

**COMPLIANCE WORLDWIDE INC.
TEST REPORT 102-23R1**

**In Accordance with the Requirements of
FCC PART 15.247, SUBPART C
ISED Canada RSS-247, Issue 4**

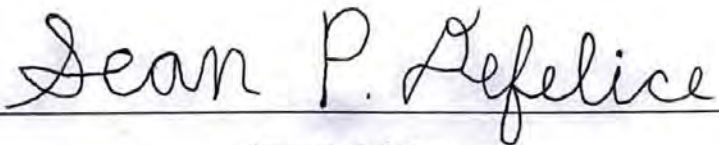
**Issued to
ShotTracker, Inc.
7220 W Frontage Road
Merriam, KS 66203**

**for the
2.0 Tag, Model S2P2
with BLE Radio**

**FCC ID: 2AC4B-S2P2
IC: 12327A-S2P2**

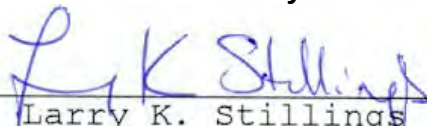
**Report Issued on April 28, 2026
Revision R1 Issued on August 31, 2026**

Tested by



Sean P. Defelice

Reviewed by



Larry K. Stillings

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1. Scope

This test report certifies that the ShotTracker 2.0 Tag model S2P2, as tested, meets the FCC Part 15, Subpart C and ISED Canada RSS-247, Issue 4 requirements. The scope of this test report is limited to the test sample 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. Revision R1 changes the tabulated data in the restricted bands using DCCF instead of an average measurement and updated the antenna gain.

2. Product Details

- 2.1. Manufacturer:** ShotTracker
- 2.2. Model Number:** S2P2
- 2.3 Serial Numbers:** 33523, 34386
- 2.4 Description of EUT:** The S2P2 sends and receives ultra wideband (UWB) transmissions so that player wearing the tag can be accurately located and tracked by other nearby UWB sensors. The S2P2 also has a Bluetooth Low Energy (BLE) transceiver that operates in the 2.402 to 2.48 GHz frequency band for provisioning, configuration and maintenance purposes.
- 2.5 Power Source:** 3.7 VDC via Battery
- 2.6 Hardware Revision:** Rev A
- 2.7 Software Revision:** N/A
- 2.8. Modulation Type:** Gaussian frequency shift keying
- 2.9. Operating Frequencies:** 2402 to 2480 MHz
- 2.10. EMC Modifications:** None

3. Product Configuration

3.1. EUT Hardware

Manufacturer	Model	Serial Numbers	Input Volts	Freq (Hz) Or DC	Description/Function
ShotTracker	S2P2	33523, 34386	3.7	DC	Tracking Tag

3.2. Support Equipment

Device	Manufacturer	Model	Serial No.	Comment
Laptop	Lenovo	ThinkPad T440P	PB-031DX9	For setting up EUT

3.3. Cables

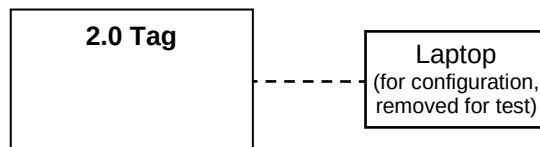
Cable Type	Length	Shield	From	To
None				

3. Product Configuration (continued)

3.4. Operational Characteristics & Software

The device is configured using a laptop to configure the device to transmit a modulated signal at frequencies of 2402, 2440 MHz or 2480 MHz

3.5. Block Diagram



4. Measurements Parameters

4.1. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due	Interval
EMI Test Receiver, 9 kHz - 7GHz ¹	Rohde & Schwarz	ESR7	101156	10/16/2025	4 Years
EMI Test Receiver, 10 Hz - 7GHz ¹	Rohde & Schwarz	ESR7	101770	7/23/2026	2 Years
EMI Test Receiver, 9 kHz – 26.5 GHz ¹	Rohde & Schwarz	ESR26	101693	6/26/2026	2 Years
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	6/27/2026	2 Years
Spectrum Analyzer 10 Hz – 40 GHz ¹	Rohde & Schwarz	FSVR40	100909	9/18/2025	5 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	7/1/2026	5 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
Horn Antenna, 18 GHz to 40 GHz	Com-Power	AH-840	03075	4/4/2026	4 Years
Horn Antenna, 18 GHz to 40 GHz	Com-Power	AH-840	101032	1/25/2026	4 Years
Preamplifier, 1 GHz to 26.5 GHz	Hewlett Packard	8449B	3008A01323	3/5/2026	2 Years
Preamplifier, 1 GHz to 26.5 GHz	Hewlett Packard	8449B H02	3008A00329	4/9/2026	2 Years
Band Reject Filter (Notch), 2.4 GHz	Micro-Tronics	BRM50702	150	2/27/2026	2 Years
Digital Barometer	Control Company	4195	ID236	3/15/2026	2 Years
Barometric Pressure/Humidity & Temp Datalogger	Extech Instruments	SD700	Q590483	4/4/2026	2 Years

¹ ESR7/26 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. Measurements Parameters

4.2. Measurement Software

Manufacturer	Software Description	Title or Model #	Rev.	Report Sections
Compliance Worldwide	Test Report Generation Software	Test Report Generator	1.0	7.10. Conducted Emissions

4.3. Measurement & Equipment Setup

Test Dates:	3/21/2023, 3/22/2023, 3/23/2023, 3/28/2023, 3/31/2023, 4/7/2023
Test Engineers:	Sean Defelice
Normal Site Temperature (15 - 35°C):	21.2
Relative Humidity (20 -75%RH):	35
Frequency Range:	30 kHz to 25 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	200 Hz – 9 to 150 kHz 9 kHz – 150 kHz to 30 MHz 120 kHz - 30 MHz to 1 GHz 1 MHz - Above 1 GHz
EMI Receiver Average Bandwidth:	>= 3 * IF (BW) or RBW
Detector Function:	Peak, Quasi-Peak & Average

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 C63.10-2020: *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 ISSED RSS-247, Issue 4, 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 this versions and dates detailed in this paragraph.

4. Measurements Parameters

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 Suites

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 40 channels, from channels 0 to 39 in the 2.4 GHz band.

In accordance with ANSI C63.10-2020, 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 (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

5.4 Mode of Operation

Modulation type : GFSK
Payload pattern : PRB29
Payload Length : 37 bytes

For band edge measurements (section 7.6), the DTS bandwidth measurements were taken into consideration for the worse case examples.

6. Measurement Summary

Test Requirement	FCC Rule Requirement	ISED Rule Requirement	Test Report Section	Result
Antenna Requirement	15.203	RSS-GEN 6.8	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 and Out of Band Measurements	15.247 (d)	RSS-247 5.5	7.6	Compliant
Emissions in Non-restricted Frequency Bands	15.247(e)	RSS-247 5.5	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

7. Measurement Data

7.1. Antenna Requirement (Part 15.203, RSS-GEN 6.8)

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 coiled wire antenna that is not user replaceable.

7. Measurement Data

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

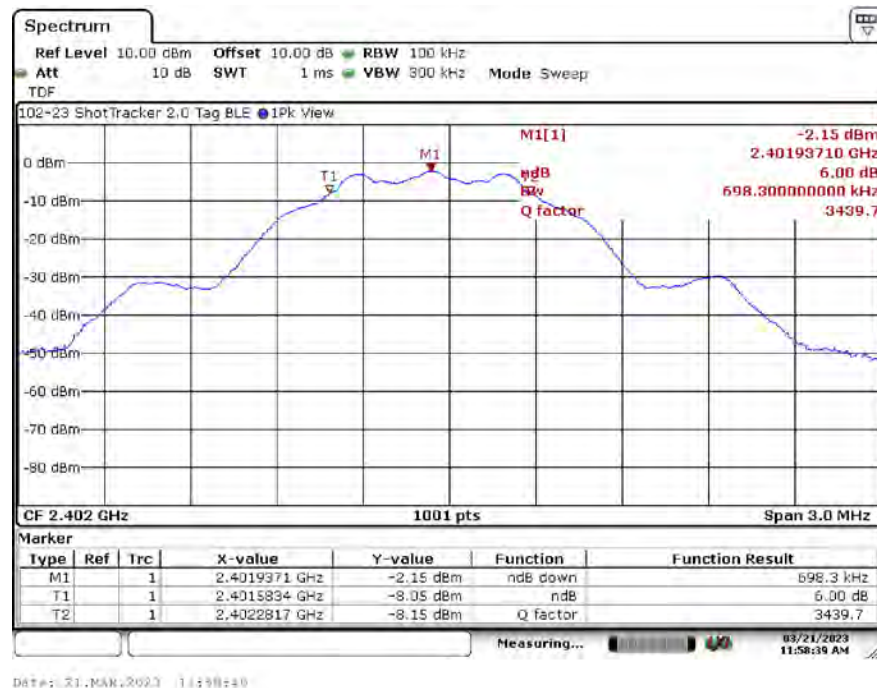
Requirement: Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Procedure: This test was performed in accordance with the procedure detailed in ANSI C63.10:2020 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
37	2402	698.30	>500	Compliant
17	2440	707.30	>500	Compliant
39	2480	707.30	>500	Compliant

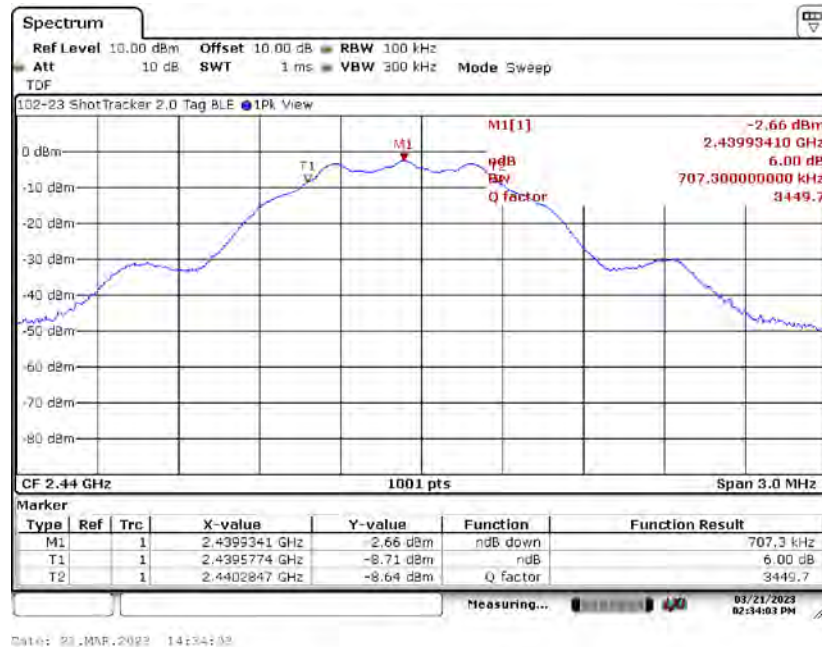
7.2.1. Low Channel – 37, 2402 MHz



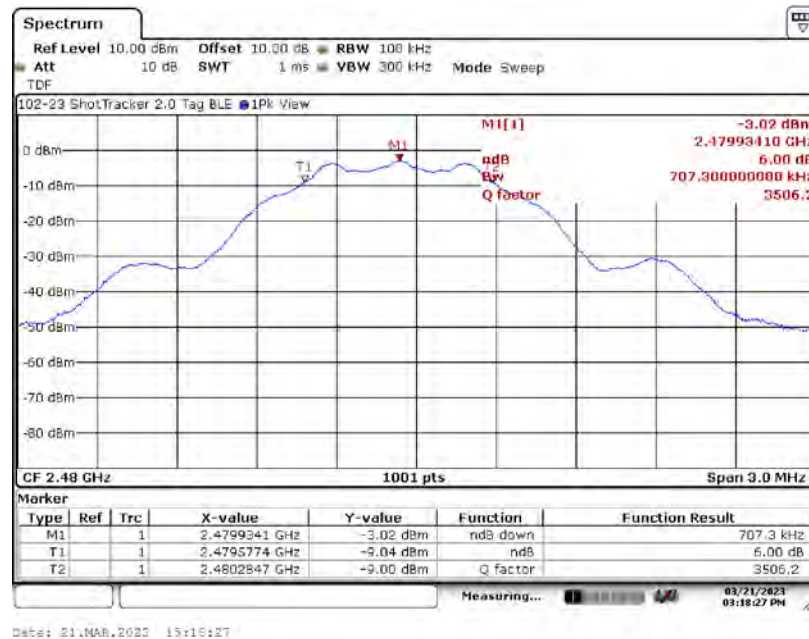
7. Measurement Data

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

7.2.2. Middle Channel – 17, 2440 MHz



7.2.3. High Channel – 39, 2480 MHz



7. Measurement Data (continued)

7.3. Maximum Peak Conducted Output Power (FCC 15.247 (b)(3), ISED 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).

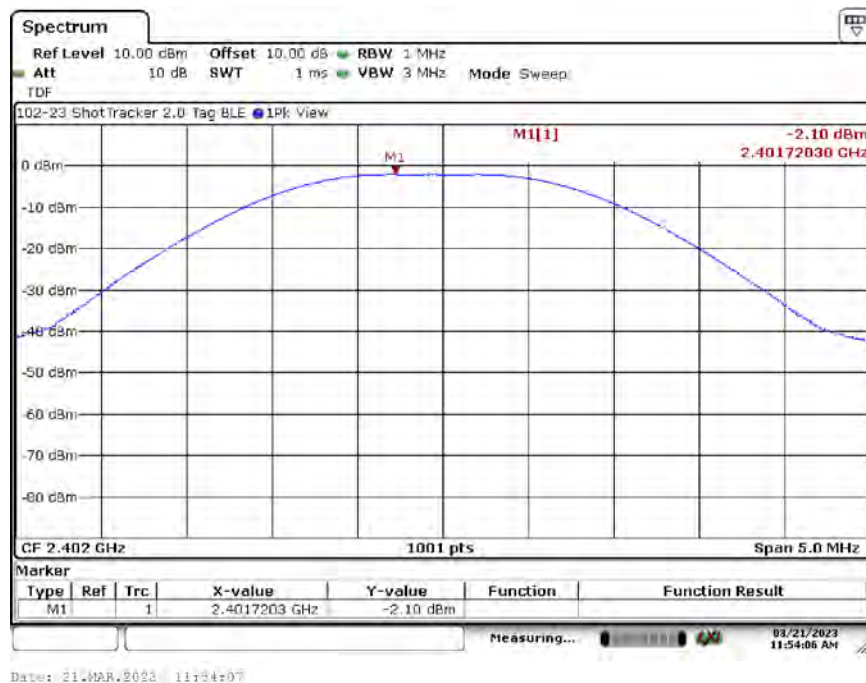
Procedure: This test was performed in accordance with the procedure detailed in ANSI C63.10:2020 Clause 11.9.1.1

Test Note: A spectrum analyzer resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz were used to meet the requirements of FCC OET publication number 558074, Section 9.1.1 and the measured product DTS bandwidth.

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

BLE Channel	Frequency	Maximum Peak Conducted Output Power	Peak Limit	Margin	Result
	(MHz)	(dBm)	(dBm)	(dB)	
37	2402	-2.10	30	-32.10	Compliant
17	2440	-2.60	30	-32.60	Compliant
39	2480	-2.93	30	-32.93	Compliant

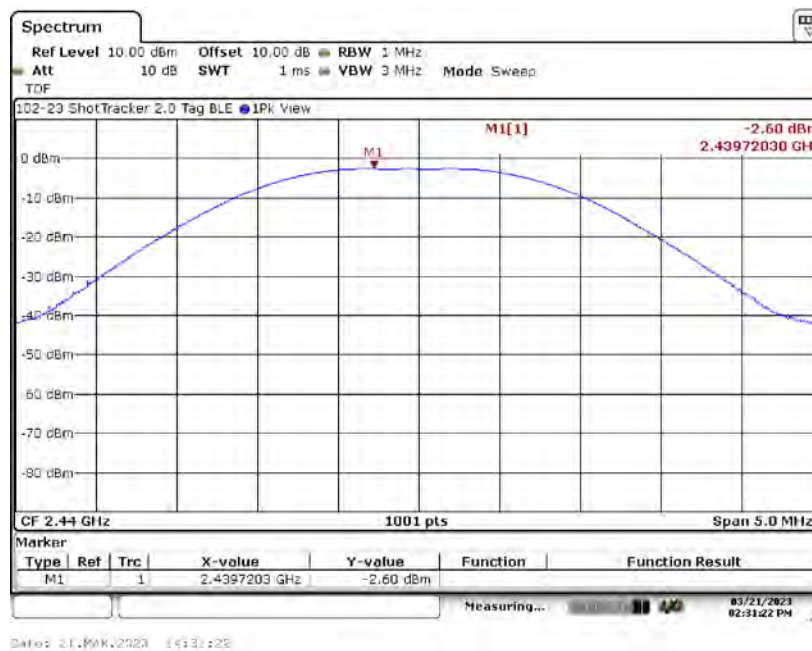
7.3.1. Low Channel – 37, 2402 MHz



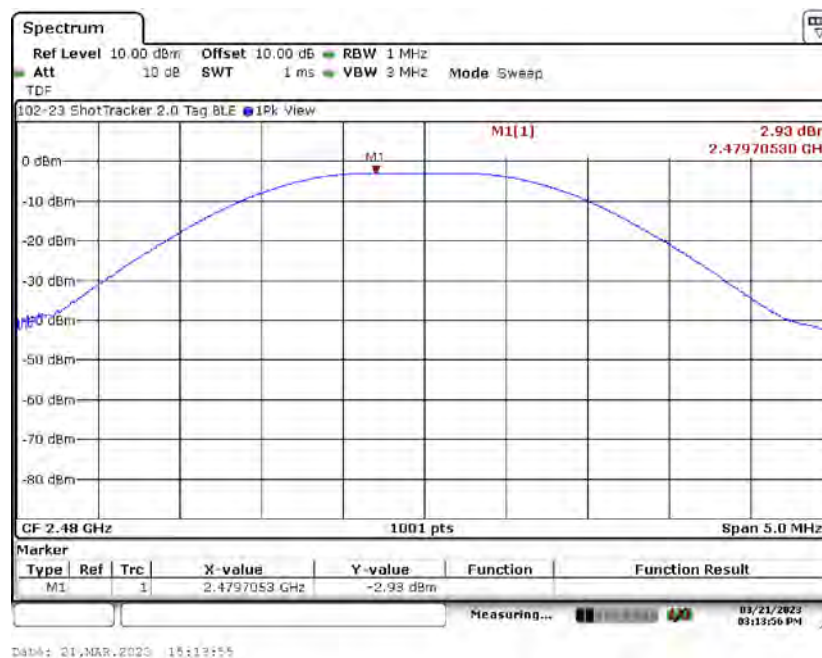
7. Measurement Data

7.3. Maximum Peak Conducted Output Power (continued)

7.3.2. Middle Channel – 17, 2440 MHz



7.3.3. High Channel – 39, 2480 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.

DUT Status: The DUT utilizes a coil wire antenna with an approximate gain of 0.47 dBi.

7. Measurement Data (continued)

7.5. Transmitter Spurious Radiated Emissions (30 kHz to 40 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 C63.10:2020, Section 11.12 American National Standard for Testing Unlicensed Wireless Devices.

Test Notes: Measurements were made from the lowest oscillator frequency as stated by the manufacturer (32.768 kHz) to the 10th harmonic of the highest transmitter frequency or 40 GHz, whichever is lower.

Reference FCC Part 15.33(a) and FCC Part 15.33(a)(1).

Each of the test modes documented within the test report were evaluated and the worst case of each of the test modes is detailed in this section. A full set of measurement scans are presented in Appendix A of this test report.

Results: The Emissions from the EUT did not exceed the field strength levels specified in the above table.

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 (30 kHz to 25 GHz) (FCC 15.209, ISED RSS-GEN 6.13)

7.5.1 Transmitter Spurious Radiated Emissions (continued)

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	0.03005	70.77	118.03	-47.26	A1.1.3	Ground Parallel
150 kHz - 30 MHz	0.16800	64.44	83.07	-18.63	A2.7.3	Ground Parallel
30 MHz - 1000 MHz	700.11000	33.93	46.00	-12.07	A3.6.1	H
1000 MHz - 10000 MHz	9760.500	43.19	54.00	-10.81	A4.8.1	H
10000 MHz - 18000 MHz	16738.700	53.09	54.00	-0.91	A5.3.1	H
18000 MHz - 25000 MHz	19842.200	43.29	54.00	-10.71	A6.3.2	V

Note: Worst-case measured data from Appendix A. Above 1 GHz are max held peak values against the CISPR Average Limits therefore the margin is greater than measured.

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 (dBμV/m)			Limit (dBμV/m)		Margin (dBμV/m)		Antenna Polarity (H/V)	Result
	Peak	DCCF	Ave	Peak	Average	Peak	Average		
4804	48.36	-9.03	39.33	74.00	54.00	-25.64	-14.67	H	Compliant
4852	47.91	-9.03	38.88	74.00	54.00	-26.09	-15.12	H	Compliant
4960	48.19	-9.03	39.16	74.00	54.00	-25.81	-14.84	H	Compliant
7278	50.65	-9.03	41.62	74.00	54.00	-23.35	-12.38	H	Compliant
7440	50.59	-9.03	41.56	74.00	54.00	-23.41	-12.44	V	Compliant
12010	58.06	-9.03	49.03	74.00	54.00	-15.94	-4.97	V	Compliant
12130	58.35	-9.03	49.32	74.00	54.00	-15.65	-4.68	H	Compliant
12400	57.64	-9.03	48.61	74.00	54.00	-16.36	-5.39	V	Compliant
19216	58.96	-9.03	49.93	74.00	54.00	-15.04	-4.07	H	Compliant
19408	59.09	-9.03	50.06	74.00	54.00	-14.91	-3.94	V	Compliant
19840	58.80	-9.03	49.77	74.00	54.00	-15.20	-4.23	H	Compliant
22320	60.23	-9.03	51.20	74.00	54.00	-13.77	-2.80	H	Compliant

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

² The DCCF was calculated using $20 * \text{LOG} (0.222 / 0.628) = -9.03 \text{ dB}$

7. Measurement Data (continued)

7.6. Band Edge and Out of Band Measurements (FCC 15.209, ISSED RSS-GEN 6.13)

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 band edge, this measurement was 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 C63.10:2020, Section 11.11 American National Standard for Testing Unlicensed Wireless Devices.

For the upper band edge, this measurement was performed as a typical restricted band radiated emissions measurement above 1 GHz. Peak and CISPR average detectors and a 1 MHz resolution and 3 MHz video bandwidth were utilized.

Test Note: The radiated band edge and worst case out of band measurements in this report represent the measurements made with the worst case receive antenna polarity. In addition, the DTS bandwidth measurements were taken into consideration for the worst-case examples.

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

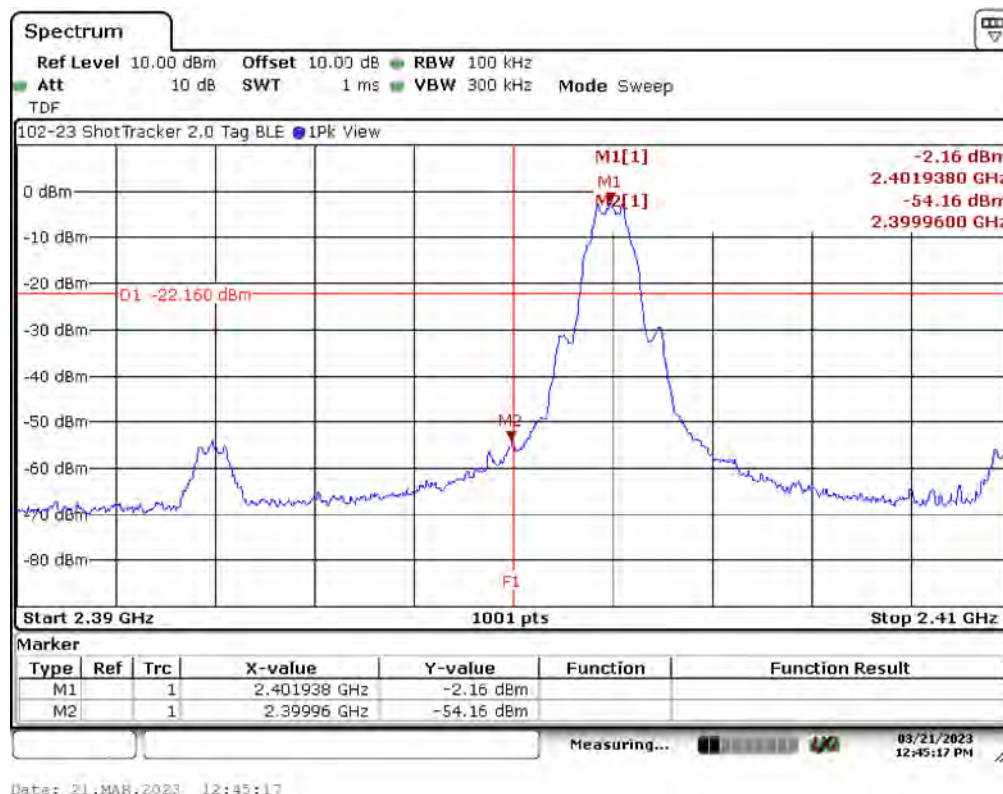
Band Edge Frequency	Lowest Transmitter Frequency	Maximum PSD (100 kHz)	Band Edge Delta to Max PSD (100 kHz)	Minimum Required Delta	Result
(MHz)	(MHz)	(dBm)	(dB)	(dB)	
2400	2402	-2.16	-52.00	-20	Compliant

Note: Reference the plot in section 7.6.2 on the next 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 and Worst Case Out of Band

Upper Band Edge

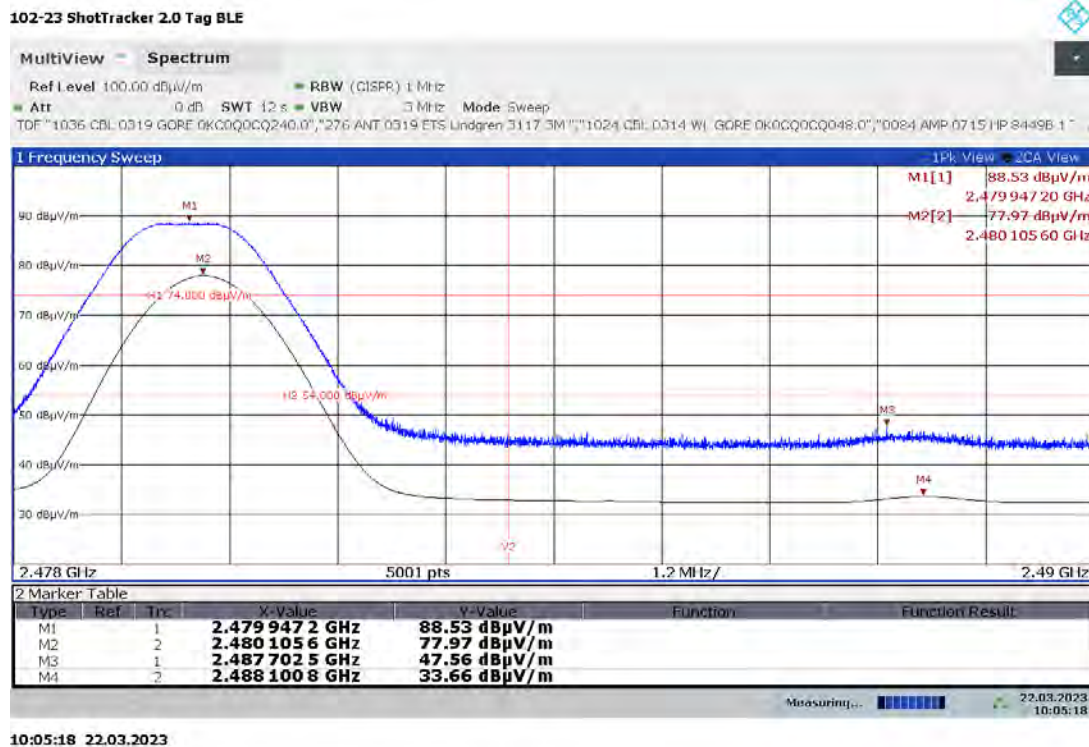
Band Edge Frequency	Field Strength (dBμV/m)		Limit (dBμV/m)		Margin (dB)		Result
	Peak	Average	Peak	Average	Peak	Average	
2483.5	47.56	33.66	74	54	-26.44	-20.34	Compliant

Note: Reference the plot in Section 7.6.4. on the following page.

7. Measurement Data (continued)

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

7.6.4. Upper Band Edge and Worst Case Out of Band



7.6.5. Lower Restricted Band, 2.310 MHz to 2390 MHz

Frequency (MHz)	Field Strength (dBμV/m)		Limit (dBμV/m)		Margin (dB)		Result
	Peak	Average	Peak	Average	Peak	Average	
2378.17	46.18	32.68	74	54	-27.82	-21.32	Compliant

Reference the plot in section 7.6.7. on the following page.

7.6.6. Upper Restricted Band, 2483.5 MHz, to 2500 MHz

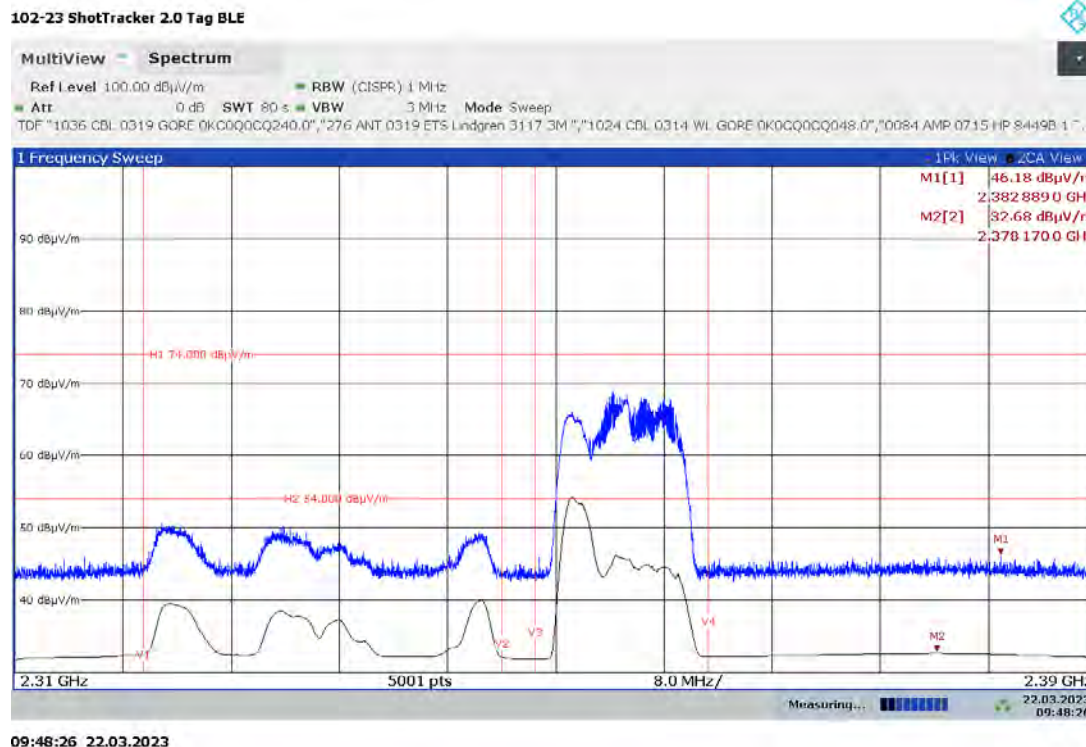
Frequency (MHz)	Field Strength (dBμV/m)		Limit (dBμV/m)		Margin (dB)		Result
	Peak	Average	Peak	Average	Peak	Average	
2488.065	47.57	33.71	74	54	-26.43	-20.29	Compliant

Reference the plot in section 7.6.8. on the following, following page.

7. Measurement Data (continued)

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

7.6.7. Lower Restricted Band, 2310 MHz, to 2390 MHz



Note about the non-EUT transmissions in this band:

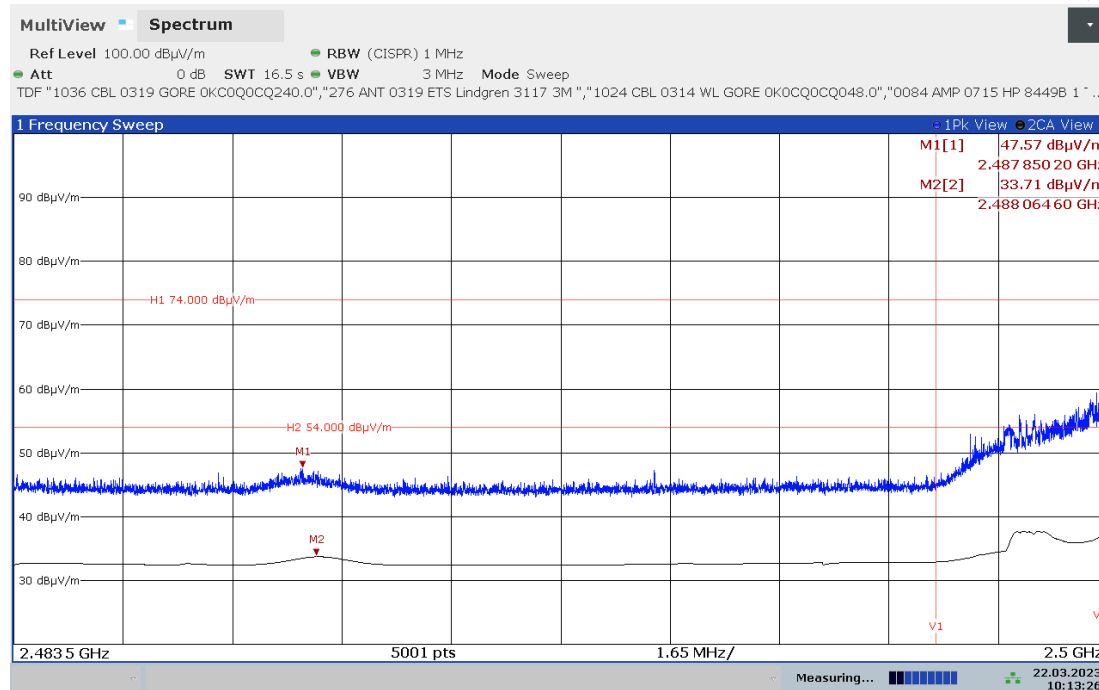
The emissions in enclosed in vertical markers were due to transmissions in the Wireless Communications Service (WCS) B Block (2310 MHz to 2315 MHz). The emission near the center of the Lower Restricted Band was due to a transmission in the WCS A and B Blocks (2350 MHz to 2360 MHz). A real-time observation of the Lower Restricted Band confirmed that there were no emissions contributed by the EUT in either of these WCS Blocks during the absence of the ambient signals. However, due to the time requirements of the CISPR average detector, this could not be realized on the spectrum analyzer display. Markers 1 and 2 represent the peak and CISPR average values of the worst case emission contributed by the EUT.

7. Measurement Data (continued)

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

7.6.8. Upper Restricted Band, 2483.5 MHz, to 2500 MHz

102-23 ShotTracker 2.0 Tag BLE



10:13:26 22.03.2023

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.

Emissions in Non-restricted Frequency Bands

Maximum PSD (100 kHz) In-Band ¹ (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)	Result
-2.15	2393.925	-55.29	-53.14	-22.15	Compliant

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 C63.10:2020 Clause 11.10.2 PKPSD (peak PSD).

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

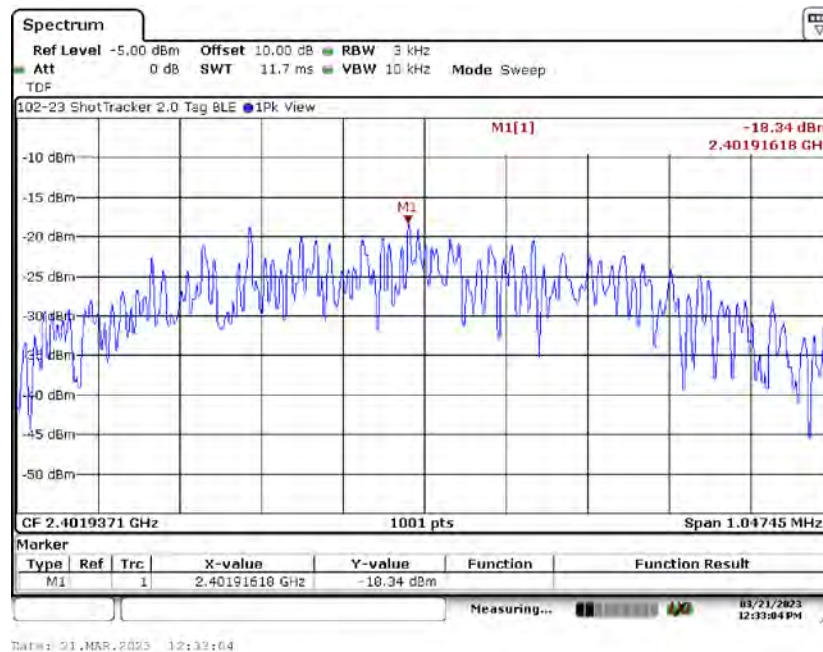
7.8.1. Measurement Results in 2400 MHz to 2483.5 MHz Band

Channel	Frequency	Maximum PSD Frequency	Maximum Power Spectral Density	Limit	Margin	Result
	(MHz)	(MHz)	(dBm)	(dBm)	(dB)	
37	2402	2401.916	-18.34	8	-26.34	Compliant
17	2440	2439.914	-18.74	8	-26.74	Compliant
39	2480	2479.913	-19.28	8	-27.28	Compliant

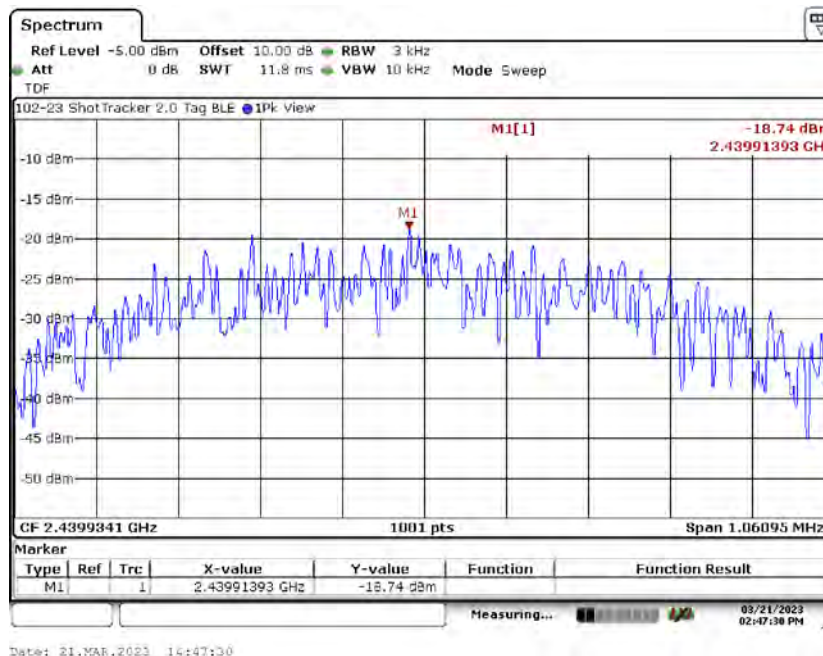
7. Measurement Data (continued)

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

7.8.2. Low Channel – 37, 2402 MHz



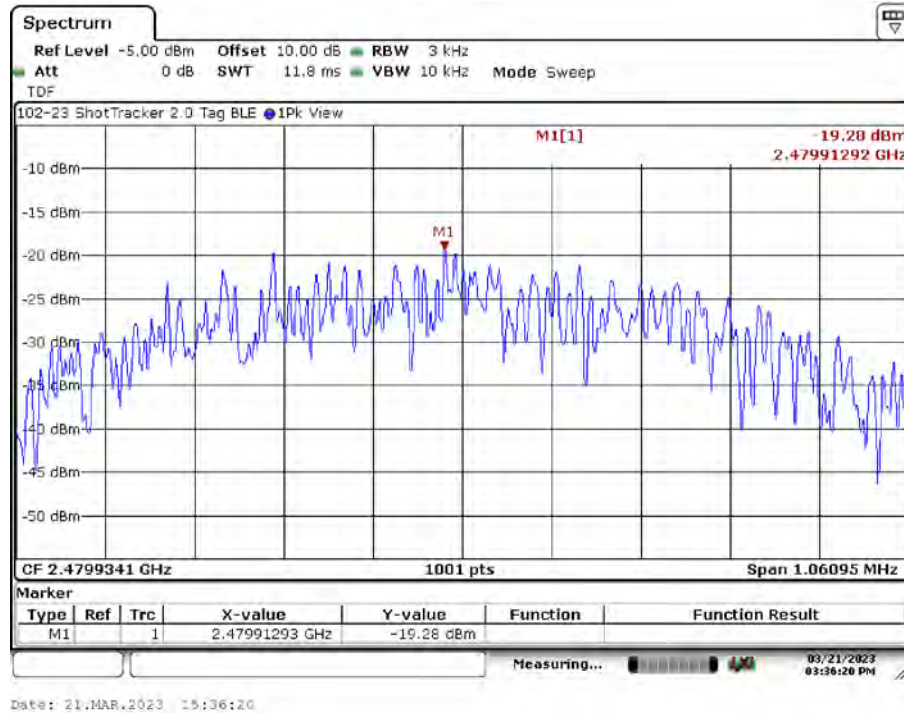
7.8.3. Middle Channel – 17, 2440 MHz



7. Measurement Data

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

7.8.4. High Channel – 39, 2480 MHz



7. Measurement Data (continued)

7.9. Conducted Emissions (FCC Part 15.207, ISED 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 C63.10-2020, Section 6.2: Standard test method for ac power-line conducted emissions from unlicensed wireless devices.

Results: The device under test meets the FCC Part 15.207 & RSS-GEN 7.2 test requirements.

Measurement & Equipment Setup

Test Date:	3/20/2023
Test Engineer:	Jeffrey Paquette
Site Temperature (°C):	22.5
Relative Humidity (%RH):	35
Frequency Range:	0.15 MHz to 30 MHz
EMI Receiver IF Bandwidth:	9 kHz
EMI Receiver Avg Bandwidth:	$\geq 3 * \text{RBW or IF(BW)}$
Detector Functions:	Peak, Quasi-Peak. & Average
Measurement Uncertainty	$\pm 3.40 \text{ dB}$

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.

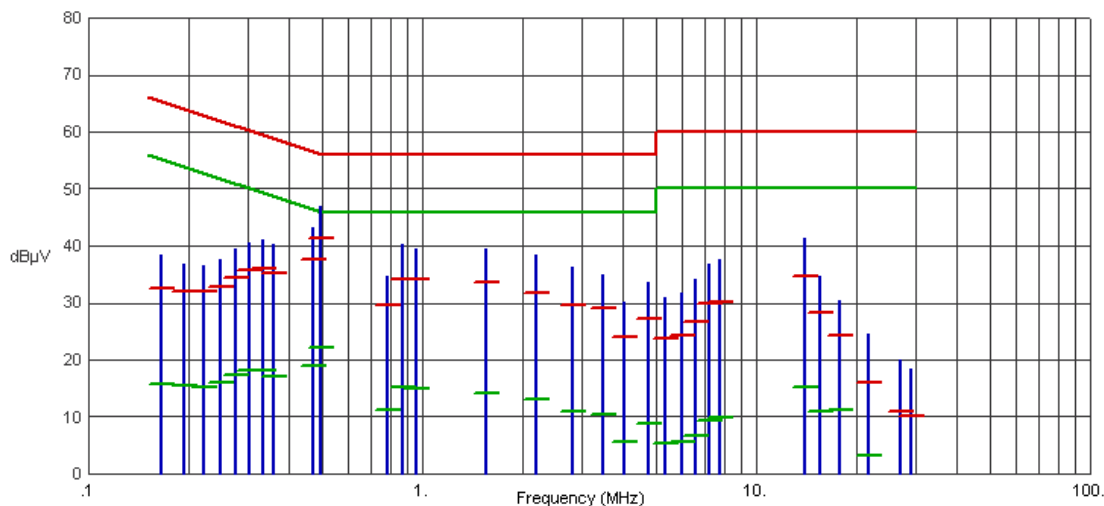
7. Conducted Emissions Test Results

7.10. Conducted Emissions (FCC Part 15.207)

7.10.1. 120 Volts, 60 Hz Phase

Test No.: 155-23, 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
.1658	38.53	32.63	65.17	-32.54	15.77	55.17	-39.40	
.1928	36.92	32.05	63.92	-31.87	15.38	53.92	-38.54	
.2220	36.61	32.04	62.74	-30.70	15.20	52.74	-37.54	
.2490	37.58	32.77	61.79	-29.02	15.94	51.79	-35.85	
.2760	39.36	34.46	60.94	-26.48	17.27	50.94	-33.67	
.3030	40.62	35.61	60.16	-24.55	18.12	50.16	-32.04	
.3323	41.12	35.94	59.39	-23.45	18.21	49.39	-31.18	
.3593	40.35	35.13	58.74	-23.61	17.17	48.74	-31.57	
.4695	43.15	37.53	56.52	-18.99	18.81	46.52	-27.71	
.4965	46.89	41.45	56.06	-14.61	22.20	46.06	-23.86	
.7890	34.79	29.53	56.00	-26.47	11.15	46.00	-34.85	
.8723	40.15	34.10	56.00	-21.90	15.18	46.00	-30.82	
.9555	39.53	34.01	56.00	-21.99	14.91	46.00	-31.09	
1.5518	39.47	33.48	56.00	-22.52	14.24	46.00	-31.76	
2.1998	38.27	31.81	56.00	-24.19	13.03	46.00	-32.97	
2.8253	36.30	29.73	56.00	-26.27	10.84	46.00	-35.16	
3.4733	34.94	29.14	56.00	-26.86	10.27	46.00	-35.73	
4.0403	30.05	23.96	56.00	-32.04	5.67	46.00	-40.33	
4.7760	33.52	27.16	56.00	-28.84	8.70	46.00	-37.30	
5.3453	30.81	23.84	60.00	-36.16	5.41	50.00	-44.59	
5.9753	31.77	24.27	60.00	-35.73	5.50	50.00	-44.50	
6.5580	34.03	26.73	60.00	-33.27	6.60	50.00	-43.40	
7.2060	36.80	29.97	60.00	-30.03	9.33	50.00	-40.67	
7.8158	37.54	30.22	60.00	-29.78	9.98	50.00	-40.02	
13.9515	41.34	34.66	60.00	-25.34	15.08	50.00	-34.92	
15.5850	34.79	28.14	60.00	-31.86	10.85	50.00	-39.15	
17.6955	30.44	24.26	60.00	-35.74	11.12	50.00	-38.88	
21.6578	24.50	15.90	60.00	-44.10	3.32	50.00	-46.68	
27.1388	19.87	11.06	60.00	-48.94	-2.73	50.00	-52.73	
29.1120	18.52	10.03	60.00	-49.97	-2.26	50.00	-50.26	

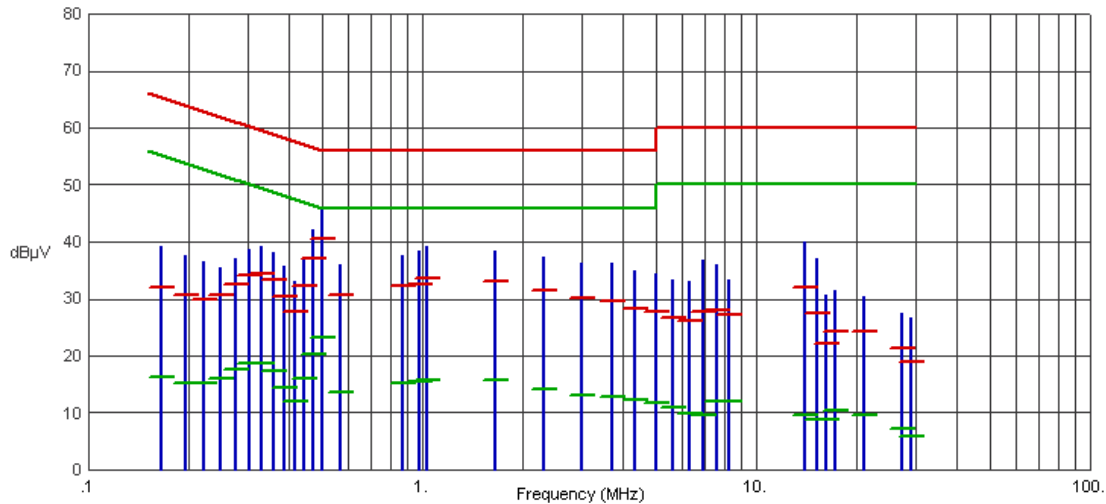
7. Conducted Emissions Test Results

7.10. Conducted Emissions (FCC Part 15.207 continued)

7.10.2. 120 Volts, 60 Hz Neutral

Test No.: 155-23, 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
.1658	39.31	31.92	65.17	-33.25	16.31	55.17	-38.86	
.1950	37.66	30.56	63.82	-33.26	15.15	53.82	-38.67	
.2220	36.48	30.00	62.74	-32.74	15.08	52.74	-37.66	
.2490	35.47	30.78	61.79	-31.01	16.09	51.79	-35.70	
.2760	37.18	32.60	60.94	-28.34	17.69	50.94	-33.25	
.3030	38.68	34.00	60.16	-26.16	18.66	50.16	-31.50	
.3300	39.18	34.33	59.45	-25.12	18.68	49.45	-30.77	
.3570	38.25	33.28	58.80	-25.52	17.34	48.80	-31.46	
.3840	35.69	30.51	58.19	-27.68	14.41	48.19	-33.78	
.4133	33.17	27.74	57.58	-29.84	11.94	47.58	-35.64	
.4425	37.34	32.22	57.01	-24.79	16.11	47.01	-30.90	
.4695	42.01	36.96	56.52	-19.56	20.30	46.52	-26.22	
.4988	45.52	40.43	56.02	-15.59	23.15	46.02	-22.87	
.5708	36.11	30.54	56.00	-25.46	13.53	46.00	-32.47	
.8700	37.70	32.14	56.00	-23.86	15.25	46.00	-30.75	
.9803	38.31	32.60	56.00	-23.40	15.48	46.00	-30.52	
1.0298	39.16	33.53	56.00	-22.47	15.77	46.00	-30.23	
1.6553	38.44	32.96	56.00	-23.04	15.62	46.00	-30.38	
2.3010	37.26	31.51	56.00	-24.49	14.14	46.00	-31.86	
3.0143	36.33	30.16	56.00	-25.84	12.97	46.00	-33.03	
3.6848	36.17	29.67	56.00	-26.33	12.85	46.00	-33.15	
4.3418	35.01	28.38	56.00	-27.62	12.19	46.00	-33.81	
5.0190	34.31	27.86	60.00	-32.14	11.71	50.00	-38.29	
5.6378	33.21	26.64	60.00	-33.36	10.96	50.00	-39.04	
6.3015	32.99	26.16	60.00	-33.84	9.84	50.00	-40.16	
6.9608	36.74	27.67	60.00	-32.33	9.52	50.00	-40.48	
7.6065	36.09	27.98	60.00	-32.02	12.09	50.00	-37.91	
8.2883	33.45	27.21	60.00	-32.79	12.02	50.00	-37.98	
13.9448	40.03	31.97	60.00	-28.03	9.62	50.00	-40.38	
15.2498	36.95	27.48	60.00	-32.52	8.81	50.00	-41.19	
16.2263	30.75	22.03	60.00	-37.97	8.82	50.00	-41.18	
17.1443	31.57	24.28	60.00	-35.72	10.46	50.00	-39.54	

7. Conducted Emissions Test Results

7.10. Conducted Emissions (FCC Part 15.207 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
21.0930	30.46	24.38	60.00	-35.62	9.63	50.00	-40.37	
27.3413	27.42	21.28	60.00	-38.72	7.25	50.00	-42.75	
29.2290	26.66	19.05	60.00	-40.95	5.92	50.00	-44.08	

7. Measurement Data (continued)

7.11. Duty Cycle (FCC OET publication number 558074)

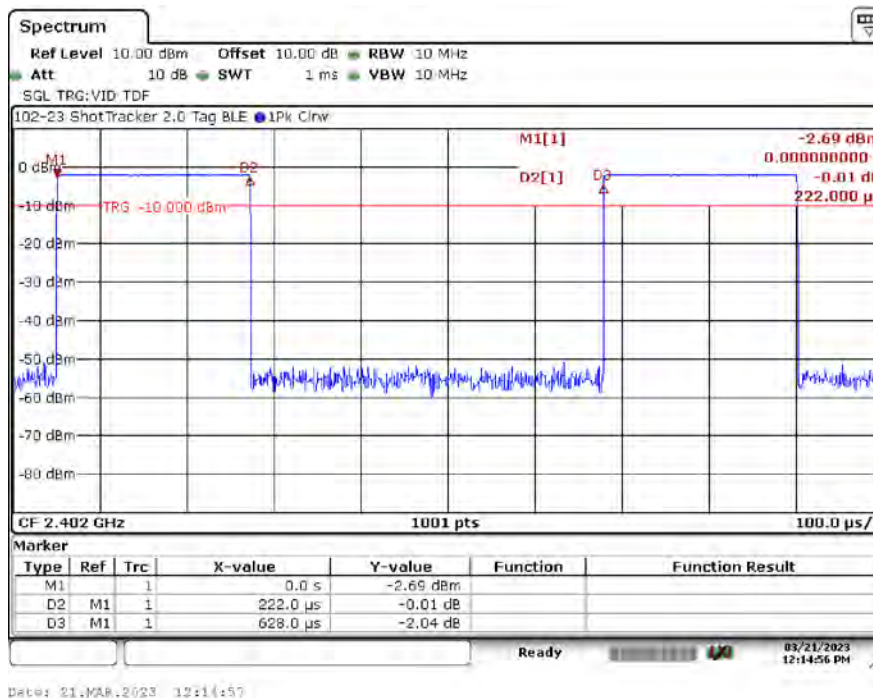
Requirement: Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%).

Procedure: Duty cycle measurements were made according to the procedure detailed FCC OET publication number 558074, Section 6(b).

Results: Duty cycle measurements are listed in the following table, Max held Peak detection was used for the measurements. A DCCF was calculated using $20 * \text{LOG} (0.222 / 0.628) = -9.03 \text{ dB}$

Channel	Frequency	Time High	Time per Period	Duty Cycle	
	(MHz)	(mS)	(mS)	(Numeric)	(%)
37	2402	0.222	0.628	0.35	35.35
17	2440	0.222	0.628	0.35	35.35
39	2480	0.222	0.628	0.35	35.35

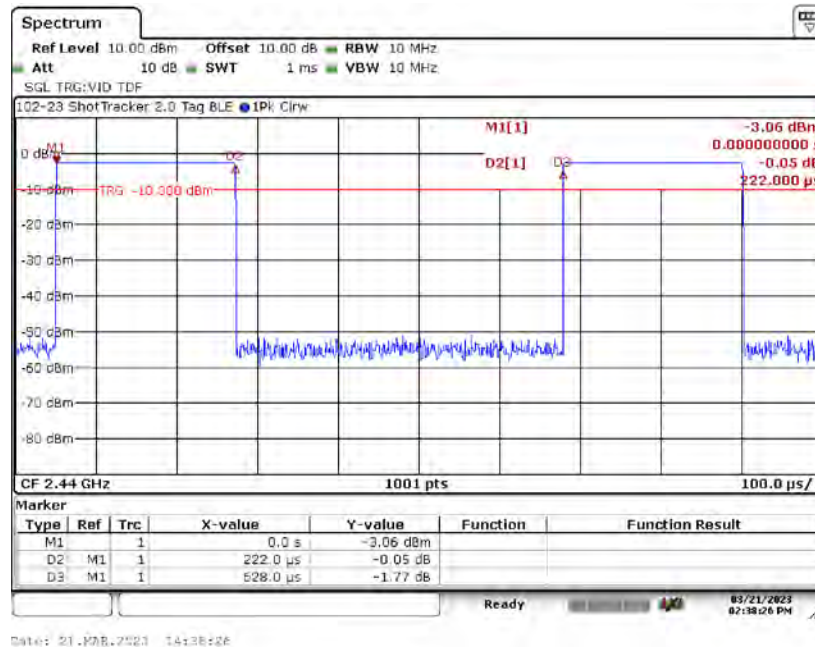
7.11.1. Low Channel – 37, 2402 MHz



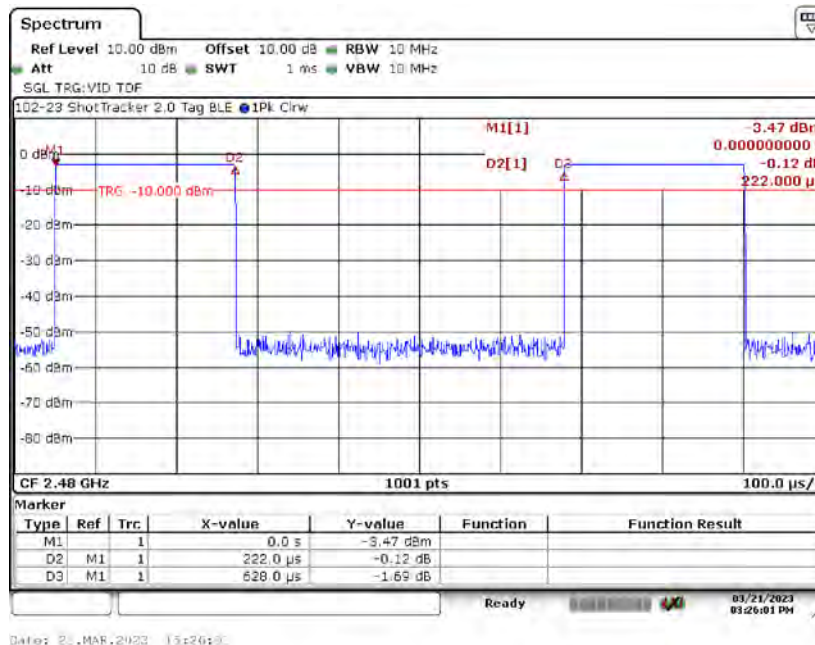
7. Measurement Data (continued)

7.10. Duty Cycle (continued)

7.11.2. Middle Channel – 17, 2440 MHz



7.11.3. High Channel – 39, 2480 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 (MHz)
Low	2402	1.0529
Middle	2440	1.0589
High	2480	1.0509

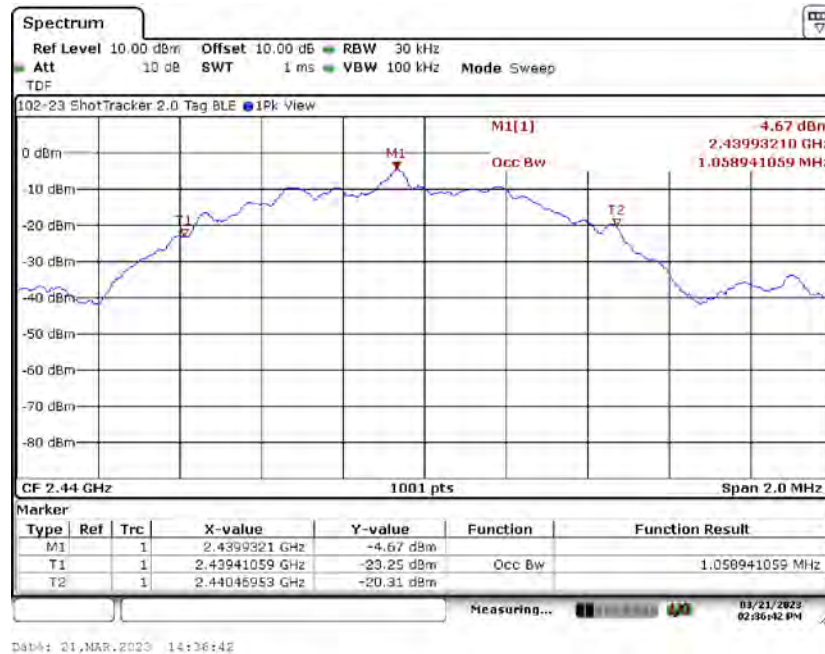
7.12.1.1. 99% Power Bandwidth – Low Frequency (2402 MHz)



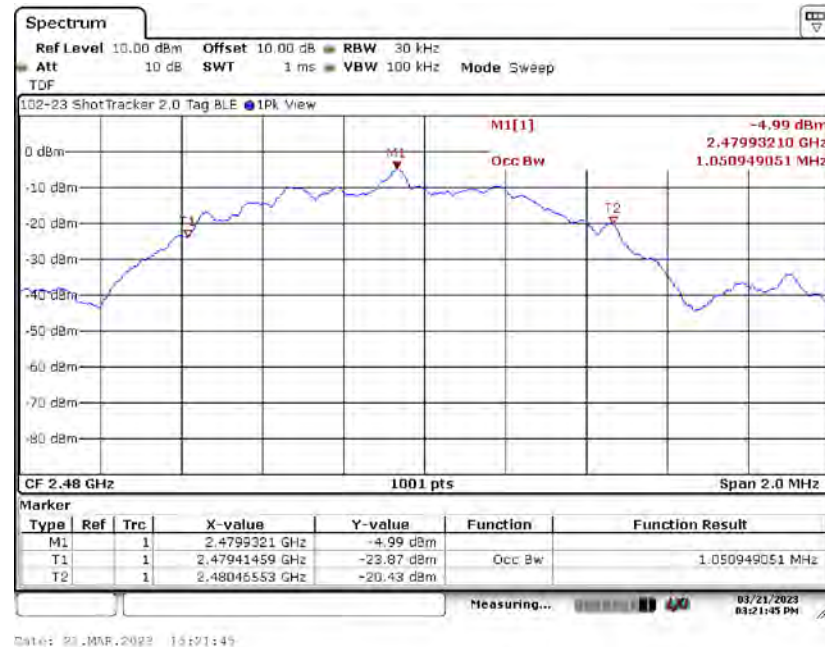
7. Measurement Data (continued)

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

7.12.1.2. 99% Power Bandwidth – Middle Frequency (2440 MHz)



7.12.1.3. 99% Power Bandwidth – High Frequency (2480 MHz)



8. Test Setup Photographs

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



8. Test Setup Photographs

8.2. Spurious Radiated Emissions, < 30 MHz – Rear



8. Test Setup Photographs

8.3. Spurious Radiated Emissions, 30 MHz to 1 GHz – Rear View



8. Test Setup Photographs

8.4. Radiated Emissions Above 1 GHz – Front



8. Test Setup Photographs

8.5. Radiated Emissions 1 to 18 GHz – Rear



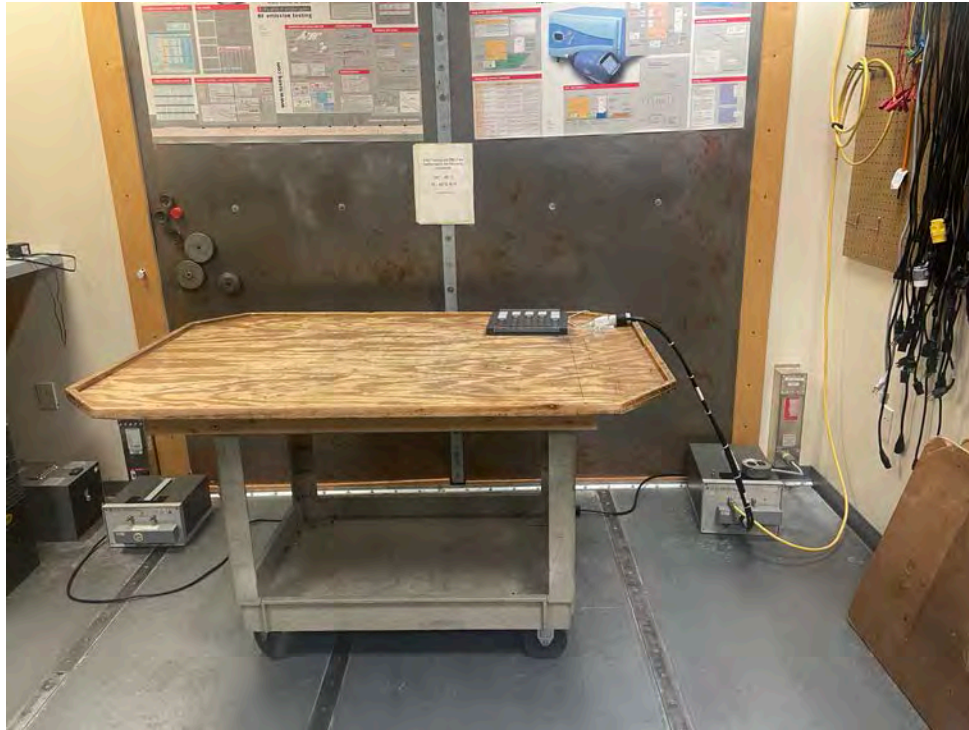
8. Test Setup Photographs

8.6. Radiated Emissions Above 18 GHz – Rear



8. Test Setup Photographs

8.7. Conducted Emissions Measurements - Front



8. Test Setup Photographs

8.8. Conducted Emissions Measurements - Rear



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 Innovation Science and Economic Development Canada (ISED) 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 required by EN 55022. 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.

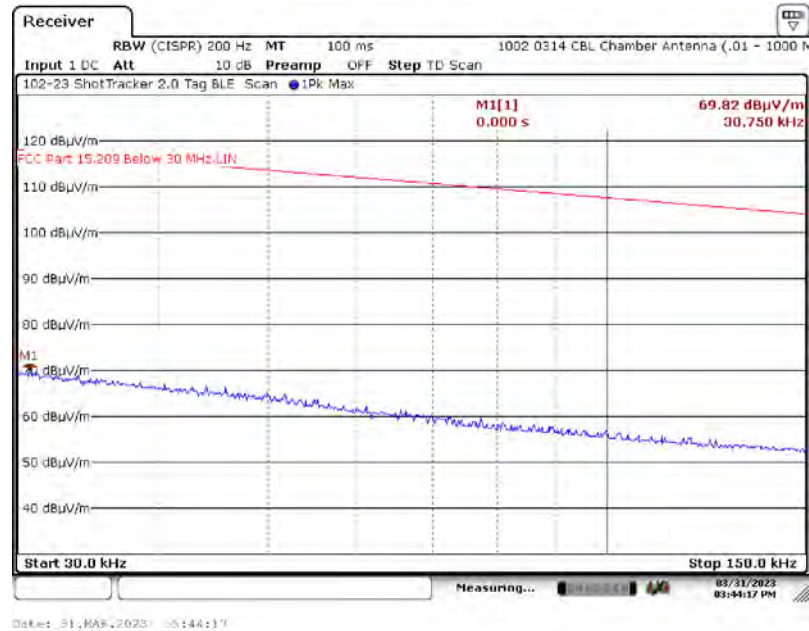
The sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or tabletop.

Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

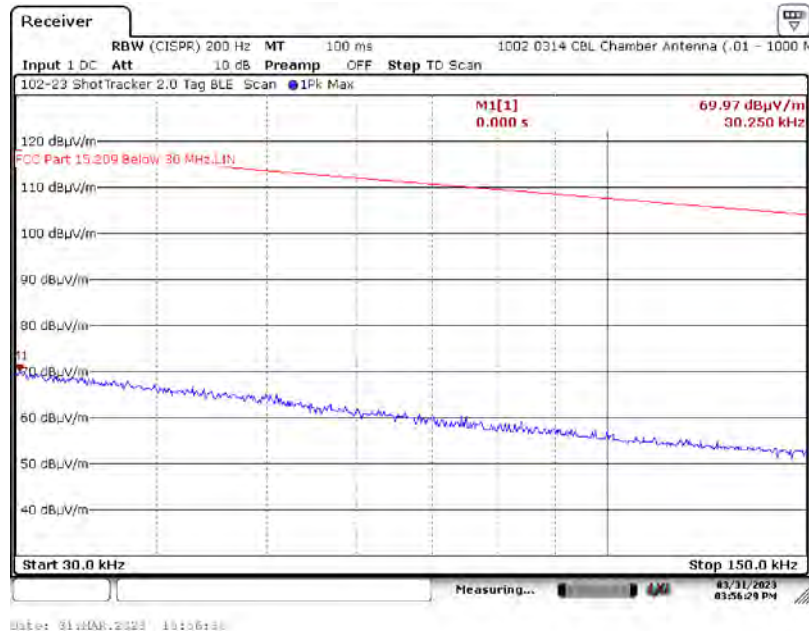
A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

A1.1. Channel 37, 2402 MHz – X-Axis

A1.1.1. Measurement Results: Parallel Antenna



A1.1.2. Measurement Results: Perpendicular Antenna

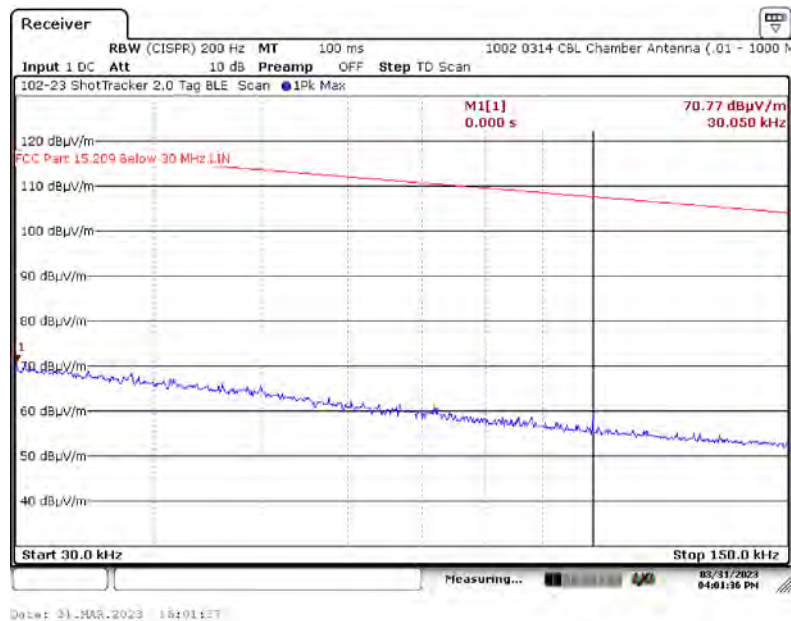


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

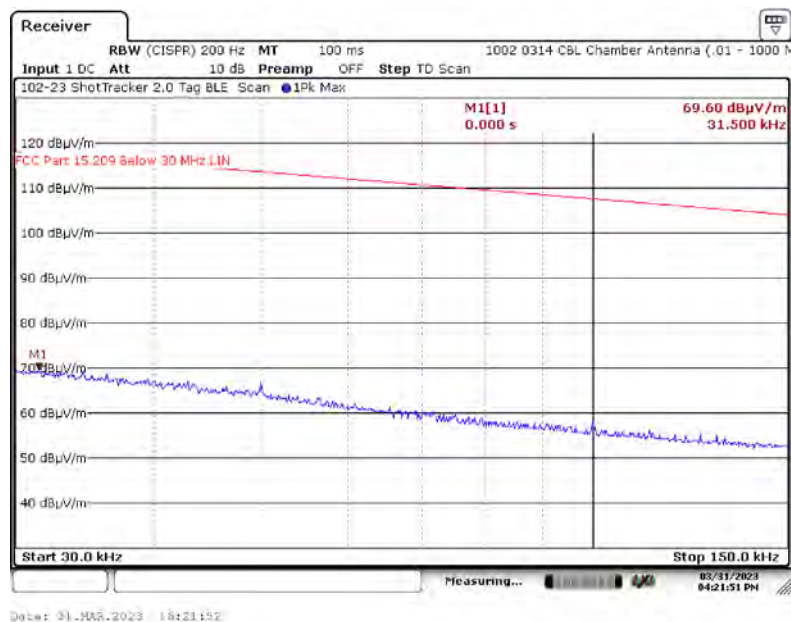
A1.1. Channel 37, 2402 MHz – X Axis

A1.1.3. Measurement Results: Ground-Parallel Antenna



A1.2. Channel 17, 2440 MHz – X Axis

A1.2.1. Measurement Results: Parallel Antenna

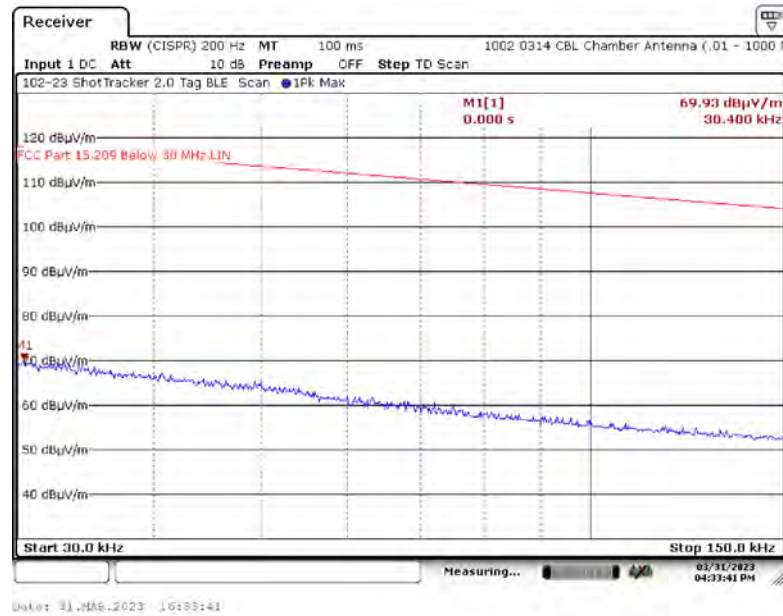


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

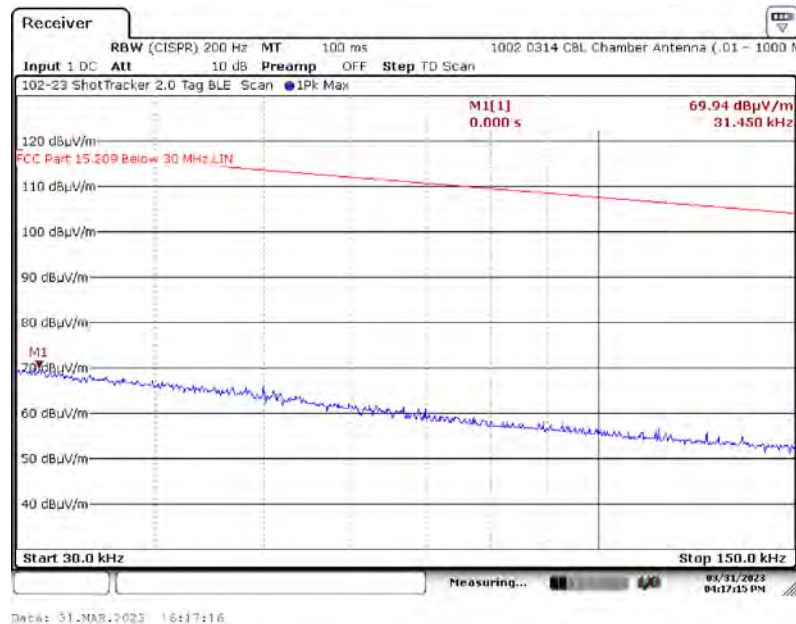
A1.2. Channel 17, 2440 MHz – X Axis

A1.2.2. Measurement Results: Perpendicular Antenna



A1.2. Channel 17, 2440 MHz – X Axis

A1.2.3. Measurement Results: Ground-Parallel Antenna

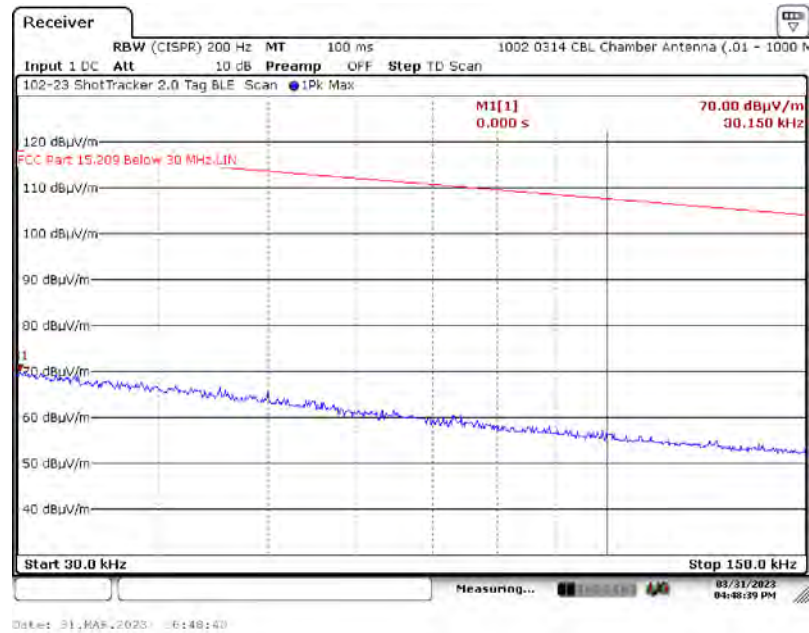


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

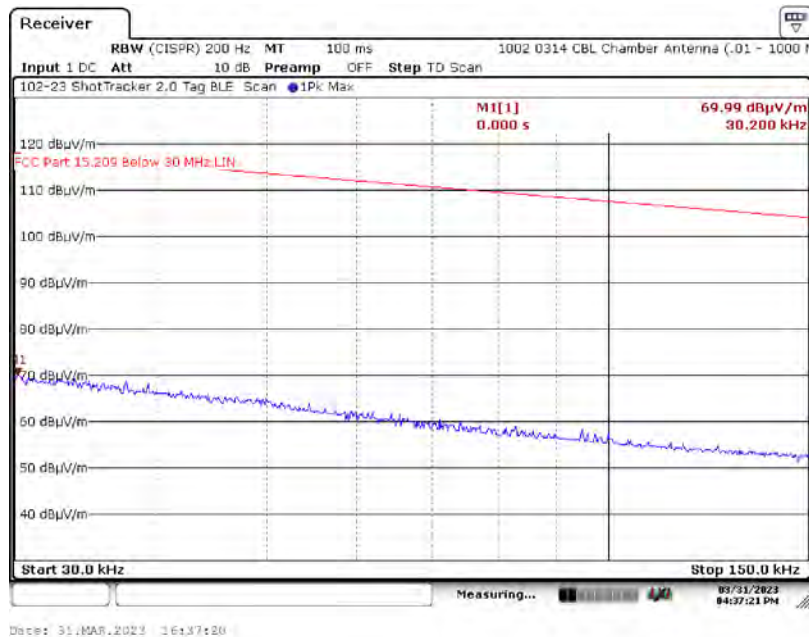
A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

A1.3. Channel 39, 2480 MHz – X Axis

A1.3.1. Measurement Results: Parallel Antenna



A1.3.2. Measurement Results: Perpendicular Antenna

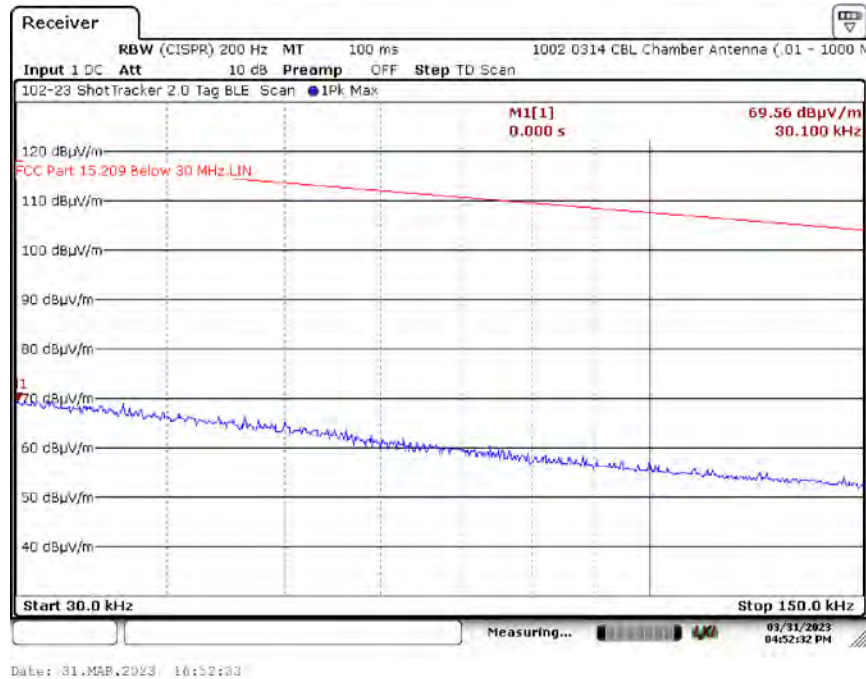


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A1.3. Channel 39, 2480 MHz – X Axis

A1.3.3. Measurement Results: Ground-Parallel Antenna

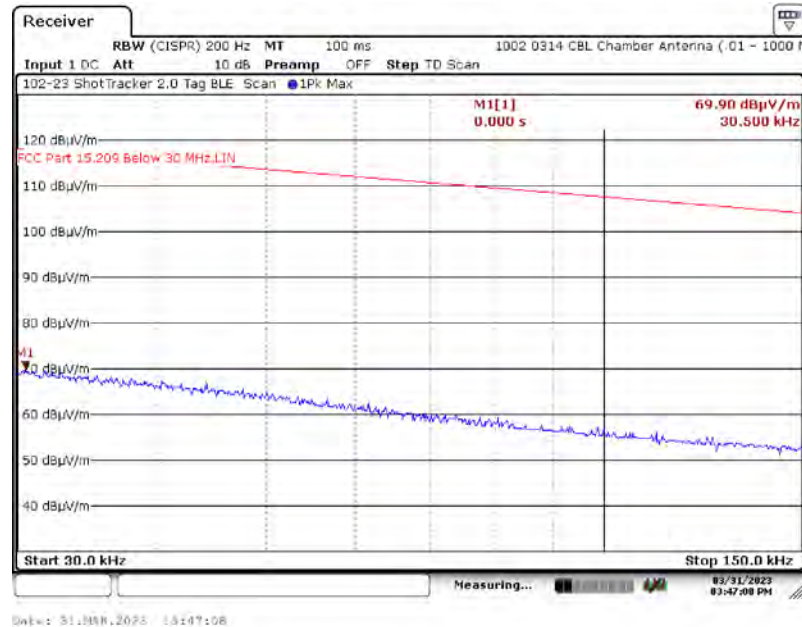


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

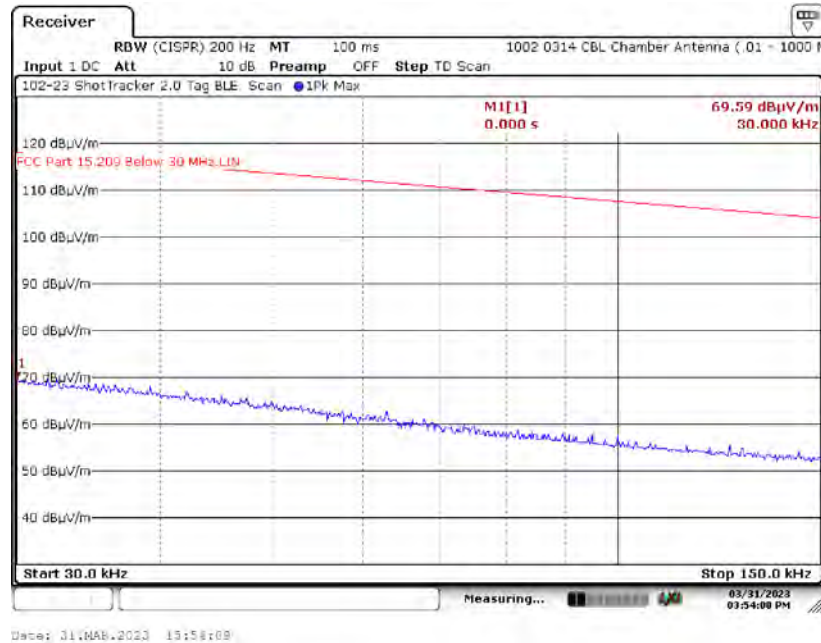
A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

A1.4. Channel 37, 2402 MHz – Y-Axis

A1.4.1. Measurement Results: Parallel Antenna



A1.4.2. Measurement Results: Perpendicular Antenna

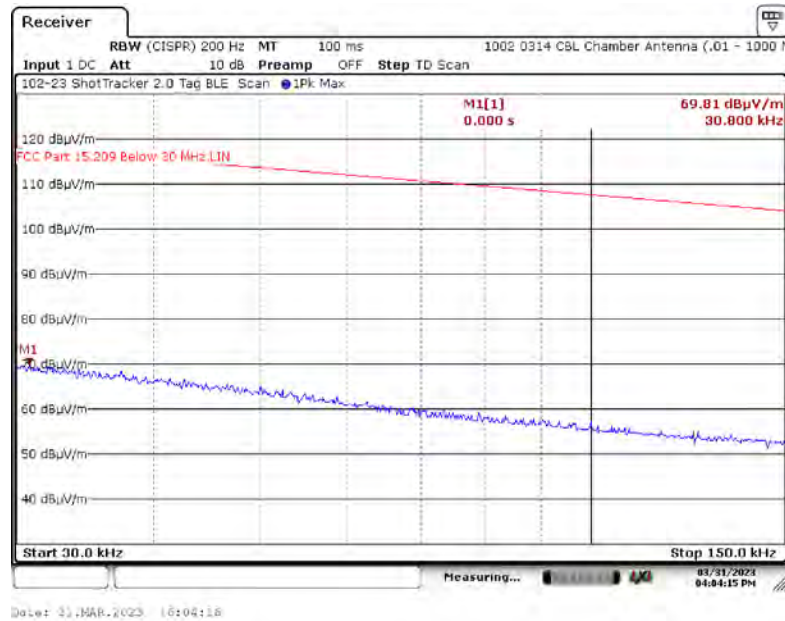


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

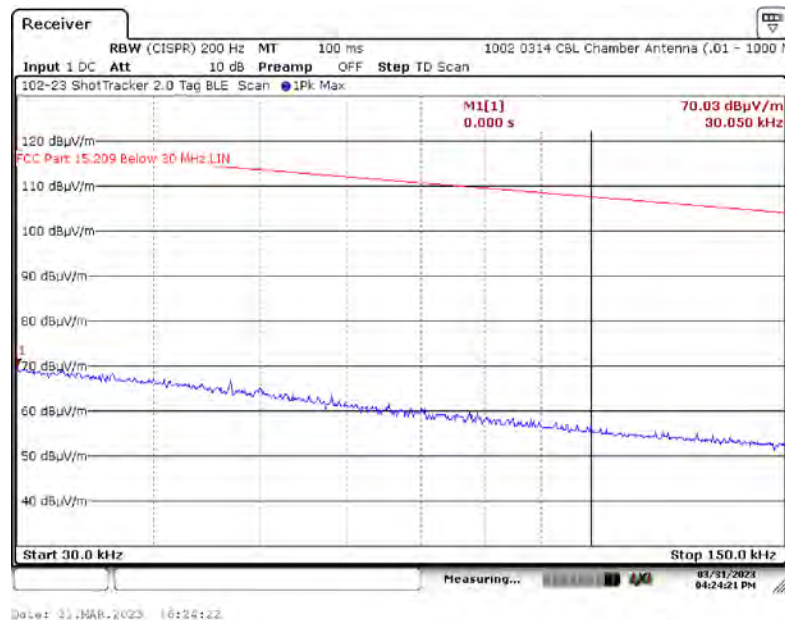
A1.4. Channel 37, 2402 MHz – Y Axis

A1.4.3. Measurement Results: Ground-Parallel Antenna



A1.5. Channel 17, 2440 MHz – Y Axis

A1.5.1. Measurement Results: Parallel Antenna

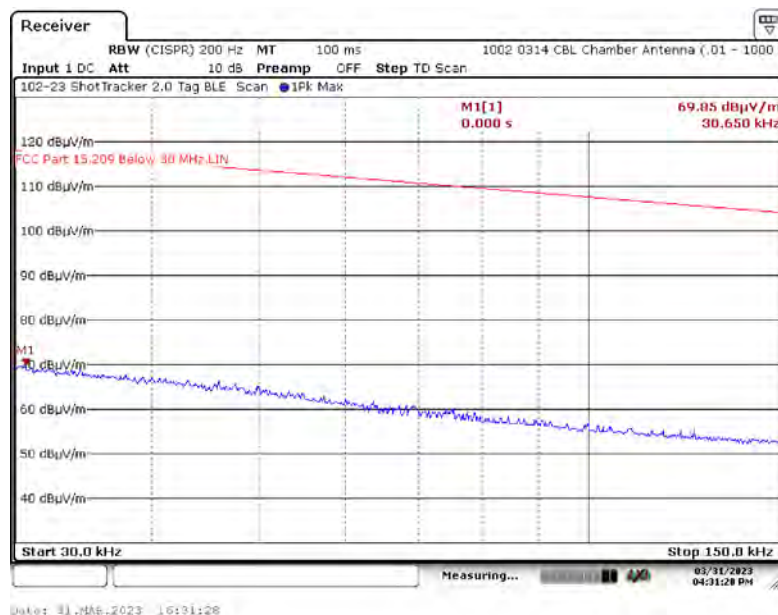


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

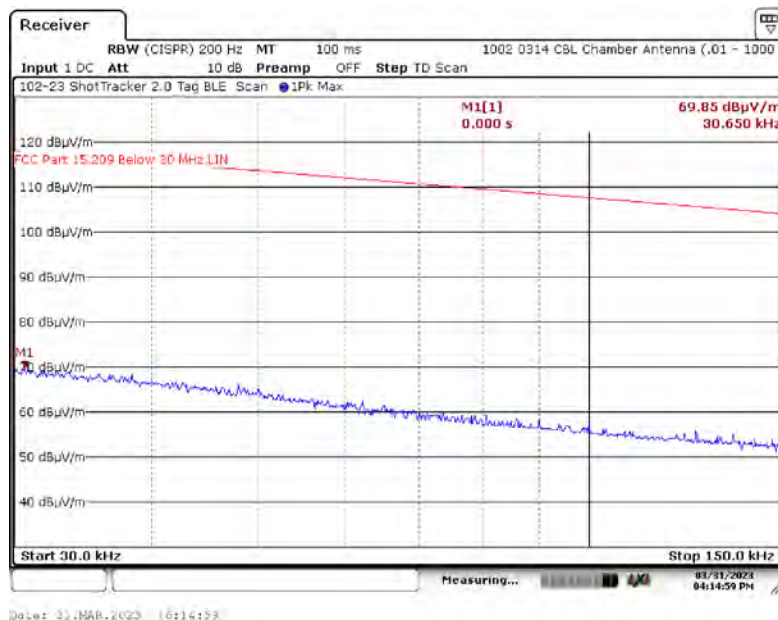
A1.5. Channel 17, 2440 MHz – Y Axis

A1.5.2. Measurement Results: Perpendicular Antenna



A1.5. Channel 17, 2440 MHz – Y Axis

A1.5.3. Measurement Results: Ground-Parallel Antenna

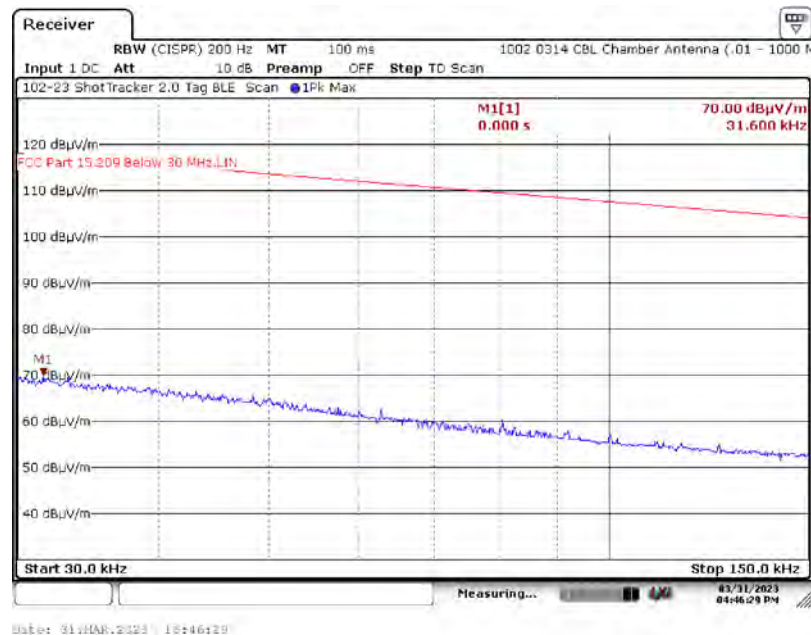


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

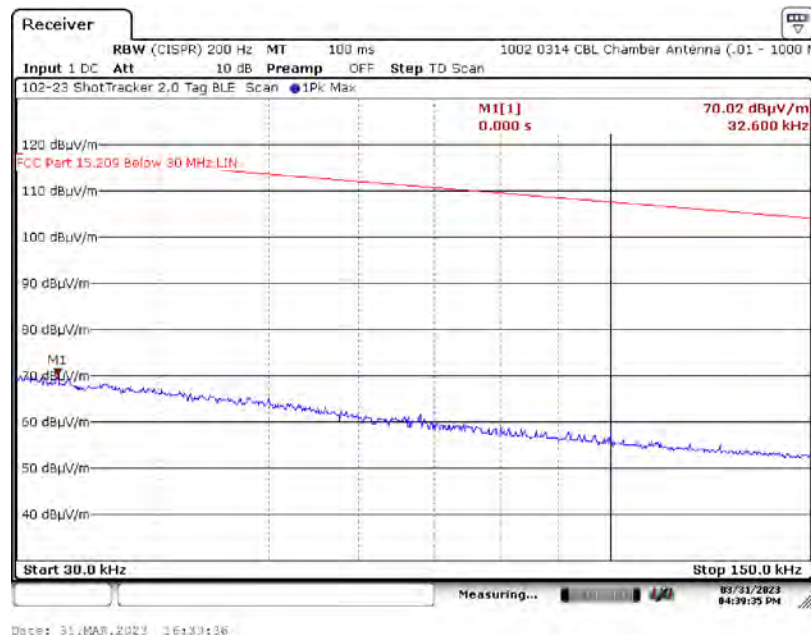
A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

A1.6. Channel 39, 2480 MHz – Y Axis

A1.6.1. Measurement Results: Parallel Antenna



A1.6.2. Measurement Results: Perpendicular Antenna

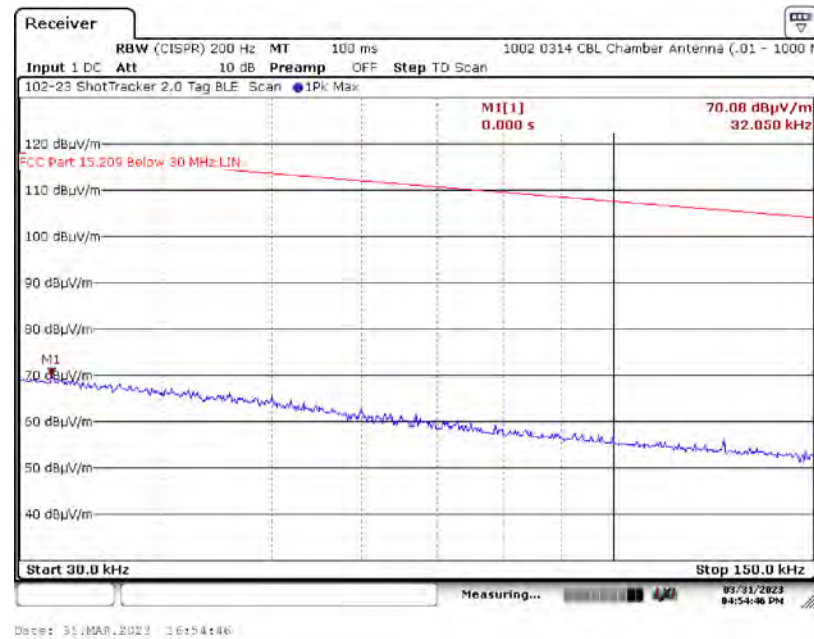


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A1.6. Channel 39, 2480 MHz – Y Axis

A1.6.3. Measurement Results: Ground-Parallel Antenna



Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

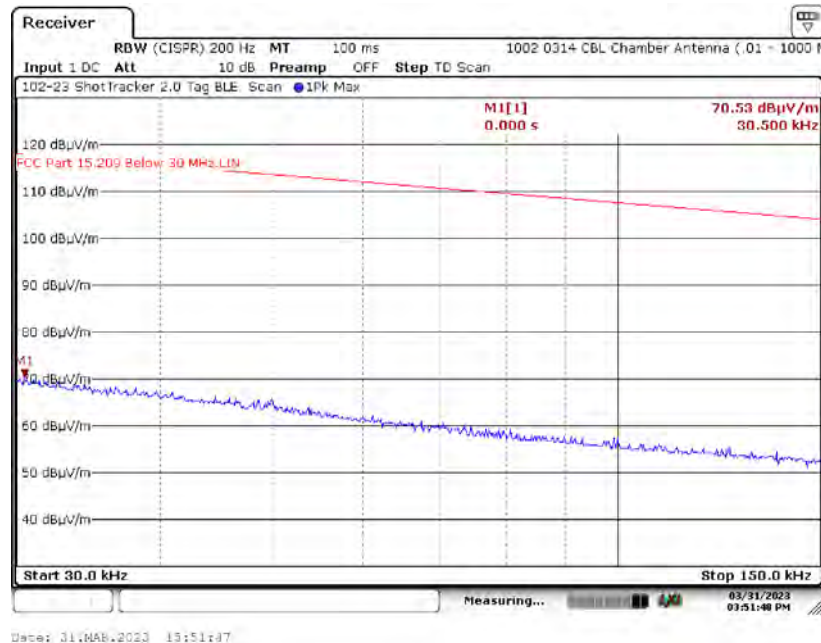
A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

A1.7. Channel 37, 2402 MHz – Z-Axis

A1.7.1. Measurement Results: Parallel Antenna



A1.7.2. Measurement Results: Perpendicular Antenna

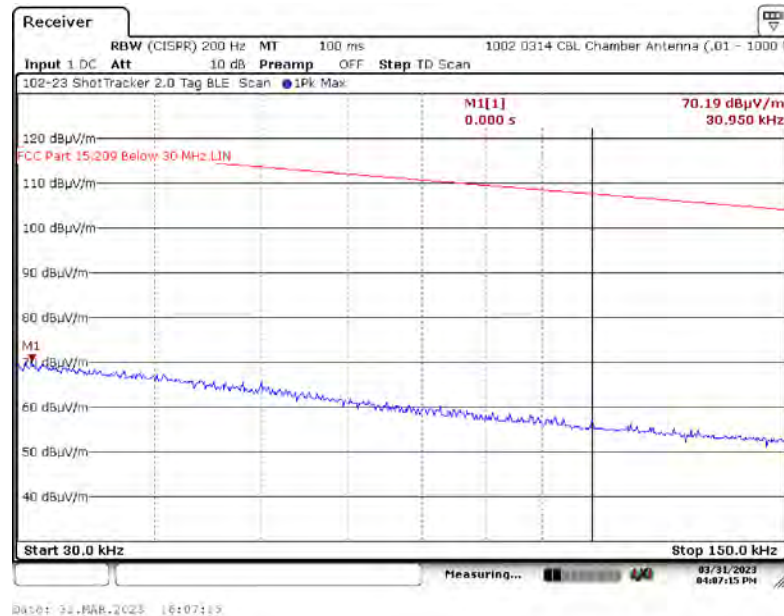


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

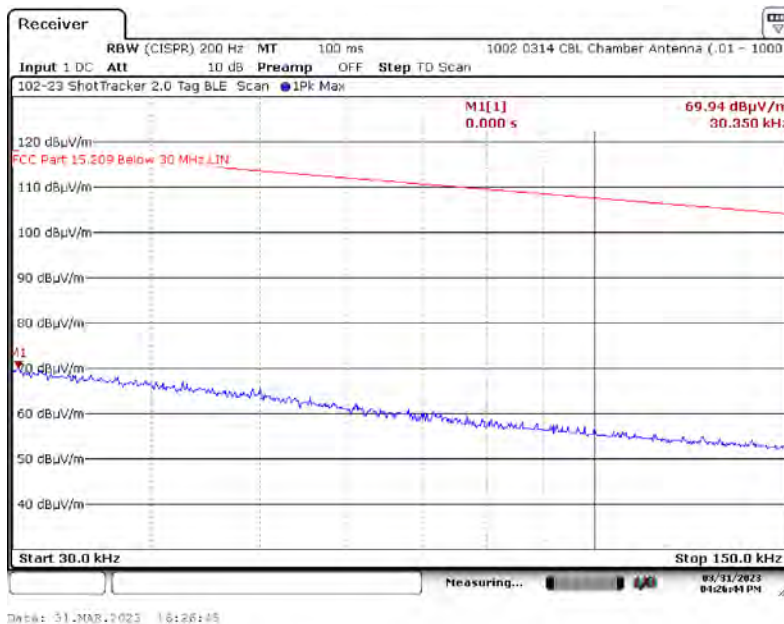
A1.7. Channel 37, 2402 MHz – Z Axis

A1.7.3. Measurement Results: Ground-Parallel Antenna



A1.8. Channel 17, 2440 MHz – Z Axis

A1.8.1. Measurement Results: Parallel Antenna

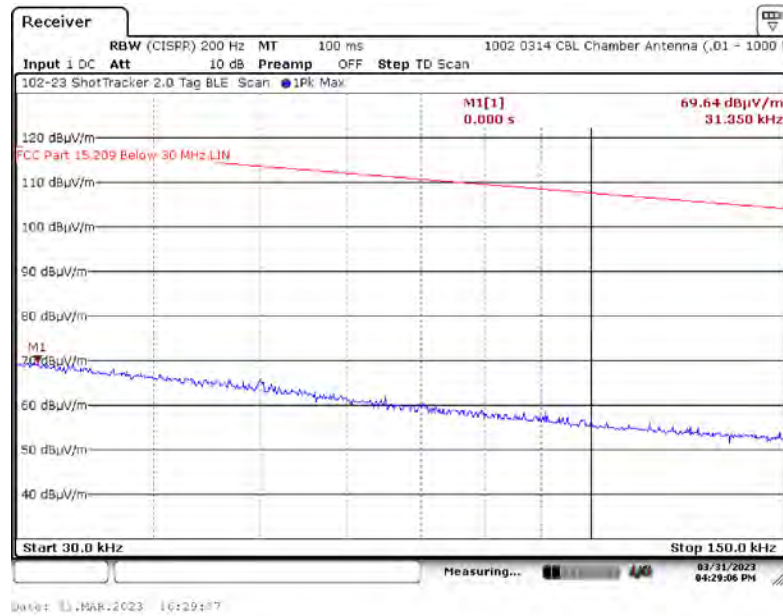


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

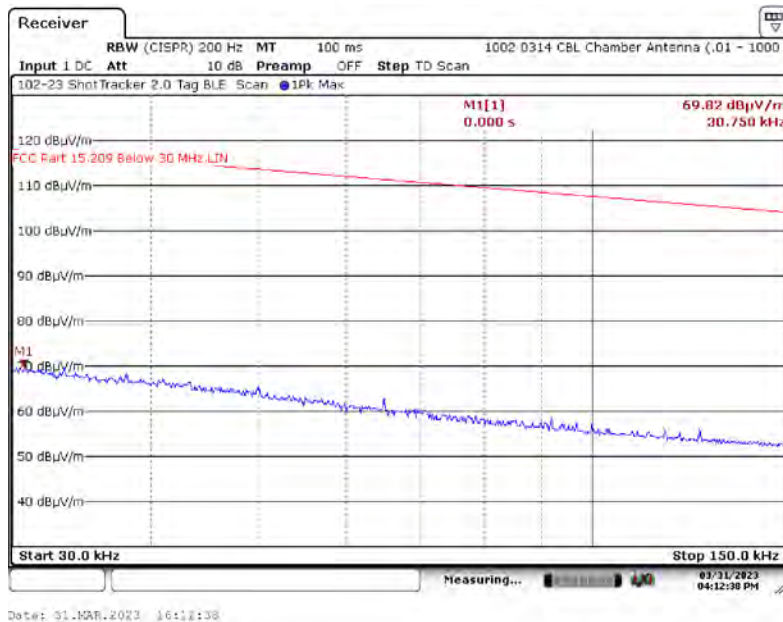
A1.8. Channel 17, 2440 MHz – Z Axis

A1.8.2. Measurement Results: Perpendicular Antenna



A1.8. Channel 17, 2440 MHz – Z Axis

A1.8.3. Measurement Results: Ground-Parallel Antenna

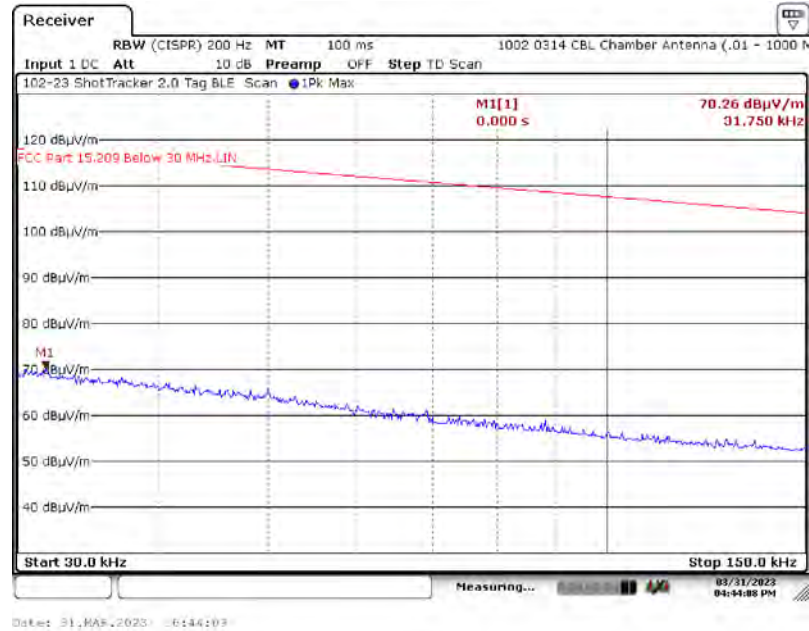


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

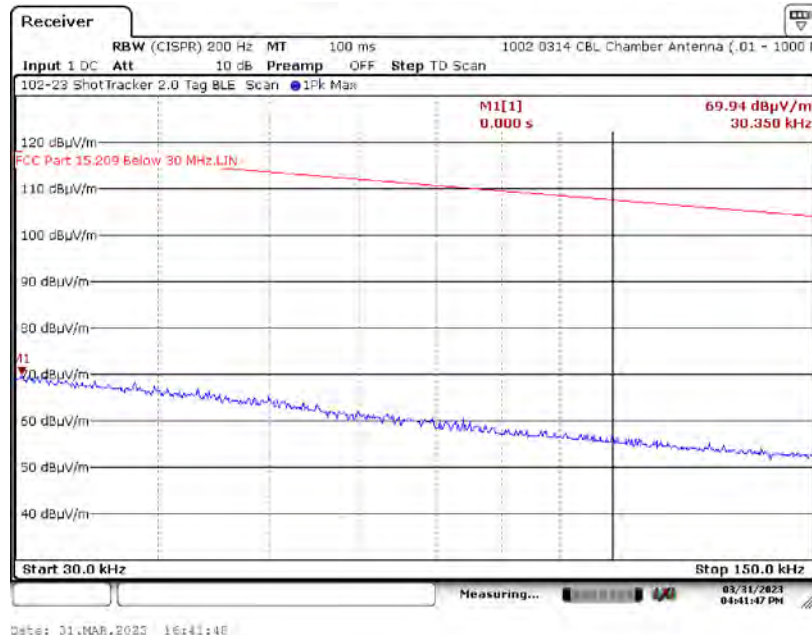
A1. Spurious Radiated Emissions (30 kHz – 150 kHz) Test Results

A1.9. Channel 39, 2480 MHz – Z Axis

A1.9.1. Measurement Results: Parallel Antenna



A1.9.2. Measurement Results: Perpendicular Antenna



Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A1.9. Channel 39, 2480 MHz – Z Axis

A1.9.3. Measurement Results: Ground-Parallel Antenna

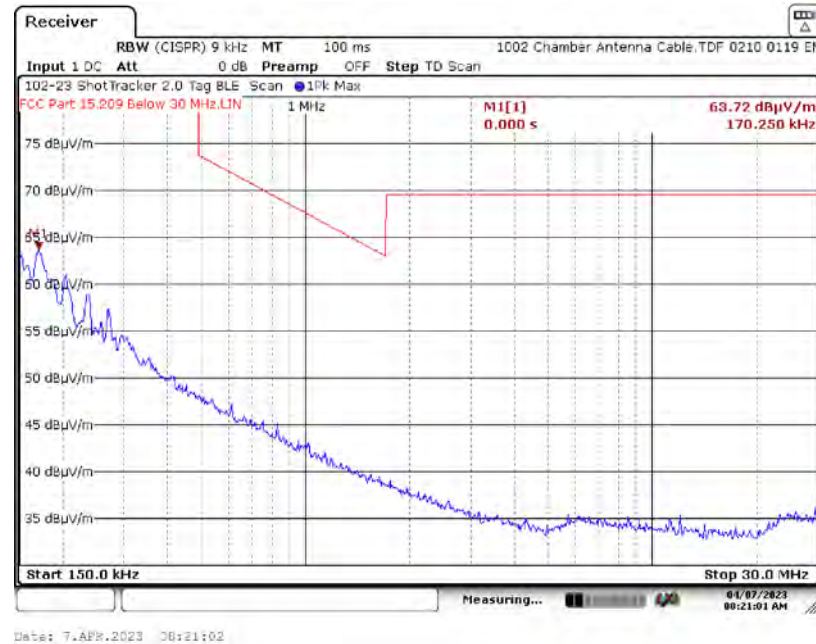


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.1. Channel 37, 2402 MHz- X Axis

A2.1.1. Measurement Results: Parallel Antenna



A2.1.2. Measurement Results: Perpendicular Antenna

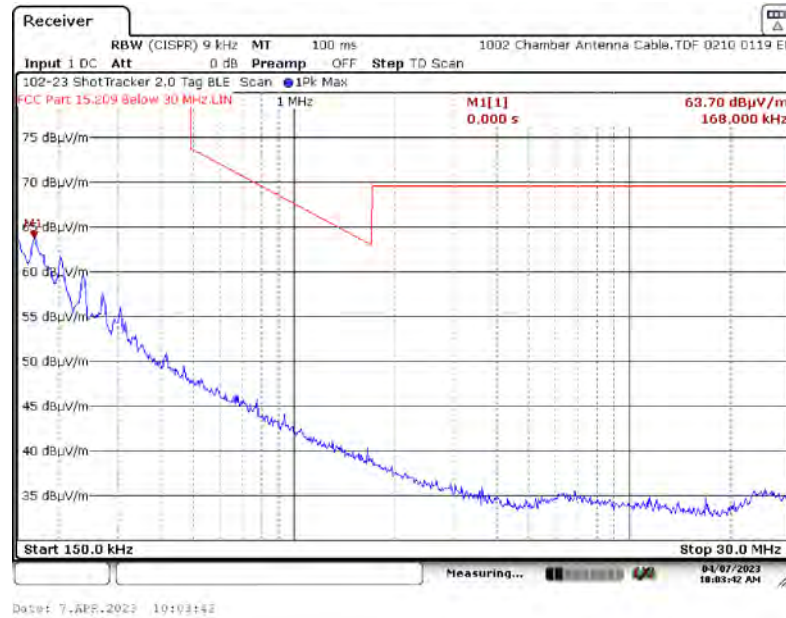


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.1. Channel 37, 2402 MHz – X Axis

A2.1.3. Measurement Results: Ground-Parallel Antenna



A2.2. Channel 17, 2440 MHz – X Axis

A2.2.1. Measurement Results: Parallel Antenna



Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.2. Channel 17, 2440 MHz – X Axis

A2.2.2. Measurement Results: Perpendicular Antenna



A2.2.3. Measurement Results: Ground-Parallel Antenna

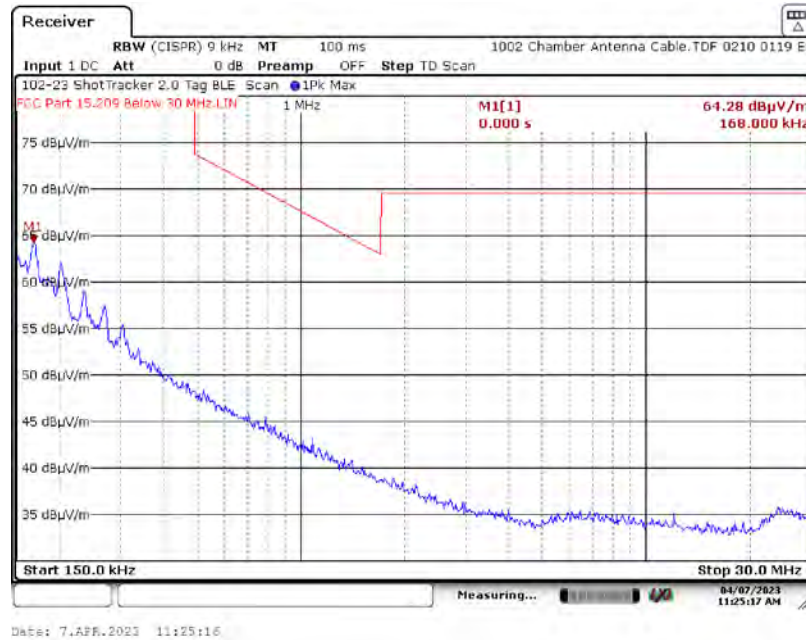


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.3. Channel 39, 2480 MHz – X Axis

A2.3.1. Measurement Results: Parallel Antenna



A2.3.2. Measurement Results: Perpendicular Antenna

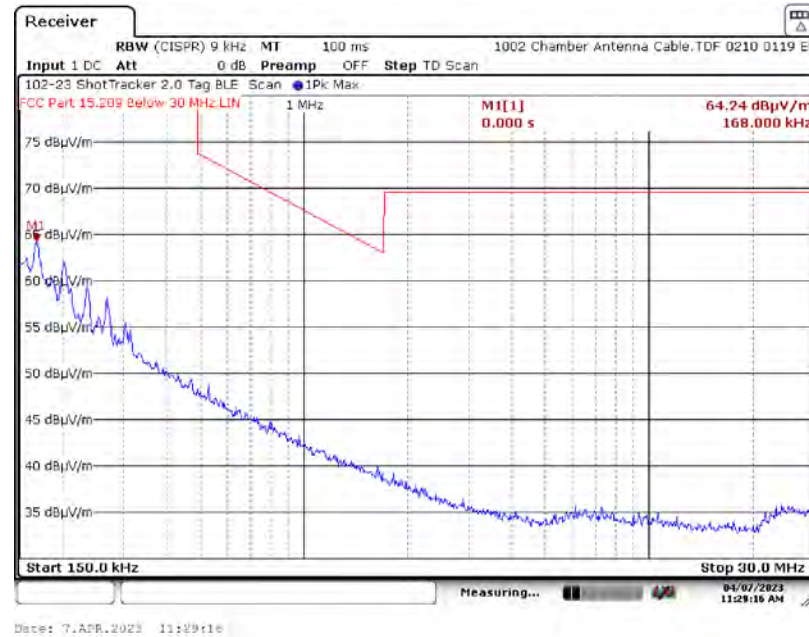


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.3. Channel 39, 2480 MHz – X Axis

A2.3.3. Measurement Results: Ground-Parallel Antenna

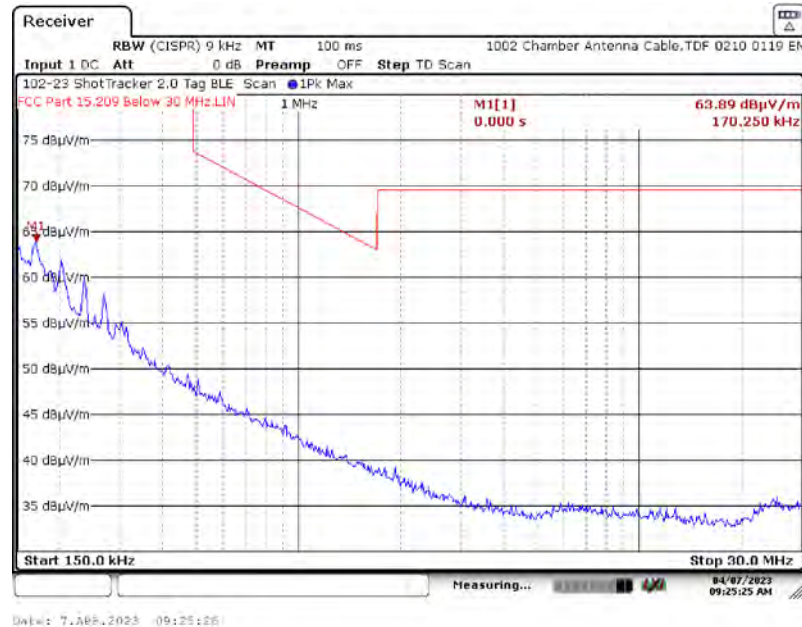


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

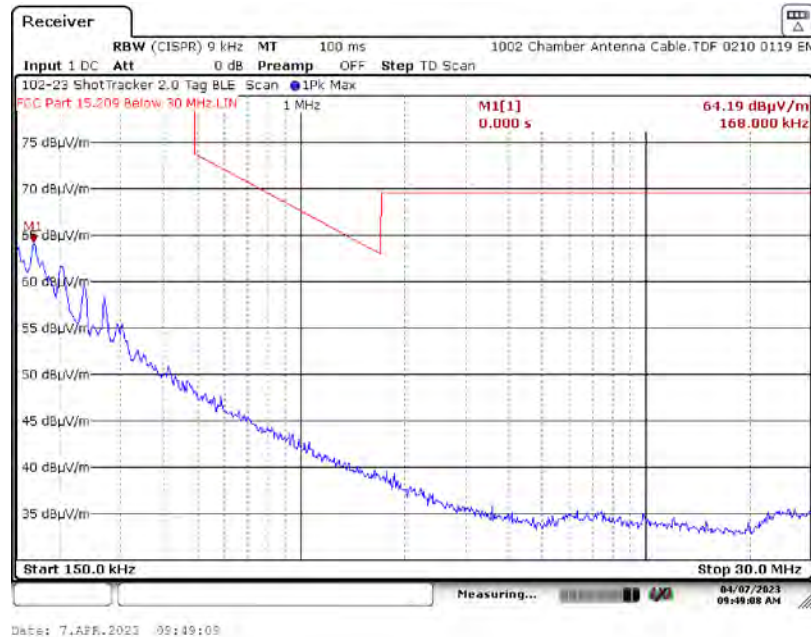
A2. Spurious Radiated Emissions (150 kHz – 30 MHz) Test Results

A2.4. Channel 37, 2402 MHz- Y Axis

A2.4.1. Measurement Results: Parallel Antenna



A2.4.2. Measurement Results: Perpendicular Antenna

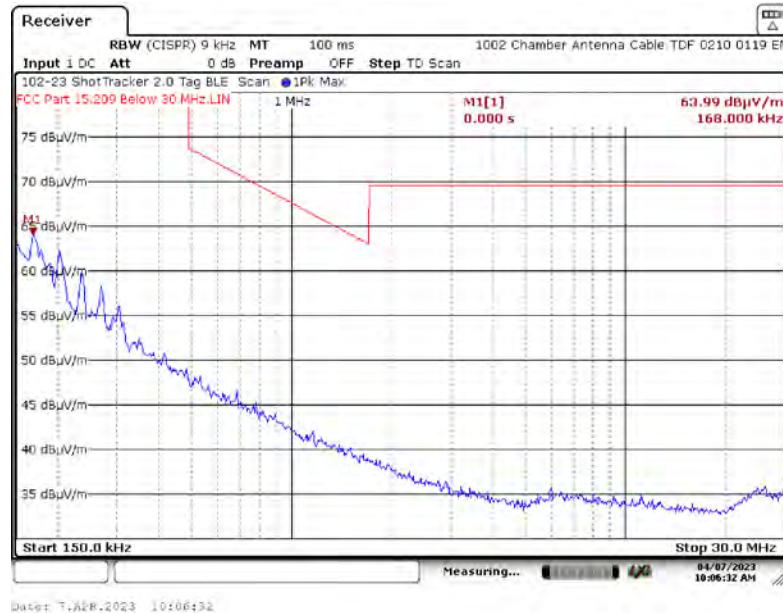


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.4. Channel 37, 2402 MHz – Y Axis

A2.4.3. Measurement Results: Ground-Parallel Antenna



A2.5. Channel 17, 2440 MHz – Y Axis

A2.5.1. Measurement Results: Parallel Antenna



Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.5. Channel 17, 2440 MHz – Y Axis

A2.5.2. Measurement Results: Perpendicular Antenna



A2.5.3. Measurement Results: Ground-Parallel Antenna

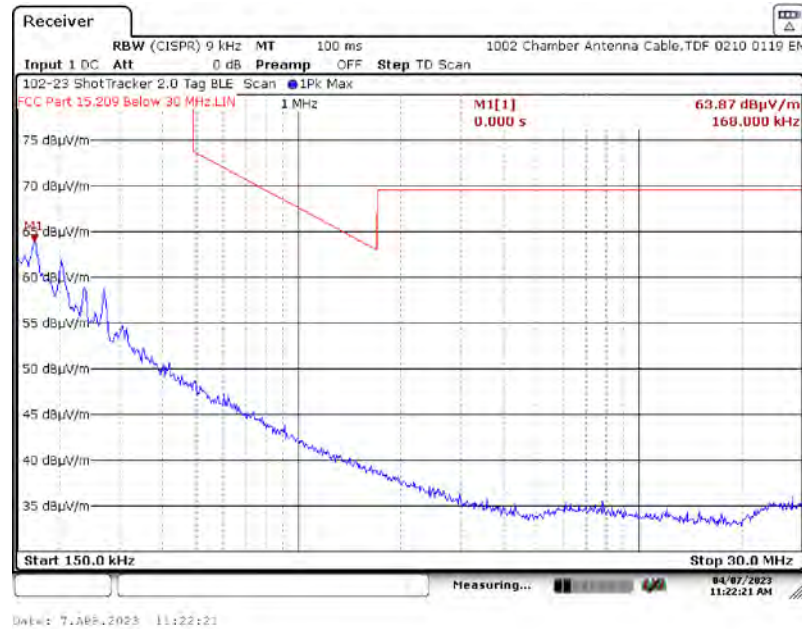


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.6. Channel 39, 2480 MHz – Y Axis

A2.6.1. Measurement Results: Parallel Antenna



A2.6.2. Measurement Results: Perpendicular Antenna

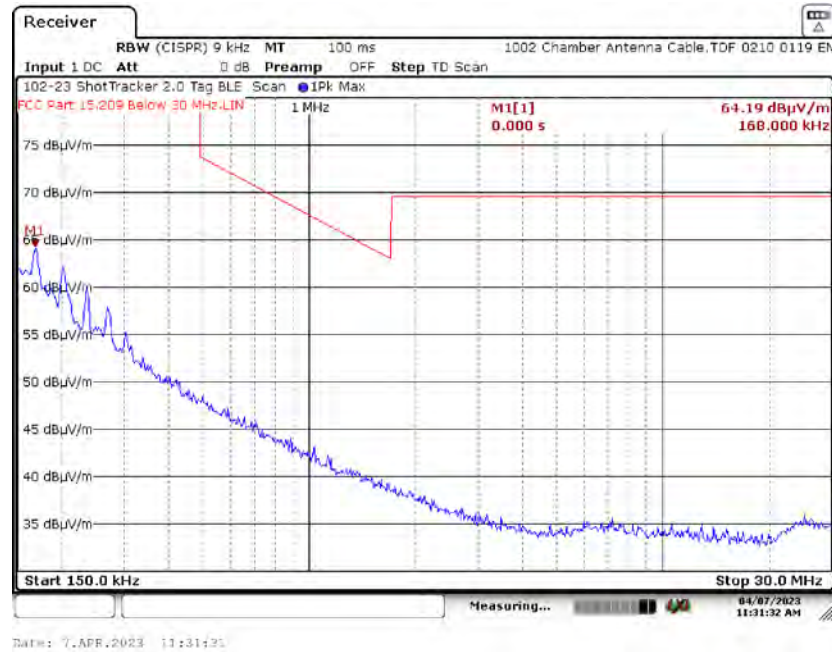


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.6. Channel 39, 2480 MHz – Y Axis

A2.6.3. Measurement Results: Ground-Parallel Antenna

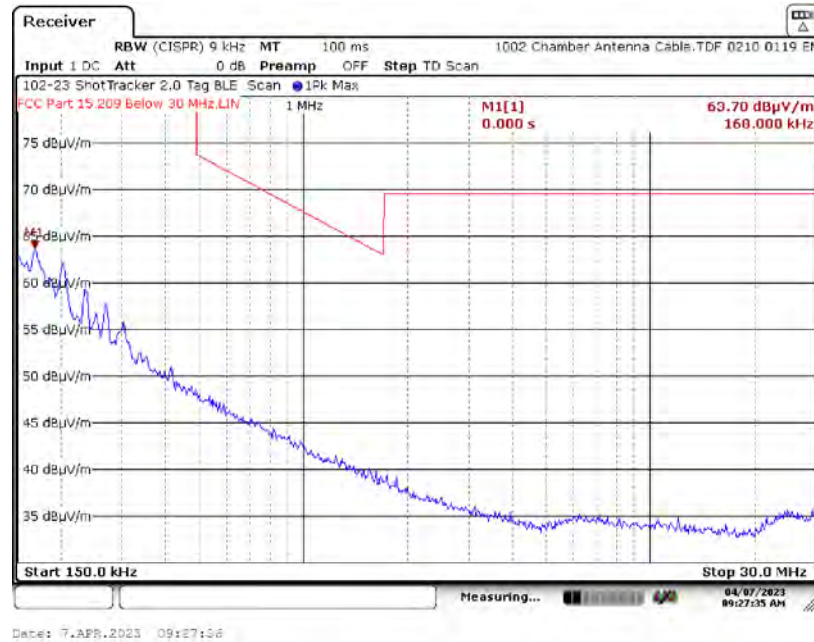


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

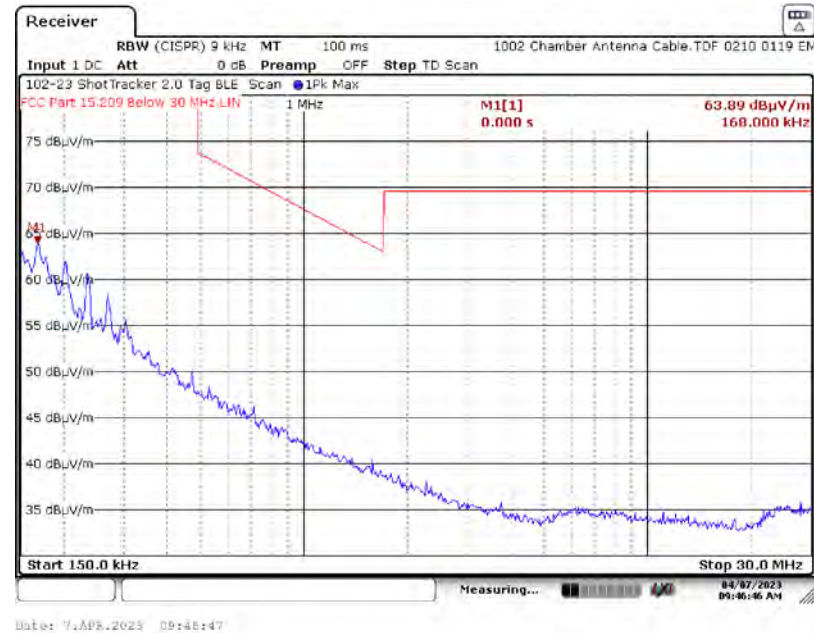
A2. Spurious Radiated Emissions (150 kHz – 30 MHz) Test Results

A2.7. Channel 37, 2402 MHz- Z Axis

A2.7.1. Measurement Results: Parallel Antenna



A2.7.2. Measurement Results: Perpendicular Antenna

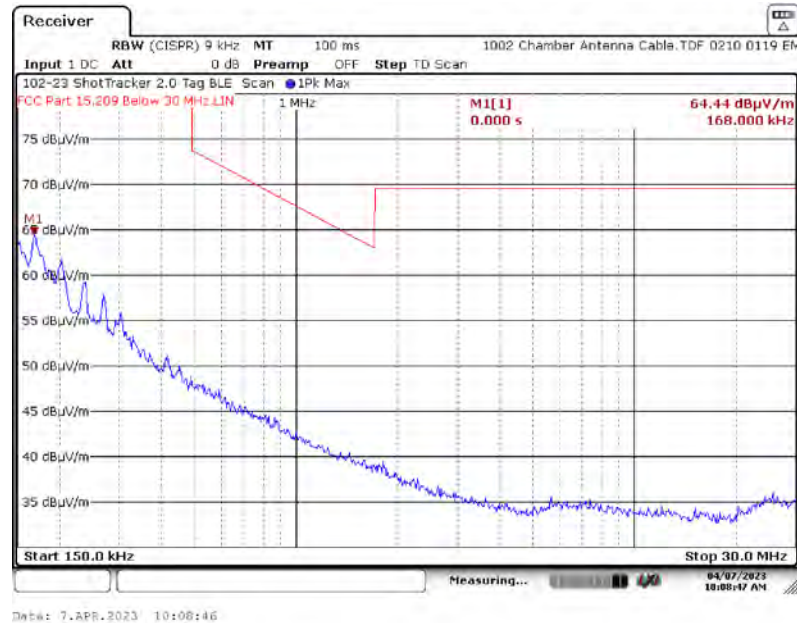


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.7. Channel 37, 2402 MHz – Z Axis

A2.7.3. Measurement Results: Ground-Parallel Antenna



A2.8. Channel 17, 2440 MHz – Z Axis

A2.8.1. Measurement Results: Parallel Antenna

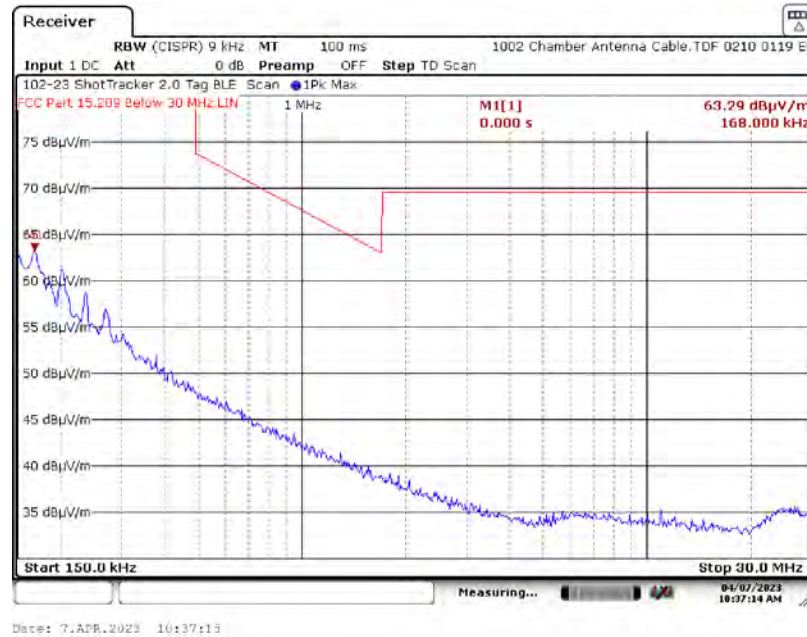


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.8. Channel 17, 2440 MHz – Z Axis

A2.8.2. Measurement Results: Perpendicular Antenna



A2.8.3. Measurement Results: Ground-Parallel Antenna

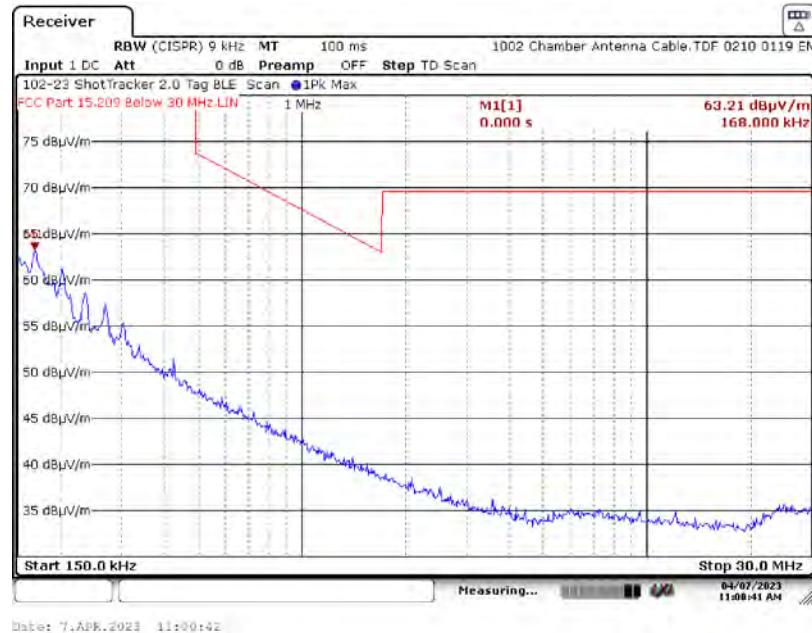


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

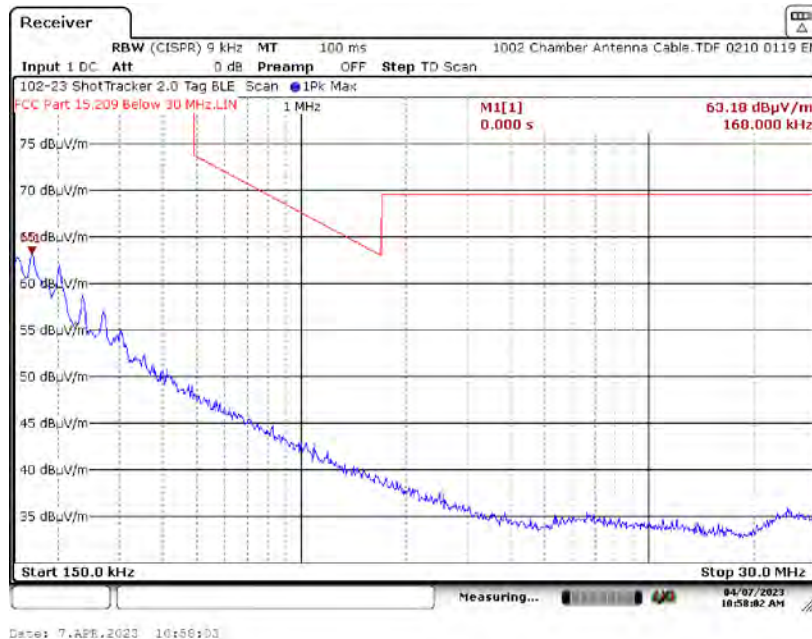
A2. Spurious Radiated Emissions (150 kHz – 30 MHz) Test Results

A2.9. Channel 39, 2480 MHz – Z Axis

A2.9.1. Measurement Results: Parallel Antenna



A2.9.2. Measurement Results: Perpendicular Antenna

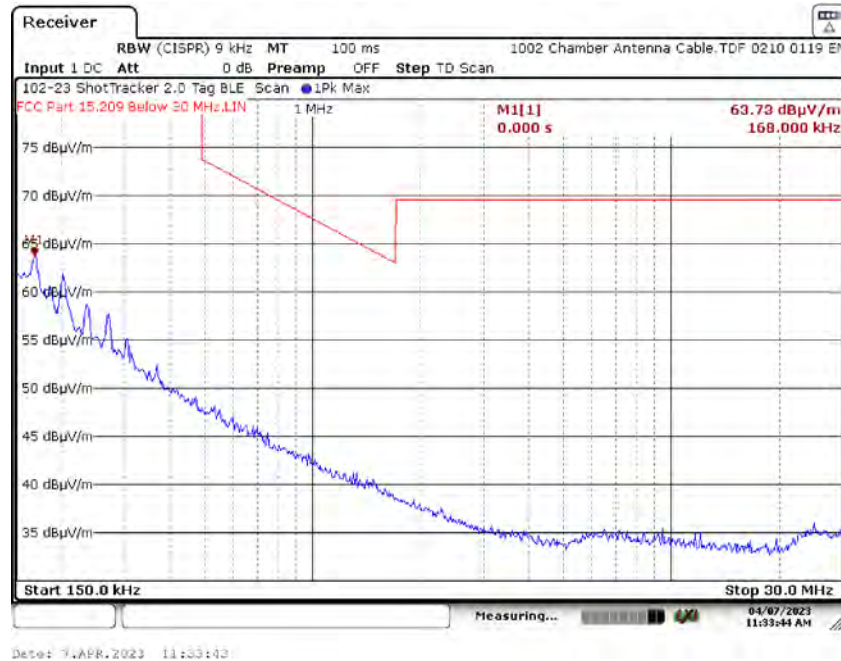


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

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

A2.9. Channel 39, 2480 MHz – Z Axis

A2.9.3. Measurement Results: Ground-Parallel Antenna

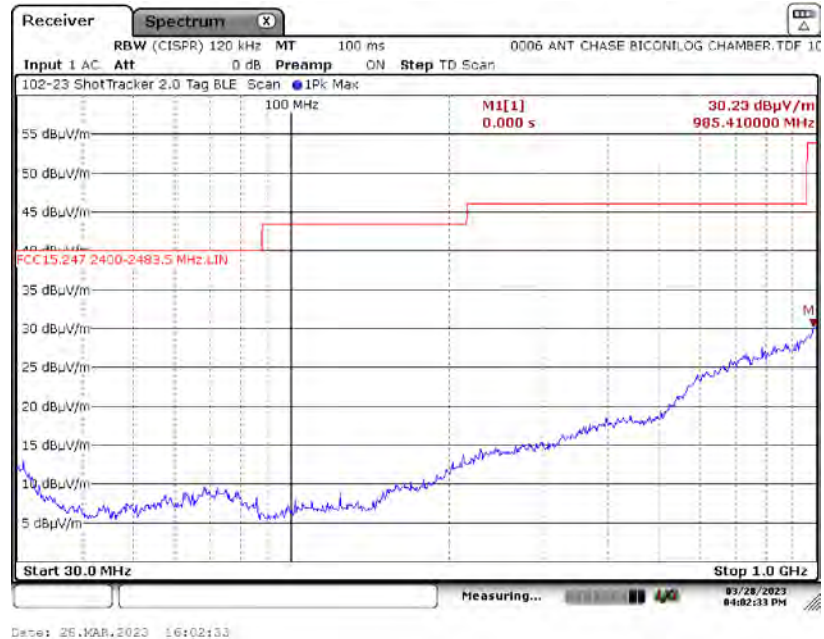


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

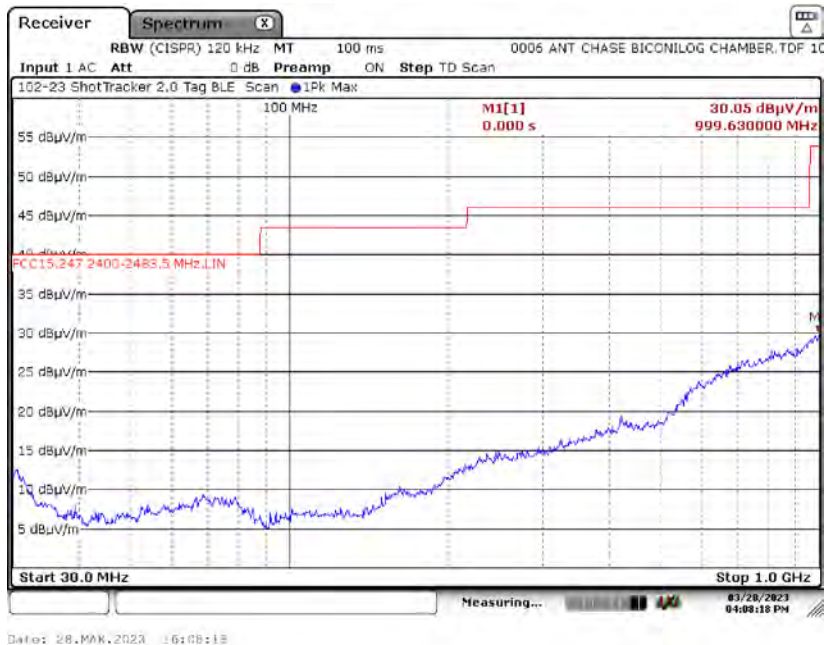
A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.1. Channel 37, 2402 MHz – X Axis

A3.1.1. Measurement Results: Horizontal Antenna



A3.1.2. Measurement Results: Vertical Antenna

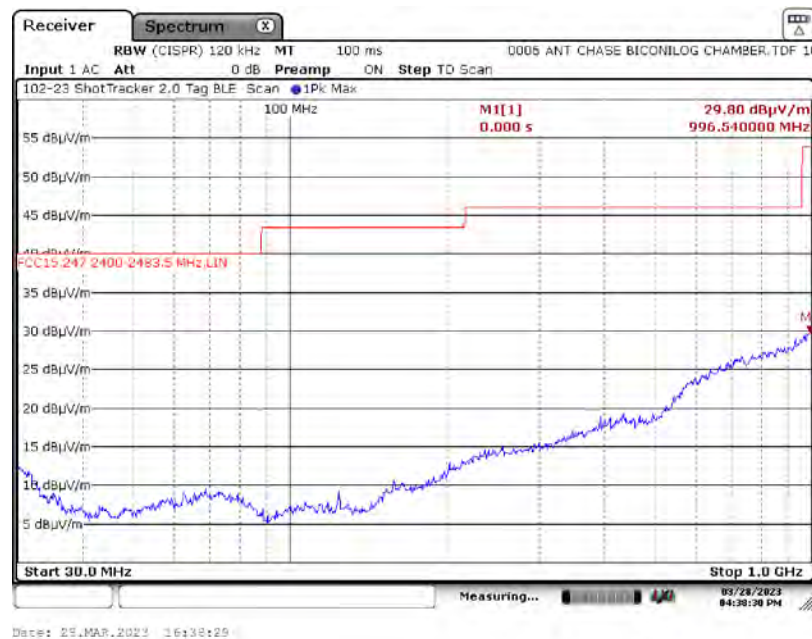


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.2. Channel 17, 2440 MHz – X Axis

A3.2.1. Measurement Results: Horizontal Antenna



A3.2.2. Measurement Results: Vertical Antenna

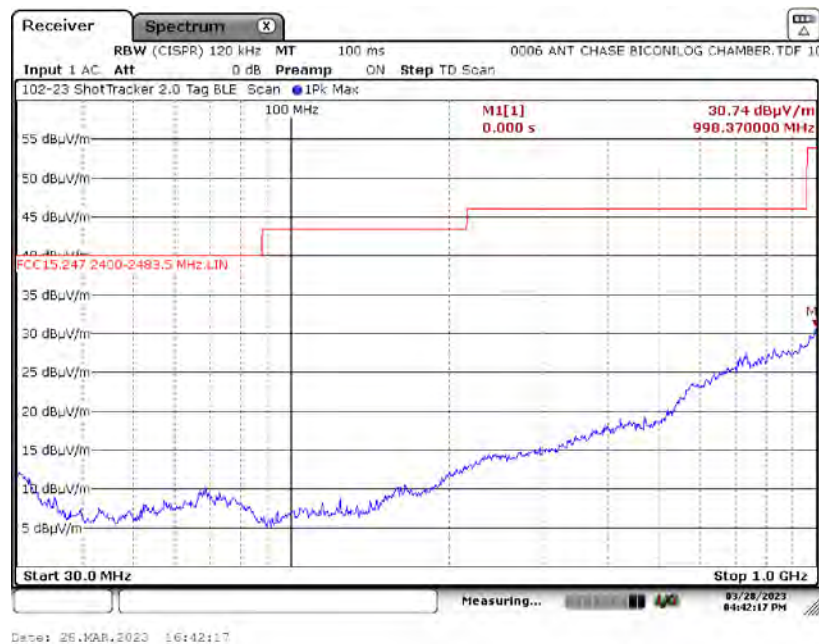


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

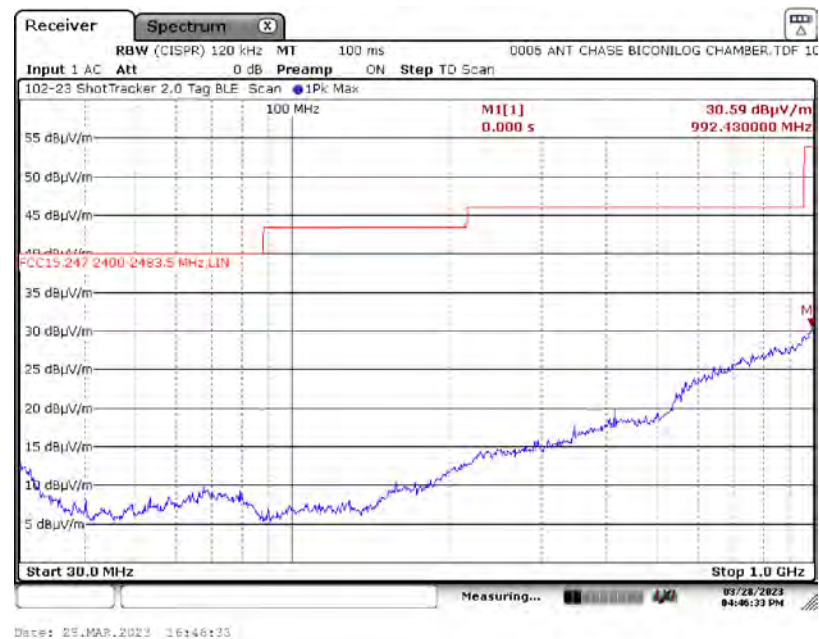
A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.3. Channel 39, 2480 MHz – X Axis

A3.3.1. Measurement Results: Horizontal Antenna



A3.3.2. Measurement Results: Vertical Antenna

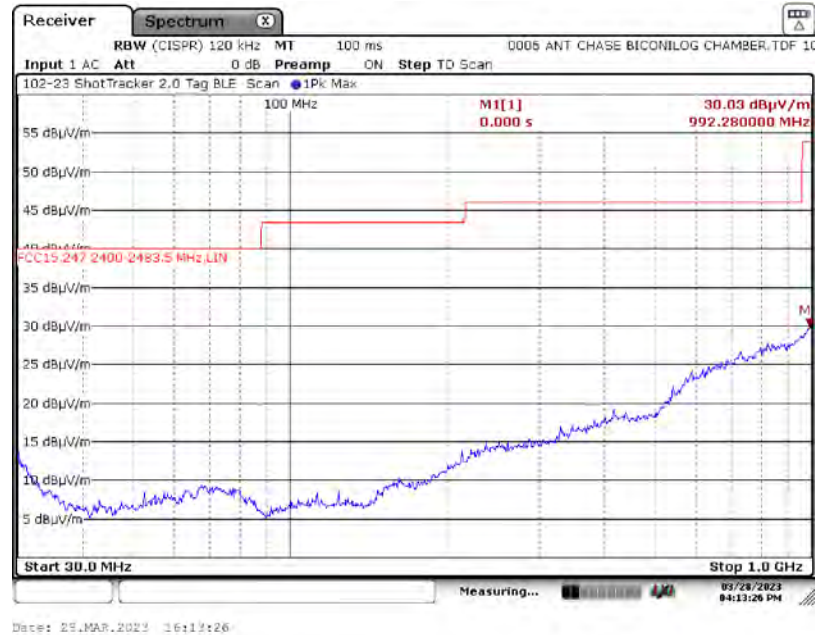


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.4. Channel 37, 2402 MHz – Y Axis

A3.4.1. Measurement Results: Horizontal Antenna



A3.4.2. Measurement Results: Vertical Antenna

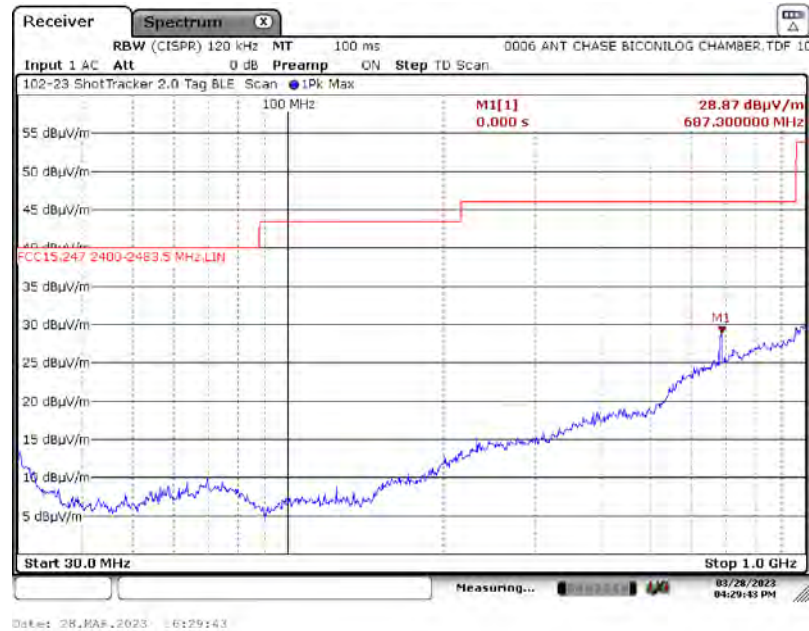


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

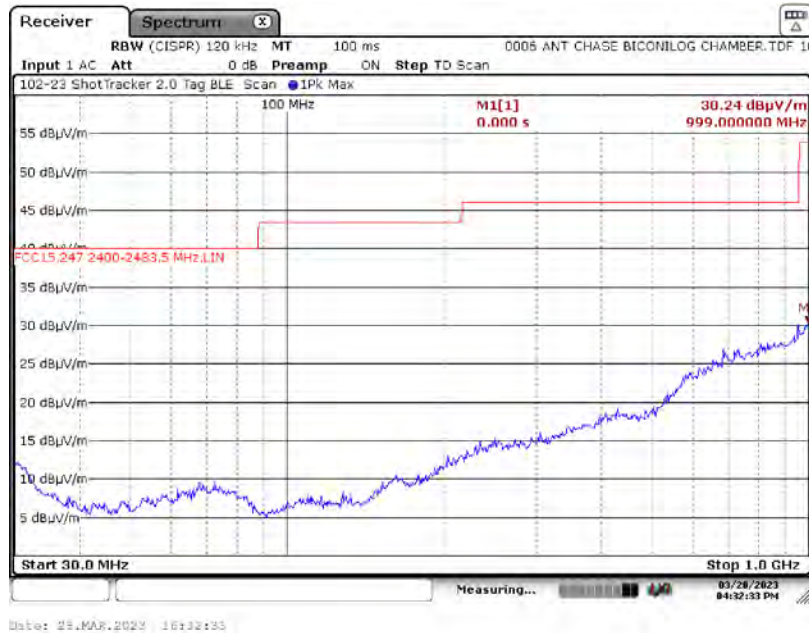
A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.5. Channel 17, 2440 MHz – Y Axis

A3.5.1. Measurement Results: Horizontal Antenna



A3.5.2. Measurement Results: Vertical Antenna

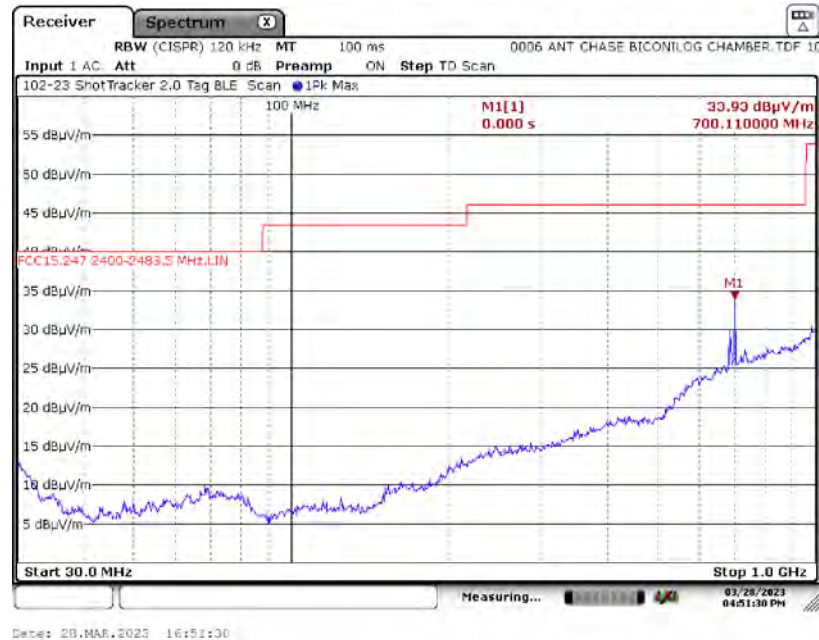


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

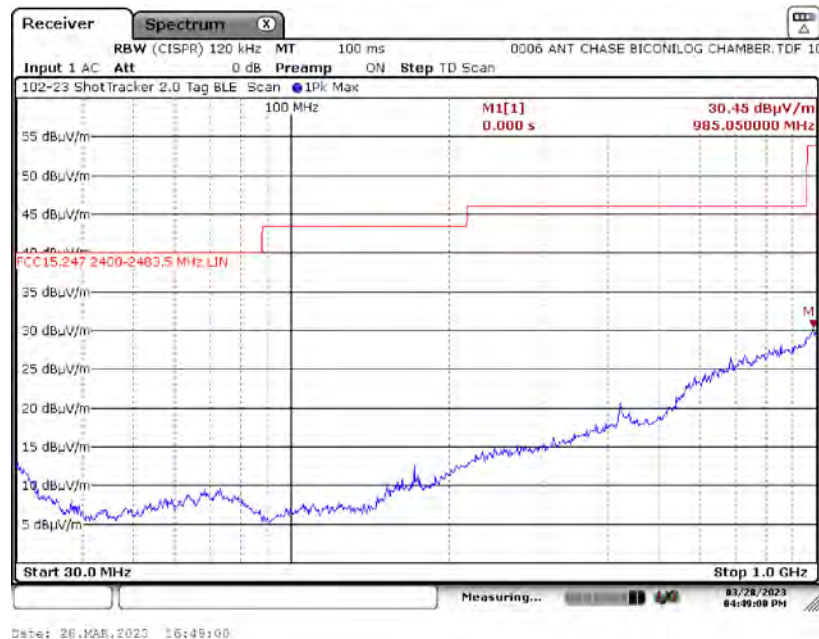
A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.6. Channel 39, 2480 MHz – Y Axis

A3.6.1. Measurement Results: Horizontal Antenna



A3.6.2. Measurement Results: Vertical Antenna

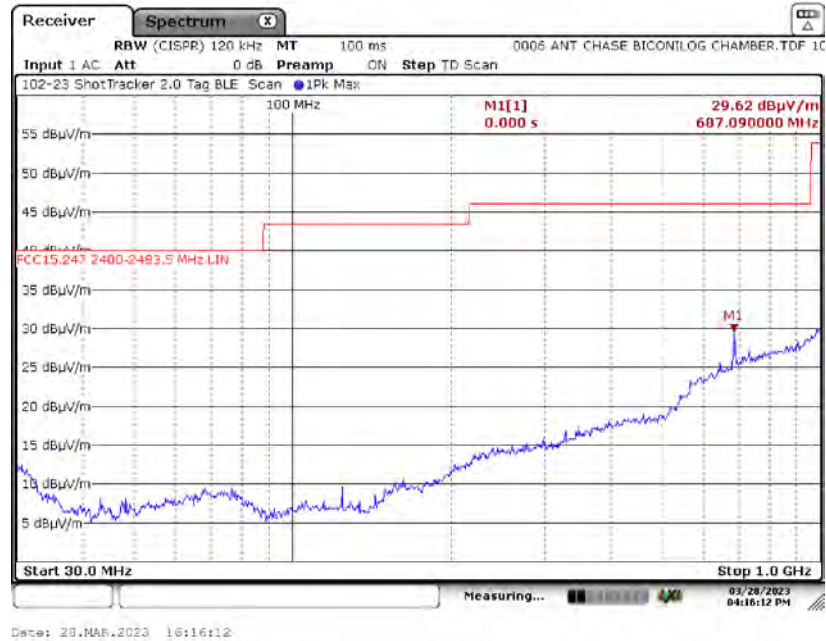


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

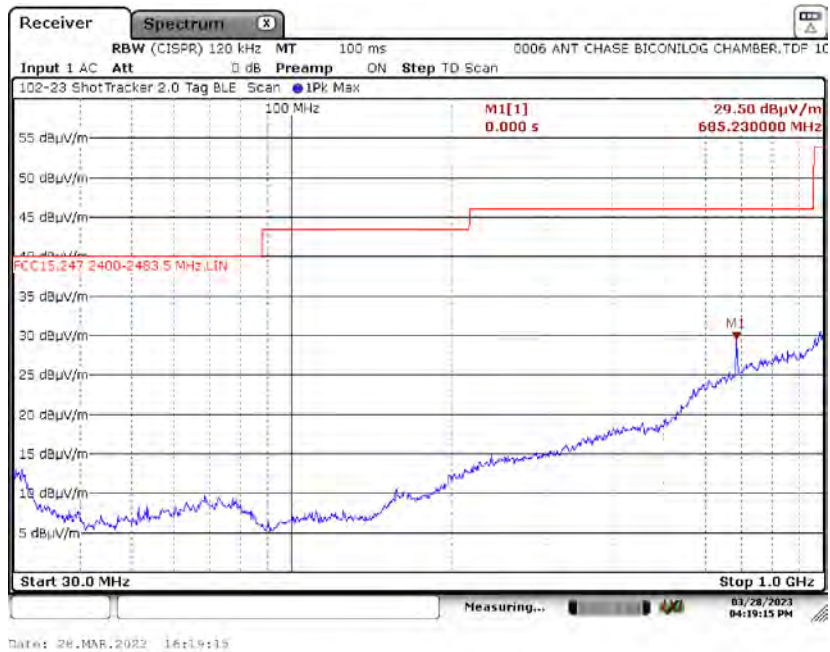
A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.7. Channel 37, 2402 MHz – Z Axis

A3.7.1. Measurement Results: Horizontal Antenna



A3.7.2. Measurement Results: Vertical Antenna

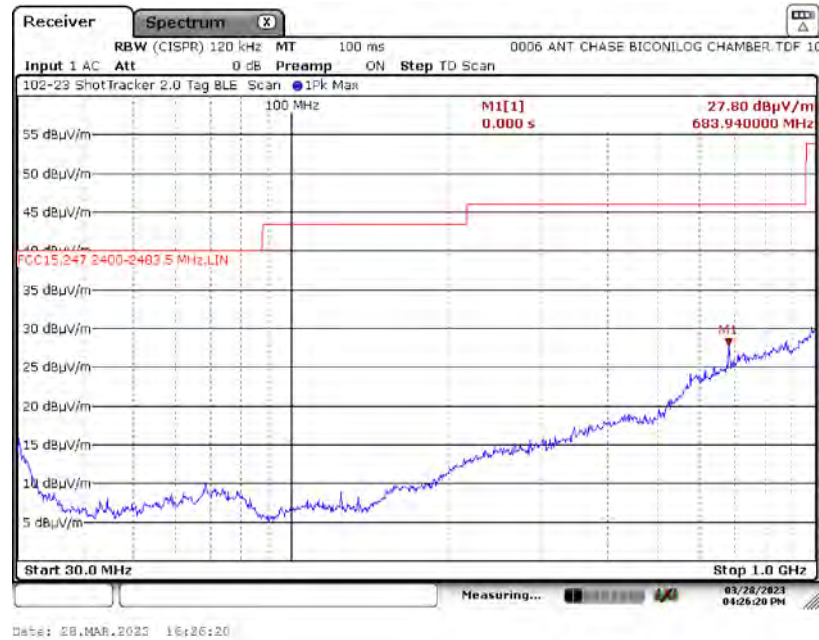


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

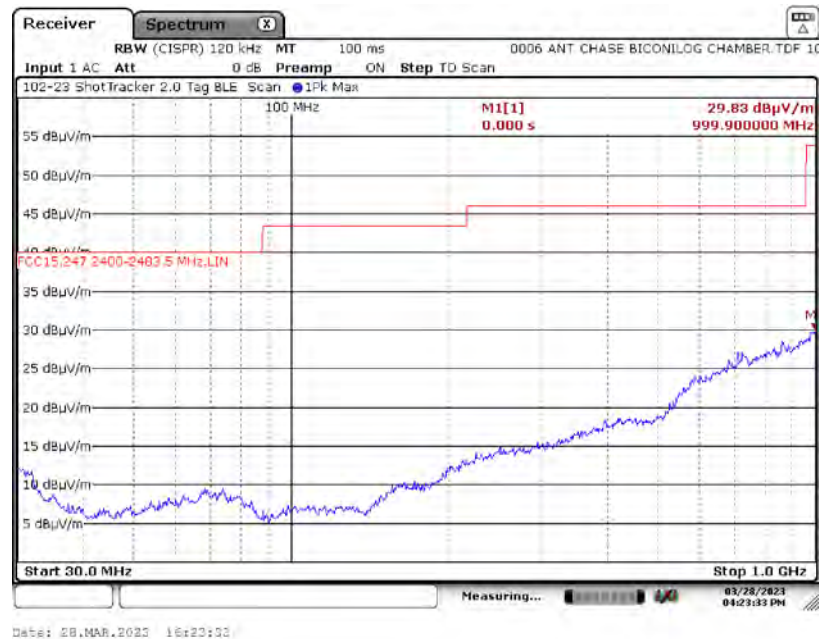
A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.8. Channel 17, 2440 MHz – Z Axis

A3.8.1. Measurement Results: Horizontal Antenna



A3.8.2. Measurement Results: Vertical Antenna

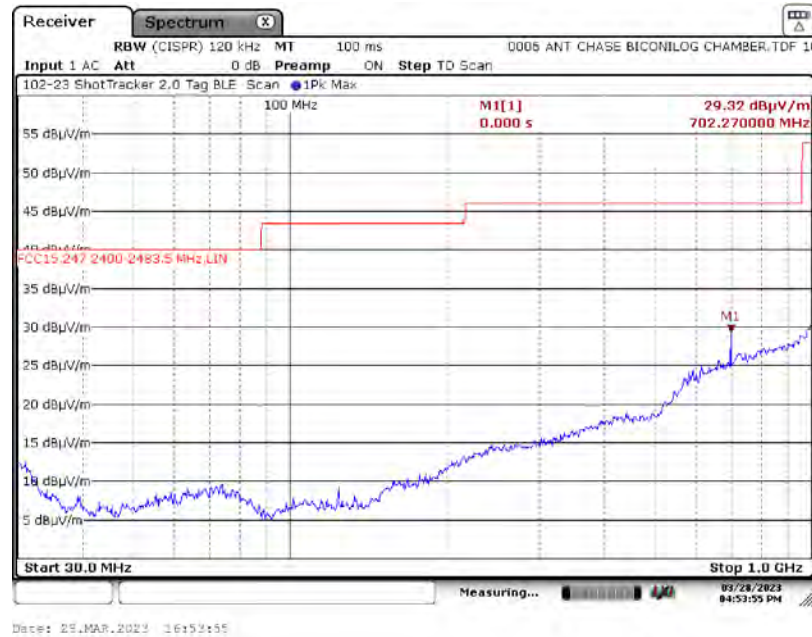


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

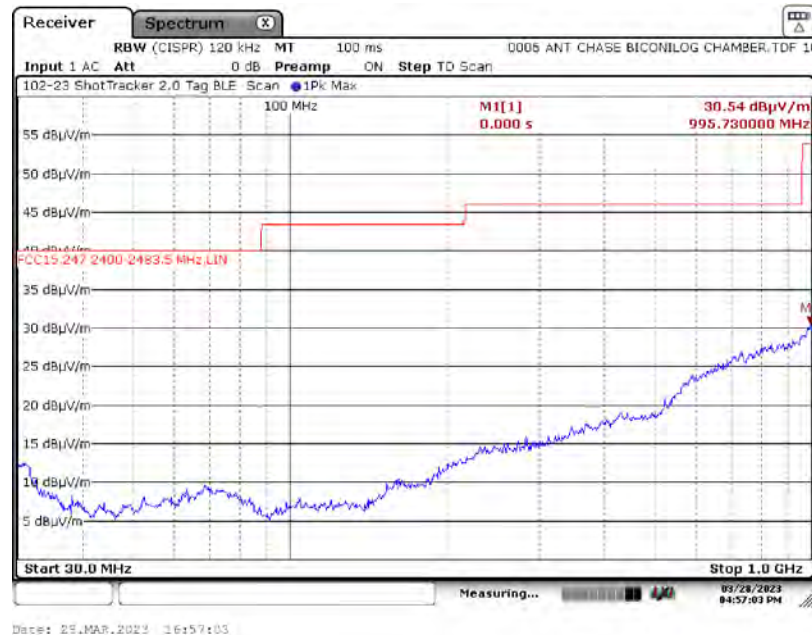
A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.9. Channel 39, 2480 MHz – Z Axis

A3.9.1. Measurement Results: Horizontal Antenna



A3.9.2. Measurement Results: Vertical Antenna

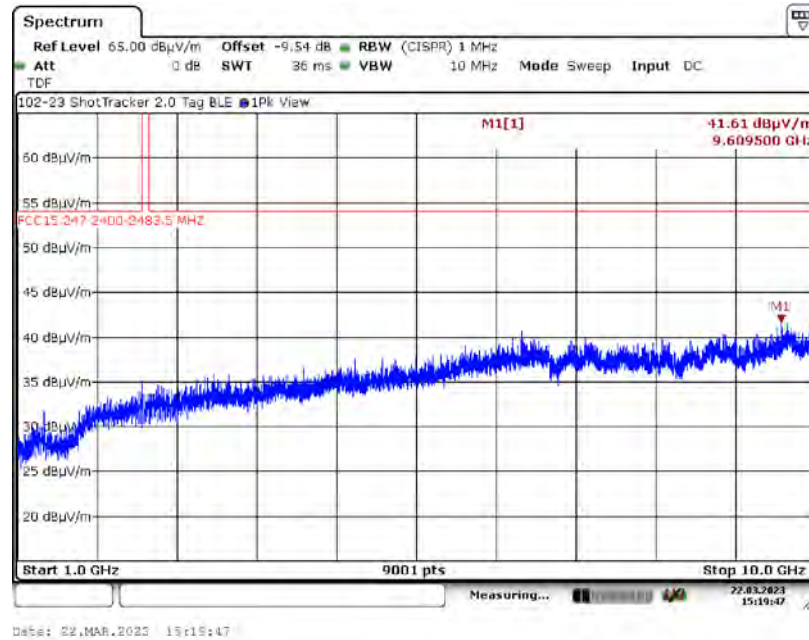


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

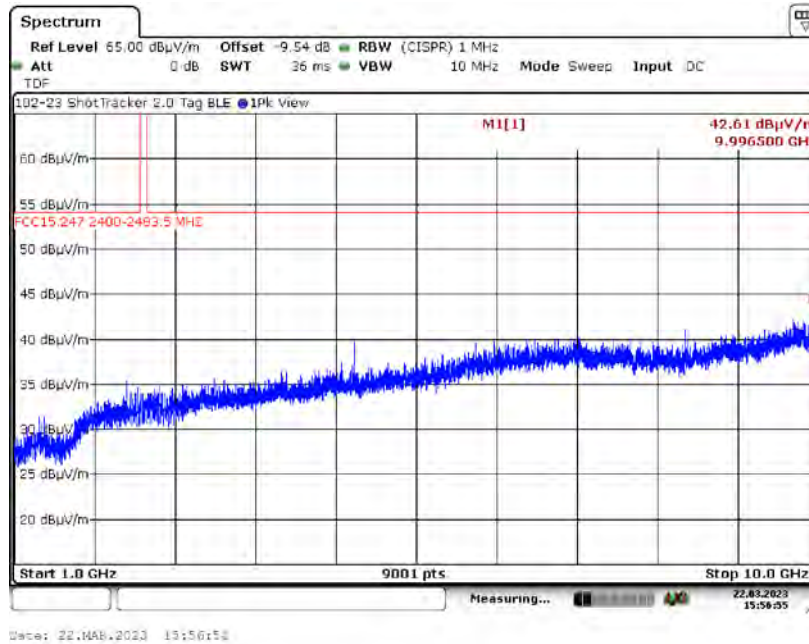
A4. Spurious Radiated Emissions (1 GHz – 10 GHz) Test Results

A4.1. Channel 37, 2402 MHz – X Axis

A4.1.1. Measurement Results: Horizontal Antenna



A4.1.2. Measurement Results: Vertical Antenna

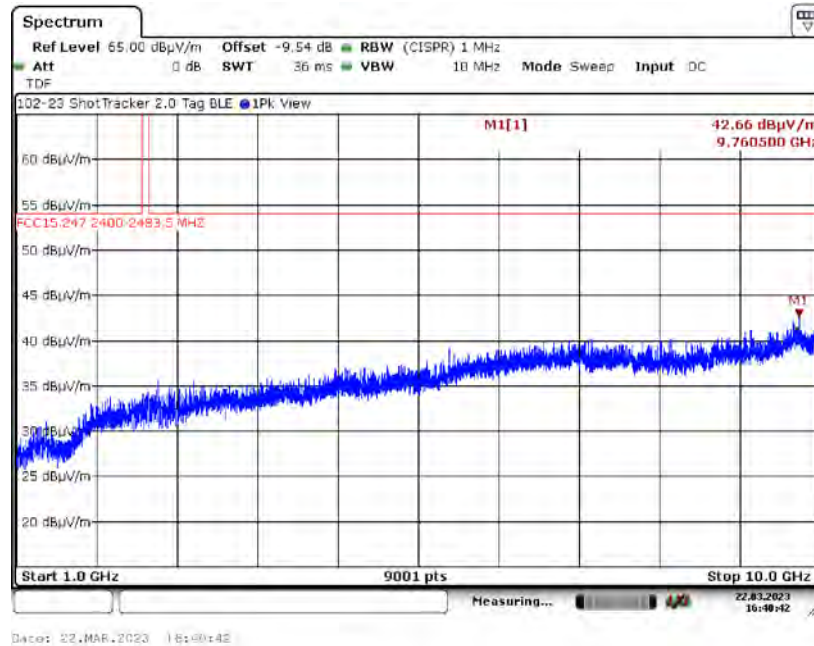


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

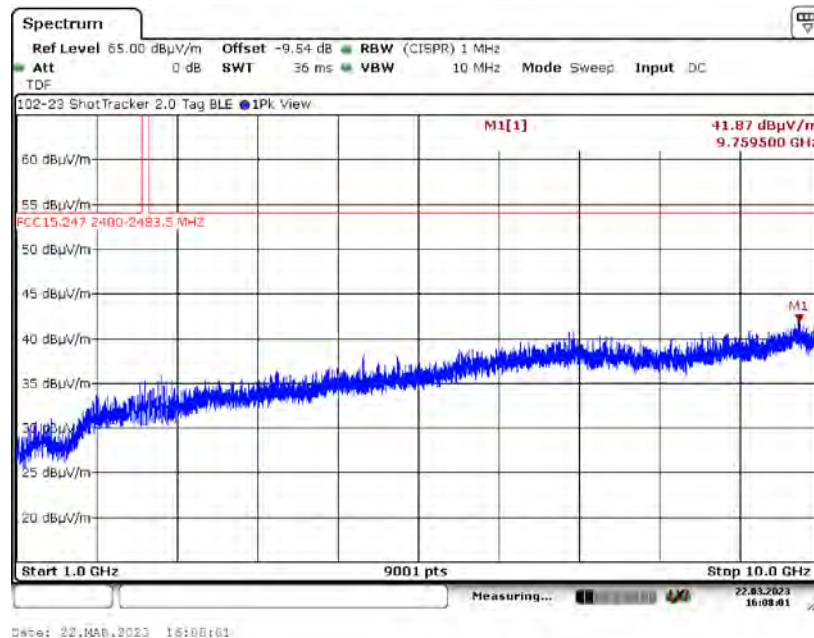
A4. Spurious Radiated Emissions 1 GHz – 10 GHz) Test Results

A4.2. Channel 17, 2440 MHz – X Axis

A4.2.1. Measurement Results: Horizontal Antenna



A4.2.2. Measurement Results: Vertical Antenna

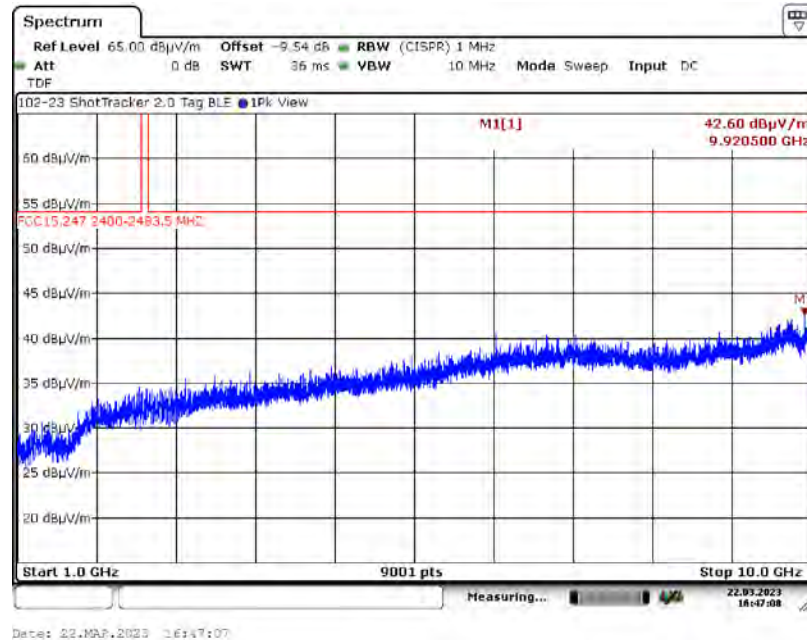


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

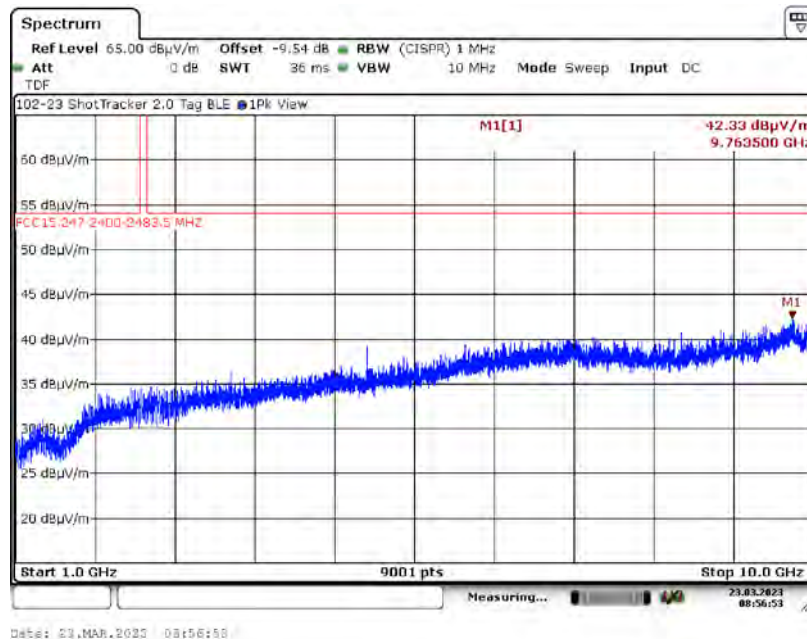
A4. Spurious Radiated Emissions (1 GHz – 10 GHz) Test Results

A4.3. Channel 39, 2480 MHz – X Axis

A4.3.1. Measurement Results: Horizontal Antenna



A4.3.2. Measurement Results: Vertical Antenna

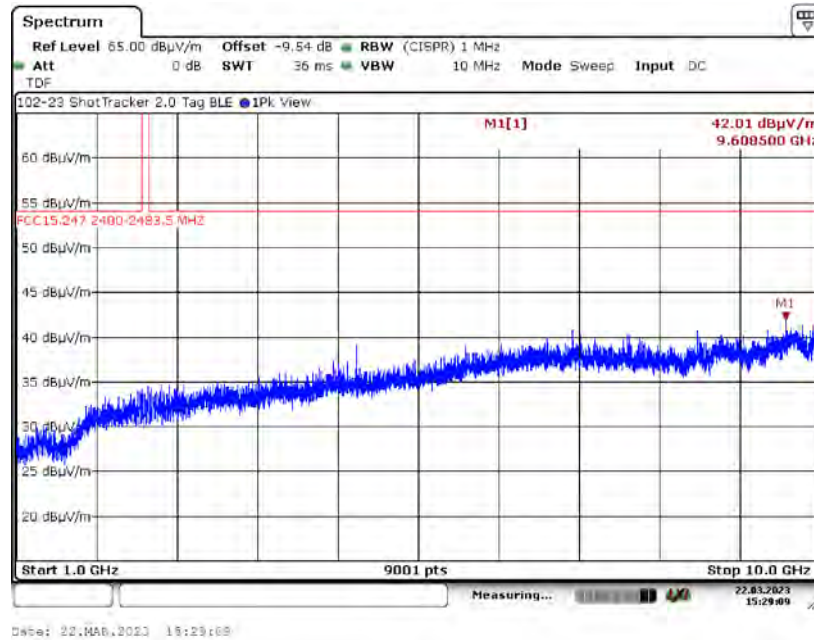


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

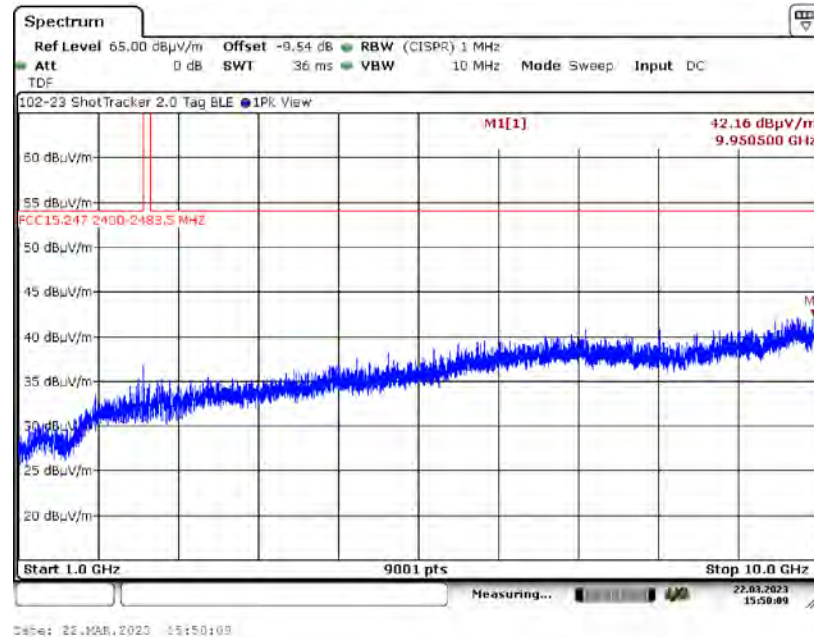
A4. Spurious Radiated Emissions (1 GHz – 10 GHz) Test Results

A4.4. Channel 37, 2402 MHz – Y Axis

A4.4.1. Measurement Results: Horizontal Antenna



A4.4.2. Measurement Results: Vertical Antenna

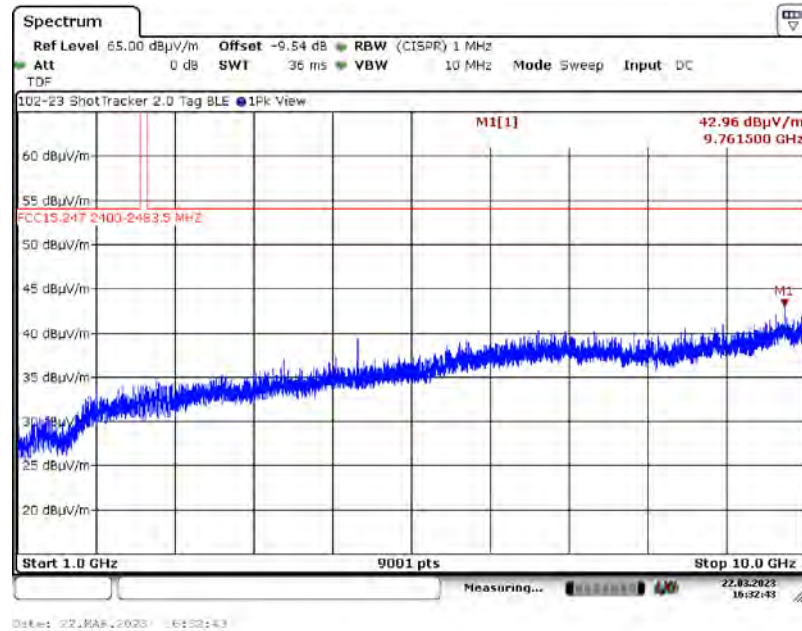


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

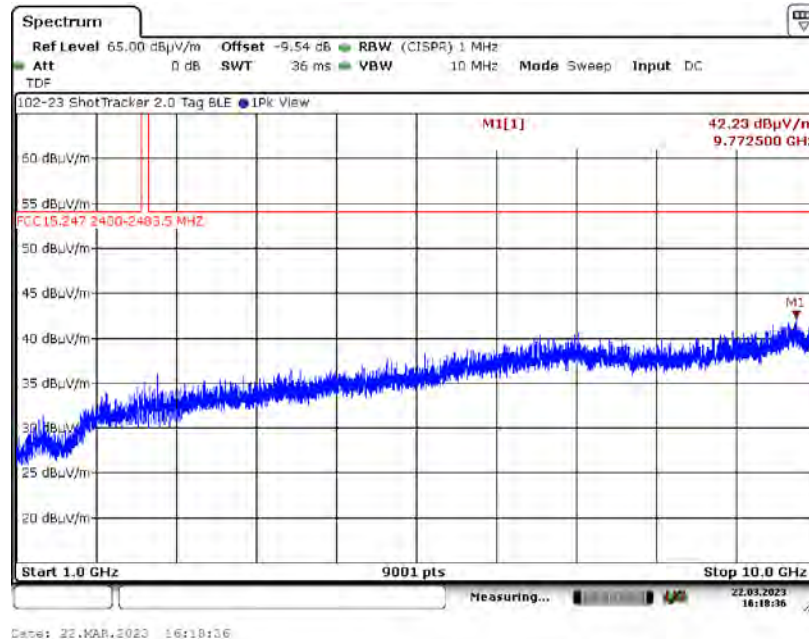
A4. Spurious Radiated Emissions 1 GHz – 10 GHz) Test Results

A4.5. Channel 17, 2440 MHz – Y Axis

A4.5.1. Measurement Results: Horizontal Antenna



A4.5.2. Measurement Results: Vertical Antenna

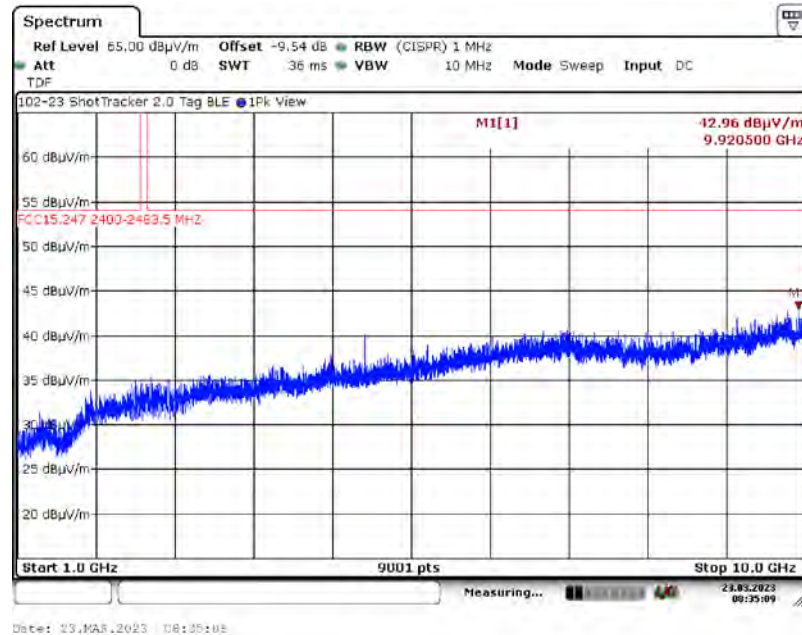


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

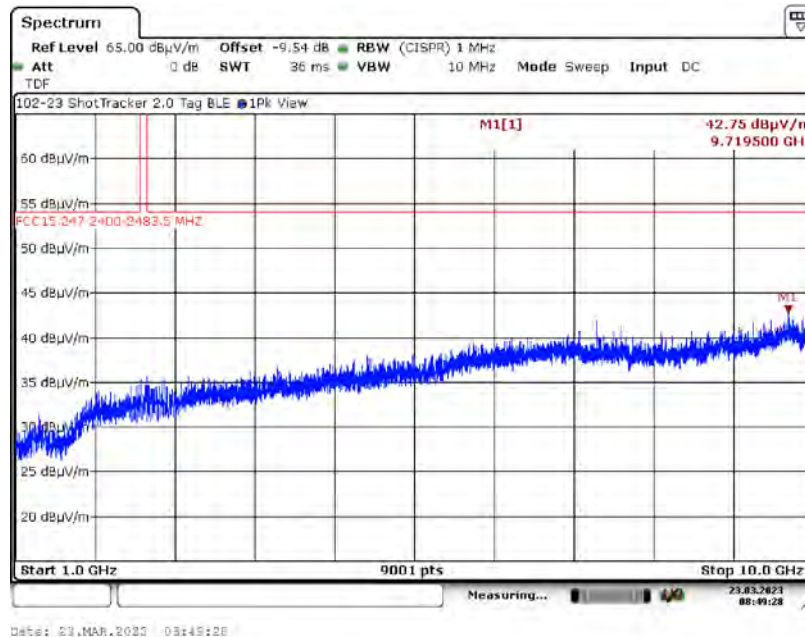
A4. Spurious Radiated Emissions (1 GHz – 10 GHz) Test Results

A4.6. Channel 39, 2480 MHz – Y Axis

A4.6.1. Measurement Results: Horizontal Antenna



A4.6.2. Measurement Results: Vertical Antenna

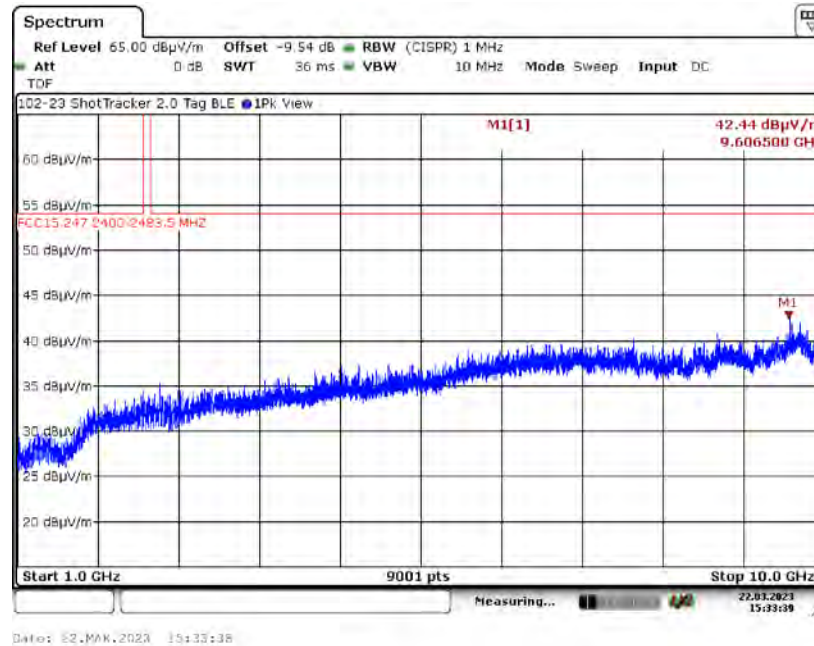


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

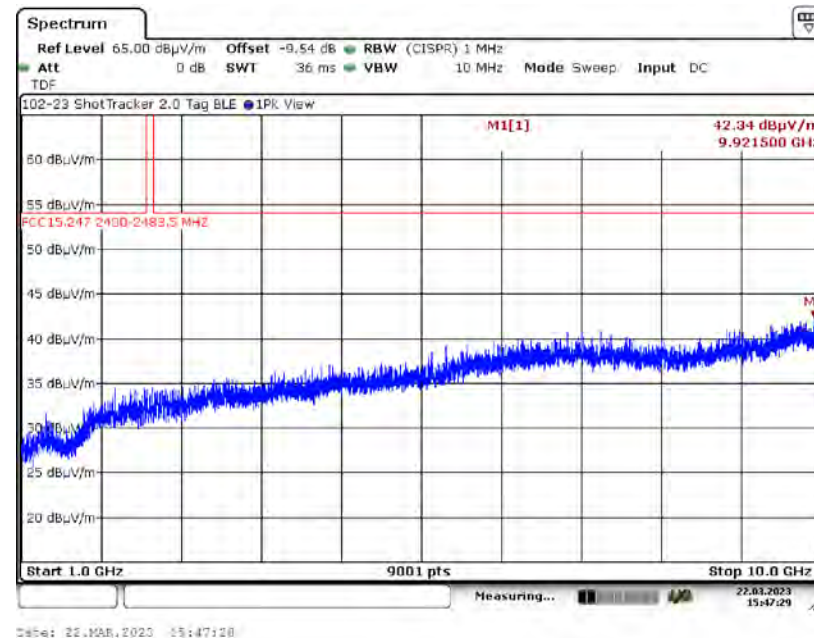
A4. Spurious Radiated Emissions (1 GHz – 10 GHz) Test Results

A4.7. Channel 37, 2402 MHz – Z Axis

A4.7.1. Measurement Results: Horizontal Antenna



A4.7.2. Measurement Results: Vertical Antenna

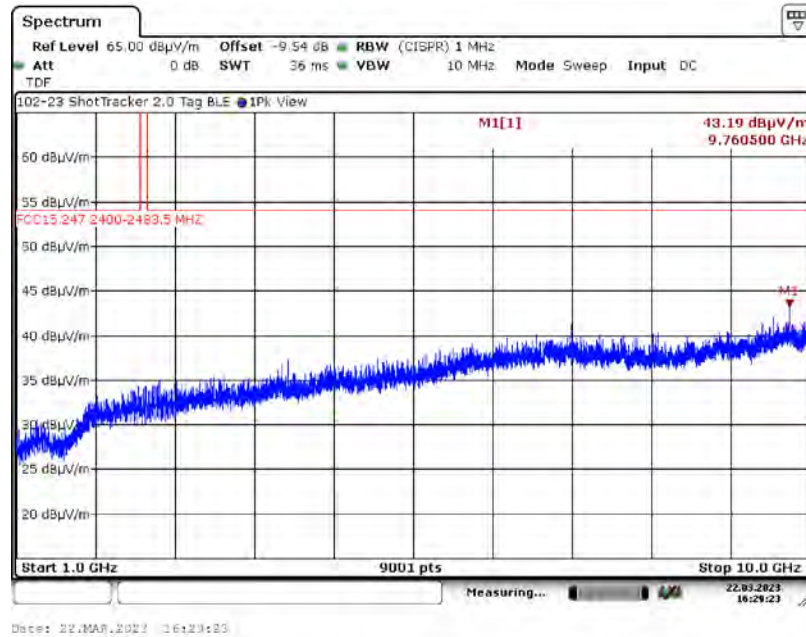


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

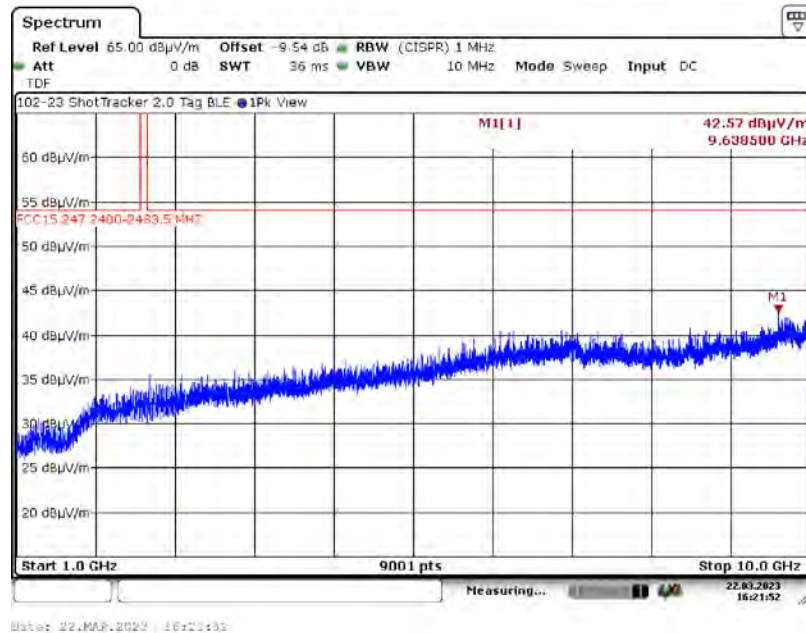
A4. Spurious Radiated Emissions 1 GHz – 10 GHz) Test Results

A4.8. Channel 17, 2440 MHz – Z Axis

A4.8.1. Measurement Results: Horizontal Antenna



A4.8.2. Measurement Results: Vertical Antenna

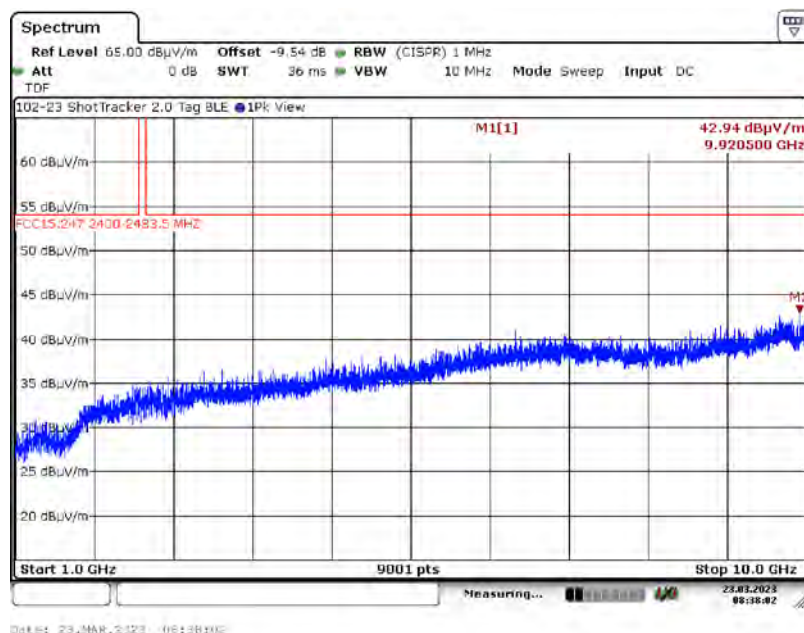


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

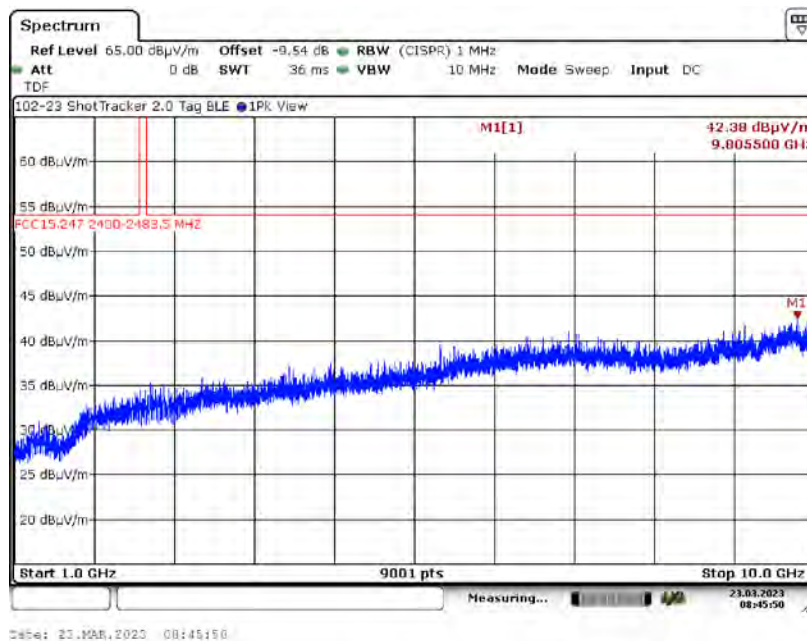
A4. Spurious Radiated Emissions (1 GHz – 10 GHz) Test Results

A4.9. Channel 39, 2480 MHz – Z Axis

A4.9.1. Measurement Results: Horizontal Antenna



A4.9.2. Measurement Results: Vertical Antenna

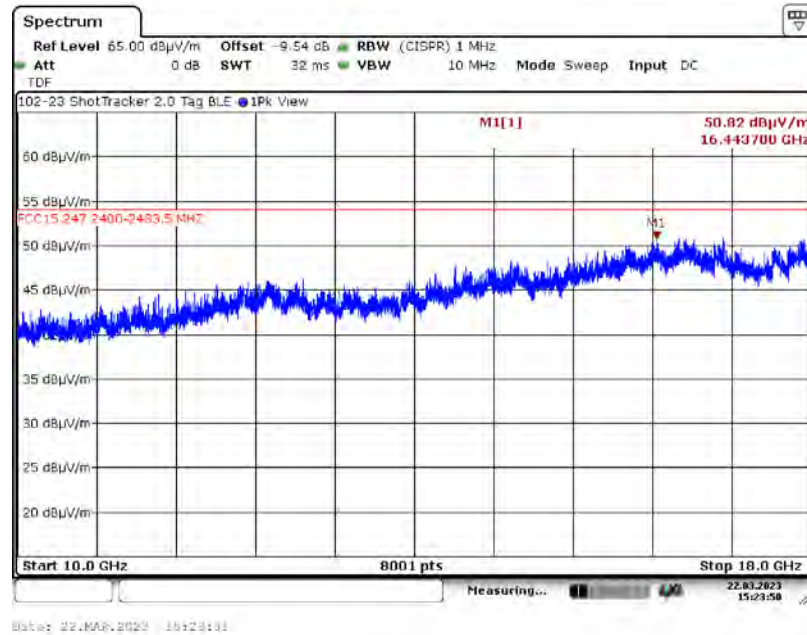


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

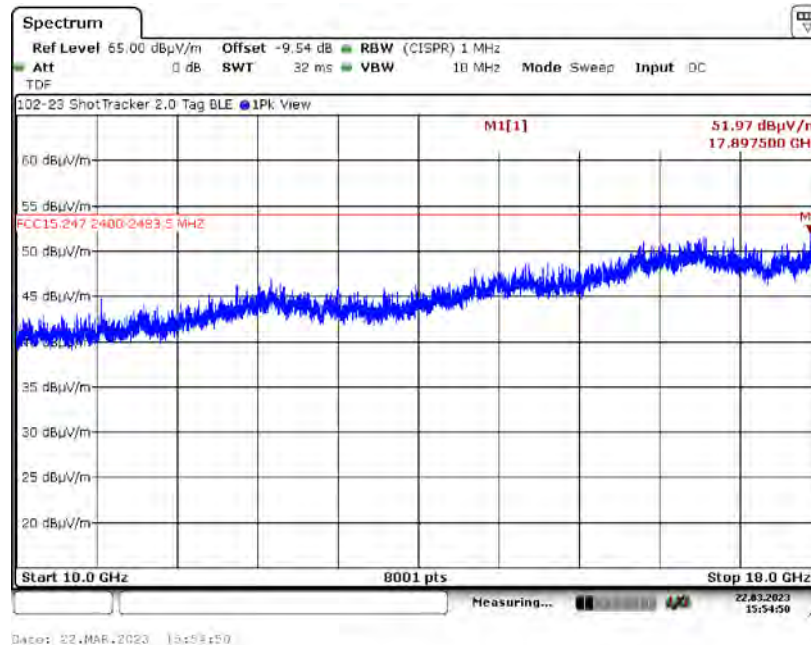
A5. Spurious Radiated Emissions (10 – 18 GHz) Test Results

A5.1. Channel 37, 2402 MHz – X Axis

A5.1.1. Measurement Results: Horizontal Antenna



A5.1.2. Measurement Results: Vertical Antenna

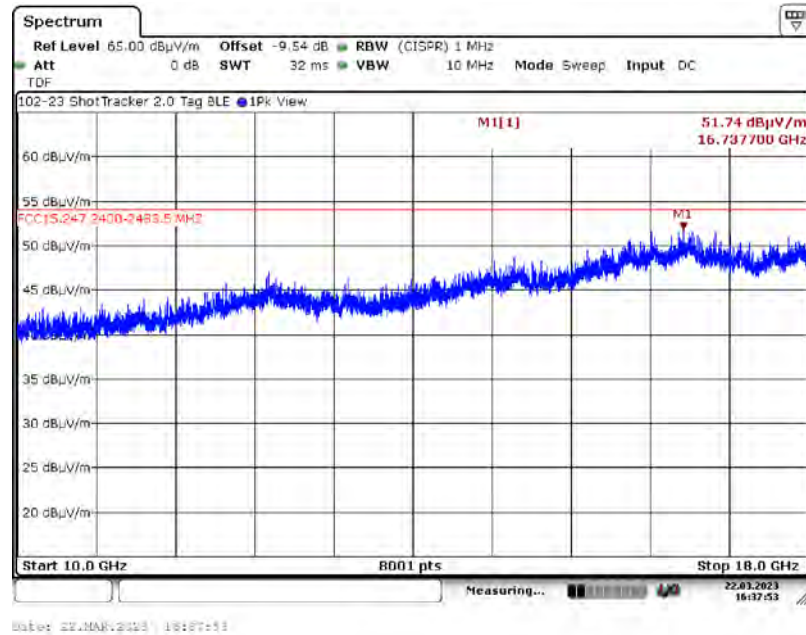


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

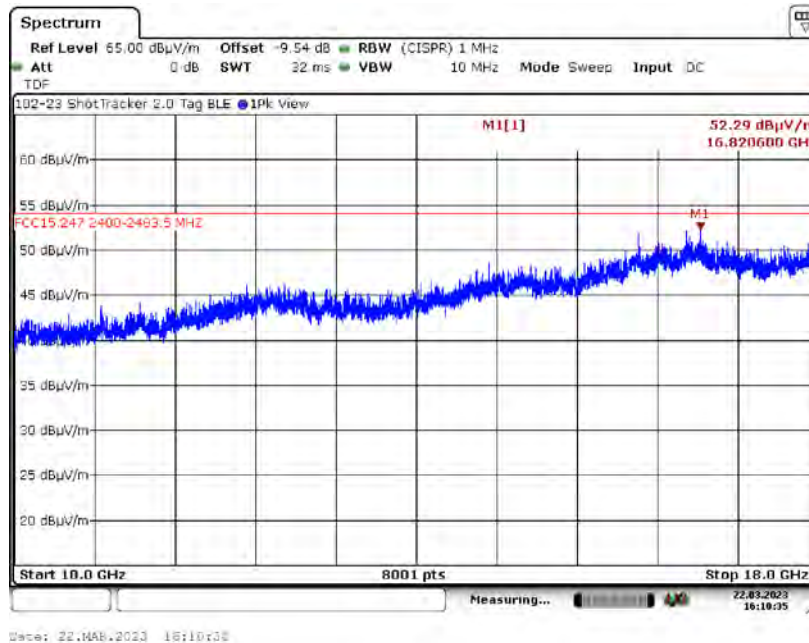
A5. Spurious Radiated Emissions (10 – 18 GHz) Test Results

A5.2. Channel 17, 2440 MHz – X Axis

A5.2.1. Measurement Results: Horizontal Antenna



A5.2.2. Measurement Results: Vertical Antenna

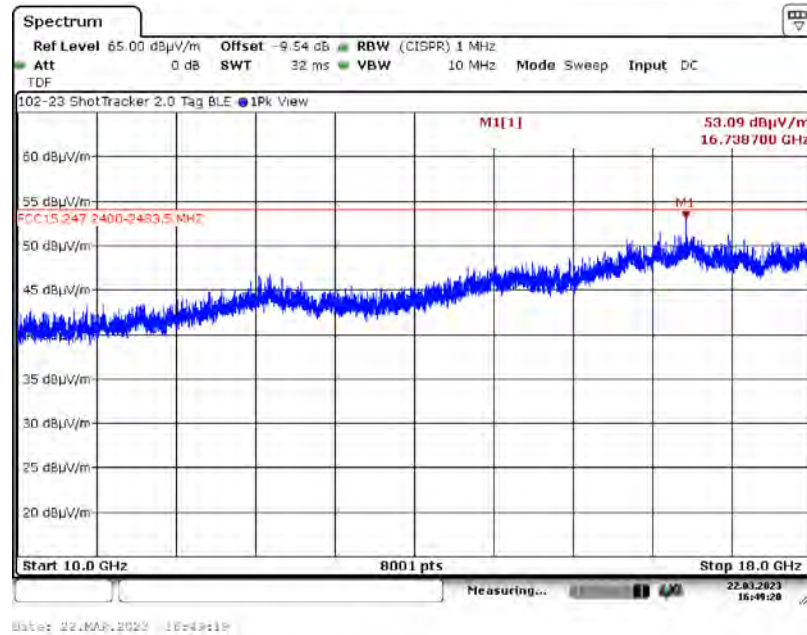


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

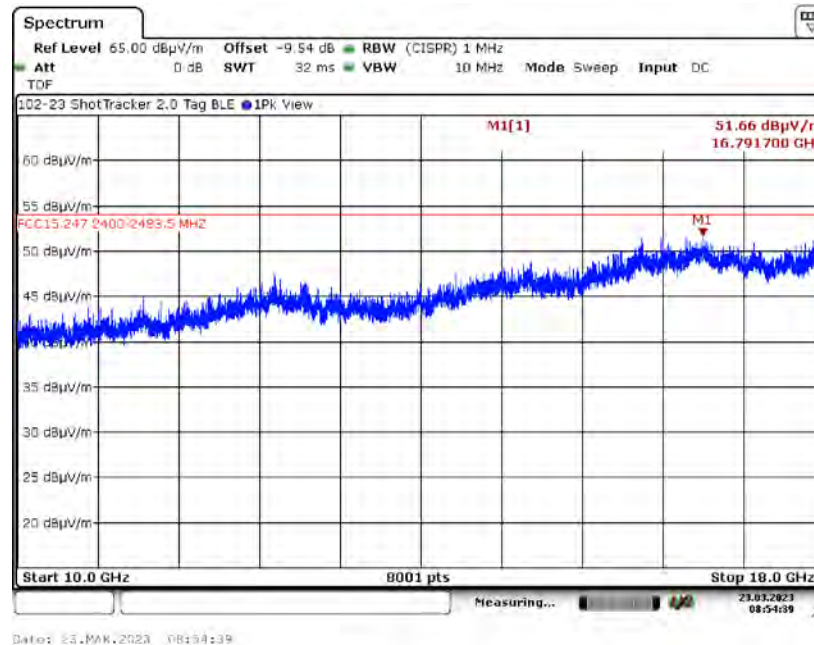
A5. Spurious Radiated Emissions (10 – 18 GHz) Test Results

A5.3. Channel 39, 2480 MHz – X Axis

A5.3.1. Measurement Results: Horizontal Antenna



A5.3.2. Measurement Results: Vertical Antenna

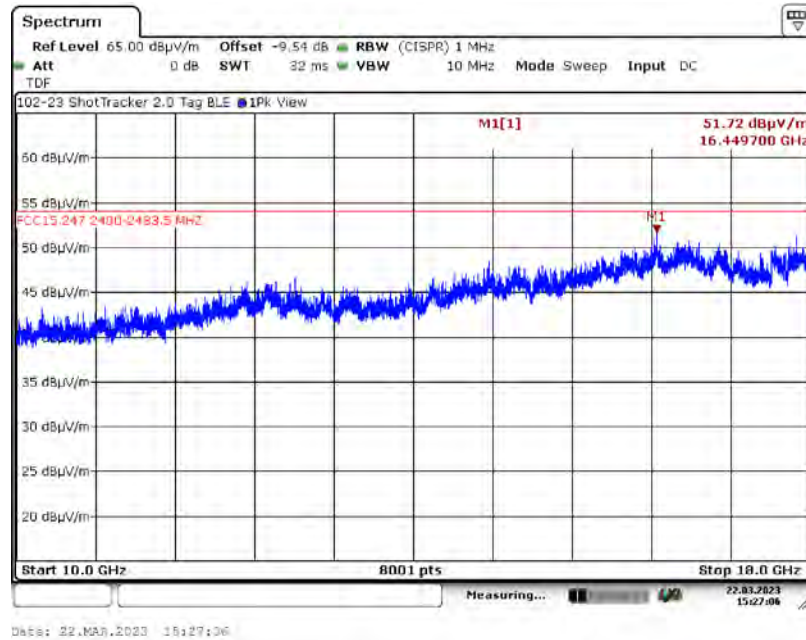


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

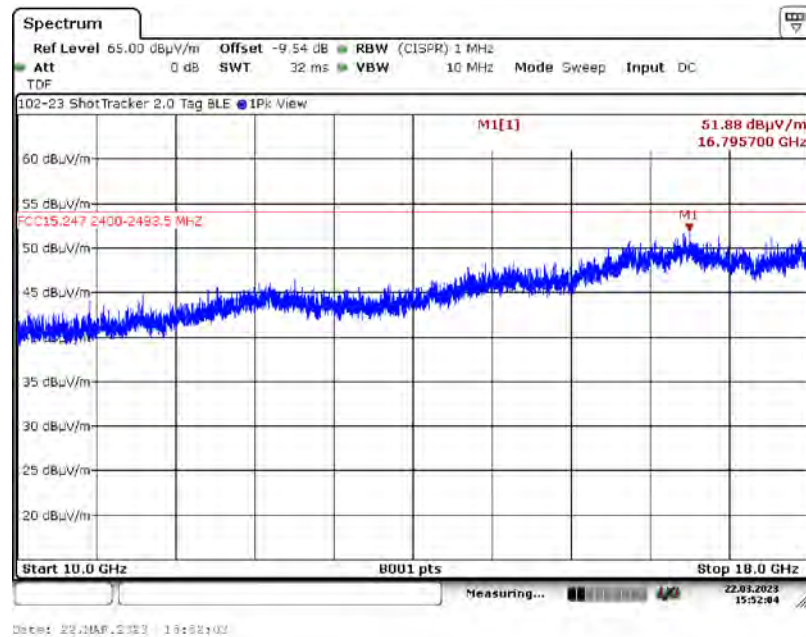
A5. Spurious Radiated Emissions (10 – 18 GHz) Test Results

A5.4. Channel 37, 2402 MHz – Y Axis

A5.4.1. Measurement Results: Horizontal Antenna



A5.4.2. Measurement Results: Vertical Antenna

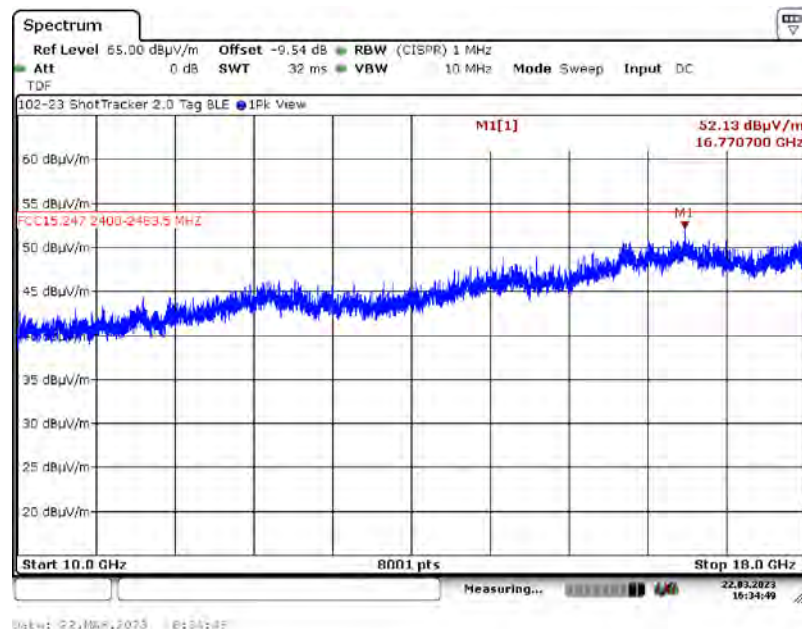


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

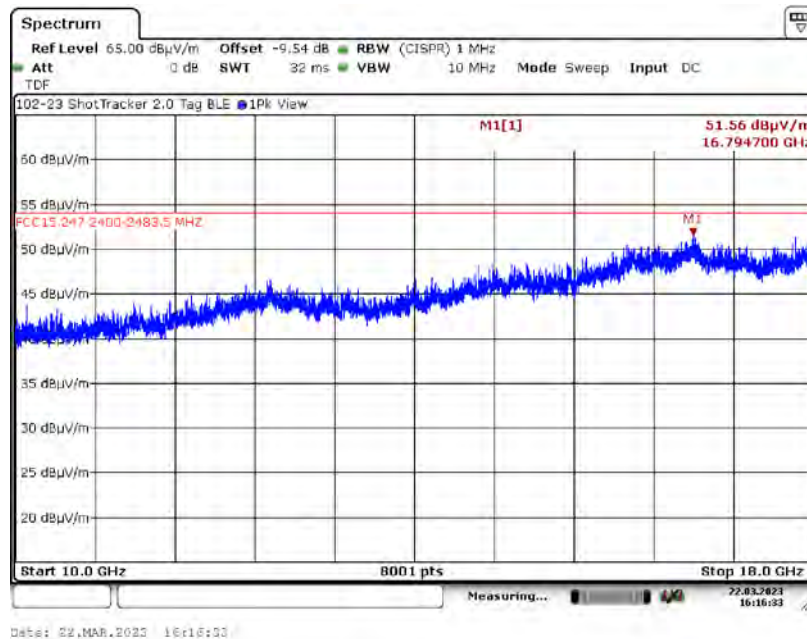
A5. Spurious Radiated Emissions (10 – 18 GHz) Test Results

A5.5. Channel 17, 2440 MHz – Y Axis

A5.5.1. Measurement Results: Horizontal Antenna



A5.5.2. Measurement Results: Vertical Antenna

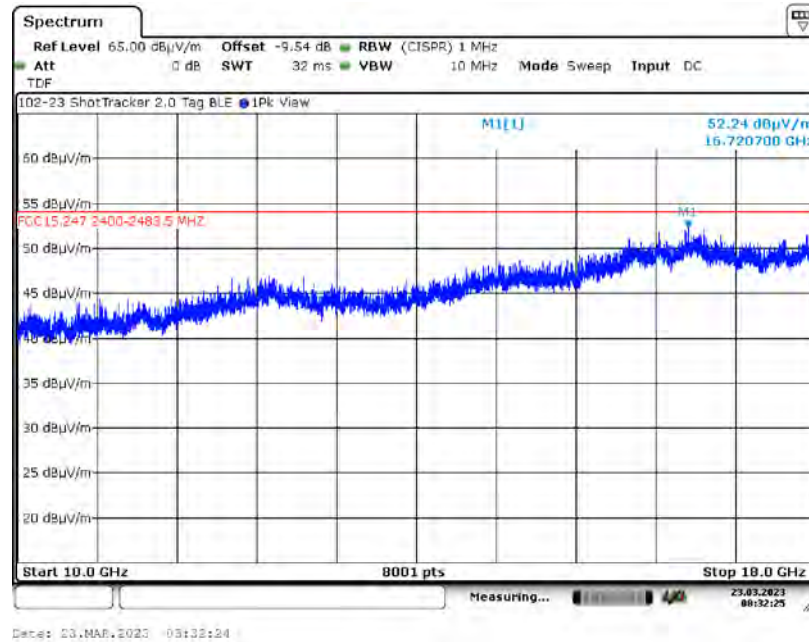


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

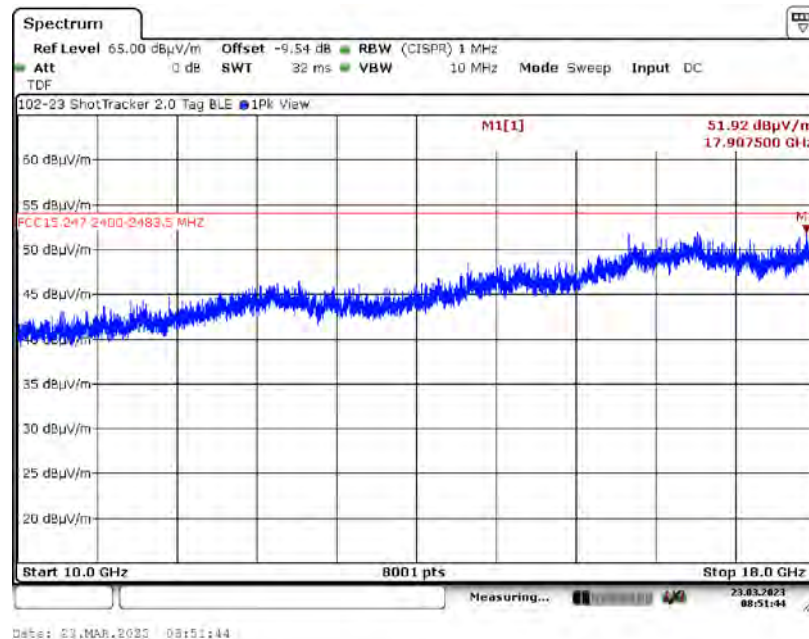
A5. Spurious Radiated Emissions (10 – 18 GHz) Test Results

A5.6. Channel 39, 2480 MHz – Y Axis

A5.6.1. Measurement Results: Horizontal Antenna



A5.6.2. Measurement Results: Vertical Antenna

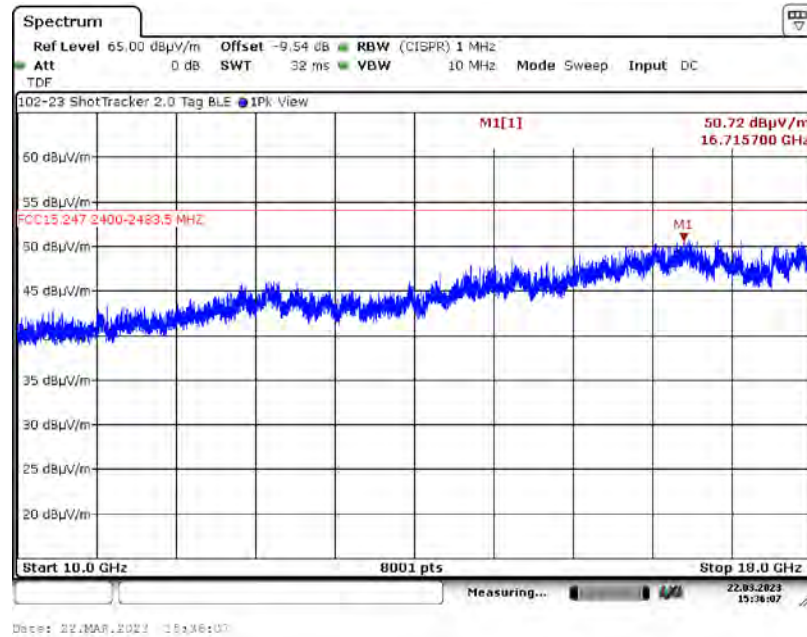


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

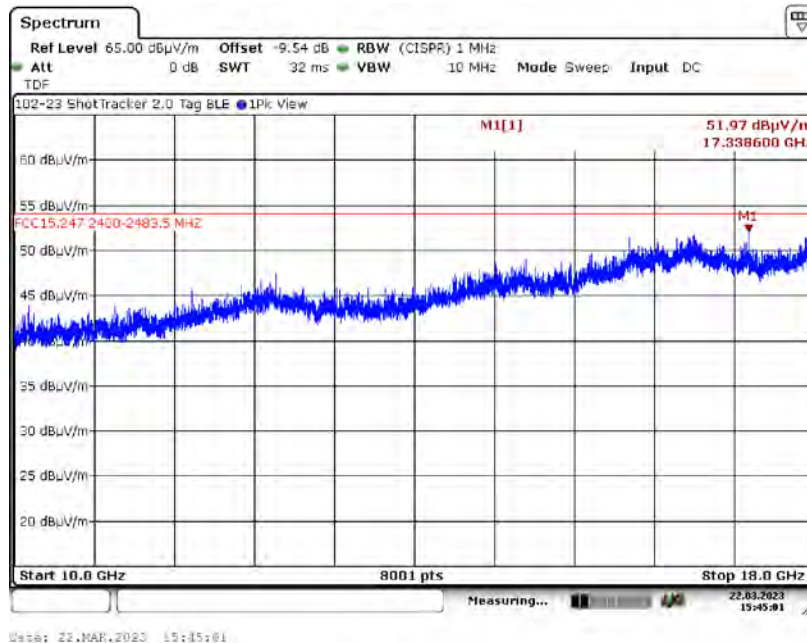
A5. Spurious Radiated Emissions (10 – 18 GHz) Test Results

A5.7. Channel 37, 2402 MHz – Z Axis

A5.7.1. Measurement Results: Horizontal Antenna



A5.7.2. Measurement Results: Vertical Antenna

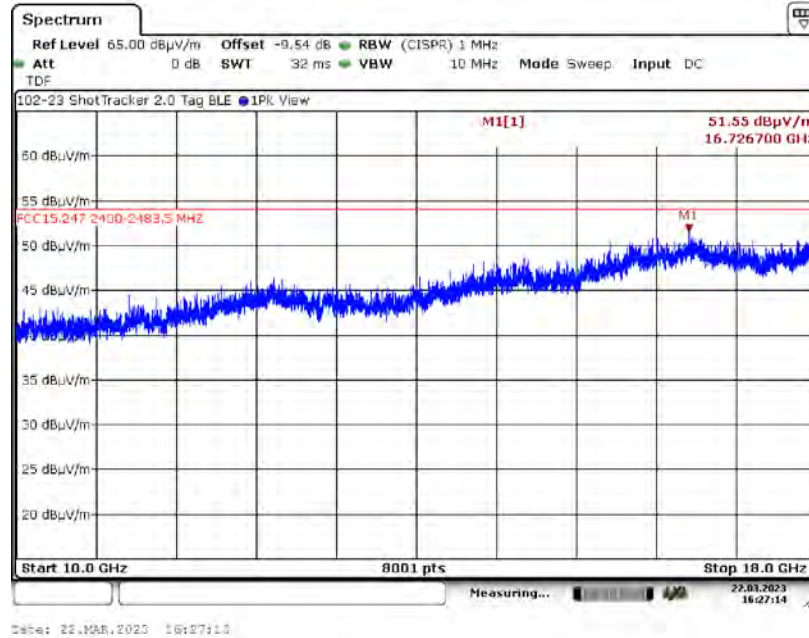


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

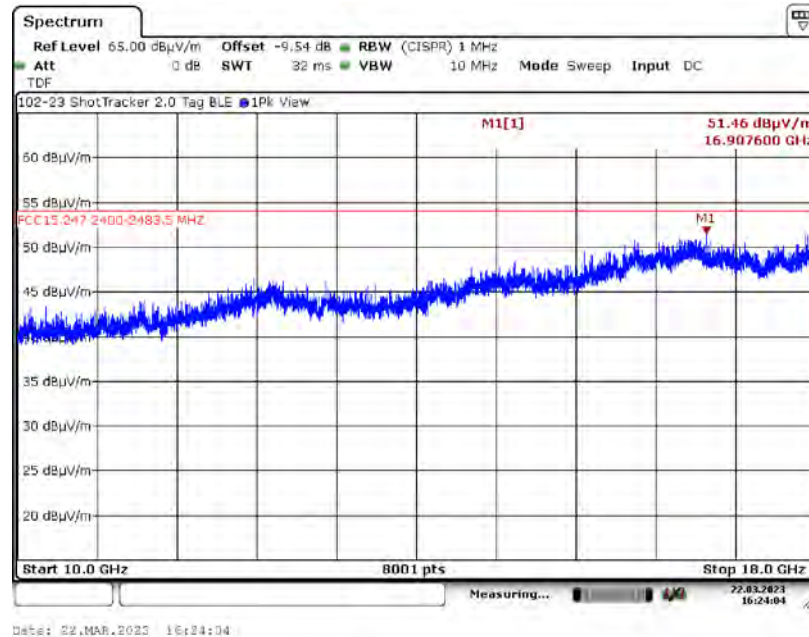
A5. Spurious Radiated Emissions (10 – 18 GHz) Test Results

A5.8. Channel 17, 2440 MHz – Z Axis

A5.8.1. Measurement Results: Horizontal Antenna



A5.8.2. Measurement Results: Vertical Antenna

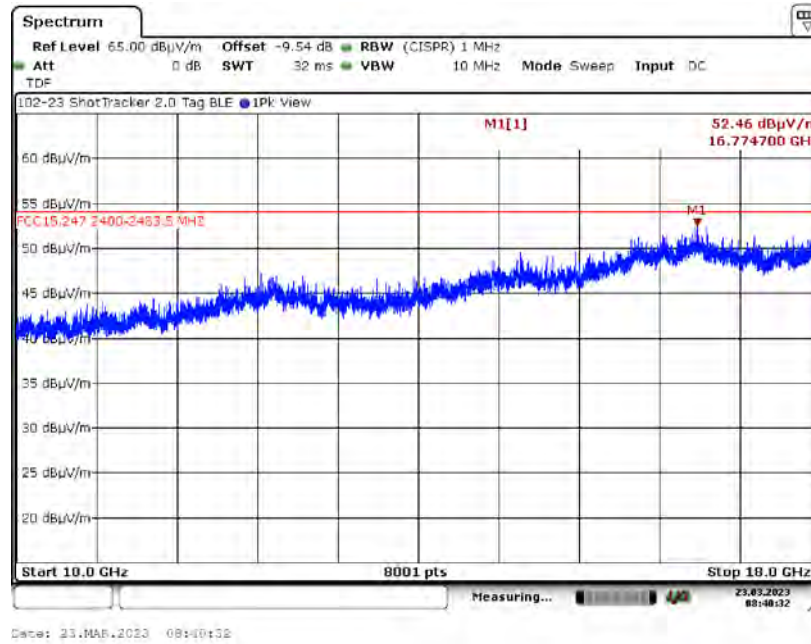


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

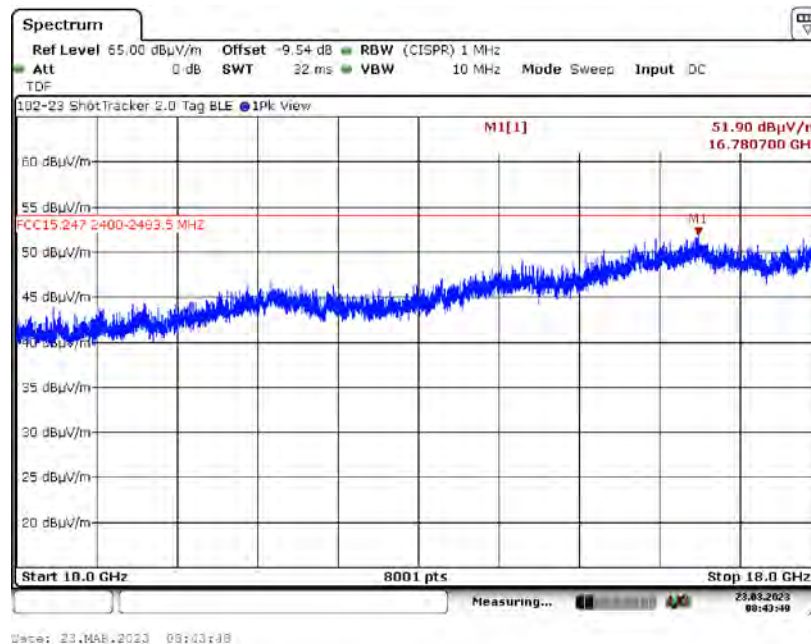
A5. Spurious Radiated Emissions (10 – 18 GHz) Test Results

A5.9. Channel 39, 2480 MHz – Z Axis

A5.9.1. Measurement Results: Horizontal Antenna



A5.9.2. Measurement Results: Vertical Antenna

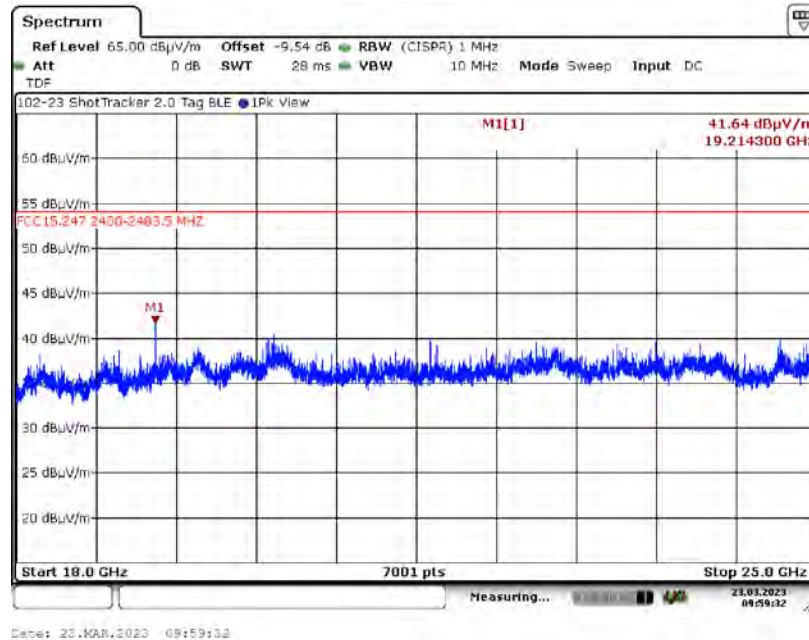


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

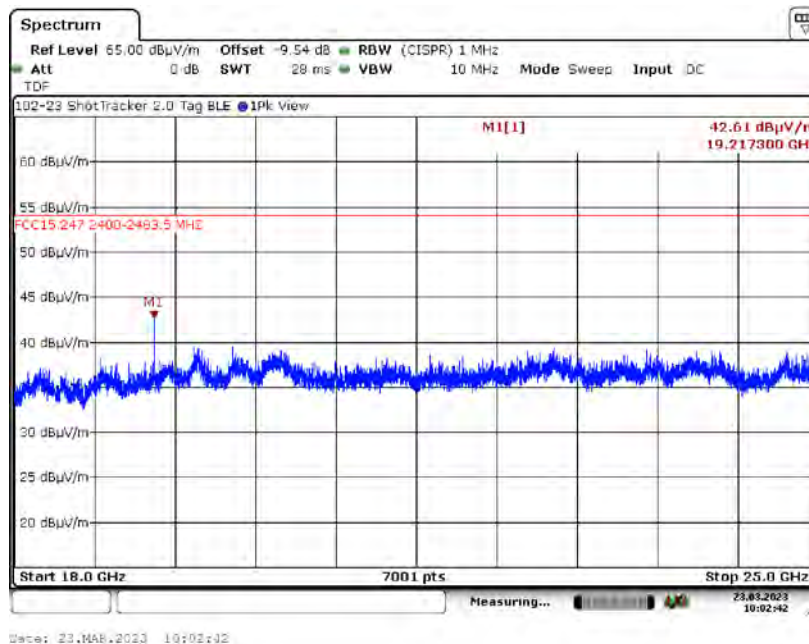
A6. Spurious Radiated Emissions (18 – 25 GHz) Test Results

A6.1. Channel 37, 2402 MHz – X Axis

A6.1.1. Measurement Results: Horizontal Antenna



A6.1.2. Measurement Results: Vertical Antenna

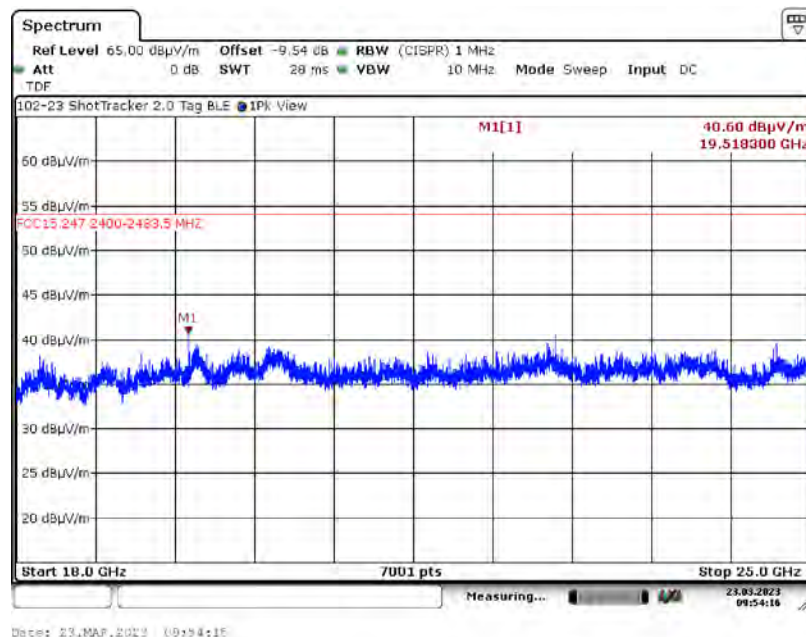


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

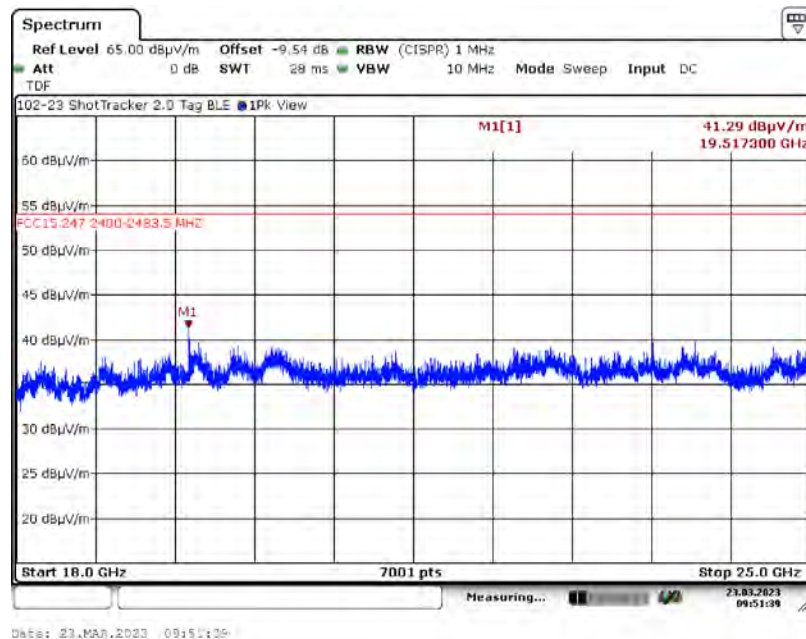
A6. Spurious Radiated Emissions (18 – 25 GHz) Test Results

A6.2. Channel 17, 2440 MHz – X Axis

A6.2.1. Measurement Results: Horizontal Antenna



A6.2.2. Measurement Results: Vertical Antenna

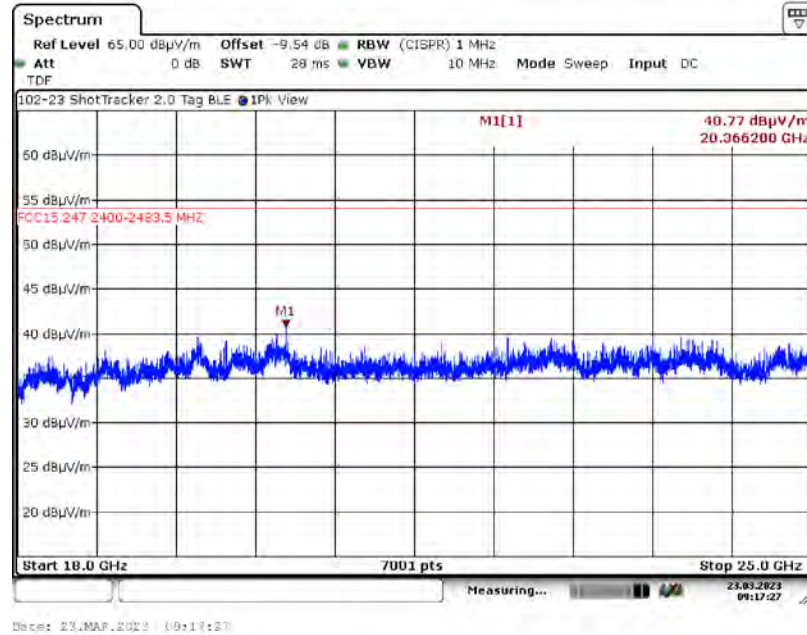


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

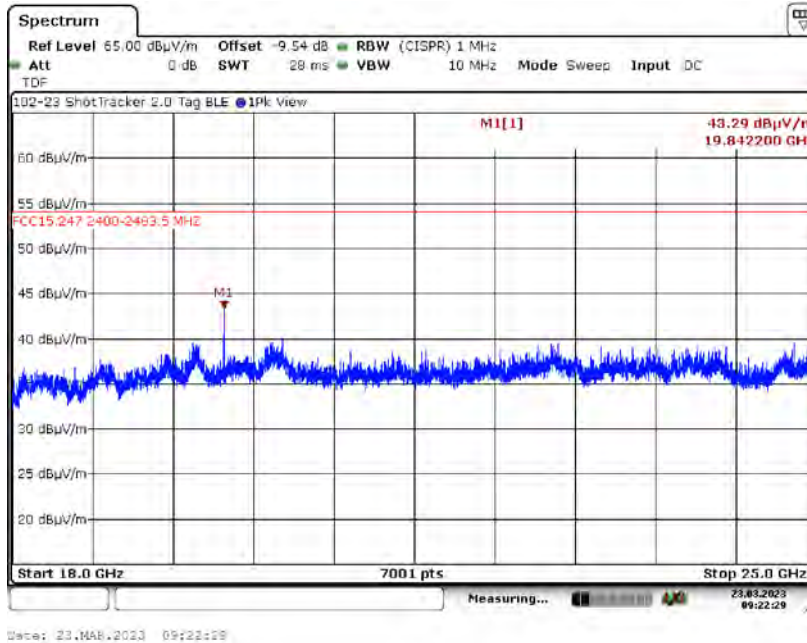
A6. Spurious Radiated Emissions (18 – 25 GHz) Test Results

A6.3. Channel 39, 2480 MHz – X Axis

A6.3.1. Measurement Results: Horizontal Antenna



A6.3.2. Measurement Results: Vertical Antenna

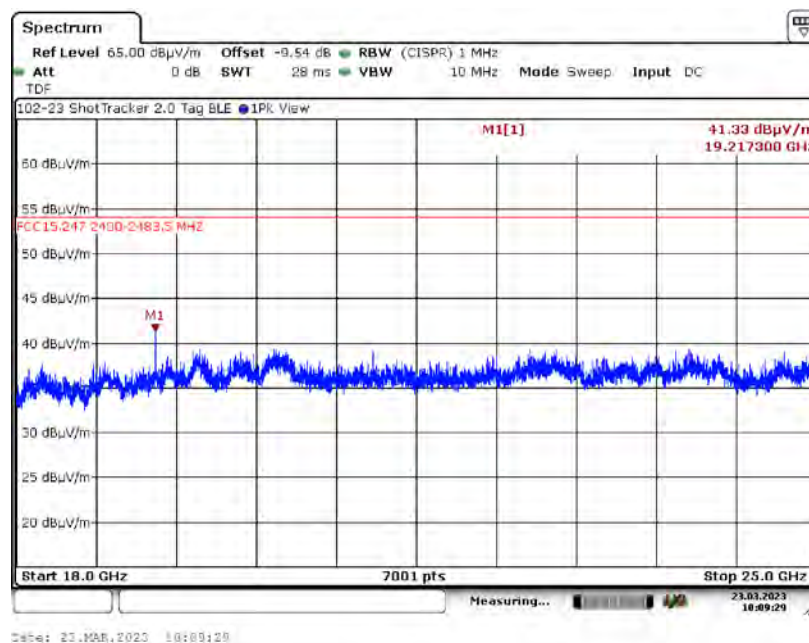


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

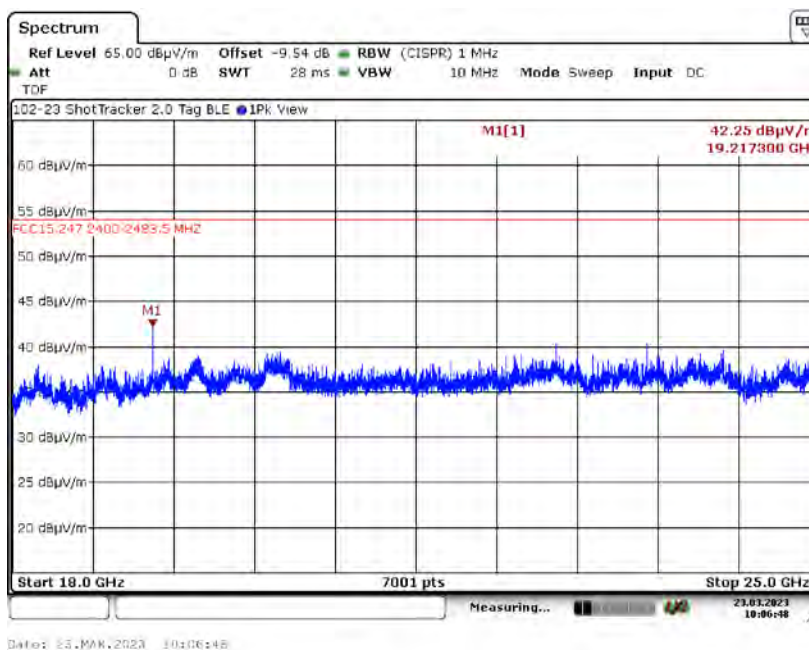
A6. Spurious Radiated Emissions (18 – 25 GHz) Test Results

A6.4. Channel 37, 2402 MHz – Y Axis

A6.4.1. Measurement Results: Horizontal Antenna



A6.4.2. Measurement Results: Vertical Antenna

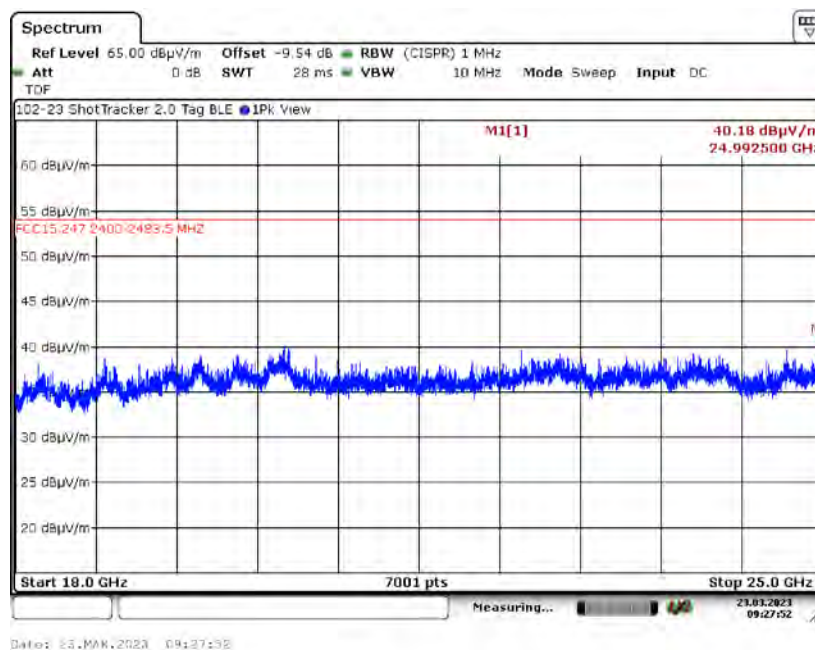


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

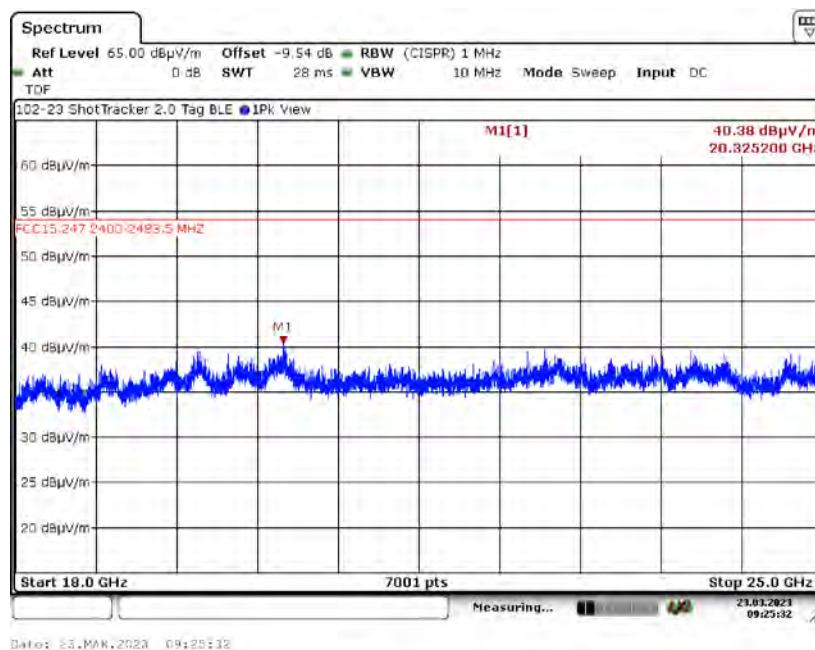
A6. Spurious Radiated Emissions (18 – 25 GHz) Test Results

A6.6. Channel 39, 2480 MHz – Y Axis

A6.6.1. Measurement Results: Horizontal Antenna



A6.6.2. Measurement Results: Vertical Antenna

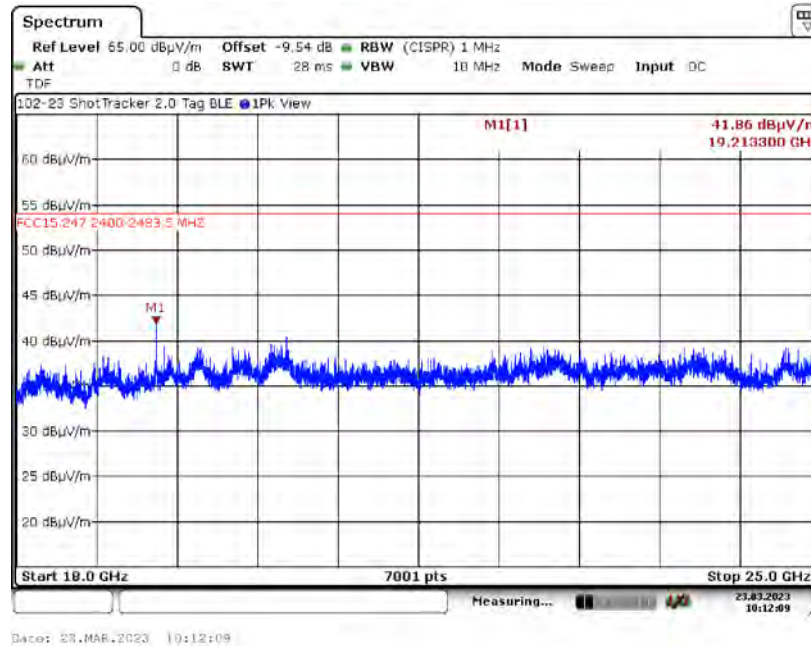


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

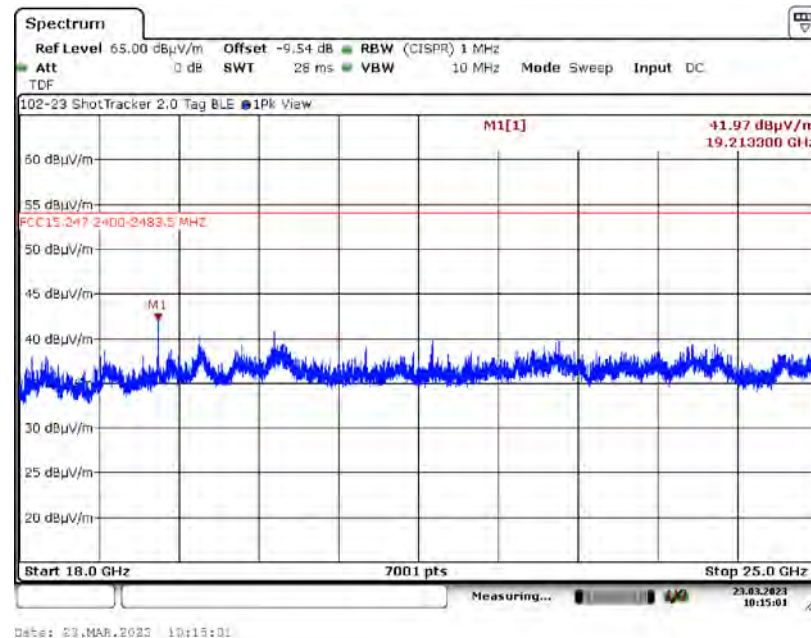
A6. Spurious Radiated Emissions (18 – 25 GHz) Test Results

A6.7. Channel 37, 2402 MHz – Z Axis

A6.7.1. Measurement Results: Horizontal Antenna



A6.7.2. Measurement Results: Vertical Antenna

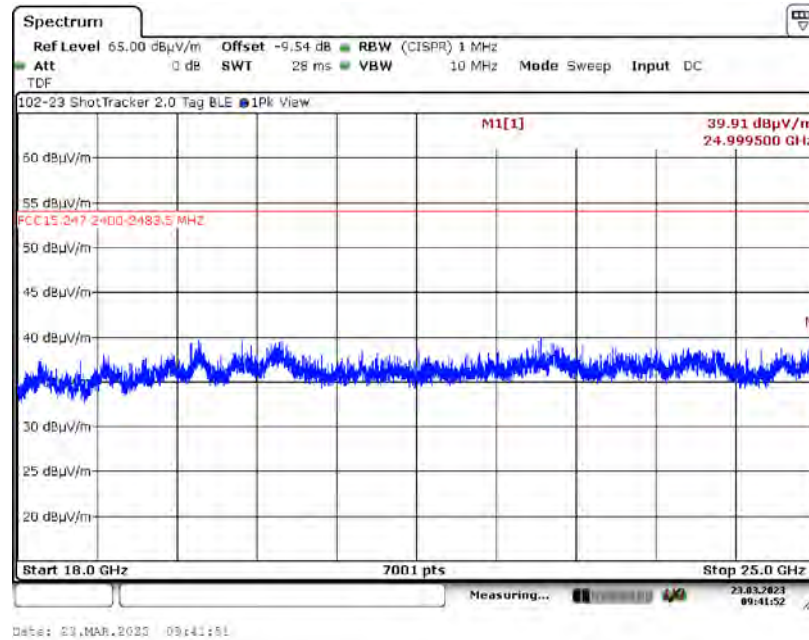


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

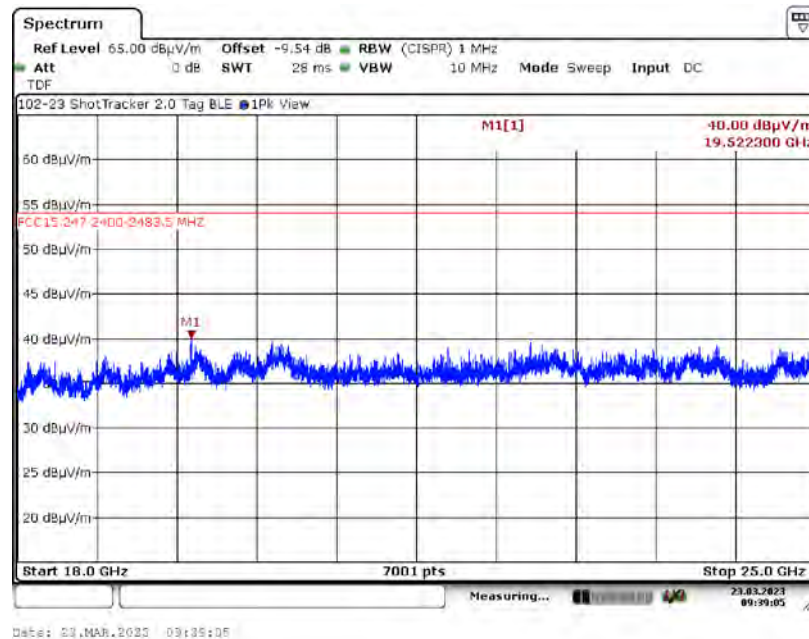
A6. Spurious Radiated Emissions (18 – 25 GHz) Test Results

A6.8. Channel 17, 2440 MHz – Z Axis

A6.8.1. Measurement Results: Horizontal Antenna



A6.8.2. Measurement Results: Vertical Antenna

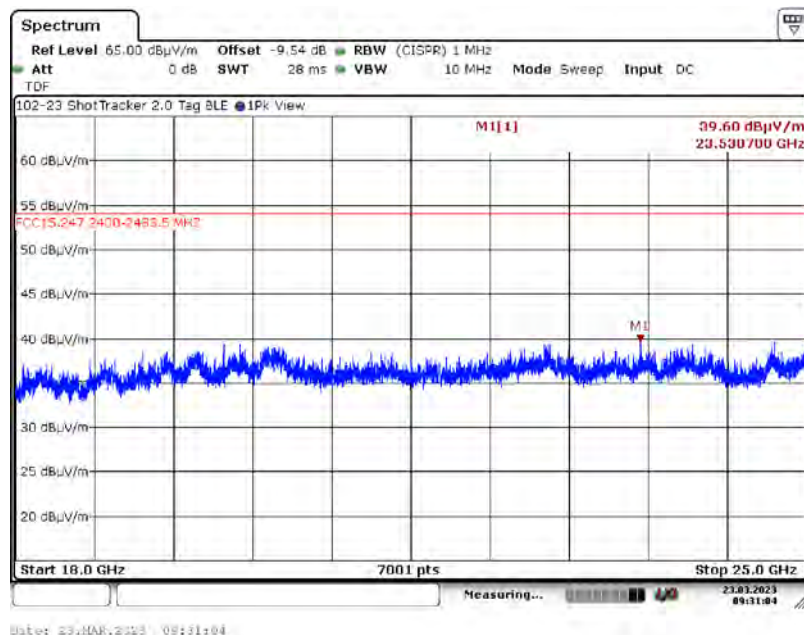


Appendix A - Transmitter Spurious Radiated Emissions (30 kHz to 25 GHz)

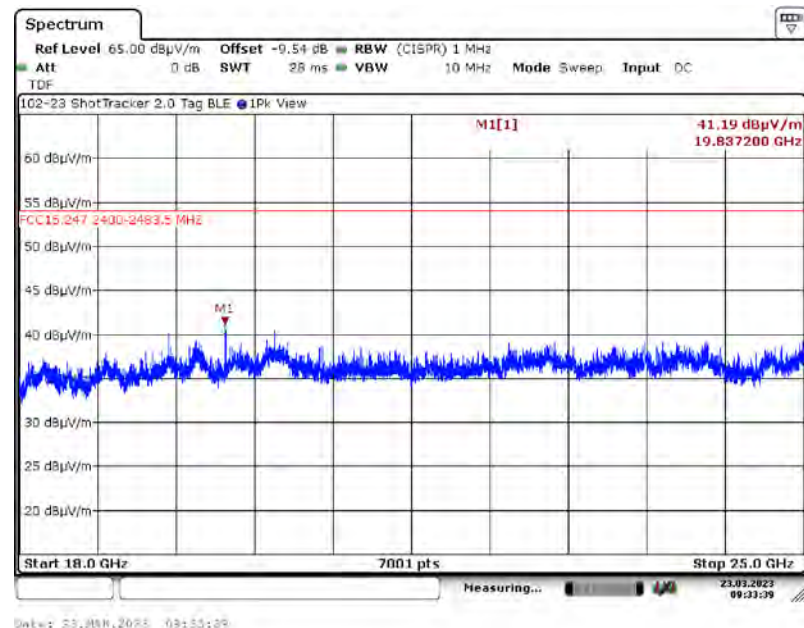
A6. Spurious Radiated Emissions (18 – 25 GHz) Test Results

A6.9. Channel 39, 2480 MHz – Z Axis

A6.9.1. Measurement Results: Horizontal Antenna



A6.9.2. Measurement Results: Vertical Antenna

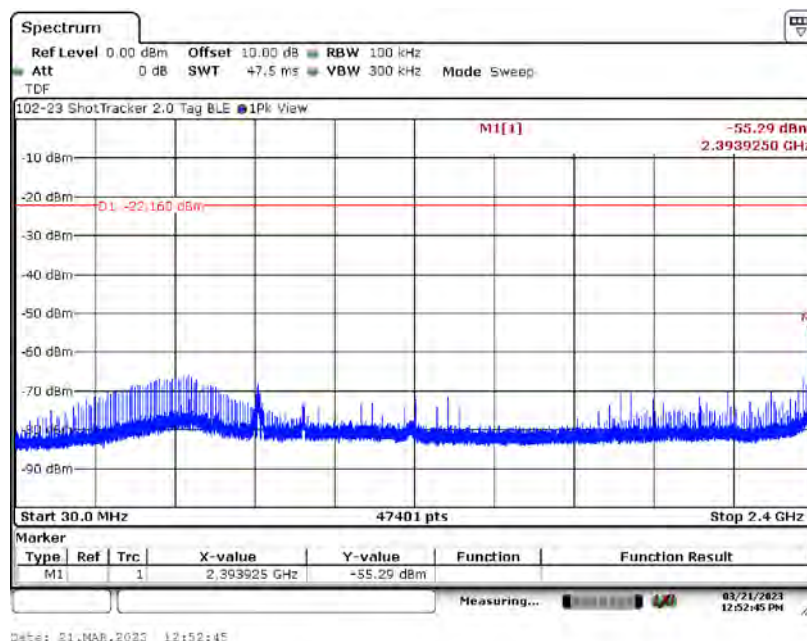


Appendix B

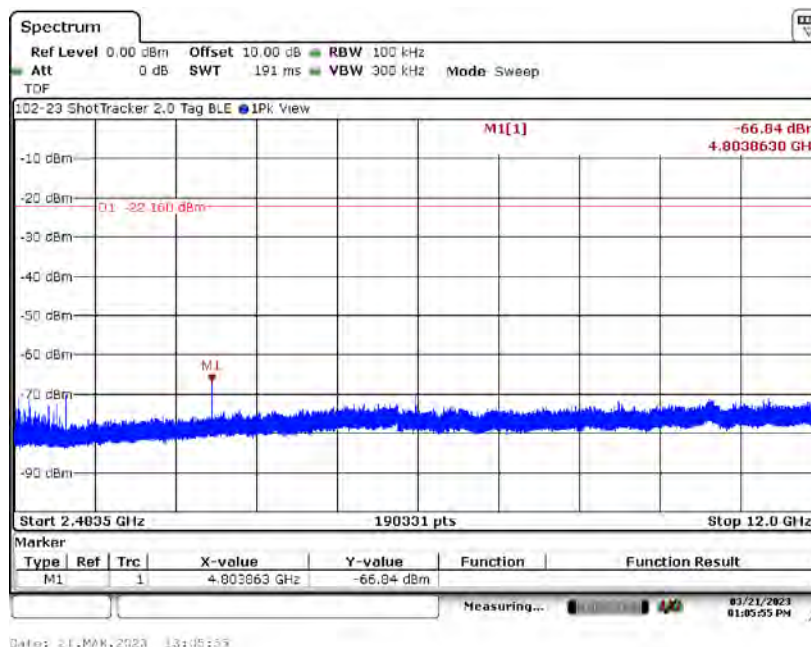
B1. Emissions in Non-restricted Frequency Bands (30 MHz to 25 GHz)

B1.1. Emissions in Non-restricted Frequency Bands (30 MHz – 25 GHz) Test Results

B1.1.1. Measurement Results, 2402 MHz, 30 MHz – 2.4 GHz



B1.1.2. Measurement Results, 2402 MHz: 2.4835 – 12 GHz

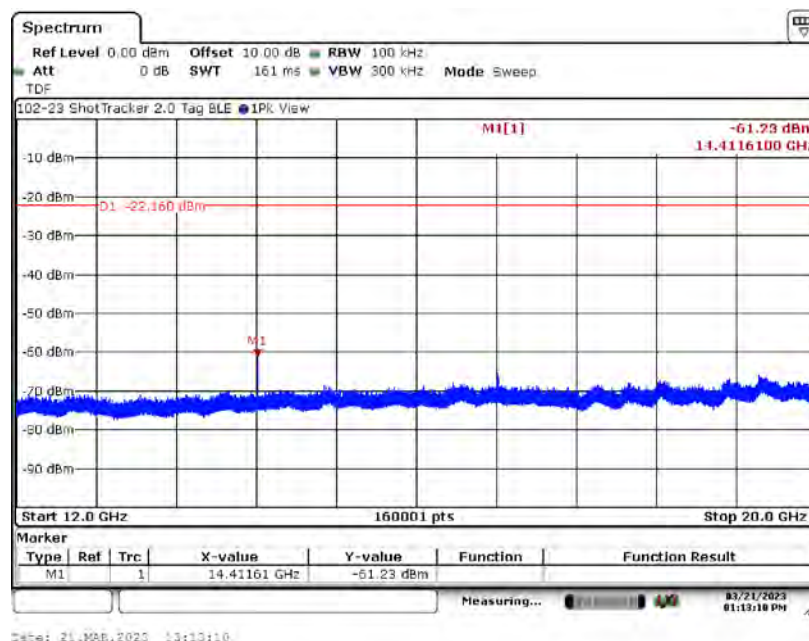


Appendix B

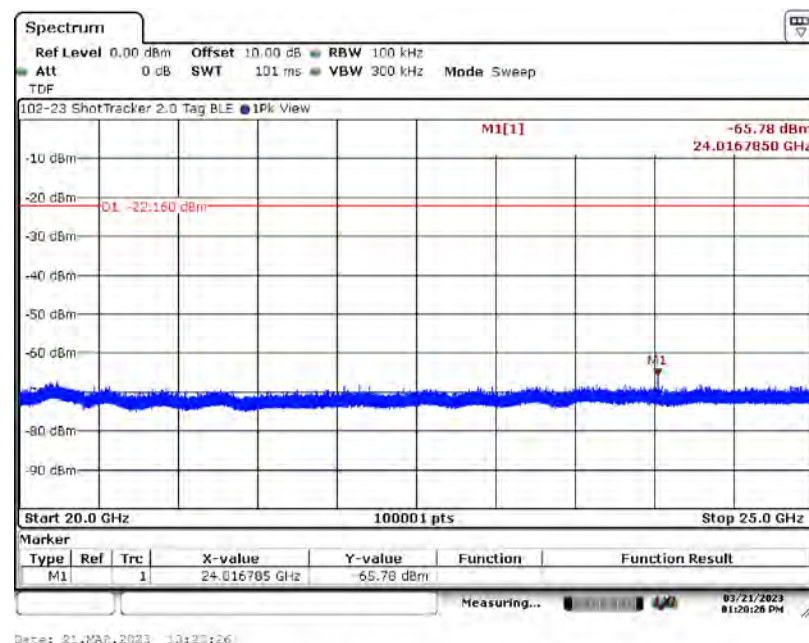
B1. Emissions in Non-restricted Frequency Bands (30 MHz to 25 GHz) (continued)

B1.1. Emissions in Non-restricted Frequency Bands (30 MHz – 25 GHz) Test Results

B1.1.3. Measurement Results, 2402 MHz, 12 – 20 GHz



B1.1.4. Measurement Results, 2402 MHz, 20 – 25 GHz

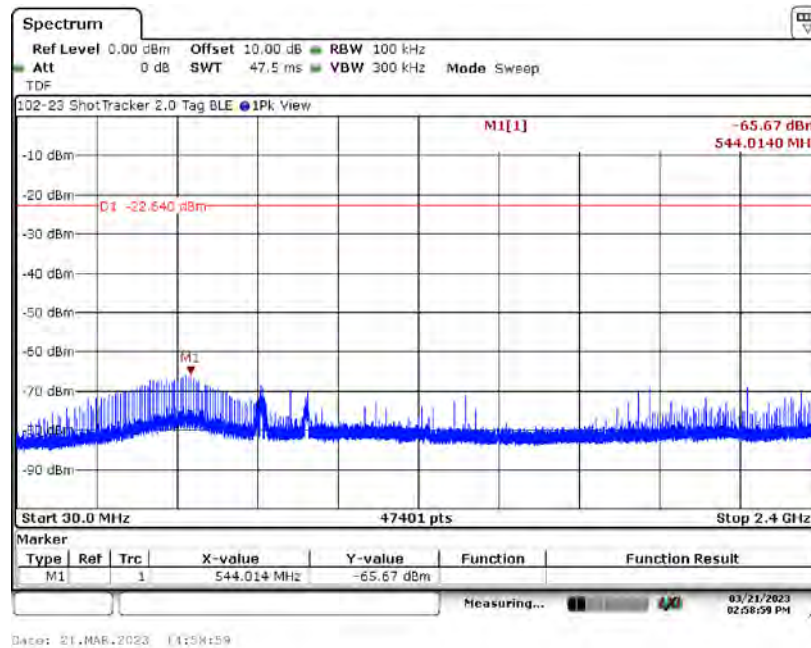


Appendix B

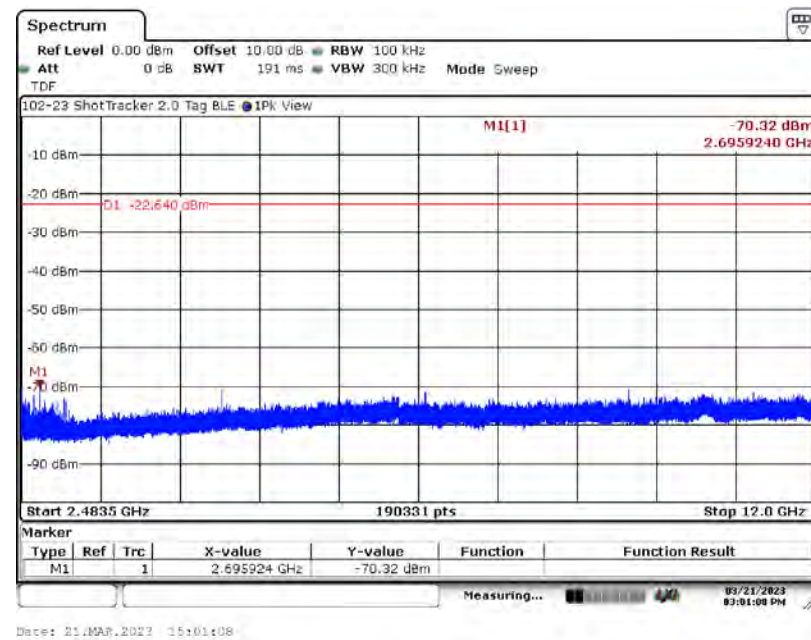
B1. Emissions in Non-restricted Frequency Bands (30 MHz to 25 GHz) (continued)

B1.1. Emissions in Non-restricted Frequency Bands (30 MHz – 25 GHz) Test Results

B1.2.1. Measurement Results, 2440 MHz, 30 MHz – 2.4 GHz



B1.2.2. Measurement Results, 2440 MHz, 2.4835 – 12 GHz

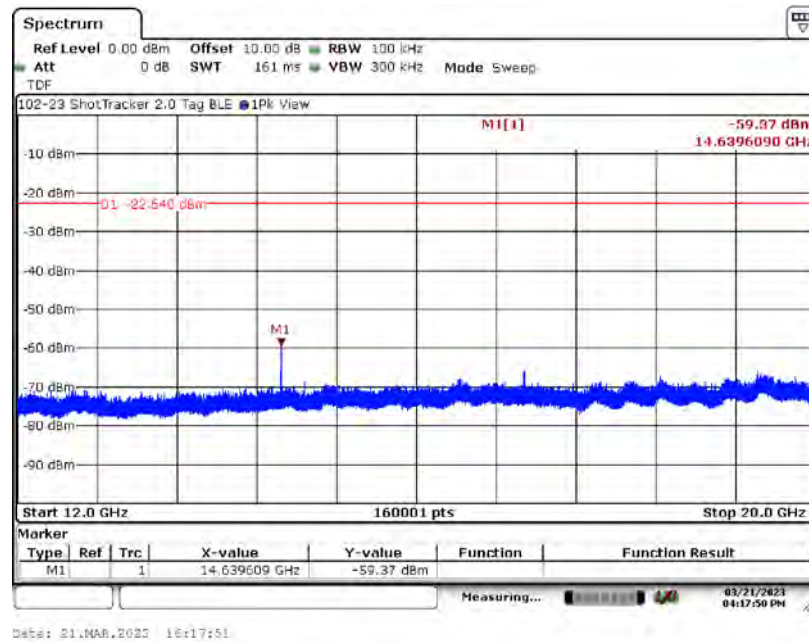


Appendix B

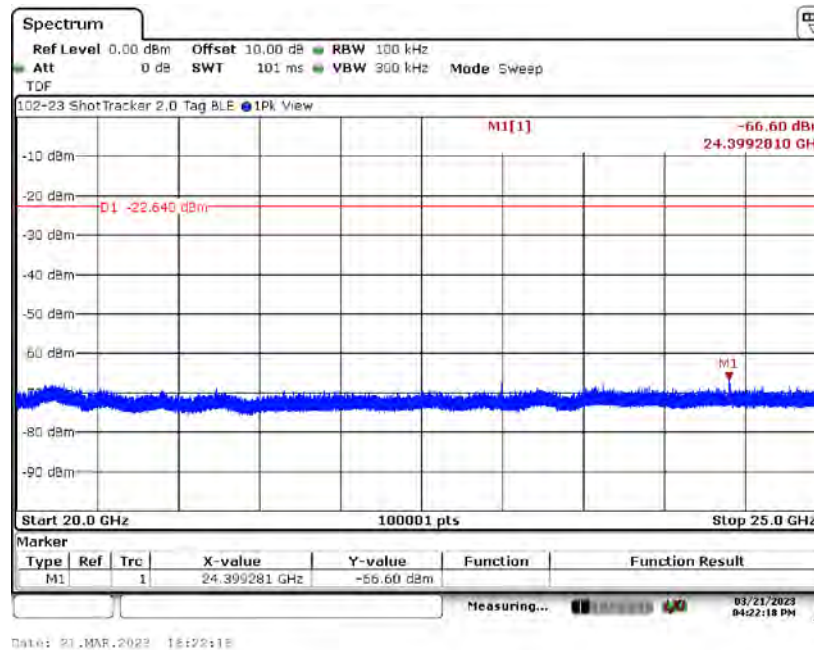
B1. Emissions in Non-restricted Frequency Bands (30 MHz to 25 GHz) (continued)

B1.2. Emissions in Non-restricted Frequency Bands (30 MHz – 25 GHz) Test Results

B1.2.3. Measurement Results, 2440 MHz, 12 – 20 GHz



B1.2.4. Measurement Results, 2440 MHz, 20 – 25 GHz

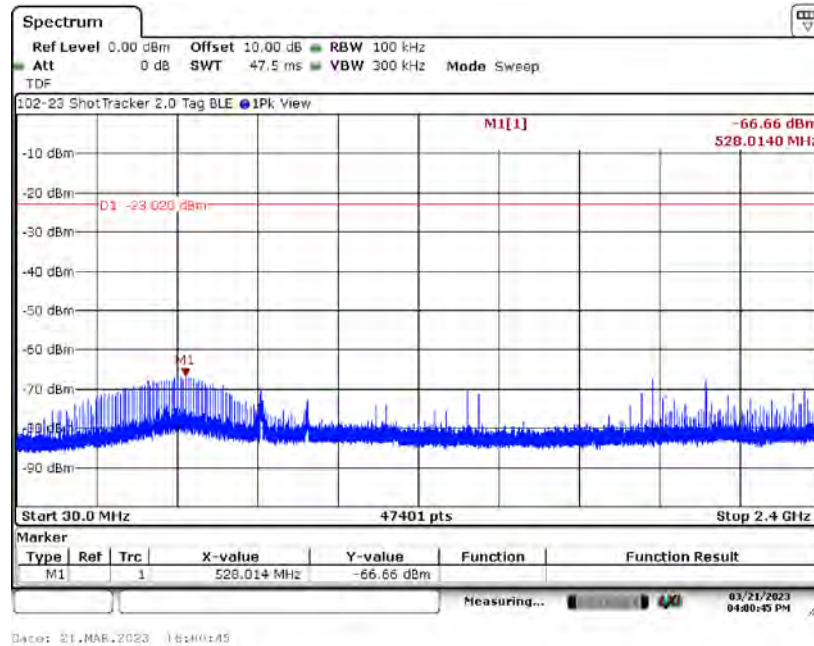


Appendix B

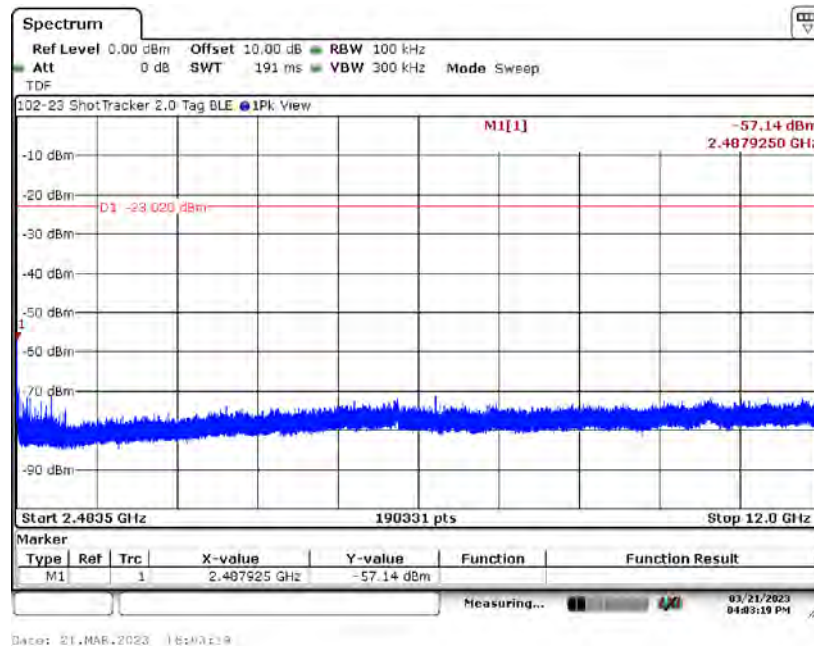
B1. Emissions in Non-restricted Frequency Bands (30 MHz to 25 GHz) (continued)

B1.2. Emissions in Non-restricted Frequency Bands (30 MHz – 25 GHz) Test Results

B1.3.1. Measurement Results, 2480 MHz, 30 MHz – 2.4 GHz



B1.3.2. Measurement Results, 2480 MHz, 2.4835 – 12 GHz

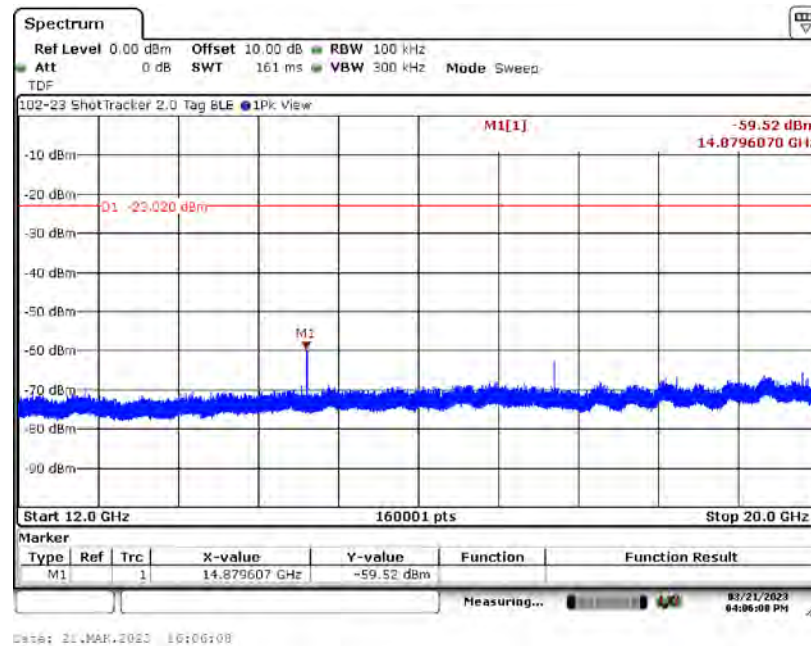


Appendix B

B1. Emissions in Non-restricted Frequency Bands (30 MHz to 25 GHz) (continued)

B1.2. Emissions in Non-restricted Frequency Bands (30 MHz – 25 GHz) Test Results

B1.3.3. Measurement Results, 2480 MHz, 12 – 20 GHz



B1.3.4. Measurement Results, 2480 MHz, 20 – 25 GHz

