DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29507456

ISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:
76077RRF.002A1

Test Report

USA FCC Part 15.249, 15.209
CANADA RSS-210, RSS-Gen

(*) Identification of item tested	Receiver-In-The-Canal Hearing Aid (air-conduction, wireless)
(*) Trademark	Phonak
(*) Model and /or type reference	Phonak Audéo I90-Sphere
(*) Derived models not tested	Phonak Audéo I70-Sphere Phonak Audéo ISphereTrial See section “Data provided by the client”.
(*) Other identification of the product	FCC ID: KWC-IRP IC: 2262A-IRP HW version: 050-1029 SW version: 067-1602
(*) Features	DM, Flora, Bluetooth Classic, Bluetooth Low Energy
Applicant	Sonova AG Laubisrütistrasse 28 8712 Stäfa, Switzerland
Test method requested, standard	USA FCC Part 15.249 (10-1-21 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, 5725 - 5875 MHz, and 24.0 – 24.25 GHz. USA FCC Part 15.209 (10-1-21 Edition): Radiated emission limits; general requirements. CANADA RSS-210 Issue 10 (April 2020) Licence-Exempt Radio Apparatus: Category I Equipment CANADA RSS-Gen Issue 5 amendment 2 (February 2021). ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Antonio José Jurado Industrial & Automotive EMC Lab. Manager 80157242B ANTONIO JOSE JURADO (C:A29507456) Firmado digitalmente por 80157242B ANTONIO JOSE JURADO (C:A29507456) Fecha: 2024.07.18 07:48:59 +02'00'
Date of issue	2024-07-17
Report template No	FDT08_24 (*) “Data provided by the client”

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Acronyms

Acronym ID	Acronym Description
99OBW	99% Occupied Channel Bandwidth
Detector	Detector used
Equipment	Equipment Type
Freq	Frequency
Freq Rng	Frequency Range
MP	Measurement Point
Mod	Modulation
Operation Band	Operation Band
Pol	Polarization
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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General conditions

1. This report is only referred to the item that has undergone the test.
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 ≤ ± 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 ≤ ± 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 ≤ ± 5,51 dB with factor (k = 2).

The total uncertainty of the measurement system for the conducted testing of EUT is:
Field strength of fundamental and harmonic emissions: Measurement uncertainty ≤ ± 4,32 dB
Occupied Channel Bandwidth: Measurement uncertainty ≤ ± 1,40 %

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").

2. The sample consists of a Receiver-In-The-Canal Hearing Aid (air-conduction, wireless). The hearing aid is intended to amplify and transmit sound to the ear and thereby compensate for impaired hearing.

3. Derived models not tested. These models have been declared by the supplier of the sample as being in all relevant parts and hardware construction identical to the corresponding product identified. The derived models not tested document provided by the supplier is included hereby:

(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.**)**

DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29507456

To whom it may concern

Stäfa (Switzerland), April 2024 / David Sooprayen, Interim Head of Regulatory Affairs

Product Equality Declaration

We, Sonova AG, hereby declare under our own responsibility that the products listed below as "Hardware Equivalent Products" are in all relevant parts and hardware construction identical to the corresponding product identified as "Products with basis Hardware". The following standards and/or technical regulations and corresponding test reports fully apply accordingly:

Standards
Hearing aid standards: ACUSTIC: IEC (International Electroacoustic Commission) 60118-0 and NSH 7.0 (including Annex A); EMC (Electromagnetic Compatibility): IEC 60118-13; EMC immunity: ANSI (American National Standards Institute) C63.19; SW: IEC/EN 62304:2006 + A1:2015; UNE EN 62304:2007 + Corr:2009 + A1:2016; Europe: HEALTH & SAFETY: IEC/EN 60601-1; IEC/EN 60601-1-6; IEC/EN 60601-1-11; IEC/EN 60601-2-66; IEC/EN 62133-2; UN 38.3 Test 7; IEC/EN 62479; EMC: IEC/EN 60601-1-2; EN ETSI 301 489-1, -17 ; SPECTRUM: EN 300 328; USA: 47 CFR Part 15 (B); Part 15 (C):15.249, 15.209; Part 2: 2.1093; 2.1091 Canada: RSS-Gen, ICES-003, RSS-210, RSS-102 Japan: ARIB T66, Ordinance regulating Radio Equipment (2005-08) Ar12 item 19

The only difference between the listed equivalent and corresponding basis models is the model's name, a separate set of audiological features per performance level.

Products with basis Hardware (tested representative model)	**Hardware Equivalent Products**
Phonak Audéo I90-Sphere (with S/M/P/UP/MAV receivers) HW version: 050-1029-xx FW version: 067-1602 SW version: Target 10	**Phonak Audéo I70-Sphere** (with S/M/P/UP/MAV receivers) HW version: 050-1060-xx SW version: Target 10.0 FW version: 067-1603 **Phonak Audéo ISphereTrial** (with S/M/P/UP/MAV receivers) HW version: 050-1030-xx SW version: Target 10.0 FW version: 067-1602

where xx – means colour identification

Place and date

Staefa, 23. April 2024

David Sooprayen

Interim Head of Regulatory Affairs

Staefa, 24. April 2024

Lora Braun

Regulatory Affairs Manager

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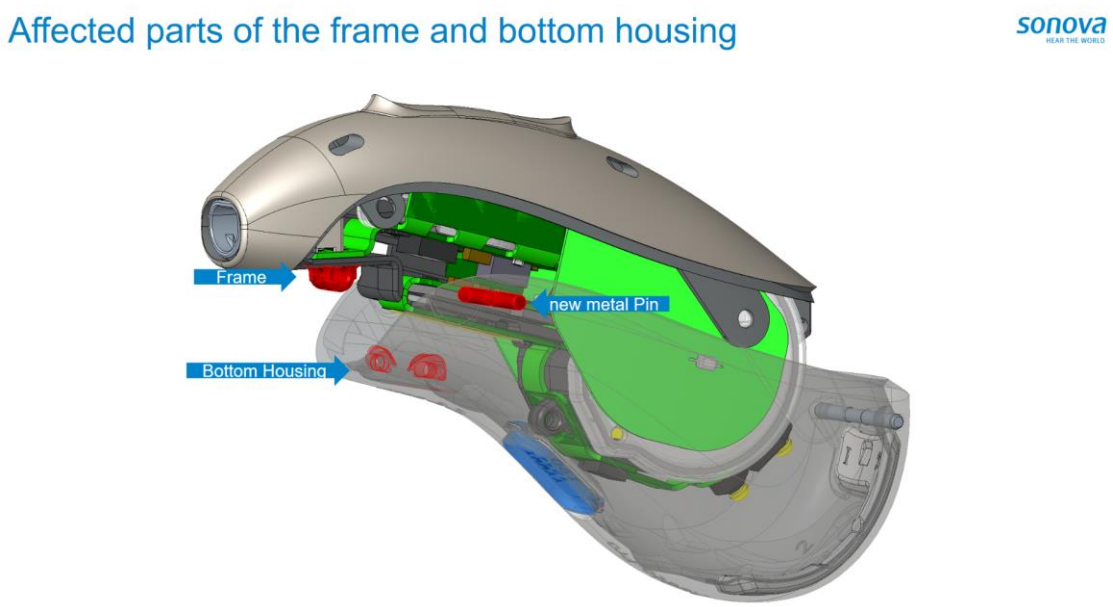
Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial Nº	Date of Reception	Application
S/01	76077D_34.1	Hearing aid RADIATED	Phonak Audéo I90-Sphere	WN42H1JVR	2023-12-27	Element Under Test
S/02	76077D_20.1	SetUp Module Conducted	Phonak Audéo I90-Sphere	WN42H1JNU	2023-12-27	Element Under Test
S/03	76077D_91.1	Hearing aid RADIATED	Phonak Audéo I90-Sphere	--	2024-04-17	Element Under Test

Notes referenced to samples during the project:

Id	Type
S/01	Radiated
S/02	Conducted
S/03	Radiated. This is a modified sample with a minor change in the housing. 

Test sample description

Ports…… :	Port name and description	Cable			
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)
	N/A	.....	[ ]	[ ]	[ ]
Supplementary information to the ports…… :	Not provided data				

Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[ ]	AC:	[ ]	[ ]	[ ]	[ ]	[ ]
	[X]	DC: 3.7 Vdc (Internal battery).					

Rated Power .....:	Not provided data	
Clock frequencies.....:	Not provided data	
Other parameters .....:	Not provided data	
Software version .....:	067-1602	
Hardware version .....:	050-1029	
Dimensions in cm (W x H x D) ....:	Not provided data	
Mounting position .....:	[ ]	Table top equipment
	[ ]	Wall/Ceiling mounted equipment
	[ ]	Floor standing equipment
	[ ]	Hand-held equipment
	[X]	Other: Hearing Aid.

Modules/parts.....:	Module/parts of test item	Type	Manufacturer
	Not provided data	.....	.....
Accessories (not part of the test item) .....:	Description	Type	Manufacturer
	Not provided data	.....	.....

Documents as provided by the applicant.....:	Description	File name	Issue date
	Test plan	Test plan - V.2020	2024-04-05
	Pass Fail criteria	PDL-9421 - V2.0	2023-12-04
	Declaration equipment data	FDT30	2024-04-02
	Operational and technical description	PDL-1420 – V3.0	2024-01-11

(3) Only for Medical Equipment

Identification of the client

Sonova AG
Laubisrütistrasse 28 8712 Stäfa, Switzerland

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2024-01-10
Date (finish)	2024-01-17

Document history

Report number	Date	Description
76077RRF.002	2024-05-30	First release.
76077RRF.002A1	2024-07-17	First modification. Some typos and correction has been performed. Pag 18. Information about the selected frequency range has been added. Pag 19. A note is adding indicating that limits on all the graph of 15.247 have to be considered as limits of 15.249, as both are referring to the referenced limits in 15.209. Along de report: A typo referenced to “Equipment type: Digital Transmission System (DTS)” has been removed. This report cancels and replaces the previous 76077RRF.002.

Environmental conditions

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

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

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

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

In the chamber for conducted measurements, the following limits were not exceeded during the test:

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

Remarks and comments

The tests have been performed by the technical personnel: Alvaro Borrego Robles, Rubén Mora Fernández and Victoria Olmedo Villalba.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
05862	EMI TEST RECEIVER 9kHz-7GHz	ESR7	ROHDE AND SCHWARZ	2025-02-15
07040	EXTENSION FOR OPEN SWITCH UNIT UP TO 40GHz	OSP-B157Wx	Rohde&Schwarz	2025-04-19
07763	HORN ANTENNA 1-18GHz	BBHA 9120D	SCHWARZBECK MESS-ELEKTRONIK	2026-01-16
06495	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2024-03-19
09968	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2026-09-22
07862	PRE-AMPLIFIER G>30dB 18-40GHz	BLMA 1840-3G	BONN ELEKTRONIK	2024-03-14
07769	PREAMPLIFIER 30dB 500MHz-18GHz	BBV 9718 C	SCHWARZBECK	2024-02-15
07039	Rohde&Schwarz	OSP-B157W8	ROHDE & SCHWARZ	2025-05-25
08130	SEMIANECHOIC ABSORBER LINED CHAMBER	P29419	ALBATROSS	--
08134	SHIELDED ROOM	P29419	ALBATROSS PROJECTS GMBH	--
08661	SHIELDED ROOM	-	SIEPEL	--
06158	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2026-02-05
08835	SIGNAL AND SPECTRUM ANALYZER 2Hz-50GHz	FSW50	ROHDE AND SCHWARZ	2025-02-08
07550	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2024-05-02
07549	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2024-05-02
07552	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2024-05-02
00939	TEMPERATURE CHAMBER	VMT 04/35	HERAEUS	2025-01-11
07798	WMS32	WMS32	ROHDE AND SCHWARZ	--

Testing verdicts

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

Summary

FCC PART 15 PARAGRAPH / RSS-210			
Requirement – Test case		**Verdict**	**Remark**
15.249 (a) / RSS-210 B.10 (a)	Field strength of fundamental and harmonic emissions	P	(1)
15.249 (d) / RSS-210 B.10 (b)	Emissions radiated outside of the specific frequency bands	P	(1)
99dBw	Occupied Channel Bandwidth 99%	P	(1)
Supplementary information and remarks: (1) The equipment supports multiple 2.4 GHz modulation: Proprietary protocol DM 2.4 GHz, Proprietary protocol Flora 2.4 GHz, BTLE GFSK, BT BASIC RATE.			

Appendix A: Test results

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TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 3.7V DC

Type of Power Supply: Battery

ANTENNA (*):

Type of Antenna: Integral Antenna

Maximum Declared Antenna Gain: -9.2 dBi

TEST FREQUENCIES (*):

Modulation	Data rates	Low Channel:	Middle Channel	High Channel
Proprietary protocol DM 2.4 GHz	Proprietary	2402 MHz	2440 MHz	2480 MHz
Proprietary protocol Flora 2.4 GHz	Proprietary	2402 MHz	2440 MHz	2480 MHz
BTLE GFSK	1M 1 Mbit/s	2402 MHz	2440 MHz	2480 MHz
BTLE GFSK	2M 2 Mbit/s	2402 MHz	2440 MHz	2480 MHz
BT BASIC RATE	GFSK	2402 MHz	2441 MHz	2480 MHz
BT BASIC RATE	Pi/4 DQPSK 2-DH5	2402 MHz	2441 MHz	2480 MHz
BT BASIC RATE	8DPSK 3-DH5	2402 MHz	2441 MHz	2480 MHz

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. The duty cycle for all modulations is 100%.

CONDUCTED MEASUREMENTS:

The equipment under test was set up in a shielded room and it is connected to the TS8997 using a low loss RF cable. The reading of the spectrum analyser is corrected taking into account the cable loss.

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).

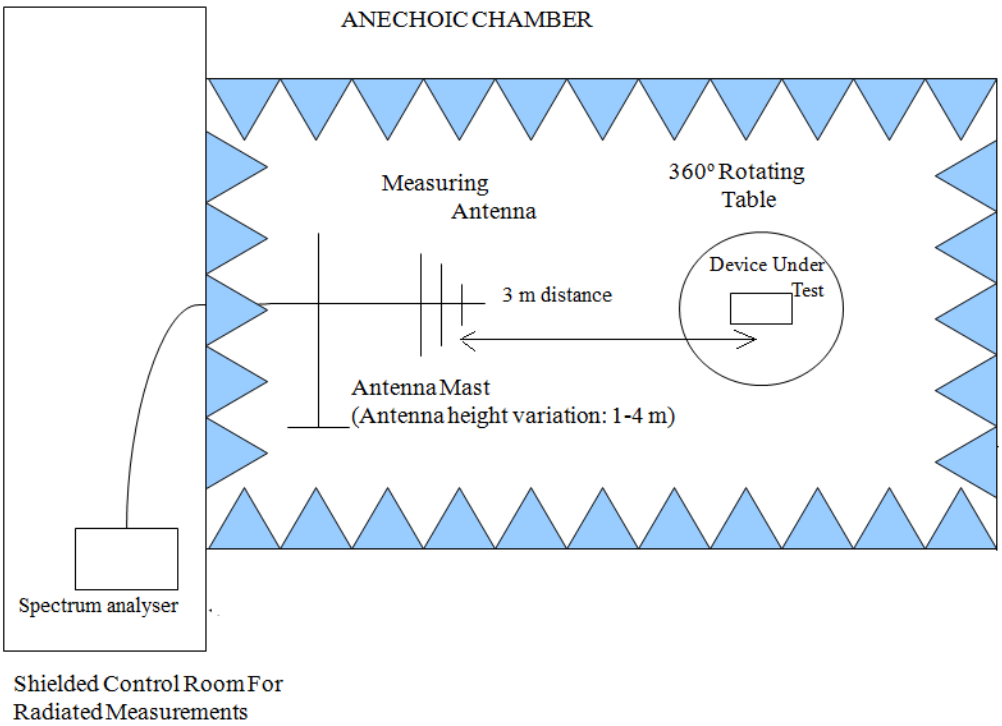
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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 360º and the antenna height (Bilog antenna and Double ridge horn antenna) was varied from 1 to 4 meters to find the maximum radiated emission.

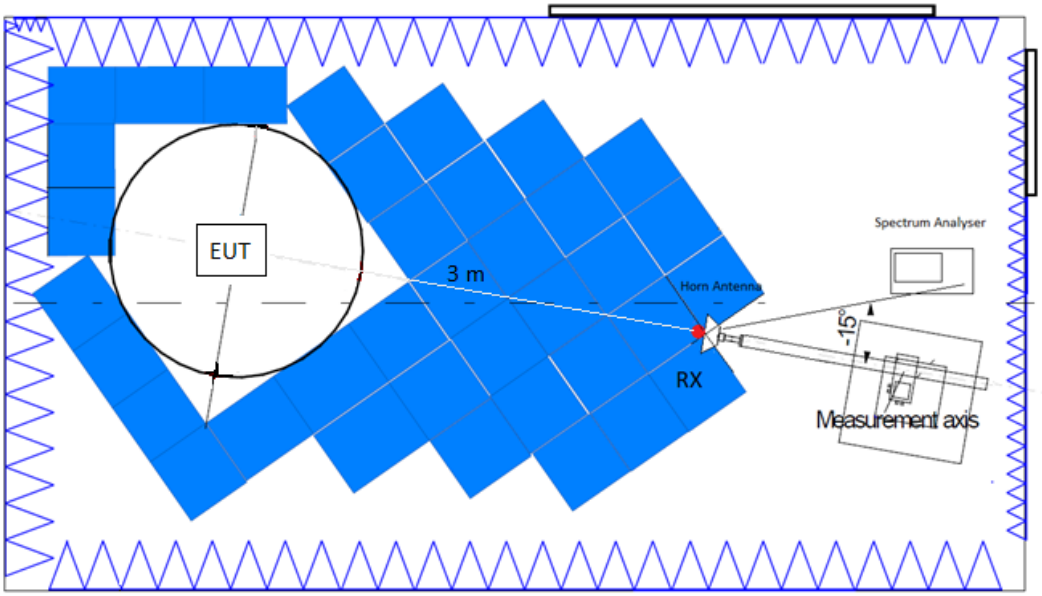
Measurements were made in both horizontal and vertical planes of polarization.

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.

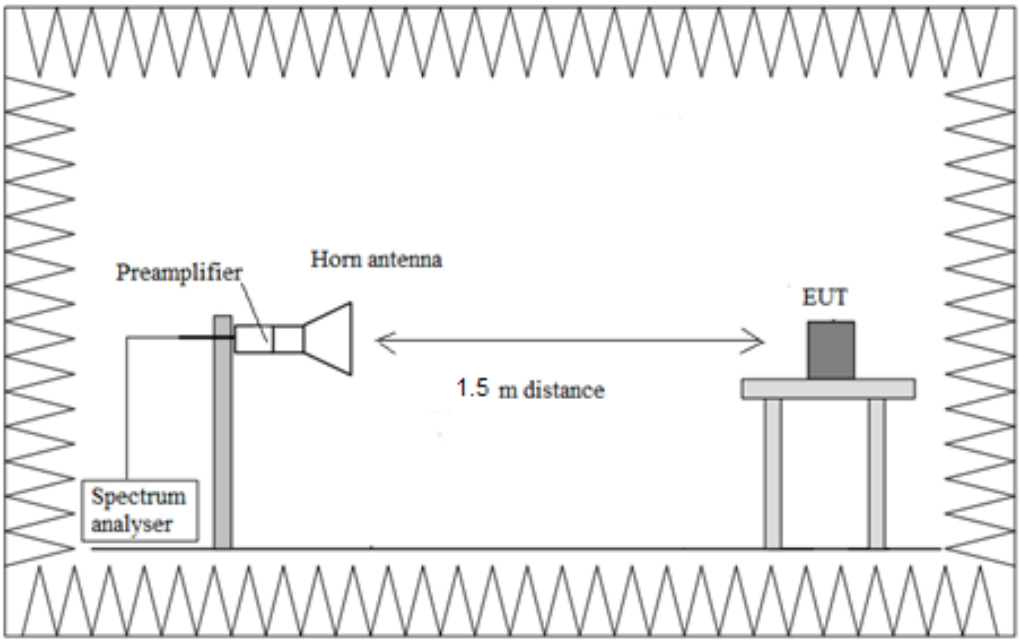
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup f > 17 GHz:



TEST CASES DETAILS

15.249 (d) (e) / RSS-210 B.10 (b) Emissions radiated outside of the specific frequency bands

Limits

The field strength of harmonics from intentional radiators shall comply with the following

Fundamental frequency (MHz)	Field strength of harmonics (µV/m)	Field strength of harmonics (dBµV/m)	Measurement distance (m)
902 - 928	500	54	3
2400 – 2483.5	500	54	3
5725 - 5875	500	54	3
24000-24250	2500	67.96	3

Emissions radiated outside of the specific frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of fundamental or to the general radiated emission limits specified in section 15.209:

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
960 - 25000	500	54	3

whichever is the lesser attenuation.

Frequency range tested for Radiated emissions according to section 15.33:
Start frequency: no radiofrequency signal generated in the device found below 10th sub-armonic, no further investigation required.
Stop frequency: it has been performed the radiated spurious emissions until 10th armonic.

Spectrum Analyzer Parameters:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
Receiver: [ESR 7]					
30 MHz - 1 GHz	48,5 kHz	PK+	100 kHz	1 s	20 dB
Receiver: [FSV 40]					
1 GHz - 3 GHz	66,667 kHz	PK+ ; AVG	1 MHz	1 s	0 dB
Receiver: [FSV 40]					
3 GHz - 17 GHz	500 kHz	PK+ ; AVG	1 MHz	1 s	0 dB
Receiver: [FSV 40]					
17 GHz - 26 GHz	500 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

Note: Limits in the following graphs regarding 15.247 are based on 15.209 limits in the same way as 15.249. Please, consider labels 15.247 in all the below graphs also valid in this case for 15.249.

Modulation: BT (GFSK)

Results

The spurious frequencies detected at less than 20 dB below the limit:

Freq Rng (GHz)	Freq (MHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[0.03, 1]	2480.00000	959.405500	17.56	V	QP

* The spurious frequencies detected does not depend of the selected channel.

Freq Rng (GHz)	Freq (MHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Unwanted Lvl (dBµV/m)	Pol	Detector
[3, 17]	2441.00000	7323.50000	54.49	--	H	PK
			--	48.33		AVG
	2480.00000	7440.500000	55.63	--	H	PK
			--	49.50		AVG

In order to choose the worst case acoustic receiver and battery type, a radiated emission pre-test is performed. See comparison below in the attachments section.

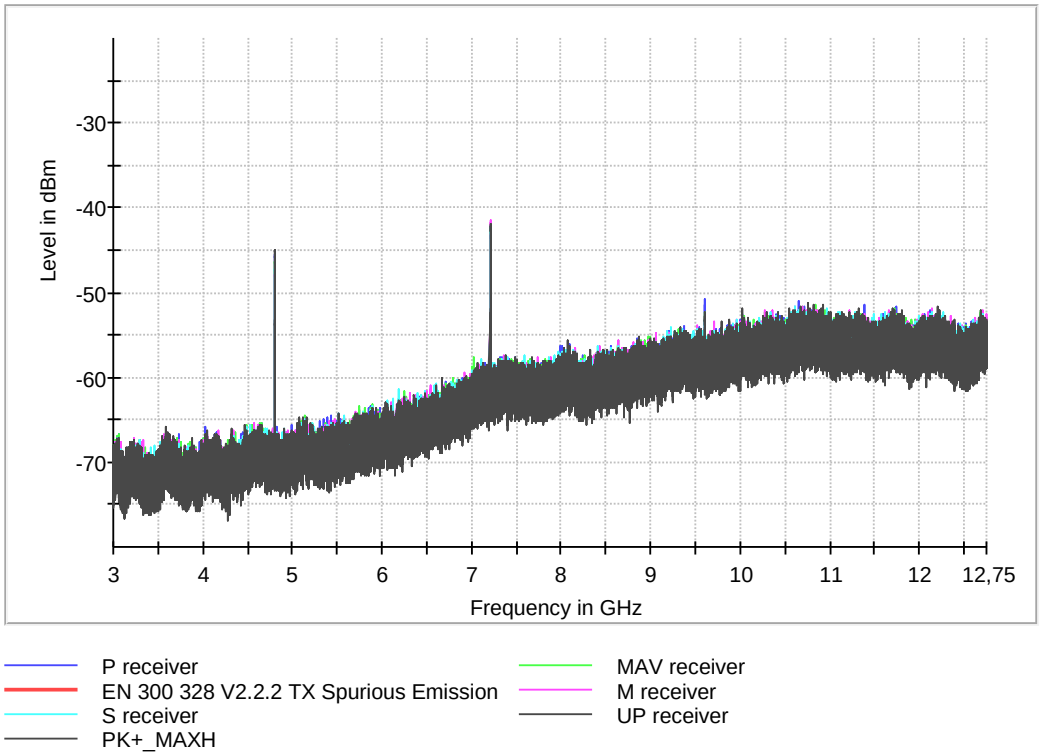
Verdict

Pass

Attachments

Pre-test with different acoustic receivers:

EN300328_TX_3GHz-12,75GHz

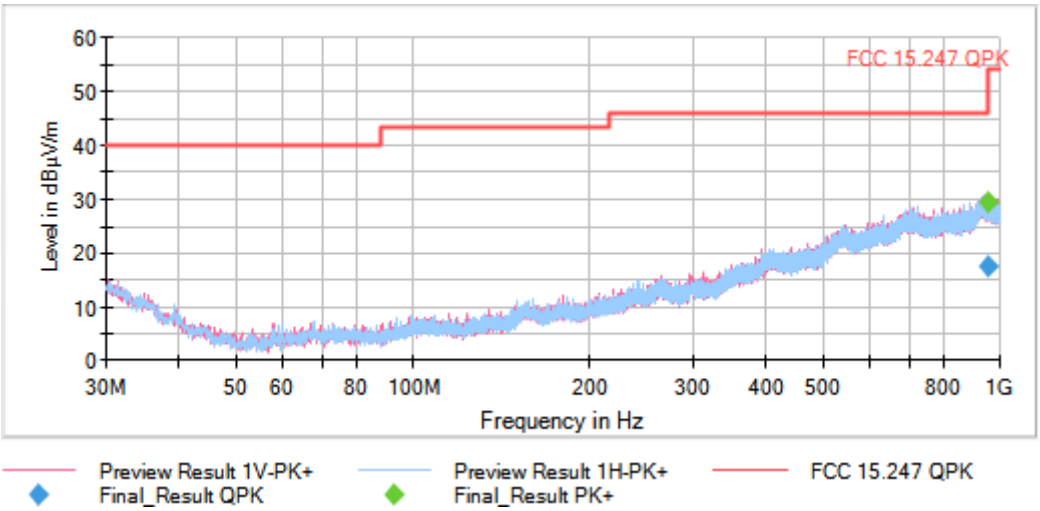


After this preview, the receiver “M” and battery “Varta” configuration is selected as representative for the rest of the tests.

Frequency MHz = 2480.00000 Modulation = BT (GFSK)

Frequency Range GHz = [0.03, 1]

Images:

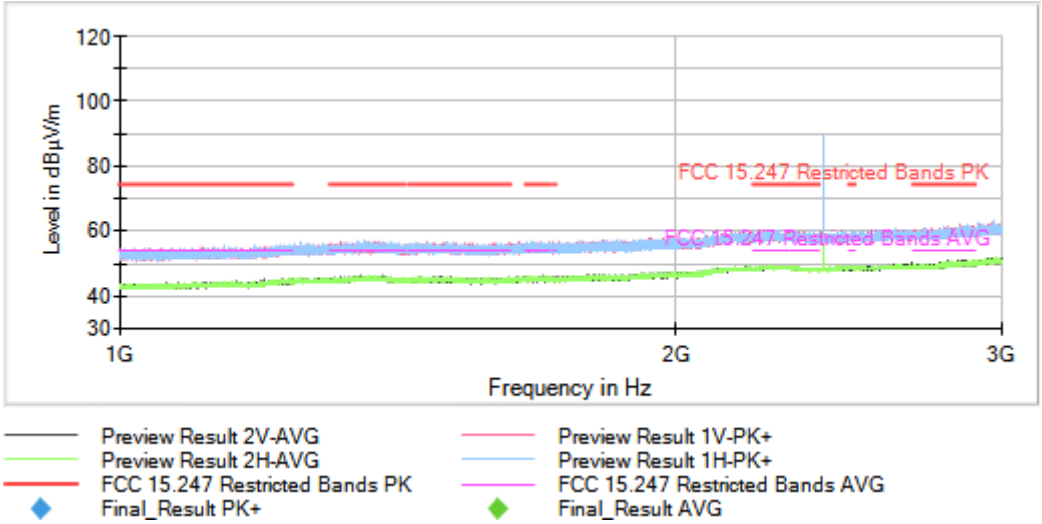


This plot is valid for all channels

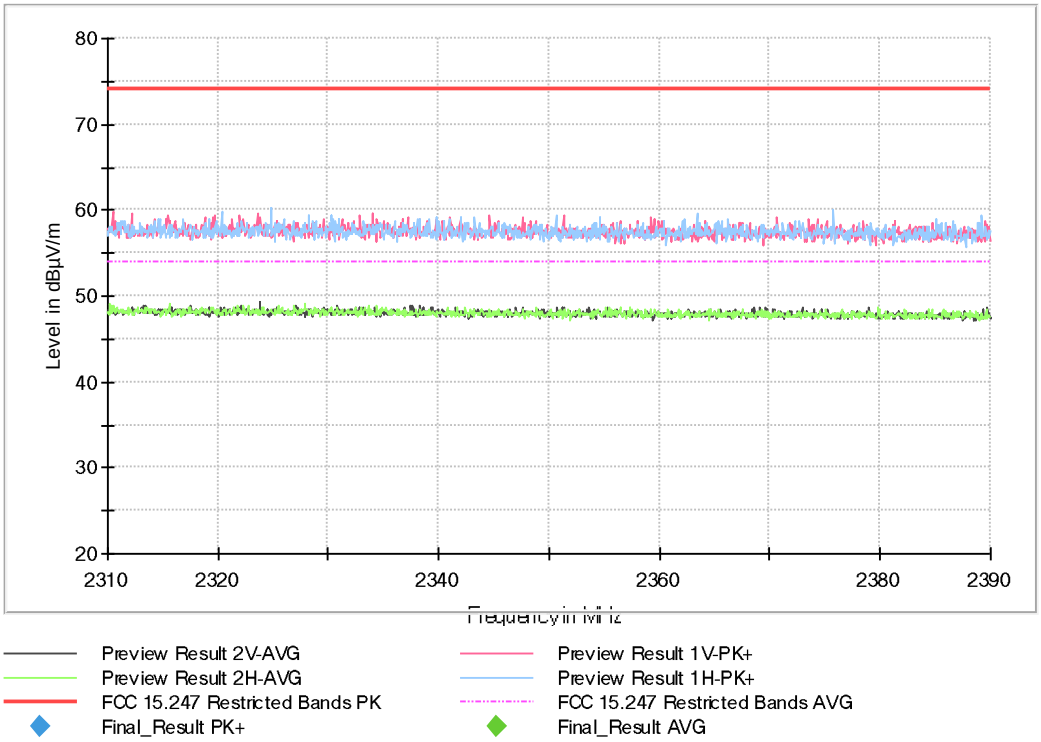
Frequency MHz = 2402.00000 Modulation = BT (GFSK)

Frequency Range GHz = [1, 3]

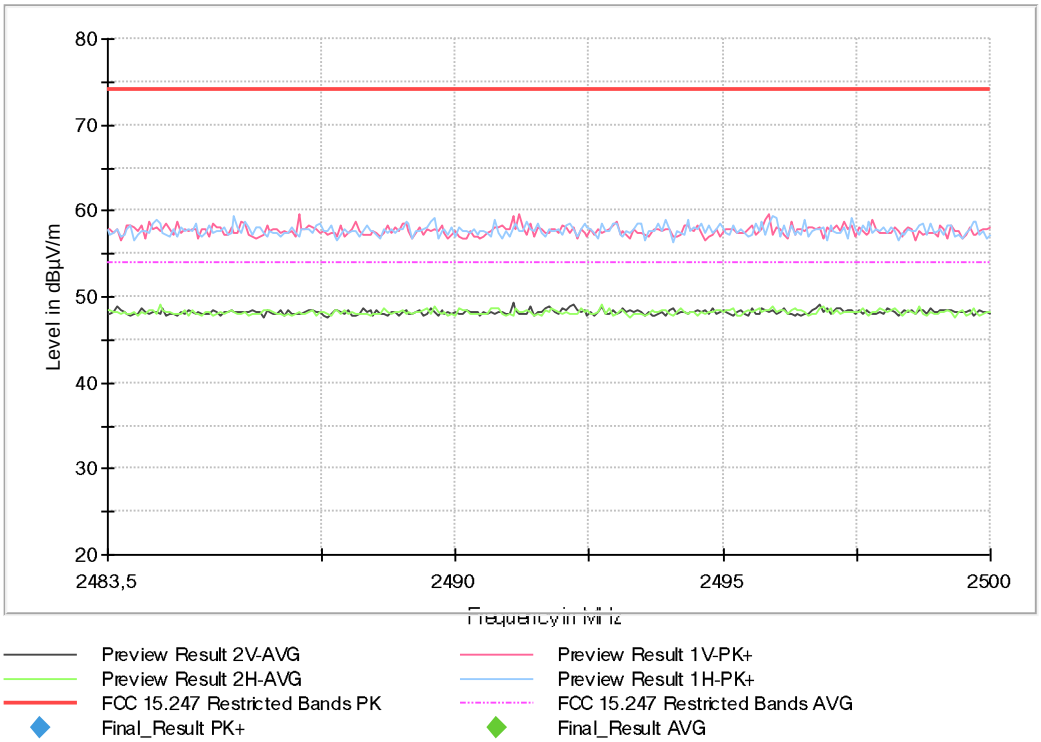
Images:



Full Spectrum



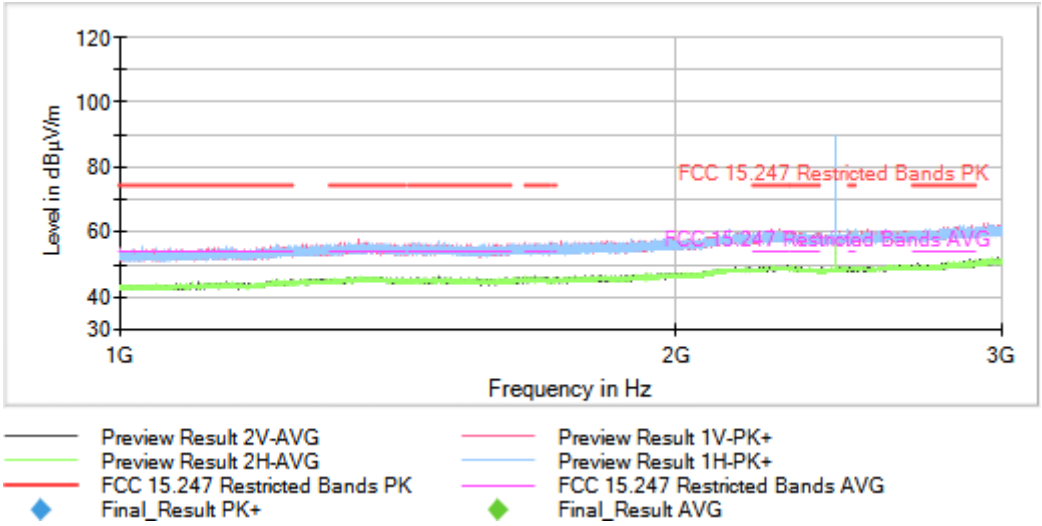
Full Spectrum



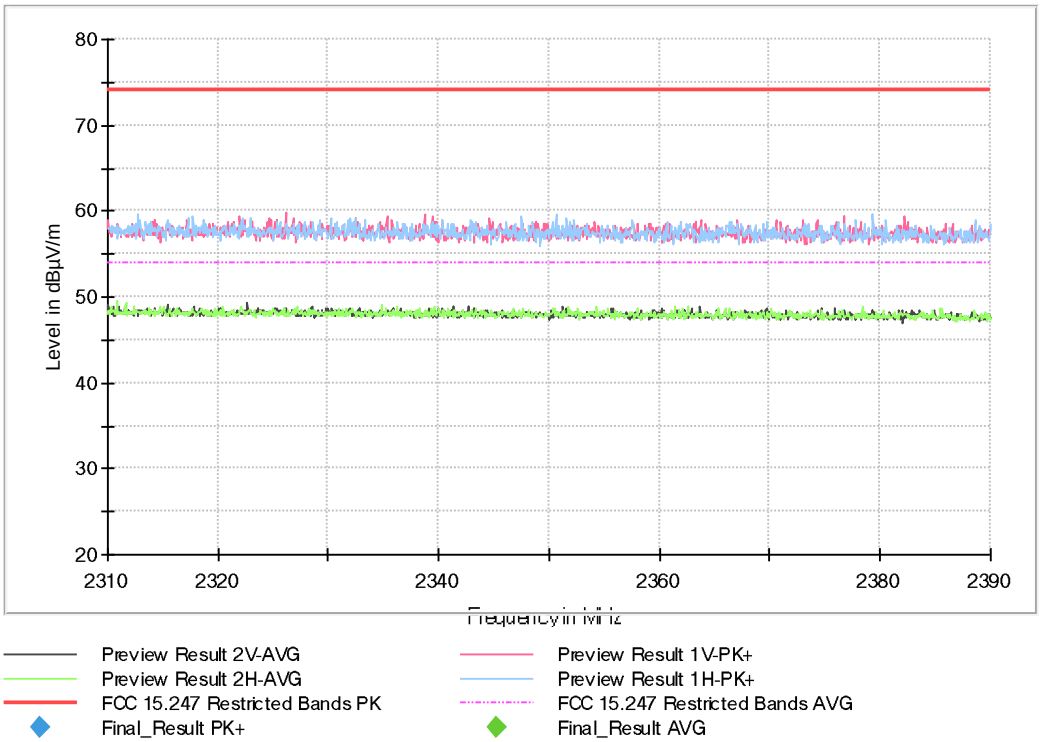
Frequency MHz = 2441.00000 Modulation = BT (GFSK)

Frequency Range GHz = [1, 3]

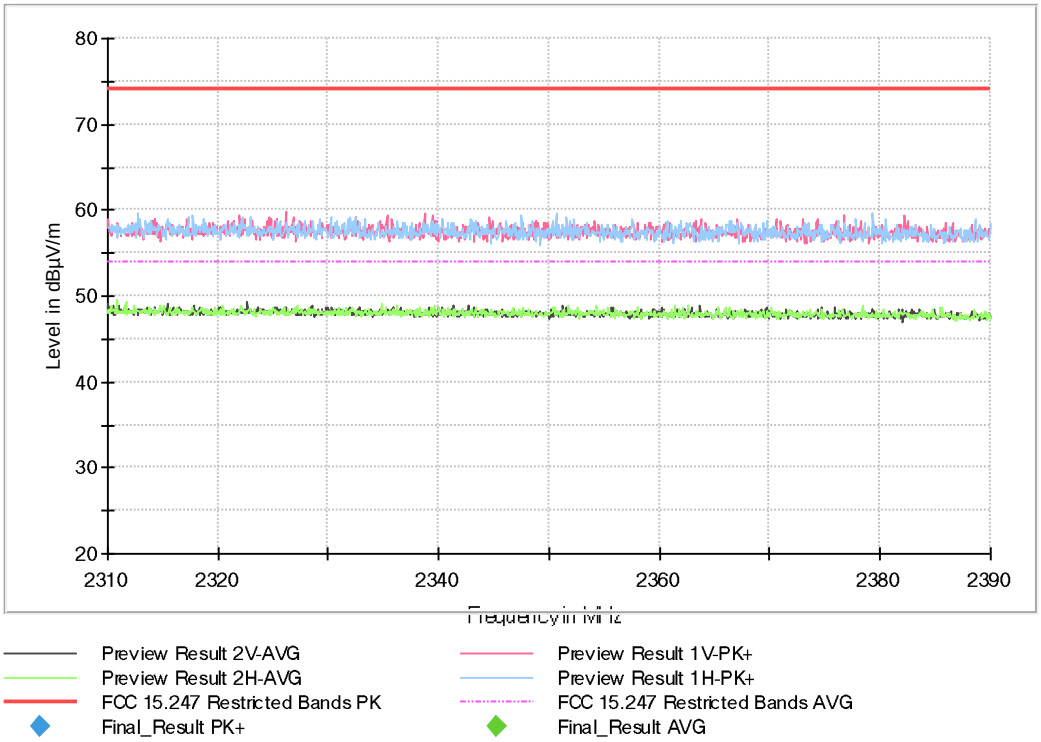
Images:



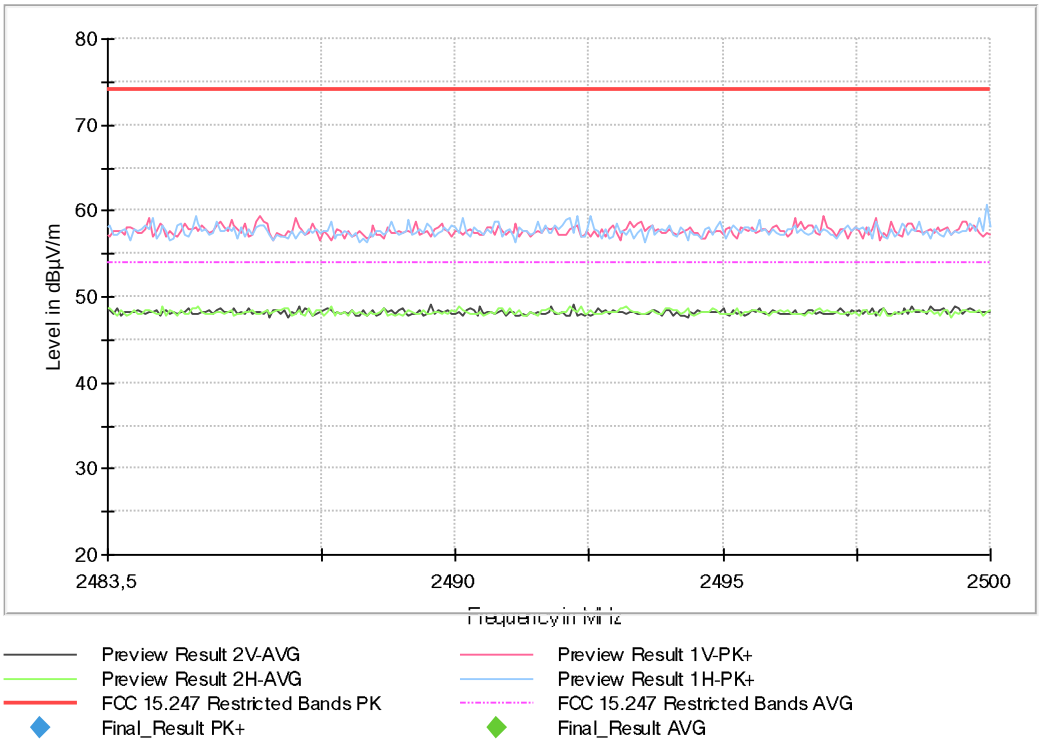
Full Spectrum



Full Spectrum



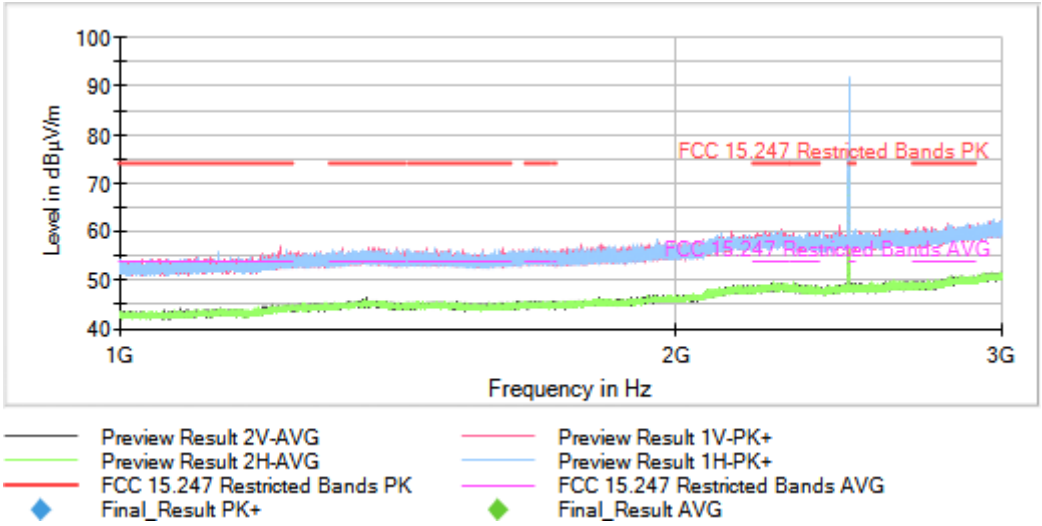
Full Spectrum



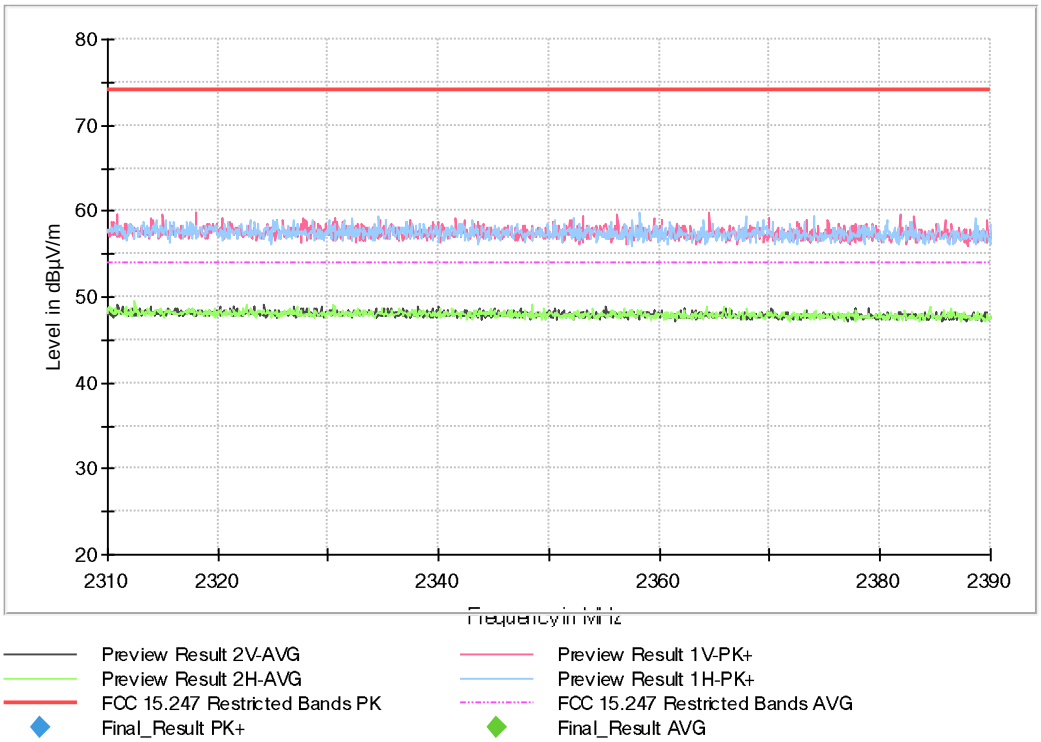
Frequency MHz = 2480.00000 Modulation = BT (GFSK)

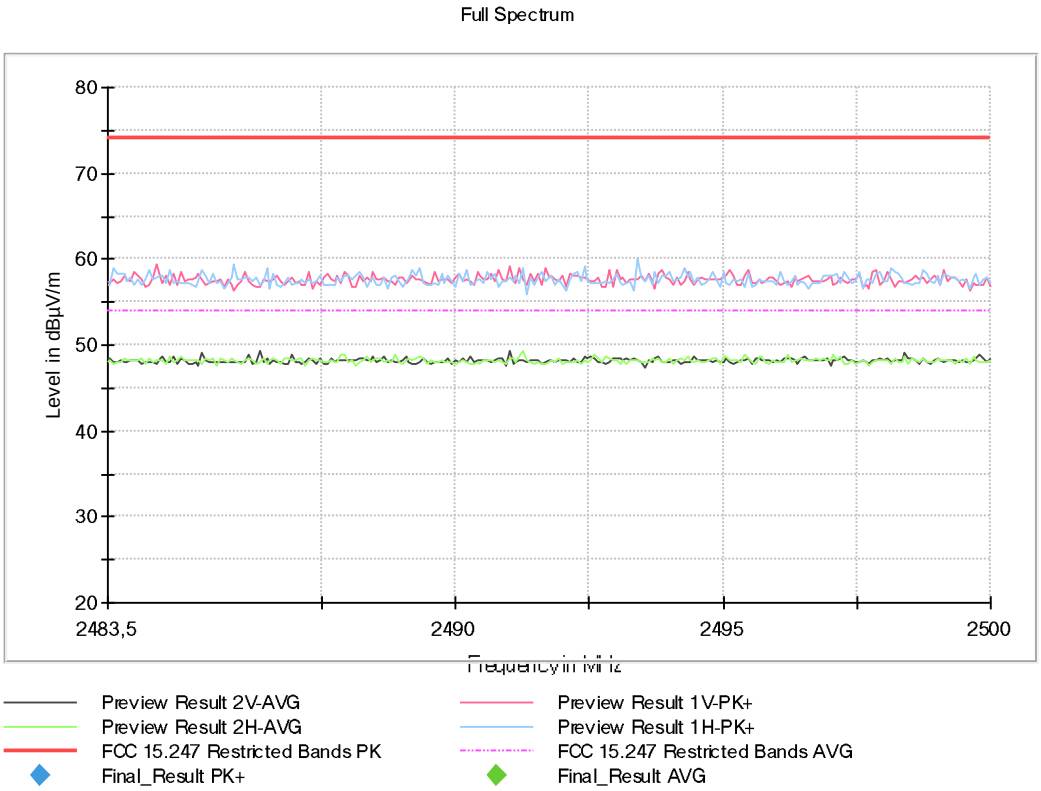
Frequency Range GHz = [1, 3]

Images:



Full Spectrum

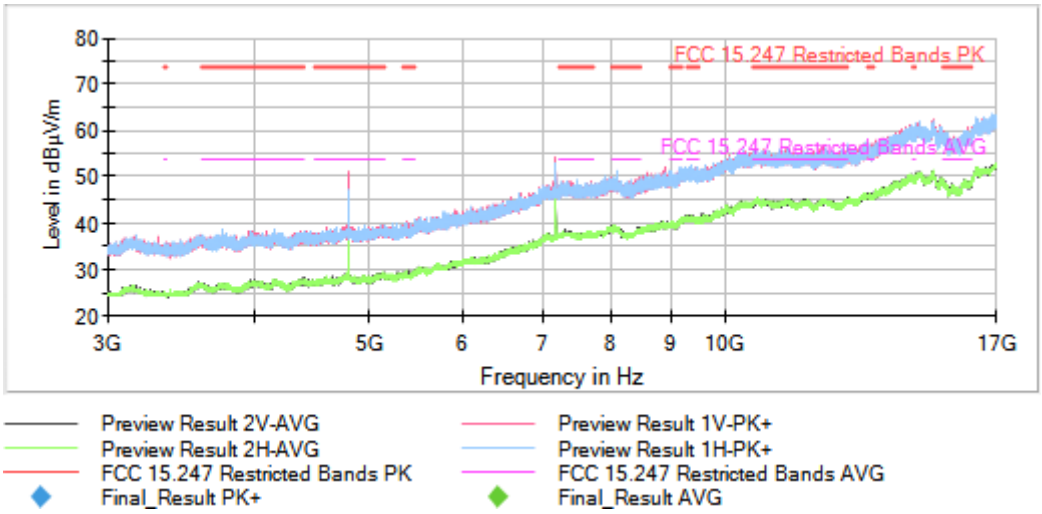




Frequency MHz = 2402.00000 Modulation = BT (GFSK)

Frequency Range GHz = [3, 17]

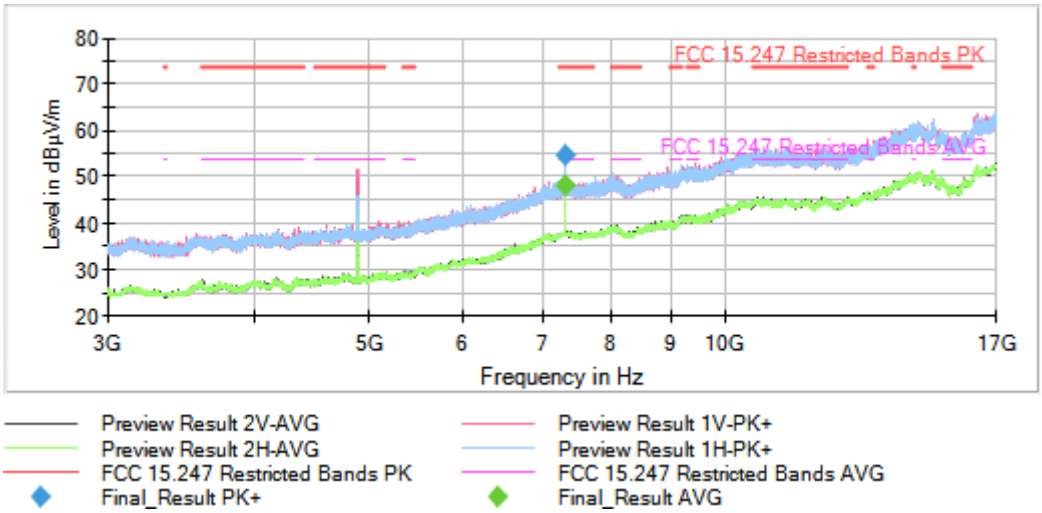
Images:



Frequency MHz = 2441.00000 Modulation = BT (GFSK)

Frequency Range GHz = [3, 17]

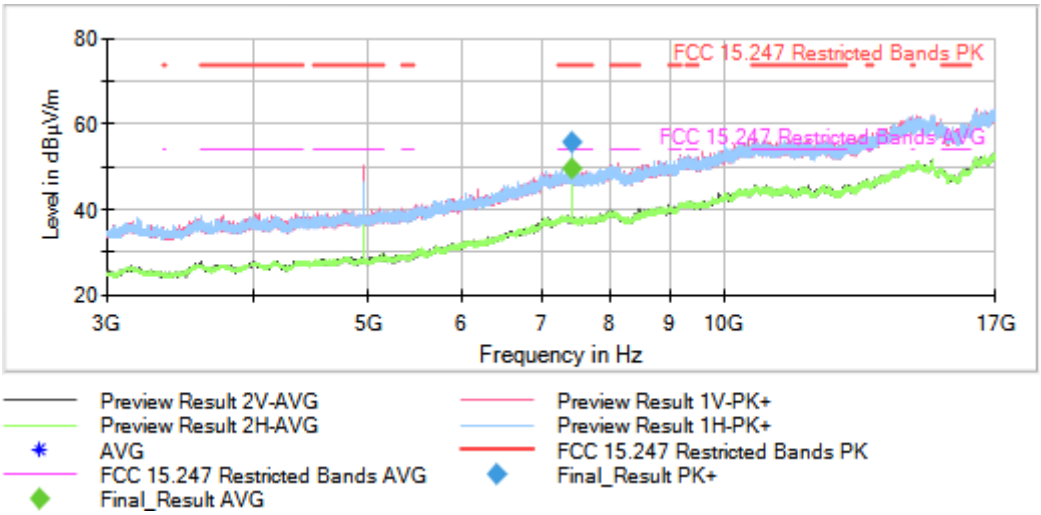
Images:



Frequency MHz = 2480.00000 Modulation = BT (GFSK)

Frequency Range GHz = [3, 17]

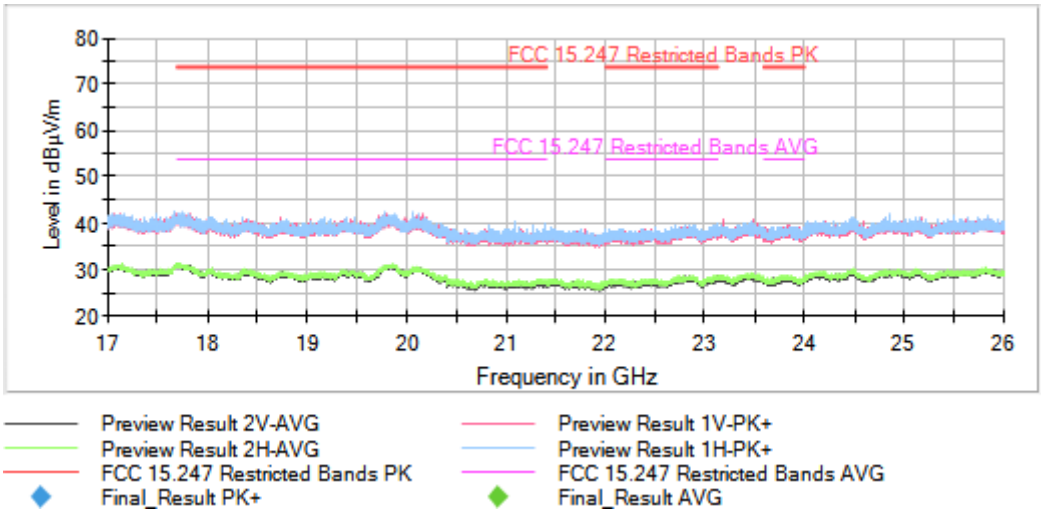
Images:



Frequency MHz = 2480.00000 Modulation = BT (GFSK)

Frequency Range GHz = [17, 26]

Images:



This plot is valid for all channels

Results for Sample 03

No spurious frequencies detected at less than 20 dB below the limit.

Verdict

Pass

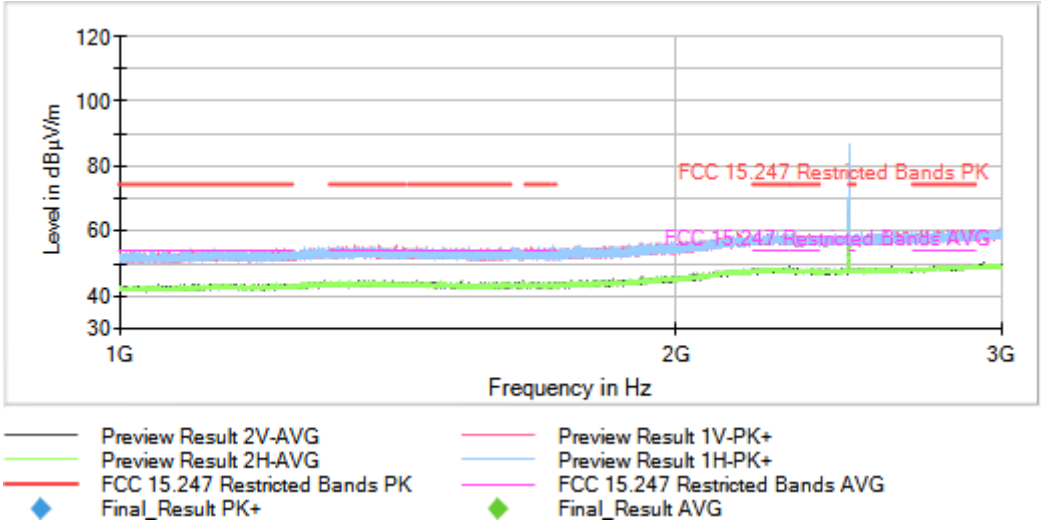
Attachments

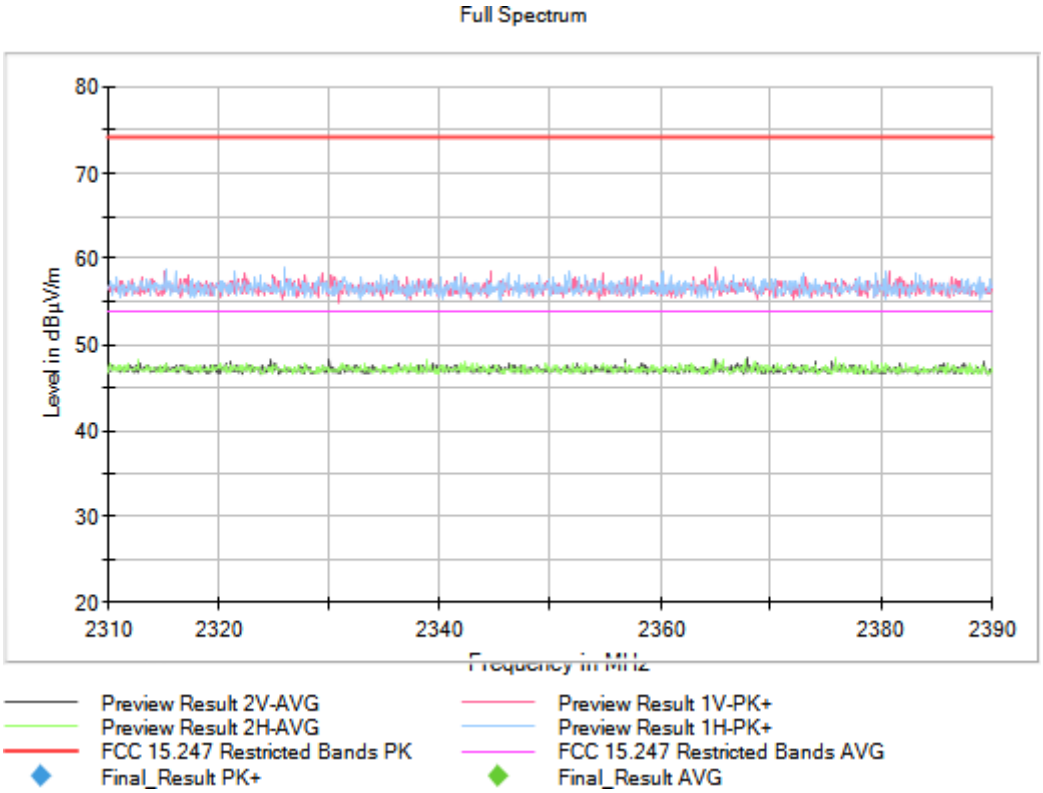
Operation Band MHz = [2400, 2483.5]

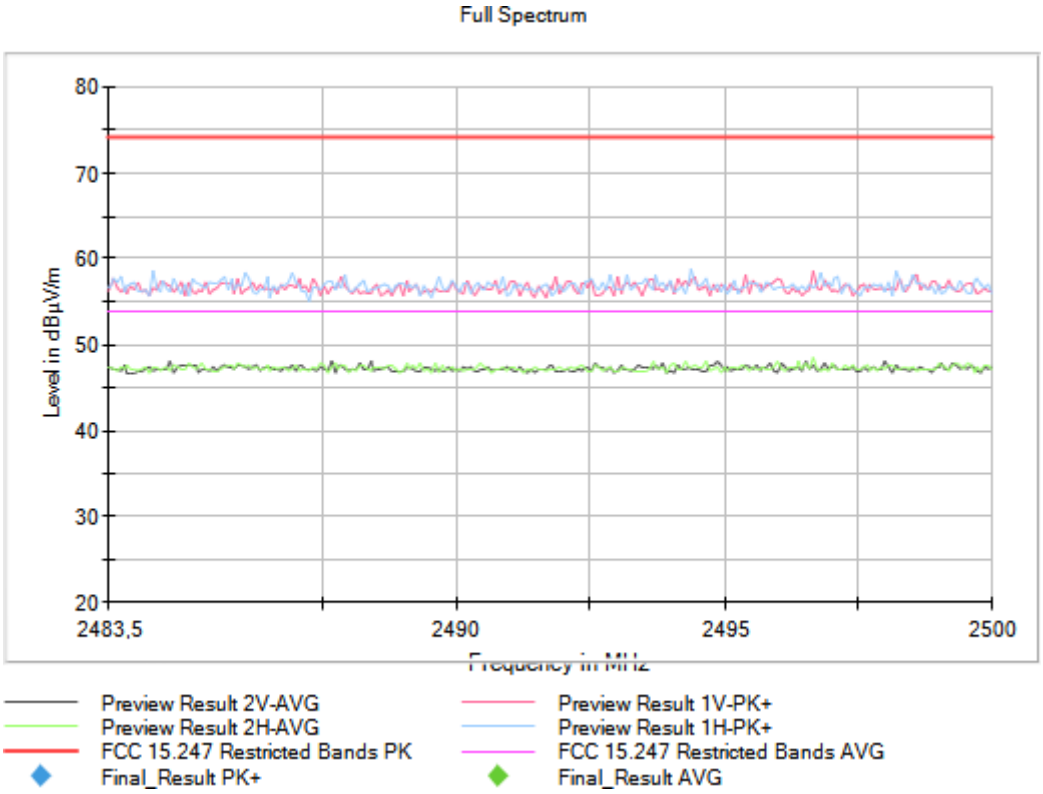
Frequency MHz = 2480.00000 Modulation = BT (GFSK 1-DH5)

Frequency Range GHz = [1, 3]

Images:




Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2340
2360
2380
2390
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

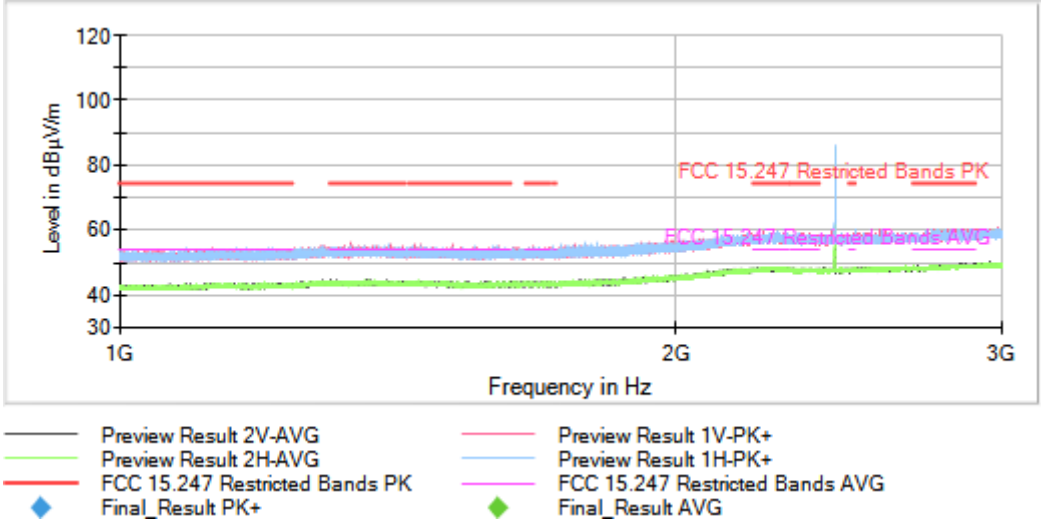

Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5]

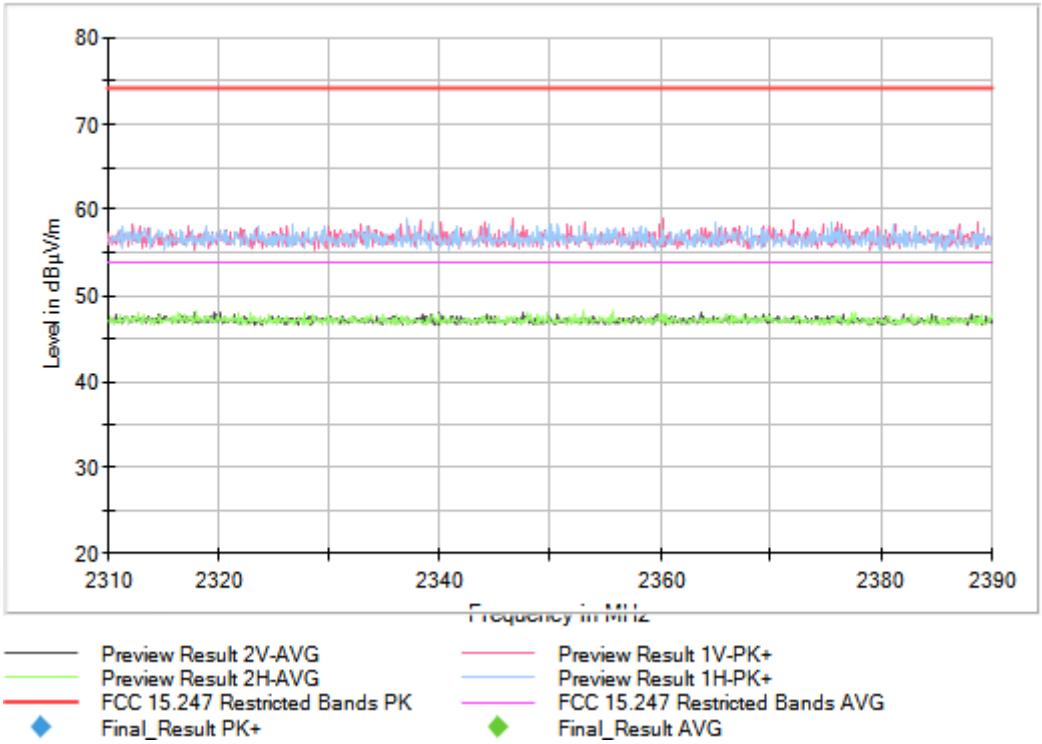
Frequency MHz = 2441.00000 Modulation = BT (GFSK 1-DH5)

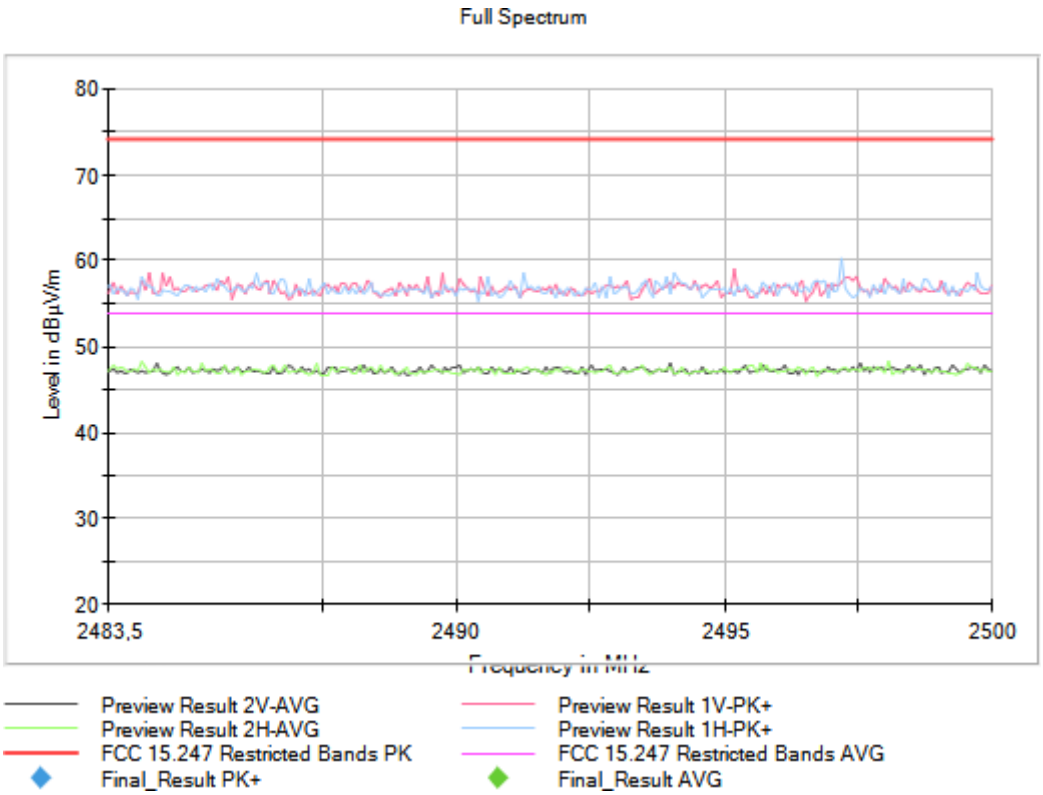
Frequency Range GHz = [1, 3]

Images:



Full Spectrum



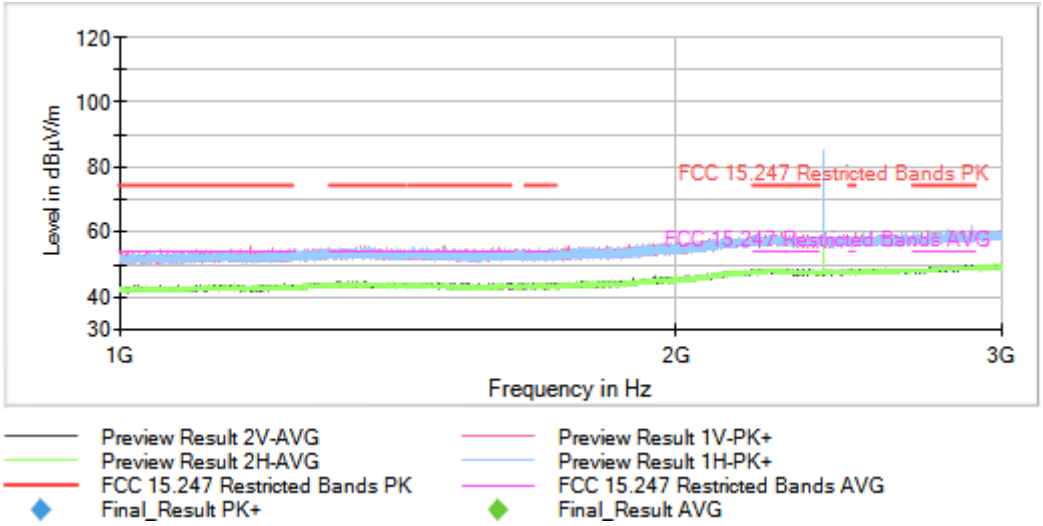


Operation Band MHz = [2400, 2483.5]

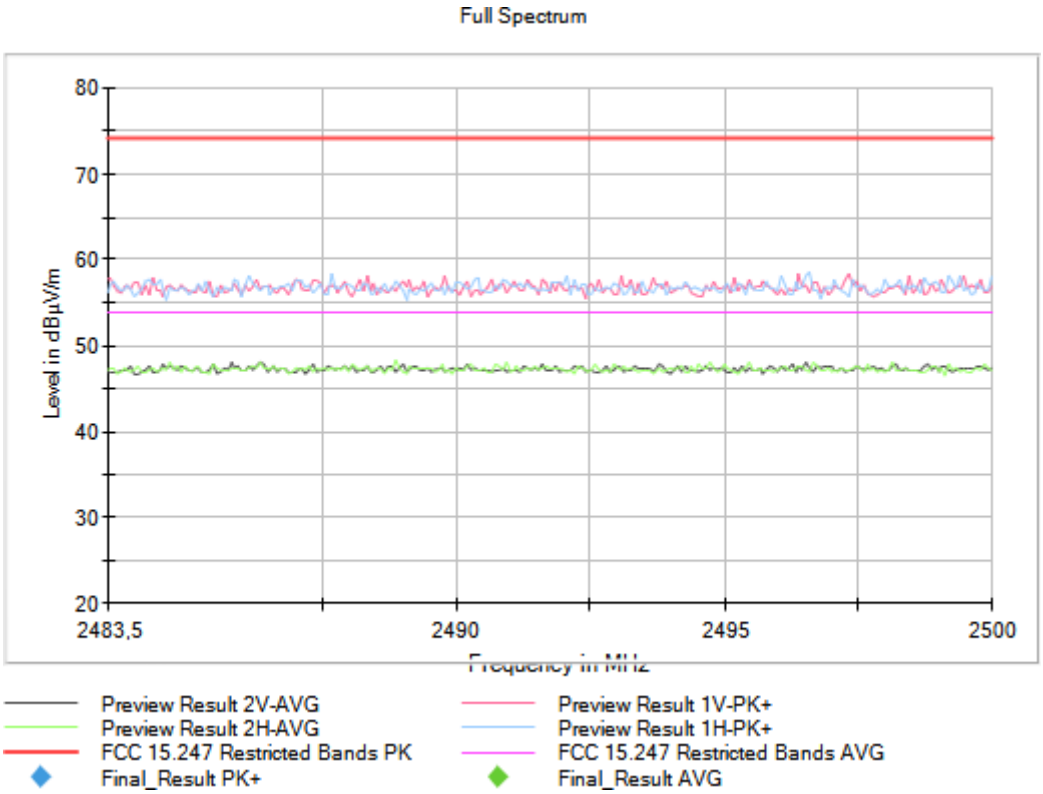
Frequency MHz = 2402.00000 Modulation = BT (GFSK 1-DH5)

Frequency Range GHz = [1, 3]

Images:



Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2340
2360
2380
2390
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

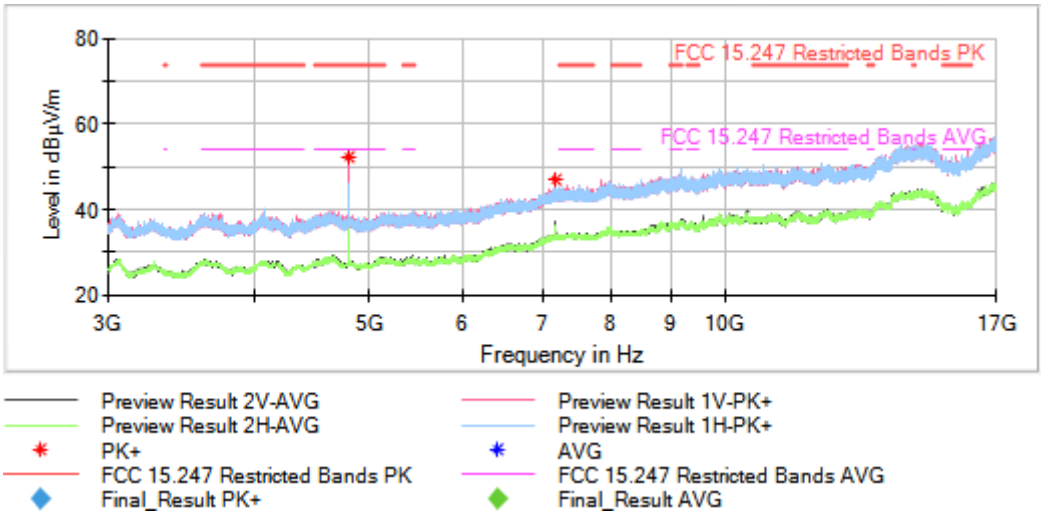

Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2402.00000 Modulation = BT (GFSK 1-DH5)

Frequency Range GHz = [3, 17]

Images:

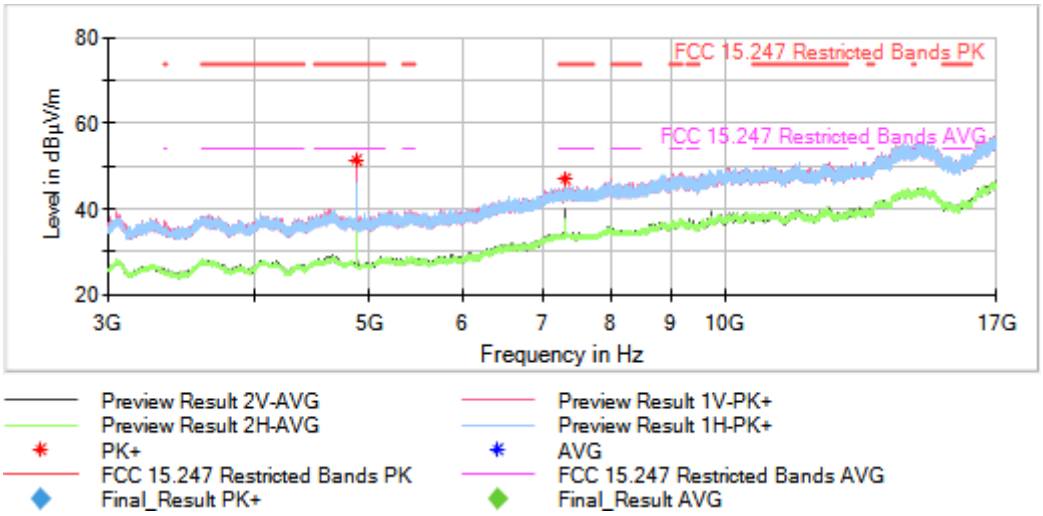


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2441.00000 Modulation = BT (GFSK 1-DH5)

Frequency Range GHz = [3, 17]

Images:

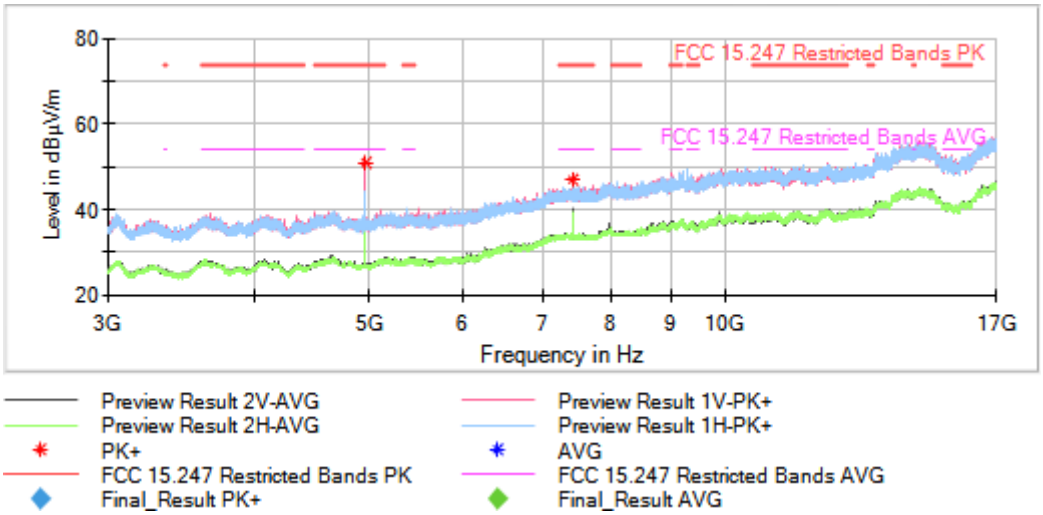


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2480.00000 Modulation = BT (GFSK 1-DH5)

Frequency Range GHz = [3, 17]

Images:



Modulation: BT (Pi/4 DQPSK 2-DH5)

Results

The spurious frequencies detected at less than 20 dB below the limit:

Freq Rng (GHz)	Freq (MHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[0.03, 1]	2480.00000	918.471500	16.79	V	QP

* The spurious frequencies detected does not depend of the selected channels

Verdict

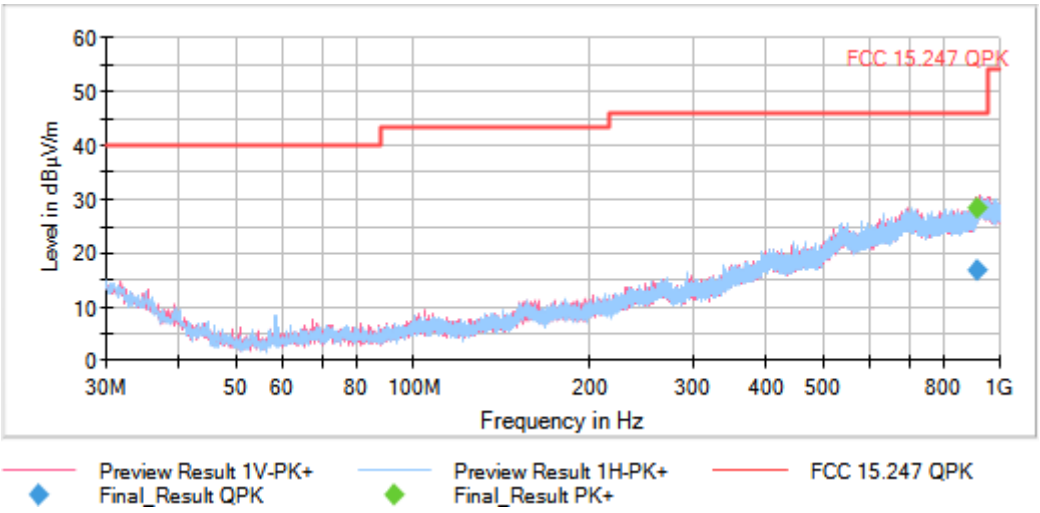
Pass

Attachments

Frequency MHz = 2480.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [0.03, 1]

Images:

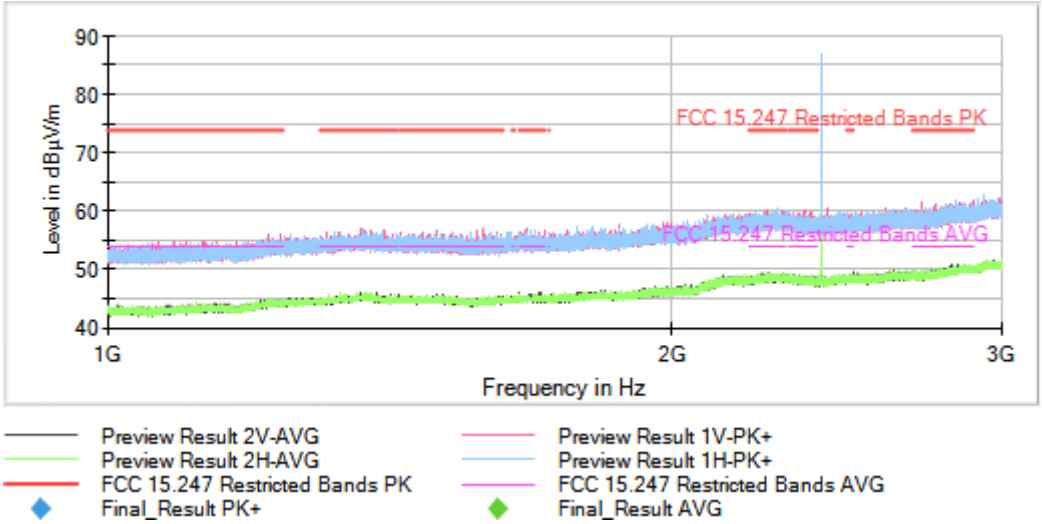


This plot is valid for all channels

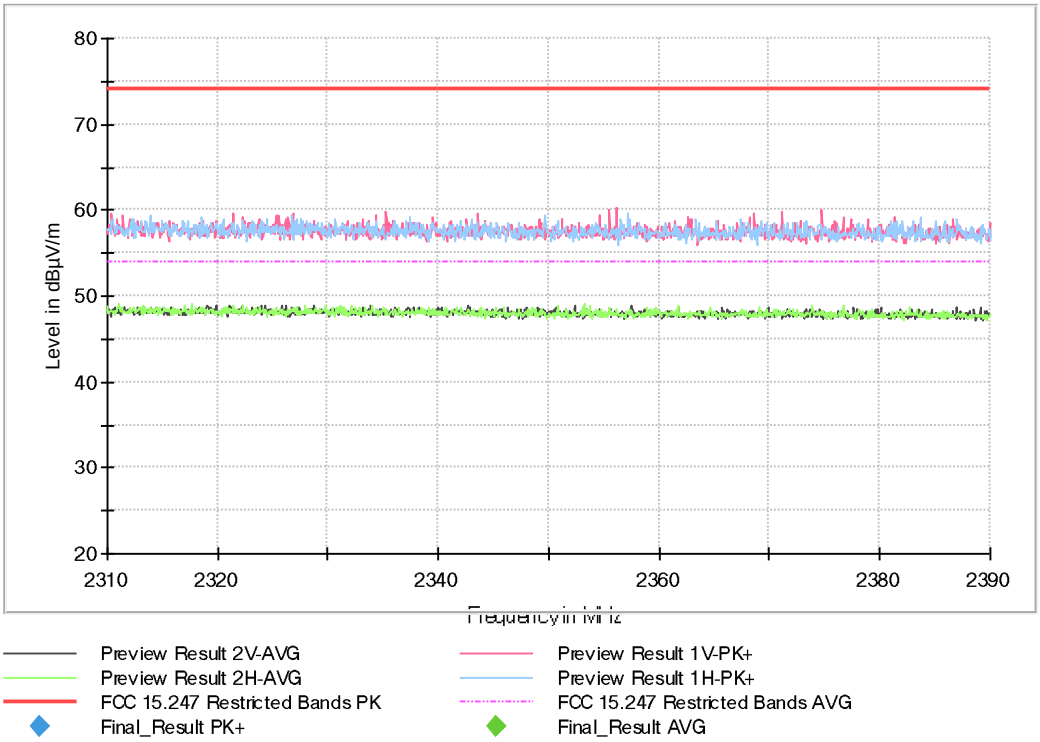
Frequency MHz = 2402.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [1, 3]

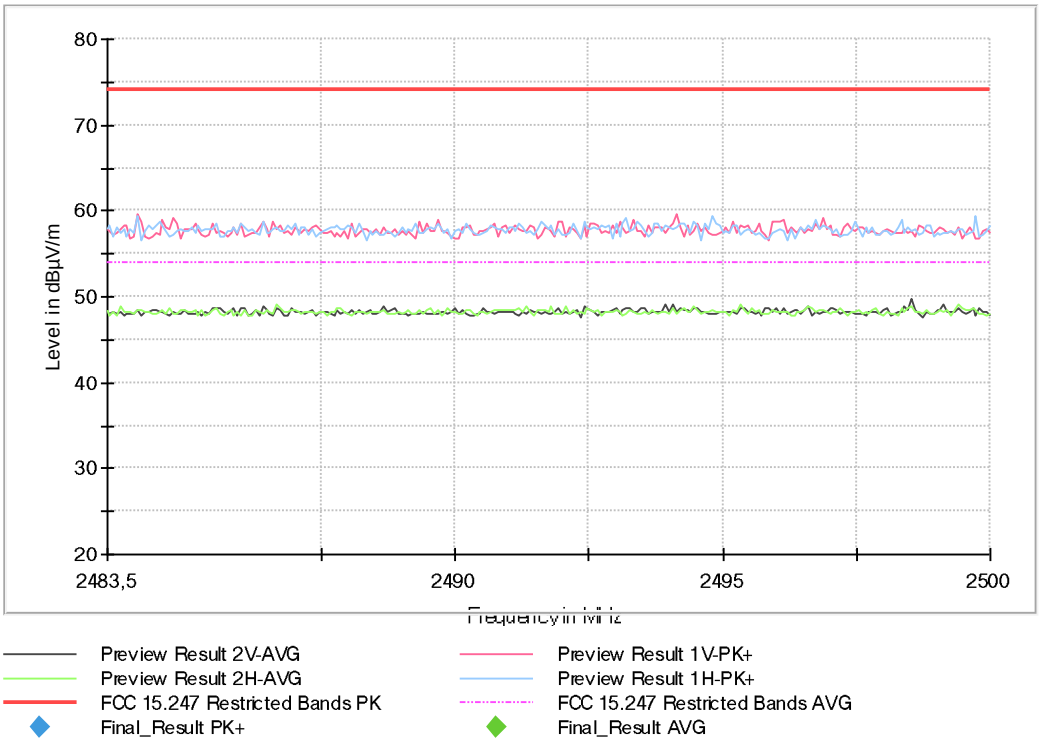
Images:



Full Spectrum



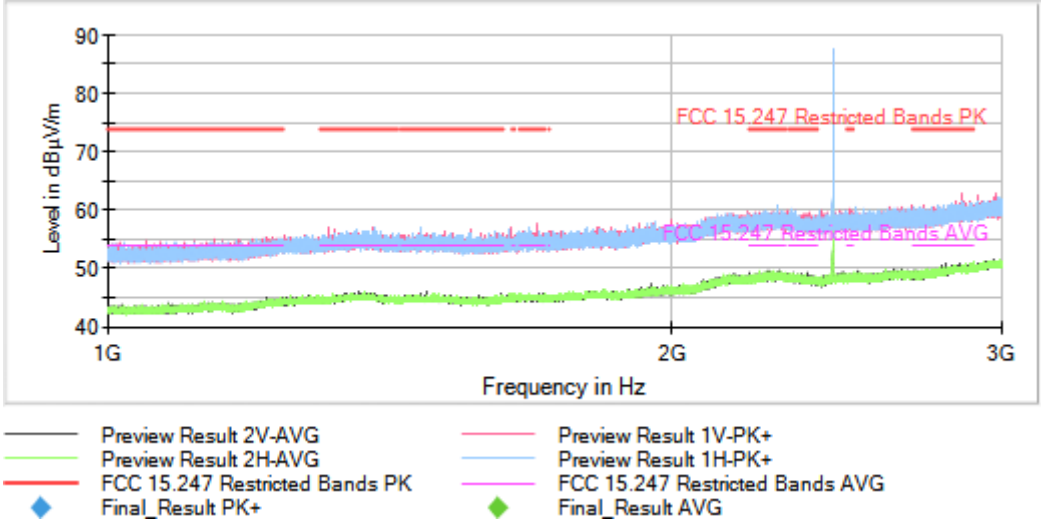
Full Spectrum



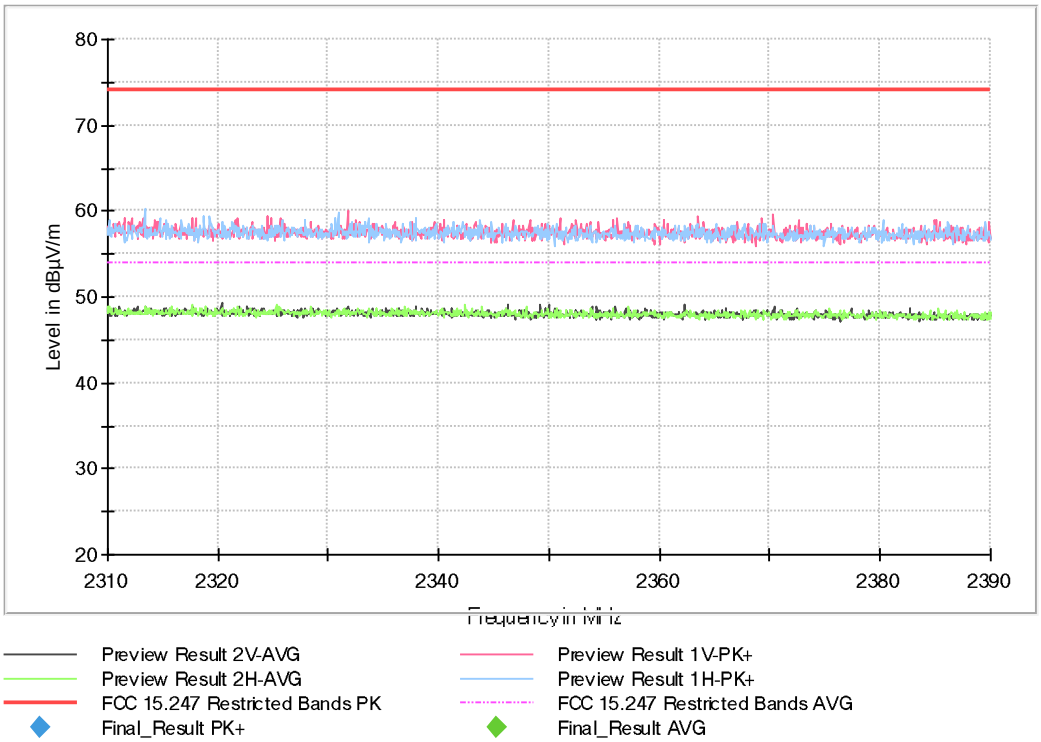
Frequency MHz = 2441.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

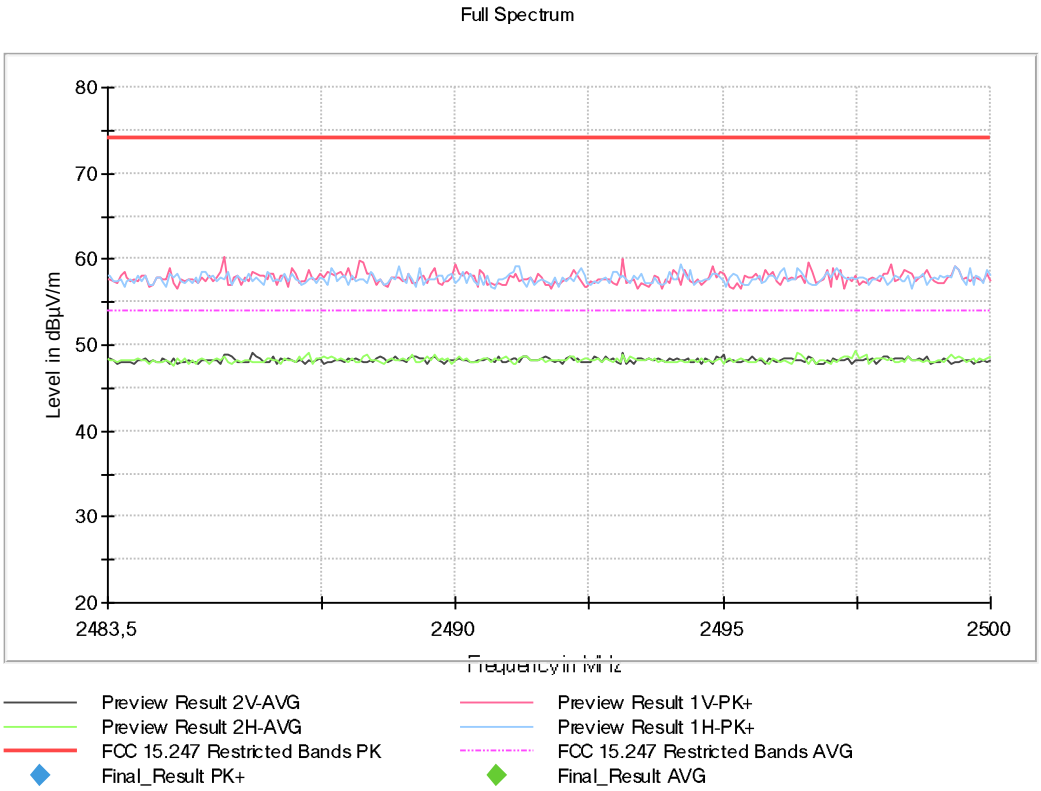
Frequency Range GHz = [1, 3]

Images:



Full Spectrum

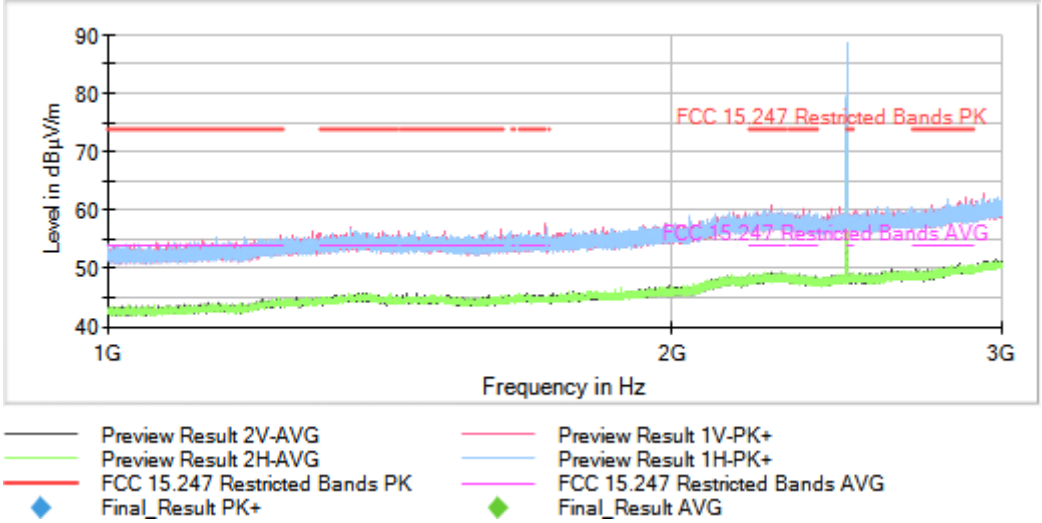




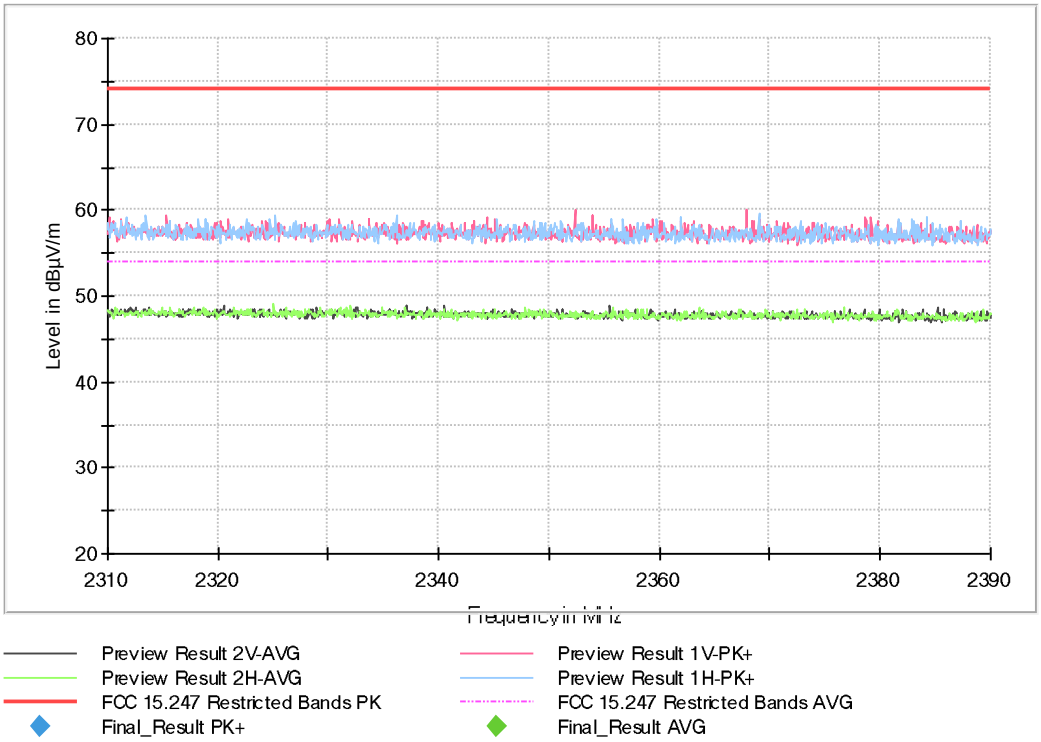
Frequency MHz = 2480.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [1, 3]

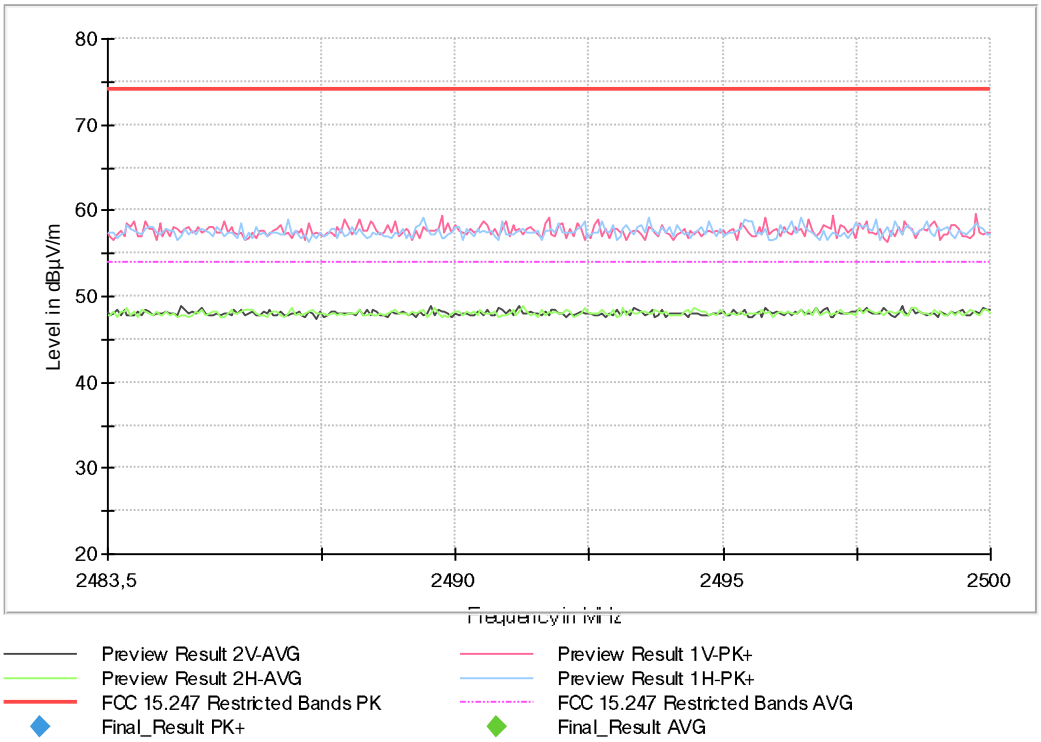
Images:



Full Spectrum



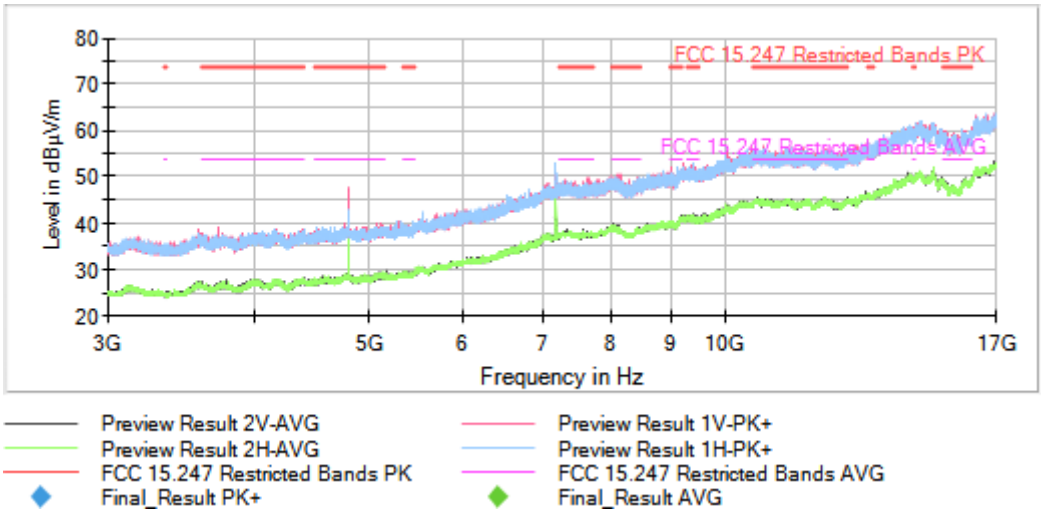
Full Spectrum



Frequency MHz = 2402.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [3, 17]

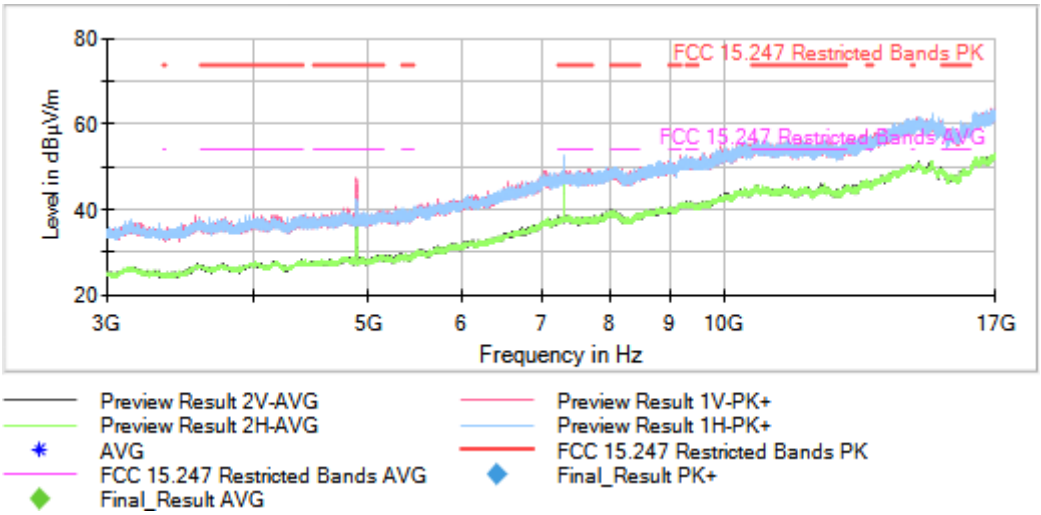
Images:



Frequency MHz = 2441.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [3, 17]

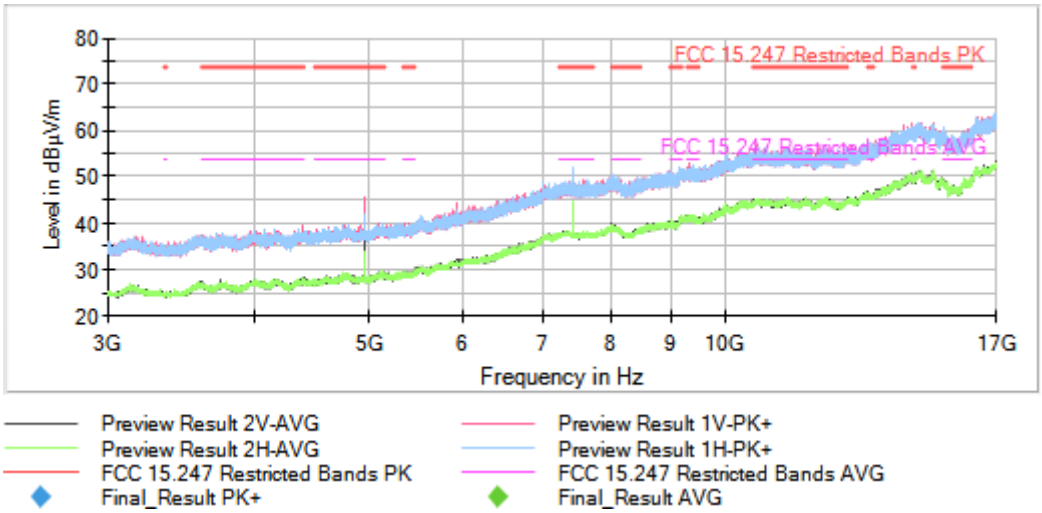
Images:



Frequency MHz = 2480.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [3, 17]

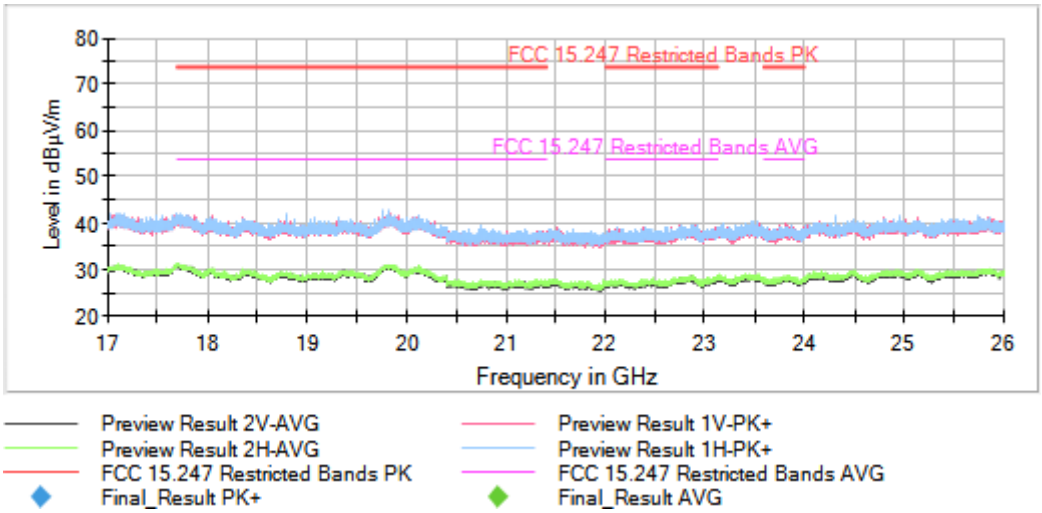
Images:



Frequency MHz = 2402.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [17, 26]

Images:



This plot is valid for all channels

Results for Sample 03

No spurious frequencies detected at less than 20 dB below the limit.

Verdict

Pass

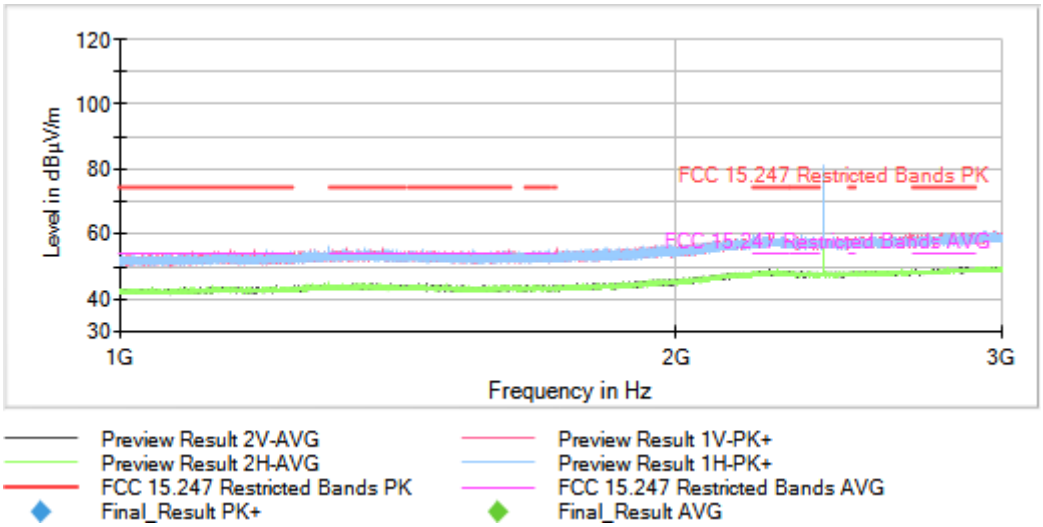
Attachments

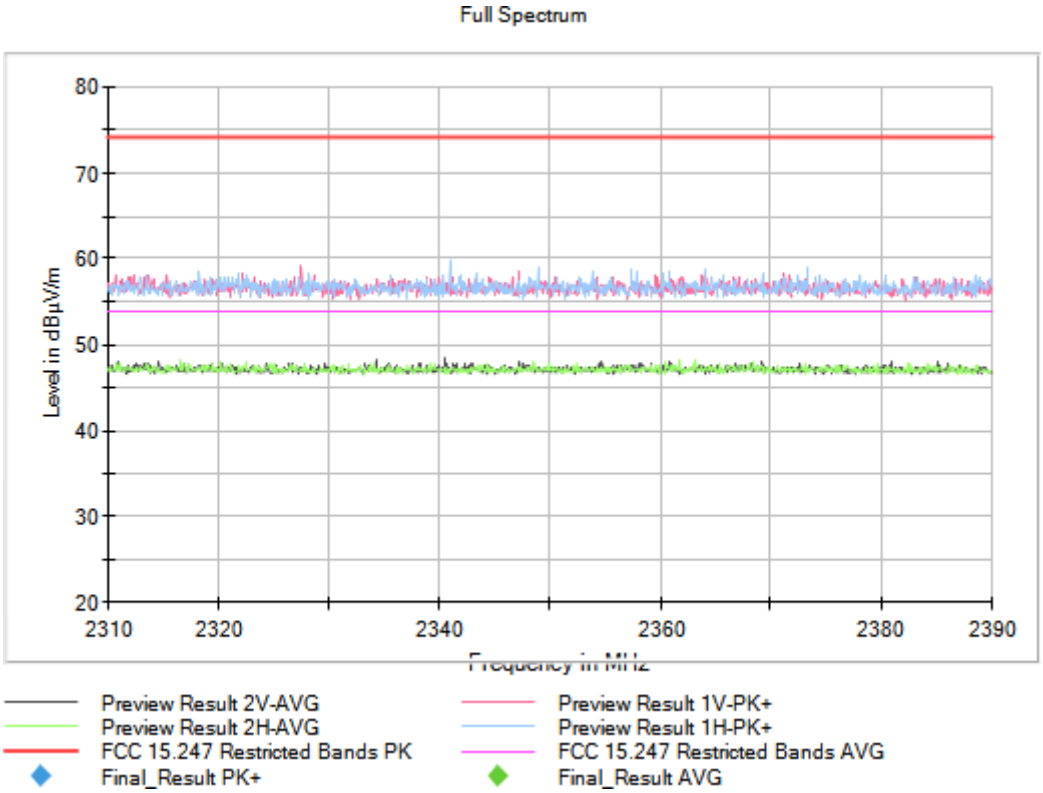
Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2402.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [1, 3]

Images:




Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2340
2360
2380
2390
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

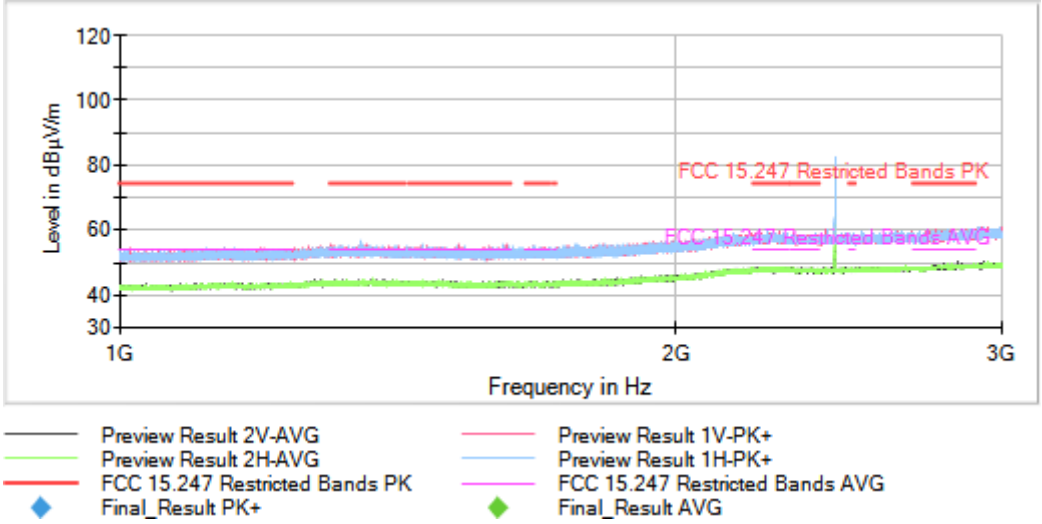
Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5]

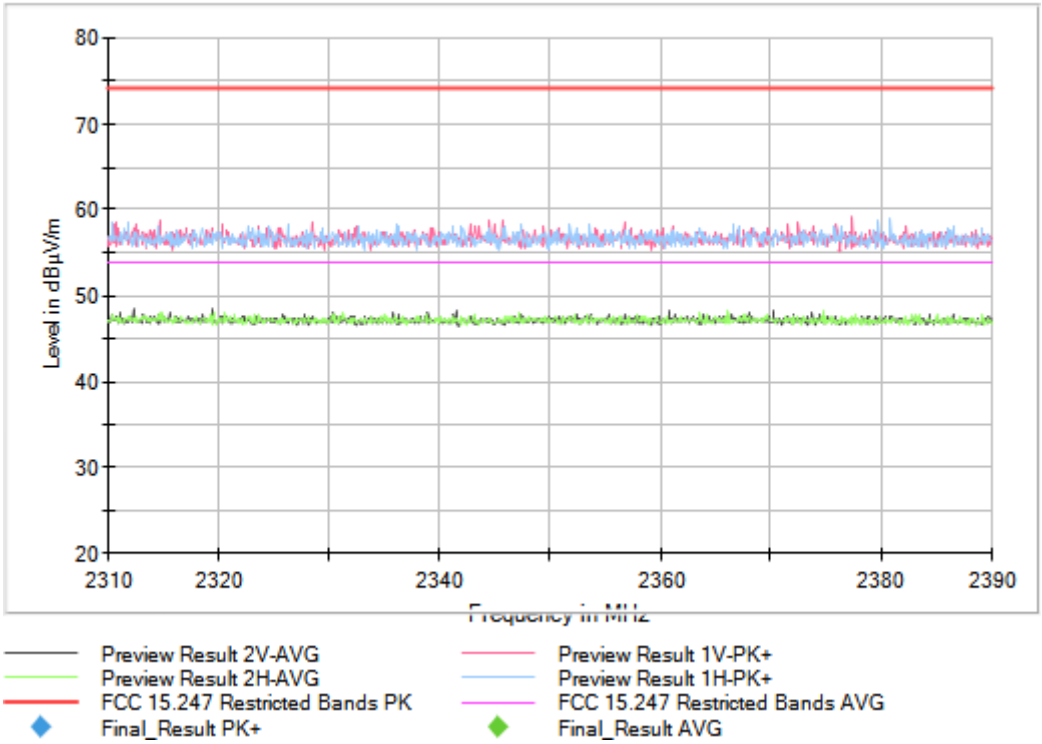
Frequency MHz = 2441.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

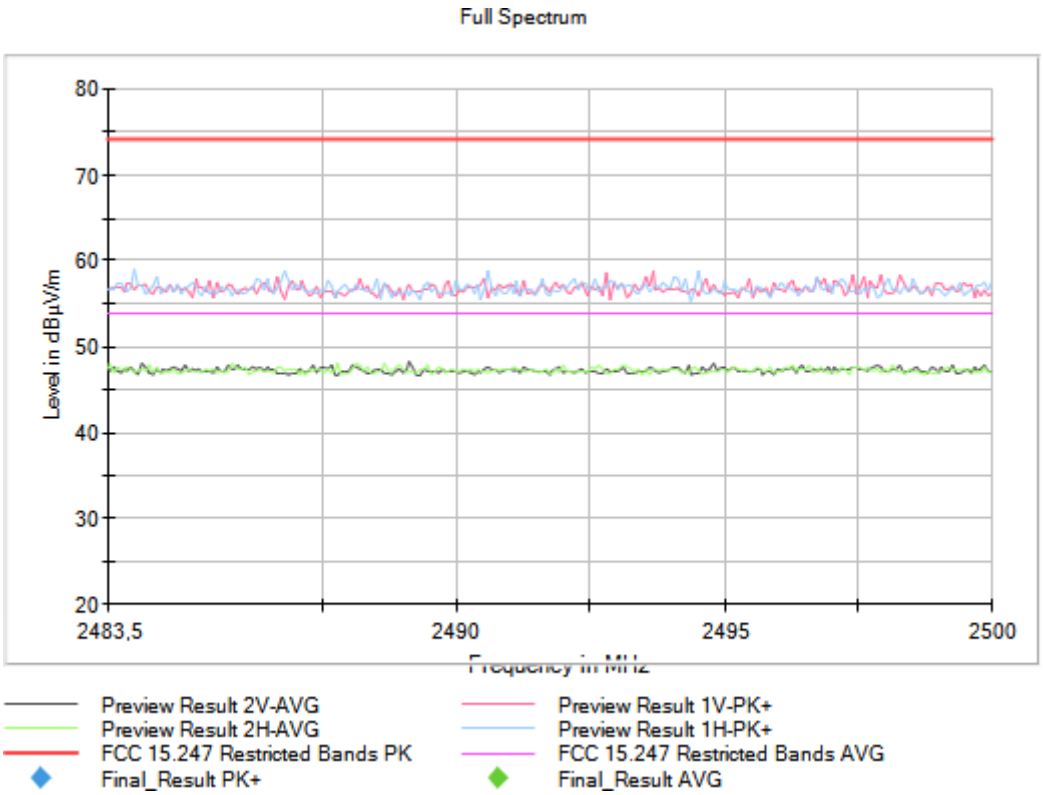
Frequency Range GHz = [1, 3]

Images:



Full Spectrum



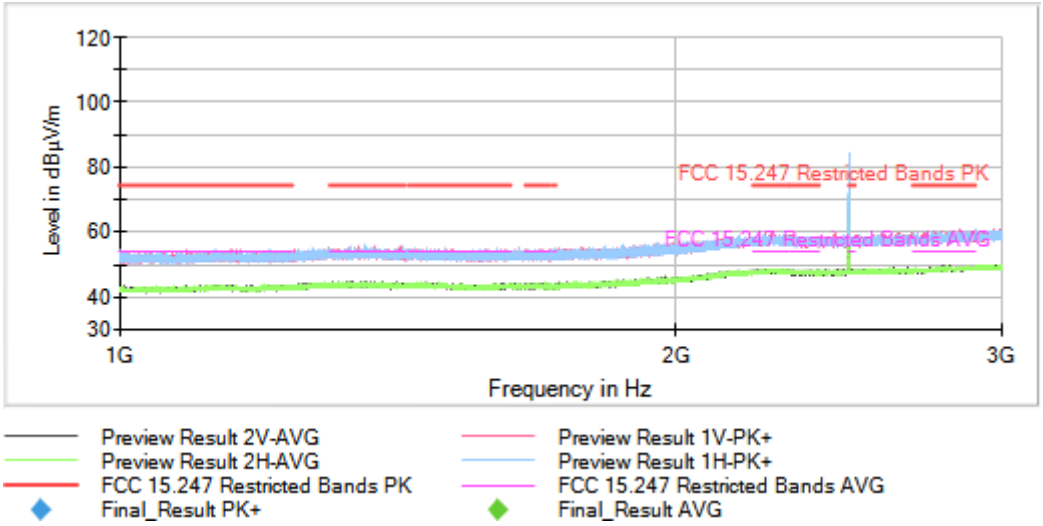


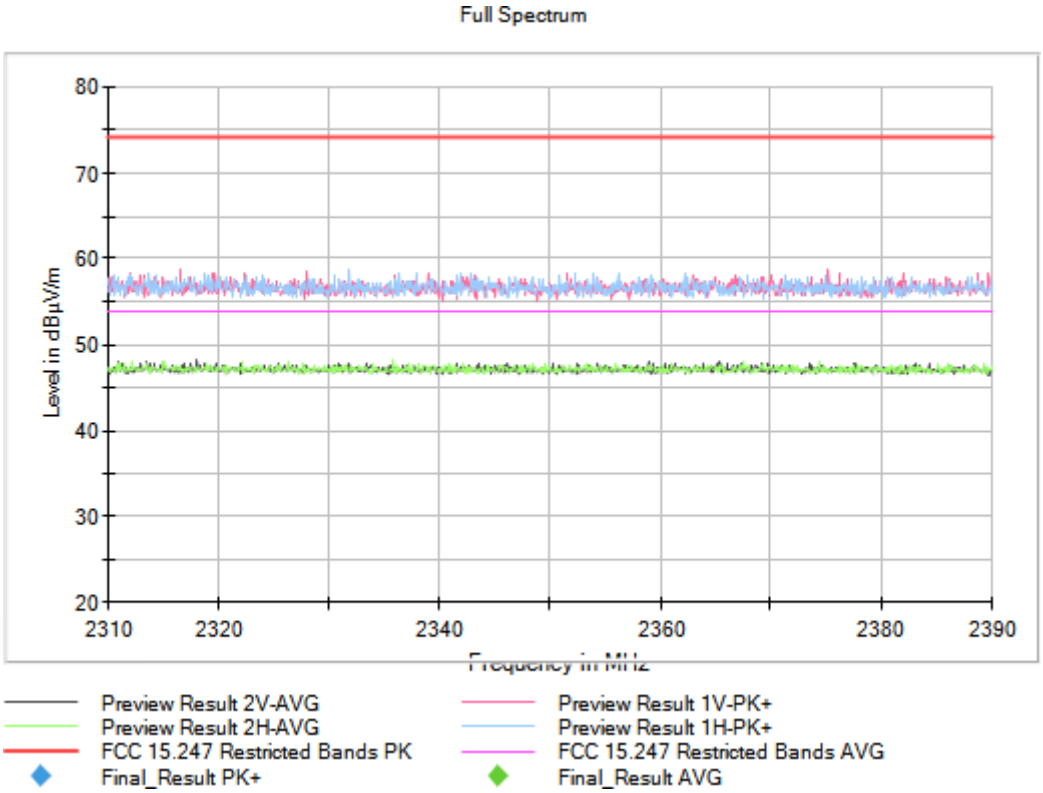
Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2480.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [1, 3]

Images:




Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2340
2360
2380
2390
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

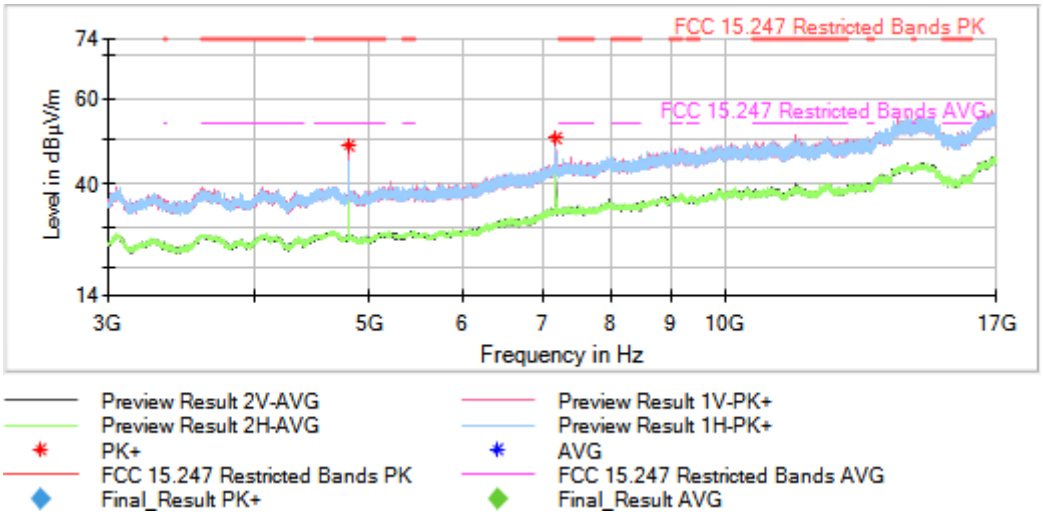
Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2402.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [3, 17]

Images:

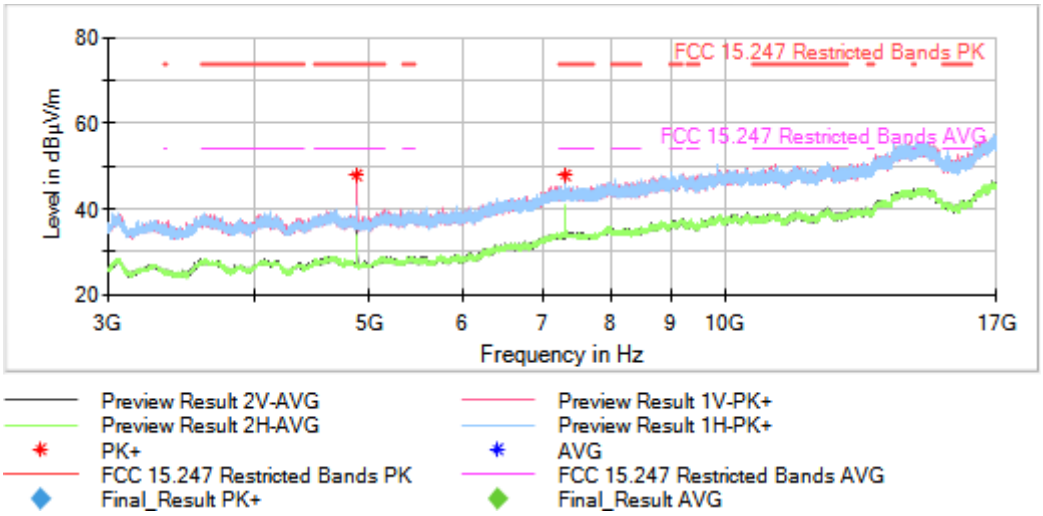


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2440.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [3, 17]

Images:

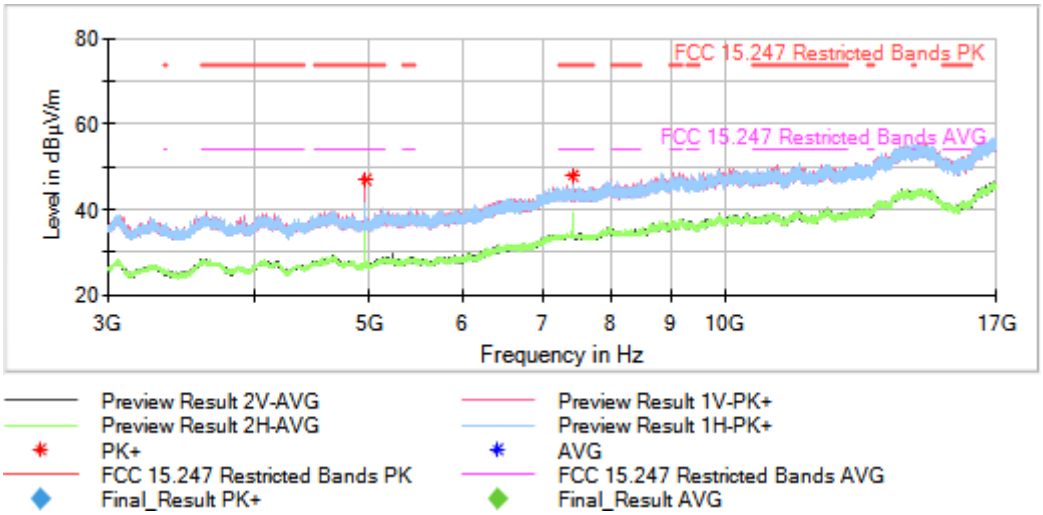


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2480.00000 Modulation = BT (Pi/4 DQPSK 2-DH5)

Frequency Range GHz = [3, 17]

Images:



Modulation: BT (8DPSK 3-DH5)

Results

The spurious frequencies detected at less than 20 dB below the limit:

Freq Rng (GHz)	Freq (MHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[0.03, 1]	2480.00000	941.169500	17.41	V	QP

* The spurious frequencies detected does not depend of the selected channels

Verdict

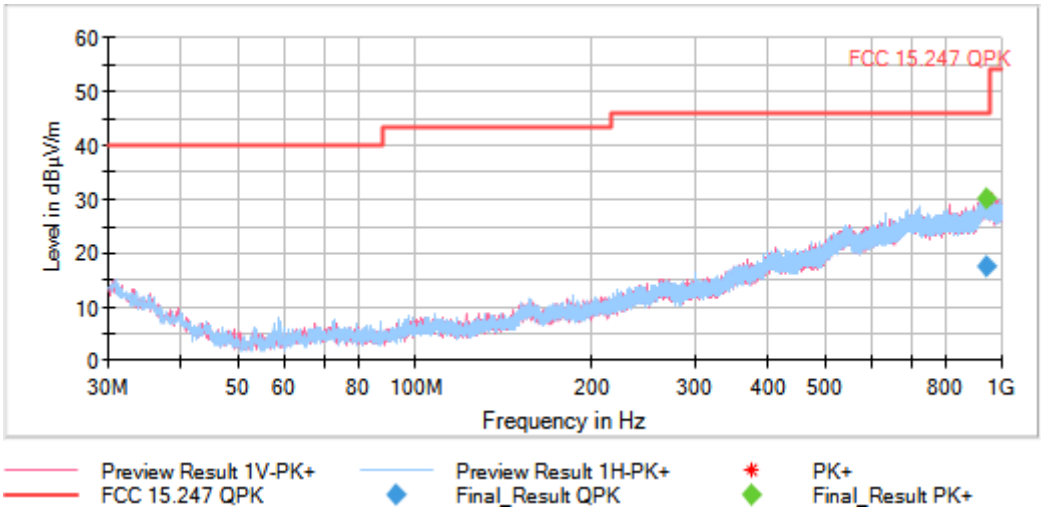
Pass

Attachments

Frequency MHz = 2480.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [0.03, 1]

Images:

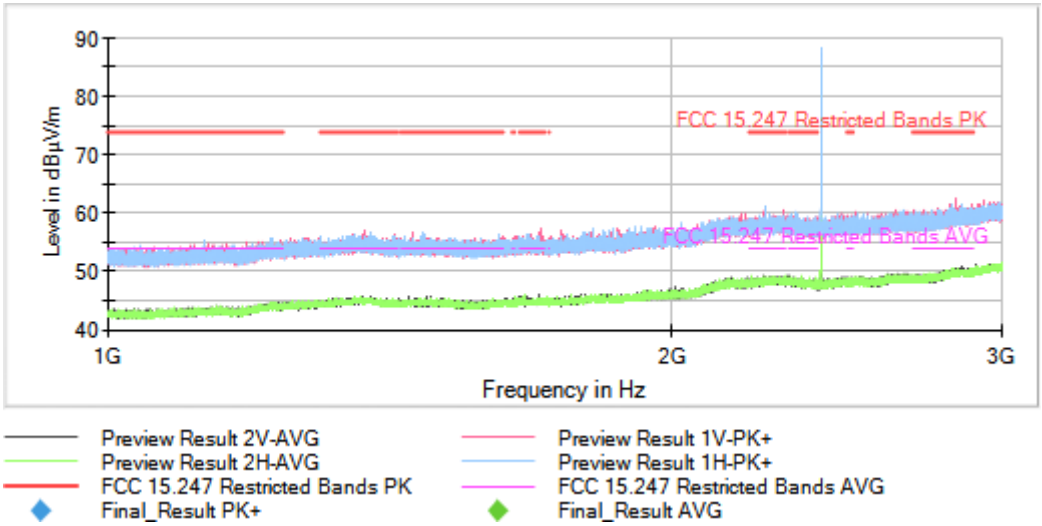


This plot is valid for all channels

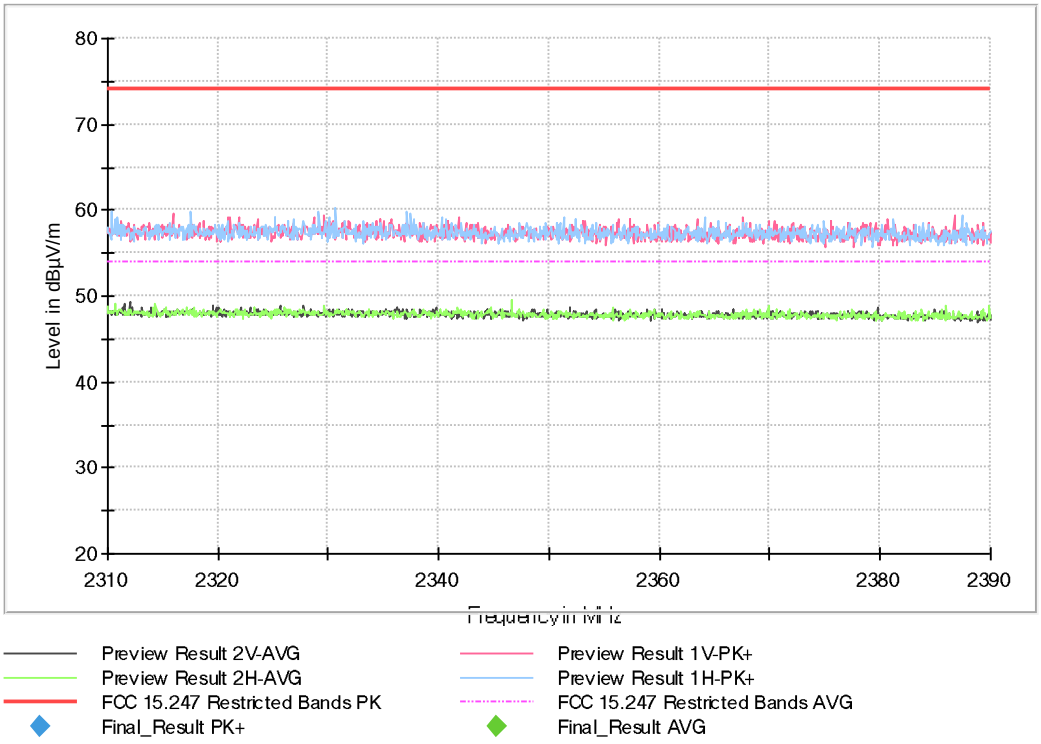
Frequency MHz = 2402.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [1, 3]

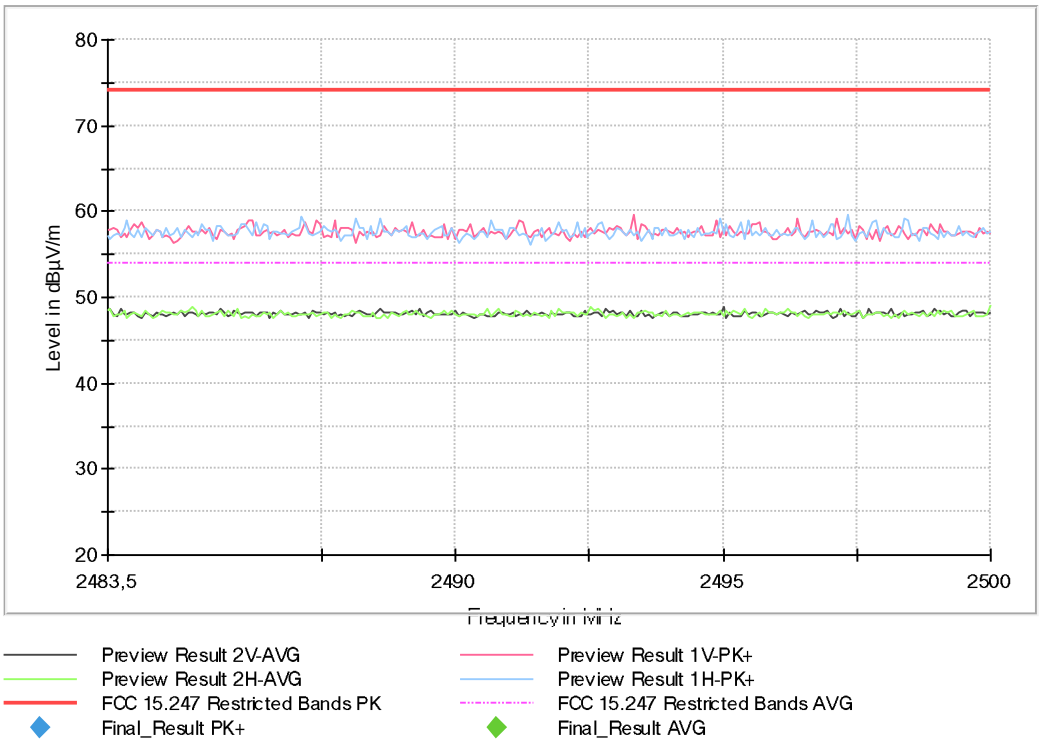
Images:



Full Spectrum



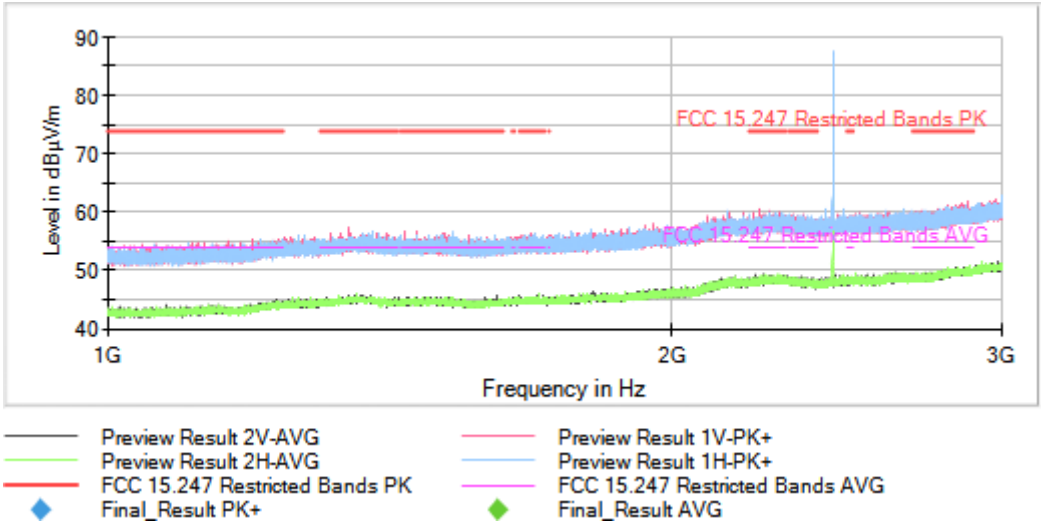
Full Spectrum



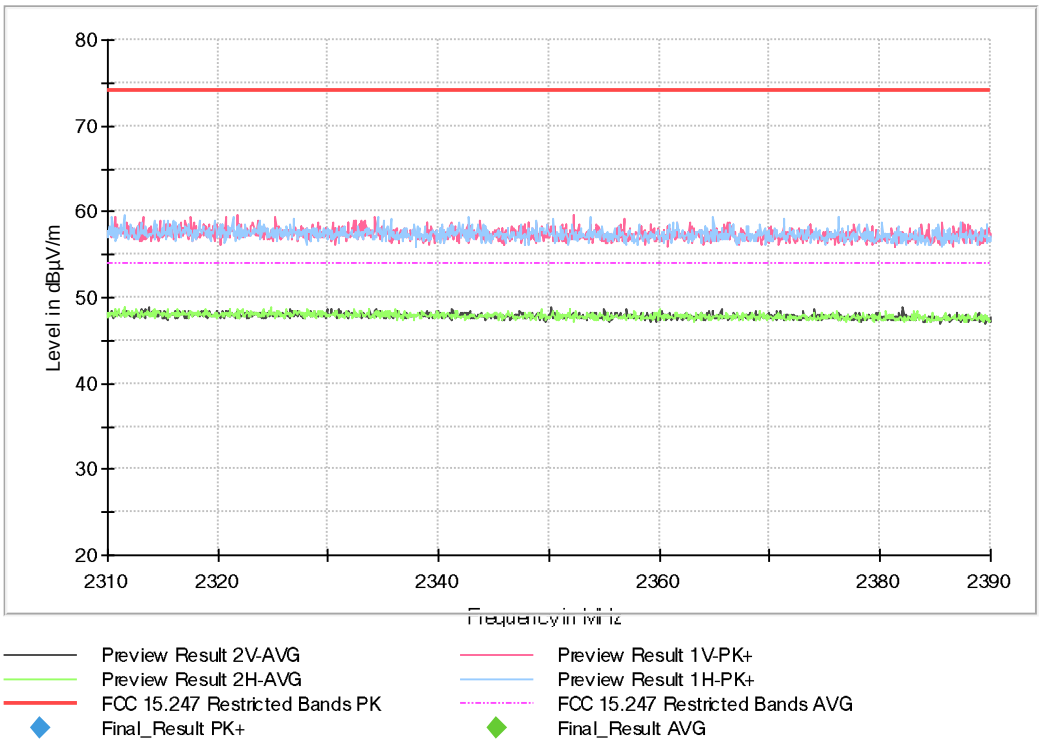
Frequency MHz = 2441.00000 Modulation = BT (8DPSK 3-DH5)

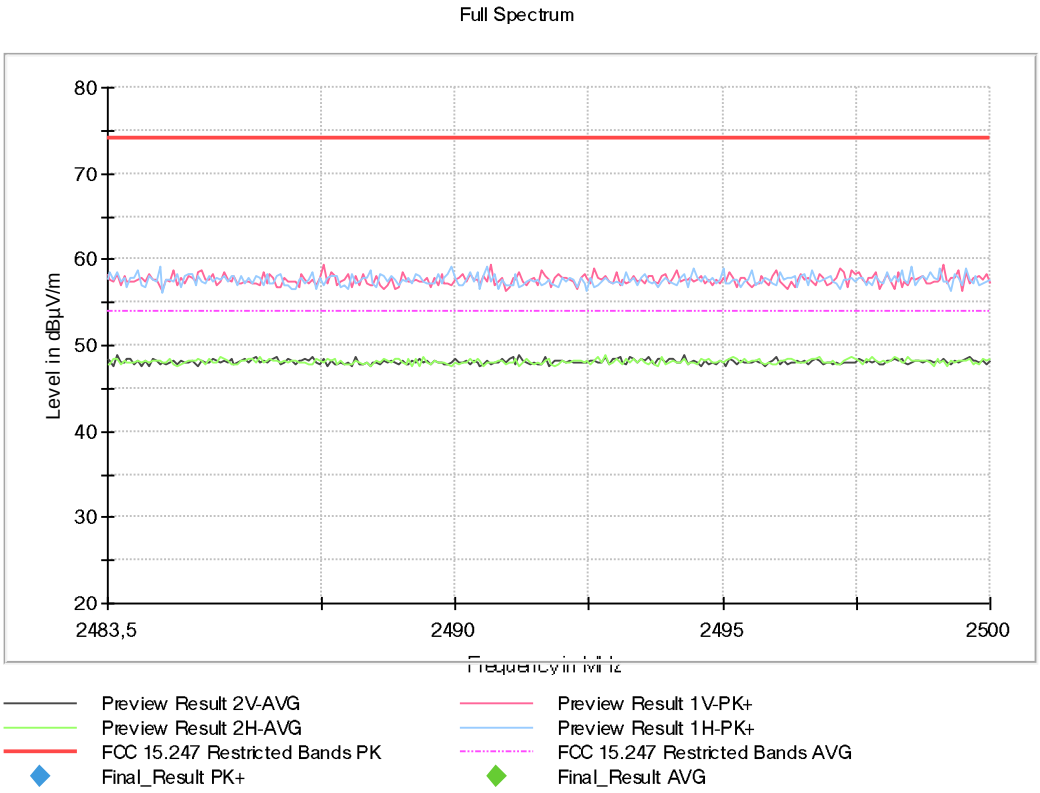
Frequency Range GHz = [1, 3]

Images:



Full Spectrum

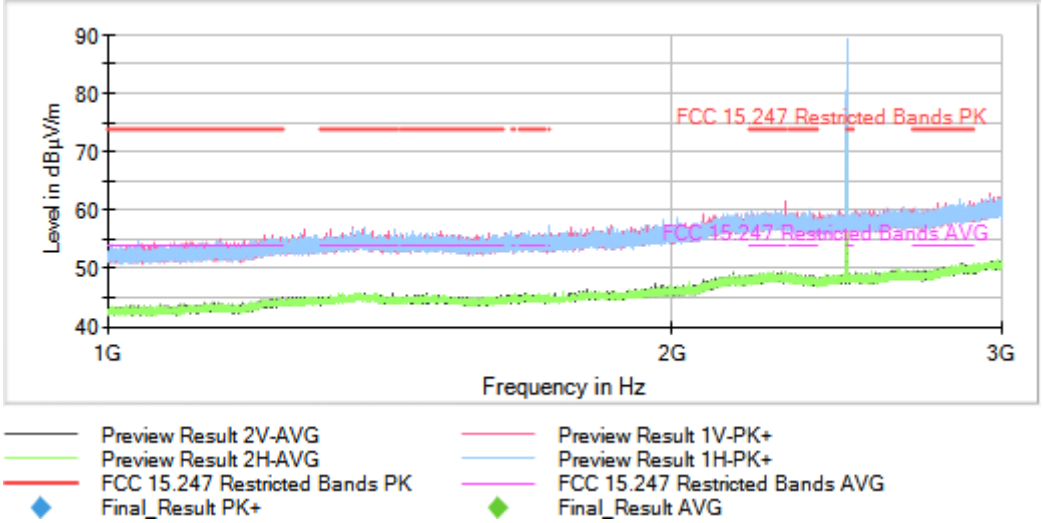




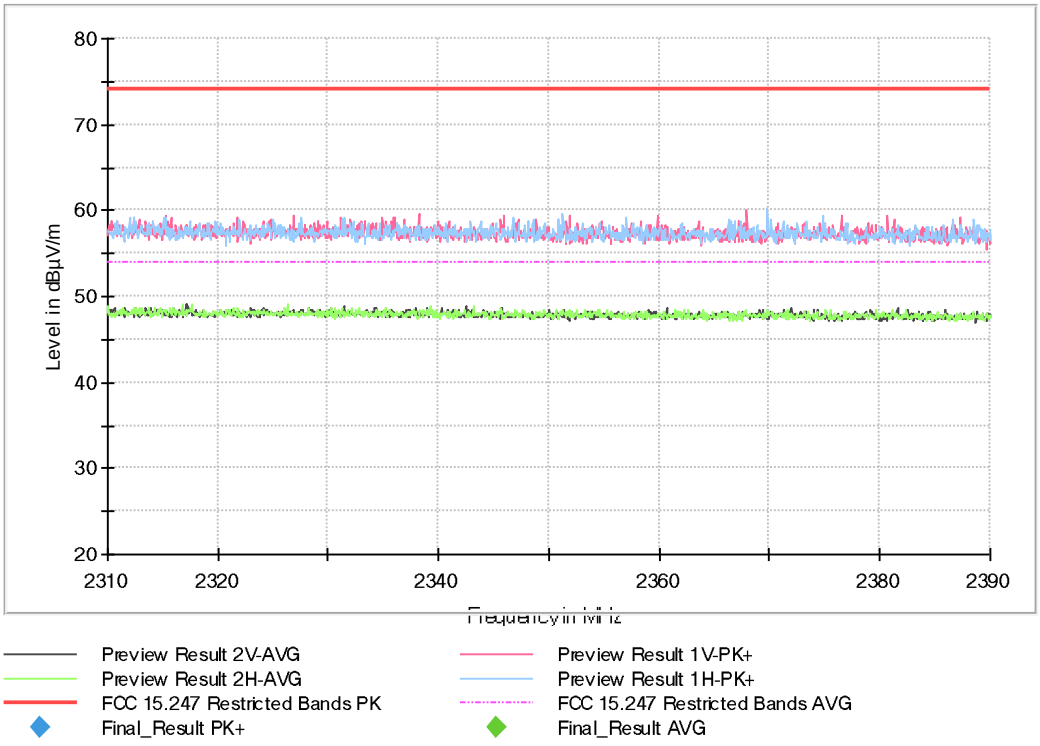
Frequency MHz = 2480.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [1, 3]

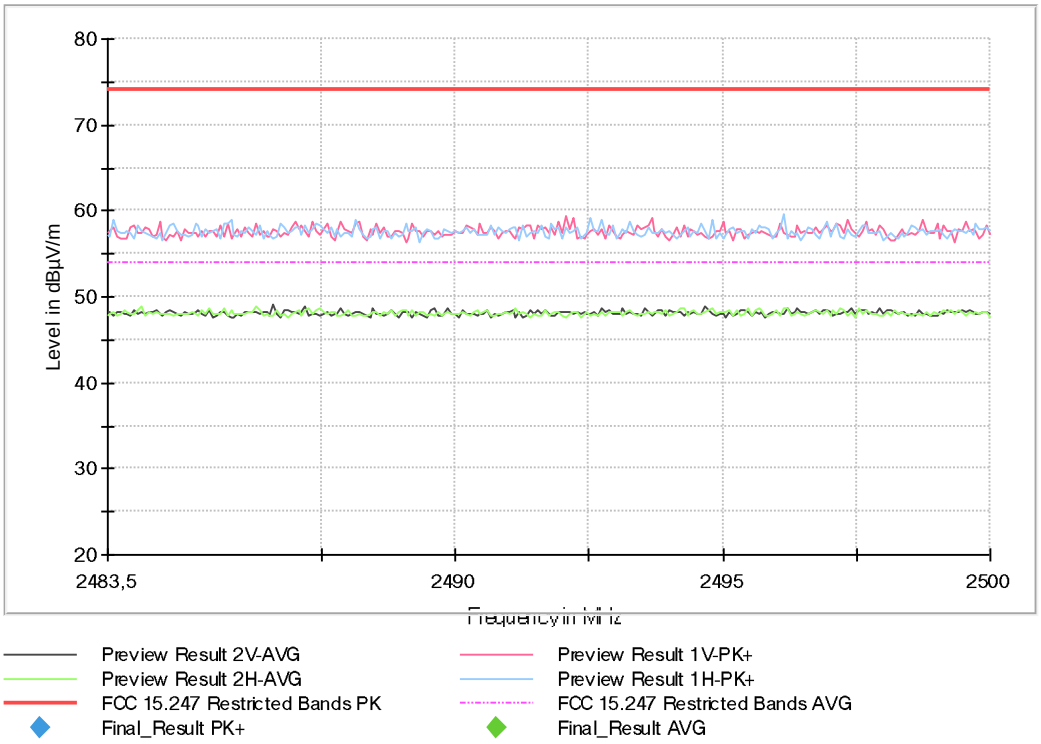
Images:



Full Spectrum



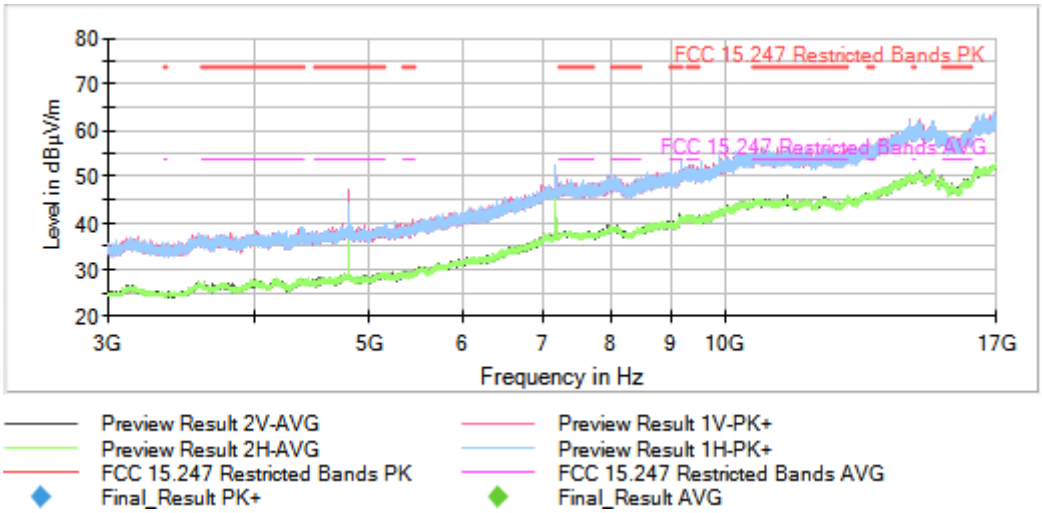
Full Spectrum



Frequency MHz = 2402.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [3, 17]

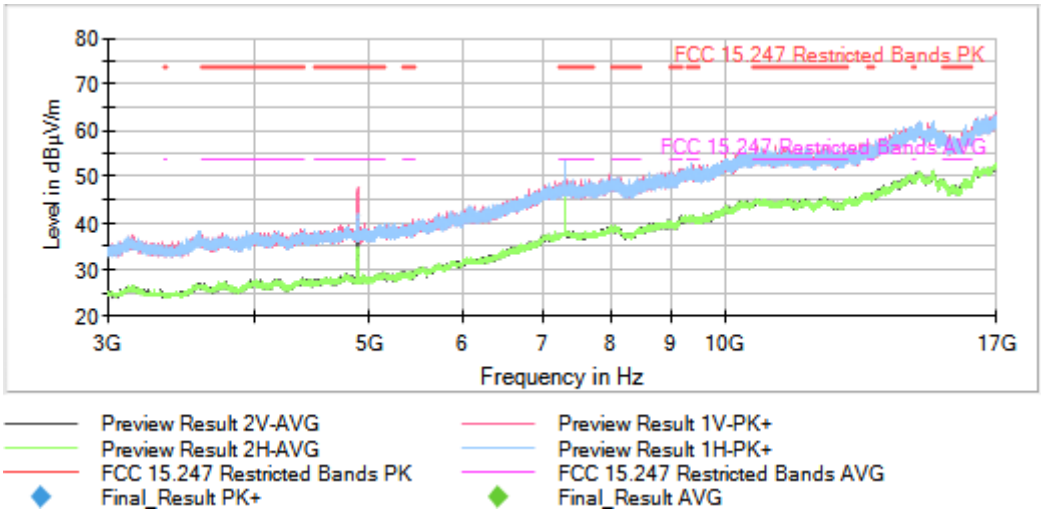
Images:



Frequency MHz = 2441.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [3, 17]

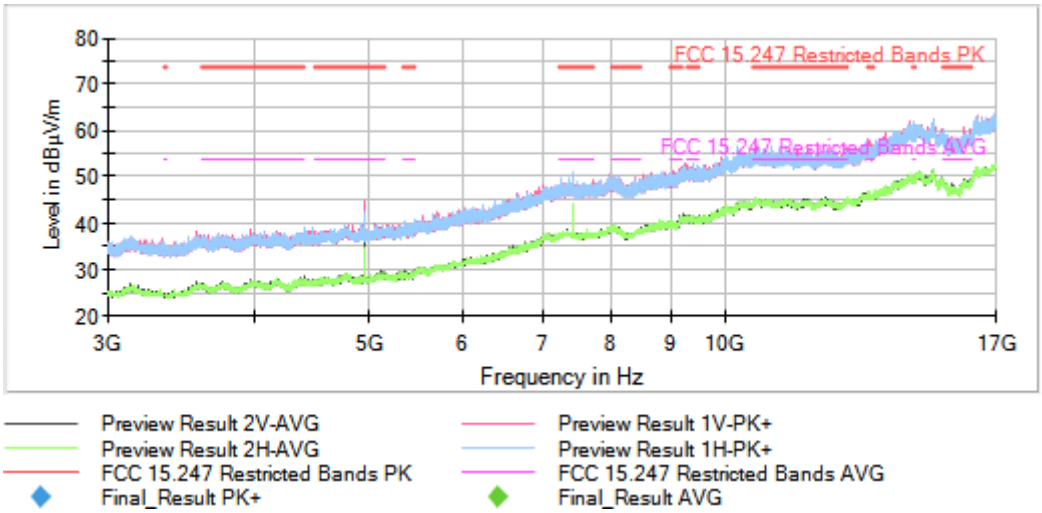
Images:



Frequency MHz = 2480.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [3, 17]

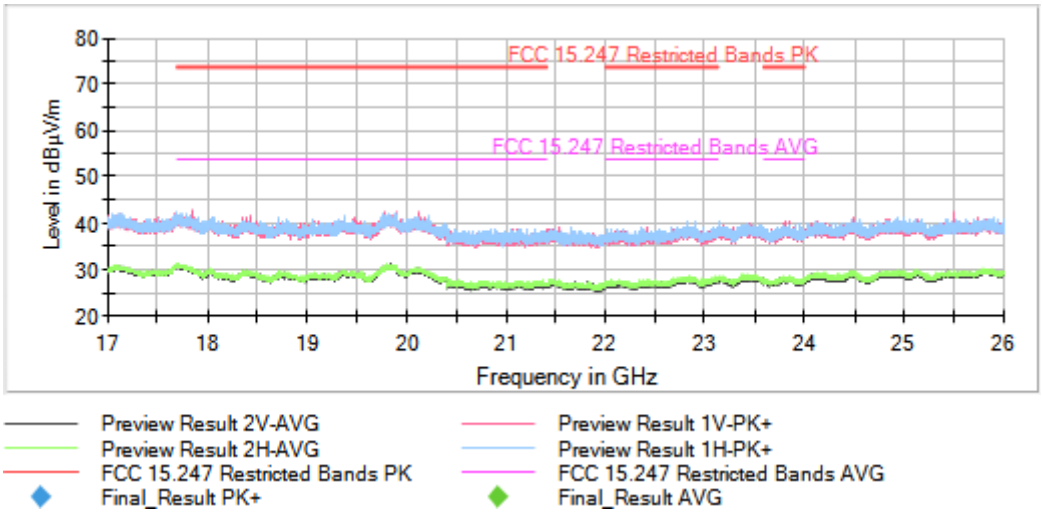
Images:



Frequency MHz = 2441.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [17, 26]

Images:



This plot is valid for all channels

Results for Sample 03

No spurious frequencies detected at less than 20 dB below the limit.

Verdict

Pass

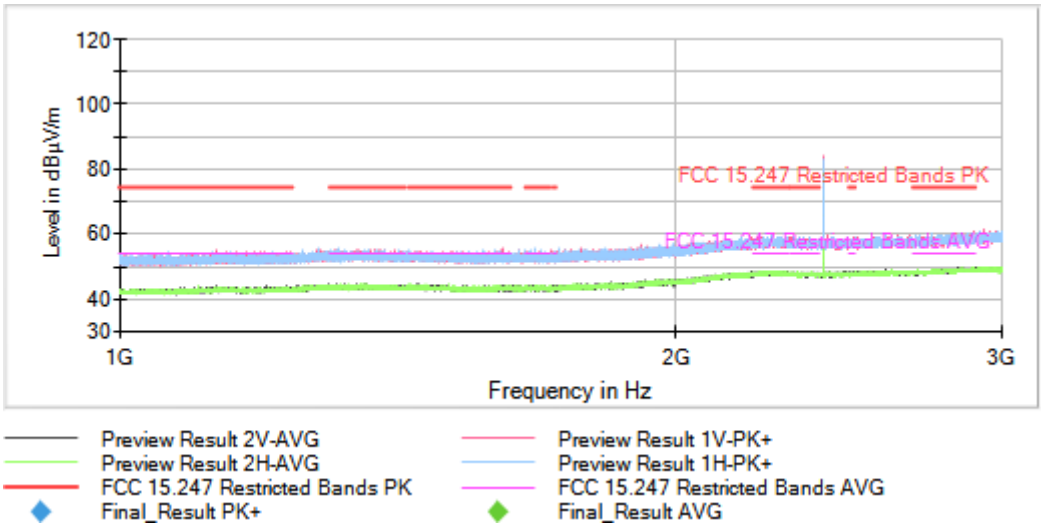
Attachments

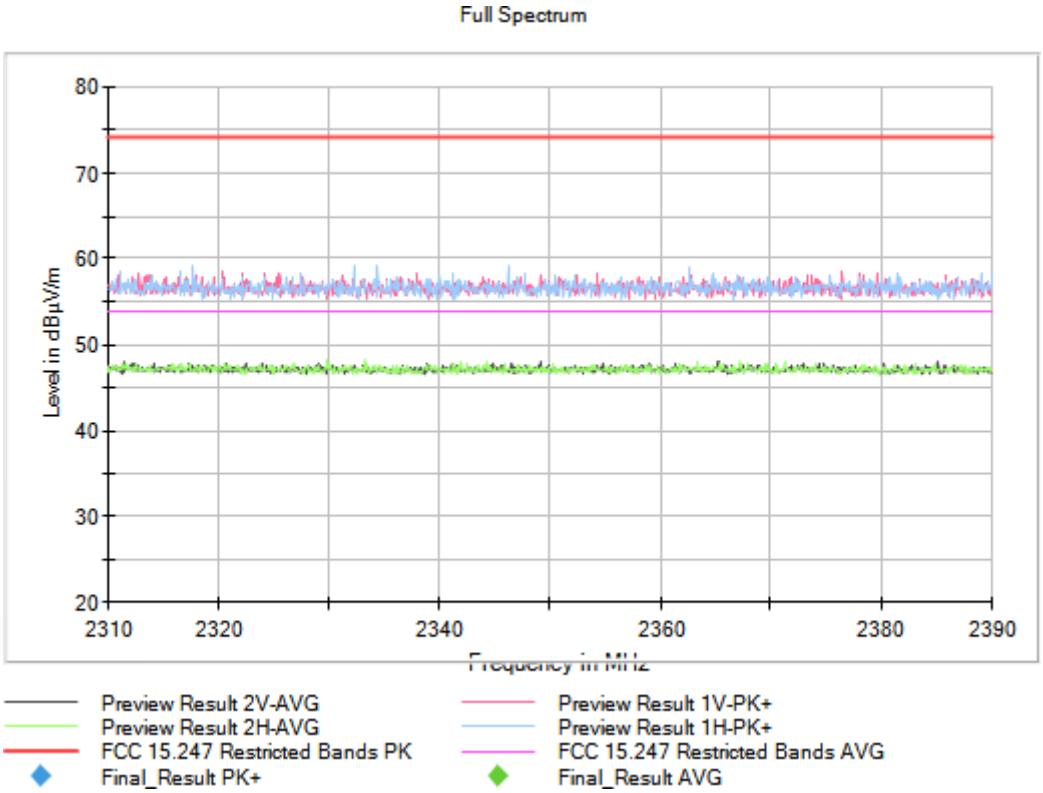
Operation Band MHz = [2400, 2483.5]

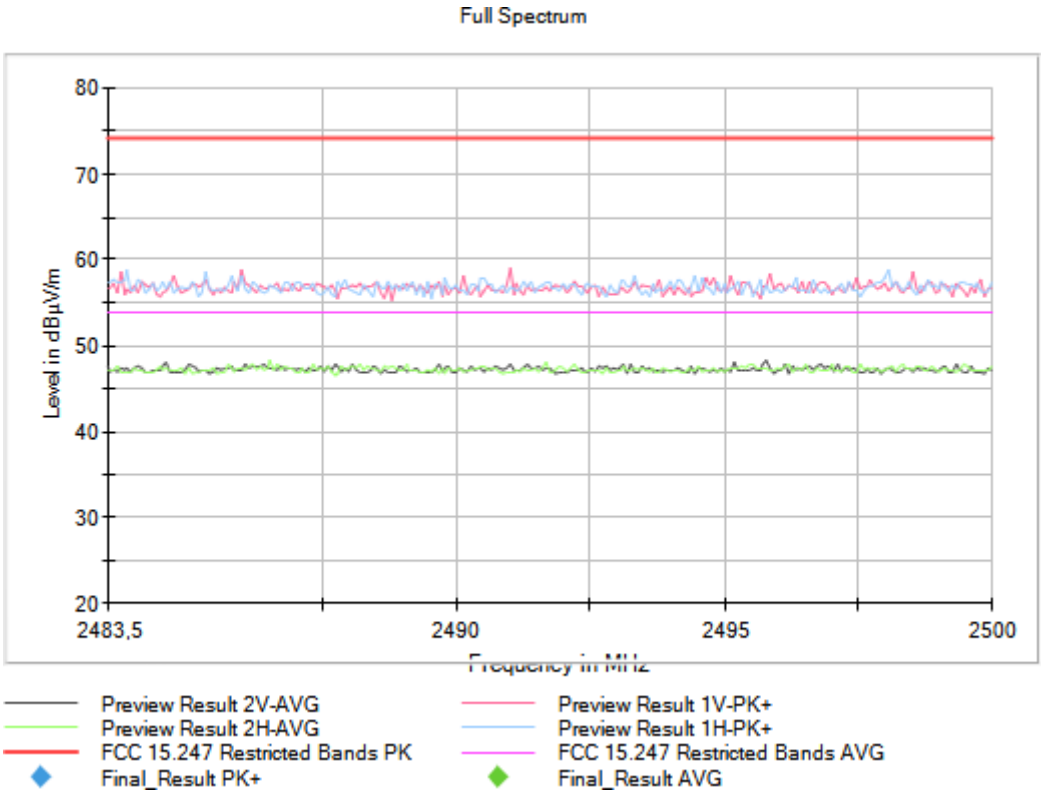
Frequency MHz = 2402.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [1, 3]

Images:




Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2340
2360
2380
2390
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

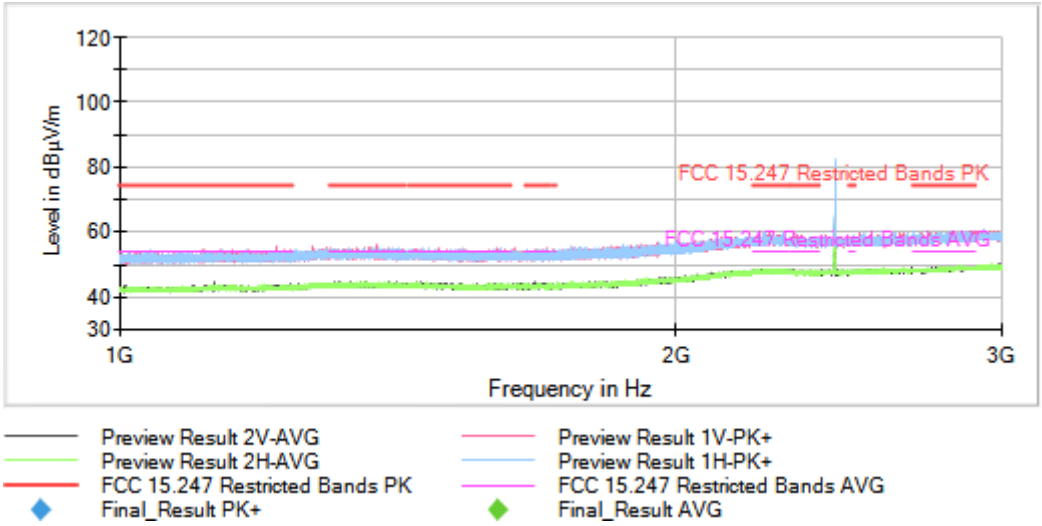

Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5]

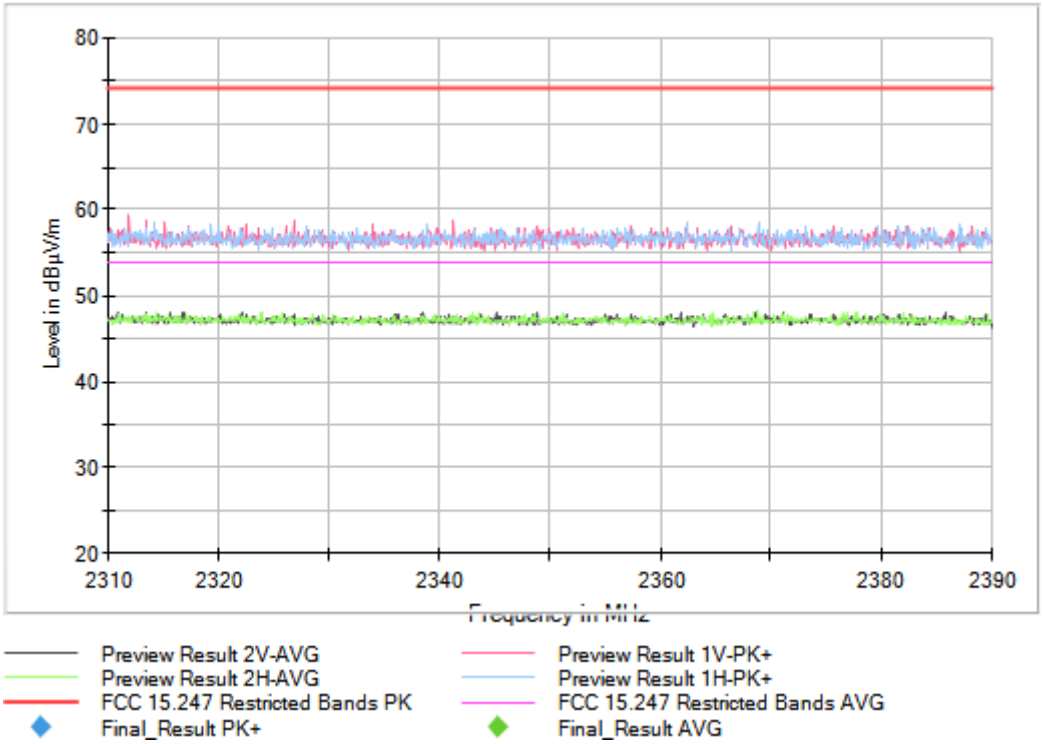
Frequency MHz = 2441.00000 Modulation = BT (8DPSK 3-DH5)

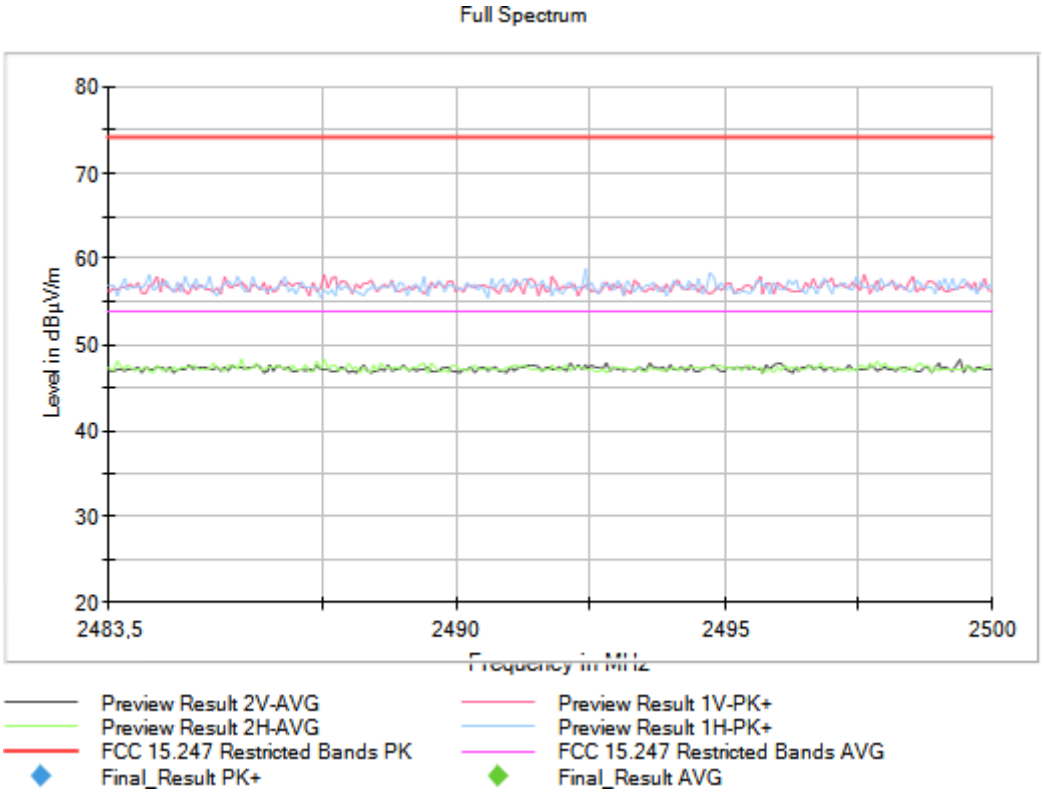
Frequency Range GHz = [1, 3]

Images:



Full Spectrum



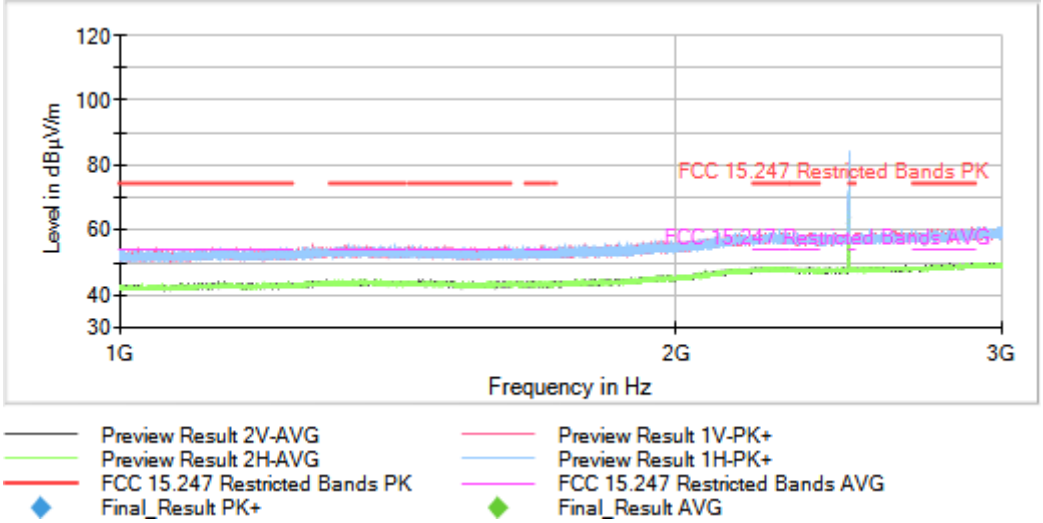


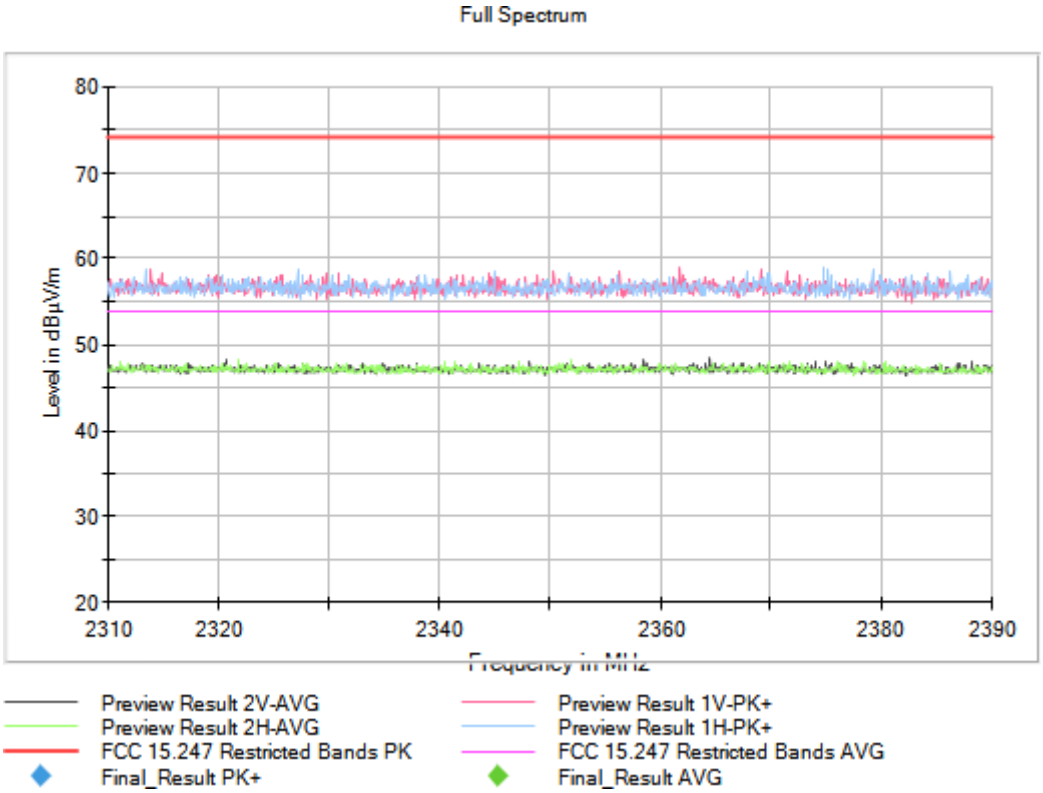
Operation Band MHz = [2400, 2483.5]

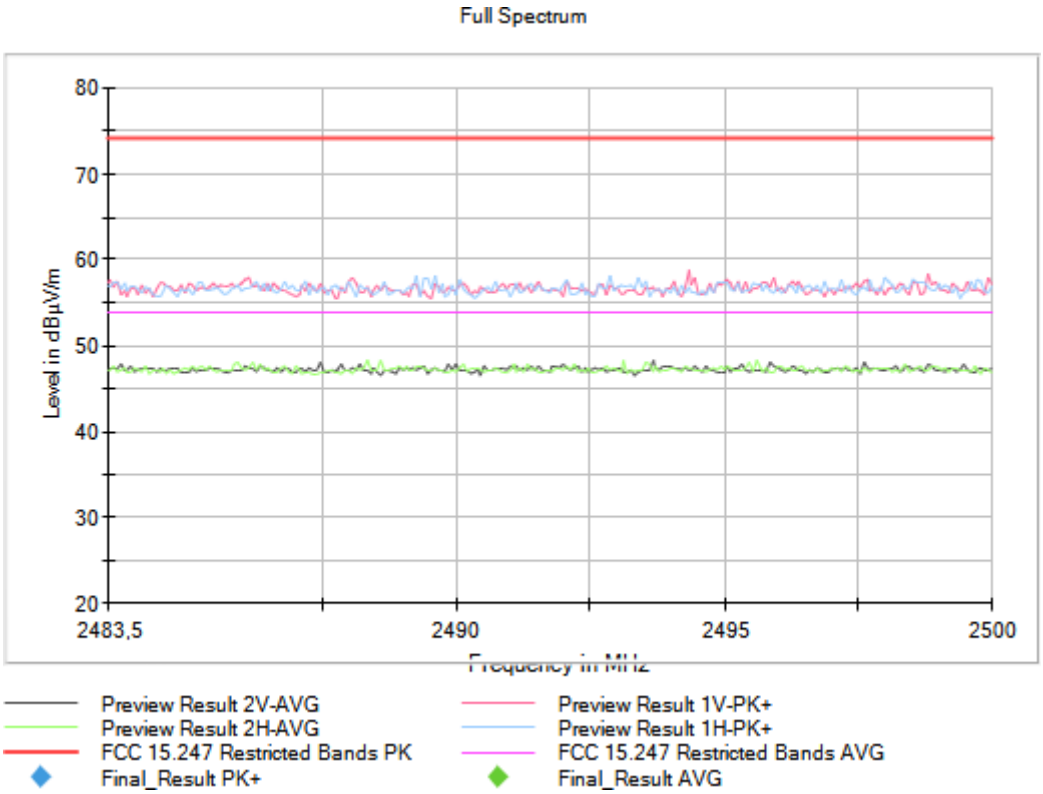
Frequency MHz = 2480.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [1, 3]

Images:




Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2340
2360
2380
2390
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

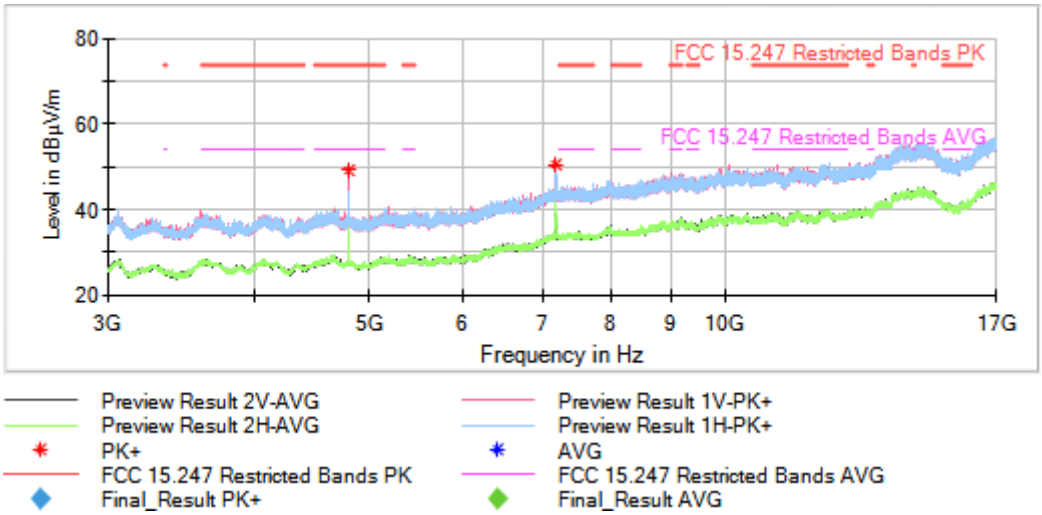

Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2402.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [3, 17]

Images:

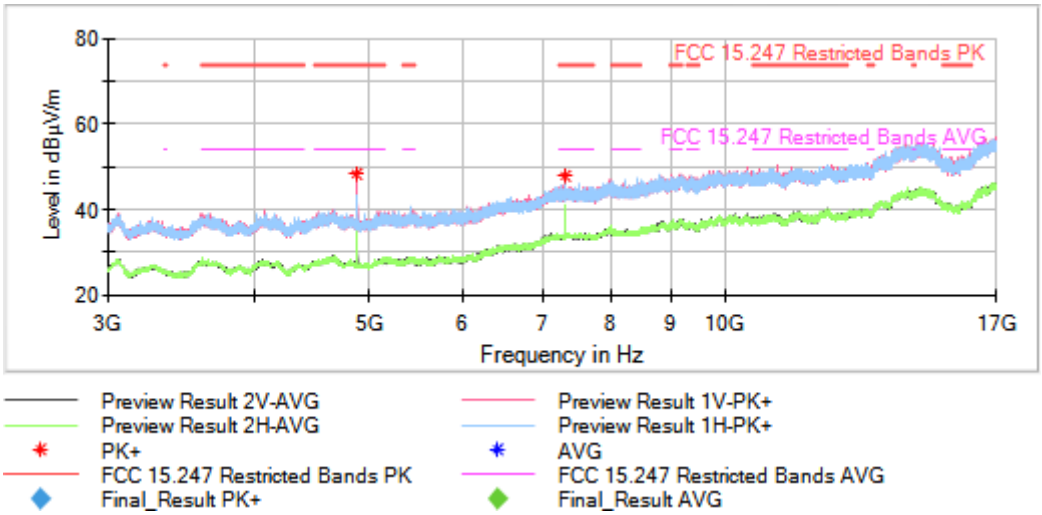


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2440.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [3, 17]

Images:

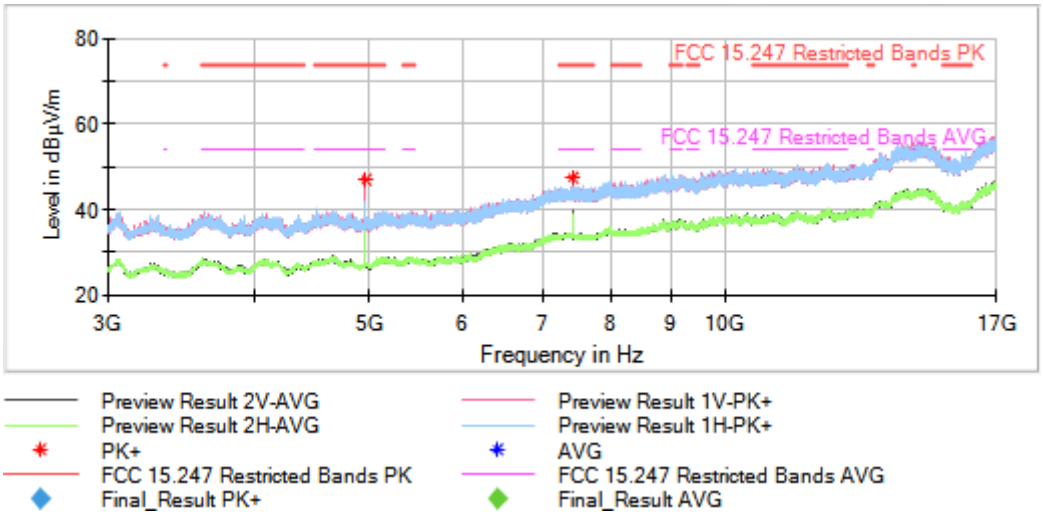


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2480.00000 Modulation = BT (8DPSK 3-DH5)

Frequency Range GHz = [3, 17]

Images:



Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

The spurious frequencies detected at less than 20 dB below the limit:

Freq Rng (GHz)	Freq (MHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[0.03, 1]	2480.00000	931.760500	17.79	H	QP

* The spurious frequencies detected does not depend of the selected channel.

Verdict

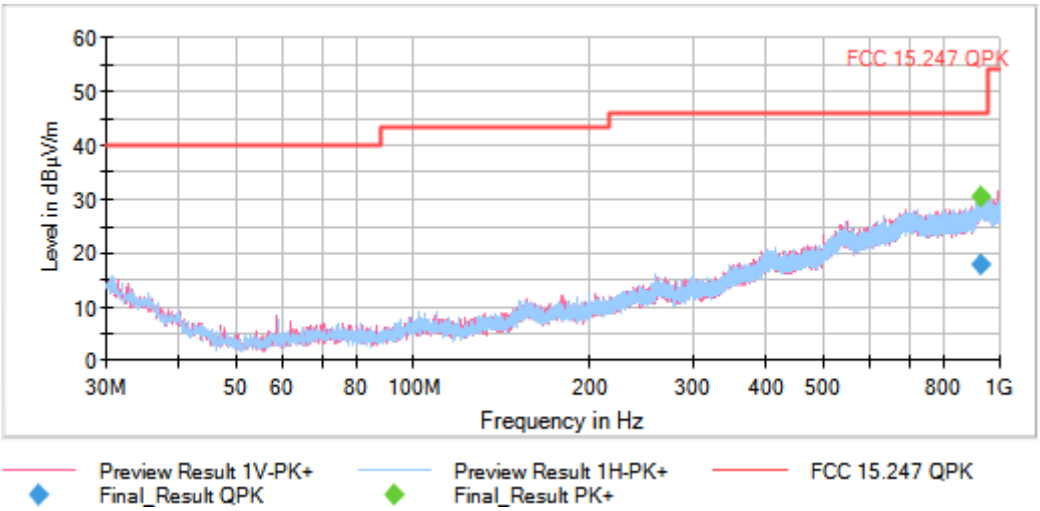
Pass

Attachments

Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [0.03, 1]

Images:

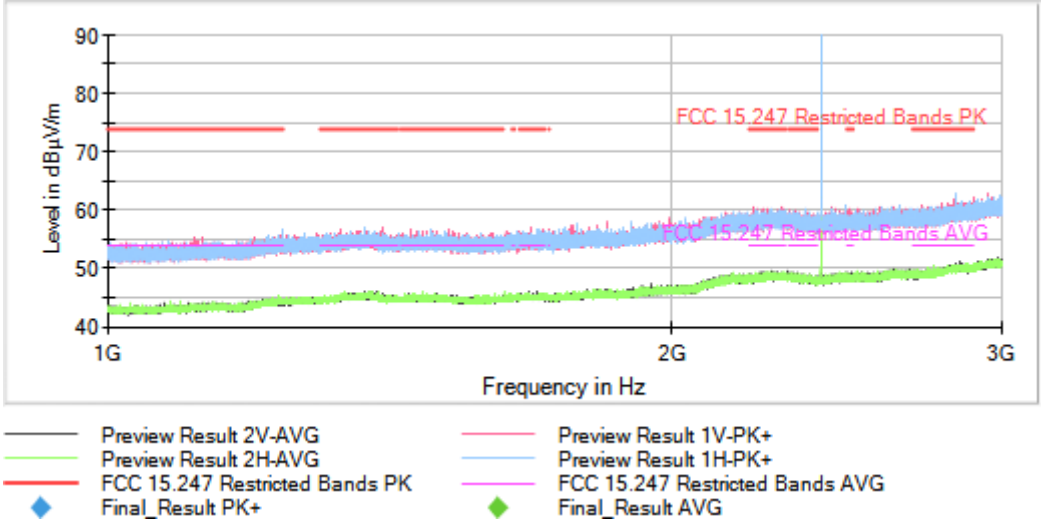


This plot is valid for all channels

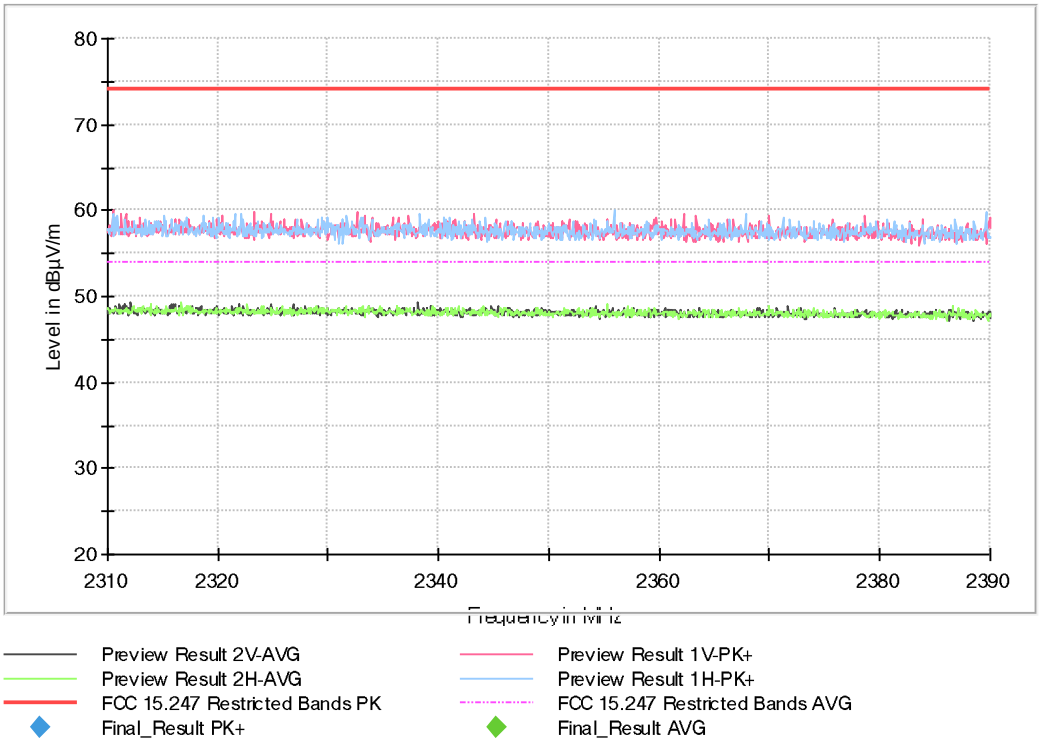
Frequency MHz = 2402.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [1, 3]

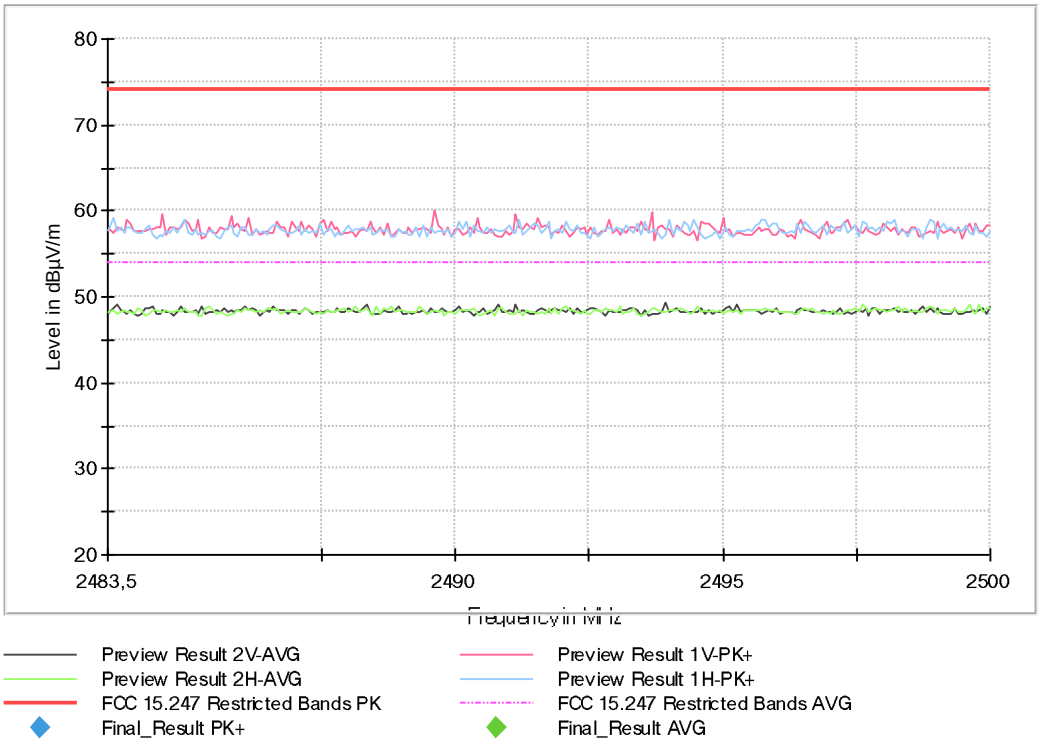
Images:



Full Spectrum



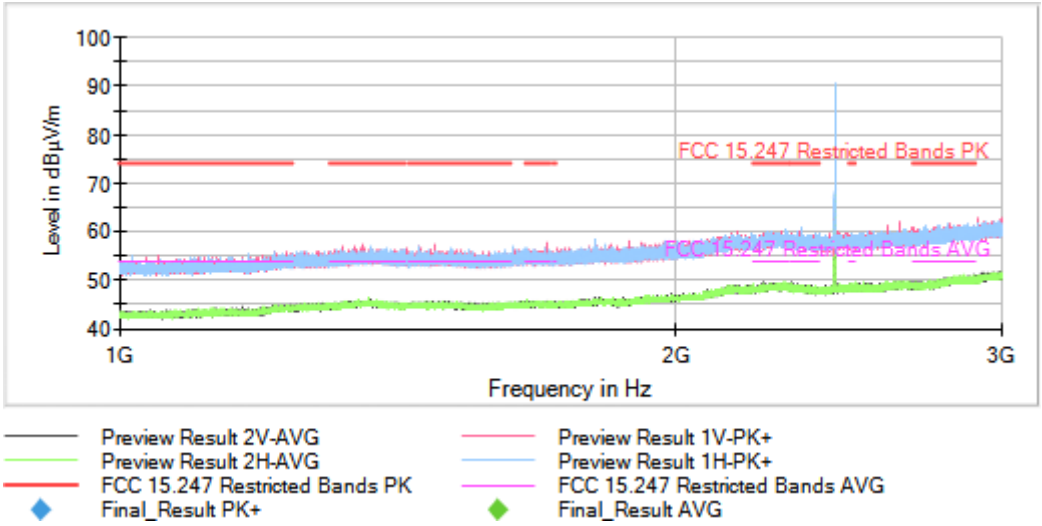
Full Spectrum



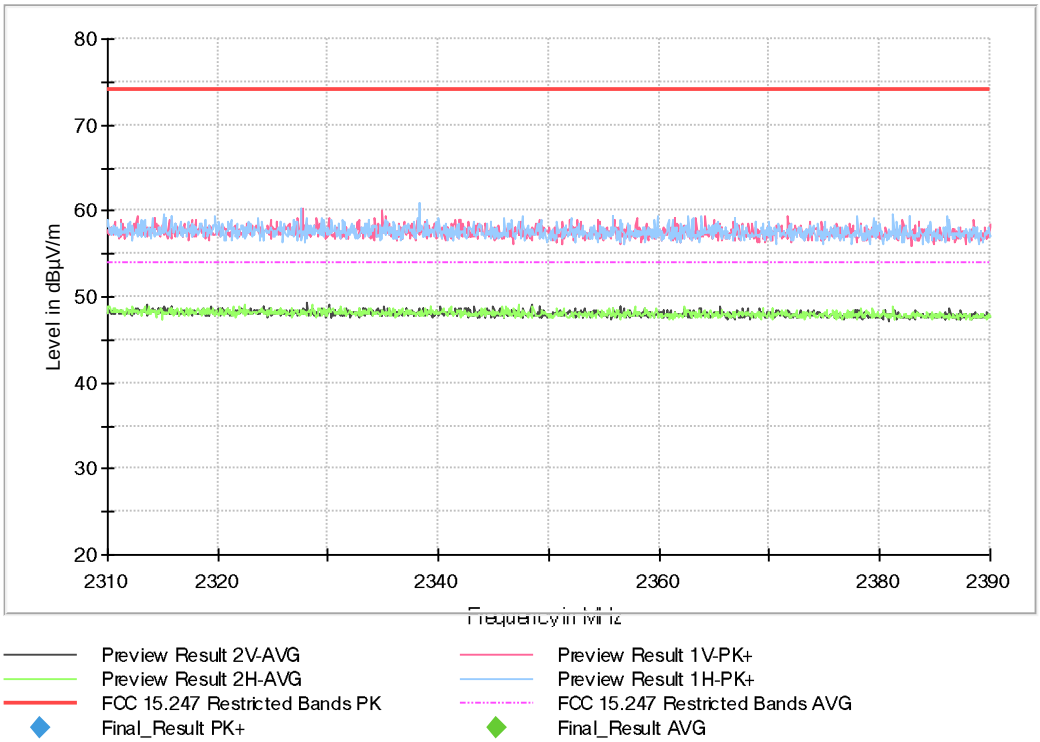
Frequency MHz = 2440.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

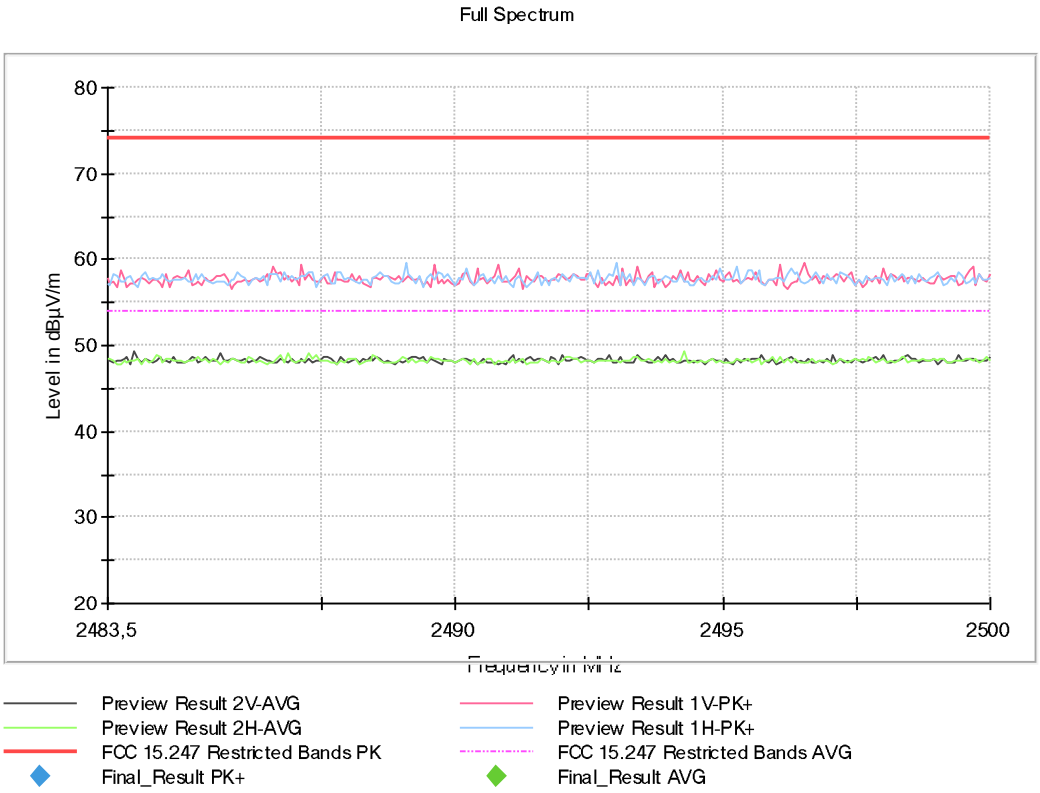
Frequency Range GHz = [1, 3]

Images:



Full Spectrum

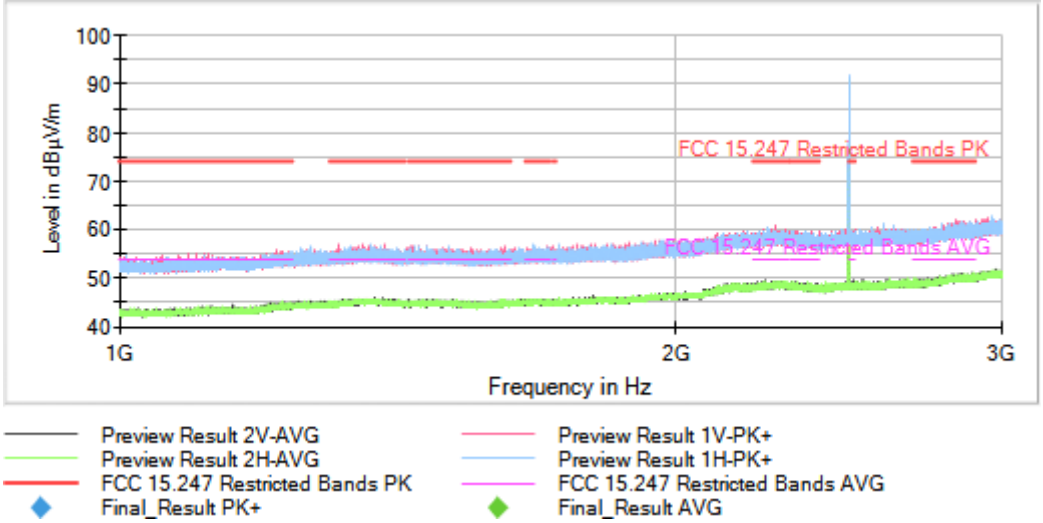




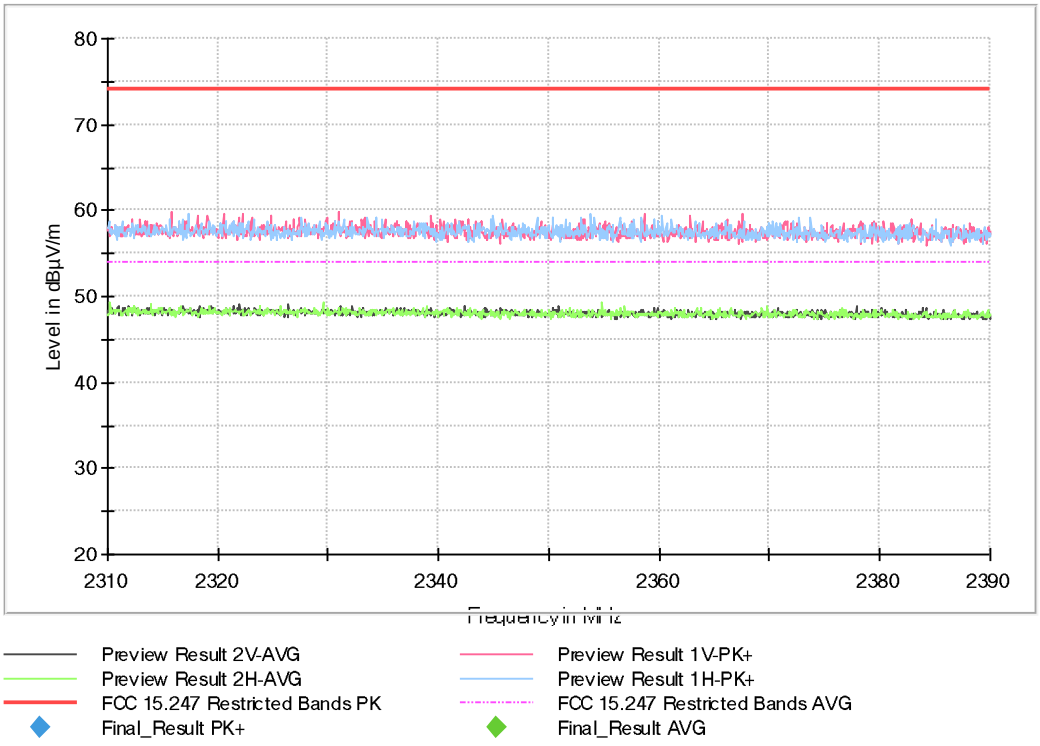
Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [1, 3]

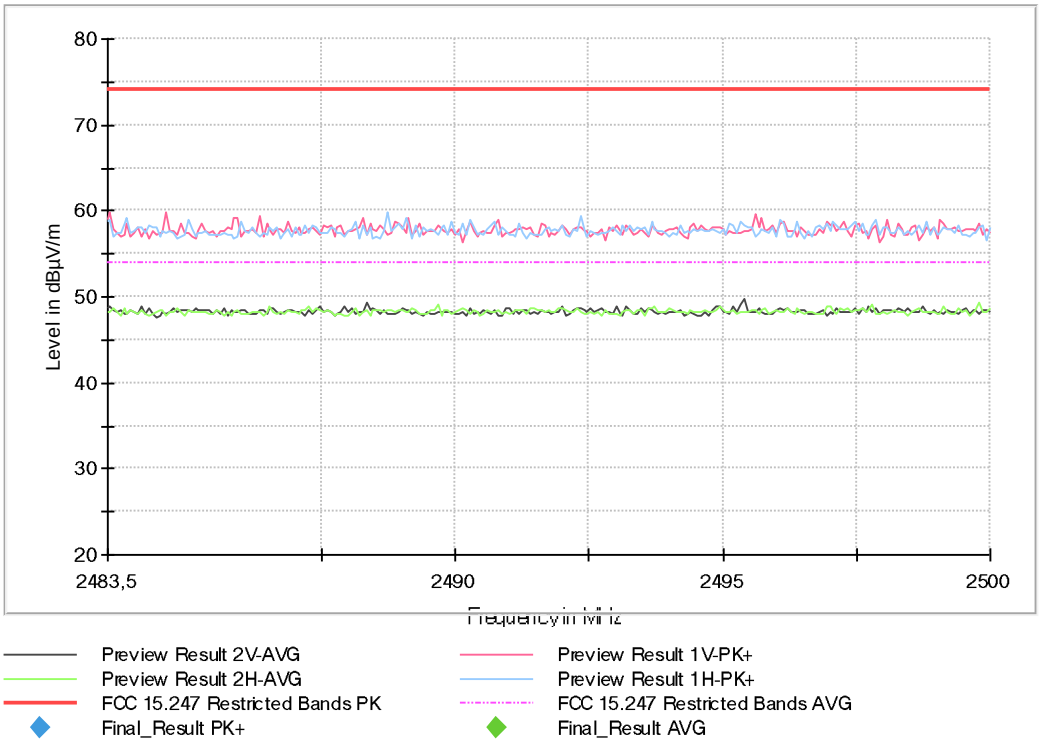
Images:



Full Spectrum



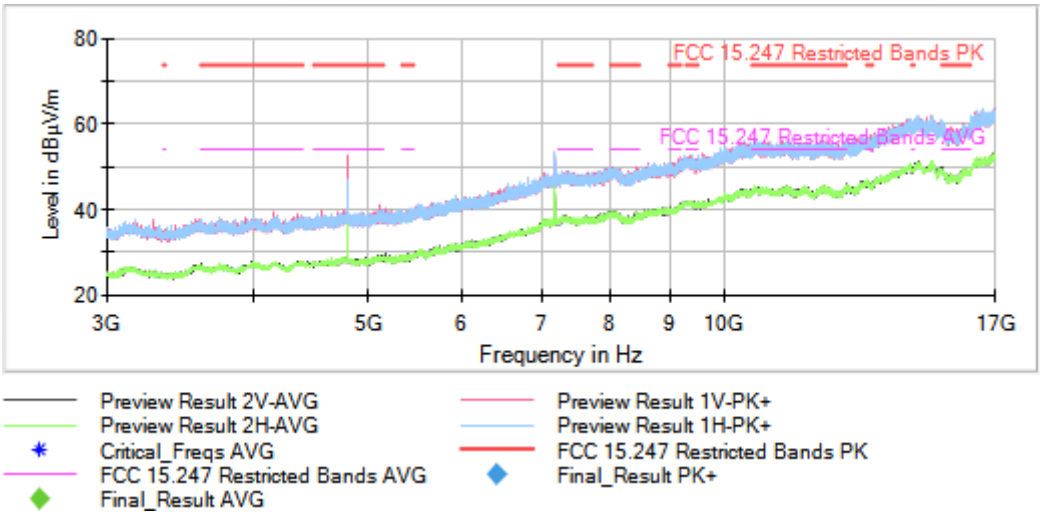
Full Spectrum



Frequency MHz = 2402.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [3, 17]

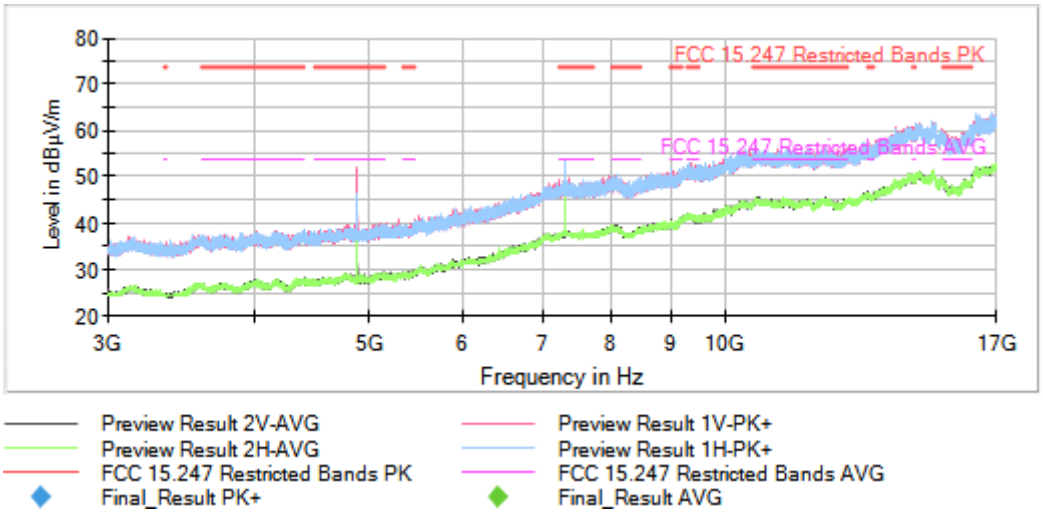
Images:



Frequency MHz = 2440.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [3, 17]

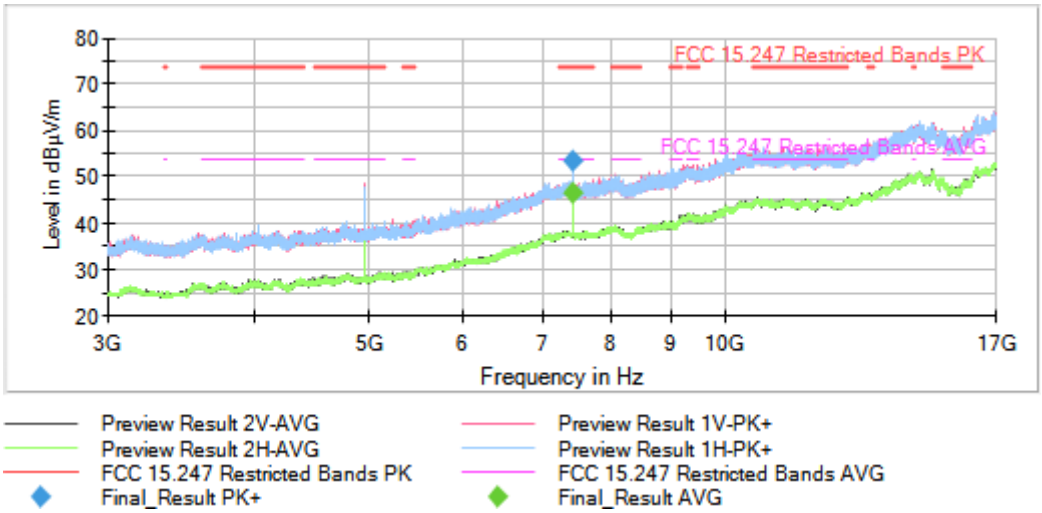
Images:



Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [3, 17]

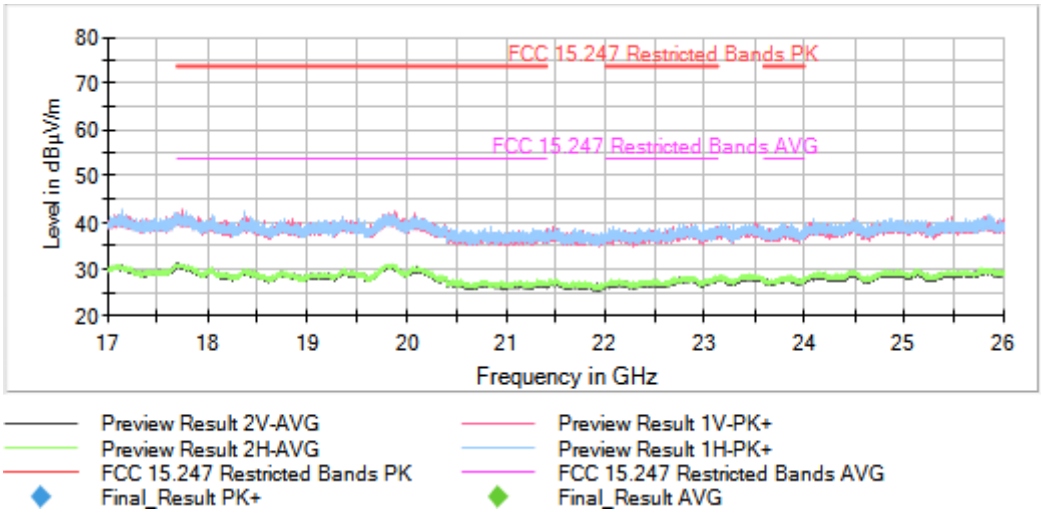
Images:



Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [17, 26]

Images:



This plot is valid for all channels

Results for Sample 03

No spurious frequencies detected at less than 20 dB below the limit.

Verdict

Pass

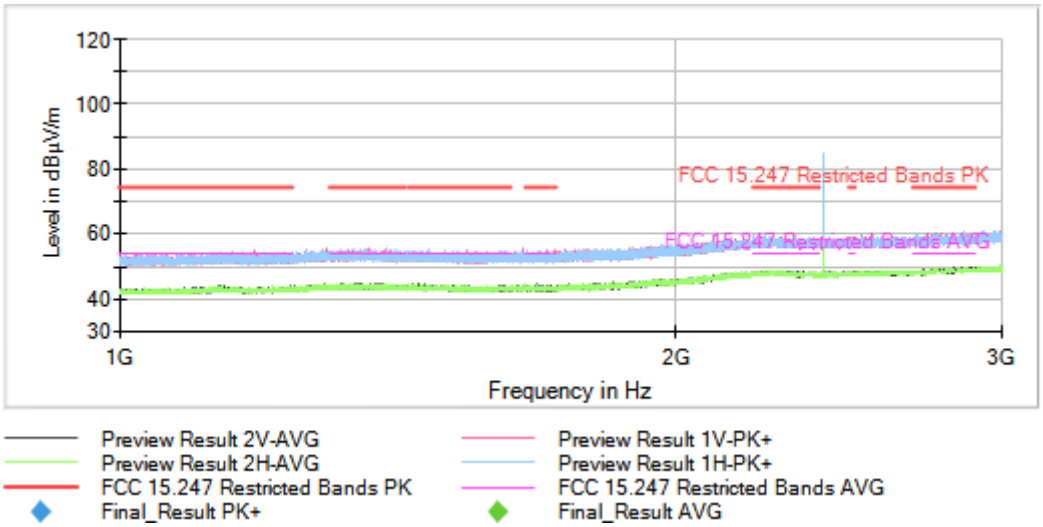
Attachments

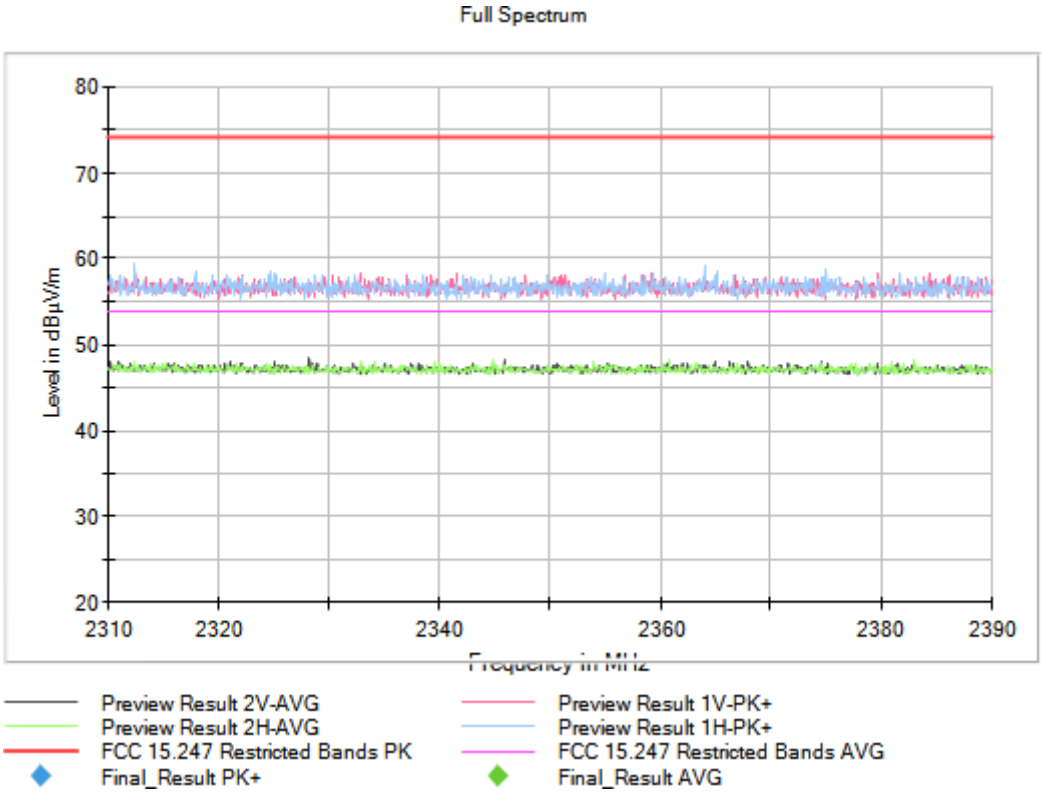
Operation Band MHz = [2400, 2483.5]

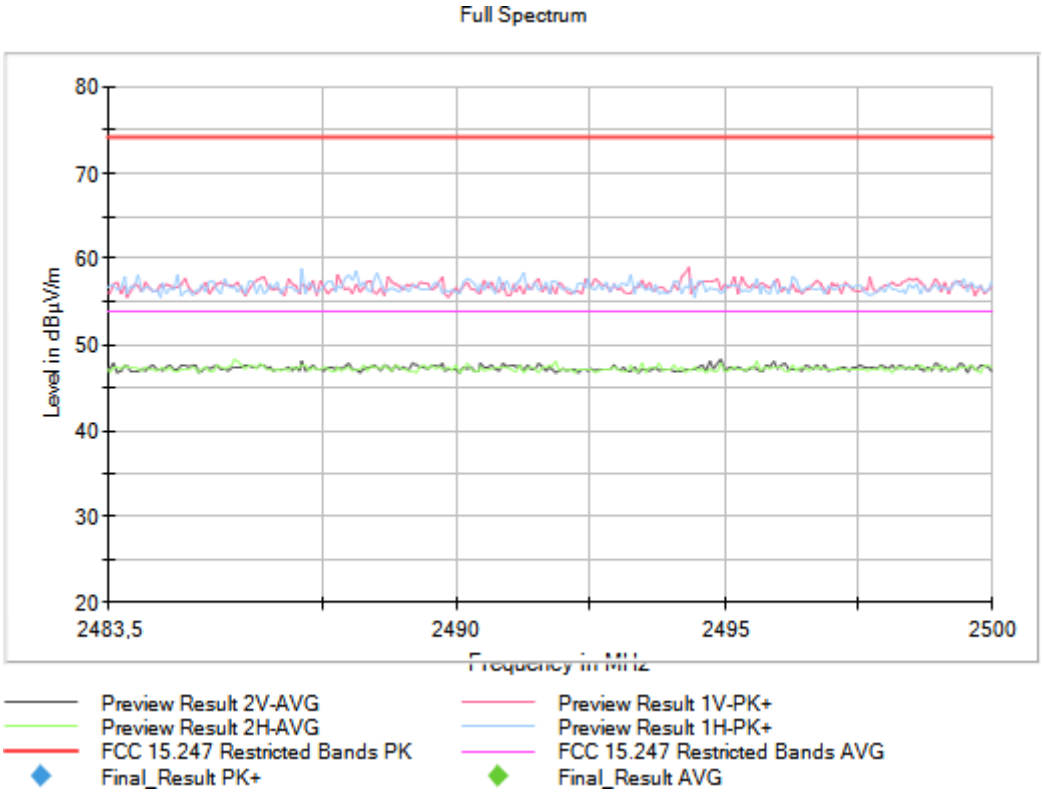
Frequency MHz = 2402.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [1, 3]

Images:




Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2340
2360
2380
2390
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

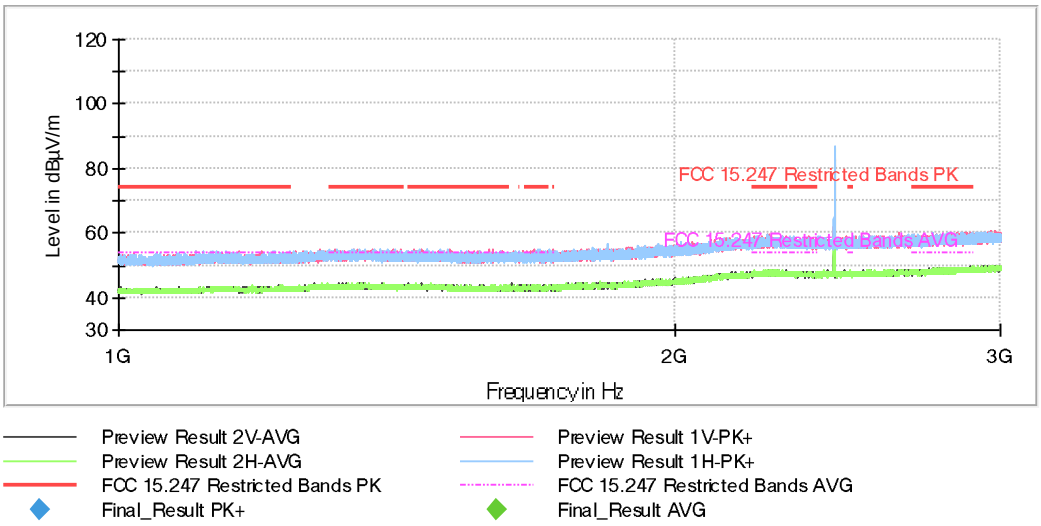

Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5]

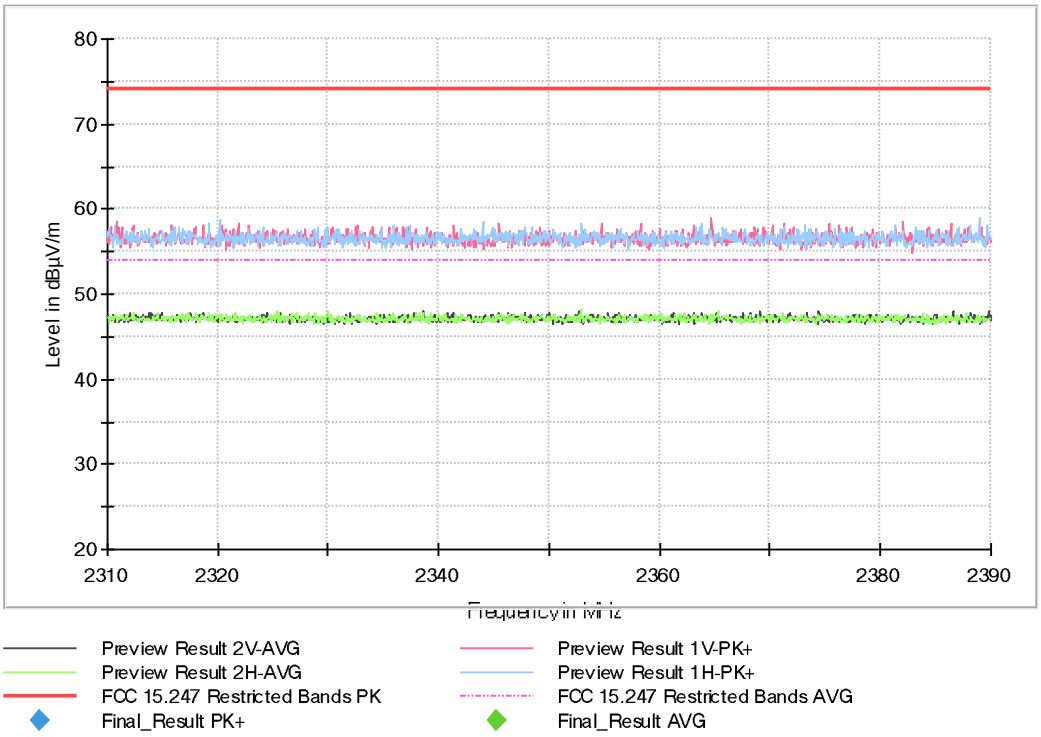
Frequency MHz = 2440.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

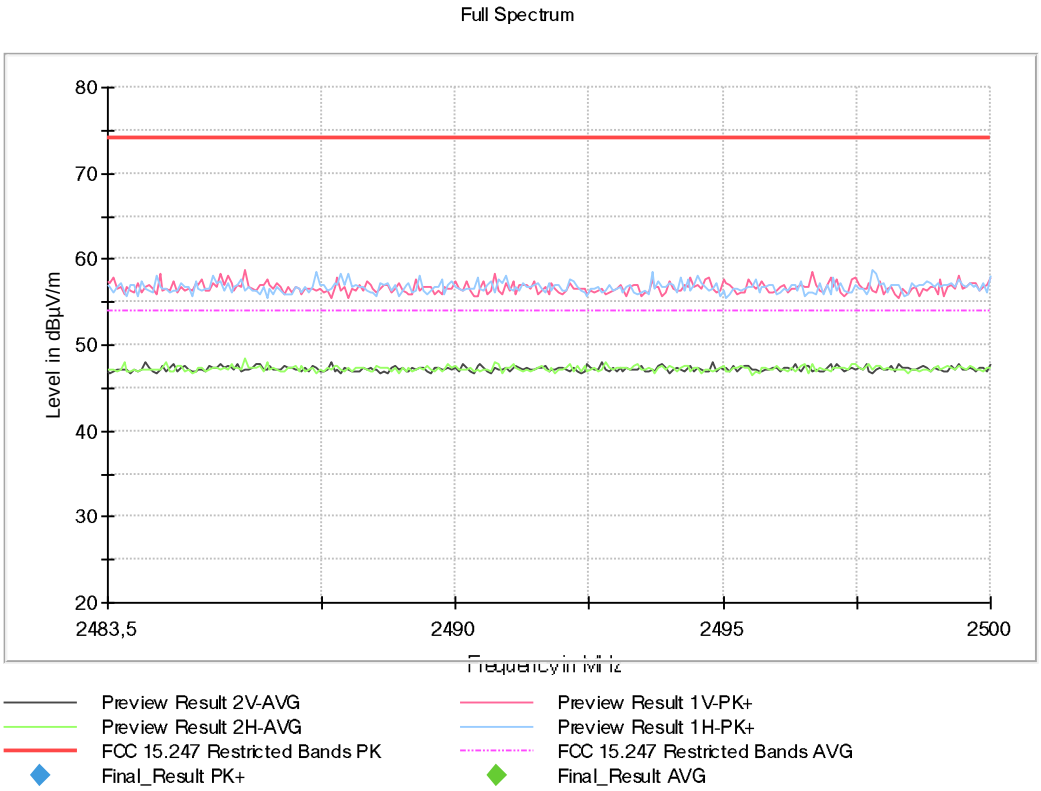
Frequency Range GHz = [1, 3]

Images:



Full Spectrum



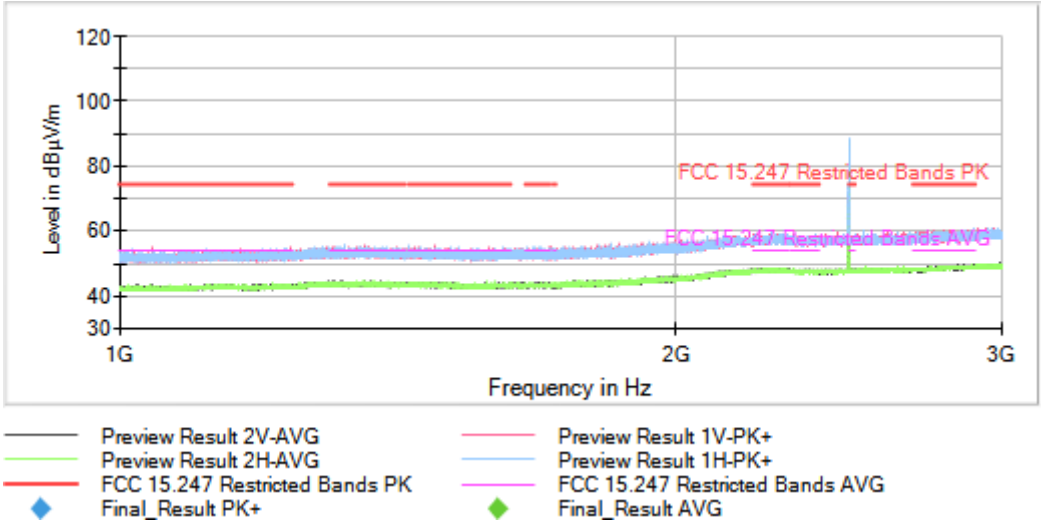


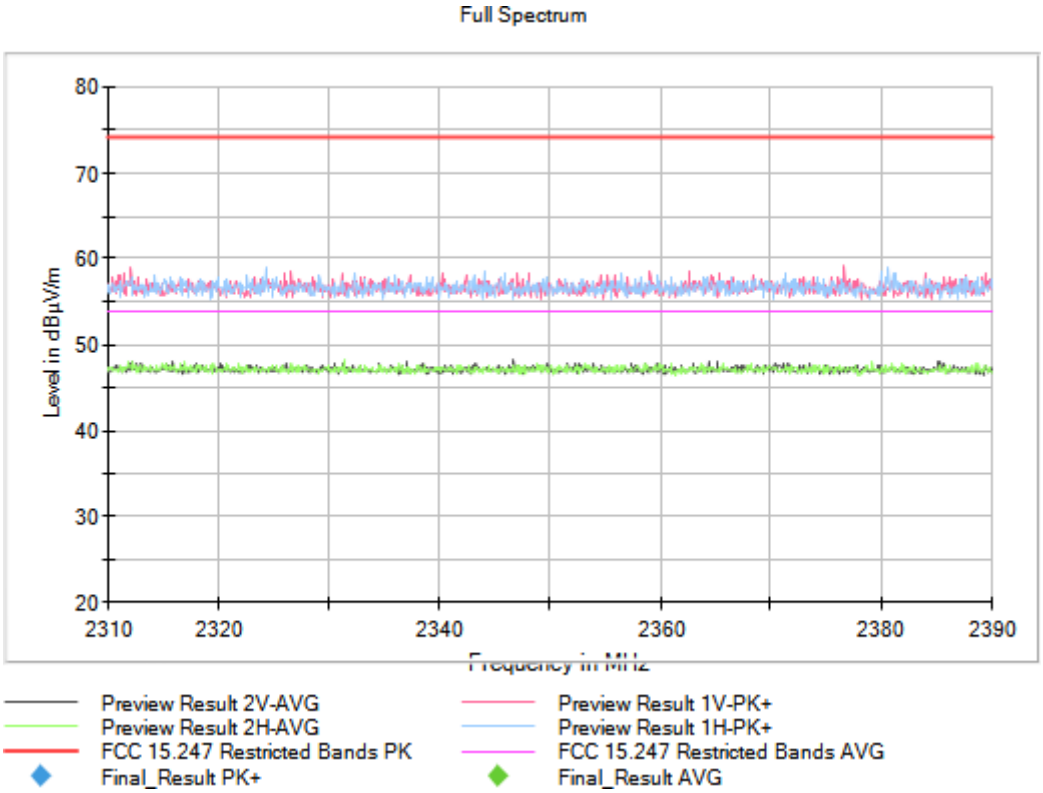
Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [1, 3]

Images:




Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2340
2360
2380
2390
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

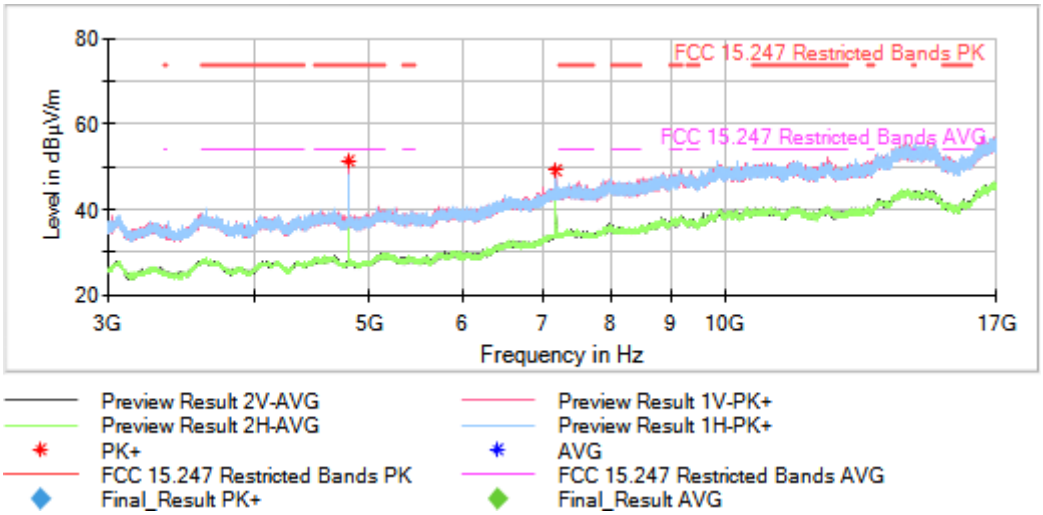
Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2402.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [3, 17]

Images:

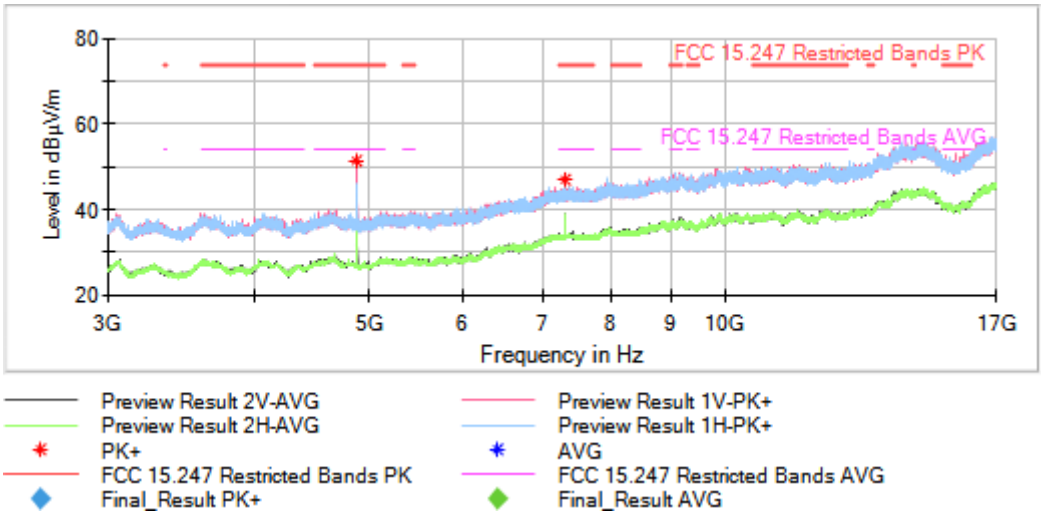


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2440.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [3, 17]

Images:

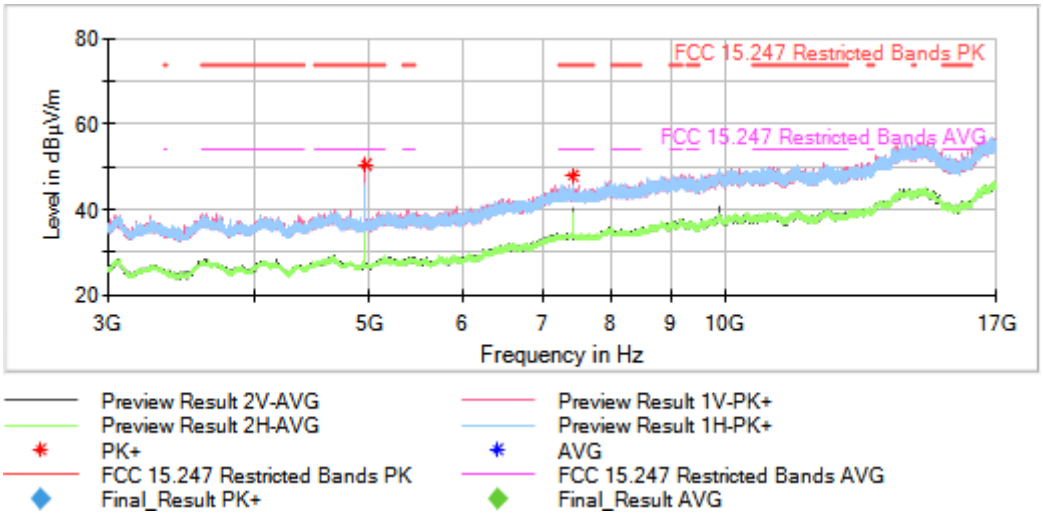


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency Range GHz = [3, 17]

Images:



Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

The spurious frequencies detected at less than 20 dB below the limit:

Freq Rng (GHz)	Freq (MHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[0.03, 1]	2480.00000	942.964000	17.63	V	QP

* The spurious frequencies detected does not depend of the selected channel.

Freq Rng (GHz)	Freq (MHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Unwanted Lvl (dBµV/m)	Pol	Detector
[3, 17]	2440.00000	7321.50000	54.80	--	V	PK
			--	46.35		AVG

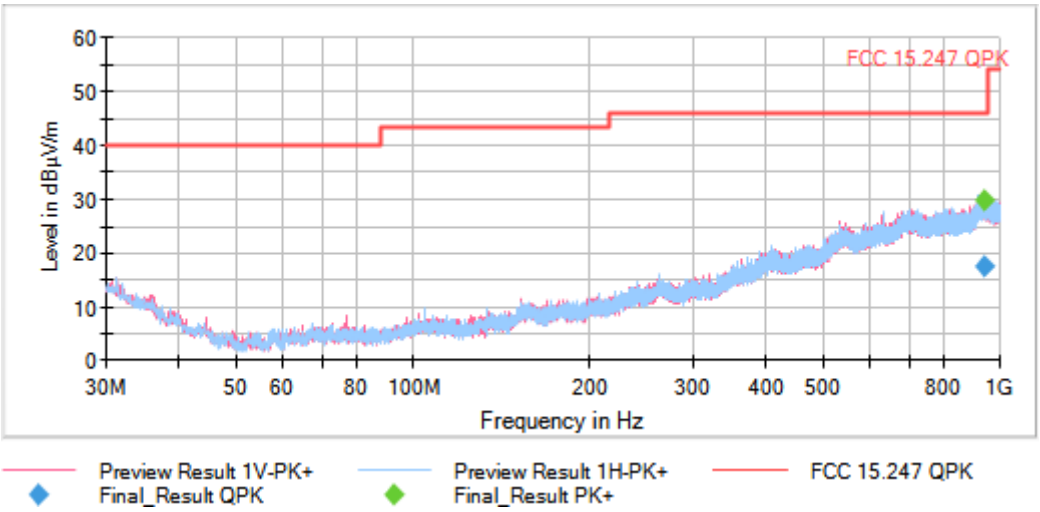
Verdict

Pass

Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [0.03, 1]

Images:



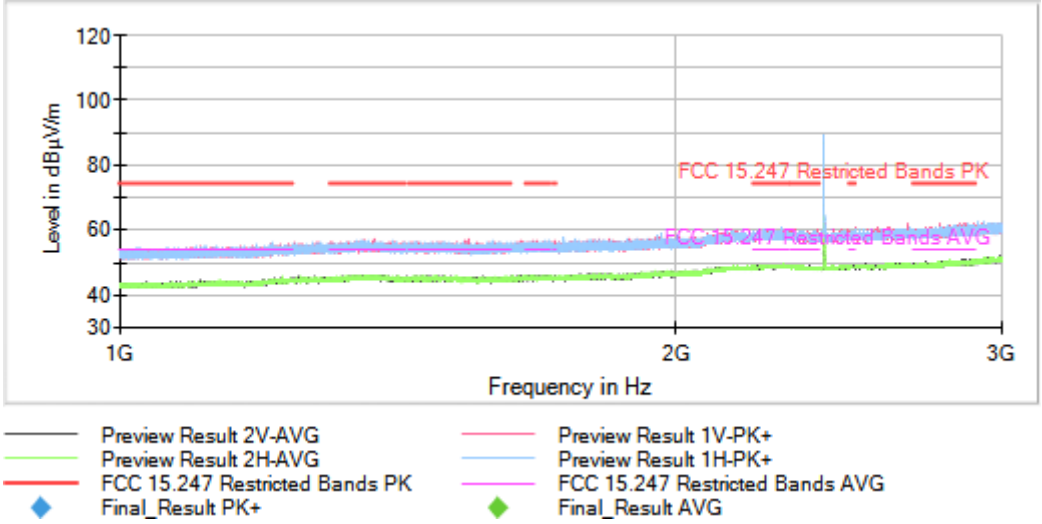
This plot is valid for all channels

Attachments

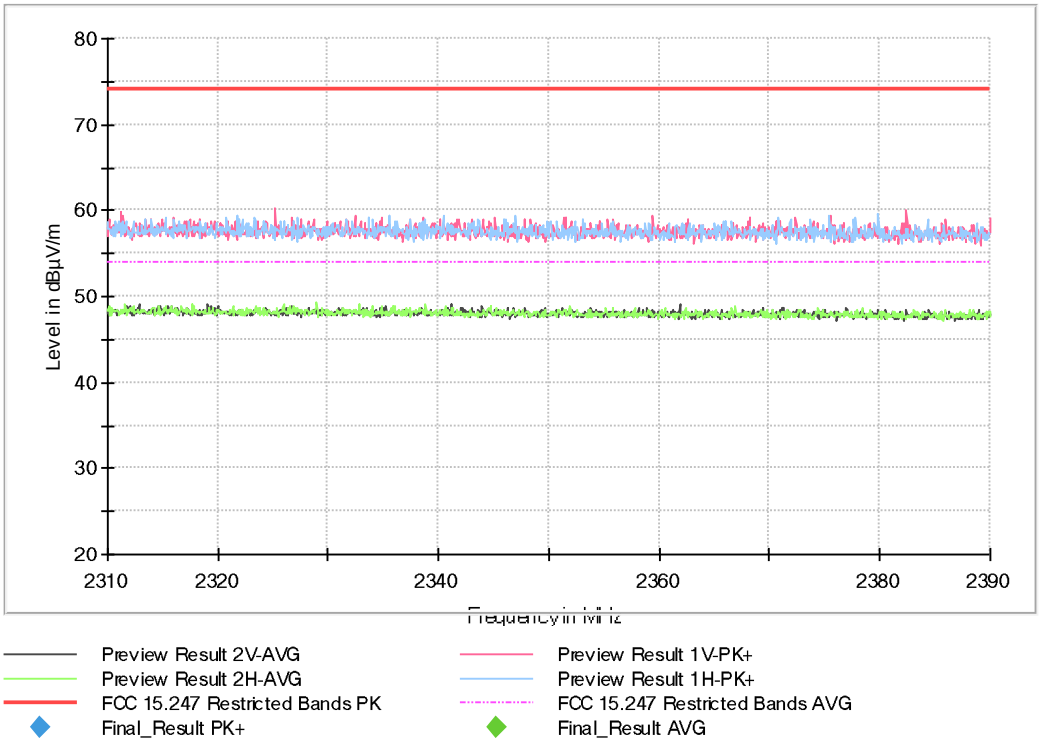
Frequency MHz = 2402.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [1, 3]

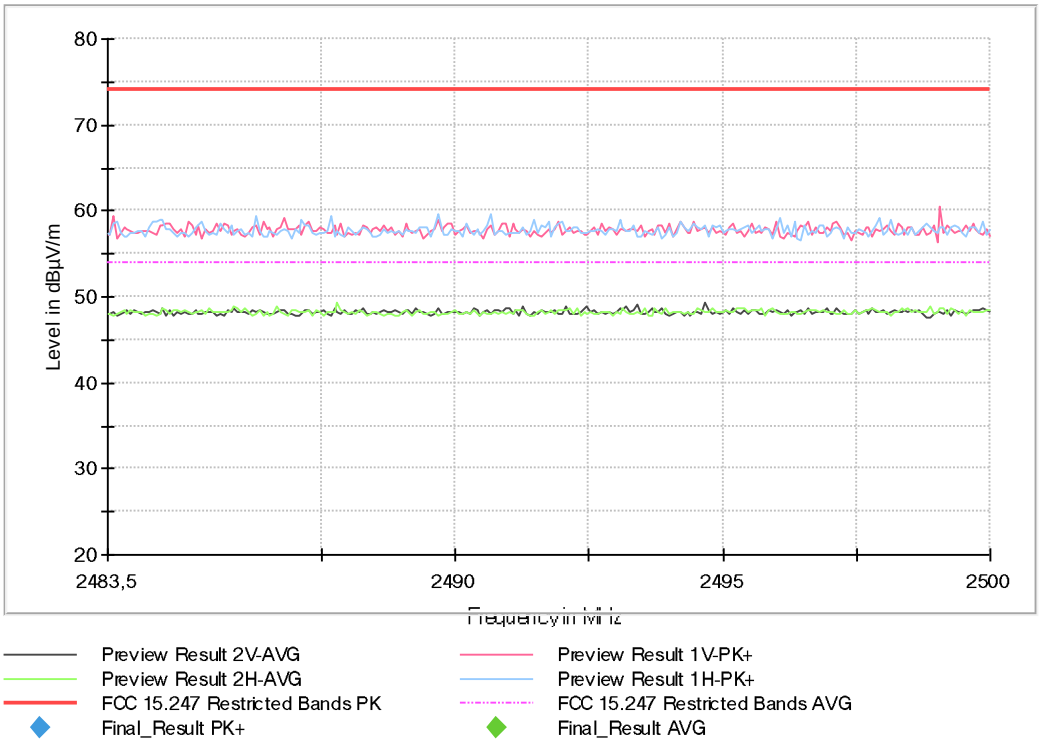
Images:



Full Spectrum



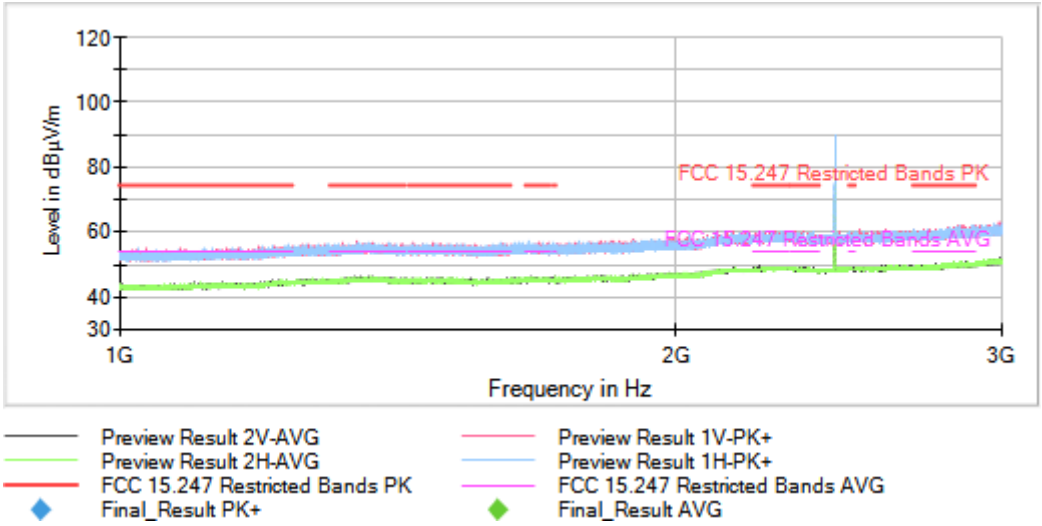
Full Spectrum



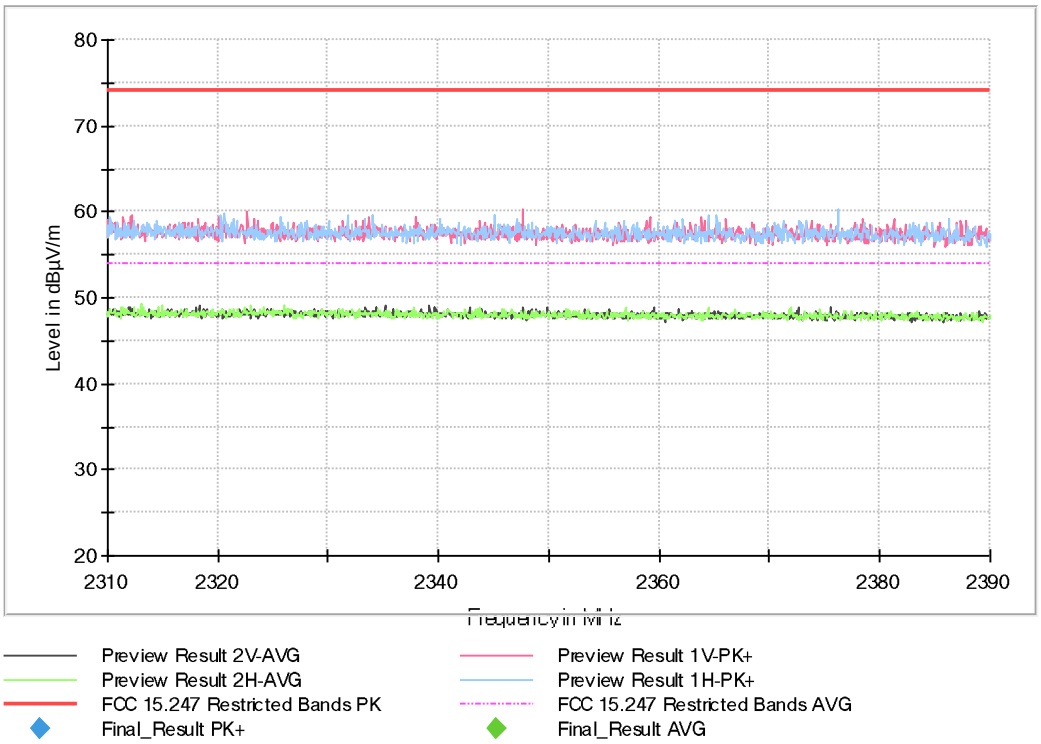
Frequency MHz = 2440.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

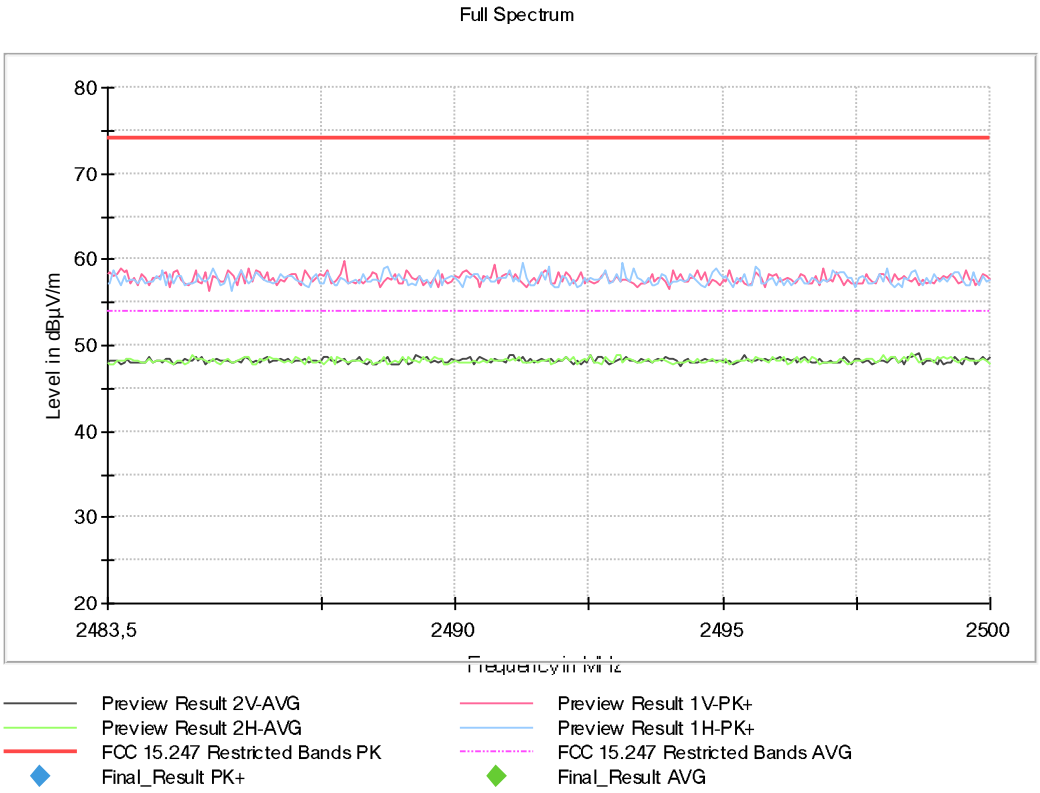
Frequency Range GHz = [1, 3]

Images:



Full Spectrum

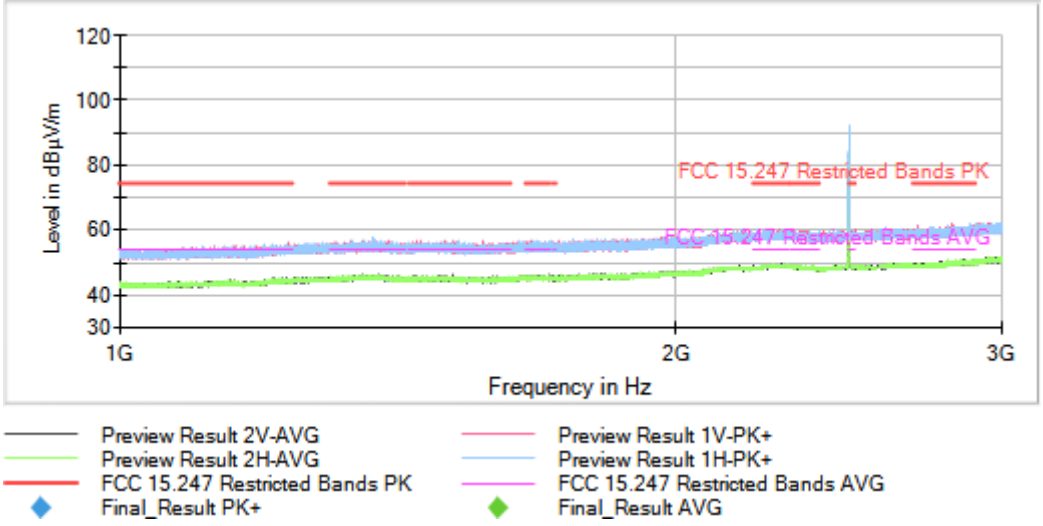




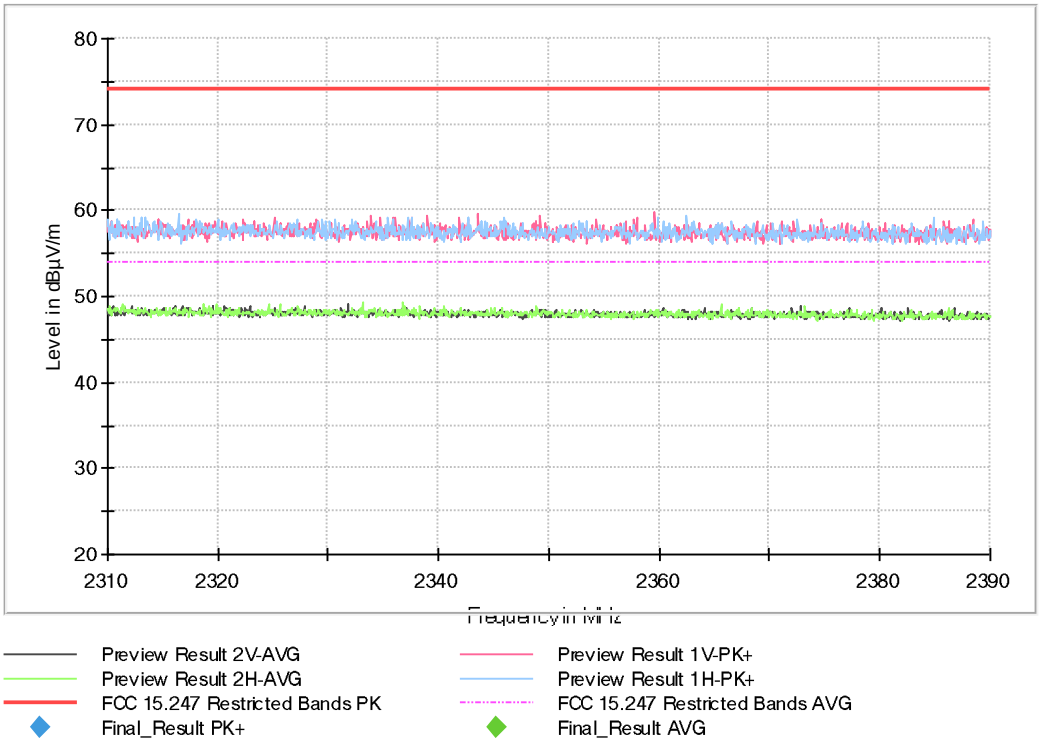
Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [1, 3]

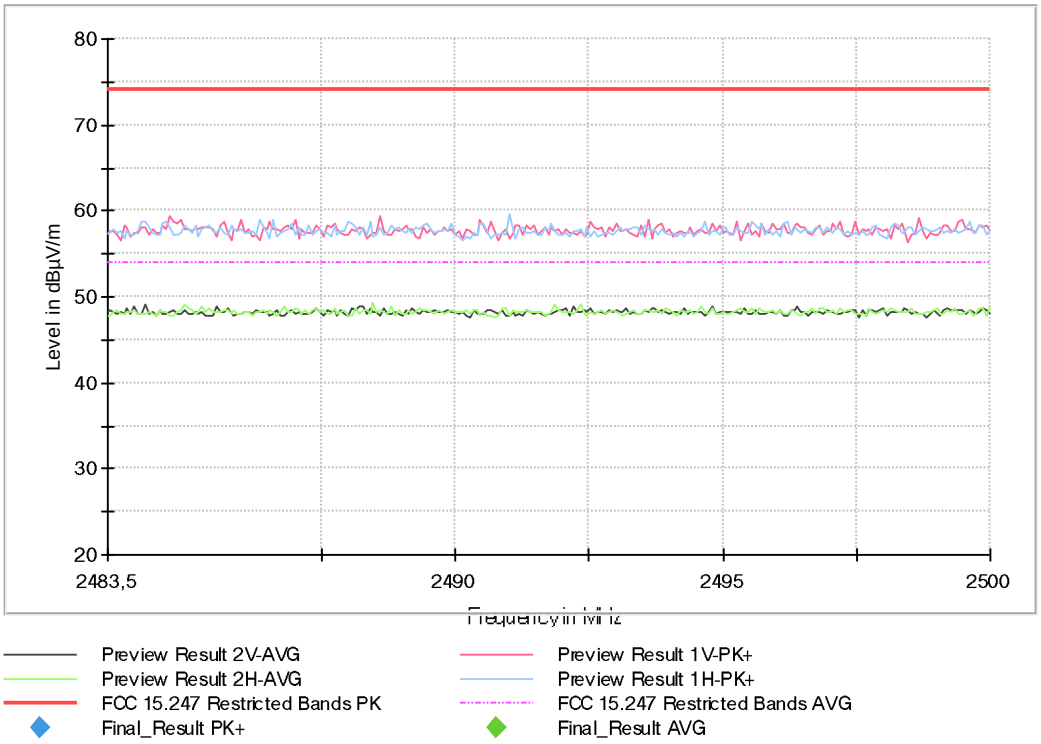
Images:



Full Spectrum



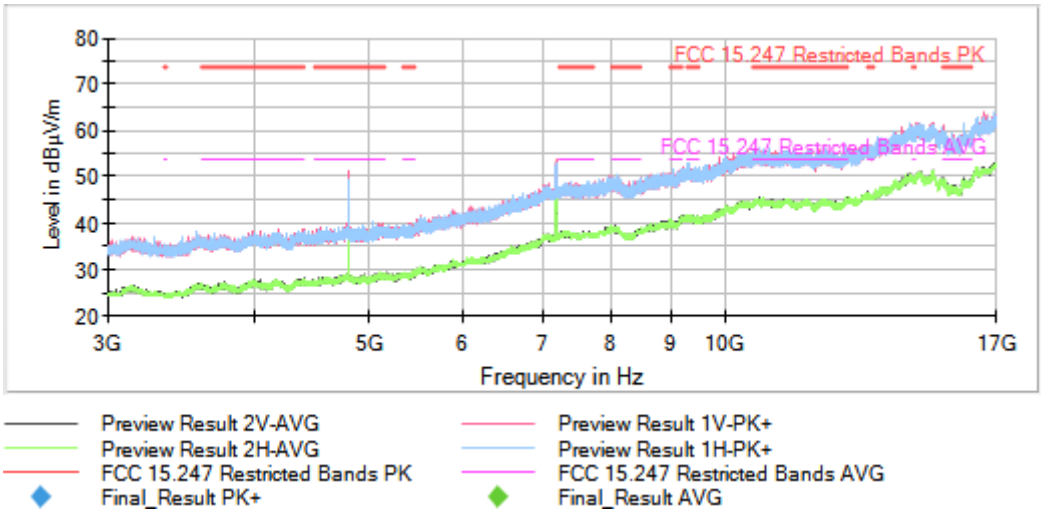
Full Spectrum



Frequency MHz = 2402.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [3, 17]

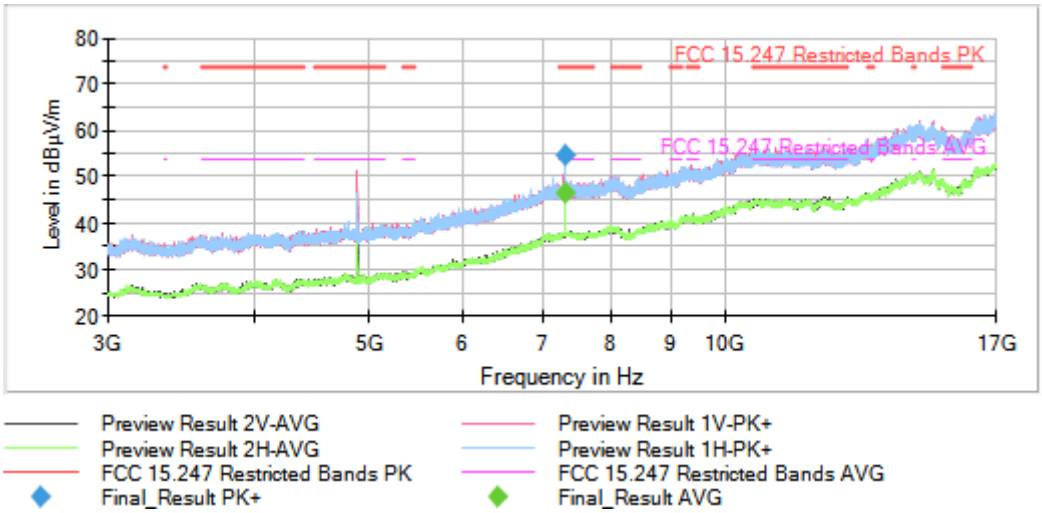
Images:



Frequency MHz = 2440.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [3, 17]

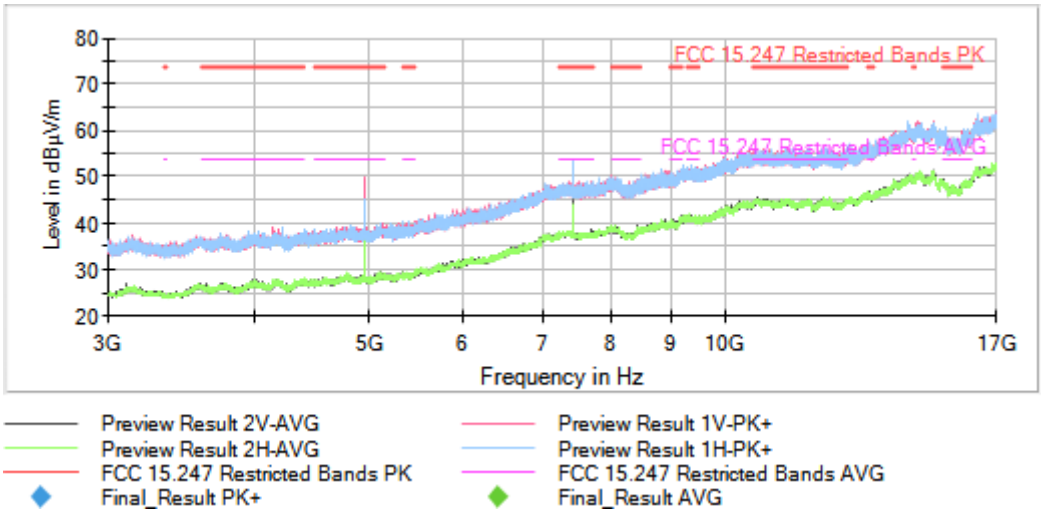
Images:



Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [3, 17]

Images:

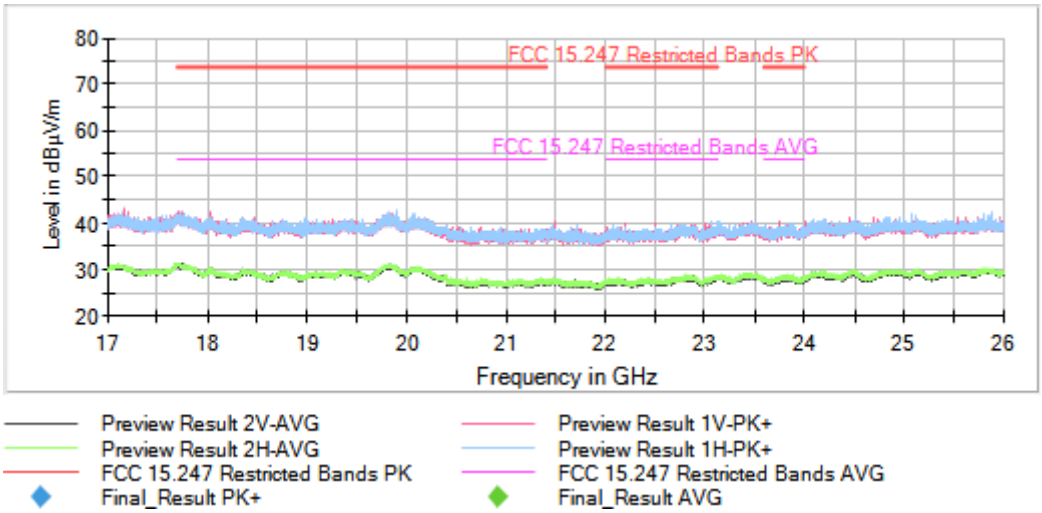


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2402.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [17, 26]

Images:



This plot is valid for all channels

Results for Sample 03

No spurious frequencies detected at less than 20 dB below the limit.

Verdict

Pass

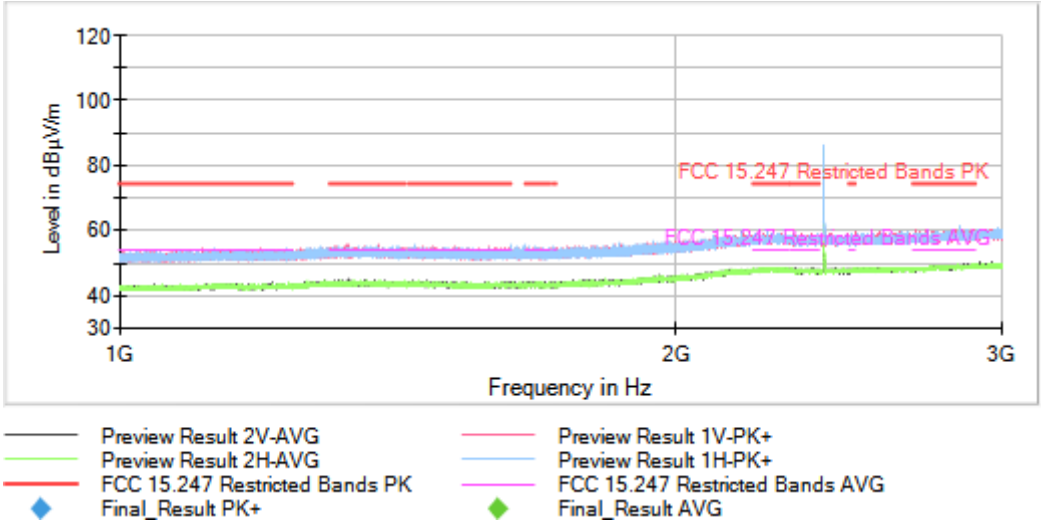
Attachments

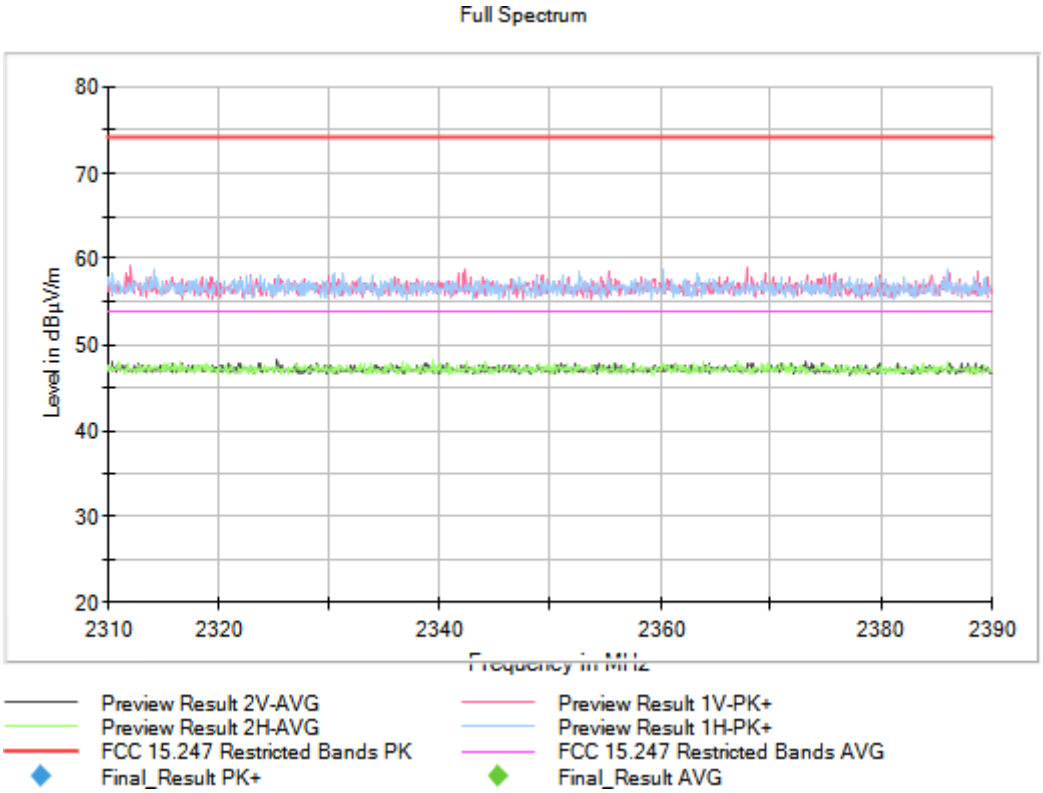
Operation Band MHz = [2400, 2483.5]

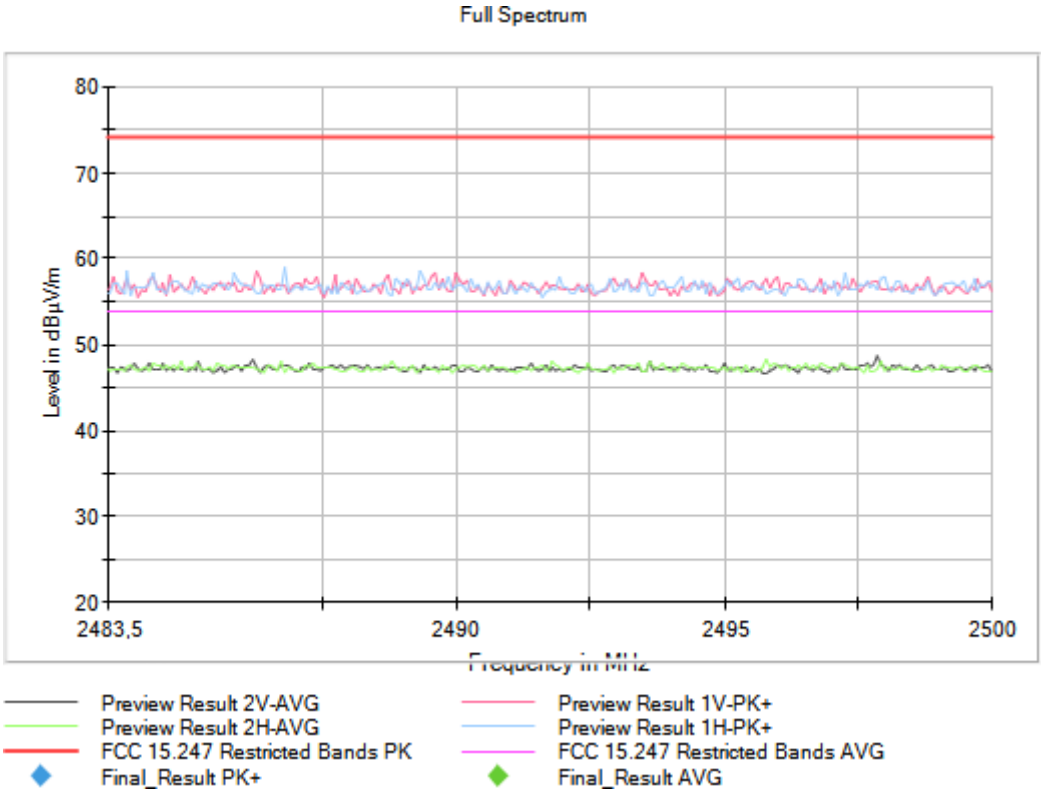
Frequency MHz = 2402.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [1, 3]

Images:




Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2340
2360
2380
2390
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

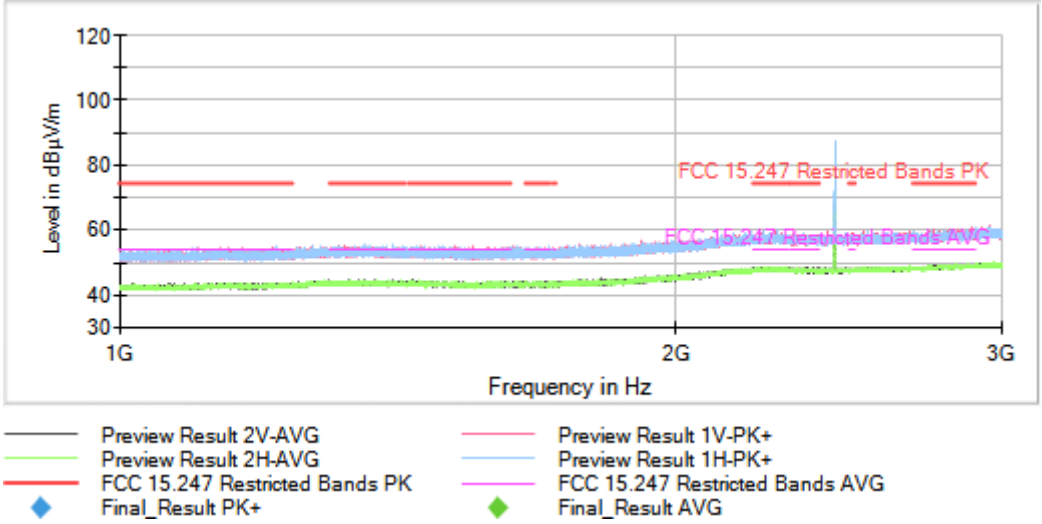

Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2440.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [1, 3]

Images:

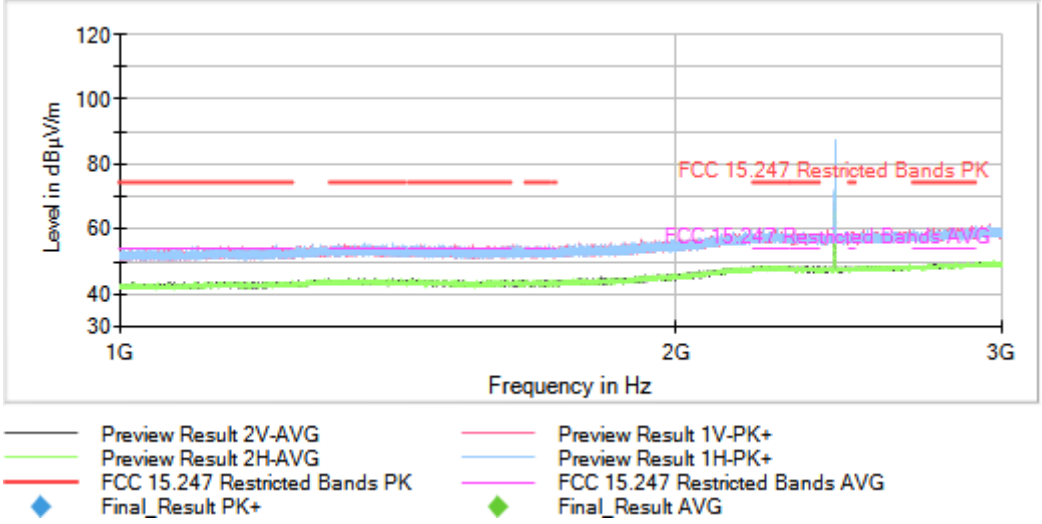


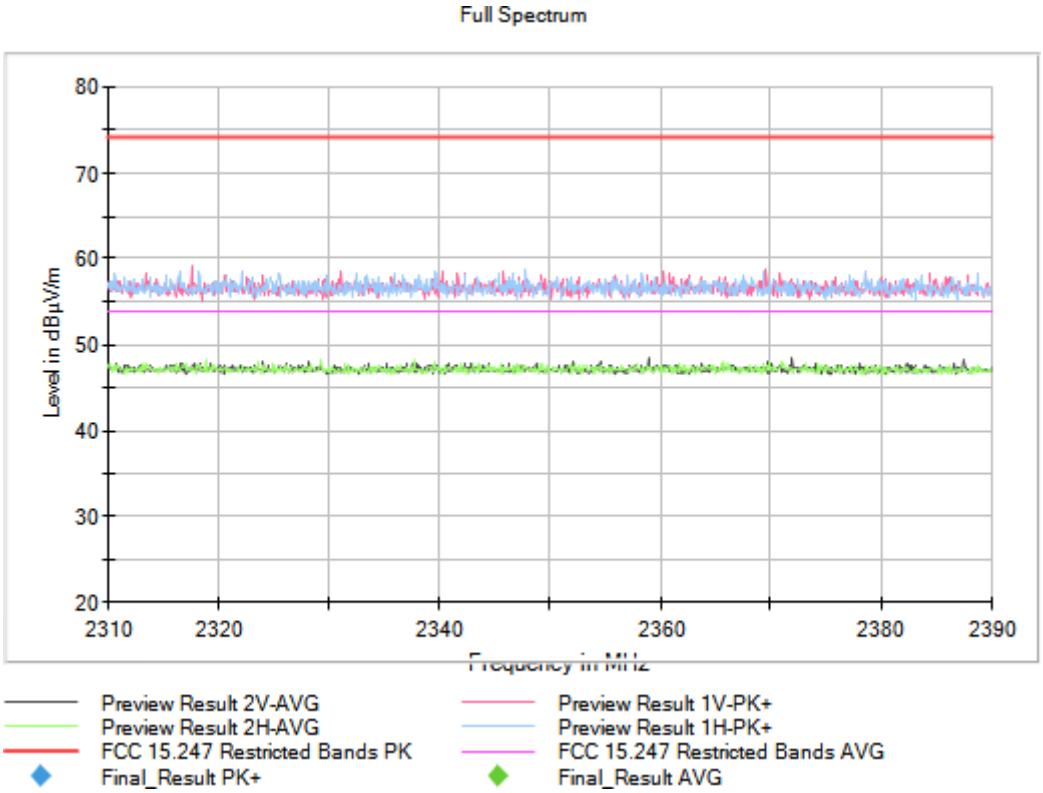
Operation Band MHz = [2400, 2483.5]

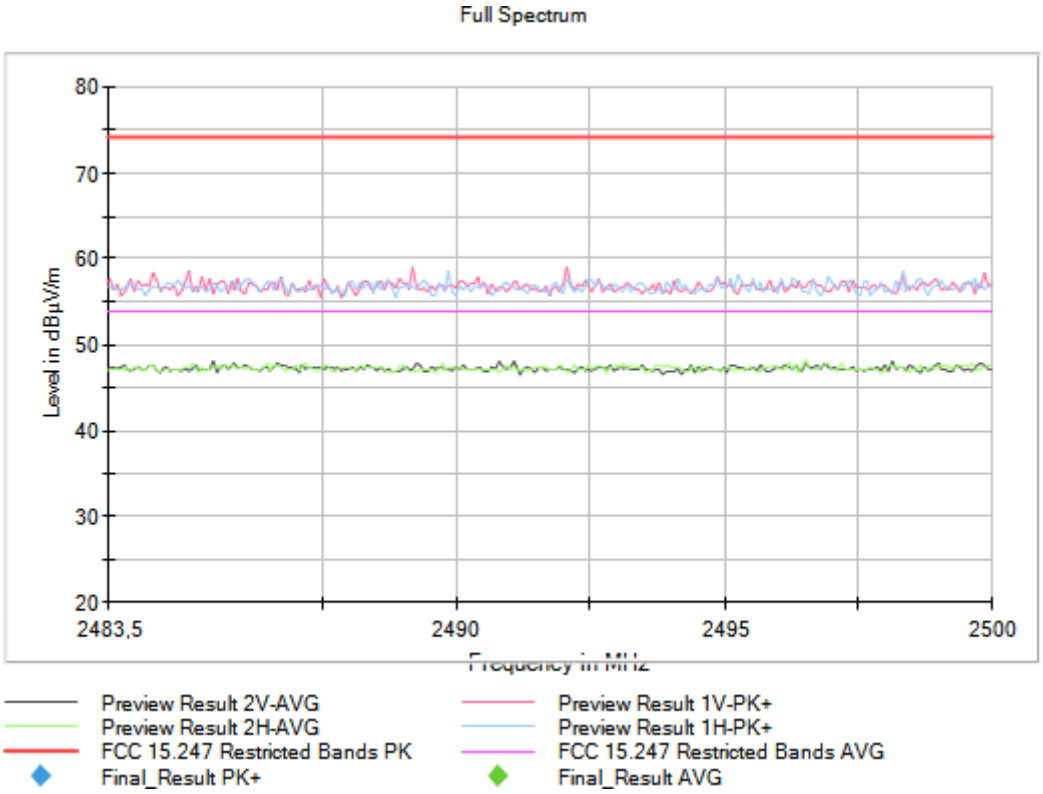
Frequency MHz = 2440.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [1, 3]

Images:




Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2310
2320
2340
2360
2380
2390
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

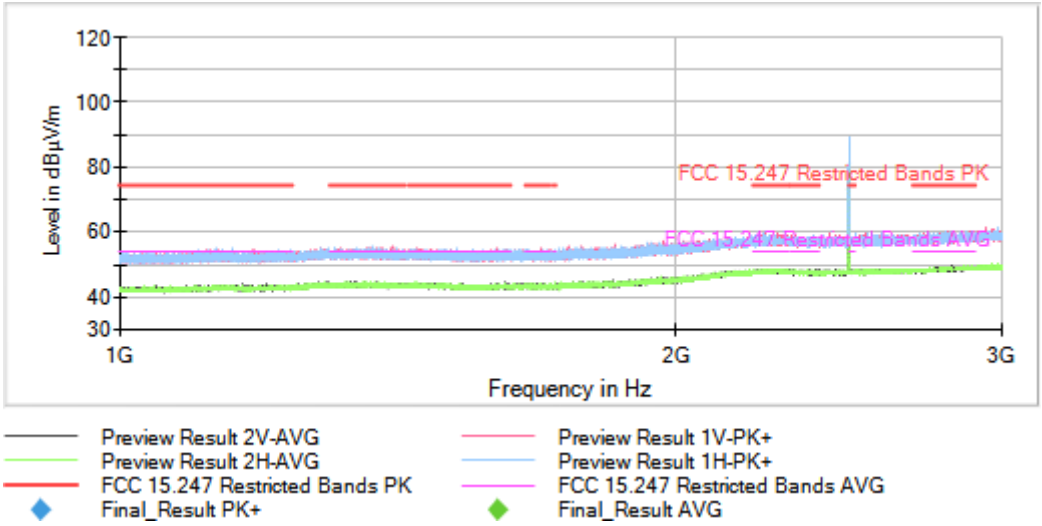

Full Spectrum
Level in dBµV/m
80
70
60
50
40
30
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Operation Band MHz = [2400, 2483.5]

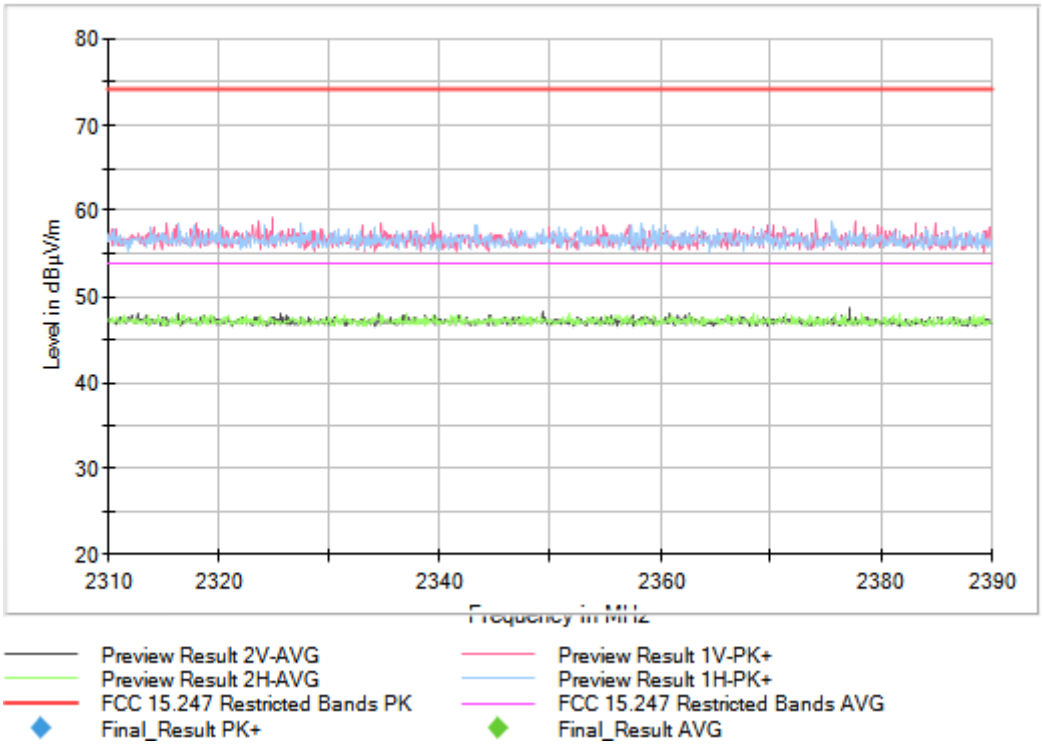
Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

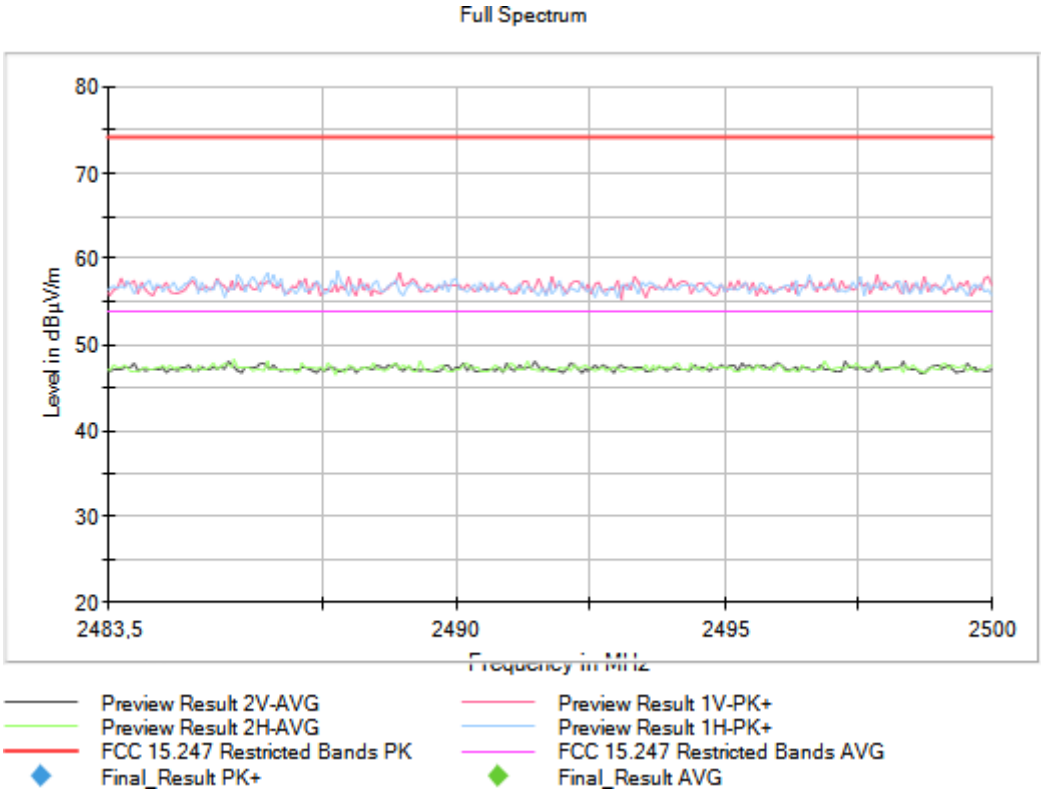
Frequency Range GHz = [1, 3]

Images:



Full Spectrum



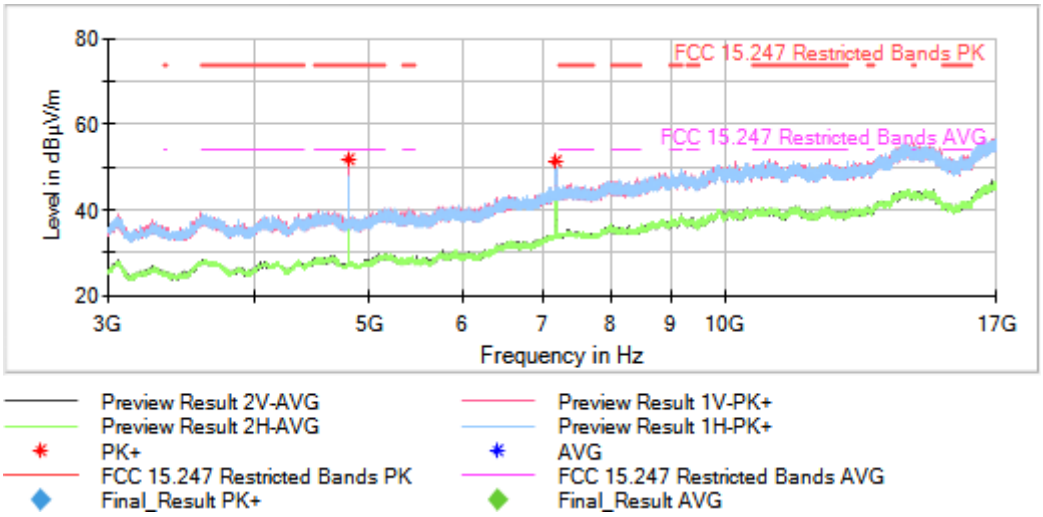


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2402.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [3, 17]

Images:

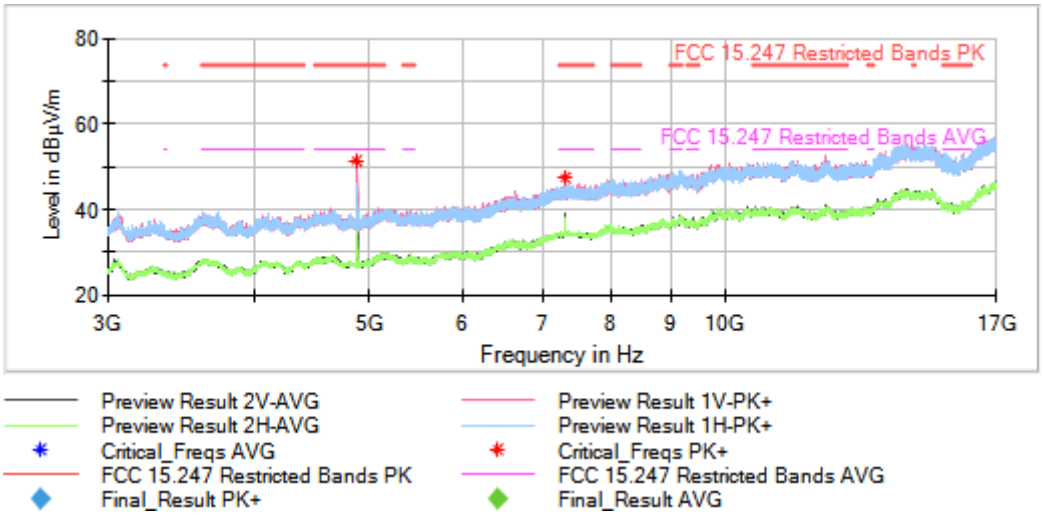


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2440.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [3, 17]

Images:

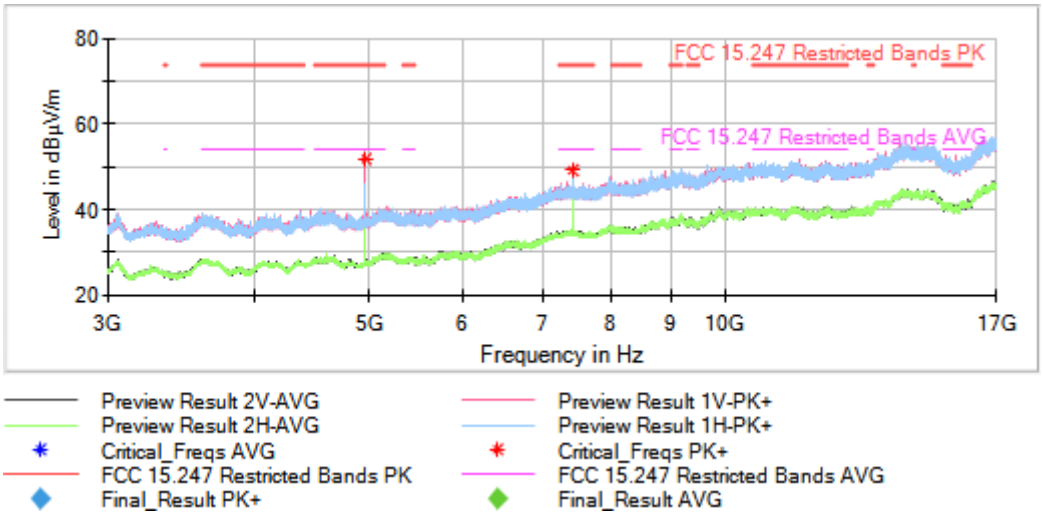


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2480.00000 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency Range GHz = [3, 17]

Images:



Modulation: DM

Results

The spurious frequencies detected at less than 20 dB below the limit:

Freq Rng (GHz)	Freq (MHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[0.03, 1]	2480.00000	930.548000	17.27	V	QP

* The spurious frequencies detected does not depend of the selected channel.

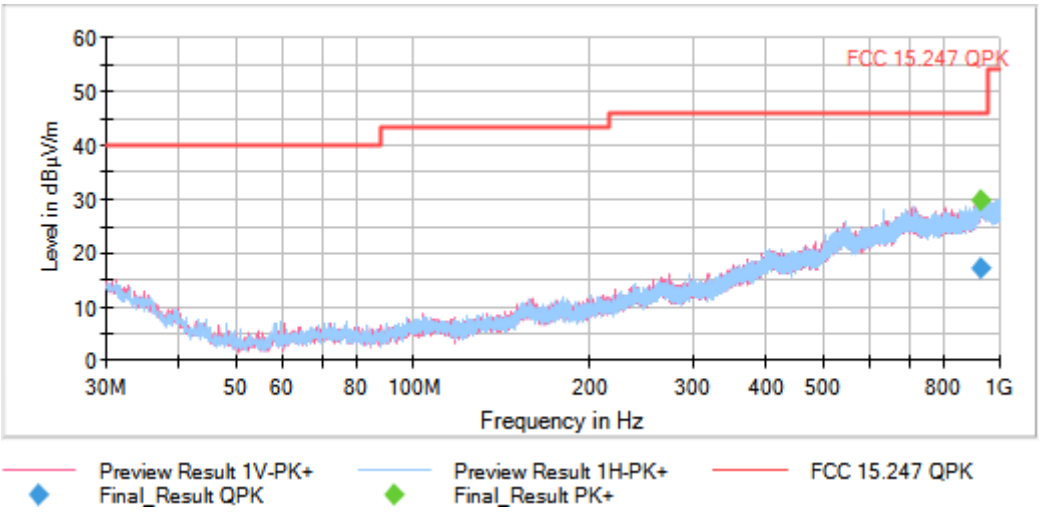
Verdict

Pass

Frequency MHz = 2480.00000 Modulation = DM

Frequency Range GHz = [0.03, 1]

Images:

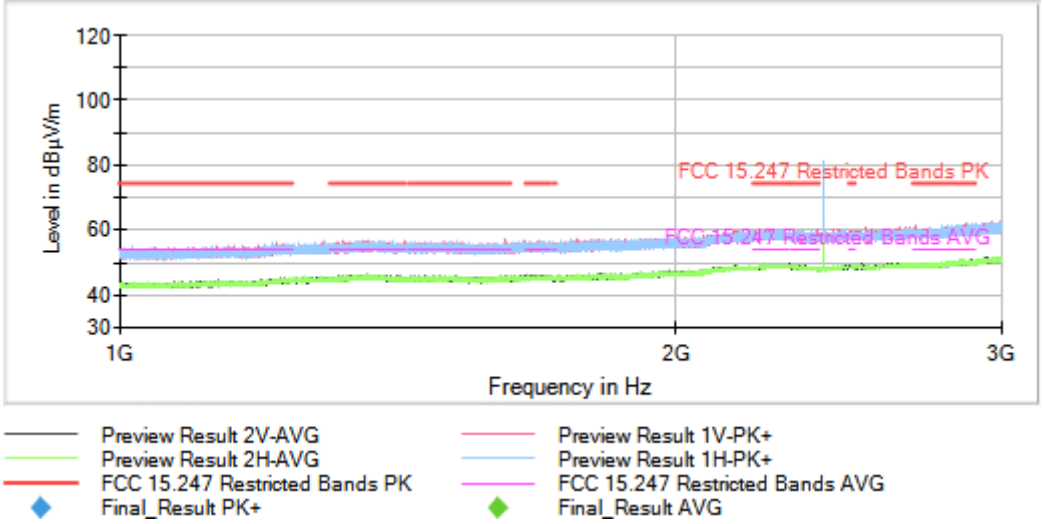


Attachments

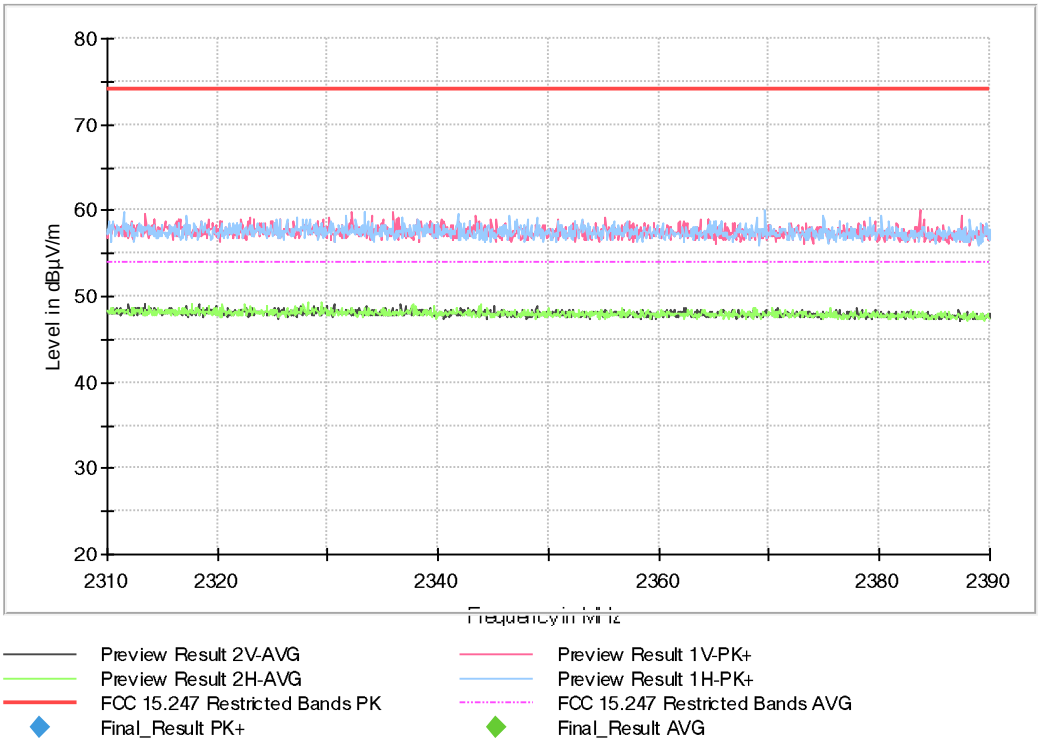
Frequency MHz = 2402.00000 Modulation = DM

Frequency Range GHz = [1, 3]

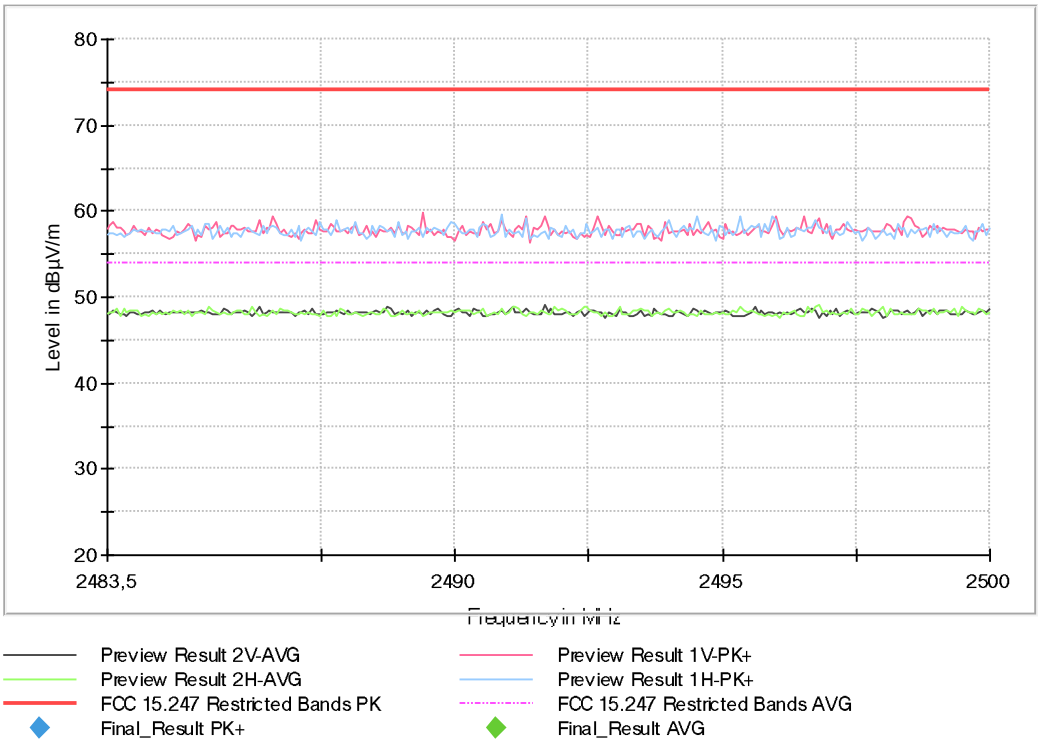
Images:



Full Spectrum



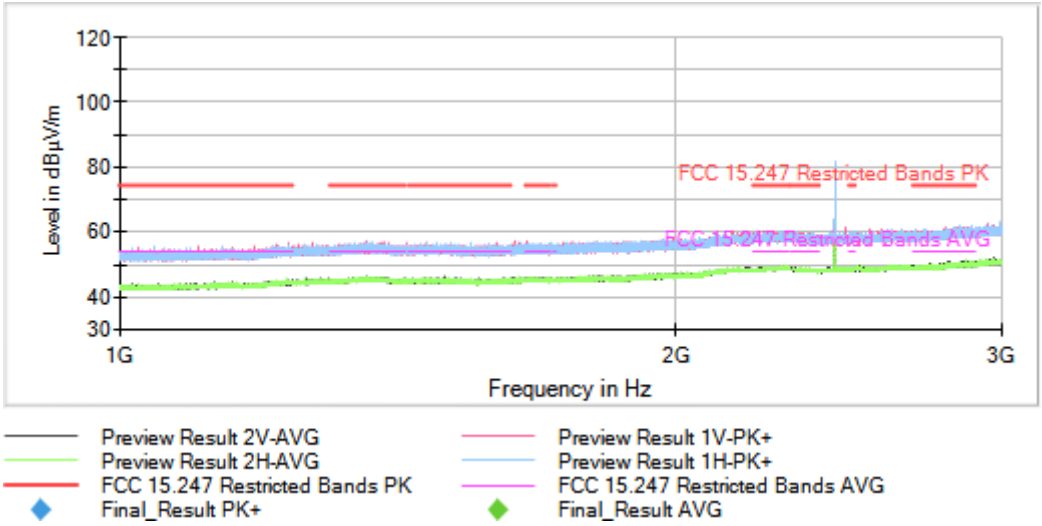
Full Spectrum



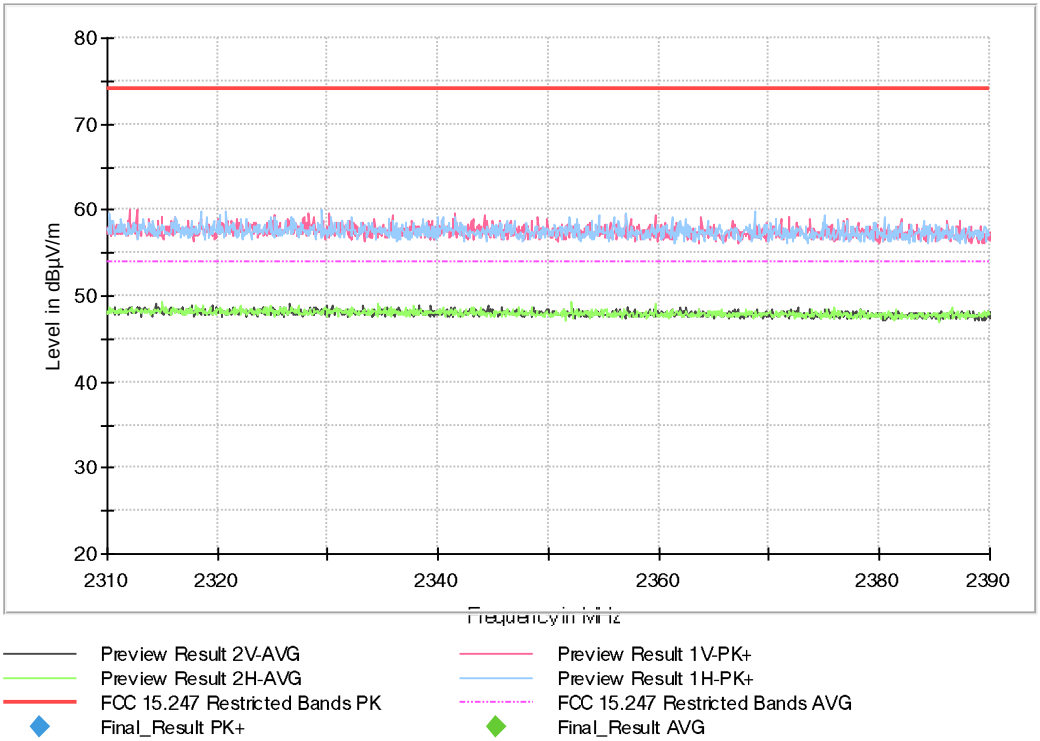
Frequency MHz = 2440.00000 Modulation = DM

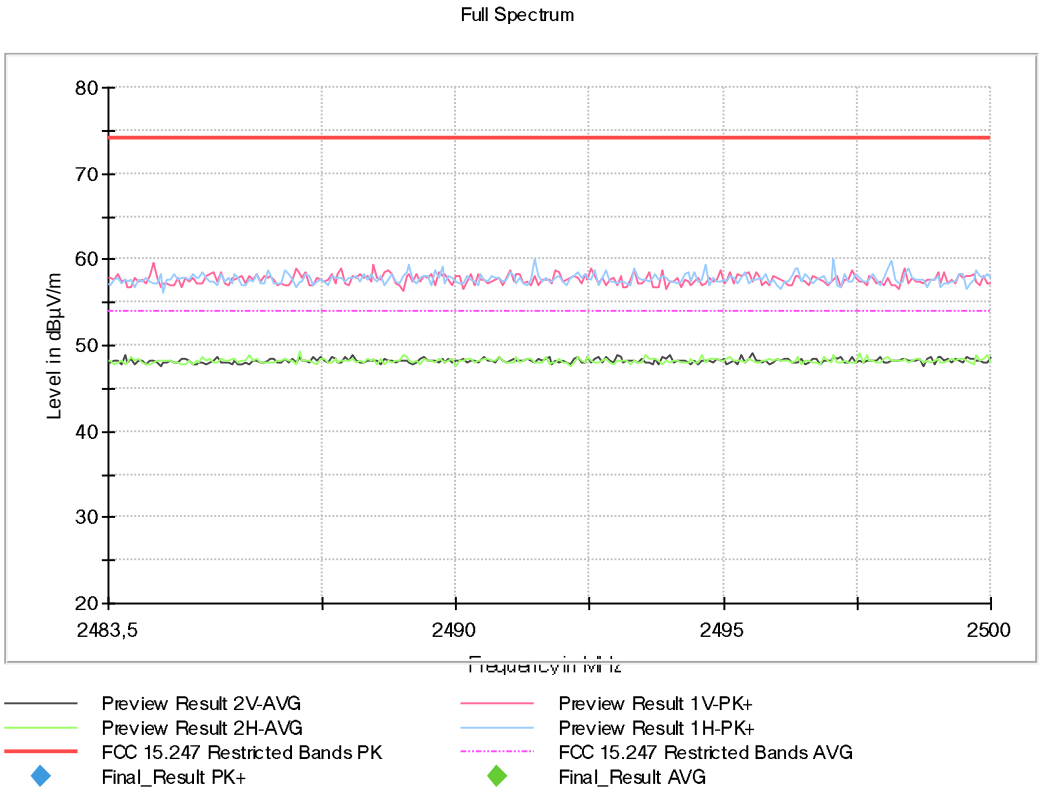
Frequency Range GHz = [1, 3]

Images:



Full Spectrum

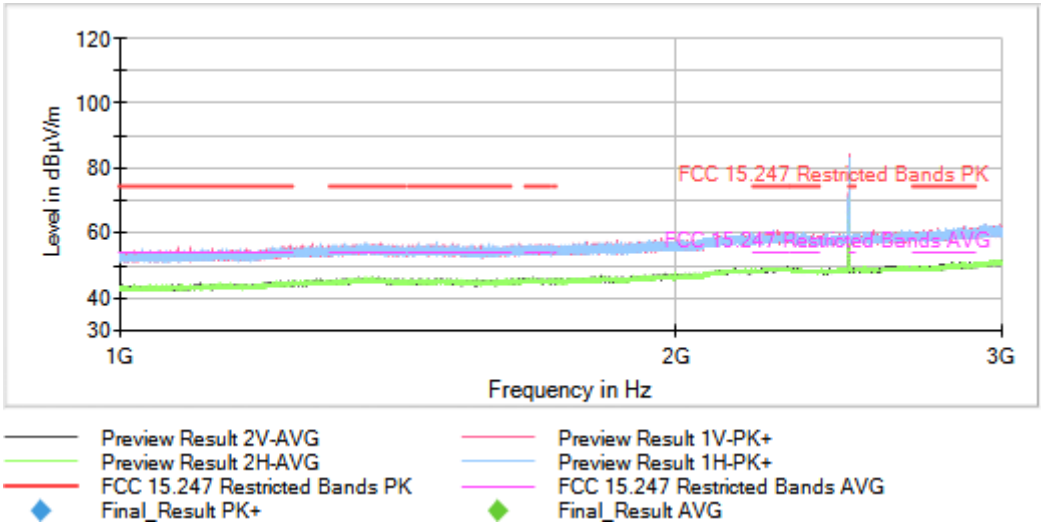




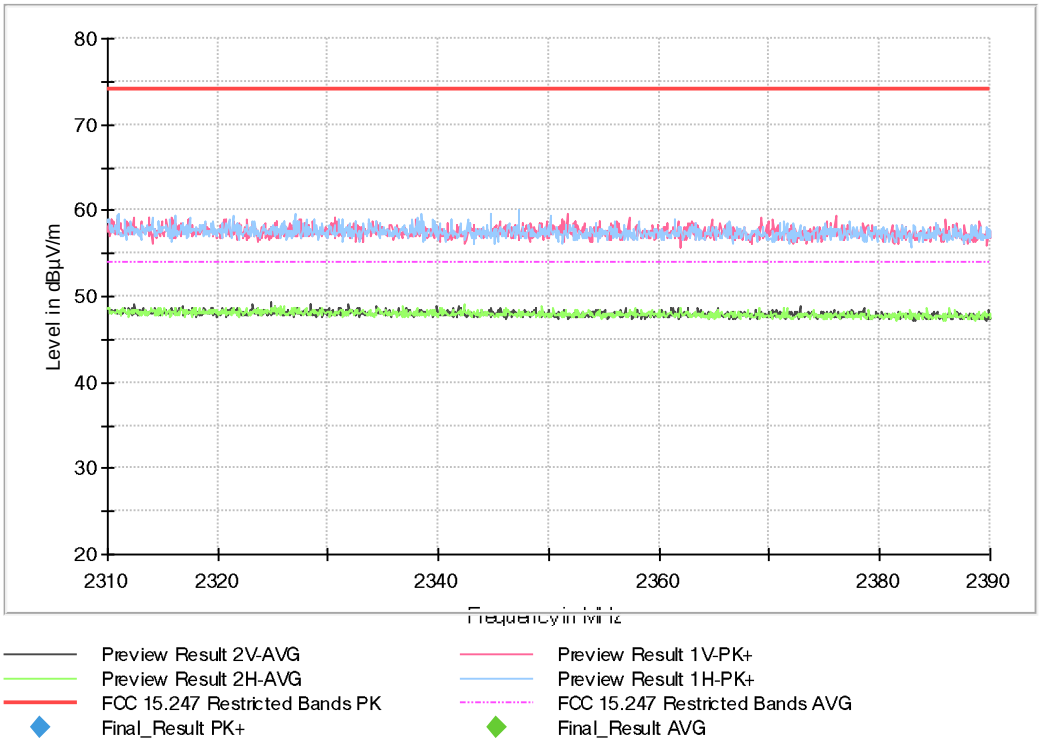
Frequency MHz = 2480.00000 Modulation = DM

Frequency Range GHz = [1, 3]

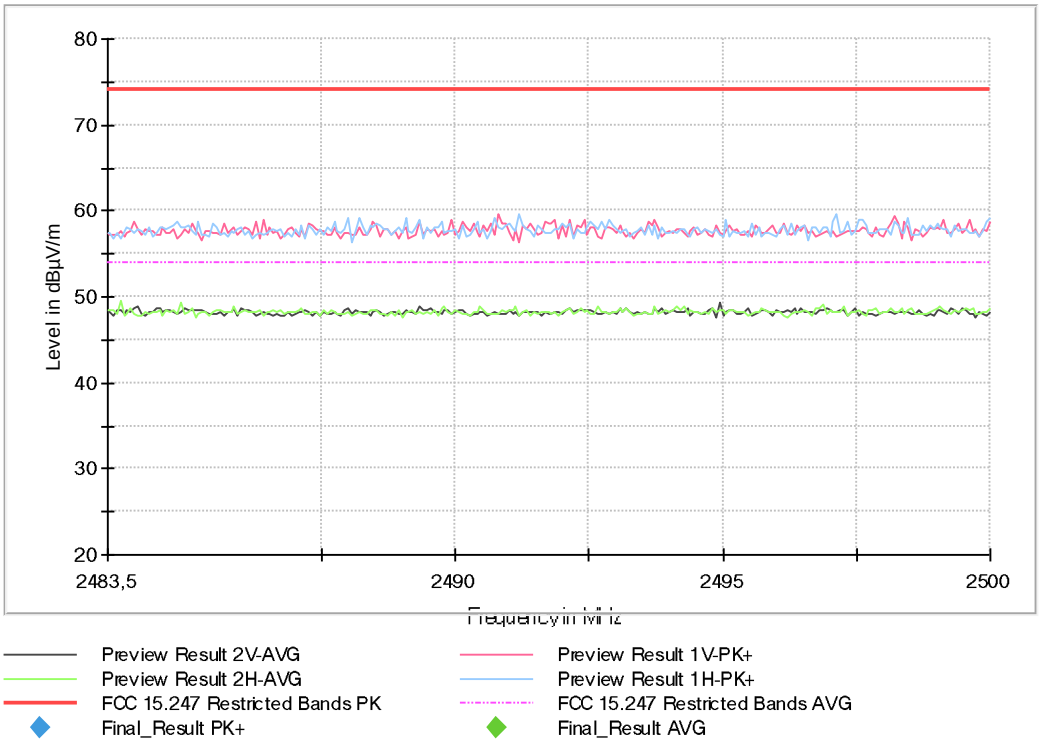
Images:



Full Spectrum



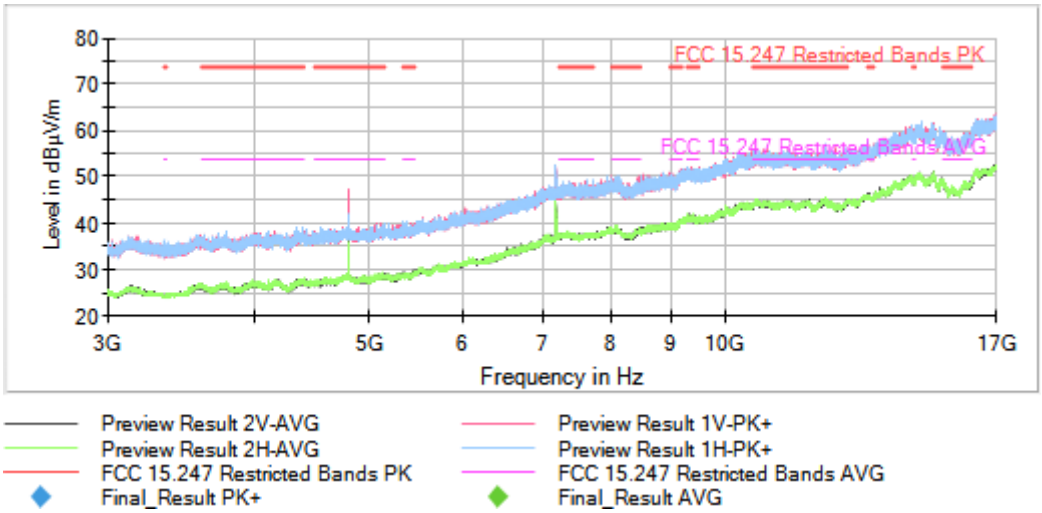
Full Spectrum



Frequency MHz = 2402.00000 Modulation = DM

Frequency Range GHz = [3, 17]

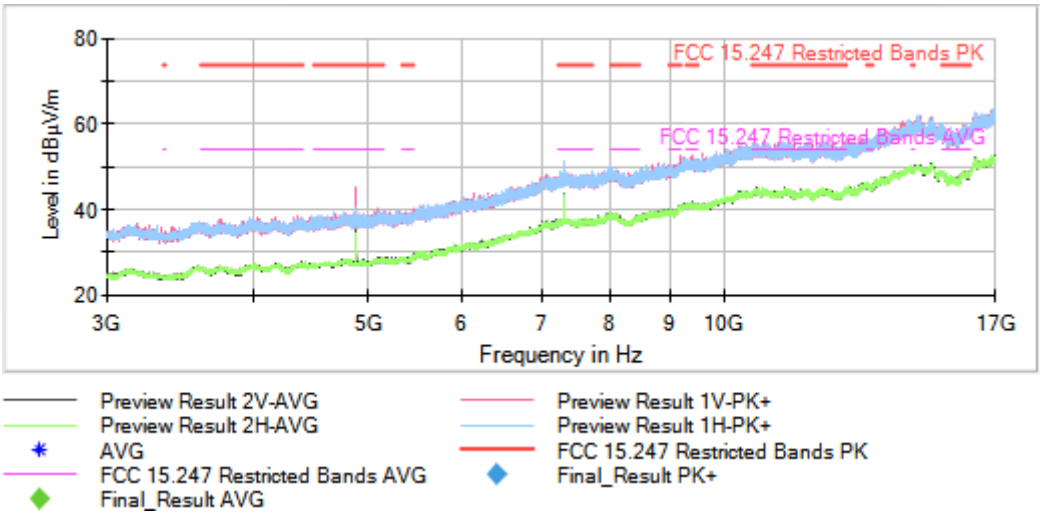
Images:



Frequency MHz = 2440.00000 Modulation = DM

Frequency Range GHz = [3, 17]

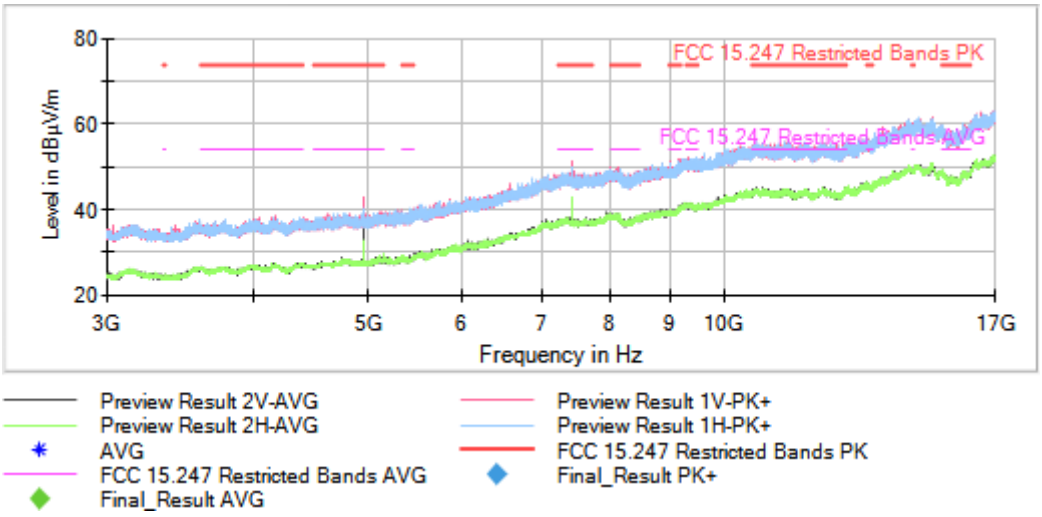
Images:



Frequency MHz = 2480.00000 Modulation = DM

Frequency Range GHz = [3, 17]

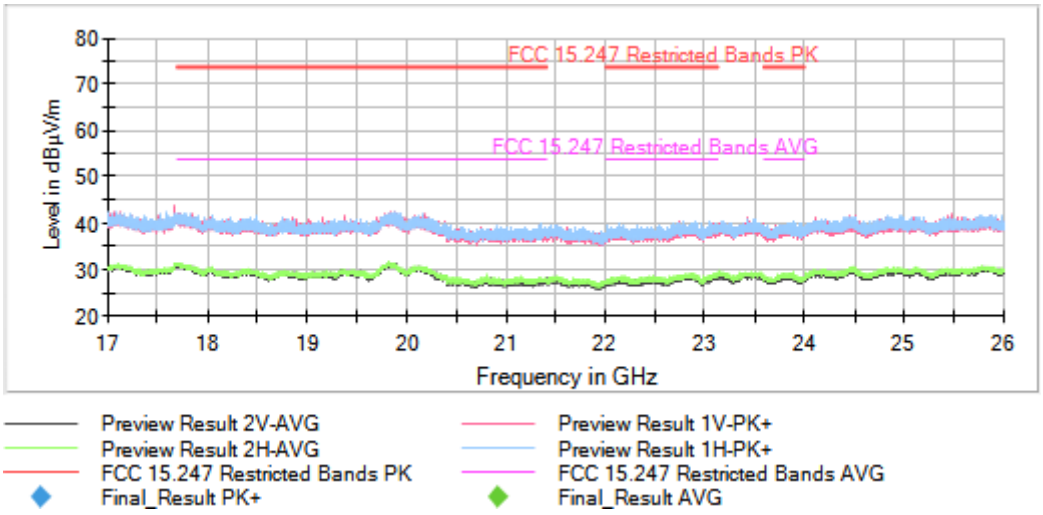
Images:



Frequency MHz = 2402.00000 Modulation = DM

Frequency Range GHz = [17, 26]

Images:



This plot is valid for all channels

Results for Sample 03

No spurious frequencies detected at less than 20 dB below the limit.

Verdict

Pass

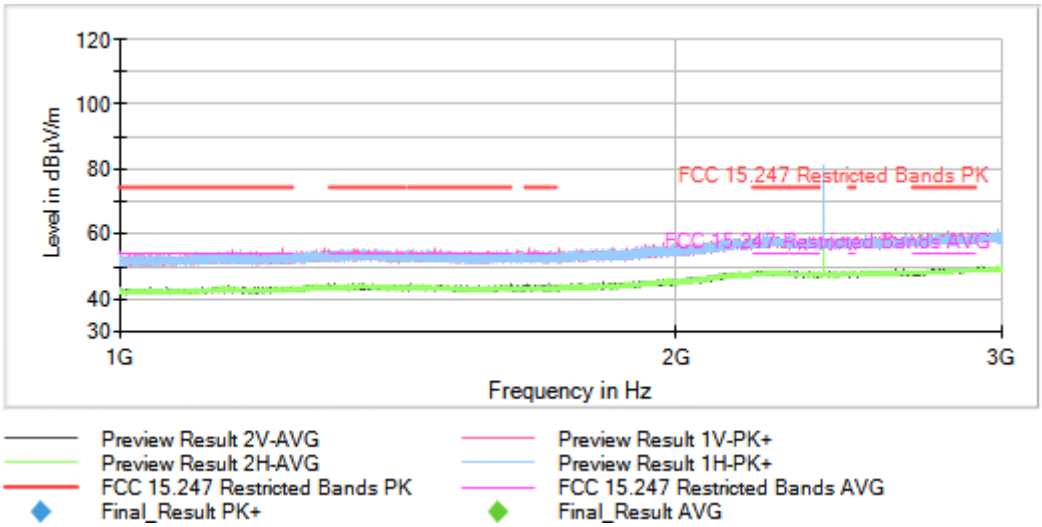
Attachments

Operation Band MHz = [2400, 2483.5]

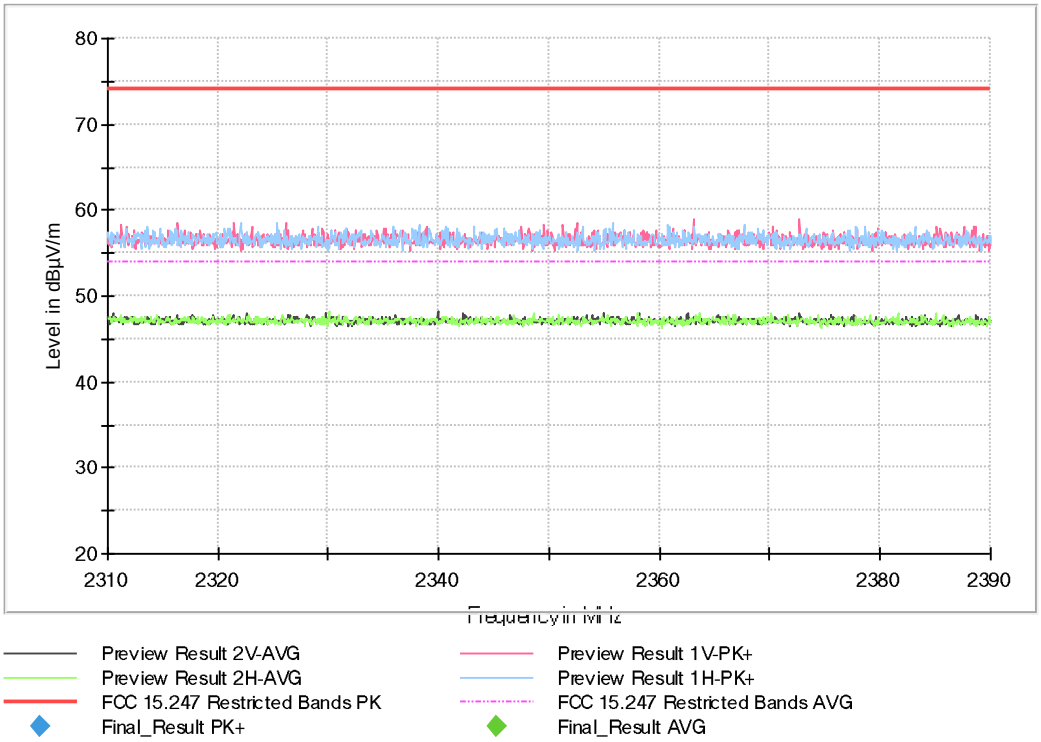
Frequency MHz = 2402.00000 Modulation = DM

Frequency Range GHz = [1, 3]

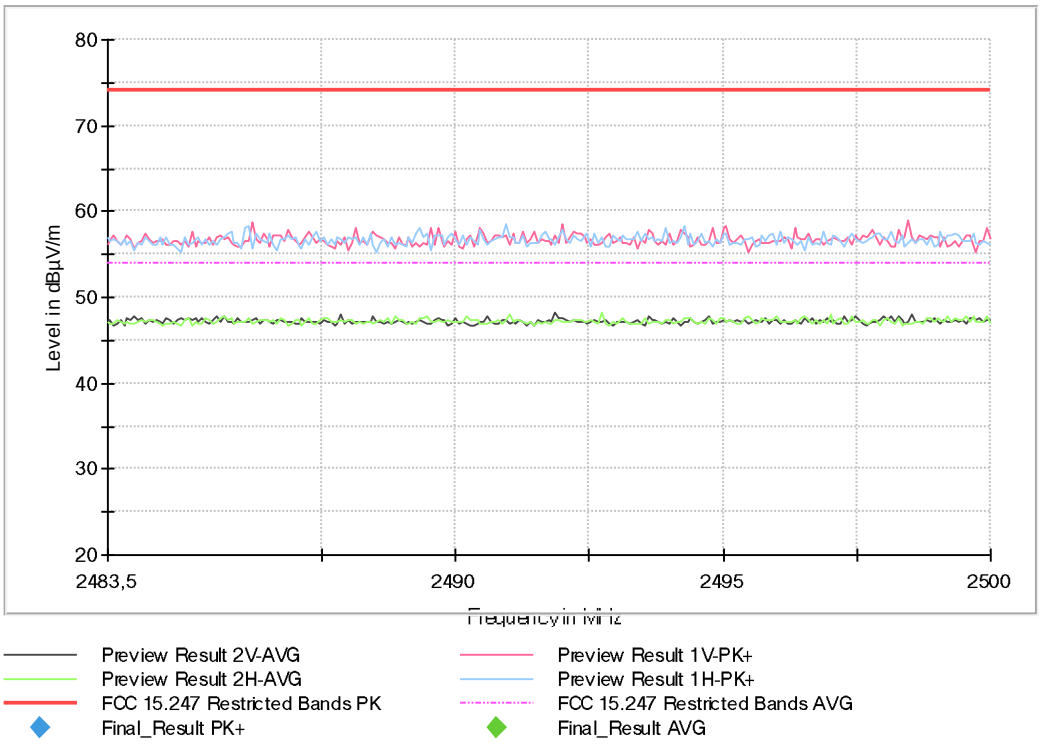
Images:



Full Spectrum



Full Spectrum

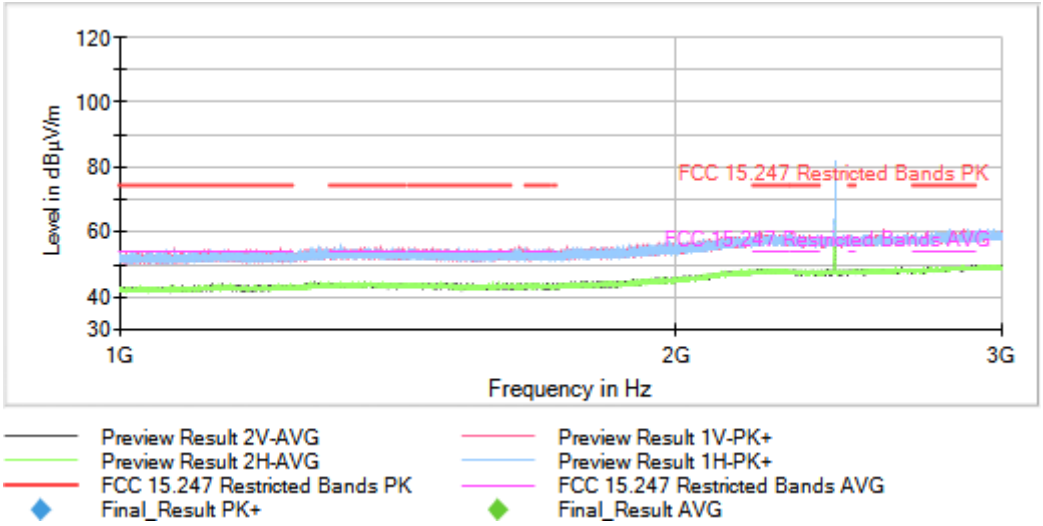


Operation Band MHz = [2400, 2483.5]

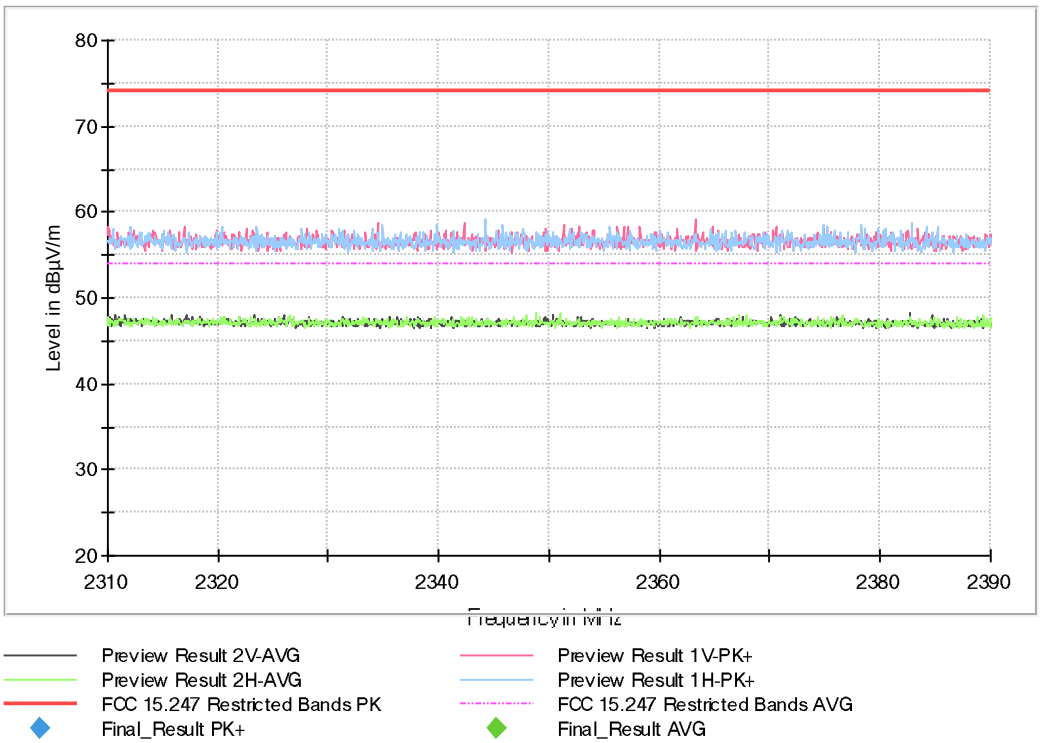
Frequency MHz = 2440.00000 Modulation = DM

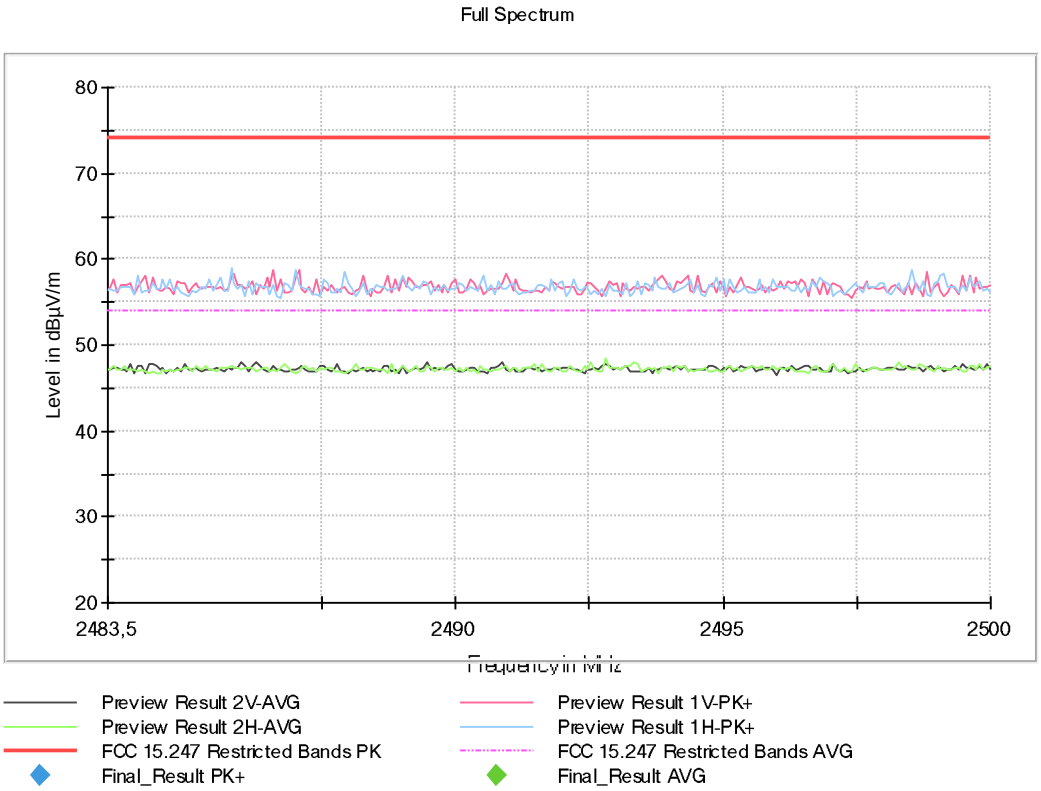
Frequency Range GHz = [1, 3]

Images:



Full Spectrum



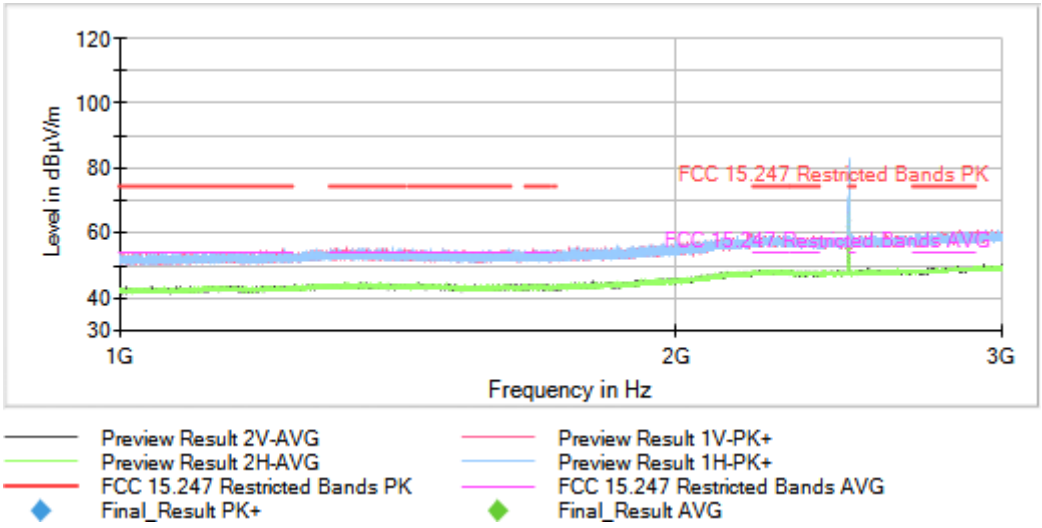


Operation Band MHz = [2400, 2483.5]

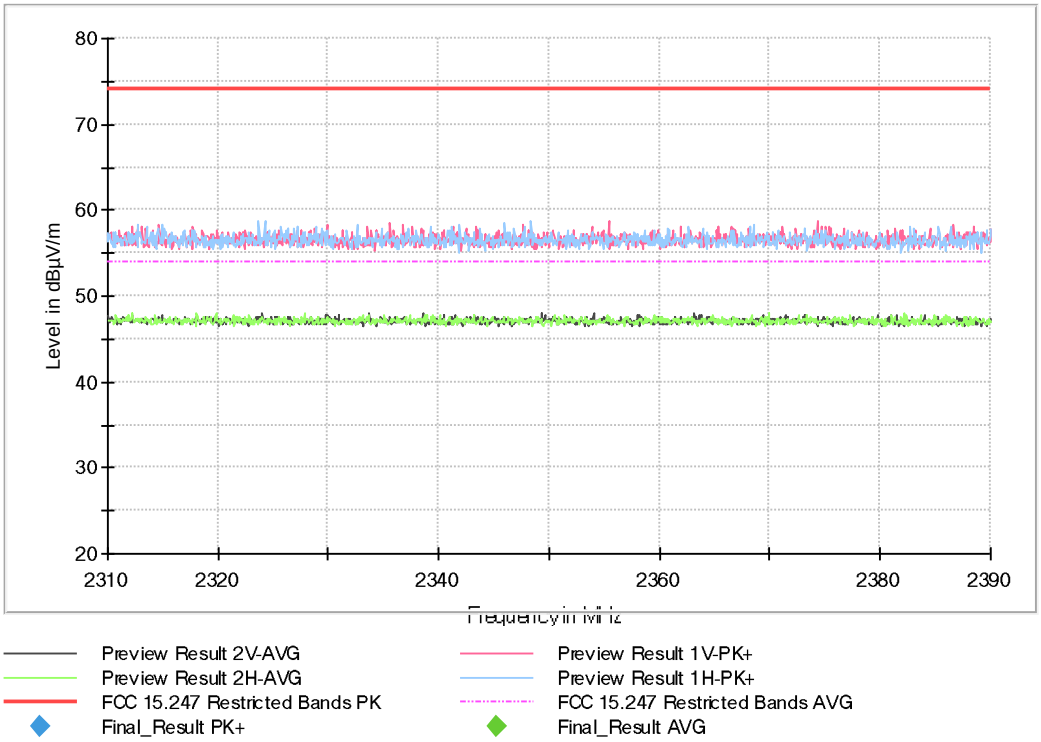
Frequency MHz = 2480.00000 Modulation = DM

Frequency Range GHz = [1, 3]

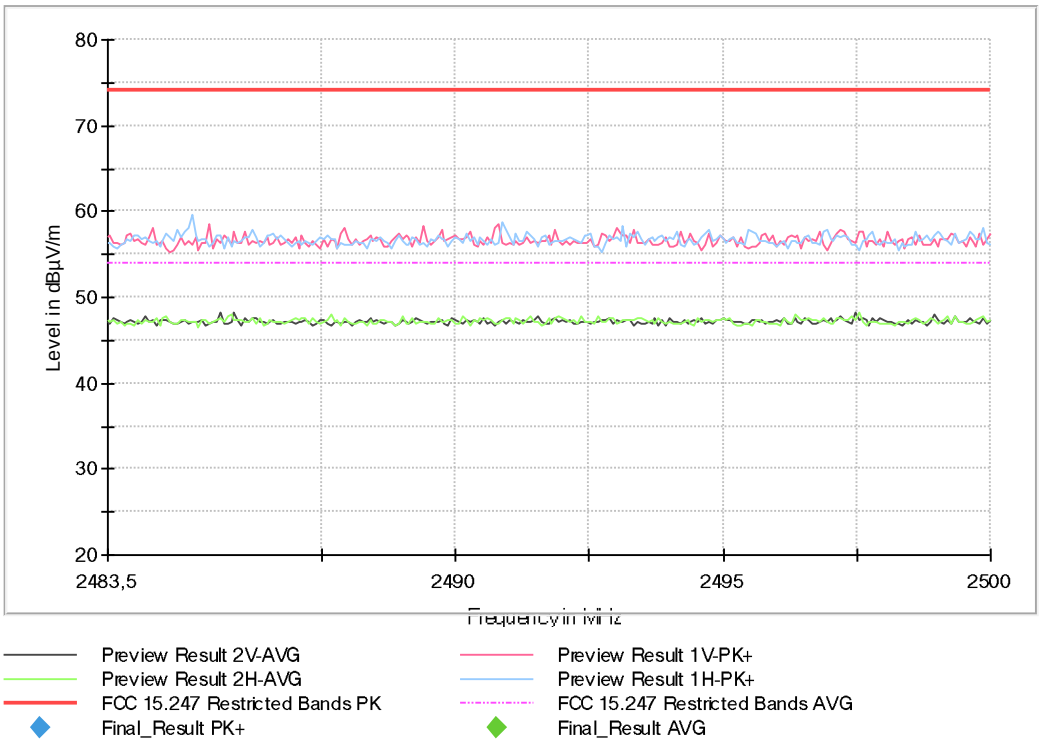
Images:



Full Spectrum



Full Spectrum

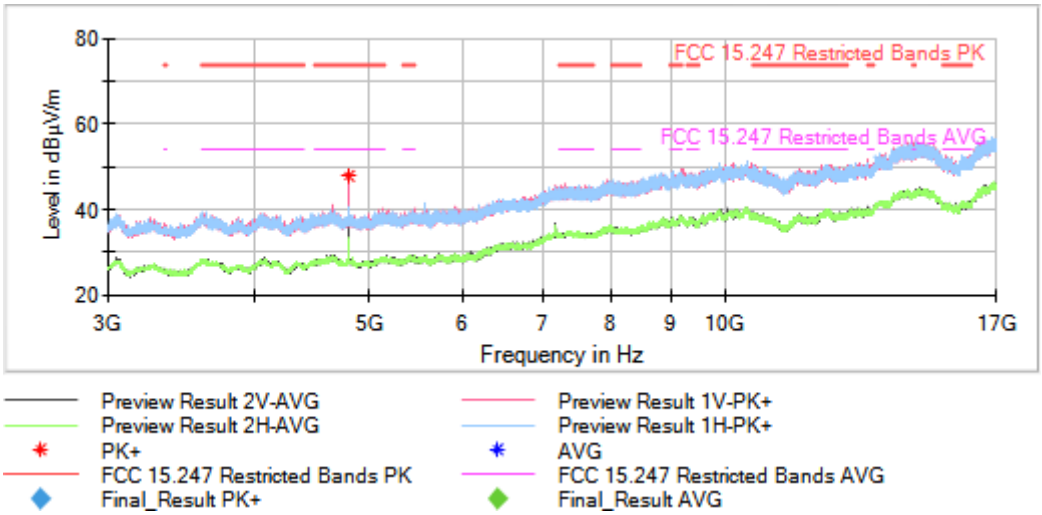


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2402.00000 Modulation = DM

Frequency Range GHz = [3, 17]

Images:

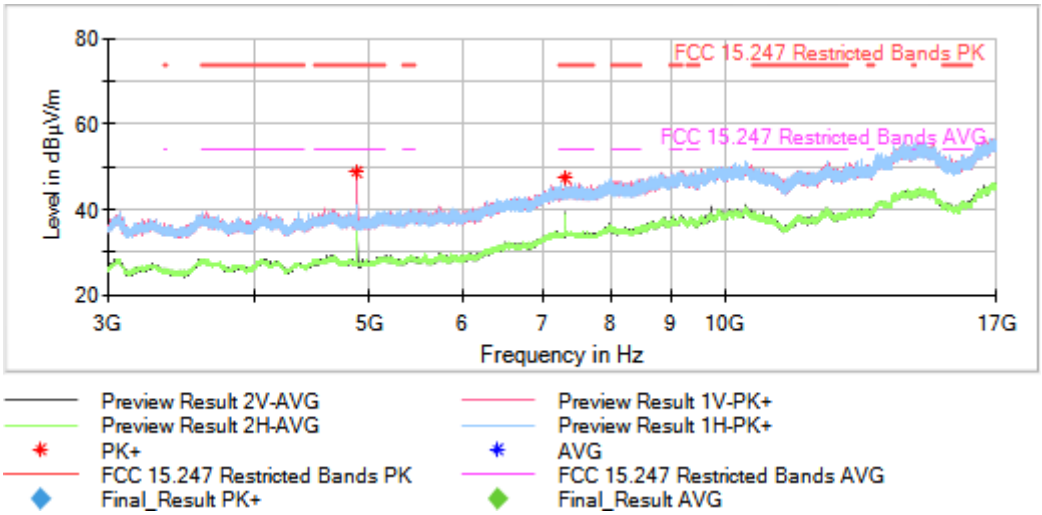


Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2440.00000 Modulation = DM

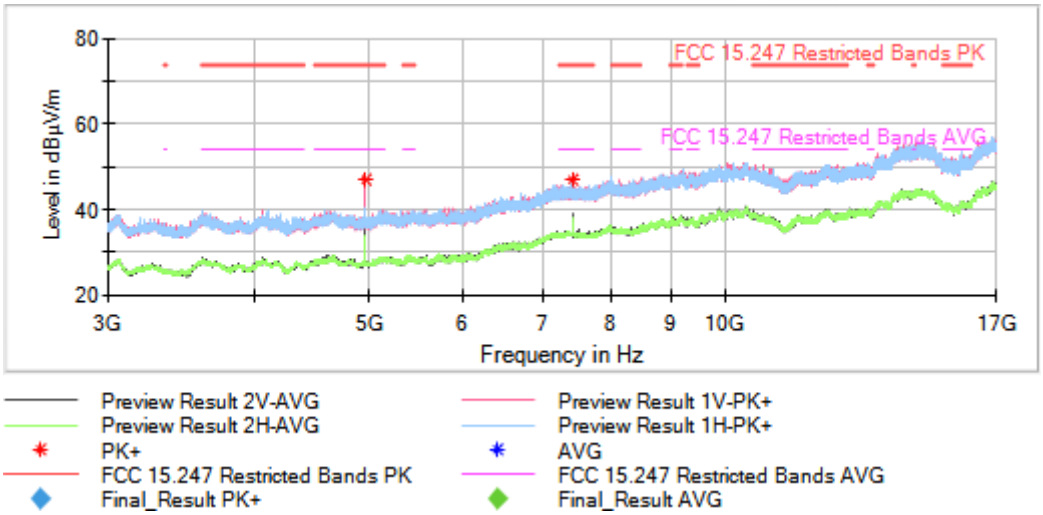
Frequency Range GHz = [3, 17]

Images:



Operation Band MHz = [2400, 2483.5]

Frequency MHz = 2480.00000 Modulation = DM

Frequency Range GHz = [3, 17]

Images: