

**COMPLIANCE WORLDWIDE INC.
TEST REPORT 162-25**

**In Accordance with the Requirements of
FCC PART 15.247, SUBPART C
Innovation, Science and Economic Development Canada
RSS-247, Issue 3**

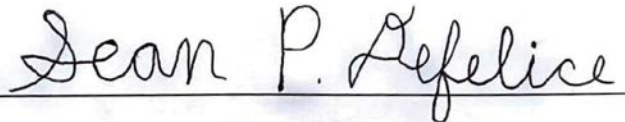
**Issued to
BLP Technologies Inc
2A Research Parkway
Wallingford, CT 06492**

**for the
Sensorworx Advanced Wireless Lighting Load Controller
with 0-10V Dimming
Model: SWX-970-D2
903-927 MHz Transmitter**

**FCC ID: 2AVRY-SWX00004
IC: 26012-SWX00004**

Report Issued on May 30, 2025

Tested by



Sean P. Defelice

Reviewed By



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1. Scope

This test report certifies that the BLP Technologies Sensorworx Advanced Lighting Load Controller, Model SWX-970-D2 as tested, meet the FCC Part 15, Subpart C and ISED Canada RSS-247, Issue 3 requirements. The scope of this test report is limited to the test samples provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated, and a retest may be required. Measurement Uncertainty will not be applied to any of the measurement / testing results in this test report to determine pass/fail criteria per the Decision Rule as defined in ISO/IEC Guide 17025-2017 Clause 3.7.

2. Product Details

2.1. Manufacturer:	BLP Technologies
2.2. Model Number:	SWX-970-D2
2.3. Serial Number:	Date Code 250312
2.4. Description:	Advanced Lighting Load Controller with 0-10V Dimming
2.5. Power Source:	120 VAC, 60 Hz
2.6. Hardware Revision:	N/A
2.7. Software Revision:	N/A
2.8. Modulation Type:	FSK
2.9. Operating Frequency:	915 MHz Nominal, 903 MHz, 915 MHz and 927 MHz tested
2.10. EMC Modifications:	None

3. Product Configuration

3.1. Operational Characteristics & Software

- Normal Operating Mode: the white led is indicating a 1 second 'on' then a 1 second 'off' heartbeat (continually). This is a visual indication that the processor is executing the test firmware successfully.
- Command Mode: the user can enter a command instruction from the 'Normal operating mode' only. Press and release the button sequentially to enter the desired command number, the blue led will illuminate feedback for each button press (the white led will remain off during this time). The processor allows a pause of 1 second between sequential button presses before interpreting the entered command. After entering a command, the processor will provide feedback for the command entered. (2) rapid white led flashes indicates the command was successfully executed, and (2) rapid blue flashes indicate the command failed.

3. Product Configuration (continued)

3.1. Operational Characteristics & Software (continued)

Commands (button pressed):

1. Stop all radio transmitters
2. Transmit continuously on Bluetooth LE Channel 37, 2402MHz (lowest)
3. Transmit continuously on Bluetooth LE Channel 17, 2440MHz (middle)
4. Transmit continuously on Bluetooth LE Channel 39, 2480MHz (highest)
5. Transmit continuously on each Bluetooth LE Channel for 1 second, then repeat sequence continuously
6. Transmit continuously on Proprietary Channel 1, 903MHz (lowest)
7. Transmit continuously on Proprietary Channel 11, 915MHz (middle)
8. Transmit continuously on Proprietary Channel 21, 927MHz (highest)

3.2. EUT Hardware

Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Freq (Hz)	Description/Function
BLP Technologies	SWX-970-D2	Date Code 250312	120	60	

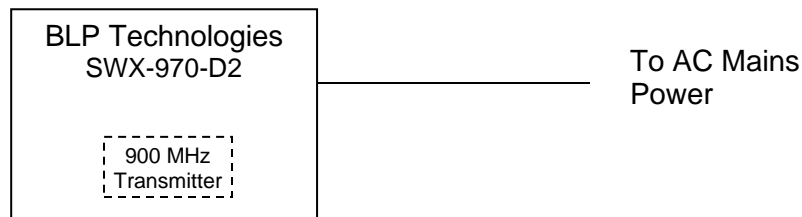
3.3. EUT Cables/Transducers

Cable Type	Length	Shield	From	To
Power Cable	2M	No	EUT	AC Mains Power

3.4. Support Equipment

Device	Manufacturer	Model	Serial No.	Comment
None				

3.5. Block Diagrams



4. Measurements Parameters

4.1 Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due	Interval
EMI Test Receiver, 9kHz - 7GHz ¹	Rohde & Schwarz	ESR7	101156	10/16/2025	4 Years
EMI Test Receiver, 10 Hz - 7GHz ¹	Rohde & Schwarz	ESR7	101770	7/23/2025	1 Year
Spectrum Analyzer, 2 Hz to 26.5 GHz ²	Rohde & Schwarz	FSW26	102057	7/19/2026	2 Years
Spectrum Analyzer, 9 kHz to 40 GHz ³	Rohde & Schwarz	FSV40	100899	6/27/2025	1 Year
Spectrum Analyzer 10 Hz – 40 GHz ⁴	Rohde & Schwarz	FSVR40	100909	9/18/2025	4 Years
Loop Antenna 9 kHz - 30 MHz	EMCO	6512	9309-1139	4/14/2026	4 Years
Biconilog Antenna, 30 MHz - 2 GHz	Sunol Sciences	JB1	A050913	7/1/2025	4 Years
Dbl Ridged Guide Antenna 1- 18 GHz	ETS-Lindgren	3117	00143292	5/11/2026	4 Years
Dbl Ridged Guide Antenna 1- 18 GHz	ETS-Lindgren	3117	00227631	4/21/2026	4 Years
Preamplifier, 1 GHz to 26.5 GHz	Hewlett Packard	8449B	3008A01323	4/9/2026	2 Years
Preamplifier, 1 GHz to 26.5 GHz	Hewlett Packard	8449B H02	3008A00329	4/9/2026	2 Years
1.8 GHz - 9.3 GHz Passband Filter	Mini-Circuits	VHP-16	0341	2/27/2026	2 Years
Barometric Pressure/Humidity & Temp Datalogger	Extech Instruments	SD700	Q590483	4/4/2026	2 Years

¹ ESR7 Firmware revision: V3.48 SP3, Date installed: 09/30/2020

² FSW26 Firmware revision: V4.71 SP1, Date installed: 11/16/2020

³ FSV40 Firmware revision: V2.30 SP4, Date installed: 05/04/2016

⁴ FSVR40 Firmware revision: V2.23 SP1, Date installed: 08/19/2016

Previous V3.48 SP2, installed 07/23/2020.

Previous V4.61, installed 08/11/2020.

Previous V2.30 SP1, installed 10/22/2014.

Previous V2.23, installed 10/22/2014.

4.2. Measurement Software

Manufacturer	Software Description	Title or Model #	Rev.	Report Sections
Compliance Worldwide	Test Report Generation Software	Test Report Generator	1.0	Not required for this product

4.3. Measurement & Equipment Setup

Test Dates: 4/4/2025, 5/5/2025, 5/6/2025, 5/7/2025

Test Engineers: Sean Defelice

Normal Site Temperature (15 - 35°C): 17.5

Relative Humidity (20 -75% RH): 48

Frequency Range: 32 kHz to 10 GHz

Measurement Distance: 3 Meters

EMI Receiver IF Bandwidth: 200 Hz – 9 kHz to 150 kHz
9 kHz – 150 kHz to 30 MHz
120 kHz – 30 MHz to 1 GHz
1 MHz – Above 1 GHz

EMI Receiver Avg Bandwidth: $\geq 3 * RBW$

Detector Function: Peak, QP - 150 kHz to 1 GHz
Peak, Avg - Above 1 GHz
Unless otherwise specified.

4. Measurements Parameters (continued)

4.4. Measurement Procedures

Test measurements were made in accordance FCC Part 15.247: Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5850 MHz, and 24.0 - 24.25 GHz.

The measurement procedures in this report are in accordance with ANSI C63.10-2013: *American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices*. FCC OET Publication Number KDB 558074 D01 v05r02, *Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS)*, Frequency Hopping Spread Spectrum Systems, and Hybrid System Devices *Operating Under §15.247*, dated April 2, 2019 and ISED RSS-247, Issue 3, *Digital Transmission Systems (DTSS)*, Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices, was also referenced for the test procedures used to generate the data in this report.

All references to these publications refer to these versions and dates detailed in this paragraph.

4.5. Measurement Uncertainty

The following uncertainties are expressed for an expansion/coverage factor of K=2.

RF Frequency	$\pm 1 \times 10^{-8}$
Radiated Emission of Transmitter	± 4.55 dB
Radiated Emission of Receiver	± 4.55 dB
Temperature	$\pm 0.91^{\circ}$ C
Humidity	$\pm 5\%$

5. Choice of Equipment for Test Suits

5.1 Choice of Model

This test report is based on the test samples supplied by the manufacturer and are reported by the manufacturer to be equivalent to the production units.

5.2 Presentation

This test sample was tested complete with all required ancillary equipment. Refer to Section 3 of this report for product equipment configuration.

5.3 Choice of Operating Frequencies

The EUT, as tested, operates on 21 channels in the 902 MHz to 928 MHz band.

In accordance with ANSI C63.10-2013, section 5.6, and FCC Part 15.31 (m), the choice of operating frequencies selected for the testing detailed in this report are outlined in the following table:

Channel	Frequency	Channel	Frequency	Channel	Frequency
1	903.0	8	911.4	15	919.8
2	904.2	9	912.6	16	921.0
3	905.4	10	913.8	17	922.2
4	906.6	11	915.0	18	923.4
5	907.8	12	916.2	19	924.6
6	909.0	13	917.4	20	925.8
7	910.2	14	918.6	21	927.0

5.4 EUT Position for Emissions Measurements

During all radiated mode measurement testing, the EUT was mounted on a polystyrene foam to simulate the device being wall mounted.

6. Measurement Summary

Test Requirement	FCC Rule Requirement	ISED Rule Requirement	Test Report Section	Result
Antenna Requirement	15.203	---	7.1	Compliant
Minimum DTS Bandwidth	15.247 (a) (2)	RSS-247 5.2 (a)	7.2	Compliant
Maximum Peak Conducted Output Power	15.247 (b) (1)	RSS-247 5.4 (d)	7.3	Compliant
Operation with directional antenna gains greater than 6 dBi	15.247 (b) (4)	---	7.4	Compliant
Spurious Radiated Emissions	15.247 (d)	RSS-GEN 6.13	7.5	Compliant
Spurious Radiated Emissions (> GHz) - Harmonic Measurements	15.247 (d)	RSS-GEN 6.13		Compliant
Band Edge Measurements	15.247 (d)	RSS-GEN 6.13	7.6	Compliant
Emissions in Non-restricted Frequency Bands	15.247(e)	RSS-GEN 6.13	7.7	Compliant
Peak Power Spectral Density	15.247(e)	RSS-247 5.2 (b)	7.8	Compliant
AC Power Line Conducted Emissions	15.207	RSS-GEN 7.2	7.9 7.10	Compliant
Duty Cycle	15.247	N/A	7.11	Compliant
99% (Occupied) Bandwidth	---	RSS-GEN 6.7	7.12	Compliant
Public Exposure to Radio Frequency Energy Levels	1.1307 (b) (1)	RSS-GEN, Issue 5, Section 3.4, RSS 102	7.11	Compliant

7. Measurement Data

7.1. Antenna Requirement (15.203)

Requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section.

Results: The EUT utilizes a surface mount Johanson Technology 0915AT43A0026E chip antenna that is not user replaceable.

7. Measurement Data

7.2. Minimum DTS Bandwidth (15.247 (a) (2), ISED RSS-247 5.2 (a))

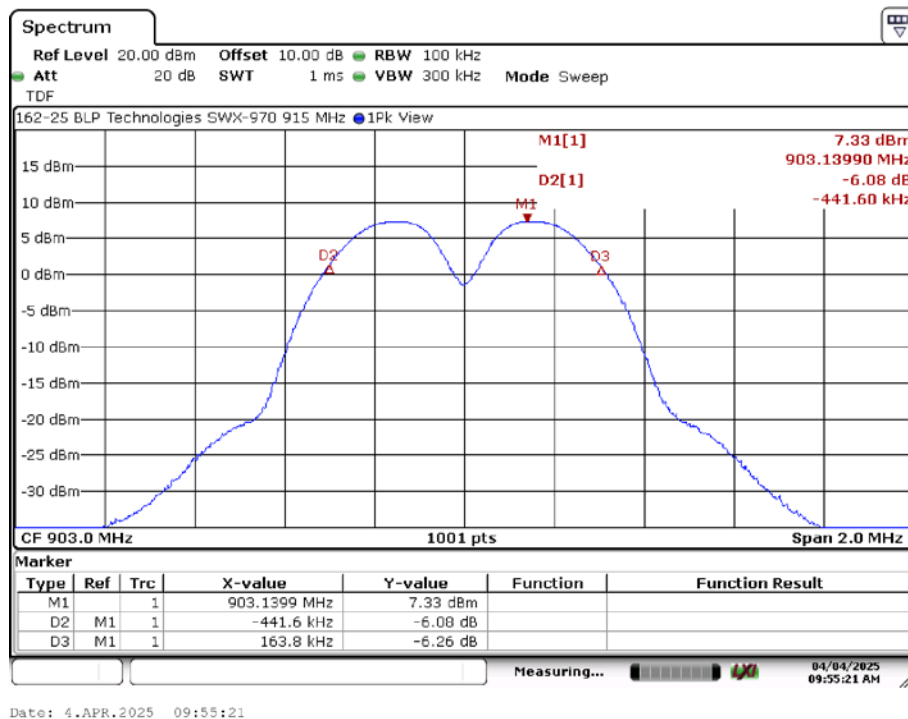
Requirement: Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Procedure: This test was performed in accordance with the procedure detailed in ANSI C63.10:2013 Clause 11.8.1 DTS Bandwidth Option 1.

Results: The device under test meets the minimum 500 kHz DTS (6 dB) bandwidth requirement.

Channel	Frequency (MHz)	-6 dB Bandwidth (kHz)	Minimum -6 dB Bandwidth (kHz)	Result
1	903	588.60	>500	Compliant
11	915	586.68	>500	Compliant
21	927	585.88	>500	Compliant

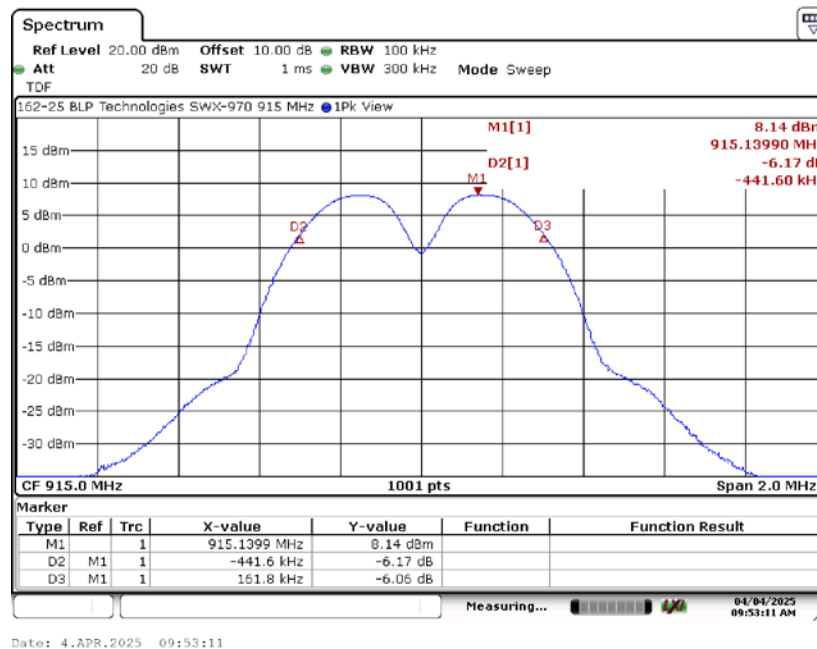
7.2.1. Low Channel – 1, 903 MHz



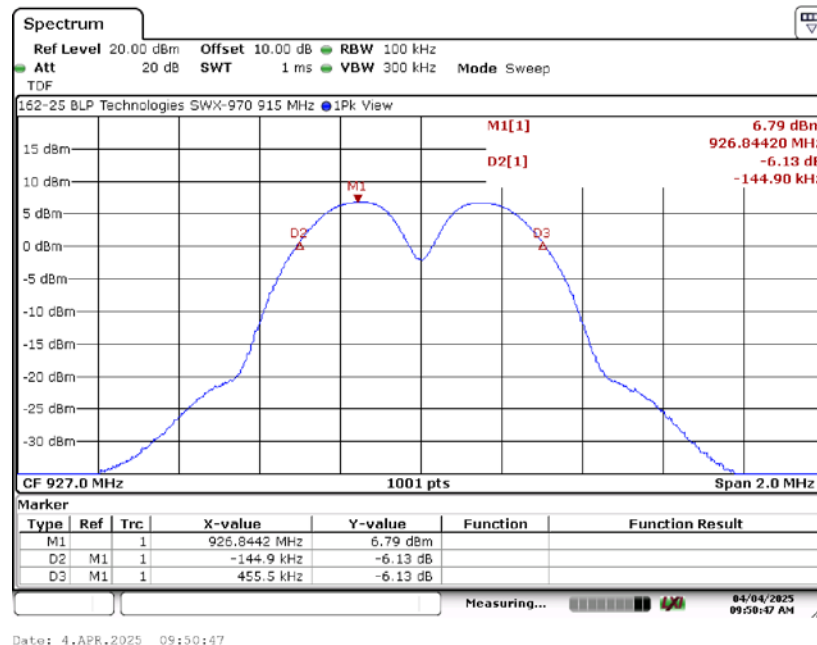
7. Measurement Data

7.2. Minimum DTS Bandwidth (15.247 (a) (2), ISED RSS-247 5.2 (a)) (continued)

7.2.2. Middle Channel – 11, 915 MHz



7.2.3. High Channel – 21, 927 MHz



7. Measurement Data (continued)

7.3. Maximum Conducted Output Power (FCC 15.247 (b)(3), ISSED RSS-247 5.4 (d))

Requirement: The maximum peak conducted output power of the intentional radiator shall not exceed the following: For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt (+30 dBm).

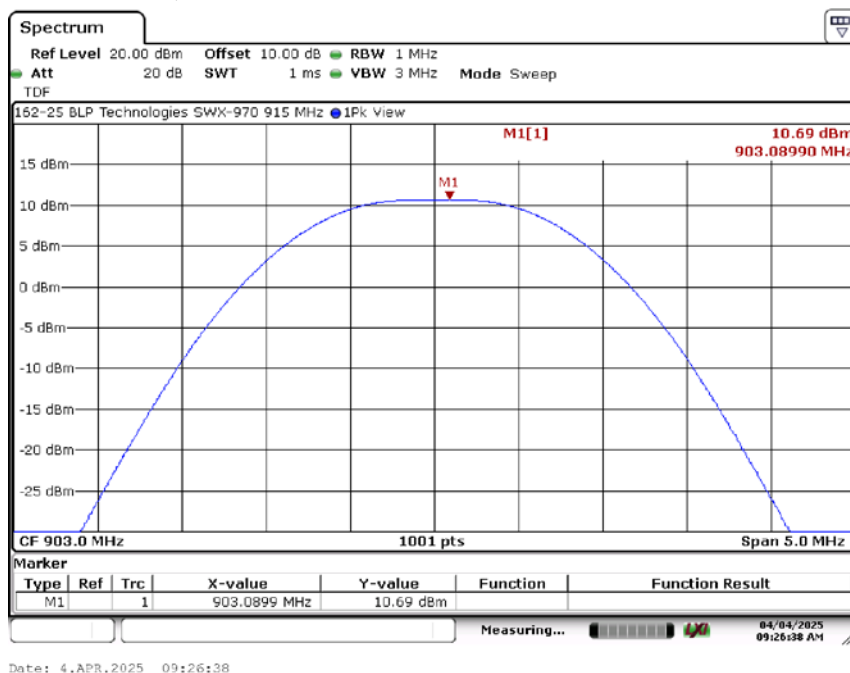
Procedure: This test was performed in accordance with the procedure detailed in ANSI C63.10:2013 Clause 11.9.1.1

Test Note: A spectrum analyzer resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz were used to meet the requirements ANSI C63.10:2013 Clause 11.9.1.1 RBW ≥ DTS bandwidth.

Results: The device under test meets the required maximum peak conducted output power level of 1 Watt (30 dBm).

Channel	Frequency	Maximum Peak Conducted Output Power	Peak Limit	Margin	Result
	(MHz)	(dBm)	(dBm)	(dB)	
1	903	10.69	30	-19.31	Compliant
11	915	11.57	30	-18.43	Compliant
21	927	10.18	30	-19.82	Compliant

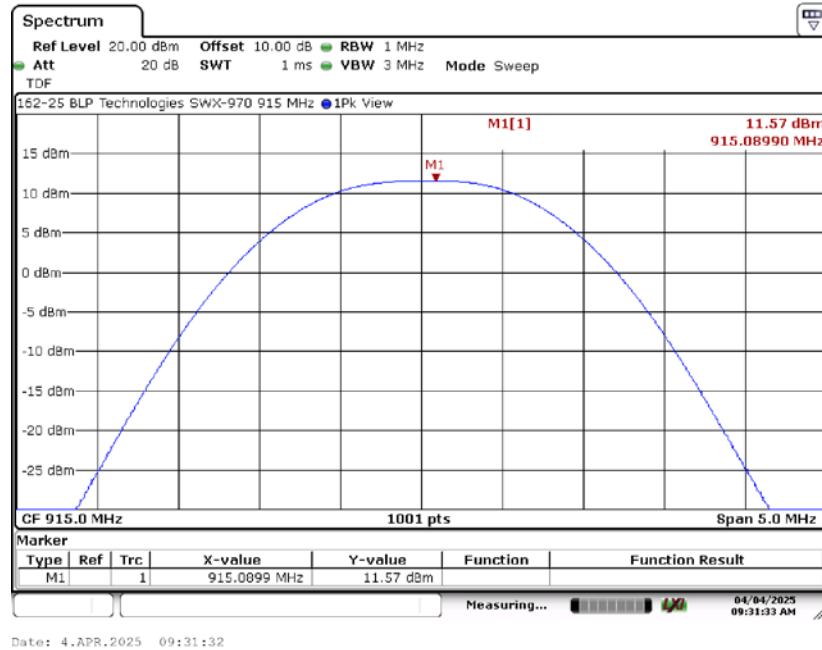
7.3.1. Low Channel – 1, 903 MHz



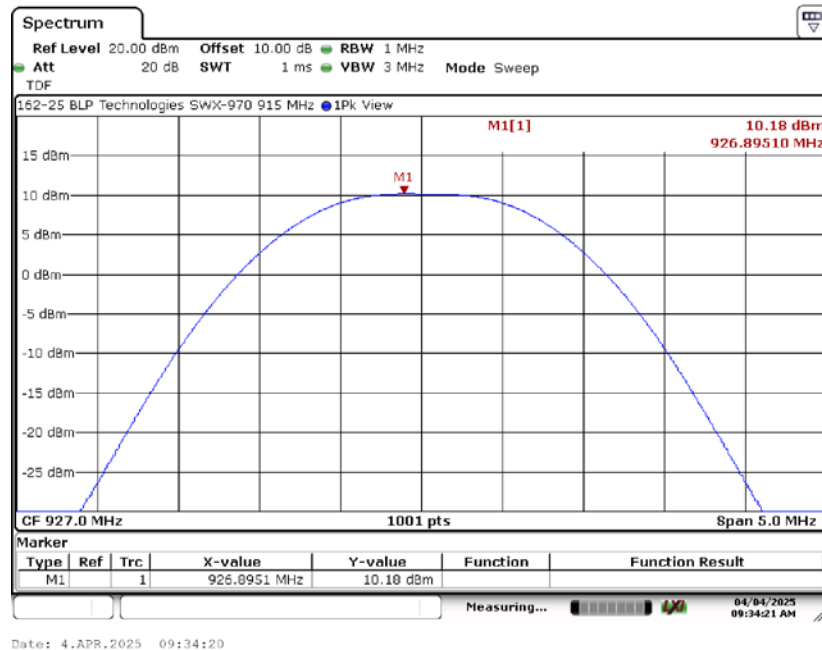
7. Measurement Data

7.3. Maximum Peak Conducted Output Power (continued)

7.3.2. Middle Channel – 11, 915 MHz



7.3.3. High Channel – 21, 927 MHz



7. Measurement Data

7.4. Operation with directional antenna gains greater than 6 dBi (15.247 (b)(4))

Requirement: If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of FCC Part 15.247, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400 – 2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Procedure: Not applicable for the device under test.

Result: The EUT a Johanson Technology 0915AT43A0026E chip antenna with a peak gain of -1.0 dBi and therefore is exempt from this requirement.

7. Measurement Data (continued)

7.5. Transmitter Spurious Radiated Emissions (32 kHz to 9.4 GHz) (FCC 15.209, ISED RSS-GEN 6.13)

7.5.1 Transmitter Spurious Radiated Emissions

Requirement: The Emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency Range (MHz)	Distance (Meters)	Limit (dBμV/m) ¹
0.009 to 0.490	3	128.5 to 93.8
0.490 to 1.705	3	73.8 to 63.0
1.705 to 30	3	69.5
30 to 88	3	40.0
88 to 216	3	43.5
216 to 960	3	46.0
>960	3	54.0

¹Measurements in the 9 to 90 kHz, 110 to 490 kHz and above 1000 MHz ranges employ an average detector. Otherwise, a quasi-peak detector is used.

Procedure: This test was performed in accordance with the procedure detailed in FCC OET publication number 558074, Section 8.6: DTS Emissions in restricted frequency bands and FCC 47CFR Part 15.209: Radiated Emission Limits; General Requirements.

The test methods used to generate the data in this test report is in accordance with ANSI C63.10:2013, Section 11.12 American National Standard for Testing Unlicensed Wireless Devices.

Test Notes: Measurements were made from the lowest oscillator frequency (32.768 kHz) to the 10th harmonic of the highest transmitter frequency (9270 MHz) Reference FCC Part 15.33(a) and FCC Part 15.33(a)(1).

The spurious radiated emissions scans used for the following tables can be found in Appendix A.

Results: Compliant. The emissions from EUT did not exceed the field strength levels specified in the above table. Reference the tables on the following page.

Sample Calculation: Final Result (dBμV/m) = Measurement Value (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) – Pre-amplifier Gain (dB) Internal or External.

Note: All correction factors are loaded into the measurement instrument prior to testing to determine the final result.

7. Measurement Data (continued)

7.5. Transmitter Spurious Radiated Emissions (32 kHz to 9.4 GHz) (FCC 15.209, ISED RSS-GEN 6.13)

7.5.1 Transmitter Spurious Radiated Emissions

Frequency Range	Worst-Case Measured Frequency	Field Strength	FCC Part 15.209 Limit	Margin	Reference	Receive Antenna Polarity
	(MHz)	(dBμV/m)	(dBμV/m)	(dB)	Appendix A	(H/V)
30 kHz - 150 kHz	0.0323	70.60	117.41	-46.81	A1.2.1	Parallel
150 kHz - 30 MHz	0.1500	61.70	104.08	-42.38	A2.2.2	Perpendicular
30 MHz - 1000 MHz	802.65	33.56	46.00	-12.44	A3.1.1	H
1000 MHz - 9400 MHz	1830.40	46.07	54.00	-7.93	A4.2.2	V

7. Measurement Data (continued)

7.5. Transmitter Spurious Radiated Emissions (32 kHz to 10 GHz) (FCC 15.209, ISED RSS-GEN 6.13)

7.5.2. Transmitter Spurious Radiated Emissions (Harmonic Meas.) Test Results

Worst case measurements of Harmonics that fall into the restricted bands.

Freq. (MHz)	Field Strength (dB μ V/m) ¹		Limit (dB μ V/m)		Margin (dB μ V/m)		Antenna Polarity (H/V)	Result
	Peak	Average	Peak	Average	Peak	Average		
2709.00	49.28	37.90	74.00	54.00	-24.72	-16.10	V	Compliant
2745.00	48.24	35.33	74.00	54.00	-25.76	-18.67	V	Compliant
2781.00	49.11	35.90	74.00	54.00	-24.89	-18.10	H	Compliant
3612.00	52.86	39.90	74.00	54.00	-21.14	-14.10	H	Compliant
3660.00	52.82	38.97	74.00	54.00	-21.18	-15.03	V	Compliant
3708.00	51.30	38.47	74.00	54.00	-22.70	-15.53	V	Compliant
4515.00	52.51	39.37	74.00	54.00	-21.49	-14.63	V	Compliant
4575.00	49.64	37.71	74.00	54.00	-24.36	-16.29	V	Compliant
4635.00	49.48	37.36	74.00	54.00	-24.52	-16.64	V	Compliant
5418.00	51.51	38.38	74.00	54.00	-22.49	-15.62	H	Compliant
7320.00	53.06	41.22	74.00	54.00	-20.94	-12.78	V	Compliant
7416.00	53.46	41.22	74.00	54.00	-20.54	-12.78	V	Compliant
8127.00	55.97	43.62	74.00	54.00	-18.03	-10.38	H	Compliant
8235.00	55.69	43.55	74.00	54.00	-18.31	-10.45	H	Compliant
8343.00	55.34	43.36	74.00	54.00	-18.66	-10.64	H	Compliant
9030.00	53.11	40.68	74.00	54.00	-20.89	-13.32	H	Compliant
9150.00	53.00	40.84	74.00	54.00	-21.00	-13.16	V	Compliant

¹ All correction factors are stored in the spectrum analyzer and applied to these column entries.

7. Measurement Data (continued)

7.6. Band Edge Measurements (FCC 15.209, ISSED RSS-247 5.5)

Requirement: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Procedure: For the lower and upper band edges, the measurements were performed in accordance with the procedure detailed in FCC OET publication number 558074, Section 8.5: DTS Emissions in non-restricted frequency bands.

The test methods used to generate the data in this test report is in accordance with ANSI C63.10:2013, Section 11.11 American National Standard for Testing Unlicensed Wireless Devices.

Test Note: Measurements performed were conducted mode measurements.

Results: The DUT met the 20 dB requirement at the lower band edge and the Part 15.209 requirements at the upper band edge.

7.6.1. Lower Band Edge

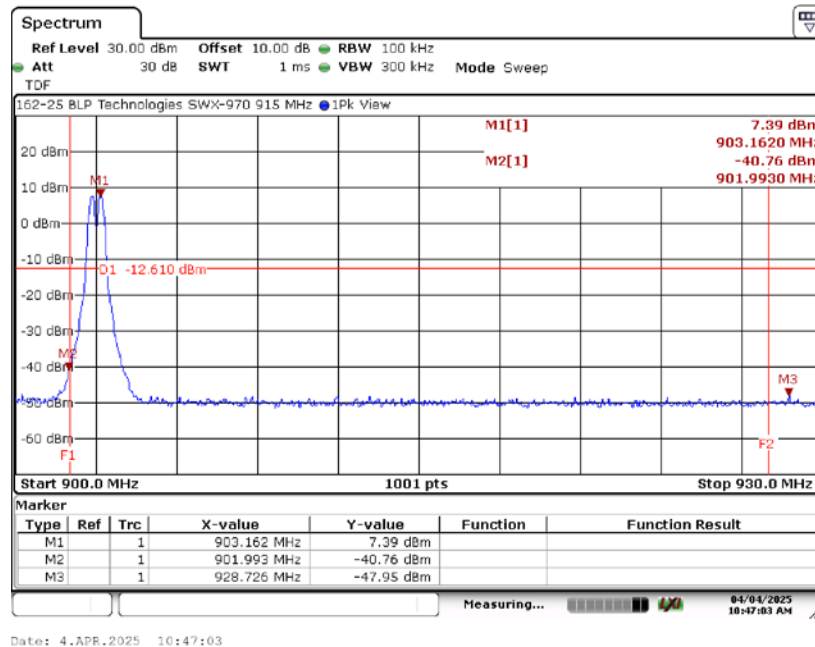
Band Edge Frequencies	Lower & Upper Transmitter Frequency	Maximum PSD (100 kHz)	Band Edge Delta to Max PSD (100 kHz)	Minimum Required Delta	Result
(MHz)	(MHz)	(dB/m)	(dB)	(dB)	
902	903	7.39	-40.76	-20	Compliant
928	927	7.10	-41.17	-20	Compliant

Note: Reference the plots on the following page.

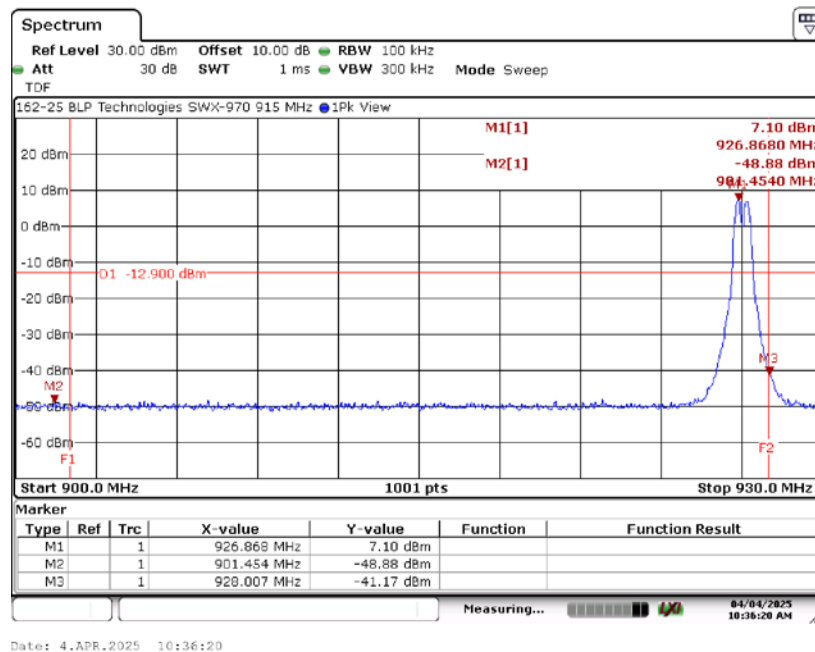
7. Measurement Data (continued)

7.6. Band Edge and Out of Band Measurements (continued)

7.6.2. Lower Band Edge



7.6.3. Upper Band Edge



7. Measurement Data (continued)

7.7. Emissions in Non-restricted Frequency Bands

Requirement: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Notes: Peak in-band measurements were taken at the time the DTS (-6 dB) bandwidth measurements were made. These values were used as the reference levels for the following measurements. Refer to section 7.2 of this report for these values.

Reference Appendix B for the measurement data used for this test section.

Results: The DUT met the 20 dB requirement emission level delta requirement in the non restricted frequency bands.

7.7.1. Worst Case Emission in Non-restricted Frequency Bands

Maximum PSD (100 kHz) In-Band (dBm)	Worst Case Out-of-Band Frequency (MHz)	Maximum PSD (100 kHz) Out-of-Band (dBm)	Delta to Maximum PSD (dB)	Minimum Required Delta (dBm) Level	Result	Reference Appendix B
8.14	901.975	-42.09	-45.35	-11.86	Compliant	B1.1

¹Taken from Section 7.2 - DTS Bandwidth

7. Measurement Data (continued)

7.8. Peak Power Spectral Density (FCC 15.247(e), ISED RSS-247, 5.2 b))

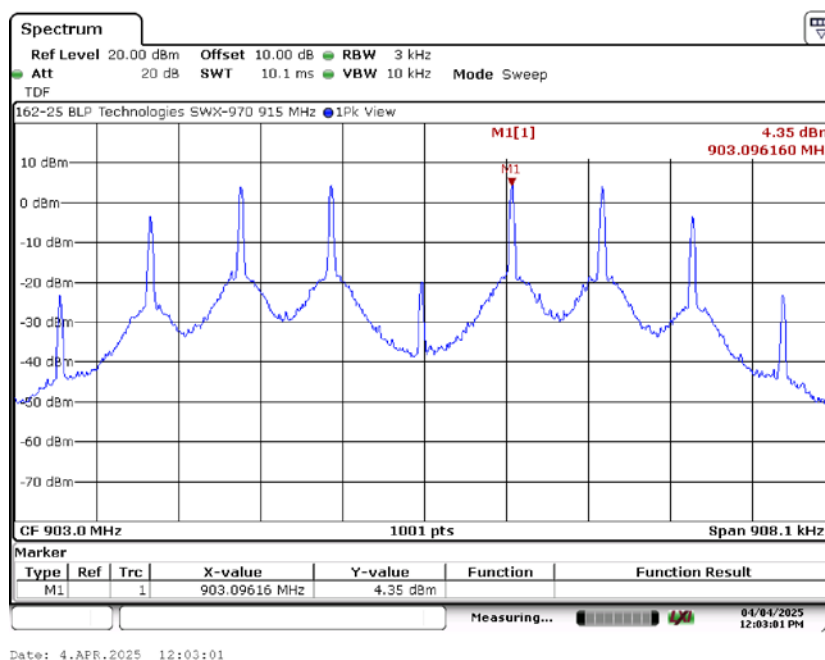
Requirement: For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of FCC Part 15.247. The same method of determining the conducted output power shall be used to determine the power spectral density.

Procedure: FCC OET publication number 558074, Section 8.5: DTS maximum power spectral density level in the fundamental emission using the method in ANSI C63.10:2013 Clause 11.10.2 PKPSD (peak PSD).

Results: The DUT met the required power spectral density limit at the tested frequencies.

Channel	Frequency	Maximum PSD Frequency	Maximum Power Spectral Density	Limit	Margin	Result
	(MHz)	(MHz)	(dBm)	(dBm)	(dB)	
1	903	903.09616	4.35	8	-3.65	Compliant
11	915	915.09675	5.17	8	-2.83	Compliant
21	927	926.89649	3.96	8	-4.04	Compliant

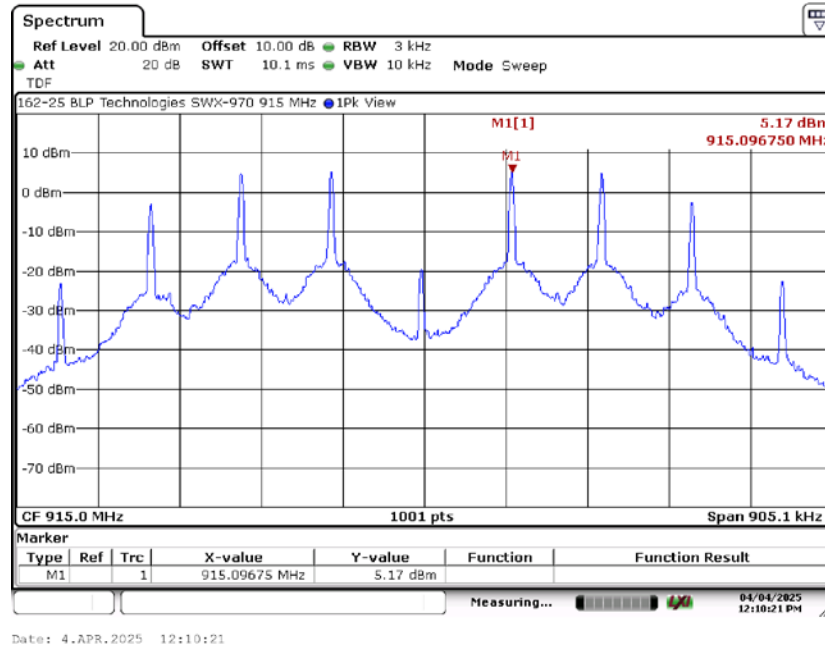
7.8.1. Low Channel – 1, 903 MHz



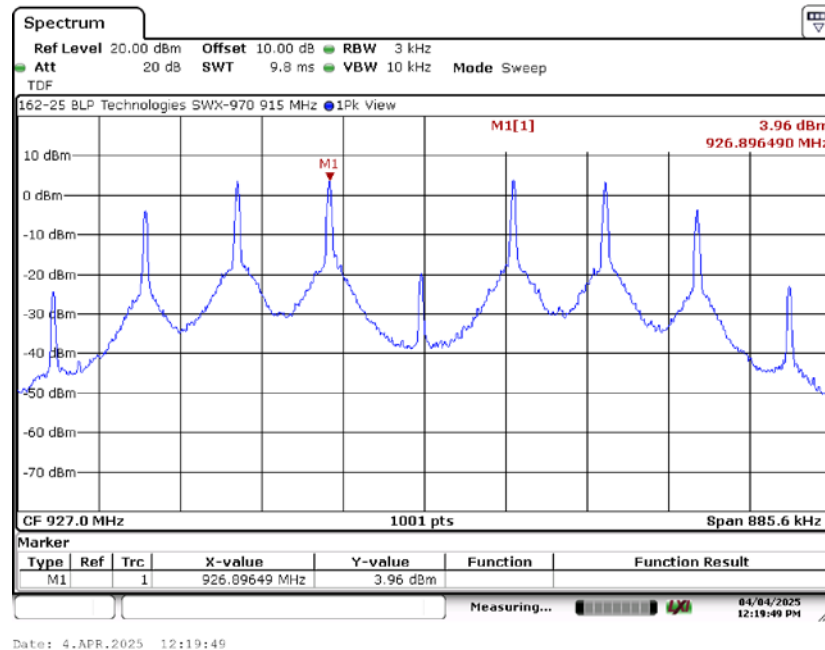
7. Measurement Data

7.8. Peak Power Spectral Density (15.247(e), ISED RSS-247, 5.2 b)) (continued)

7.8.2. Middle Channel – 11, 915 MHz



7.8.3. High Channel – 21, 927 MHz



7. Measurement Data (continued)

7.9. Conducted Emissions (FCC Part 15.207, RSS-GEN 7.2)

Requirement: With certain exceptions, an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-Peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5.0	56	46
5.0 to 30.0	60	50
* Decreases with the logarithm of the frequency.		

Procedure: This test was performed in accordance with the procedure detailed in ANSI C63.10-2013, Section 6.2: Standard test method for ac powerline conducted emissions from unlicensed wireless devices.

Results: The device under test meets the FCC Part 15.207 test requirements.

Measurement & Equipment Setup

Test Date: 5/16/2025
 Test Engineer: Sean Defelice
 Site Temperature ($^{\circ}$ C): 21.5
 Relative Humidity (%RH): 52
 Frequency Range: 0.15 MHz to 30 MHz
 EMI Receiver IF Bandwidth: 9 kHz
 EMI Receiver Avg Bandwidth: $\geq 3 \times$ IF BW (RBW)
 Detector Functions: Peak, Quasi-Peak & Average

Sample Calculation: Final Result (dB μ V) = Measurement Value (dB μ V) + LISN Insertion Loss (dB) + Cable Loss (dB).

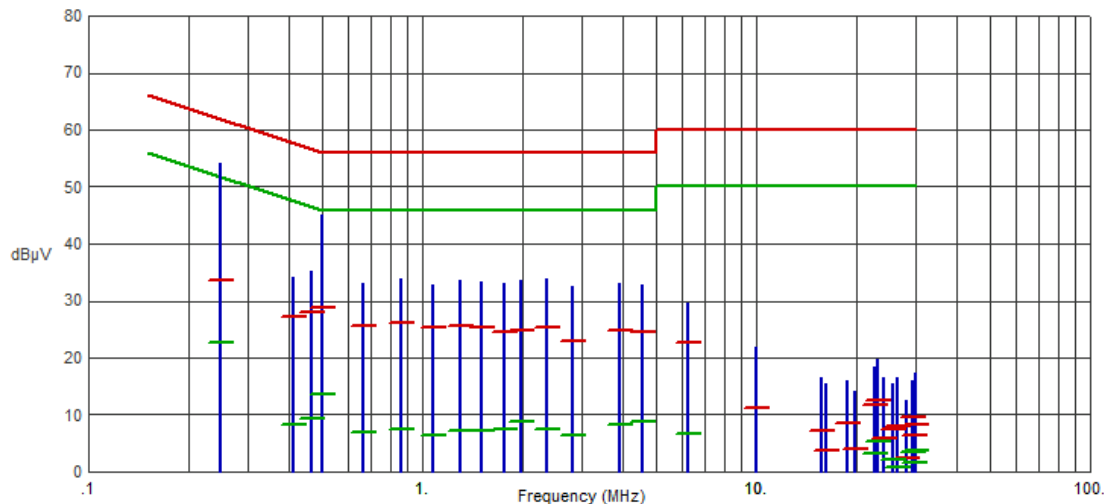
Note: All correction factors are loaded into the measurement instrument prior to testing to determine the final result.

7.10. Conducted Emissions Test Results

7.10.1. 120 Volts, 60 Hz Phase

Test No.: 195-25, 120 Volts, 60 Hz Phase

FCC, Class B



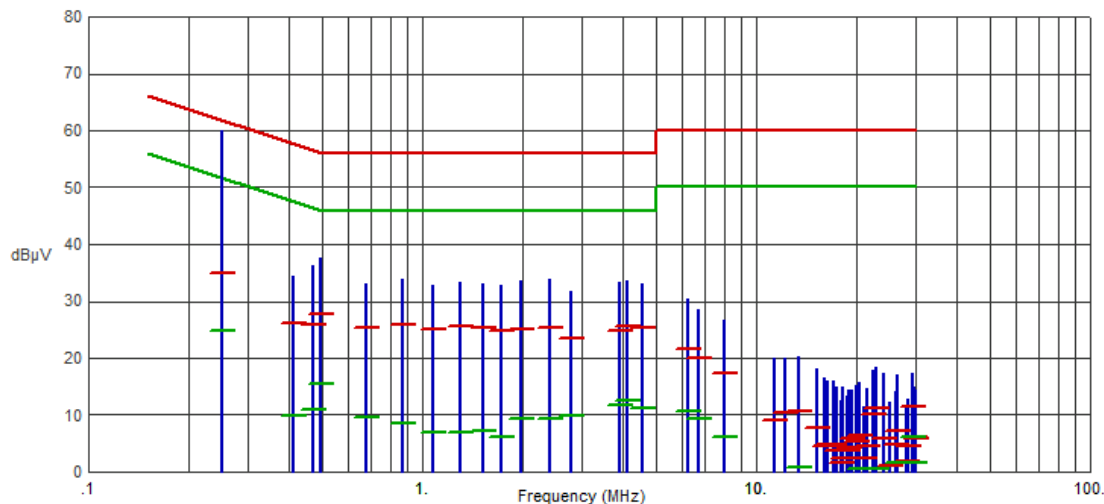
Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
.2490	54.02	33.71	61.79	-28.08	22.58	51.79	-29.21	
.4088	34.03	27.25	57.67	-30.42	8.22	47.67	-39.45	
.4650	35.28	27.93	56.60	-28.67	9.41	46.60	-37.19	
.4988	44.96	28.93	56.02	-27.09	13.58	46.02	-32.44	
.6630	33.17	25.58	56.00	-30.42	6.93	46.00	-39.07	
.8655	33.89	26.25	56.00	-29.75	7.51	46.00	-38.49	
1.0815	32.83	25.29	56.00	-30.71	6.34	46.00	-39.66	
1.3043	33.53	25.68	56.00	-30.32	7.09	46.00	-38.91	
1.5113	33.32	25.38	56.00	-30.62	7.13	46.00	-38.87	
1.7543	33.07	24.60	56.00	-31.40	7.55	46.00	-38.45	
1.9658	33.66	24.71	56.00	-31.29	8.76	46.00	-37.24	
2.3663	33.78	25.35	56.00	-30.65	7.40	46.00	-38.60	
2.8208	32.47	22.82	56.00	-33.18	6.37	46.00	-39.63	
3.9030	33.09	24.87	56.00	-31.13	8.29	46.00	-37.71	
4.5488	32.93	24.45	56.00	-31.55	8.68	46.00	-37.32	
6.2408	29.57	22.75	60.00	-37.25	6.56	50.00	-43.44	
9.9533	21.80	11.27	60.00	-48.73	-1.37	50.00	-51.37	
15.7268	16.41	7.29	60.00	-52.71	-3.63	50.00	-53.63	
16.2285	15.60	3.61	60.00	-56.39	-4.19	50.00	-54.19	
18.8273	16.00	8.48	60.00	-51.52	-2.15	50.00	-52.15	
19.7768	14.03	4.13	60.00	-55.87	-5.01	50.00	-55.01	
22.5780	18.27	11.61	60.00	-48.39	3.19	50.00	-46.81	
23.1293	19.72	12.63	60.00	-47.37	5.44	50.00	-44.56	
24.1485	16.51	5.79	60.00	-54.21	-3.02	50.00	-53.02	
25.6943	15.58	7.37	60.00	-52.63	2.11	50.00	-47.89	
26.5493	16.60	8.01	60.00	-51.99	.80	50.00	-49.20	
28.2323	12.49	2.39	60.00	-57.61	-4.24	50.00	-54.24	
29.2358	16.07	9.56	60.00	-50.44	3.55	50.00	-46.45	
29.8140	15.18	6.32	60.00	-53.68	1.72	50.00	-48.28	
29.9063	17.40	8.23	60.00	-51.77	3.64	50.00	-46.36	

7.10. Conducted Emissions Test Results (continued)

7.10.2. 120 Volts, 60 Hz Neutral

Test No.: 195-25, 120 Volts, 60 Hz Neutral

FCC, Class B



Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
.2513	60.13	34.91	61.71	-26.80	24.90	51.71	-26.81	
.4088	34.29	26.26	57.67	-31.41	9.83	47.67	-37.84	
.4695	36.17	25.74	56.52	-30.78	10.91	46.52	-35.61	
.4965	37.47	27.64	56.06	-28.42	15.60	46.06	-30.46	
.6788	33.09	25.21	56.00	-30.79	9.61	46.00	-36.39	
.8768	33.82	25.91	56.00	-30.09	8.44	46.00	-37.56	
1.0748	32.71	25.01	56.00	-30.99	6.86	46.00	-39.14	
1.2975	33.37	25.54	56.00	-30.46	6.95	46.00	-39.05	
1.5203	33.14	25.26	56.00	-30.74	7.33	46.00	-38.67	
1.7273	32.89	24.75	56.00	-31.25	6.22	46.00	-39.78	
1.9658	33.73	25.00	56.00	-31.00	9.25	46.00	-36.75	
2.4158	33.80	25.28	56.00	-30.72	9.35	46.00	-36.65	
2.7983	31.77	23.48	56.00	-32.52	9.86	46.00	-36.14	
3.8805	33.22	24.71	56.00	-31.29	11.64	46.00	-34.36	
4.0988	33.49	25.48	56.00	-30.52	12.48	46.00	-33.52	
4.5420	32.97	25.27	56.00	-30.73	11.25	46.00	-34.75	
6.2385	30.37	21.55	60.00	-38.45	10.70	50.00	-39.30	
6.6840	28.53	19.88	60.00	-40.12	9.38	50.00	-40.62	
8.0025	26.65	17.31	60.00	-42.69	6.14	50.00	-43.86	
11.3460	20.01	9.02	60.00	-50.98	-1.16	50.00	-50.16	
12.1920	20.10	10.51	60.00	-49.49	-3.7	50.00	-50.37	
13.3643	20.33	10.76	60.00	-49.24	.77	50.00	-49.23	
15.1418	18.11	7.66	60.00	-52.34	-3.90	50.00	-53.90	
15.9945	16.43	4.66	60.00	-55.34	-5.75	50.00	-55.75	
16.3703	16.10	4.89	60.00	-55.11	-5.70	50.00	-55.70	
16.9913	16.13	4.72	60.00	-55.28	-5.74	50.00	-55.74	
17.4593	14.93	3.84	60.00	-56.16	-6.29	50.00	-56.29	
17.9295	12.55	1.70	60.00	-58.30	-6.36	50.00	-56.36	
18.1140	14.84	2.49	60.00	-57.51	-5.93	50.00	-55.93	
18.7350	13.43	3.64	60.00	-56.36	-4.40	50.00	-54.40	
18.9623	14.27	4.28	60.00	-55.72	-4.02	50.00	-54.02	

7.10. Conducted Emissions Test Results (continued)

7.10.2. 120 Volts, 60 Hz Neutral (continued)

Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
19.4258	14.48	5.92	60.00	-54.08	-3.38	50.00	-53.38	
19.8803	15.33	5.38	60.00	-54.62	-4.06	50.00	-54.06	
20.3798	15.86	6.27	60.00	-53.73	.50	50.00	-49.50	
21.0615	11.59	2.30	60.00	-57.70	-4.72	50.00	-54.72	
21.5430	14.74	4.43	60.00	-55.57	-3.22	50.00	-53.22	
22.3440	17.92	10.05	60.00	-49.95	-.11	50.00	-50.11	
22.8503	18.41	11.19	60.00	-48.81	.60	50.00	-49.40	
24.0968	17.46	5.87	60.00	-54.13	-3.79	50.00	-53.79	
25.2285	12.39	1.13	60.00	-58.87	-5.12	50.00	-55.12	
26.1150	14.21	4.91	60.00	-55.09	-3.17	50.00	-53.17	
26.4863	16.98	7.28	60.00	-52.72	1.72	50.00	-48.28	
28.1355	11.80	1.99	60.00	-58.01	-4.42	50.00	-54.42	
28.6260	12.84	4.55	60.00	-55.45	-2.28	50.00	-52.28	
29.2358	17.31	11.41	60.00	-48.59	6.17	50.00	-43.83	
29.7848	14.98	6.08	60.00	-53.92	1.47	50.00	-48.53	
29.9040	14.43	5.80	60.00	-54.20	-.59	50.00	-50.59	

7. Measurement Data (continued)

7.11. Duty Cycle (FCC OET publication number 558074)

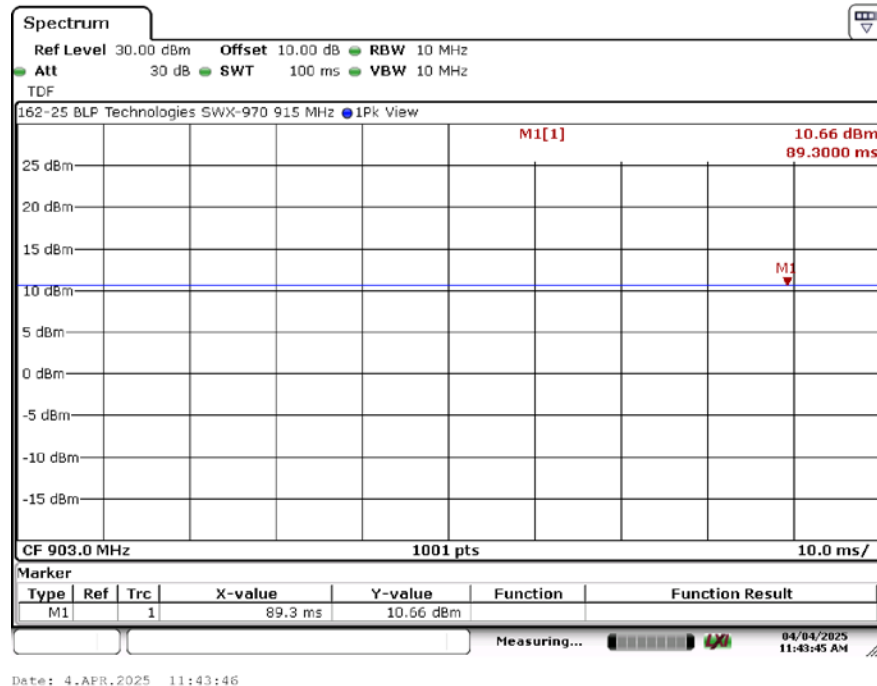
Requirement: Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%).

Procedure: Duty cycle measurements were made according to the procedure detailed FCC OET publication number 558074, Section 11.6 (b)

Results: Duty cycle measurements are listed in the following table.

Channel	Frequency	Time High	Time per Period	Duty Cycle	
	(MHz)	(mS)	(mS)	(Numeric)	(%)
1	903	100	100	1.0	100.00
11	915	100	100	1.0	100.00
21	927	100	100	1.0	100.00

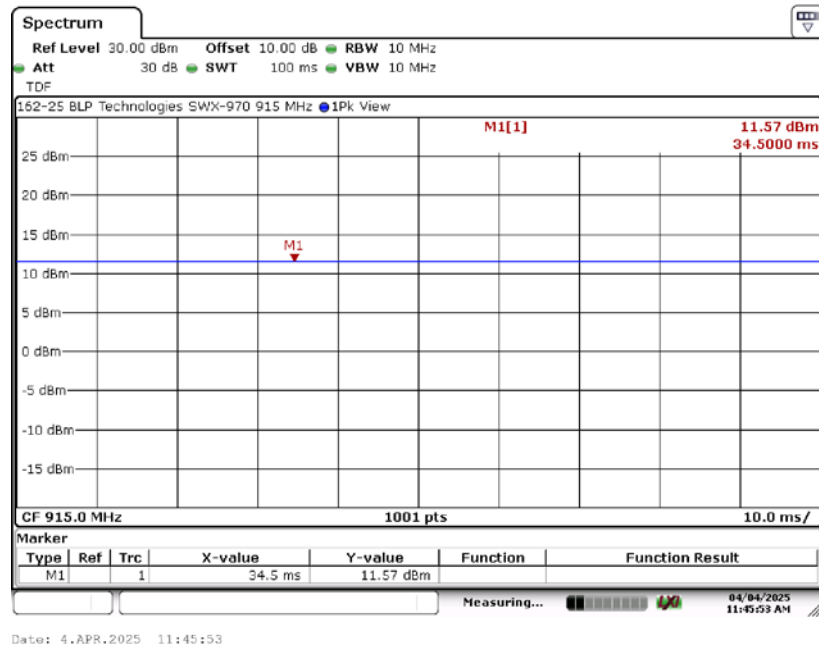
7.11.1. Low Channel – 1, 903 MHz



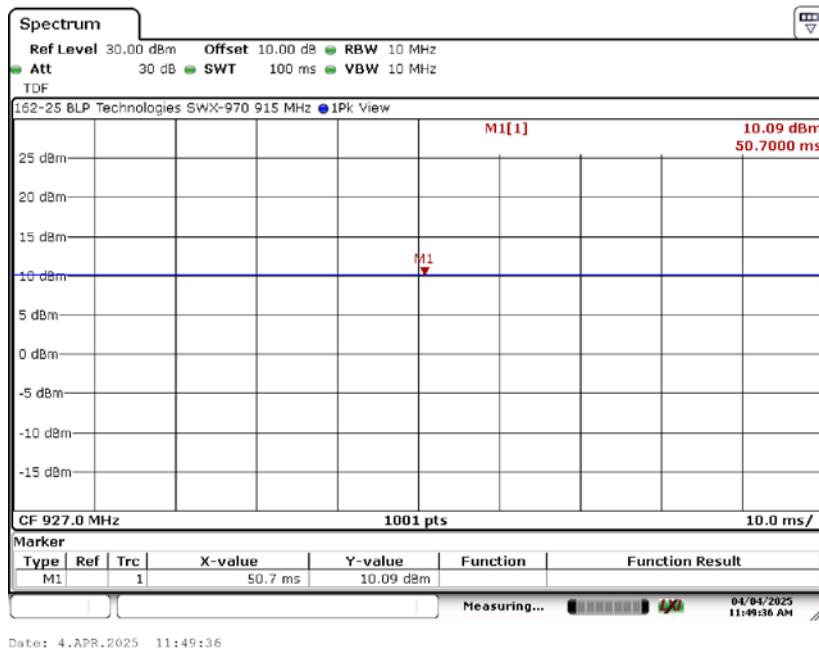
7. Measurement Data (continued)

7.11. Duty Cycle (continued)

7.11.2. Middle Channel – 11, 915 MHz



7.11.3. High Channel – 21, 927 MHz



7. Measurement Data (continued)

7.12. 99% (Occupied) Bandwidth (RSS-GEN 6.7)

Requirement: The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

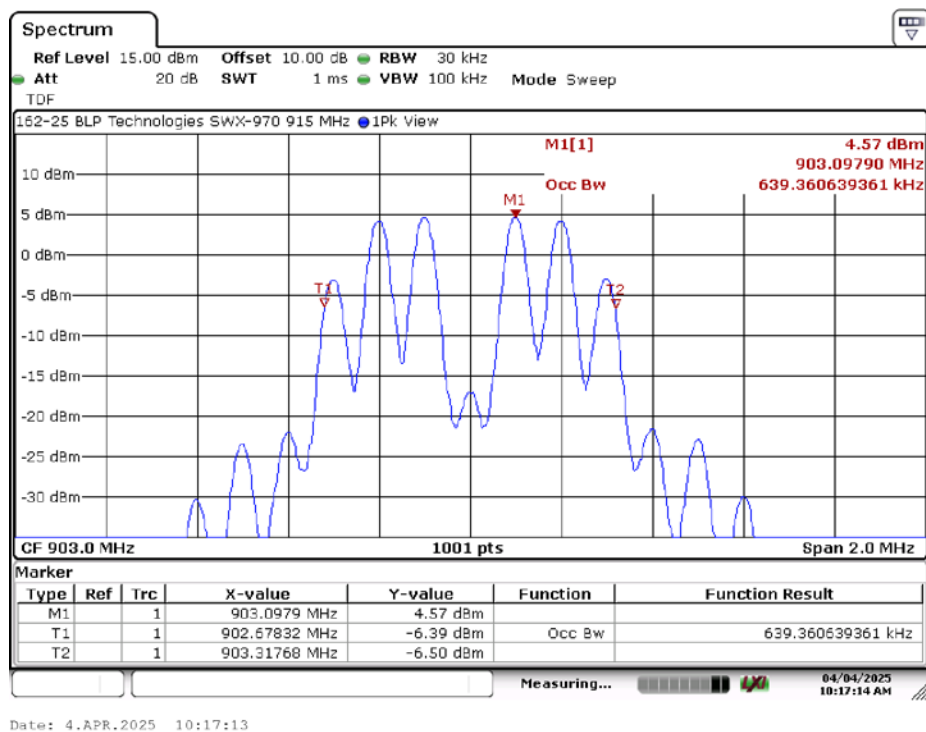
The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value.

The sample detector of the spectrum analyzer shall be used to make the measurement.

7.12.1. Measurement Results

Channel	Channel Frequency (MHz)	99% Power Bandwidth (kHz)
1	903	639.3606
11	915	639.3606
21	927	639.3606

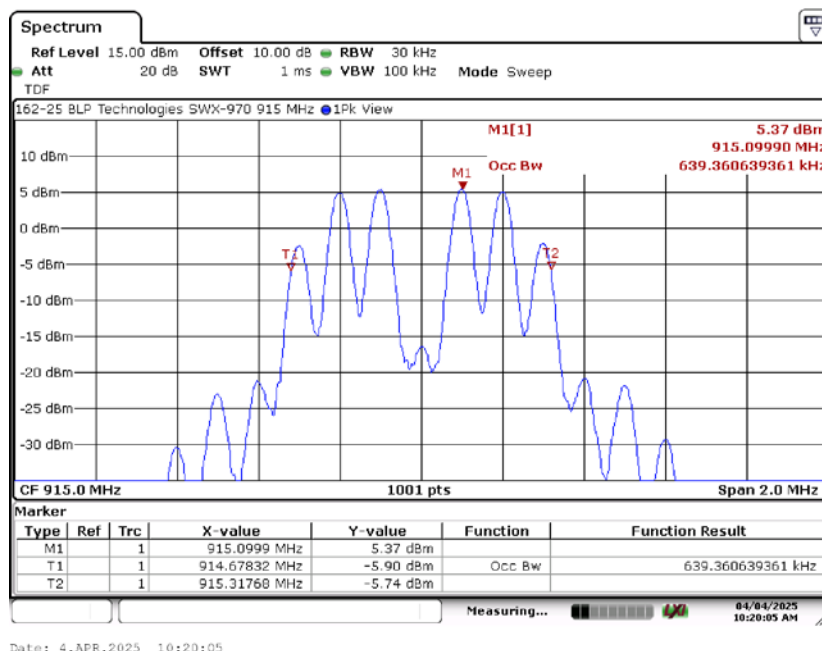
7.12.1.1. 99% Power Bandwidth – Channel 1 (903 MHz)



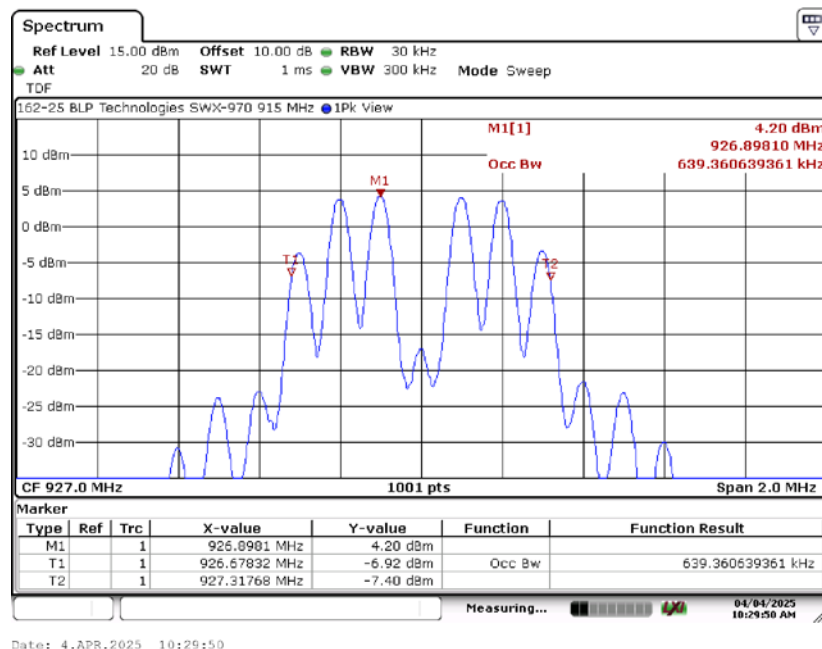
7. Measurement Data (continued)

7.12. 99% (Occupied) Bandwidth (RSS-GEN 6.7)

7.12.1.2. 99% Power Bandwidth – Channel 11 (915 MHz)



7.12.1.3. 99% Power Bandwidth – Channel 21 (927 MHz)



8. Test Setup Photographs

8.1. Spurious Radiated Emissions 30 kHz to 30 MHz – Front



8. Test Setup Photographs (continued)

8.2. Spurious Radiated Emissions, 30 kHz to 30 MHz – Rear



8. Test Setup Photographs (continued)

8.3. Spurious Radiated Emissions, 30 MHz to 1000 MHz – Front



8. Test Setup Photographs (continued)

8.4. Spurious Radiated Emissions, 30 MHz to 1000 MHz – Rear



8. Test Setup Photographs (continued)

8.5. Spurious Radiated Emissions, 1 to 9.4 GHz – Front



8. Test Setup Photographs (continued)

8.6. Spurious Radiated Emissions, 1 to 9.4 GHz – Rear



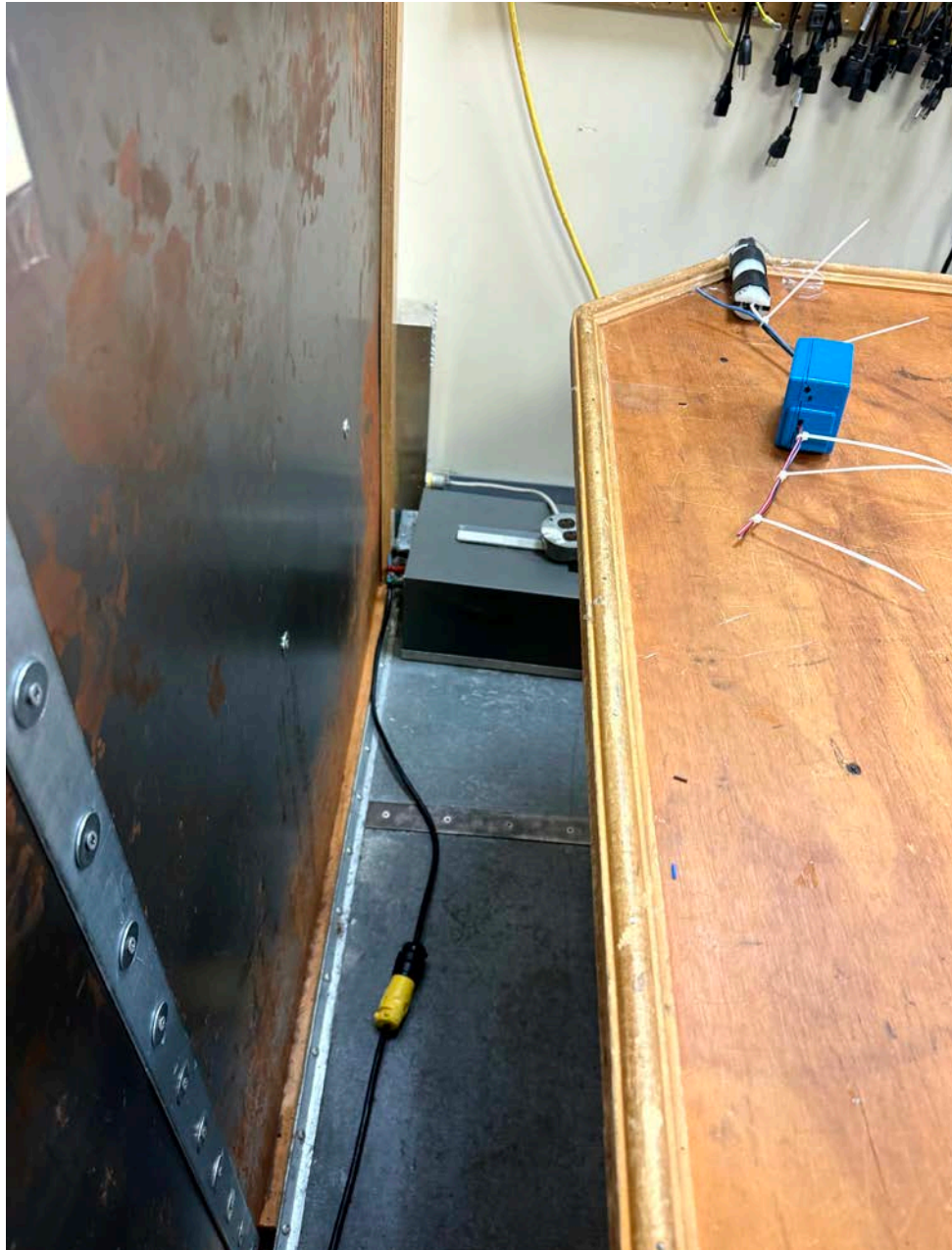
8. Test Setup Photographs (continued)

8.7. Conducted Emissions, Front View



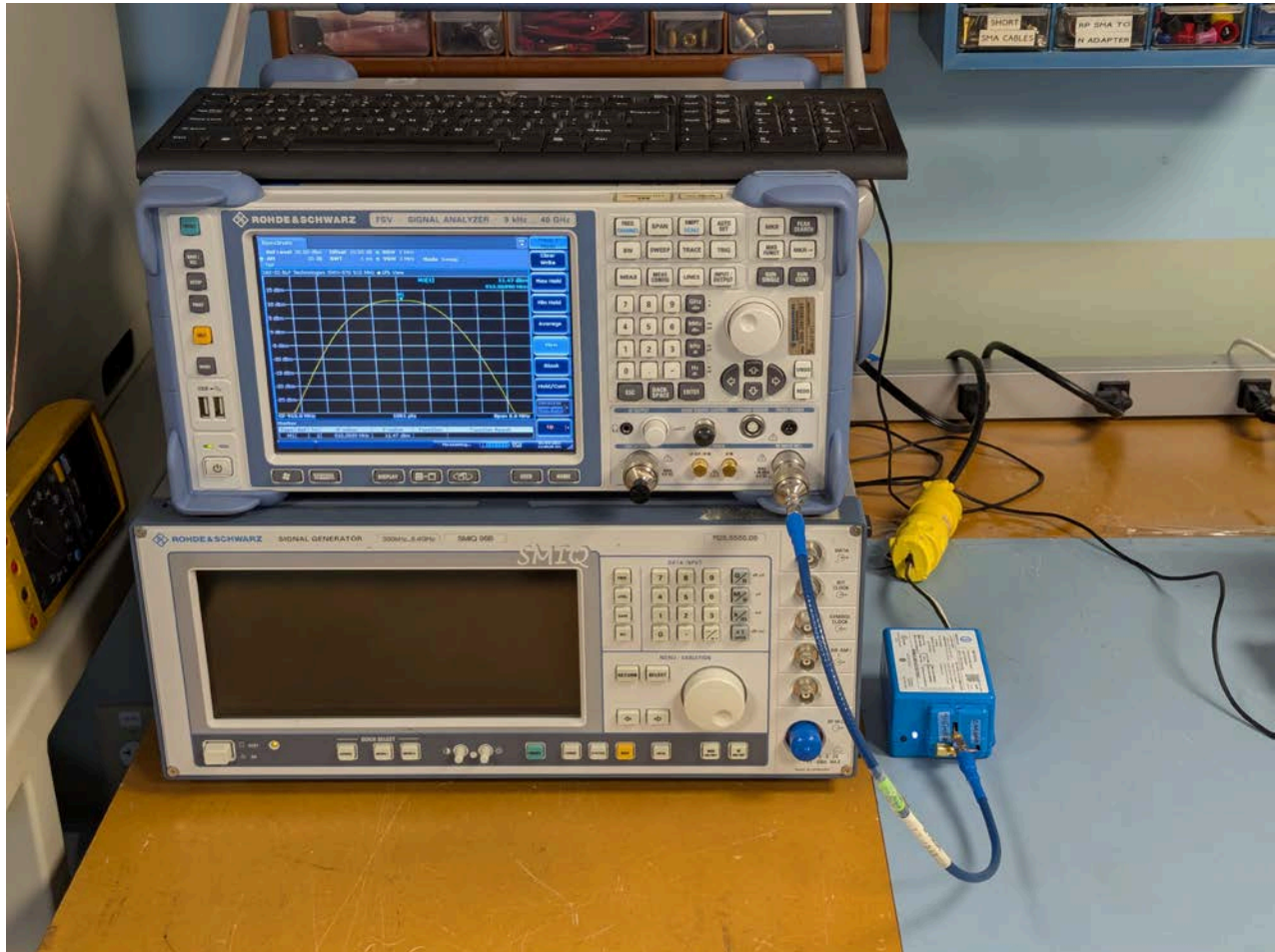
8. Test Setup Photographs (continued)

8.8. Conducted Emissions, Rear View



8. Test Setup Photographs (continued)

8.9. Conducted Mode Measurements



9. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with the Federal Communications Commission (FCC) and Industry Canada standards. Through our American Association for Laboratory Accreditation (A2LA) ISO Guide 17025 Accreditation our test sites are designated with the FCC (designation number **US1091**) and Industry Canada (file number **IC 3023A-1**).

Compliance Worldwide is also designated as a Phase 1 CAB under APEC-MRA (US0132) for Australia/New Zealand AS/NZS CISPR 11, AS/NZS CISPR 14-1, AS/NZS CISPR 15, AS/NZS CISPR 32, Chinese-Taipei (Taiwan) BSMI CNS 15936 and Korea (RRA) KS C 9811, KS C 9814-1, KS C 9815, KS C 9832, KS C 9610-6-3 & KS C 9610-6-4.

The radiated emissions test site is a 3- and 10-meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane. A second conducted emissions site is also located in the basement of the OATS site with a 2.3 x 2.5-meter ground plane and a 2.4 x 2.4 meter vertical wall.

The radiated emissions test site for measurements above 1GHz is a 3 Meter open area test site (OATS) with a 3.6 by 3.6-meter anechoic absorber floor patch to achieve a quasi-free space measurement environment per ANSI C63.4/C63.10 and CISPR 16-1-4 standards.

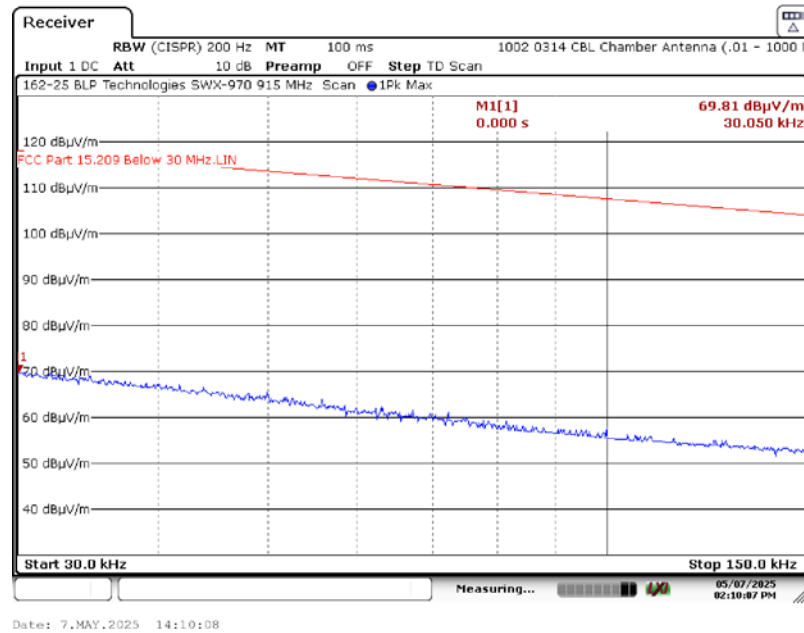
The sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or tabletop.

Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

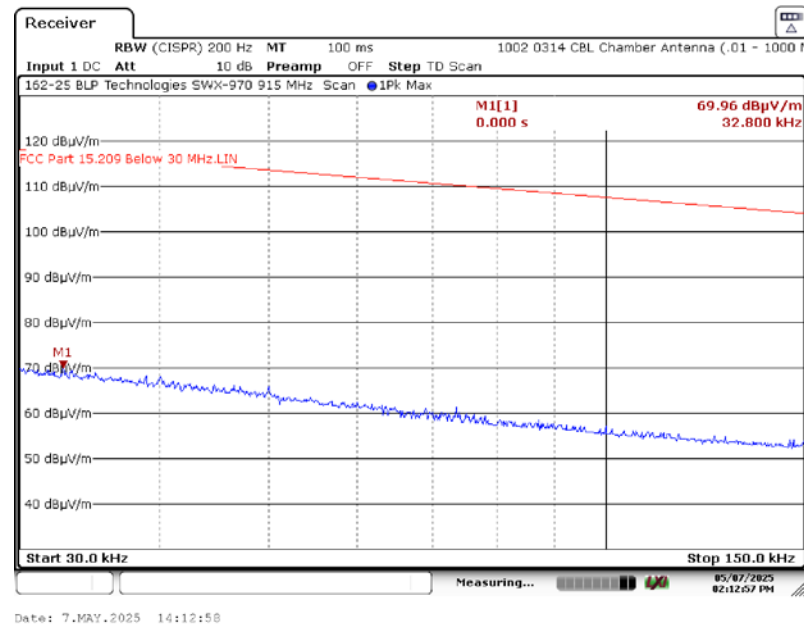
A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

A1.1. Channel 1, 903 MHz

A1.1.1. Measurement Results: Parallel Receive Antenna



A1.1.2. Measurement Results: Perpendicular Receive Antenna

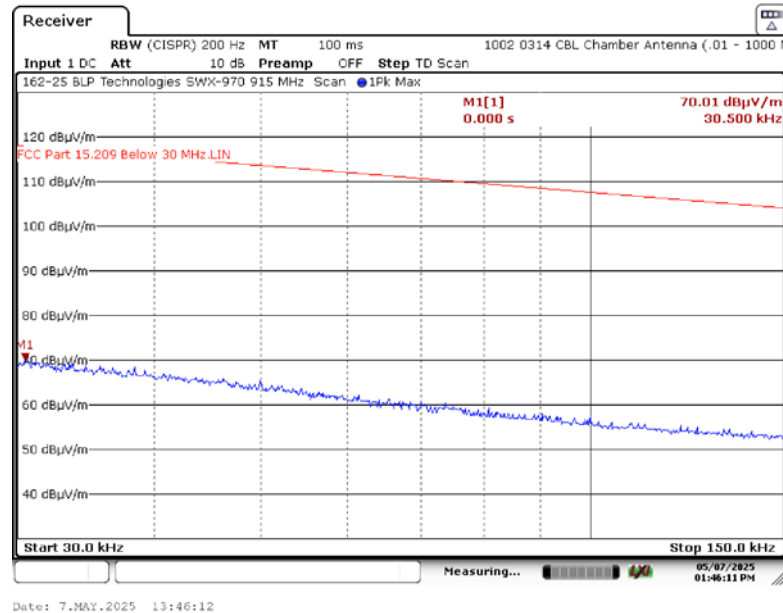


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

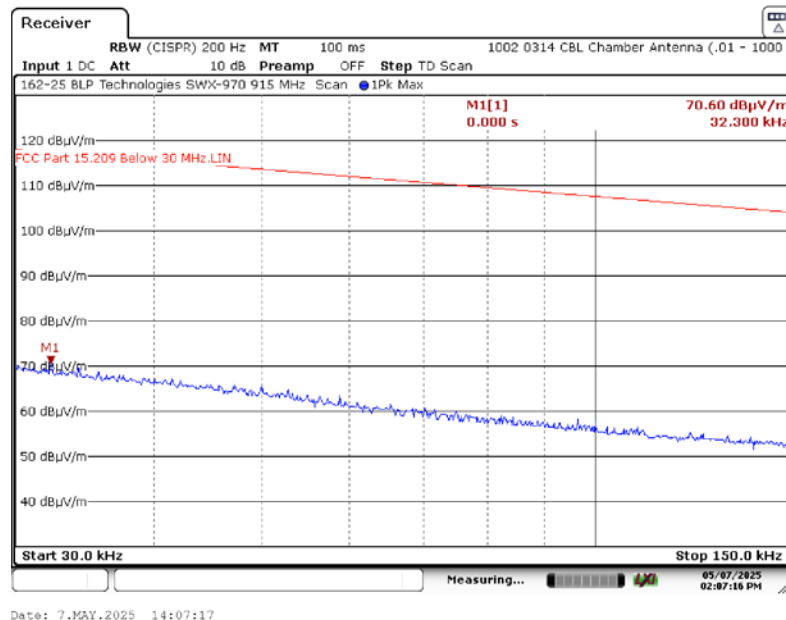
A1.1. Channel 1, 903 MHz

A1.1.3. Measurement Results: Ground Parallel Receive Antenna



A1.2. Channel 11, 915 MHz

A1.2.1. Measurement Results: Parallel Receive Antenna

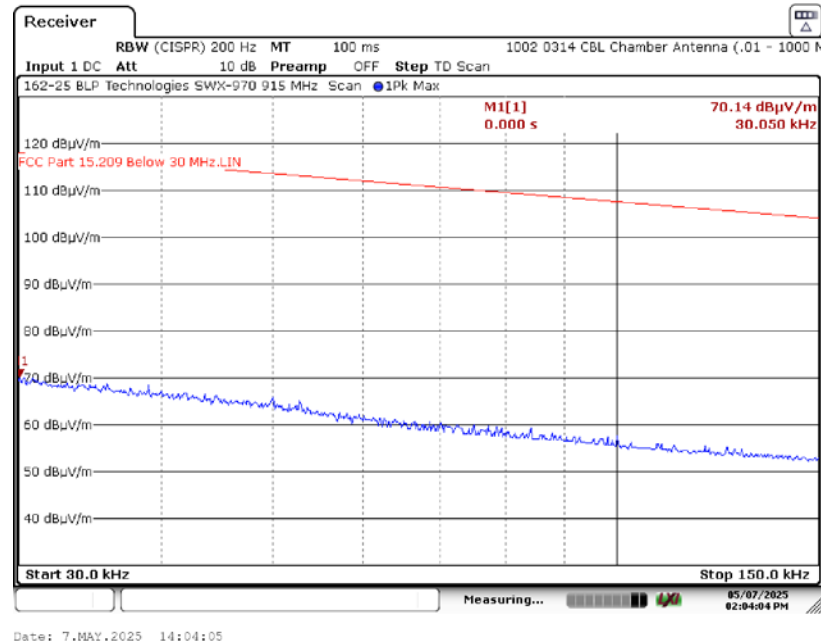


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

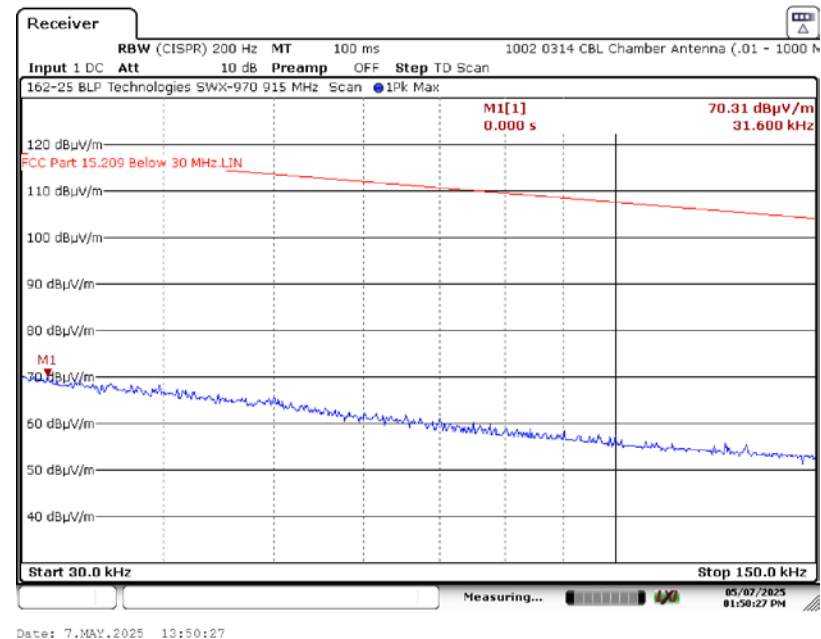
A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

A1.2 Channel 11, 915 MHz

A1.2.2. Measurement Results: Perpendicular Receive Antenna



A1.2.3. Measurement Results: Ground-Parallel Receive Antenna

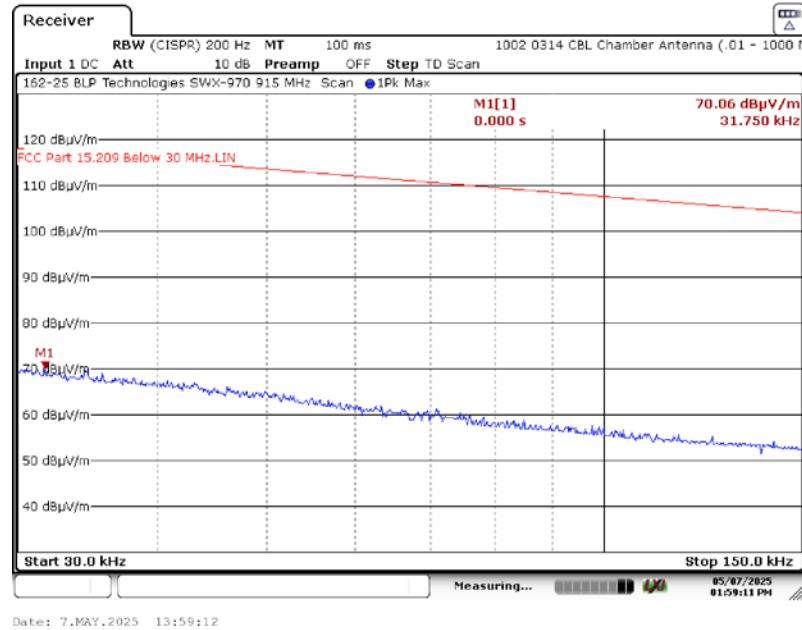


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

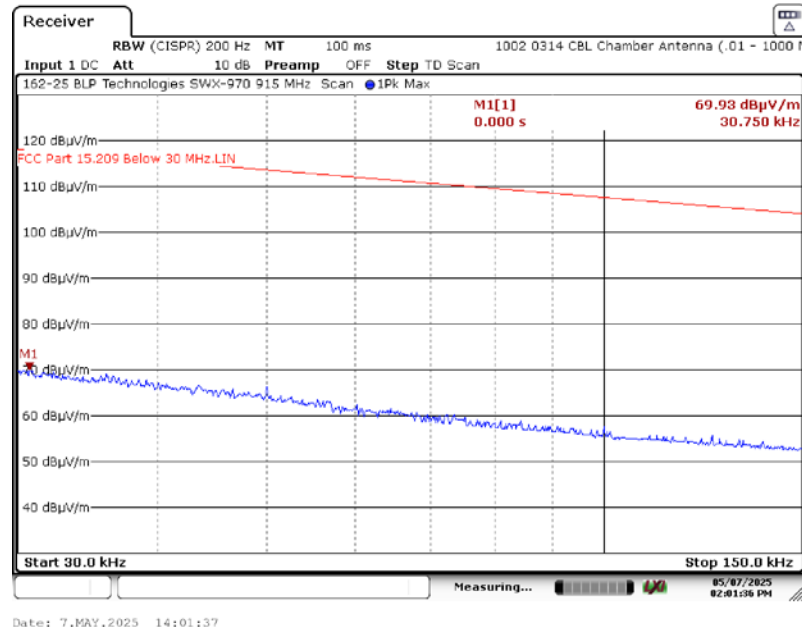
A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

A1.3 Channel 21, 927 MHz

A1.3.1. Measurement Results: Parallel Receive Antenna



A1.3.2. Measurement Results: Perpendicular Receive Antenna

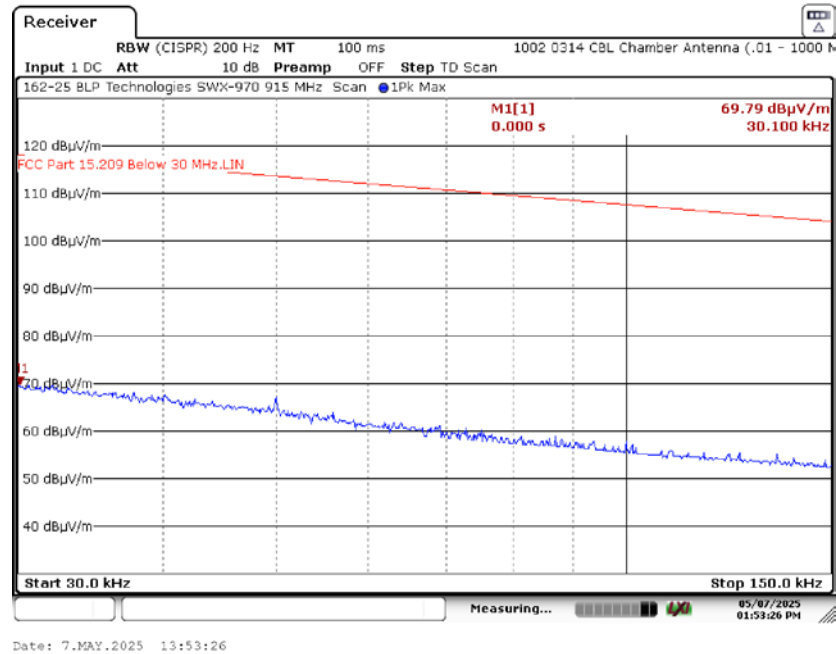


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

A1.3 Channel 21, 927 MHz

A1.3.3. Measurement Results: Ground Parallel Receive Antenna

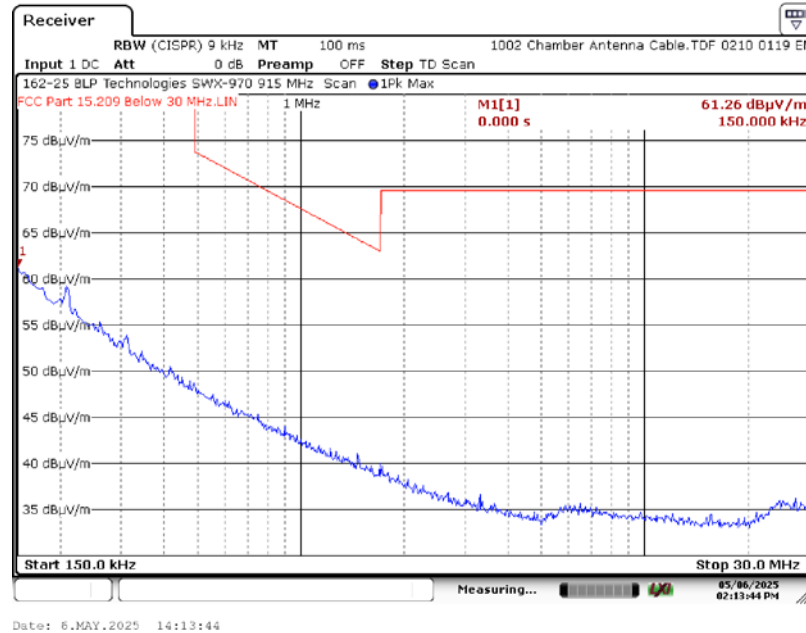


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

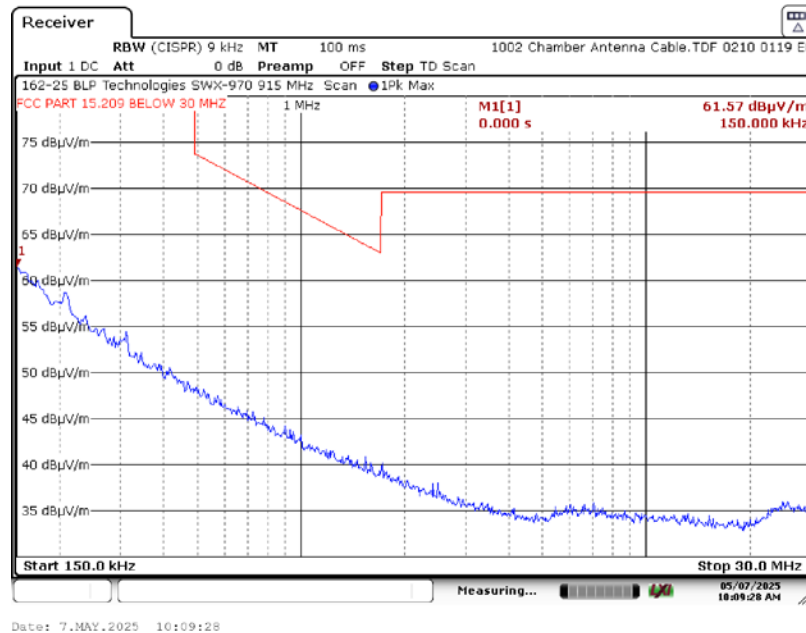
A2. Spurious Radiated Emissions (150 kHz – 30 MHz) Test Results

A2.1. Channel 1, 903 MHz

A2.1.1. Measurement Results: Parallel Receive Antenna



A2.1.2. Measurement Results: Perpendicular Receive Antenna

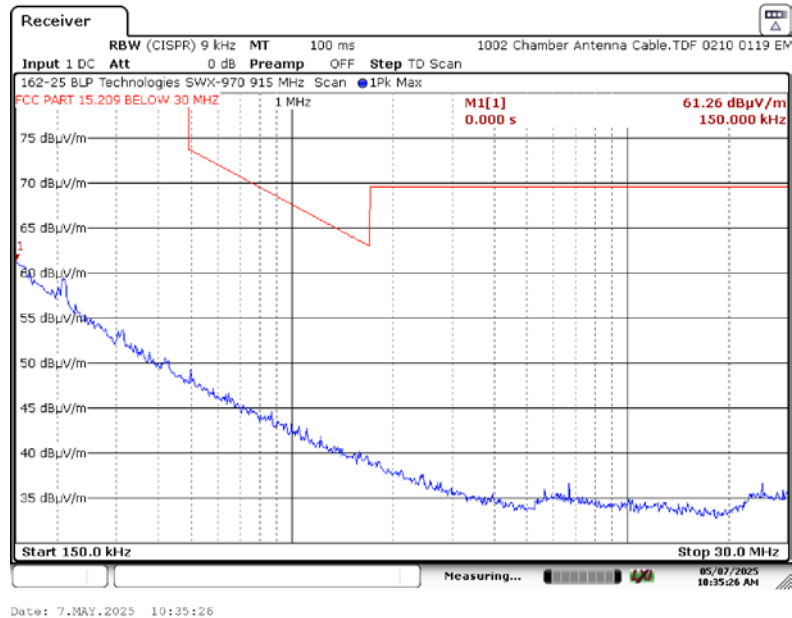


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

A2. Spurious Radiated Emissions (150 kHz – 30 MHz) Test Results

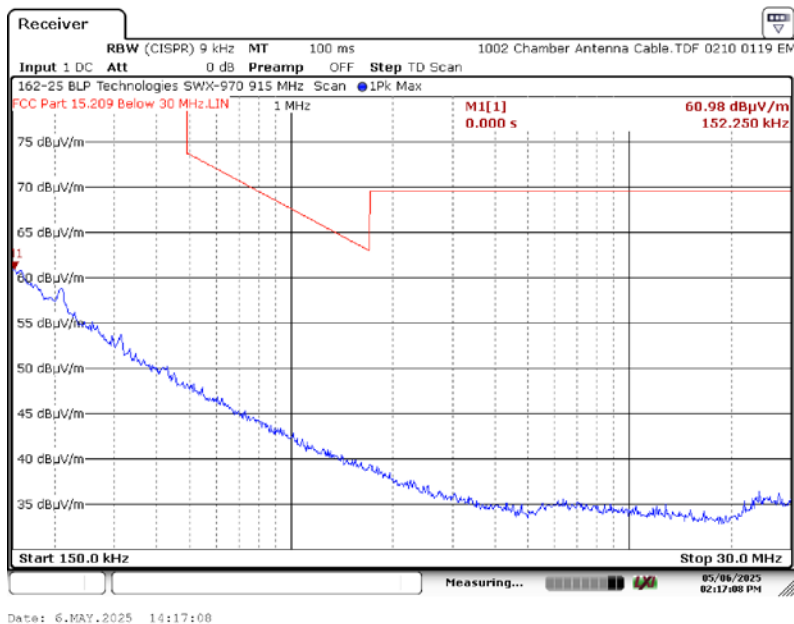
A2.1. Channel 1, 903 MHz

A2.1.3. Measurement Results: Ground Parallel Receive Antenna



A2.2. Channel 11, 915 MHz

A2.2.1. Measurement Results: Parallel Receive Antenna

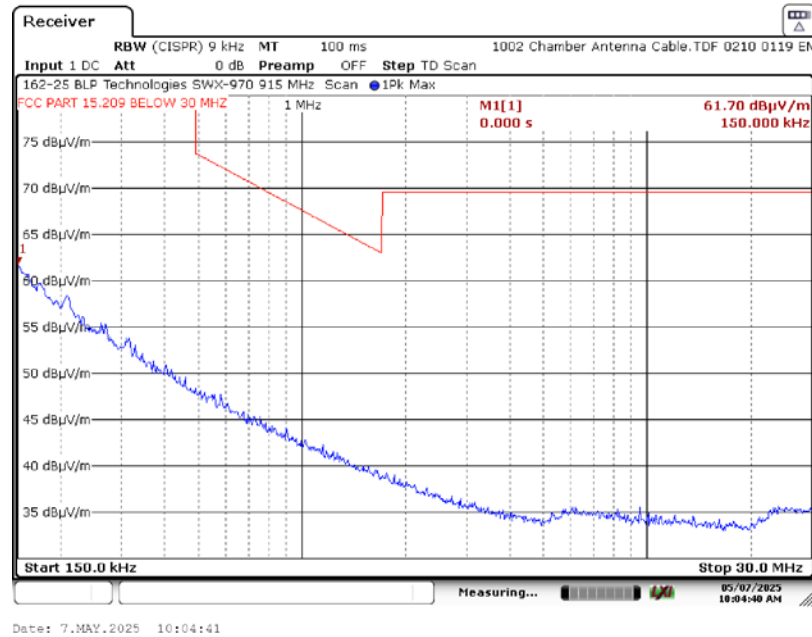


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

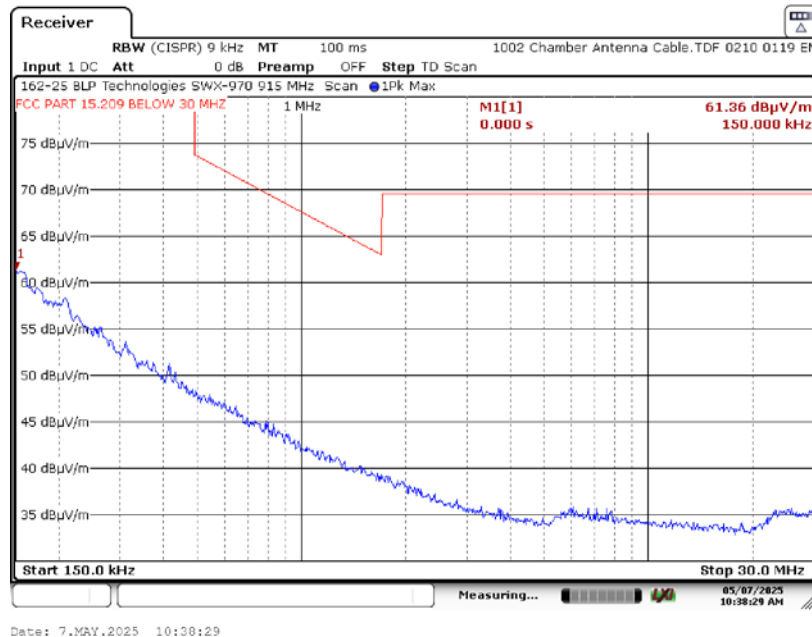
A2. Spurious Radiated Emissions (150 kHz – 30 MHz) Test Results

A2.2 Channel 11, 915 MHz

A2.2.2. Measurement Results: Perpendicular Receive Antenna



A2.2.3. Measurement Results: Ground-Parallel Receive Antenna

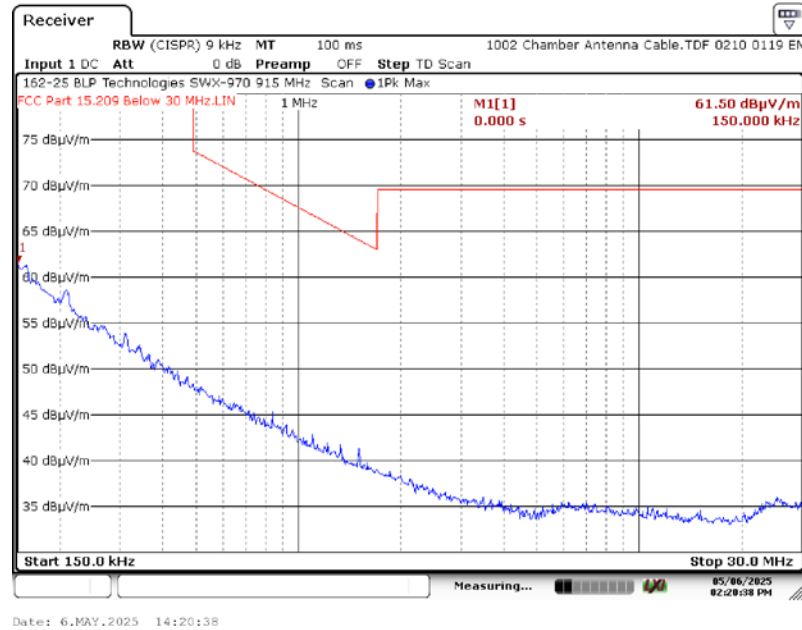


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

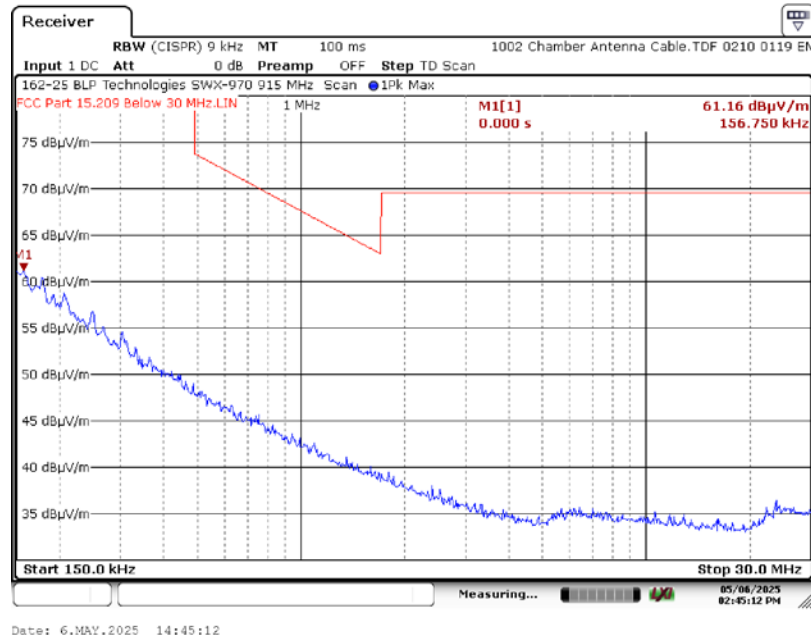
A2. Spurious Radiated Emissions (150 kHz – 30 MHz) Test Results

A2.3 Channel 21, 927 MHz

A2.3.1. Measurement Results: Parallel Receive Antenna



A2.3.2. Measurement Results: Perpendicular Receive Antenna

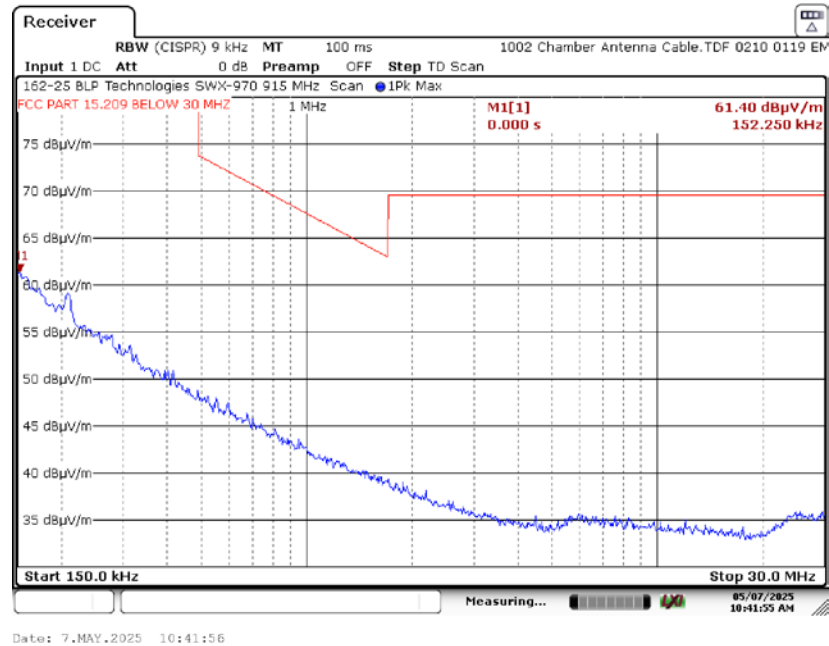


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

A2. Spurious Radiated Emissions (150 kHz – 30 MHz) Test Results

A2.3 Channel 21, 927 MHz

A2.3.3. Measurement Results: Ground Parallel Receive Antenna

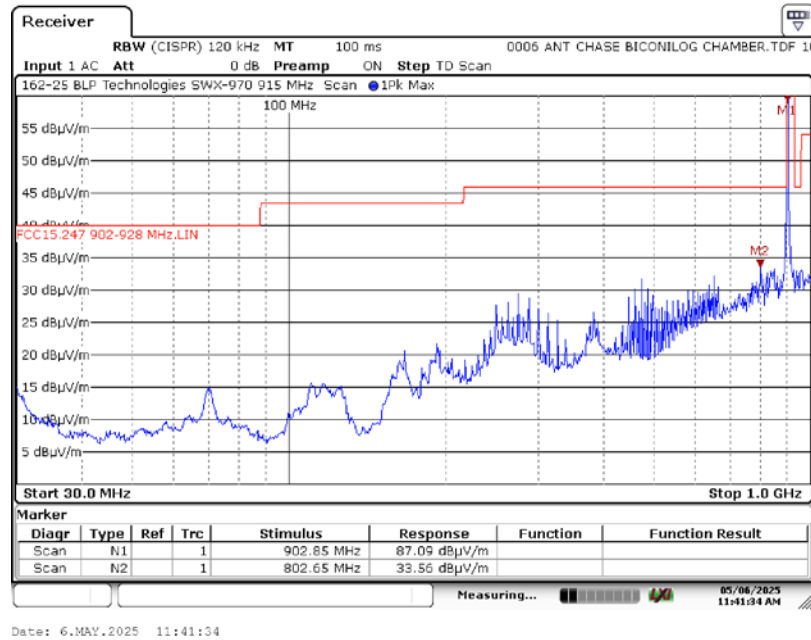


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

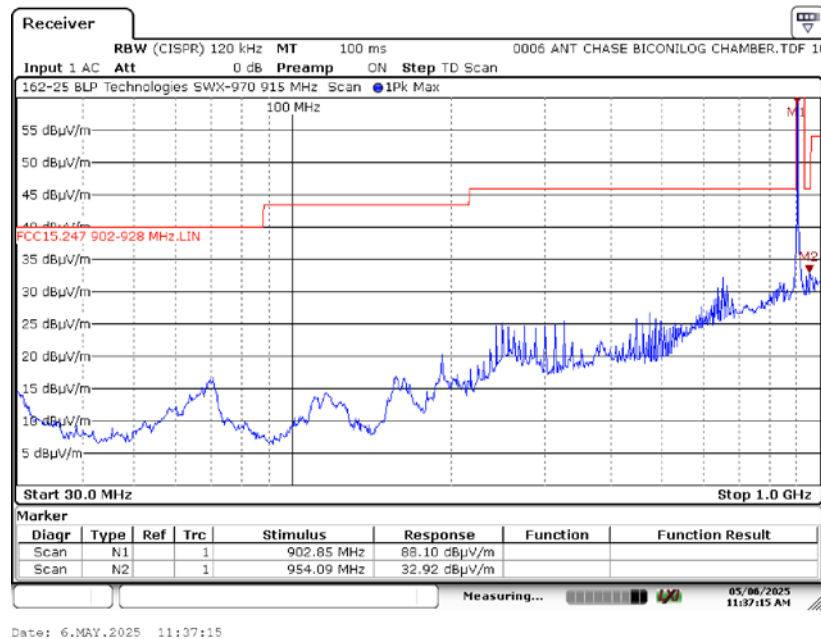
A3. Spurious Radiated Emissions (30 MHz – 1000 MHz) Test Results

A3.1 Channel 1, 903 MHz

A3.1.1. Measurement Results: Horizontal Receive Antenna



A3.1.2. Measurement Results: Vertical Receive Antenna

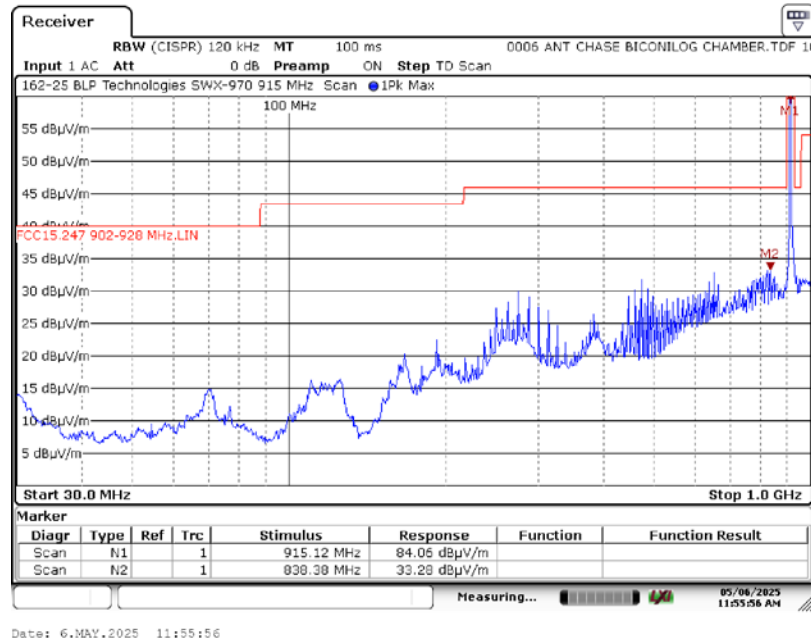


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

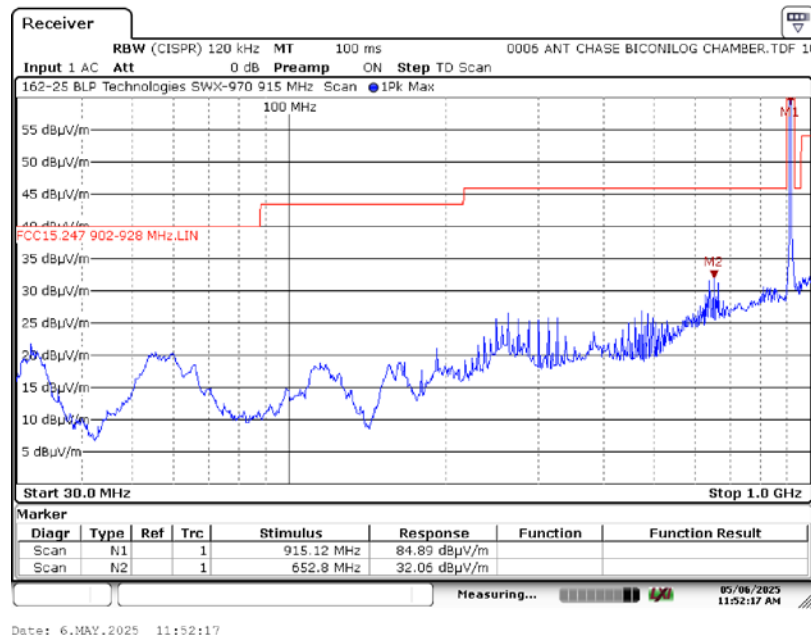
A3. Spurious Radiated Emissions (30 MHz – 1000 MHz) Test Results

A3.2 Channel 11, 915 MHz

A3.2.1. Measurement Results: Horizontal Receive Antenna



A3.2.2. Measurement Results: Vertical Receive Antenna

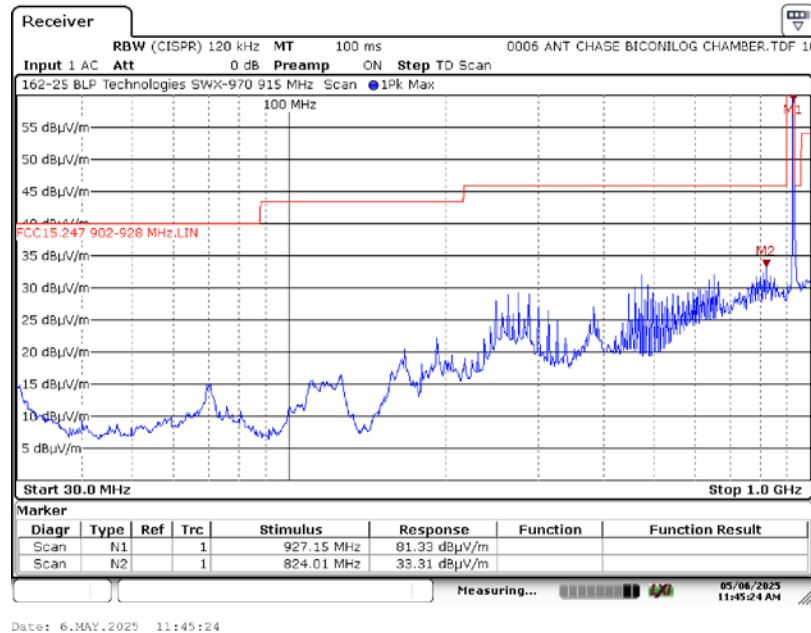


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

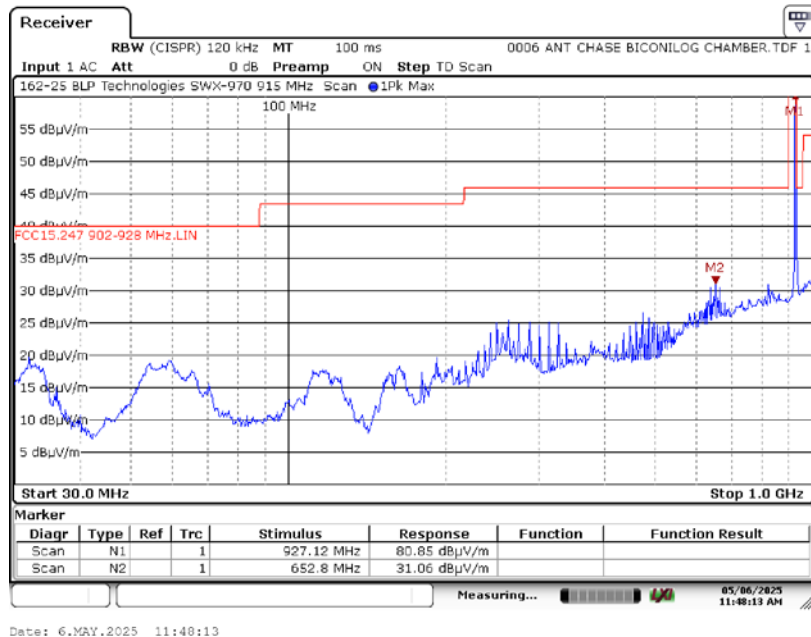
A3. Spurious Radiated Emissions (30 MHz – 1000 MHz) Test Results

A3.3 Channel 21, 927 MHz

A3.3.1. Measurement Results: Horizontal Receive Antenna



A3.3.2. Measurement Results: Vertical Receive Antenna

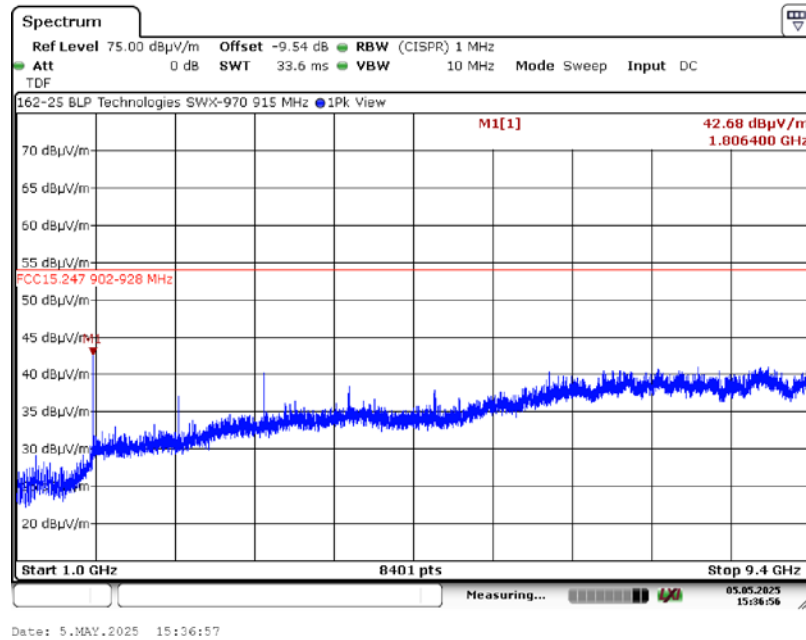


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

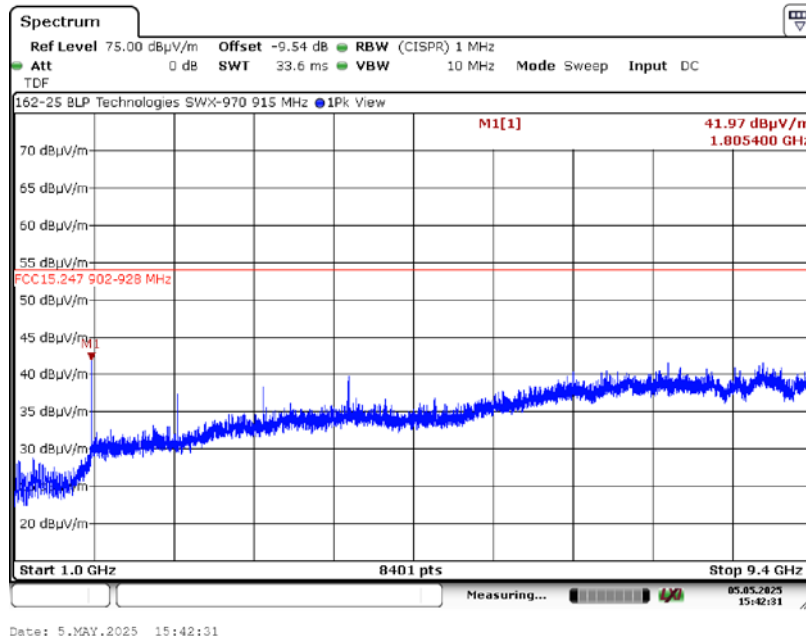
A4. Spurious Radiated Emissions (1 – 9.4 GHz) Test Results

A4.1 Channel 1, 903 MHz

A4.1.1. Measurement Results: Horizontal Receive Antenna



A4.1.2. Measurement Results: Vertical Receive Antenna

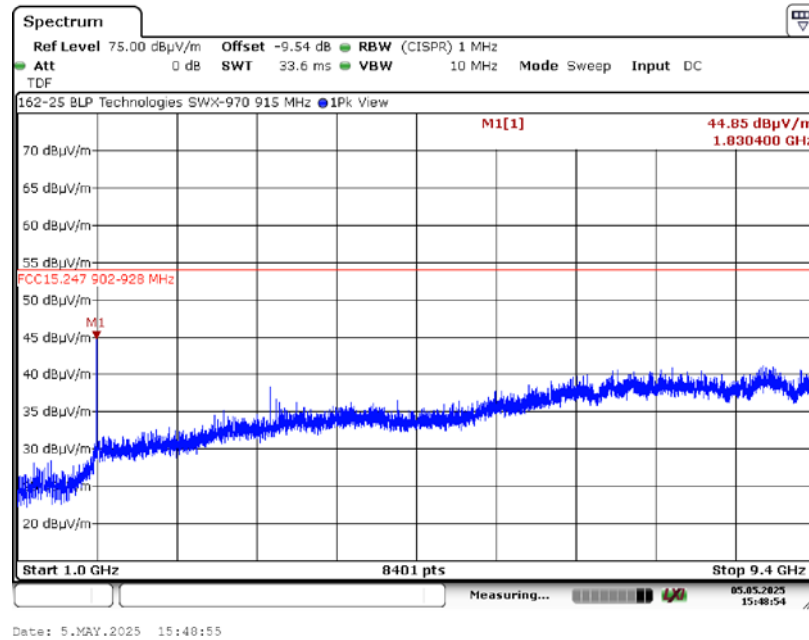


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

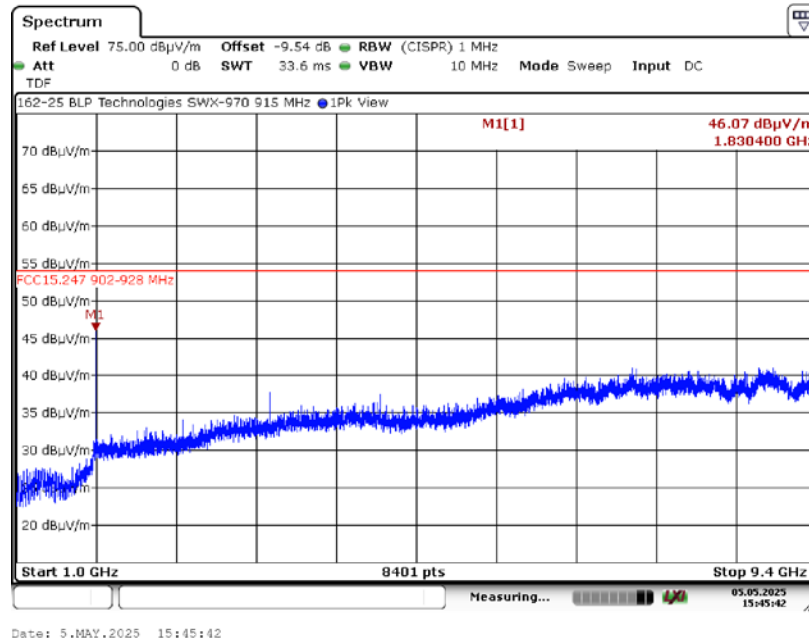
A4. Spurious Radiated Emissions (1 - 9.4 GHz) Test Results

A4.2 Channel 11, 915 MHz

A4.2.1. Measurement Results: Horizontal Receive Antenna



A4.2.2. Measurement Results: Vertical Receive Antenna

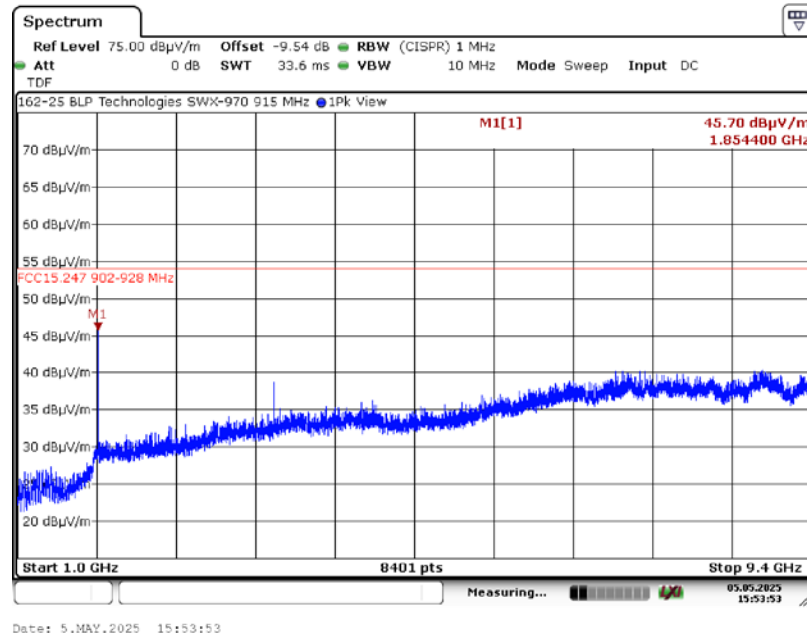


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 9.4 GHz)

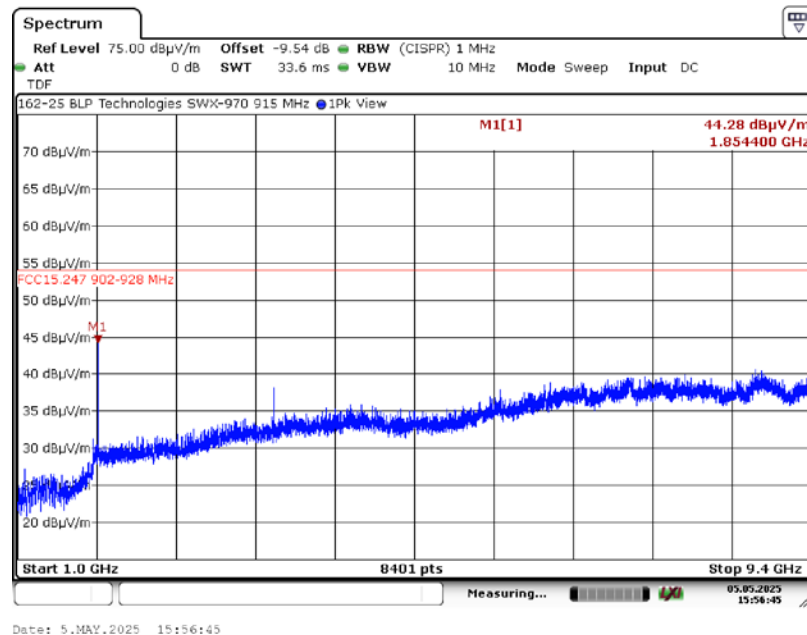
A4. Spurious Radiated Emissions (1 – 9.4 GHz) Test Results

A4.3 Channel 21, 927 MHz

A4.3.1. Measurement Results: Horizontal Receive Antenna



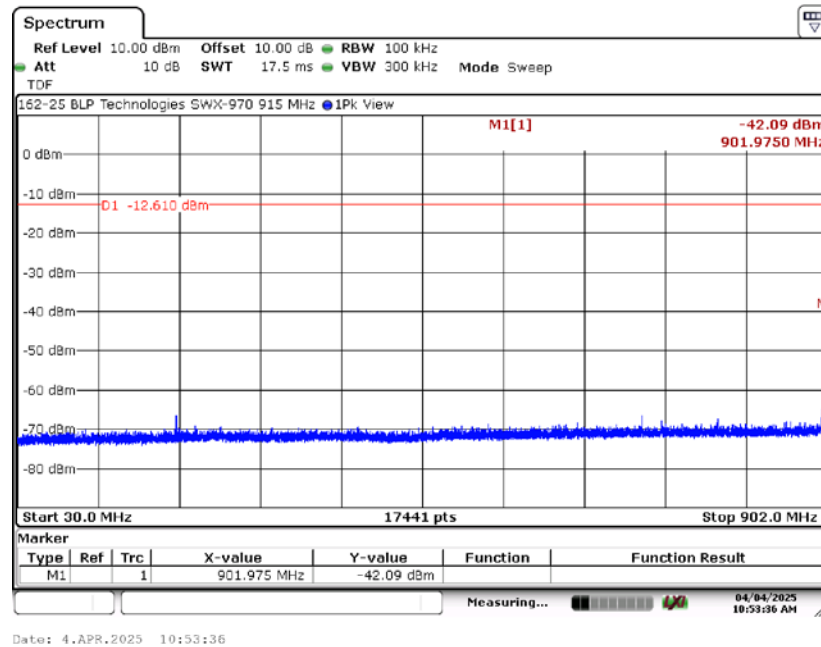
A4.3.2. Measurement Results: Vertical Receive Antenna



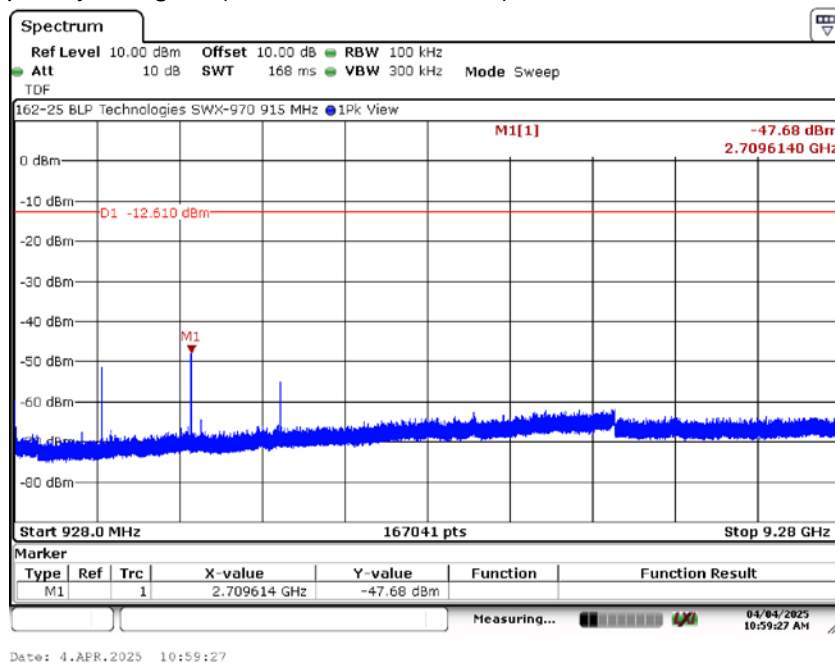
Appendix B - Emissions in Non-restricted Frequency Bands (30 MHz to 9.28 GHz)

B1. Channel 1, 903 MHz

B1.1. Frequency Range 1 (30 MHz – 902 MHz) Test Results



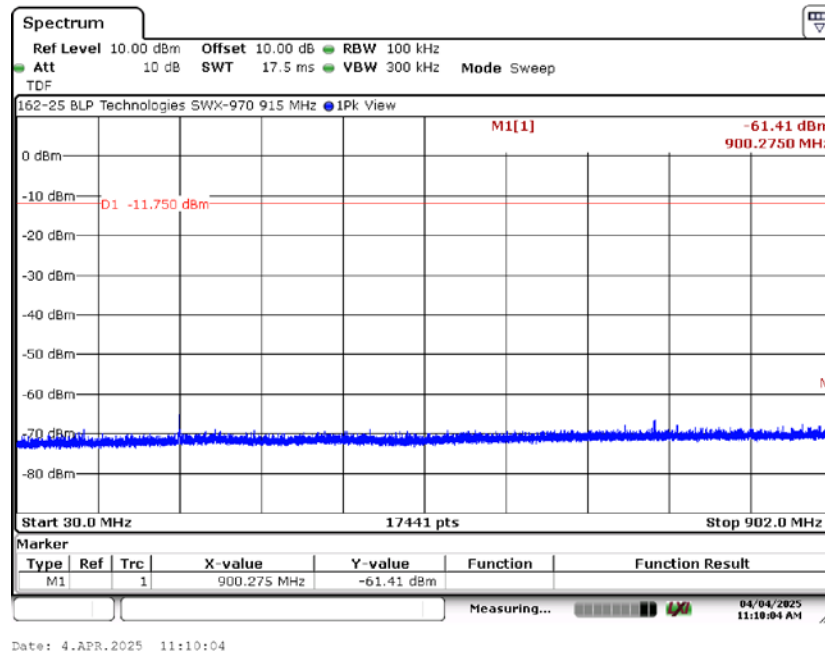
B1.2. Frequency Range 2 (928 MHz – 9.28 GHz) Test Results



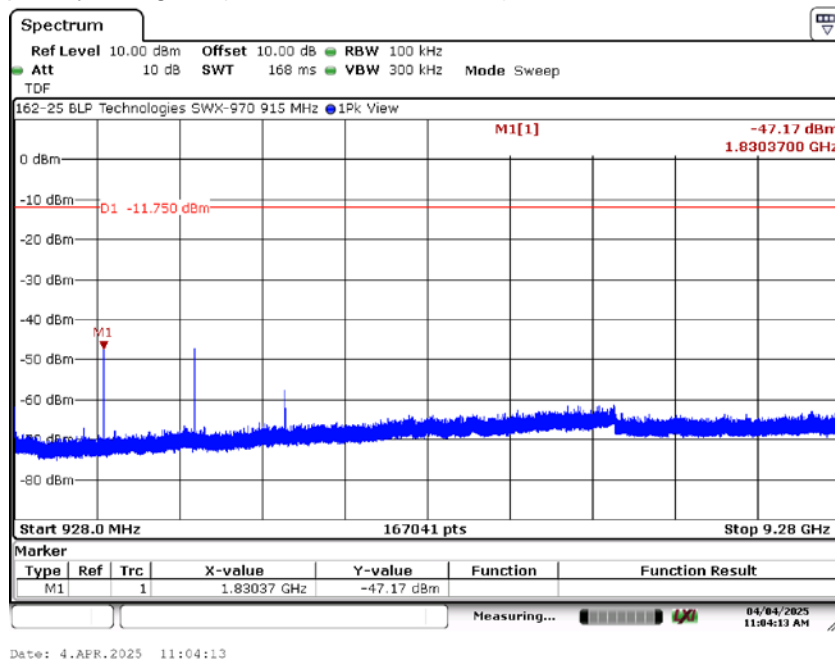
Appendix B - Emissions in Non-restricted Frequency Bands (30 MHz to 9.28 GHz)

B2. Channel 11, 915 MHz

B2.1. Frequency Range 1 (30 MHz – 902 MHz) Test Results



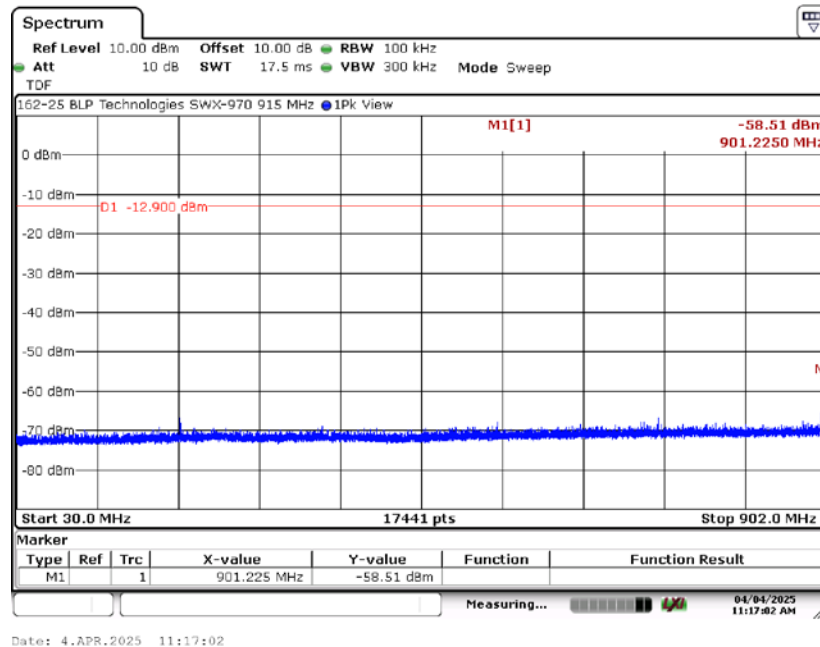
B2.2. Frequency Range 2 (928 MHz – 9.28 GHz) Test Results



Appendix B - Emissions in Non-restricted Frequency Bands (30 MHz to 9.28 GHz)

B3. Channel 21, 927 MHz

B3.1. Frequency Range 1 (30 MHz – 902 MHz) Test Results



B3.2. Frequency Range 2 (928 MHz – 9.28 GHz) Test Results

