COMPLIANCE WORLDWIDE INC.
TEST REPORT 432-19

In Accordance with the Requirements of

FCC PART 15.247, SUBPART C
Class II Permissive Change
Innovation, Science and Economic Development Canada
RSS-247, Issue 2

Low Power License-Exempt Radio Communication Devices
Intentional Radiators

Issued to

iZotope, Inc.
60 Hampshire Street
Cambridge, MA 02139
617- 577-7799

for the

iZotope Spire Studio (Tonos Product)
Model: SP121
Bluetooth Transmitter

FCC ID: 2AKPU1DX
IC: 23446-PU1DX

Report Issued on December 17, 2019

Tested by

Brian F. Breault

Reviewed by

Larry K. Stillings

Table of Contents

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1. Scope

This test report certifies that the iZotope Spire Studio (Tonos Product) Bluetooth Transmitter, as tested, meets the FCC Part 15.247**,** and ISED Canada RSS-247, Issue 2 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.

2. Product Details

2.1. Manufacturer: iZotope, Inc.
2.2. Model Number: Spire Studio
2.3. Serial Number: HA-389 (including HA-414 CPU, HA-426 UI, and HA-401 Audio)
2.4. Description: "Spire Capture Pro": wireless internet enabled audio recording device.
2.5. Power Source: DC 5 Volts @ 2 Amps. (Wall adapter)
2.6. Hardware Revision: Tonos_Rev2
2.7. Software Revision: Bare Modus 2.2.0.15384
2.8. Modulation Type: OFDM
2.9. Operating Frequency: 2.4 GHz Nominal
2.10. EMC Modifications: .None

3. Product Configuration

3.1. Operational Characteristics & Software

First, make sure to plug the device in and let it charge for at least two hours. Turn the device on by pressing and holding the power button on the rear for at least two seconds. The LED panel will display a boot-up animation with white LEDs. After a few seconds, the device will enter testing mode and the LED panel will display one yellow and nine purple segments. The device will initially be in an idle, non-transmitting state.

For Bluetooth testing, the device has four test modes:

Test Mode	Tx Mode	Channel	Data Rate
1	Idle	-	-
9	Bluetooth	0	3 Mbps
10	Bluetooth	40	3 Mbps
11	Bluetooth	78	3 Mbps

3.2. EUT Hardware

Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Freq (Hz)	Description/Function
iZotope, Inc.	Spire Studio	None	5	DC	

3.3. EUT Cables/Transducers

Cable Type	Length	Shield	From	To
Power	1 Meter	No	Power Adapter	Equipment under test
Mic/Line In 1	1 Meter	Yes	Unterminated	Equipment under test
Mic/Line In 2	1 Meter	Yes	Unterminated	Equipment under test
Headphones	1 Meter	Yes	Headphones	Equipment under test

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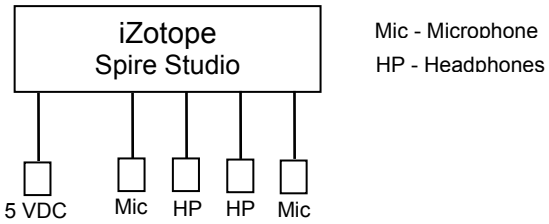
3. Product Configuration (continued)

3.4. Support Equipment

Device	Manufacturer	Model	Serial No.	Comment
None				

3.5. Block Diagram Cables



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	9/10/2020	2 Years
EMI Test Receiver, 10 Hz - 7GHz [1]	Rohde & Schwarz	ESR7	101770	10/3/2020	2 Years
Spectrum Analyzer, 2 Hz to 26.5 GHz[2]	Rohde & Schwarz	FSW26	102057	9/13/2020	2 Years
Spectrum Analyzer, 9 kHz to 40 GHz[3]	Rohde & Schwarz	FSV40	100899	9/10/2020	2 Years
EMI Receiver 9 kHz - 1 GHz	Hewlett Packard	8546A	3650A00360	9/11/2020	2 Years
Loop Antenna 9 kHz - 30 MHz	EMCO	6512	9309-1139	1/28/2022	3 Years
Biconilog Antenna, 30 MHz to 2 GHz	Sunol Sciences Corp	JB1	A050913	6/5/2022	2 Years
Horn Antenna, 960 MHz to 18 GHz	Electro-Metrics	EM-6961	6337	10/3/2020	2 Years
Horn Antenna, 18 GHz to 40 GHz	Com-Power	AH-840	03075	1/7/2021	2 Years
Preamplifier, 1 GHz to 26.5 GHz	Hewlett Packard	8449B	3008A01323	9/11/2020	2 Years
Digital Barometer	Control Company	4195	ID236	4/3/2020	2 Years
Temperature Chamber	Associated Environmental	SD-308	10782	CNR	

[1] ESR7 Firmware revision: V3.46 SP1, Date installed: 12/22/2018 Previous V3.36 SP2, installed 12/5/2018.
[2] FSW26 Firmware revision: V4.30 SP1, Date installed: 02/22/2019 Previous V3.36 SP2, installed 10/26/2018.
[3] FSV40 Firmware revision: V2.30 SP4, Date installed: 05/04/2016 Previous V2.30 SP1, 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	7.10. Conducted Emissions

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4. Measurements Parameters

4.3. Measurement & Equipment Setup

Test Dates:	Dec. 9th to Dec. 16th 2019
Test Engineers:	Sean Defelice, Brian Breault
Normal Site Temperature (15 - 35°C):	21.7
Relative Humidity (20 -75%RH):	32%
Frequency Range:	30 kHz to 25 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	9 kHz – 150 kHz to 30 MHz 120 kHz – 30 MHz to 1 GHz 1 MHz – Above 1 GHz
EMI Receiver Avg Bandwidth:	30 kHz – 150 kHz to 30 MHz 300 kHz – 30 MHz to 1 GHz 3 MHz – Above 1 GHz
Detector Function:	Peak, QP - 150 kHz to 1 GHz Peak, Avg - Above 1 GHz Unless otherwise specified.

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, 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.

4.5. Measurement Uncertainty

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

RF Frequency	± $1x10^{-8}$
Radiated Emission of Transmitter	± 4.55 dB
Radiated Emission of Receiver	± 4.55 dB
Temperature	± 0.91° C
Humidity	± 5%

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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 Izotope Spire Studio, as tested, operates on 40 channels, from channels 0 to 39 in the 2.4 GHz 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 (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

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 worst case examples.

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6. Measurements Summary

Test Requirement	FCC Rule Requirement	IC Rule Requirement	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-210 A8.1 (b)	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-GEN 6.13	7.6	Compliant
Unwanted 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	Compliant
Duty Cycle	15.247	N/A	7.10	Compliant
99% (occupied) bandwidth	N/A	RSS-GEN 4.6.1	7.11	Compliant
Public Exposure to Radio Frequency Energy Levels	1.1307 (b) (1)	RSS-GEN, Issue 5, Section 3.4, RSS 102	7.12	Compliant

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7. Measurement Data

7.1. Antenna Requirement (15.203, RSS-GEN 7.1.2)

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 Izotope Spire Studio utilizes a chip etch antenna that is not user replaceable.

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7. Measurement Data

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

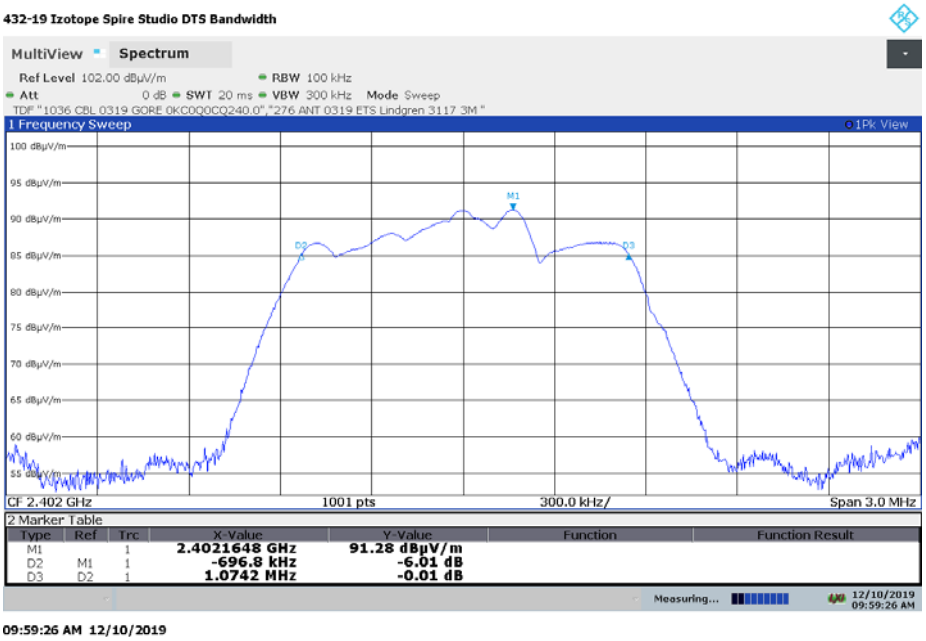
Requirement: (15.247 (a) (2)
Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Procedure: This test was performed in accordance with the procedure detailed in FCC OET publication number 558074, Section 8.1 Option 1, DTS (6 dB) Channel Bandwidth.

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
0	2402	1074.20	>500	Compliant
40	2442	1072.90	>500	Compliant
78	2480	1063.90	>500	Compliant

7.2.1. Low Channel – 37, 2402 MHz



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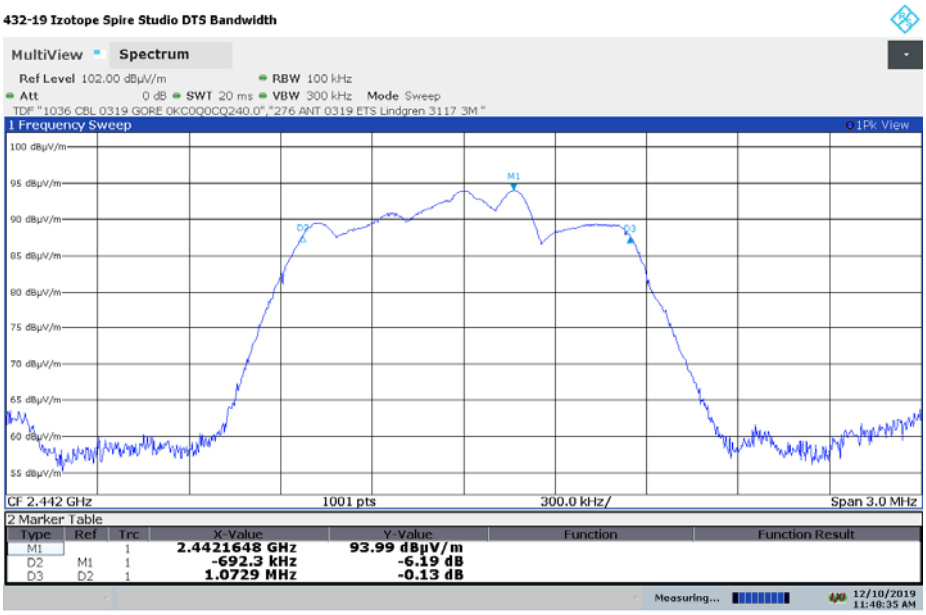
7. Measurement Data

7.2. Minimum DTS Bandwidth (15.247 (a) (2)) (continued)

7.2.2. Middle Channel – 17, 2440 MHz



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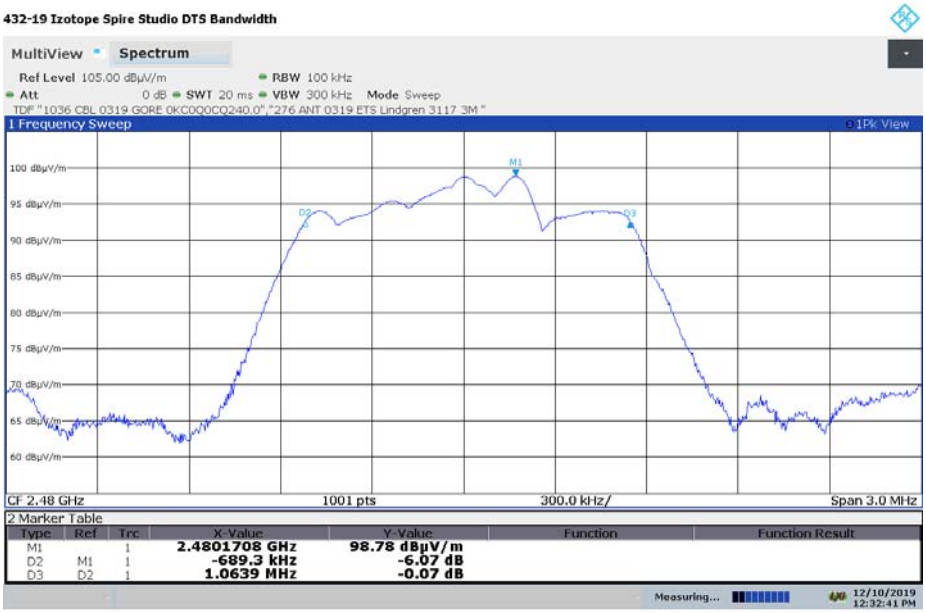
7.2.3. High Channel – 39, 2480 MHz



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7. Measurement Data (continued)

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

Requirement: (15.247 (b) (3))
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 FCC OET publication number KDB 558074, Section 9.1.1.

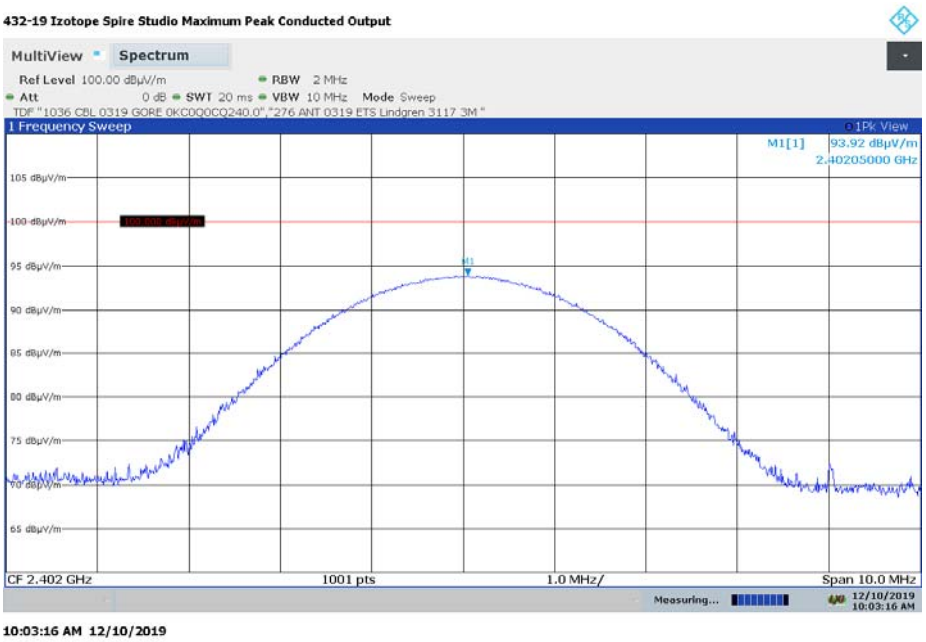
Test Note: A spectrum analyzer resolution bandwidth of 1 MHz and a video bandwidth of 3 MHz were used to meet the requirements of FCC OET publication number 558074, Section 9.1.1 and the measured product DTS bandwidth.

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

BLE Channel	Frequency	Maximum Peak Radiated Output Power		Peak Limit	Margin	Result
	(MHz)	(dBµV/m)	(dBm)[1]	(dBm)	(dB)	
0	2402	93.92	-1.31	30	-31.31	Compliant
40	2442	96.80	1.57	30	-28.43	Compliant
78	2480	101.09	5.86	30	-24.14	Compliant

[1]Converted from field strength. Reference ANSI C63.10-2013, Annex G, section G2

7.3.1. Low Channel – 37, 2402 MHz



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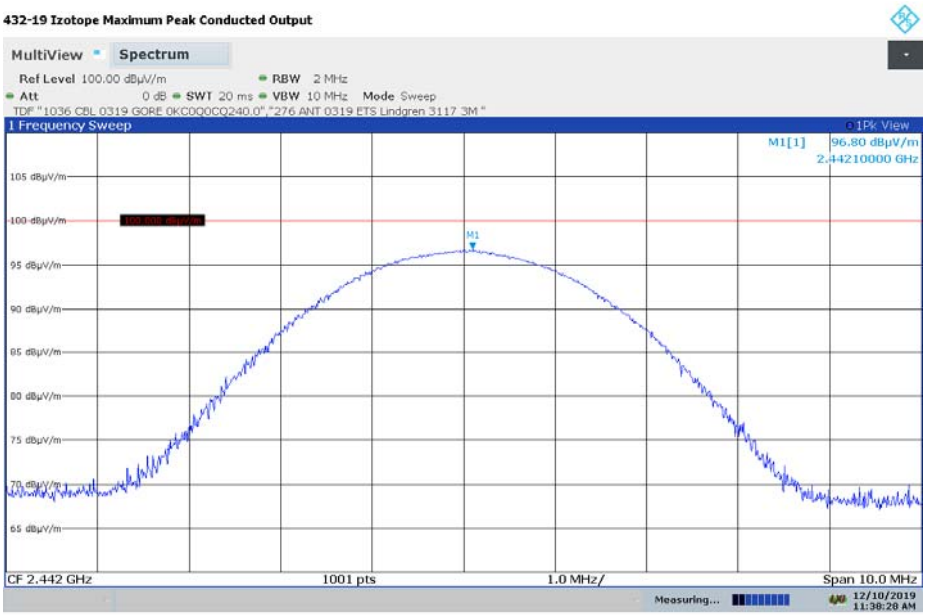
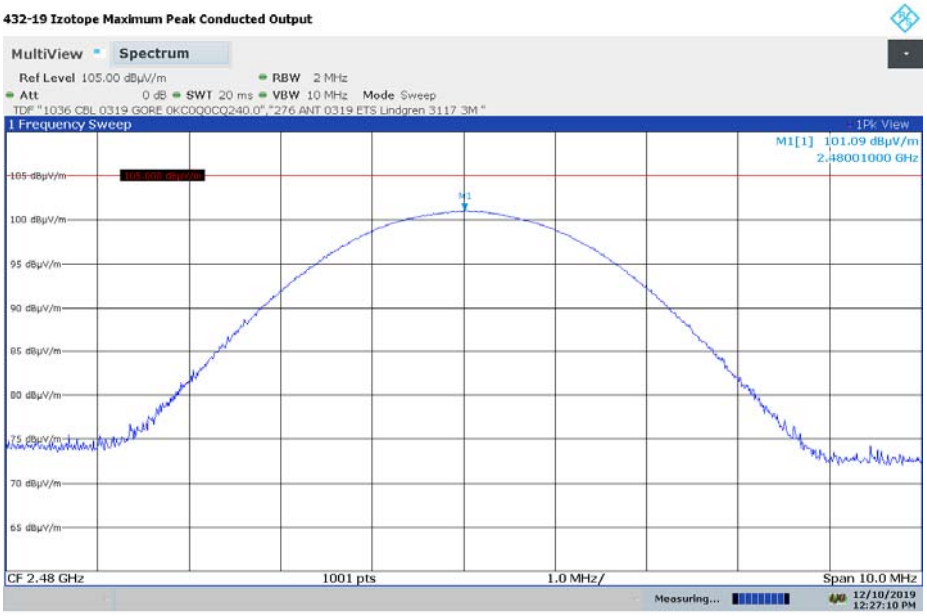
7. Measurement Data

7.3. Maximum Peak Conducted Output Power (continued)

7.3.2. Middle Channel – 17, 2440 MHz



7.3.3. High Channel – 39, 2480 MHz



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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 an antenna with a gain of 1.5 dBi and therefore is exempt from this requirement.

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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: (15.209) 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

[1] Measurements 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 12.0: Emissions in restricted frequency bands and FCC 47CFRPart 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, 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 DUT did not exceed the field strength levels specified in the above table.

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)
10 kHz - 150 kHz	0.01575	78.19	123.64	-45.45	A1.2.2	Perpendicular
150 kHz - 30 MHz	0.73500	55.23	68.43	-13.20	A2.1.2	Perpendicular
30 MHz - 1000 MHz	905.07000	37.01	46.00	-8.99	A3.1.2	H
1000 MHz - 2400 MHz	1992.010	45.2	74.00	-28.80	A4.3.2	V
2483 MHz - 7000 MHz	6988.940	43.52	74.00	-30.48	A5.1.1	H
7000 MHz - 18000 MHz	17889.500	48.40	74.00	-25.60	A6.1.1	H
18000 MHz - 25000 MHz	23543.800	44.46	74.00	-29.54	A7.2.1	H

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7. Measurement Data (continued)

7.5. Transmitter Spurious Radiated Emissions (30 kHz to 40 GHz) (FCC 15.209, ISED RSS-GEN 6.13)

7.5.2. 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)[1]		Limit (dBµV/m)		Margin (dBµV/m)		Antenna Polarity (H/V)	Result
	Peak	Average	Peak	Average	Peak	Average		
4804	50.79	36.46	74.00	54.00	-23.21	-17.54	H	4804
4884	50.23	35.90	74.00	54.00	-23.77	-18.10	H	4884
4960	49.72	35.96	74.00	54.00	-24.28	-18.04	V	4960
7326	53.18	38.68	74.00	54.00	-20.82	-15.32	V	7326
7440	52.46	38.85	74.00	54.00	-21.54	-15.15	V	7440
12010	60.91	46.36	74.00	54.00	-13.09	-7.64	H	12010
12210	59.82	46.31	74.00	54.00	-14.18	-7.69	H	12210
12400	59.66	46.03	74.00	54.00	-14.34	-7.97	H	12400
19216	62.03	0.00	74.00	54.00	-11.97	-54.00	H	19216
19536	62.30	48.95	74.00	54.00	-11.70	-5.05	V	19536
19840	61.60	47.59	74.00	54.00	-12.40	-6.41	H	19840
22320	62.85	48.70	74.00	54.00	-11.15	-5.30	V	22320

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

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7. Measurement Data (continued)

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

Requirement: 15.247(d) 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 11: Emissions in non-restricted frequency bands.

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)	(dBµV/m)	(dB)	(dB)	
2400	2402	91.1	-39.06	-20	Compliant

Note: Reference the plot on the following page.

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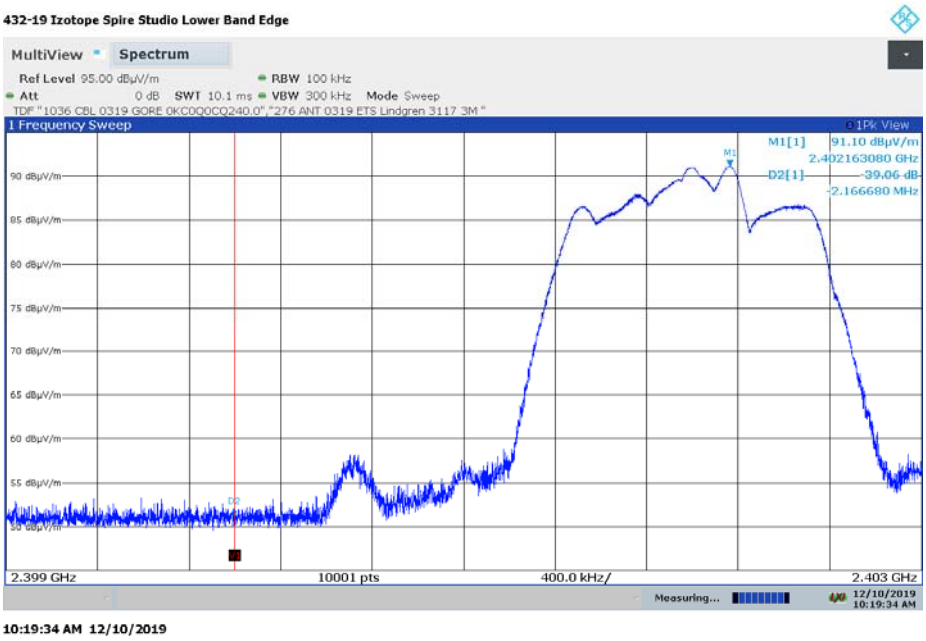
7. Measurement Data (continued)

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

Lower Band Edge



7.6.2. 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
(MHz)	Peak	Average	Peak	Average	Peak	Average	
2483.5	56.63	42.46	74	54	-17.37	-11.54	Compliant

Worst Case Out of Band

Band Edge Frequency	Out of Band Frequency	Field Strength (dBµV/m)		Limit (dBµV/m)		Margin (dBµV/m)		Result
(MHz)	(MHz)	Peak	Average	Peak	Average	Peak	Average	
2483.5	2484.8723	58.88	42.38	74	54	-15.12	-11.62	Compliant

Note: Reference the plot on the following page**.**

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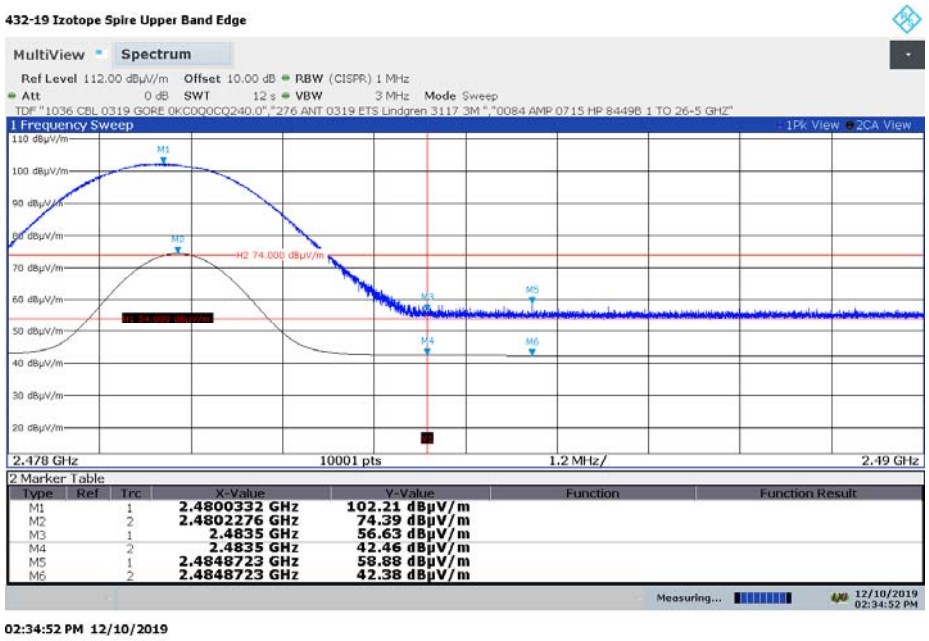
7. Measurement Data (continued)

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

Upper Band Edge and Worst Case Out of Band



7.6.3. 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	
2375.4775	46.21	32.05	74	54	-27.79	-21.95	Compliant

Reference the plot on the following page.

7.6.4. 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	
2484.6887	56.86	42.20	74	54	-17.14	-11.80	Compliant

Reference the plot on the following page.

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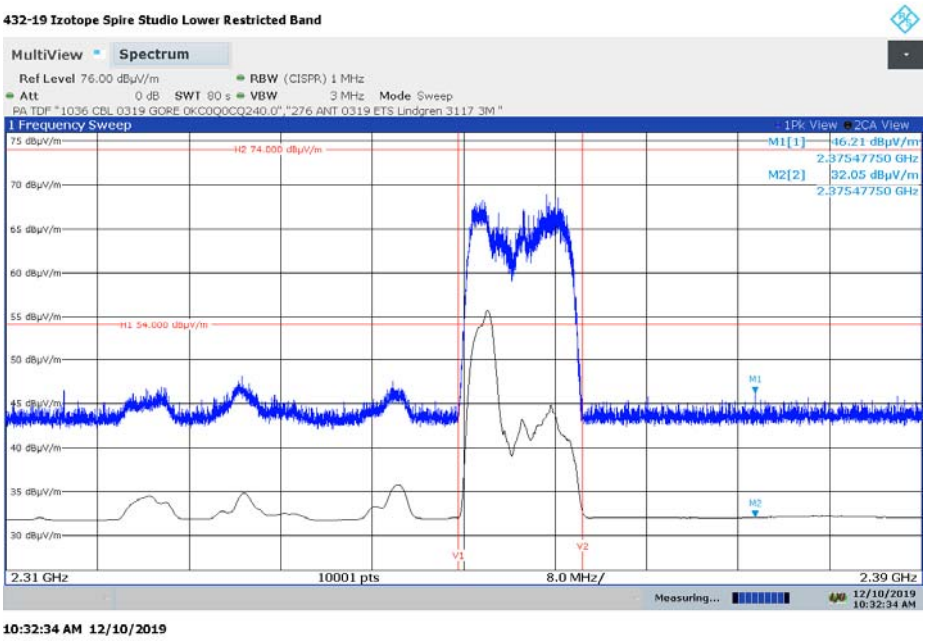
7. Measurement Data (continued)

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

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.

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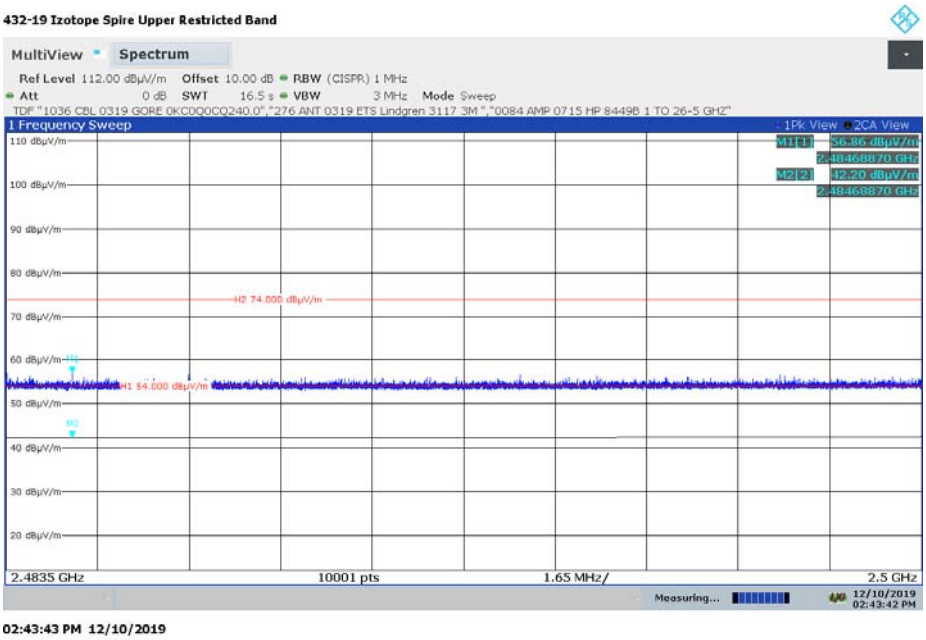
7. Measurement Data (continued)

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

Upper Restricted Band, 2483.5 MHz, to 2500 MHz



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7. Measurement Data (continued)

7.7. Emissions in Non-restricted Frequency Bands

Requirement: 15.247(d) 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] (dBµV/m)	Worst Case Out-of-Band Frequency (MHz)	Worst Case PSD (100 kHz) Out-of-Band (dBm)	Delta to Worst Case PSD (dB)	Minimum Required Delta to Worst Case PSD	Result
95.42	17912.3	52.37	43.05	<75.42	Compliant

[1]Taken from Section 7.2 - DTS Bandwidth

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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 (103.2 dBµV/m) 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 10.2: Method PKPSD (peak PSD). FCC OET 662911 was referenced to determine the procedure for measuring in-band power spectral density of transmitters with multiple outputs in the same band.

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

Measurement Results in 2400 MHz to 2483.5 MHz Band

Channel	Frequency	Maximum PSD Frequency	Maximum Power Spectral Density		Limit	Margin	Result
	(MHz)	(MHz)	(dBµV/m)	(dBm)[1]	(dBm)	(dB)	
0	2402	2402.1638	77.30	-17.93	8	-25.93	Compliant
40	2442	2442.1678	80.27	-14.96	8	-22.96	Compliant
78	2480	2480.1718	84.89	-10.34	8	-18.34	Compliant

[1]Converted from field strength. Reference ANSI C63.10-2013, Annex G, section G2

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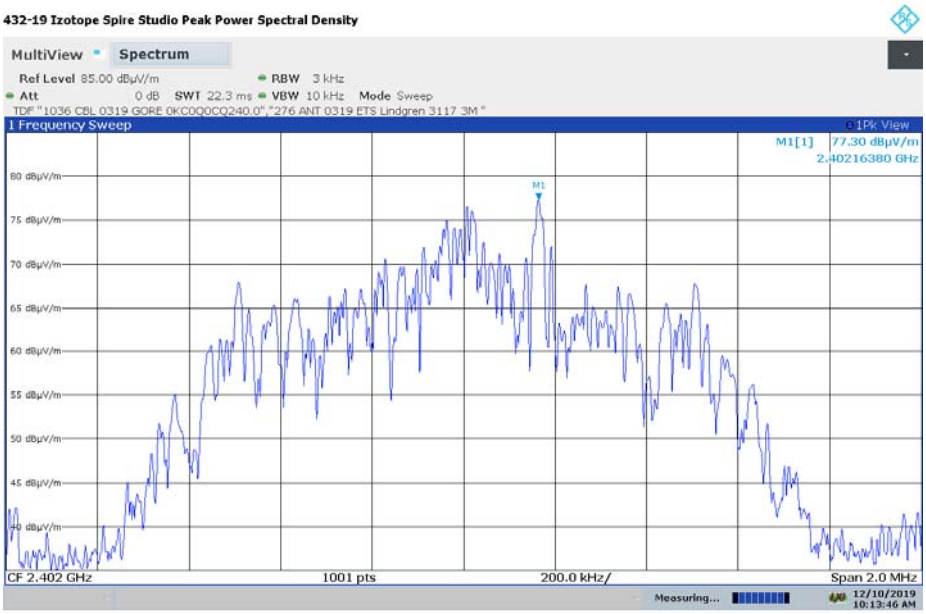
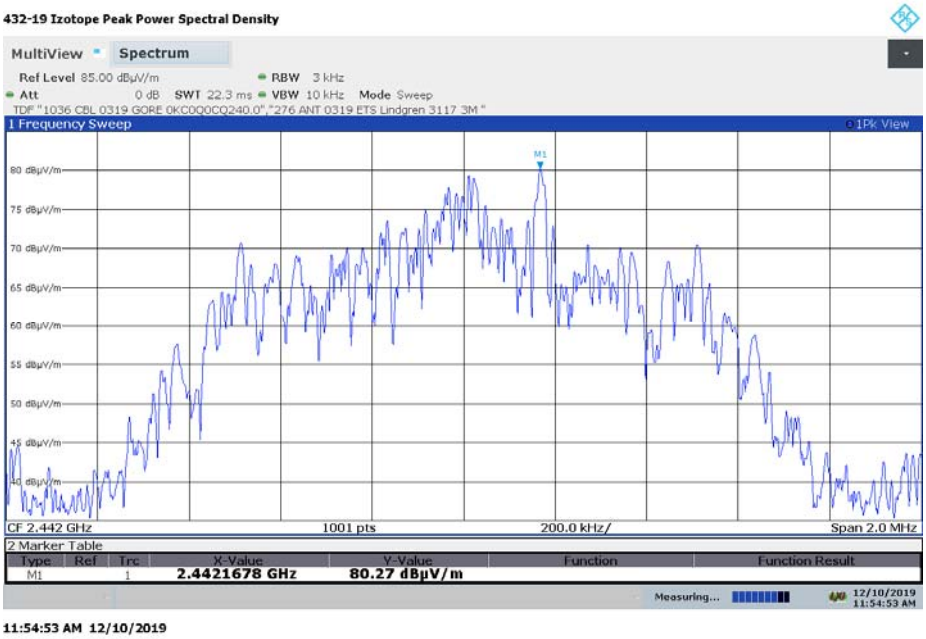
7. Measurement Data (continued)

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

7.8.1. Low Channel – 0, 2402 MHz



7.8.2. Middle Channel – 40, 2442 MHz



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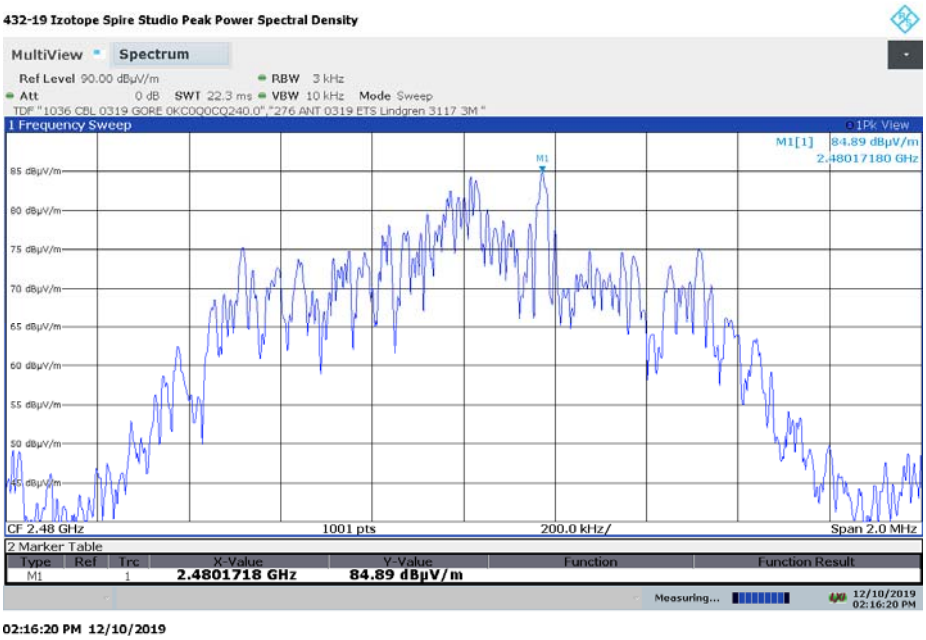
7. Measurement Data

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

7.8.3. High Channel – 78, 2480 MHz



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7. Measurement Data (continued)

7.9. Conducted Emissions

Requirement: 15.207 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 µH/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dBµV)	
	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 power-line conducted emissions from unlicensed wireless devices.

Test Notes: The device was tested using the support equipment laptop.

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

Measurement & Equipment Setup

Test Date:	11/08/2019
Test Engineer:	Sean Defelice
Site Temperature (°C):	23.3
Relative Humidity (%RH):	40.9
Frequency Range:	0.15 MHz to 30 MHz
EMI Receiver IF Bandwidth:	9 kHz
EMI Receiver Avg Bandwidth:	30 kHz
Detector Functions:	Peak, Quasi-Peak & Average

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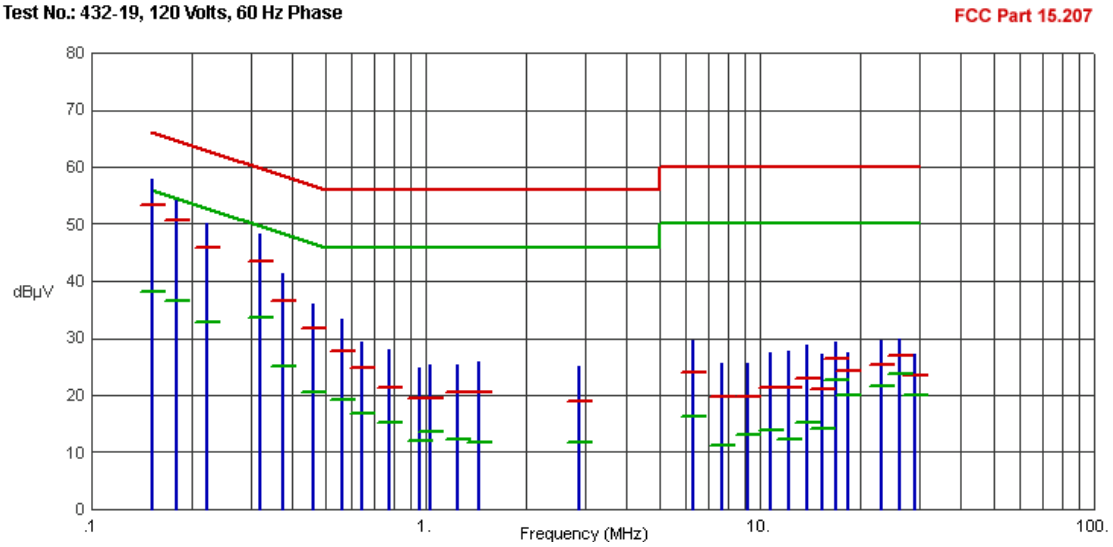
8. Conducted Emissions Test Results

7.9. Conducted Emissions (FCC Part 15.207)

7.9.1. 120 Volts, 60 Hz Phase



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1523	57.95	53.29	65.87	-12.58	38.08	55.87	-17.79	
.1793	54.13	50.68	64.52	-13.84	36.61	54.52	-17.91	
.2220	50.04	45.93	62.74	-16.81	32.86	52.74	-19.88	
.3210	48.24	43.37	59.68	-16.31	33.71	49.68	-15.97	
.3750	41.42	36.49	58.39	-21.90	25.02	48.39	-23.37	
.4628	35.92	31.67	56.64	-24.97	20.56	46.64	-26.08	
.5595	33.32	27.65	56.00	-28.35	19.31	46.00	-26.69	
.6450	29.45	24.79	56.00	-31.21	16.78	46.00	-29.22	
.7800	27.96	21.42	56.00	-34.58	15.15	46.00	-30.85	
.9623	24.78	19.38	56.00	-36.62	11.94	46.00	-34.06	
1.0298	25.21	19.55	56.00	-36.45	13.49	46.00	-32.51	
1.2458	25.41	20.48	56.00	-35.52	12.36	46.00	-33.64	
1.4370	25.91	20.63	56.00	-35.37	11.65	46.00	-34.35	
2.8703	25.16	19.01	56.00	-36.99	11.64	46.00	-34.36	
6.2948	29.47	24.09	60.00	-35.91	16.32	50.00	-33.68	
7.6808	25.54	19.66	60.00	-40.34	11.07	50.00	-38.93	
9.2153	25.71	19.86	60.00	-40.14	13.03	50.00	-36.97	
10.7475	27.47	21.40	60.00	-38.60	13.76	50.00	-36.24	
12.2573	27.76	21.25	60.00	-38.75	12.40	50.00	-37.60	
13.8255	28.91	22.97	60.00	-37.03	15.26	50.00	-34.74	
15.3578	27.10	21.07	60.00	-38.93	14.09	50.00	-35.91	
16.8945	29.26	26.51	60.00	-33.49	22.67	50.00	-27.33	
18.4313	27.47	24.18	60.00	-35.82	20.09	50.00	-29.91	
23.0393	29.59	25.23	60.00	-34.77	21.49	50.00	-28.51	
26.1105	29.77	26.87	60.00	-33.13	23.74	50.00	-26.26	
29.0850	27.09	23.53	60.00	-36.47	20.12	50.00	-29.88	

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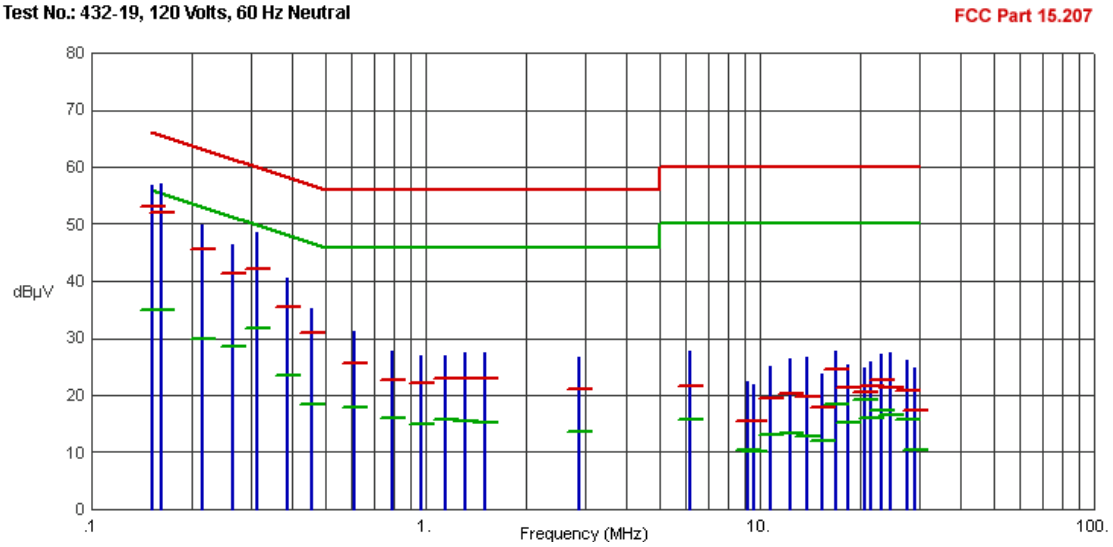
8. Conducted Emissions Test Results (continued)

7.9. Conducted Emissions (FCC Part 15.207) (continued)

7.9.2. 120 Volts, 60 Hz Neutral



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1523	56.76	52.98	65.87	-12.89	34.94	55.87	-20.93	
.1613	57.11	52.07	65.40	-13.33	34.84	55.40	-20.56	
.2153	49.82	45.61	63.00	-17.39	30.00	53.00	-23.00	
.2648	46.51	41.37	61.28	-19.91	28.43	51.28	-22.85	
.3120	48.60	42.22	59.92	-17.70	31.78	49.92	-18.14	
.3840	40.40	35.55	58.19	-22.64	23.51	48.19	-24.68	
.4538	35.20	30.89	56.81	-25.92	18.44	46.81	-28.37	
.6090	31.22	25.69	56.00	-30.31	17.90	46.00	-28.10	
.7913	27.70	22.64	56.00	-33.36	15.97	46.00	-30.03	
.9645	26.95	22.11	56.00	-33.89	14.88	46.00	-31.12	
1.1423	26.94	22.98	56.00	-33.02	15.80	46.00	-30.20	
1.3178	27.41	22.91	56.00	-33.09	15.56	46.00	-30.44	
1.5023	27.58	22.87	56.00	-33.13	15.16	46.00	-30.84	
2.8815	26.75	21.16	56.00	-34.84	13.72	46.00	-32.28	
6.1958	27.60	21.55	60.00	-38.45	15.62	50.00	-34.38	
9.2198	22.36	15.52	60.00	-44.48	10.47	50.00	-39.53	
9.5820	21.97	15.37	60.00	-44.63	10.16	50.00	-39.84	
10.7520	24.97	19.44	60.00	-40.56	13.16	50.00	-36.84	
12.2888	26.32	20.30	60.00	-39.70	13.38	50.00	-36.62	
13.8233	26.79	19.62	60.00	-40.38	12.75	50.00	-37.25	
15.3578	23.65	17.86	60.00	-42.14	11.99	50.00	-38.01	
16.8945	27.71	24.45	60.00	-35.55	18.35	50.00	-31.65	
18.4290	25.45	21.26	60.00	-38.74	15.16	50.00	-34.84	
20.6858	24.72	20.59	60.00	-39.41	19.30	50.00	-30.70	
21.5025	25.92	21.72	60.00	-38.28	16.12	50.00	-33.88	
23.0393	27.17	22.73	60.00	-37.27	17.27	50.00	-32.73	
24.5738	27.43	21.36	60.00	-38.64	16.64	50.00	-33.36	
27.6450	26.22	20.75	60.00	-39.25	15.64	50.00	-34.36	
29.1818	24.80	17.33	60.00	-42.67	10.48	50.00	-39.52	

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7. Measurement Data (continued)

7.10. Duty Cycle

Requirement: (FCC OET publication number 558074)
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%).

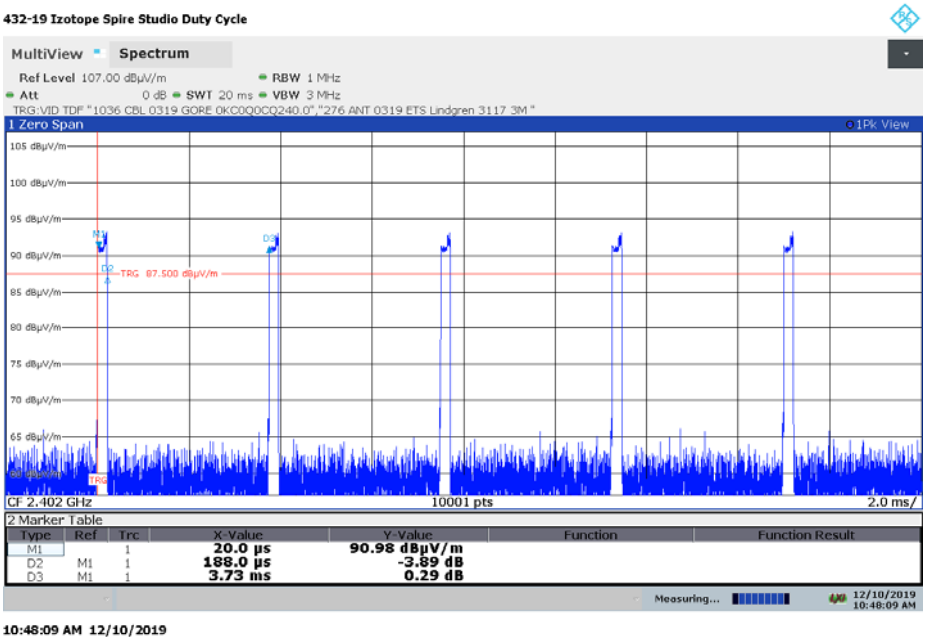
Procedure: Duty cycle measurements were made according to the procedure detailed ANSI C63.10-2013, Section 11.6(b)

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

All power and power spectral density measurements for this report are peak mode measurements. Ample peak hold time was provided to ensure maximum peak measurements.

Channel	Frequency	Time High	Time per Period	Duty Cycle	
	(MHz)	(µS)	(µS)	(Numeric)	(%)
0	2402	0.188	3.730	0.1	5.04
40	2442	0.210	3.752	0.1	5.60
78	2480	0.208	3.750	0.1	5.55

7.10.1. Low Channel – 37, 2402 MHz



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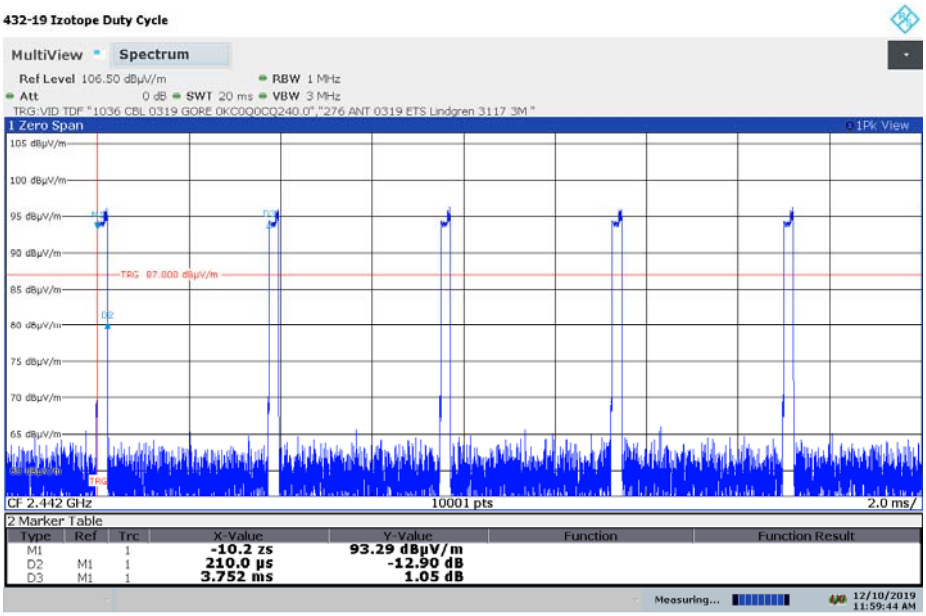
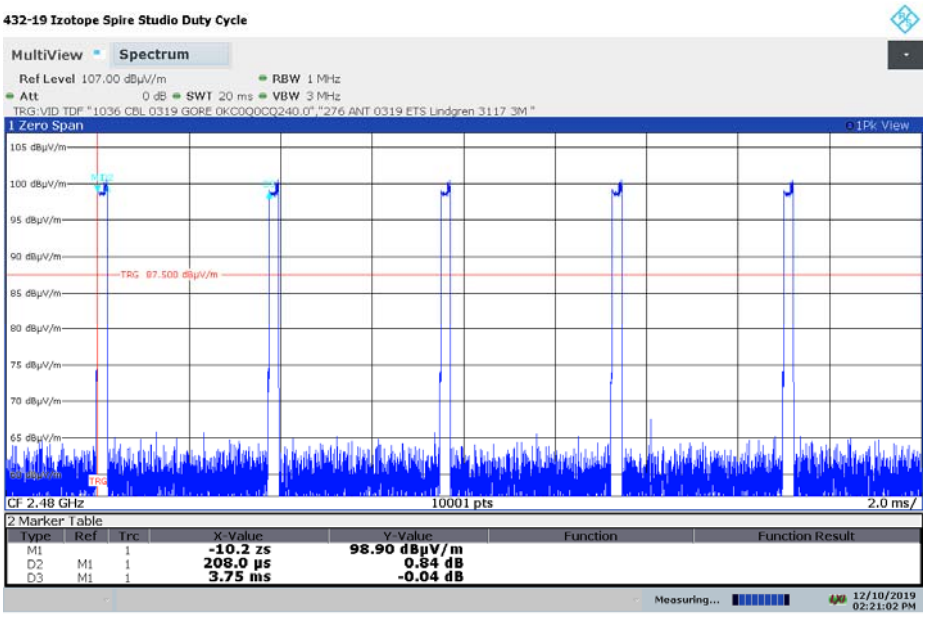
7. Measurement Data (continued)

7.10. Duty Cycle (continued)

7.10.2. Middle Channel – 38, 2426 MHz



7.10.3. High Channel – 39, 2480 MHz



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7. Measurement Data (continued)

7.11. 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.

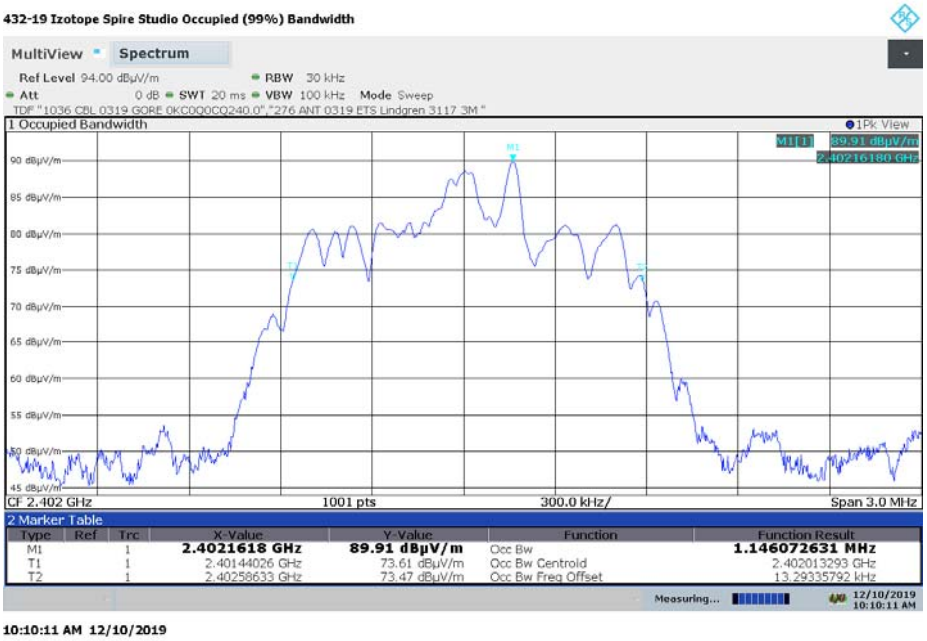
The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value.

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

7.11.1. Measurement Results

Channel	Channel Frequency (MHz)	99% Power Bandwidth (MHz)
0	2402	1.1460
40	2442	1.1440
78	2480	1.1473

7.11.1.1. 99% Power Bandwidth – Low Frequency (2402 MHz)



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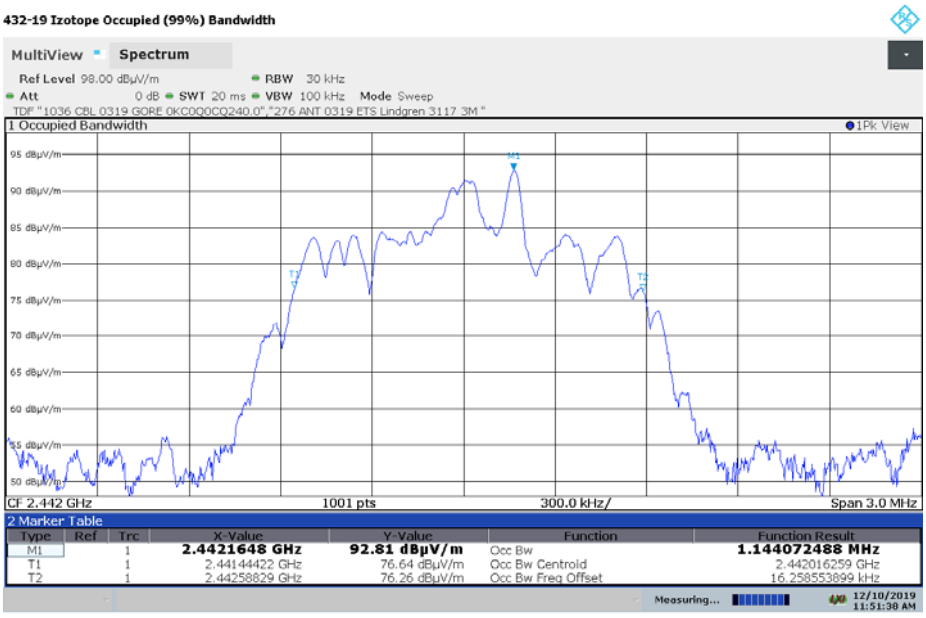
7. Measurement Data (continued)

7.11. 99% (Occupied) Bandwidth (RSS-GEN 6.7)

7.11.1.2. 99% Power Bandwidth – Middle Frequency (2441 MHz)



11:51:39 AM 12/10/2019

7.11.1.3. 99% Power Bandwidth – High Frequency (2480 MHz)

12:52:35 PM 12/10/2019

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7. Measurement Data (continued)

7.12. Public Exposure to Radio Frequency Energy Levels (15.247(i) (1.1307 (b)(1)) RSS-GEN, ISSUE 4 5.5, RSS-102)

7.12.1. 15.247(i) (1.1307 (b)(1) Requirements

Requirement: Portable devices are subject to radio frequency radiation exposure requirements.

For a 1-g head or body SAR, the test exclusion result must be ≤ 3.0.
For a 10-g extremity SAR, the test exclusion result must be ≤ 7.5.

Test Notes: The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by the following formula:

$$\text{SAR Test Exclusion} = \frac{P_{MAX}}{d_{MIN}} \times \sqrt{f_{(GHz)}} \quad (1)$$

P_{MAX}	mW	Maximum power of channel, including tune-up tolerance
d_{MIN}	mm	Minimum test separation distance, mm (≤ 50 mm)
$f_{(GHz)}$	GHz	$f_{(GHz)}$ is the RF channel transmit frequency in GHz (>100 MHz and <6 GHz)

(1) FCC OET 447498 - Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

Results: Passed - The device under test meets the exclusion requirement detailed in FCC OET 447498.

Channel:		**37**	**17**	**39**	
Input[1]:	P_{MAX}	0.740	1.436	3.856	**mW**
	d_{MIN}[2]	5.00	5.00	5.00	**mm**
	$f_{(GHz)}$	2.400	2.442	2.480	**GHz**
Test Exclusion:		**0.23**	**0.45**	**1.21**	
Limit Exemption:		**7.5**	**7.5**	**7.5**	
Measurement Result:		**Compliant**	**Compliant**	**Compliant**	

[1] Taken from column 3 of the table in Section 7.3 of this test report.

[2] When the minimum test separation distance is < 5 mm, a distance of 5 mm according to KDB 447498, 4.1 f) is applied to determine SAR test exclusion.

Note: BLE and UWB Radios do not transmit simultaneously.

7.12.2. IC RSS-102 Issue 5 SAR Evaluation (Reference RSS-102, Table 1)

Frequency	Separation Distance	Maximum Power	RSS-102 Limit	Result
MHz	mm	mW	mW	
2402	≤ 20	0.74	10.65	Compliant
2440	≤ 20	1.44	10.11	Compliant
2480	≤ 20	3.86	9.86	Compliant

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8. Test Setup Photographs

8.1. Spurious Radiated Emissions, 10 kHz to 1 GHz – Front

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8. Test Setup Photographs

8.2. Spurious Radiated Emissions, 10 kHz to 30 MHz – Rear

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8. Test Setup Photographs

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

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8. Test Setup Photographs

8.4. Radiated Emissions Above 1 GHz – Front

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8. Test Setup Photographs

8.5. Radiated Emissions 1 to 18 GHz – Rear

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8. Test Setup Photographs

8.6. Radiated Emissions Above 18 GHz – Rear

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8. Test Setup Photographs

8.7. Conducted Emissions Measurements - Front

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8. Test Setup Photographs

8.8. Conducted Emissions Measurements - Rear

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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 17025:2005 Accreditation our test sites are designated with the FCC (designation number **US1091**), Industry Canada (file number **IC 3023A-1)** and VCCI (Member number 3168) under registration number A-0274.

Compliance Worldwide is also designated as a Phase 1 CAB under APEC-MRA (US0132) for Australia/New Zealand AS/NZS CISPR 22, Chinese-Taipei (Taiwan) BSMI CNS 13438 and Korea (RRA) KN 11, KN 13, KN 14-1, KN 22, KN 32, KN 61000-6-3, KN 61000-6-4.

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.

Both 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 table top.

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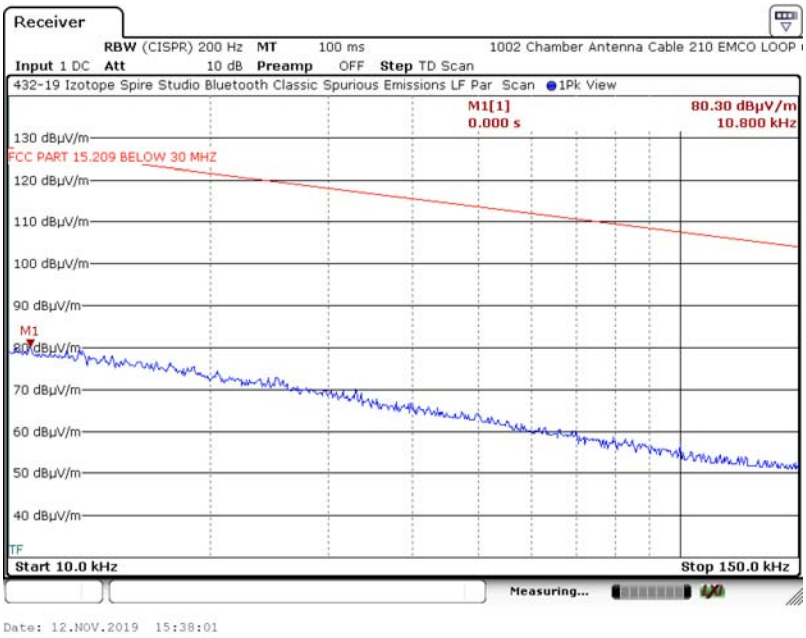
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

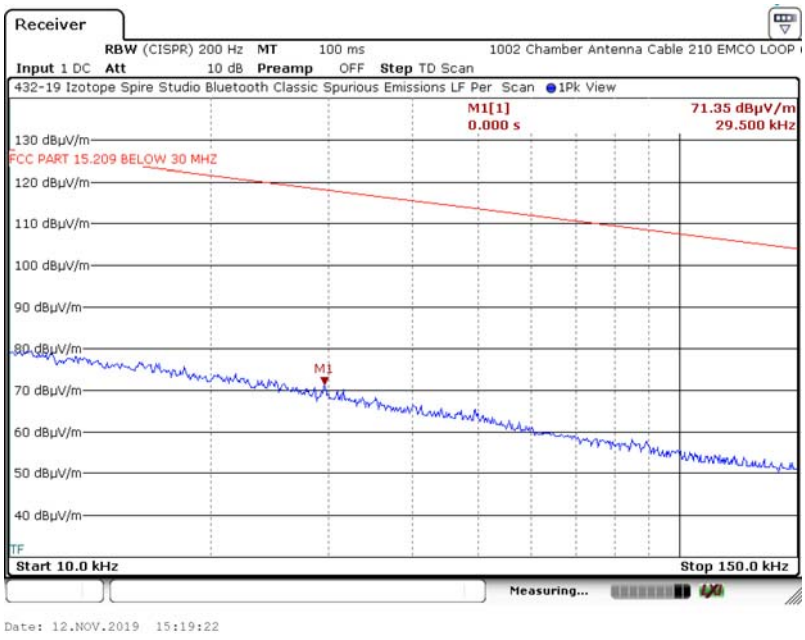
A1. Spurious Radiated Emissions (10 kHz – 150 kHz) Test Results

A1.1. Channel 0, 2402 MHz

A1.1.1. Measurement Results: Parallel Antenna



A1.1.2. Measurement Results: Perpendicular Antenna



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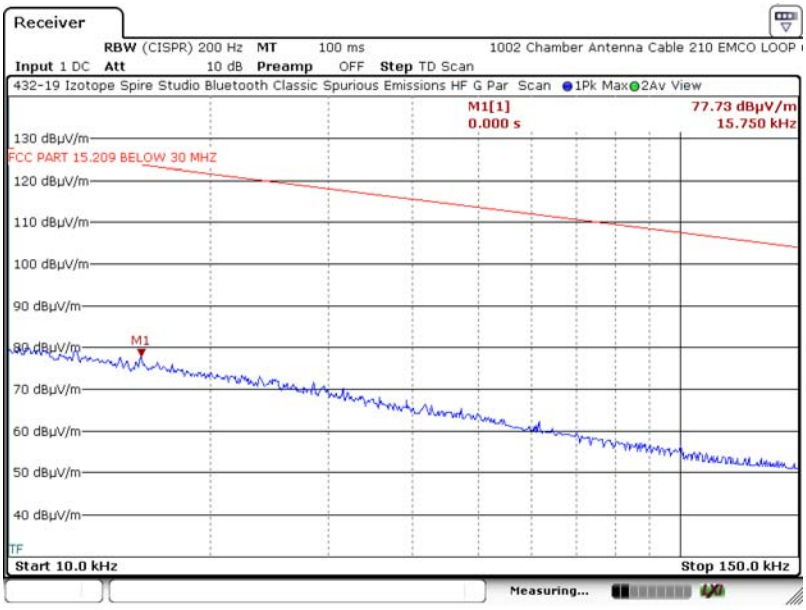
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A1. Spurious Radiated Emissions (10 kHz – 150 kHz) Test Results

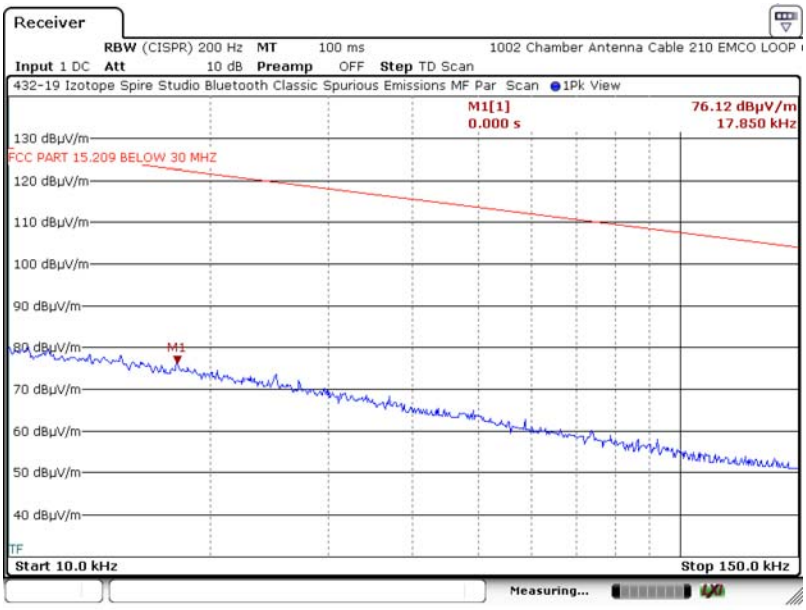
A1.1. Channel 0, 2402 MHz

A1.1.3. Measurement Results: Ground-Parallel Antenna



A1.2. Channel 40, 2442 MHz

A1.2.1. Measurement Results: Parallel Antenna



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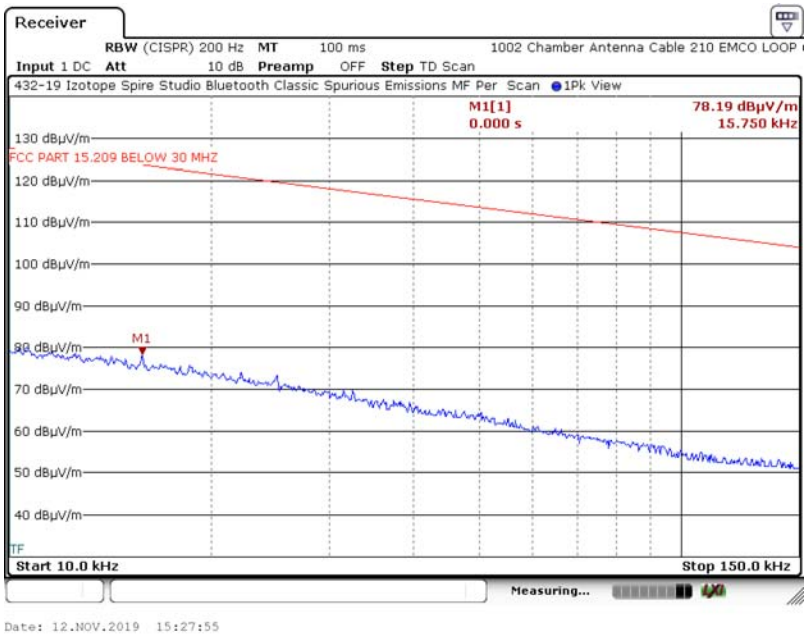
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

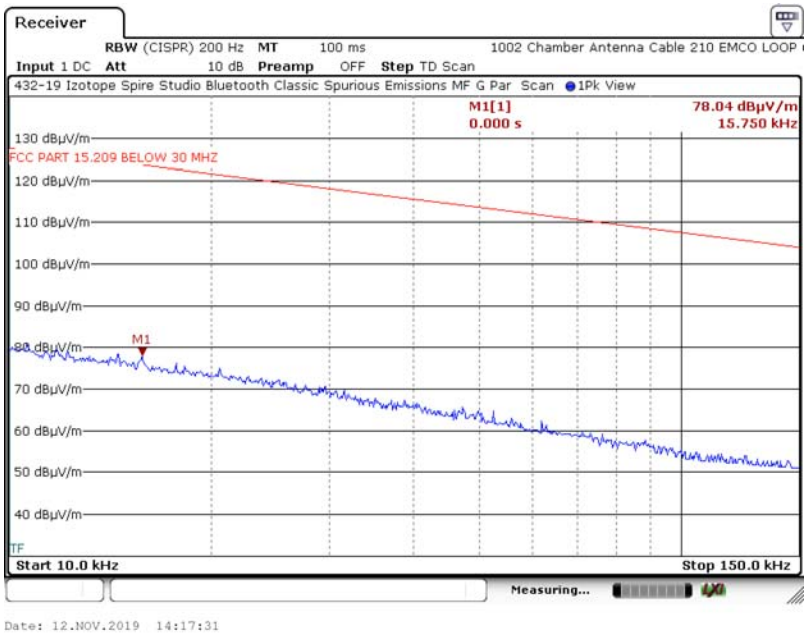
A1. Spurious Radiated Emissions (10 kHz – 150 kHz) Test Results

A1.2. Channel 40, 2442 MHz

A1.2.2. Measurement Results: Perpendicular Antenna



A1.2.3. Measurement Results: Ground-Parallel Antenna



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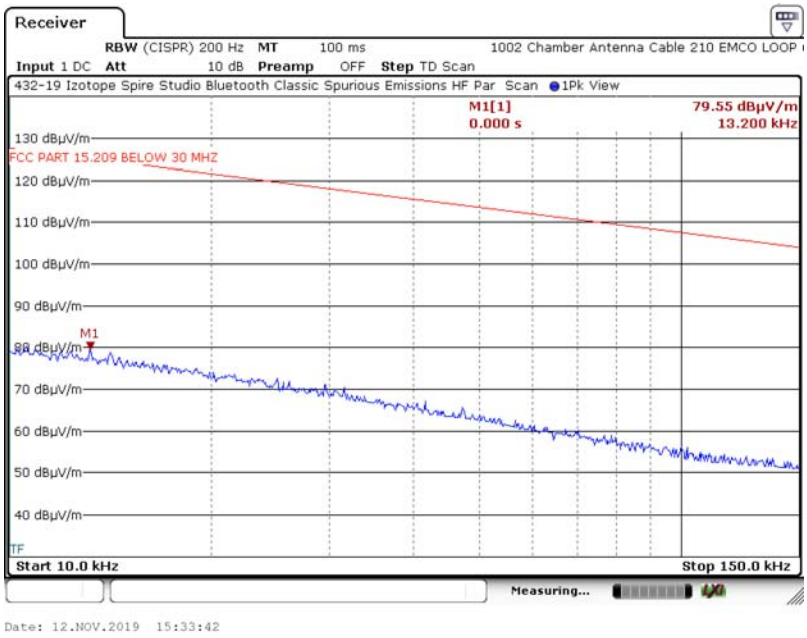
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

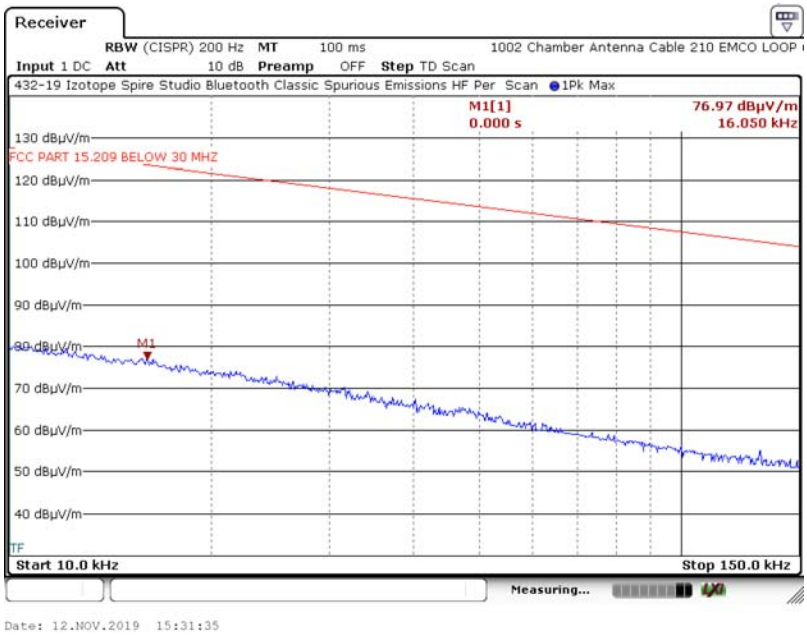
A1. Spurious Radiated Emissions (10 kHz – 150 kHz) Test Results

A1.3. Channel 78, 2480 MHz

A1.3.1. Measurement Results: Parallel Antenna



A1.3.2. Measurement Results: Perpendicular Antenna



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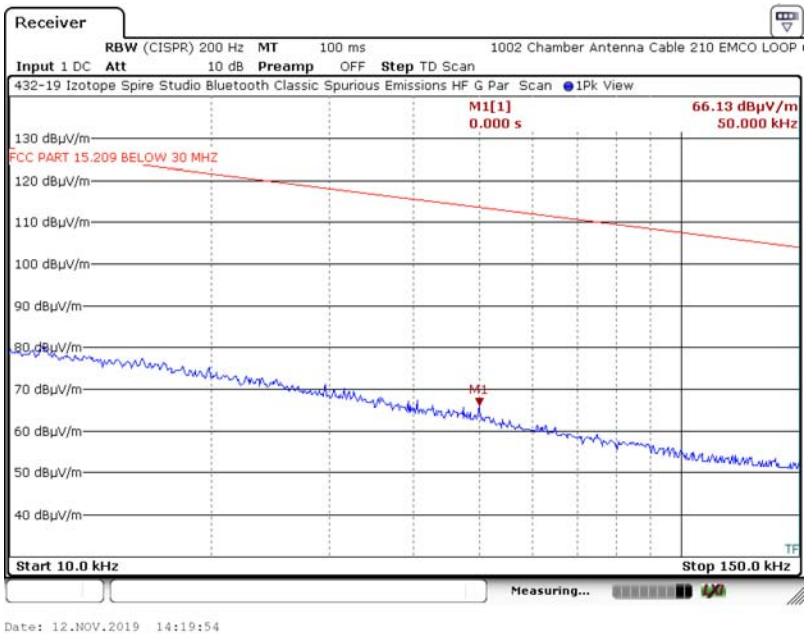
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A1. Spurious Radiated Emissions (10 kHz – 150 kHz) Test Results

A1.3. Channel 78, 2480 MHz

A1.3.3. Measurement Results: Ground-Parallel Antenna



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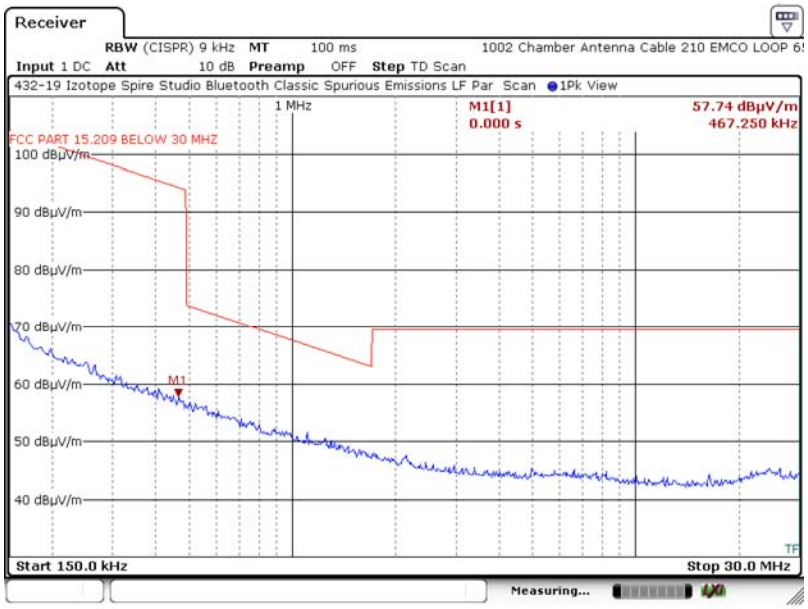
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

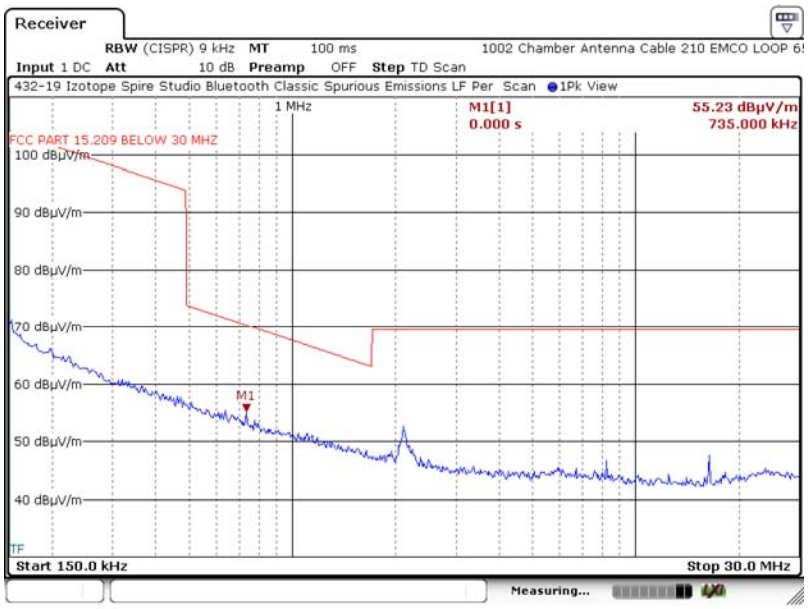
A2. Spurious Radiated Emissions (150 kHz – 30 MHz) Test Results

A2.1. Channel 0, 2402 MHz

A2.1.1. Measurement Results: Parallel Antenna



A2.1.2. Measurement Results: Perpendicular Antenna



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Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

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

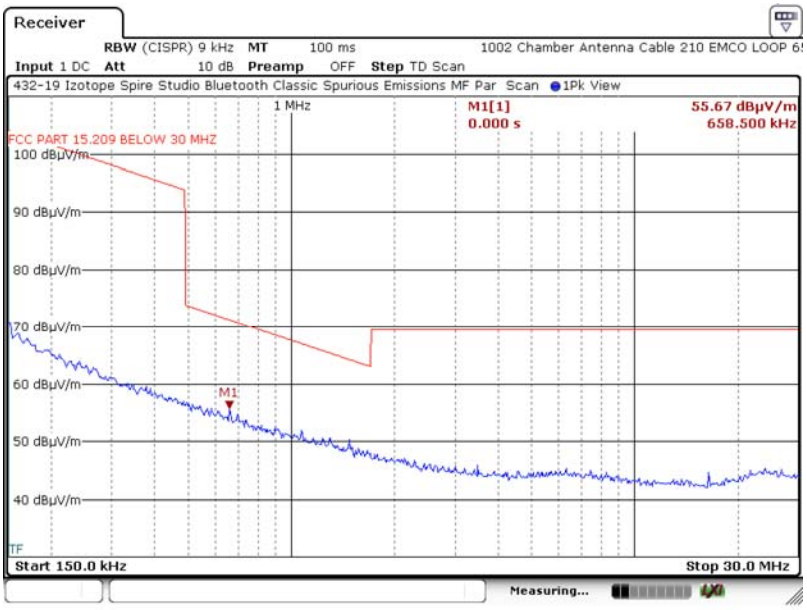
A2.1. Channel 0, 2402 MHz

A2.1.3. Measurement Results: Ground-Parallel Antenna

Date: 12.NOV.2019 13:47:19

A2.2. Channel 40, 2442 MHz

A2.2.1. Measurement Results: Parallel Antenna



Date: 12.NOV.2019 11:45:04

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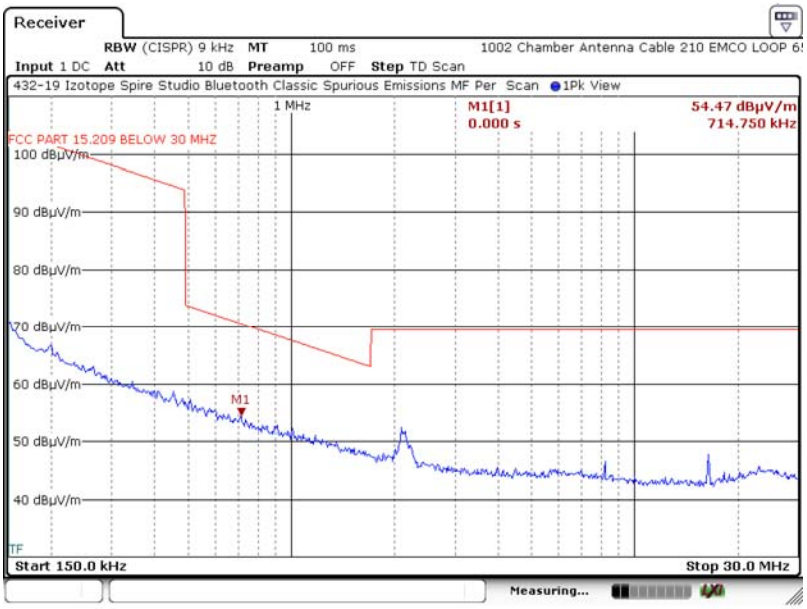
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

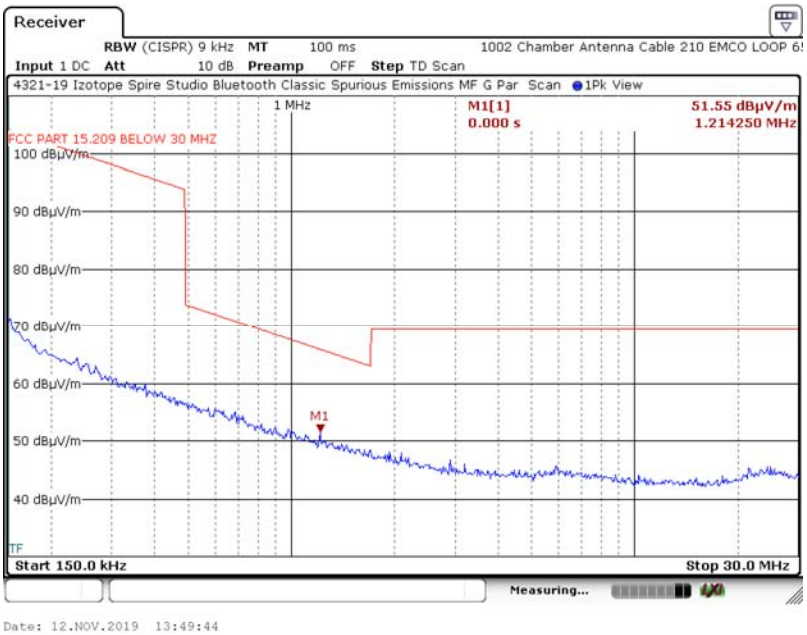
A2. Spurious Radiated Emissions (150 kHz – 30 MHz) Test Results

A2.2. Channel 40, 2442 MHz

A2.2.2. Measurement Results: Perpendicular Antenna



A2.2.3. Measurement Results: Ground-Parallel Antenna



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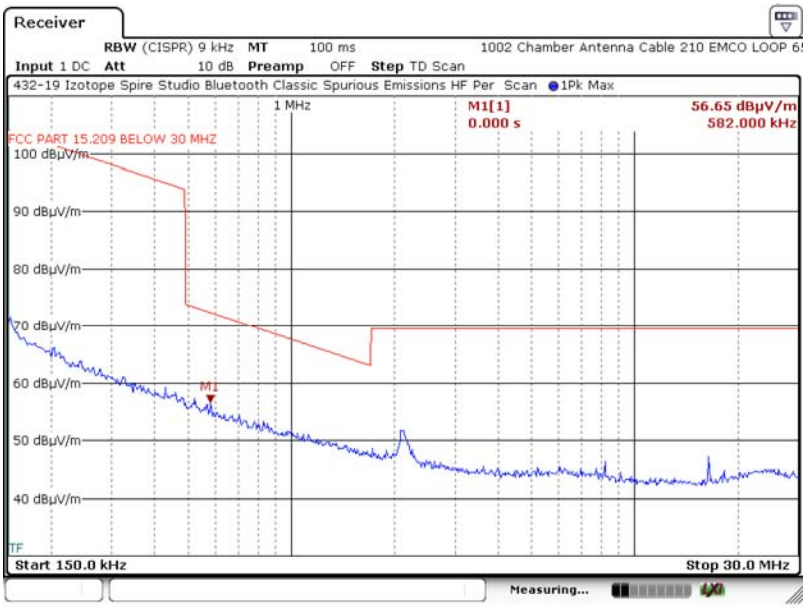
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

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

A2.3. Channel 78, 2480 MHz

A2.3.1. Measurement Results: Parallel Antenna

A2.3.2. Measurement Results: Perpendicular Antenna



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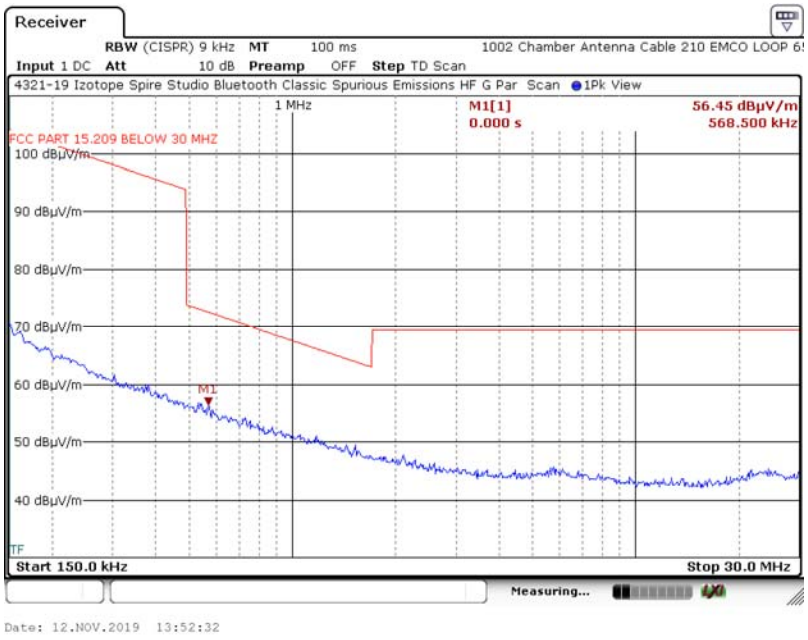
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

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

A2.3. Channel 78, 2480 MHz

A2.3.3. Measurement Results: Ground-Parallel Antenna



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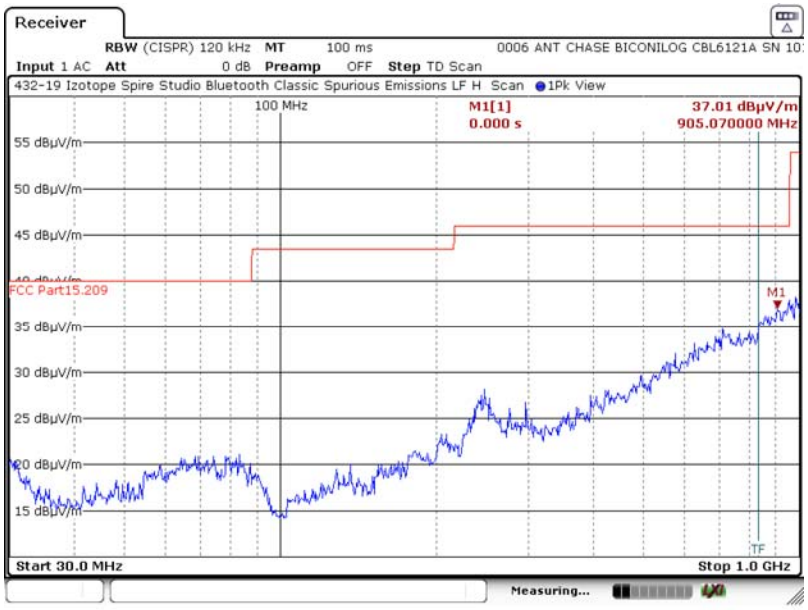
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

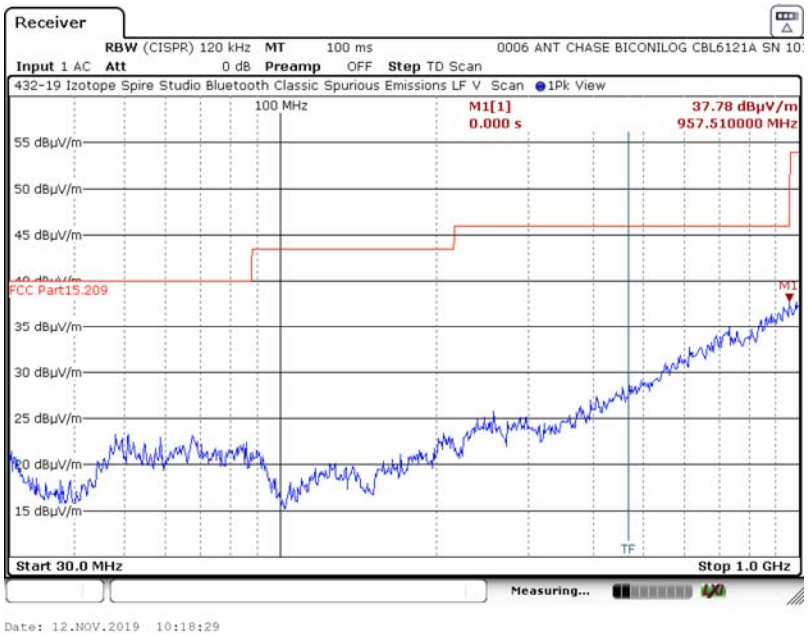
A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.1. Channel 0, 2402 MHz

A3.1.1. Measurement Results: Horizontal Antenna



A3.1.2. Measurement Results: Vertical Antenna



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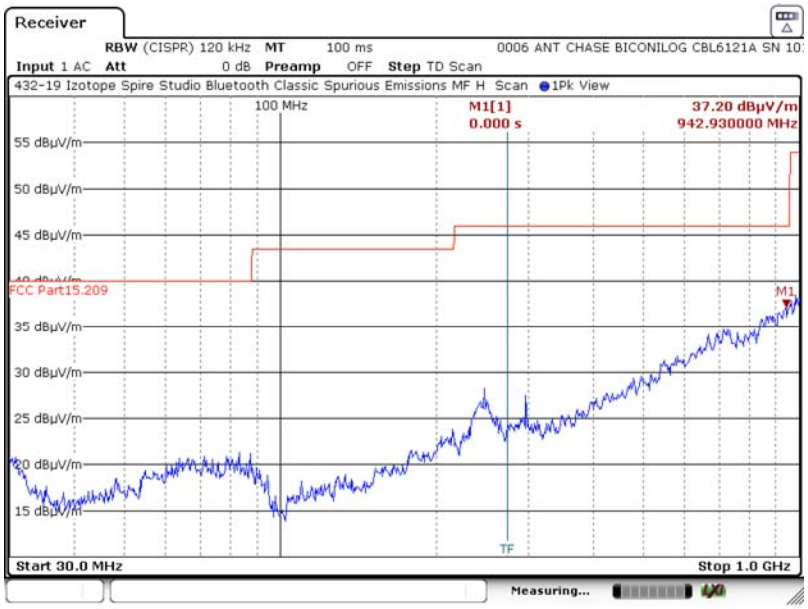
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

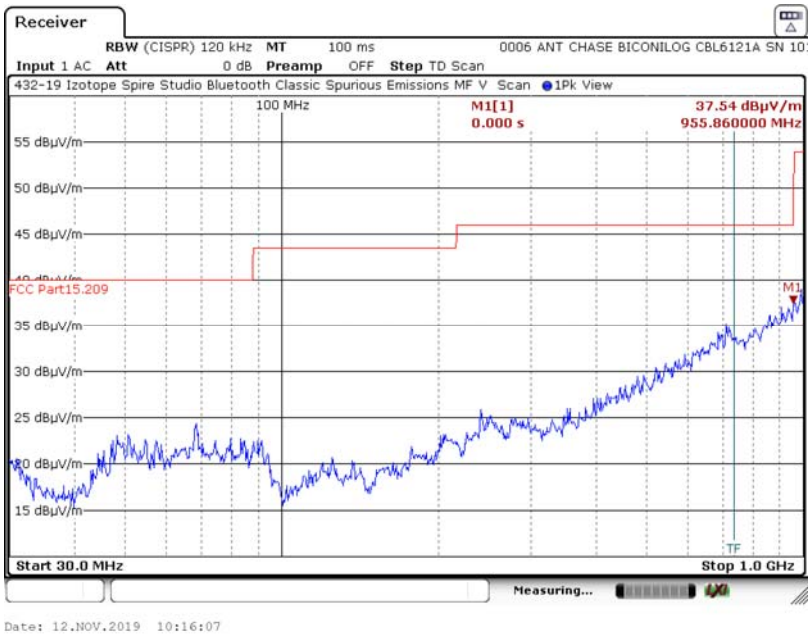
A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.2. Channel 40, 2442 MHz

A3.2.1. Measurement Results: Horizontal Antenna



A3.2.2. Measurement Results: Vertical Antenna



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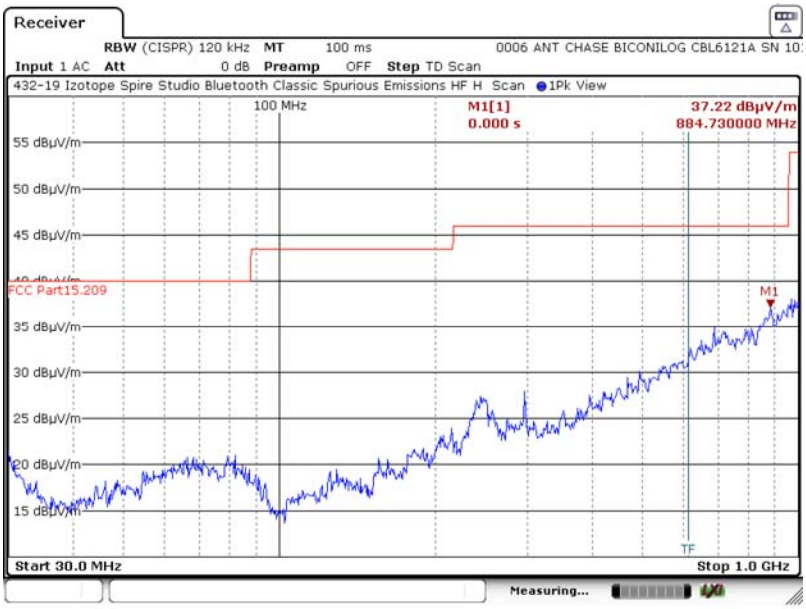
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

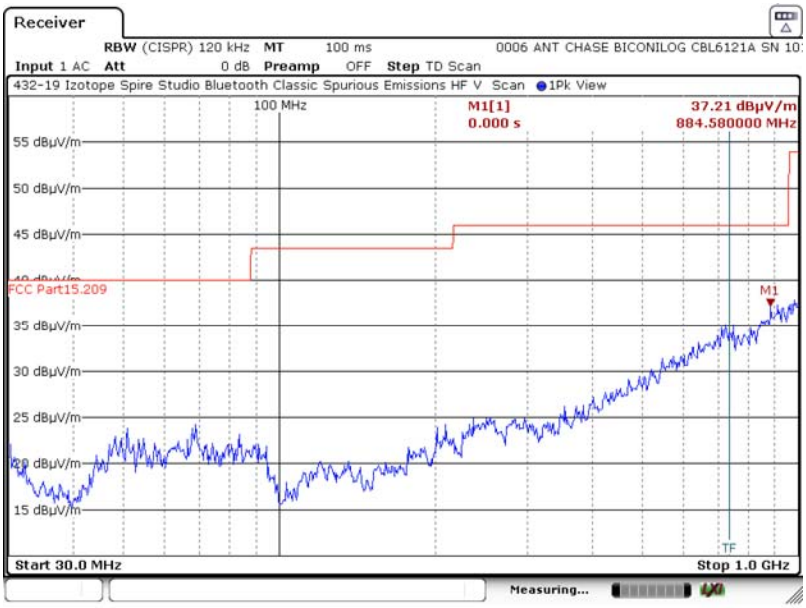
A3. Spurious Radiated Emissions (30 MHz – 1 GHz) Test Results

A3.3. Channel 78, 2480 MHz

A3.3.1. Measurement Results: Horizontal Antenna



A3.3.2. Measurement Results: Vertical Antenna



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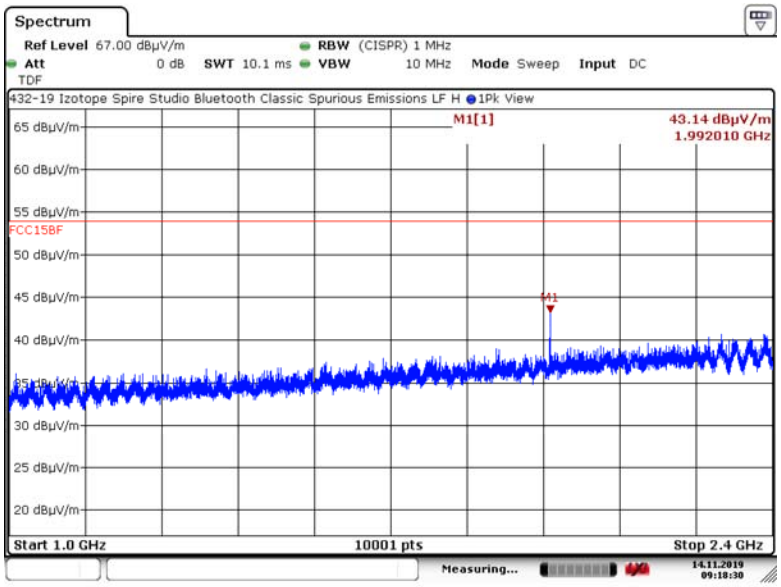
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A4. Spurious Radiated Emissions (1 GHz – 2.4 GHz) Test Results

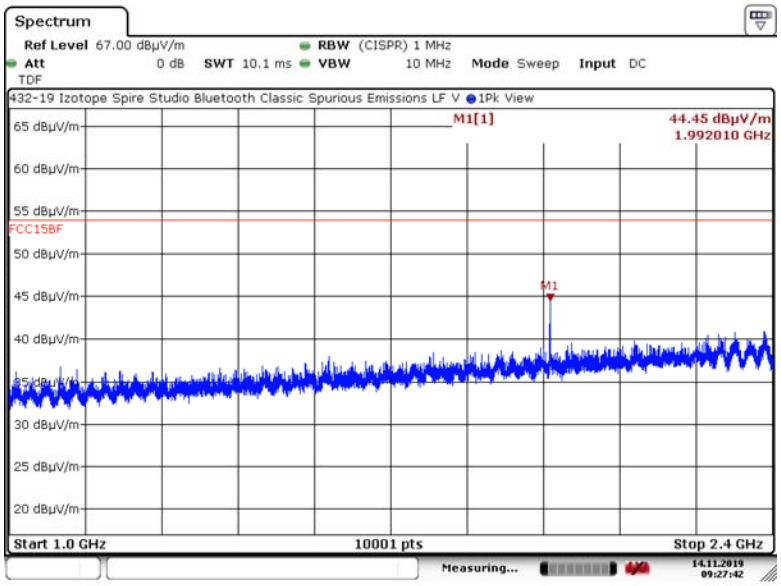
A4.1. Channel 0, 2402 MHz

A4.1.1. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 09:18:30

A4.1.2. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 09:27:42

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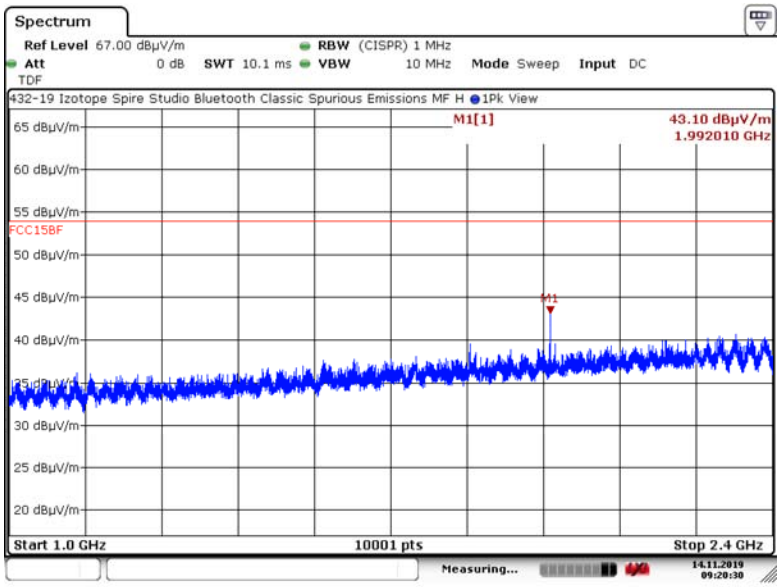
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A4. Spurious Radiated Emissions (1 GHz – 2.4 GHz) Test Results

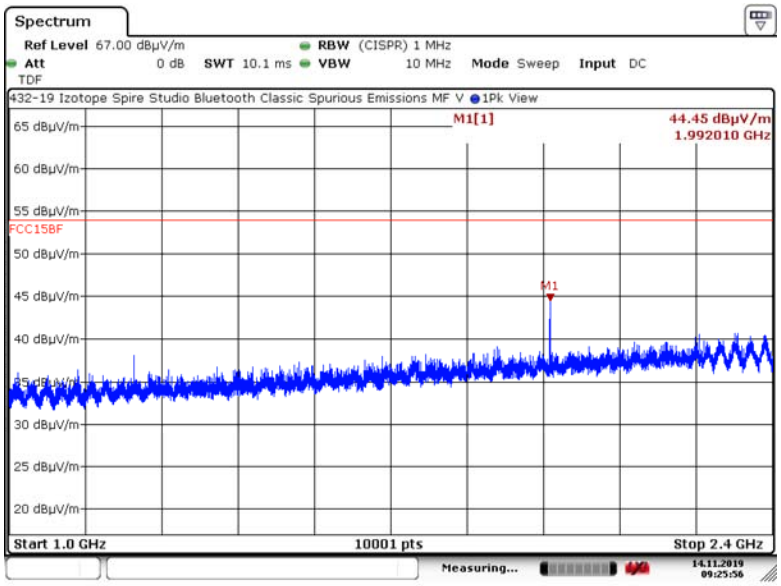
A4.2. Channel 40, 2442 MHz

A4.2.1. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 09:20:30

A4.2.2. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 09:25:55

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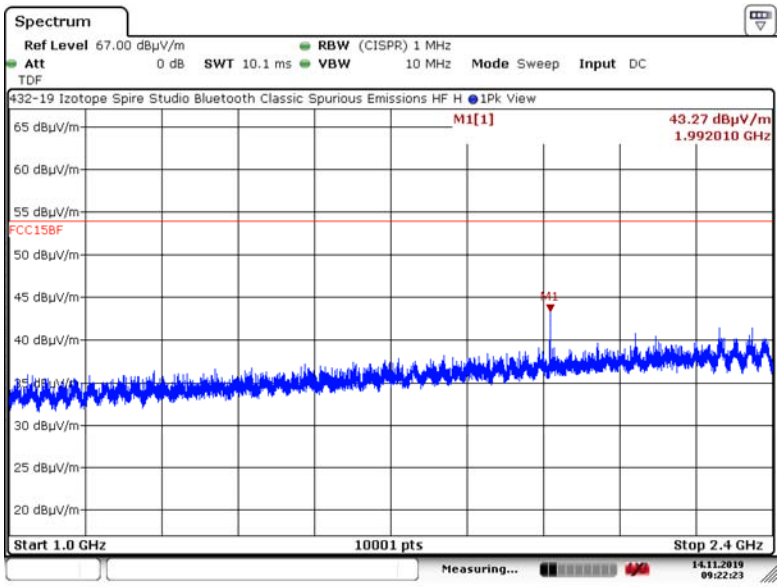
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A4. Spurious Radiated Emissions (1 GHz – 2.4 GHz) Test Results

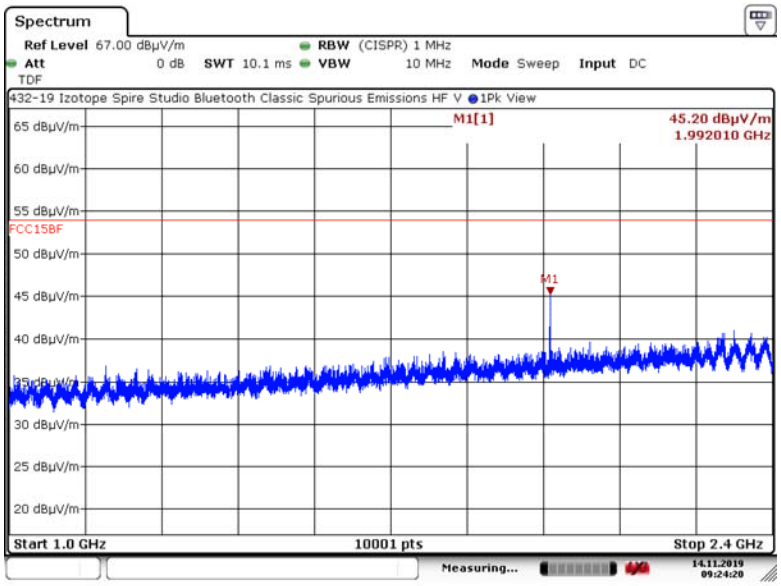
A4.3. Channel 78, 2480 MHz

A4.3.1. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 09:22:23

A4.3.2. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 09:24:20

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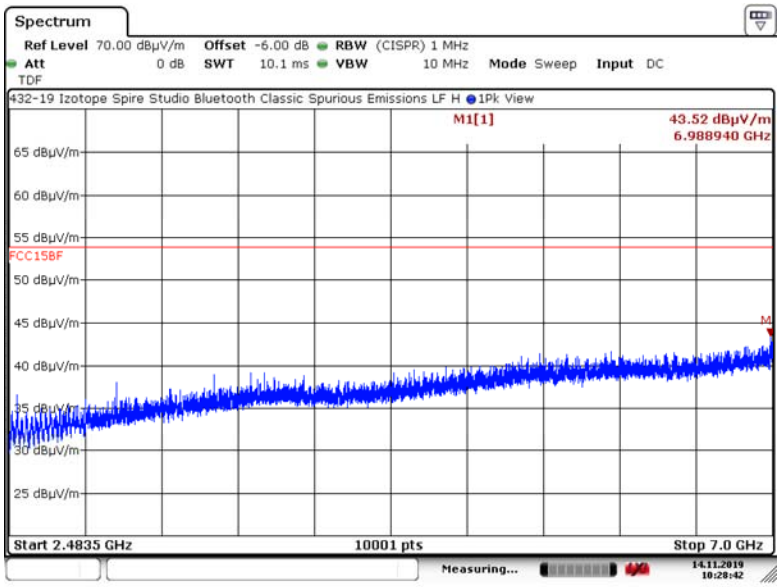
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A5. Spurious Radiated Emissions (2.4835 GHz – 7 GHz) Test Results

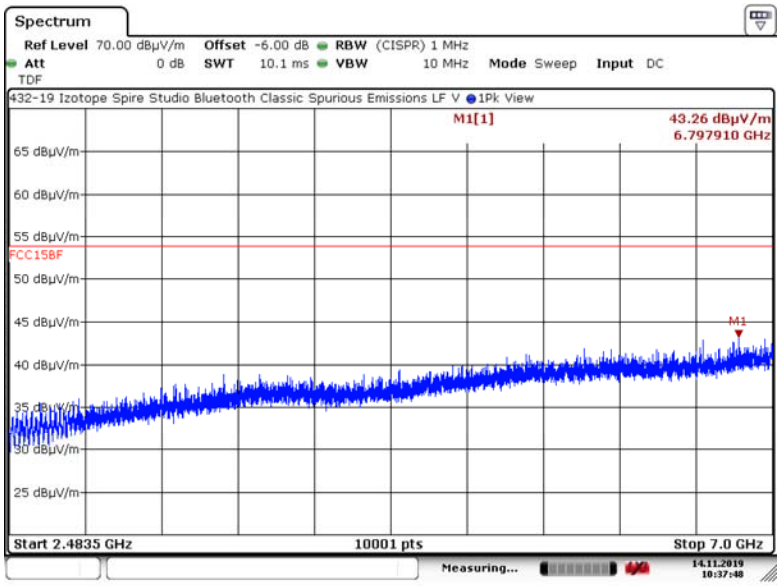
A5.1. Channel 0, 2402 MHz

A5.1.1. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 10:28:42

A5.1.2. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 10:37:48

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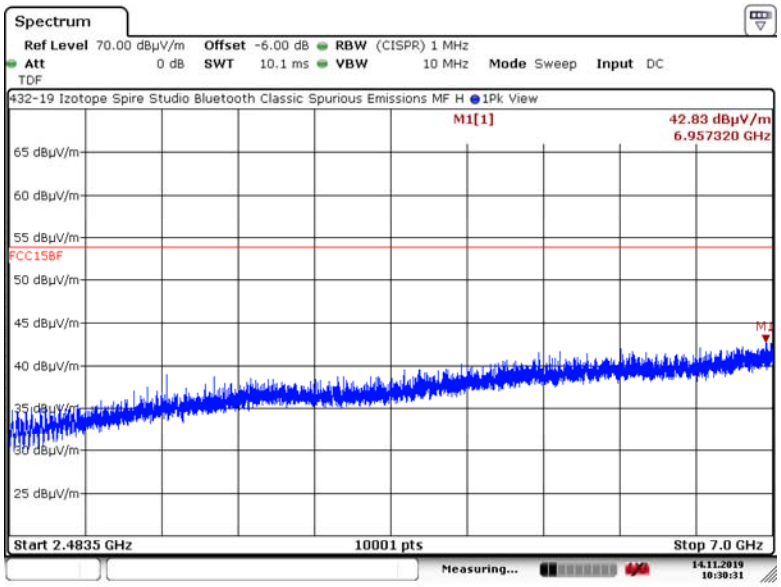
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A5. Spurious Radiated Emissions (2.4835 GHz – 7 GHz) Test Results

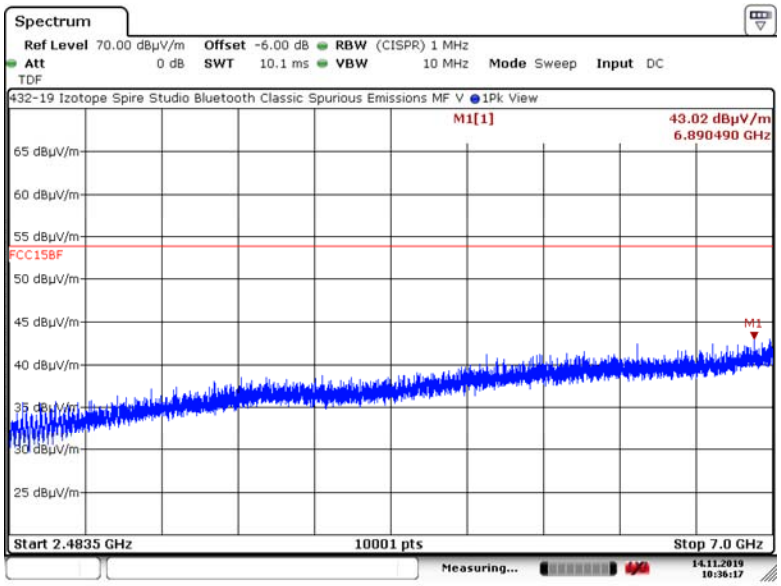
A5.2. Channel 40, 2442 MHz

A5.2.1. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 10:30:31

A5.2.2. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 10:36:17

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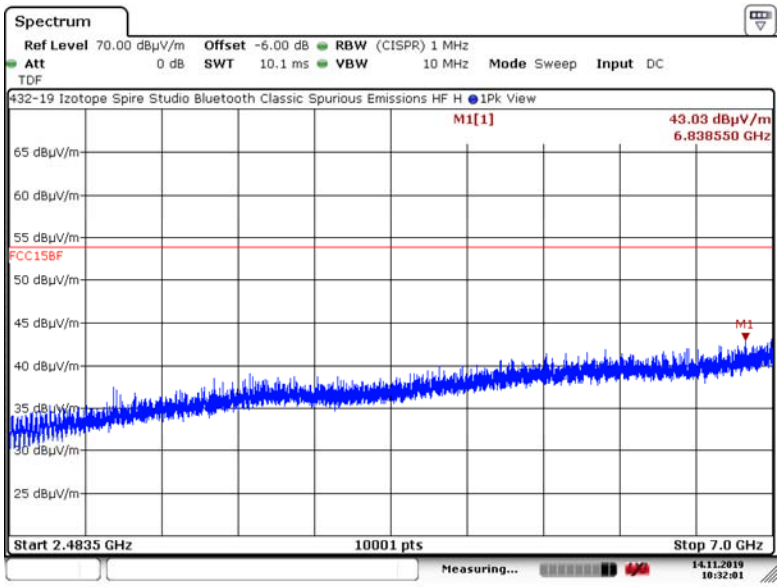
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A5. Spurious Radiated Emissions (2.4835 GHz – 7 GHz) Test Results

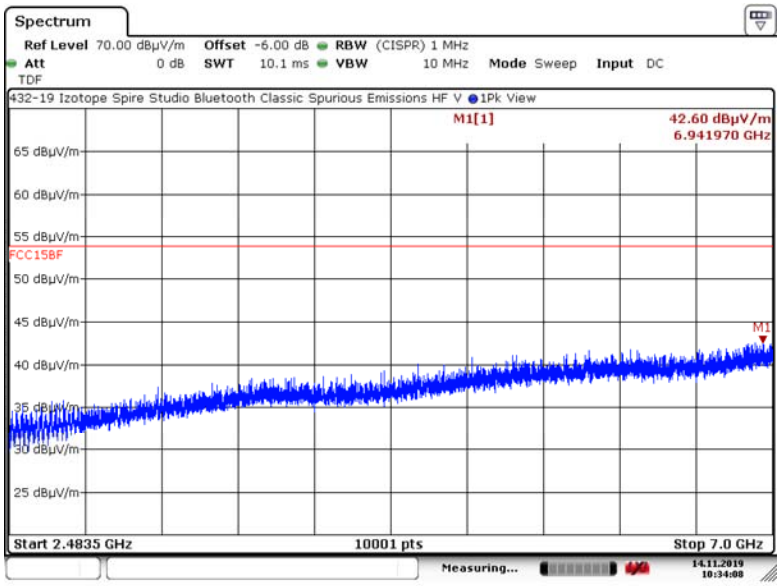
A5.3. Channel 78, 2480 MHz

A5.3.1. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 10:32:01

A5.3.2. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 10:34:08

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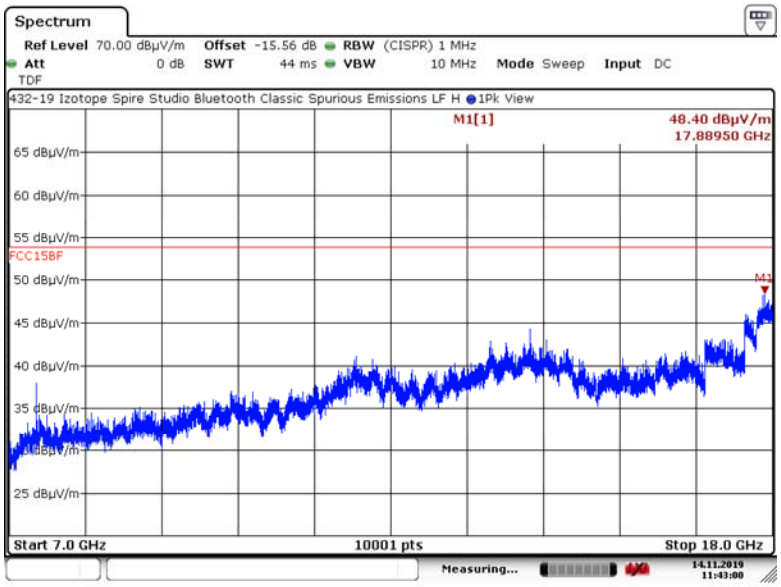
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A6. Spurious Radiated Emissions (7 GHz – 18 GHz) Test Results

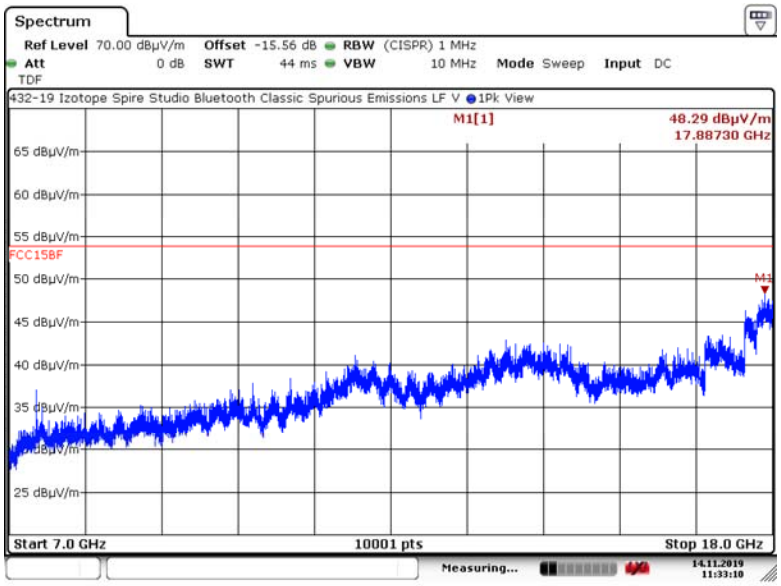
A6.1. Channel 0, 2402 MHz

A6.1.1. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 11:43:00

A6.1.2. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 11:33:10

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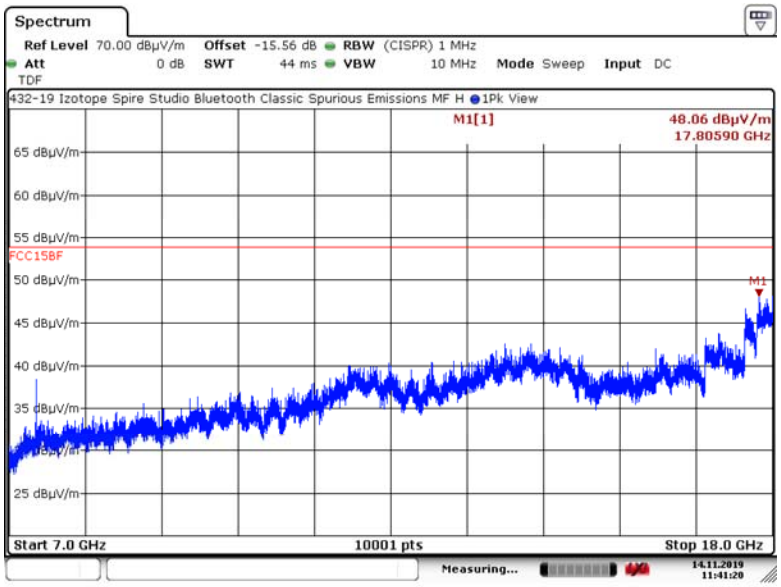
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A6. Spurious Radiated Emissions (7 GHz – 18 GHz) Test Results

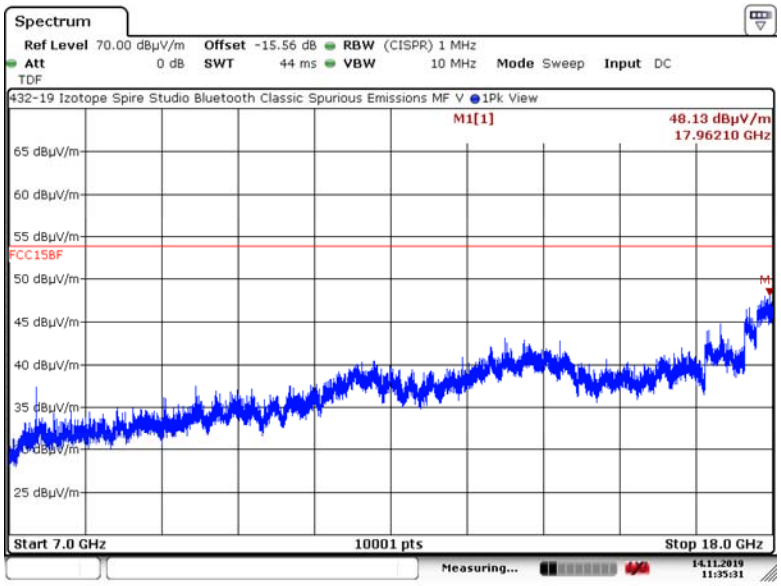
A6.2. Channel 40, 2442 MHz

A6.2.1. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 11:41:20

A6.2.2. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 11:35:31

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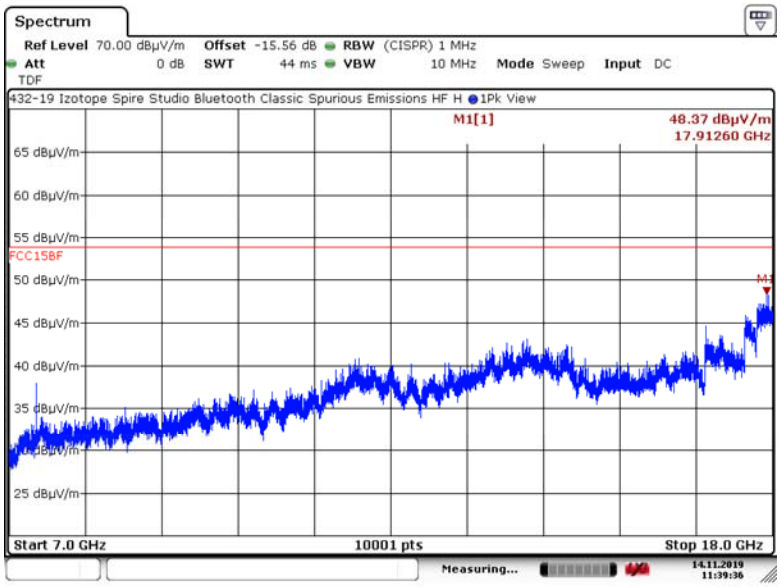
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A6. Spurious Radiated Emissions (7 GHz – 18 GHz) Test Results

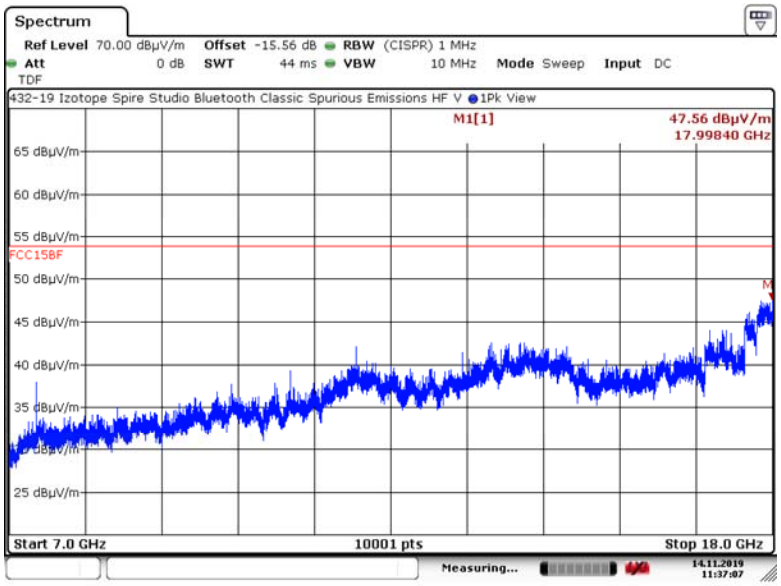
A6.3. Channel 78, 2480 MHz

A6.3.1. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 11:39:36

A6.3.2. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 11:37:07

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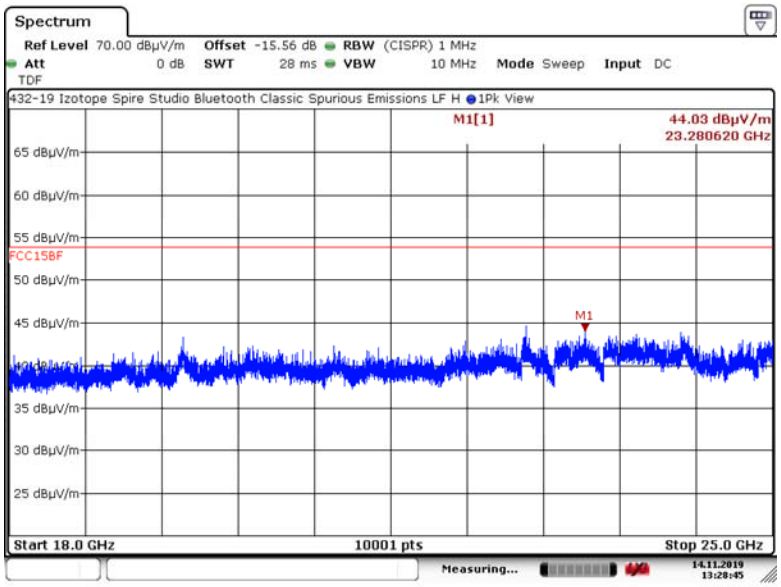
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

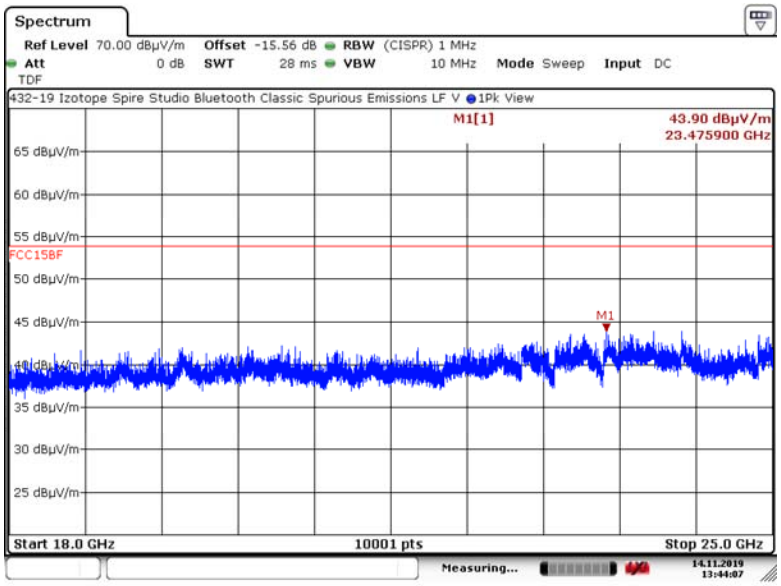
A7. Spurious Radiated Emissions (18 GHz – 25 GHz) Test Results

A7.1. Channel 0, 2402 MHz

A7.1.1. Measurement Results: Horizontal Antenna



A7.1.2. Measurement Results: Vertical Antenna



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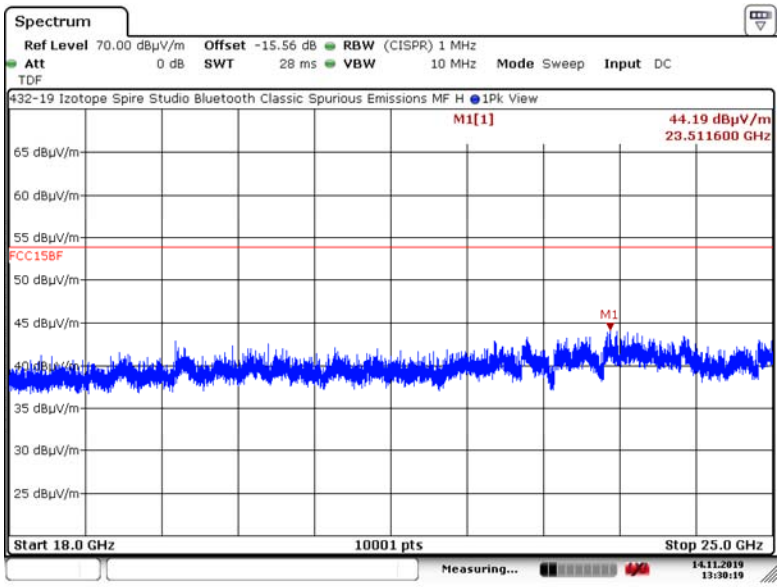
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A7. Spurious Radiated Emissions (18 GHz – 25 GHz) Test Results

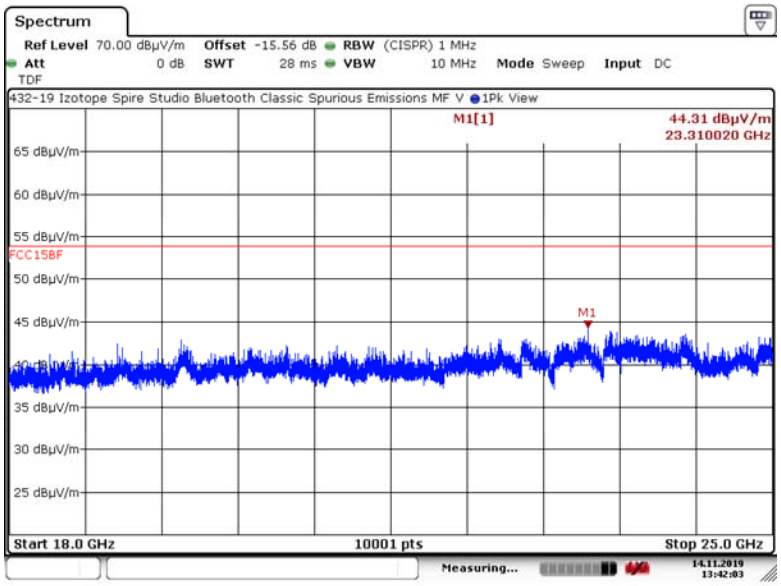
A7.2. Channel 40, 2442 MHz

A7.2.3. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 13:30:19

A7.2.4. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 13:42:03

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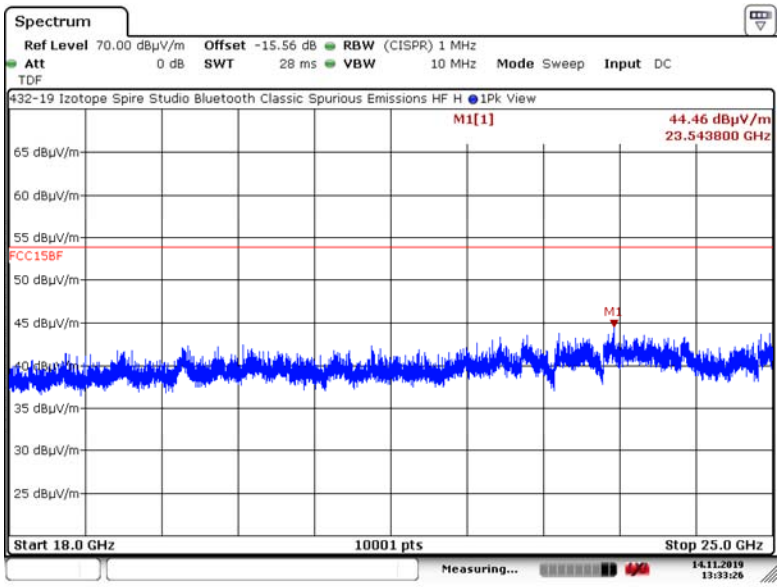
Appendix A - Transmitter Spurious Radiated Emissions (10 kHz to 25 GHz)

A7. Spurious Radiated Emissions (18 GHz – 25 GHz) Test Results

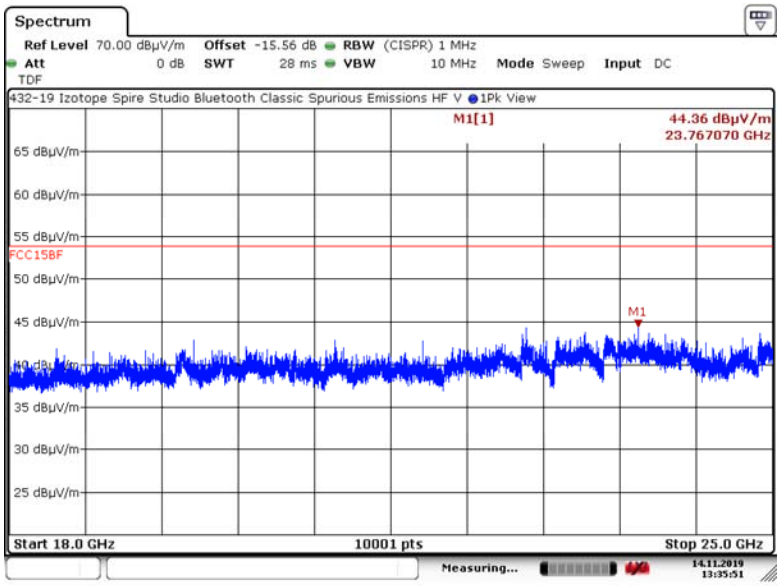
A7.2. Channel 78, 2480 MHz

A7.2.1. Measurement Results: Horizontal Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 13:33:26

A7.2.2. Measurement Results: Vertical Antenna



H_001 1-6GHz - Baseline
Date: 14.NOV.2019 13:35:51

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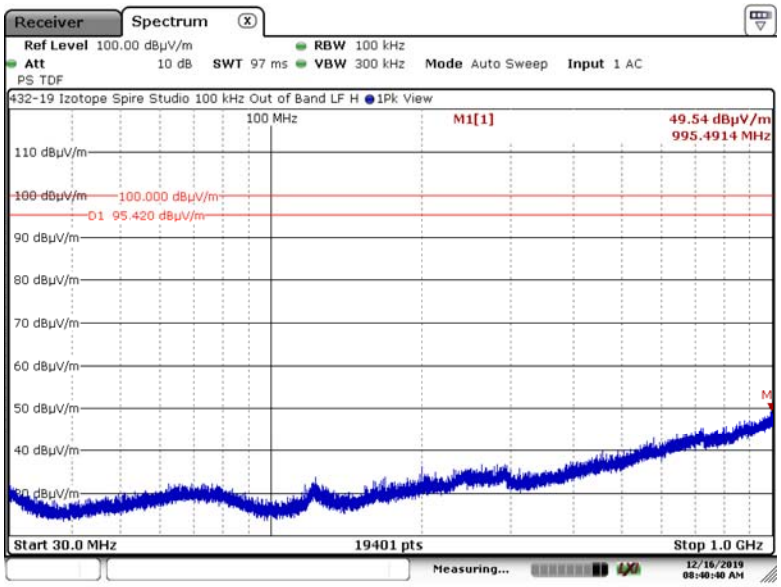
Appendix B

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

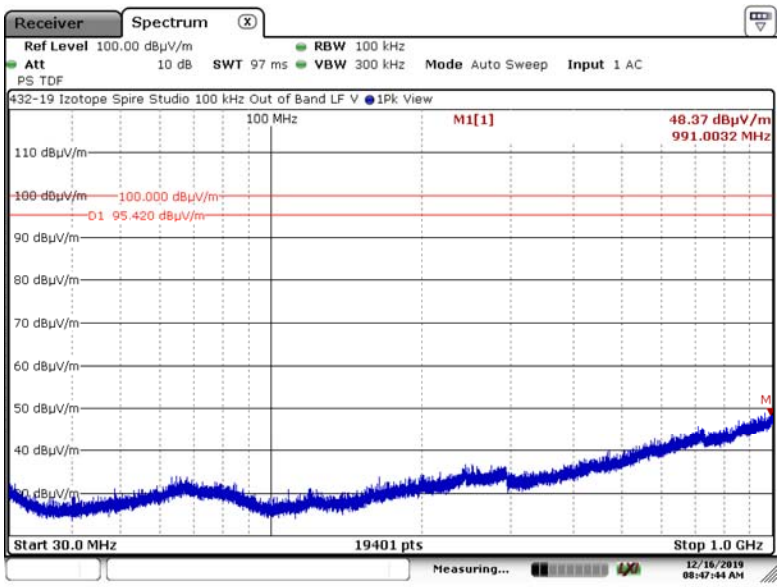
B1.1. Emissions in Non-restricted Frequency Bands (30 MHz – 1 GHz) Test Results

B1.1.1. Measurement Results, LF: Horizontal Receive Antenna



120VAC-60Hz - Phase
Date: 16.DEC.2019 08:40:41

B1.1.2. Measurement Results, LF: Vertical Receive Antenna



120VAC-60Hz - Phase
Date: 16.DEC.2019 08:47:43

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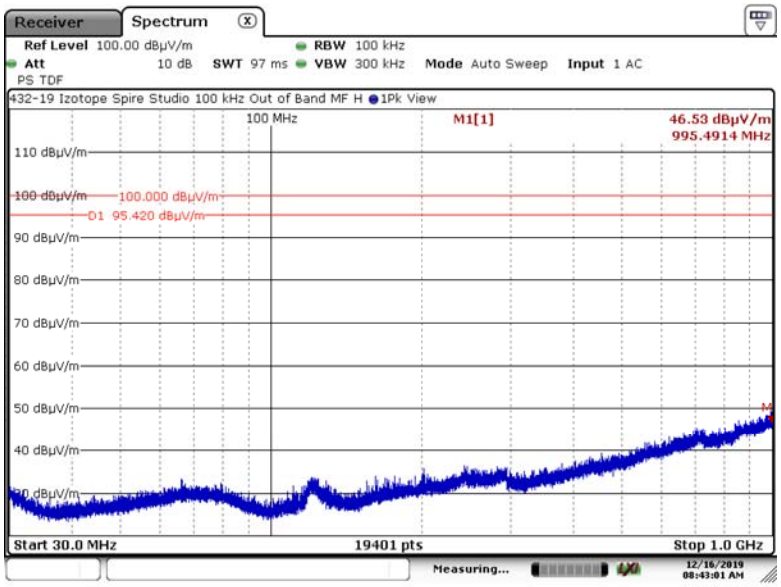
Appendix B

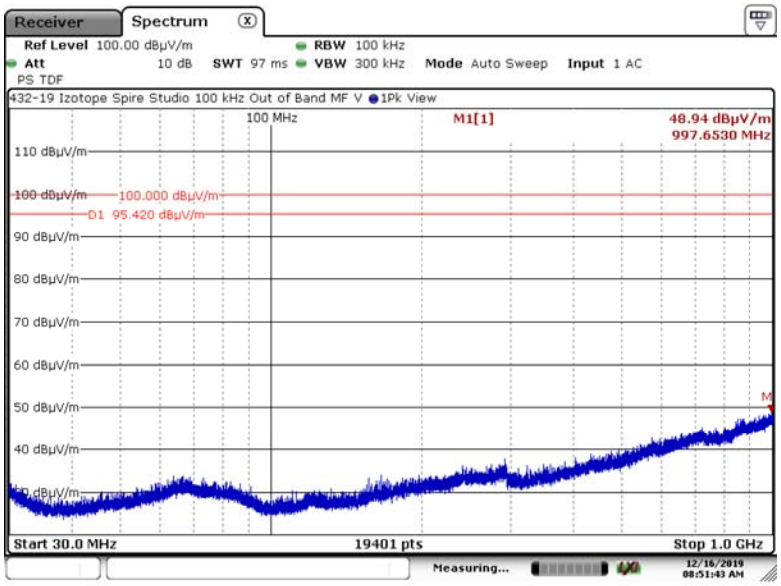
B1. Emissions in Non-restricted Frequency Bands (30 MHz to 25 GHz) (continued)

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

B1.1.3. Measurement Results, MF: Horizontal Receive Antenna



B1.1.4. Measurement Results, MF: Vertical Receive Antenna



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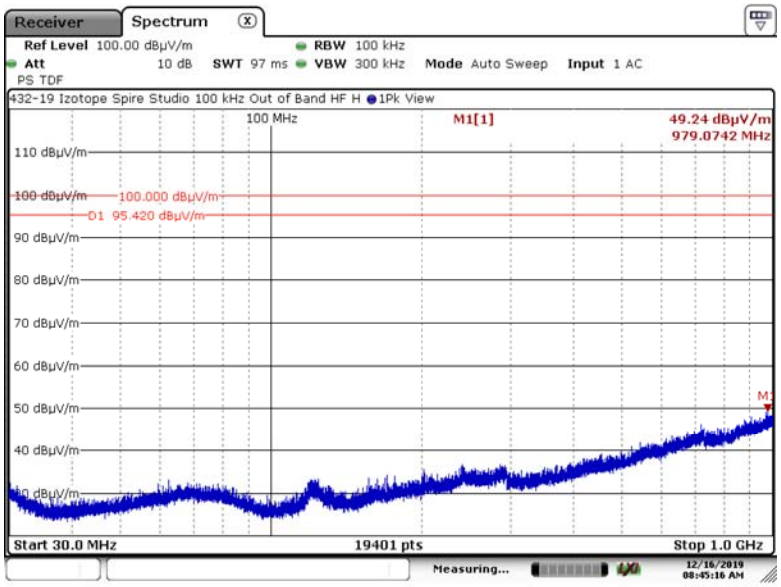
Appendix B

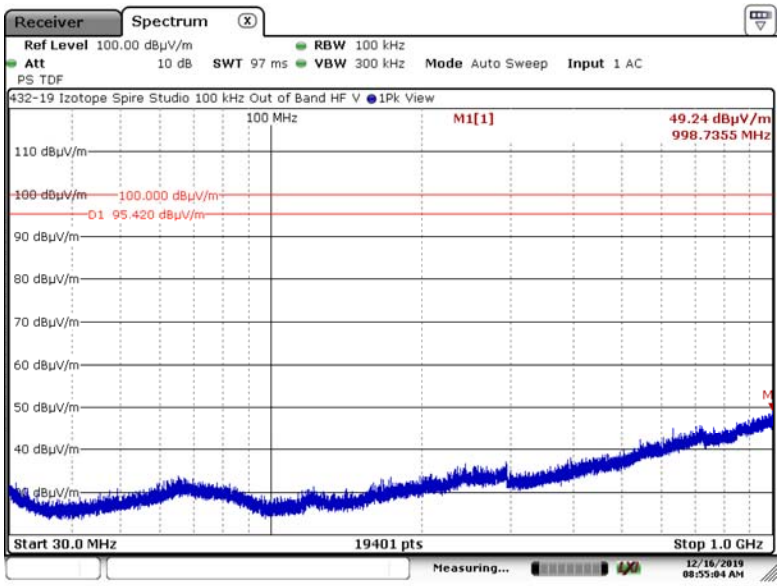
B1. Emissions in Non-restricted Frequency Bands (30 MHz to 25 GHz) (continued)

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

B1.1.5. Measurement Results, HF: Horizontal Receive Antenna



B1.1.6. Measurement Results, HF: Vertical Receive Antenna



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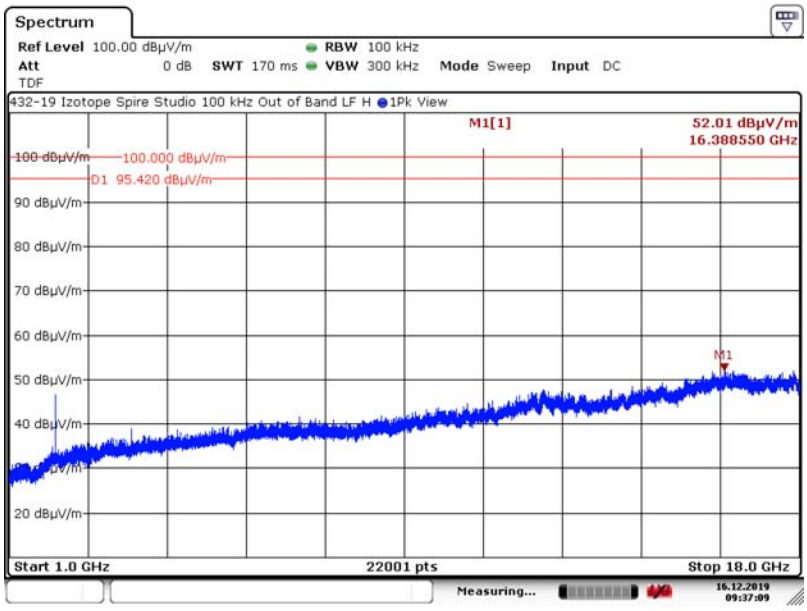
Appendix B

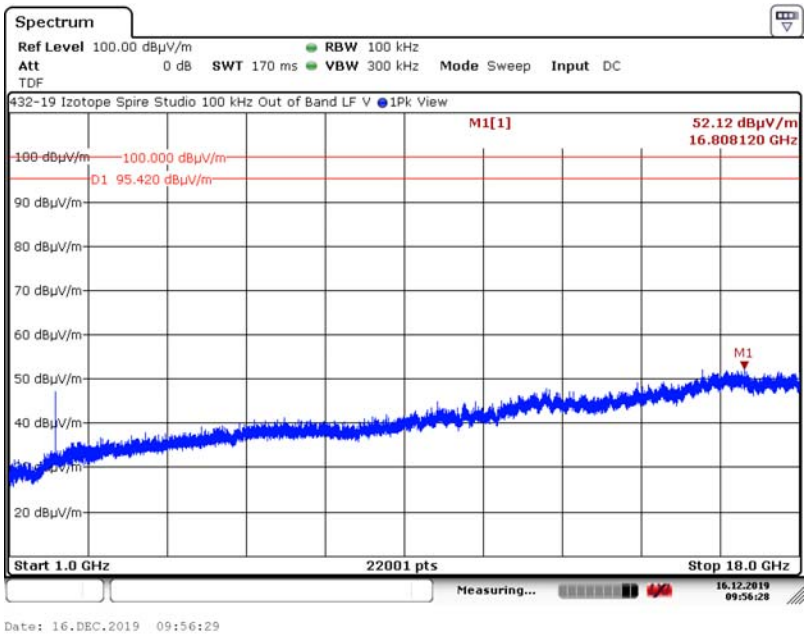
B1. Emissions in Non-restricted Frequency Bands (30 MHz to 25 GHz) (continued)

B1.2. Emissions in Non-restricted Frequency Bands (1 GHz – 18 GHz) Test Results

B1.2.1. Measurement Results, LF: Horizontal Receive Antenna



B1.2.2. Measurement Results, LF: Vertical Receive Antenna



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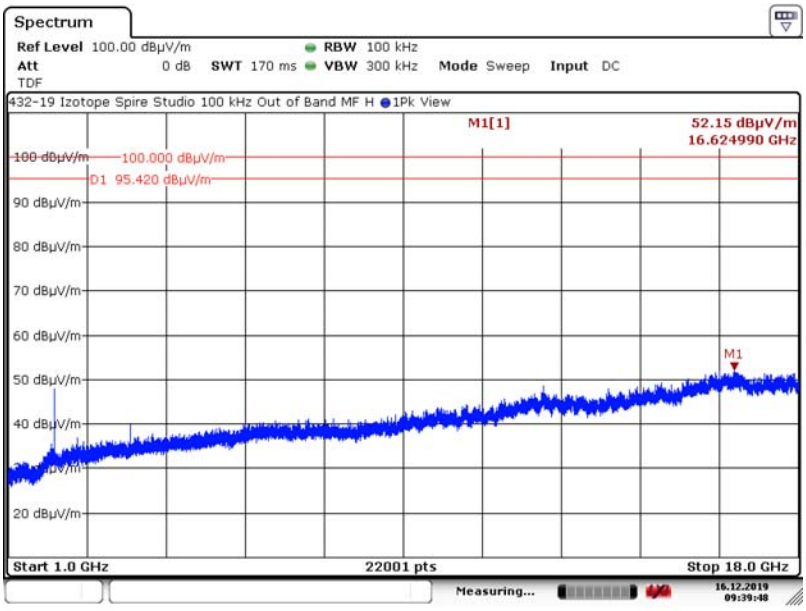
Appendix B

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

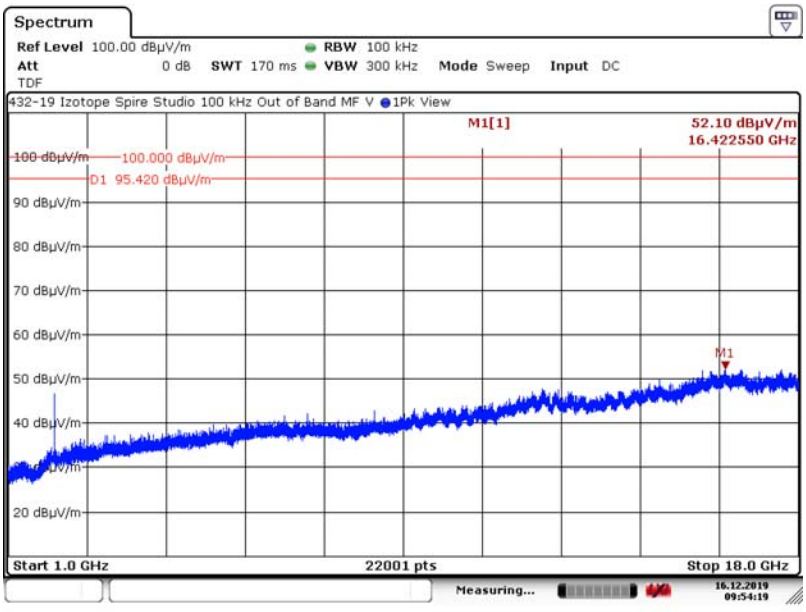
B1.2. Emissions in Non-restricted Frequency Bands (1 GHz – 18 GHz) Test Results

B1.2.3. Measurement Results, MF: Horizontal Receive Antenna



Date: 16.DEC.2019 09:39:48

B1.2.4. Measurement Results, MF: Vertical Receive Antenna



Date: 16.DEC.2019 09:54:19

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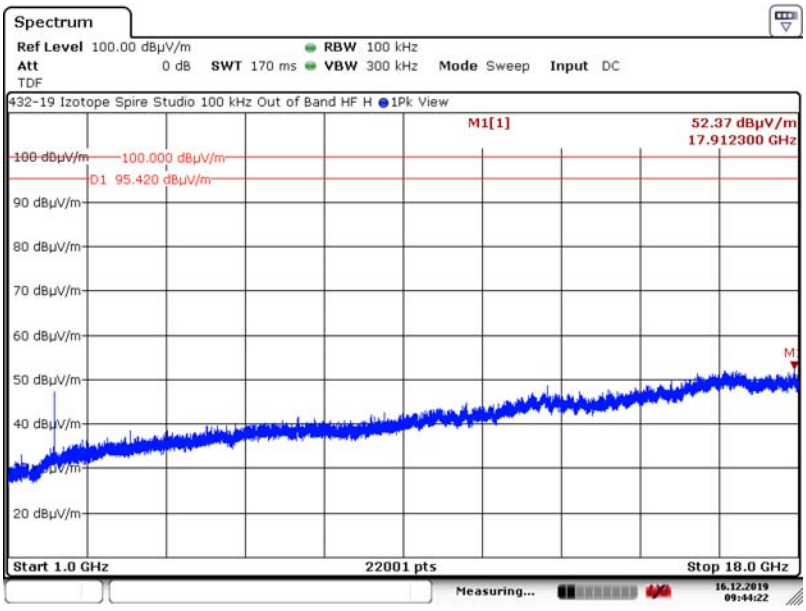
Appendix B

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

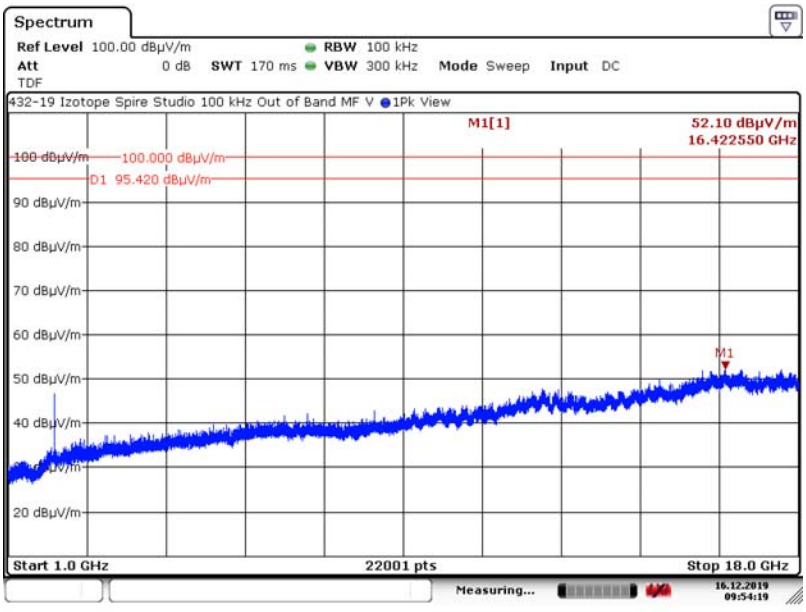
B1.2. Emissions in Non-restricted Frequency Bands (1 GHz – 18 GHz) Test Results

B1.2.5. Measurement Results, HF: Horizontal Receive Antenna



Date: 16.DEC.2019 09:44:23

B1.2.6. Measurement Results, HF: Vertical Receive Antenna



Date: 16.DEC.2019 09:54:19

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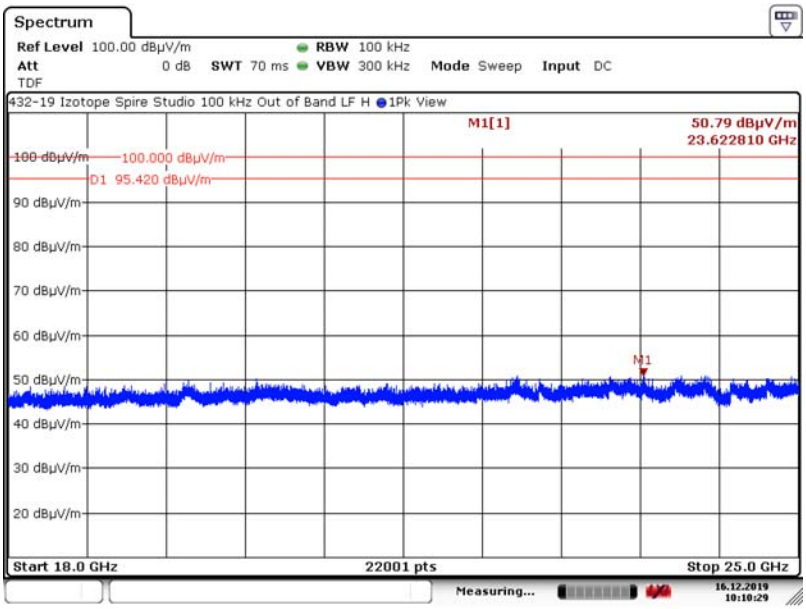
Appendix B

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

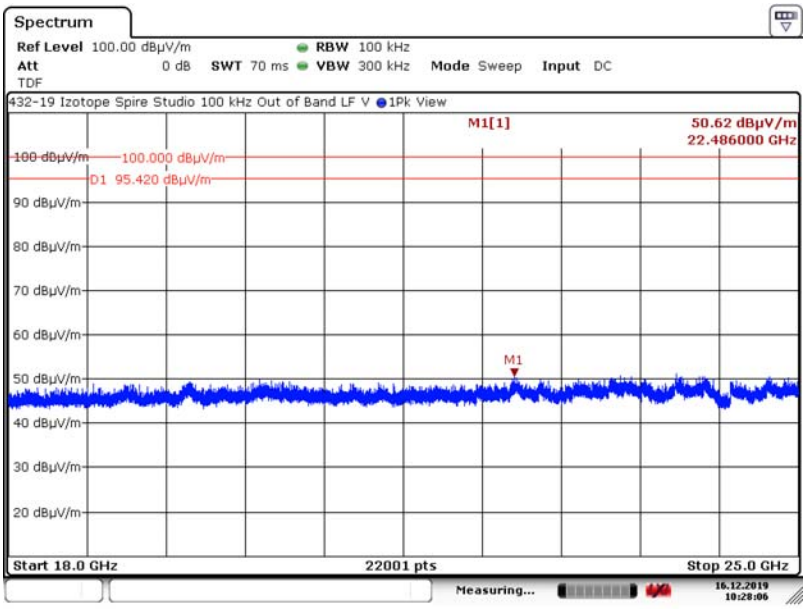
B1.3. Emissions in Non-restricted Frequency Bands (18 GHz – 25 GHz) Test Results

B1.3.1. Measurement Results, LF: Horizontal Receive Antenna



Date: 16.DEC.2019 10:10:29

B1.3.2 Measurement Results, LF: Vertical Receive Antenna



Date: 16.DEC.2019 10:28:06

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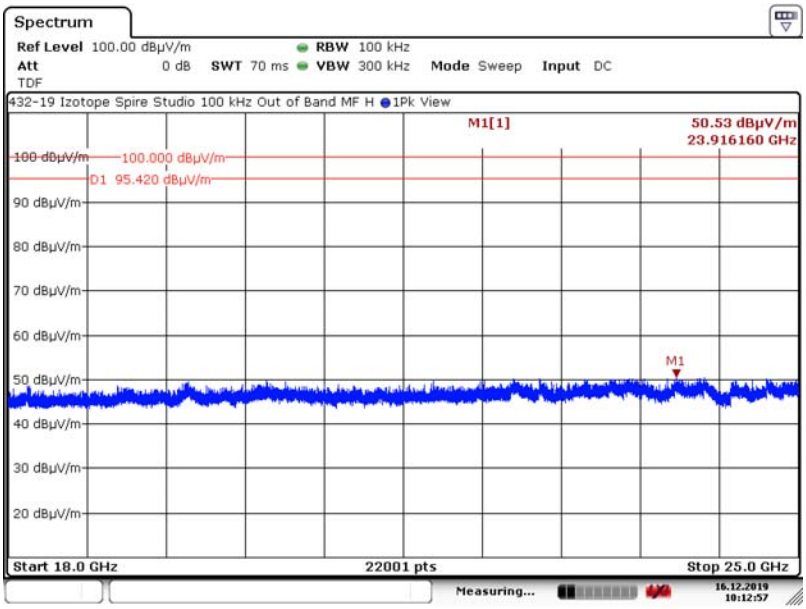
Appendix B

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

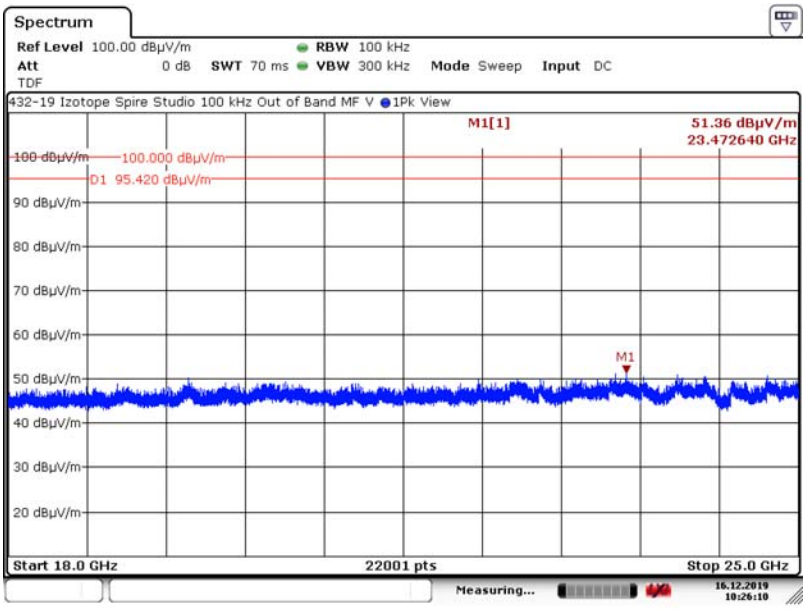
B1.3. Emissions in Non-restricted Frequency Bands (18 GHz – 25 GHz) Test Results

B1.3.3. Measurement Results, MF: Horizontal Receive Antenna



Date: 16.DEC.2019 10:12:57

B1.3.4 Measurement Results, MF: Vertical Receive Antenna



Date: 16.DEC.2019 10:26:10

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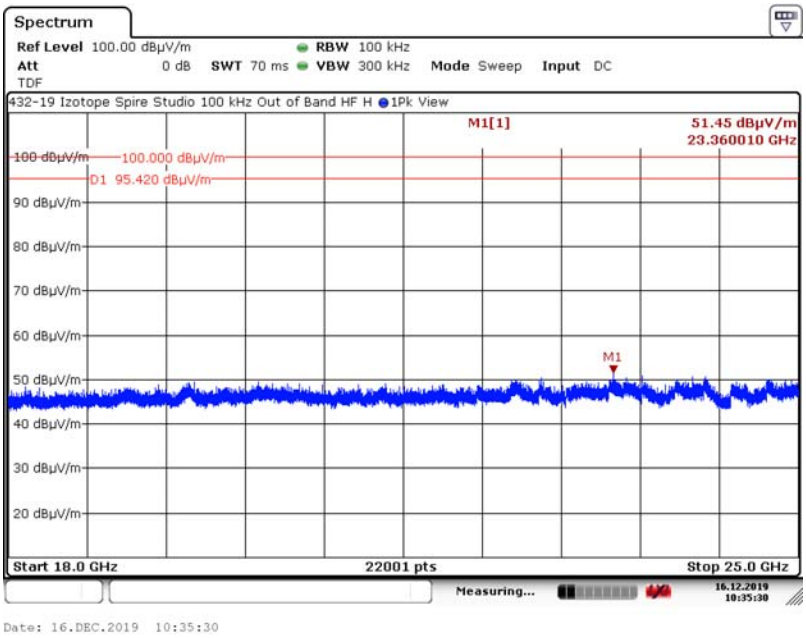
Appendix B

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

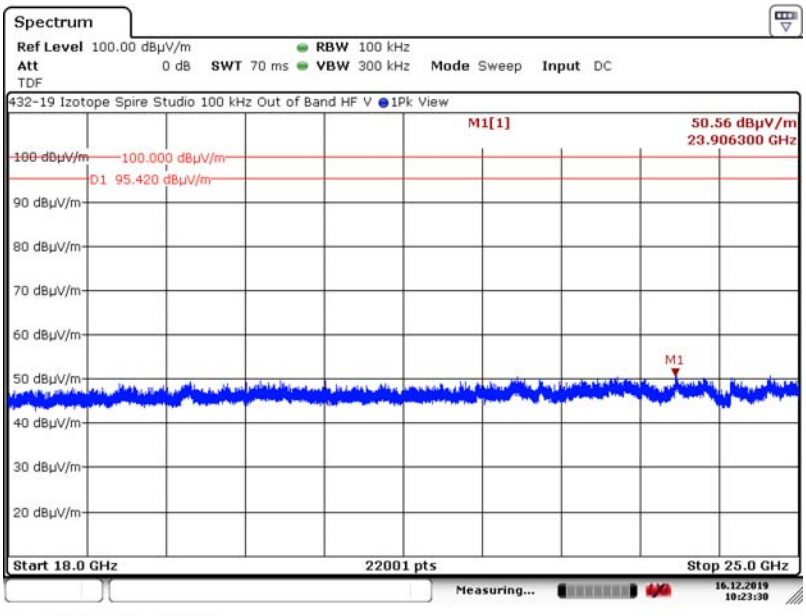
B1.3. Emissions in Non-restricted Frequency Bands (18 GHz – 25 GHz) Test Results

B1.3.5. Measurement Results, HF: Horizontal Receive Antenna



Date: 16.DEC.2019 10:35:30

B1.3.6 Measurement Results, HF: Vertical Receive Antenna



Date: 16.DEC.2019 10:23:30

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