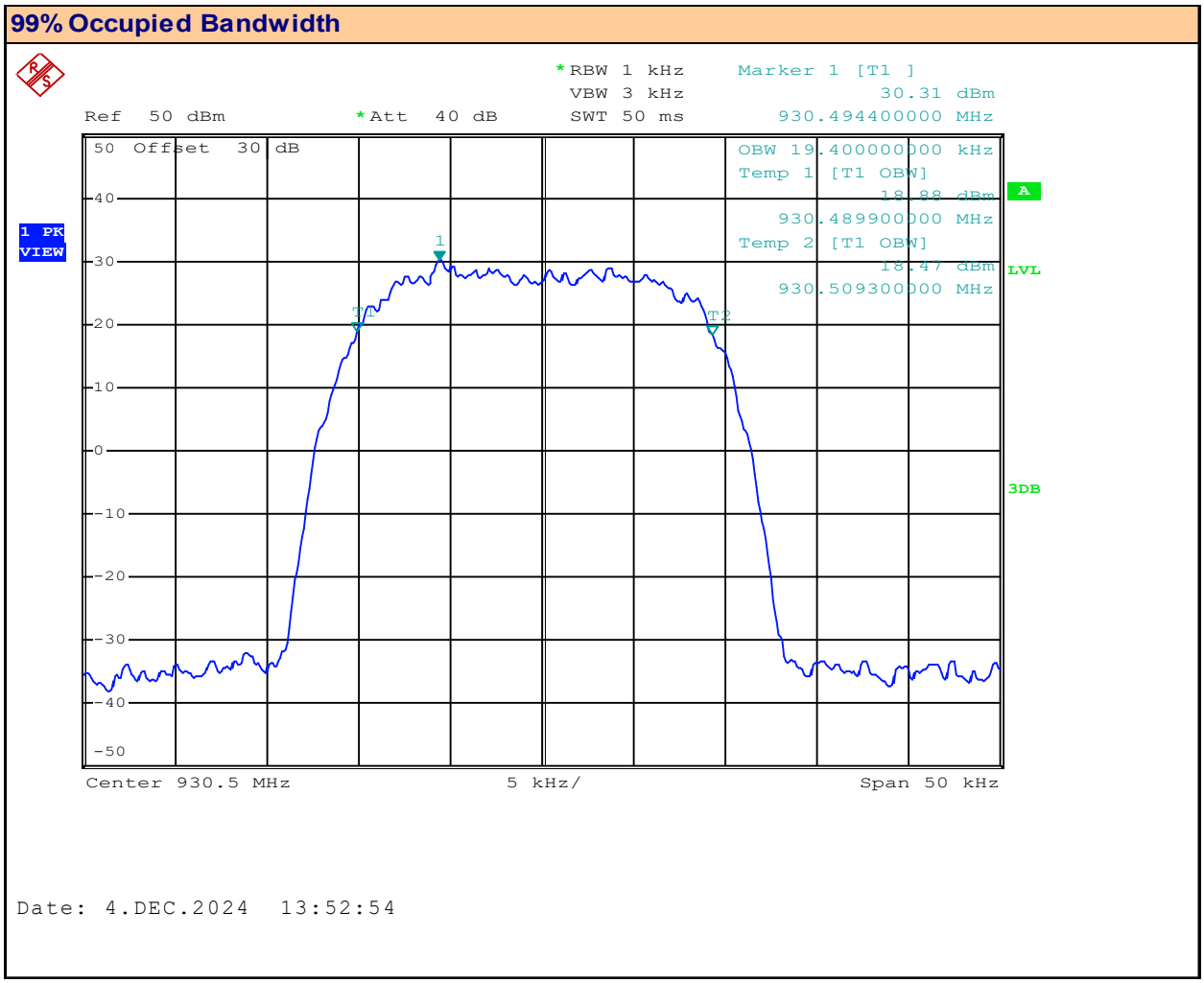
Channel Frequency:	930.5	MHz	**Channel Bandwidth:**	12.5	kHz
Designator:	D1D		**Modulation:**	64QAM	
			Measured Occupied Bandwidth:	9.42	kHz

Plot 8.4 – Occupied Bandwidth – 930.5MHz, 12.5kHz BW, 256QAM



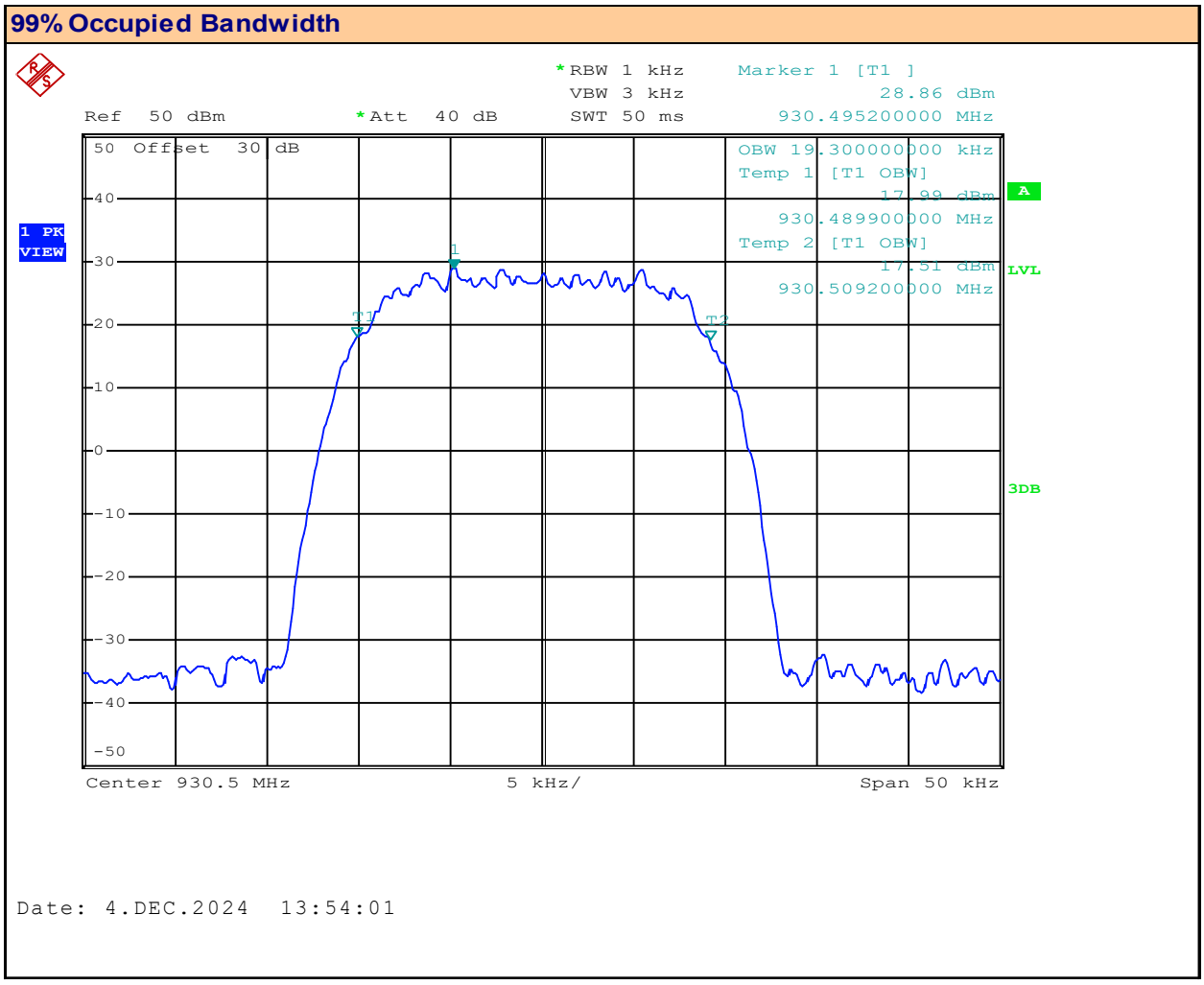
Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**12.5**	**kHz**
Designator:	**D1D**		**Modulation:**	**256QAM**	
			Measured Occupied Bandwidth:	**9.42**	**kHz**

Plot 8.5 – Occupied Bandwidth – 930.5MHz, 25Hz BW, QPSK



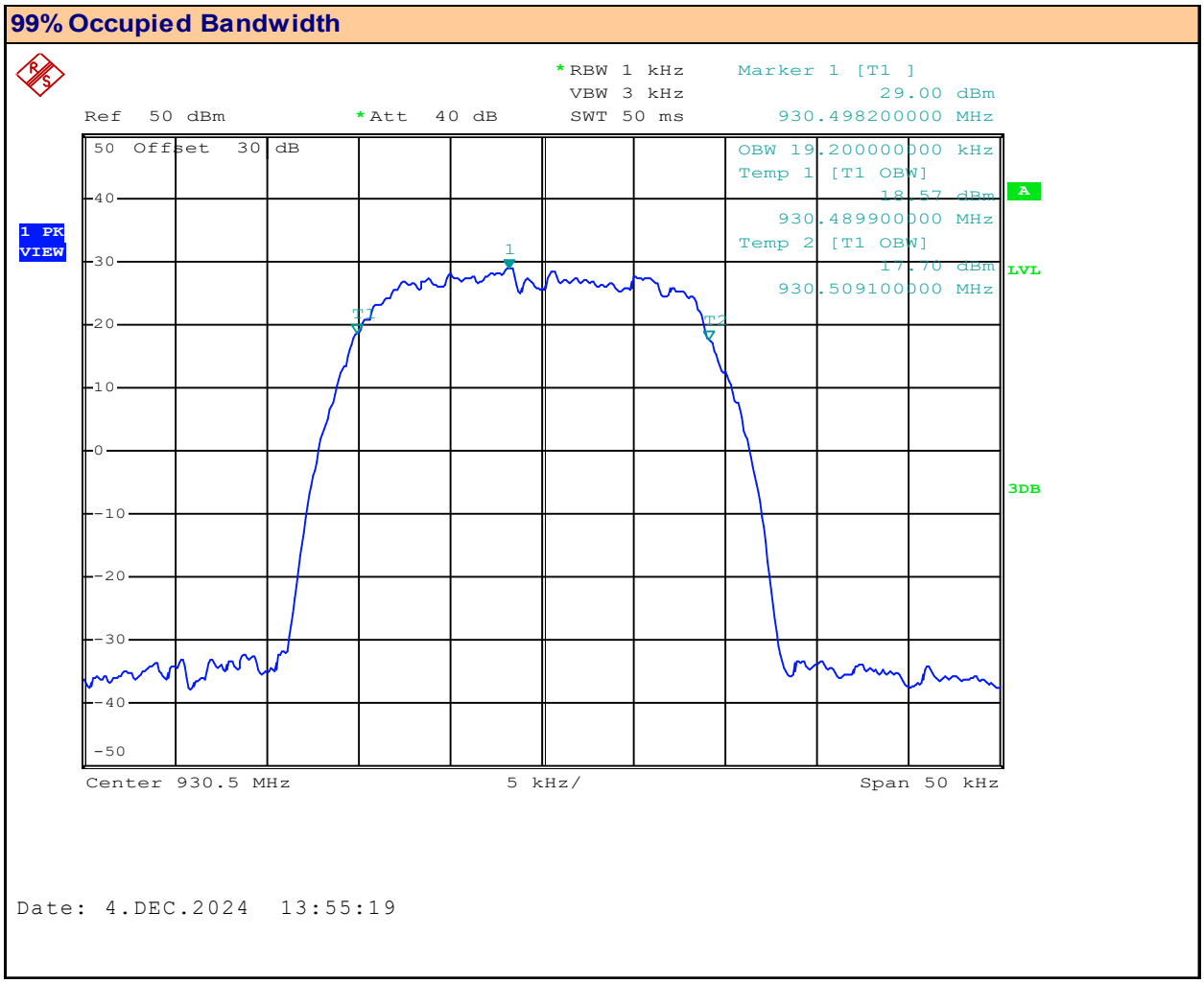
Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**25**	**kHz**
Designator:	**G1D**		**Modulation:**	**QPSK**	
			Measured Occupied Bandwidth:	**19.4**	**kHz**

Plot 8.6 – Occupied Bandwidth – 930.5MHz, 25Hz BW, 16QAM



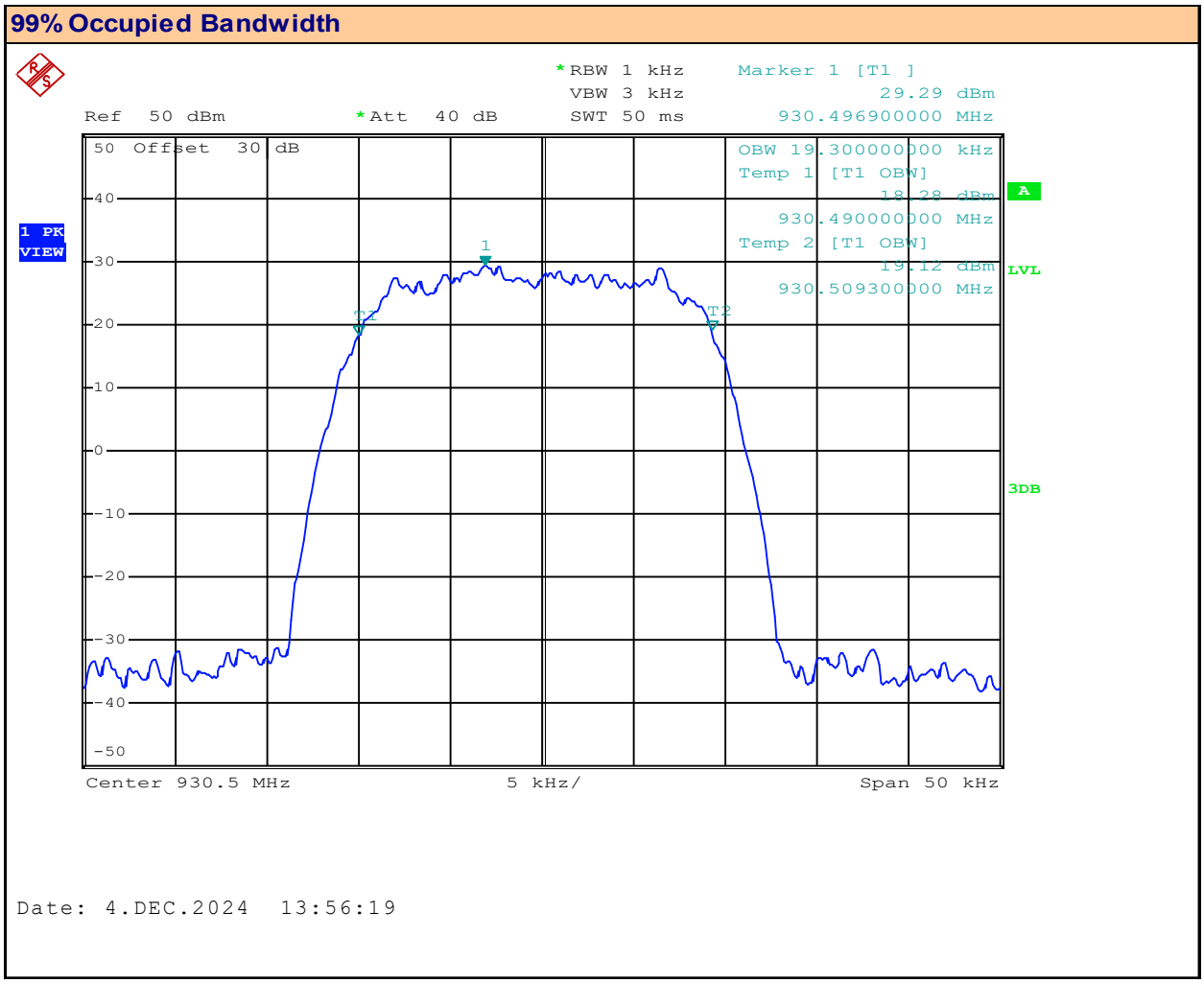
Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**25**	**kHz**
Designator:	**D1D**		**Modulation:**	**16QAM**	
			Measured Occupied Bandwidth:	**19.3**	**kHz**

Plot 8.7 – Occupied Bandwidth – 930.5MHz, 25Hz BW, 64QAM



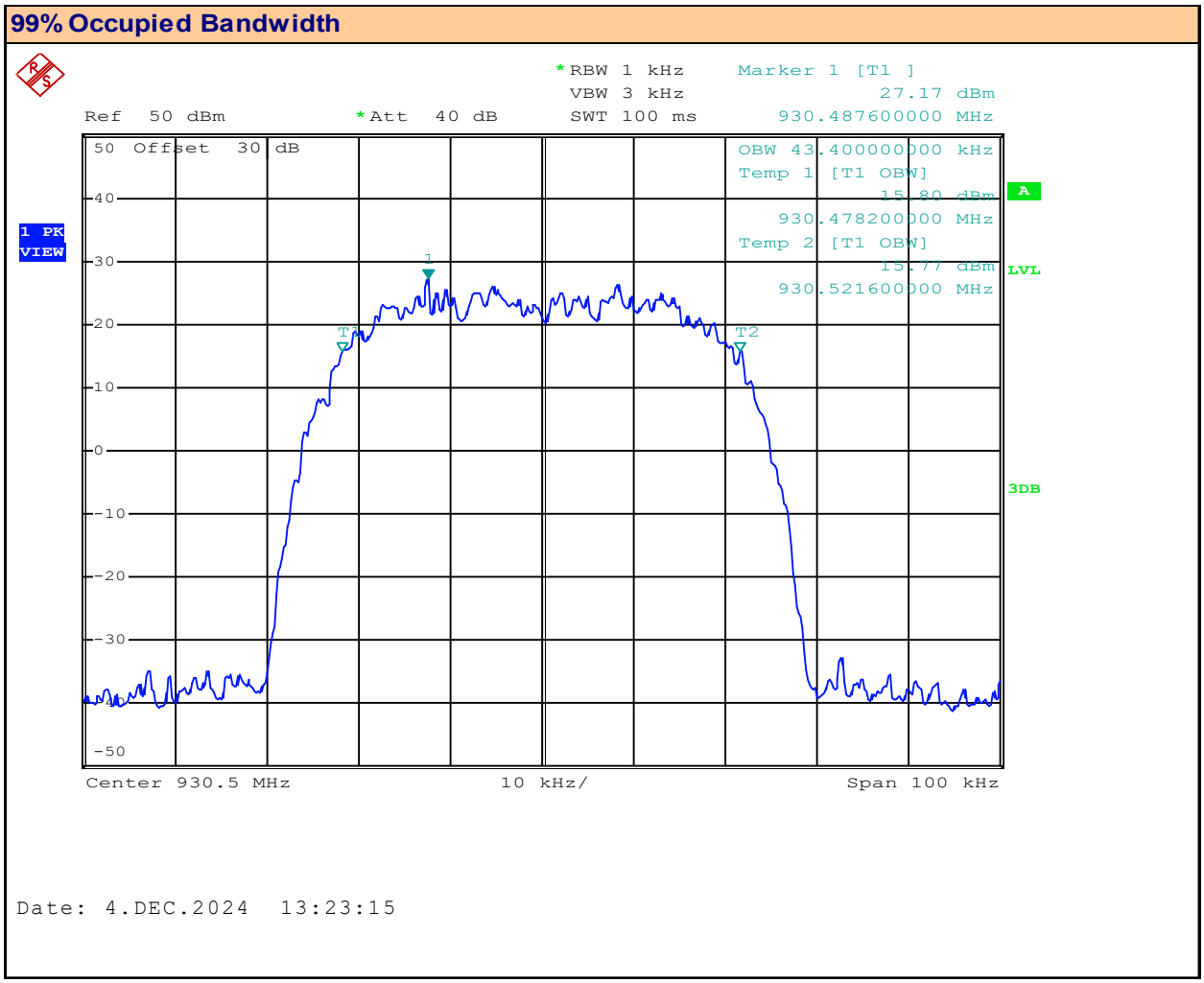
Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**25**	**kHz**
Designator:	**D1D**		**Modulation:**	**64QAM**	
			Measured Occupied Bandwidth:	**19.2**	**kHz**

Plot 8.8 – Occupied Bandwidth – 930.5MHz, 25Hz BW, 256QAM



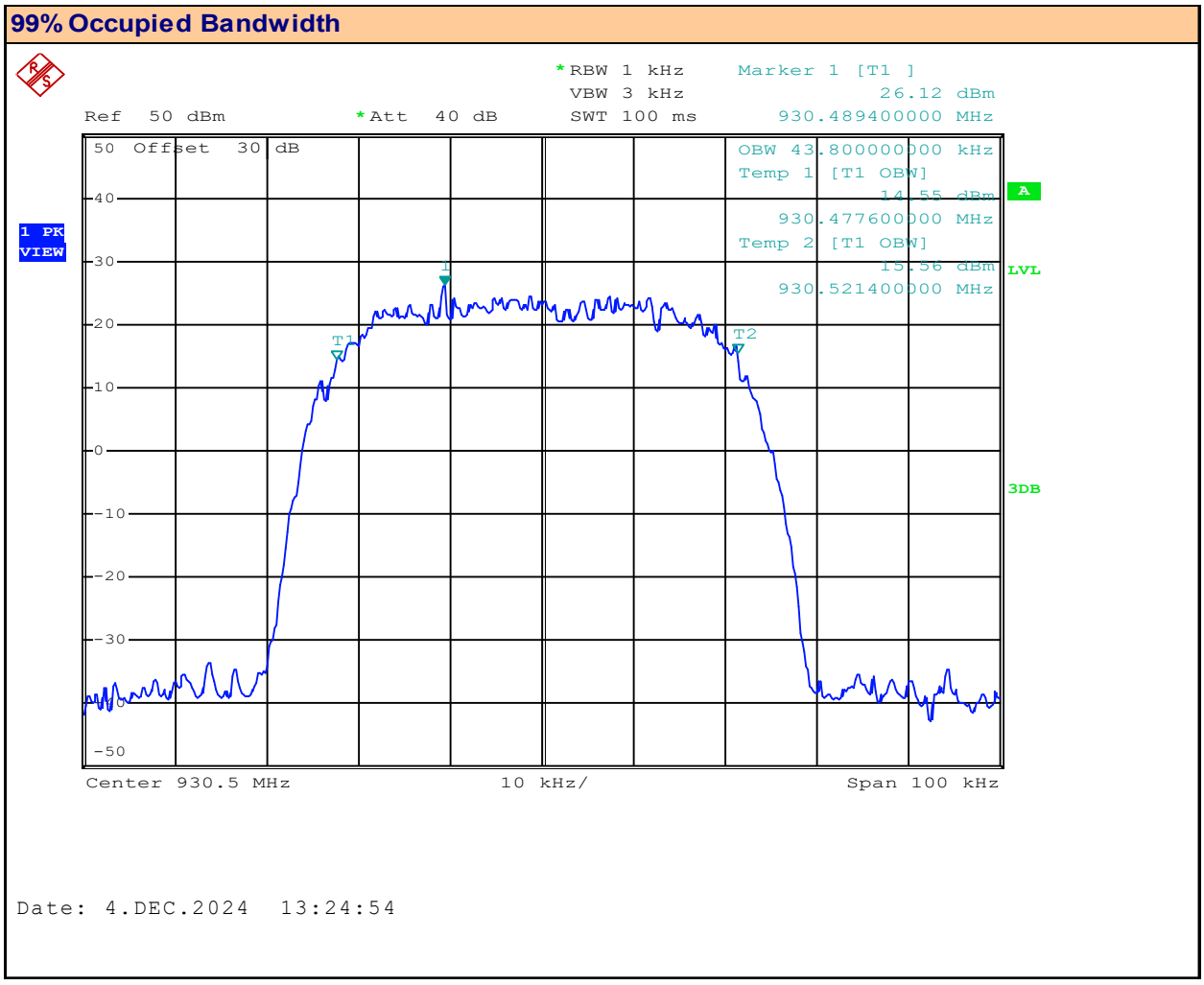
Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**25**	**kHz**
Designator:	**D1D**		**Modulation:**	**256QAM**	
			Measured Occupied Bandwidth:	**19.3**	**kHz**

Plot 8.9 – Occupied Bandwidth – 930.5MHz, 50Hz BW, QPSK



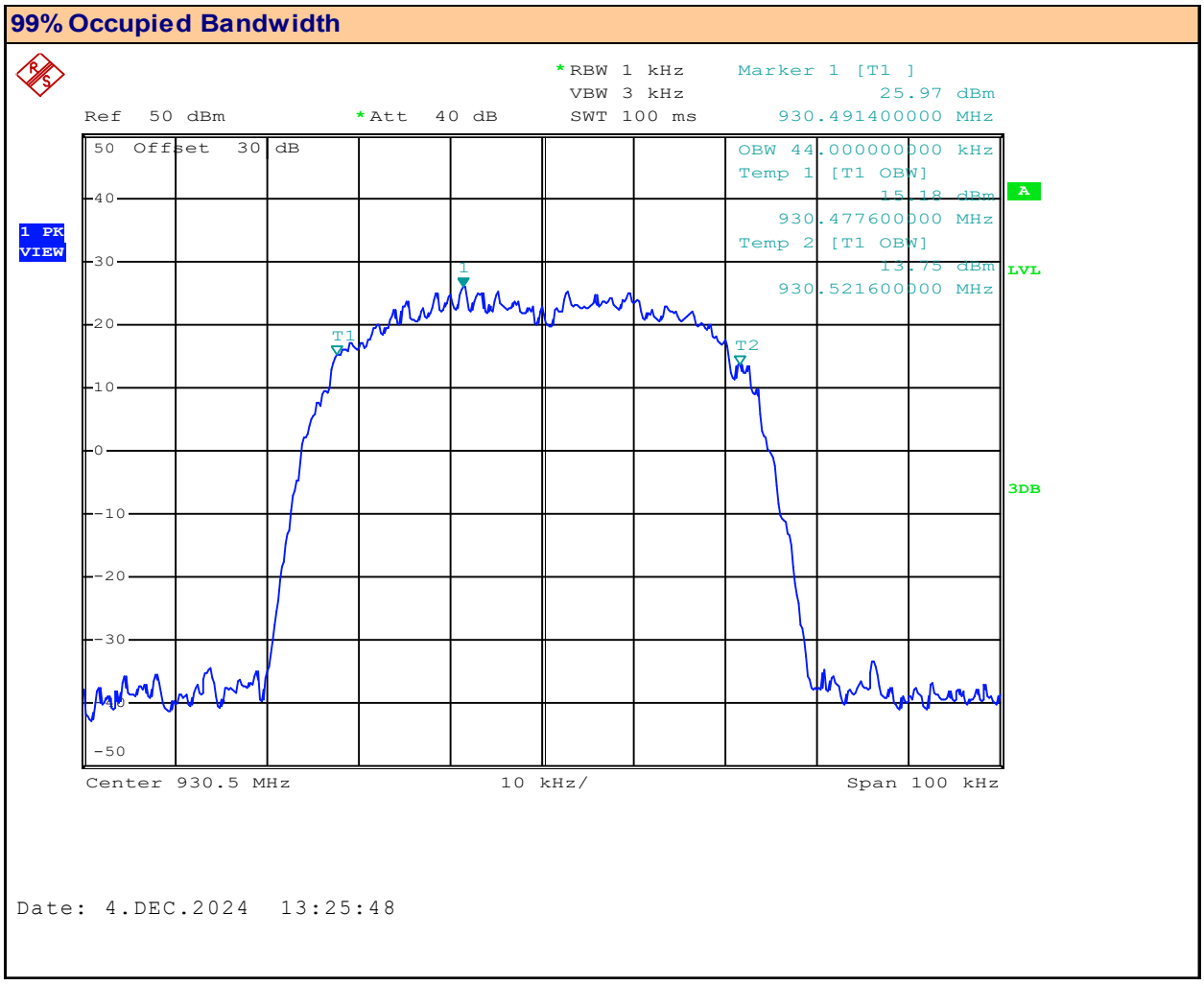
Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**50**	**kHz**
Designator:	**G1D**		**Modulation:**	**QPSK**	
			Measured Occupied Bandwidth:	**43.4**	**kHz**

Plot 8.10 – Occupied Bandwidth – 930.5MHz, 50Hz BW, 16QAM



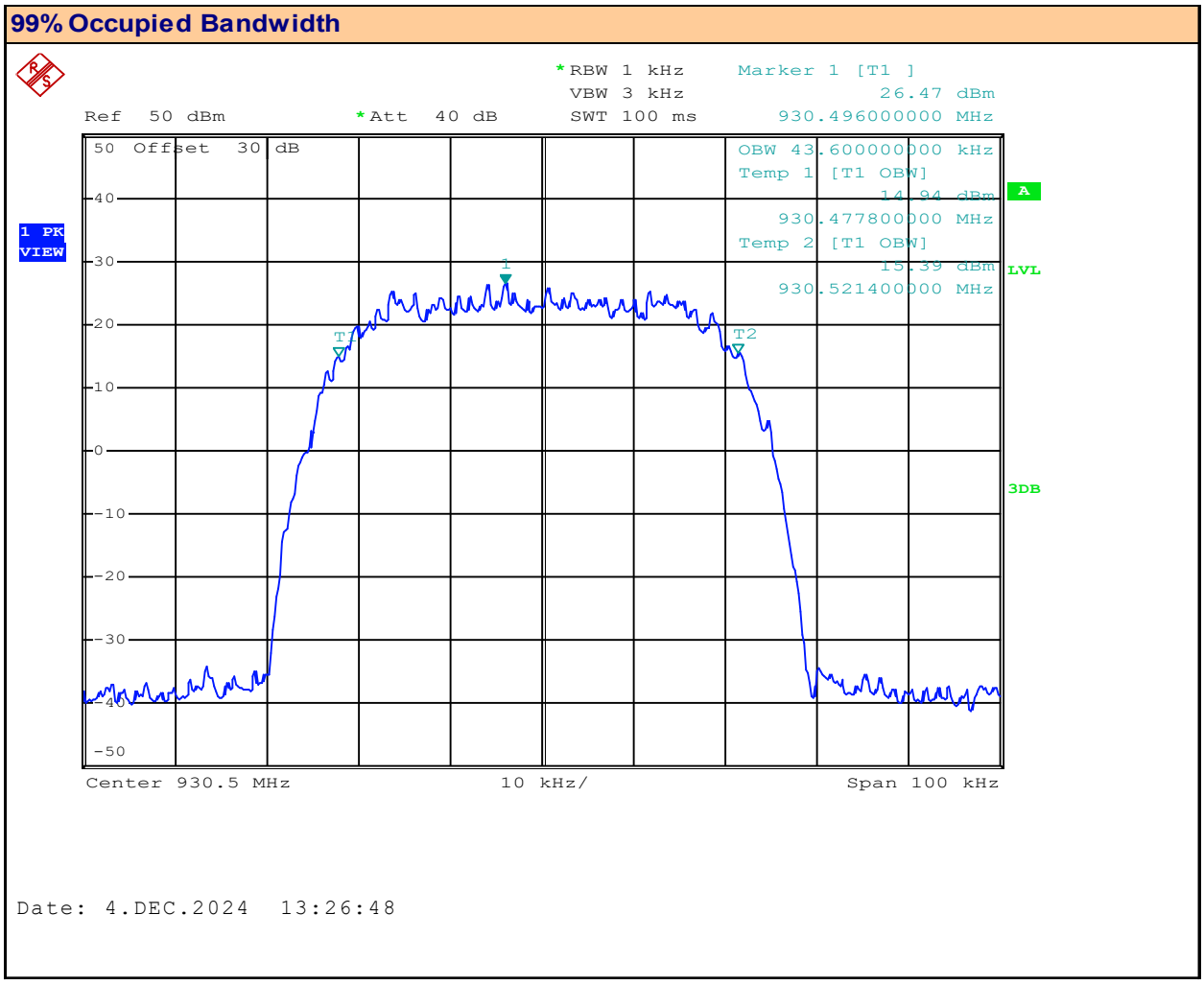
Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**50**	**kHz**
Designator:	**D1D**		**Modulation:**	**16QAM**	
			Measured Occupied Bandwidth:	**43.8**	**kHz**

Plot 8.11 – Occupied Bandwidth – 930.5MHz, 50Hz BW, 64QAM



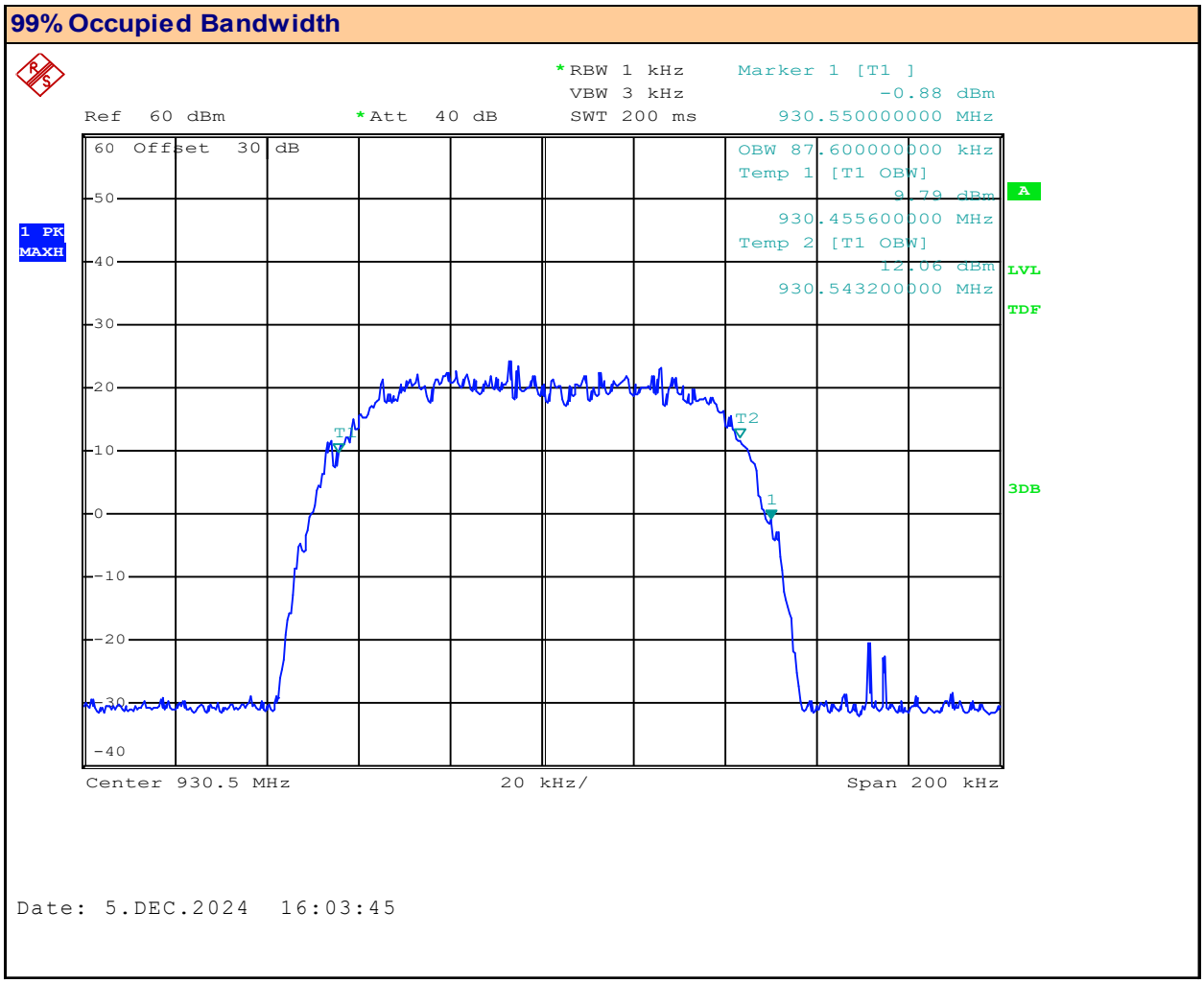
Channel Frequency:	930.5	MHz	**Channel Bandwidth:**	50	kHz
Designator:	D1D		**Modulation:**	64QAM	
			Measured Occupied Bandwidth:	44.0	kHz

Plot 8.12 – Occupied Bandwidth – 930.5MHz, 50Hz BW, 256QAM



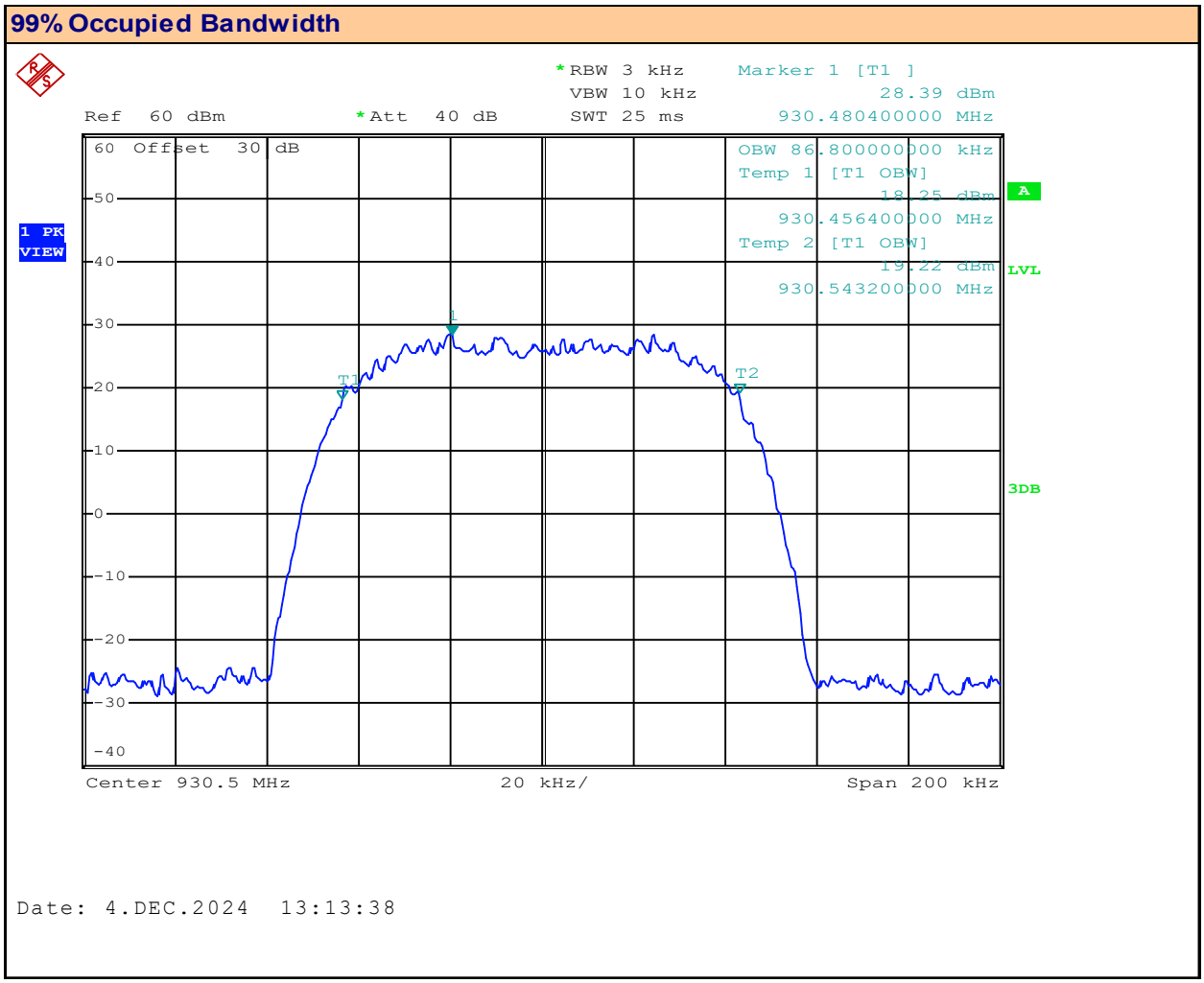
Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**50**	**kHz**
Designator:	**D1D**		**Modulation:**	**256QAM**	
			Measured Occupied Bandwidth:	**43.6**	**kHz**

Plot 8.13 – Occupied Bandwidth – 930.5MHz, 100Hz BW, QPSK



Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**100**	**kHz**
Designator:	**G1D**		**Modulation:**	**QPSK**	
			Measured Occupied Bandwidth:	**87.6**	**kHz**

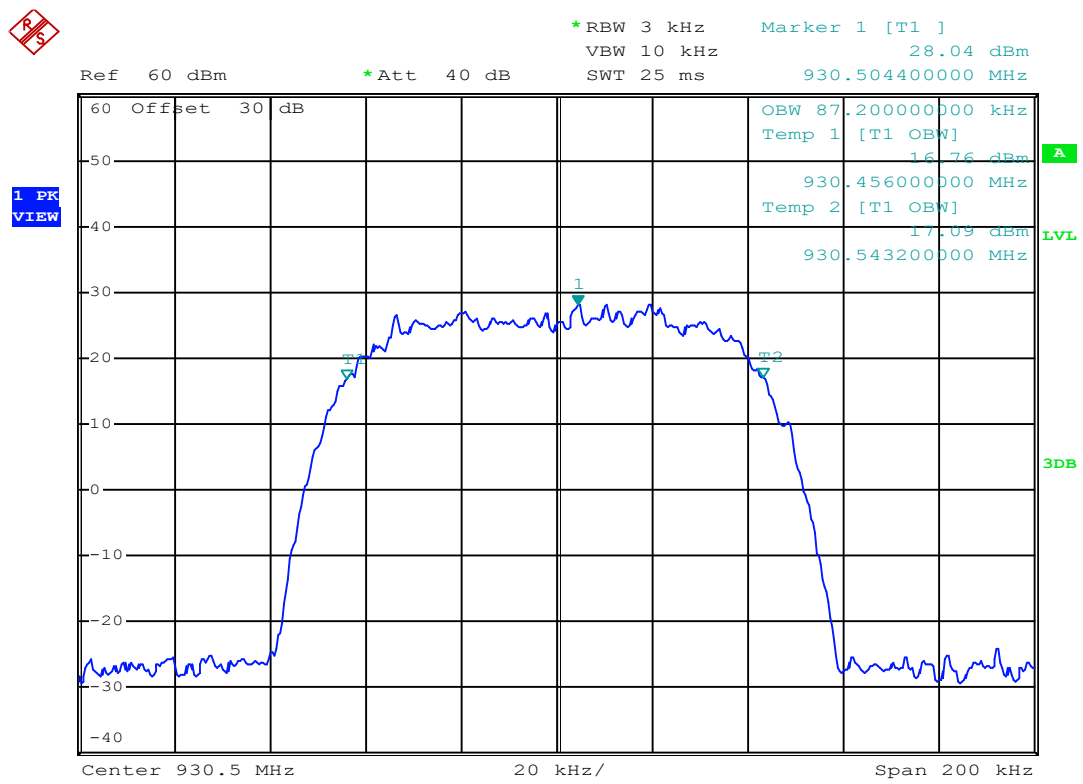
Plot 8.14 – Occupied Bandwidth – 930.5MHz, 100Hz BW, 16QAM



Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**100**	**kHz**
Designator:	**D1D**		**Modulation:**	**16QAM**	
			Measured Occupied Bandwidth:	**86.8**	**kHz**

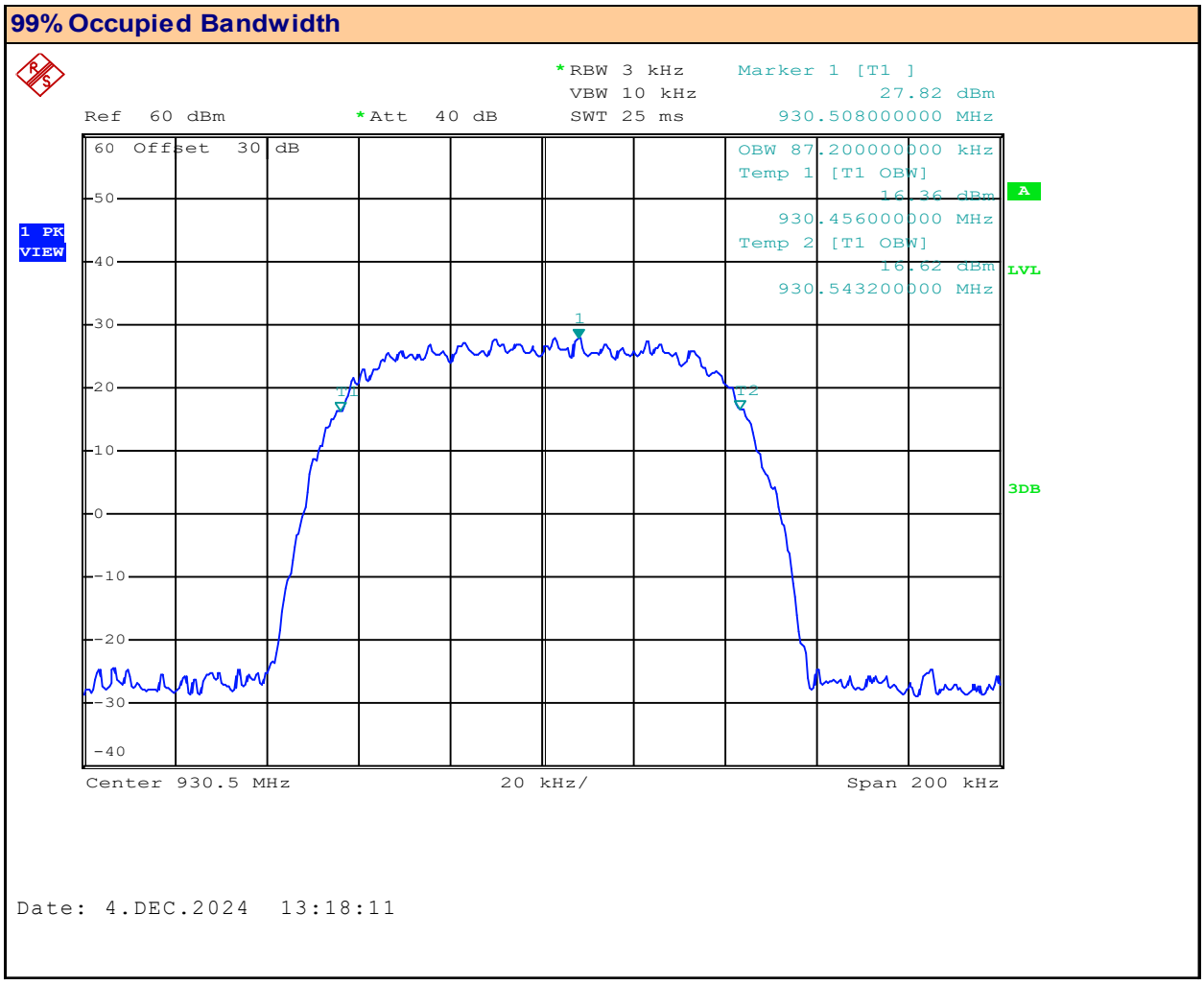
Plot 8.15 – Occupied Bandwidth – 930.5MHz, 100Hz BW, 64QAM

99% Occupied Bandwidth



Channel Frequency:	930.5	MHz	**Channel Bandwidth:**	100	kHz
Designator:	D1D		**Modulation:**	64QAM	
			Measured Occupied Bandwidth:	87.2	kHz

Plot 8.16 – Occupied Bandwidth – 930.5MHz, 100Hz BW, 256QAM



Channel Frequency:	**930.5**	**MHz**	**Channel Bandwidth:**	**100**	**kHz**
Designator:	**D1D**		**Modulation:**	**256QAM**	
			Measured Occupied Bandwidth:	**87.2**	**kHz**

Table 8.1 - Summary of Occupied Bandwidth Measurements

99% Occupied Bandwidth Results:				
Channel Frequency (MHz)	Channel Bandwidth (kHz)	Modulation	Measured Occupied Bandwidth (kHz)	Emission Designator
930.5	12.5	QPSK	9.42	9K42G1D
		16QAM	9.36	9K36D1D
		64QAM	9.42	9K42D1D
		256QAM	9.42	9K42D1D
	25.0	QPSK	19.4	19K4G1D
		16QAM	19.3	19K3D1D
		64QAM	19.2	19K2D1D
		256QAM	19.3	19K3D1D
	50.0	QPSK	43.4	43K4G1D
		16QAM	43.8	43K8D1D
		64QAM	44.0	44K0D1D
		256QAM	43.6	43K6D1D
	100.0	QPSK	87.6	87K6G1D
		16QAM	86.8	86K8D1D
		64QAM	87.2	87K2D1D
		256QAM	87.2	87K2D1D
			Result:	Complies

9.0 CONDUCTED SPURIOUS EMISSIONS – EMISSIONS MASK

Test Procedure	
Normative References	FCC 47 CFR §24.133(a)(1)
	ANSI C63.26

Requirement / Limits	
47 CFR §24.133	**§24.133 Authorized Bandwidth**
	(a) The power of any emission shall be attenuated below the transmitter power (P), as measured in accordance with § 24.132(f), in accordance with the following schedule:
	(1) For transmitters authorized a bandwidth greater than 10 kHz:
	(i) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of up to and including 40 kHz: at least 116 Log10 ((fd + 10)/6.1) decibels or 50 plus 10 Log10 (P) decibels or 70 decibels, whichever is the lesser attenuation;
	(ii) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 40 kHz: at least 43 + 10 Log10 (P) decibels or 80 decibels, whichever is the lesser attenuation.

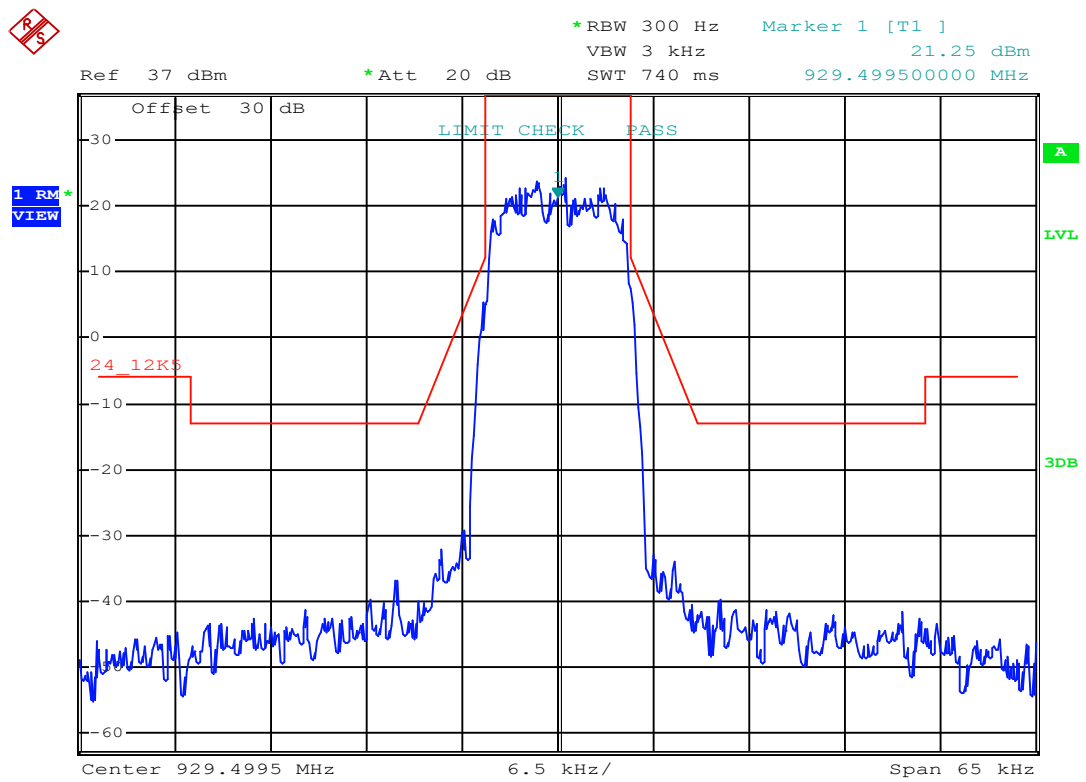
Test Setup	Appendix A - Figure A.1

Measurement Procedure

The DUT was connected to a Spectrum Analyzer via a 30dB attenuator. The DUT was configured to transmit modulated at its highest output power. The emissions mask was created in the SA and the SA Reference Level was set to the DUT's maximum rated power. The SA's Limit Check (Pass/Fail) was enabled and the results recorded for each applicable bandwidth and modulation.

Plot 9.1 – Emissions Mask – 929.5, 12.5kHz BW, QPSK

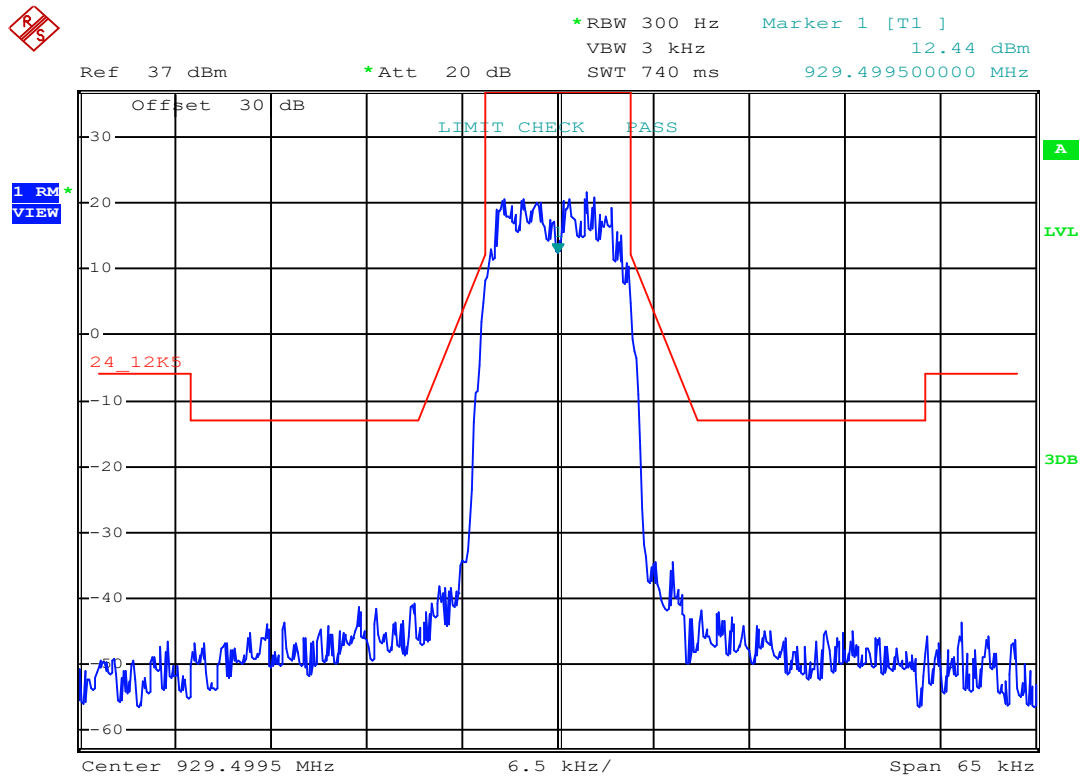
Emissions Mask



Channel Frequency:	**929.5**	**MHz**	**Channel Bandwidth:**	**12.5**	**kHz**
			Modulation:	**QPSK**	
			Mask Results:	**PASS**	

Plot 9.2 – Emissions Mask – 929.5, 12.5kHz BW, 16QAM

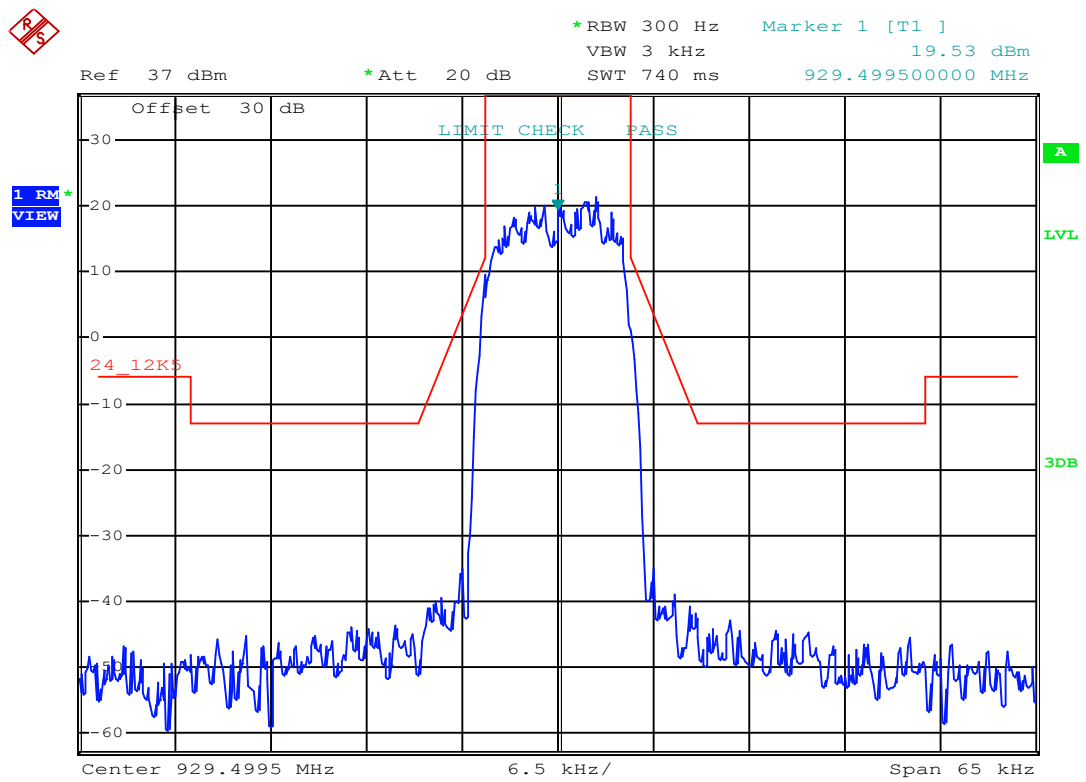
Emissions Mask



Channel Frequency:	**929.5**	**MHz**	**Channel Bandwidth:**	**12.5**	**kHz**
			Modulation:	**16QAM**	
			Mask Results:	**PASS**	

Plot 9.3 – Emissions Mask – 929.5, 12.5kHz BW, 64QAM

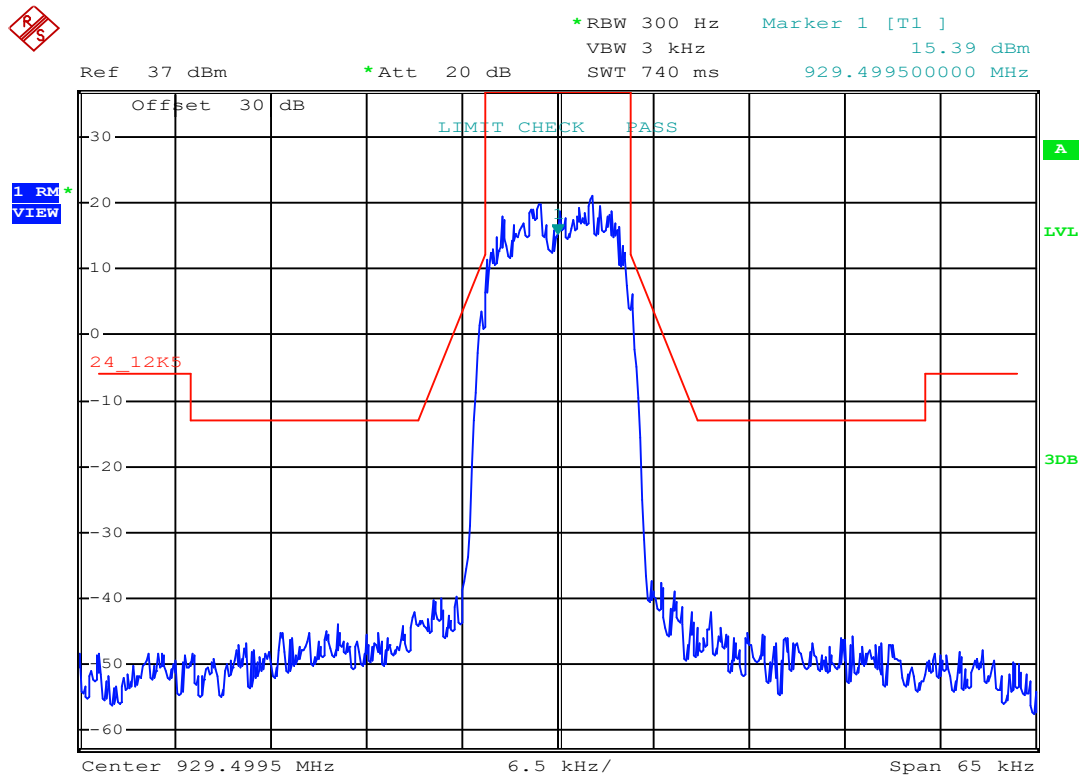
Emissions Mask



Channel Frequency:	**929.5**	**MHz**	**Channel Bandwidth:**	**12.5**	**kHz**
			Modulation:	**64QAM**	
			Mask Results:	**PASS**	

Plot 9.4 – Emissions Mask – 929.5, 12.5kHz BW, 256QAM

Emissions Mask

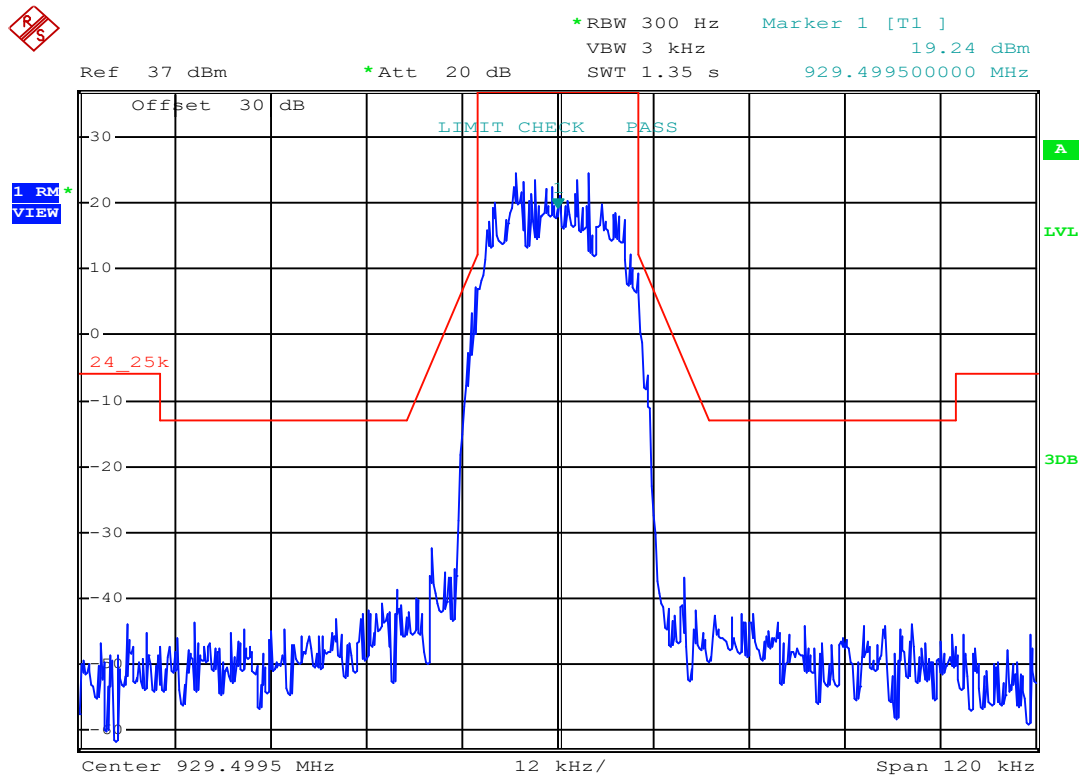


Date: 6.FEB.2025 10:31:49

Channel Frequency:	**929.5** MHz	**Channel Bandwidth:**	**12.5** kHz
		Modulation:	**256QAM**
		Mask Results:	**PASS**

Plot 9.5 – Emissions Mask – 929.5, 25kHz BW, QPSK

Emissions Mask

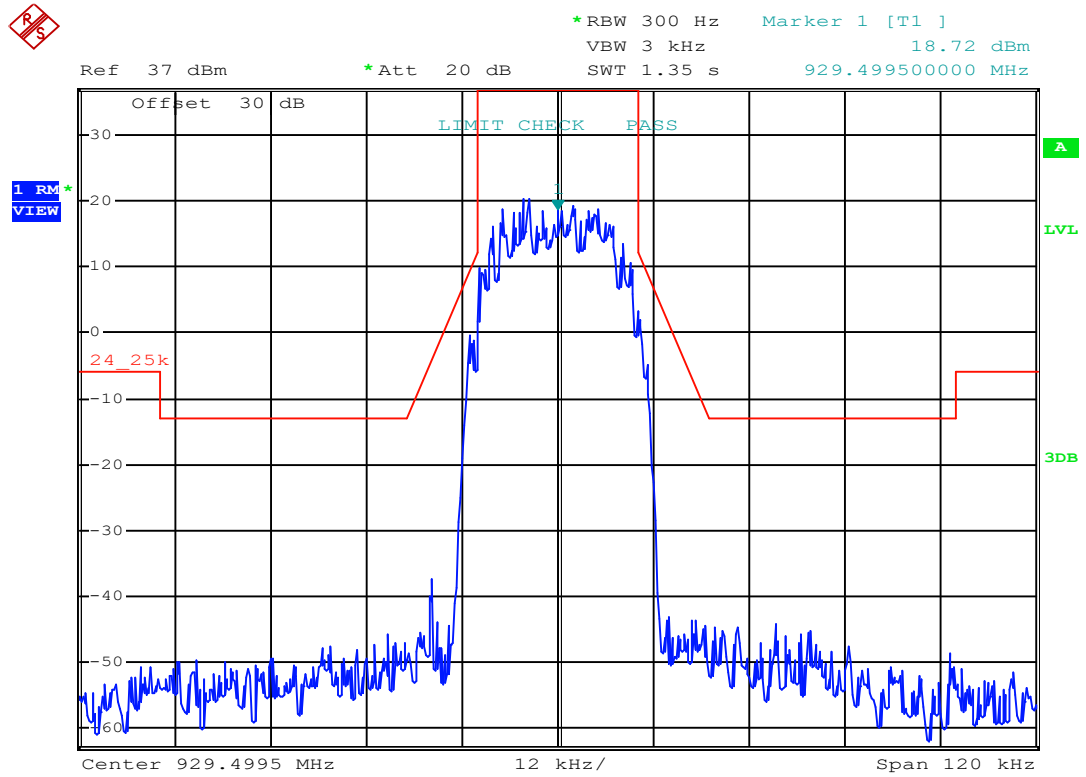


Date: 6.FEB.2025 10:35:53

Channel Frequency:	**929.5** MHz	**Channel Bandwidth:**	**25** kHz
		Modulation:	**QPSK**
		Mask Results:	**PASS**

Plot 9.6 – Emissions Mask – 929.5, 25kHz BW, 16QAM

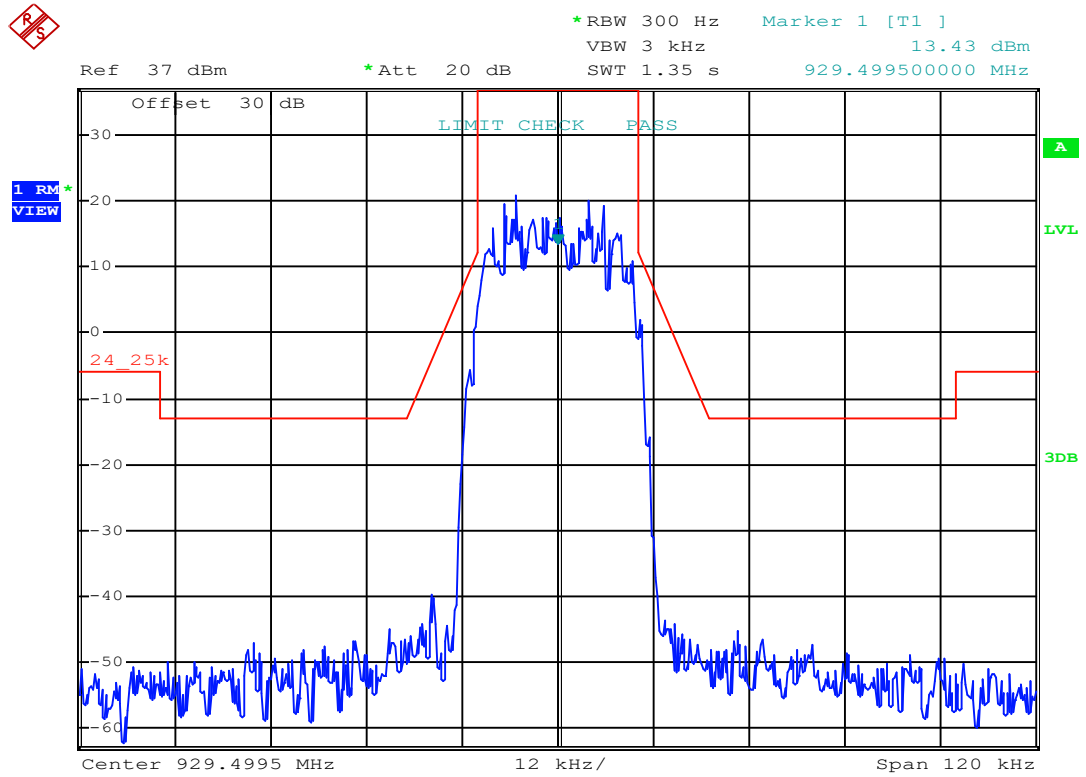
Emissions Mask



Channel Frequency:	929.5 MHz	**Channel Bandwidth:**	25 kHz
		Modulation:	16QAM
		Mask Results:	PASS

Plot 9.7 – Emissions Mask – 929.5, 25kHz BW, 64QAM

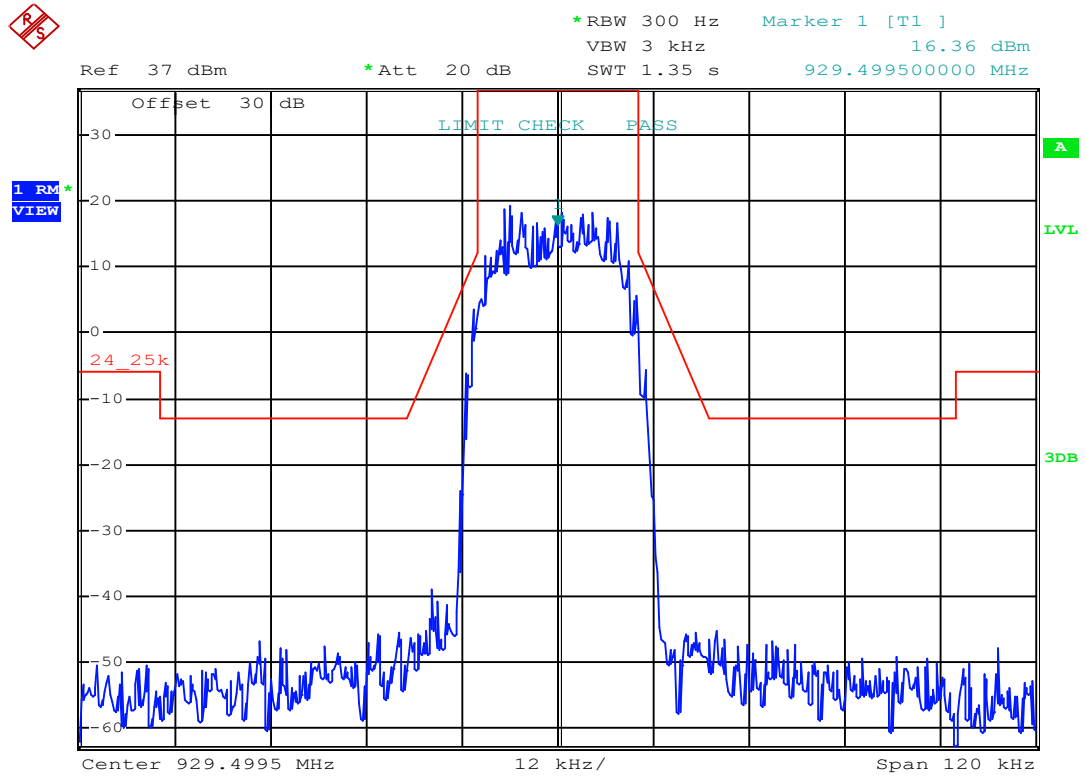
Emissions Mask



Channel Frequency:	**929.5** MHz	**Channel Bandwidth:**	**25** kHz
		Modulation:	**64QAM**
		Mask Results:	**PASS**

Plot 9.8 – Emissions Mask – 929.5, 25kHz BW, 256QAM

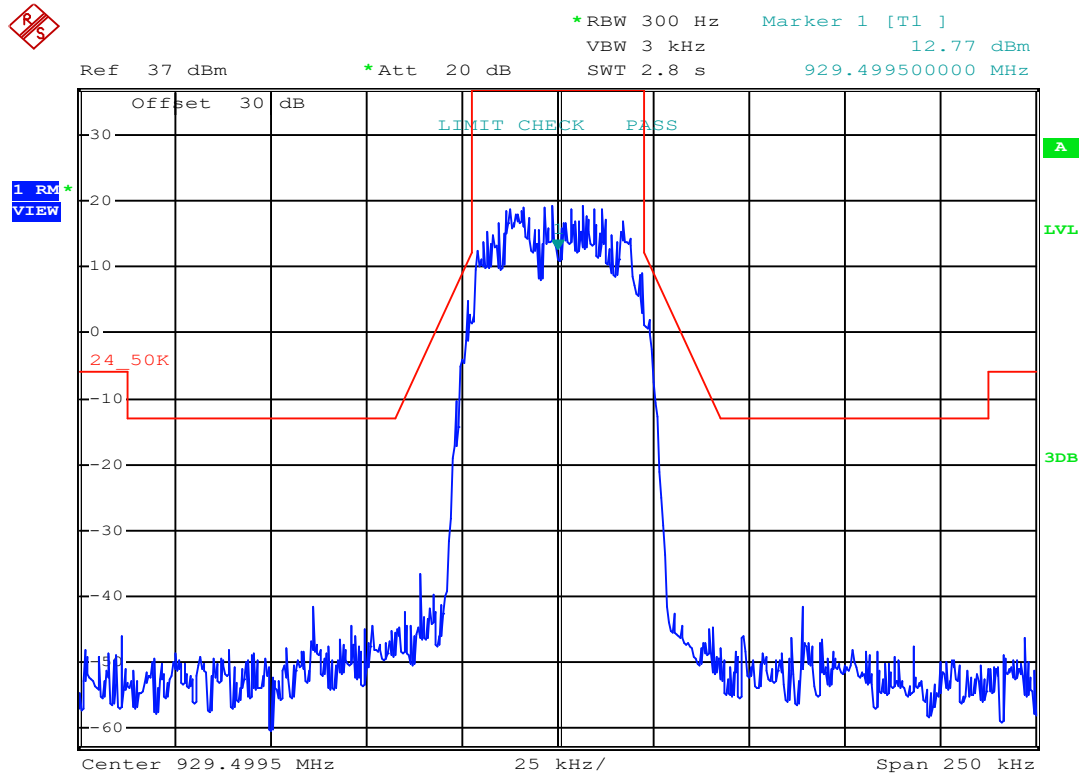
Emissions Mask



Channel Frequency:	**929.5** MHz	**Channel Bandwidth:**	**25** kHz
		Modulation:	**256QAM**
		Mask Results:	**PASS**

Plot 9.9 – Emissions Mask – 929.5, 50kHz BW, QPSK

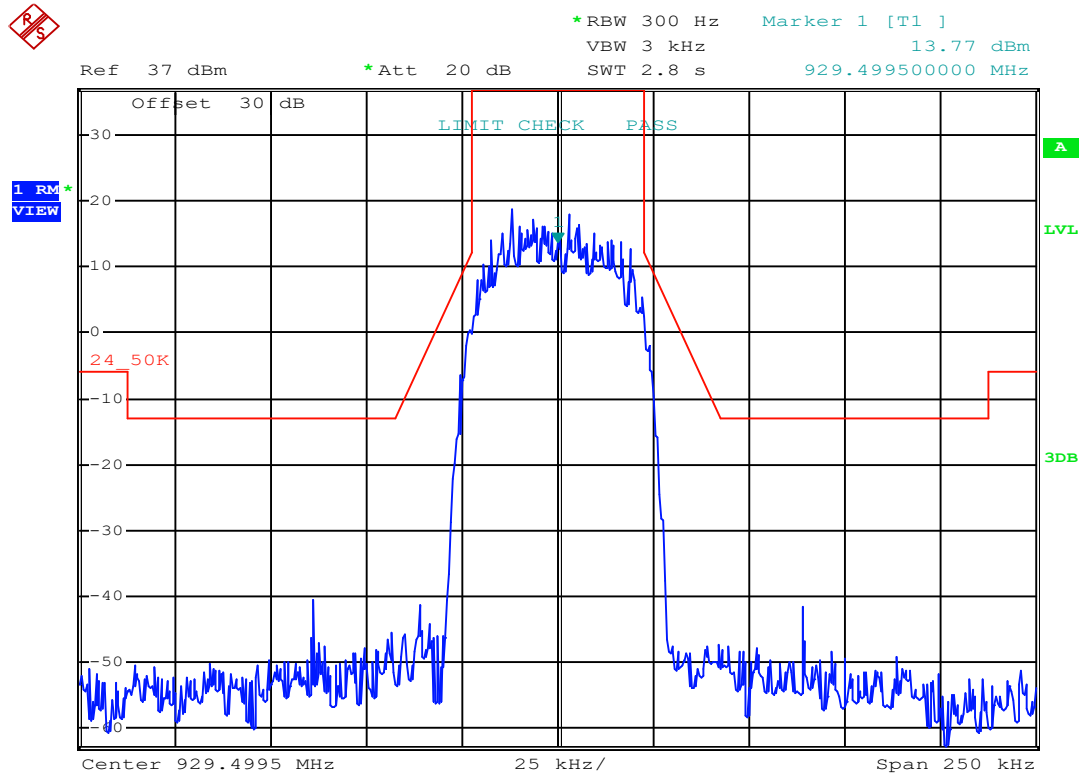
Emissions Mask



Channel Frequency:	**929.5** MHz	**Channel Bandwidth:**	**50** kHz
		Modulation:	**QPSK**
		Mask Results:	**PASS**

Plot 9.10 – Emissions Mask – 929.5, 50kHz BW, 16QAM

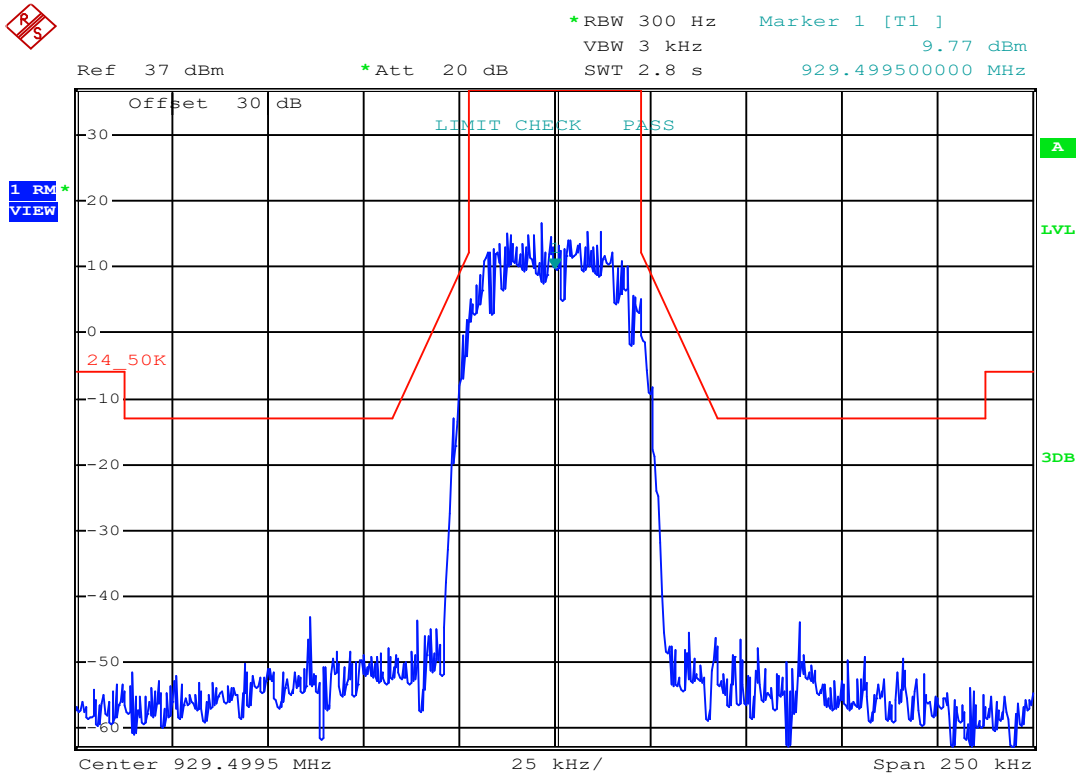
Emissions Mask



Channel Frequency:	**929.5**	**MHz**	**Channel Bandwidth:**	**50**	**kHz**
			Modulation:	**16QAM**	
			Mask Results:	**PASS**	

Plot 9.11 – Emissions Mask – 929.5, 50kHz BW, 64QAM

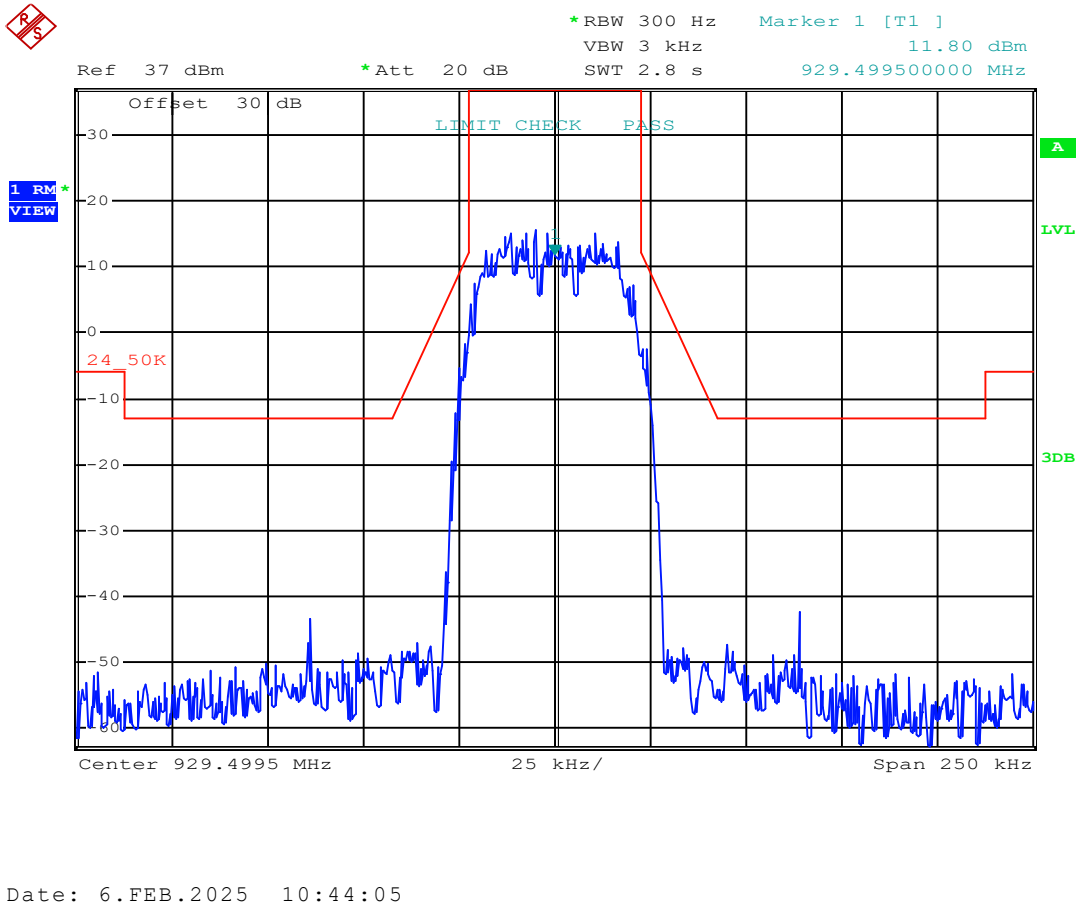
Emissions Mask



Channel Frequency:	**929.5** MHz	**Channel Bandwidth:**	**50** kHz
		Modulation:	**64QAM**
		Mask Results:	**PASS**

Plot 9.12 – Emissions Mask – 929.5, 50kHz BW, 256QAM

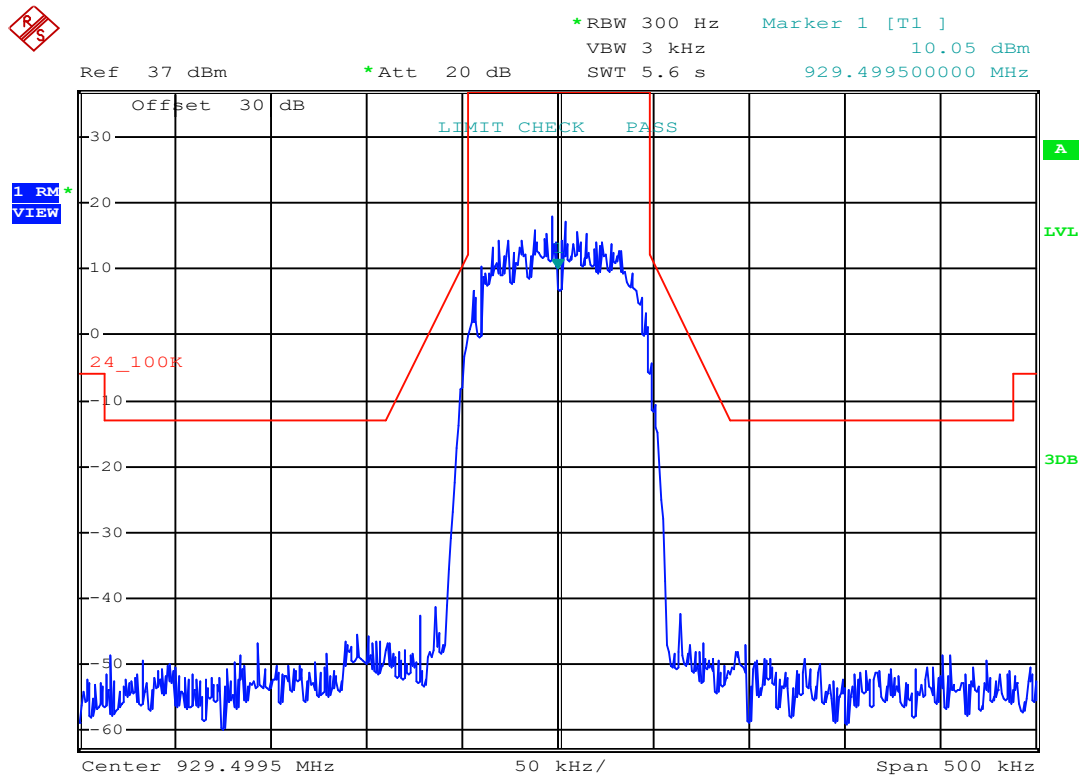
Emissions Mask



Channel Frequency:	**929.5**	**MHz**	**Channel Bandwidth:**	**50**	**kHz**
			Modulation:	**256QAM**	
			Mask Results:	**PASS**	

Plot 9.13 – Emissions Mask – 929.5, 100kHz BW, QPSK

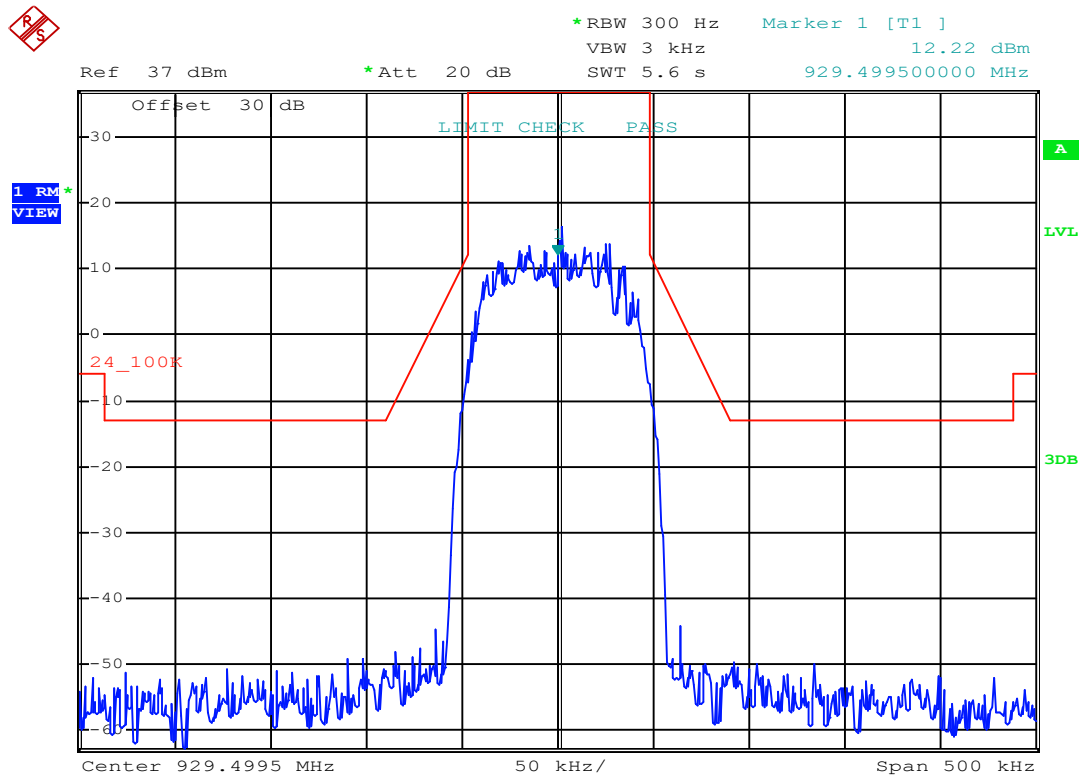
Emissions Mask



Channel Frequency:	**929.5** MHz	**Channel Bandwidth:**	**100** kHz
		Modulation:	**QPSK**
		Mask Results:	**PASS**

Plot 9.14 – Emissions Mask – 929.5, 100kHz BW, 16QAM

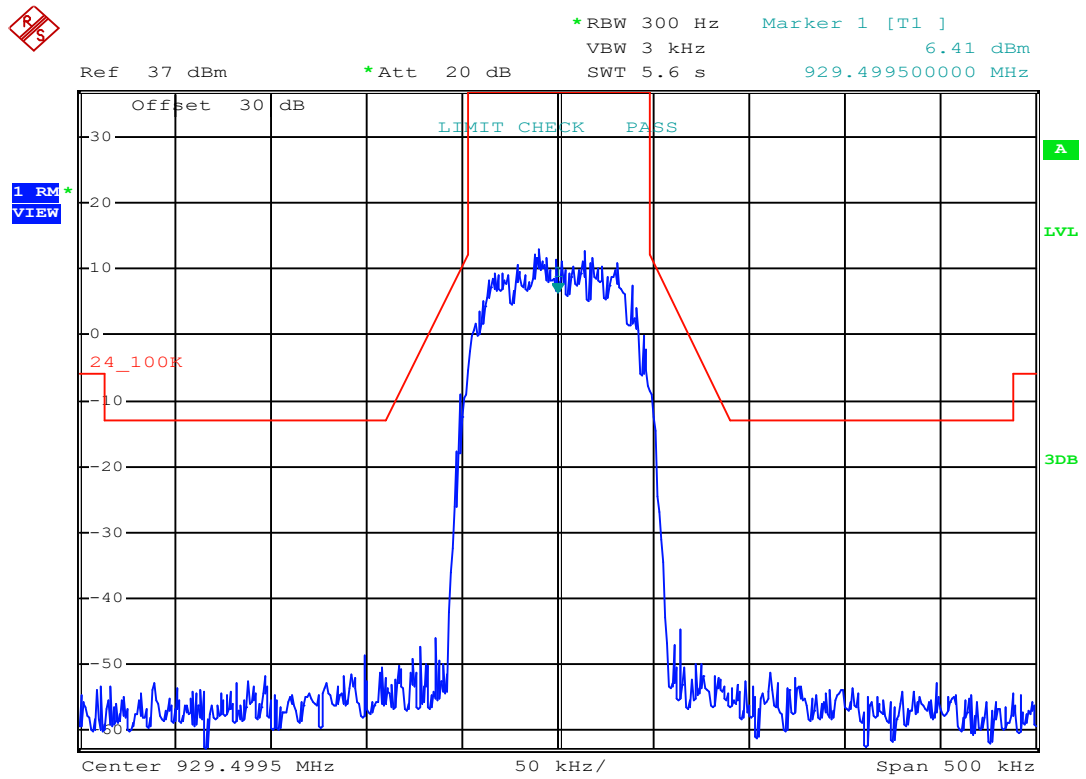
Emissions Mask



Channel Frequency:	**929.5**	**MHz**	**Channel Bandwidth:**	**100**	**kHz**
			Modulation:	**16QAM**	
			Mask Results:	**PASS**	

Plot 9.15 – Emissions Mask – 929.5, 100kHz BW, 64QAM

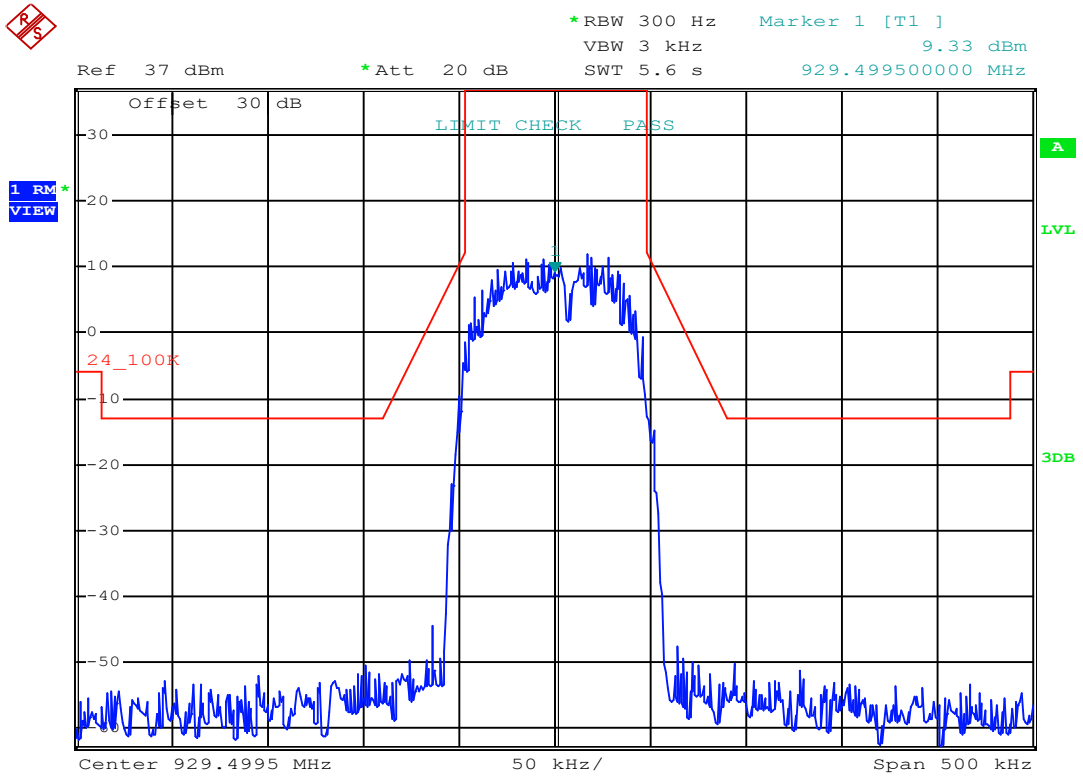
Emissions Mask



Channel Frequency:	**929.5** MHz	**Channel Bandwidth:**	**100** kHz
		Modulation:	**64QAM**
		Mask Results:	**PASS**

Plot 9.16 – Emissions Mask – 929.5, 100kHz BW, 256QAM

Emissions Mask



Channel Frequency:	**929.5**	**MHz**	**Channel Bandwidth:**	**100**	**kHz**
			Modulation:	**256QAM**	
			Mask Results:	**PASS**	

Table 9.1 - Summary of Emissions Mask Measurements

Emissions Mask Results			
Channel Frequency (MHz)	Channel Bandwidth (kHz)	Modulation	MASK Results
929.5	12.5	QPSK	PASS
		16QAM	
		64QAM	
		256QAM	
	25.0	QPSK	
		16QAM	
		64QAM	
		256QAM	
	50.0	QPSK	
		16QAM	
		64QAM	
		256QAM	
	100.0	QPSK	
		16QAM	
		64QAM	
		256QAM	
		Result:	Complies

10.0 CONDUCTED SPURIOUS EMISSIONS TO 10TH HARMONIC

Test Procedure	
Normative References	FCC 47 CFR §24.133(a)(1)
	ANSI C63.26

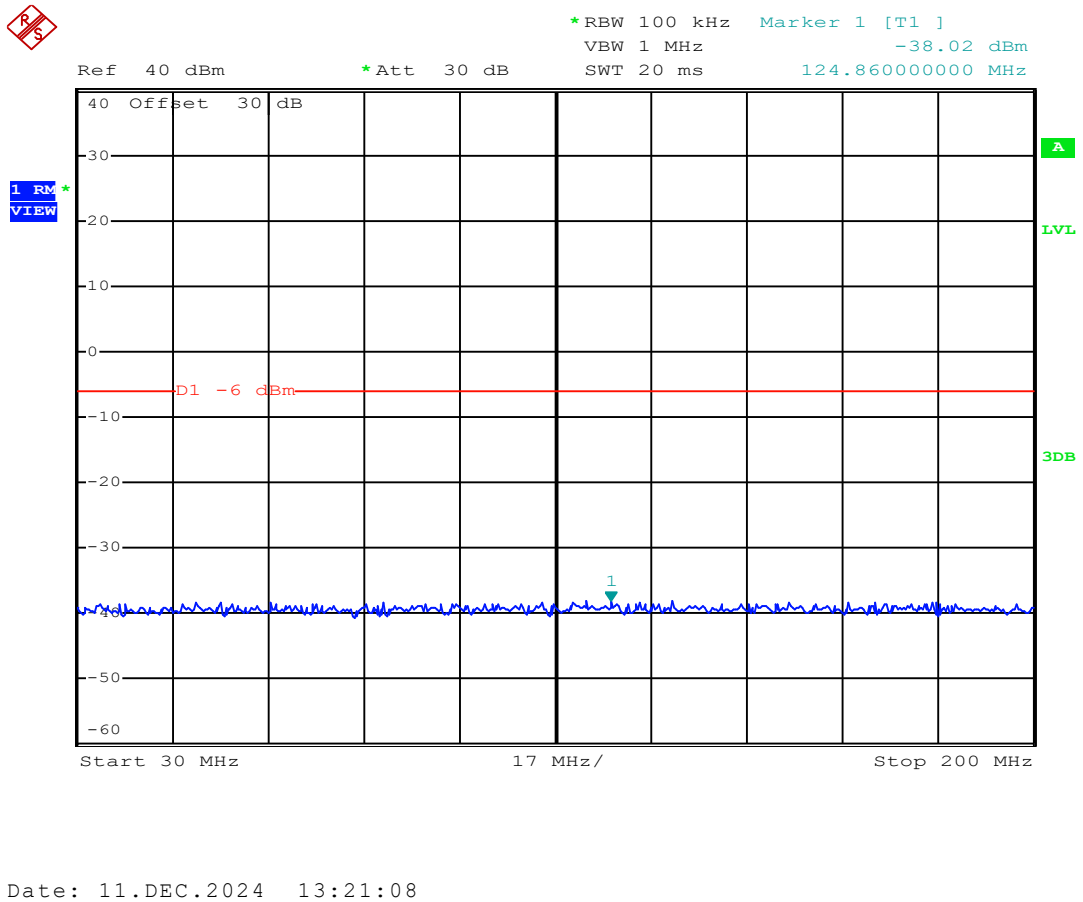
Requirement / Limits	
47 CFR §24.133	**§24.133 Authorized Bandwidth**
	(a) The power of any emission shall be attenuated below the transmitter power (P), as measured in accordance with § 24.132(f), in accordance with the following schedule:
	(1) For transmitters authorized a bandwidth greater than 10 kHz:
	(i) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of up to and including 40 kHz: at least 116 Log10 ((fd + 10)/6.1) decibels or 50 plus 10 Log10 (P) decibels or 70 decibels, whichever is the lesser attenuation;
	(ii) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 40 kHz: at least 43 + 10 Log10 (P) decibels or 80 decibels, whichever is the lesser attenuation.

Test Setup	Appendix A - Figure A.1

Measurement Procedure
The DUT was connected to a Spectrum Analyzer via a 30dB attenuator. The DUT was configured to transmit modulated at its highest output power. The emissions mask was created in the SA and the SA Reference Level was set to the DUT's maximum rated power. The SA's Limit Check (Pass/Fail) was enabled and the results recorded for each applicable bandwidth and modulation.

Plot 10.1 – Conducted Spurious Emissions 925.5MHz Channel, 30 – 200MHz

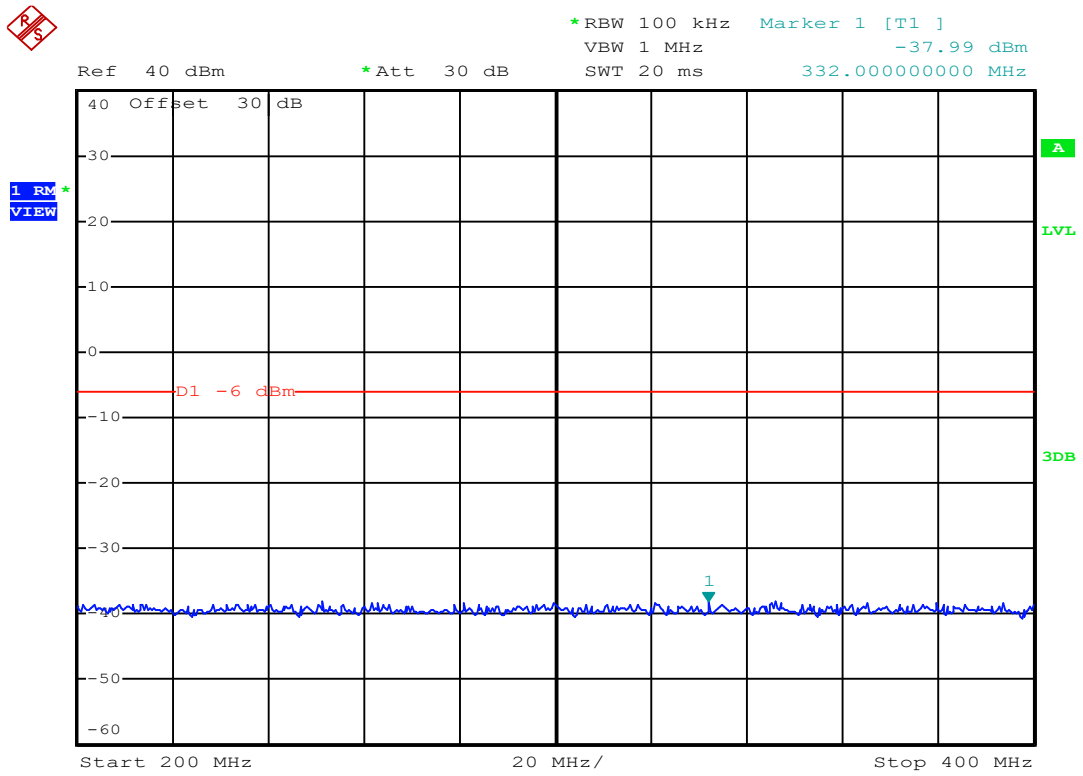
Conducted Spurious Emissions:



Channel Frequency:	**925.5** MHz		
Modulation:	**CW**		
Emission Frequency:	**ND** MHz	**Measured Emission:**	**ND** dBm

Plot 10.2 – Conducted Spurious Emissions 925.5MHz Channel, 200 – 400MHz

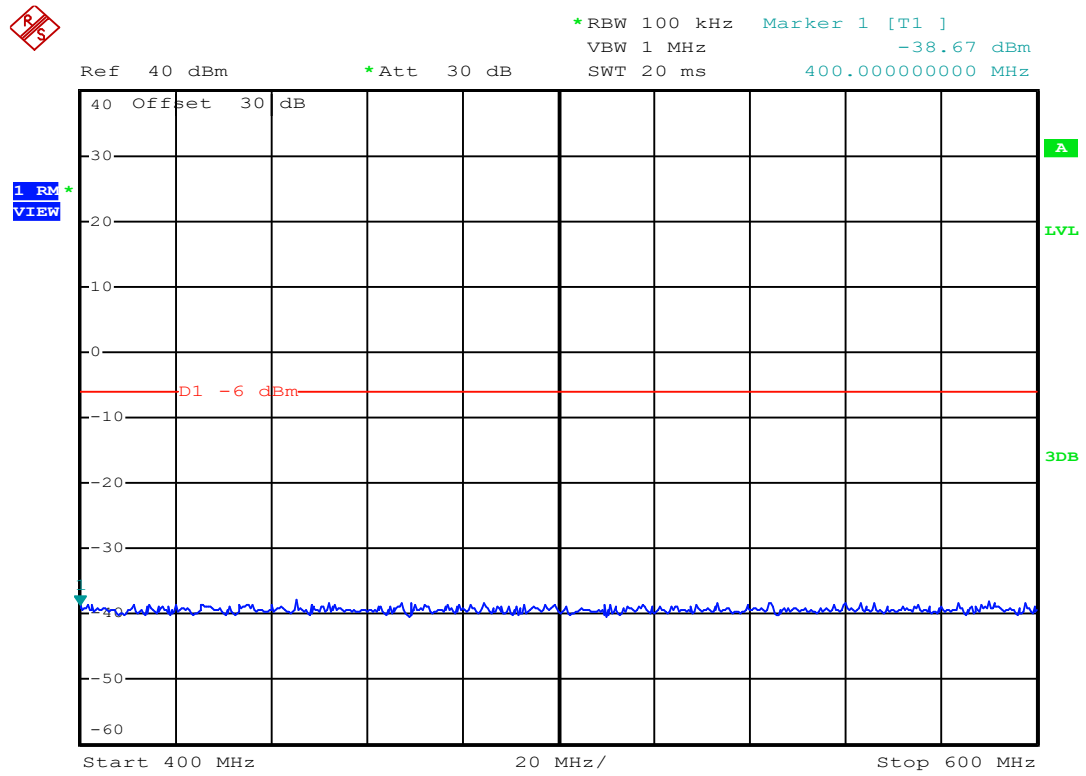
Conducted Spurious Emissions:



Channel Frequency:	925.5 MHz		
Modulation:	CW		
Emission Frequency:	ND MHz	Measured Emission:	ND dBm

Plot 10.3 – Conducted Spurious Emissions 925.5MHz Channel, 400 – 600MHz

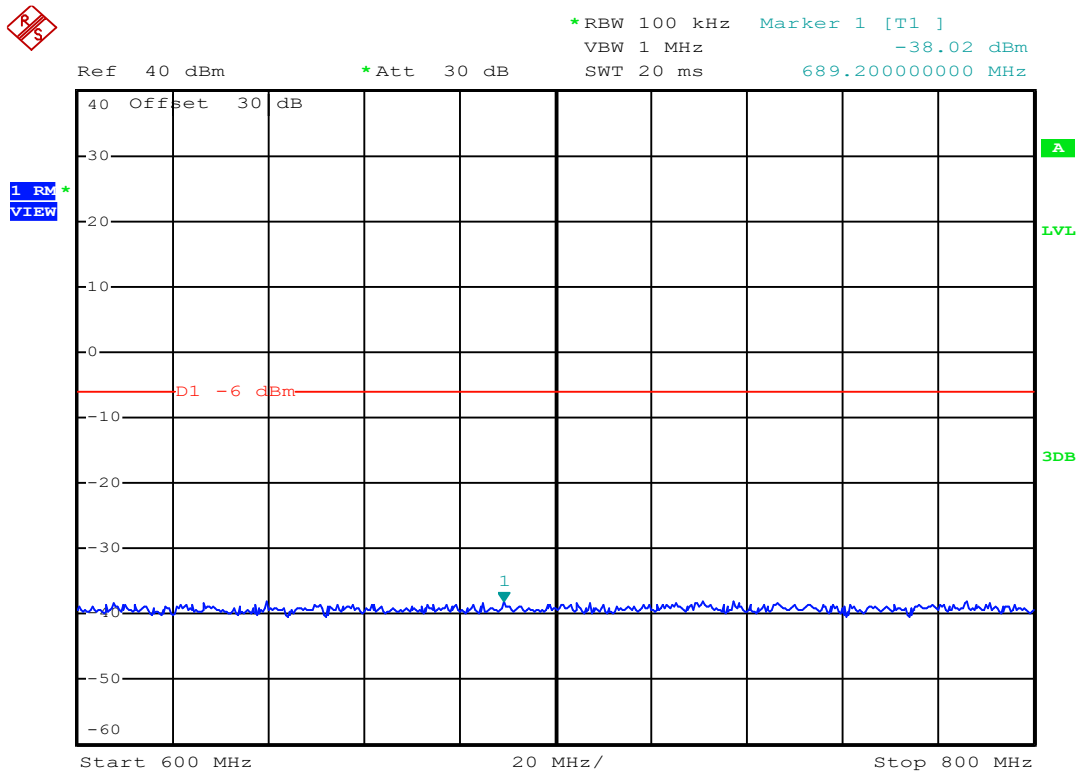
Conducted Spurious Emissions:



Channel Frequency:	925.5 MHz		
Modulation:	CW		
Emission Frequency:	ND MHz	Measured Emission:	ND dBm

Plot 10.4 – Conducted Spurious Emissions 925.5MHz Channel, 600 – 800MHz

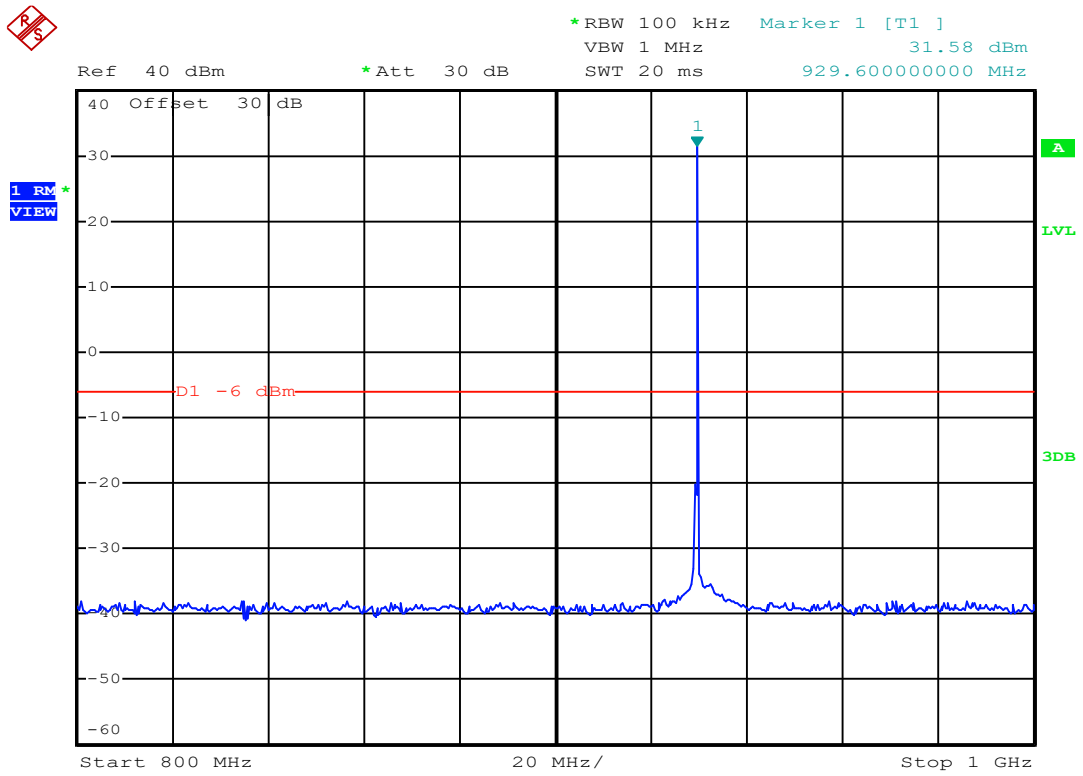
Conducted Spurious Emissions:



Channel Frequency:	925.5 MHz		
Modulation:	CW		
Emission Frequency:	ND MHz	Measured Emission:	ND dBm

Plot 10.5 – Conducted Spurious Emissions 925.5MHz Channel, 800 – 1000MHz

Conducted Spurious Emissions:

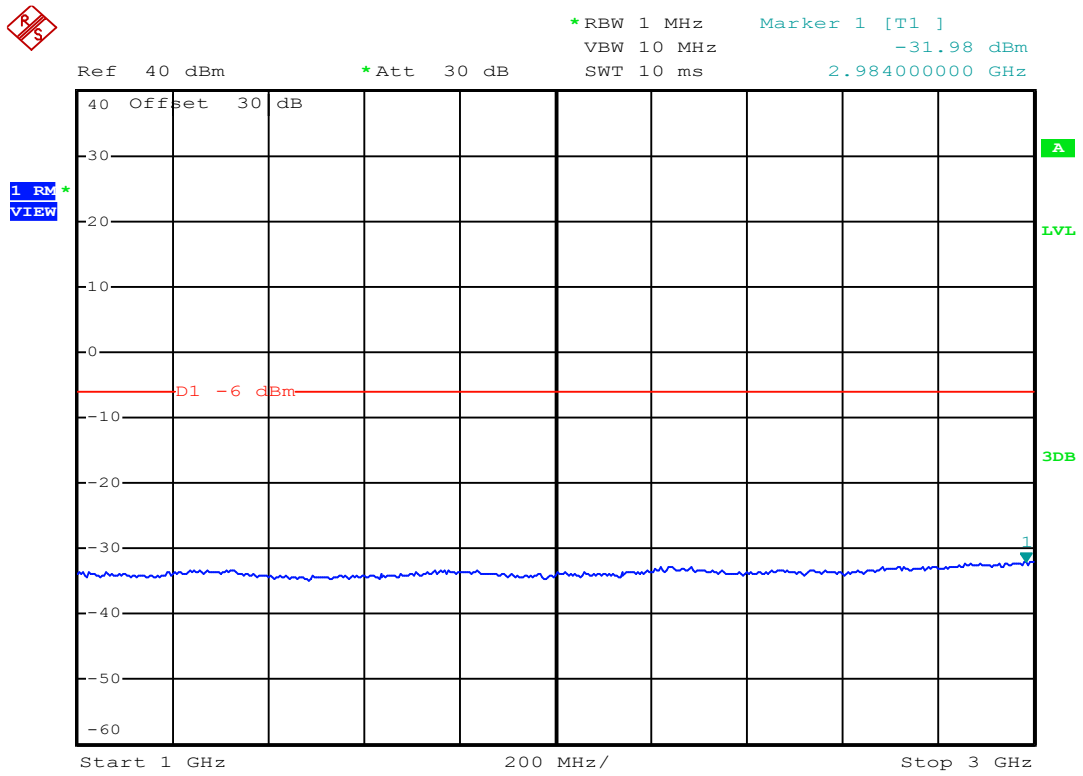


Marker 1 = Fundatamental

Channel Frequency:	925.5 MHz	**Emission Frequency:**	ND MHz
Modulation:	CW	**Measured Emission:**	ND dBm

Plot 10.6 – Conducted Spurious Emissions 925.5MHz Channel, 1 – 3GHz

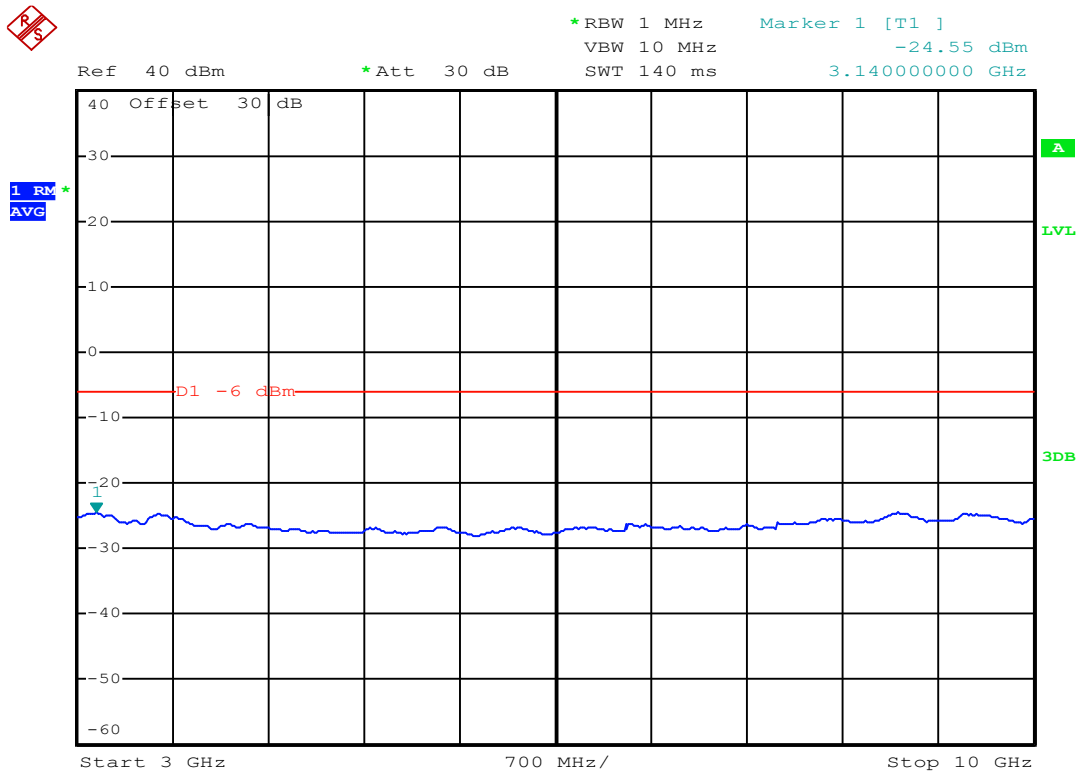
Conducted Spurious Emissions:



Channel Frequency:	**925.5**	**MHz**	
Modulation:	**CW**		
Emission Frequency:	**ND**	**MHz**	**Measured Emission:** **ND** **dBm**

Plot 10.7 – Conducted Spurious Emissions 925.5MHz Channel, 3 – 10GHz

Conducted Spurious Emissions:



Channel Frequency:	925.5 MHz		
Modulation:	CW		
Emission Frequency:	ND MHz	Measured Emission:	ND dBm

Table 10.1 - Summary of Conducted Spurious Measurements

Conducted Spurious Emissions Measurement Results:							
Frequency (MHz)	**Modulation**	**Emission Power [P_{Em}] (dBm)**	**Emission Frequency (MHz)**	**Fundamental Measurment [P_{Fund}] (dBm)**	**Attenuation [Atten] (dB)**	**Limit (dB)**	**Margin (dB)**
925.50	CW	ND	ND	37.00	n/a	43	n/a
					Results:	**Complies**	

Attenuation [Atten] = [P_{Fund}] - [P_{Em}]

Margin = Attenuation - Limit

ND = None Detected

n/a = Not Applicable

11.0 RADIATED TX SPURIOUS EMISSIONS

Test Procedure	
Normative References	FCC 47 CFR §24.133(a)(1)
	ANSI C63.26

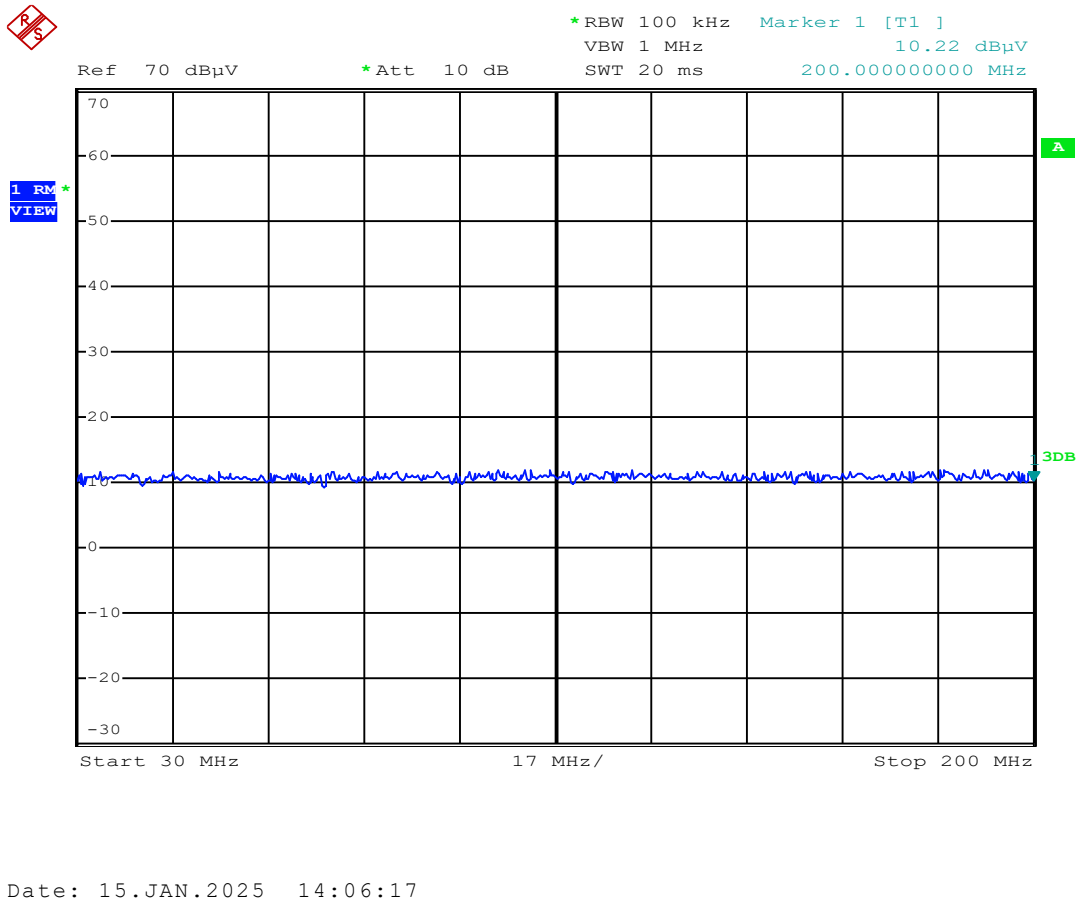
Requirement / Limits	
47 CFR §24.133	**§24.133 Authorized Bandwidth**
	(a) The power of any emission shall be attenuated below the transmitter power (P), as measured in accordance with § 24.132(f), in accordance with the following schedule:
	(1) For transmitters authorized a bandwidth greater than 10 kHz:
	(i) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of up to and including 40 kHz: at least 116 Log10 ((fd + 10)/6.1) decibels or 50 plus 10 Log10 (P) decibels or 70 decibels, whichever is the lesser attenuation;
	(ii) On any frequency outside the authorized bandwidth and removed from the edge of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 40 kHz: at least 43 + 10 Log10 (P) decibels or 80 decibels, whichever is the lesser attenuation.

Test Setup	Appendix A - Figure A.2 to A.4

Measurement Procedure
The DUT was connected to a Spectrum Analyzer via a 30dB attenuator. The DUT was configured to transmit modulated at its highest output power. The emissions mask was created in the SA and the SA Reference Level was set to the DUT's maximum rated power. The SA's Limit Check (Pass/Fail) was enabled and the results recorded for each applicable bandwidth and modulation.

Plot 11.1 – Radiated Tx Emissions, 929.5MHz, Horizontal, 30-200MHz

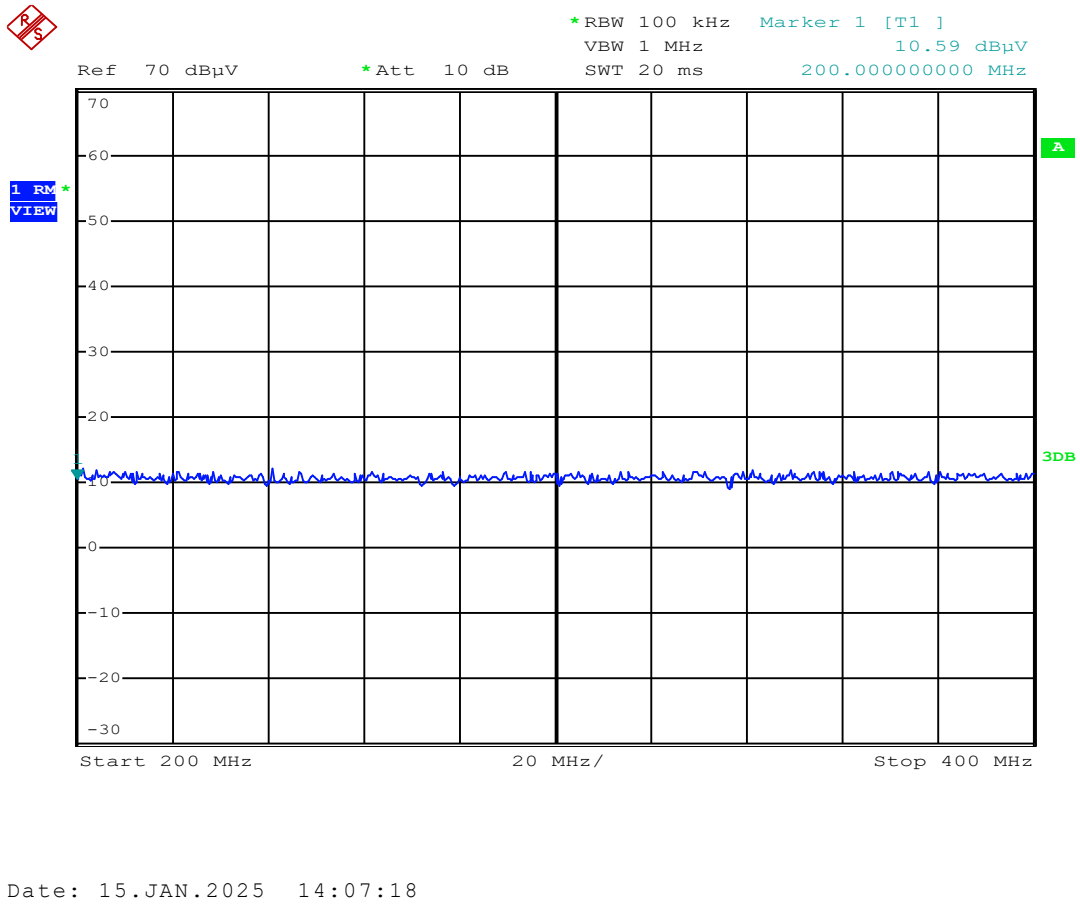
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Horizontal**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.2 – Radiated Tx Emissions, 929.5MHz, Horizontal, 200-400MHz

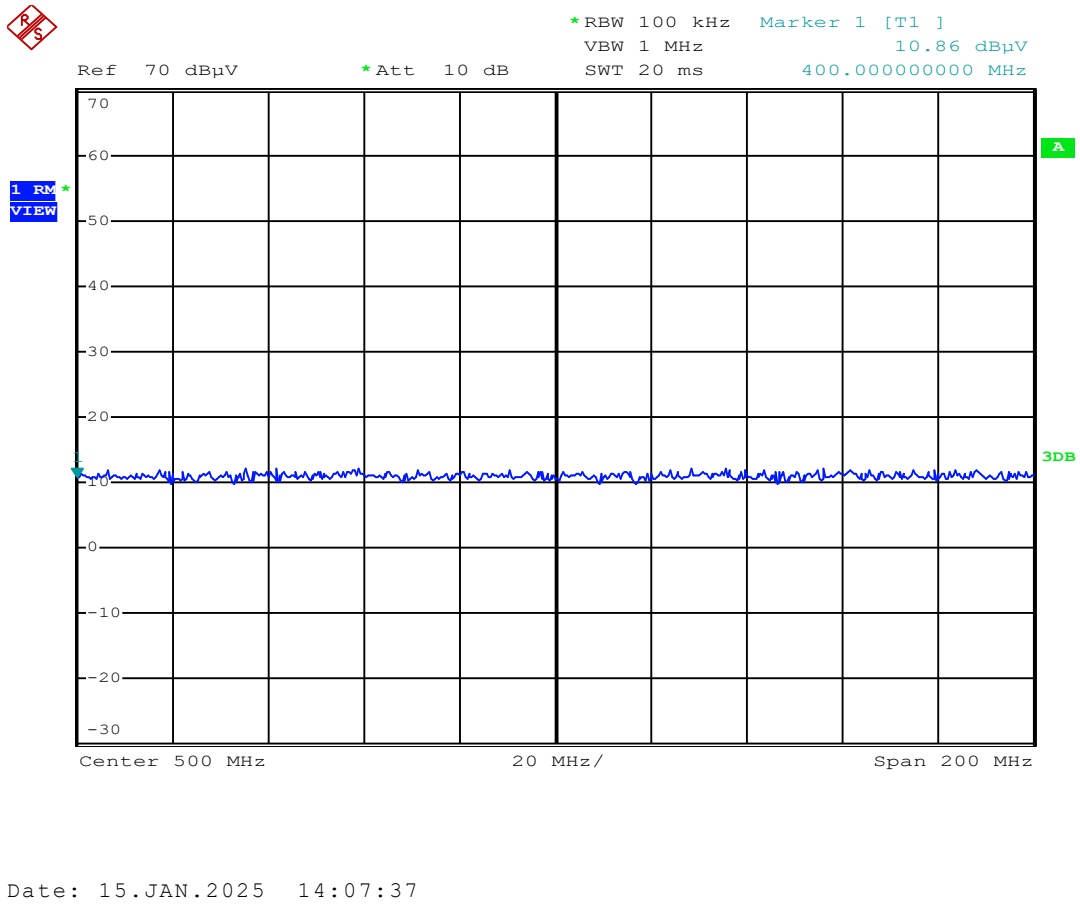
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Horizontal**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.3 – Radiated Tx Emissions, 929.5MHz, Horizontal, 400-600MHz

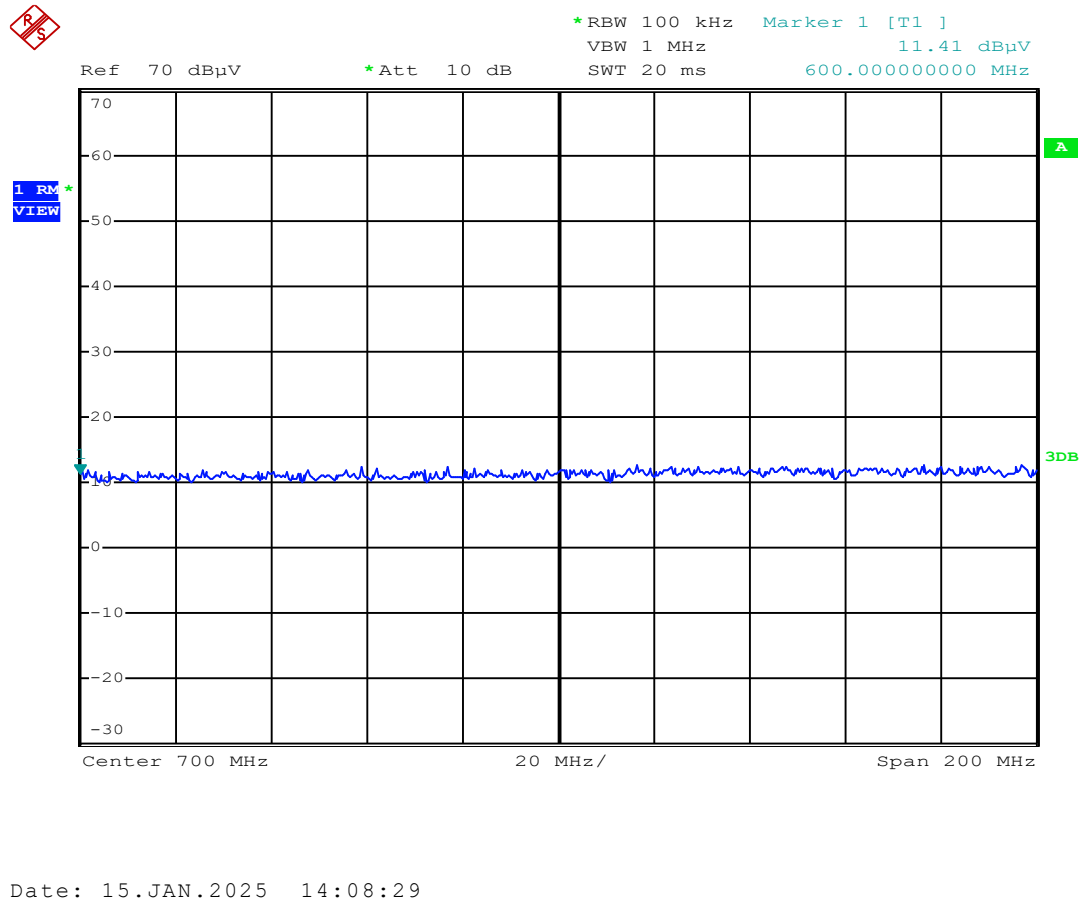
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Horizontal**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.4 – Radiated Tx Emissions, 929.5MHz, Horizontal, 600-800MHz

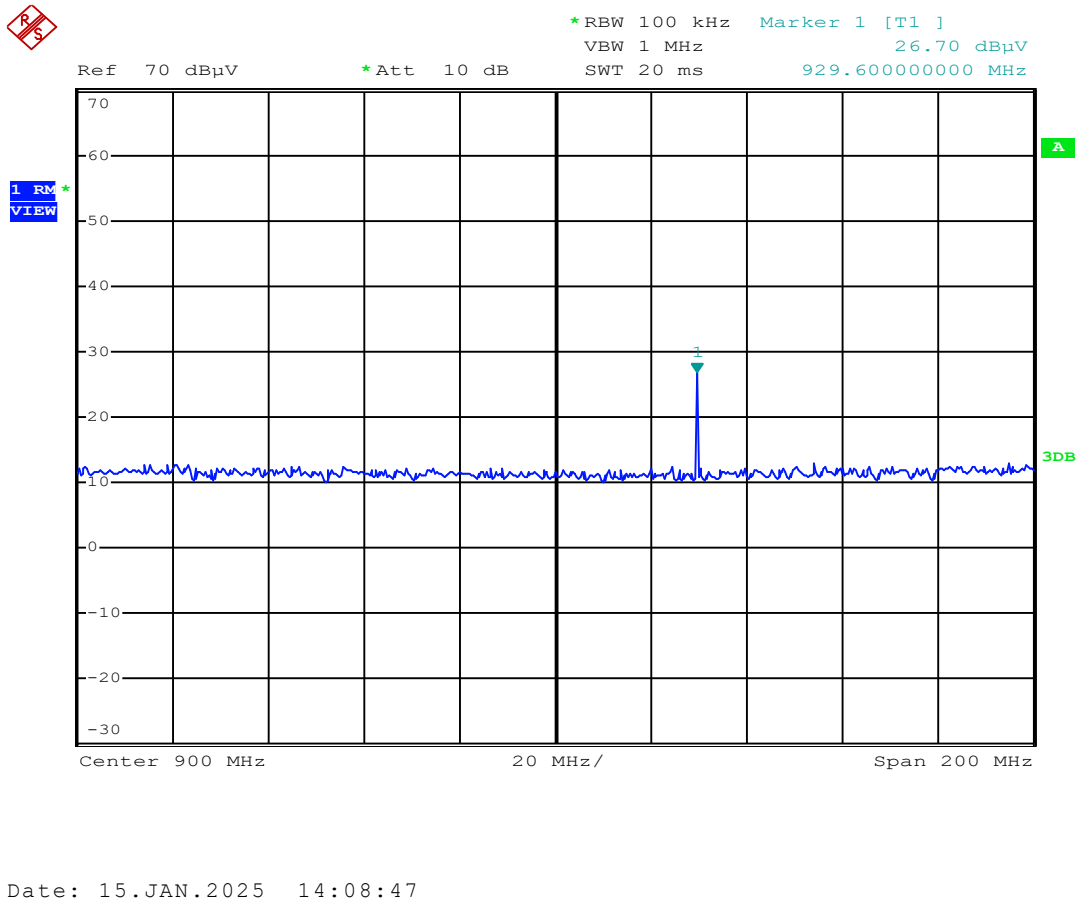
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Horizontal**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.5 – Radiated Tx Emissions, 929.5MHz, Horizontal, 800-1000MHz

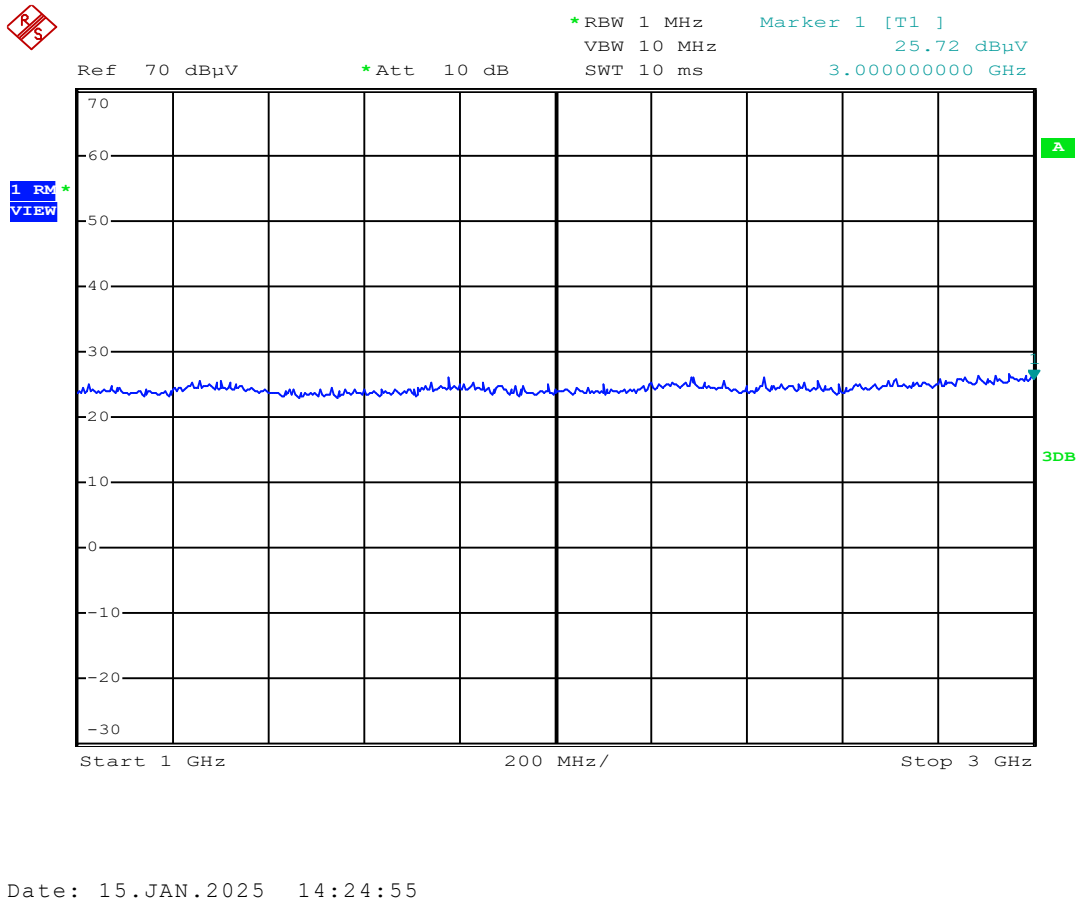
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Horizontal**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
Marker 1 = Fundamental			**Measured Emission:**	**ND**	**dBuV**

Plot 11.6 – Radiated Tx Emissions, 929.5MHz, Horizontal, 1-3GHz

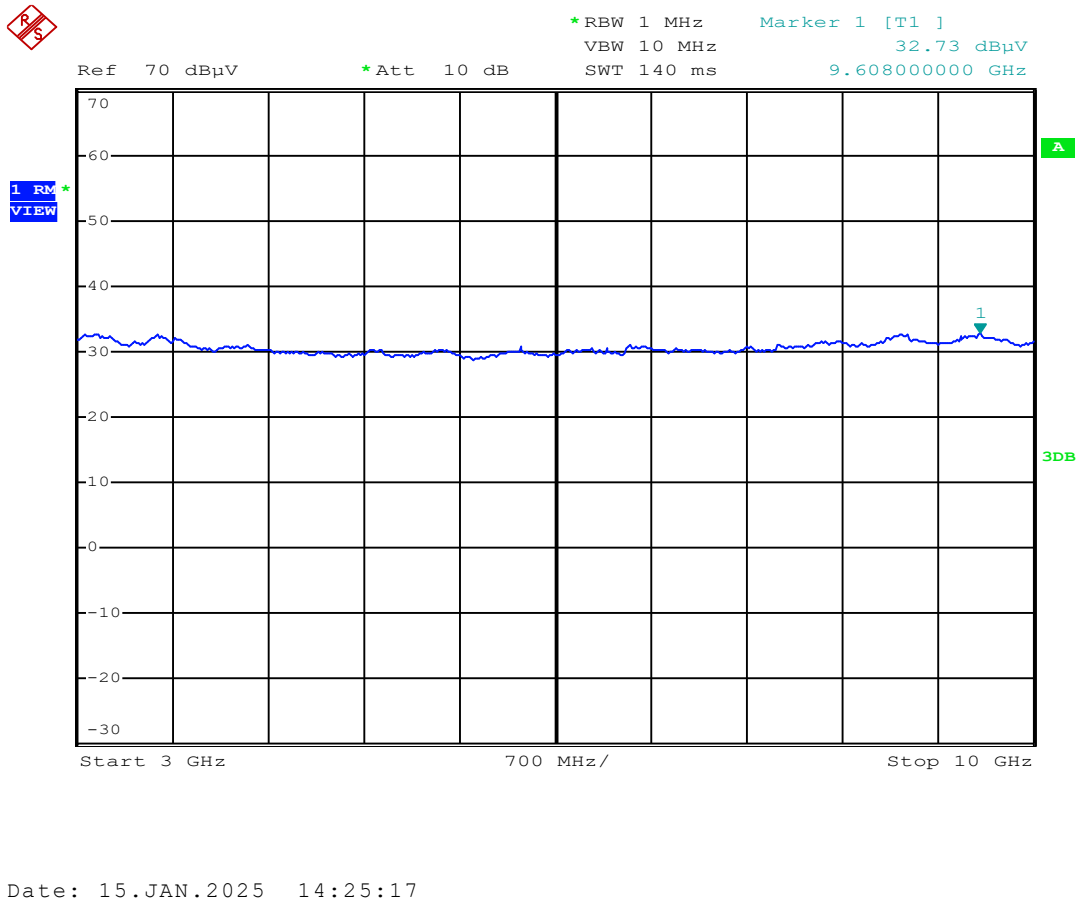
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Horizontal**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.7 – Radiated Tx Emissions, 929.5MHz, Horizontal, 3-10GHz

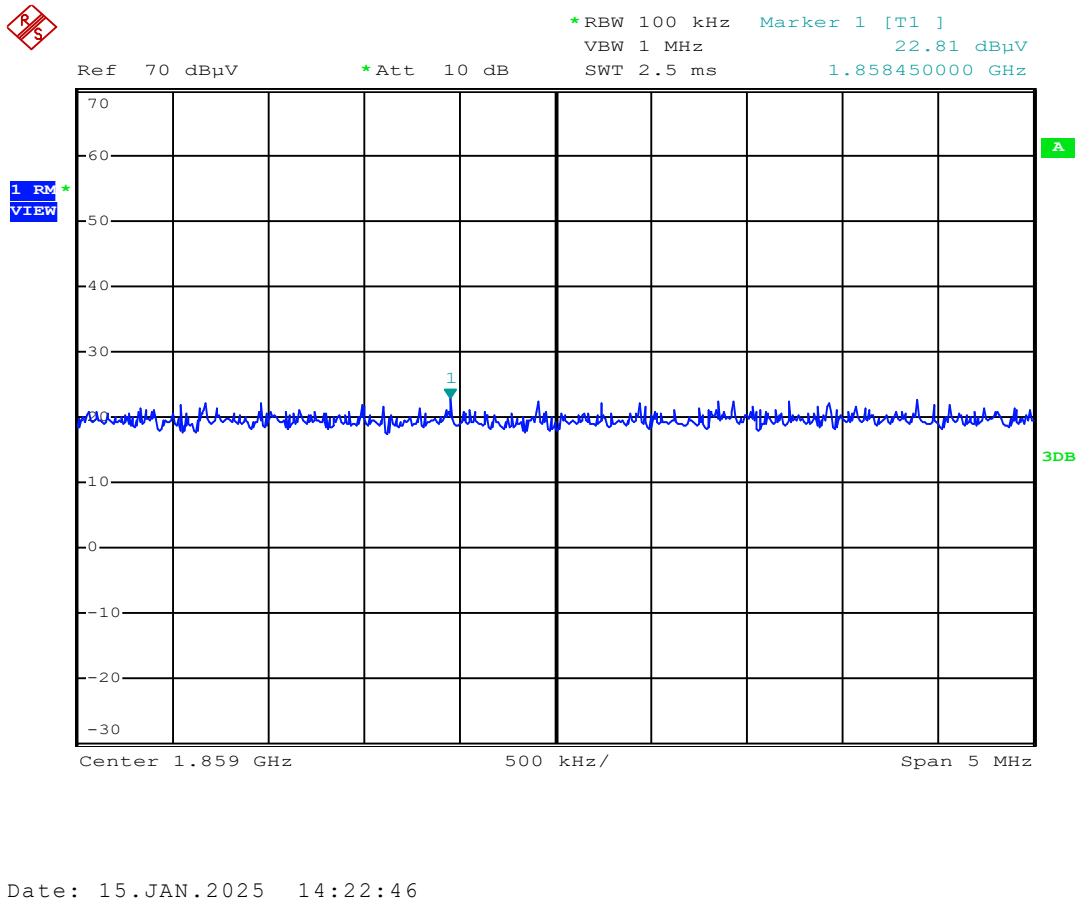
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Horizontal**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.8 – Radiated Tx Emissions, 929.5MHz, Horizontal, 2nd Harmonic

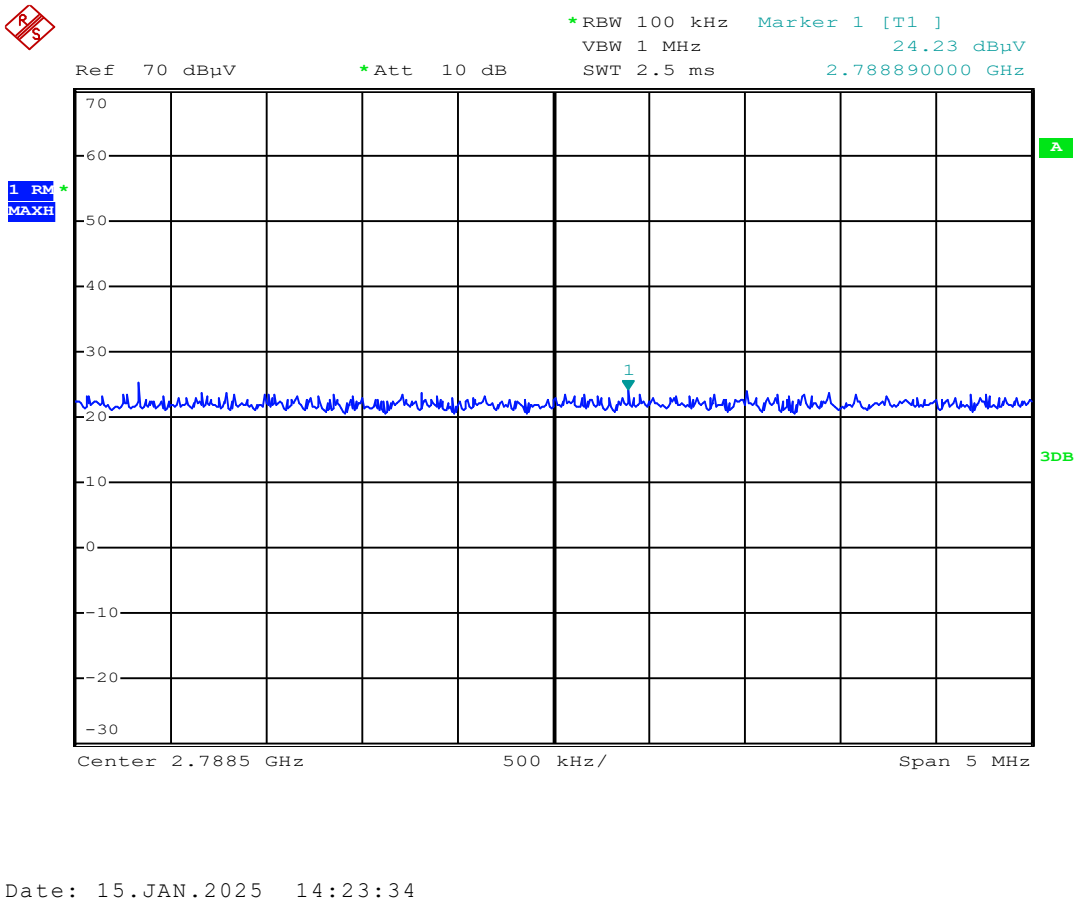
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Horizontal**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
2nd Harmonic			**Measured Emission:**	**ND**	**dBuV**

Plot 11.9 – Radiated Tx Emissions, 929.5MHz, Horizontal, 3rd Harmonic

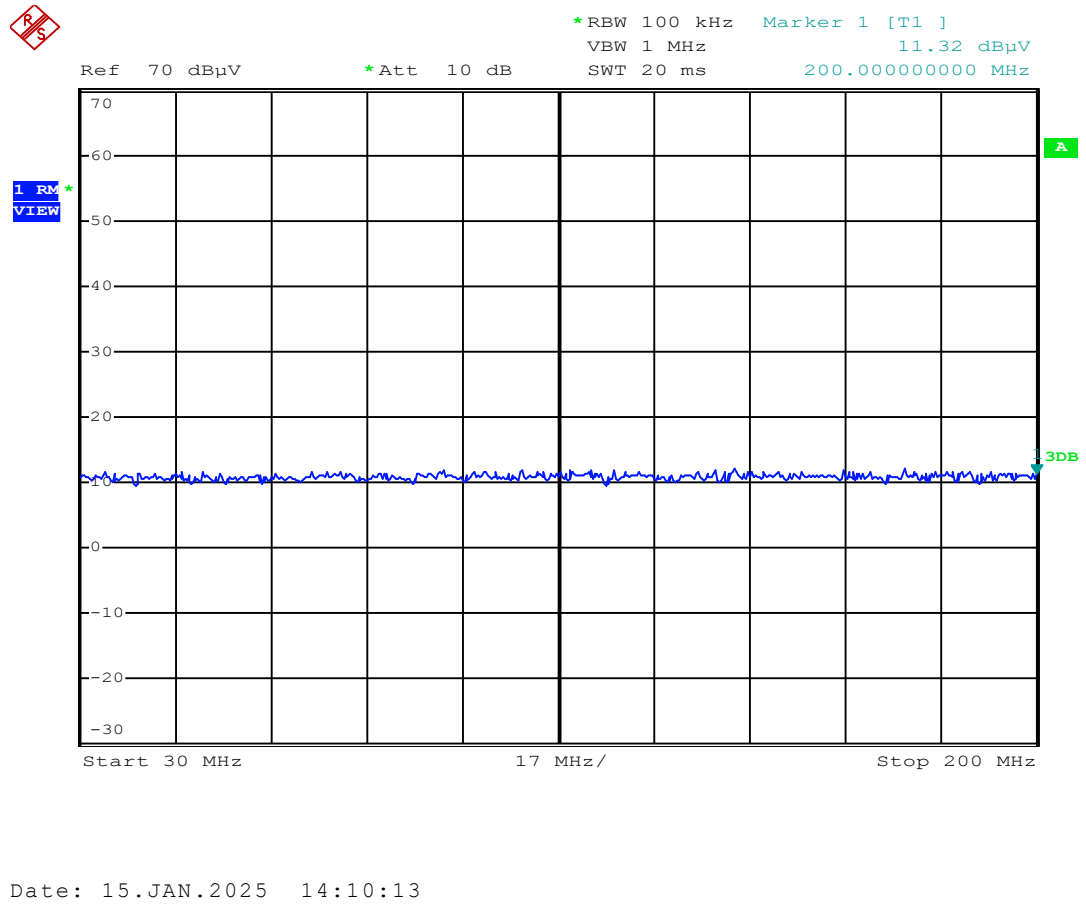
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Horizontal**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
3rd Harmonic			**Measured Emission:**	**ND**	**dBuV**

Plot 11.10 – Radiated Tx Emissions, 929.5MHz, Vertical, 30-200MHz

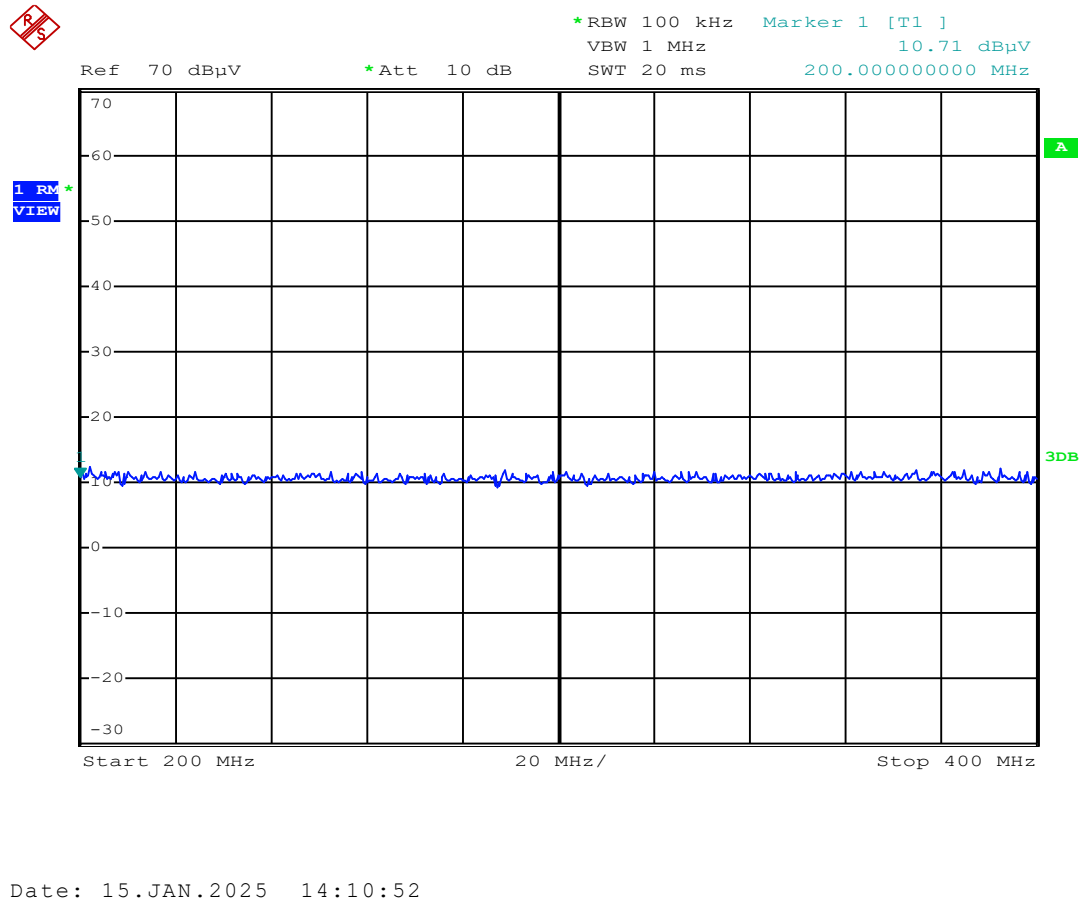
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Vertical**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.11 – Radiated Tx Emissions, 929.5MHz, Vertical, 200-400MHz

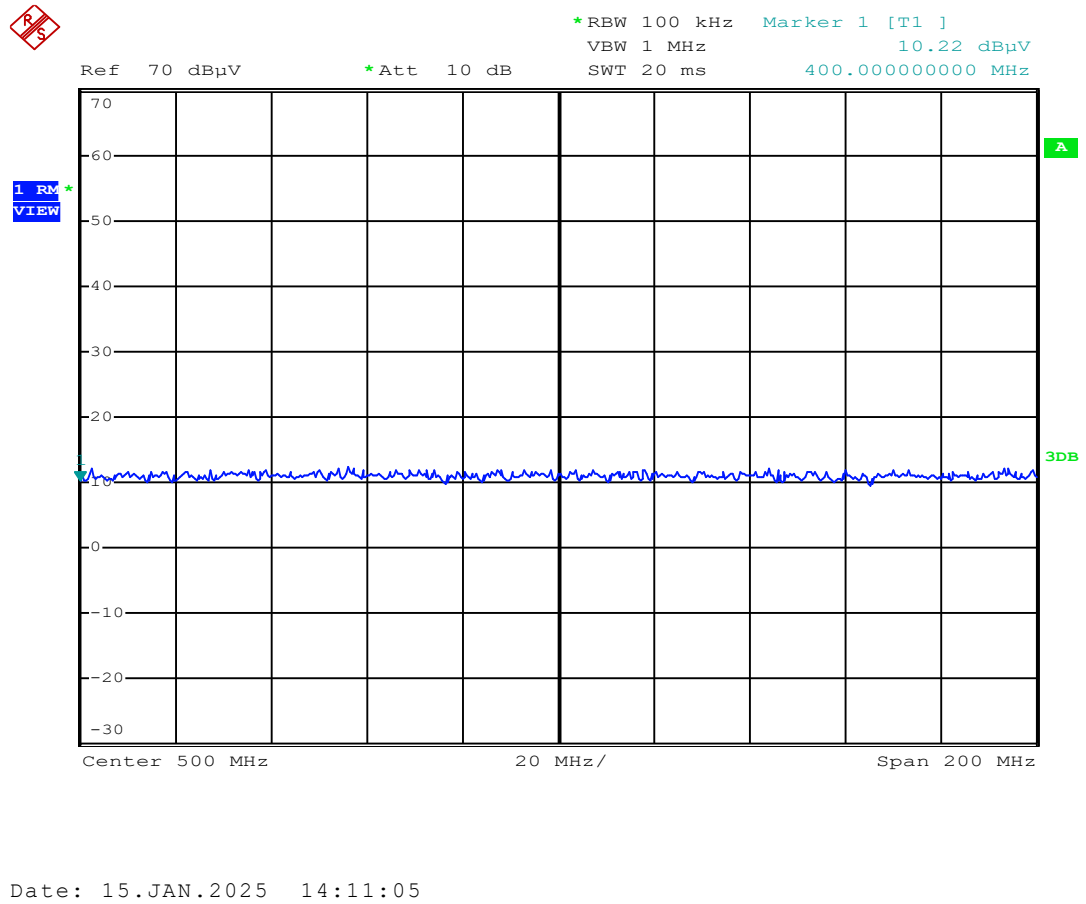
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Vertical**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.12 – Radiated Tx Emissions, 929.5MHz, Vertical, 400-600MHz

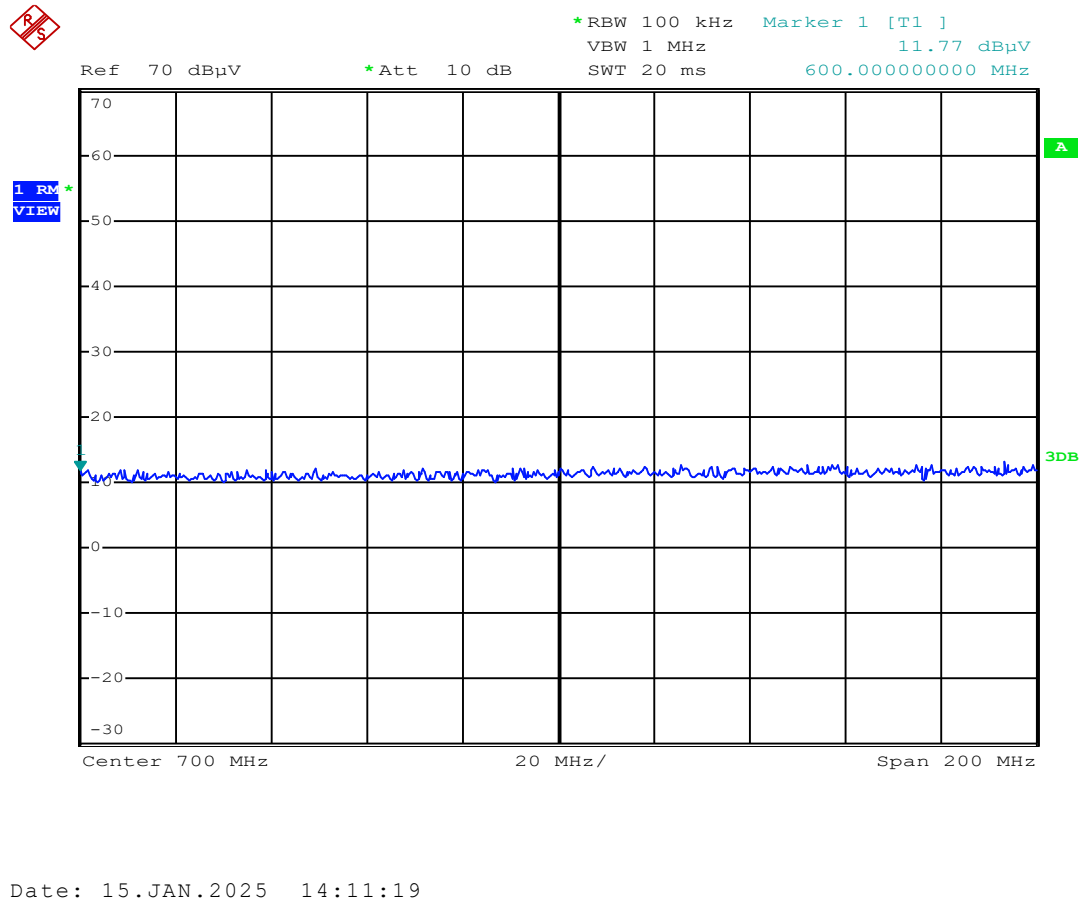
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Vertical**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.13 – Radiated Tx Emissions, 929.5MHz, Vertical, 600-800MHz

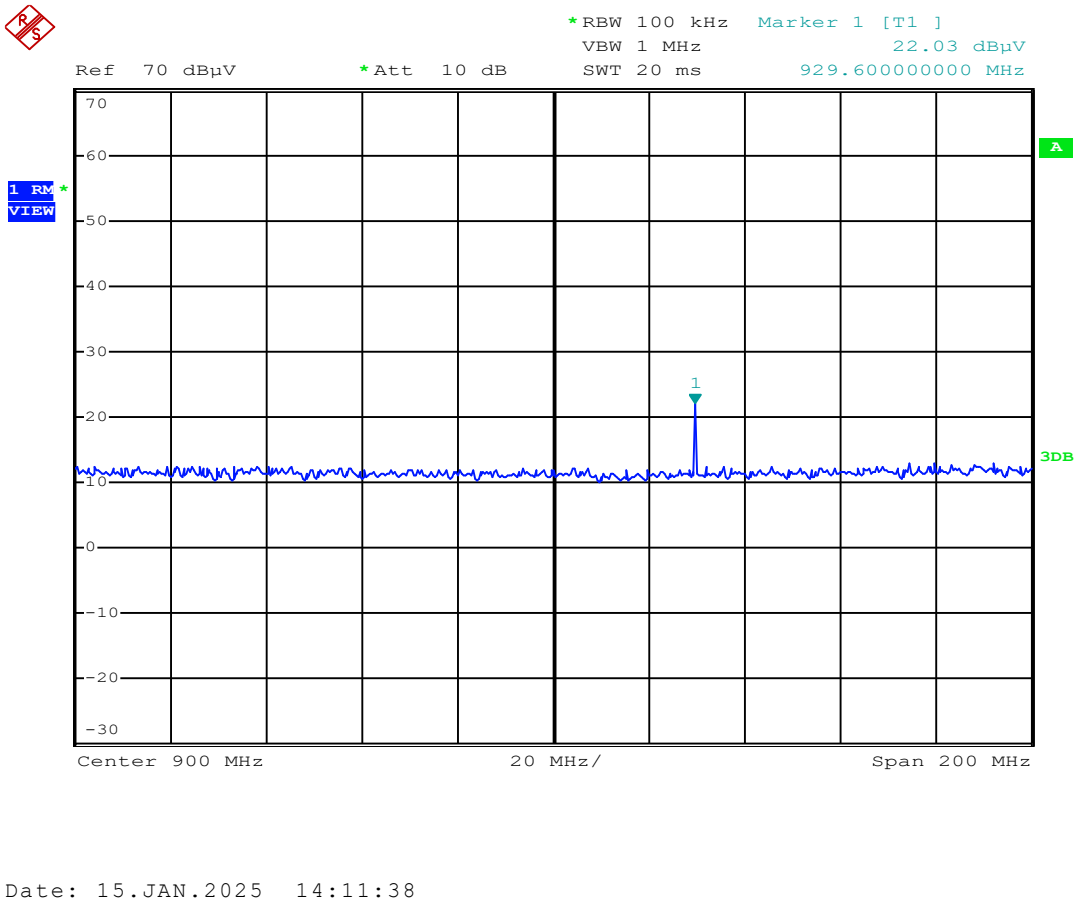
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Vertical**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.14 – Radiated Tx Emissions, 929.5MHz, Vertical, 800-1000MHz

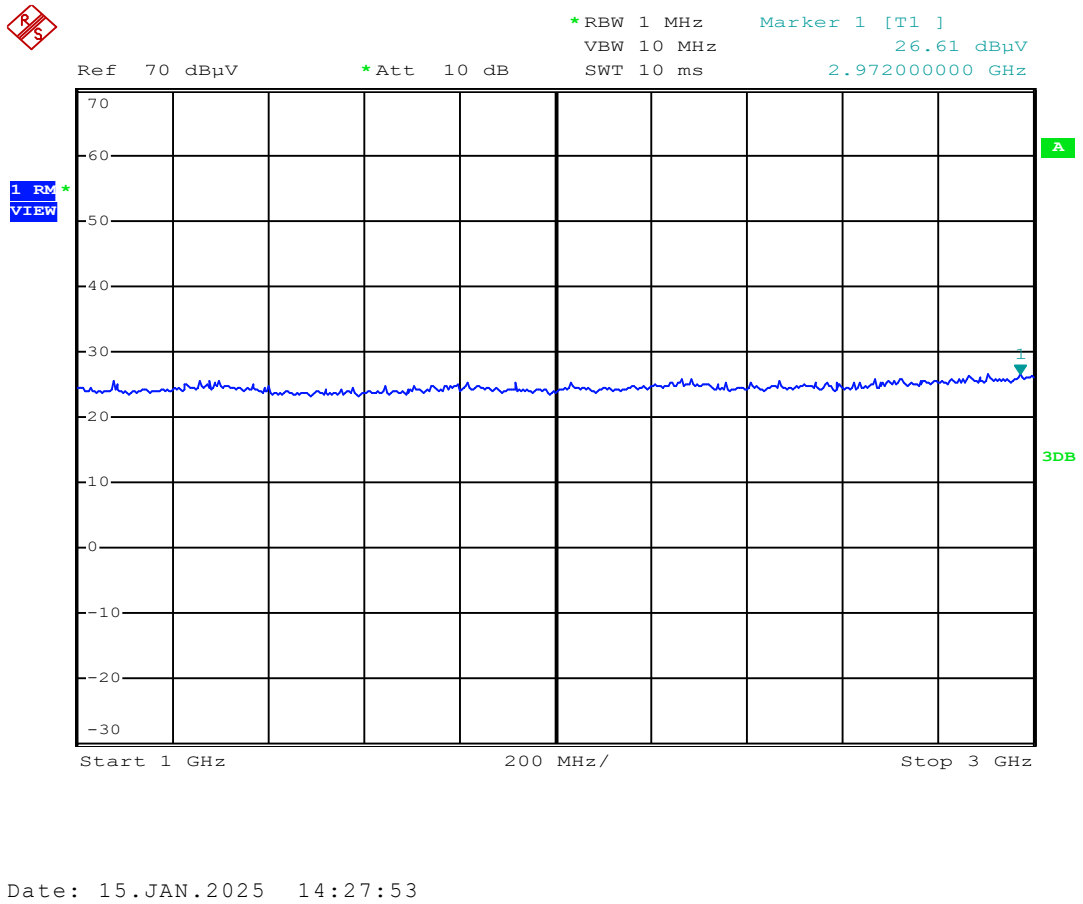
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Vertical**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
Marker 1 = Fundamental			**Measured Emission:**	**ND**	**dBuV**

Plot 11.15 – Radiated Tx Emissions, 929.5MHz, Vertical, 1-3GHz

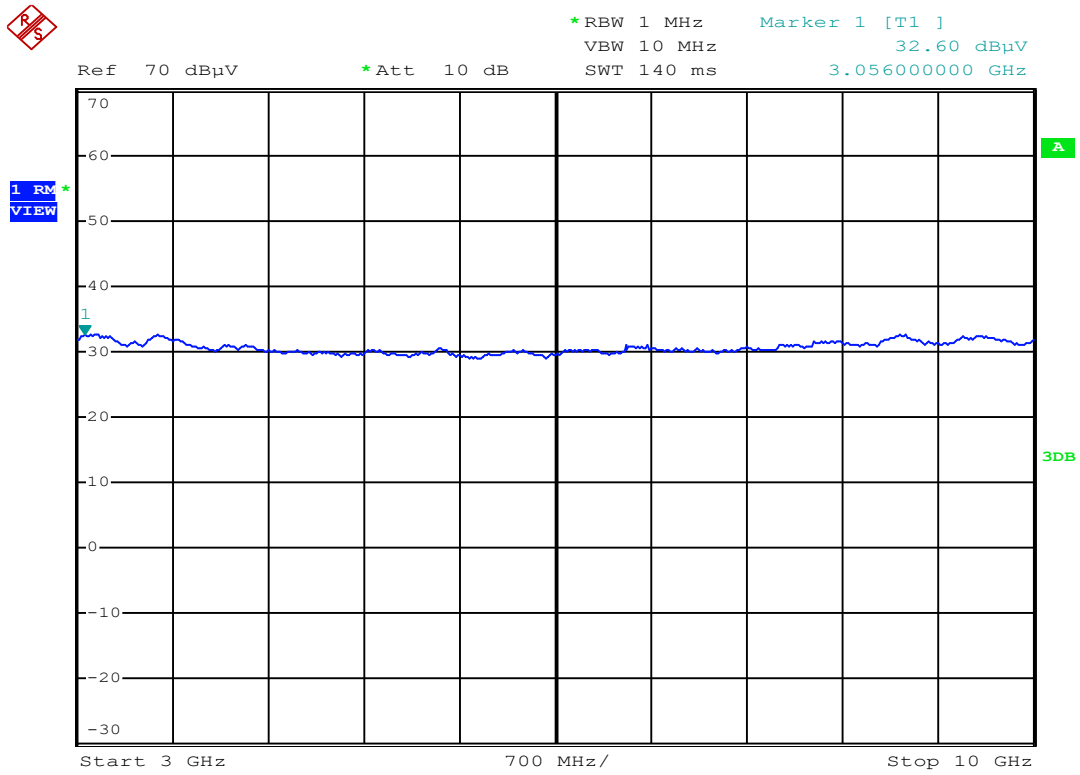
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Vertical**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.16 – Radiated Tx Emissions, 929.5MHz, Vertical, 3-10GHz

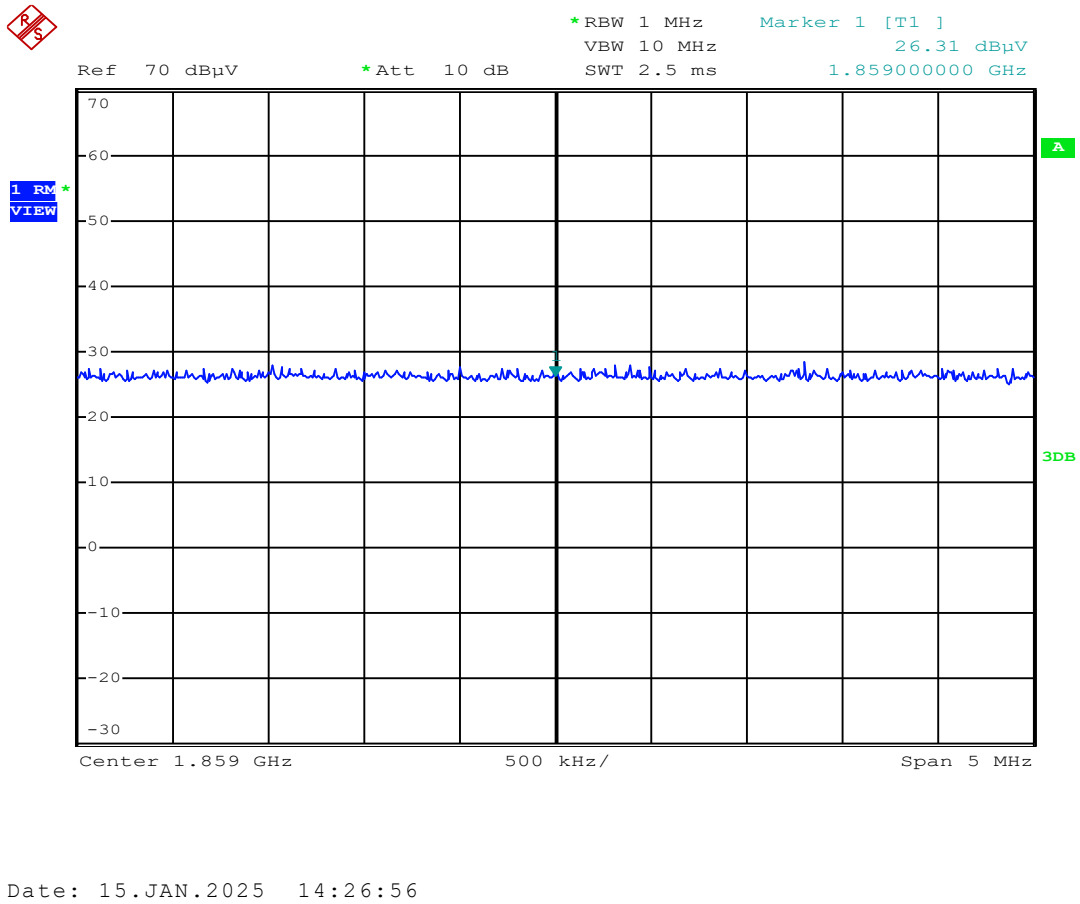
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Vertical**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
			Measured Emission:	**ND**	**dBuV**

Plot 11.17 – Radiated Tx Emissions, 929.5MHz, Vertical, 2nd Harmonic

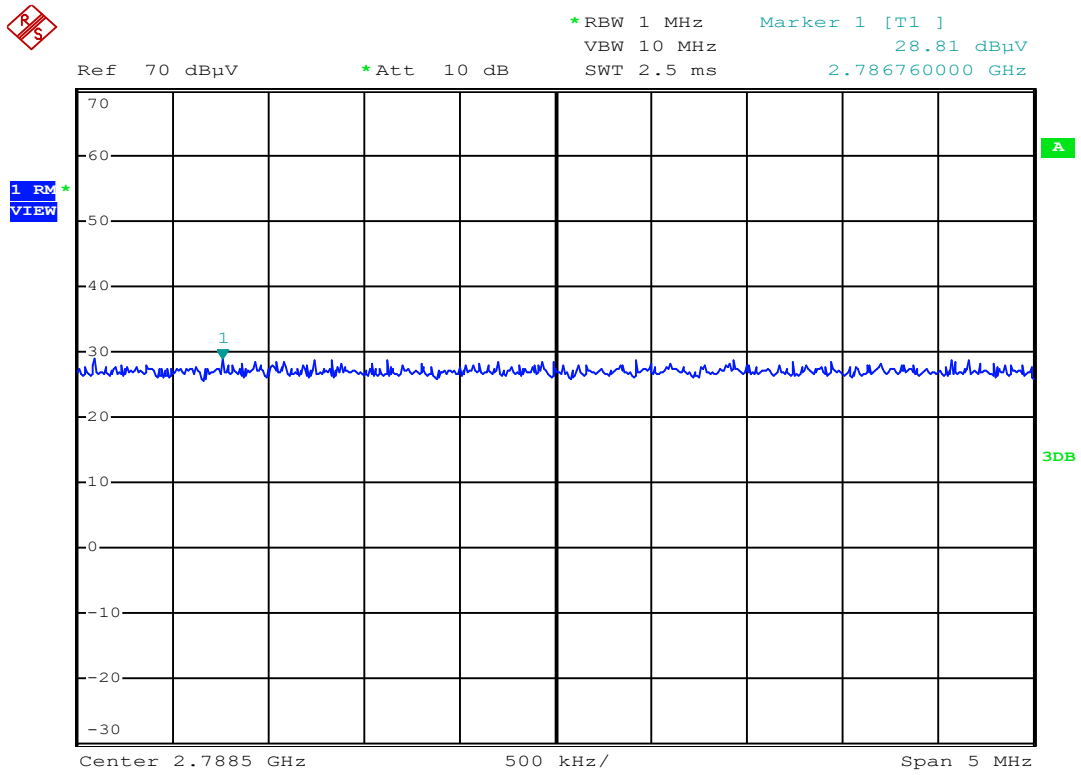
Radiated Tx Spurious Emissions:



Antenna Polarization:	**Vertical**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
2nd Harmonic			**Measured Emission:**	**ND**	**dBuV**

Plot 11.18 – Radiated Tx Emissions, 929.5MHz, Vertical, 3rd Harmonic

Radiated Tx Spurious Emissions:



Antenna Polarization:	**Vertical**		**Channel Frequency:**	**929.5**	**MHz**
Emission Frequency:	**ND**	**MHz**	**Modulation:**	**CW**	
3rd Harmonic			**Measured Emission:**	**ND**	**dBuV**

Table 11.1 – Summary of Radiated Tx Emissions Measurements

Radiated Tx Spurious Emissions Measurement Results:							
Frequency (MHz)	**Modulation**	**Emission FS [E_{Em}] (dBuV)**	**Emission Frequency (MHz)**	**Fundamental Measurment [E_{Fund}]* (dBuV)**	**Attenuation [Atten] (dB)**	**Limit (dB)**	**Margin (dB)**
929.50	CW	ND	ND	26.70	n/a	43	n/a
					Results:	**Complies**	

Attenuation [Atten] = [P_{Fund}] - [E_{Em}]
Margin = Attenuation - Limit
ND = None Detected
n/a = Not Applicable
* Uncorrected

12.0 RADIATED RX SPURIOUS EMISSIONS

Test Procedure	
Normative Reference	FCC 47 CFR §15.109 ANSI C63.4-2014

Limits		
47 CFR §15.109	(b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following:	
	30-88MHz: 39.1dBuV/m	30-88MHz: 49.6dBuV/m @ 3m
	88-216MHz: 43.5dBuV/m	88-216MHz: 54.0dBuV/m @ 3m
	216-960MHz: 46.4dBuV/m	216-960MHz: 56.9dBuV/m @ 3m
	> 960MHz: 49.5dBuV/m	> 960MHz: 60.0dBuV/m @ 3m

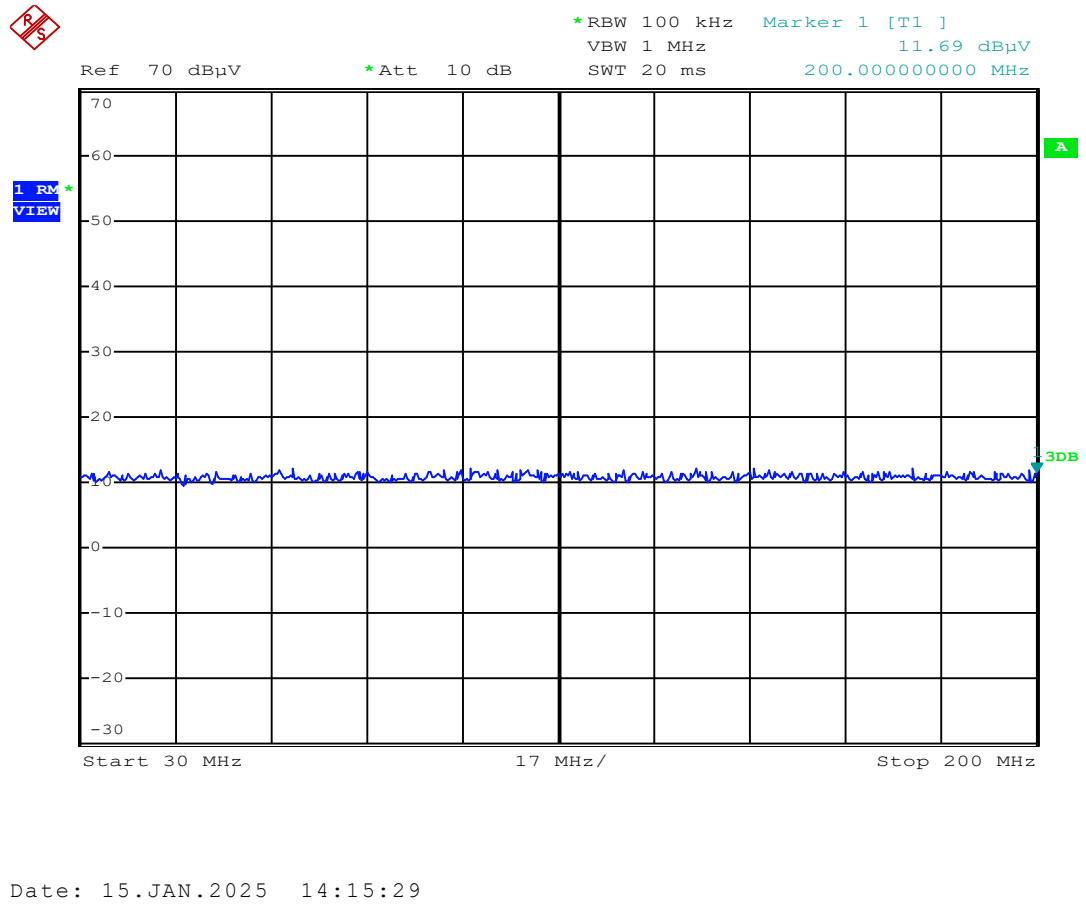
Test Setup	Appendix A	Figure A.2 to A.4

Measurement Procedure

The DUT was set up as per ANSI C63.4:2014. Emissions were scanned between 30MHz and 1000MHz. The turntable was rotated 360 degrees and the antenna was elevated to 4m to optimize the measured emissions.

Plot 12.1 – Radiated Rx Emissions, Horizontal, 30-200MHz

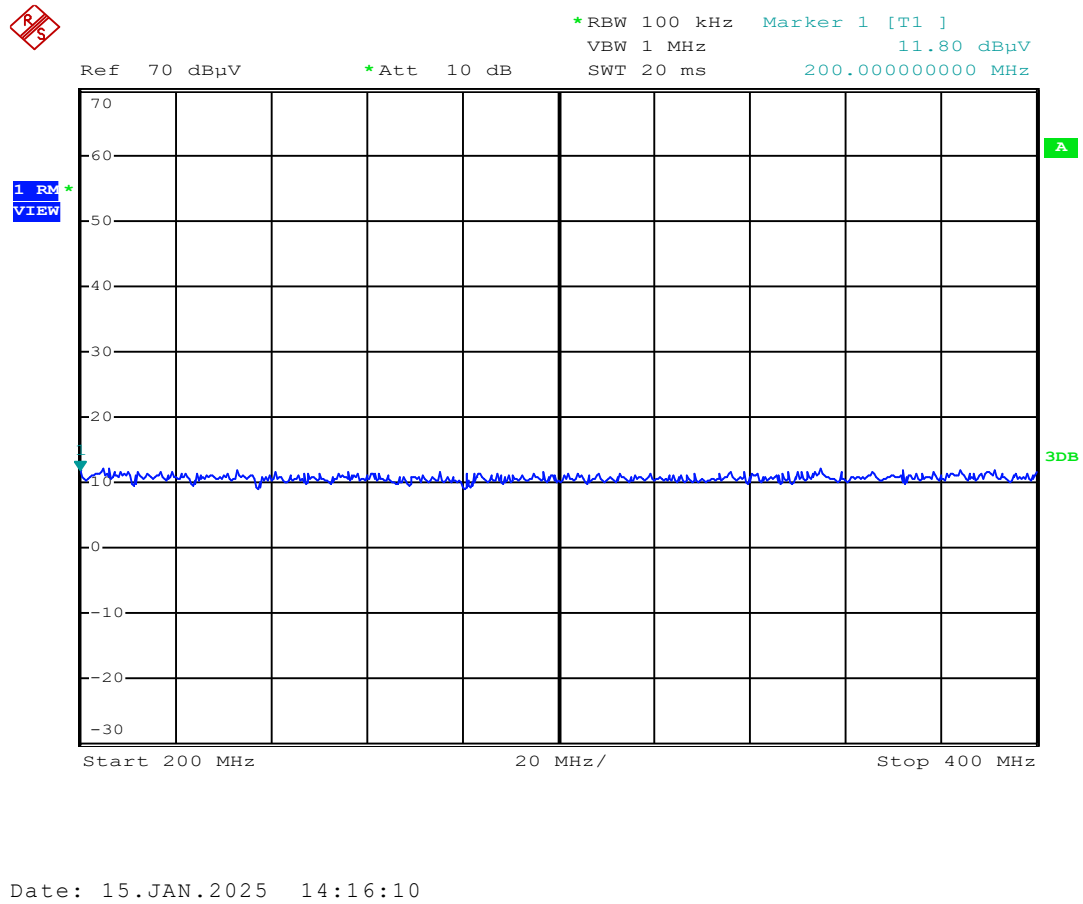
Radiated Rx Spurious Emissions:



Antenna Polarization:	**Horizontal**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Plot 12.2 – Radiated Rx Emissions, Horizontal, 200-400MHz

Radiated Rx Spurious Emissions:



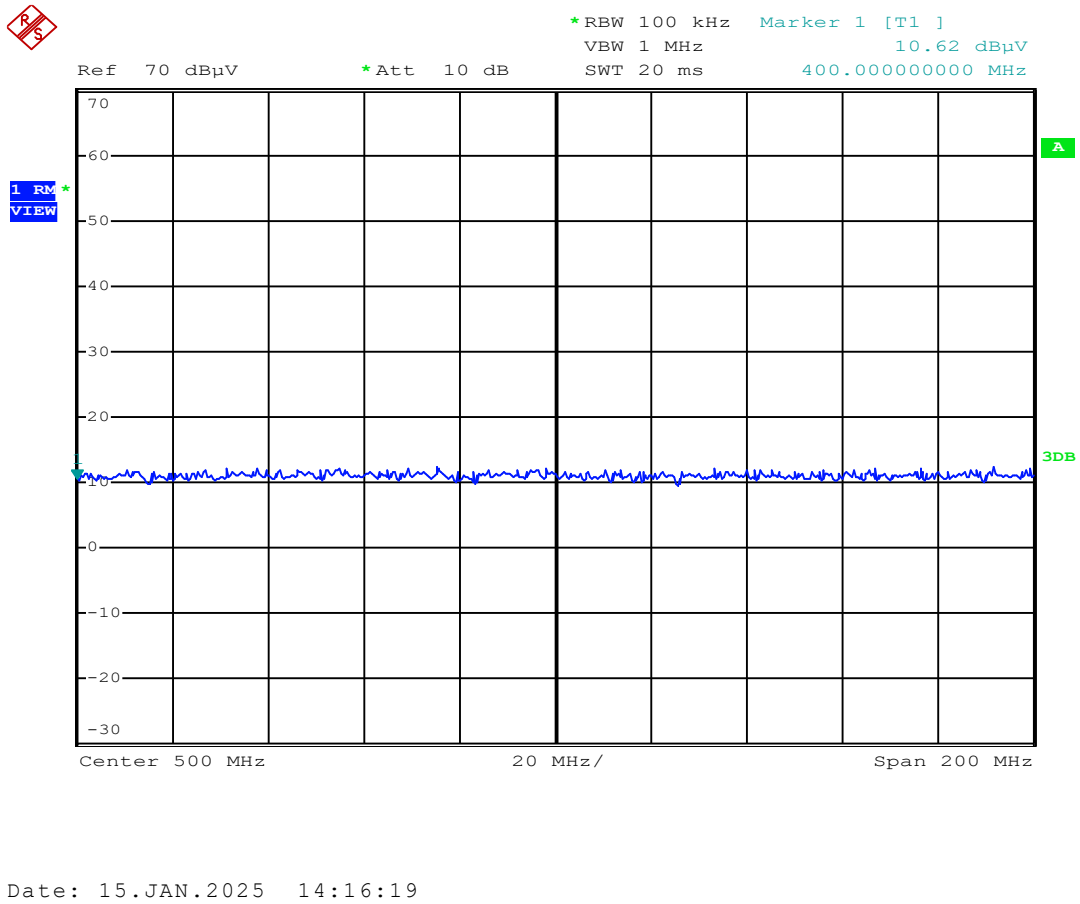
Antenna Polarization: Horizontal

Measured Emission: ND dBuV

Emission Frequency: ND MHz

Plot 12.3 – Radiated Rx Emissions, Horizontal, 400-600MHz

Radiated Rx Spurious Emissions:



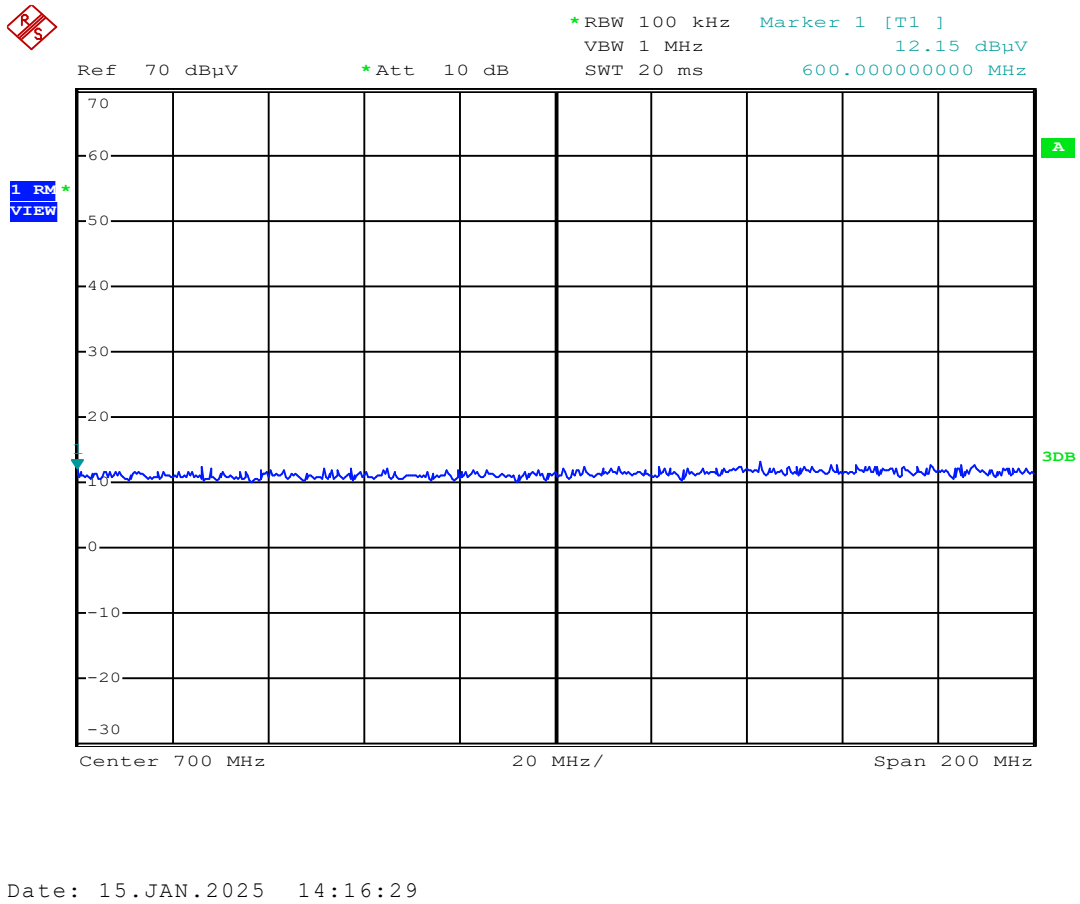
Antenna Polarization: Horizontal

Measured Emission: ND dBuV

Emission Frequency: ND MHz

Plot 12.4 – Radiated Rx Emissions, Horizontal, 600-800MHz

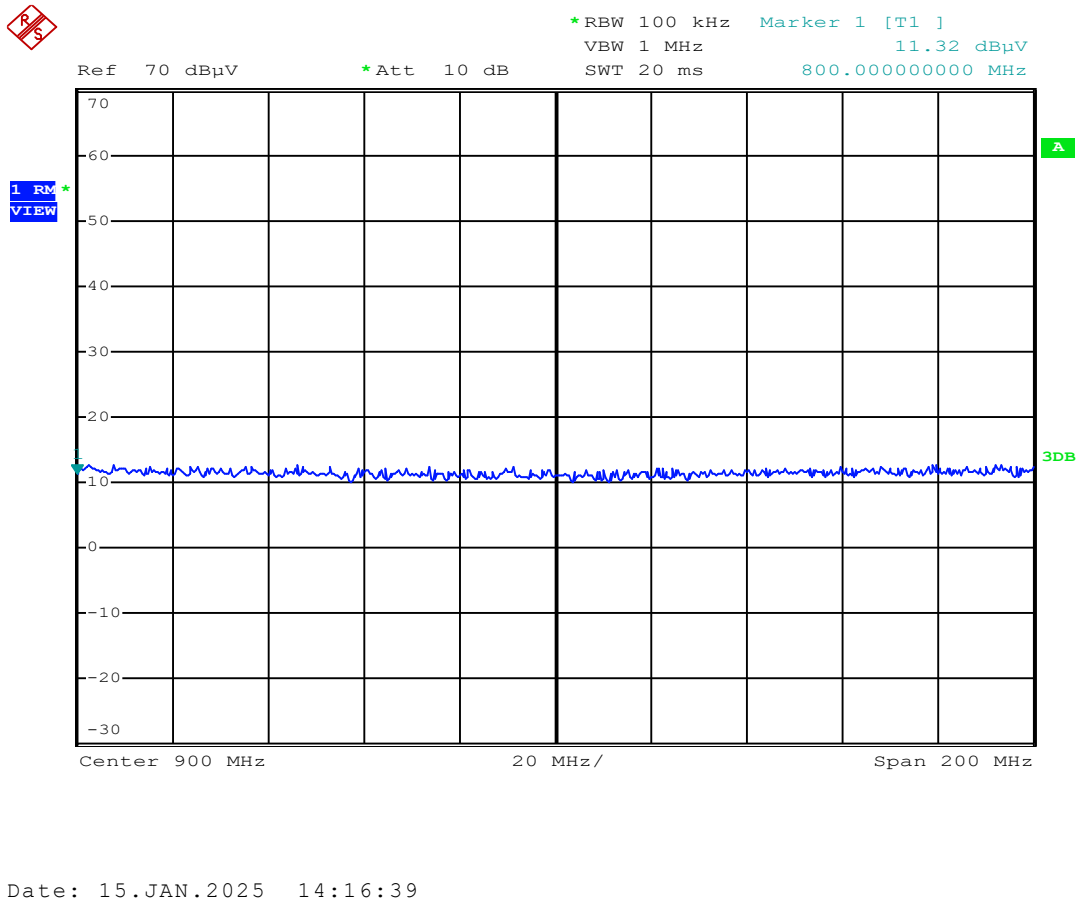
Radiated Rx Spurious Emissions:



Antenna Polarization:	**Horizontal**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Plot 12.5 – Radiated Rx Emissions, Horizontal, 800-1000MHz

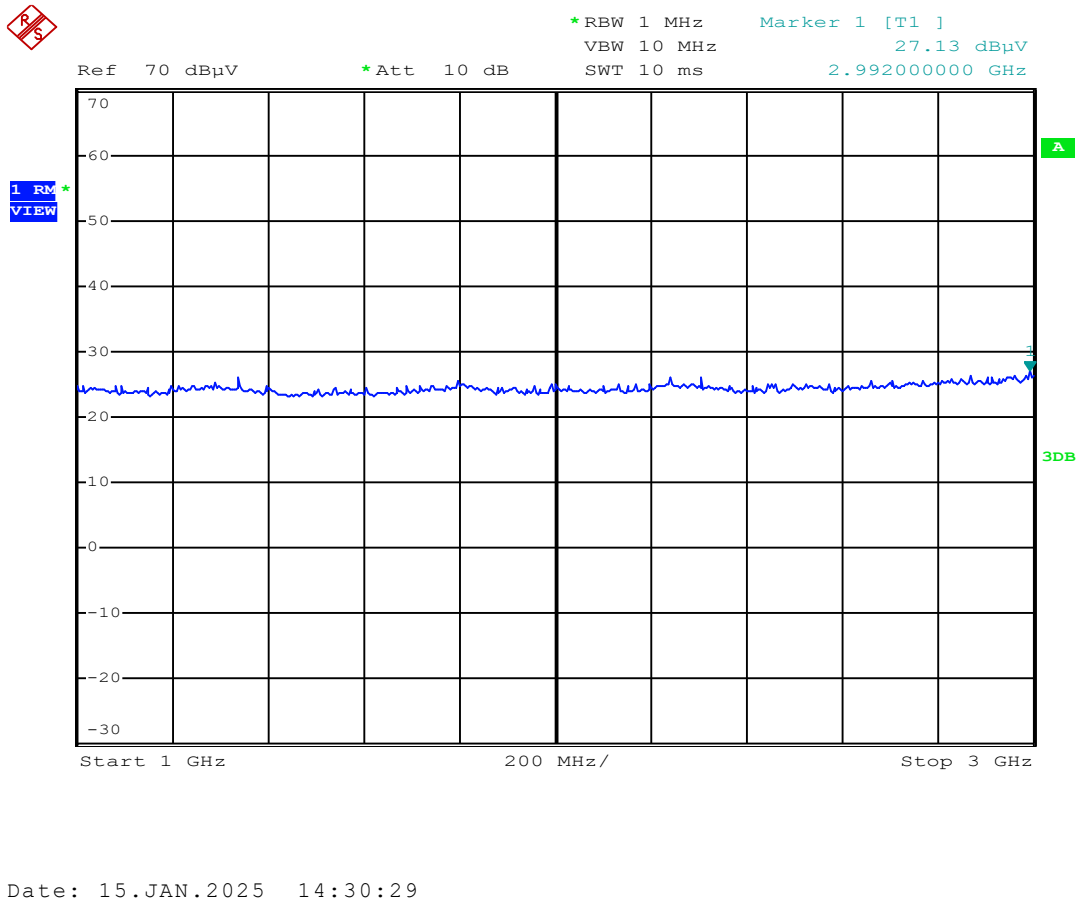
Radiated Rx Spurious Emissions:



Antenna Polarization:	**Horizontal**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Plot 12.6 – Radiated Rx Emissions, Horizontal, 1-3GHz

Radiated Rx Spurious Emissions:



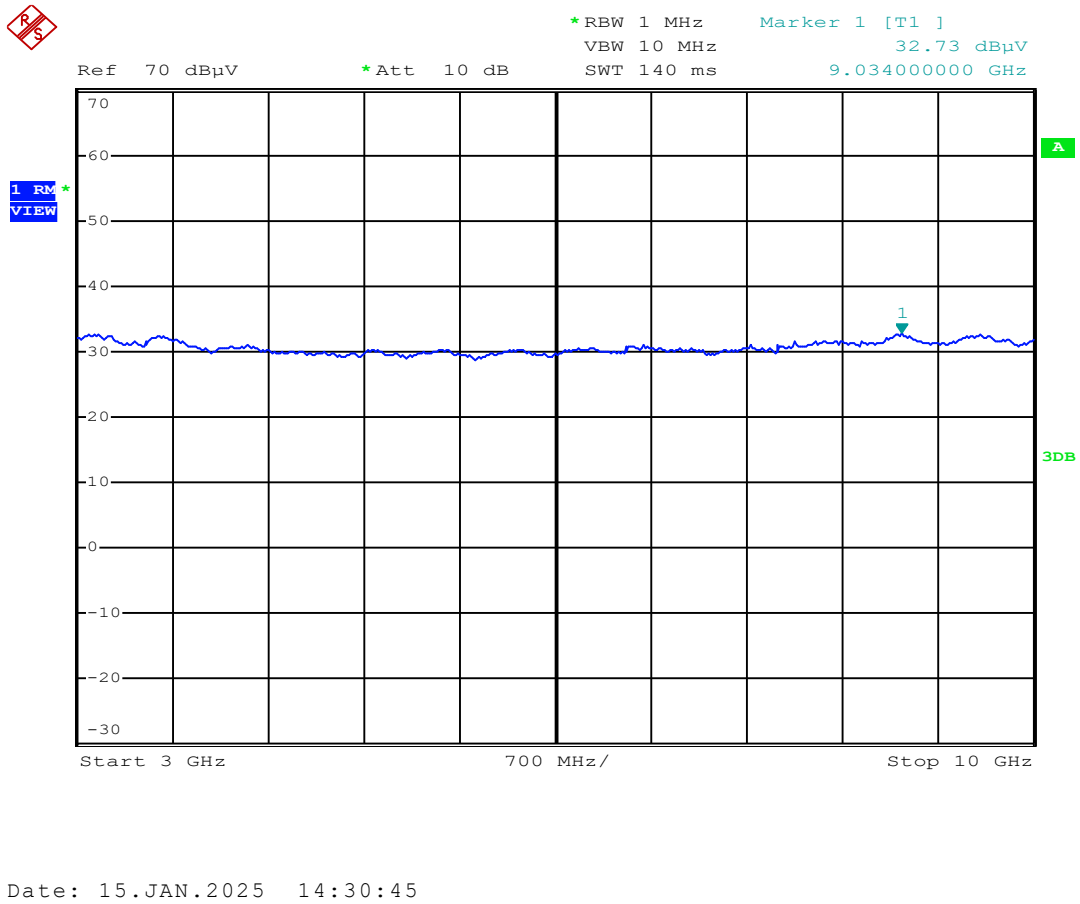
Antenna Polarization: Horizontal

Measured Emission: ND dBuV

Emission Frequency: ND MHz

Plot 12.7 – Radiated Rx Emissions, Horizontal, 3-10GHz

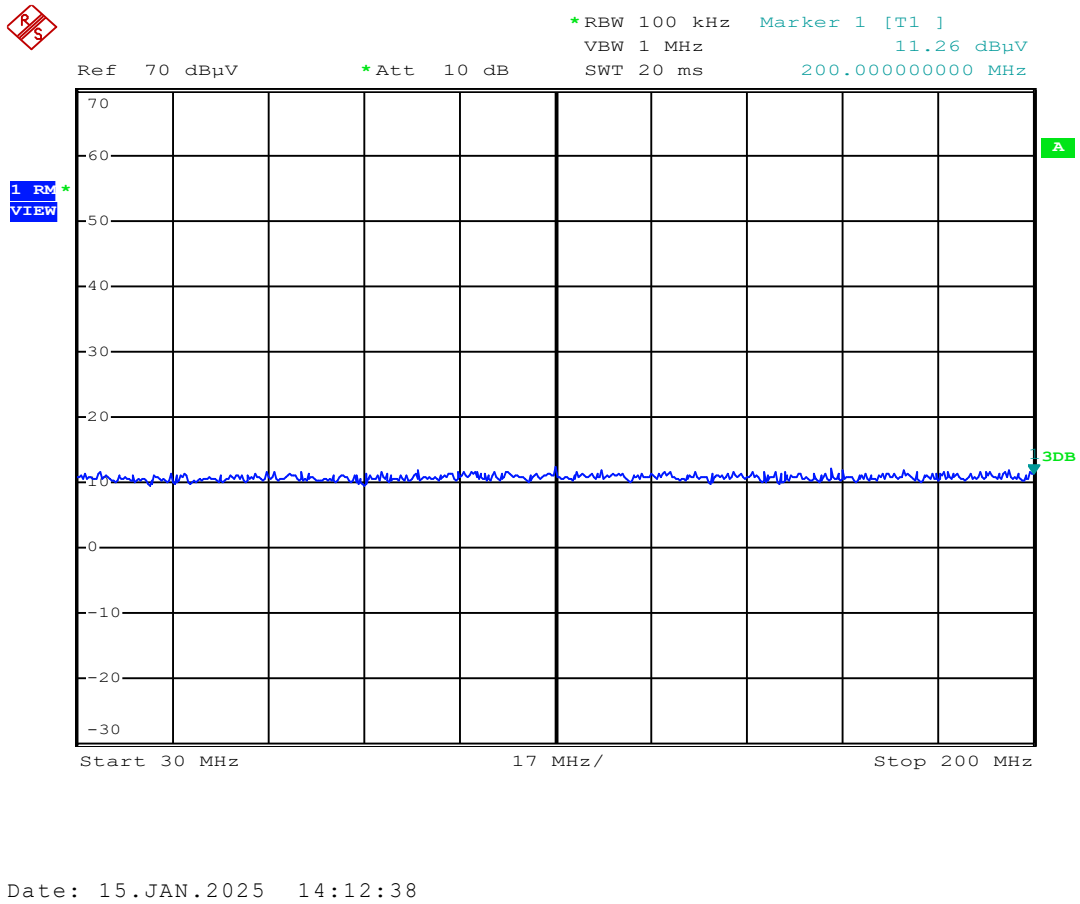
Radiated Rx Spurious Emissions:



Antenna Polarization:	**Horizontal**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Plot 12.8 – Radiated Rx Emissions, Vertical, 30-200MHz

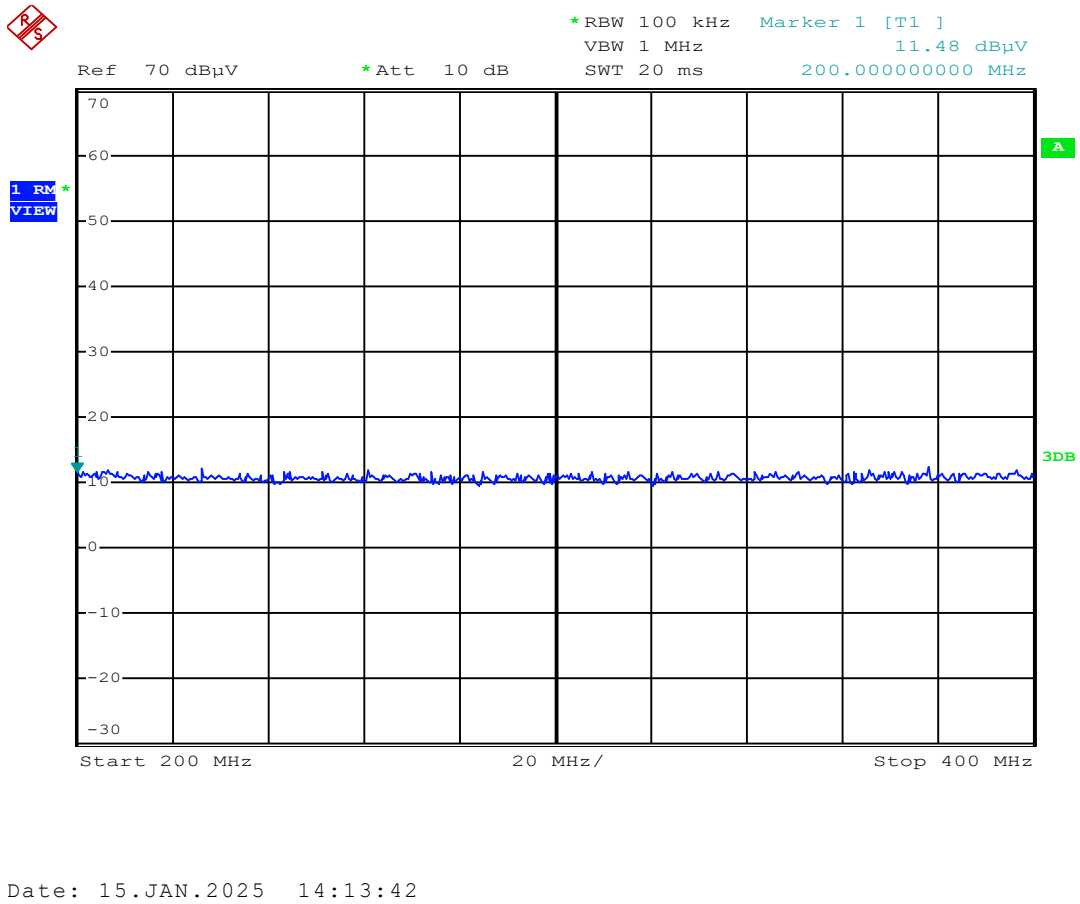
Radiated Rx Spurious Emissions:



Antenna Polarization:	**Vertical**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Plot 12.9 – Radiated Rx Emissions, Vertical, 200-400MHz

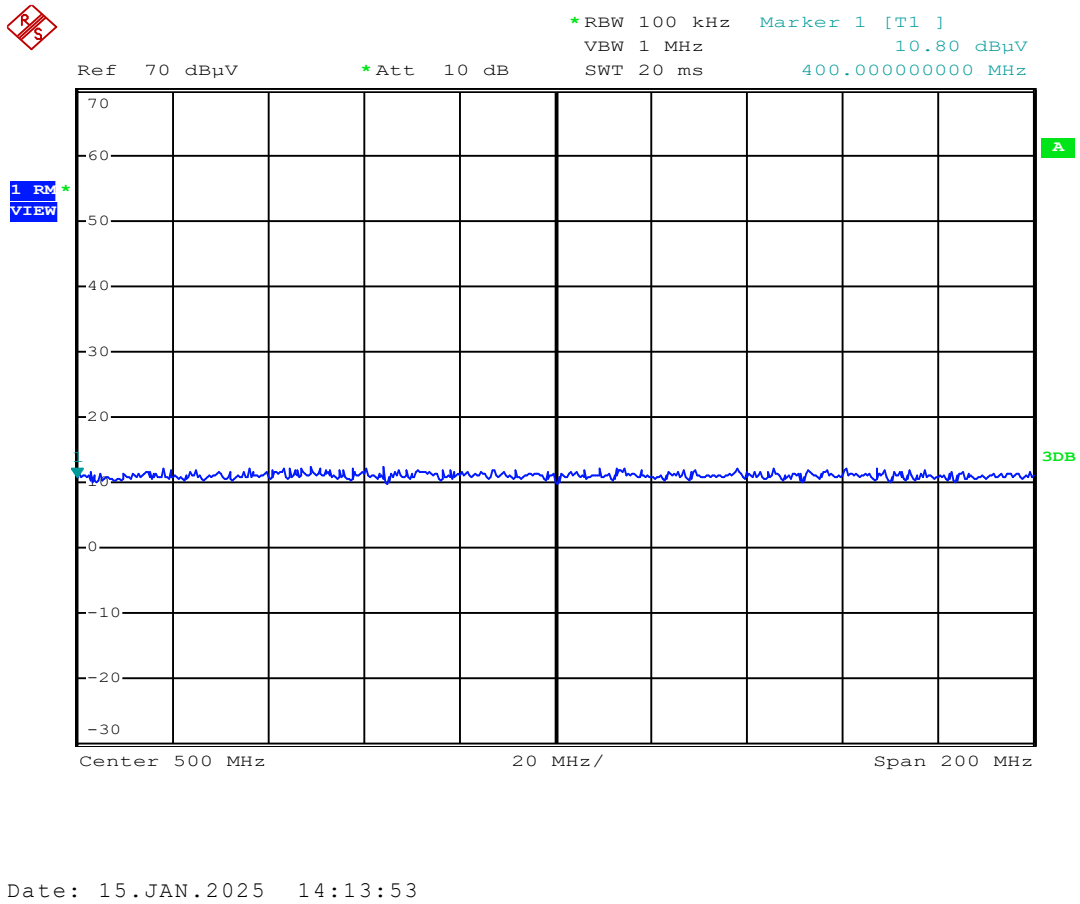
Radiated Rx Spurious Emissions:



Antenna Polarization:	**Vertical**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Plot 12.10 – Radiated Rx Emissions, Vertical, 400-600MHz

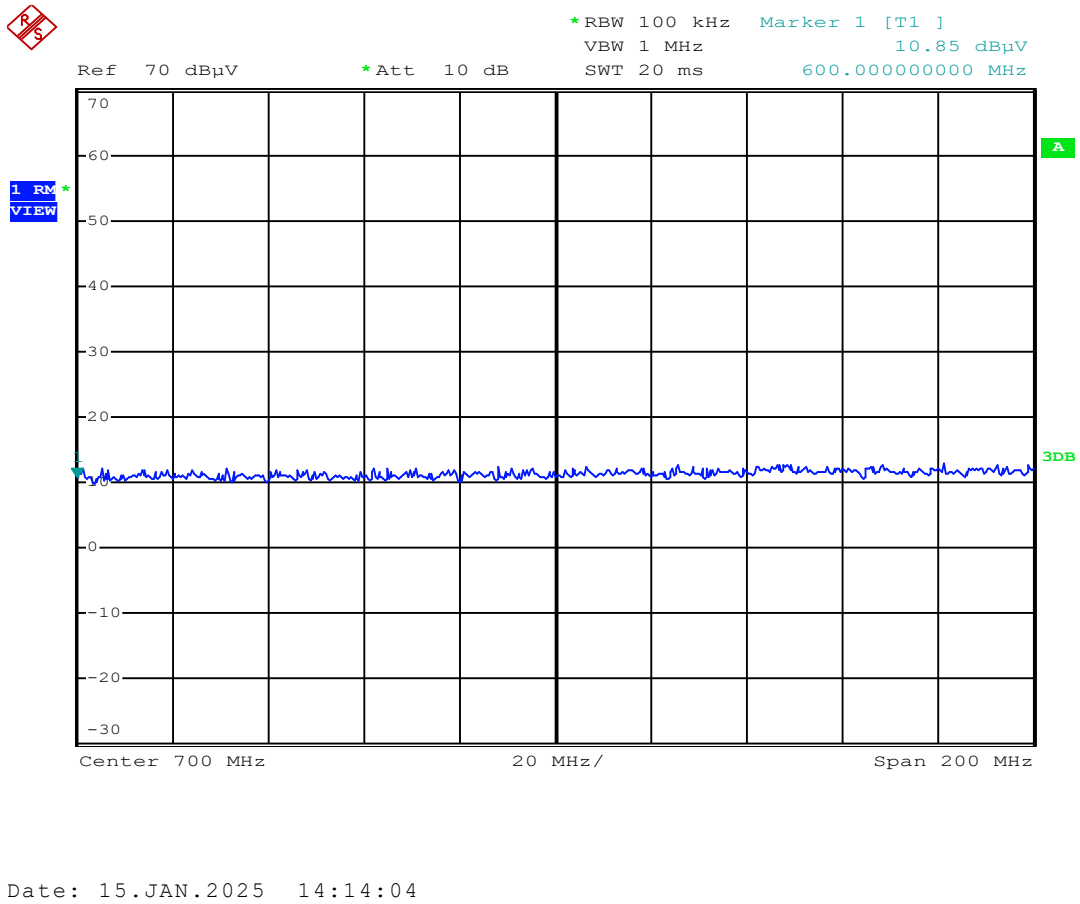
Radiated Rx Spurious Emissions:



Antenna Polarization:	**Vertical**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Plot 12.11 – Radiated Rx Emissions, Vertical, 600-800MHz

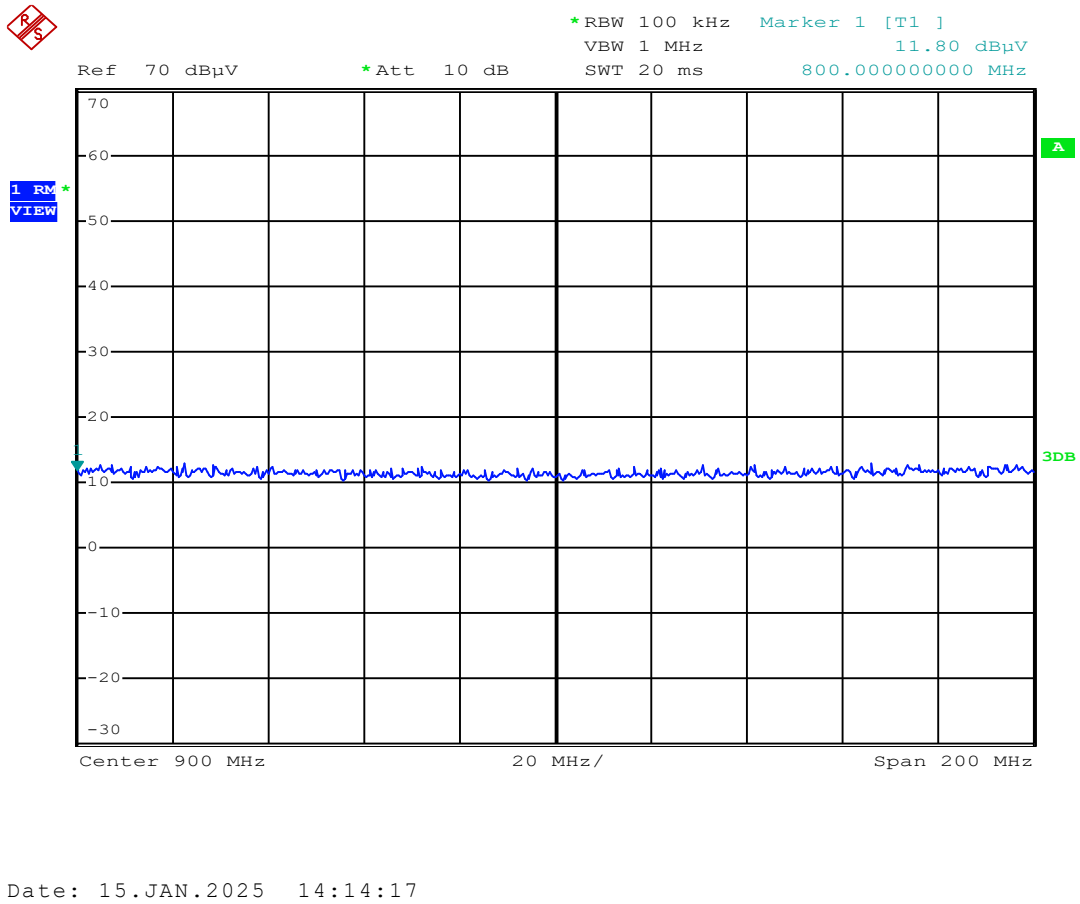
Radiated Rx Spurious Emissions:



Antenna Polarization:	**Vertical**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Plot 12.12 – Radiated Rx Emissions, Vertical, 800-1000MHz

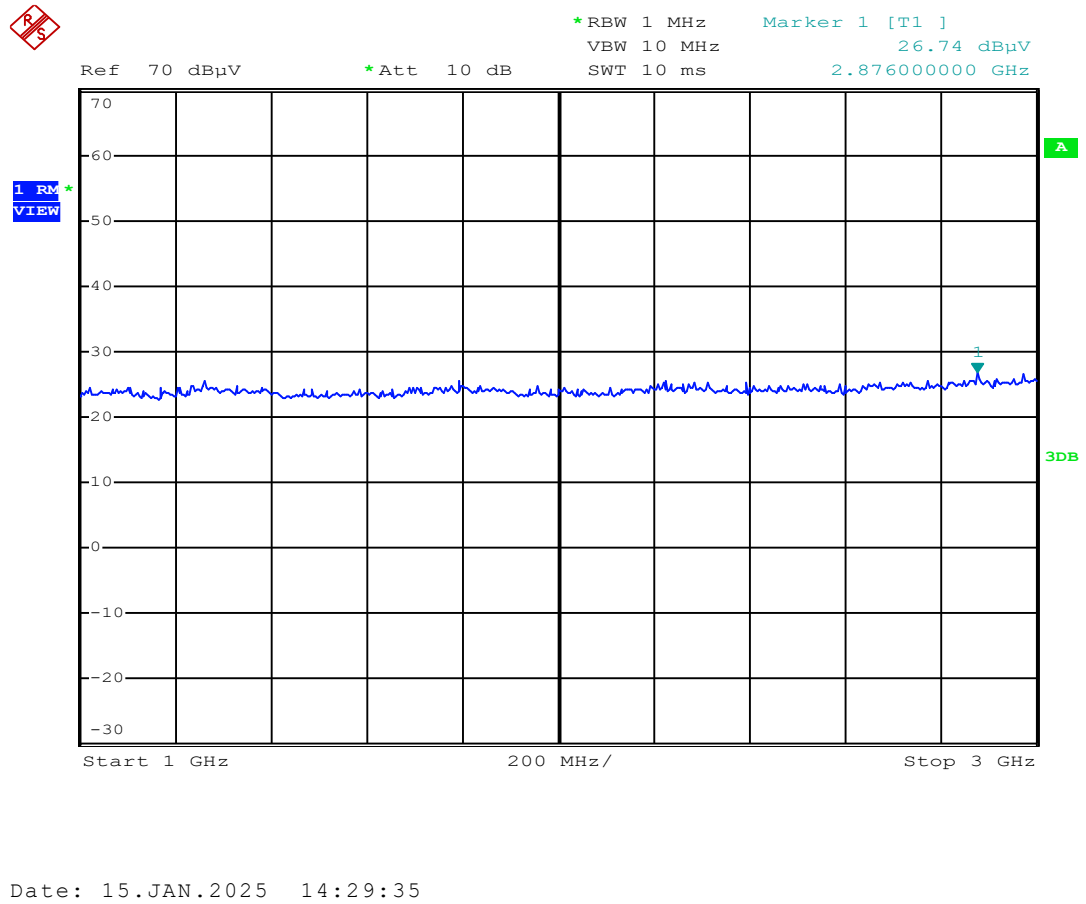
Radiated Rx Spurious Emissions:



Antenna Polarization:	**Vertical**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Plot 12.13 – Radiated Rx Emissions, Vertical, 1-3GHz

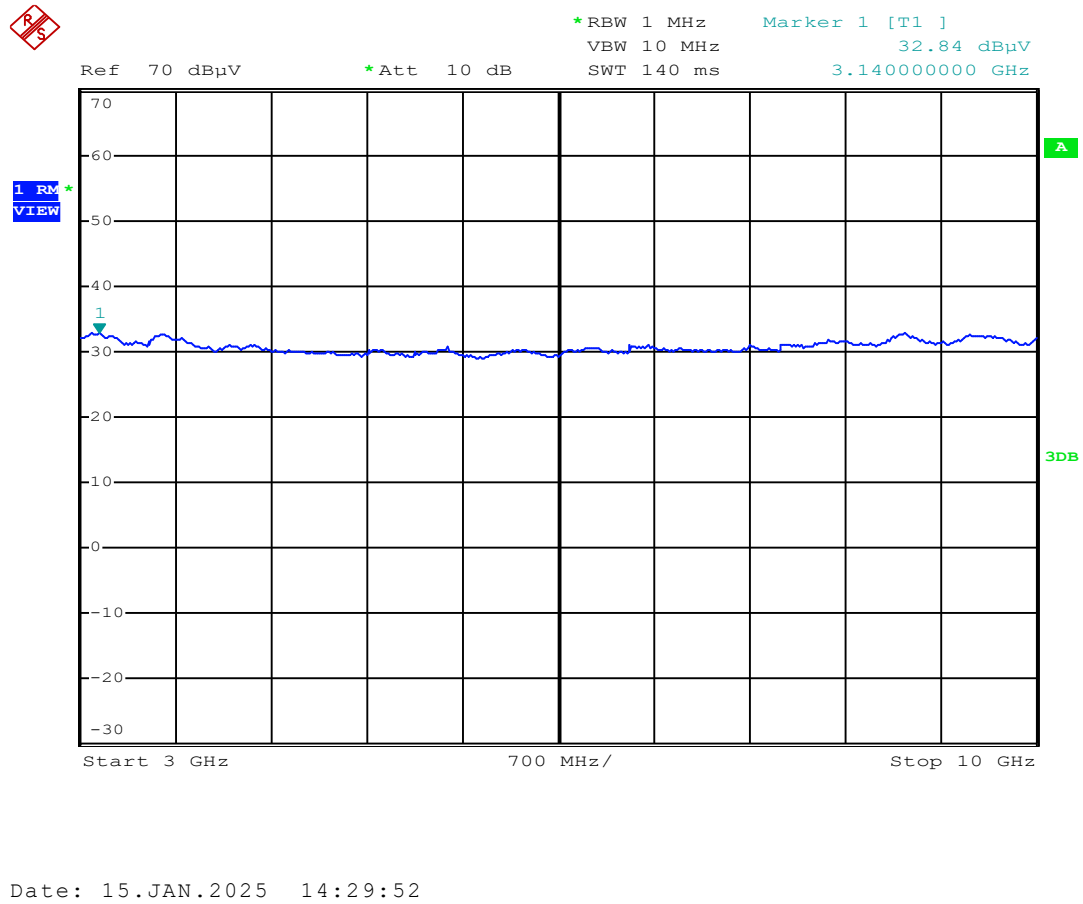
Radiated Rx Spurious Emissions:



Antenna Polarization:	**Vertical**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Plot 12.14 – Radiated Rx Emissions, Vertical, 3-10GHz

Radiated Rx Spurious Emissions:



Antenna Polarization:	**Vertical**	**Measured Emission:**	**ND** **dBuV**
Emission Frequency:	**ND** **MHz**		

Table 12.1 – Summary of Radiated Rx Emissions Measurements

Radiated Rx Spurious Emissions Measurement Results:					
Frequency (MHz)	Modulation	Emission FS [E_{Em}] (dBuV)	Emission Frequency (MHz)	Limit (dB)	Margin (dB)
n/a	n/a	ND	ND	-	n/a
			Results:	Complies	

Attenuation [Atten] = [P_{Fund}] - [P_{Em}]
Margin = Attenuation - Limit
ND = None Detected
n/a = Not Applicable

APPENDIX A – TEST SETUP DRAWINGS AND EQUIPMENT

Table A.1 – Setup - Conducted Measurements Equipment

Equipment List			
Asset Number	**Manufacturer**	**Model Number**	**Description**
00241	R&S	FSU40	Spectrum Analyzer

Figure A.1 – Test Setup Conducted Measurements

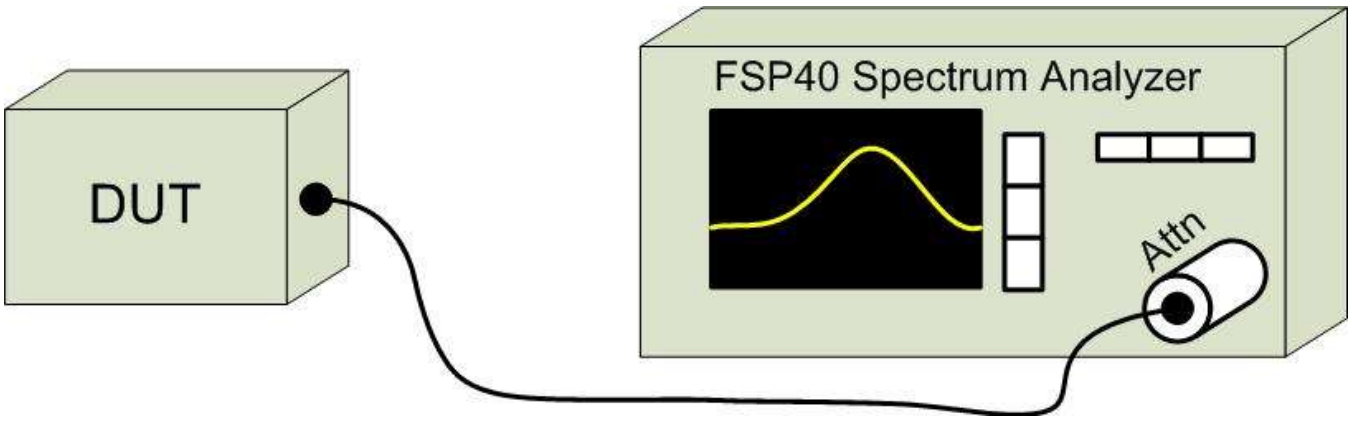


Table A.2 – Setup - Radiated Emissions Equipment

Equipment List			
Asset Number	**Manufacturer**	**Model Number**	**Description**
00072	EMCO	2075	Mini-mast
00073	EMCO	2080	Turn Table
00071	EMCO	2090	Multi-Device Controller
00241	R&S	FSU40	Spectrum Analyzer
00050	Chase	CBL-6111A	Bilog Antenna
00275	Coaxis	LMR400	25m Cable
00276	Coaxis	LMR400	4m Cable
00278	TILE	34G3	TILE Test Software
00034	ETS	3115	Double Ridged Guide Horn

CNR: Calibration Not Required
COU: Calibrate On Use

Figure A.2 – Test Setup Radiated Measurements 30MHz – 1GHz

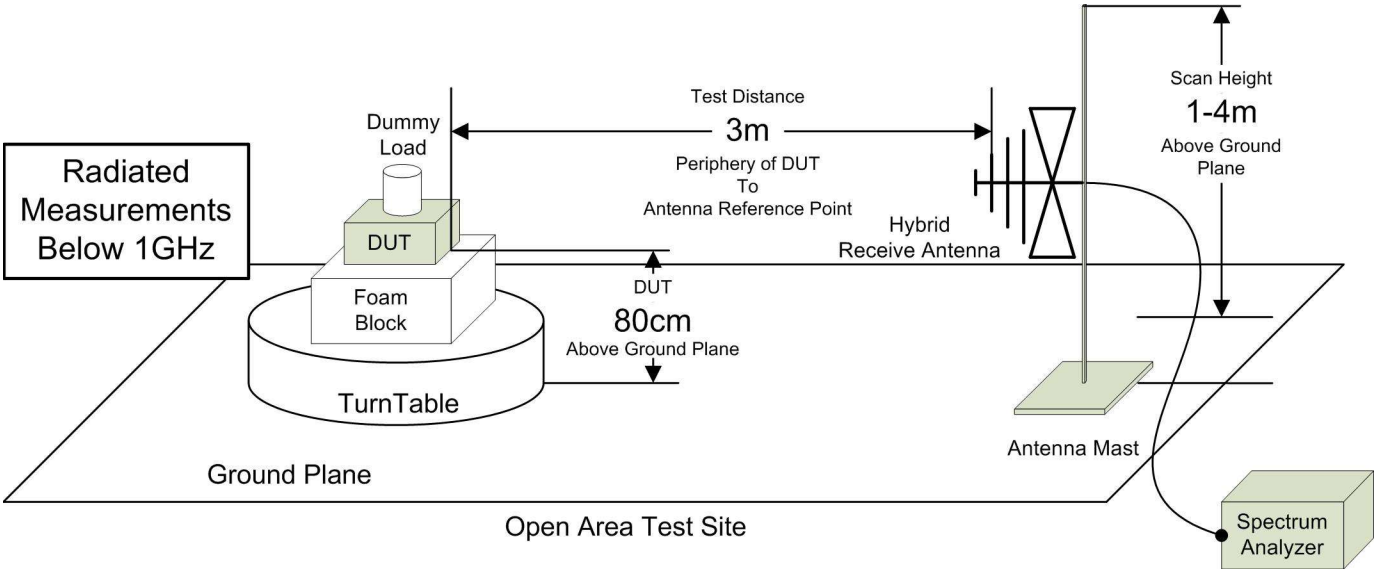


Figure A.3 – Test Setup Radiated Measurements 30MHz – 1GHz, Signal Substitution

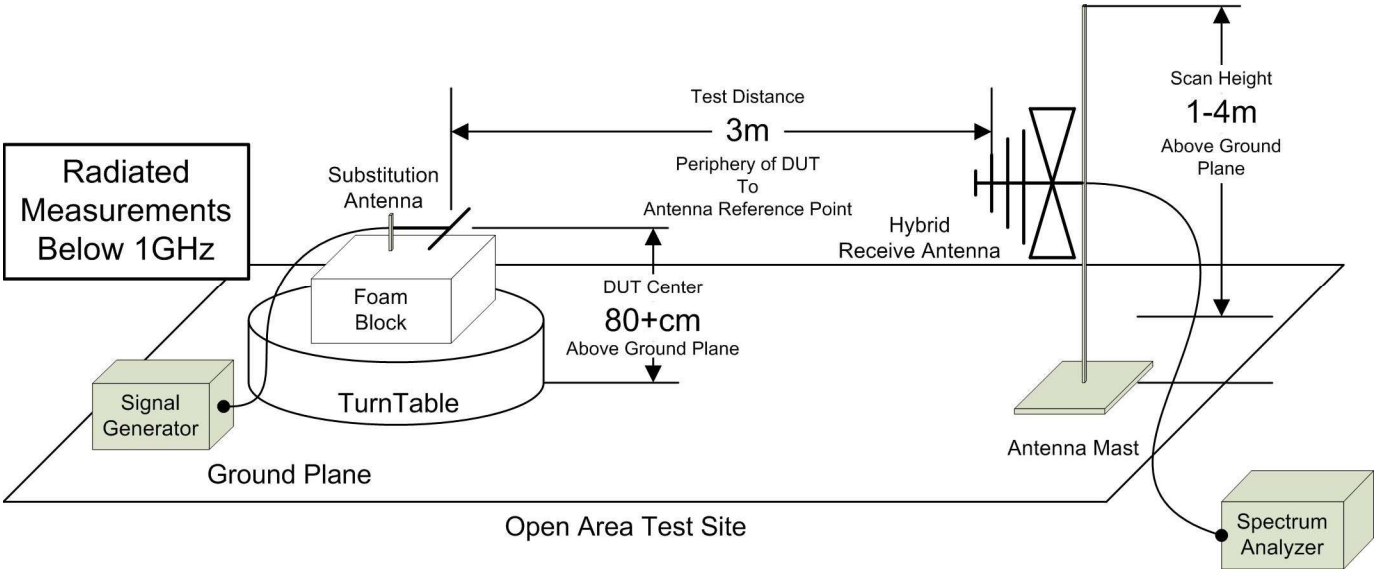
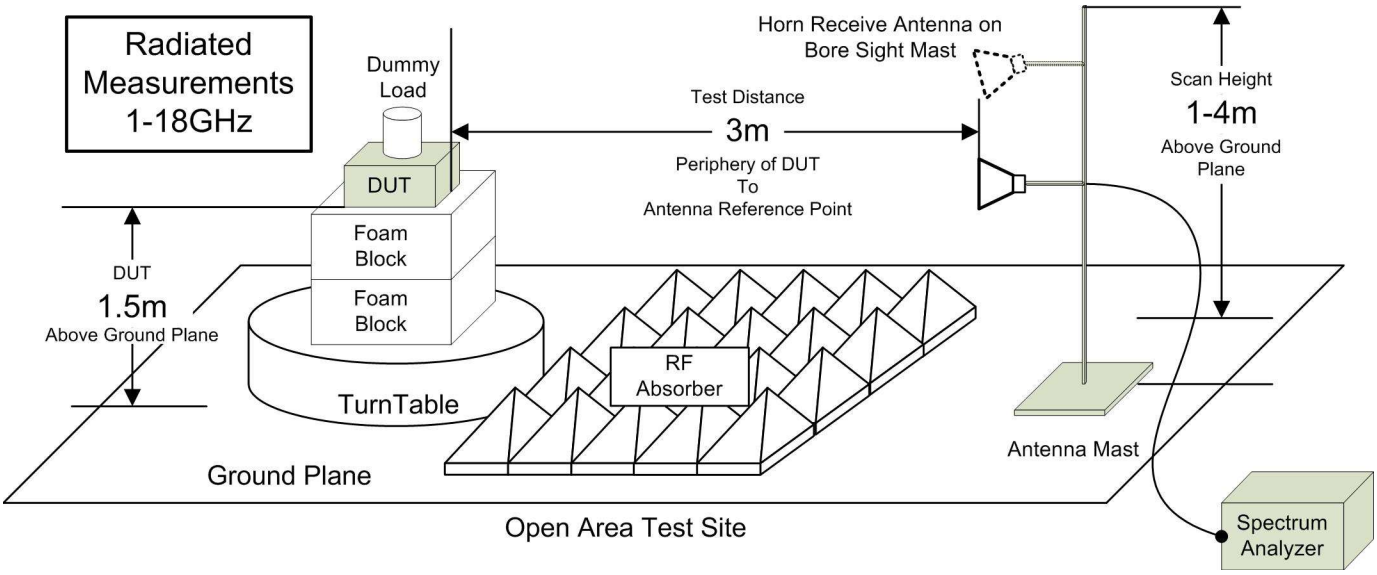


Figure A.4 – Test Setup Radiated Measurements 1 – 18GHz,



APPENDIX B – EQUIPMENT LIST AND CALIBRATION

Equipment List							
Asset Number	Manufacturer	Model Number	Serial Number	Description	Last Calibrated	Calibration Interval	Calibration Due
00050	Chase	CBL-6111A	1607	Bilog Antenna	16 Nov 2023	Triennial	16 Nov 2026
00035	ETS	3115	6276	Double Ridged Guide Horn	4 Mar 2022	Triennial	4 Mar 2025
00241	R&S	FSU40	100500	Spectrum Analyzer	6 Sep 2024	Triennial	6 Sep 2027
00250	Circuit Test	DMR-1800	TE182	Digital Multi-Meter - DVM	26 Jun 2023	Triennial	26 Jun 2026
00071	EMCO	2090	9912-1484	Multi-Device Controller	n/a	n/a	n/a
00072	EMCO	2075	0001-2277	Mini-mast	n/a	n/a	n/a
00073	EMCO	2080	0002-1002	Turn Table	n/a	n/a	n/a
00263	Koaxis	KP10-1.00M-TD	263	1m Armoured Cable	COU	n/a	COU
00263B	Koaxis	KP10-1.00M-TD	263B	1m Armoured Cable	COU	n/a	COU
00130	Pasternack	PE7019-30	n/a	30dB, 50W Attenuator	COU	n/a	COU
00275	TMS	LMR400	n/a	25m Cable	COU	n/a	COU
00278	TILE	34G3	n/a	TILE Test Software	NCR	n/a	NCR

NCR: No Calibration Required
COU: Calibrate On Use

APPENDIX C – MEASUREMENT INSTRUMENT UNCERTAINTY

CISPR 16-4 Measurement Uncertainty (U_{LAB})	
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence interval using a coverage factor of k=2	
30MHz - 200MHz	
U_{LAB} = 5.14dB U_{CISPR} = 6.3dB	
200MHz - 1000MHz	
U_{LAB} = 5.90dB U_{CISPR} = 6.3dB	
1GHz - 6GHz	
U_{LAB} = 4.80dB U_{CISPR} = 5.2dB	
6GHz - 18GHz	
U_{LAB} = 5.1dB U_{CISPR} = 5.5dB	
If the calculated uncertainty U_{lab} is **less** than U_{CISPR} then:	
1	Compliance is deemed to occur if **NO** measured disturbance exceeds the disturbance limit
2	Non-Compliance is deemed to occur if **ANY** measured disturbance **EXCEEDS** the disturbance limit
If the calculated uncertainty U_{lab} is **greater** than U_{CISPR} then:	
3	Compliance is deemed to occur if **NO** measured disturbance, increased by (U_{lab} - U_{CISPR}), exceeds the disturbance limit
4	Non-Compliance is deemed to occur if **ANY** measured disturbance, increased by (U_{lab} - U_{CISPR}), **EXCEEDS** the disturbance limit

END OF REPORT

