

ISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:

79354RRF.004

Partial Test Report

USA FCC Part 15.247, 15.209

CANADA RSS-247, RSS-Gen

(*) Identification of item tested	Stand-alone Wi-Fi 6 multiradio modules
(*) Trademark	u-blox
(*) Model and /or type reference	NORA-W406-00B
Other identification of the product	FCC ID: XPYNORAW4 IC: 8595A-NORAW4
(*) Features	BLE, Wi-Fi 6 (2.4 GHz) HW version: 04 SW version: v5.2.3
Applicant	u-blox AG Zürcherstrasse 68, 8800 Thalwil, Switzerland
Test method requested, standard	USA FCC Part 15.247 (10-1-23 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-23 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 3 (August 2023). CANADA RSS-Gen Issue 5 amendment 2 (February 2021). Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05r02 dated April 2, 2019. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager
Date of issue	2025-03-13
Report template No	FDT08_25 (*) "Data provided by the client"

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Acronyms

Acronym ID	Acronym Description
Detector	Detector used
Equipment	Equipment Type
Freq	Frequency
Freq Rng	Frequency Range
MP	Measurement Point
Mod	Modulation
Mode	MIMO Mode
OM	Operation Mode
Pol	Polarization
Port	Active Port
Unwanted Freq	Unwanted Emissions Frequency
Unwanted Lvl	Unwanted Emissions Level

Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification S.A.U. is an FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification S.A.U. is an ISED-recognized accredited testing laboratory, CABid: ES1909, Company Number: 4621A, with the appropriate scope of accreditation that covers the performed tests in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

The total uncertainty of the measurement system for the radiated emissions of EUT from 30 MHz to 1 GHz is:
Measurement uncertainty $\leq \pm 5,35$ dB with factor ($k = 2$).

The total uncertainty of the measurement system for the radiated emissions of EUT from 1 GHz to 17 GHz is:
Measurement uncertainty $\leq \pm 4,32$ dB with factor ($k = 2$).

The total uncertainty of the measurement system for the radiated emissions of EUT from 17 GHz to 26 GHz is:
Measurement uncertainty $\leq \pm 5,51$ dB with factor ($k = 2$).

The total uncertainty of the measurement system for the conducted testing of EUT is:

- RF Peak Output Power: Measurement uncertainty $\leq \pm 0,80$ dB
- RF Average Output Power: Measurement uncertainty $\leq \pm 0,99$ dB
- Power Spectral Density: Measurement uncertainty $\leq \pm 0,99$ dB
- 6dB Bandwidth: Measurement uncertainty $\leq \pm 2,84$ %
- Occupied Channel Bandwidth: Measurement uncertainty $\leq \pm 1,17$ %
- Conducted Band-edge spurious emissions: Measurement uncertainty $\leq \pm 1,76$ dB

Data provided by the client

The following data has been provided by the client:

- Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
- The sample consists of a Stand-alone Wi-Fi 6 multiradio modules.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results. The laboratory is not responsible for such information and it is not covered by accreditation.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial Nº	Date of Reception	Application
S/01	79354_44.1	Evaluation board	NORA-W406-00B	PT3#33	2024-08-21	Element Under Test
S/02	79354_43.1	Evaluation board	NORA-W406-00B	PT3#31	2024-08-21	Element Under Test

Notes referenced to samples during the project:

Id	Type
S/01	Sample used for radiated testing of Bluetooth Low Energy and ZigBee
S/02	Sample used for radiated testing of 802.11 bgnax 1x1

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded			
	-	-	-	-			
Supplementary information to the ports..... :	-						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
		AC:					
		AC:					
	X	DC: 3.0V - 3.6V					
	DC:						
Rated Power	-						
Clock frequencies..... :	-						
Other parameters	-						
Software version	v5.2.3						
Hardware version	04						
Dimensions in cm (W x H x D)	10.4mm x 14.3mm x 1.9mm						
Mounting position		Table top equipment					
		Wall/Ceiling mounted equipment					
		Floor standing equipment					
		Hand-held equipment					
		Other:					
Modules/parts..... :	Module/parts of test item			Type		Manufacturer	
	-			-		-	
Accessories (not part of the test item)	Description			Type		Manufacturer	
	-			-		-	
Documents as provided by the applicant..... :	Description			File name		Issue date	
	-			-		-	

Identification of the client

u-blox AG
Zürcherstrasse 68, 8800 Thalwil, Switzerland

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2024-09-10
Date (finish)	2024-09-18

Document history

Report number	Date	Description
79354RRF.004	2025-03-13	First release.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Valentin Andarias Diaz, Sergio Carrasco, Rafael Fernandez Martin.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
07445	DC POWER SUPPLY 30V/5A	U8002A	KEYSIGHT TECHNOLOGIES	N/A
07760	DIGITAL MULTIMETER	175	FLUKE	2025-11-07
07817	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2026-07-01
06615	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2025-04-04
06609	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2025-04-22
04953	HIGH PASS FILTER 1.1-8GHz	WHK10-990-1100-8000-40SS	WAINWRIGHT INSTRUMENTS	2025-02-14
09029	HIGH PASS FILTER 17-40 GHZ	STHP-17-40G-92	TEMSTRON/TEM WELL	2025-03-29
08770	HIGH PASS FILTER 3-18 GHZ	ST-3GA2833-HS	TEMSTRON/TEM WELL	2025-08-02
06496	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK	2026-12-01
04657	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2026-06-12
06143	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2027-01-22
07656	LOW PASS FILTER TEMSTRON/TEMWELL DC - 1 GHZ	ST-1GA3250-LS	TEMSTRON/TEM WELL	2025-02-02
07193	MULTI-DEVICE CONTROLLER	CO3000	INNCO	N/A
08856	PRE-AMPLIFIER G>30dB 18-40GHz	BLMA 1840-4A	BONN ELEKTRONIK	2025-02-27
03783	PRE-AMPLIFIER G>30dB 1GHz-18GHz	BLMA 0118-3A	BONN ELEKTRONIK	2025-03-15
06142	PRE-AMPLIFIER G>38dB 30MHz-6GHz	BLNA 0360-01N	BONN ELEKTRONIK	2025-07-25
06144	PRE-AMPLIFIER G>40dB 10MHz-6GHz	BLNA 0160-01N	BONN ELEKTRONIK	2025-07-22
06791	SEMIANECHOIC ABSORBER LINED CHAMBER IV	FACT 3 200 STP	ETS LINDGREN	N/A
04848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	N/A

Testing verdicts

Fail	F
Inconclusive	I
Not applicable	N/A
Not measured	N/M
Pass	P

Summary

Bluetooth Low Energy (2M, 1M):

FCC PART 15 PARAGRAPH/ RSS-247			
Requirement – Test case		Verdict	Remark
FCC 15.247 (a)(2) / RSS-247 5.2. (a)	6 dB Bandwidth	N/M	
FCC 15.247 (b) / RSS-247 5.4. (d)	Maximum output power and antenna gain	N/M	
FCC 15.247 (d) / RSS-247 5.5.	Band-edge emissions compliance (Transmitter)	N/M	
FCC 15.247 (e) / RSS-247 5.2. (b)	Power spectral density	N/M	
FCC 15.247 (d) / RSS-247 5.5.	Emission limitations radiated (Transmitter)	P	(1)
<u>Supplementary information and remarks:</u>			
1. Only radiated tests have been requested			

802.11 bgnax 1x1:

FCC PART 15 PARAGRAPH/ RSS-247			
Requirement – Test case		Verdict	Remark
FCC 15.247 (a)(2) / RSS-247 5.2. (a)	6 dB Bandwidth	N/M	
FCC 15.247 (b) / RSS-247 5.4. (d)	Maximum output power and antenna gain	N/M	
FCC 15.247 (d) / RSS-247 5.5.	Band-edge emissions compliance (Transmitter)	N/M	
FCC 15.247 (e) / RSS-247 5.2. (b)	Power spectral density	N/M	
FCC 15.247 (d) / RSS-247 5.5.	Emission limitations radiated (Transmitter)	P	(1)
<u>Supplementary information and remarks:</u> 1. Only radiated tests have been requested			

ZigBee:

FCC PART 15 PARAGRAPH/ RSS-247			
Requirement – Test case		Verdict	Remark
FCC 15.247 (a)(2) / RSS-247 5.2. (a)	6 dB Bandwidth	N/M	
FCC 15.247 (b) / RSS-247 5.4. (d)	Maximum output power and antenna gain	N/M	
FCC 15.247 (d) / RSS-247 5.5.	Band-edge emissions compliance (Transmitter)	N/M	
FCC 15.247 (e) / RSS-247 5.2. (b)	Power spectral density	N/M	
FCC 15.247 (d) / RSS-247 5.5.	Emission limitations radiated (Transmitter)	P	(1)
<u>Supplementary information and remarks:</u> 1. Only radiated tests have been requested			

Appendix A: Test results. Bluetooth Low Energy (2M, 1M)

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<i>RSS-247 5.5 / FCC 15.247 (d) [RSE] Emission limitations radiated (Transmitter)</i>	<i>15</i>

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 3.3 V
Type of Power Supply: DC internal.

ANTENNA (*):

Type of Antenna: u-blox PCB antenna (internal)
Maximum Declared Antenna Gain: 3 dBi

TEST FREQUENCIES (*):

Modulation	Data rates	Low Channel:	Power adjustment	Middle Channel	Power adjustment	High Channel (1)	Power adjustment	High Channel (2)	Power adjustment
BTLE GFSK	1M 1 Mbit/s	2402 MHz	15	2440 MHz	15	2478 MHz	15	2480 MHz	14
BTLE GFSK	2M 2 Mbit/s	2402 MHz	15	2440 MHz	15	2478 MHz	15	2480 MHz	14

During transmitter test the EUT was controlled by a SW tool provided by the client to operate in a continuous transmit mode on the modulation schemes and test channels as required. Power adjustment correspond to the parameter value configured in the SW tool.

All channels with frequencies above High Channel (1) will be configured at the same power adjustment as high Channel (2)

RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Bilog antenna for the range between 30 MHz to 1000 MHz and 1 GHz-17 GHz Double ridge horn antenna) is situated at a distance of 3 m and at a distance of 1.5 m for the frequency range 17 GHz-26 GHz (17 GHz-40 GHz horn antenna).

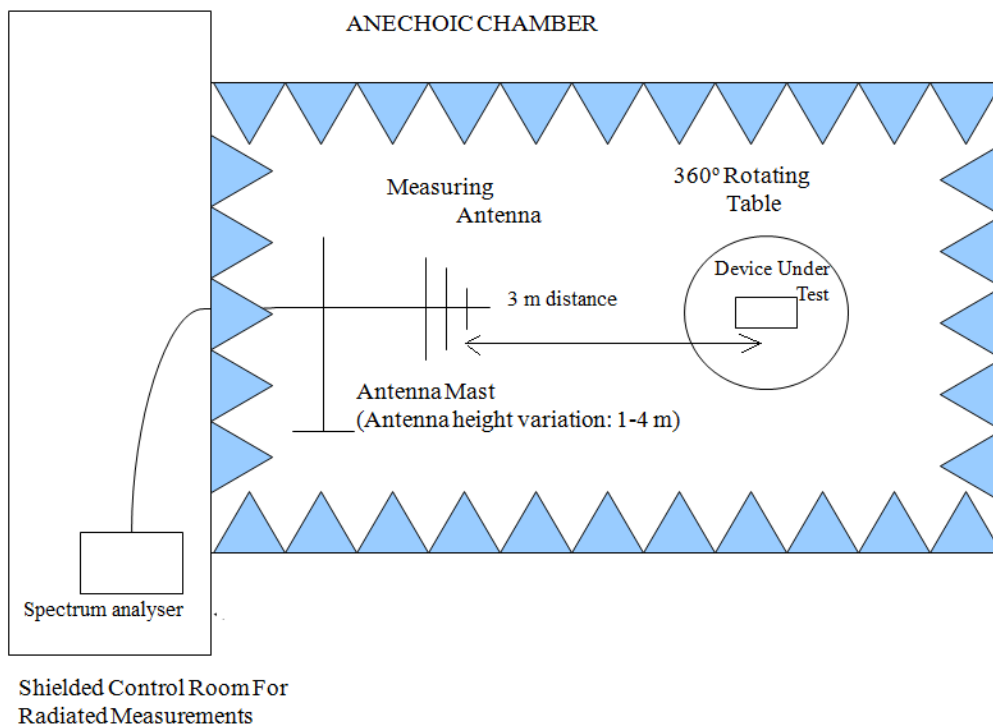
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height (Bilog antenna and Double ridge horn antenna) was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

A resolution bandwidth/video bandwidth of 100 kHz / 300 kHz was used for frequencies below 1 GHz and 1 MHz / 3 MHz for frequencies above 1 GHz.

Radiated measurements setup from 30 MHz to 1 GHz:



The diagram illustrates a reverberation chamber setup for EMI testing. A Spectrum analyser is connected to a Preamplifier, which is connected to a Horn antenna. The Horn antenna is positioned 1.5 m distance from an EUT (Equipment Under Test) mounted on a stand. The chamber walls are lined with absorbers.

TEST CASES DETAILS

RSS-247 5.5 / FCC 15.247 (d) [RSE] Emission limitations radiated (Transmitter)

Limits

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c) / RSS-Gen):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	-	300
0.490 - 1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table, specified when measuring with peak detector function.

RSS-247:

Attenuation below the general field strength limits specified in RSS-Gen is not required.

Frequency range tested for Radiated emissions:

Start frequency: no radiofrequency signal generated in the device found below 10th sub-harmonic, no further investigation required.

Stop frequency: it has been performed the radiated spurious emissions until 10th harmonic.

Verdict

Pass

Attachments

Spectrum analyzer parameter:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
Receiver: [ESW 44]					
30 MHz - 1 GHz	9,7 kHz	PK+	100 kHz	1 s	0 dB
1 GHz - 3 GHz	20 kHz	PK+ ; AVG	1 MHz	1 s	0 dB
3 GHz - 17 GHz	140 kHz	PK+ ; AVG	1 MHz	1 s	0 dB
17 GHz - 26 GHz	300 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

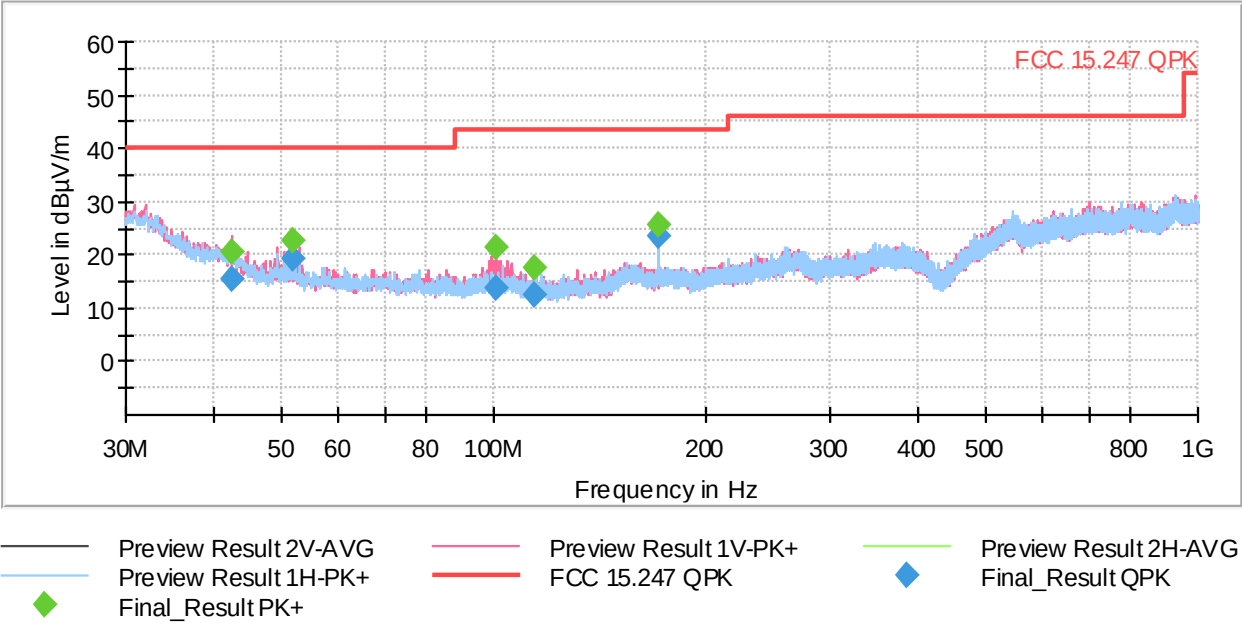
Frequency Range GHz = [0.03, 1] Equipment Type = Digital Transmission System (DTS)

The spurious frequencies detected do not depend on the transmission channel or the Modulation

MIMO Mode = SISO

Active Port = 1

Images:



Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Azimuth (deg)
42.513000	---	20.69	---	---	V	211.0
42.513000	15.43	---	40.00	24.57	V	211.0
51.631000	19.09	---	40.00	20.91	V	293.0
51.631000	---	22.74	---	---	V	293.0
100.616000	---	21.43	---	---	V	0.0
100.616000	13.70	---	43.50	29.80	V	0.0
114.487000	---	17.65	---	---	H	345.0
114.487000	12.35	---	43.50	31.15	H	345.0
171.814000	---	25.71	---	---	V	126.0
171.814000	23.49	---	43.50	20.01	V	126.0

Frequency Range GHz = [1, 17]

Equipment Type = Digital Transmission System (DTS)

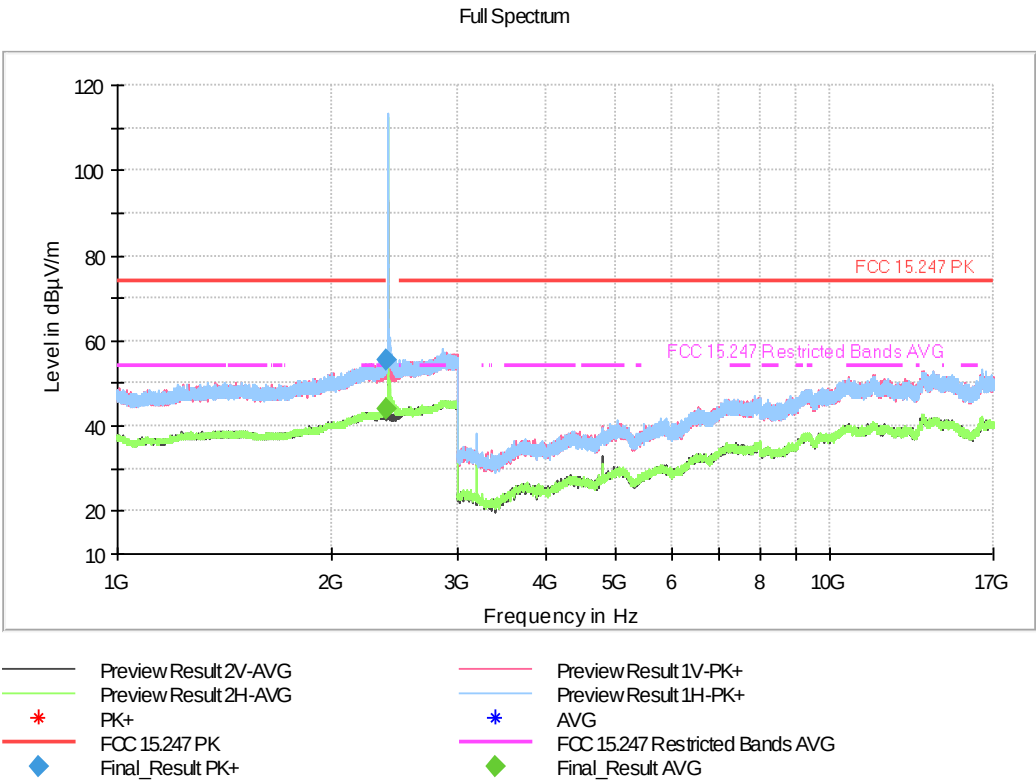
Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency MHz = 2402.00000

MIMO Mode = SISO

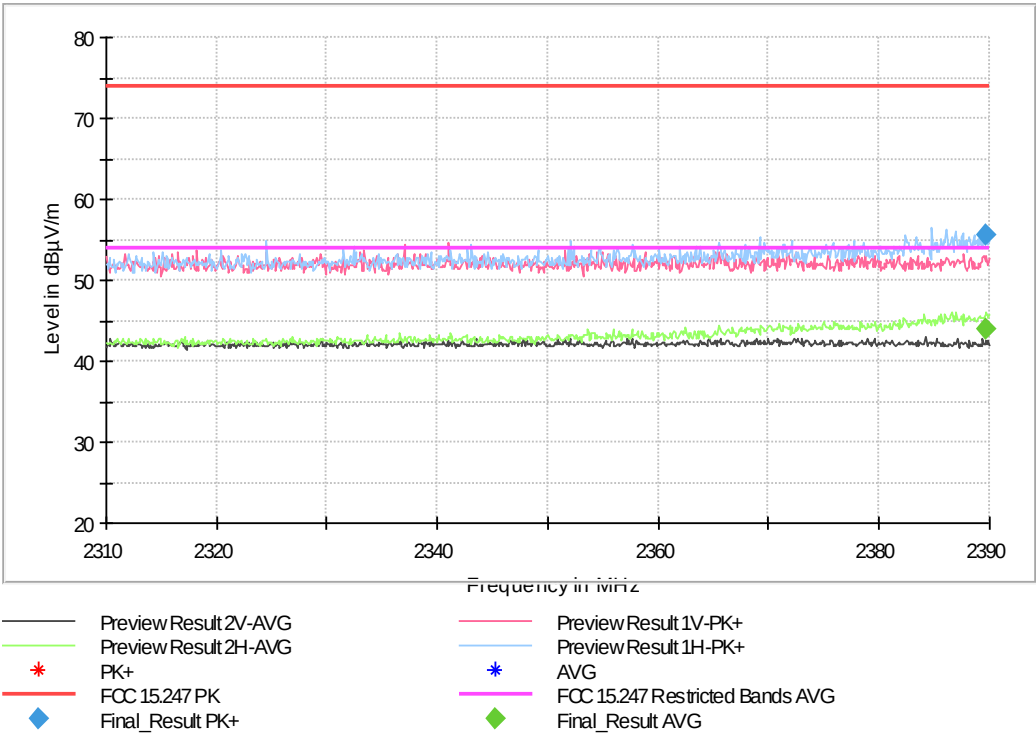
Active Port = 1

Images:

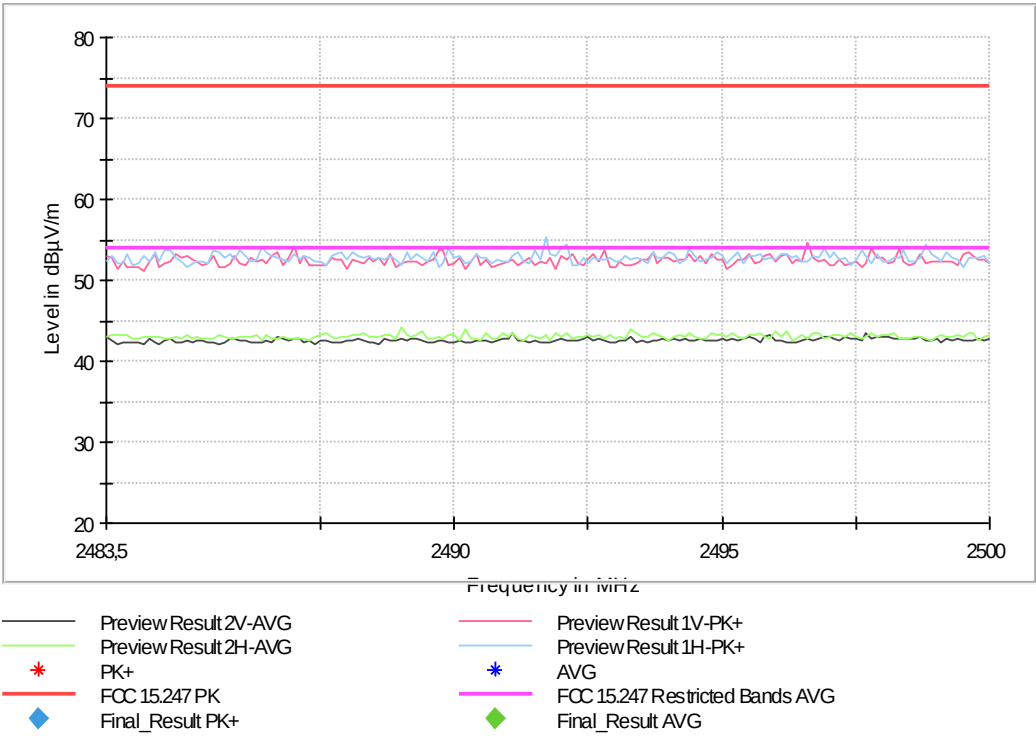


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
2389.700000	55.60	---	74.00	18.40	210.0	H	199.0
2389.700000	---	43.91	54.00	10.09	210.0	H	199.0

Full Spectrum

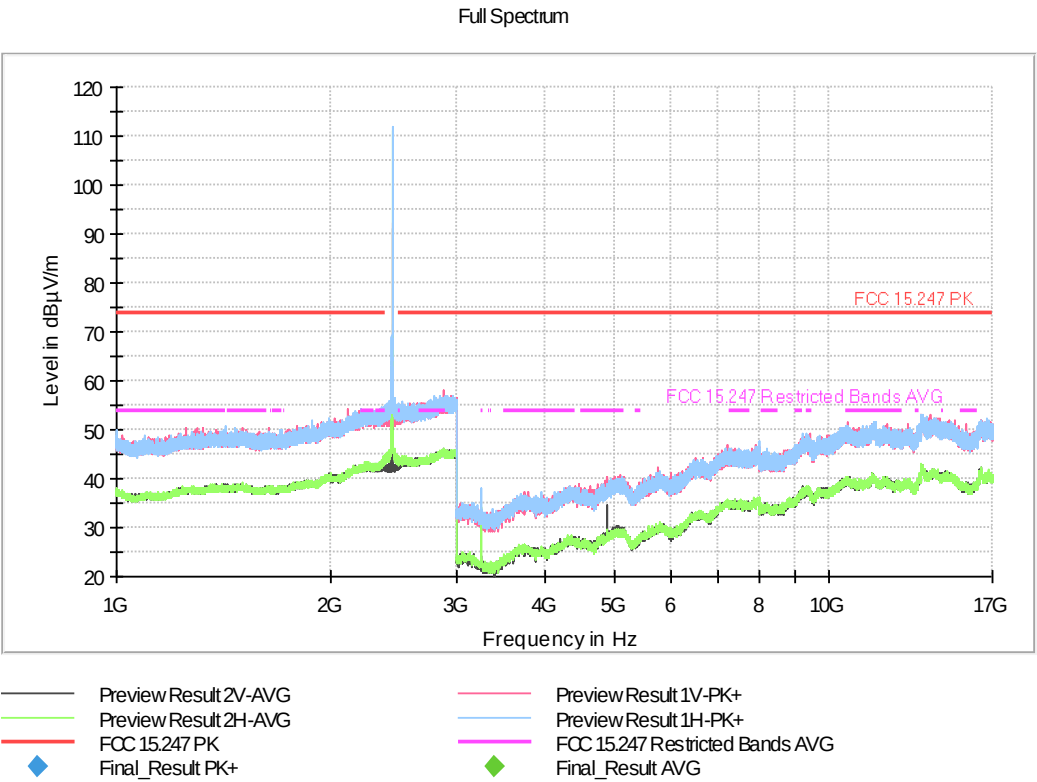


Full Spectrum

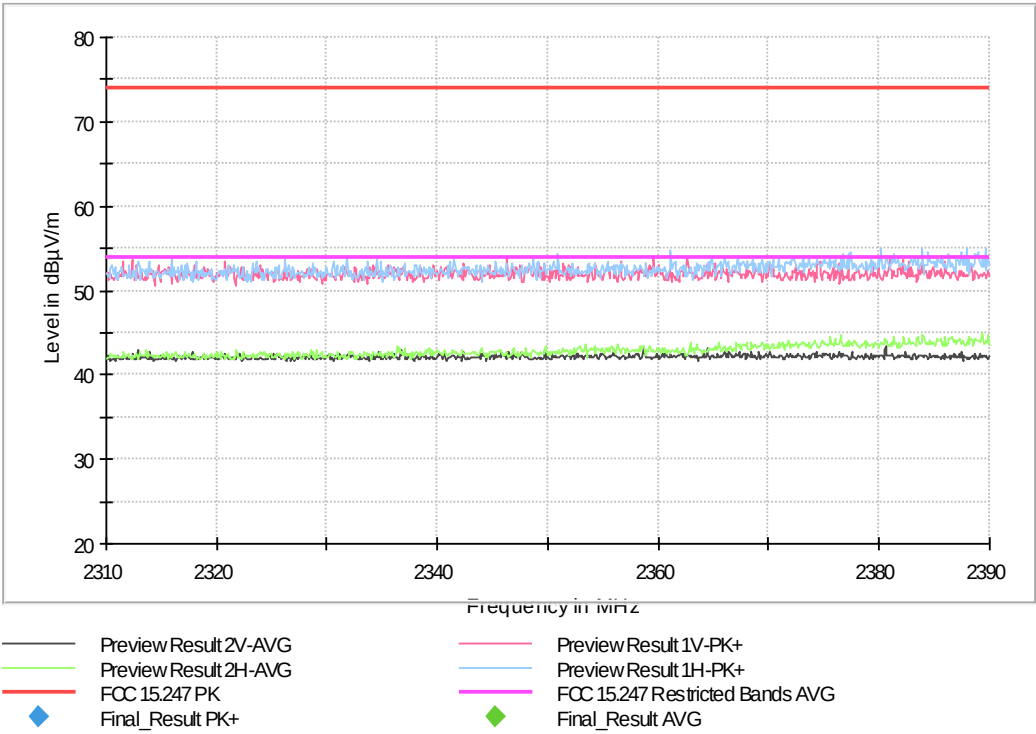


Frequency Range GHz = [1, 7] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

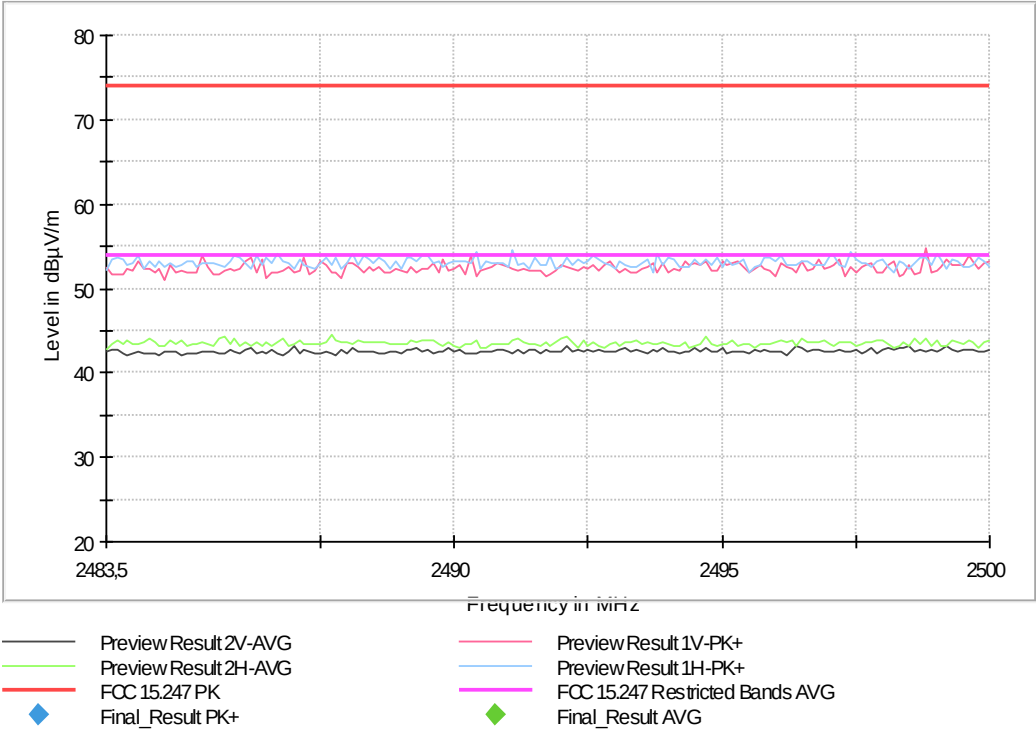
Images:



Full Spectrum

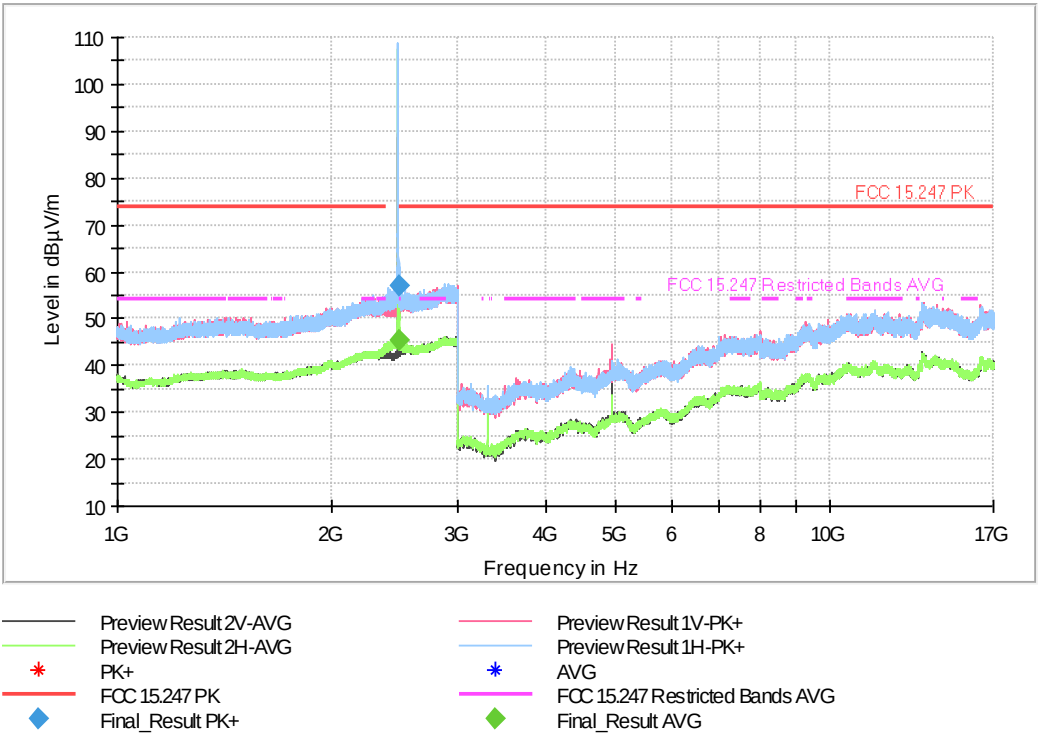


Full Spectrum



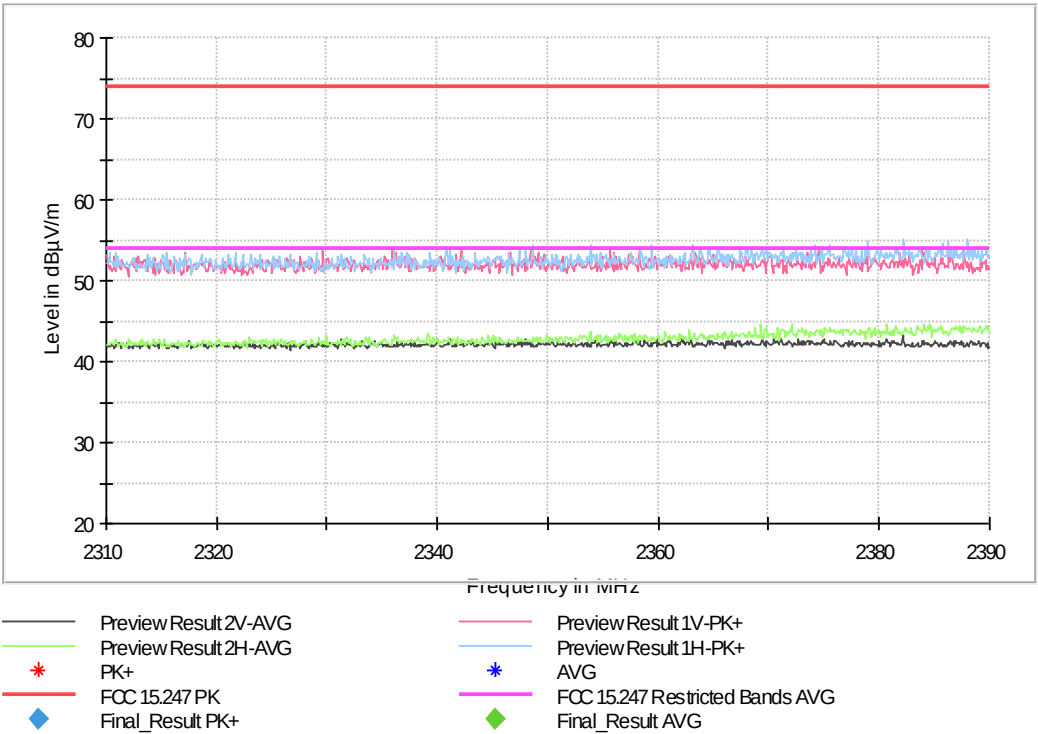
Frequency Range GHz = [1, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2478.00000
MIMO Mode = SISO Active Port = 1

Full Spectrum

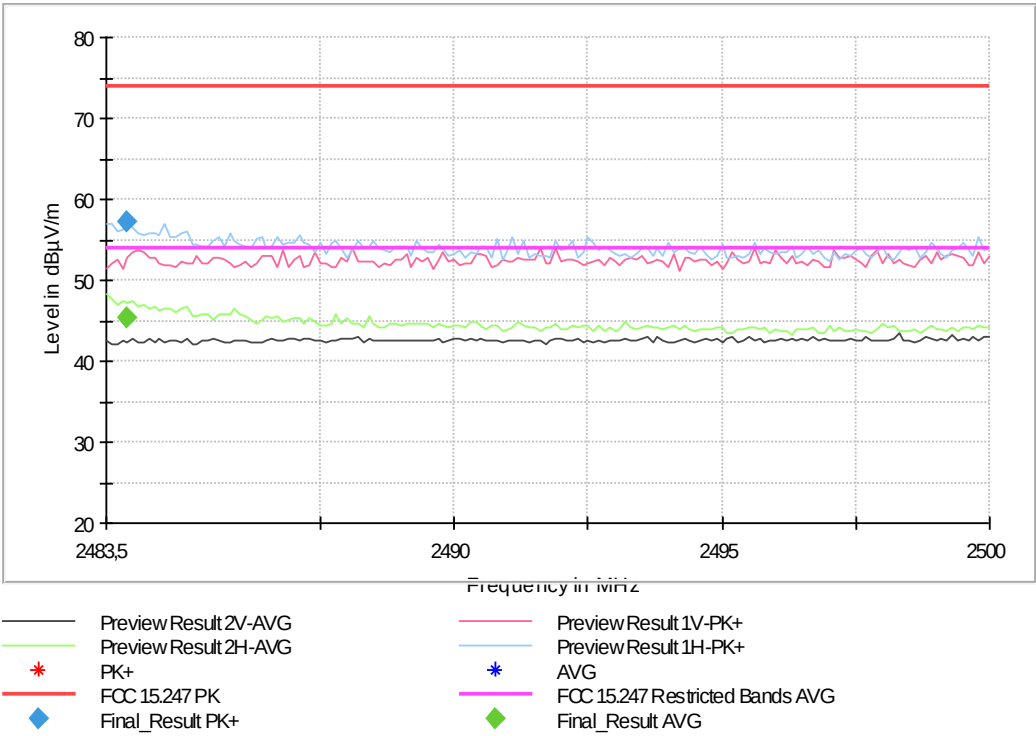


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
2483.900000	---	45.40	54.00	8.60	1000.000	276.0	H	184.0
2483.900000	57.16	---	74.00	16.84	1000.000	276.0	H	184.0

Full Spectrum

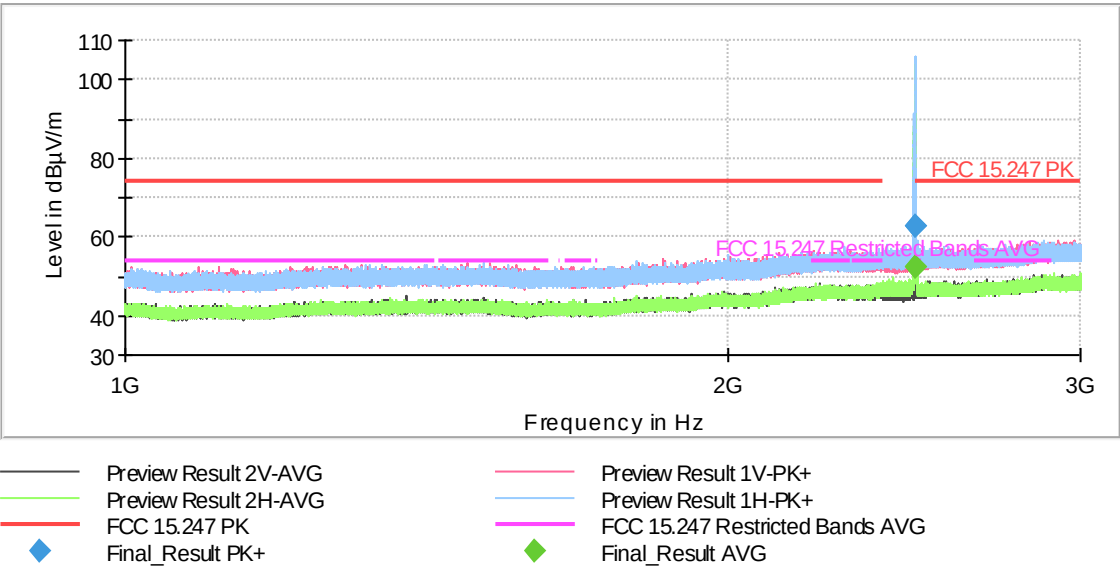


Full Spectrum

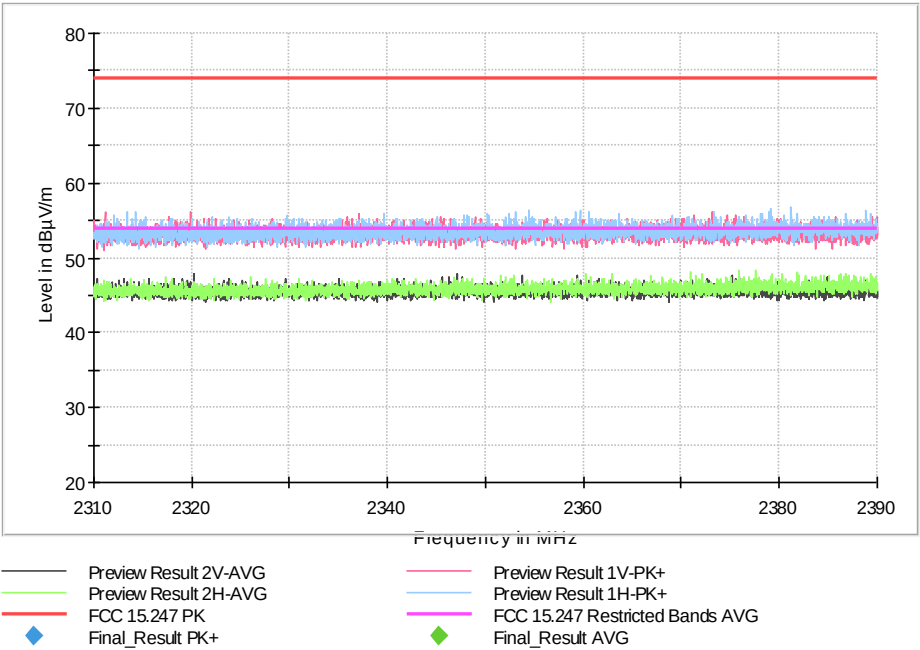


Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

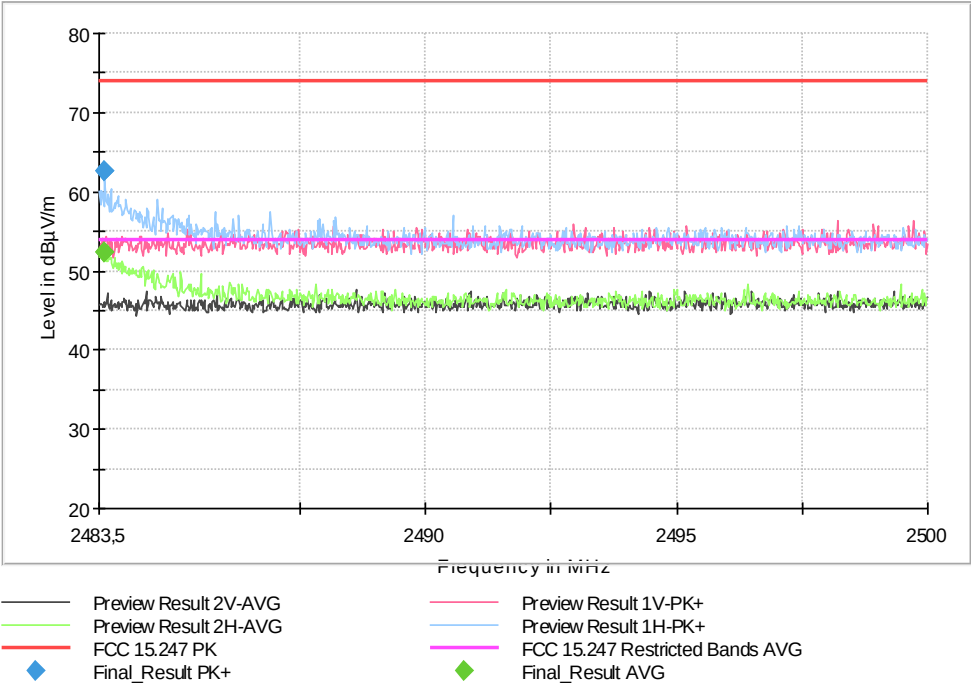
Images:



Full Spectrum



Full Spectrum

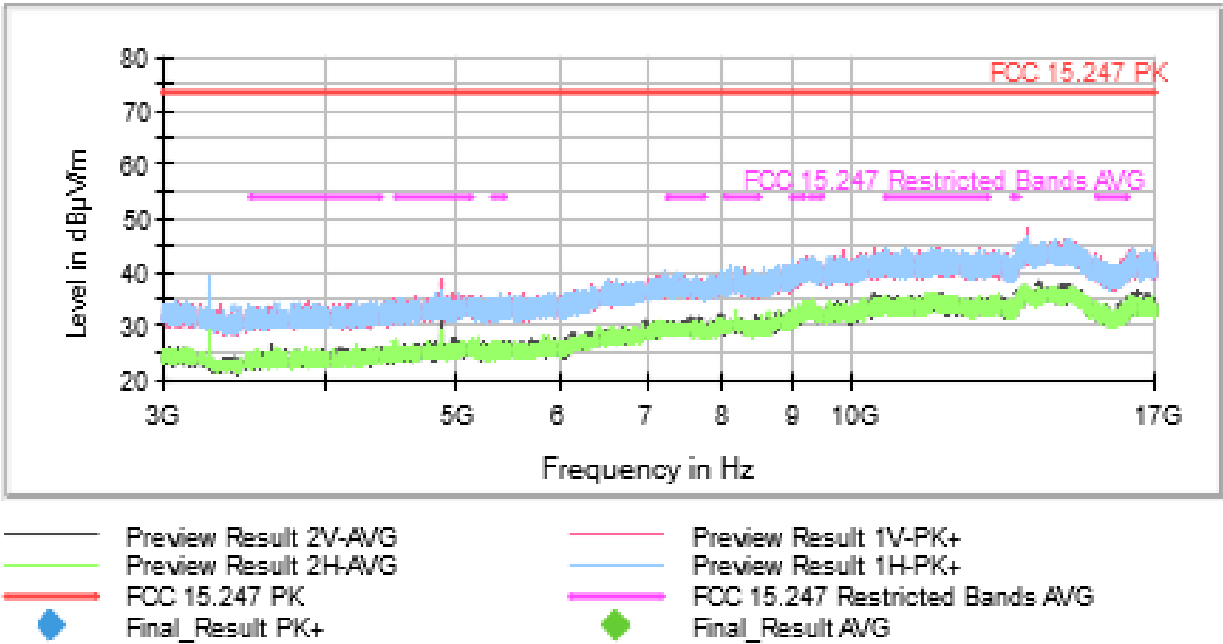


Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Operation Mode:

Images:

Full Spectrum

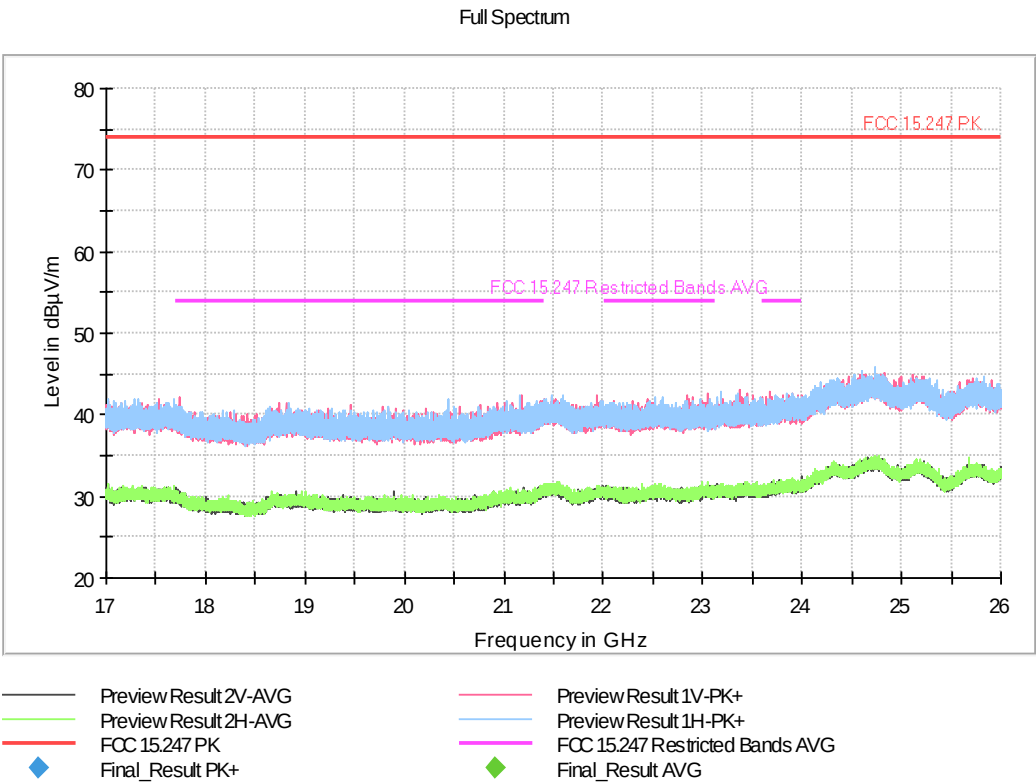


Frequency Range GHz = [17, 26] Equipment Type = Digital Transmission System (DTS)
The spurious frequencies detected do not depend on the transmission channel or the Modulation

MIMO Mode = SISO Active Port = 1

Operation Mode:

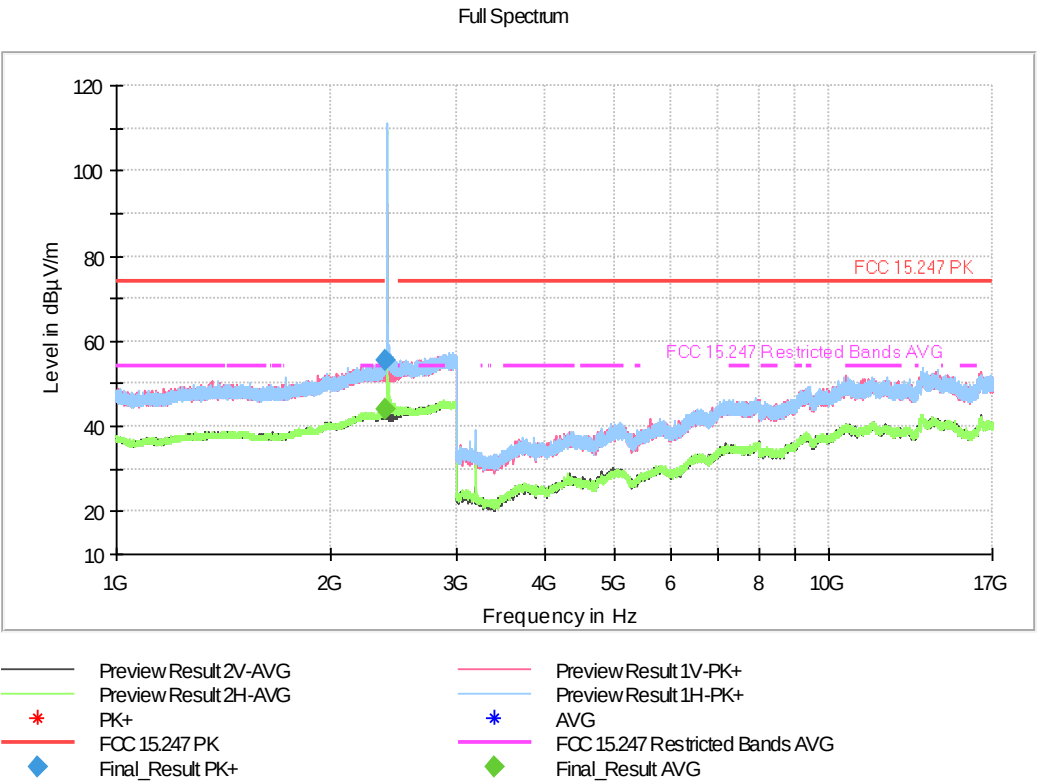
Images:



Attachments

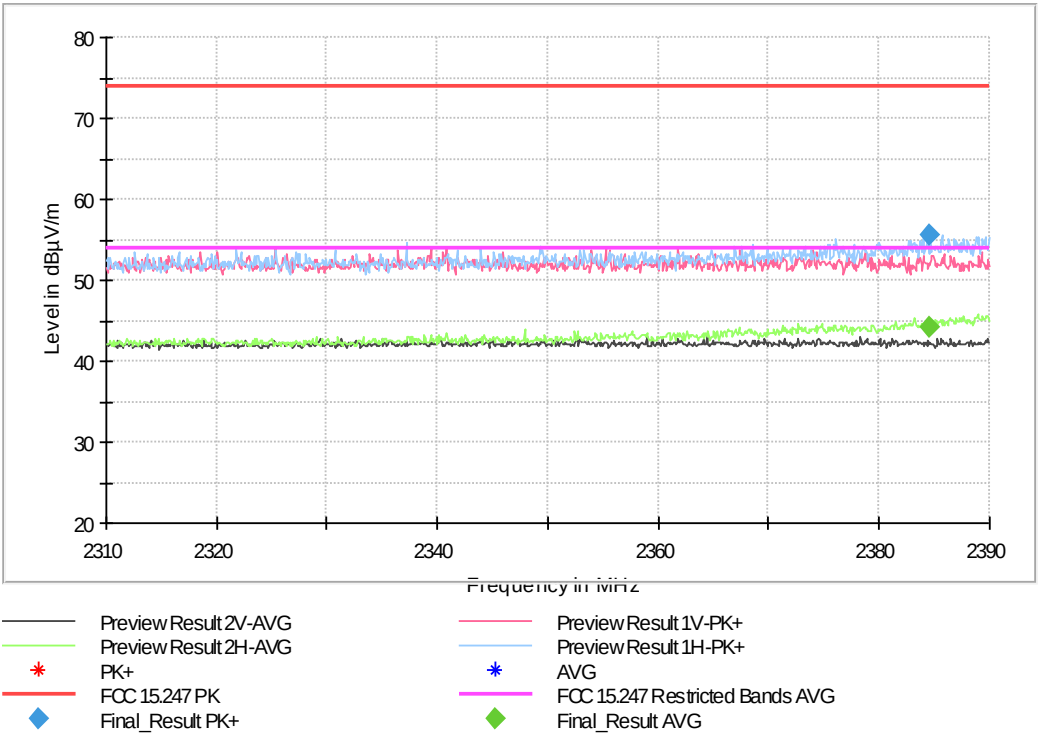
Frequency Range GHz = [1, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images:

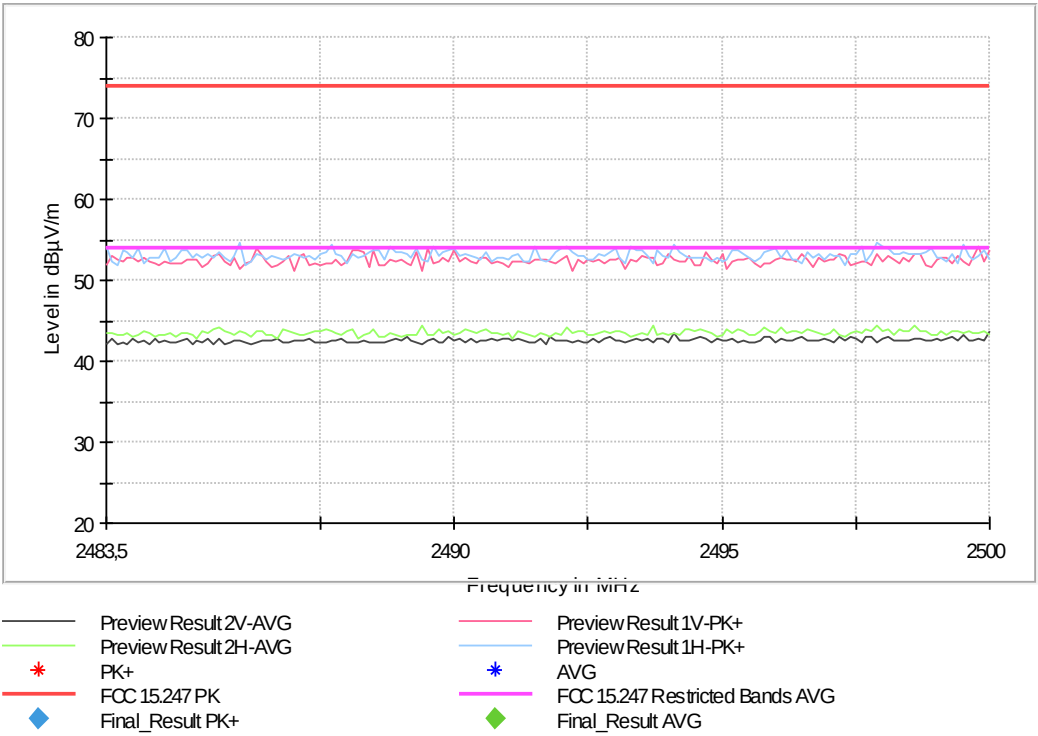


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
2384.600000	---	44.07	54.00	9.93	172.0	H	190.0
2384.600000	55.60	---	74.00	18.40	172.0	H	190.0

Full Spectrum



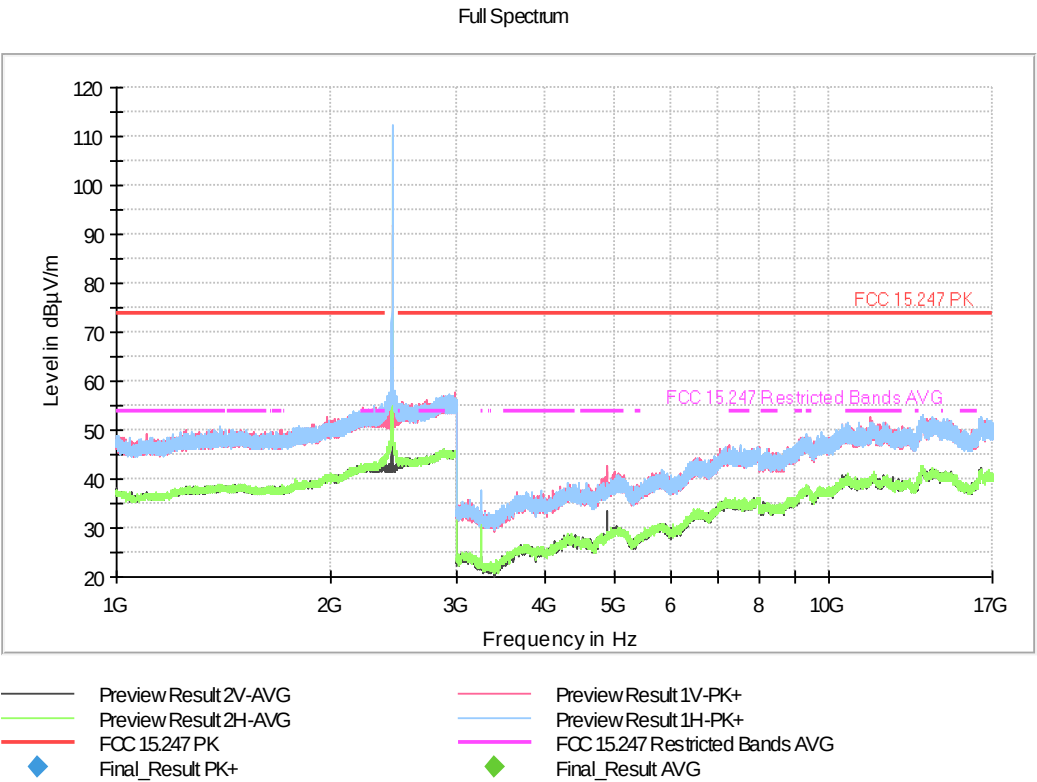
Full Spectrum



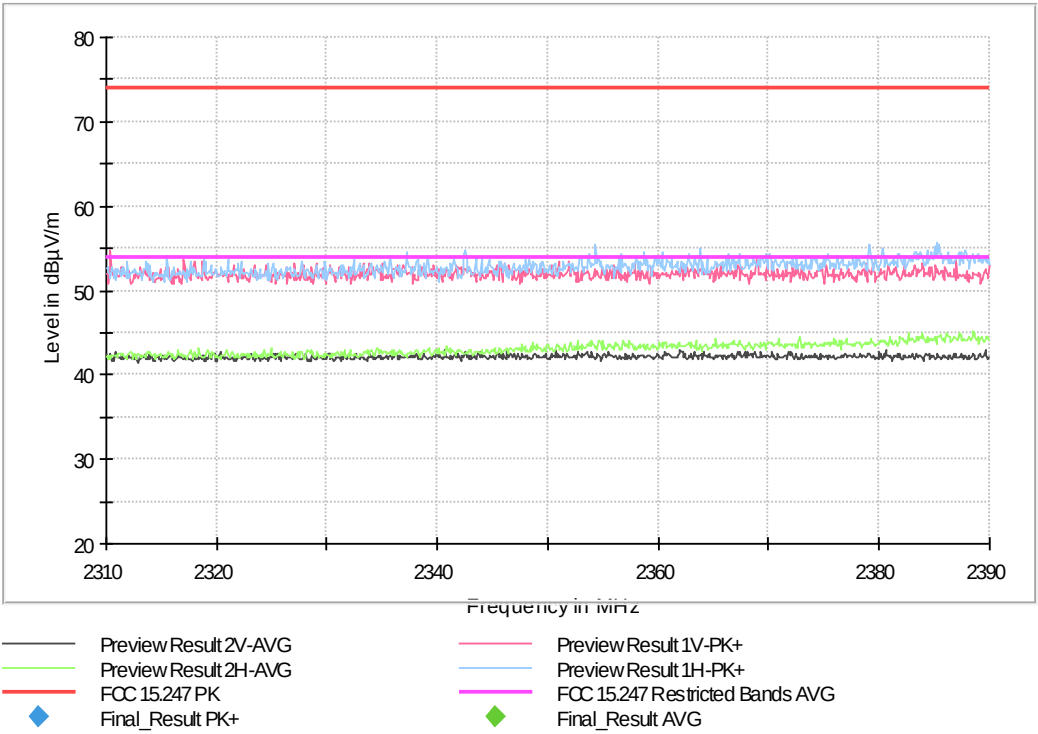
Attachments

Frequency Range GHz = [1, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

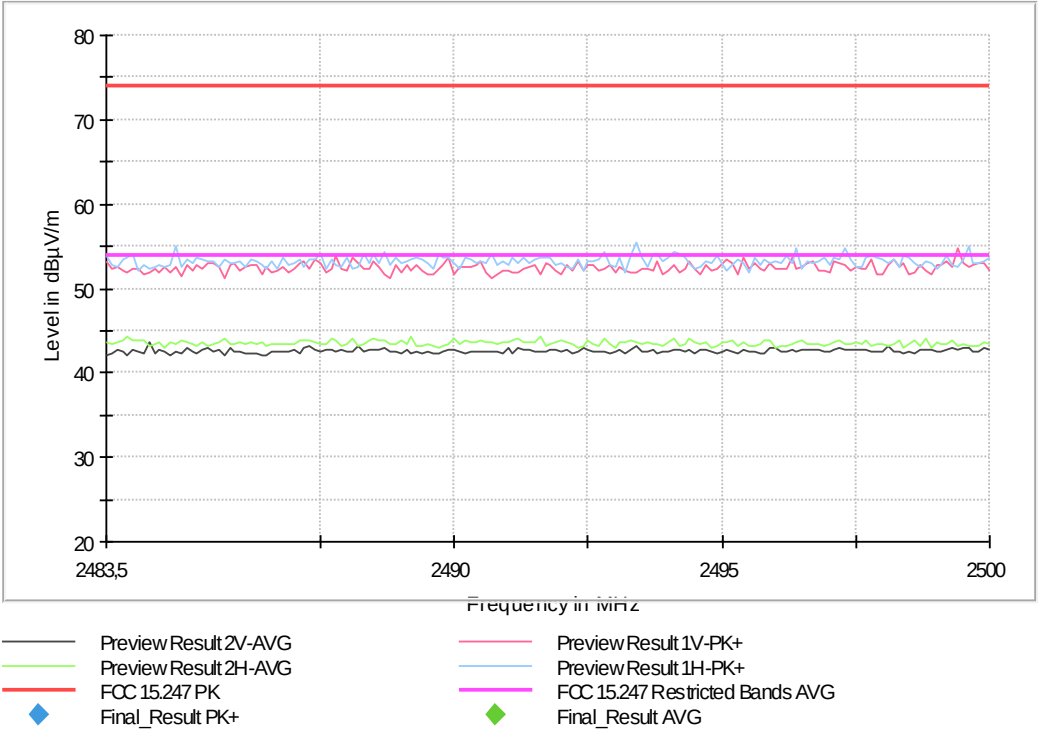
Images:



Full Spectrum



Full Spectrum



Attachments

Frequency Range GHz = [1, 17]

Equipment Type = Digital Transmission System (DTS)

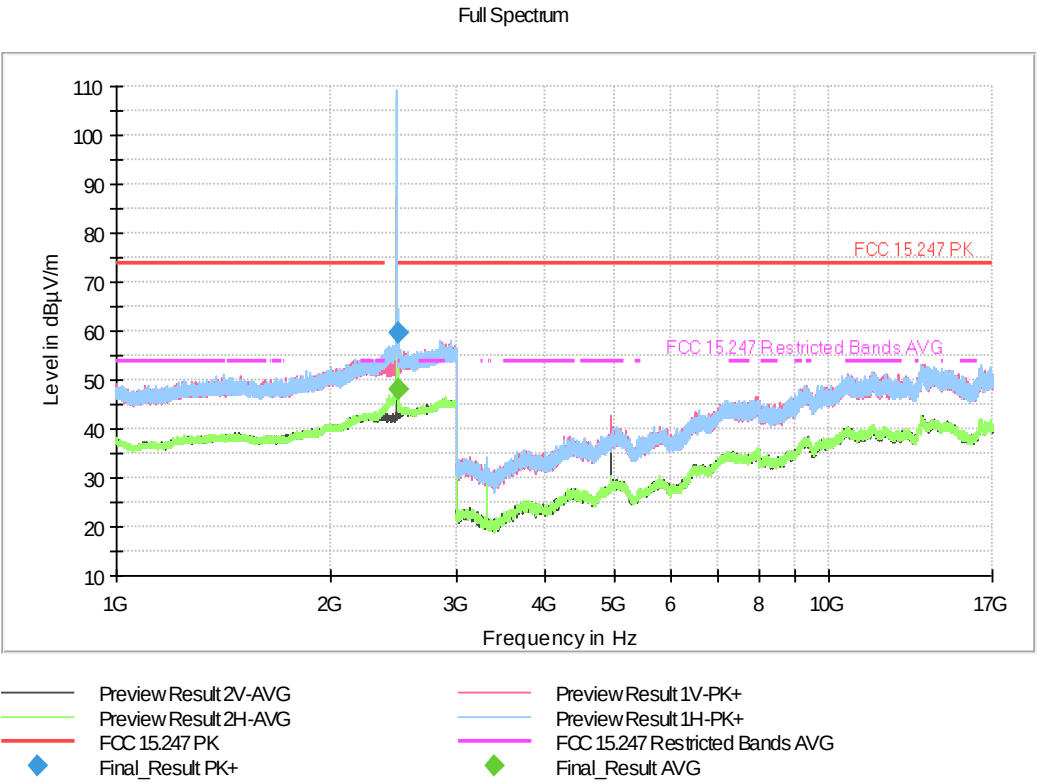
Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency MHz = 2478.00000

MIMO Mode = SISO

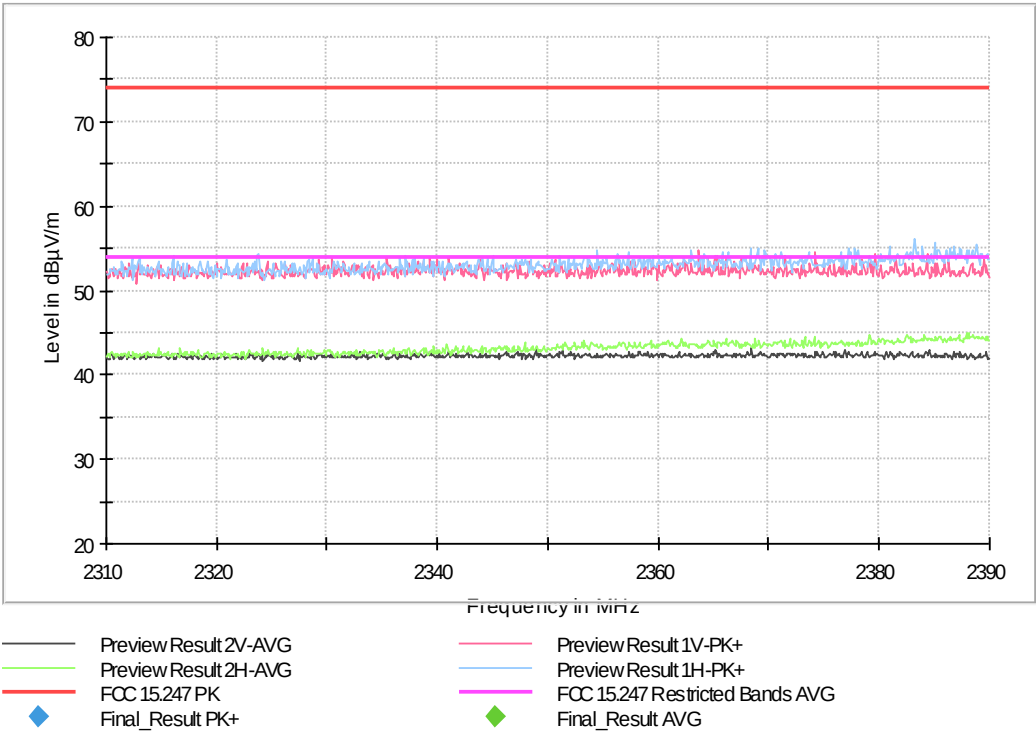
Active Port = 1

Images:

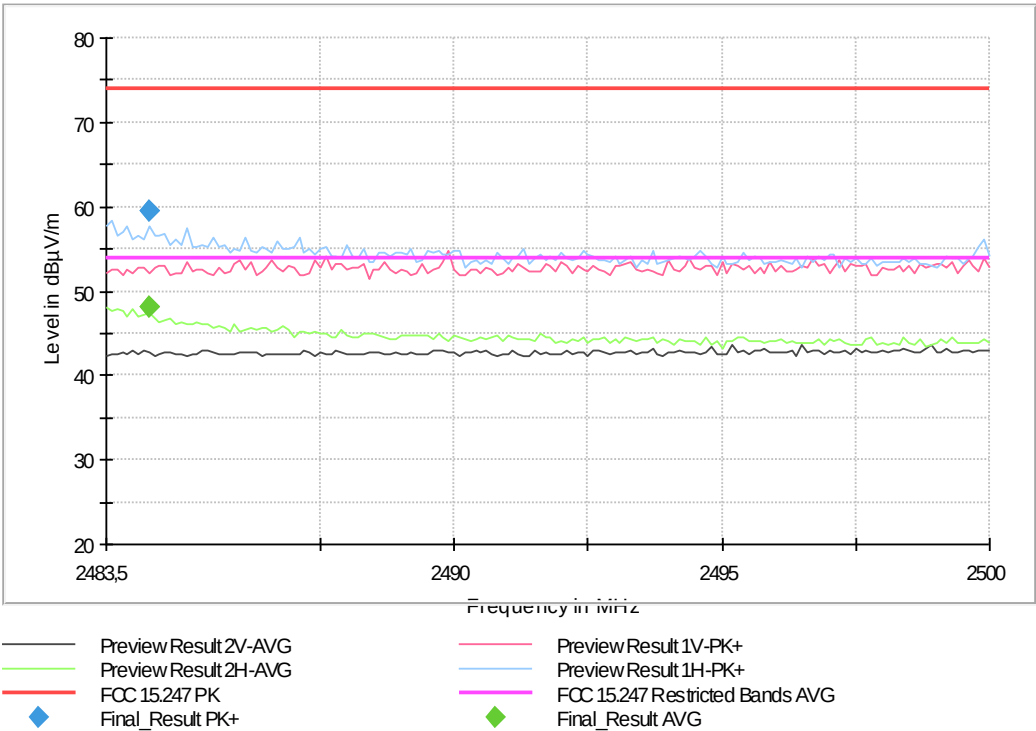


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
2484.300000	---	48.17	54.00	14.55	229.0	H	18.0
2484.300000	59.45	---	74.00	5.83	229.0	H	18.0

Full Spectrum



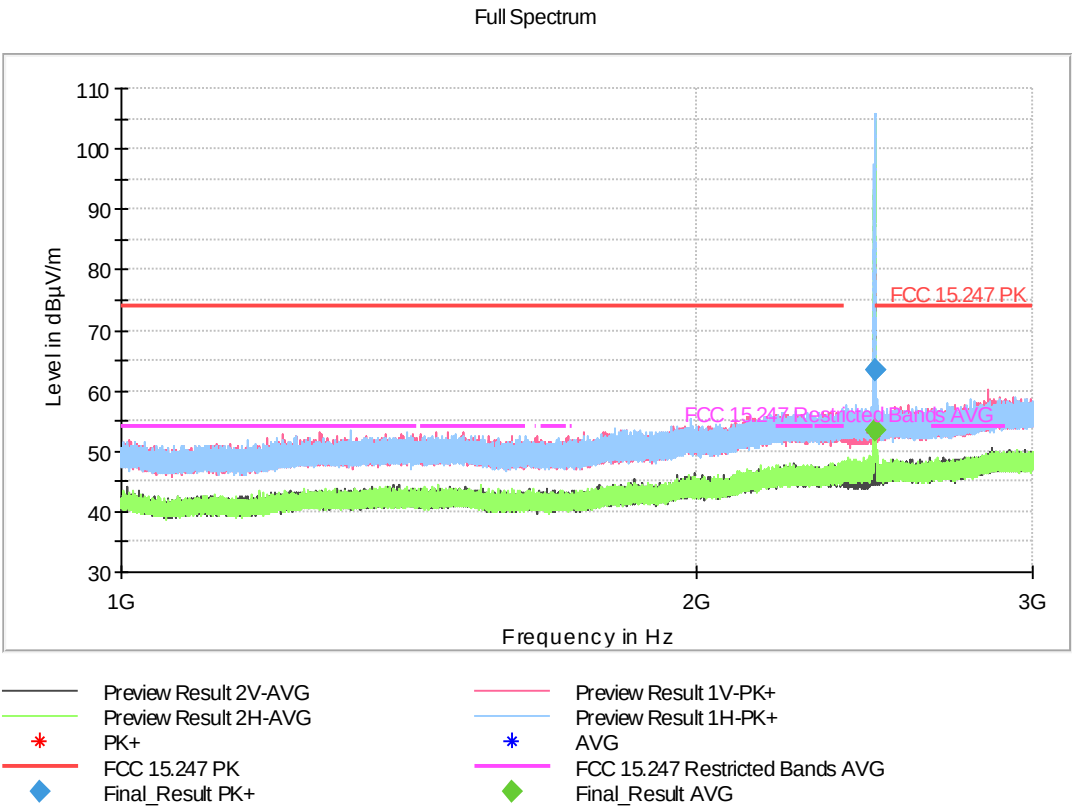
Full Spectrum



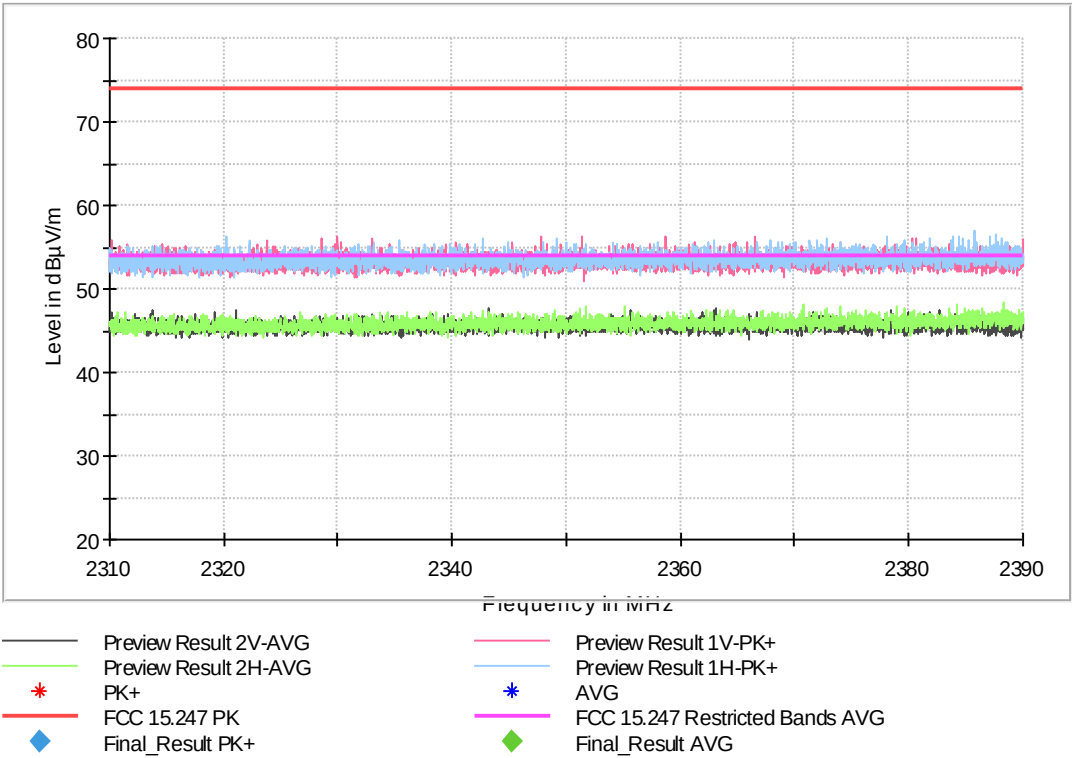
Attachments

Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

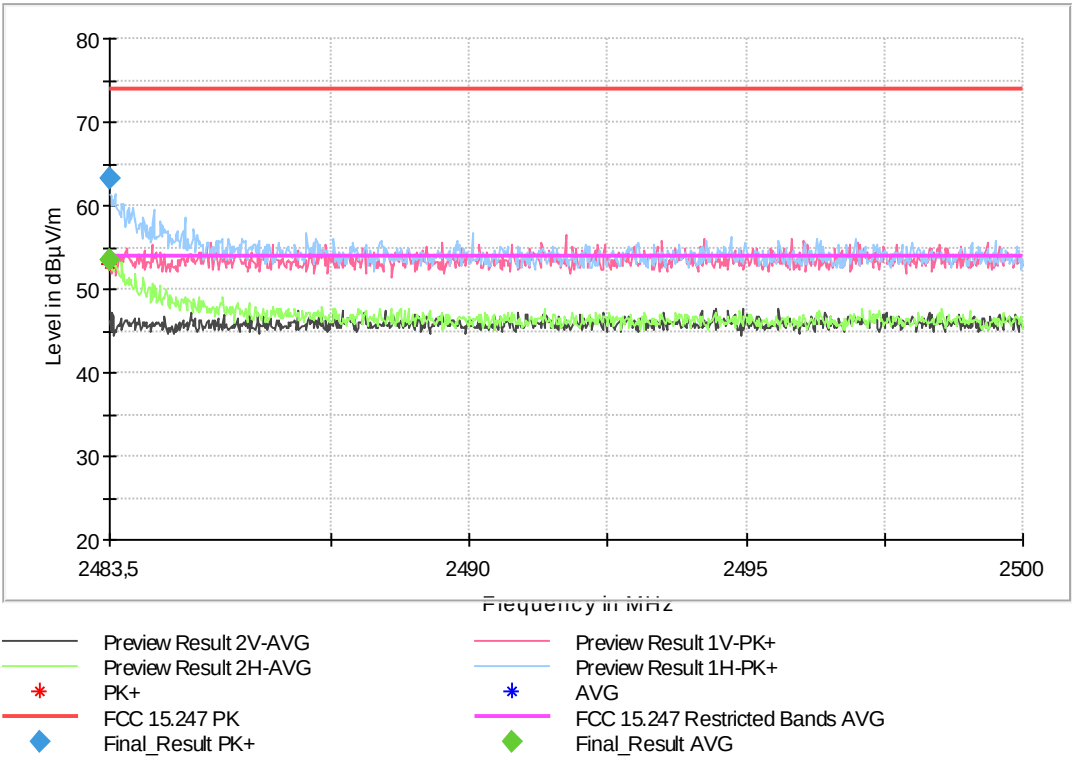
Images:



Full Spectrum



Full Spectrum

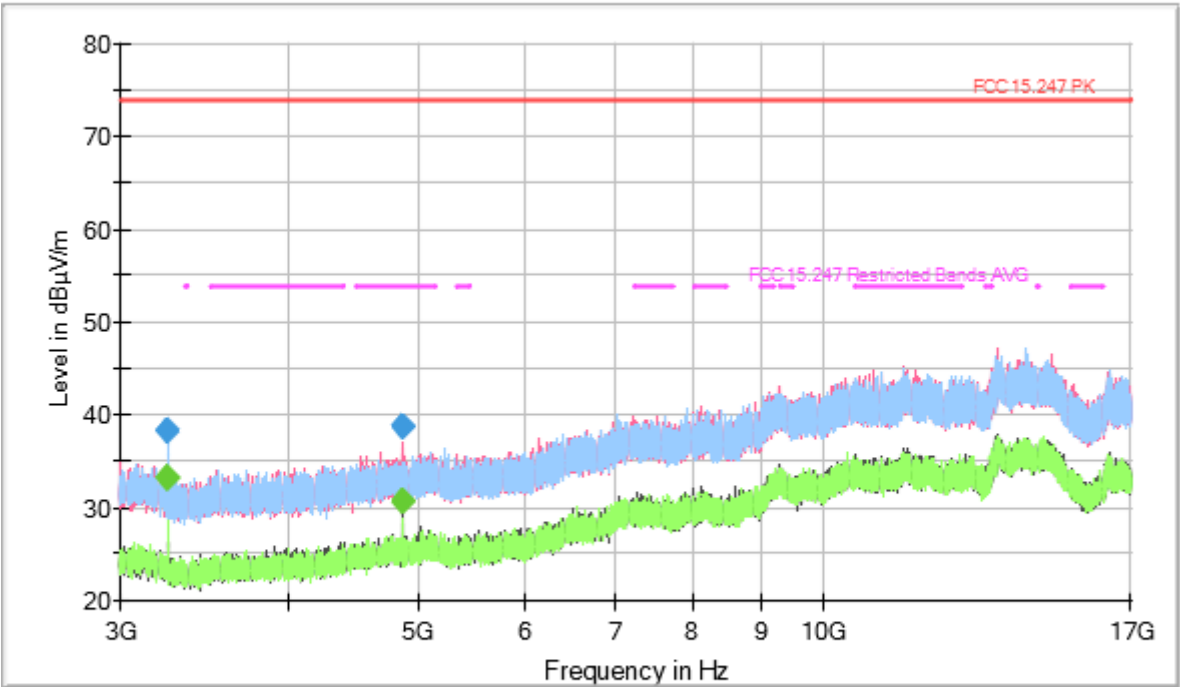


Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Operation Mode:

Images:

Full Spectrum



— Preview Result 2V-AVG	— Preview Result 1V-PK+
— Preview Result 2H-AVG	— Preview Result 1H-PK+
— FCC 15.247 PK	— FCC 15.247 Restricted Bands AVG
◆ Final_Result PK+	◆ Final_Result AVG

Appendix B: Test results. 802.11 B/G/N/AX 1x1

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TEST CONDITIONS	38
TEST CASES DETAILS	41
<i>RSS-247 5.5 / FCC 15.247 (d) [RSE] Emission limitations radiated (Transmitter)</i>	<i>41</i>

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 3.3 V
Type of Power Supply: DC internal.

ANTENNA (*):

Type of Antenna: u-blox PCB antenna (internal)
Maximum Declared Antenna Gain: 3 dBi

TEST FREQUENCIES (*):

Modulation	Data rates	Low Channel	Middle Channel	High Channel (1)	High Channel (2)
802.11b	1 Mbit/s	2412 MHz	2437 MHz	N/A	2462 MHz
	Power adjustment:	Att 0	Att 0	N/A	Att 0
802.11g	6 Mbit/s	2412 MHz	2437 MHz	2457 MHz	2462 MHz
	Power adjustment:	Att 0	Att 0	Att 0	Att 10
802.11n	HT20 MCS0 6.5 Mbit/s	2412 MHz	2437 MHz	2457 MHz	2462 MHz
	Power adjustment:	Att 0	Att 0	Att 0	Att 12
802.11n	HT40 MCS0 6.5 Mbit/s	2422 MHz	2437 MHz	NA	2452 MHz
	Power adjustment:	Att 0	Att 0	NA	Att 0
802.11ax	HE20 MCS0	2412 MHz	2437 MHz	2457 MHz	2462 MHz
	Power adjustment:	Att 0	Att 0	Att 0	Att 5

During transmitter test the EUT was controlled by a SW tool provided by the client to operate in a continuous transmit mode on the modulation schemes and test channels as required. Power adjustment correspond to the parameter value configured in the SW tool.

All channels with frequencies above High Channel (1) will be configured at the same power adjustment as high Channel (2)

RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Bilog antenna for the range between 30 MHz to 1000 MHz and 1 GHz-17 GHz Double ridge horn antenna) is situated at a distance of 3 m and at a distance of 1.5 m for the frequency range 17 GHz-26 GHz (17 GHz-40 GHz horn antenna).

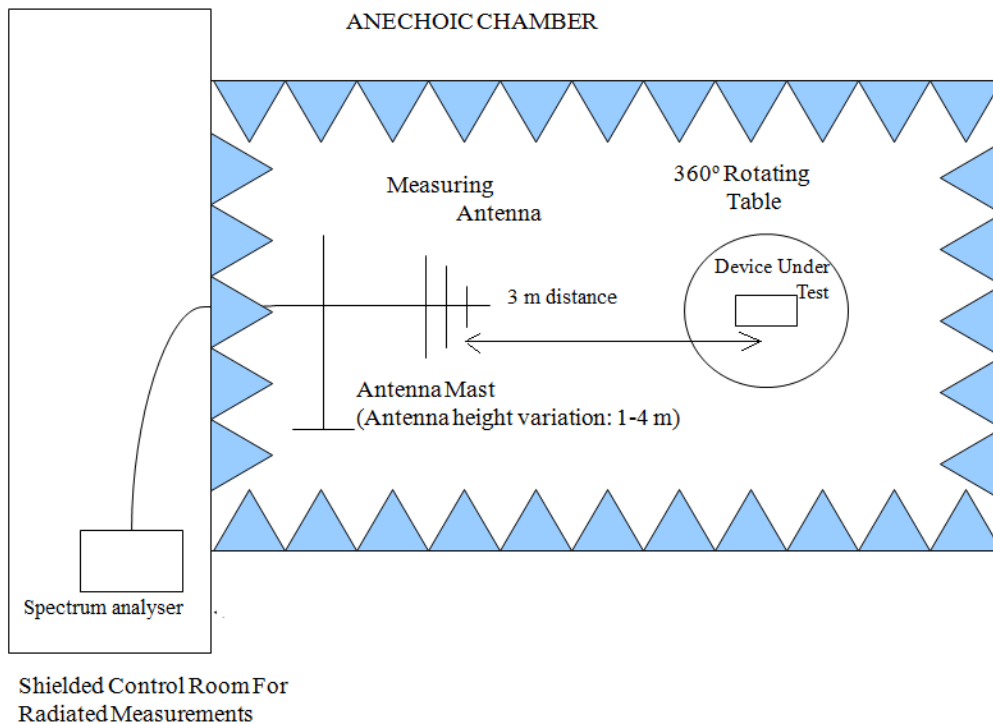
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height (Bilog antenna and Double ridge horn antenna) was varied from 1 to 4 meters to find the maximum radiated emission.

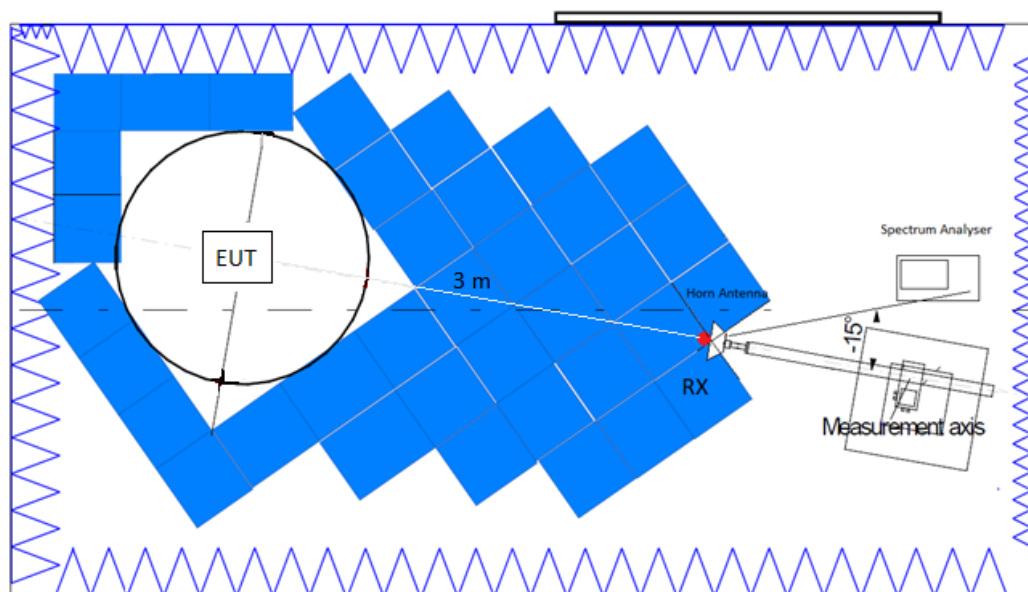
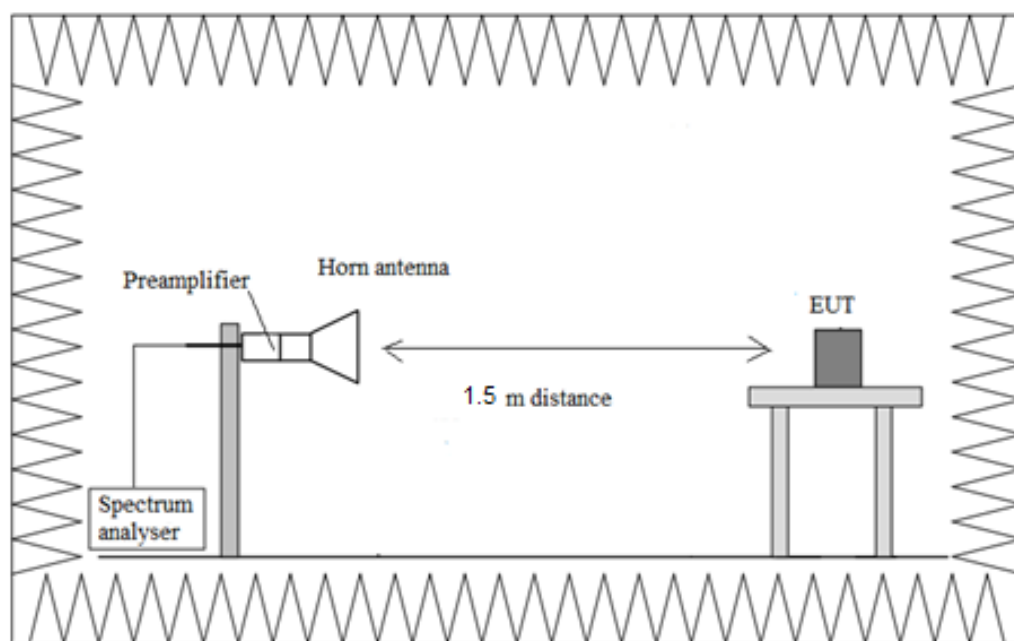
Measurements were made in both horizontal and vertical planes of polarization.

A resolution bandwidth/video bandwidth of 100 kHz / 300 kHz was used for frequencies below 1 GHz and 1 MHz / 3 MHz for frequencies above 1 GHz.

Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:

Radiated measurements setup $f > 17$ GHz:

TEST CASES DETAILS

RSS-247 5.5 / FCC 15.247 (d) [RSE] Emission limitations radiated (Transmitter)

Limits

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c) / RSS-Gen):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	-	300
0.490 - 1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table, specified when measuring with peak detector function.

RSS-247:

Attenuation below the general field strength limits specified in RSS-Gen is not required.

Verdict

Pass

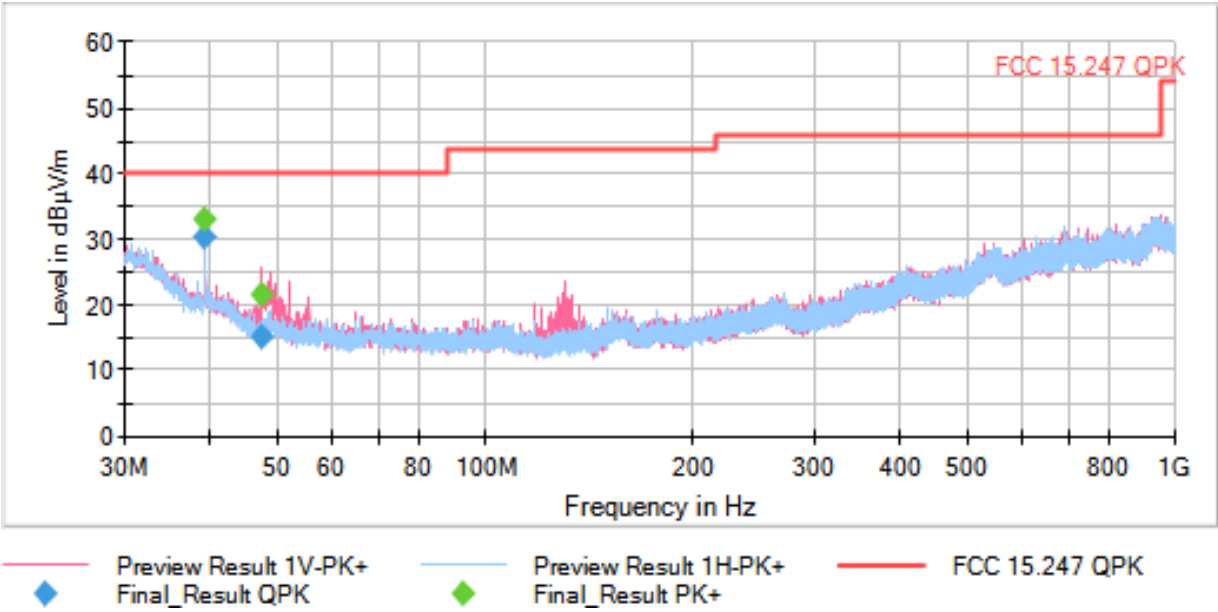
Results

Modulation: 802.11b (DSSS 1 Mbit/s)
MIMO Mode: SISO

Attachments

Frequency Range GHz = [0.03, 1] Equipment Type = Digital Transmission System (DTS)
The spurious frequencies detected do not depend on the transmission channel or the Modulation
MIMO Mode = SISO Active Port = 1

Images:



Tables:
Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	30 MHz - 1 GHz	30,312 kHz	PK+	100 kHz	1 s	0 dB

Frequency Range GHz = [1, 3]

Equipment Type = Digital Transmission System (DTS)

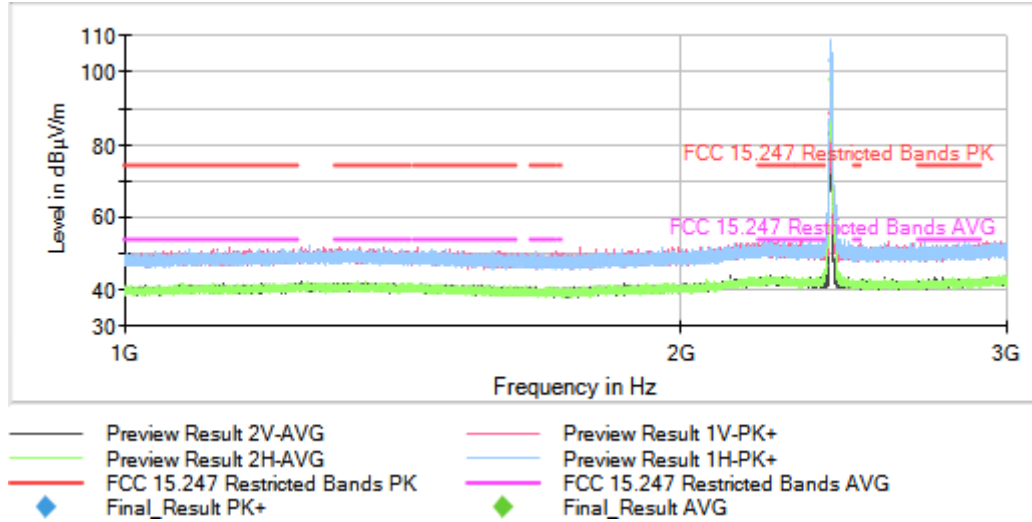
Modulation = 802.11b (DSSS 1 Mbit/s)

Frequency MHz = 2412.00000

MIMO Mode = SISO

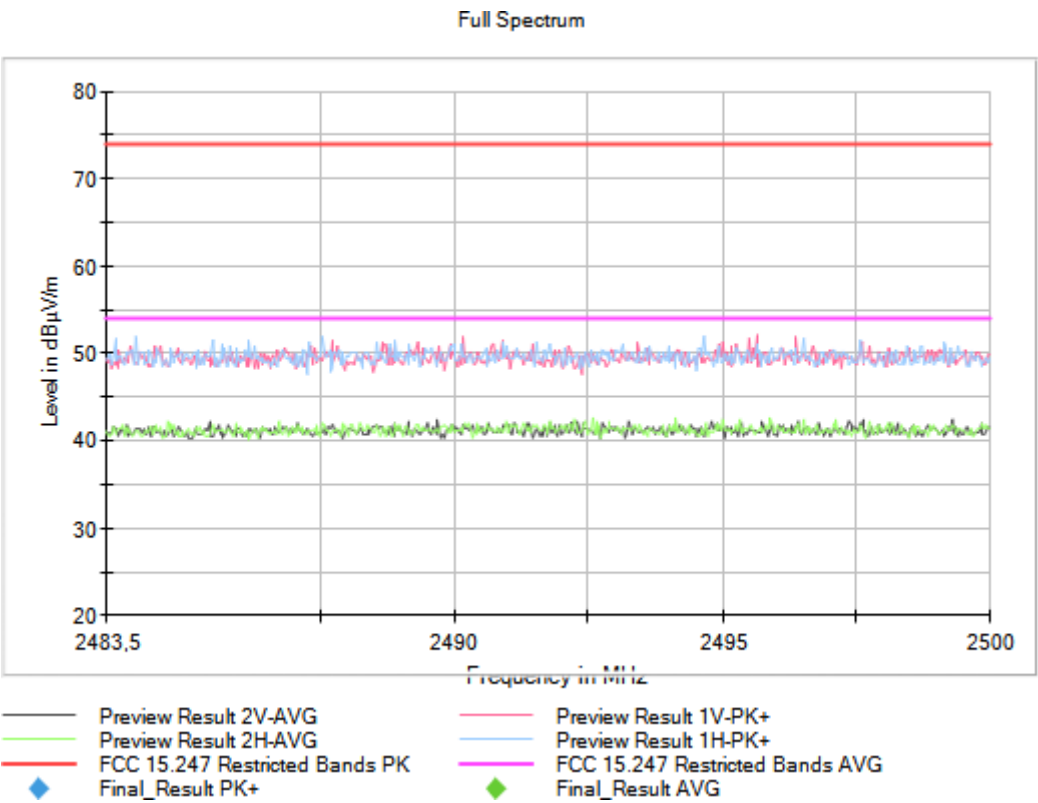
Active Port = 1

Images:



Full Spectrum



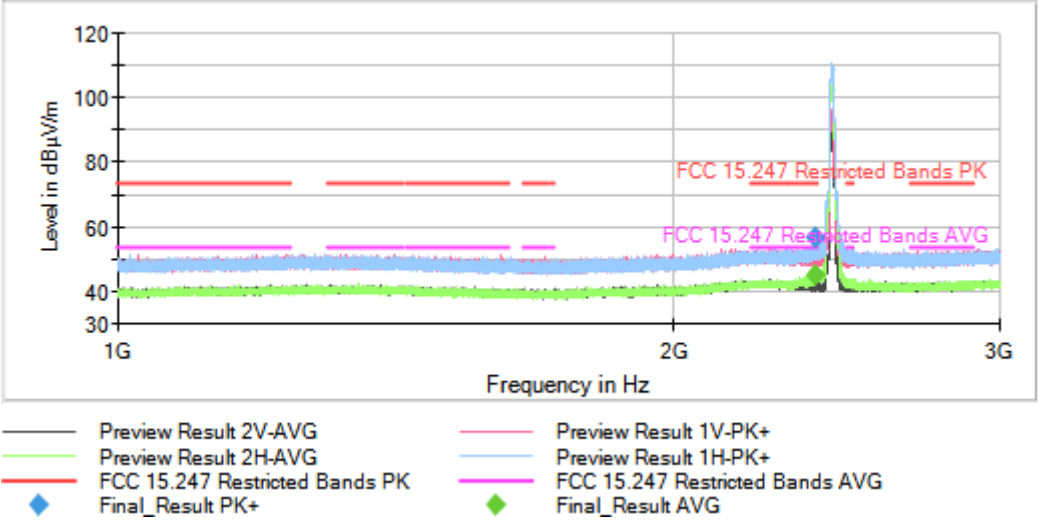


Tables:
Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	1 GHz - 3 GHz	30,769 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

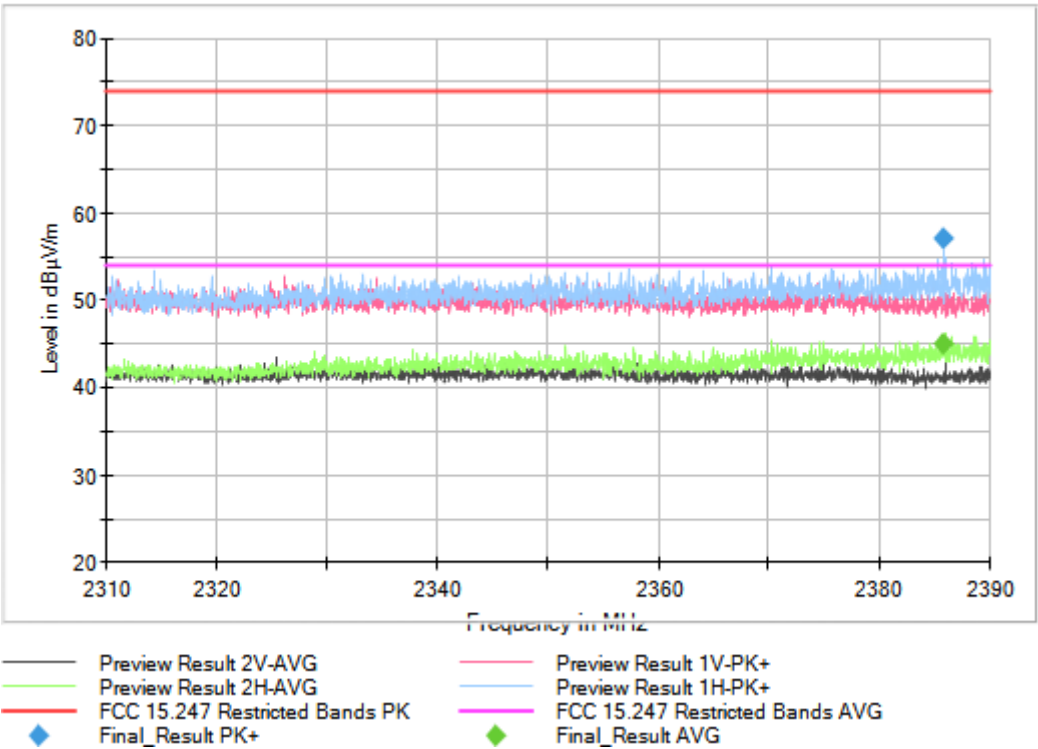
Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2437.00000
MIMO Mode = SISO Active Port = 1

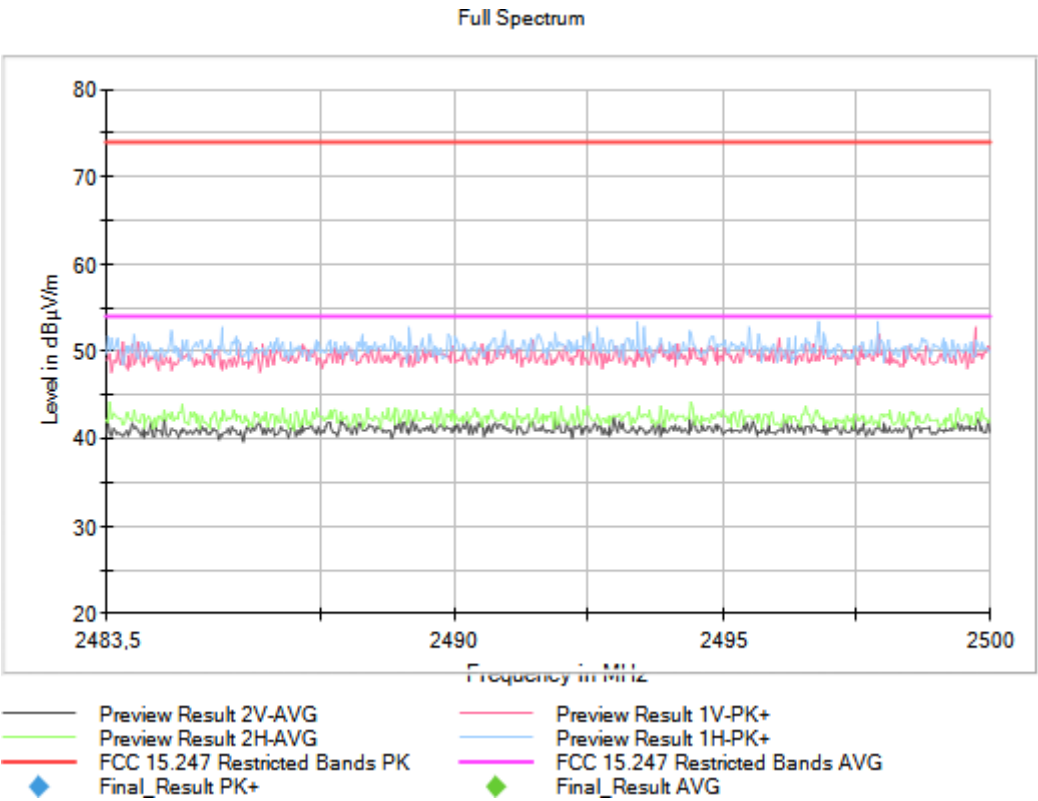
Images:



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Azimuth (deg)
2385.784615	57.07	---	74.00	16.93	H	0.0
2385.784615	---	45.02	54.00	8.98	H	0.0

Full Spectrum



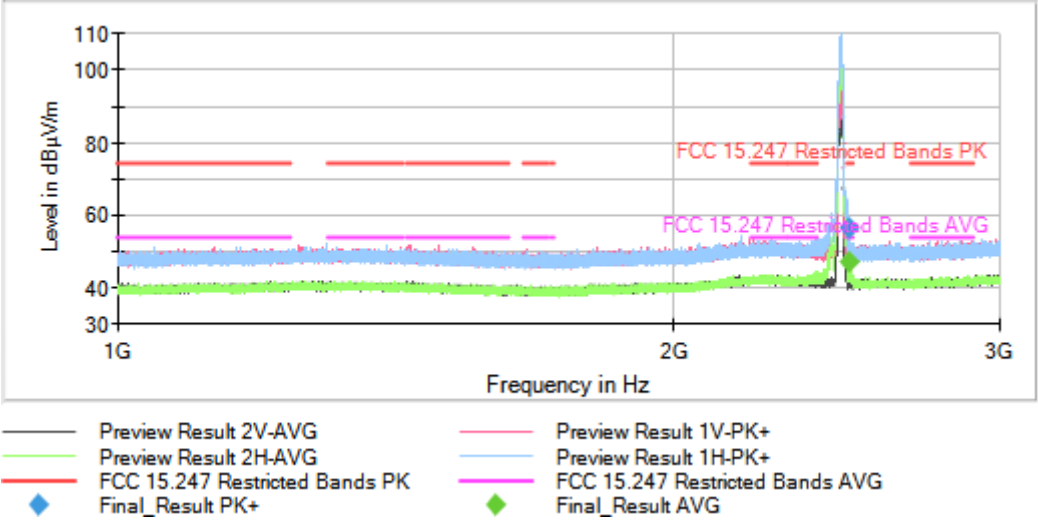


Tables:
Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	1 GHz - 3 GHz	30,769 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

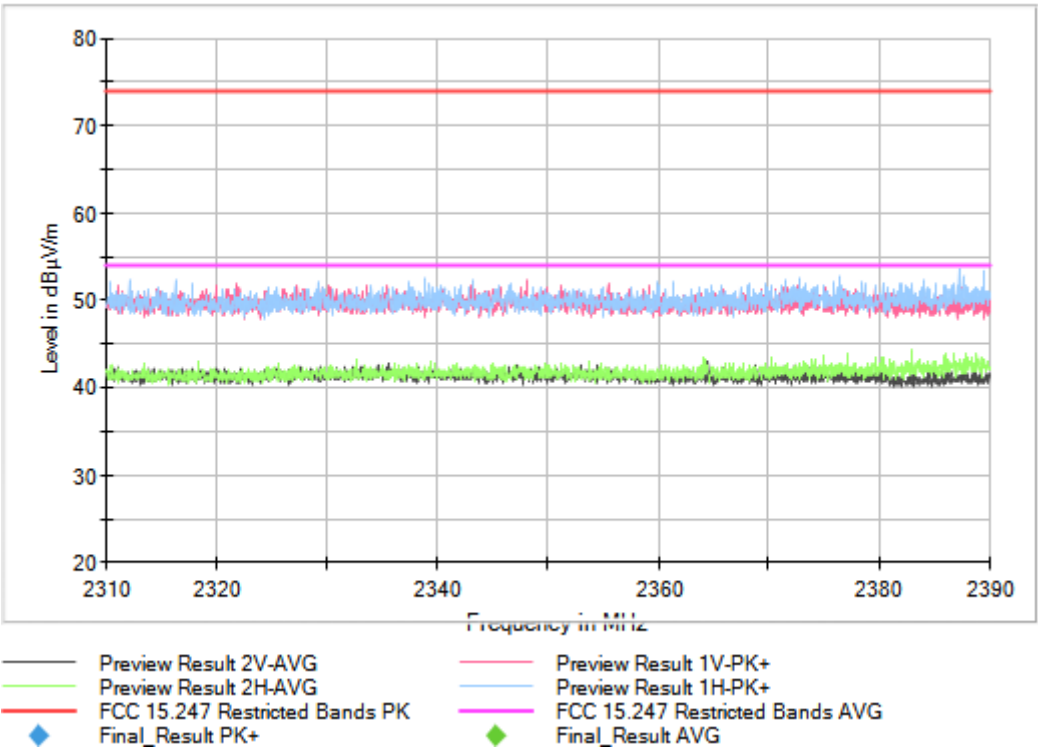
Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2462.00000
MIMO Mode = SISO Active Port = 1

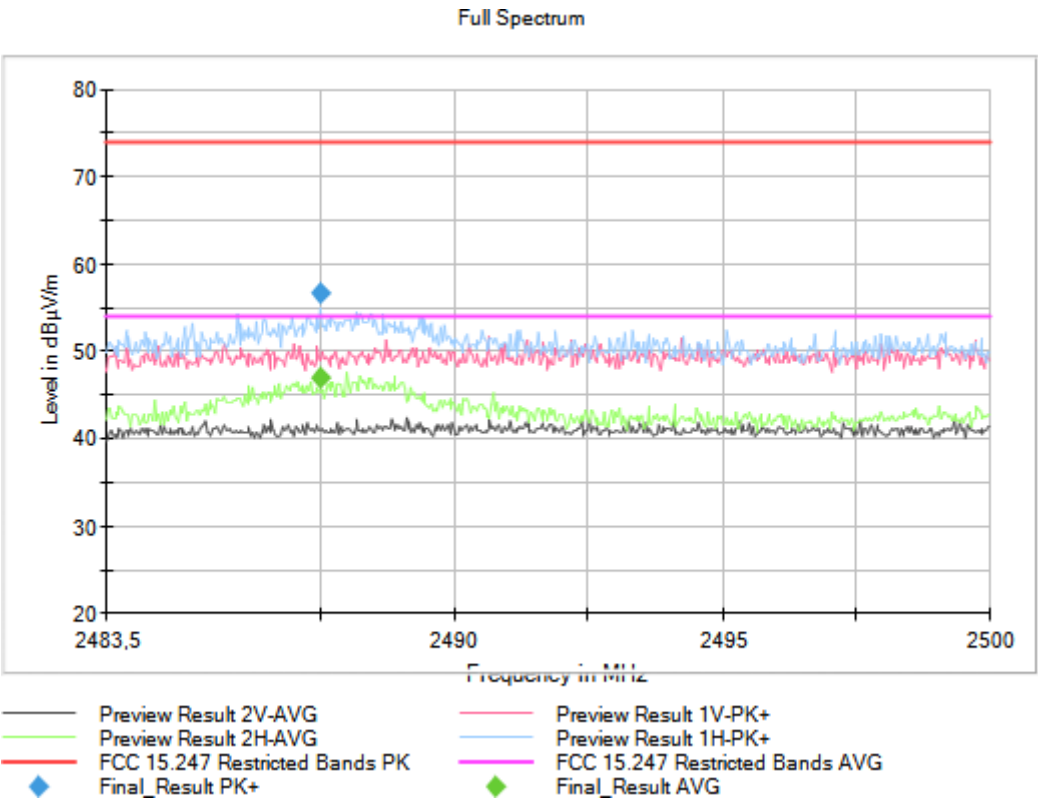
Images:



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Azimuth (deg)
2487.507692	---	46.91	54.00	7.09	H	9.0
2487.507692	56.71	---	74.00	17.29	H	9.0

Full Spectrum



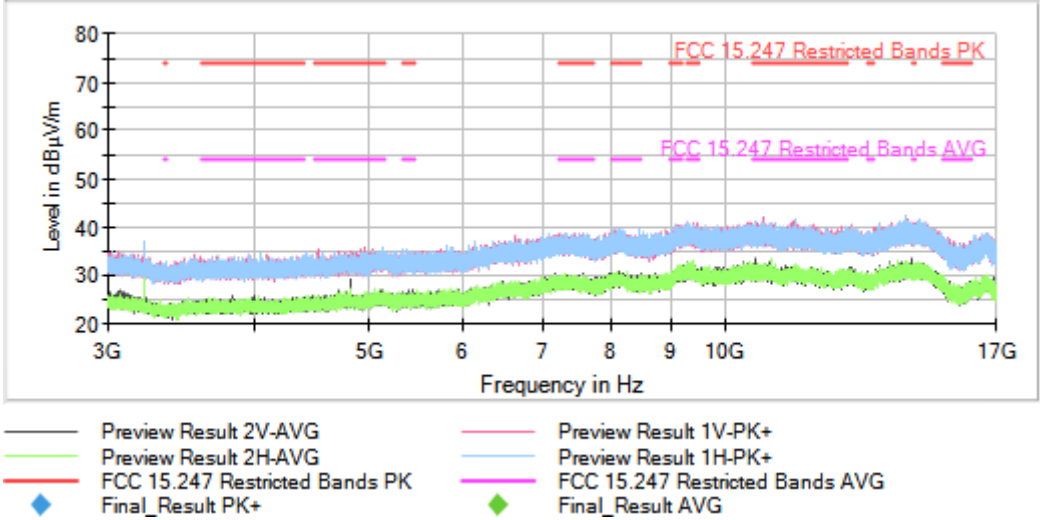


Tables:
Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	1 GHz - 3 GHz	30,769 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2412.00000
MIMO Mode = SISO Active Port = 1

Images:



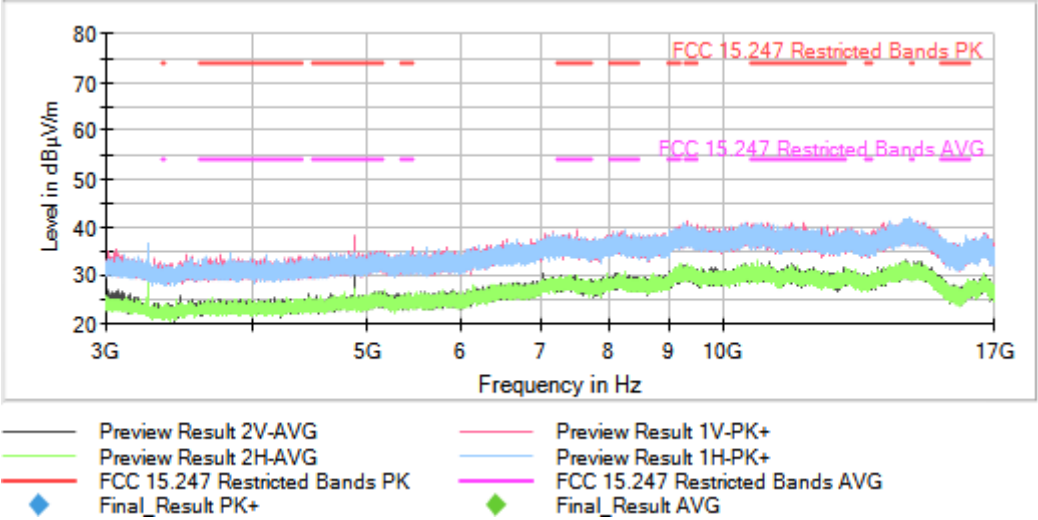
Tables:

Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	3 GHz - 17 GHz	140 kHz	PK+ ; AVG	1 MHz	1 s	30 dB

Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2437.00000
MIMO Mode = SISO Active Port = 1

Images:



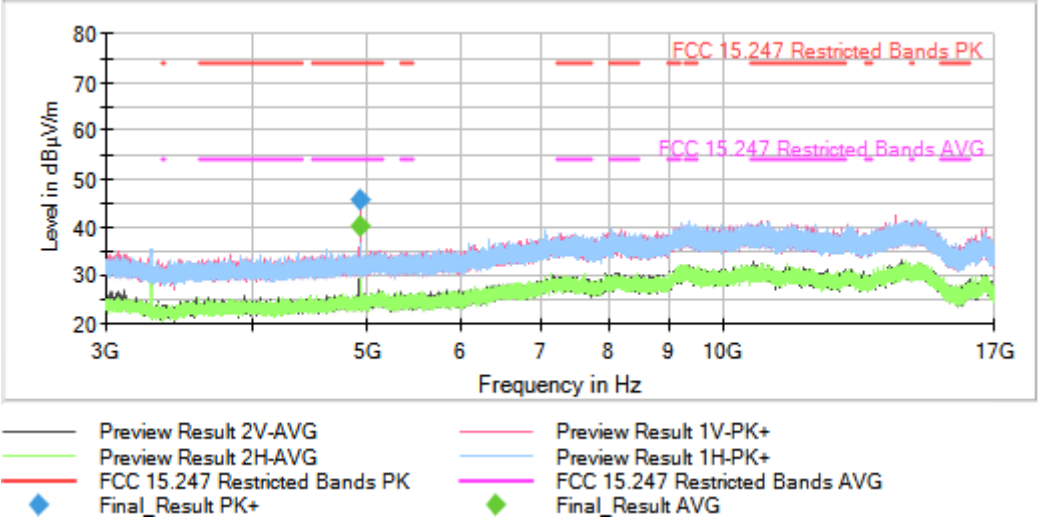
Tables:

Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	3 GHz - 17 GHz	140 kHz	PK+ ; AVG	1 MHz	1 s	30 dB

Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2462.00000
MIMO Mode = SISO Active Port = 1

Images:



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Azimuth (deg)
4924.020000	---	40.09	74.00	13.91	V	241.0
4924.020000	45.79	---	54.00	28.21	V	241.0

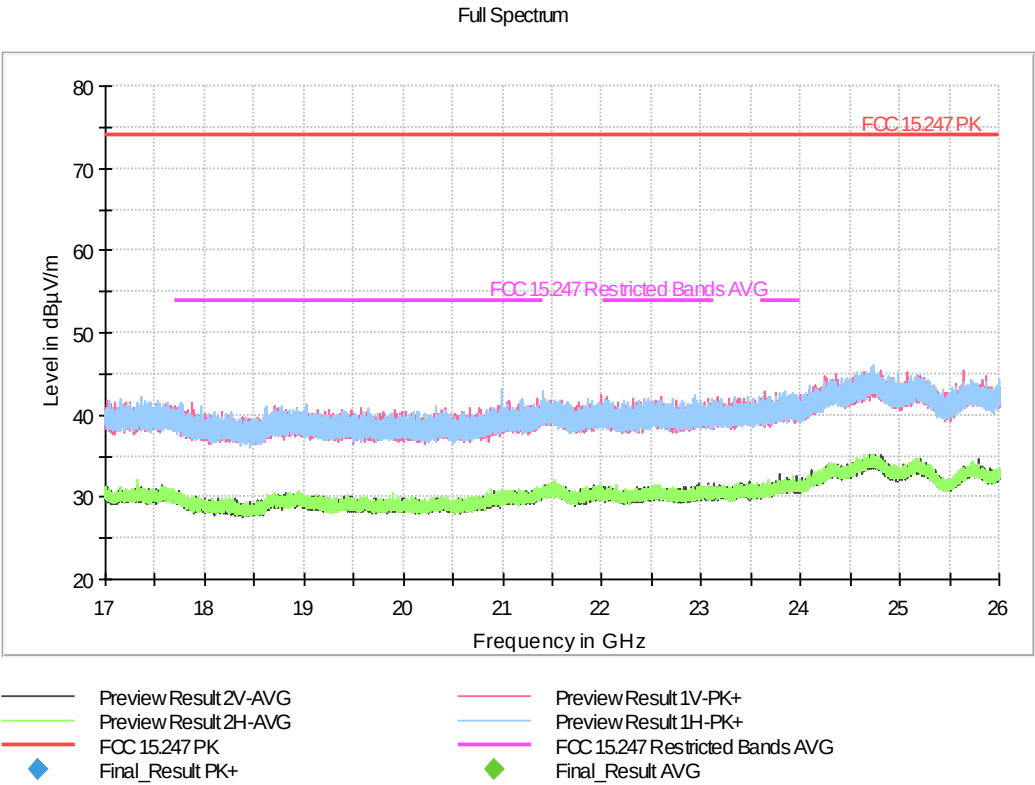
Tables:

Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	3 GHz - 17 GHz	140 kHz	PK+ ; AVG	1 MHz	1 s	30 dB

Frequency Range GHz = [17, 26] Equipment Type = Digital Transmission System (DTS)
The spurious frequencies detected do not depend on the transmission channel or the Modulation
MIMO Mode = SISO Active Port = 1

Images:



Tables:
Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [FSV 40]					
	17 GHz - 26 GHz	300 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

Frequency Range GHz = [1, 17]

Equipment Type = Digital Transmission System (DTS)

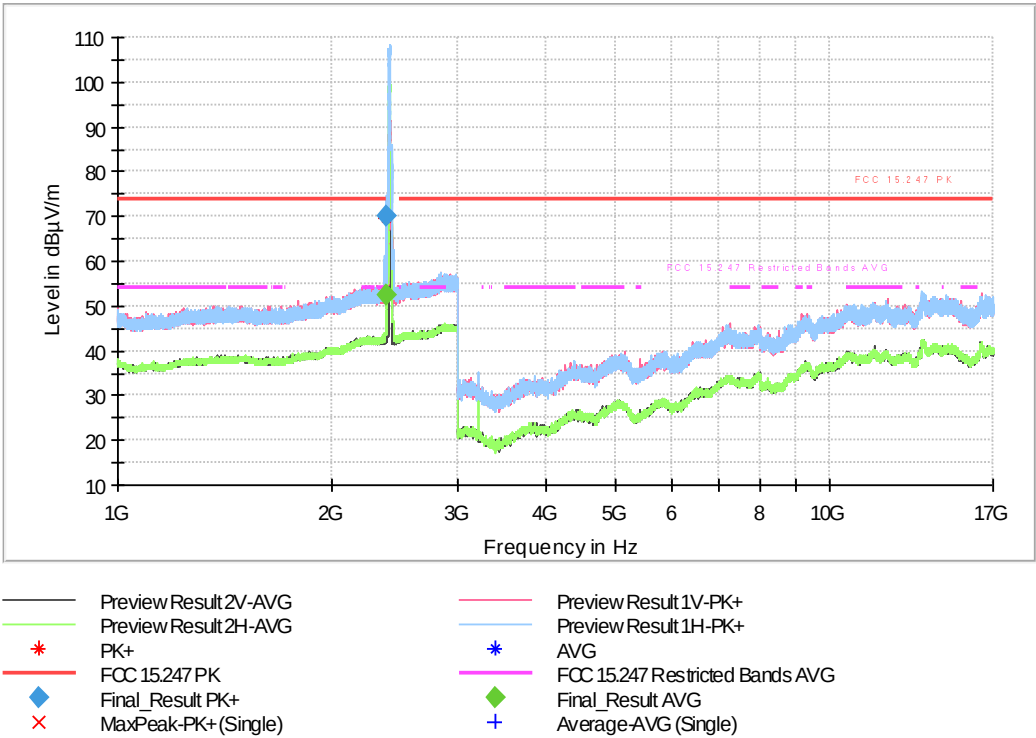
Modulation = 802.11g (OFDM 6 Mbit/s)

Frequency MHz = 2412.00000

MIMO Mode = SISO

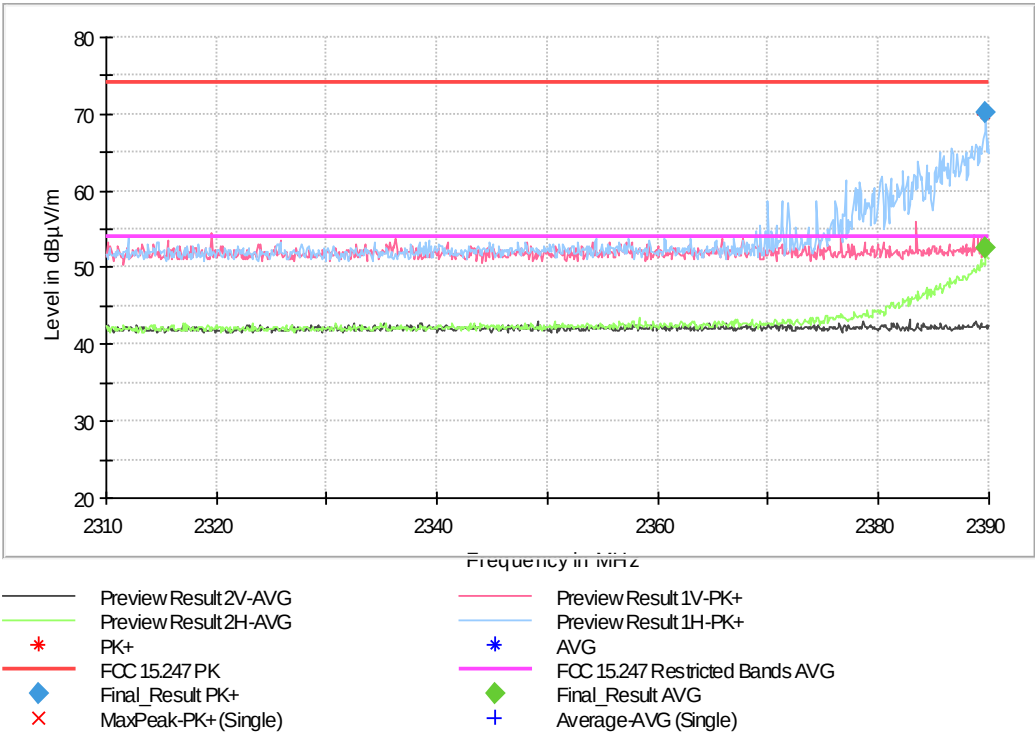
Active Port = 1

Full Spectrum

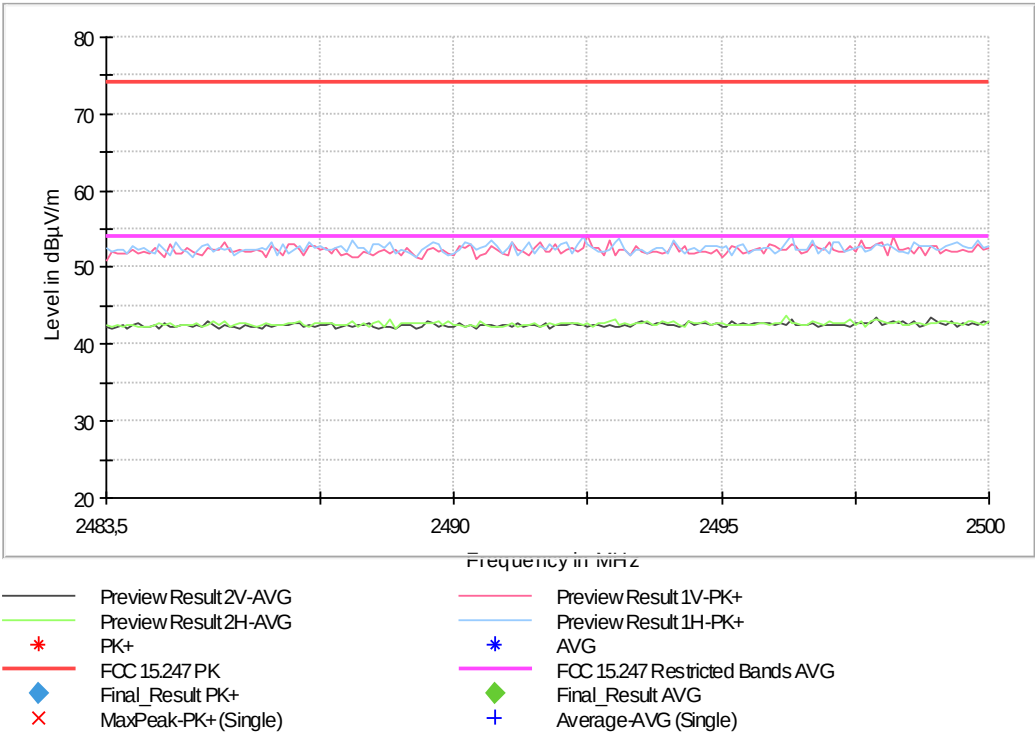


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
2389.700000	70.11	---	74.00	3.89	240.0	H	0.0
2389.700000	---	52.51	54.00	1.49	240.0	H	0.0

Full Spectrum



Full Spectrum



Frequency Range GHz = [1, 3]

Modulation = 802.11g (OFDM 6 Mbit/s)

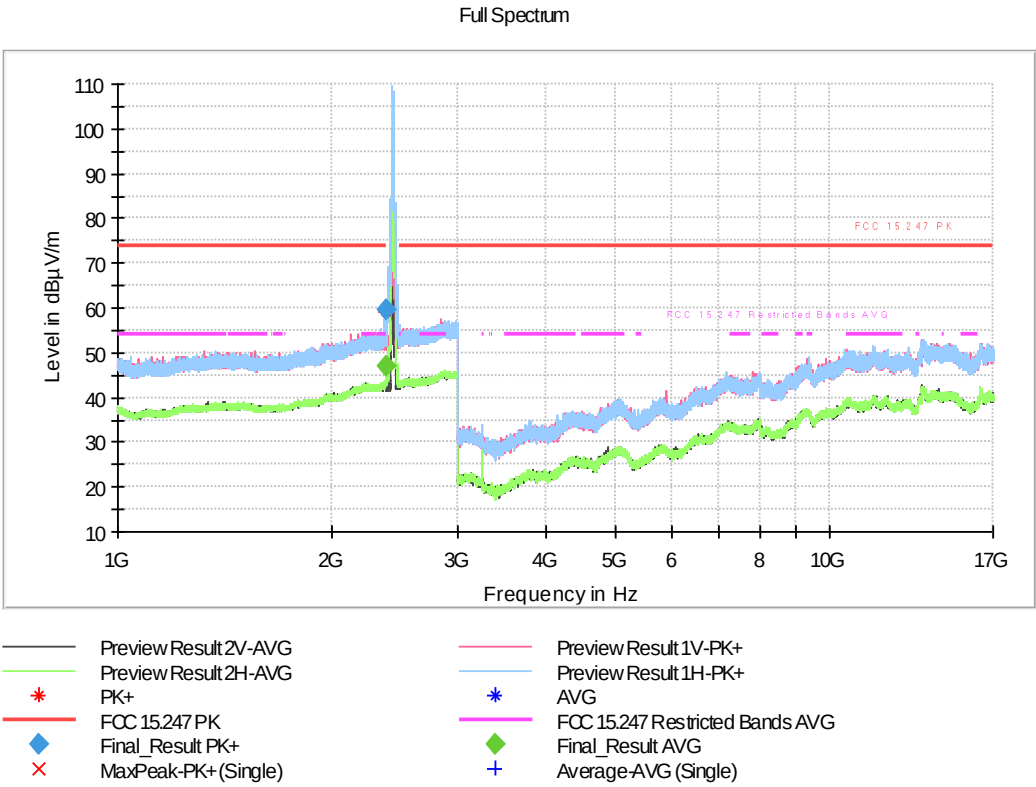
MIMO Mode = SISO

Equipment Type = Digital Transmission System (DTS)

Frequency MHz = 2437.00000

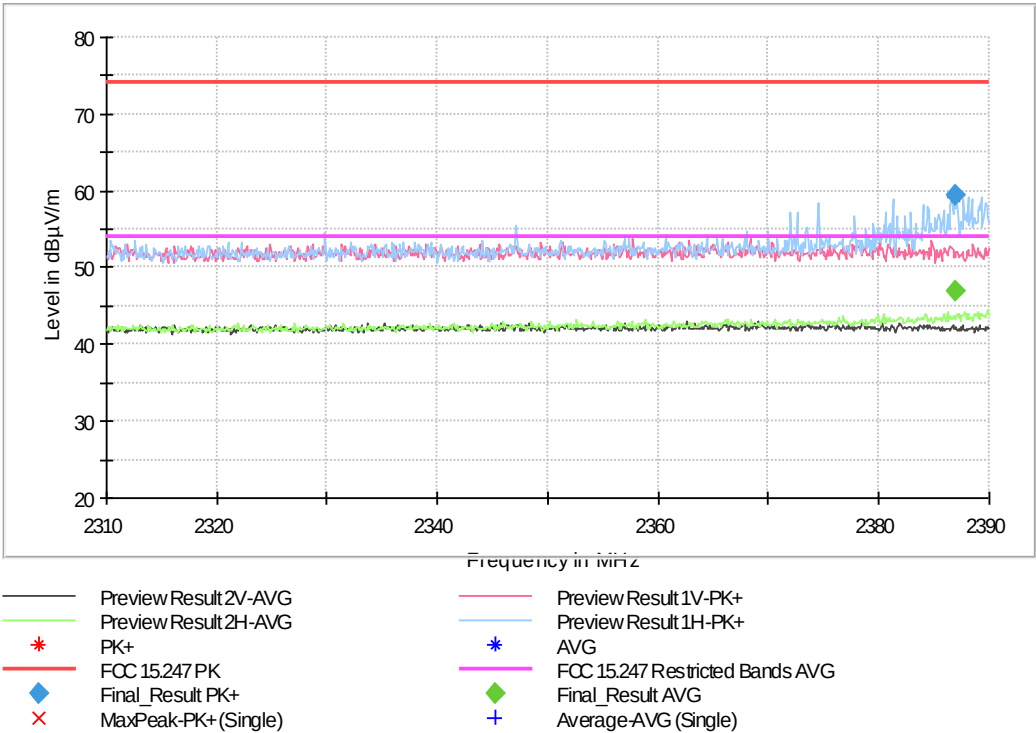
Active Port = 1

Images:

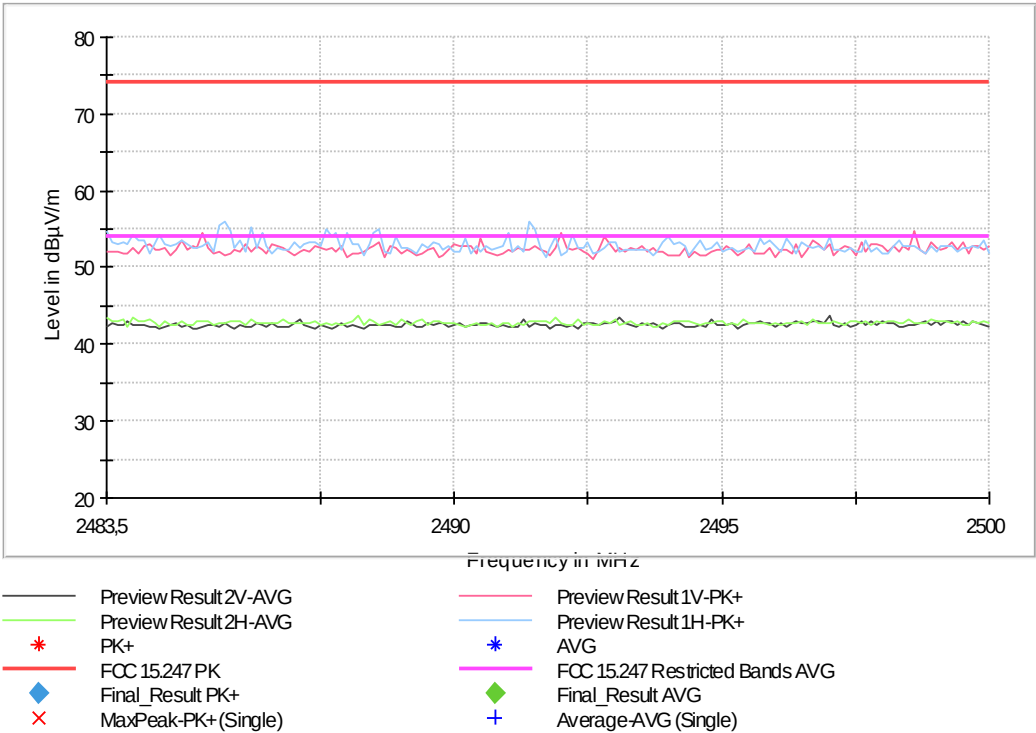


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
2387.000000	59.49	---	74.00	14.51	1000.000	233.0	H	25.0
2387.000000	---	46.99	54.00	7.01	1000.000	233.0	H	25.0

Full Spectrum



Full Spectrum



Tables:
Spectrum Analyzer Parameters

	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	1 GHz - 3 GHz	30,769 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

Frequency Range GHz = [1, 17]

Equipment Type = Digital Transmission System (DTS)

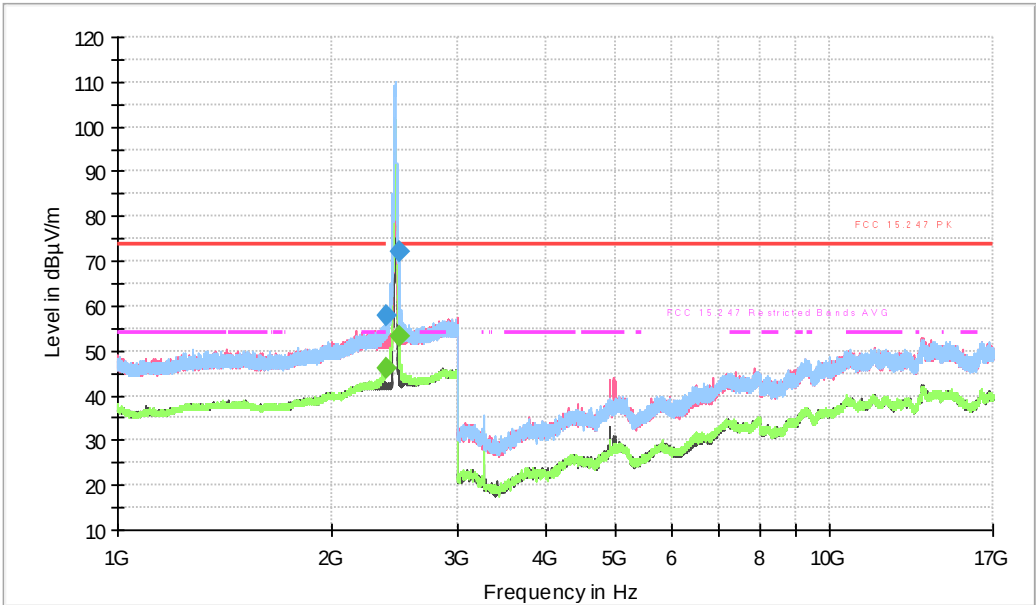
Modulation = 802.11g (OFDM 6 Mbit/s)

Frequency MHz = 2457.00000

MIMO Mode = SISO

Active Port = 1

Full Spectrum



- Preview Result 2V-AVG

Preview Result 2H-AVG

FCC 15.247 PK

Final_Result PK+
- Preview Result 1V-PK+

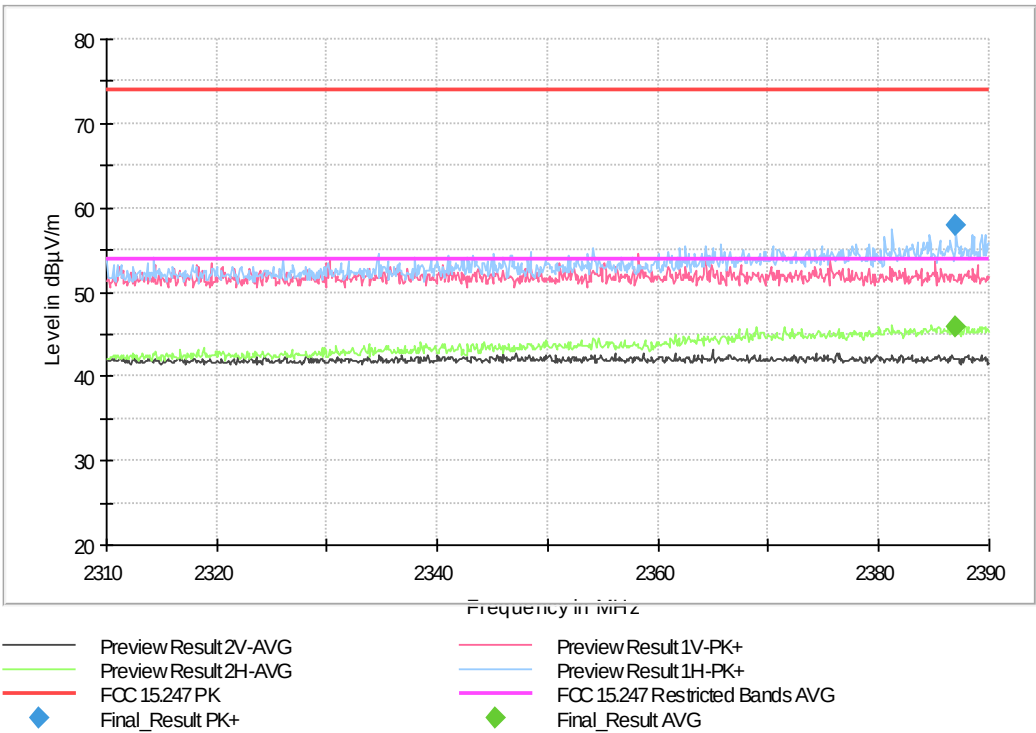
Preview Result 1H-PK+

FCC 15.247 Restricted Bands AVG

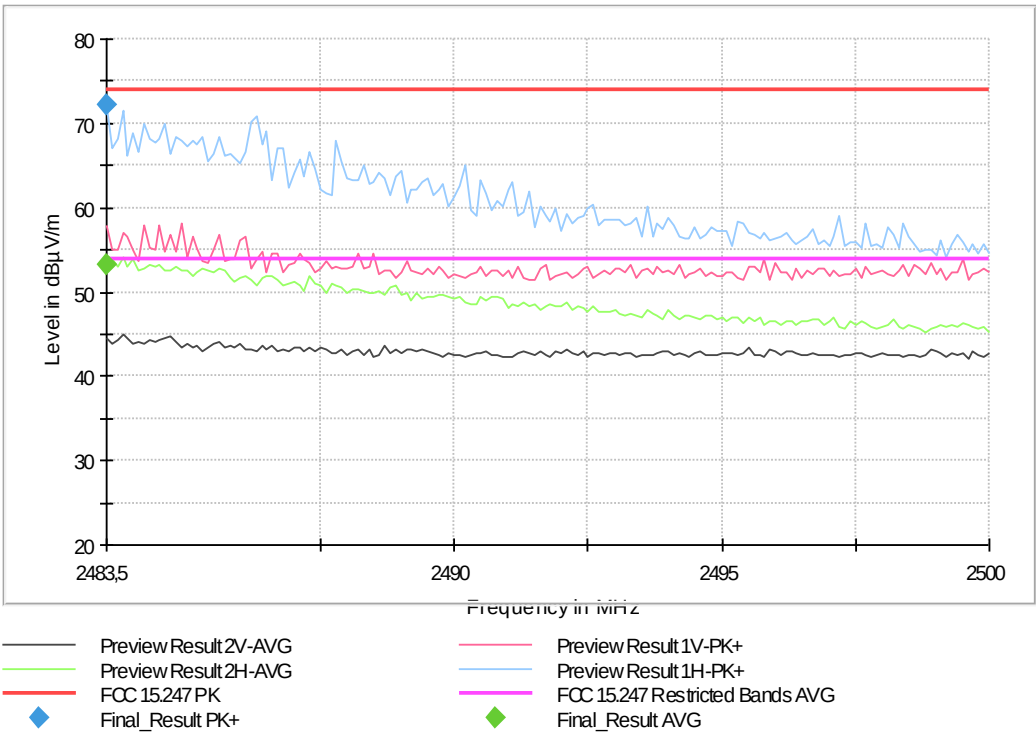
Final_Result AVG

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
2387.000000	---	45.90	54.00	8.10	1000.000	331.0	H	0.0
2387.000000	57.95	---	74.00	16.05	1000.000	331.0	H	0.0
2483.500000	---	53.34	54.00	0.66	100.000	208.0	H	0.0
2483.500000	72.30	---	74.00	1.70	100.000	208.0	H	0.0

Full Spectrum

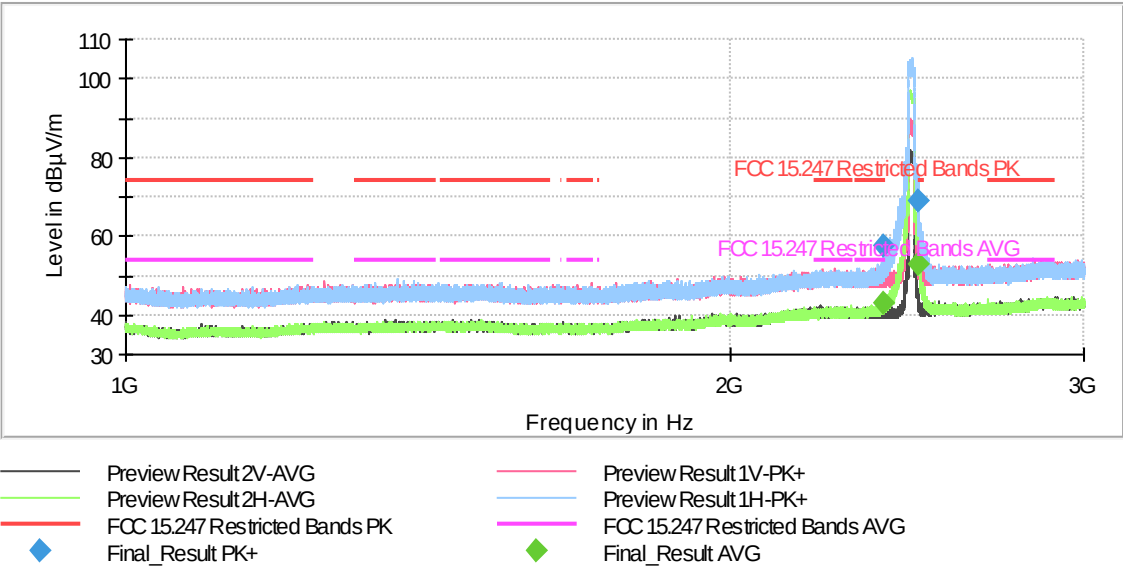


Full Spectrum



Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11g (OFDM 6 Mbit/s) Frequency MHz = 2462.00000
MIMO Mode = SISO Active Port = 1

Images:



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Azimuth (deg)
2387.353846	57.44	---	74.00	16.56	H	0.0
2387.353846	---	42.91	54.00	11.09	H	0.0
2483.630769	68.74	---	74.00	5.26	H	30.0
2483.630769	---	53.00	54.00	1.00	H	30.0