September 7, 2021

Trimble Jena GmbH
Carl-Zeiss-Promenade 10
Jena 07743, Germany

Dear Eyk Taege,

Enclosed is the Wireless test report for compliance testing of the Trimble Jena GmbH, Trimble Comm Board Hurricane (V0013E), as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), Part 15 Subpart C for Intentional Radiators and Industry Canada RSS-247.

Thank you for using the services of Eurofins Electrical and Electronic Testing NA, Inc. Please contact me if you have any questions regarding these results or if Eurofins E&E can be of further service to you.

Sincerely,

Rheine Nguyen

Documentation Department
Eurofins Electrical and Electronic Testing NA, Inc.

Reference: WIRS113635-FCC15.407-RSS247-WLAN5G Rev 3

ACCREDITED
TESTINGCERT #0591.02

Eurofins Electrical and Electronic Testing NA, Inc. is part of the Eurofins Electrical & Electronics (E&E) global compliance network.

lectromagnetic Compatibility Criteria
Test Report

for the

Trimble Jena GmbH
Trimble Comm Board Hurricane (V0013E)

Tested under
the FCC Certification Rules
contained in
15.247 Subpart C for Intentional Radiators
and
Industry Canada Standards
RSS-247

Report: WIRS113635-FCC15.407-RSS247-WLAN5G Rev 3

September 7, 2021

Prepared For:

Trimble Jena GmbH
Carl-Zeiss-Promenade 10
Jena 07743, Germany

Prepared By:
Eurofins Electrical and Electronic Testing NA, Inc.
3162 Belick St.
Santa Clara, CA 95054

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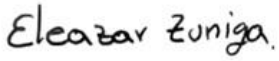
Arsalan Hasan
Project Engineer, Electromagnetic Compatibility Lab

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules Part 15.247 and RSS-247 under normal use and maintenance.



Eleazar Zuniga,
Director, Wireless Laboratory

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	August 2, 2021	Initial Issue
1	August 17, 2021	Review Updates
2	August 29, 2021	TCB Review Updates
3	September 7, 2021	TCB Review Updates

Table of Contents

Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the Trimble Jena GmbH, Trimble Comm Board Hurricane (V0013E), with the requirements of Part 15, §15.247. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the Trimble Comm Board Hurricane (V0013E). Trimble Jena GmbH should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Trimble Comm Board Hurricane (V0013E), has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, §15.247, in accordance with Trimble Jena GmbH, purchase order number PO20210214. All tests were conducted using measurement procedure ANSI C63.10-2013.

FCC Reference 47 CFR Part 15.247:2005	Description	Compliance
§15.403(i)	26dB Occupied Bandwidth	Data valid from original filing of FCC ID: YK5-73350046
§15.407 (a)(1)	Maximum Conducted Output Power	Data valid from original filing of FCC ID: YK5-73350046
§15.407 (a)(1)	Maximum Power Spectral Density	Data valid from original filing of FCC ID: YK5-73350046
§15.407 (b)(1)& (6 - 7)	Undesirable Emissions	Compliant
§15.407(b)(6)	Conducted Emission Limits	Not Applicable
§15.407(g)	Frequency Stability	Data valid from original filing of FCC ID: YK5-73350046

Executive Summary of WIR Part 15.247 ComplianceTesting

IC Reference RSS-247 Issue 2, 2017; RSS-GEN Issue 4: 2014	Description	Results
RSS-GEN (8.8)	Conducted Emission Limits	Not Applicable – EUT is DC powered device
RSS-GEN (6.6)	99% Occupied Bandwidth	Data valid from original filing of IC: 9288A-73350046
RSS-247 (6.2.1)	Conducted Transmitter Output Power	Data valid from original filing of IC: 9288A-73350046
RSS-247 (6.2.1)	Power Spectral Density	Data valid from original filing of IC: 9288A-73350046
RSS-247 (6.2.1)	Undesirable Emissions	Compliant
RSS-GEN (7.4)	Receiver Emissions	Data valid from original filing of IC: 9288A-73350046

Executive Summary of WIR RSS-247 ComplianceTesting

Equipment Configuration

A. Overview

Eurofins Electrical and Electronic Testing NA, Inc. was contracted by Trimble Jena GmbH to perform testing on the Trimble Comm Board Hurricane (V0013E), under purchase order number PO20210214.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of Trimble Jena GmbH, Trimble Comm Board Hurricane (V0013E).

The results obtained relate only to the item(s) tested.

Model(s) Tested:	Trimble Comm Board Hurricane (V0013E)	
Model(s) Covered:	Trimble Comm Board Hurricane (V0013E)	
EUT Specifications:	Primary Power: 5 VDC	
	FCC ID: YK5-73350046	
	IC: 9288A-73350046	
	Type of Modulations:	BPSK, QPSK, 16QAM
	Equipment Code:	DTS
	EUT Frequency Ranges:	5150 MHz – 5825MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35º C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Type of Filing:	CIIPC	
Evaluated by:	Arsalan Hasan	
Report Date(s):	September 7, 2021	

EUT Summary Table

B. References

CFR 47, Part 15, Subpart E	Unlicensed National Information Infrastructure Devices (UNII)
ANSI C63.4:2014	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
789033 D02 General UNII Test Procedures New Rules v02	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E
KDB 662911	Guidance for Measurement of Transmitters with Multiple Output MIMO.
RSS-247, Issue 2, February 2017	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
RSS-GEN, Issue 4, Nov. 2014	General Requirements and Information for the Certification of Radio Apparatus
ICES-003, Issue 5 August 2012	Information Technology Equipment (ITE) — Limits and methods of measurement
ANSI C63.4:2014	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

References

C. Test Site

All testing was performed at Eurofins Electrical and Electronic Testing NA, Inc., 3162 Belick St., Santa Clara, CA 95054. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 5 meter semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at Eurofins Electrical and Electronic Testing NA, Inc.

Eurofins Electrical and Electronics Testing NA, Inc. is an ISO/IEC 17025 accredited site by A2LA, California #0591.02.

D. Measurement Uncertainty

Test Method	Typical Expanded Uncertainty	K	Confidence Level
Radiated Emissions, (30 MHz – 1 GHz)	±3.24	2	95%
Radiated Emissions, (1 GHz – 18 GHz)	±3.92	2	95%
Conducted Emission Voltage	±2.44	2	95%
RF Power Conducted Spurious Emissions	±2.25 dB	2	95%
RF Power Radiated Emissions	±3.01 dB	2	95%

Uncertainty Calculations Summary

E. Description of Test Sample

Name of EUT/Model:	Trimble Comm Board Hurricane (V0013E)
Description of EUT and its intended use:	The Trimble Comm Board Hurricane (V0013E) is an 802.11a/b/g/n/ac 2.4 GHz and 5 GHz dual-band Wi-Fi and Bluetooth module that acts as a communication controller/bridge for use with a long-range wireless scanner. The core chipset is a Qualcomm QCA9378-7 and a Qualcomm CSR8811.
Selected Operation Mode(s):	A factory test mode for both WLAN and Bluetooth will be provided for radio-level testing, and instructions on how to operate the device in its normal mode will be provided for WLAN DFS testing. The factory test mode allows the operator to put the radio into a transmit-only or receive-only mode to aid in performing their measurements. The settings provided by the operator are the same as those used in normal operation, so any emissions will match those expected during normal operation – with the exception that normal mode will have a lower duty cycle. Once configured, the device will continue to operate in the specified manner until the operator disables the EUT. The normal operating mode for Wi-Fi allows a video to be streamed to simulate real-world traffic. During this simulation, other parameters (such as the EUT's ability to respond to radar waveforms) may be validated. As the video has a fixed length, extended testing will require the video to be restarted every 12 minutes.
Rationale for the selection of the Operation Mode(s):	This frequency of highest disturbance is expected to be emitted by the 2.4 GHz WLAN transmitter – HT20, MCS0 centered on 2437 MHz. This frequency produces the highest transmitter output power. Unintentional emissions caused by the transmitter will be subject to relevant regulatory limits and should not cause disturbances to other devices.

Monitoring Method(s):	In factory testing mode, both the WLAN and BT radios maintain communication with the host software and will display an error if the EUT stops working. During a transmit-only test, the output of the transmitter can be measured to confirm operational status. In the normal operating mode, the EUT will act as a Wi-Fi AP. Using any other Wi-Fi device, one could scan for the AP to confirm the device is operational. Alternatively, the beacon frames may be measured at the antenna port.
Emissions Class Declaration:	Class B (residential)
Configuration(s):	The RP-SMA pigtails and antennas shall be connected to the primary antenna ports of the EUT. The ribbon cable and USB adapter shall be connected to the EUT. The host system, simulated by a laptop, and a DC power supply capable of supplying 2 A shall be connected to the USB adapter. Tests which require conducted measurements to be made shall be performed by removing the antennas and cabling onto the RP-SMA pigtails.
EUT Power Requirement	
Voltage:	5V
AC or DC:	DC
Voltage Frequency:	N/A
Number of Phases:	N/A
Current:	2A
Physical Description	
EUT Arrangement:	Table top
System with Multiple Chassis?	No
Size (HxWxD - inches):	2x4x0.2 inches
Weight (lbs):	< 1 lbs
Highest Internal Frequency (MHz):	48 MHz
Other Info	
EUT Software (internal to EUT):	Firmware is provided by the host system.
Support Software (used by support PC to exercise EUT):	Qualcomm Radio Control Toolkit (QRCT) application for Wi-Fi test, and BlueTest for Bluetooth test.
Firmware:	Firmware is provided by the host system.
Transmitter Parameters	
Description of your unit:	Hybrid (DSSS and FHSS)
Modulation Type:	GFSK, pi/4 DQPSK, 8 DPSK, CCK, OFDM
Number of Channels:	47 (inc. 2.4 GHz and 5 GHz)
Frequency range (MHz):	2400 – 2483.5, 5150 – 5350, 5470 – 5835
Antenna Type:	Dual-band, Omni
Antenna Gain (dbi):	2.4 GHz 3 dBi, 5 GHz 5 dBi
PMN:	--
HVIN:	V0013E

FVIN:	--
HMN:	--
Data Rates:	1 Mbps – 54 Mbps, MCS0 – MCS7
Expected Power Level:	~ 10 – 30 dBm EIRP i.e. close to regulatory limit depending on modulation and channel
Number of Antenna:	2
Number of Intentional Transmitters:	1
Number of Certified Intentional Transmitter Modules:	1 - the EUT is already a certified module.

Equipment Configuration

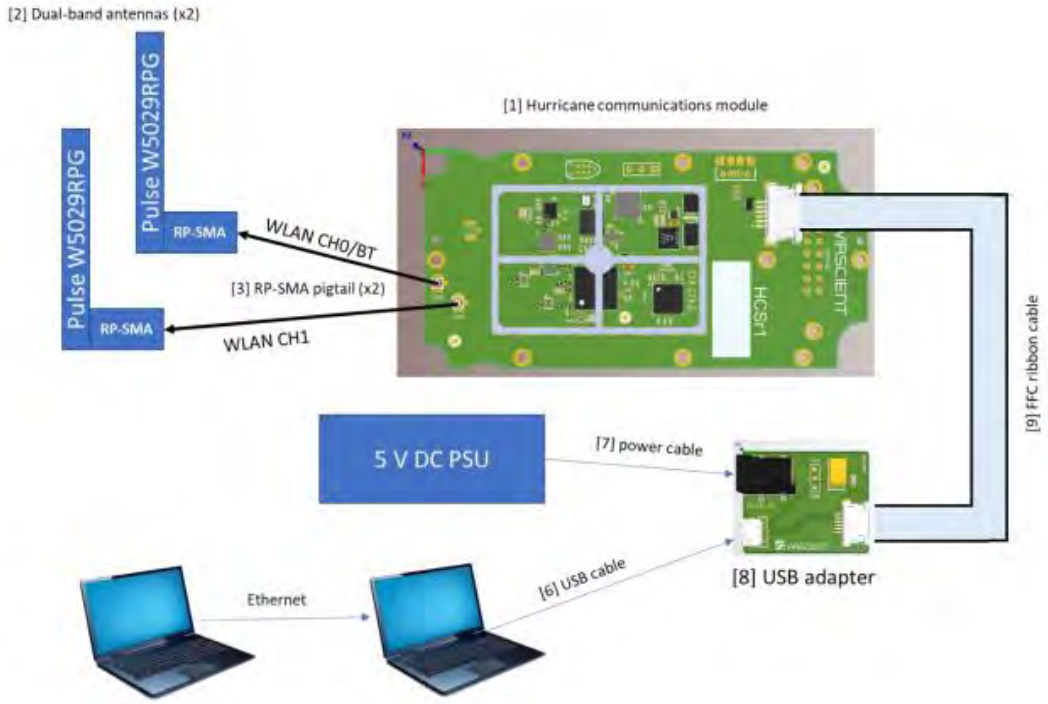
Ref.ID	Slot#	Name/Description	Model Number	Part Number	Serial Number	Rev. #
1	--	Trimble Comm Board Hurricane	V0013E	--	--	--
2	--	RP-SMA pigtails (x2)	Glyn INTCABLE58	--	--	--

Ports and Cabling

Ref. Id	Port Name on EUT	Cable Description or reason for no cable	Qty	Length as tested (m)	Max Length (m)	Shielded? (Y/N)	Termination Box ID & Port Name
1	Antenna port 0	RP-SMA pigtail	--	0.15	0.5	Yes	--
2	Antenna port 1	RP-SMA pigtail	--	0.15	0.5	Yes	--
3	Antenna port 3	Unused	--	--	--	--	--
4	Ribbon connector	FFC ribbon	--	--	--	--	--
5	USB micro B connector	Unused	1	0.2	0.5	Yes	--

Support Equipment

Ref.ID	Name/Description	Manufacturer	Model Number	Customer Supplied Calibration Data
4	Linux Laptop	Dell		Yes. fakeboar_fcc.bin and fakeboar_etsi.bin
5	Windows Laptop	Dell		
6	USB data cable	Unknown		NA
7	Banana to jack power cable	Virscient		NA
8	USB adapter	Virscient	V0006A	NA
9	FFC ribbon cable	Molex	0982670211	NA



Block Diagram

F. Modifications

a) Modifications to EUT

No modifications were made to the EUT.

b) Modifications to Test Standard

No modifications were made to the test standard.

G. Disposition of EUT

The test sample including all support equipment (if any), submitted to the Electromagnetic Compatibility Lab for testing was returned to Trimble Jena GmbH upon completion of testing.

Electromagnetic Compatibility Criteria for Intentional Radiators

Radiated Spurious Emissions Requirements

Test Requirements:

§ 15.407(b)(1): For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

§ 15.407(b)(6): Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.

§ 15.407(b)(7): The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

RSS-247 (6.2.1)(2): Unwanted emission limits.
For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz. Otherwise, the transmission is considered as intentional and the devices shall implement dynamic frequency selection (DFS) and transmitter power control (TPC) as per the requirements for the band 5250-5350 MHz.

MHz	MHz	MHz	GHz
0.090–0.110----------	16.42–16.423	399.9–410	4.5–5.15
[1] 0.495–0.505----------	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905----------	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128----------	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775----------	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775----------	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218----------	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825----------	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225----------	123–138	2200–2300	14.47–14.5
8.291–8.294----------	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366----------	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675----------	156.7–156.9	2655–2900	22.01–23.12
8.41425–8.41475----------	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293----------	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025----------	240–285	3345.8–3358 36.	43–36.5
12.57675–12.57725----------	322–335.4	3600–4400	([2])

Restricted Bands of Operation

[1] Until February 1, 1999, this restricted band shall be 0.490 – 0.510 MHz.
[2] Above 38.6

§ 15.209 (a): Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in **Error! Reference source not found.**

Frequency (MHz)	§ 15.209(a), Radiated Emission Limits (dBµV) @ 3m
30 - 88	40.00
88 - 216	43.50
216 - 960	46.00
Above 960	54.00

Radiated Emissions Limits Calculated from FCC Part 15, § 15.209 (a)

Test Procedure: The EUT was placed on a non-conducting stand on a turntable in a chamber. To find the maximum emission the EUT was set to transmit on low, mid, and high channels. Additionally, the turntable was rotated 360 degrees, the EUT was oriented through its three orthogonal axes, and the receive antenna height was varied in order to maximize emissions.

For frequencies from 30 MHz to 1 GHz, measurements were first made using a peak detector with a 100 kHz resolution bandwidth. Emissions which exceeded the limits were re-measured using a quasi-peak detector with a 120 kHz resolution bandwidth.

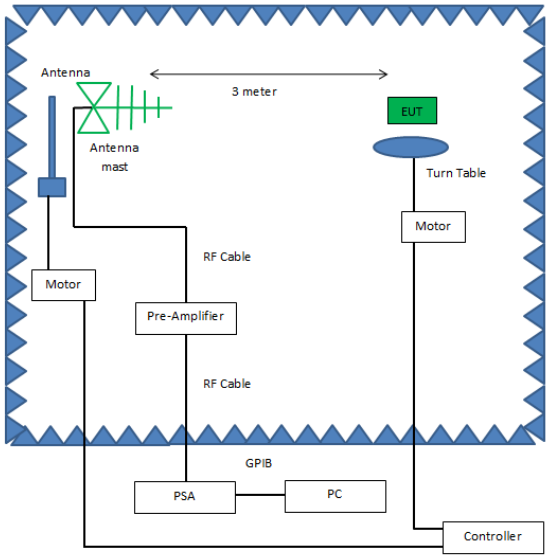
Above 1 GHz, measurements were made pursuant the method described in FCC KDB 789033 D02 General UNII Test Procedure New Rules v02. The equation, **EIRP= E + 20 log D – 104.8** was used to convert field strength to EIRP (**E** = field strength (dBµV/m) and **D** = Reference measurement distance**).**

For emissions above 1 GHz and in restricted bands, measurements of the field strength were made with a peak detector and an average detector and compared with the limits of 15.209.

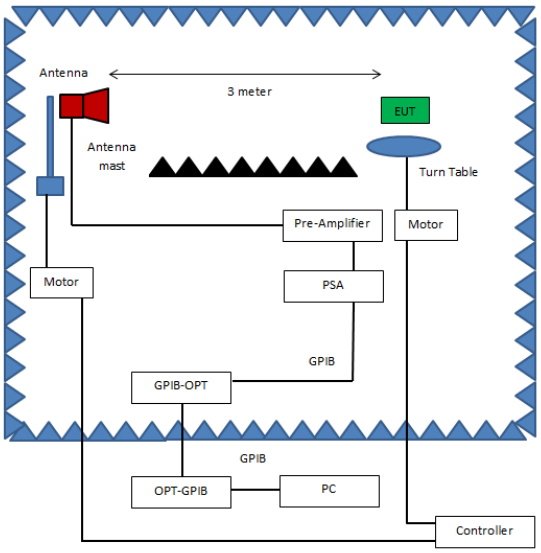
As an alternative, according to FCC KDB 789033 D02 General UNII Test Procedure New Rules v02, all emissions that comply with the peak and average limits of 15.209 satisfy the requirements of unwanted emissions in 15.407.

Test Results: EUT was compliant with the requirements of this section. Only noise was observed above 18 GHz and below 30 MHz. Emissions were investigated upto 10th harmonics. Only worst data are presented in this report except band edges.

Measured emissions were within applicable limits.



Radiated Emissions, Below 1GHz, Test Setup



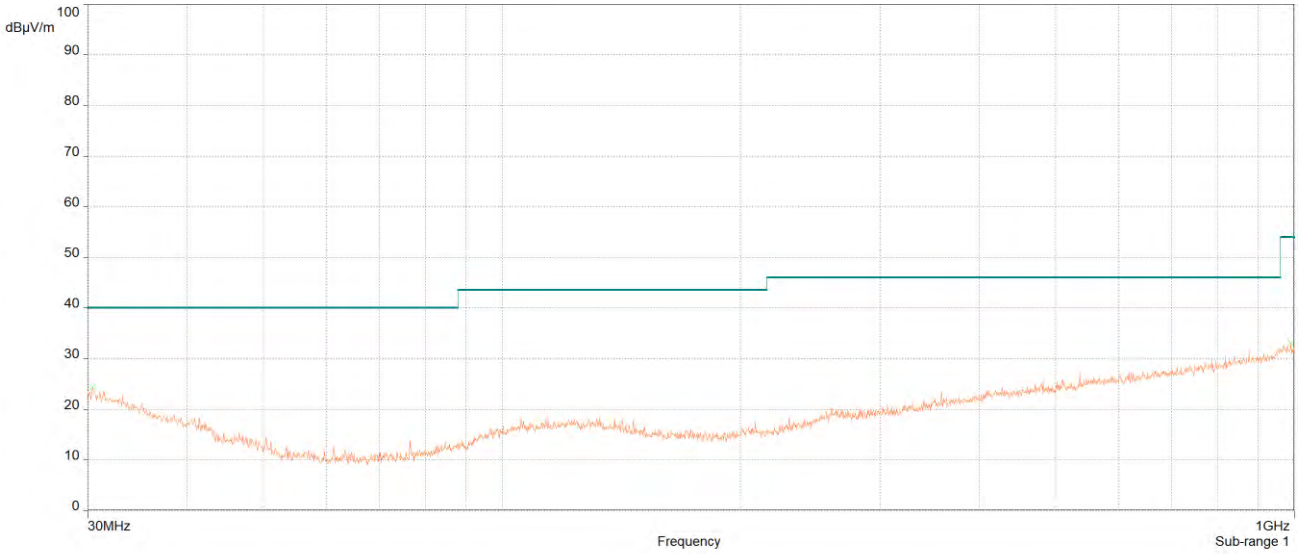
Radiated Emissions, Above 1GHz, Test Setup

Test Results: The EUT was tested is **compliant** with § 15.209 Radiated Spurious Emissions Requirements and Band Edge.

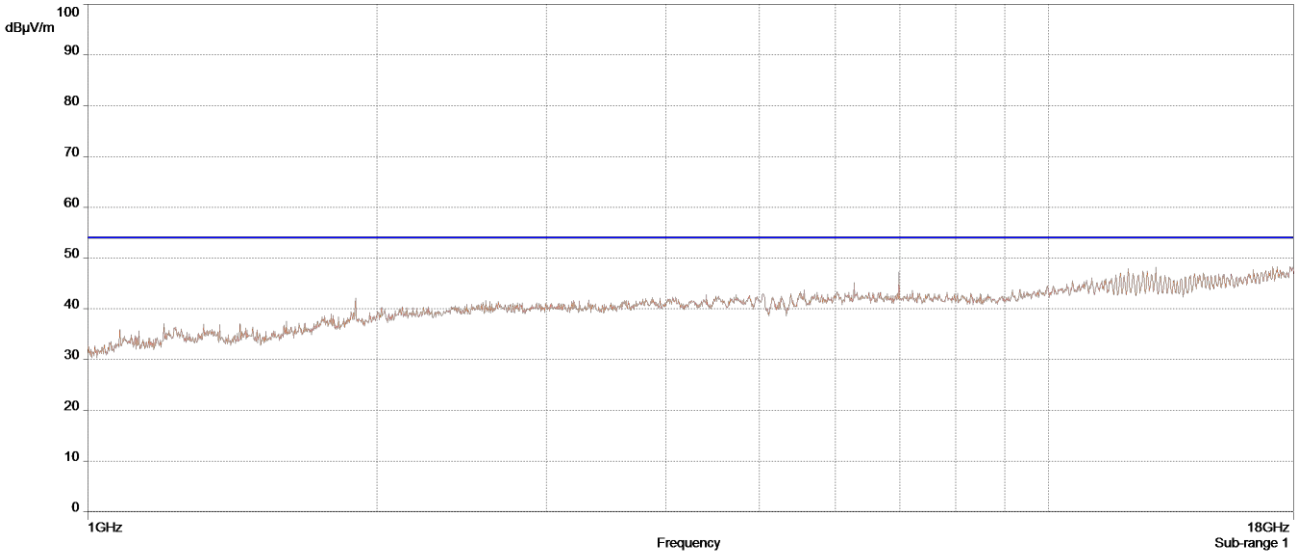
Test Engineer: Arsalan Hasan

Test Date: 08/01/2021

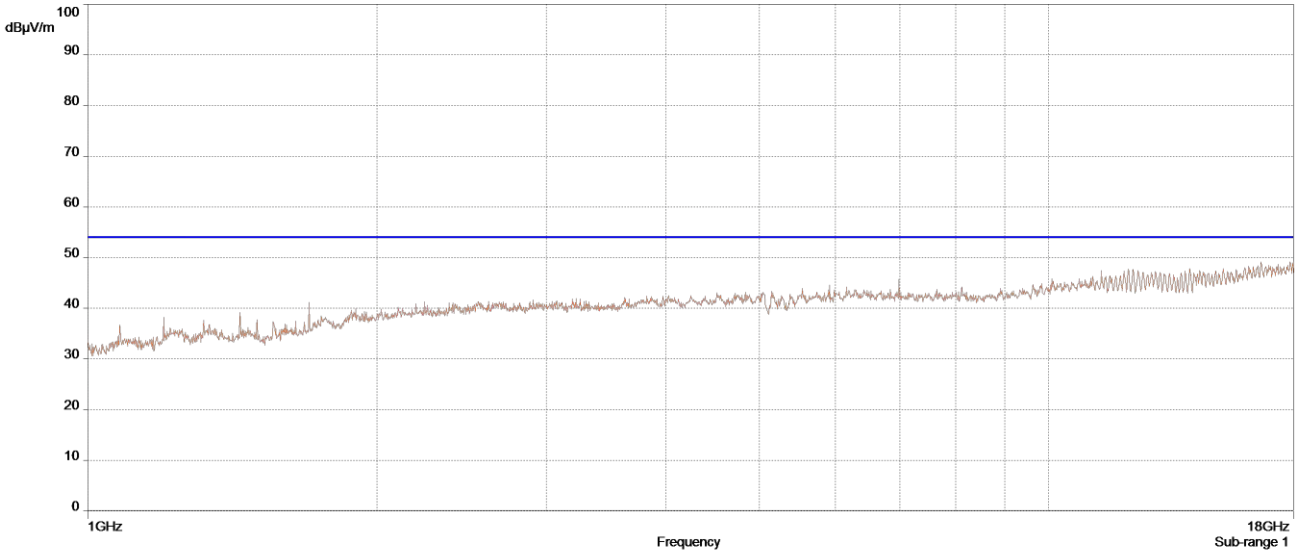
Test Data



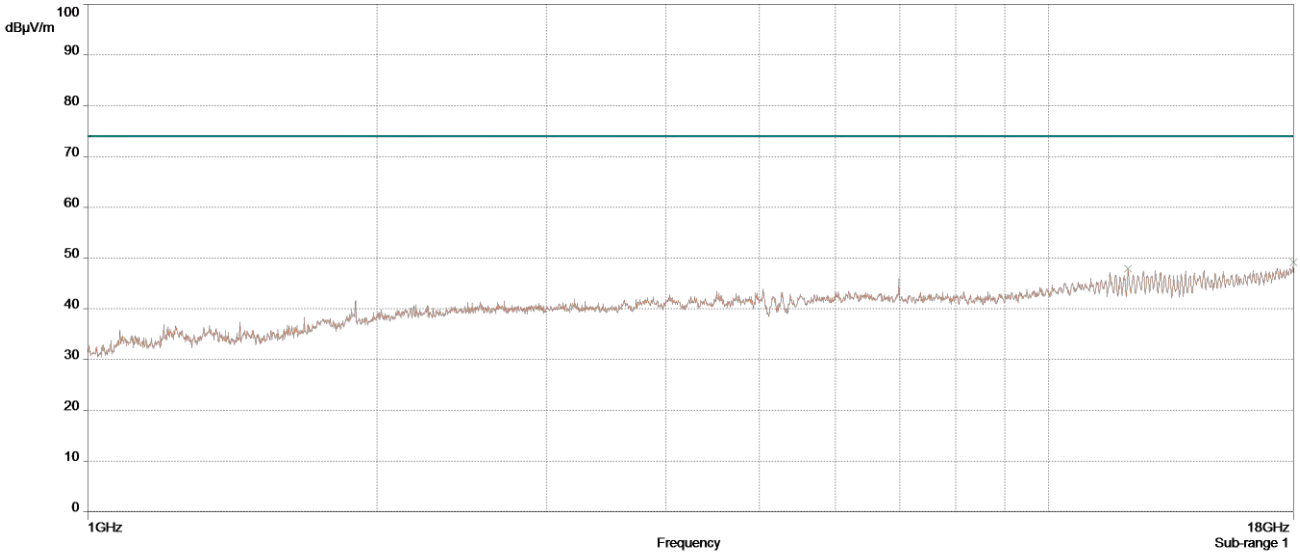
Radiated Spurious Emissions, 30MHz-1GHz, (Worst Case Pol)



Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 High Channel, a mode, Average, Chain 0 (Worst Case Pol)



Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 High Channel, a mode, Average, Chain 1 (Worst Case Pol)



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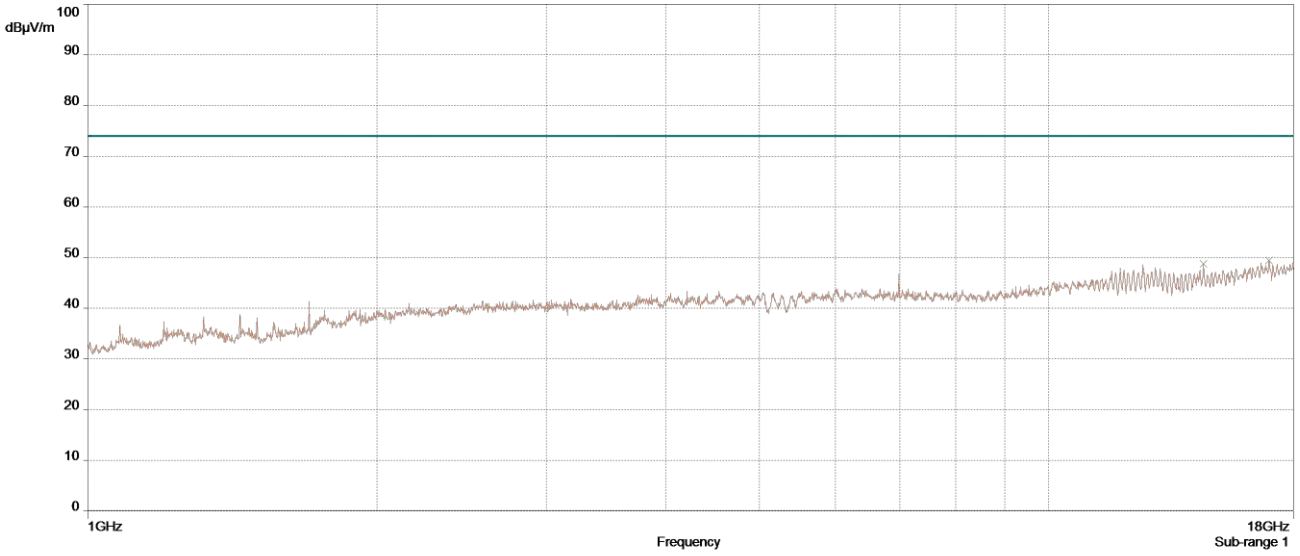
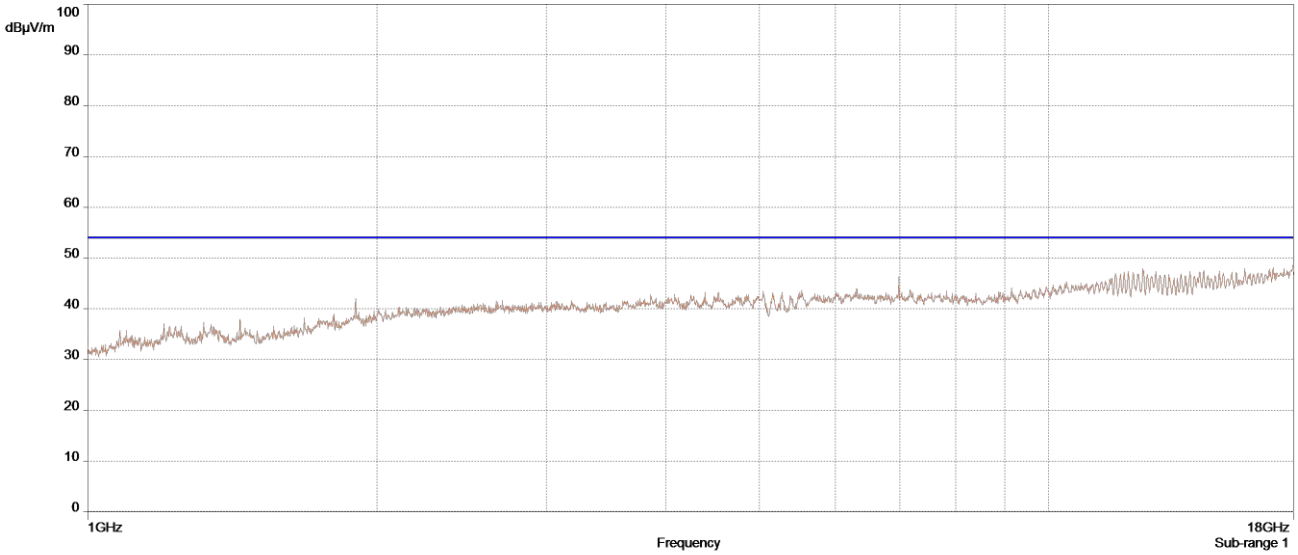
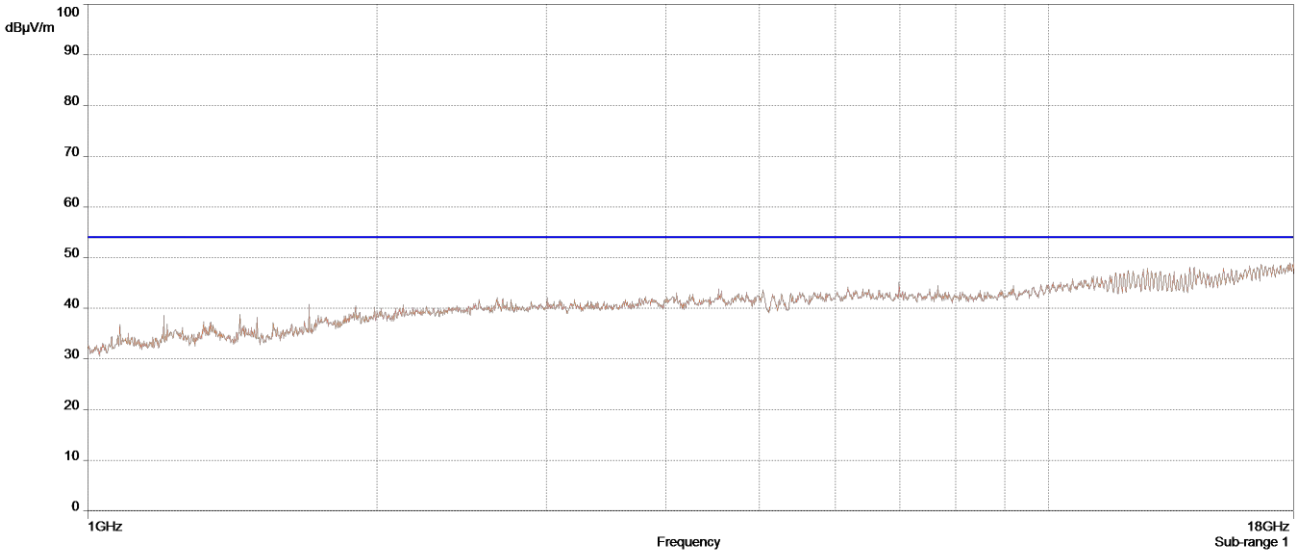


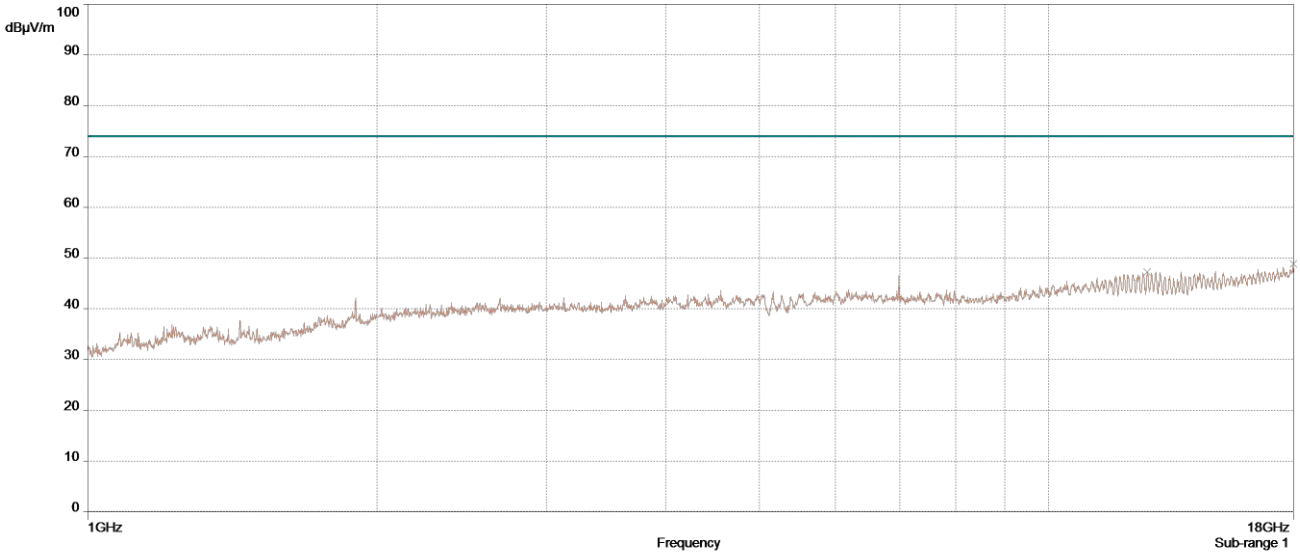
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 High Channel, a mode, Peak, Chain 1 (Worst Case Pol)



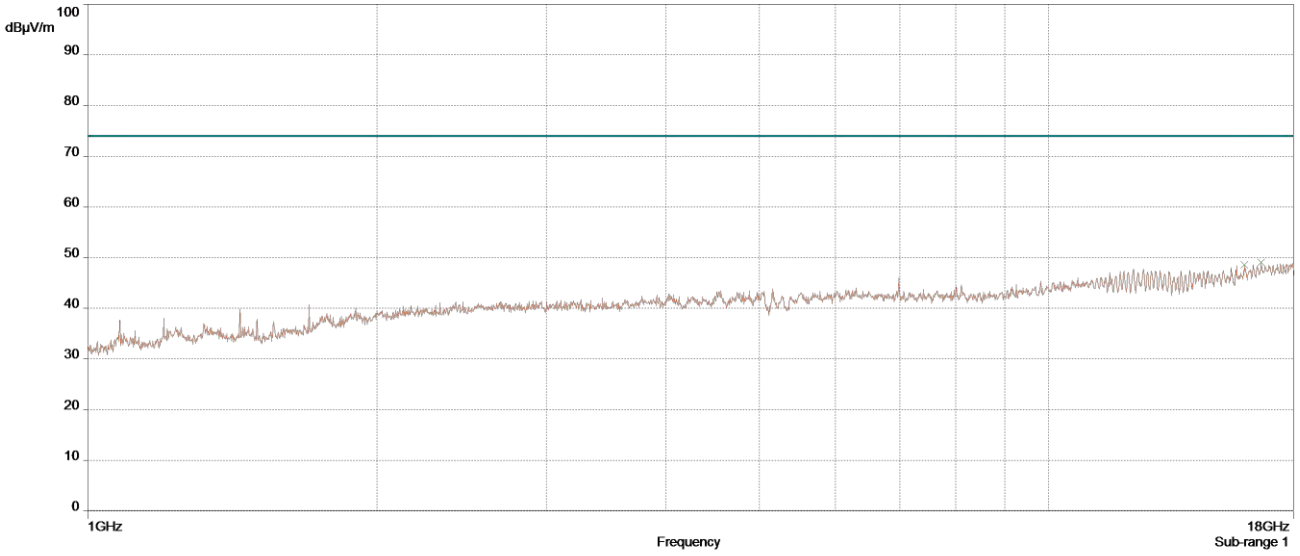
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 High Channel, n mode, Average, Chain 0 (Worst Case Pol)



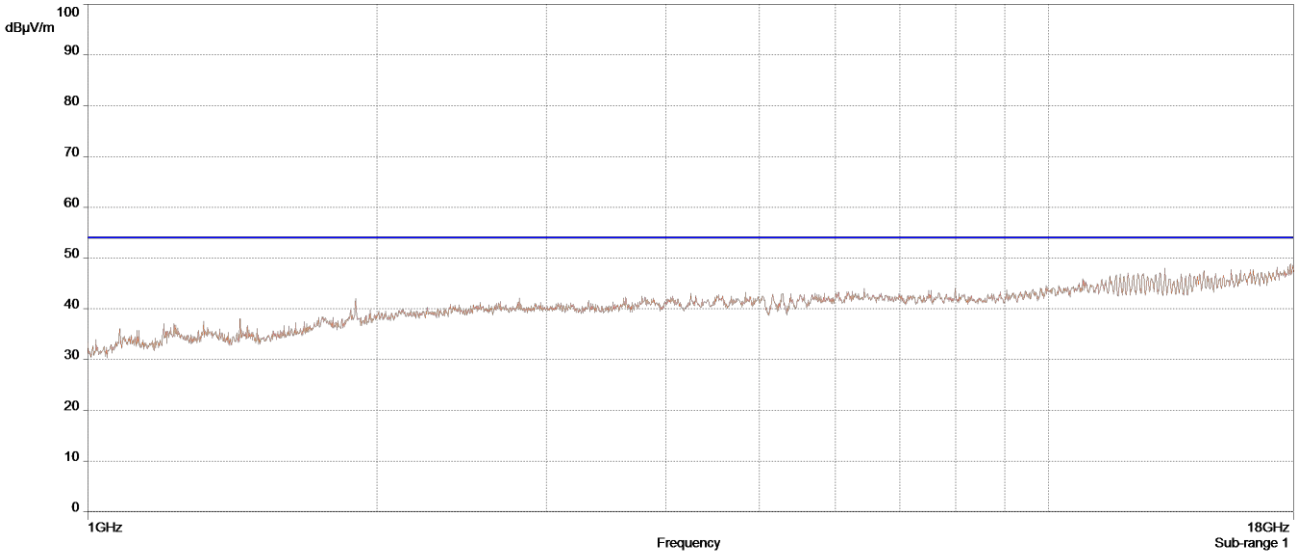
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 High Channel, n mode, Average, Chain 1 (Worst Case Pol)



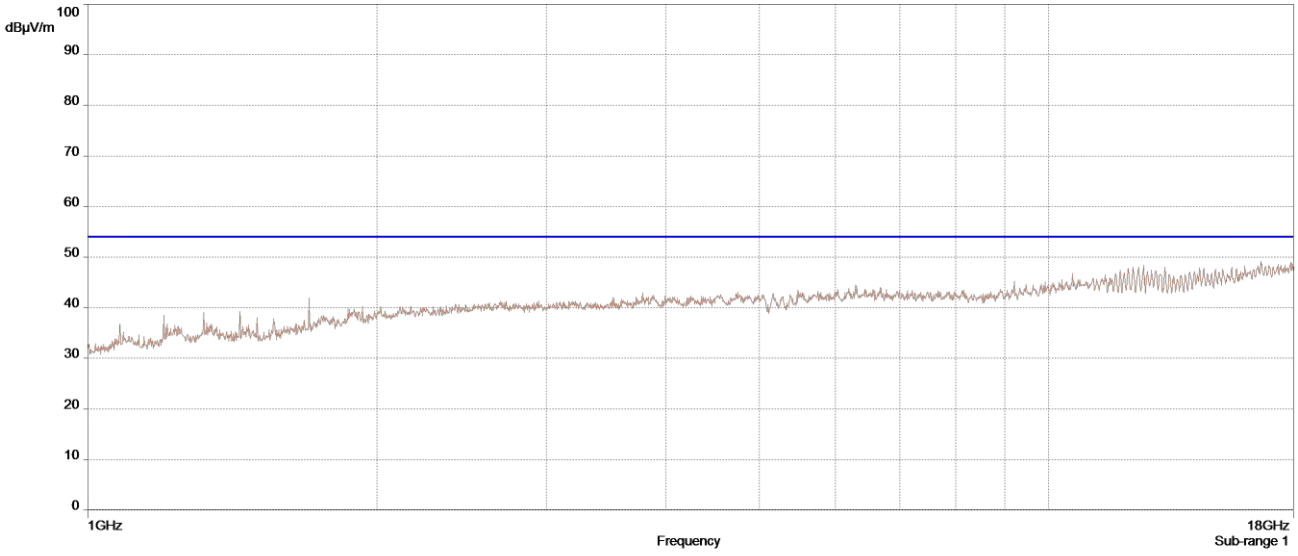
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 High Channel, n mode, Peak, Chain 0 (Worst Case Pol)



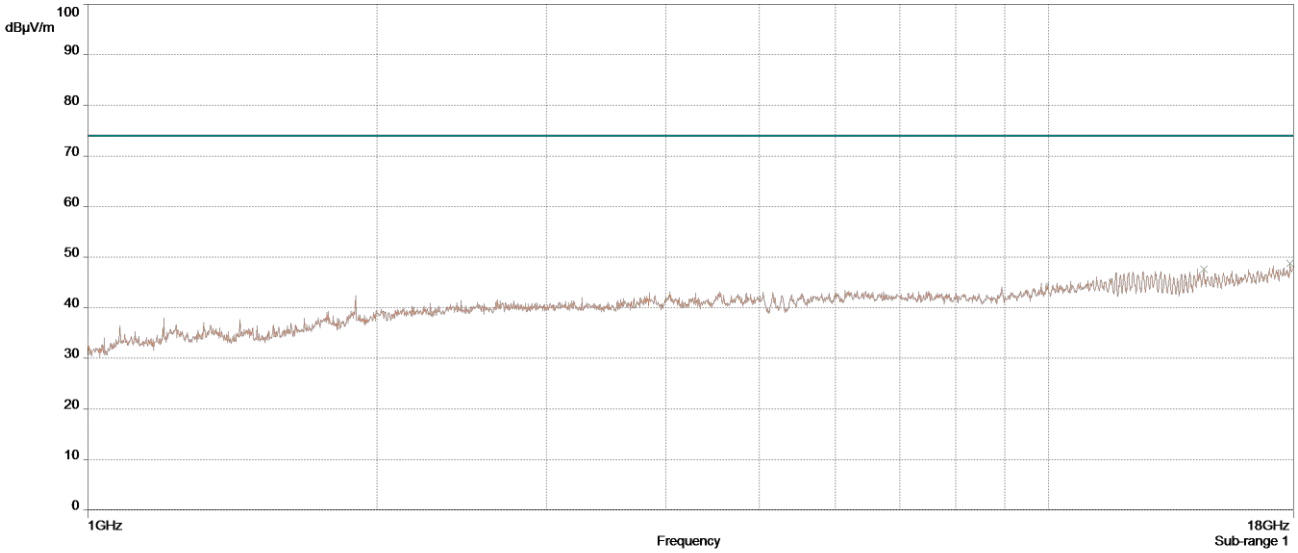
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 High Channel, n mode, Peak, Chain 1 (Worst Case Pol)



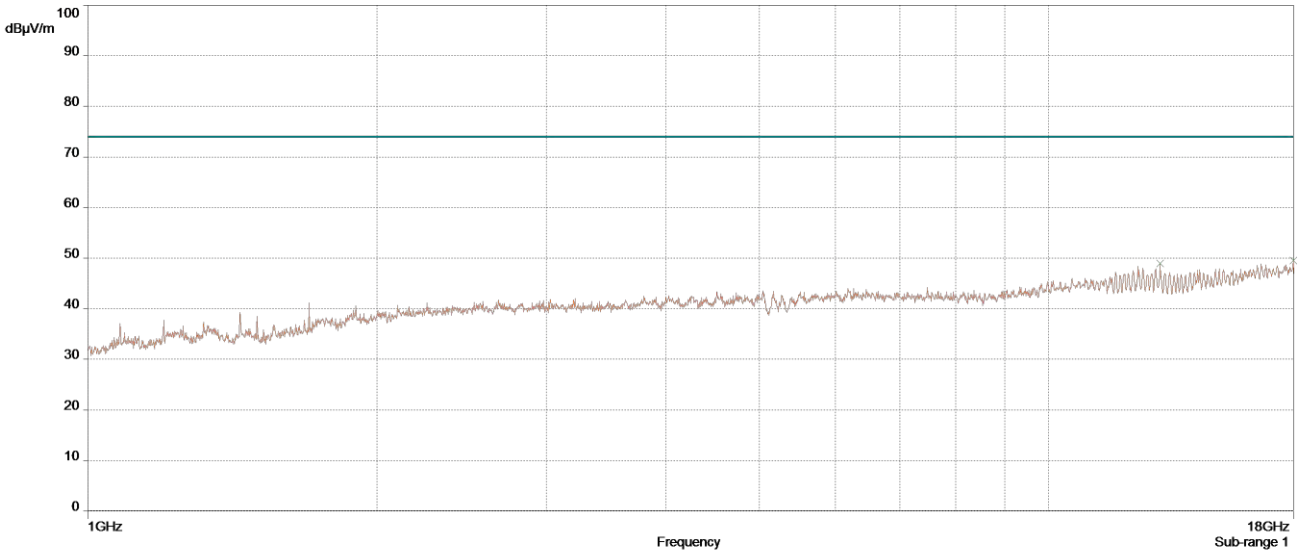
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Low Channel, a mode, Average, Chain 0 (Worst Case Pol)



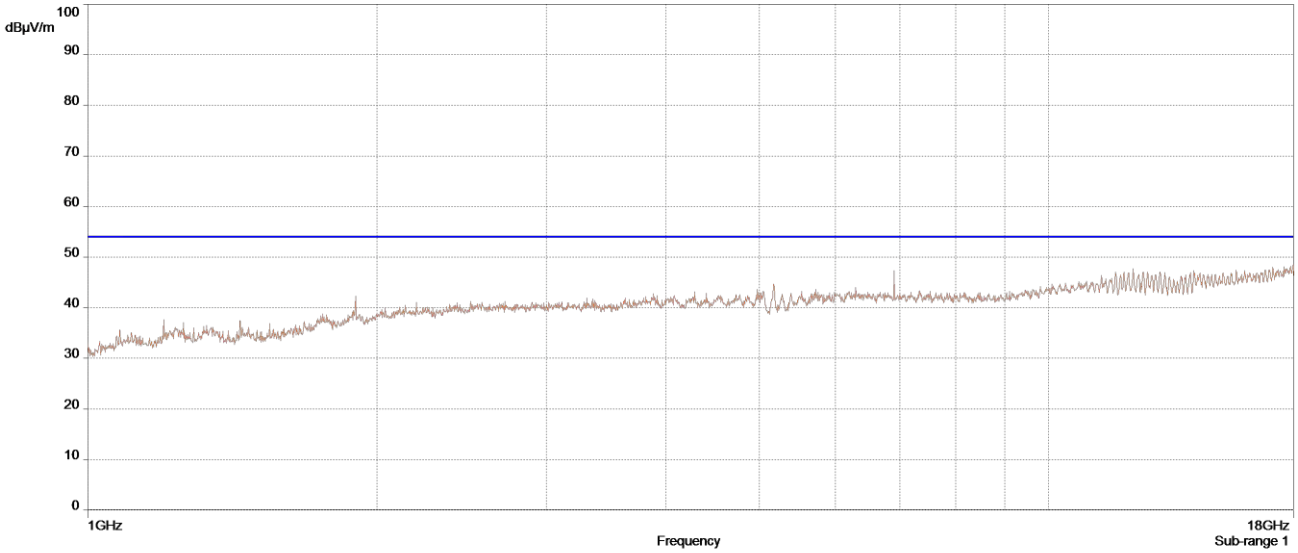
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Low Channel, a mode, Average, Chain 1 (Worst Case Pol)



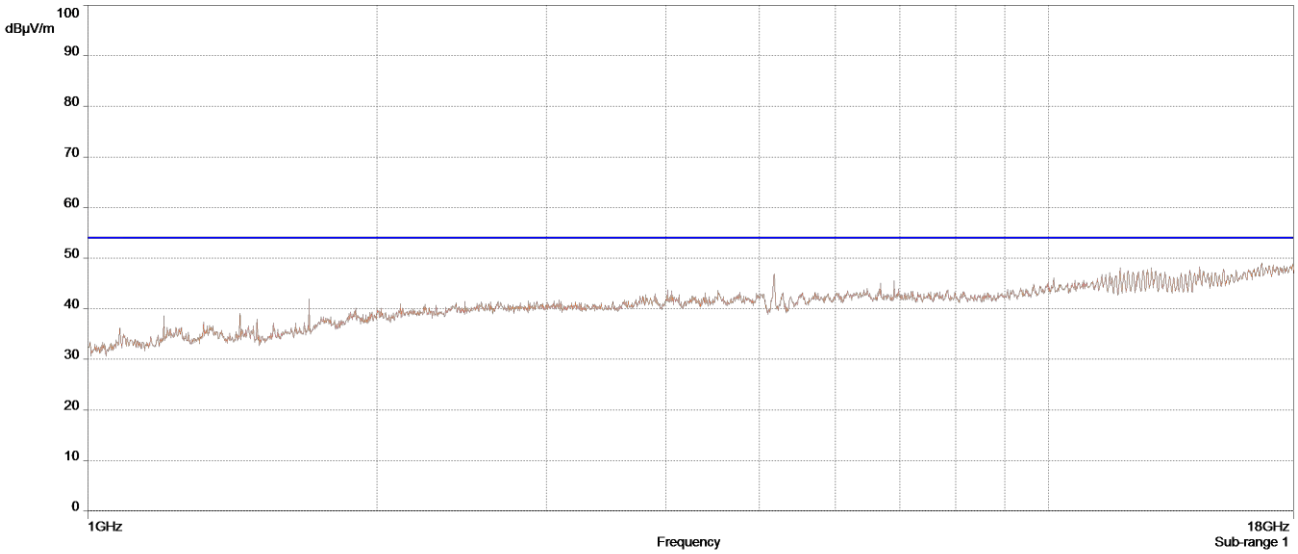
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Low Channel, a mode, Peak, Chain 0 (Worst Case Pol)



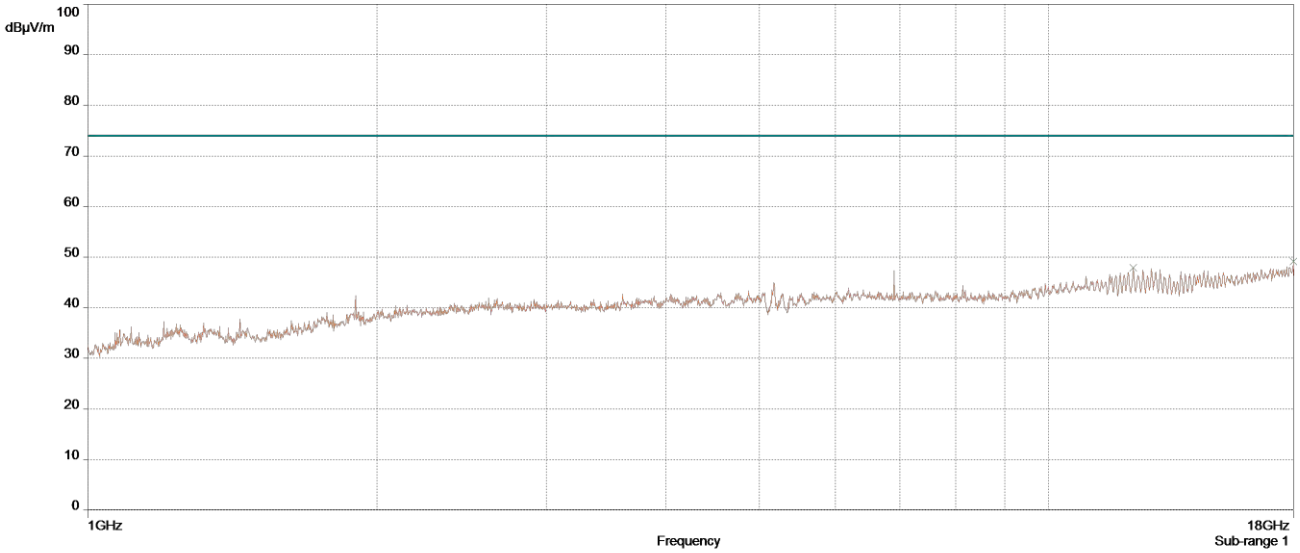
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Low Channel, a mode, Peak, Chain 1 (Worst Case Pol)



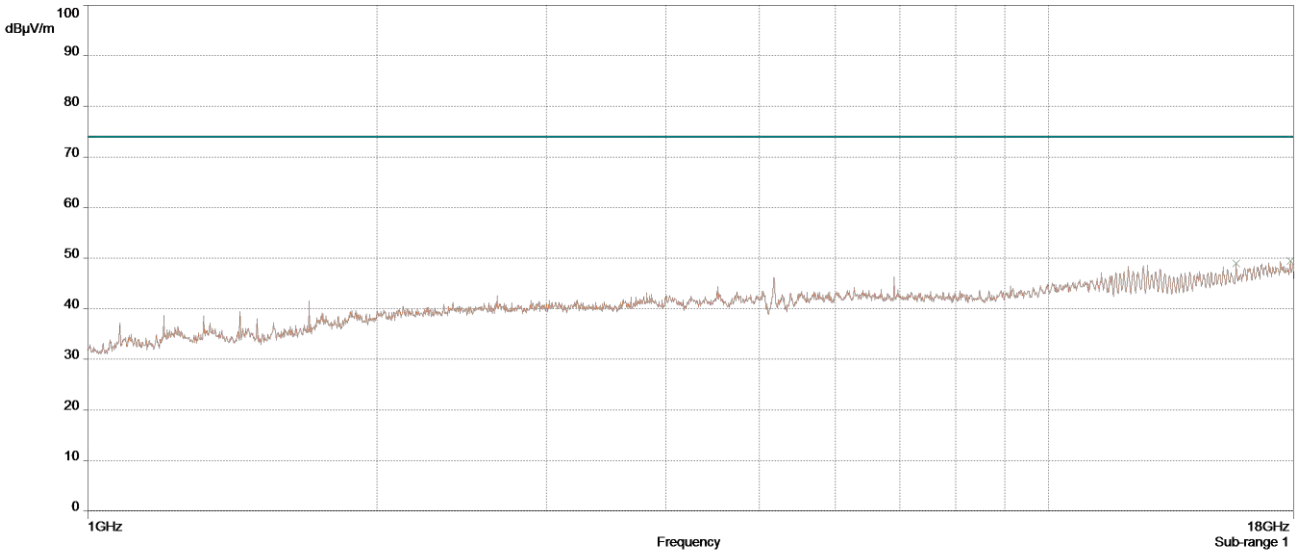
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Low Channel, n mode, Average, Chain 0 (Worst Case Pol)



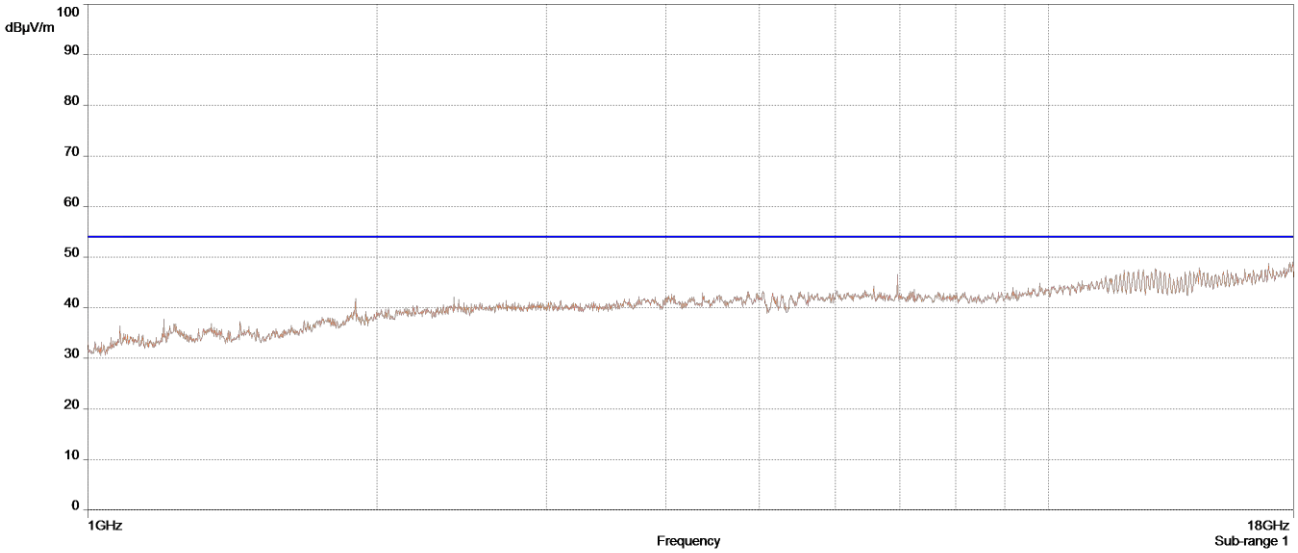
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Low Channel, n mode, Average, Chain 1 (Worst Case Pol)



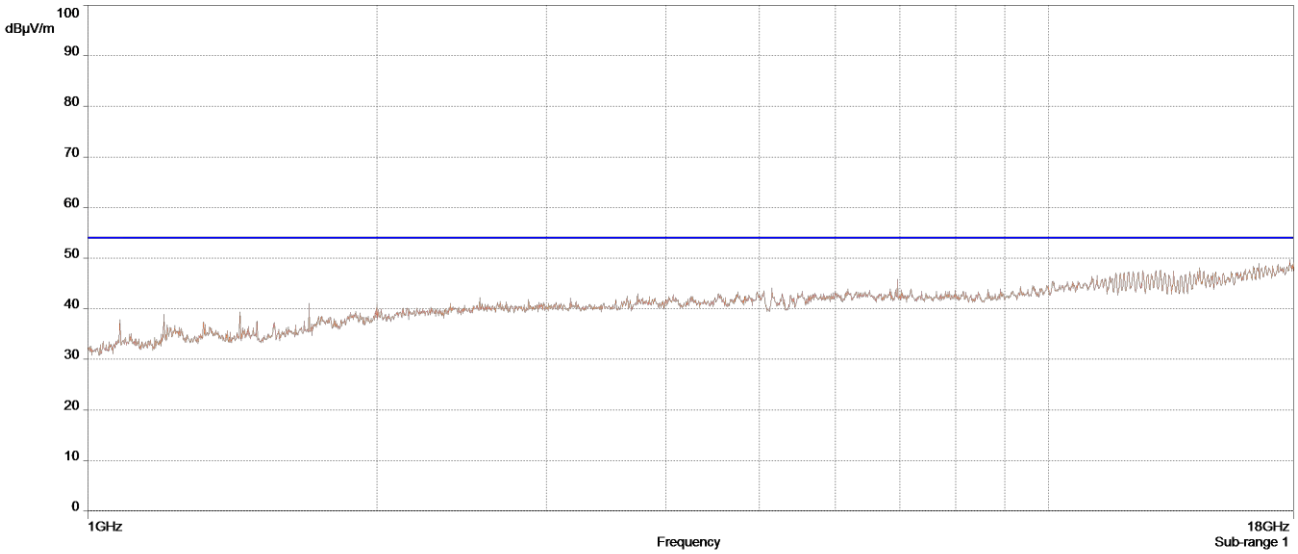
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Low Channel, n mode, Peak, Chain 0 (Worst Case Pol)



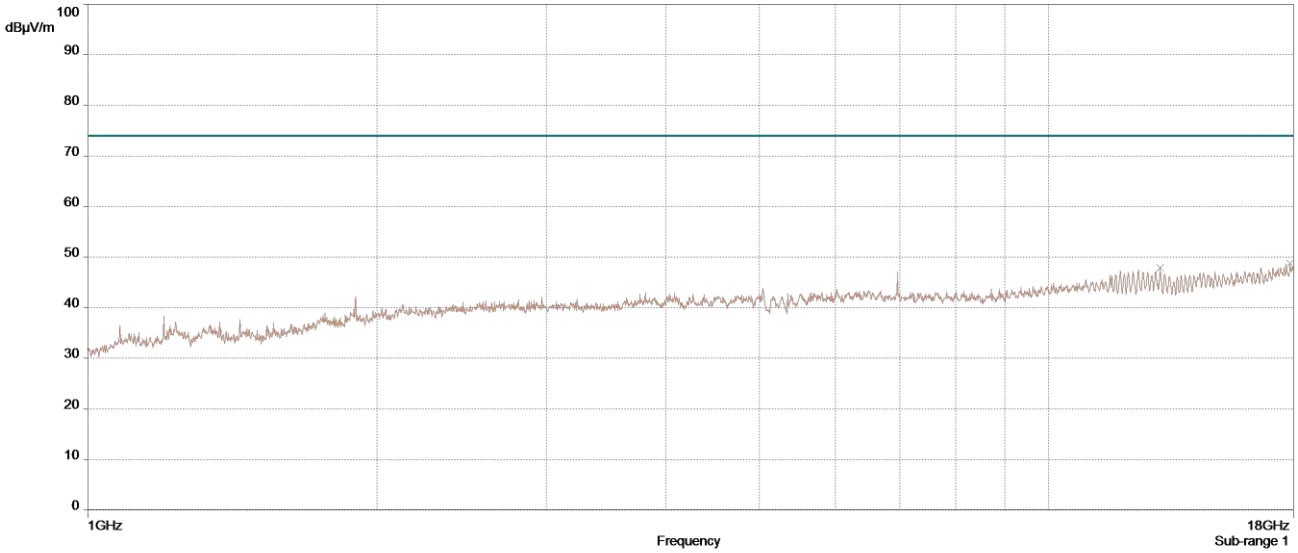
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Low Channel, n mode, Peak, Chain 1 (Worst Case Pol)



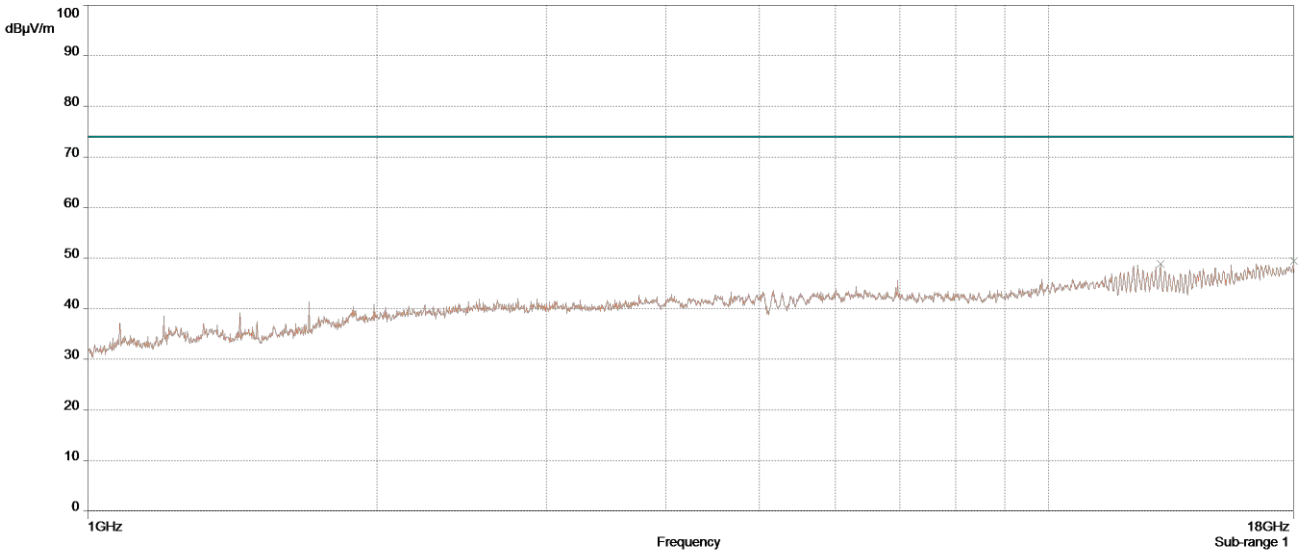
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Mid Channel, a mode, Average, Chain 0 (Worst Case Pol)



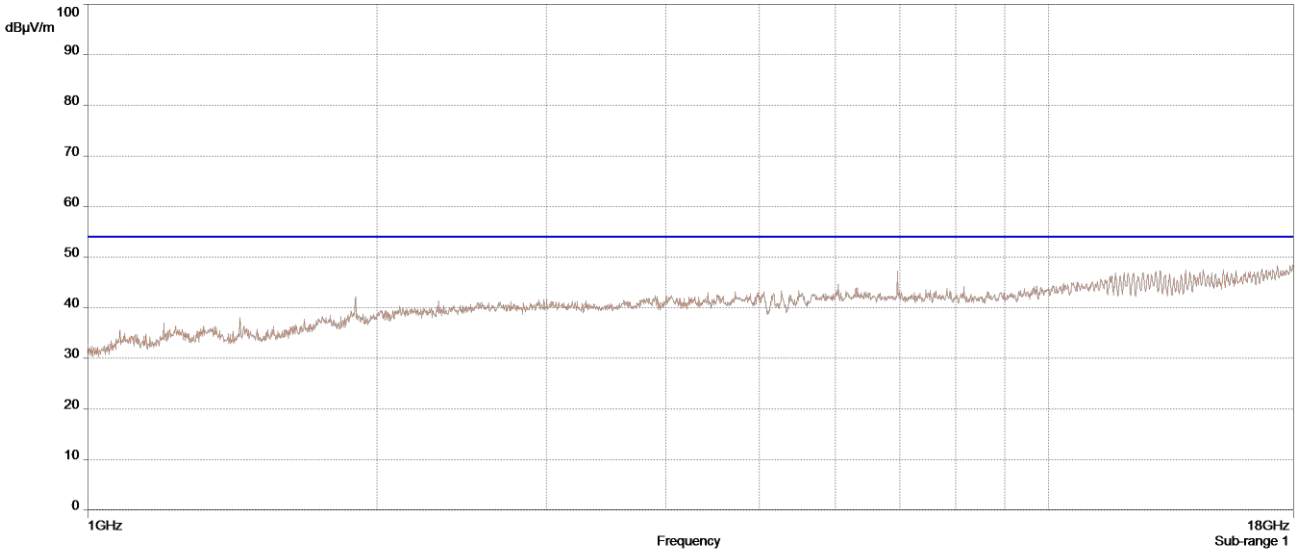
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Mid Channel, a mode, Average, Chain 1 (Worst Case Pol)



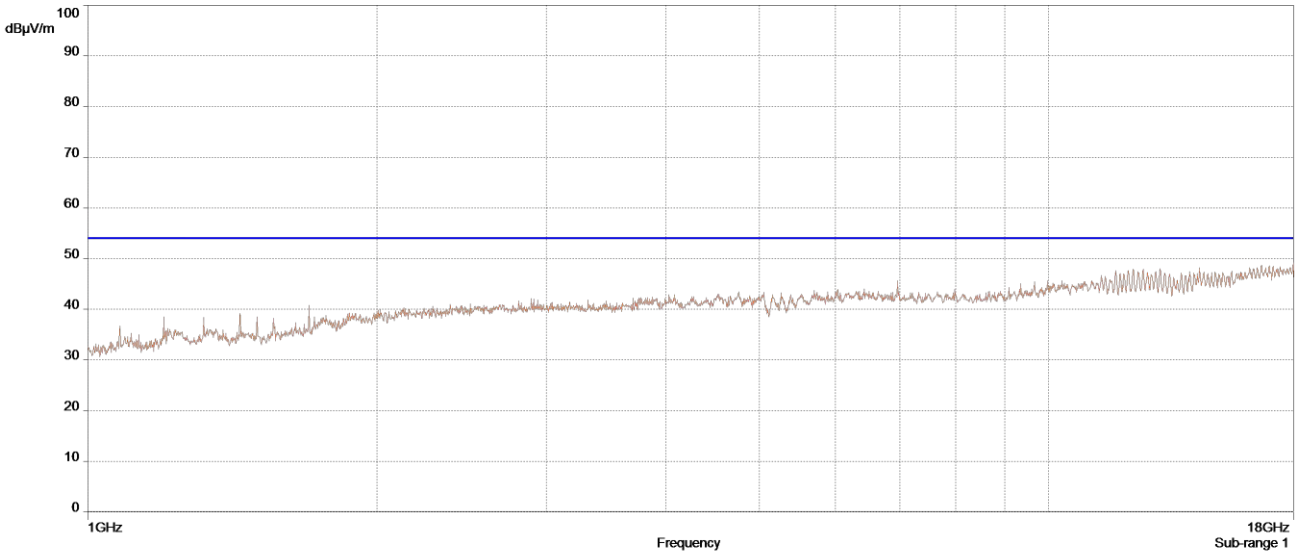
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Mid Channel, a mode, Peak, Chain 0 (Worst Case Pol)



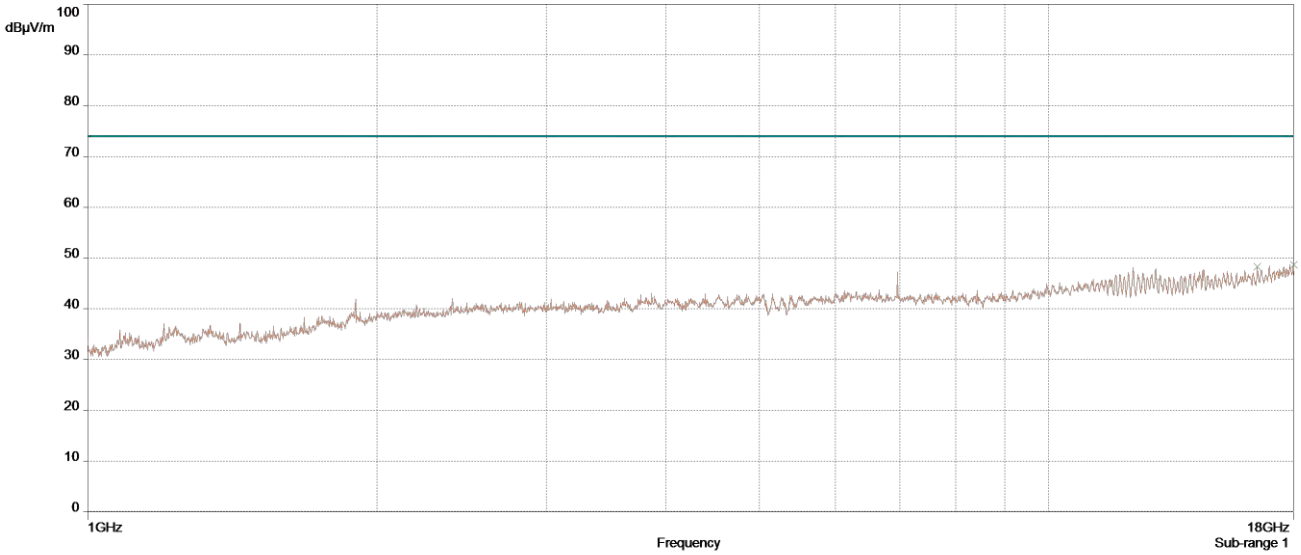
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Mid Channel, a mode, Peak, Chain 1 (Worst Case Pol)



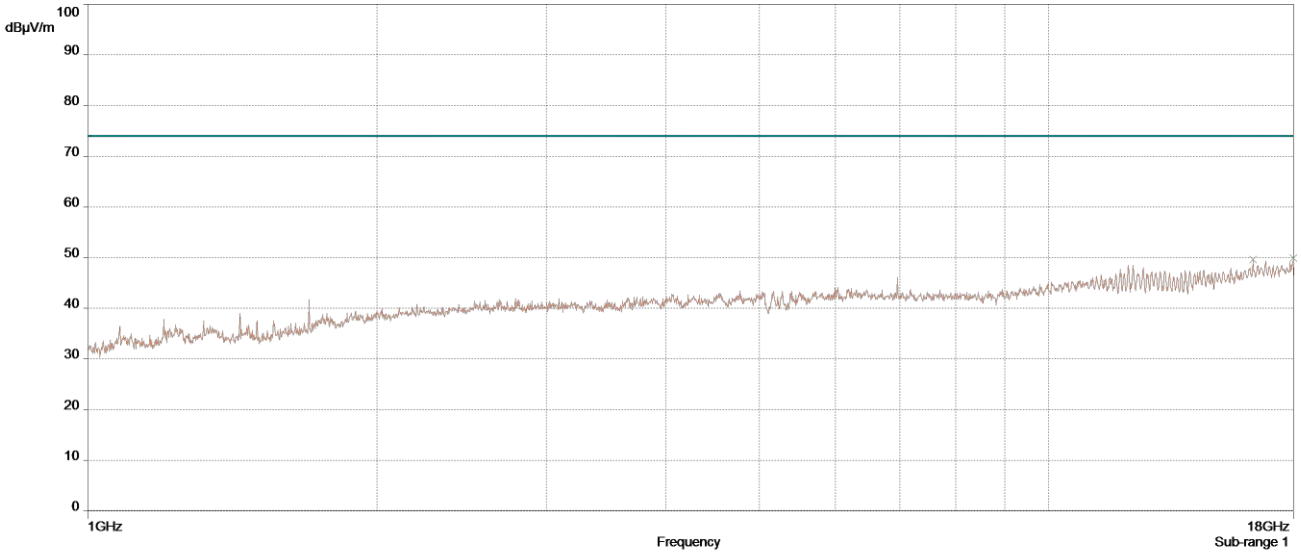
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Mid Channel, n mode, Average, Chain 0 (Worst Case Pol)



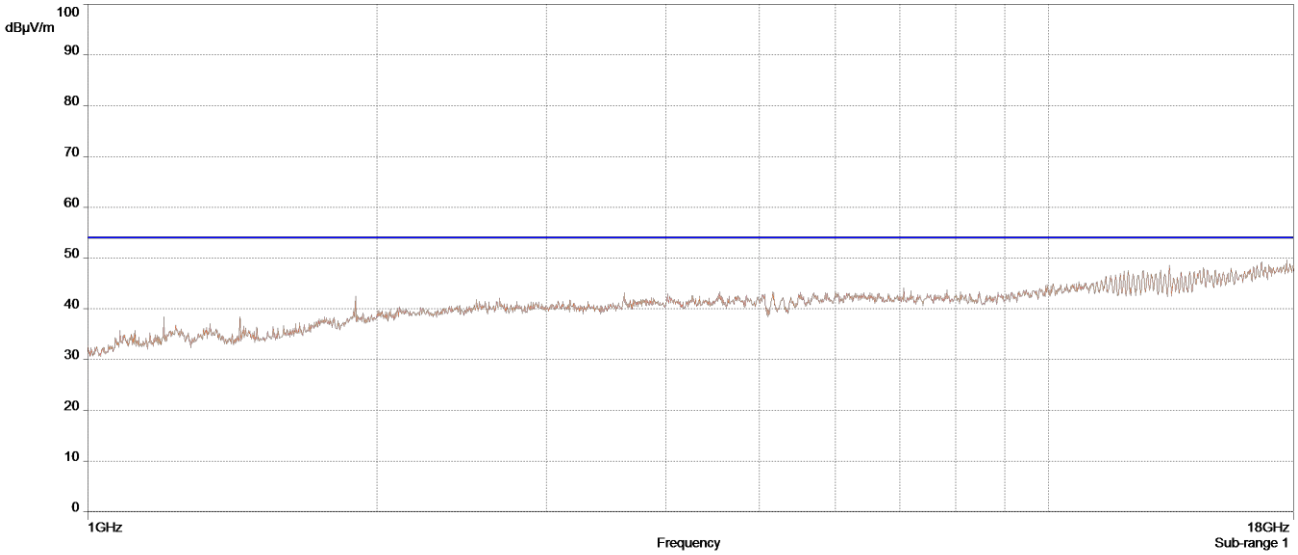
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Mid Channel, n mode, Average, Chain 1 (Worst Case Pol)



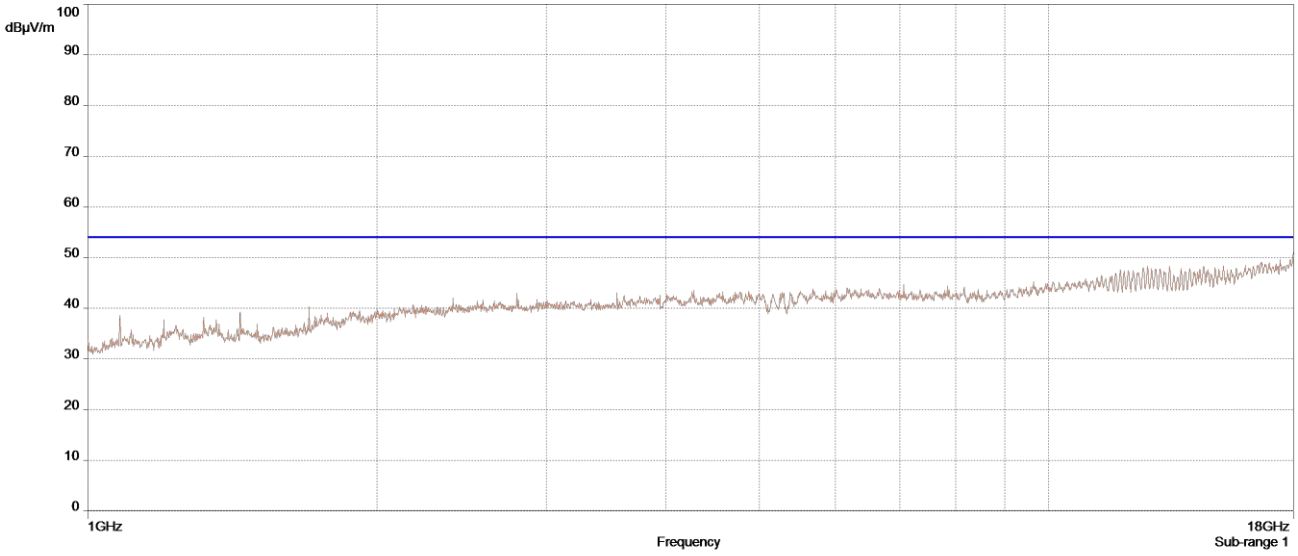
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Mid Channel, n mode, Peak, Chain 0 (Worst Case Pol)



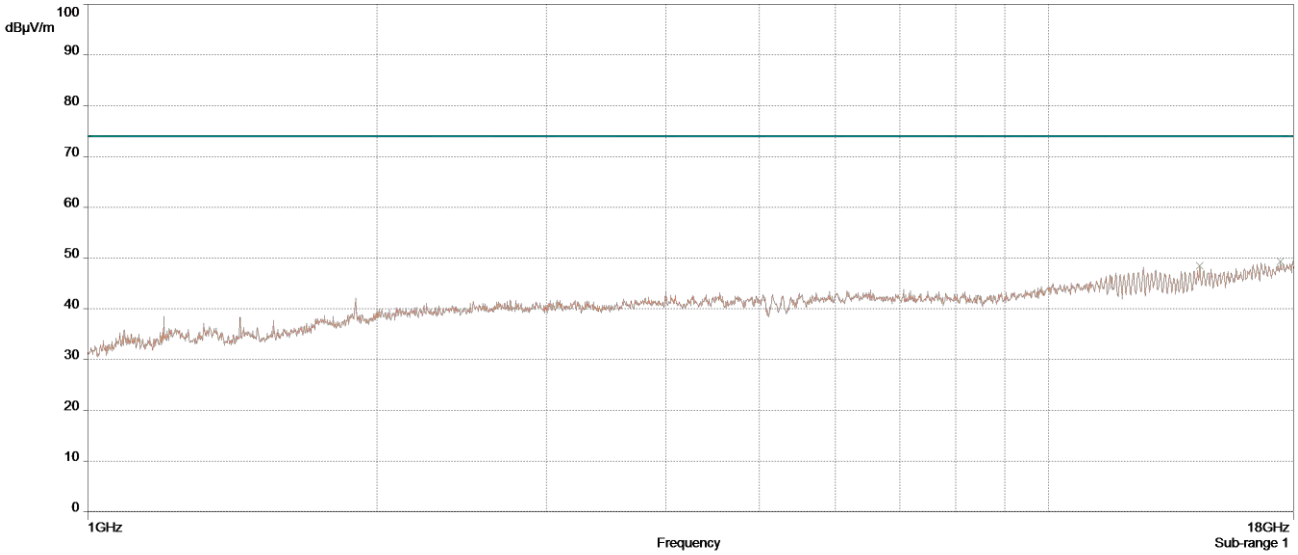
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-1 Mid Channel, n mode, Peak, Chain 1 (Worst Case Pol)



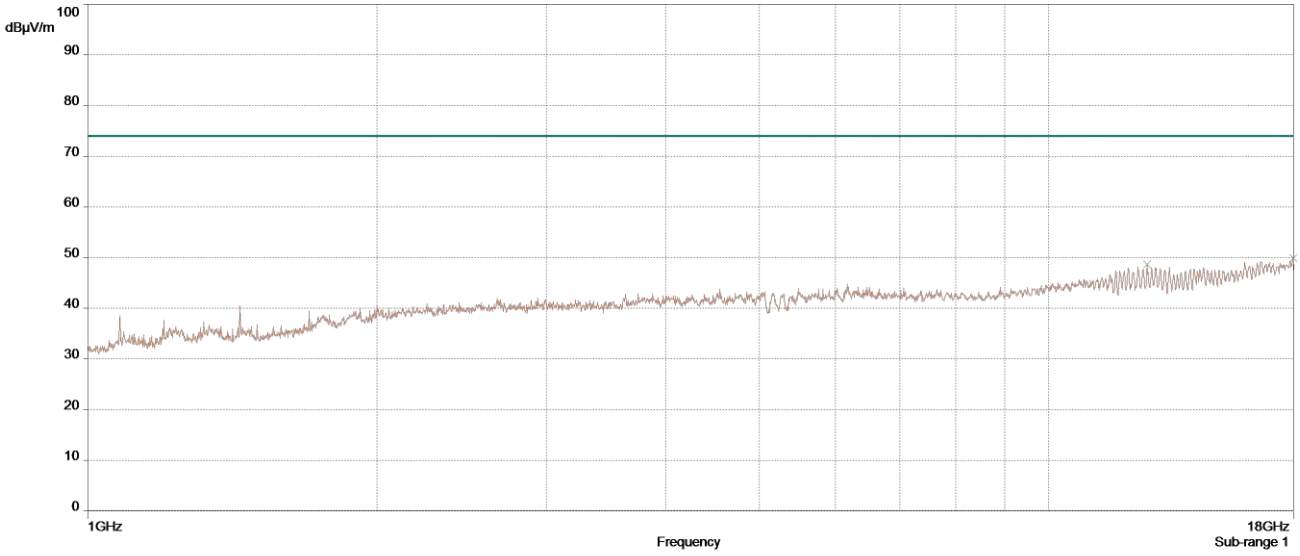
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 High Channel, a mode, Average, Chain 0 (Worst Case Pol)



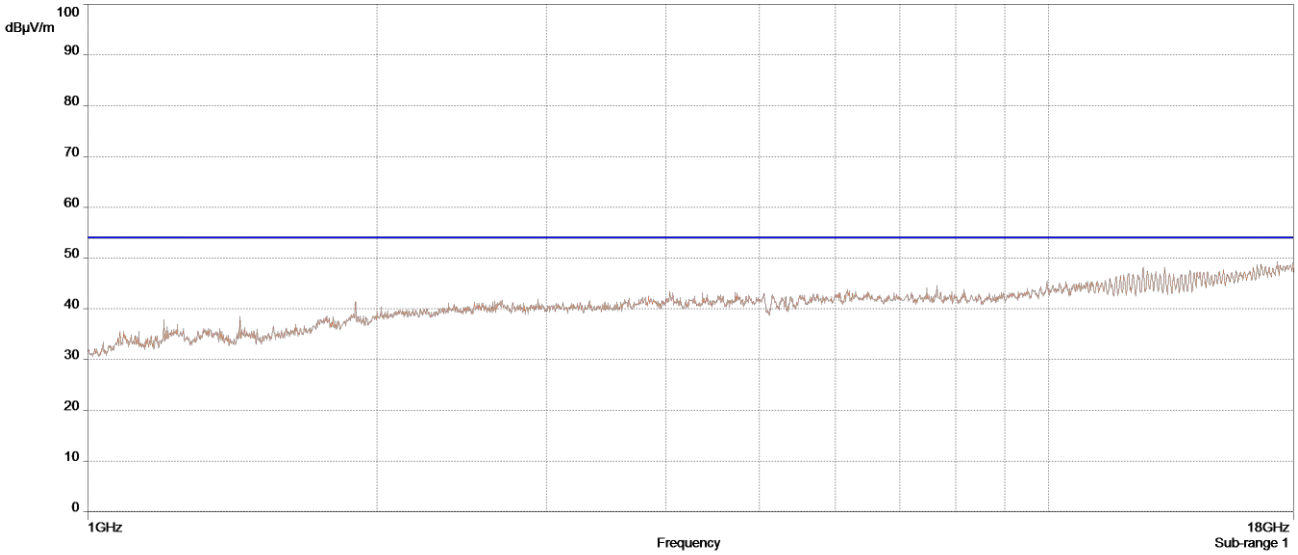
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 High Channel, a mode, Average, Chain 1 (Worst Case Pol)



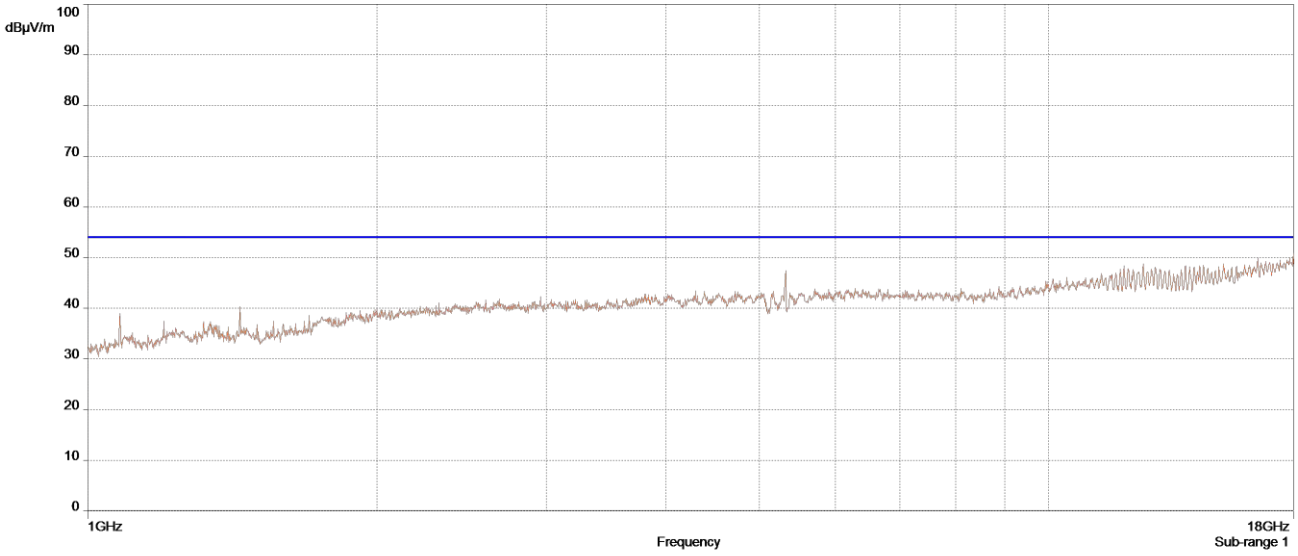
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 High Channel, a mode, Peak, Chain 0 (Worst Case Pol)



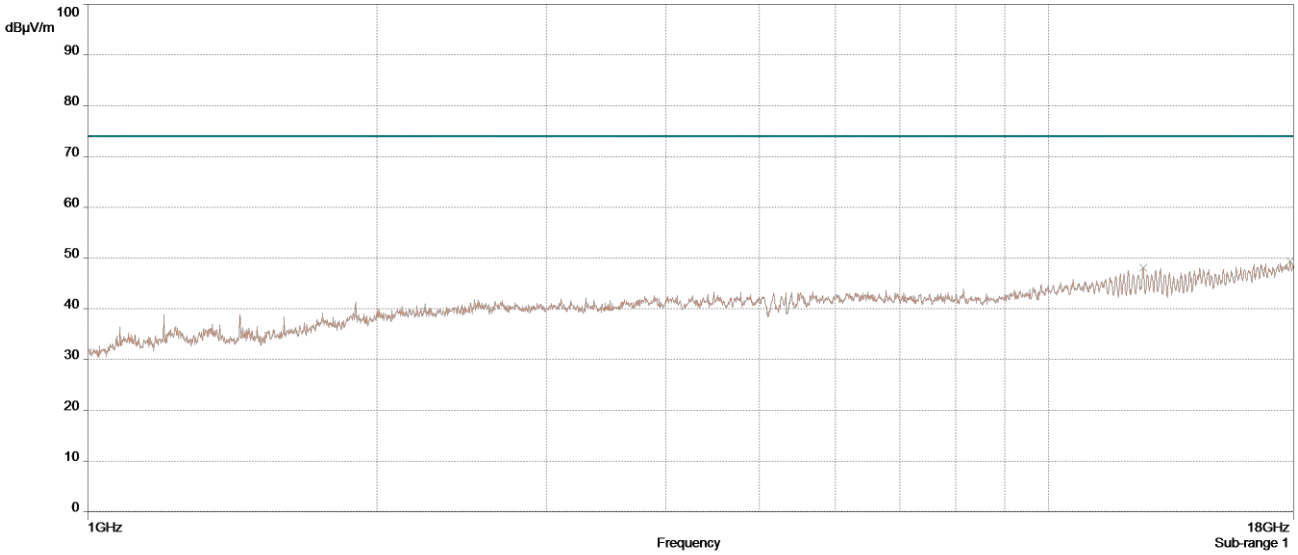
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 High Channel, a mode, Peak, Chain 1 (Worst Case Pol)



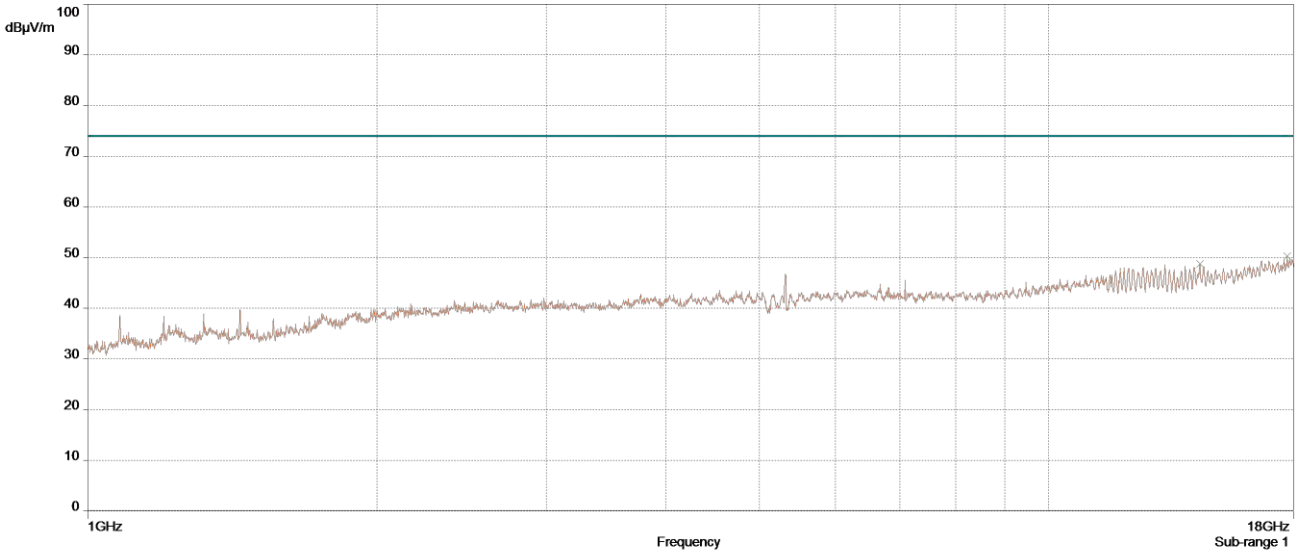
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 High Channel, n mode, Average, Chain 0 (Worst Case Pol)



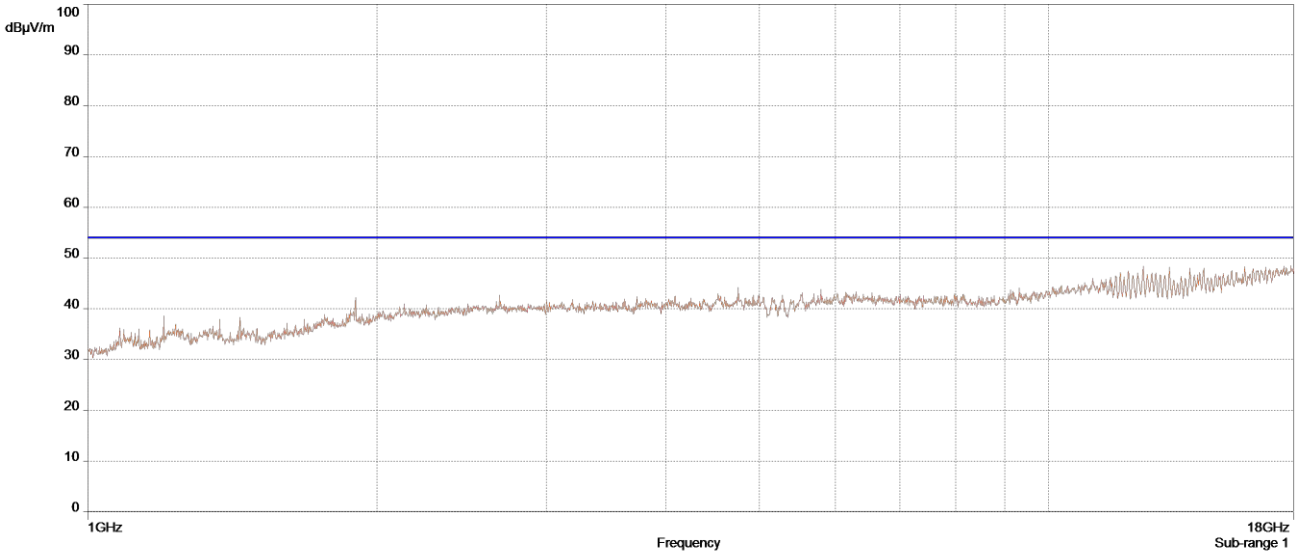
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 High Channel, n mode, Average, Chain 1 (Worst Case Pol)



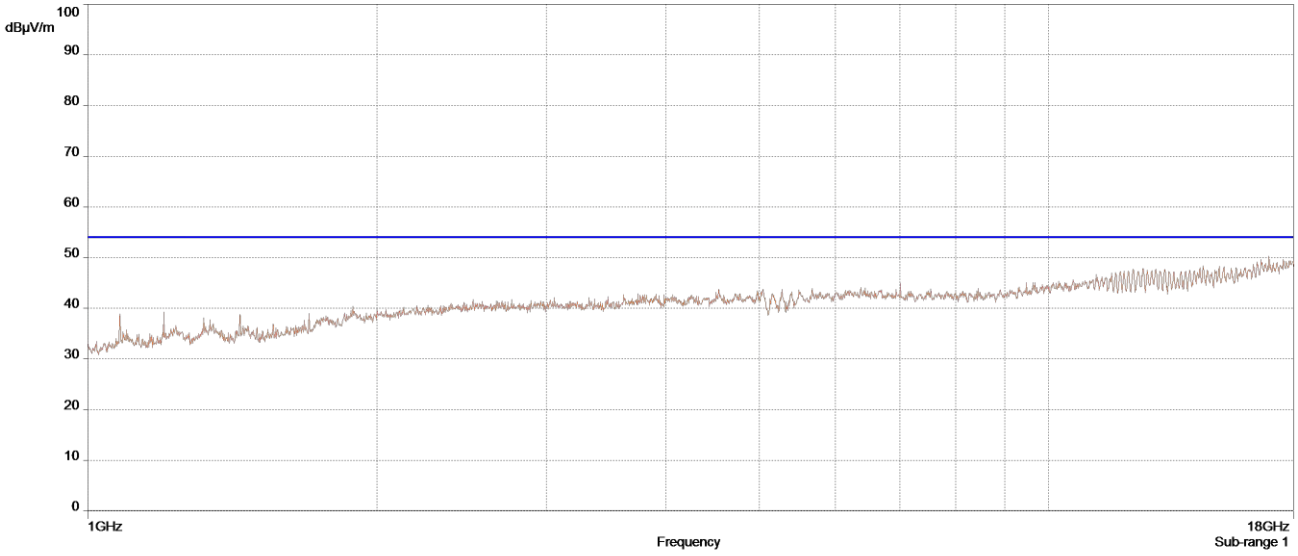
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 High Channel, n mode, Peak, Chain 0 (Worst Case Pol)



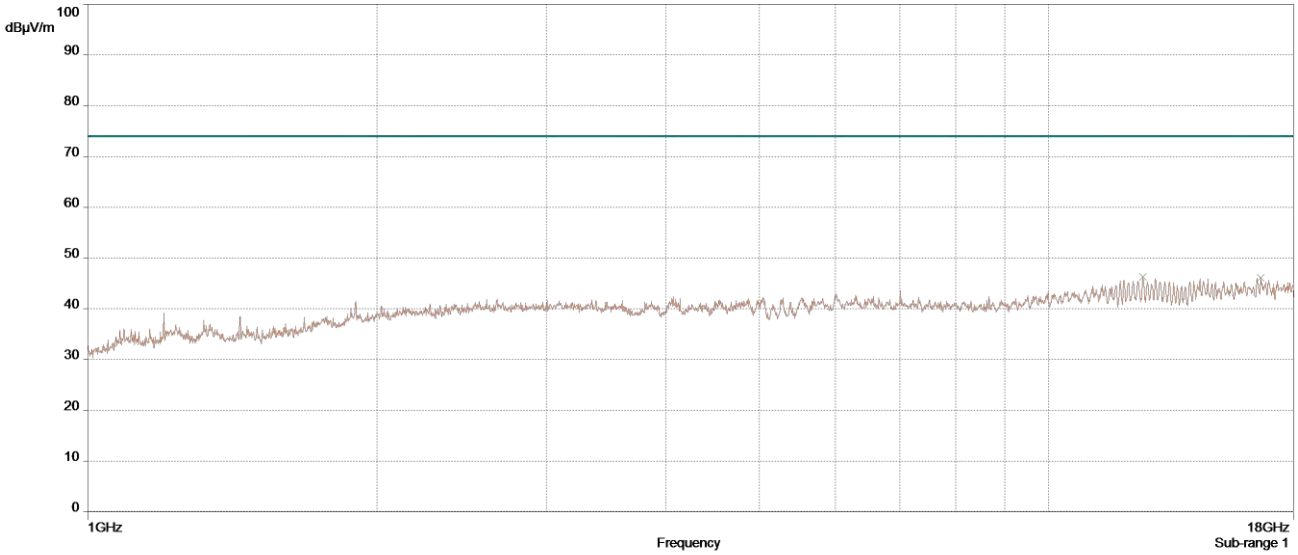
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 High Channel, n mode, Peak, Chain 1 (Worst Case Pol)



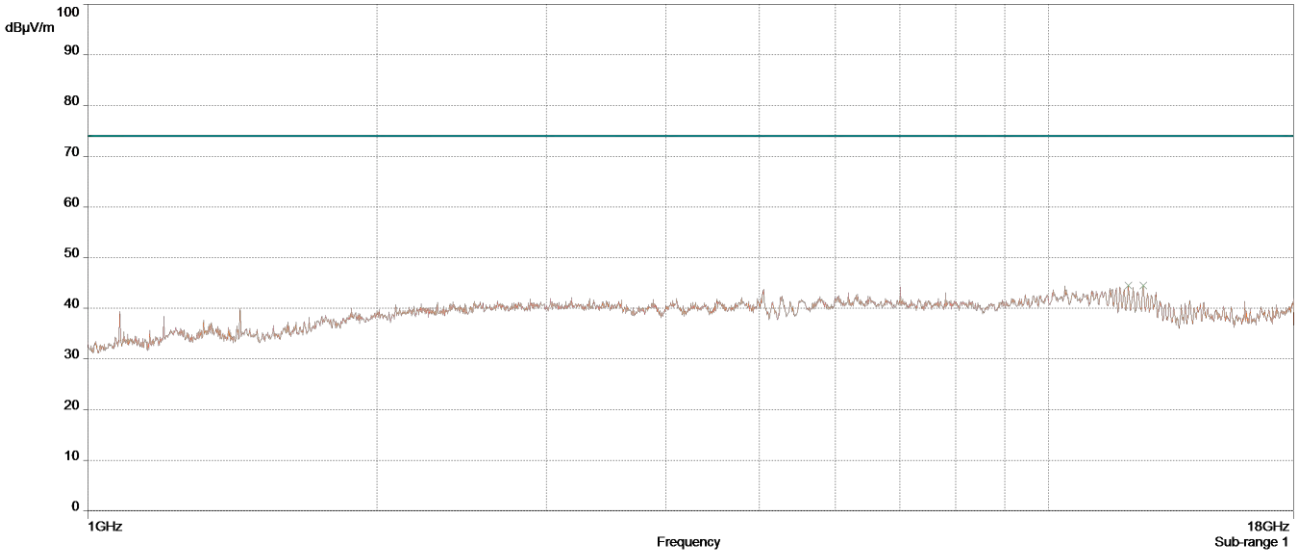
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Low Channel, a mode, Average, Chain 0 (Worst Case Pol)



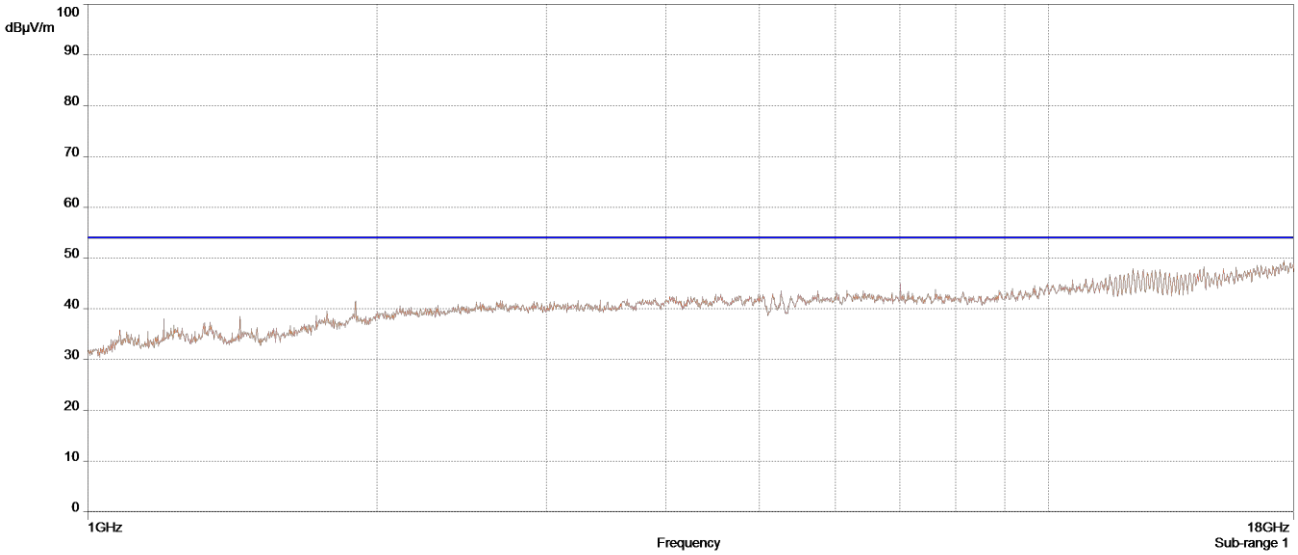
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Low Channel, a mode, Average, Chain 1 (Worst Case Pol)



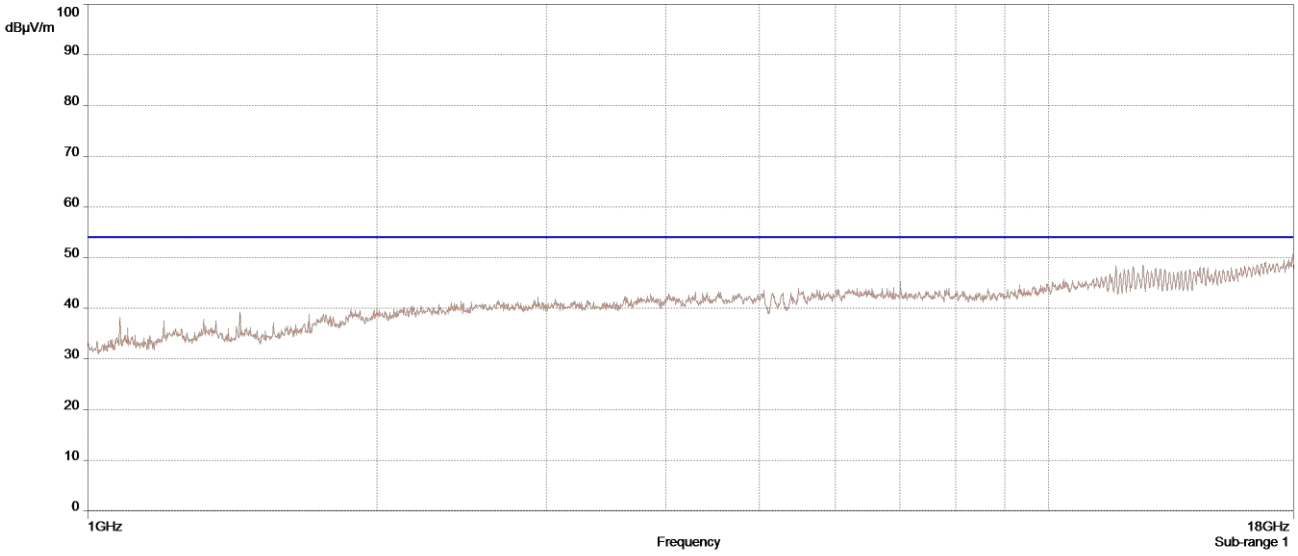
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Low Channel, a mode, Peak, Chain 0 (Worst Case Pol)



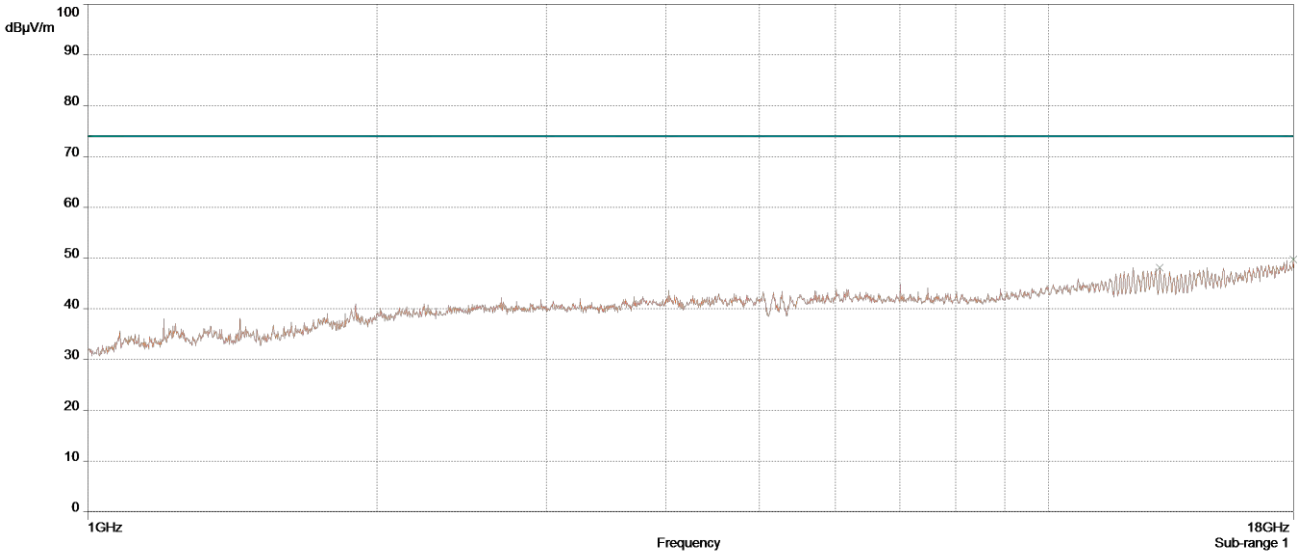
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Low Channel, a mode, Peak, Chain 1 (Worst Case Pol)



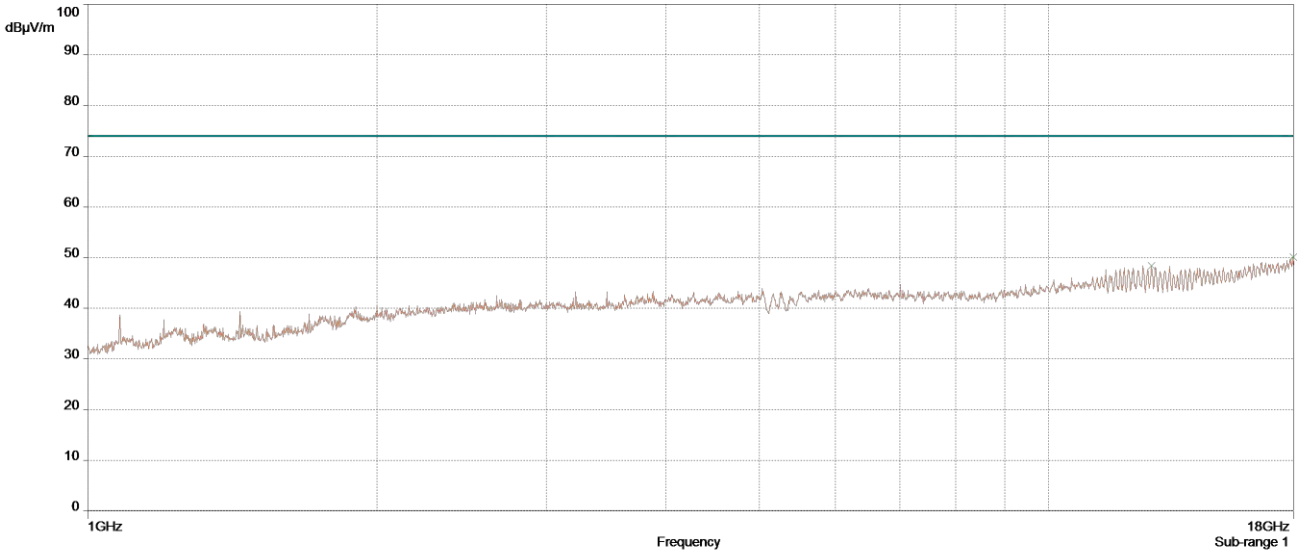
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Low Channel, n mode, Average, Chain 0 (Worst Case Pol)



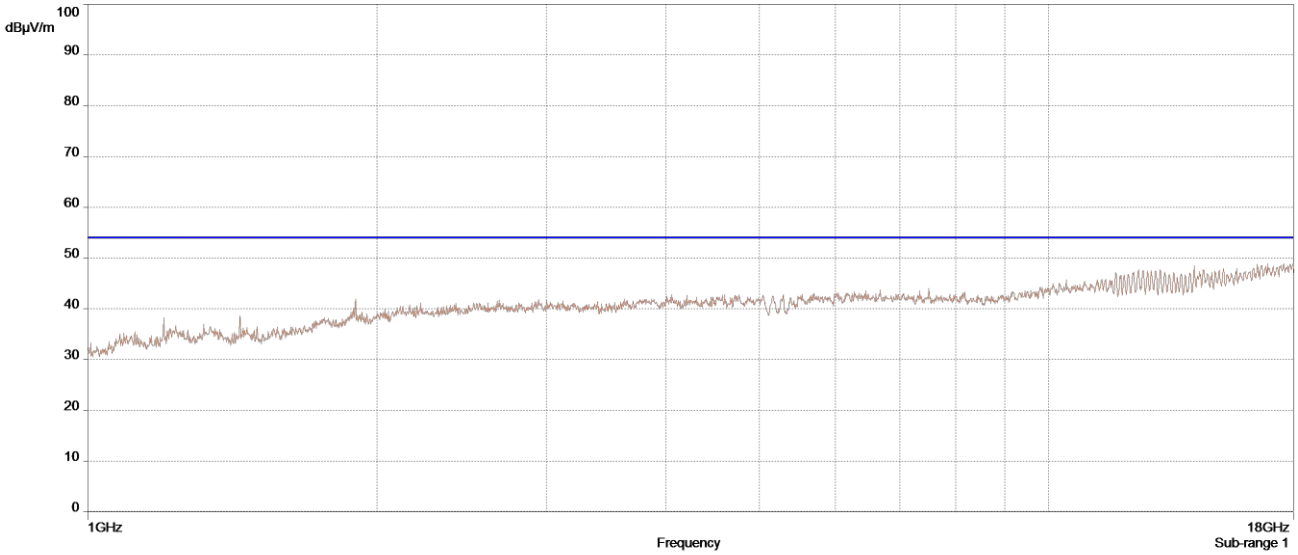
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Low Channel, n mode, Average, Chain 1 (Worst Case Pol)



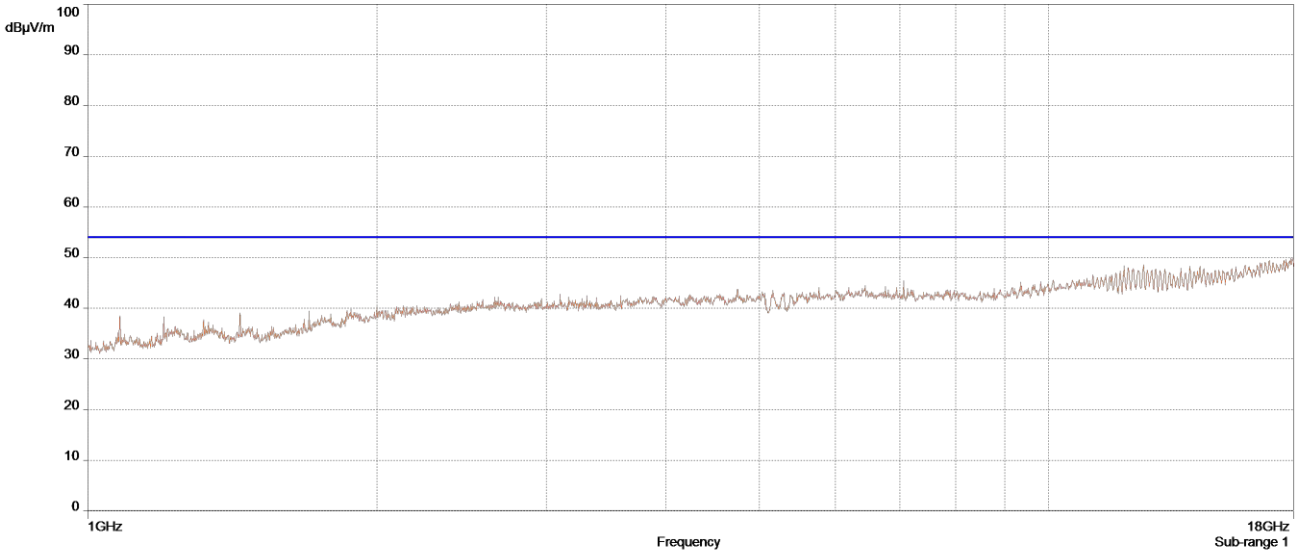
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Low Channel, n mode, Peak, Chain 0 (Worst Case Pol)



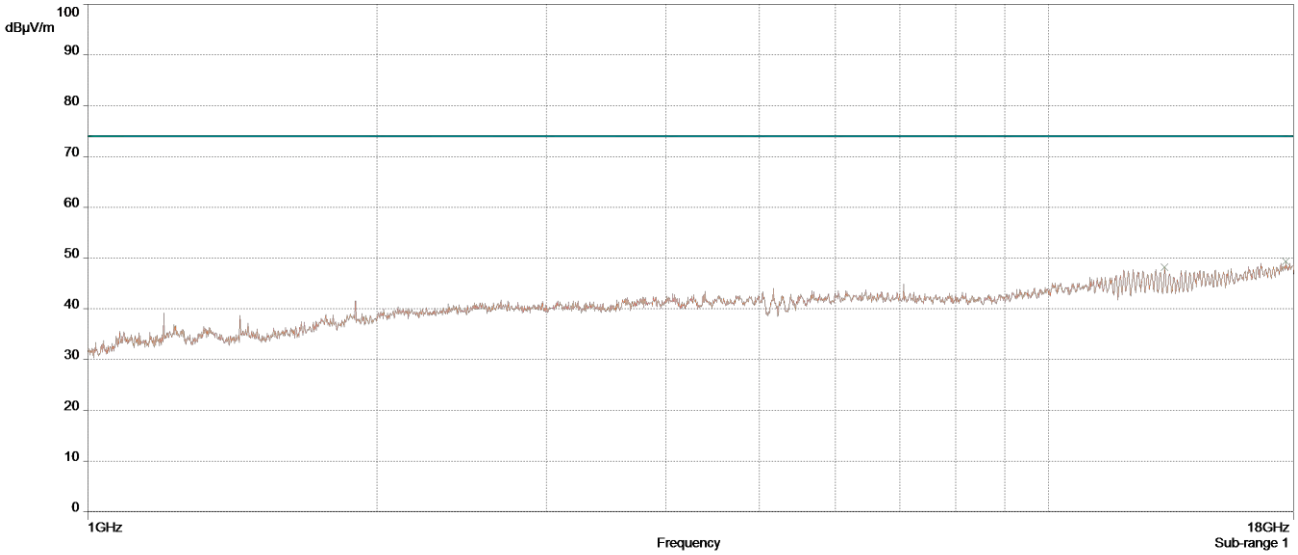
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Low Channel, n mode, Peak, Chain 1 (Worst Case Pol)



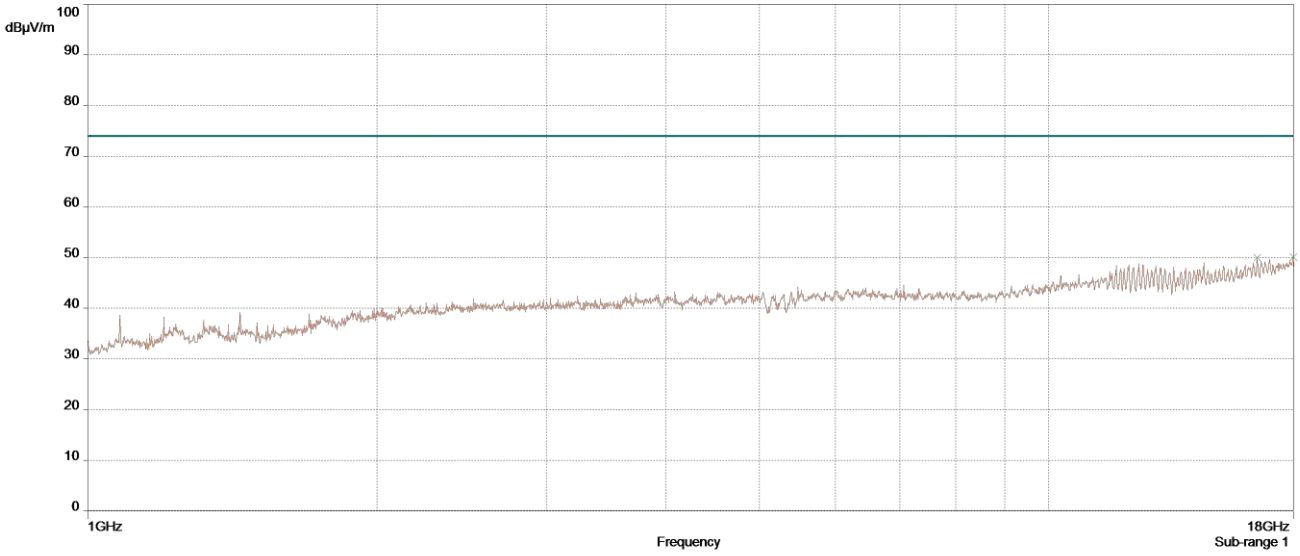
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Mid Channel, a mode, Average, Chain 0 (Worst Case Pol)



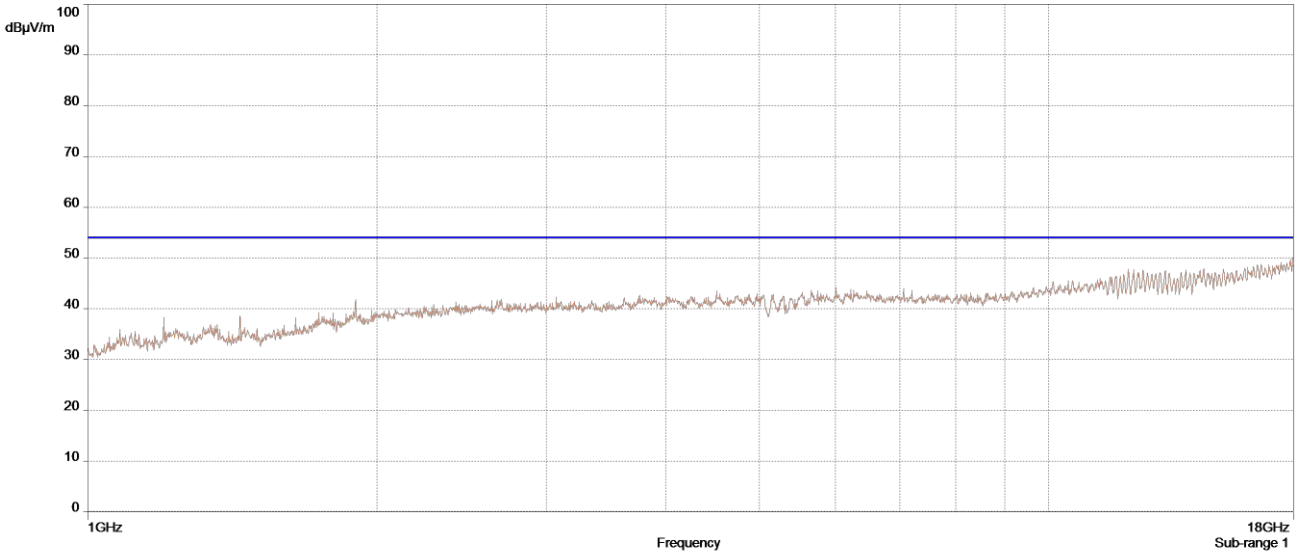
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Mid Channel, a mode, Average, Chain 1 (Worst Case Pol)



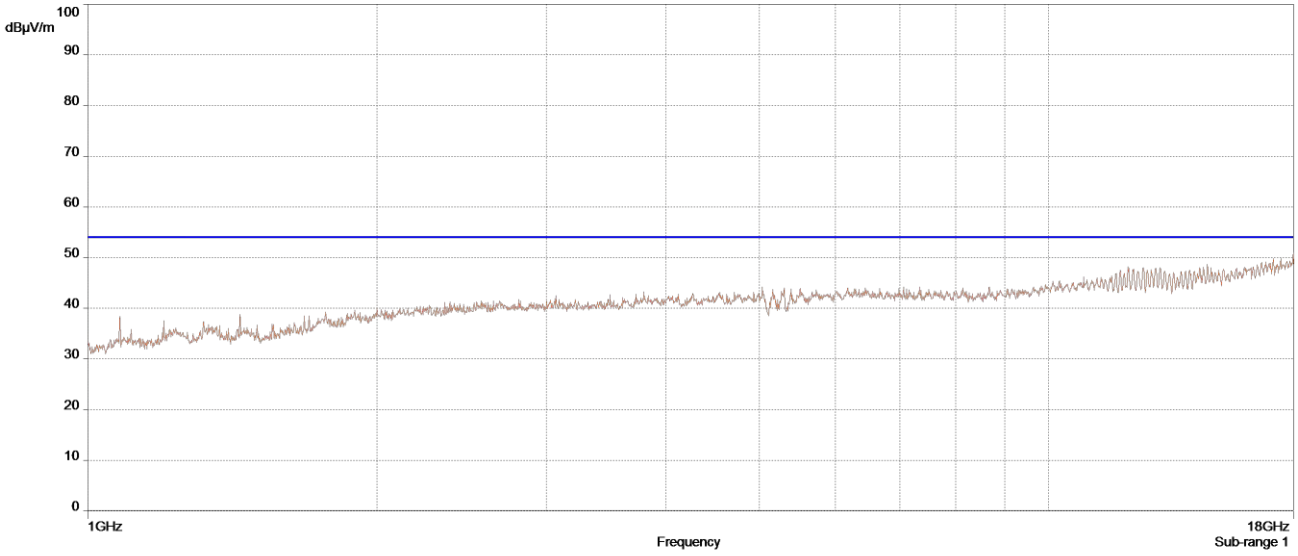
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Mid Channel, a mode, Peak, Chain 0 (Worst Case Pol)



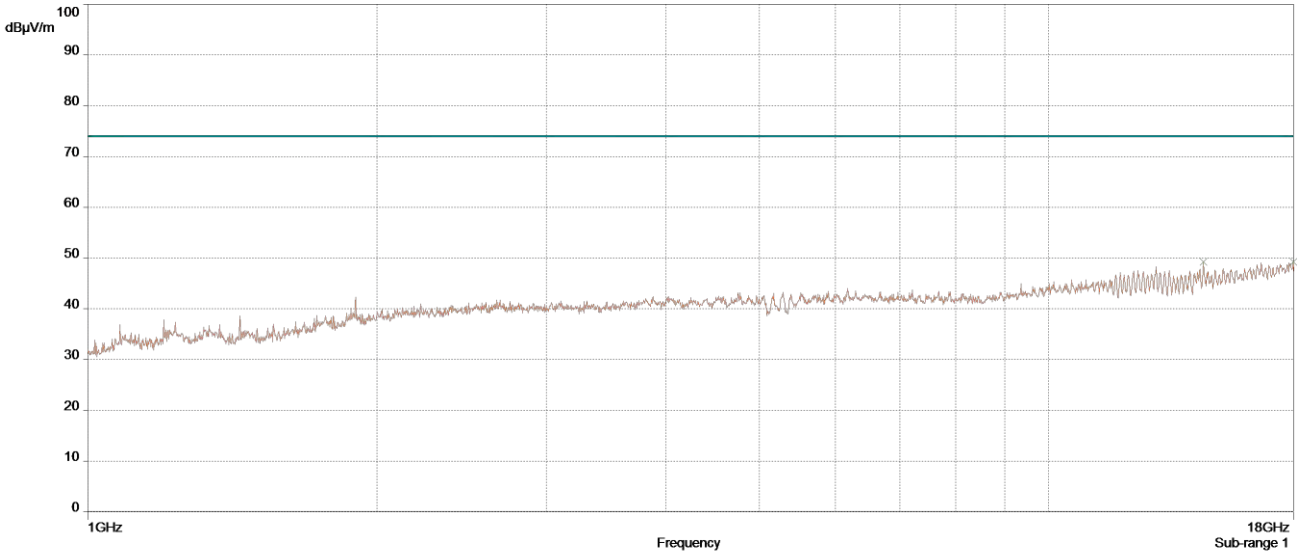
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Mid Channel, a mode, Peak, Chain 1 (Worst Case Pol)



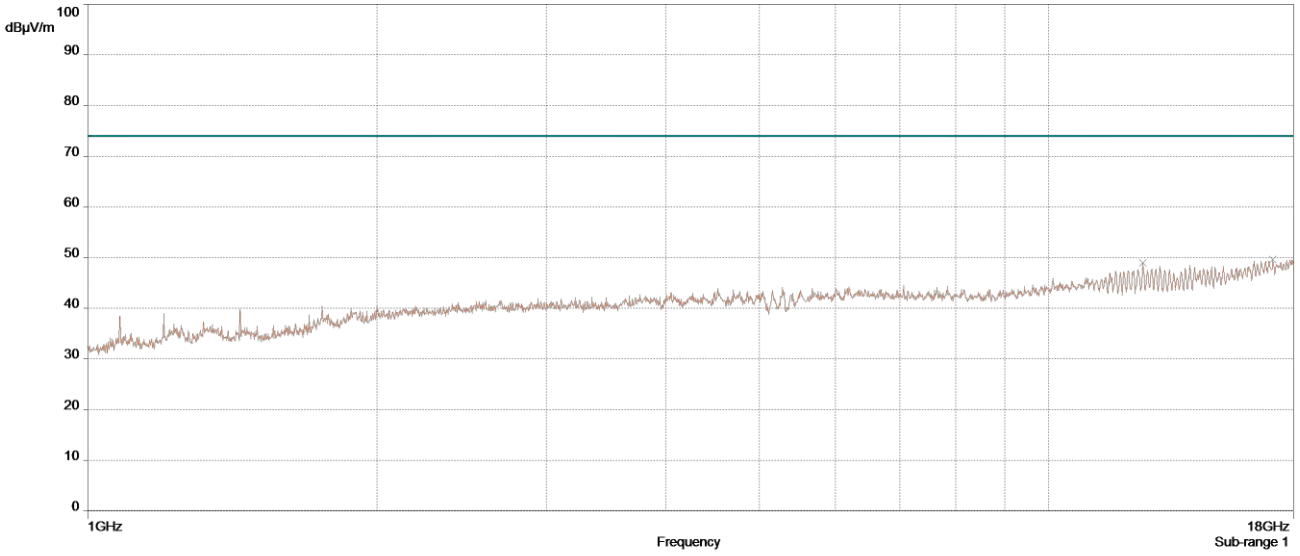
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Mid Channel, n mode, Average, Chain 0 (Worst Case Pol)



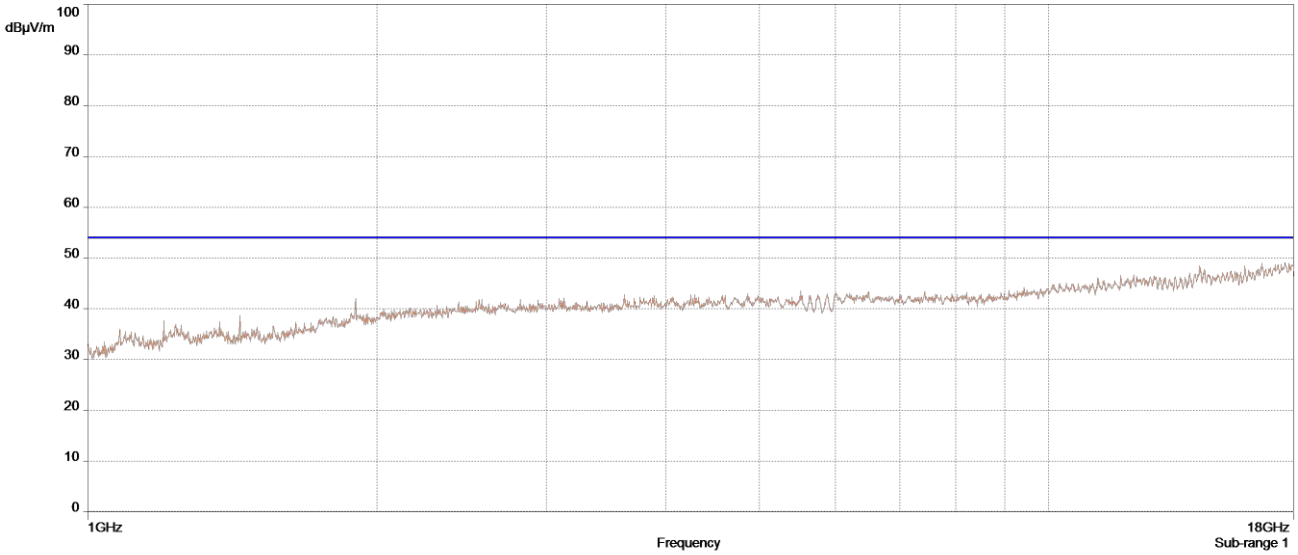
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Mid Channel, n mode, Average, Chain 1 (Worst Case Pol)



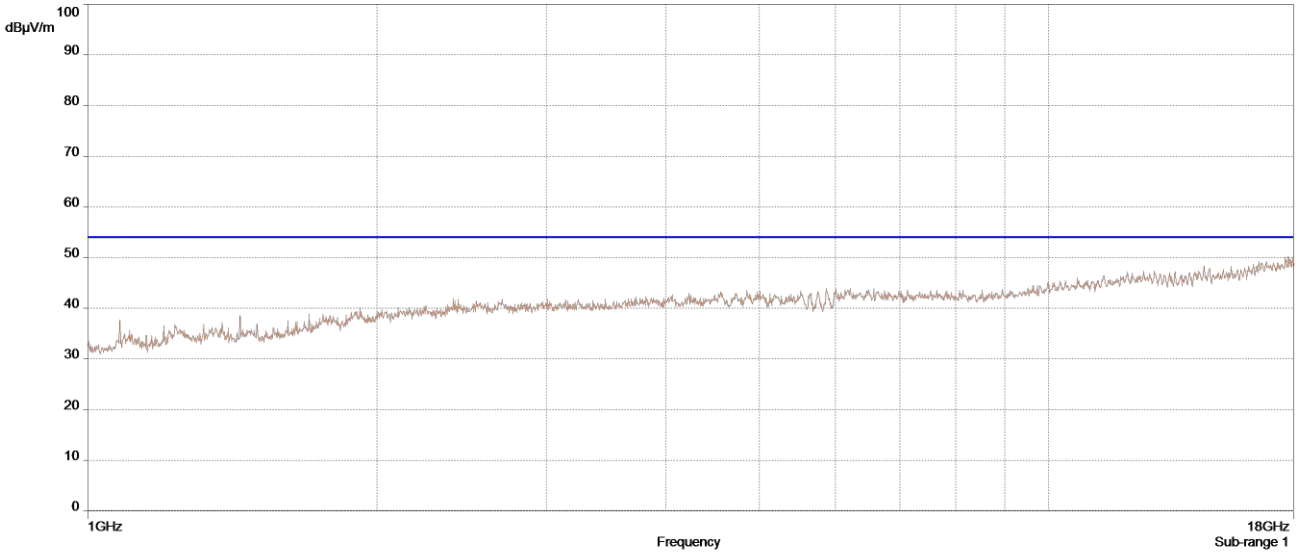
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Mid Channel, n mode, Peak, Chain 0 (Worst Case Pol)



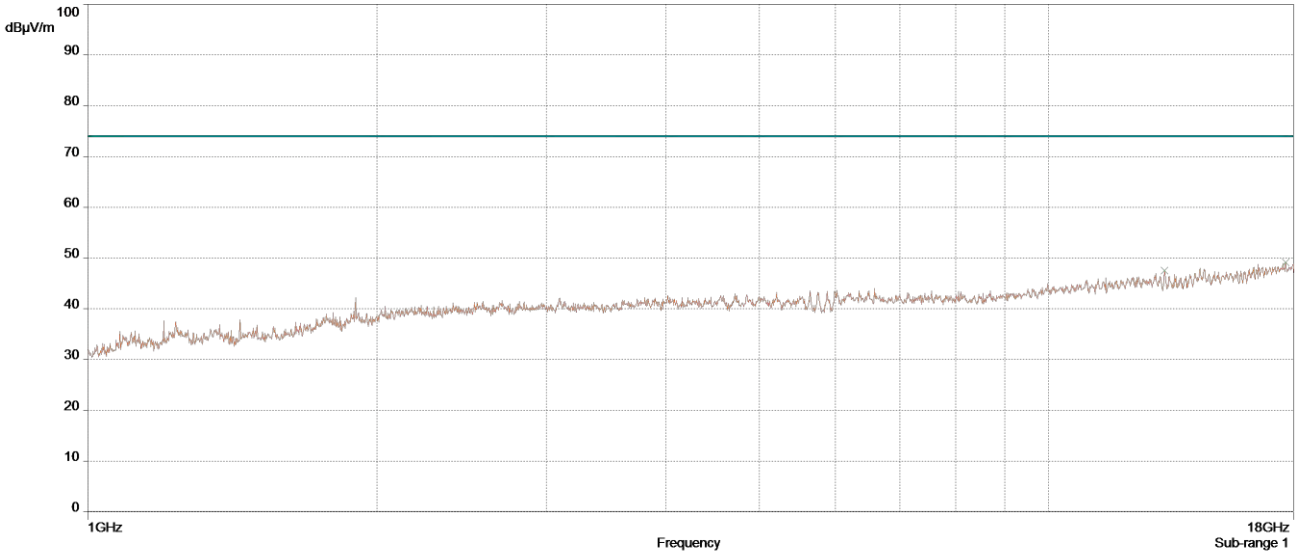
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-2 Mid Channel, n mode, Peak, Chain 1 (Worst Case Pol)



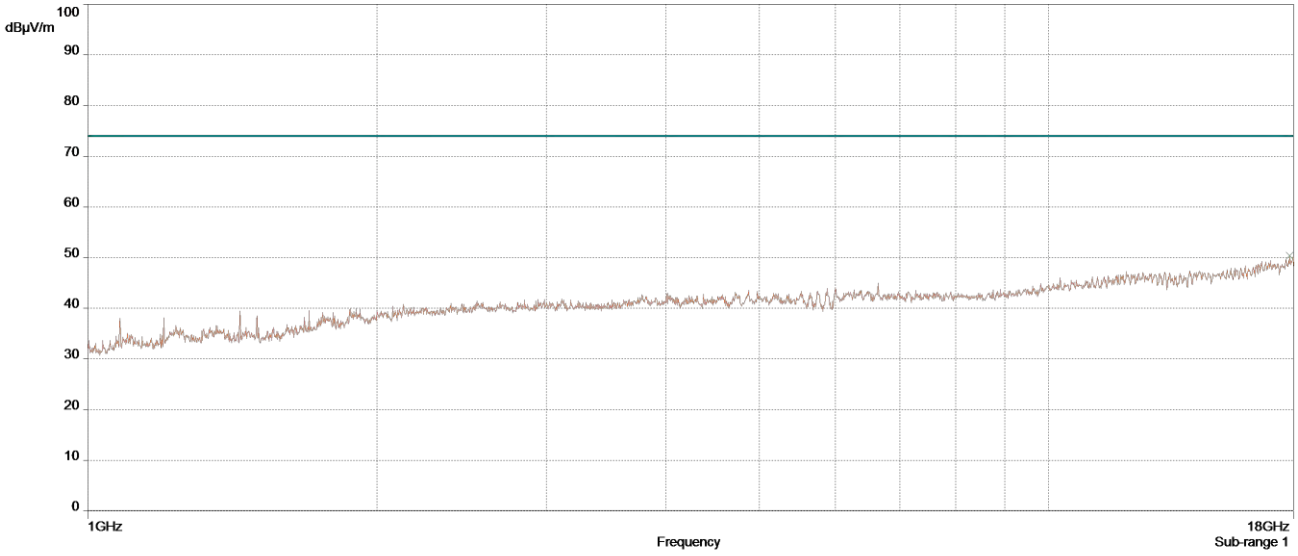
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 High Channel, a mode, Average, Chain 0 (Worst Case Pol)



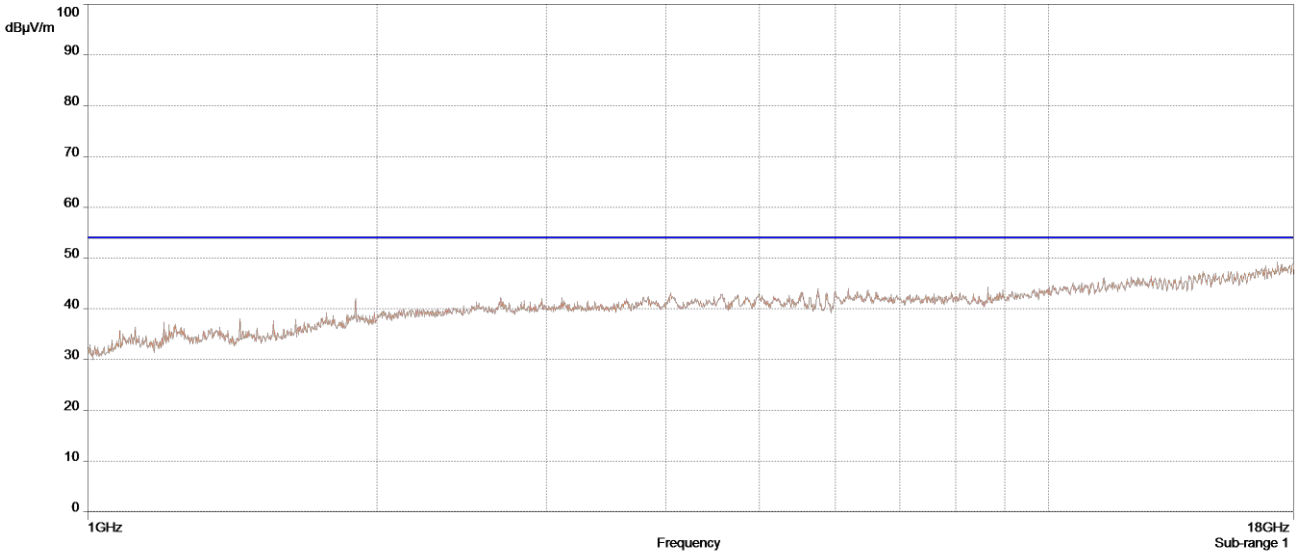
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 High Channel, a mode, Average, Chain 1 (Worst Case Pol)



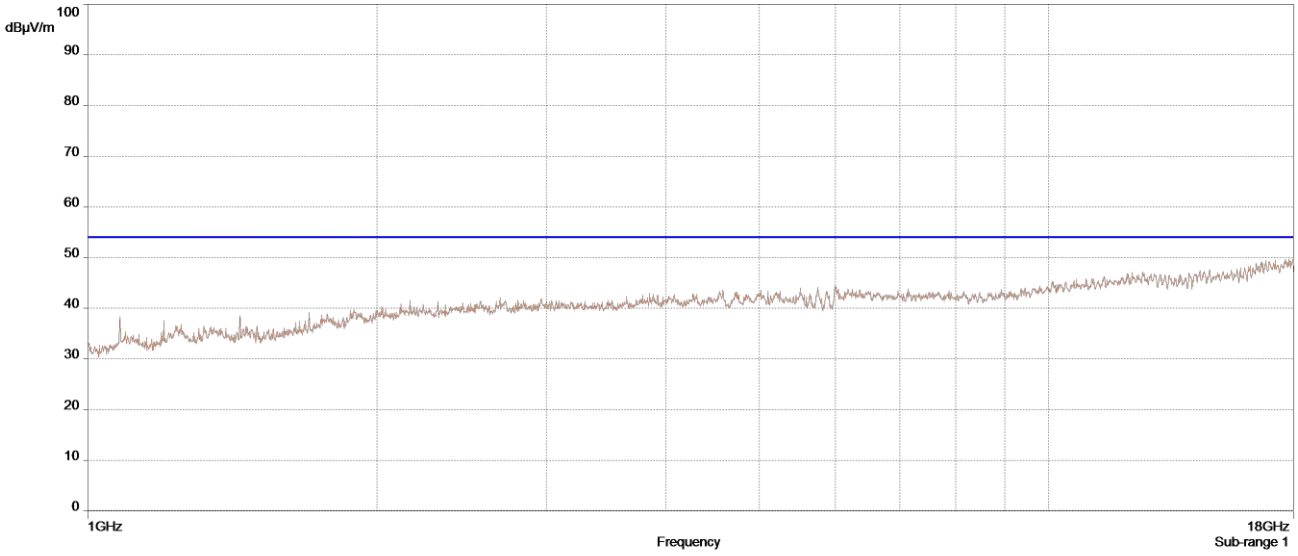
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 High Channel, a mode, Peak, Chain 0 (Worst Case Pol)



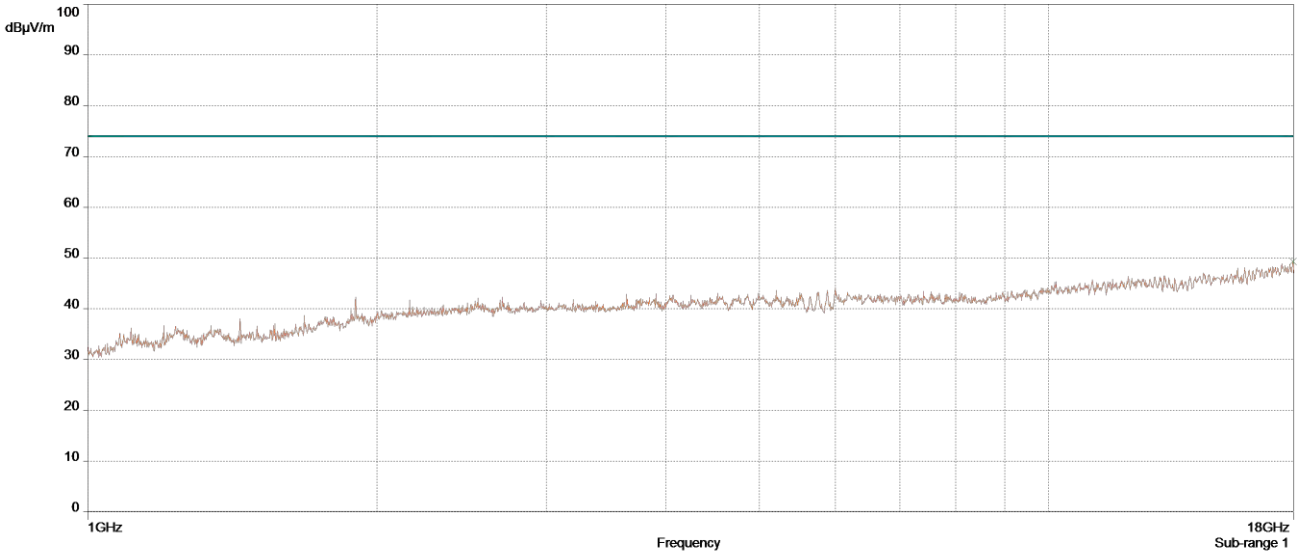
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 High Channel, a mode, Peak, Chain 1 (Worst Case Pol)



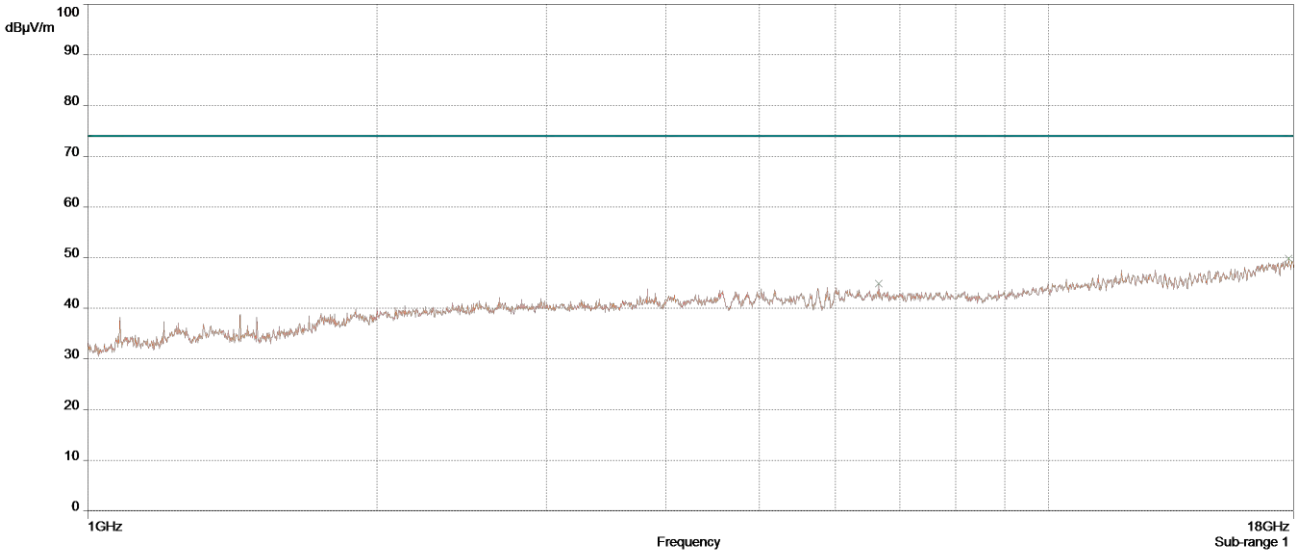
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 High Channel, n mode, Average, Chain 0 (Worst Case Pol)



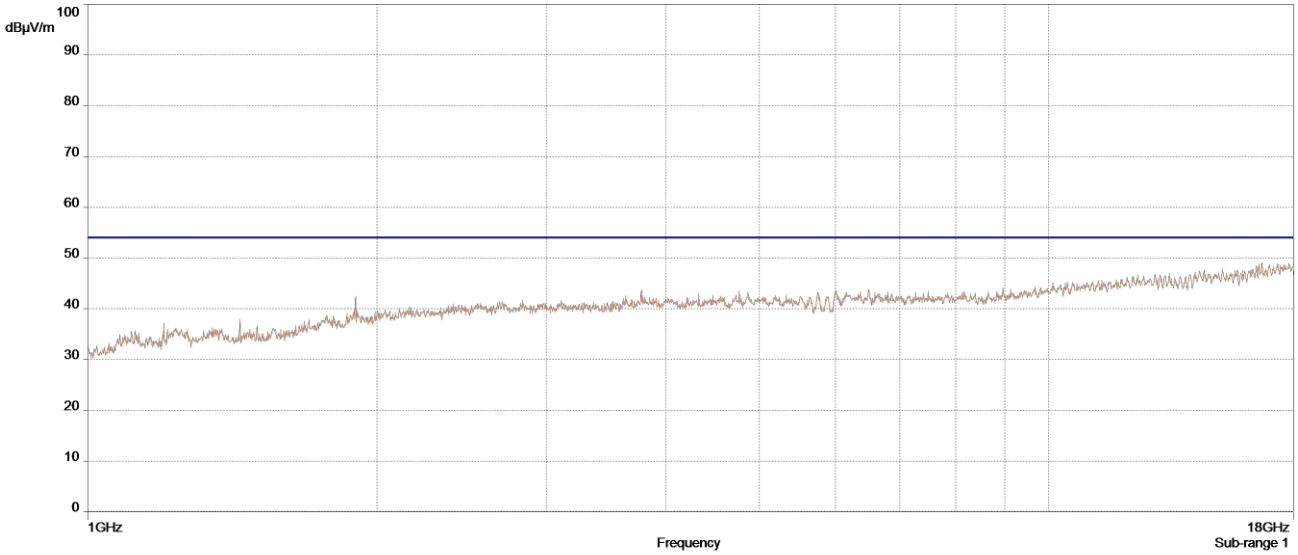
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 High Channel, n mode, Average, Chain 1 (Worst Case Pol)



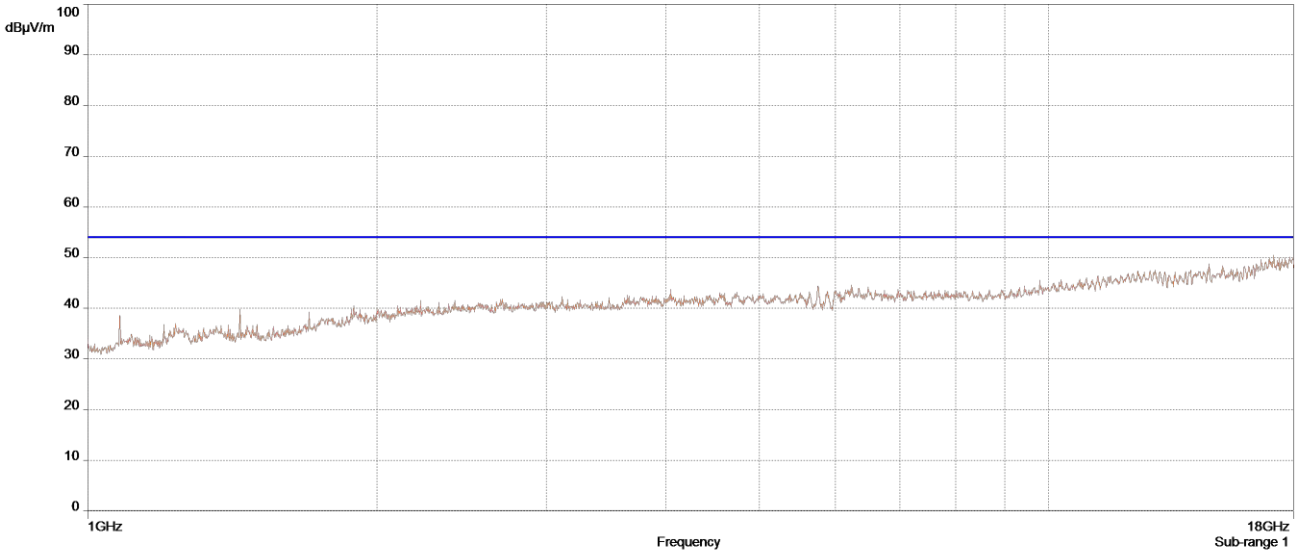
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 High Channel, n mode, Peak, Chain 0 (Worst Case Pol)



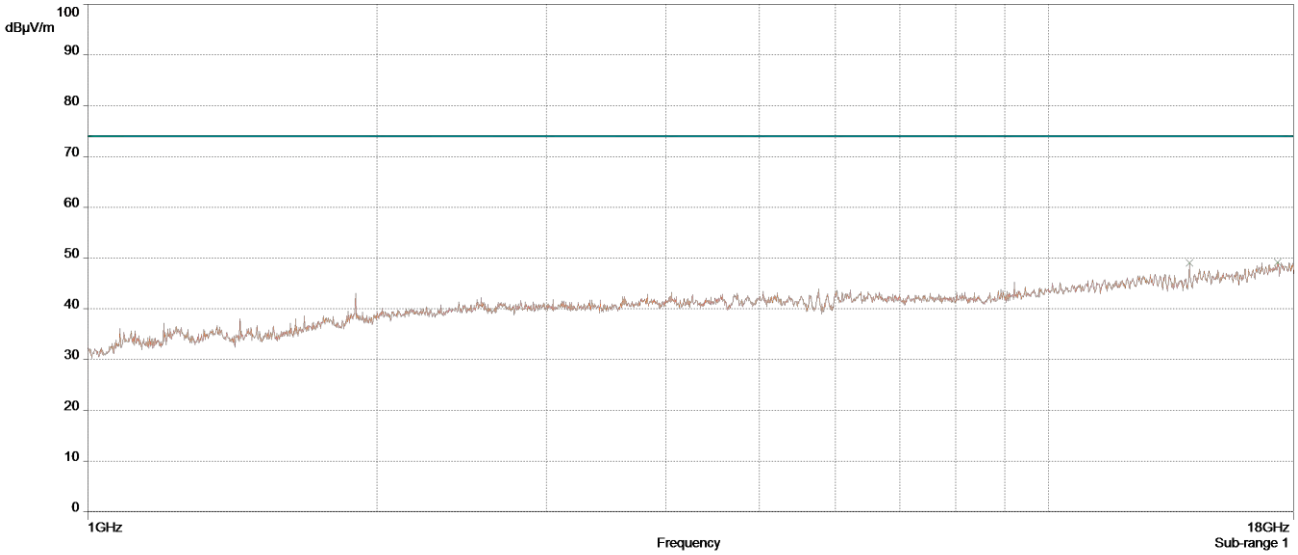
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 High Channel, n mode, Peak, Chain 1 (Worst Case Pol)



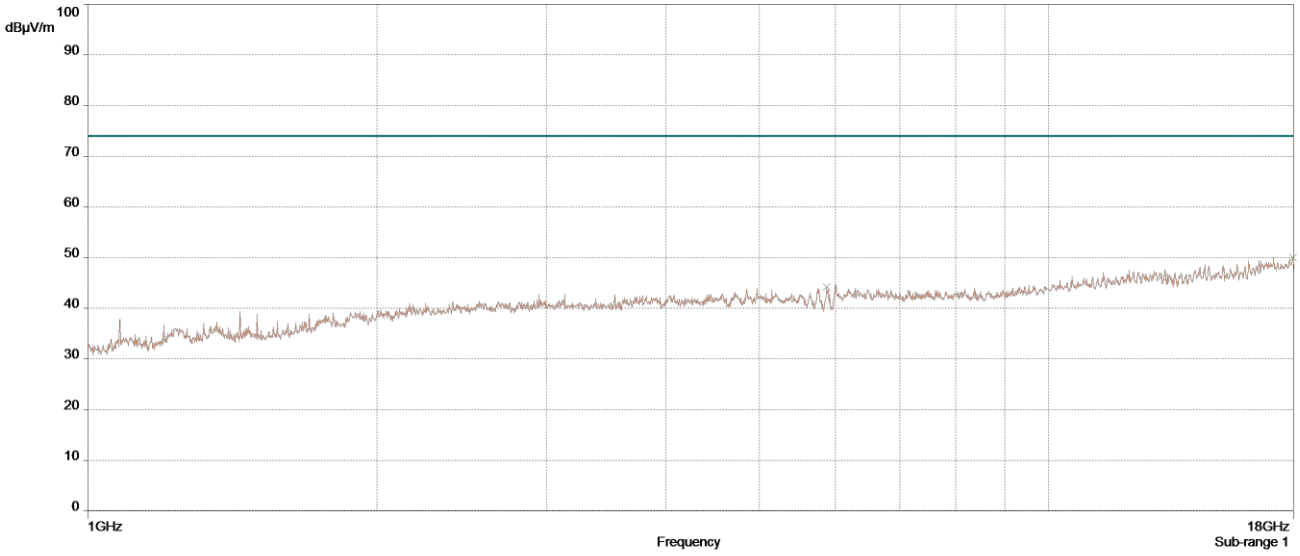
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Low Channel, a mode, Average, Chain 0 (Worst Case Pol)



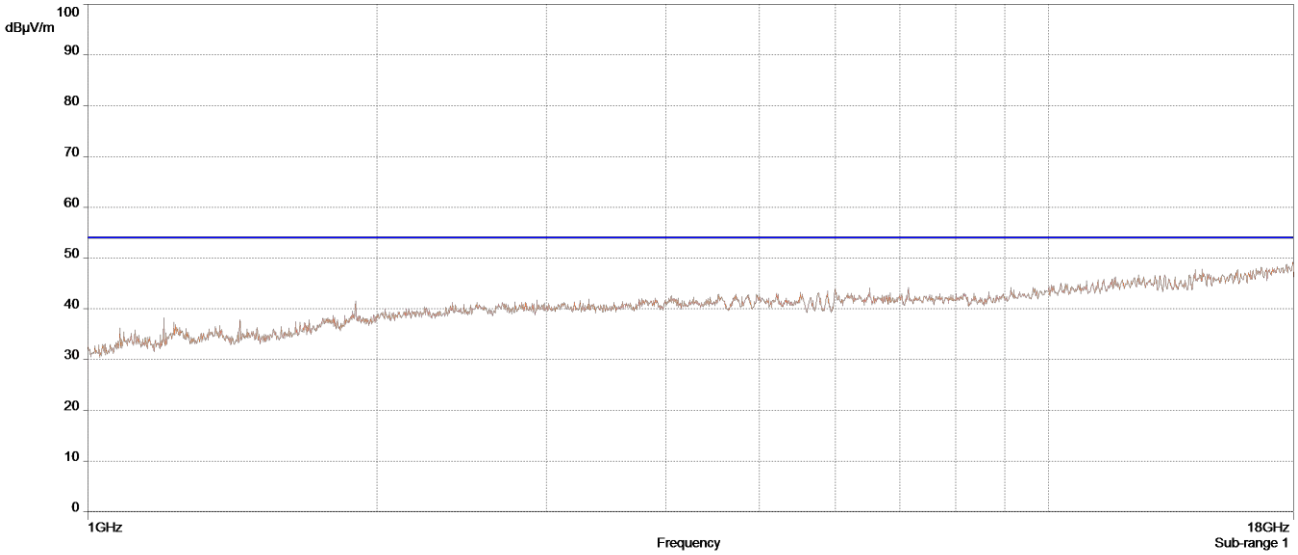
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Low Channel, a mode, Average, Chain 1 (Worst Case Pol)



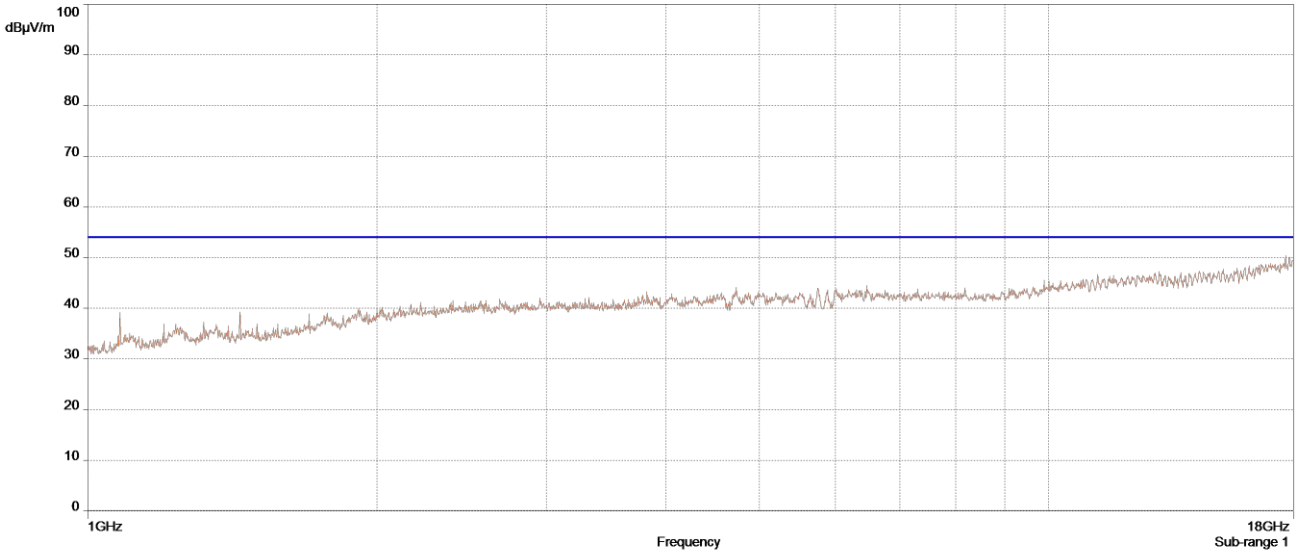
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Low Channel, a mode, Peak, Chain 0 (Worst Case Pol)



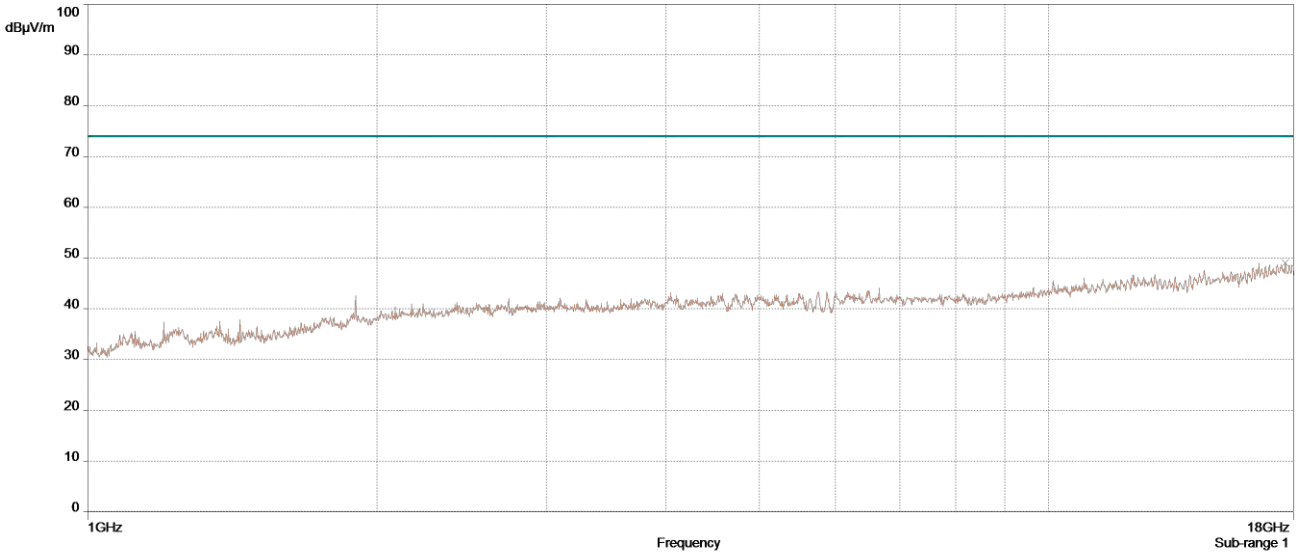
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Low Channel, a mode, Peak, Chain 1 (Worst Case Pol)



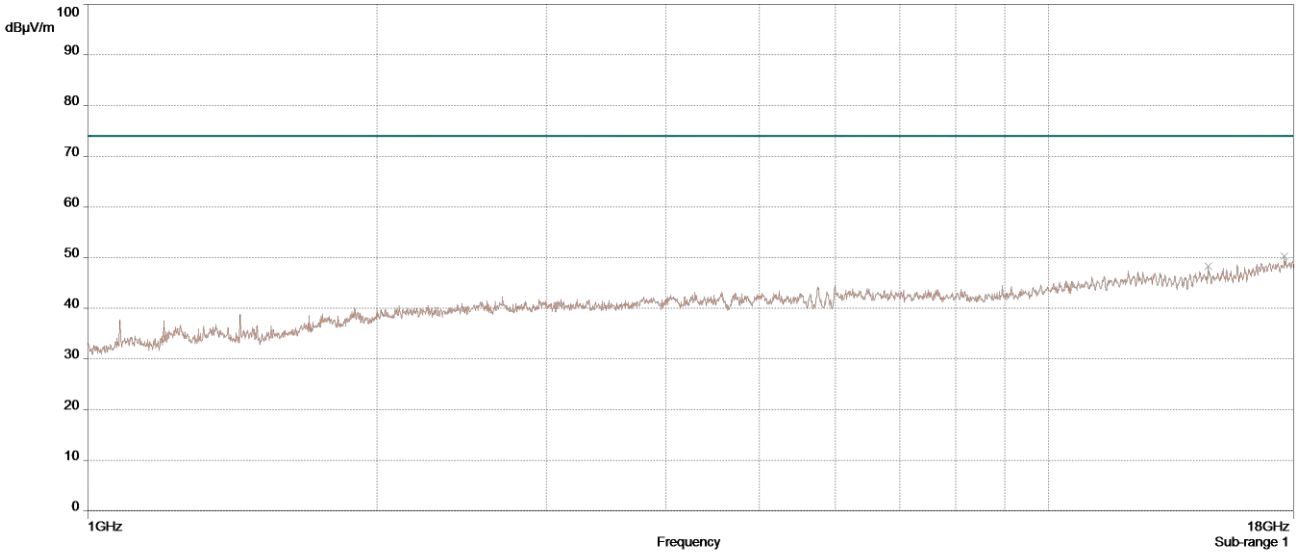
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, a mode, Average, Chain 0 (Worst Case Pol)



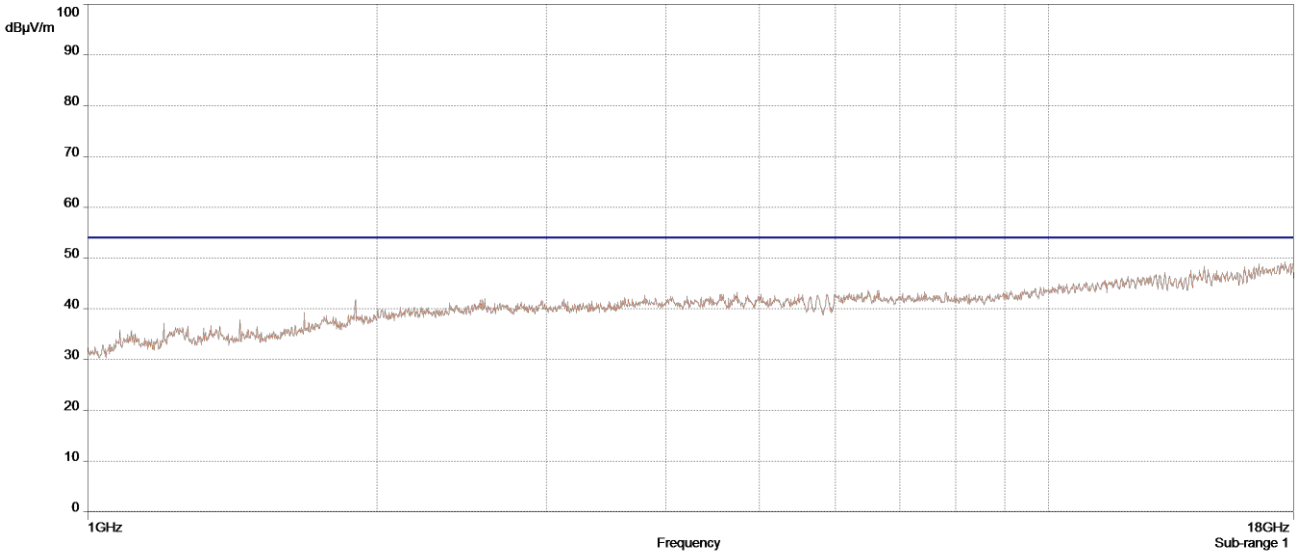
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, a mode, Average, Chain 1 (Worst Case Pol)



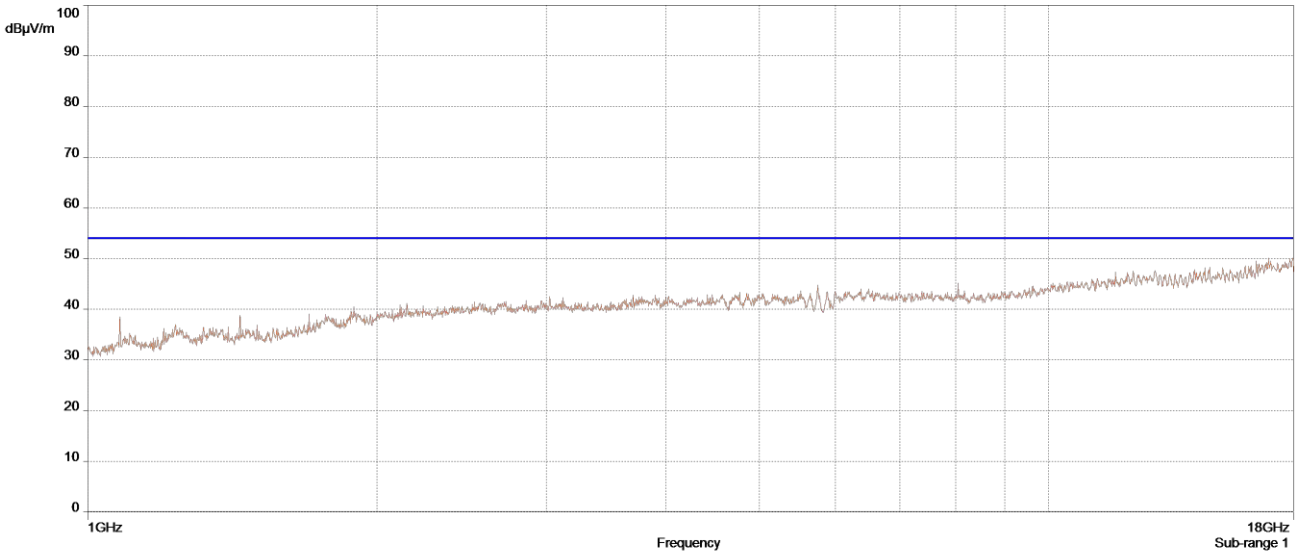
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, a mode, Peak, Chain 0 (Worst Case Pol)



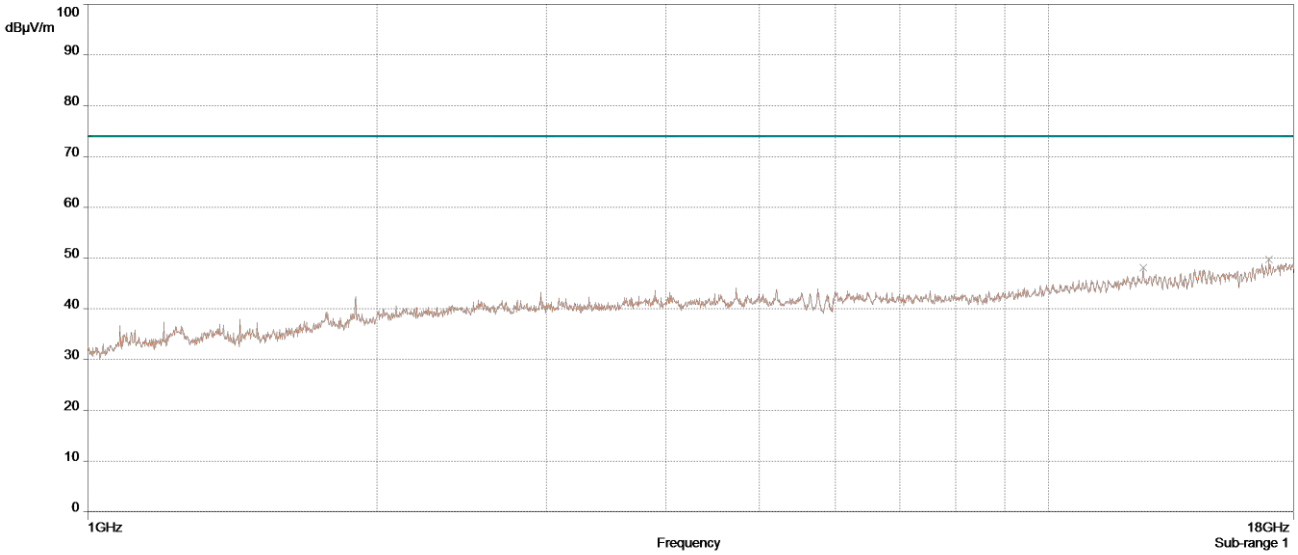
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, a mode, Peak, Chain 1 (Worst Case Pol)



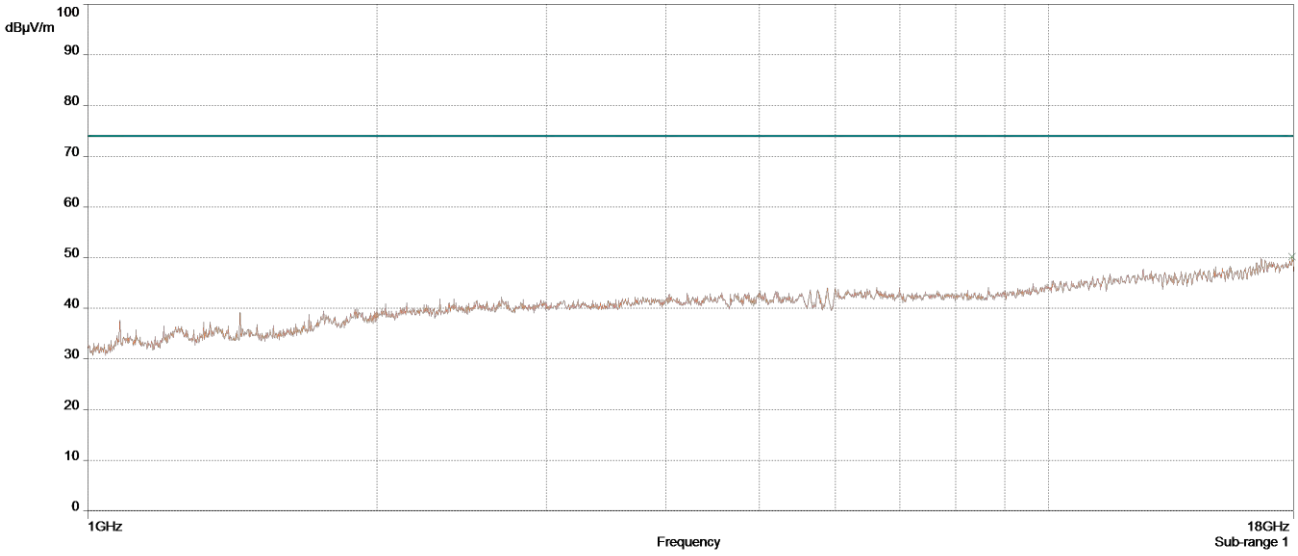
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, n mode, Average, Chain 0 (Worst Case Pol)



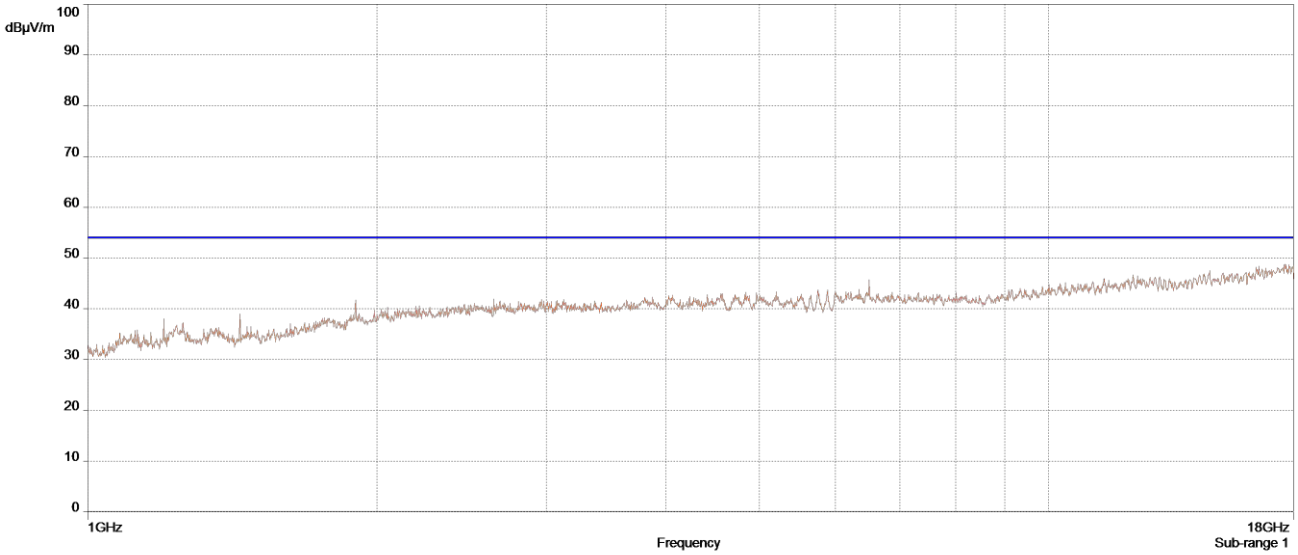
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, n mode, Average, Chain 1 (Worst Case Pol)



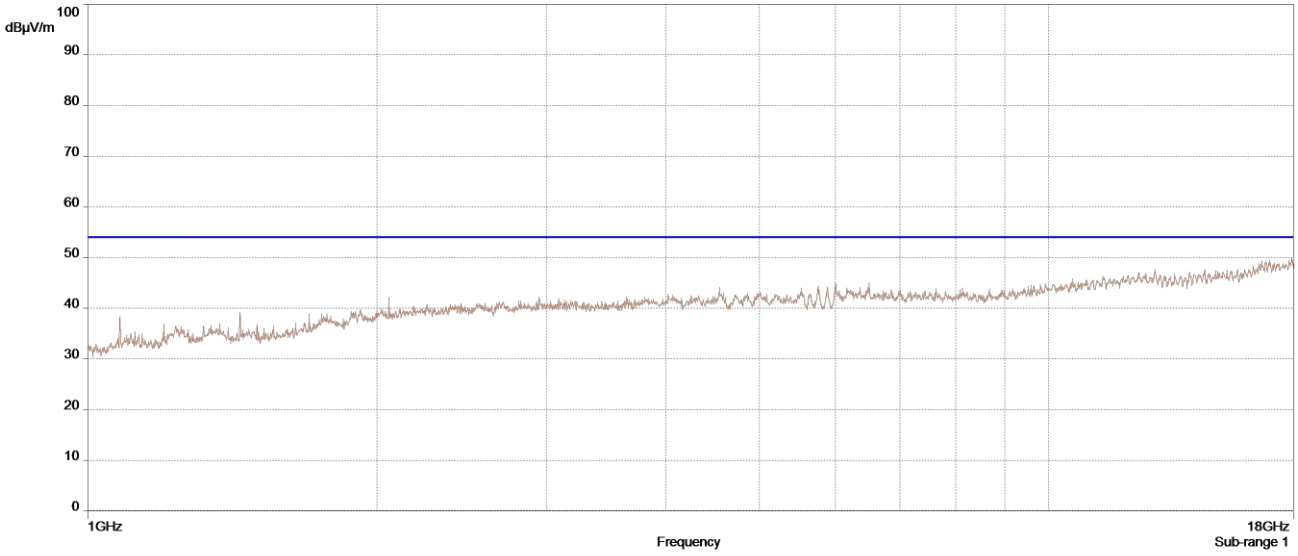
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, n mode, Peak, Chain 0 (Worst Case Pol)



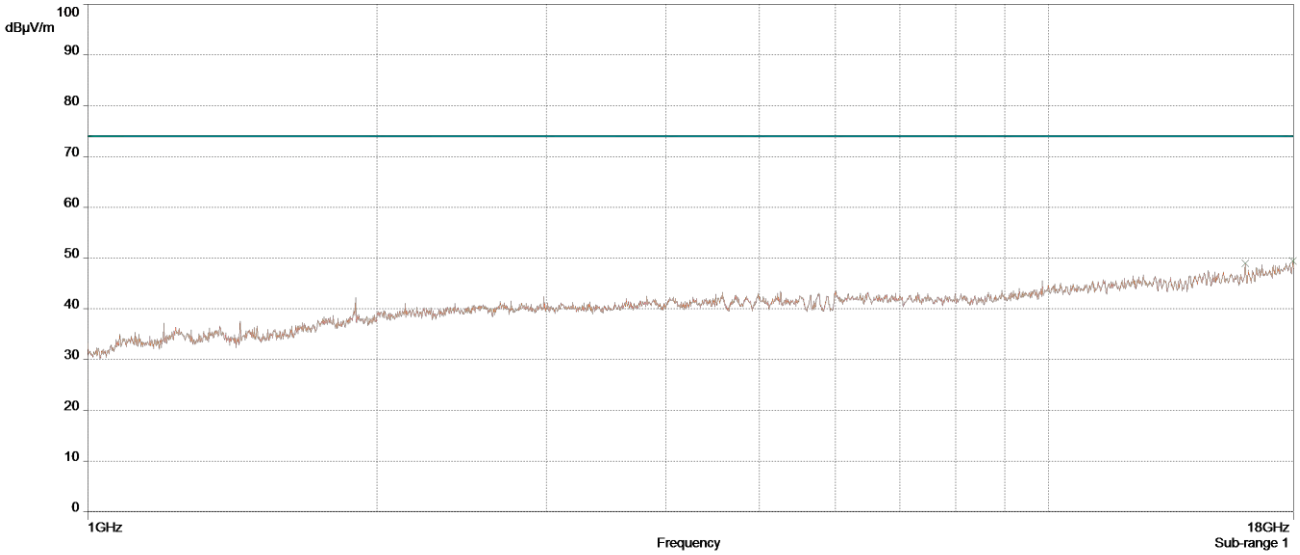
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, n mode, Peak, Chain 1 (Worst Case Pol)



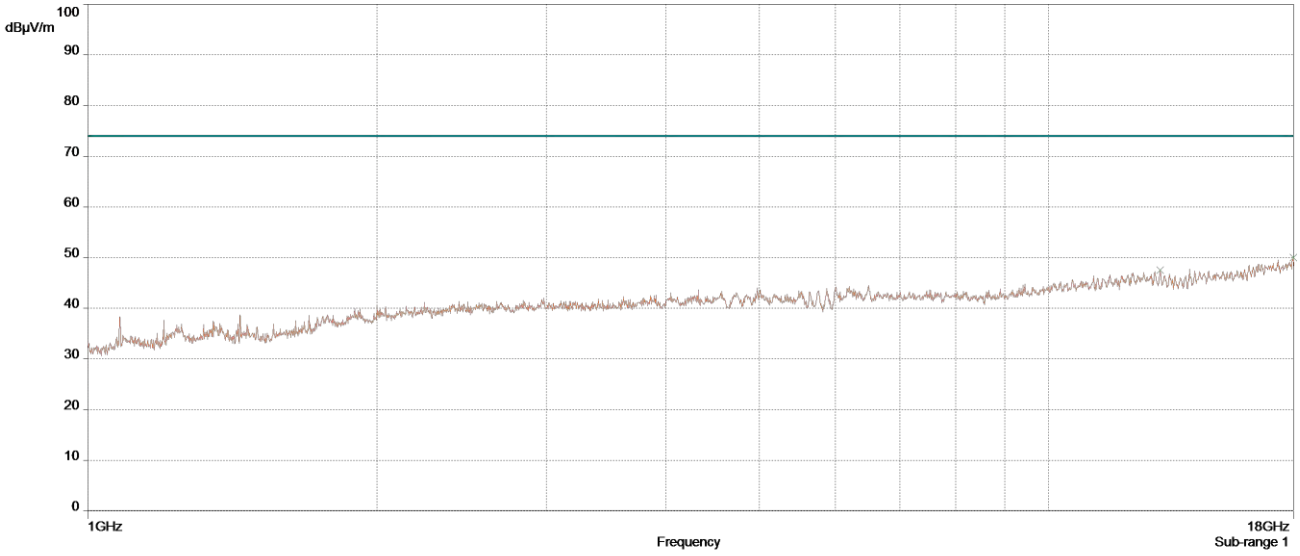
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, n mode, Average, Chain 0 (Worst Case Pol)



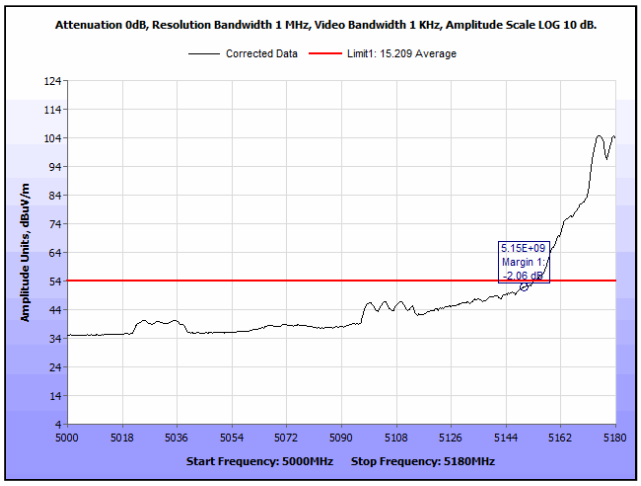
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, n mode, Average, Chain 1 (Worst Case Pol)



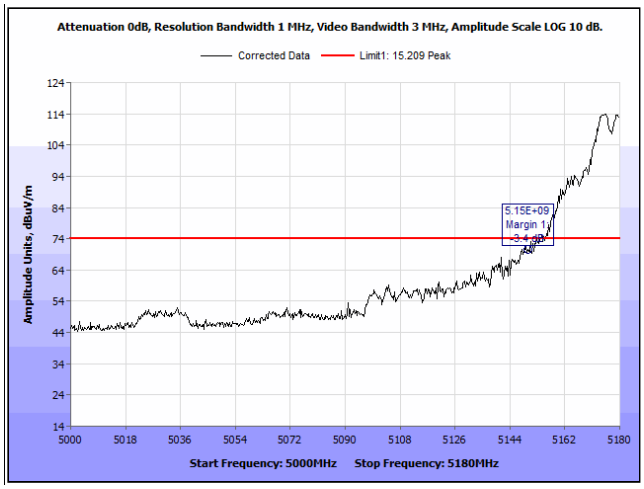
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, n mode, Peak, Chain 0 (Worst Case Pol)



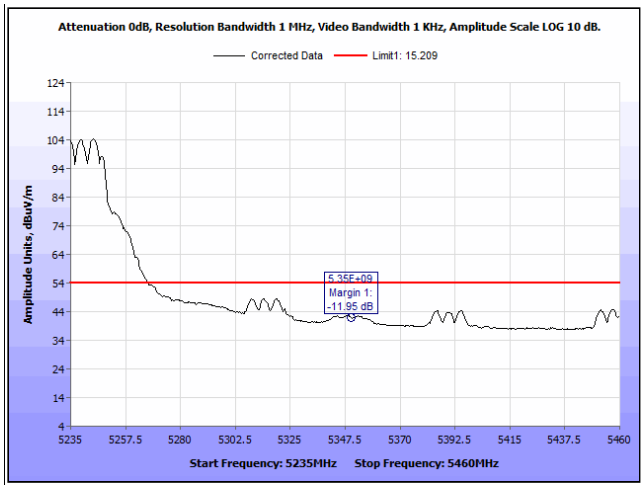
Radiated Spurious Emissions, 1GHz -18 GHz, UNII-3 Mid Channel, n mode, Peak, Chain 1 (Worst Case Pol)



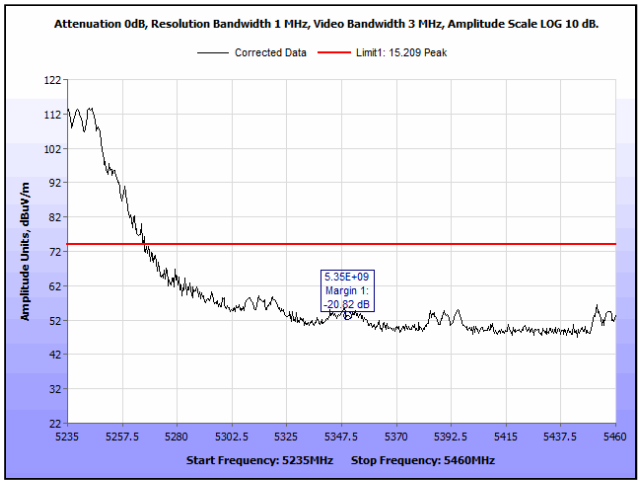
Radiated Band Edge, 802.11a 20 MHz, 5180 MHz, Both Chains, Average



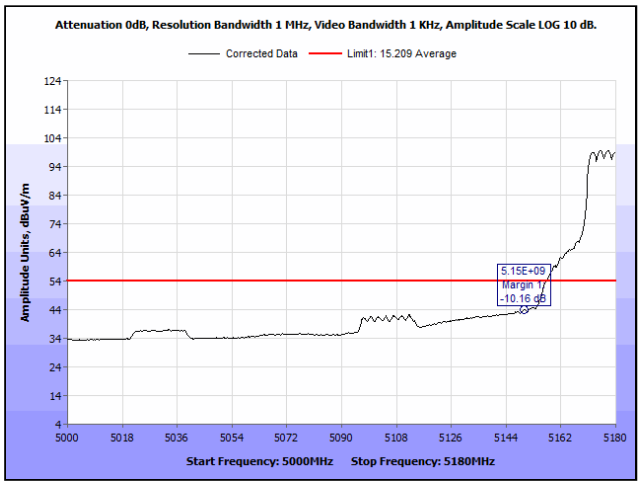
Radiated Band Edge, 802.11a 20 MHz, 5180 MHz, Both Chains, Peak



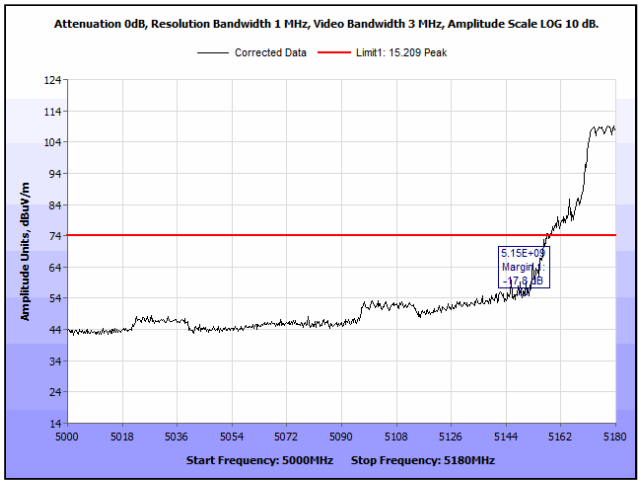
Radiated Band Edge, 802.11a 20 MHz, 5240 MHz, Both Chains, Average



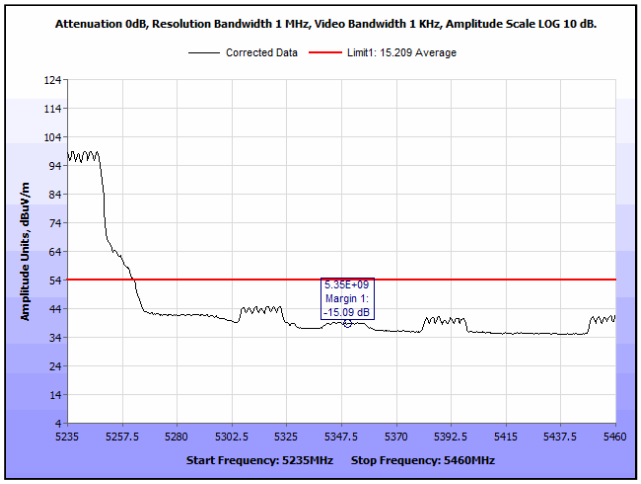
Radiated Band Edge, 802.11a 20 MHz, 5240 MHz, Both Chains, Peak



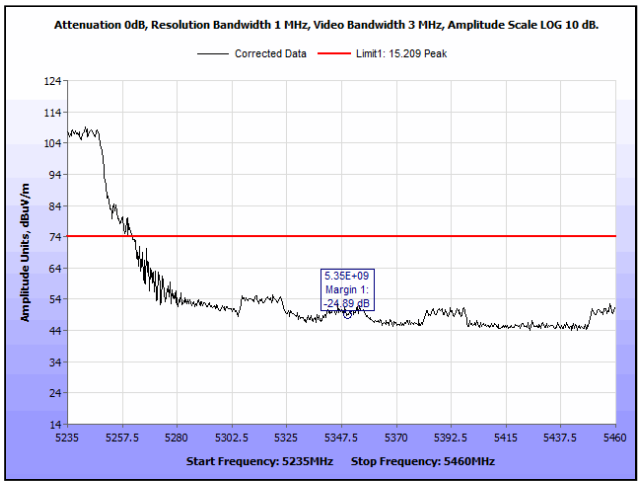
Radiated Band Edge, 802.11n 20 MHz, 5180 MHz, Both Chains, Average



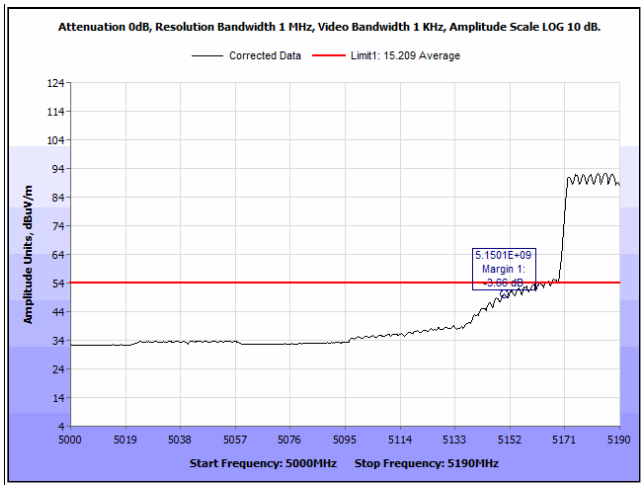
Radiated Band Edge, 802.11n 20 MHz, 5180 MHz, Both Chains, Peak



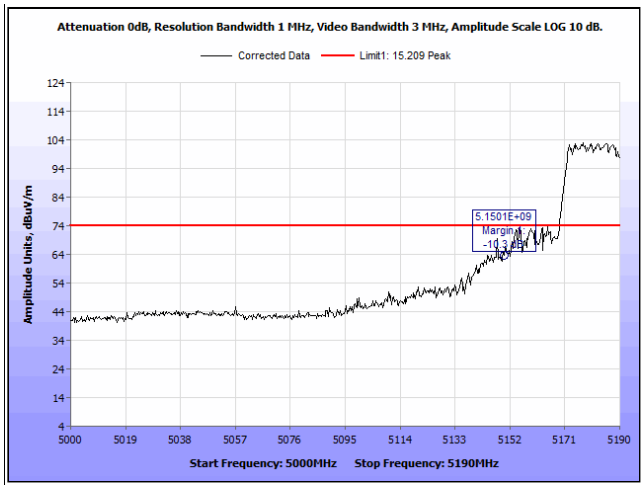
Radiated Band Edge, 802.11n 20 MHz, 5240 MHz, Both Chains, Average



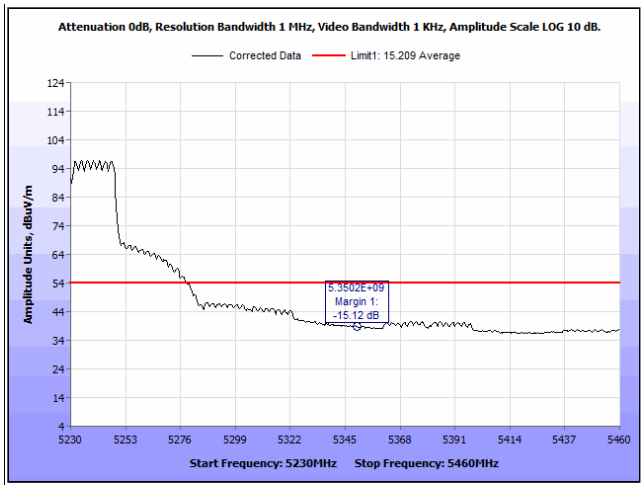
Radiated Band Edge, 802.11n 20 MHz, 5240 MHz, Both Chains, Peak



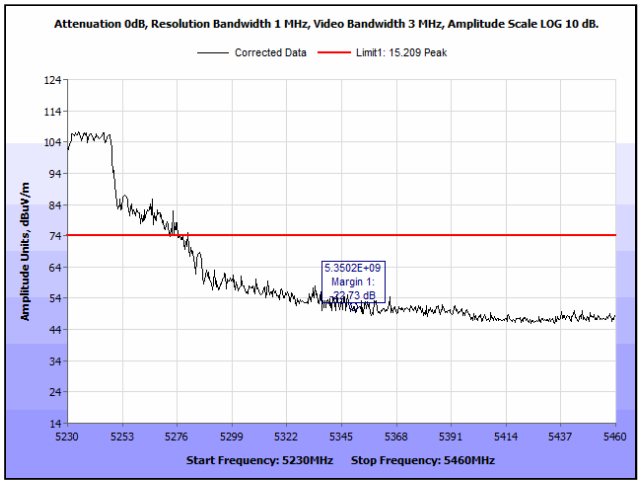
Radiated Band Edge, 802.11n 40 MHz, 5190 MHz, Both Chains, Average



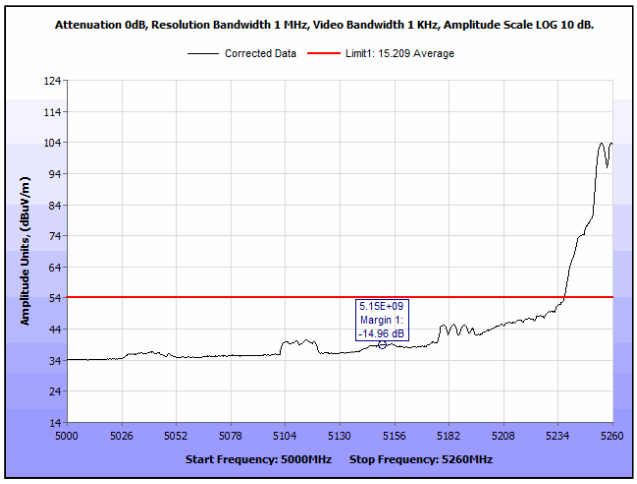
Radiated Band Edge, 802.11n 40 MHz, 5190 MHz, Both Chains, Peak



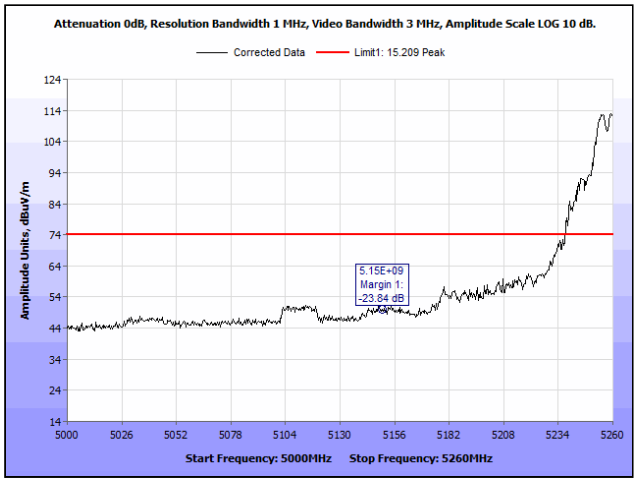
Radiated Band Edge, 802.11n 40 MHz, 5230 MHz, Both Chains, Average



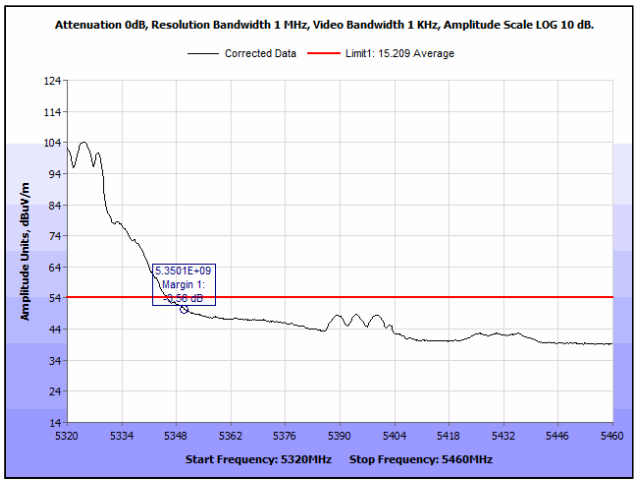
Radiated Band Edge, 802.11n 40 MHz, 5230 MHz, Both Chains, Peak



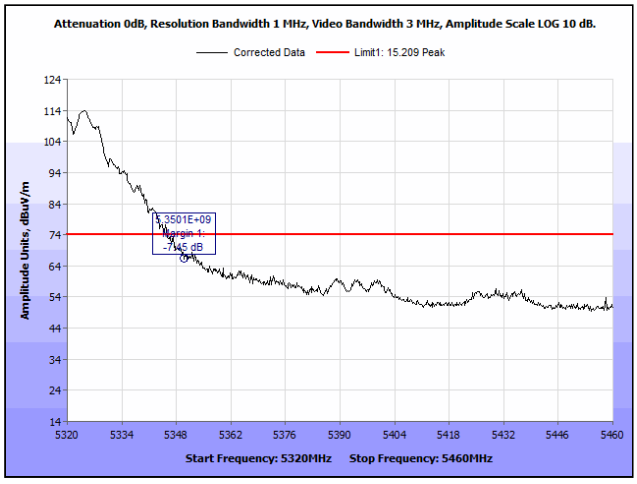
Radiated Band Edge, 802.11a 20 MHz, 5260 MHz, Both Chains, Average



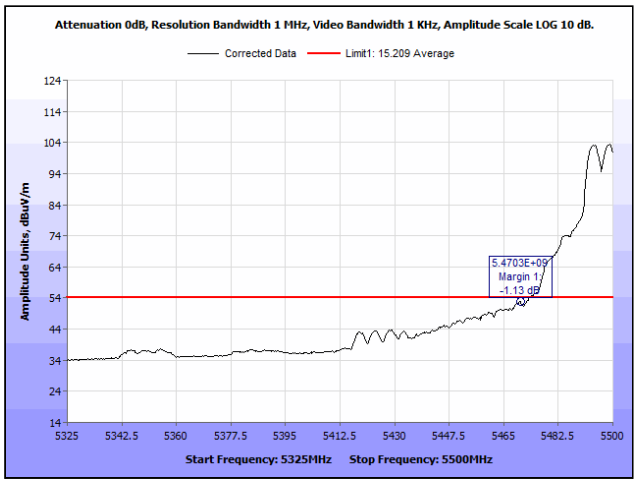
Radiated Band Edge, 802.11a 20 MHz, 5260 MHz, Both Chains, Peak



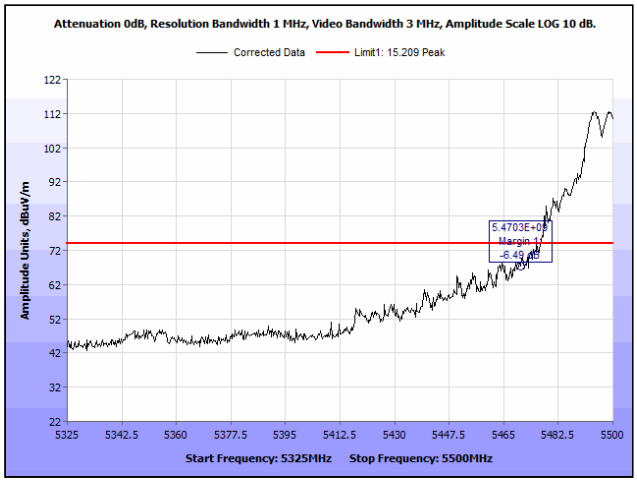
Radiated Band Edge, 802.11a 20 MHz, 5320 MHz, Both Chains, Average



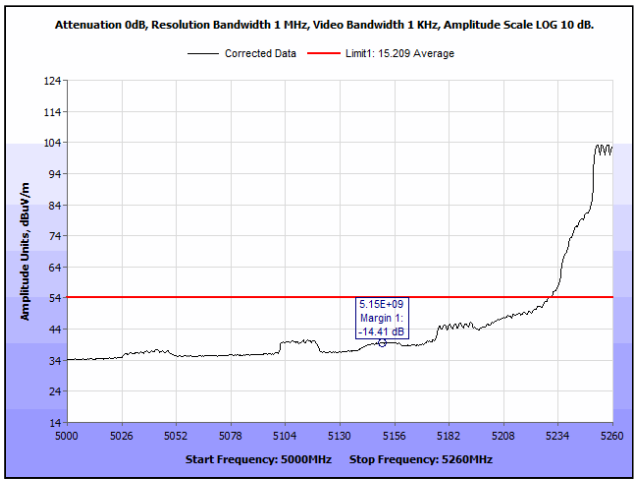
Radiated Band Edge, 802.11a 20 MHz, 5320 MHz, Both Chains, Peak



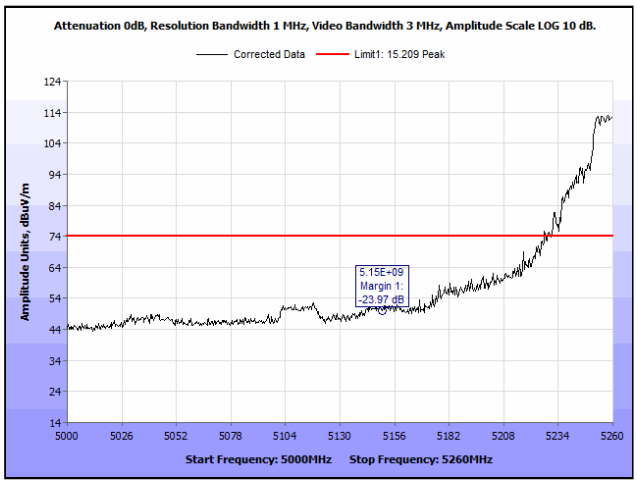
Radiated Band Edge, 802.11a 20 MHz, 5500 MHz, Both Chains, Average



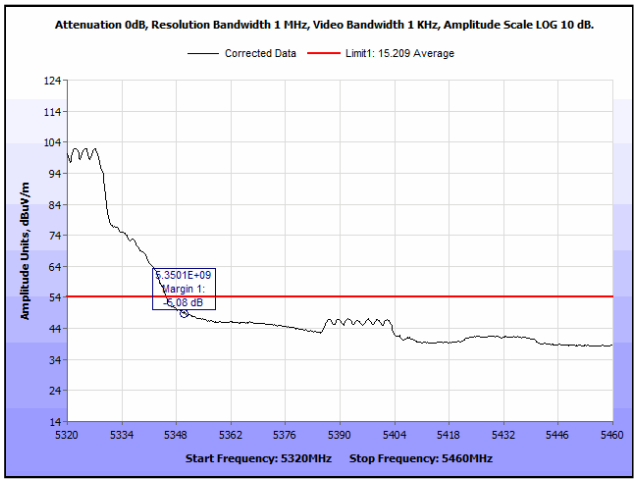
Radiated Band Edge, 802.11a 20 MHz, 5500 MHz, Both Chains, Peak



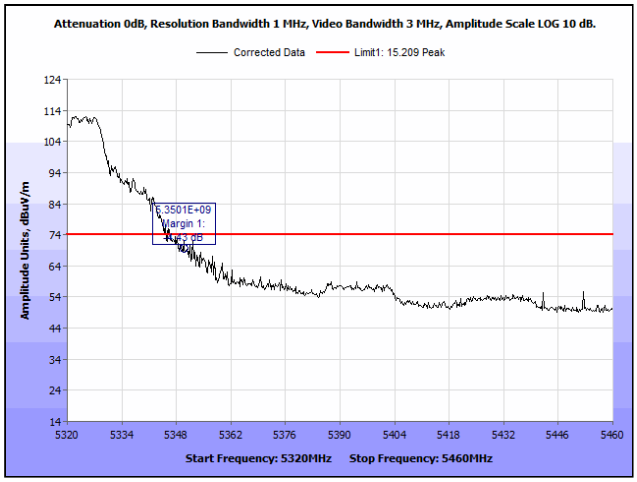
Radiated Band Edge, 802.11n 20 MHz, 5260 MHz, Both Chains, Average



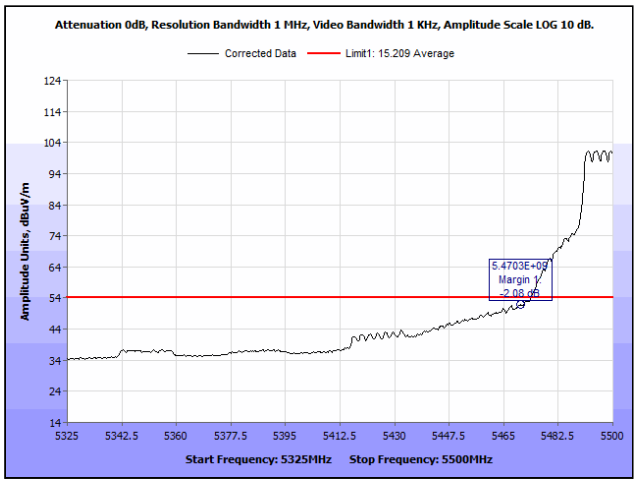
Radiated Band Edge, 802.11n 20 MHz, 5260 MHz, Both Chains, Peak



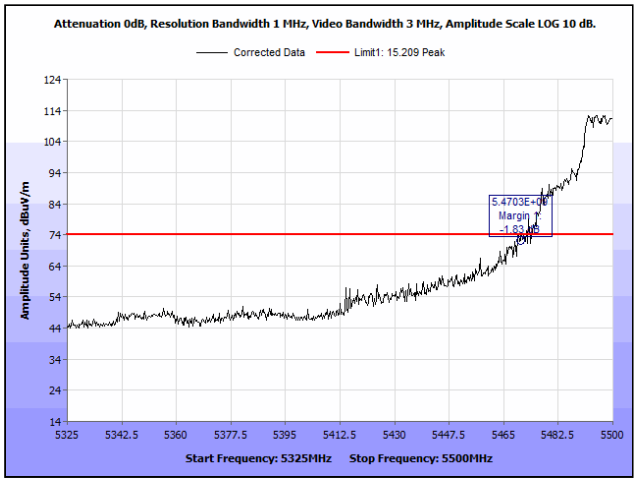
Radiated Band Edge, 802.11n 20 MHz, 5320 MHz, Both Chains, Average



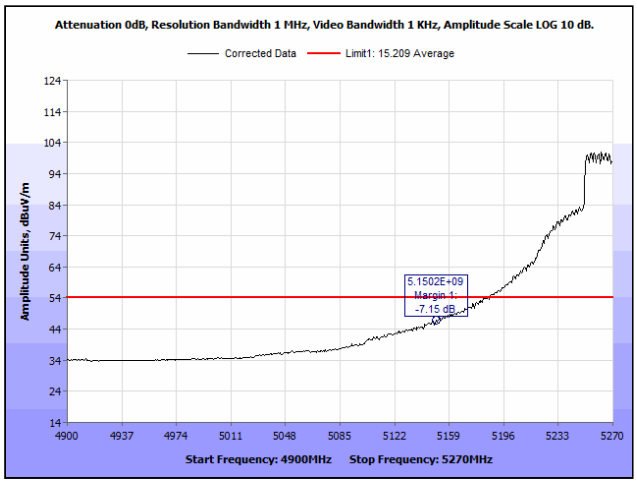
Radiated Band Edge, 802.11n 20 MHz, 5320 MHz, Both Chains, Peak



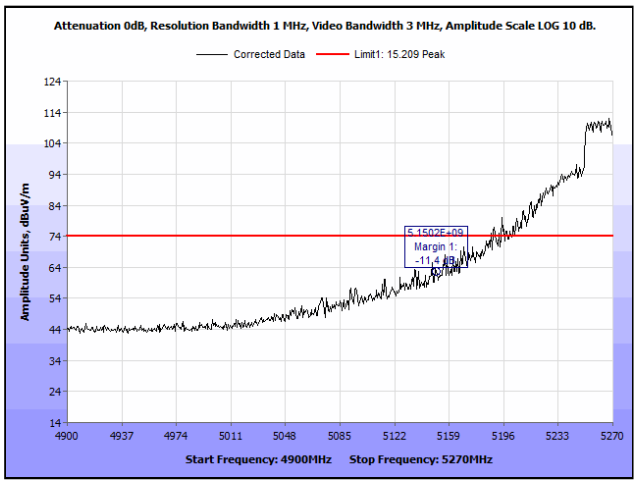
Radiated Band Edge, 802.11n 20 MHz, 5500 MHz, Both Chains, Average



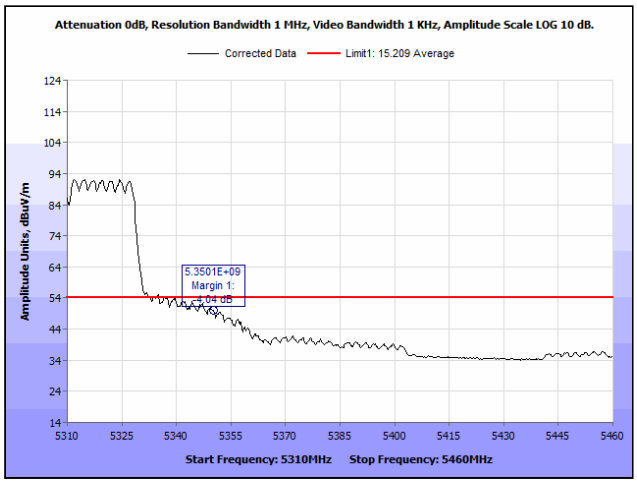
Radiated Band Edge, 802.11n 20 MHz, 5500 MHz, Both Chains, Peak



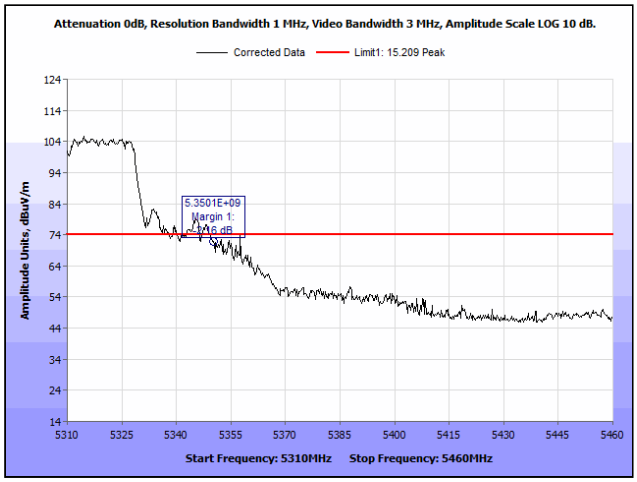
Radiated Band Edge, 802.11n 40 MHz, 5270 MHz, Both Chains, Average



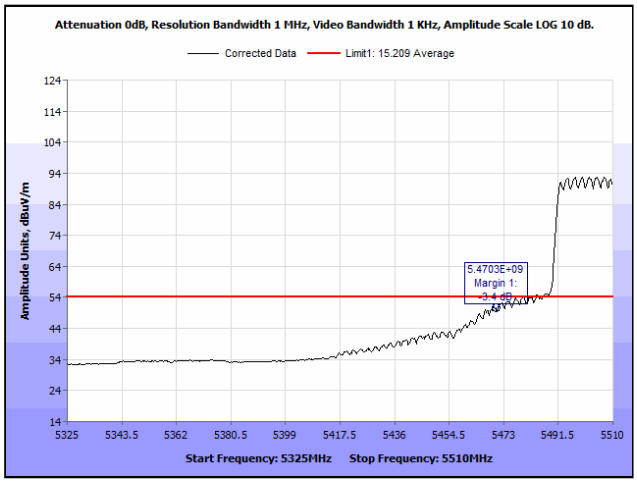
Radiated Band Edge, 802.11n 40 MHz, 5270 MHz, Both Chains, Peak



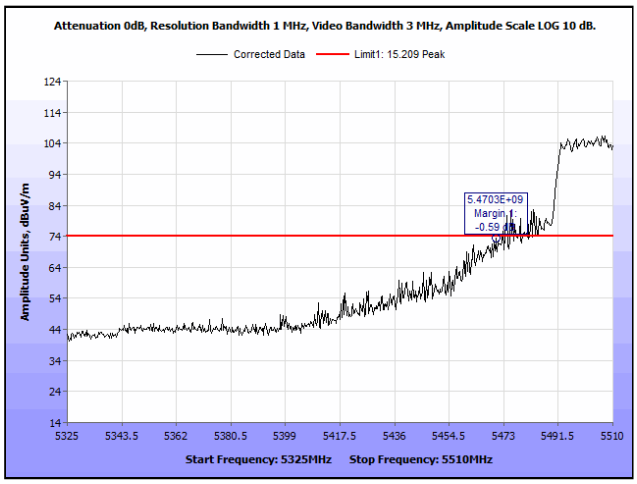
Radiated Band Edge, 802.11n 40 MHz, 5310 MHz, Both Chains, Average



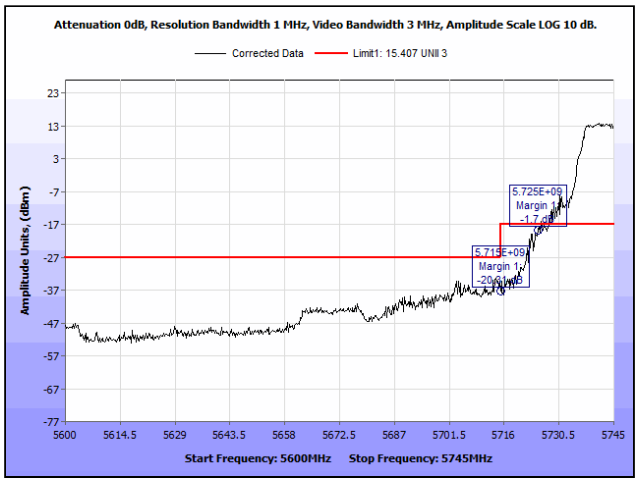
Radiated Band Edge, 802.11n 40 MHz, 5310 MHz, Both Chains, Peak



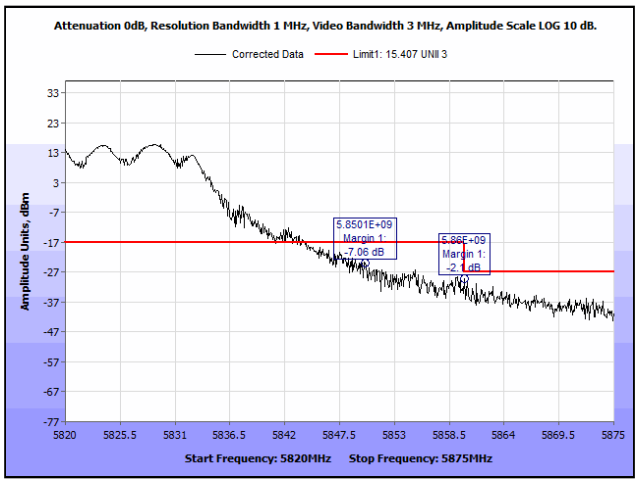
Radiated Band Edge, 802.11n 40 MHz, 5510 MHz, Both Chains, Average



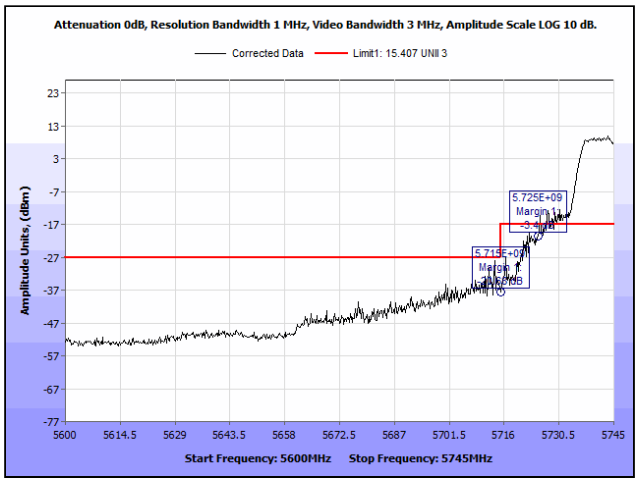
Radiated Band Edge, 802.11n 40 MHz, 5510 MHz, Both Chains, Peak



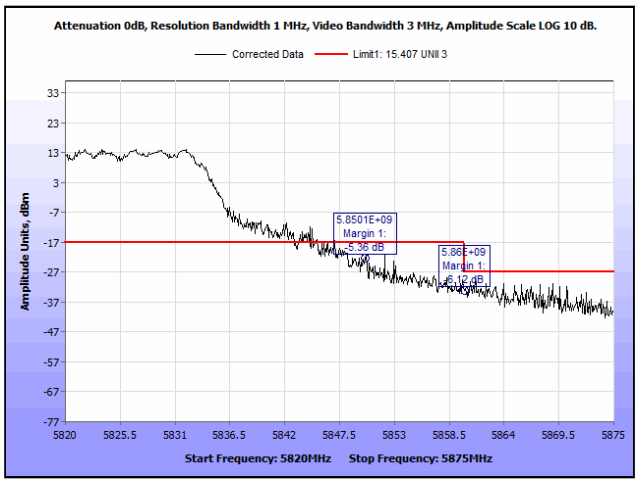
Radiated Band Edge, 802.11a 20 MHz, 5745 MHz, Both Chains



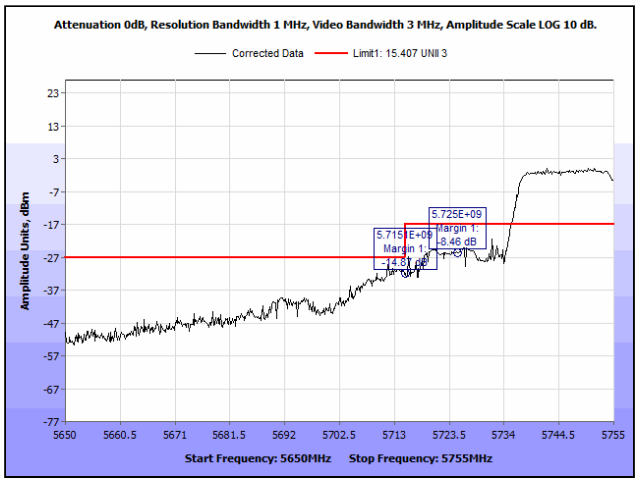
Radiated Band Edge, 802.11a 20 MHz, 5825 MHz, Both Chains



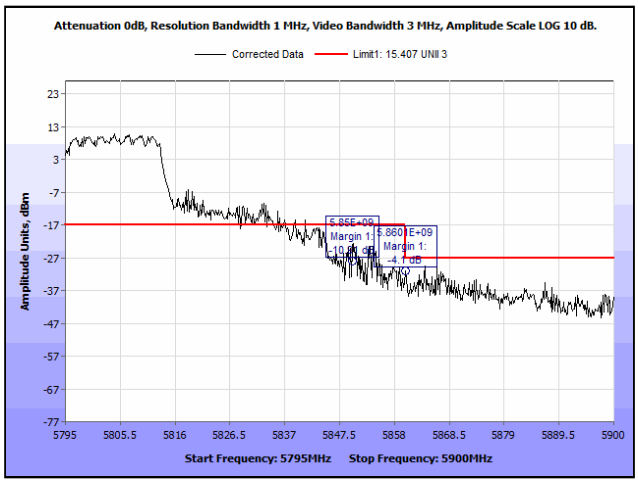
Radiated Band Edge, 802.11n 20 MHz, 5745 MHz, Both Chains



Radiated Band Edge, 802.11n 20 MHz, 5825 MHz, Both Chains



Radiated Band Edge, 802.11n 40 MHz, 5755 MHz, Both Chains



Radiated Band Edge, 802.11n 40 MHz, 5795 MHz, Both Chains

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1S2399	Turntable/Mast Controller	Sunol Sciences	SC99V	See Note[1]	
1S2600	Bilog Antenna	Teseq	CBL6112D	03/19/2021	03/19/2022
1S3826	Drg Horn Antenna	Ets-Lindgren	3117	12/03/2020	12/03/2022
1S2003	Pxa Signal Analyzer	Keysight	N9030B	09/15/2020	09/15/2021
1S2587	Pre Amplifier	Aml Communications	AML0126L3801	See Note[1]	
1S2653	Amplifier	Sonoma Instrument	310 N	See Note[1]	
1S2486	5 Meter Chamber	Panashield - Ets	5M	See Note[2]	
Note 1: Functionally tested equipment is verified using calibrated instrumentation at the time of testing. Note 2: Latest NSA and VSWR data available upon request.					

Radiated Spurious Emissions, Test Equipment List

End of Report