

APPENDIX A

WIR121164

FCC247 (BLE) Data

Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	November 1, 2022	Initial Issue
1	July 5, 2023	Updates per TCB Comments

§ 15.203 Antenna Requirement

***No data or photographs for this section.**

§ 15.207(a) Conducted Emissions Limits

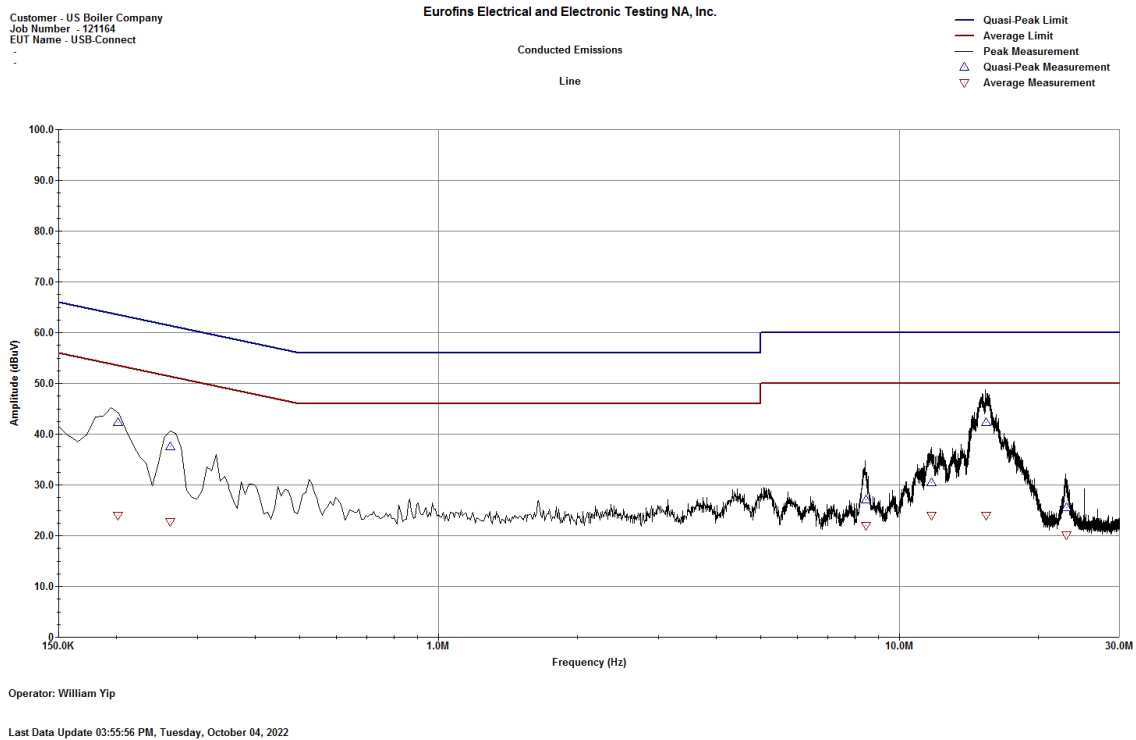


Figure 1. CEV Line

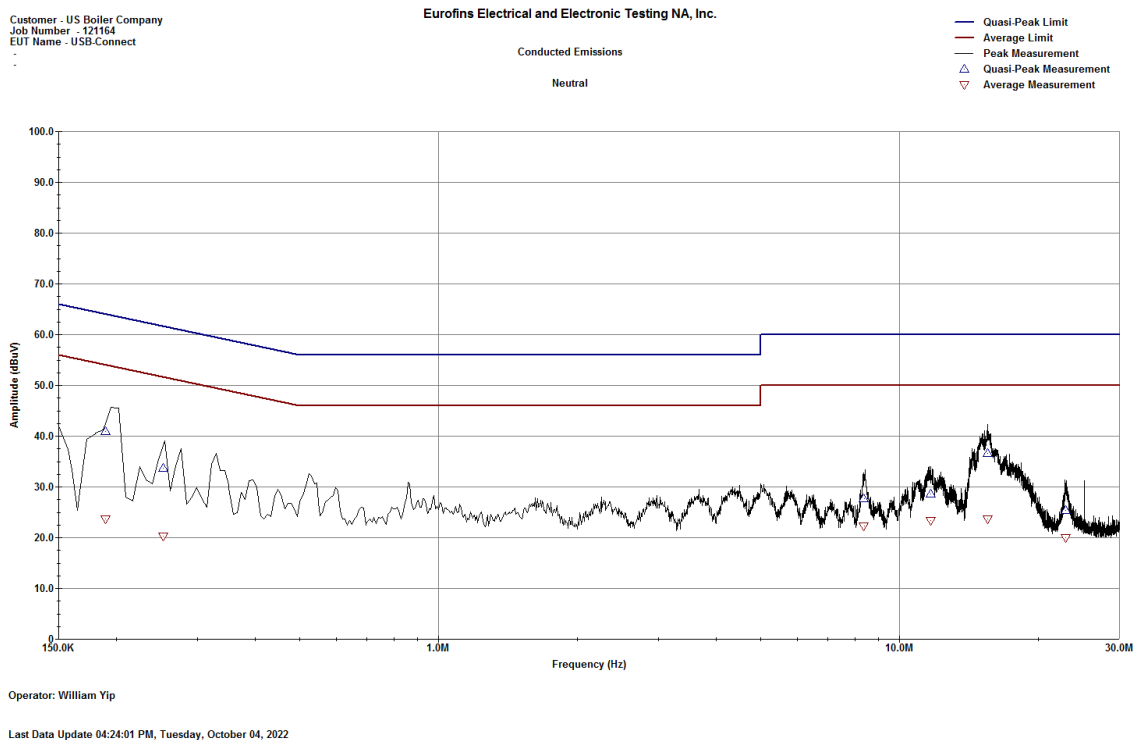
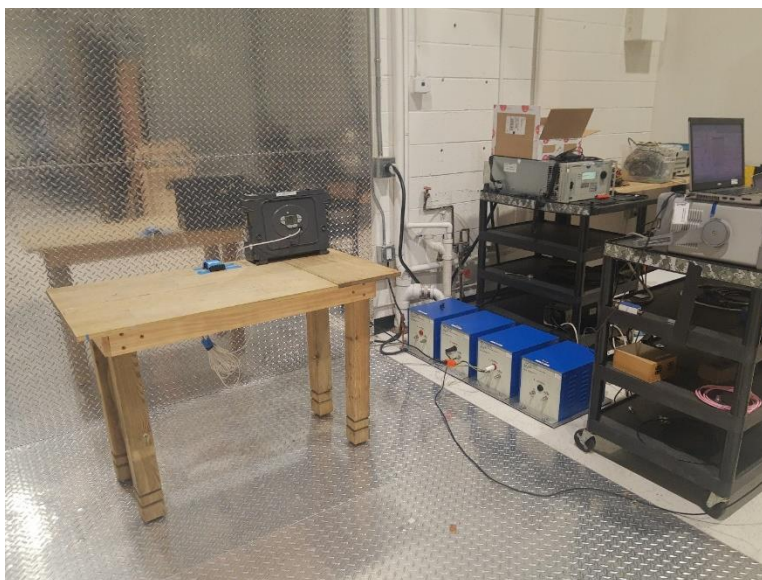


Figure 2. CEV Neutral



Photograph 1. CEV Test Setup

§ 15.247(a)(2) 6 dB Bandwidth

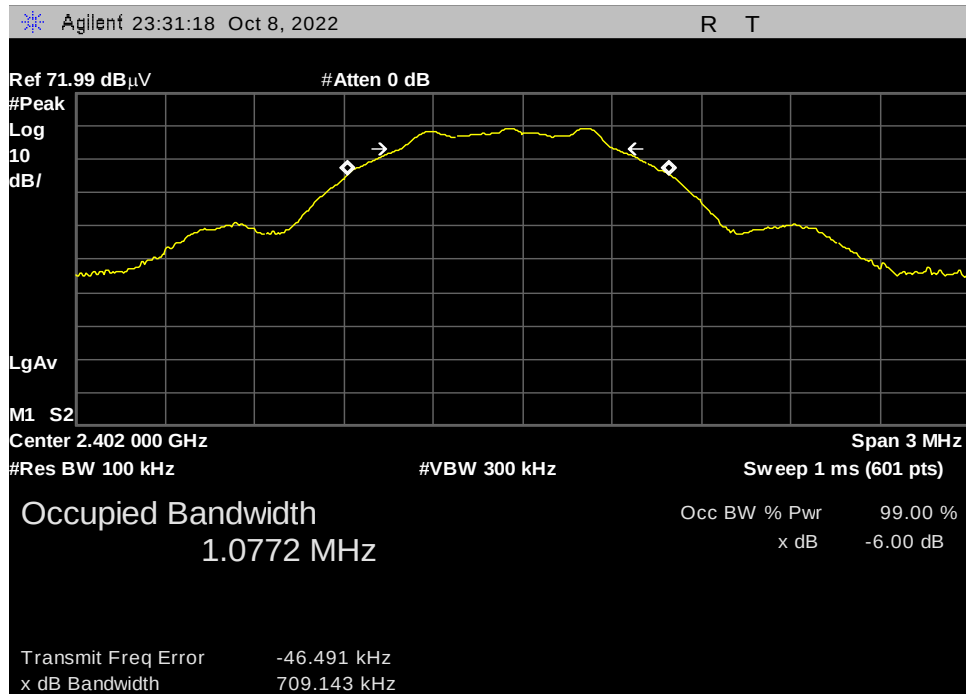


Figure 3. 6dB BW_2402MHz_1Mbps

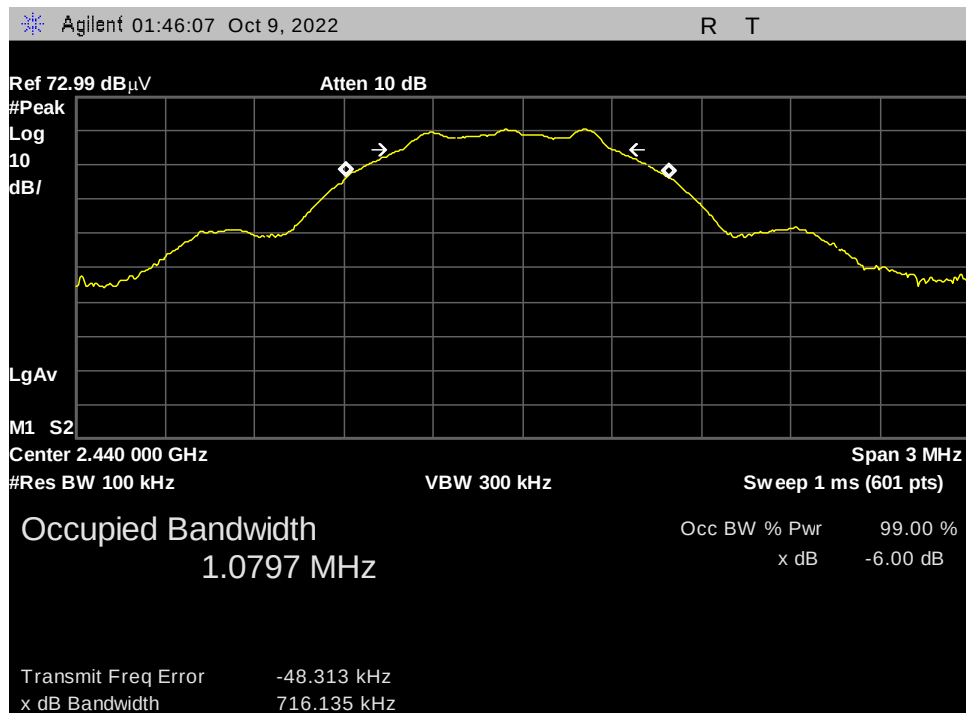


Figure 4. 6dB BW_2440MHz_1Mbps

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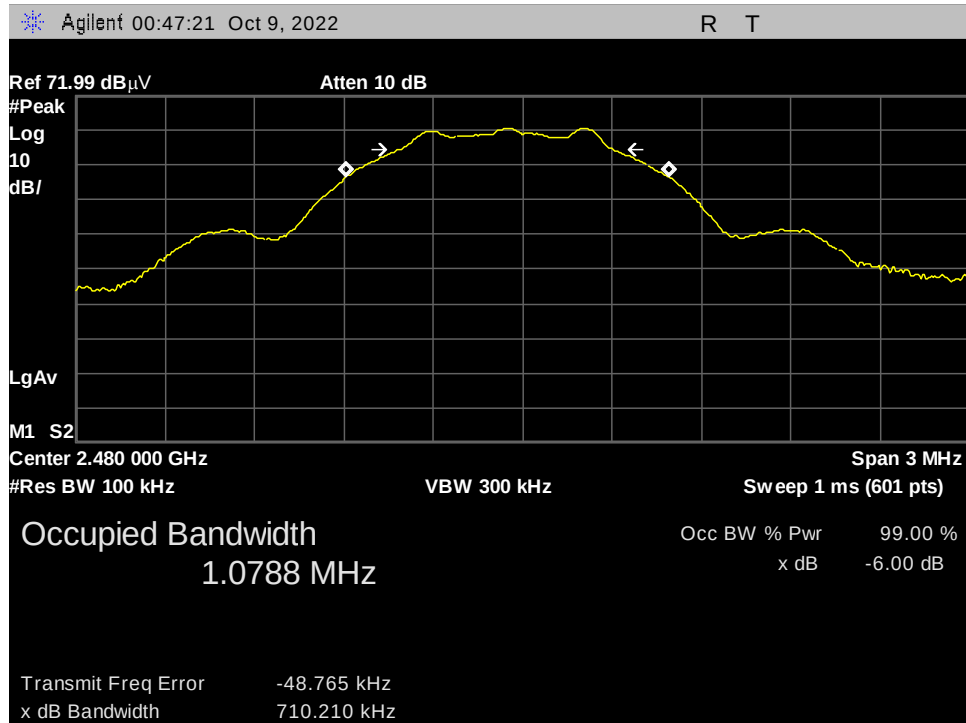


Figure 5. 6dB BW_2480MHz_1Mbps

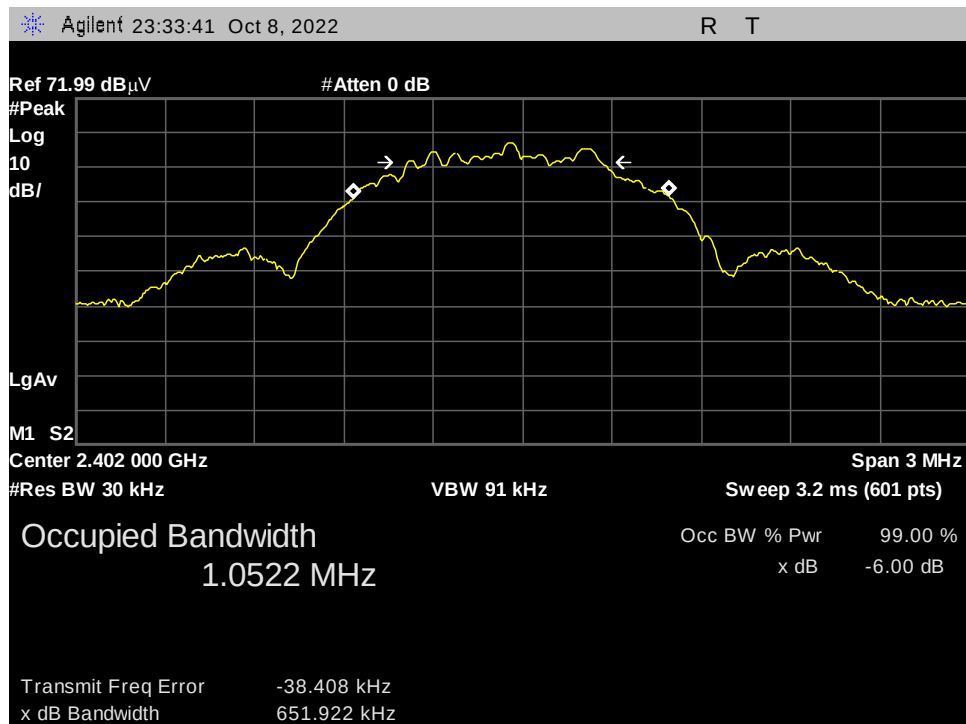


Figure 6. 99% BW_2402MHz_1Mbps

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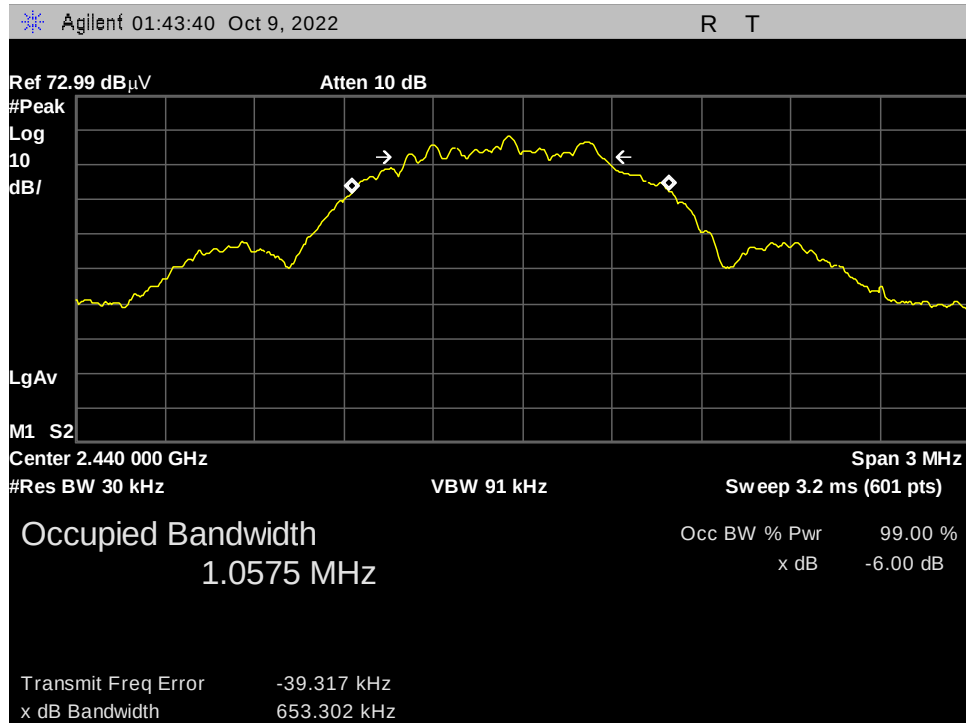


Figure 7. 99% BW_2440MHz_1Mbps

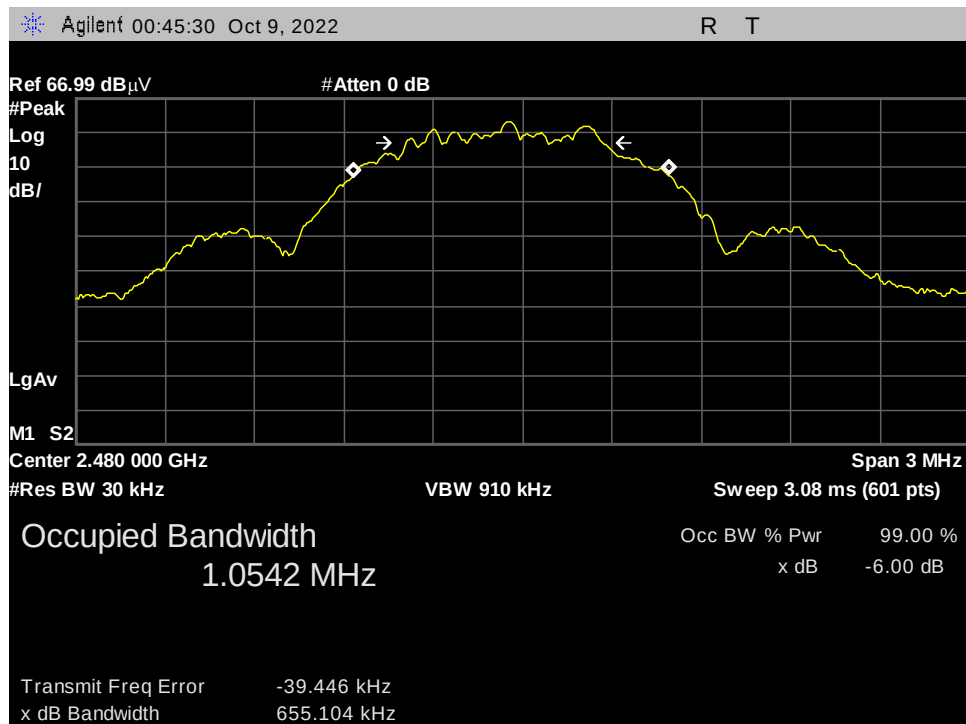


Figure 8. 99% BW_2480MHz_1Mbps

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§ 15.247(b) Peak Power Output

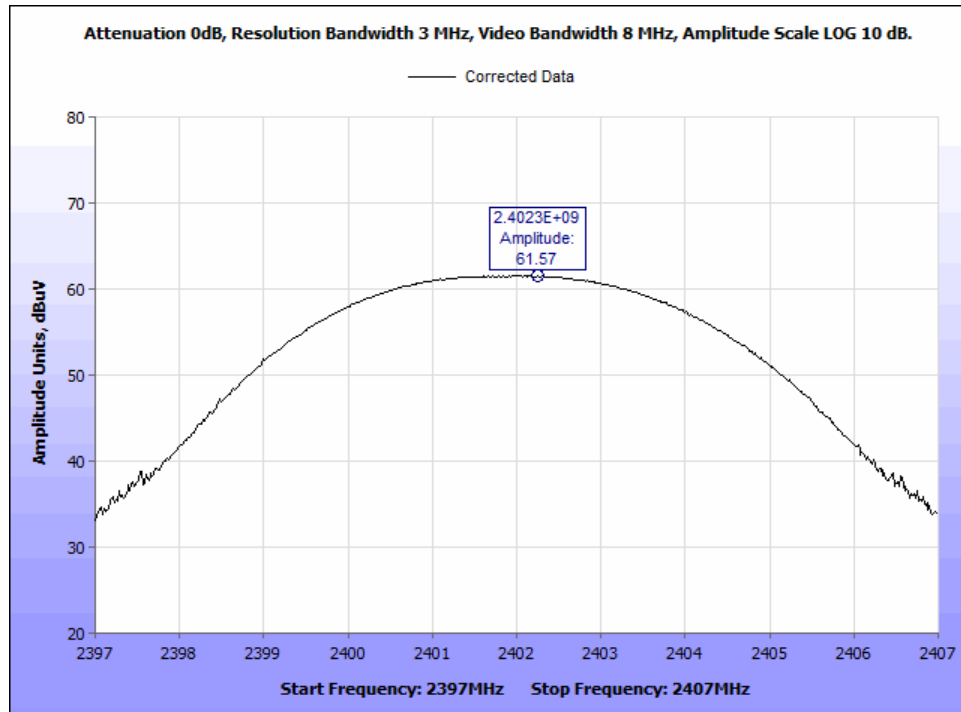


Figure 9. Uncorrected FE_Low Channel_2402MHz

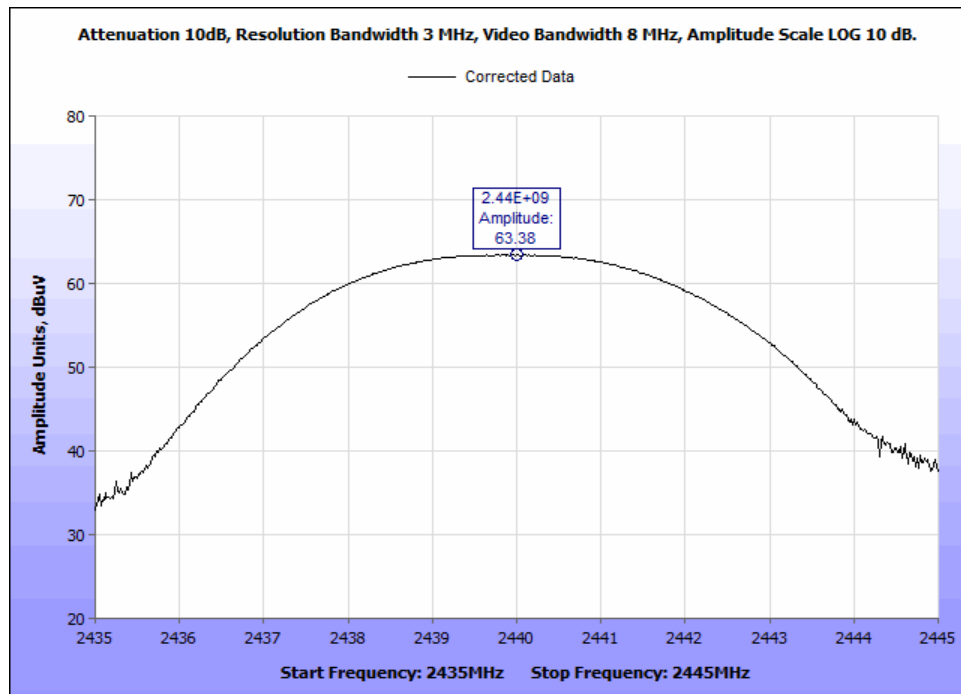


Figure 10. Uncorrected FE_Mid Channel_2440MHz

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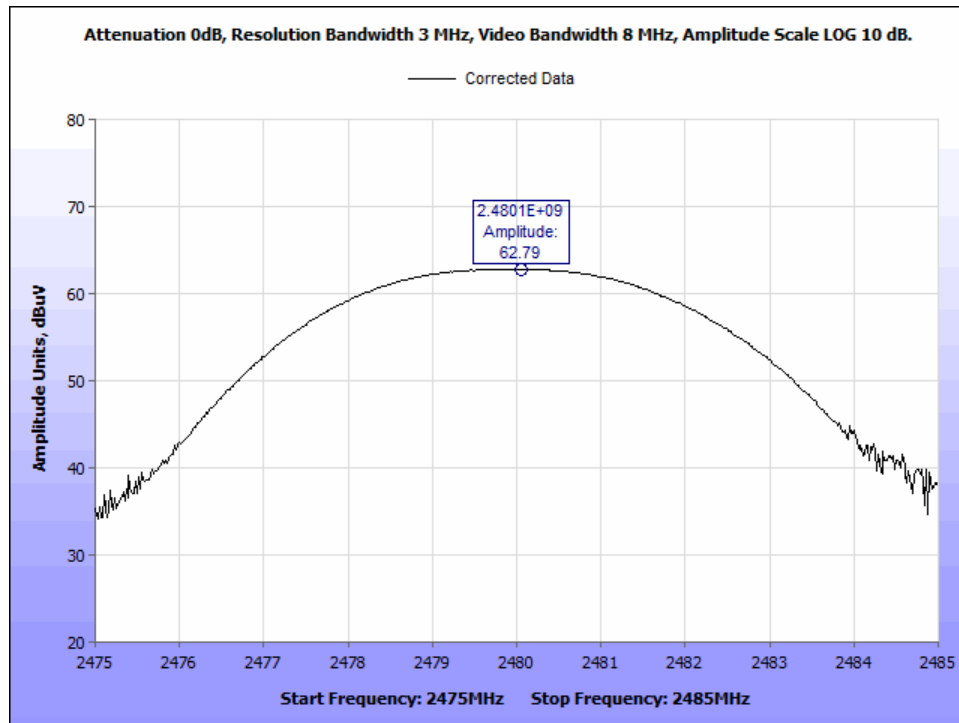
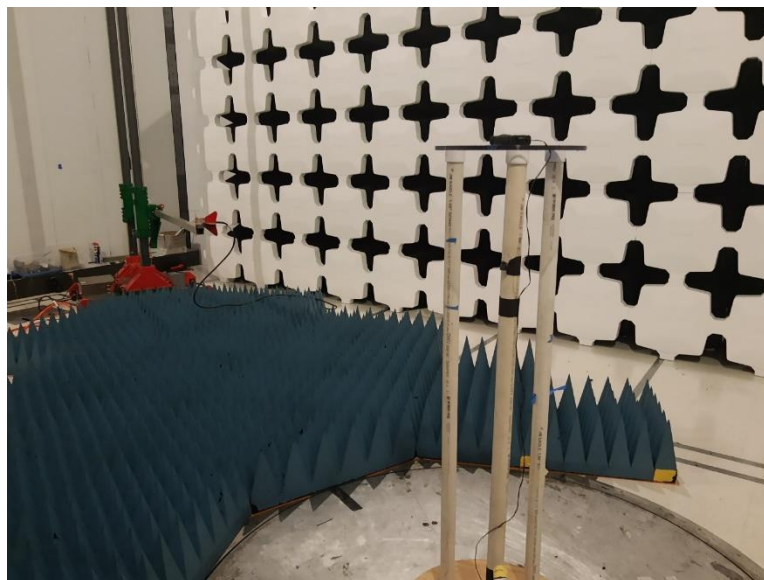


Figure 11. Uncorrected FE_High Channel_2480MHz



Photograph 2. Radiated Emissions - Fundamental Emission Test Setup

§ 15.209

Radiated Spurious Emissions Requirements and Band Edge

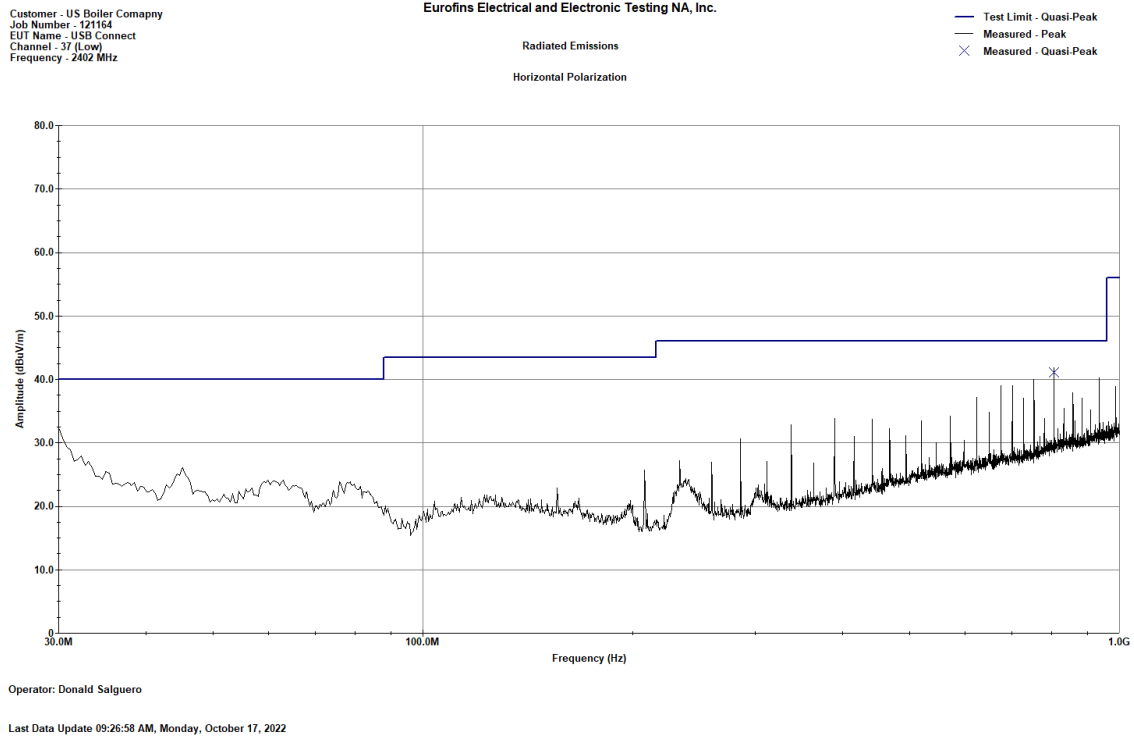


Figure 12. Radiated Emissions, 30 MHz to 1 GHz_Low Channel_1Mbps_H

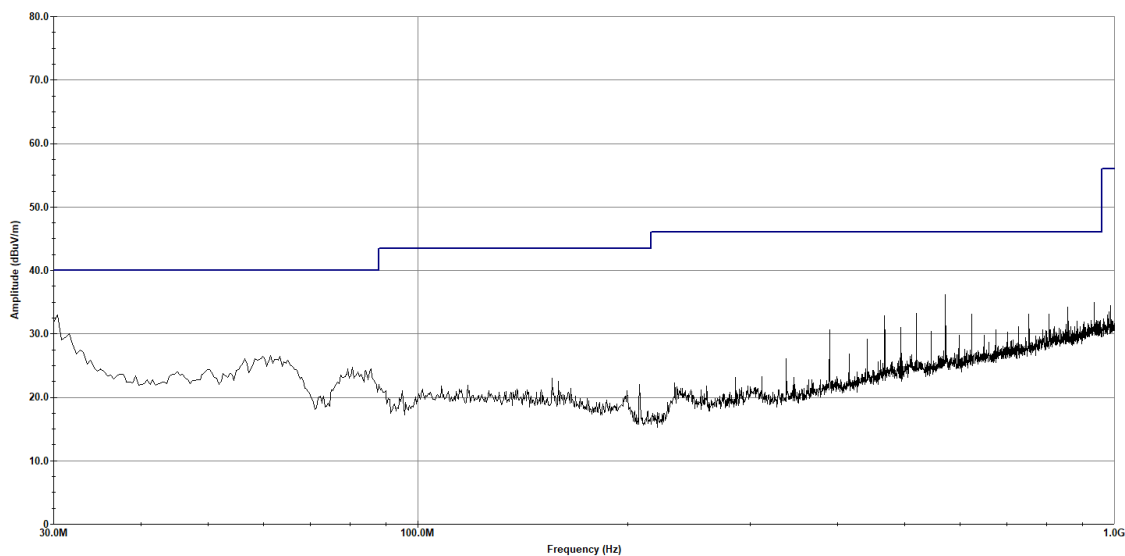
Customer - US Boiler Comapny
Job Number - 121164
EUT Name - USB Connect
Channel - 37 (Low)
Frequency - 2402 MHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions

Vertical Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



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Last Data Update 09:32:34 AM, Monday, October 17, 2022

Figure 13. Radiated Emissions, 30 MHz to 1 GHz_Low Channel_1Mbps_V

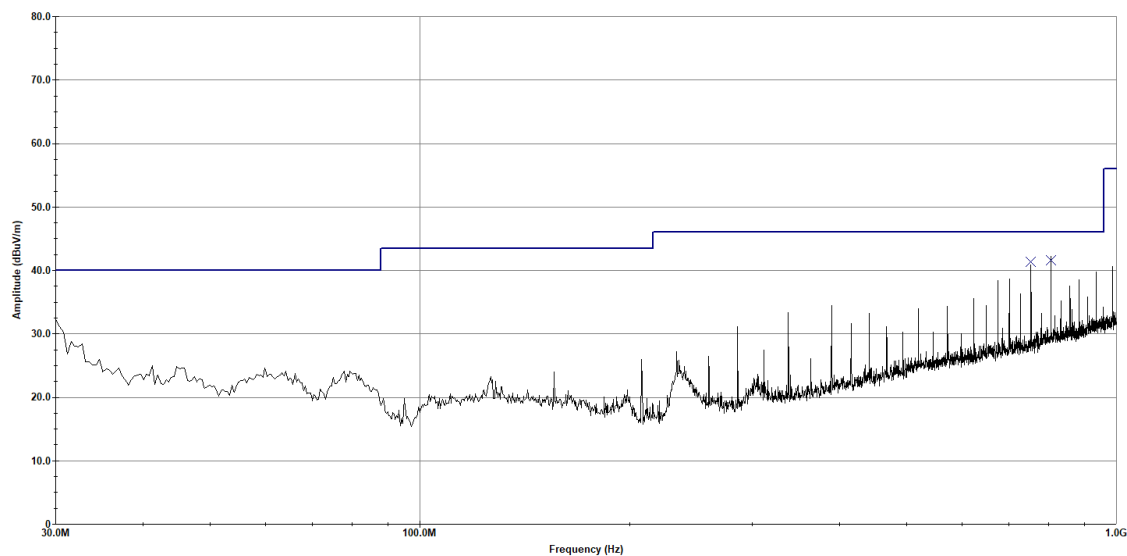
Customer - US Boiler Comapny
Job Number - 121164
EUT Name - USB Connect
Channel - 17 (Mid)
Frequency - 2440 MHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions

Horizontal Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



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Figure 14. Radiated Emissions, 30 MHz to 1 GHz_Mid Channel_1Mbps_H

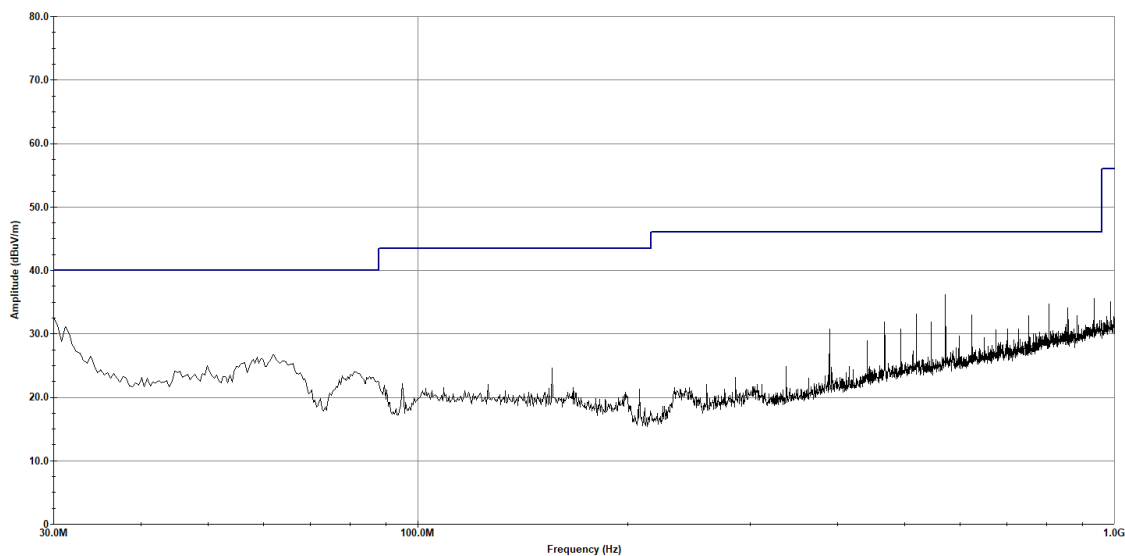
Customer - US Boiler Company
Job Number - 121164
EUT Name - USB Connect
Channel - 17 (Mid)
Frequency - 2440 MHz

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Radiated Emissions

Vertical Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



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Figure 15. Radiated Emissions, 30 MHz to 1 GHz_Mid Channel_1Mbps_V

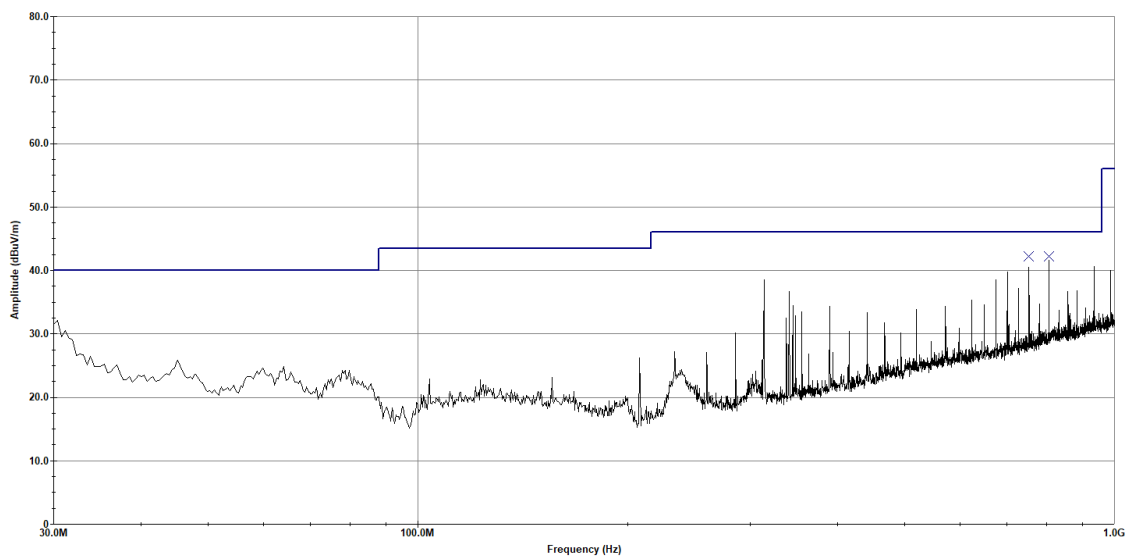
Customer - US Boiler Comapny
Job Number - 121164
EUT Name - USB Connect
Channel - 30 (High)
Frequency - 2400 MHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions

Horizontal Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



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Figure 16. Radiated Emissions, 30 MHz to 1 GHz_High Channel_1Mbps_H

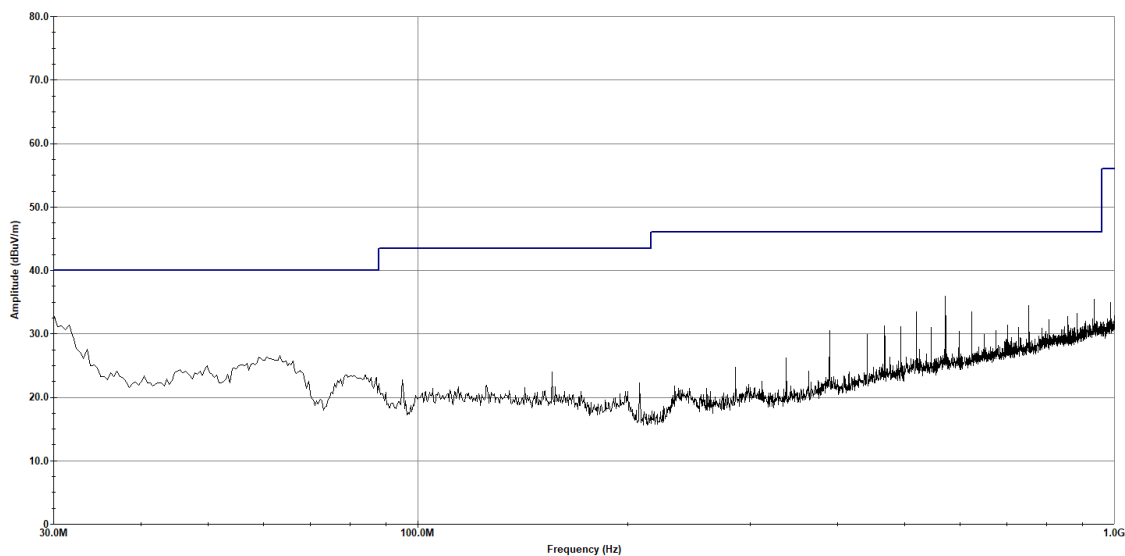
Customer - US Boiler Comapny
Job Number - 121164
EUT Name - USB Connect
Channel - 30 (High)
Frequency - 2400 MHz

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Radiated Emissions

Vertical Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



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Figure 17. Radiated Emissions, 30 MHz to 1 GHz_High Channel_1Mbps_V

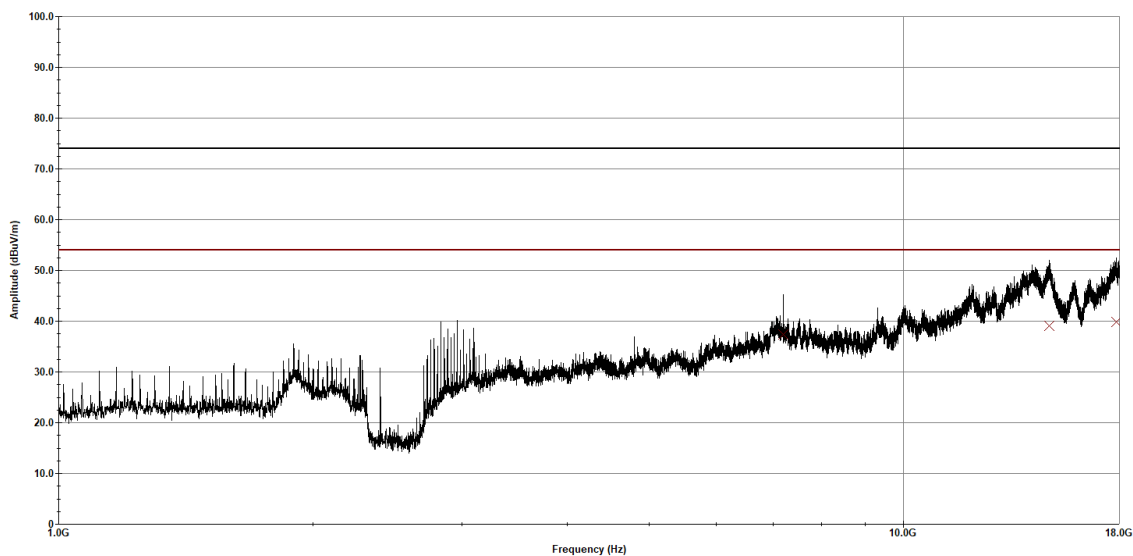
Customer - US Boiler Company, LLC
Job Number - 121164
EUT Name - USB Connect
Tx Channel - 37 (Low)
Frequency - 2402 MHz

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Radiated Emissions

Horizontal Polarization

— Test Limit - Peak
— Test Limit - Average
— Measured - Peak
× Measured - Average



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Last Data Update 01:59:18 PM, Tuesday, October 18, 2022

Figure 18. Radiated Emissions, 1-18GHz_Low Channel_1Mbps_H

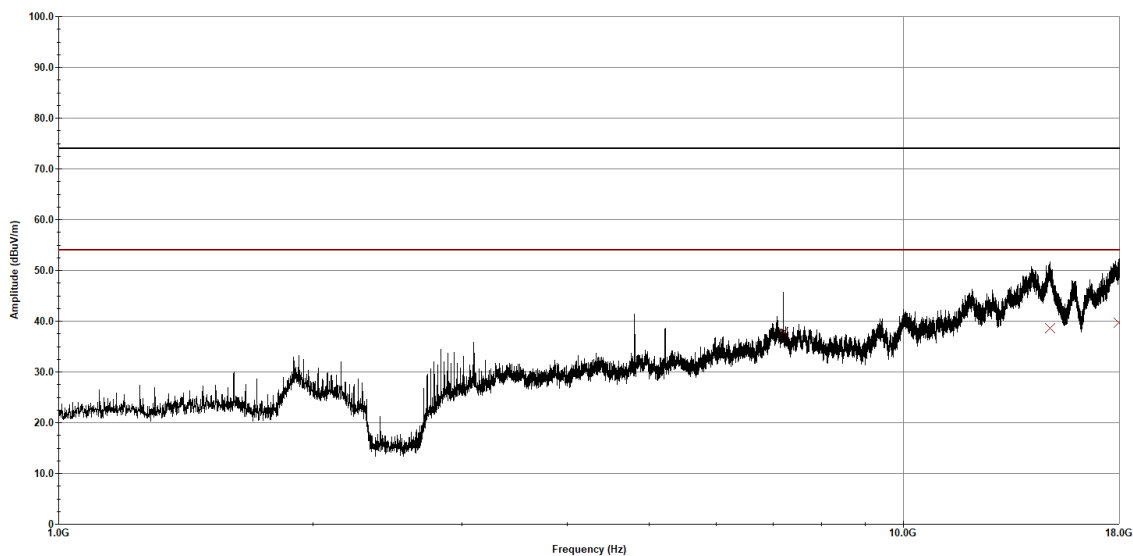
Customer - US Boiler Company, LLC
 Job Number - 121164
 EUT Name - USB Connect
 Tx Channel - 37 (Low)
 Frequency - 2402 MHz

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Radiated Emissions

Vertical Polarization

— Test Limit - Peak
 — Test Limit - Average
 — Measured - Peak
 × Measured - Average



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Last Data Update 02:11:08 PM, Tuesday, October 18, 2022

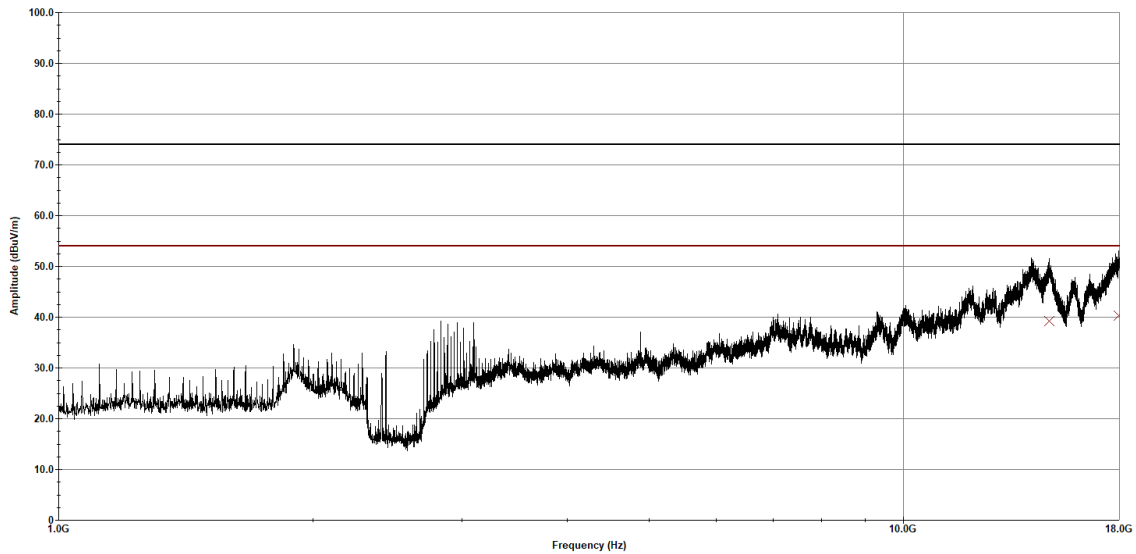
Figure 19. Radiated Emissions, 1-18GHz_Low Channel_1Mbps_V

Customer - US Boiler Company, LLC
 Job Number - 121164
 EUT Name - USB Connect
 Tx Channel - 17 (Mid)
 Frequency - 2440 MHz

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Radiated Emissions
 Horizontal Polarization

— Test Limit - Peak
 — Test Limit - Average
 — Measured - Peak
 × Measured - Average



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Last Data Update 02:28:25 PM, Tuesday, October 18, 2022

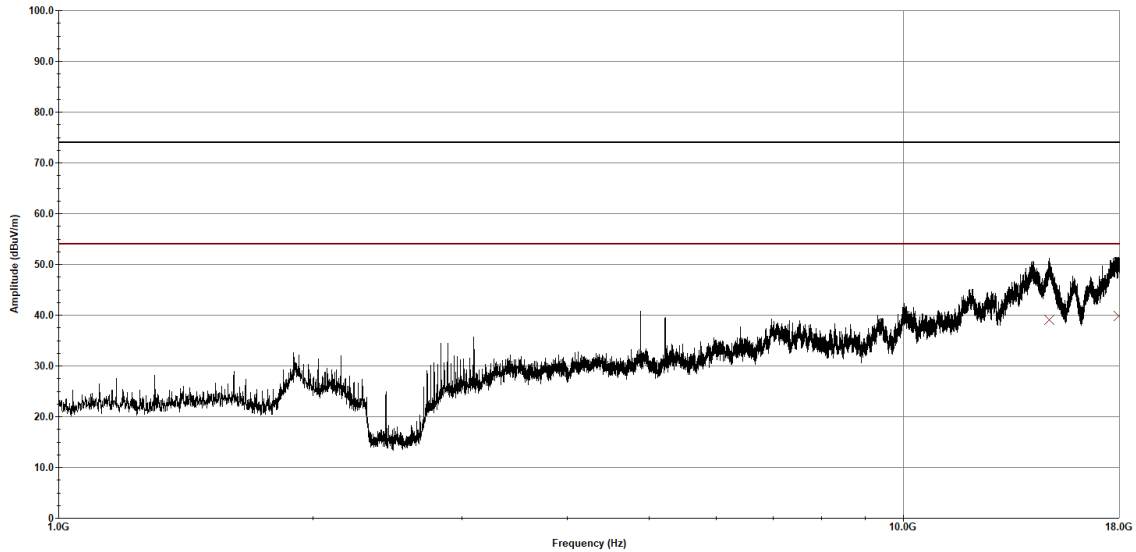
Figure 20. Radiated Emissions, 1-18GHz_Mid Channel_1Mbps_H

Customer - US Boiler Company, LLC
 Job Number - 121164
 EUT Name - USB Connect
 Tx Channel - 17 (Mid)
 Frequency - 2440 MHz

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Radiated Emissions
 Vertical Polarization

— Test Limit - Peak
 — Test Limit - Average
 — Measured - Peak
 × Measured - Average



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Last Data Update 02:38:50 PM, Tuesday, October 18, 2022

Figure 21. Radiated Emissions, 1-18GHz_Mid Channel_1Mbps_V

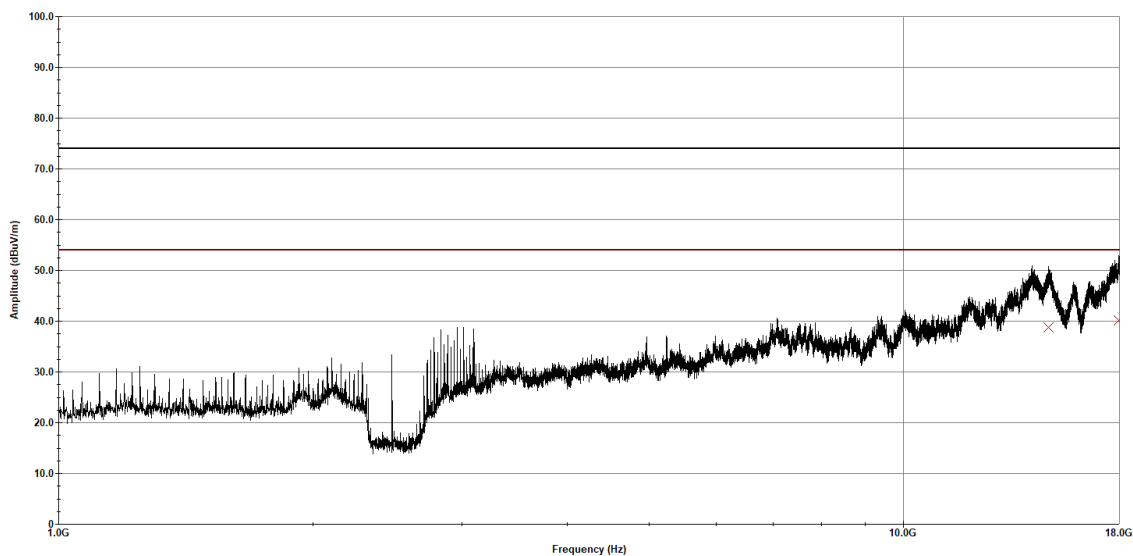
Customer - US Boiler Company, LLC
 Job Number - 121164
 EUT Name - USB Connect
 Tx Channel - 39 (High)
 Frequency - 2480 MHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions

Horizontal Polarization

— Test Limit - Peak
 — Test Limit - Average
 — Measured - Peak
 × Measured - Average



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Last Data Update 02:59:33 PM, Tuesday, October 18, 2022

Figure 22. Radiated Emissions, 1-18GHz_High Channel_1Mbps_H

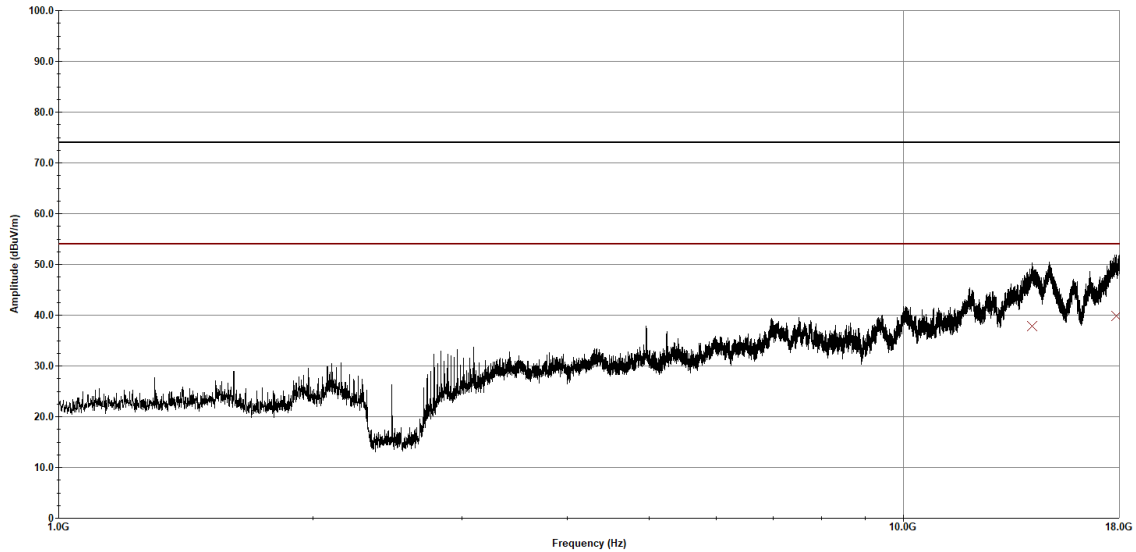
Customer - US Boiler Company, LLC
 Job Number - 121164
 EUT Name - USB Connect
 Tx Channel - 39 (High)
 Frequency - 2480 MHz

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Radiated Emissions

Vertical Polarization

— Test Limit - Peak
 — Test Limit - Average
 — Measured - Peak
 × Measured - Average



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Last Data Update 03:11:53 PM, Tuesday, October 18, 2022

Figure 23. Radiated Emissions, 1-18GHz_High Channel_1Mbps_V

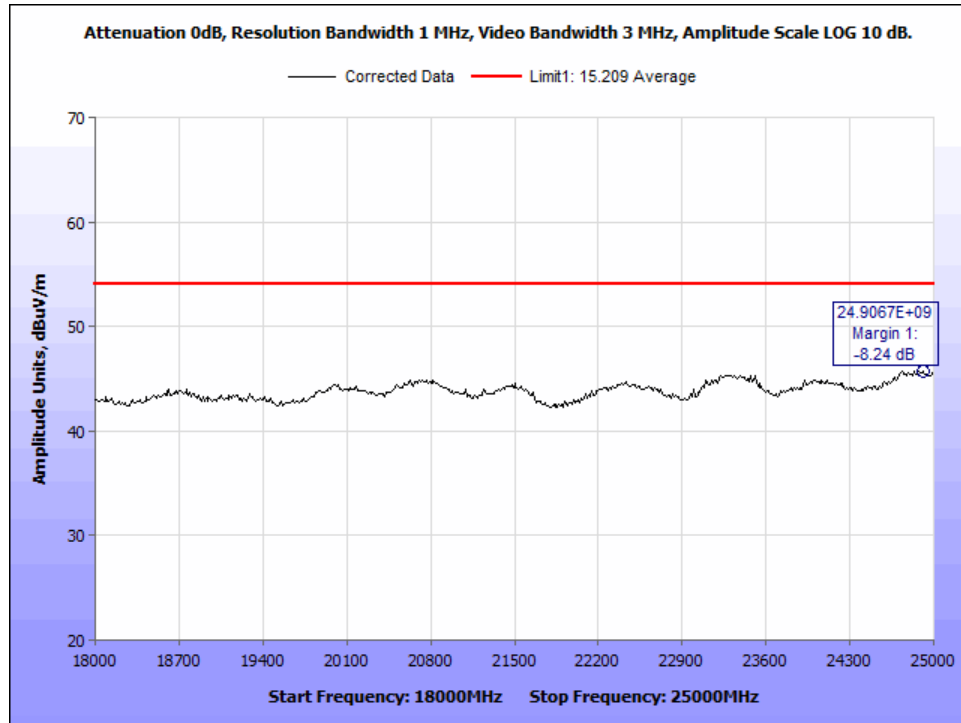


Figure 24. AVG Radiated Emissions_Low Channel_18-25GHz

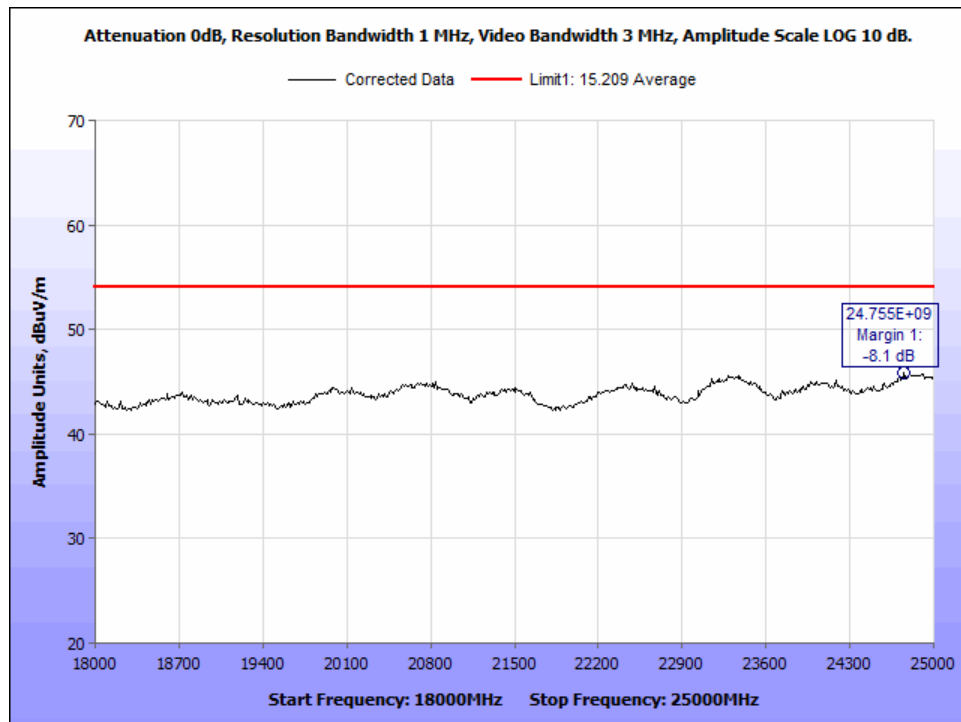


Figure 25. AVG Radiated Emissions_Mid Channel_18-25GHz

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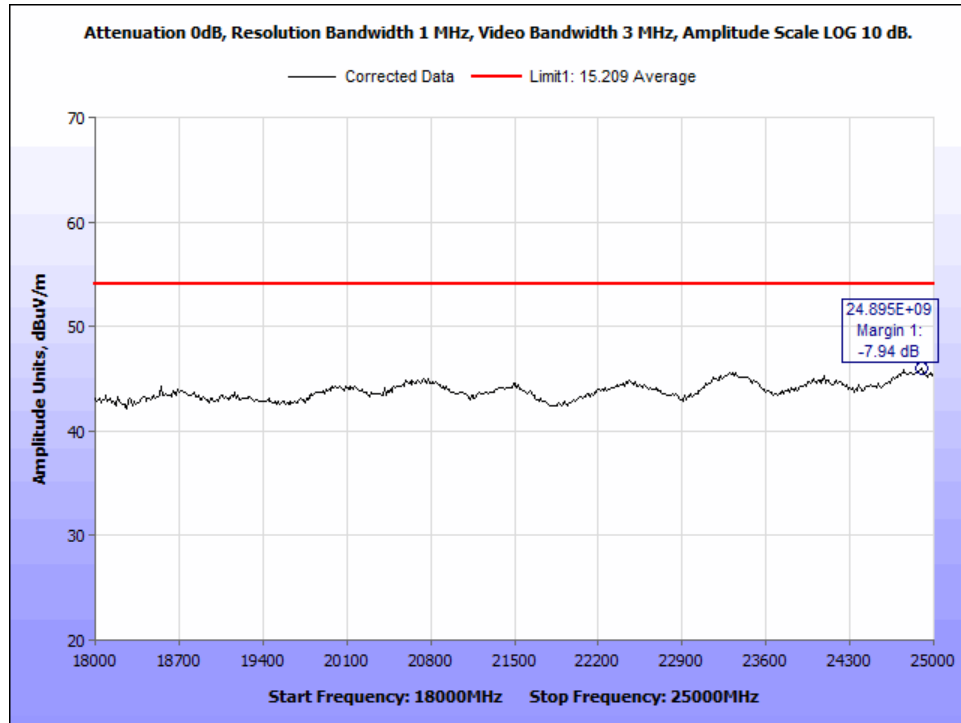


Figure 26. AVG Radiated Emissions_High Channel_18-25GHz

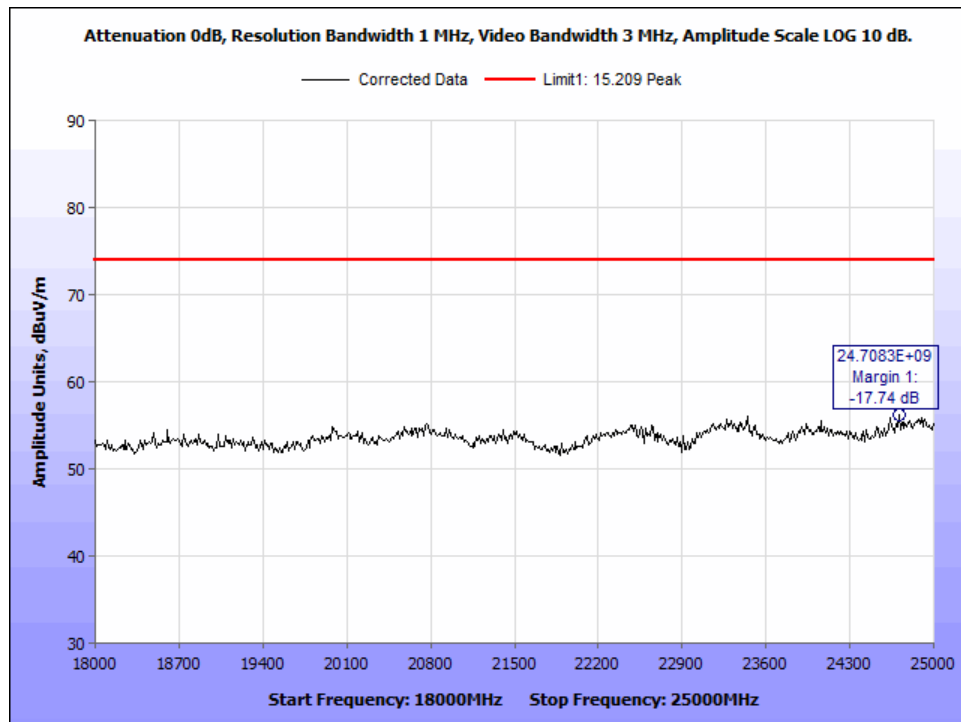


Figure 27. PK Radiated Emissions_Low Channel_18-25GHz

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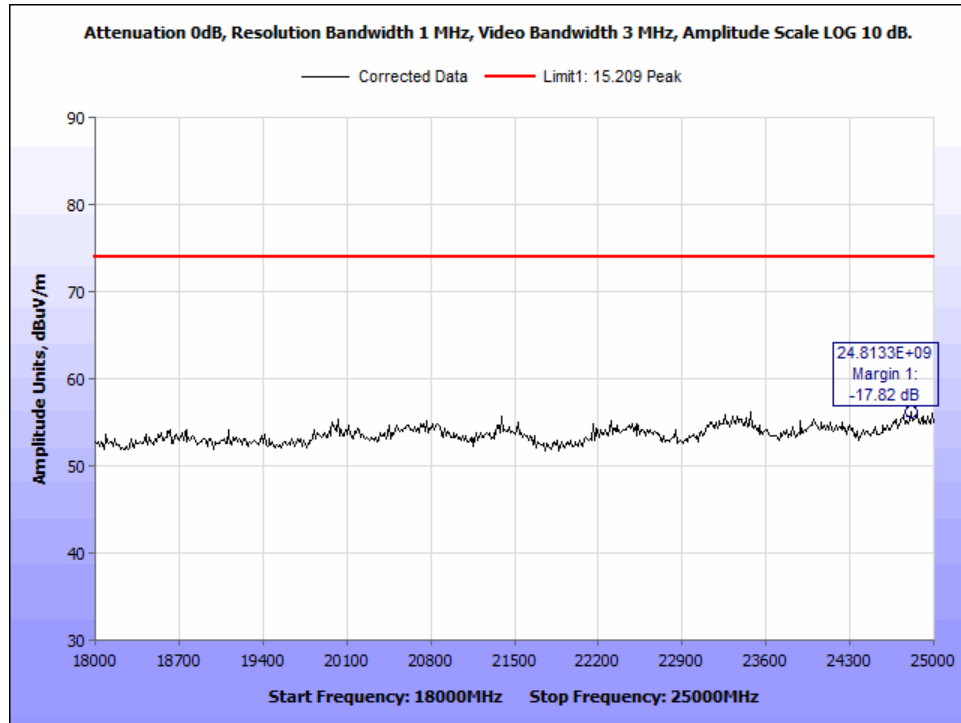


Figure 28. PK Radiated Emissions_Mid Channel_18-25GHz

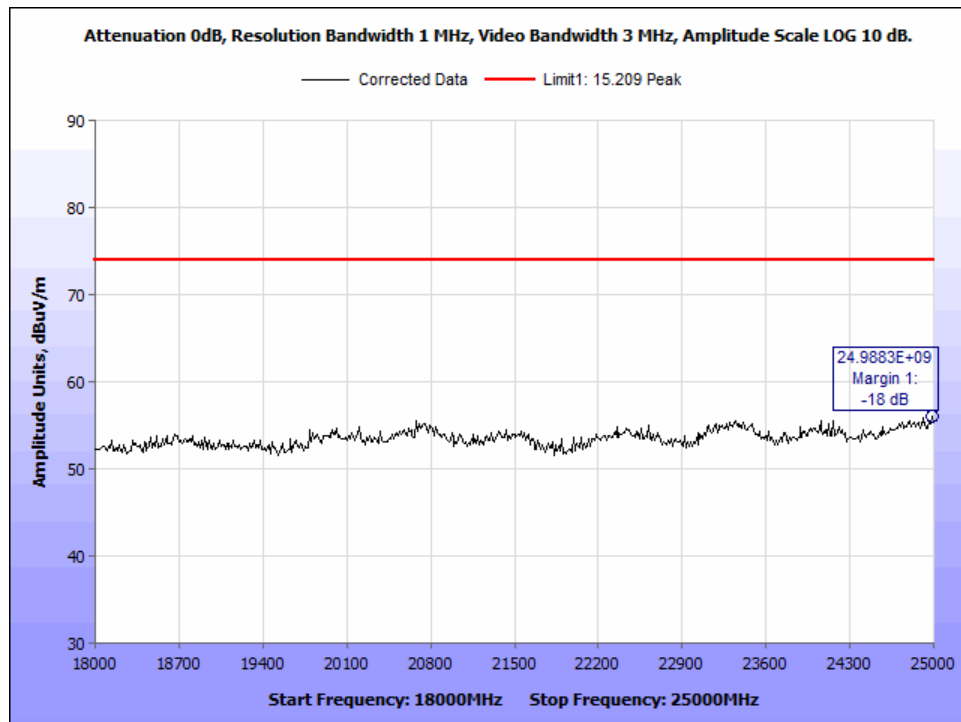


Figure 29. PK Radiated Emissions_High Channel_18-25GHz

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Radiated Band Edge Measurements

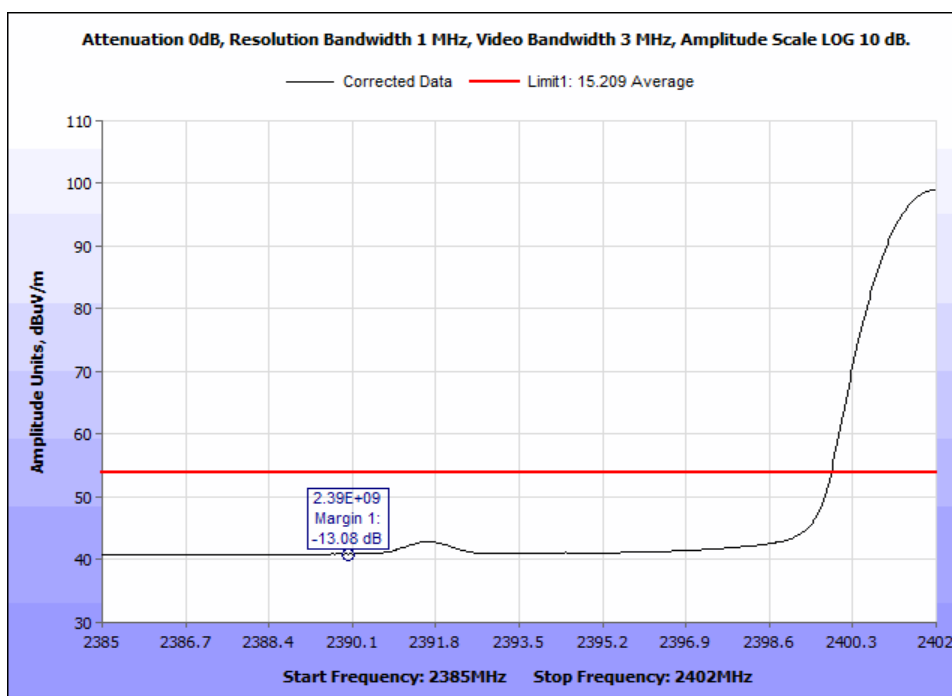


Figure 30. AVG Radiated Emissions_2390MHz Bandedge_Low Channel

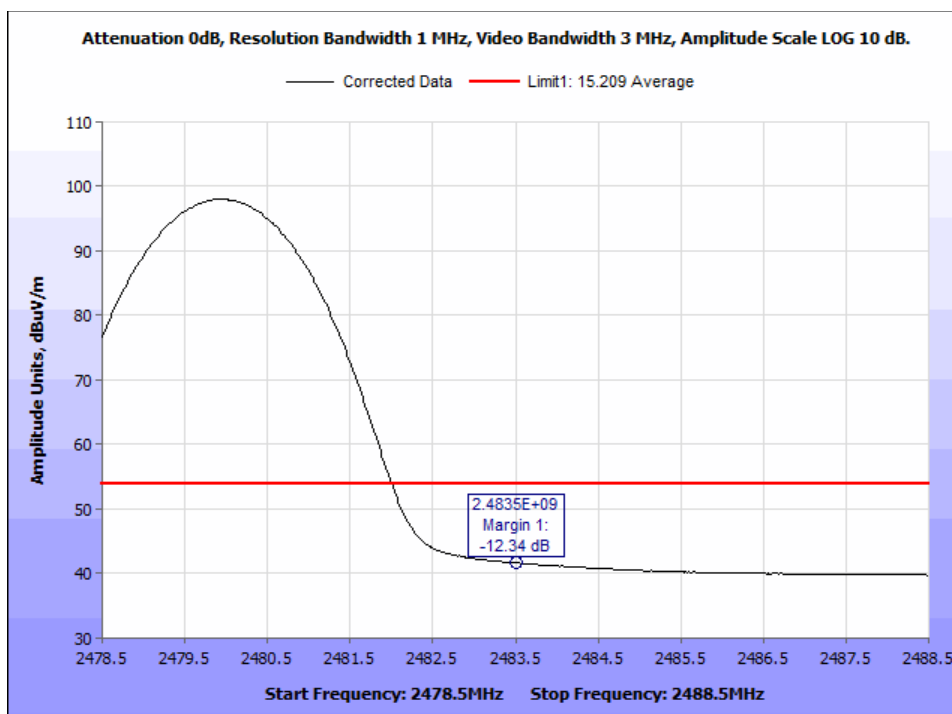


Figure 31. AVG Radiated Emissions_2483.5MHz Bandedge_High Channel

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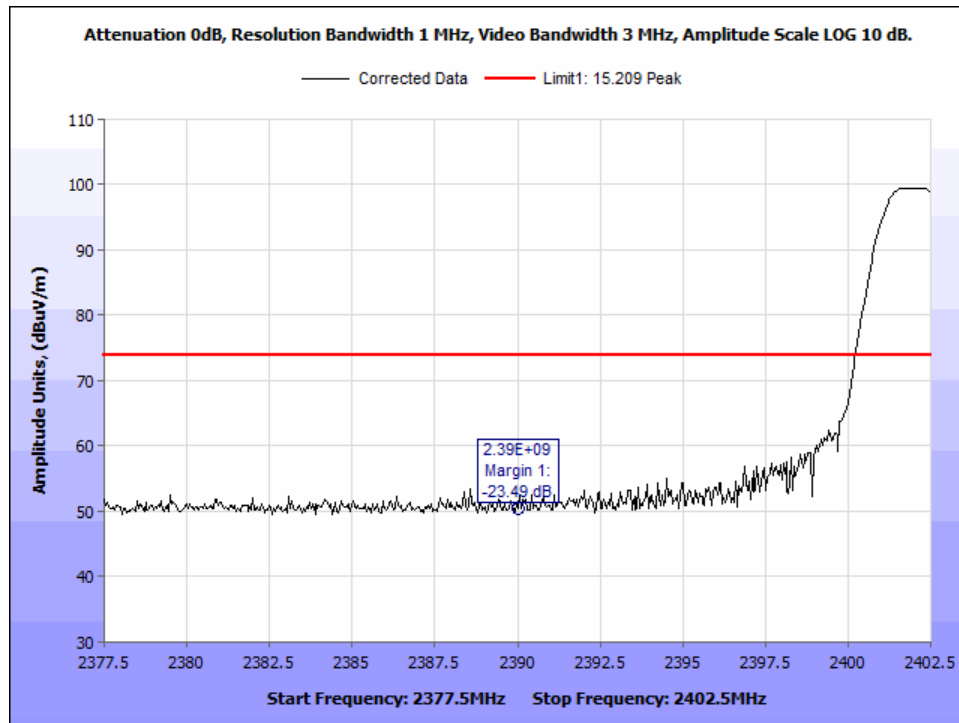


Figure 32. PK Radiated Emissions_2390MHz Bandedge_Low Channel

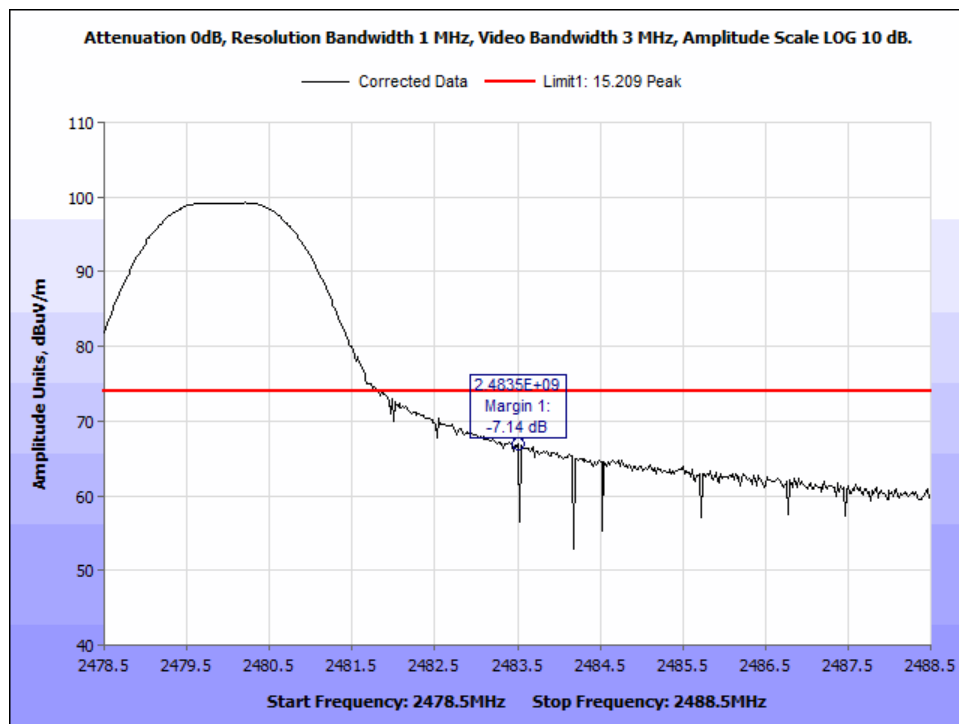


Figure 33. PK Radiated Emissions_2483.5MHz Bandedge_High Channel

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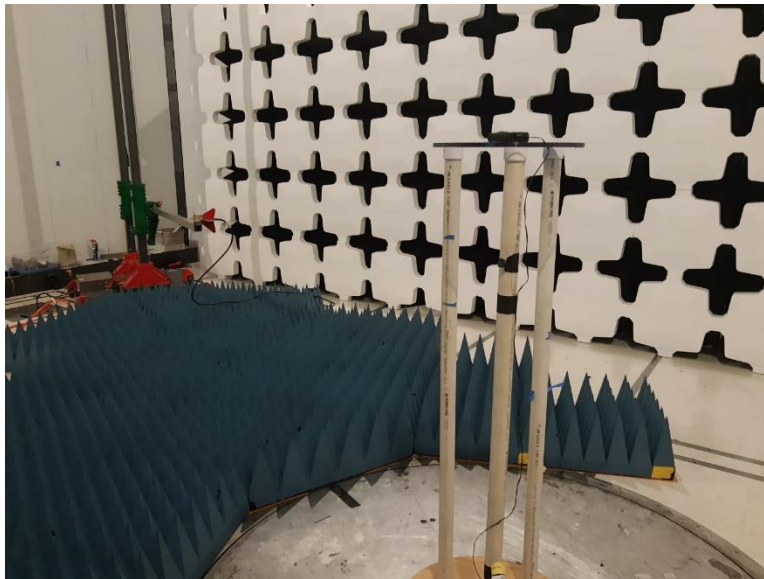
Photograph 3. Radiated Emissions - 30-1000MHz Test Setup



Photograph 4. Radiated Emissions - 1-18GHz Test Setup



Photograph 5. Radiated Emissions - 18-25GHz Test Setup



Photograph 6. Radiated Emissions - Fundamental Emission Test Setup

§ 15.247(d) Spurious Emissions in Non-restricted Bands

Since Peak power was used to measured Output Power, then 100kHz emissions limit should be 20dBc from fundamental. All emissions outside 2400-2483MHz are attenuated below 79dBuV

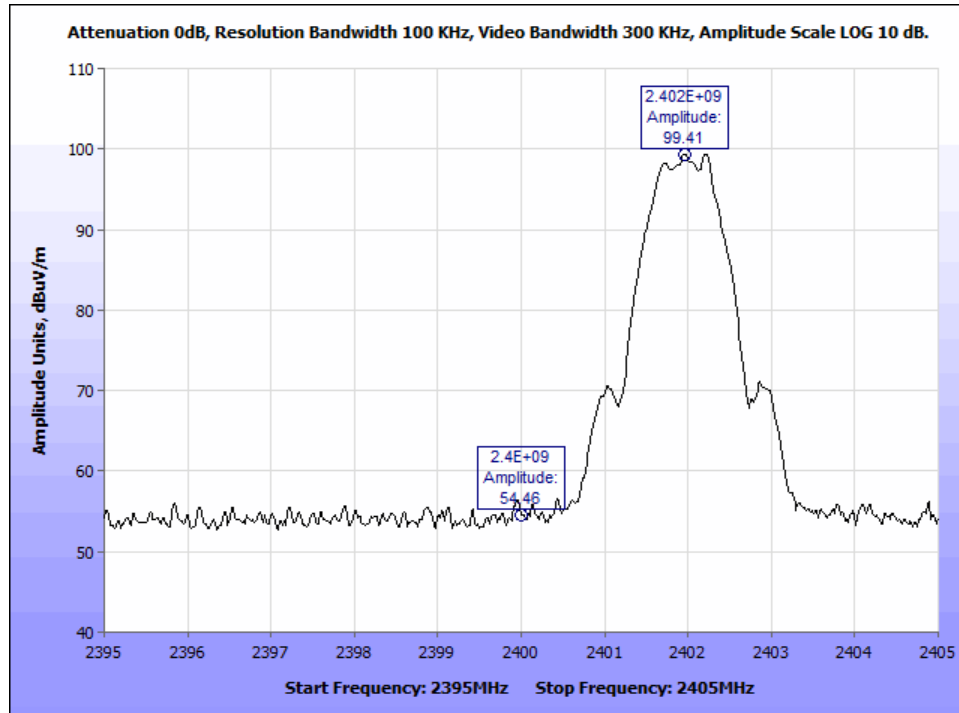


Figure 34. 100kHz Radiated Emissions_2400MHz Bandedge_Low Channel

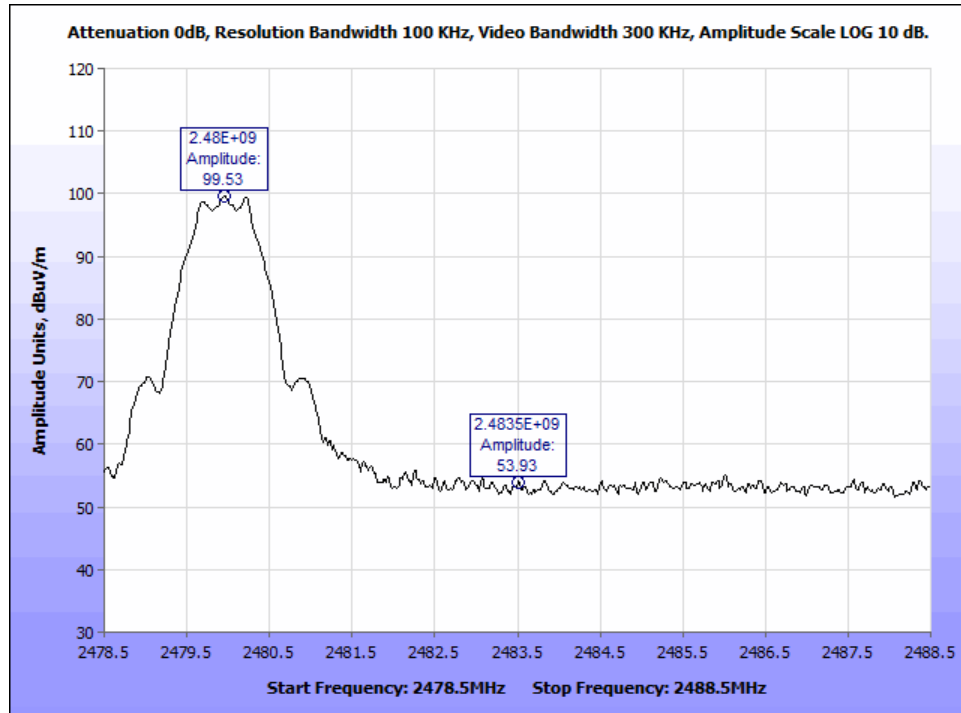


Figure 35. 100kHz Radiated Emissions_2483.5MHz Bandedge_High Channel

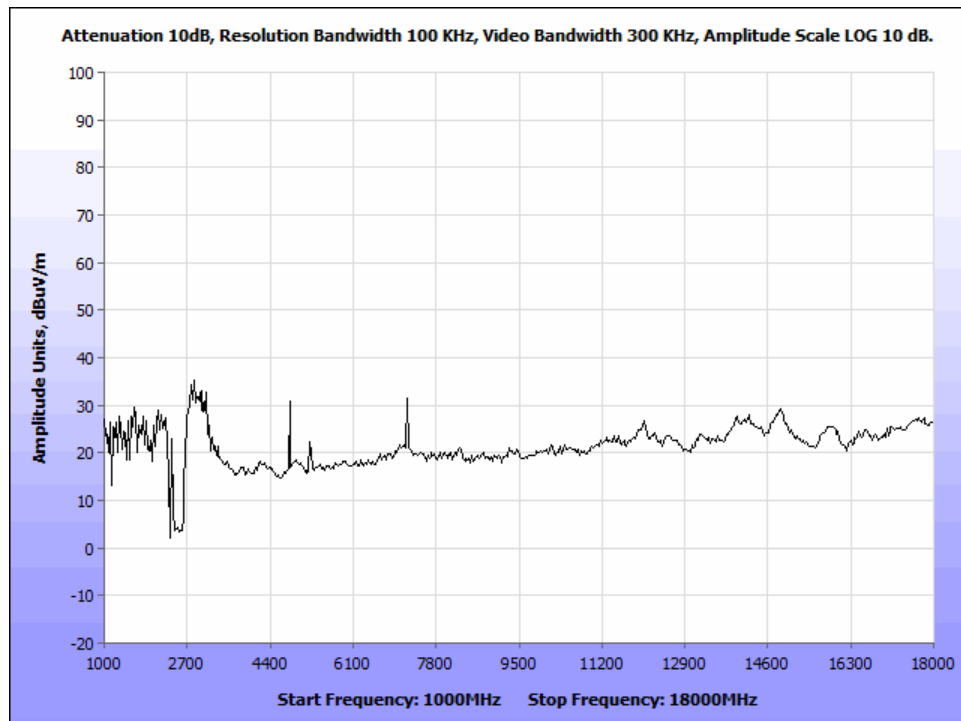


Figure 36. 100kHz Radiated Emissions_Low Channel_1-18 GHz

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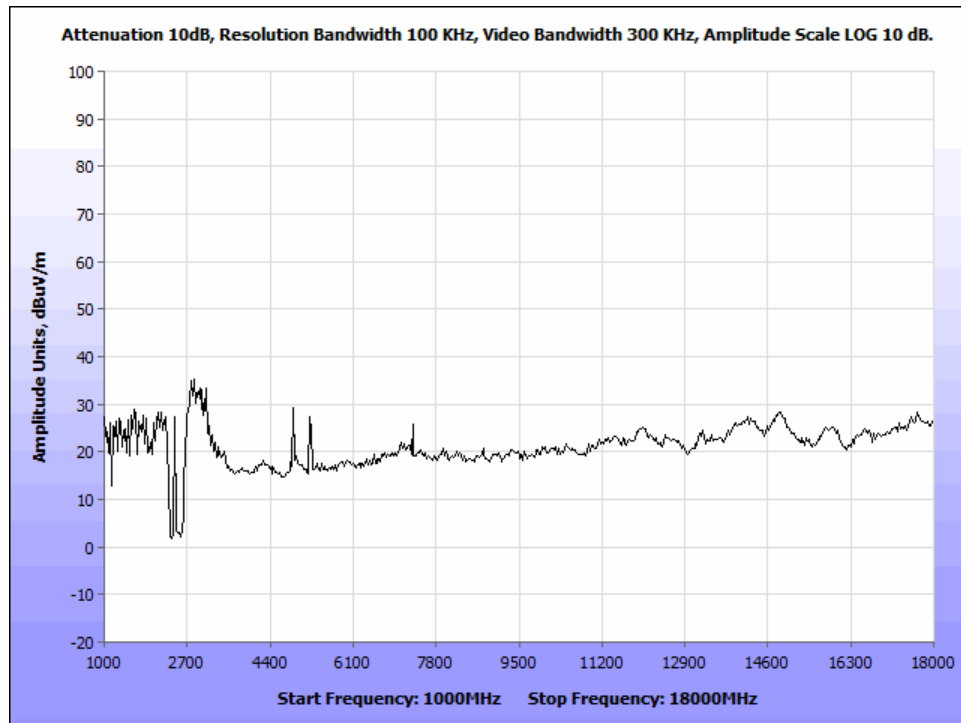


Figure 37. 100kHz Radiated Emissions_Mid Channel_1-18 GHz

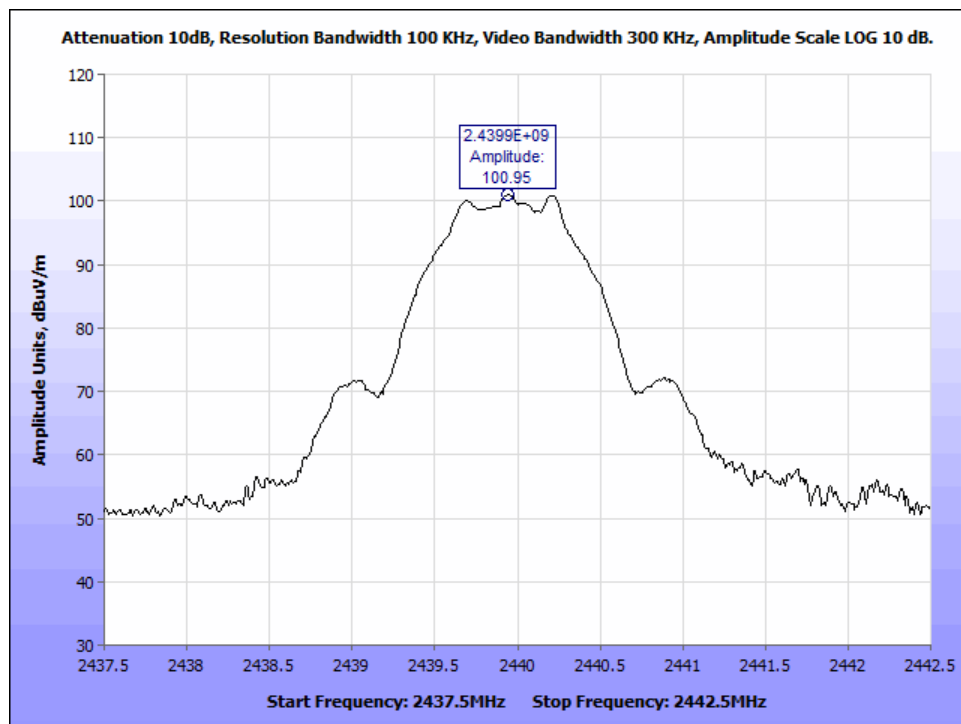


Figure 38. 100kHz Radiated Emissions_Mid Channel_Fundamental Emission

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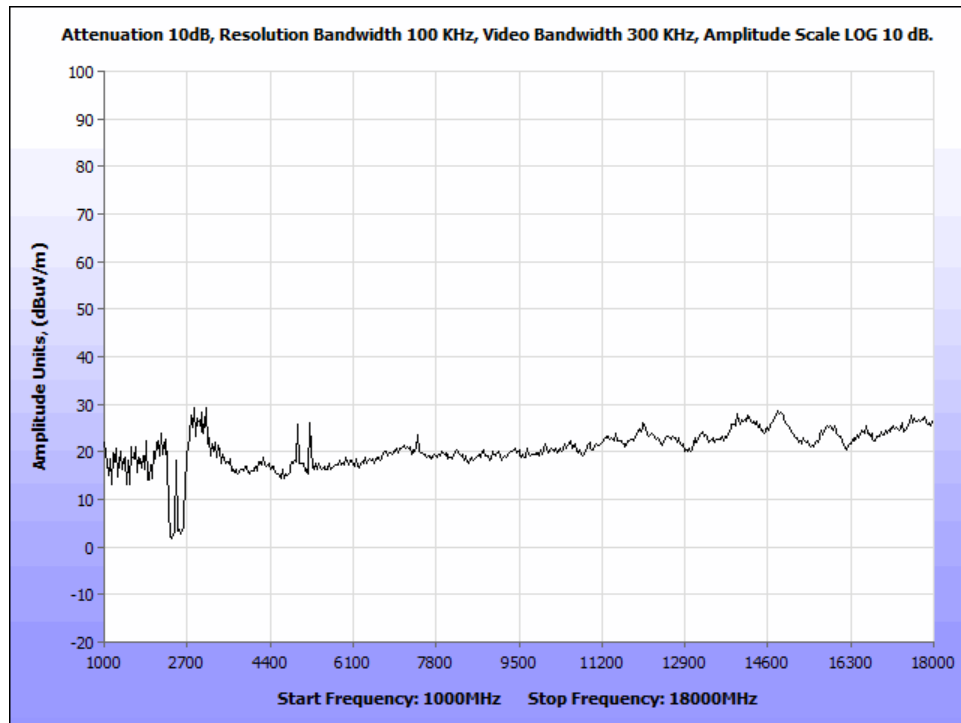


Figure 39. 100kHz Radiated Emissions_High Channel_1-18 GHz

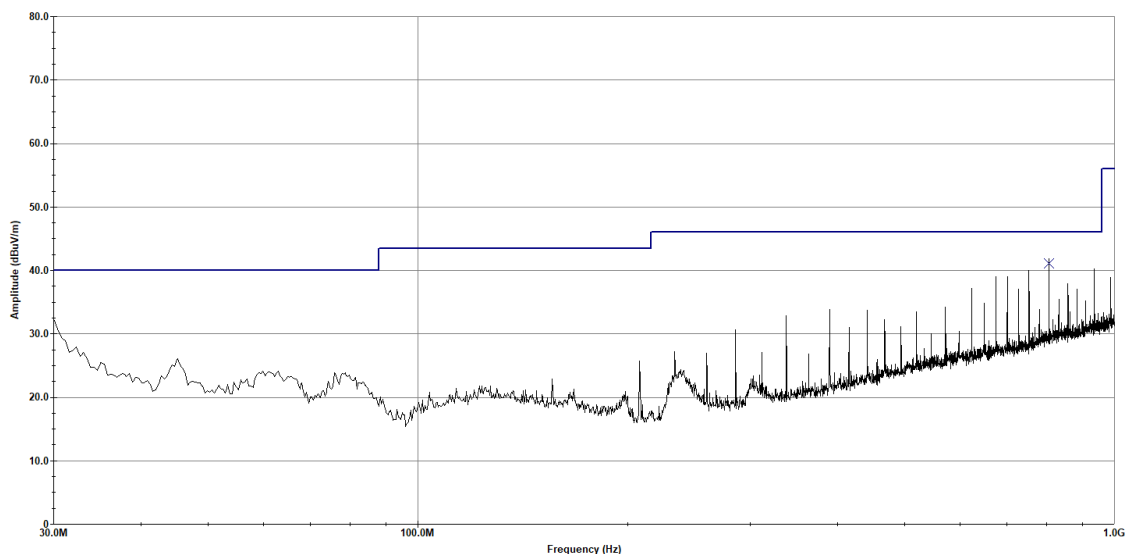
Customer - US Boiler Comapny
Job Number - 121164
EUT Name - USB Connect
Channel - 37 (Low)
Frequency - 2402 MHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions

Horizontal Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



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Figure 40. 100kHz Radiated Emissions, 30 MHz to 1 GHz_Low Channel_1Mbps_H

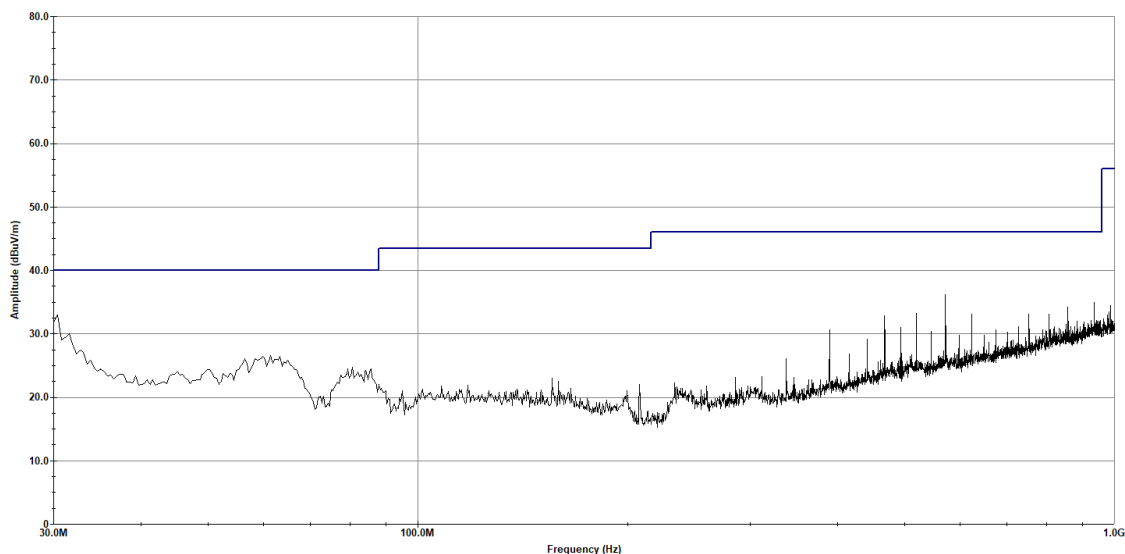
Customer - US Boiler Comapny
Job Number - 121164
EUT Name - USB Connect
Channel - 37 (Low)
Frequency - 2402 MHz

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Radiated Emissions

Vertical Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



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Last Data Update 09:32:34 AM, Monday, October 17, 2022

Figure 41. 100kHz Radiated Emissions, 30 MHz to 1 GHz_Low Channel_1Mbps_V

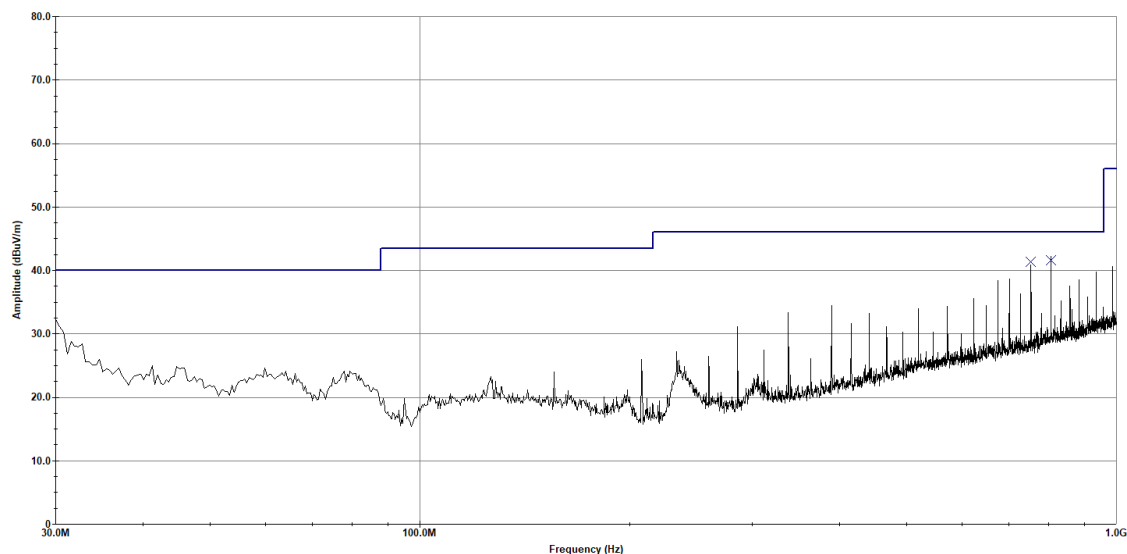
Customer - US Boiler Comapny
Job Number - 121164
EUT Name - USB Connect
Channel - 17 (Mid)
Frequency - 2440 MHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions

Horizontal Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



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Figure 42. 100kHz Radiated Emissions, 30 MHz to 1 GHz_Mid Channel_1Mbps_H

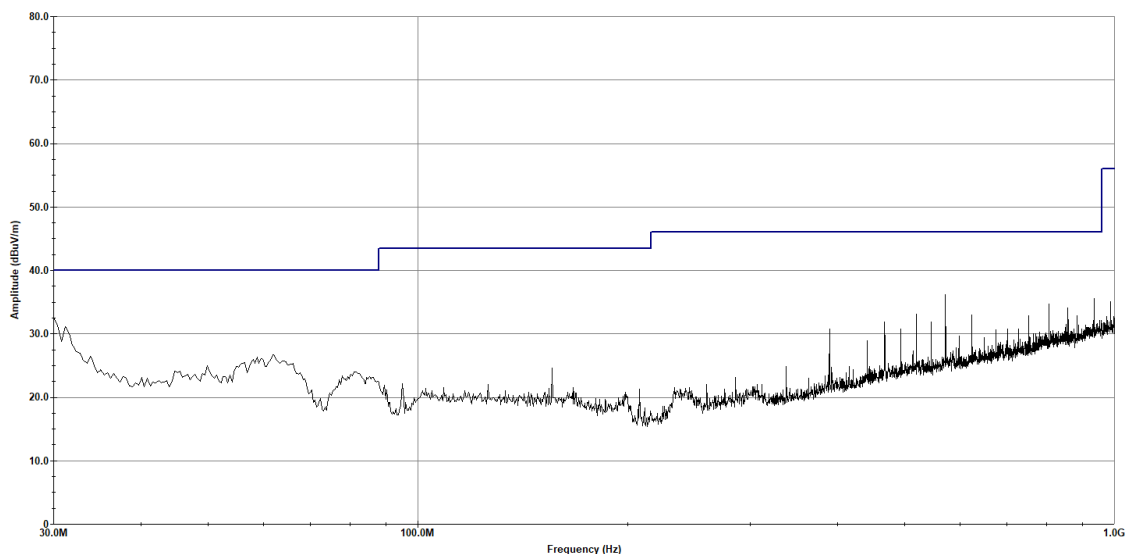
Customer - US Boiler Comapny
Job Number - 121164
EUT Name - USB Connect
Channel - 17 (Mid)
Frequency - 2440 MHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions

Vertical Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



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Last Data Update 10:04:22 AM, Monday, October 17, 2022

Figure 43. 100kHz Radiated Emissions, 30 MHz to 1 GHz_Mid Channel_1Mbps_V

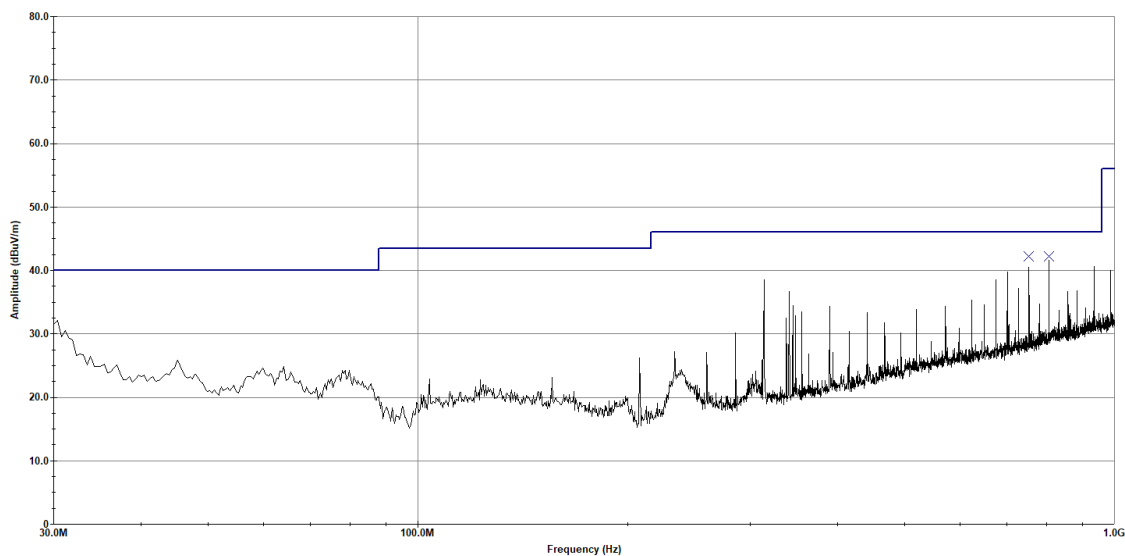
Customer - US Boiler Comapny
Job Number - 121164
EUT Name - USB Connect
Channel - 30 (High)
Frequency - 2400 MHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions

Horizontal Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



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Last Data Update 10:30:59 AM, Monday, October 17, 2022

Figure 44. 100kHz Radiated Emissions, 30 MHz to 1 GHz_High Channel_1Mbps_H

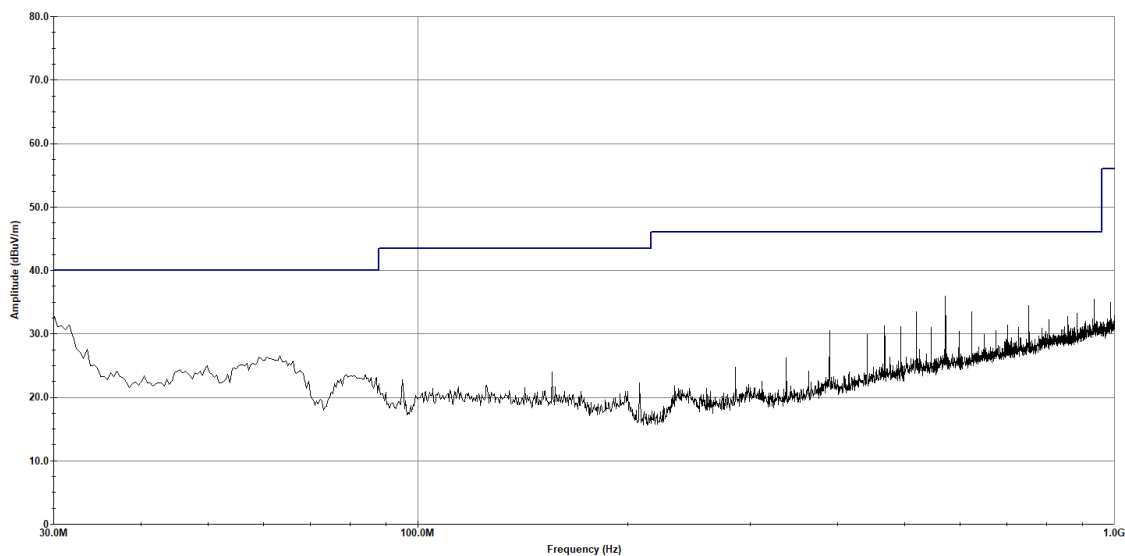
Customer - US Boiler Comapny
Job Number - 121164
EUT Name - USB Connect
Channel - 30 (High)
Frequency - 2400 MHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions

Vertical Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak

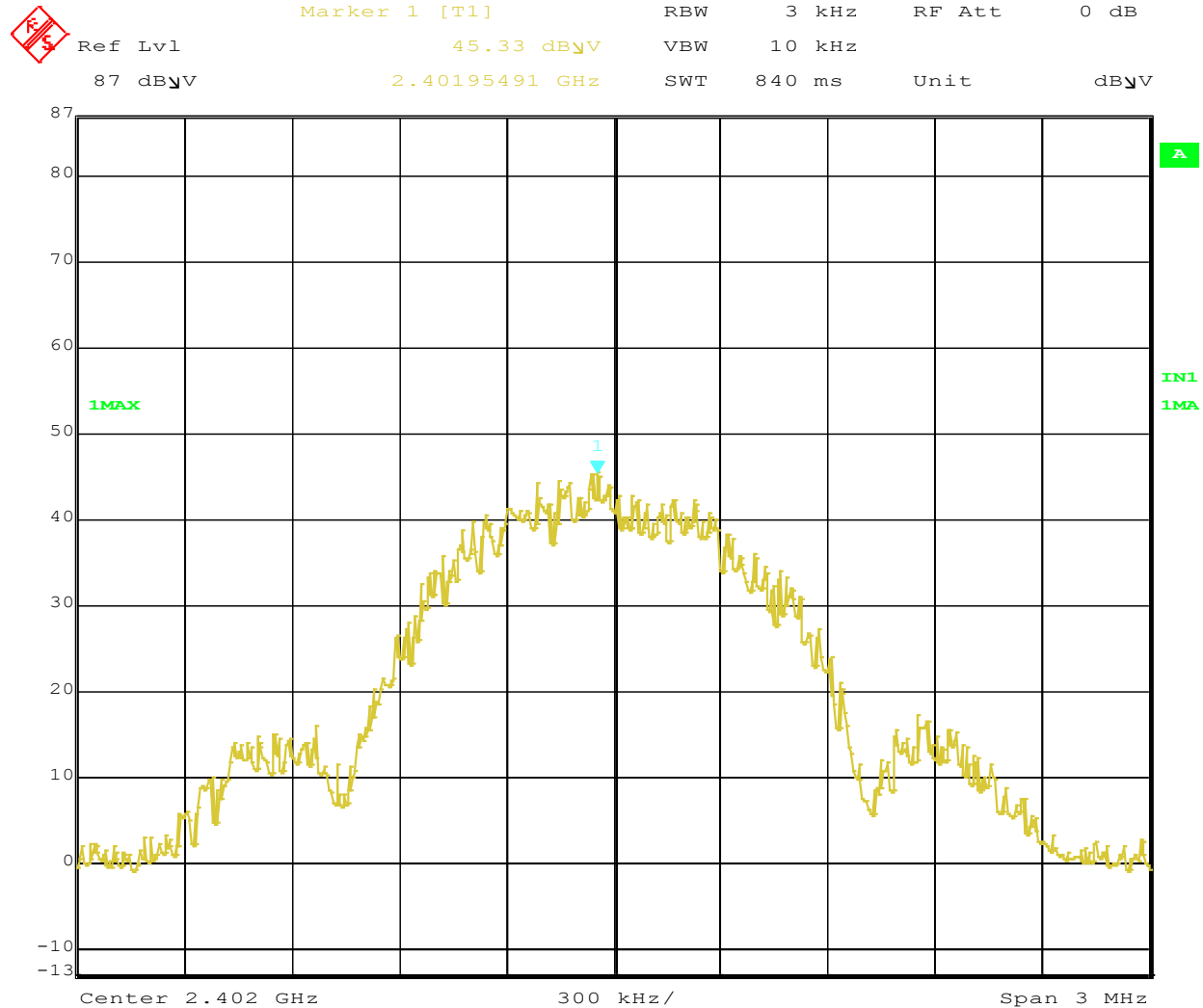


Operator: Donald Salguero

Last Data Update 10:36:41 AM, Monday, October 17, 2022

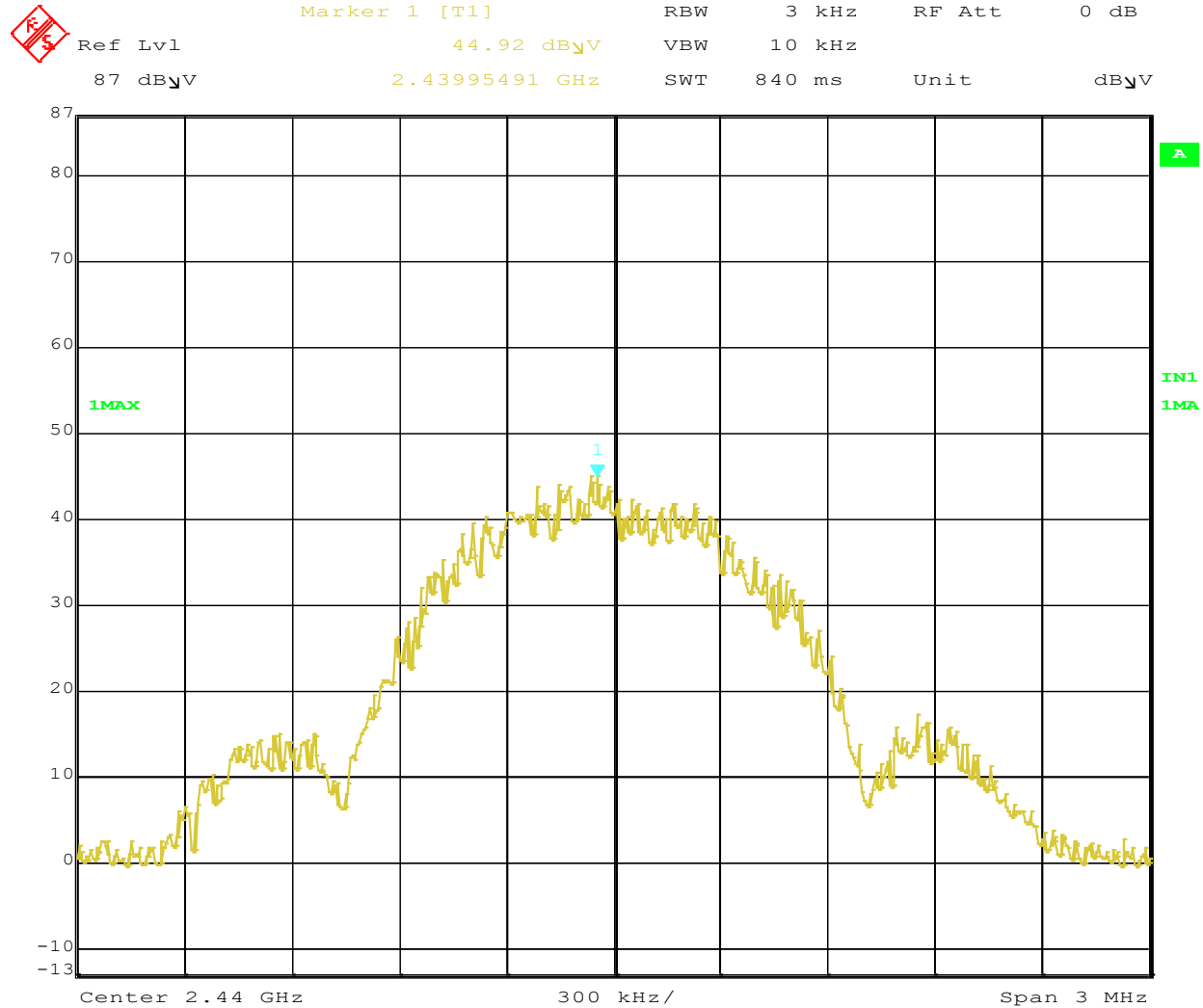
Figure 45. 100kHz Radiated Emissions, 30 MHz to 1 GHz_High Channel_1Mbps_V

§ 15.247(e) Peak Power Spectral Density



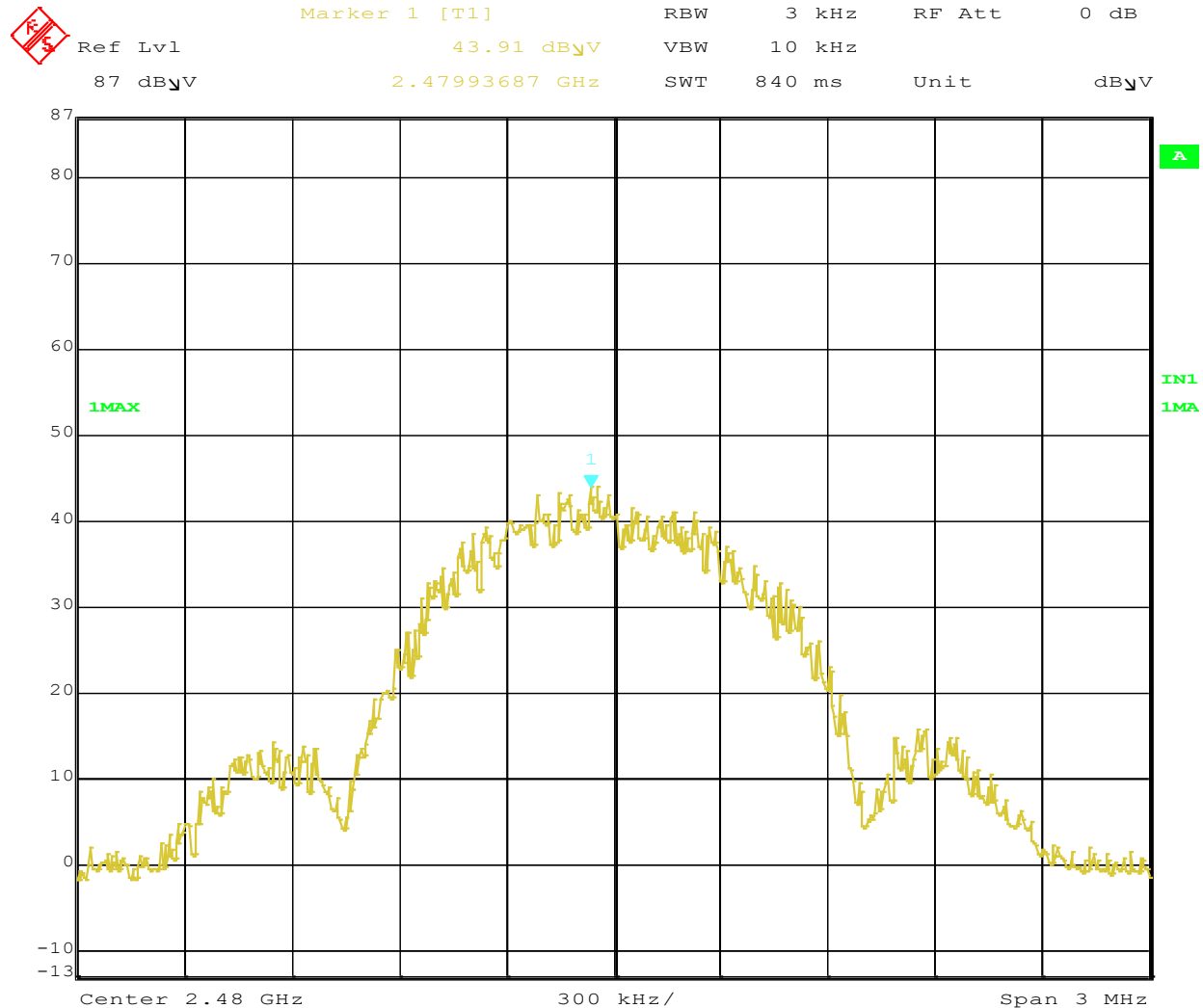
Date: 1. JAN. 1997 03:03:46

Figure 46. Uncorrected 100kHz Fundamental Emission for PSD_2402MHz_1 Mbps



Date: 1.JAN.1997 02:56:18

Figure 47. Uncorrected 100kHz Fundamental Emission for PSD_2440MHz_1 Mbps



Date: 1.JAN.1997 03:09:36

Figure 48. Uncorrected 100kHz Fundamental Emission for PSD_2480MHz_1 Mbps

§ 15.247(i) RF Human Exposure

***No data or photographs for this section.**