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

Test Report No:
NIE: 69743RRF.005A2

Partial Test Report

USA FCC Part 15.247, 15.209
CANADA RSS-247, RSS-Gen

(*) Identification of item tested	iCG100 GNSS Controller
(*) Trademark	Leica
(*) Model and /or type reference	iCG100
Other identification of the product	FCC ID: RFD-ICG100 IC: 3177A-ICG100
(*) Features	Bluetooth 4.0, 802.11@2.4GHz, GNSS RTK HW version: 2A SW version: 0.1.1707
Manufacturer	LEICA GEOSYSTEMS AG Heinrich-Wild-Strasse, 9435 Heerbrugg, Switzerland
Test method requested, standard	USA FCC Part 15.247 (10-1-20 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-20 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 2 (February 2017). CANADA RSS-Gen Issue 5 Amendment 2 (Feb. 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)	Rafael López Martín EMC Consumer & RF Lab. Manager 2022.10.18 18:07:25 +02'00'
Date of issue	2022-10-18
Report template No.	FDT08_24 (*) "Data provided by the client"

Index

Acronyms

Acronym ID	Acronym Description
Detector	Detector used
Equipment	Equipment Type
EUT	Equipment Under Test
Freq	Frequency
Freq Rng	Frequency Range
Mod	Modulation
Operation Band	Operation Band
Pol	Polarization
RSE	Radiated Spurious Emissions
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 is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification is an ISED-recognized accredited testing laboratory, CABid: ES1909, 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.

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).

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 Dual GNSS machine receiver.

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.

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	69743_17.1	iCG100 GNSS Controller with antenna connectors	iCG100	0001002	2021-12-02	Equipment Under Test
S/01	69743_2.1	LTE Dual Antenna	BPCTHPDLTE-SF-MM	24221008	2021-12-02	Equipment Under Test
S/01	69743_56.1	MSMA Antenna	WV-COVDB2458-7FT-MSMA	--	2021-12-02	Equipment Under Test
S/01	69743_82.1	C15 Robust Antenna Cable 5M	--	--	2021-12-02	Equipment Under Test
S/01	69743_83.1	C15 Robust Antenna Cable 5M	--	--	2021-12-02	Equipment Under Test
S/01	69743_88.1	GNSS Antenna	CGA100	4207189	2021-12-02	Equipment Under Test
S/01	69743_89.1	GNSS Antenna	CGA100	4207433	2021-12-02	Equipment Under Test
S/01	69743_10.1	CR50 Communications Controller	CR50	0001005	2021-12-02	Auxiliary Equipment

Id	Control Number	Description	Model	Serial No.	Date of Reception	Application
S/01	69743_24.1	Magnetic Antenna	GMLFML195	--	2021-12-02	Auxiliary Equipment
S/01	69743_44.1	480MHz Antenna	MLPV430	--	2021-12-02	Auxiliary Equipment
S/01	69743_62.1	USB Type A -Jack	--	--	2021-12-02	Auxiliary Equipment
S/01	69743_68.1	USB Type A -Jack	--	--	2021-12-02	Auxiliary Equipment
S/01	69743_73.1	D9+Power Cable	--	--	2021-12-02	Auxiliary Equipment
S/01	69743_98.1	Media Convert	100BASE-T1	050501E0	2021-12-02	Auxiliary Equipment
S/01	69743_110.1	AEC M12T M/F 5,0m cable	950559	--	2021-12-02	Auxiliary Equipment

Notes referenced to samples during the project:

Id	Type
S/01	Sample used for all tests of Appendixes A and B.

Test sample description

Ports…… :	Port name and description	Cable				
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)	
	USB	N.A.	[ ]	[ ]	[ ]	
	Auto ETH1, 2	10m	[X]	[ ]	[ ]	
			[ ]	[ ]	[ ]	
Supplementary information to the ports…… :	.....					
Rated power supply .....:	Voltage and Frequency	Reference poles				
		L1	L2	L3	N	PE
	[X] DC: 12V					
	[ ]					
Rated Power .....:	12W					
Clock frequencies.....:						
Other parameters .....:	Supply voltage range: 9 V to 36 V DC					
Software version .....:	0.1.1707					
Hardware version .....:	2A					
Dimensions in cm (W x H x D) ....:	.....					
Mounting position .....:	[ ] Table top equipment					
	[ ] Wall/Ceiling mounted equipment					
	[ ] Floor standing equipment					
	[ ] Hand-held equipment					
	[X] Other: Machine mount typically engine/cab compartment mount					
Modules/parts.....:	Module/parts of test item	Type	Manufacturer			
	OEM7720	GNSS	NOVATEL			
Accessories (not part of the test item) .....:	Description	Type	Manufacturer			
	Aut ETH to ETH Converter	.....	.....			
		.....	.....			
Documents as provided by the applicant .....:	Description	File name	Issue date			
	Blackbird Technical Data Sheet	.....	.....			
	Blackbird Test Setup	.....	.....			

(3) Only for Medical Equipment

Identification of the client

LEICA GEOSYSTEMS AG
Heinrich-Wild-Strasse, 9435 Heerbrugg, Switzerland

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2022-01-03
Date (finish)	2022-04-29

Document history

Report number	Date	Description
69743RRF.005	2022-08-25	First release.
69743RRF.005A1	2022-10-04	First modification: due to typo found. This modification test report cancels and replaces the test report 69743RRF.005.
69743RRF.005A2	2022-10-18	Second modification: including missing information. This modification test report cancels and replaces the test report 69743RRF.005A1.

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 semi-anechoic 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: Alfonso Gutiérrez Martínez, José Manuel Jiménez González and Nicolás Salguero Camarena.

Used instrumentation:

Equipment	Model	Manufacturer	Next Calibration
SEMIANECHOIC ABSORBER LINED CHAMBER IV	FACT 3 200 STP	ETS LINDGREN	2024-06-07
SHIELDED ROOM	S101	ETS LINDGREN	N/A
DC POWER SUPPLY 30V/5A	U8002A	KEYSIGHT TECHNOLOGIES	N/A
DIGITAL MULTIMETER	179	FLUKE	2022-10-19
HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2023-10-29
HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2023-08-24
HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2023-05-05
PRE-AMPLIFIER G>40dB 10MHz-6GHz	BLNA 0160-01N	BONN ELEKTRONIK	2023-03-17
PRE-AMPLIFIER G>30dB 1GHz-18GHz	BLMA 0118-3A	BONN ELEKTRONIK	2022-12-01
PRE-AMPLIFIER G>30dB 17-40GHz	BLMA 1840-4A	BONN ELEKTRONIK	2022-09-08
EMI TEST RECEIVER 9kHz-7GHz	ESR7	ROHDE AND SCHWARZ	2022-12-12
SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2023-10-22
EMC/RF MEASUREMENT SOFTWARE	EMC32	ROHDE AND SCHWARZ	N/A
SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2023-02-26
OPEN SWITCH UNIT UP TO 7.5 GHz	OSP-B157W8 PLUS	ROHDE & SCHWARZ	2023-08-20
EMC/RF MEASUREMENT SOFTWARE	WMS32	ROHDE AND SCHWARZ	N/A

Testing verdicts

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

Summary

1. Bluetooth EDR

Requirement – Test case	FCC PART 15 PARAGRAPH / RSS-247	Verdict	Remark
RSS-247 5.4 (b) / FCC 15.247 (b)	Maximum peak output power and antenna gain	P	
RSS-247 5.5 / FCC 15.247 (d)	[RSE] Emission limitations radiated (Transmitter)	P	
Supplementary information and remarks: None.			

2. 802.11 b/g/n20/n40 1x1

Requirement – Test case	FCC PART 15 PARAGRAPH / RSS-247	Verdict	Remark
FCC 15.247 (b) / RSS-247 5.4 (d)	Maximum output power and antenna gain	P	--
RSS-247 5.5 / FCC 15.247 (d)	[RSE] Emission limitations radiated (Transmitter)	P	
Supplementary information and remarks: None.			

Appendix A: Test results. Bluetooth EDR

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TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 12 Vdc

Type of Power Supply: External DC (vehicle battery).

ANTENNA:

Two antenna options (*):

- Internal antenna (Antenova SR4W030)

  Maximum Declared Antenna Gain: 5.2 dBi

- External antenna (PCTEL WV-COVDB2458-7FT-MSMA)

  Maximum Declared Antenna Gain: 6 dBi

Tests have been performed over External antenna configuration.

TEST FREQUENCIES FOR RADIATED TESTS (*):

Low Channel: 2402 MHz

Middle Channel: 2441 MHz

High Channel: 2480 MHz

POWER SETTINGS:

The EUT was tested in the following operating mode:

Continuous transmission with a modulated carrier on all required channels selecting the supported data rates/modulations types.

During transmitter test the EUT was being controlled by the SW tool to operate in a continuous transmit mode on the test channel as required and in each of the different modulation modes.

The following power settings were used to configure the EUT for the tests:

Modulation	Power setting
BT (GFSK 1-DH5)	8 dBm
BT (Pi/4 DQPSK 2-DH5)	8 dBm
BT (8DPSK 3-DH5)	8 dBm

RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Bilog antenna for the range from 30 MHz to 1000 MHz and Double ridge horn antenna for the range from 1 GHz to 17 GHz) 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).

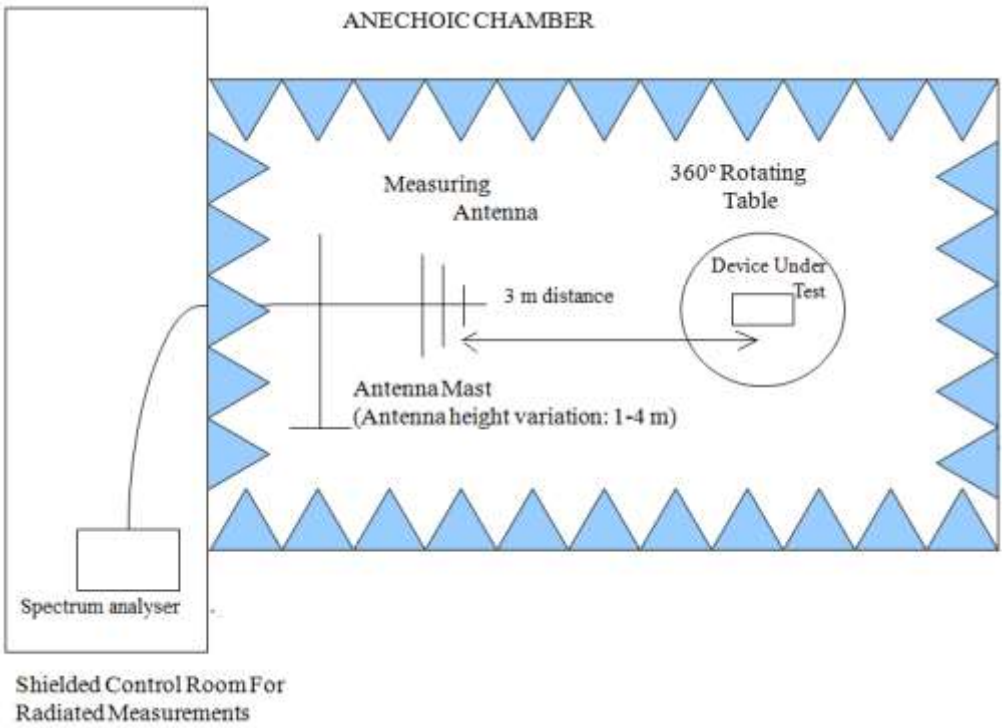
For radiated emissions in the range 17 GHz-26 GHz performed at a distance closer than the specified distance in the standard, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and its situation and orientation were 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.

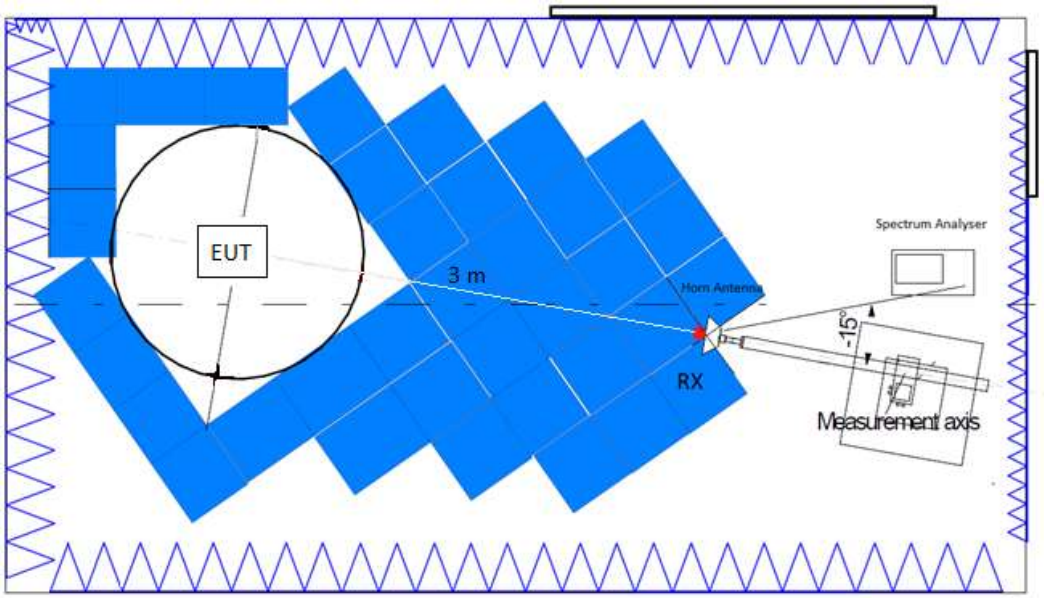
Measurements were made in both horizontal and vertical planes of polarization.

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.

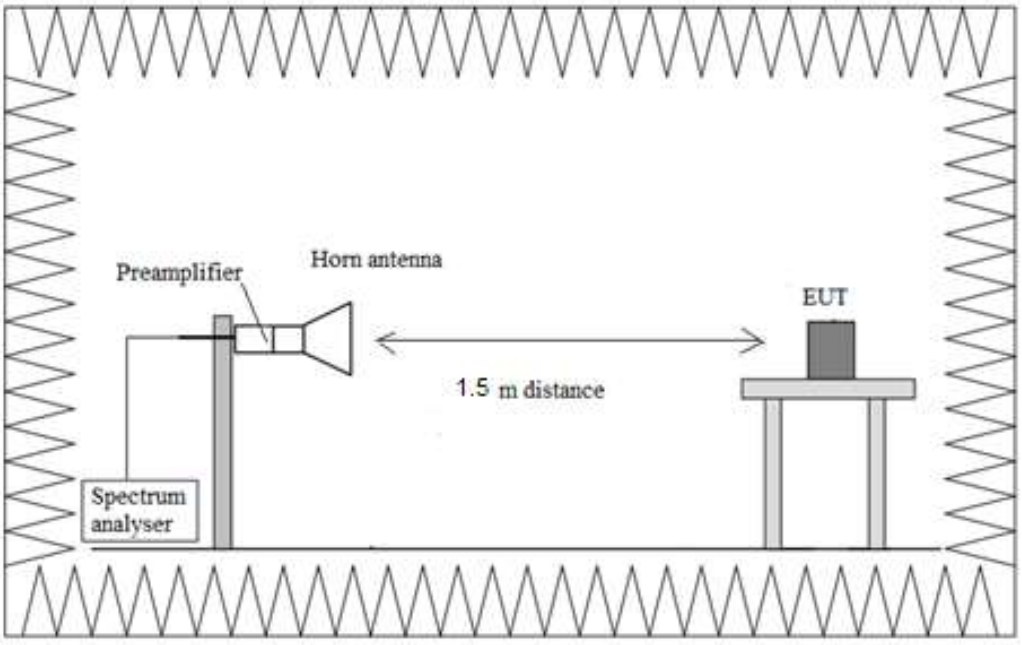
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup f > 17 GHz:



TEST CASES DETAILS

RSS-247 5.4 (b) / FCC 15.247 (b) Maximum peak output power and antenna gain

Limits

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels: 1 watt (30 dBm). The e.i.r.p. shall not exceed 4 W (RSS-247).

Results

The maximum peak conducted output power level of the fundamental emission was measured according to clause 7.8.5 “Output power test procedure for frequency-hopping spread-spectrum (FHSS) devices” of ANSI C63.10-2013.

The EIRP power (dBm) is calculated by adding the maximum declared antenna gain to the measured conducted power.

Maximum Declared Antenna Gain: 6.0 dBi

The maximum directional gain of the antenna is not greater than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Modulation: BT (GFSK 1-DH5)

Operation Band (MHz)	Freq (MHz)	Equipment	Maximum Conducted Power (dBm)	Maximum EIRP Power (dBm)
[2400, 2483.5]	2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	0.71	6.71
	2441.00000		1.32	7.32
	2480.00000		1.59	7.59

Verdict

Pass

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

Operation Band (MHz)	Freq (MHz)	Equipment	Maximum Conducted Power (dBm)	Maximum EIRP Power (dBm)
[2400, 2483.5]	2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	1.19	7.19
	2441.00000		2.03	8.03
	2480.00000		2.23	8.23

Verdict

Pass

Modulation: BT (8DPSK 3-DH5)

Operation Band (MHz)	Freq (MHz)	Equipment	Maximum Conducted Power (dBm)	Maximum EIRP Power (dBm)
[2400, 2483.5]	2402.00000	Frequency Hopping Spread Spectrum systems (DSS)	0.63	6.63
	2441.00000		1.55	7.55
	2480.00000		1.74	7.74

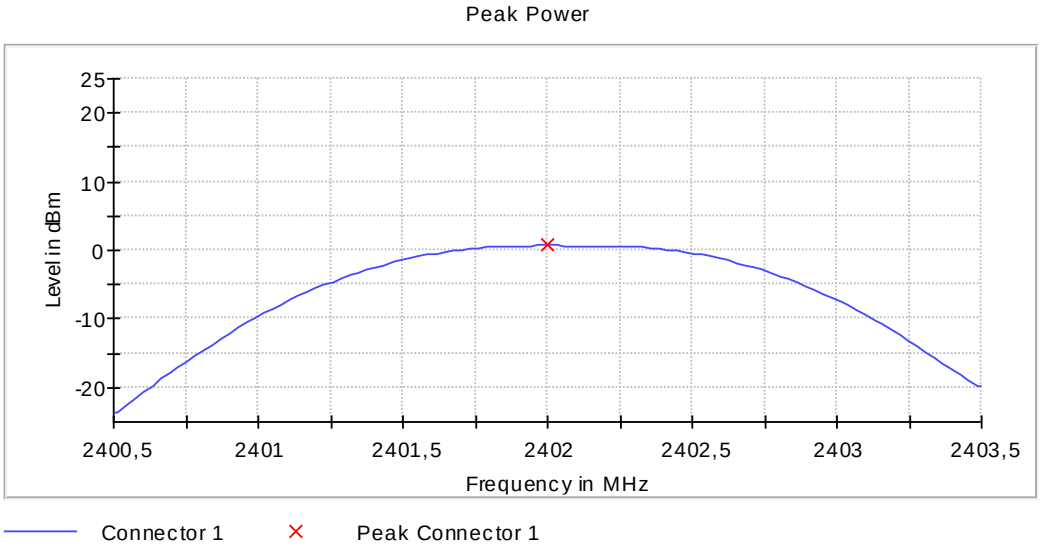
Verdict

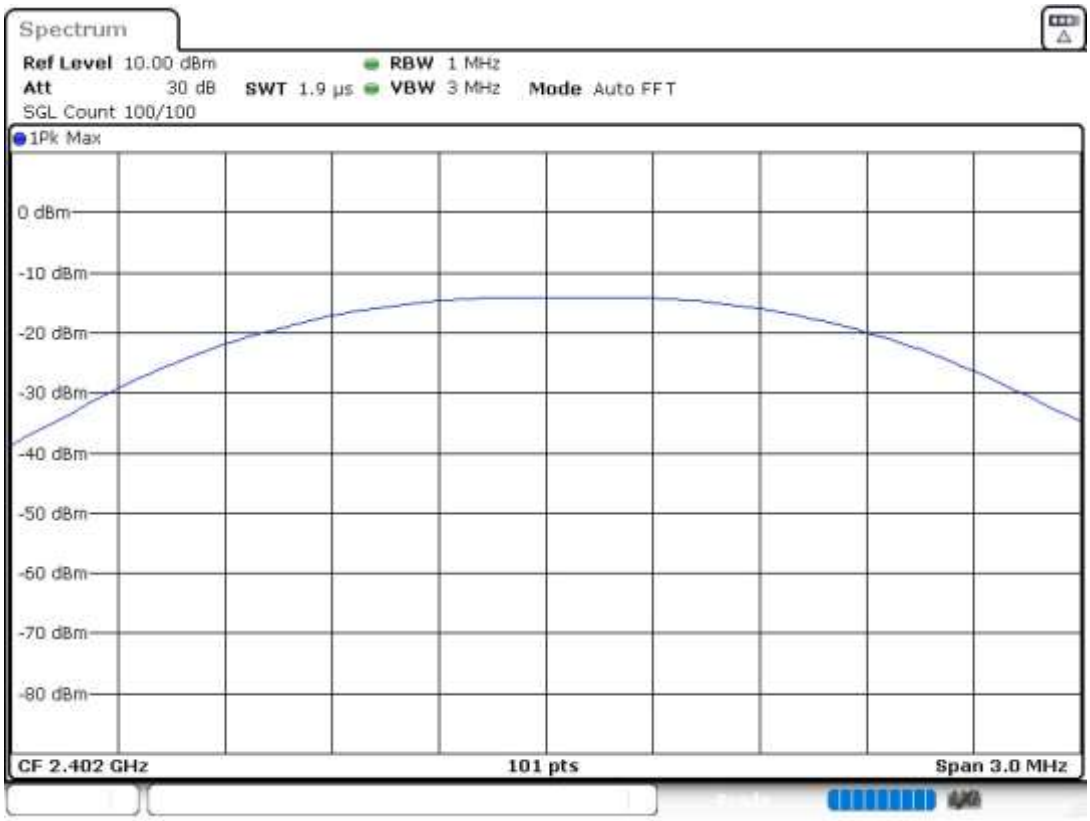
Pass

Attachments

Operation Band (MHz) = [2400, 2483.5], Frequency (MHz) = 2402.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5)

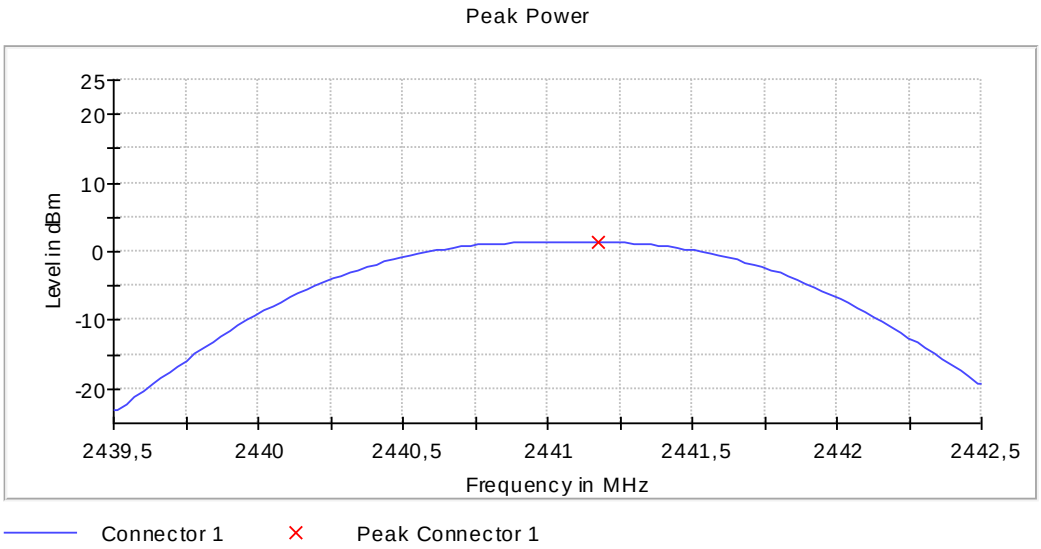
Plots:

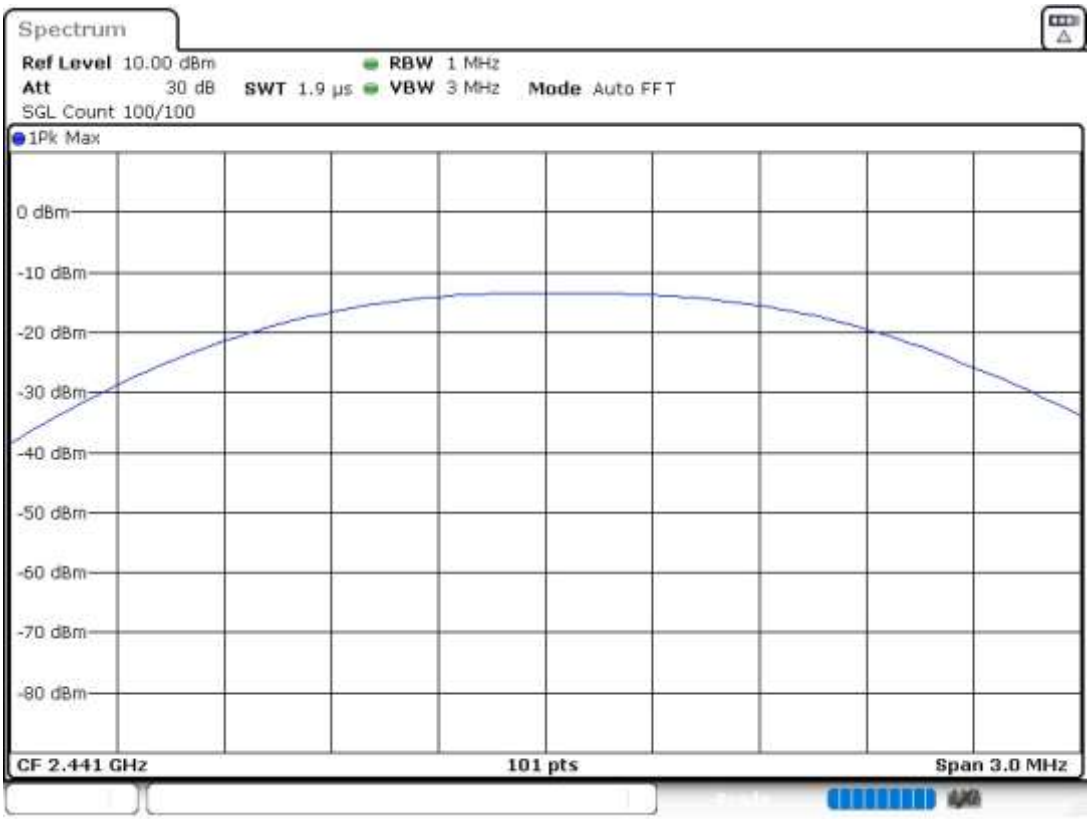




Operation Band (MHz) = [2400, 2483.5], Frequency (MHz) = 2441.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5)

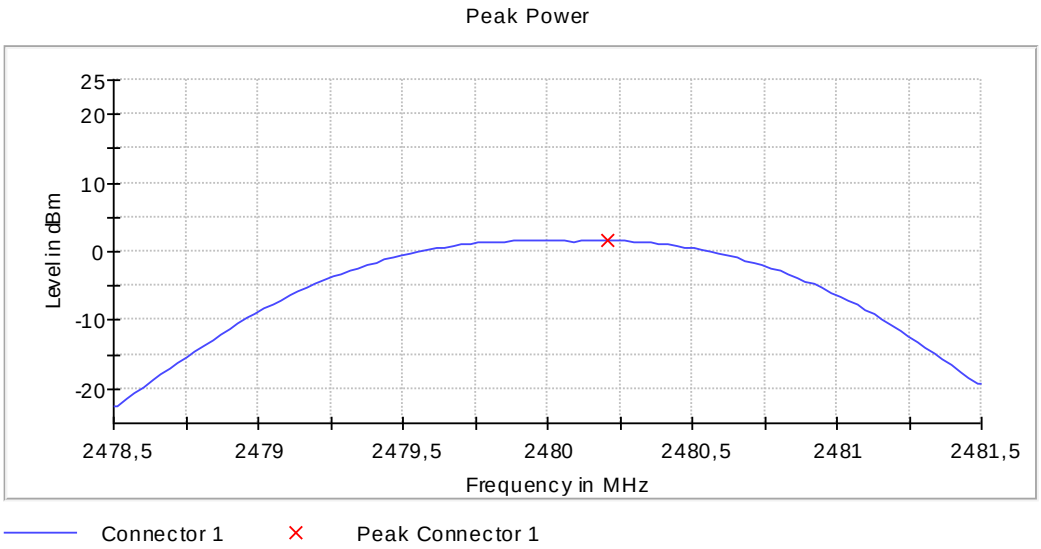
Plots:

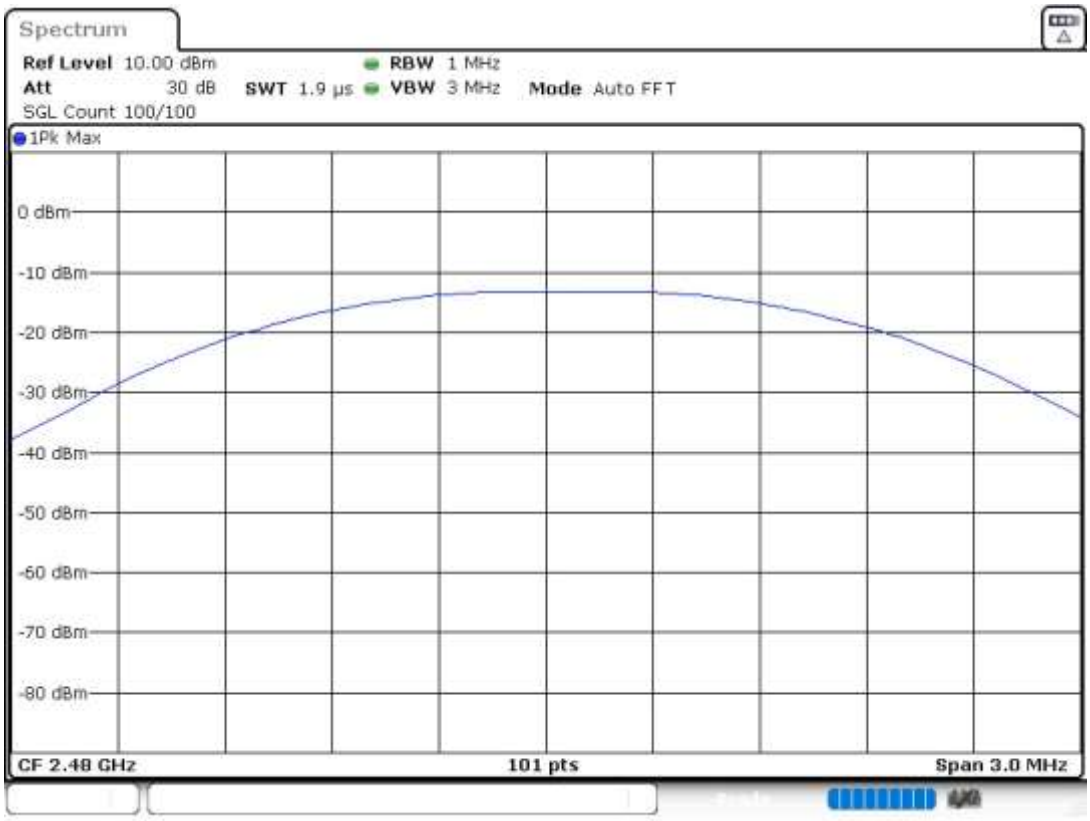




Operation Band (MHz) = [2400, 2483.5], Frequency (MHz) = 2480.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5)

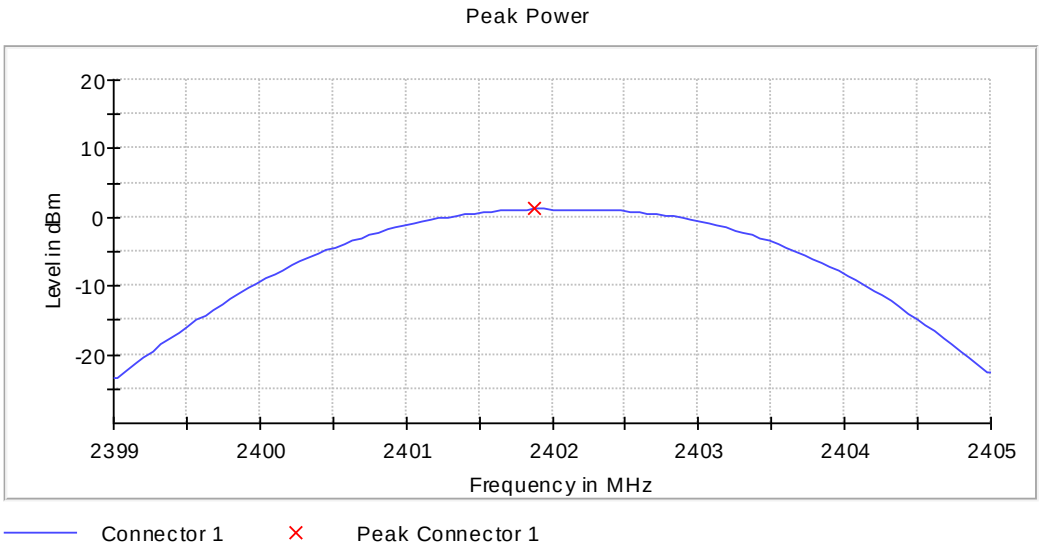
Plots:

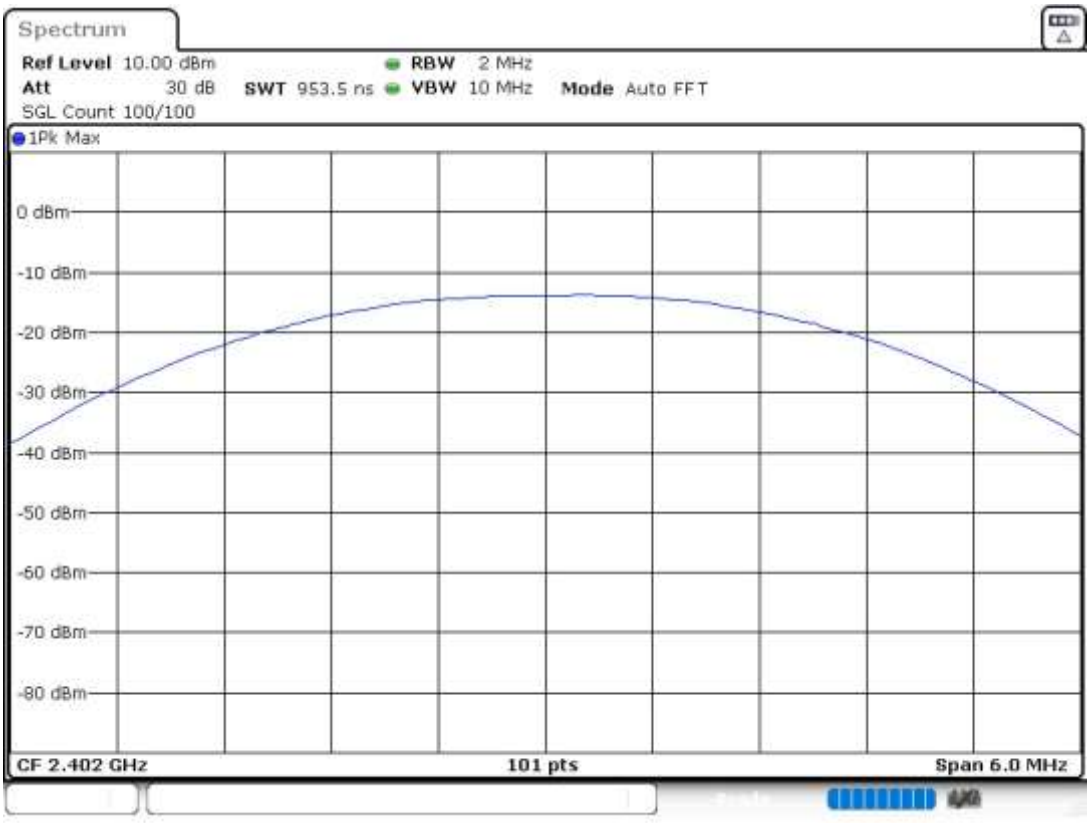




Operation Band (MHz) = [2400, 2483.5], Frequency (MHz) = 2402.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5)

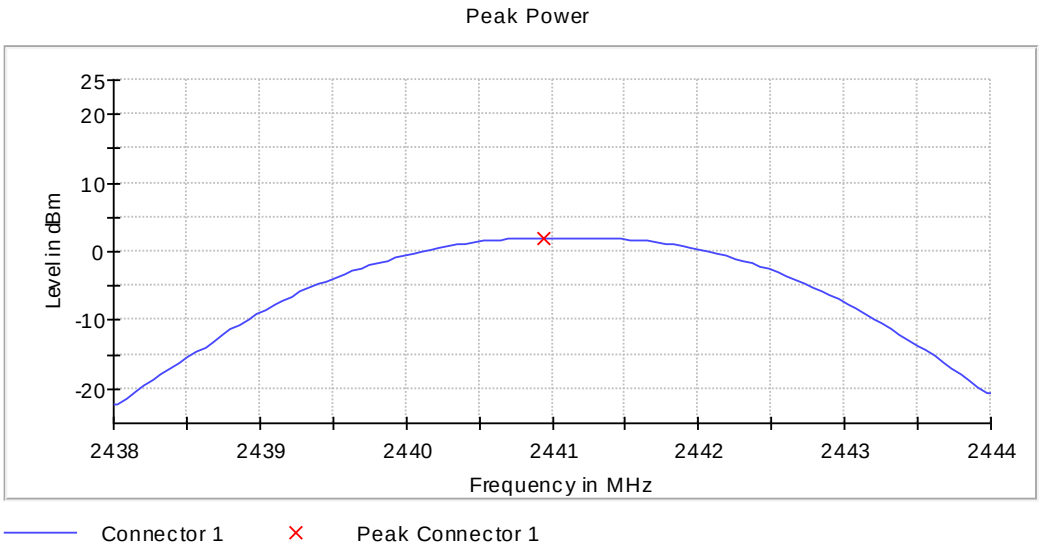
Plots:

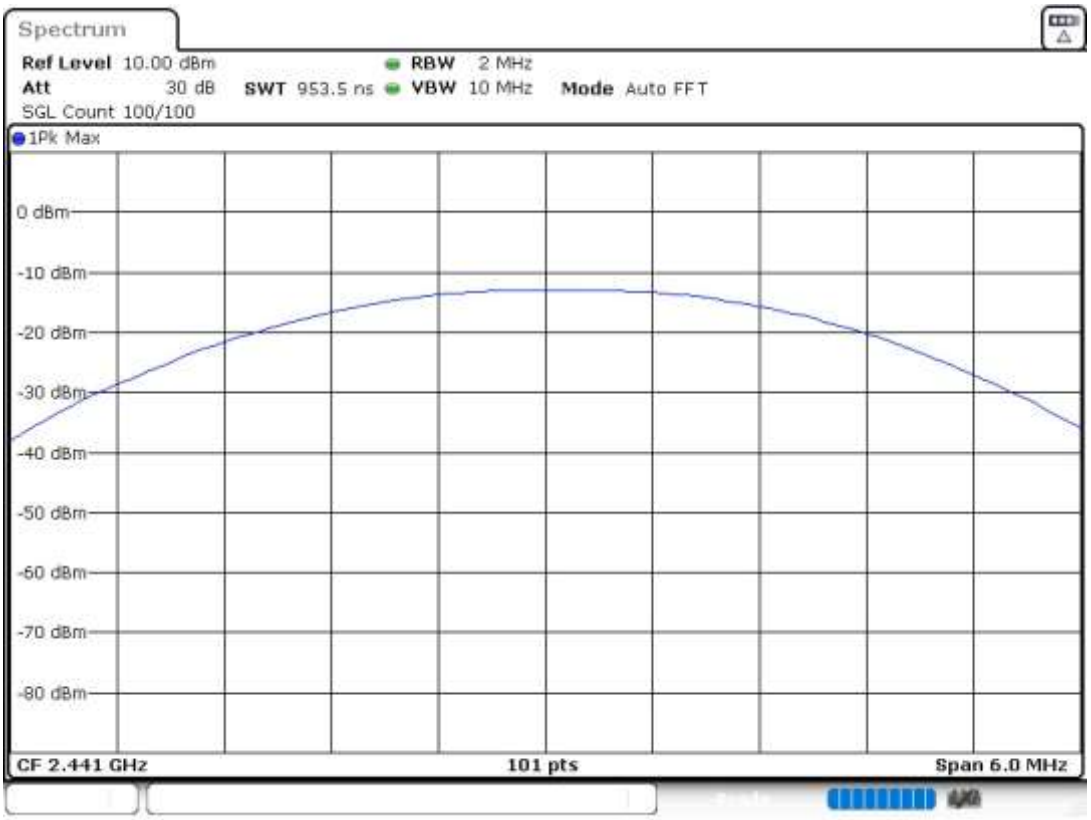




Operation Band (MHz) = [2400, 2483.5], Frequency (MHz) = 2441.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5)

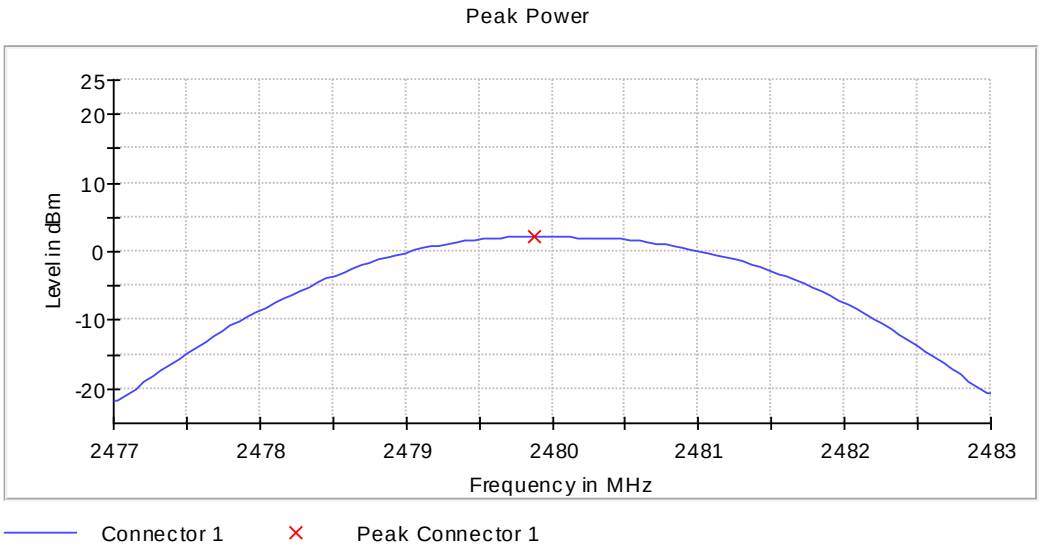
Plots:





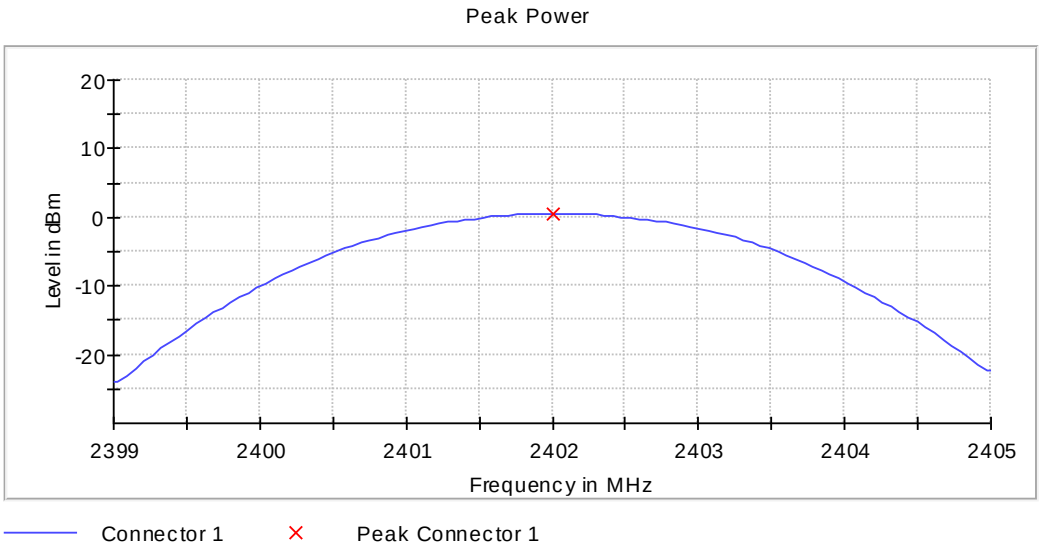
Operation Band (MHz) = [2400, 2483.5], Frequency (MHz) = 2480.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5)

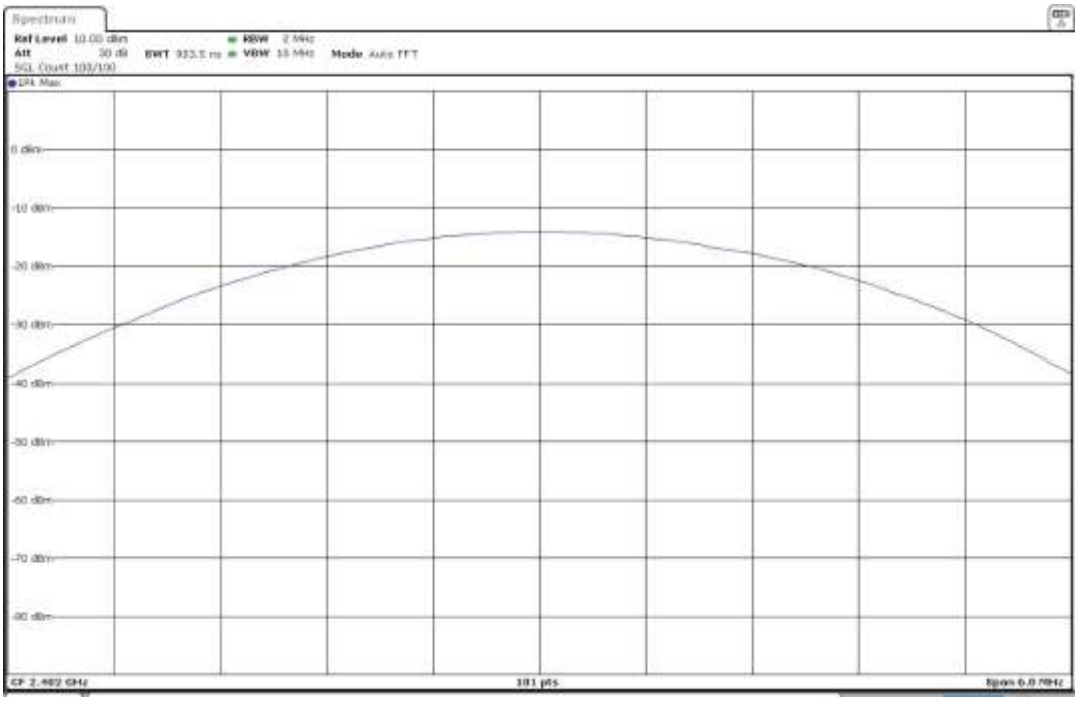
Plots:



Operation Band (MHz) = [2400, 2483.5], Frequency (MHz) = 2402.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5)

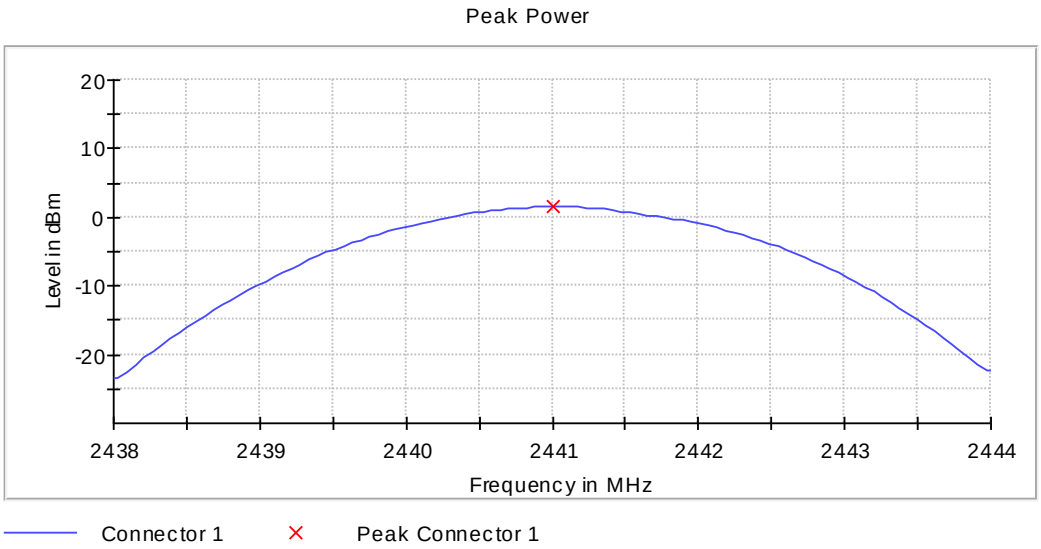
Plots:

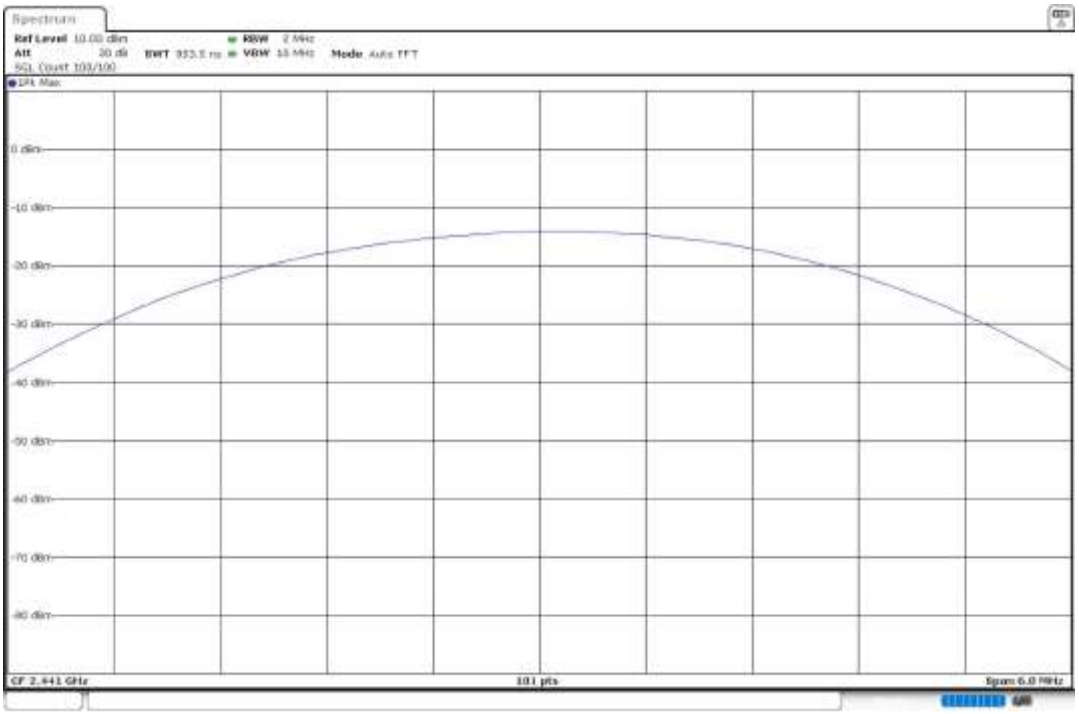




Operation Band (MHz) = [2400, 2483.5], Frequency (MHz) = 2441.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5)

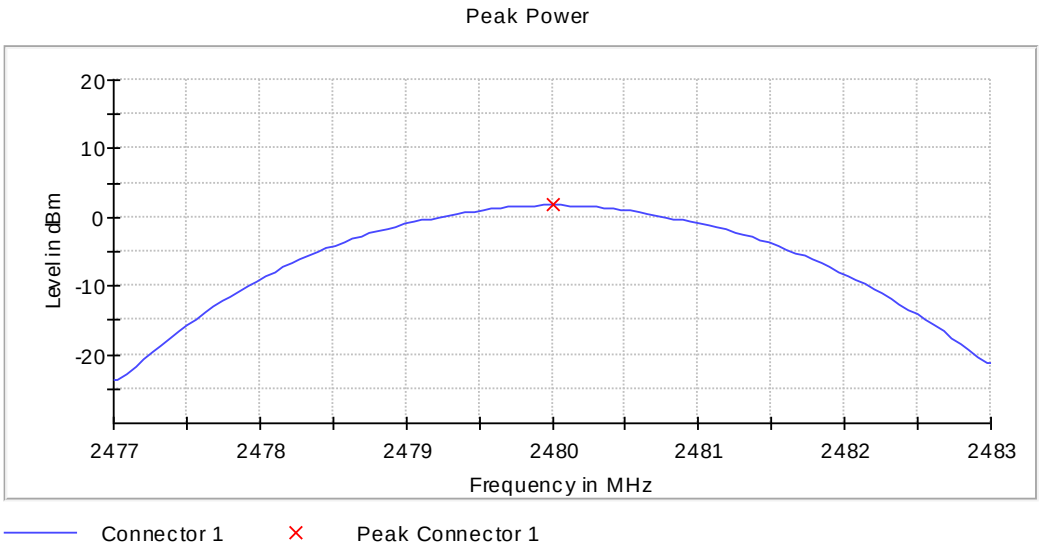
Plots:

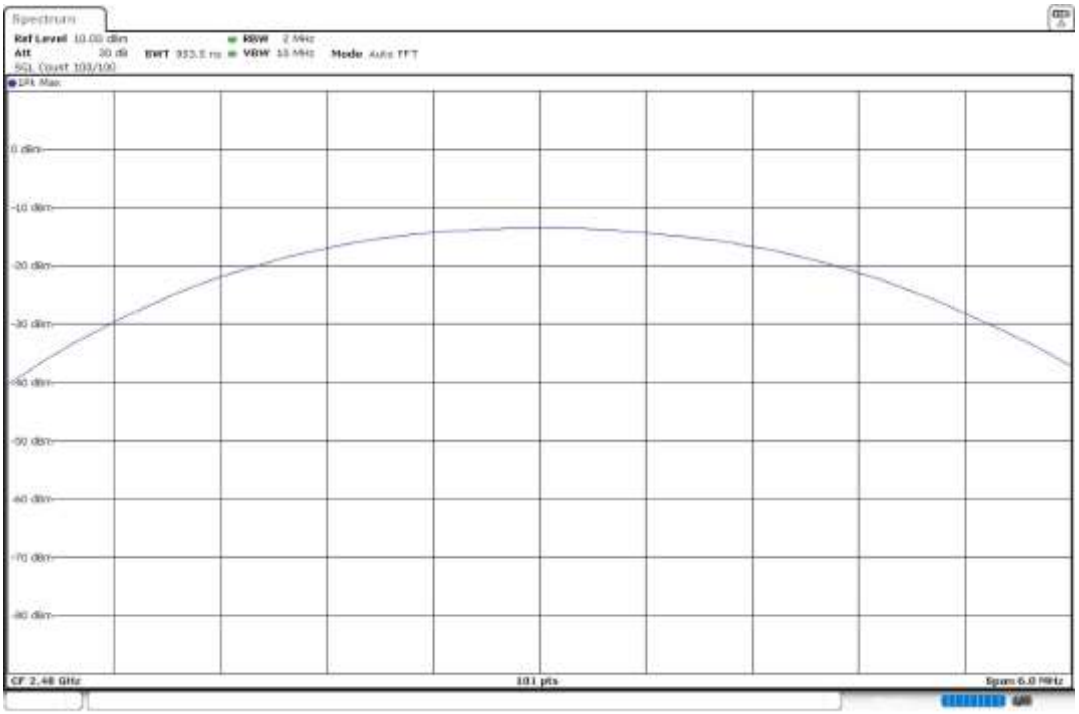




Operation Band (MHz) = [2400, 2483.5], Frequency (MHz) = 2480.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5)

Plots:





FCC 47 CFR Part 15.247 / RSS-247
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 Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 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	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 specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.

RSS-247:

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

Results

Frequency range 30 MHz – 1 GHz:

The spurious frequencies detected do not depend either on the operating channel or the modulation.

Spurious frequencies detected at less than 20 dB below the limit:

Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
40.36688	26.81	V	Quasi-Peak
41.51875	26.80	V	Quasi-Peak
42.15531	25.98	V	Quasi-Peak
43.64063	25.11	V	Quasi-Peak

Verdict

Pass

Modulation: BT (GFSK 1-DH5)

Frequency range 1 GHz – 26 GHz:

Spurious frequencies detected at less than 20 dB below the limit:

Freq (MHz)	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
2402.00000	[3, 17]	4984.50000	42.14	V	PK
2441.00000	[3, 17]	3189.87500 (*)	39.37	V	PK
		4997.18750	43.05	V	PK
2480.00000	[3, 17]	4987.56250	43.57	V	PK

(*) This Spurious Frequency is outside the restricted bands as defined in §15.205(a). The peak spurious level is more than 20 dB below the peak carrier level.

Verdict

Pass

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

Frequency range 1 GHz – 26 GHz:

Spurious frequencies detected at less than 20 dB below the limit:

Freq (MHz)	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
2402.00000	[3, 17]	4989.31250	42.53	V	PK
2441.00000	[3, 17]	4994.12500	42.26	V	PK
2480.00000	[3, 17]	4988.87500	42.67	V	PK
		8801.25000 (*)	48.08	V	PK

(*) This Spurious Frequency is outside the restricted bands as defined in §15.205(a). The peak spurious level is more than 20 dB below the peak carrier level.

Verdict

Pass

Modulation: BT (8DPSK 3-DH5)

Frequency range 1 GHz – 26 GHz:

Spurious frequencies detected at less than 20 dB below the limit:

Freq (MHz)	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
2402.00000	[3, 17]	4997.62500	42.11	V	PK
2441.00000	[3, 17]	4981.00000	41.56	V	PK
2480.00000	[3, 17]	4988.00000	40.74	V	PK

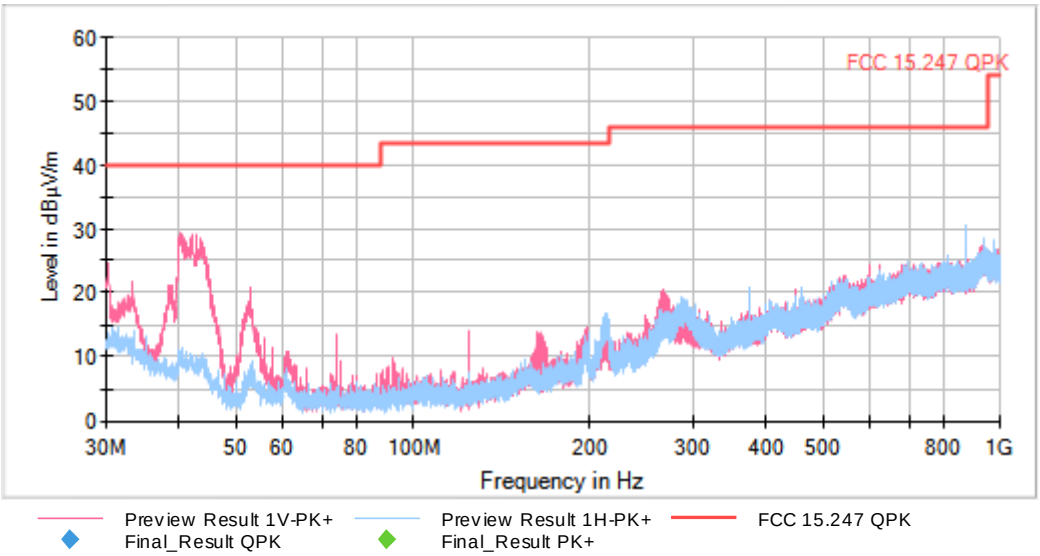
Verdict

Pass

Attachments

Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5), Frequency Range (GHz) = [0.03, 1]

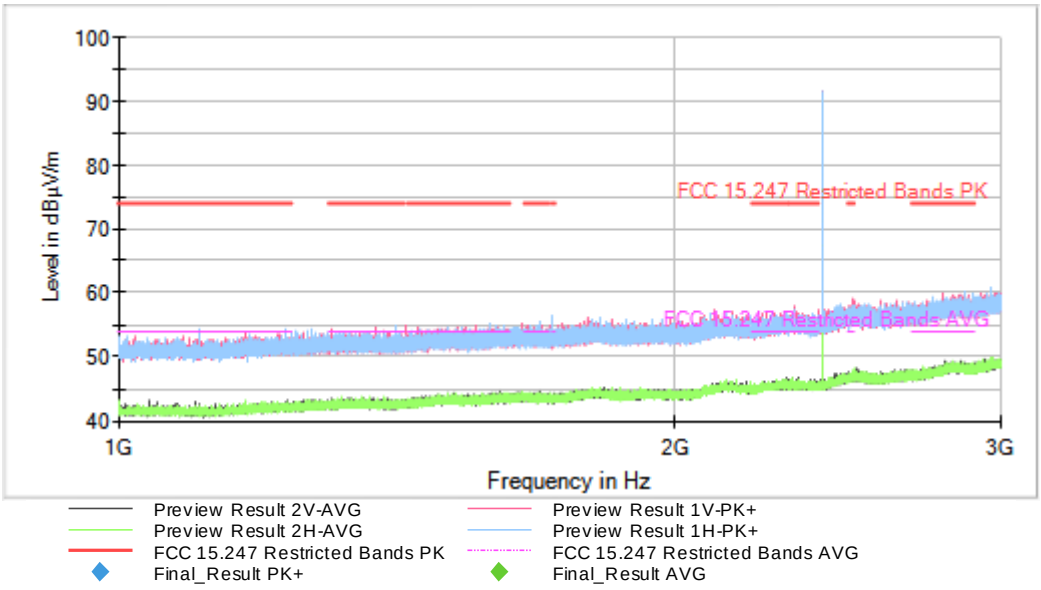
Plots:



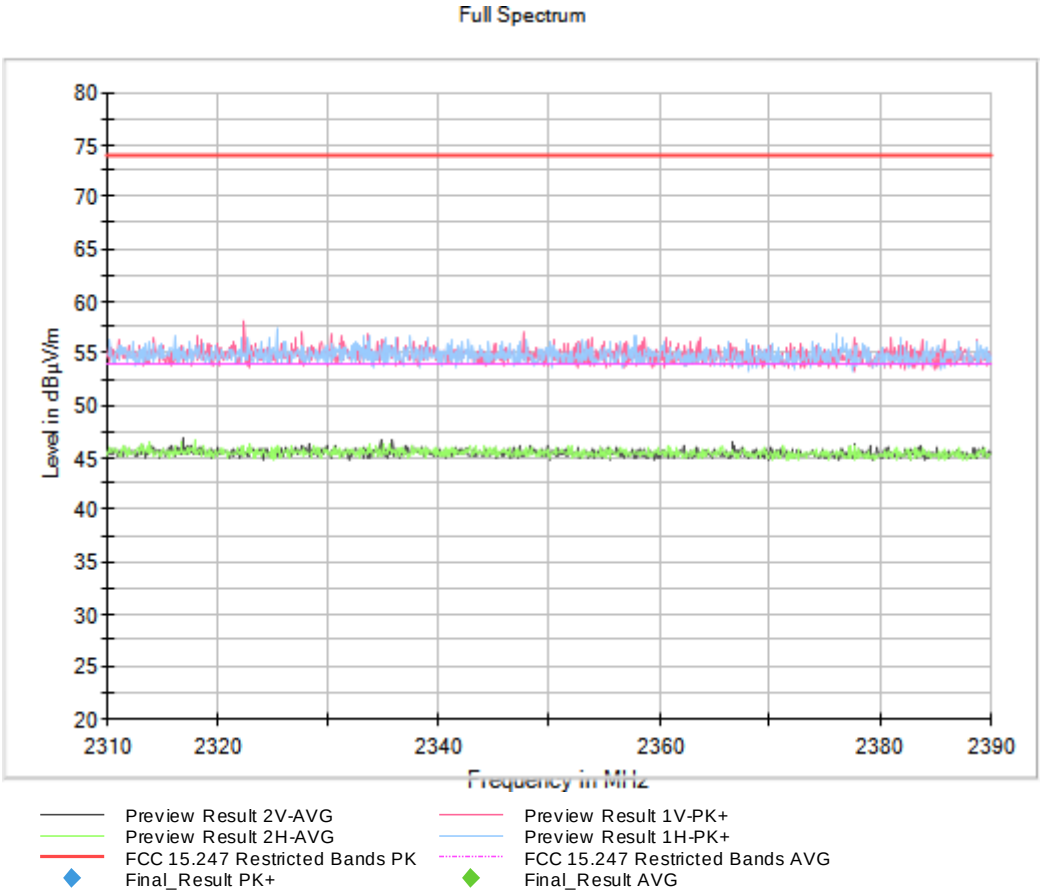
This plot is valid for Low, Middle and High Channels.
Settings: RBW = 100 kHz / VBW = 300 kHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2402.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
65
60
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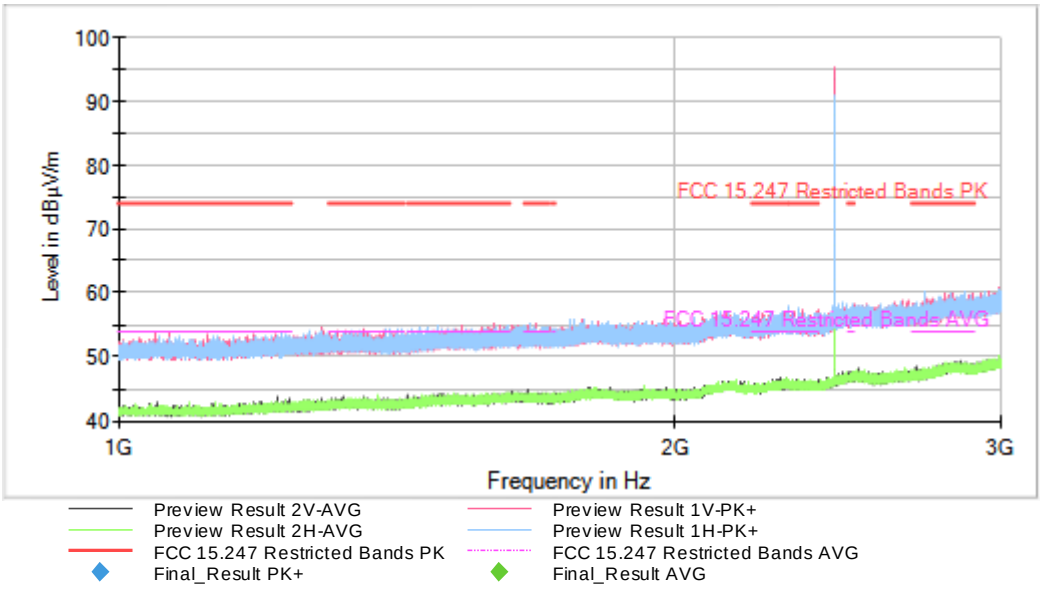
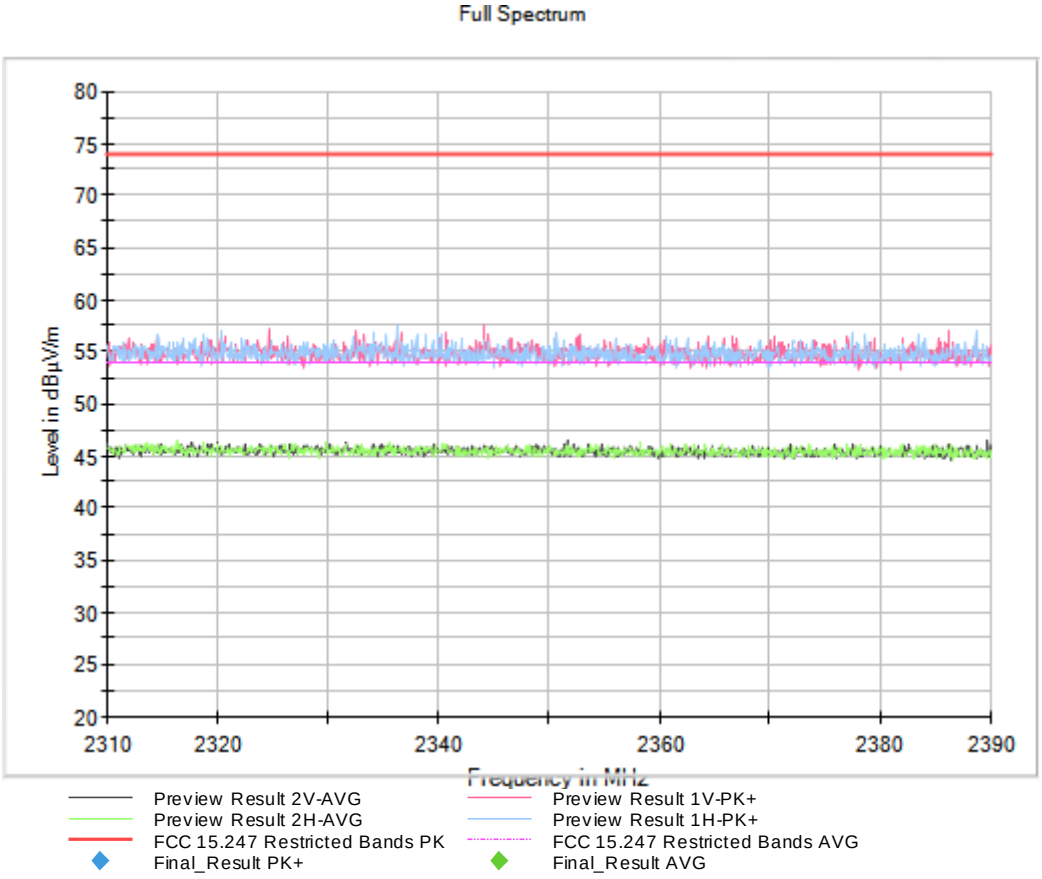
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Frequency (MHz) = 2441.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
65
60
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50
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40
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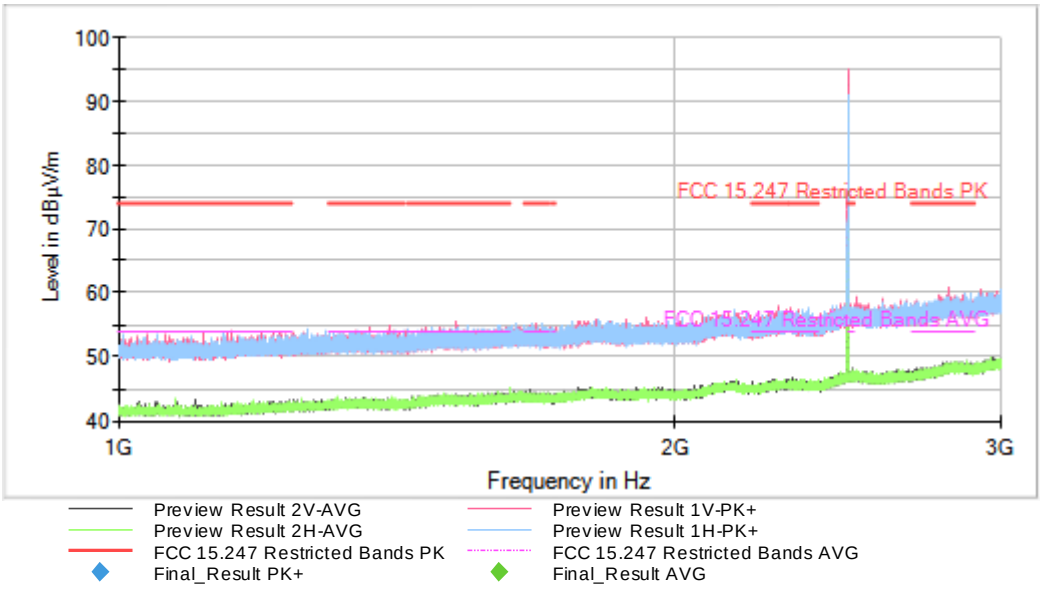
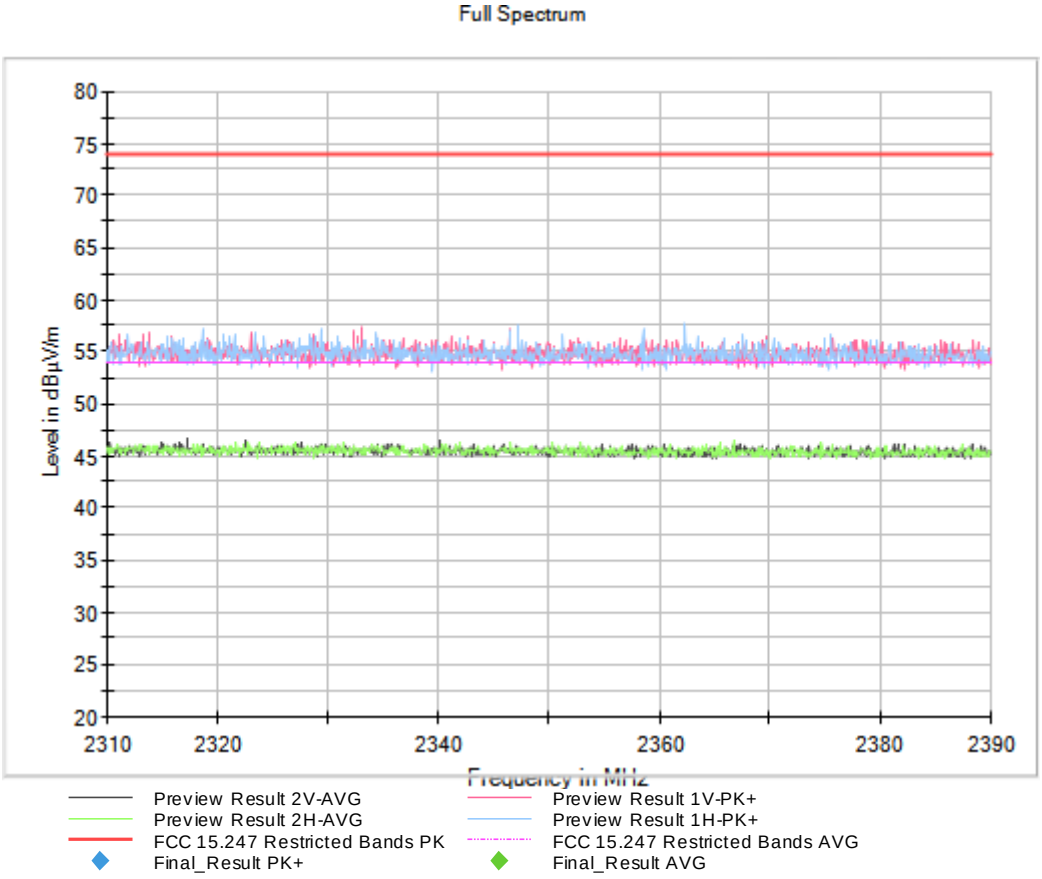
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

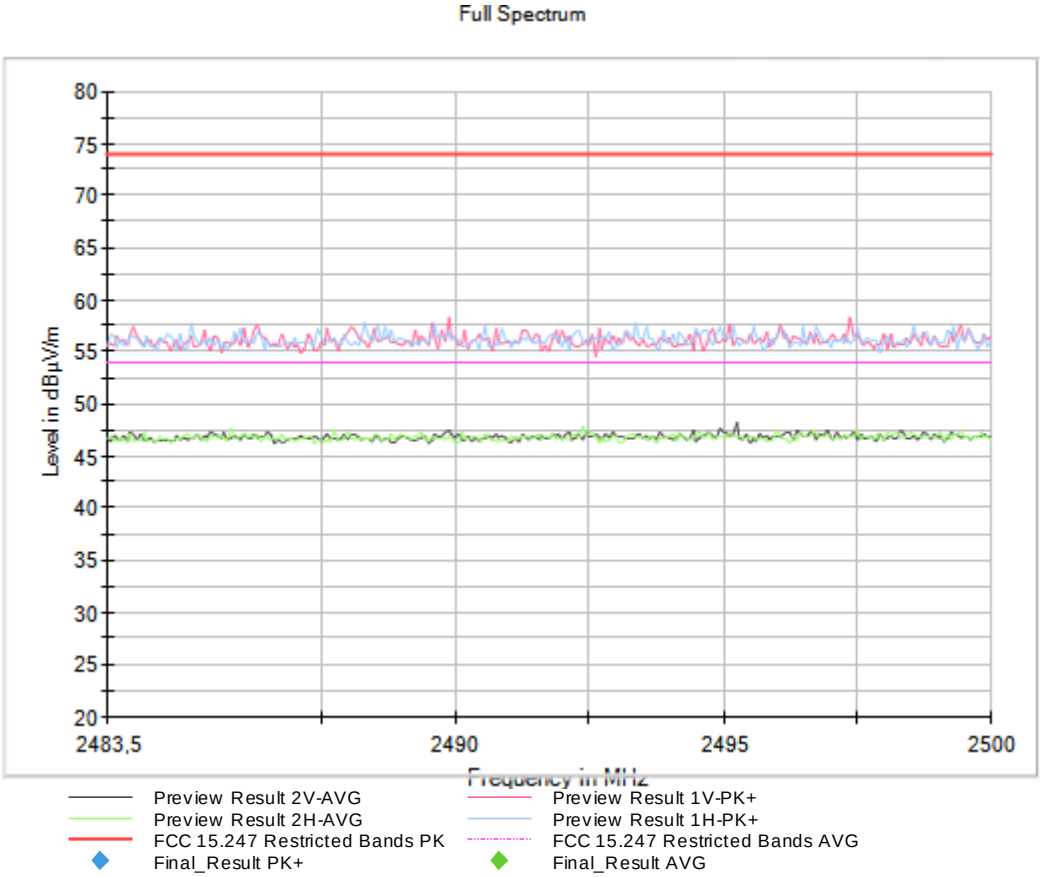
Frequency (MHz) = 2480.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5), Frequency Range (GHz) = [1, 3]

Plots:



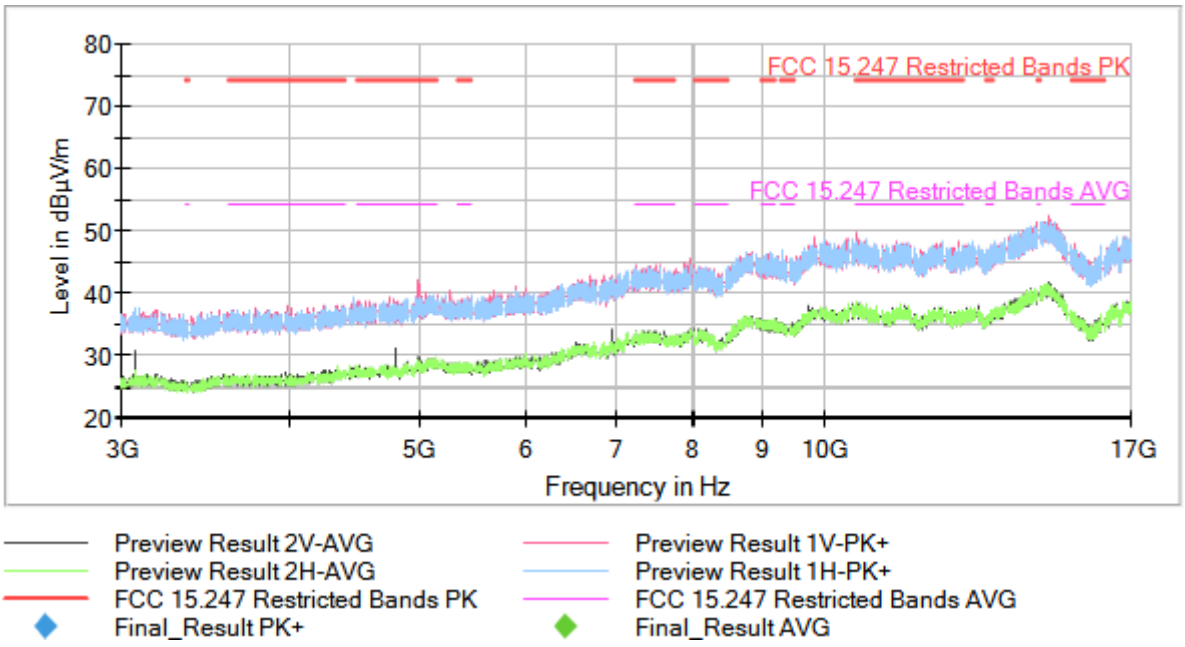
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
65
60
55
50
45
40
35
30
25
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

Frequency (MHz) = 2402.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5), Frequency Range (GHz) = [3, 17]

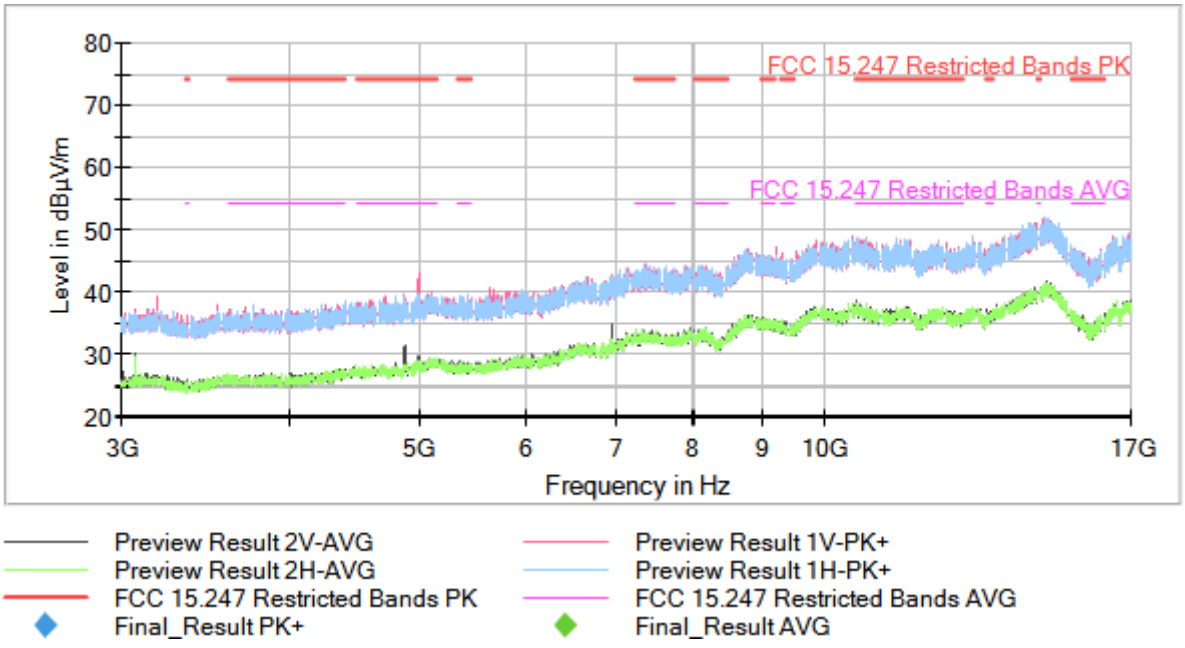
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2441.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5), Frequency Range (GHz) = [3, 17]

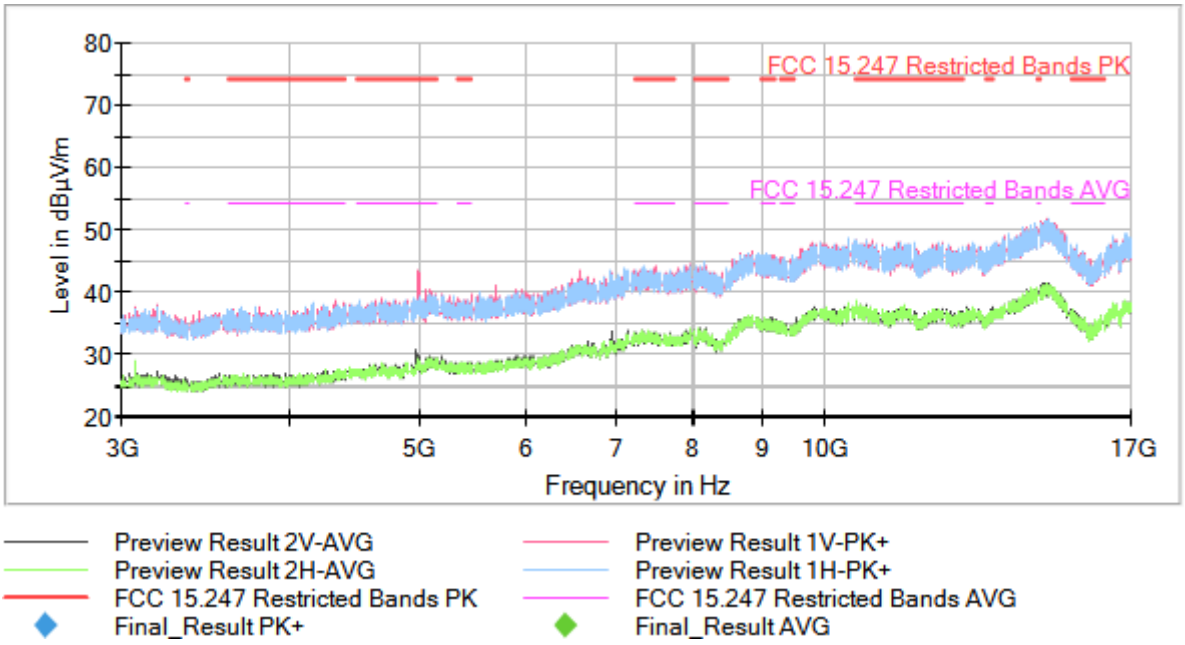
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2480.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5), Frequency Range (GHz) = [3, 17]

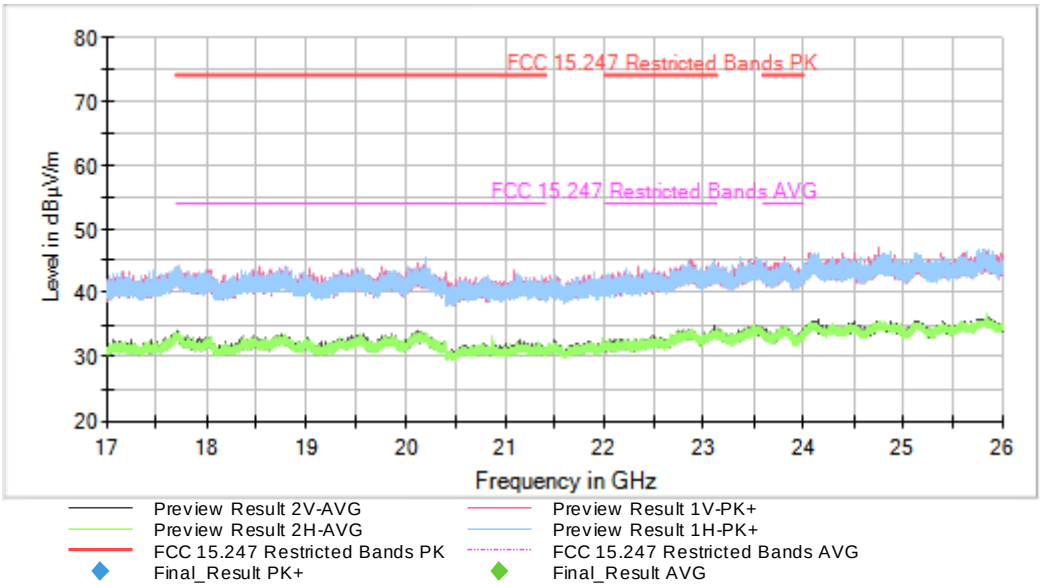
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (GFSK 1-DH5), Frequency Range (GHz) = [17, 26]

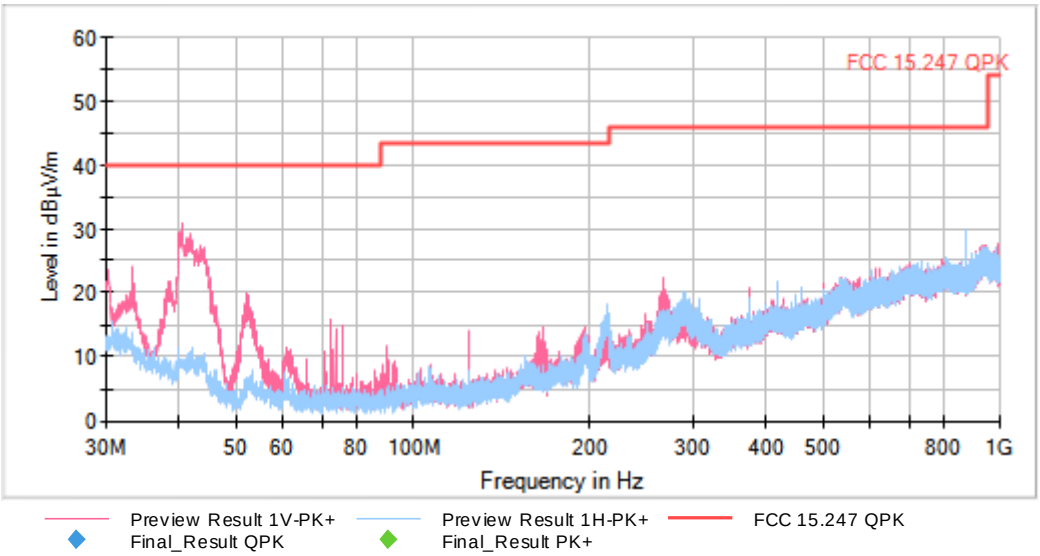
Plots:



This plot is valid for Low, Middle and High Channels.
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5), Frequency Range (GHz) = [0.03, 1]

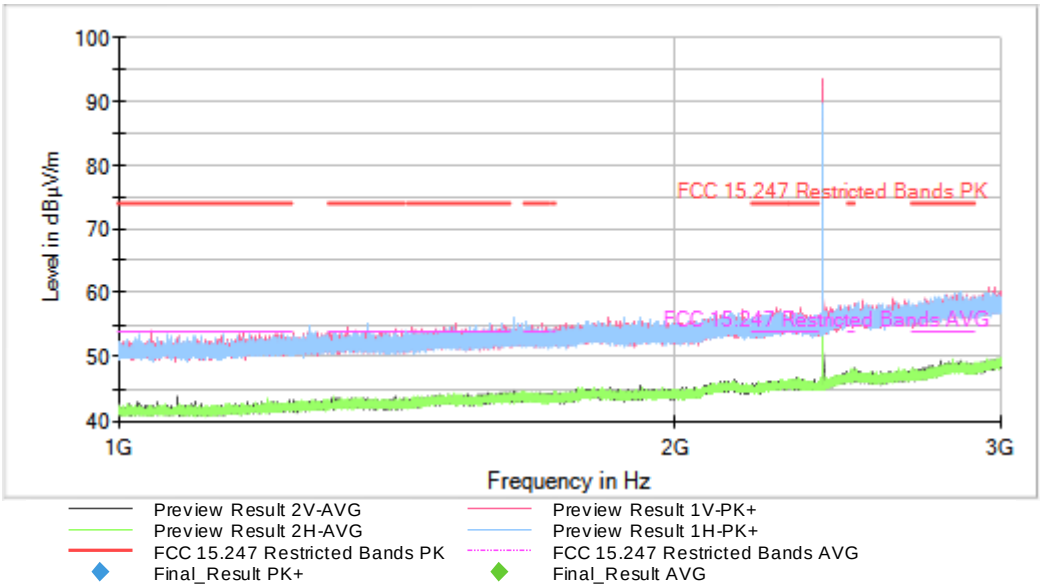
Plots:



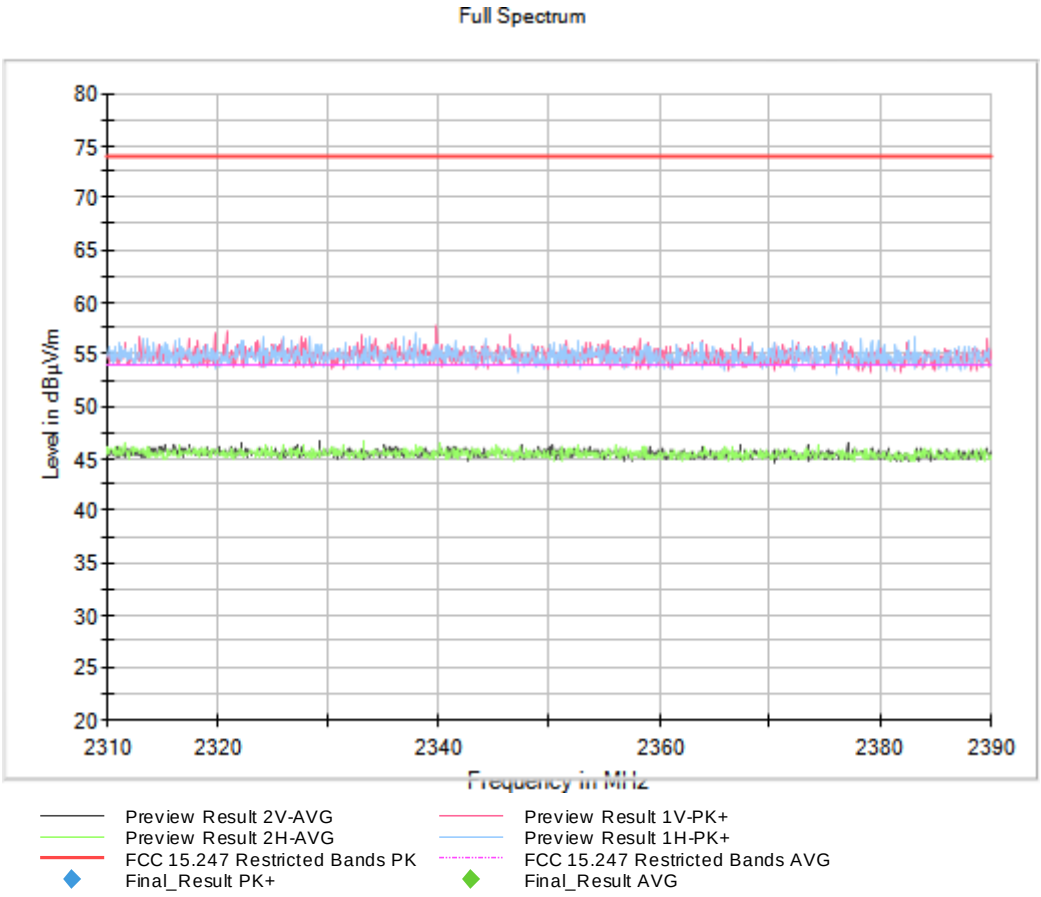
This plot is valid for Low, Middle and High Channels.
Settings: RBW = 100 kHz / VBW = 300 kHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2402.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
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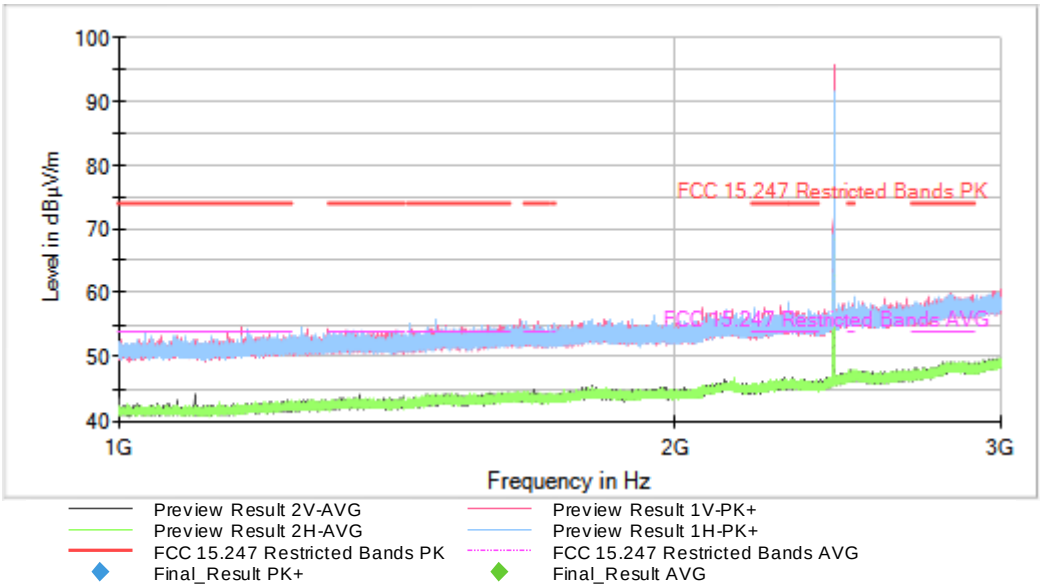
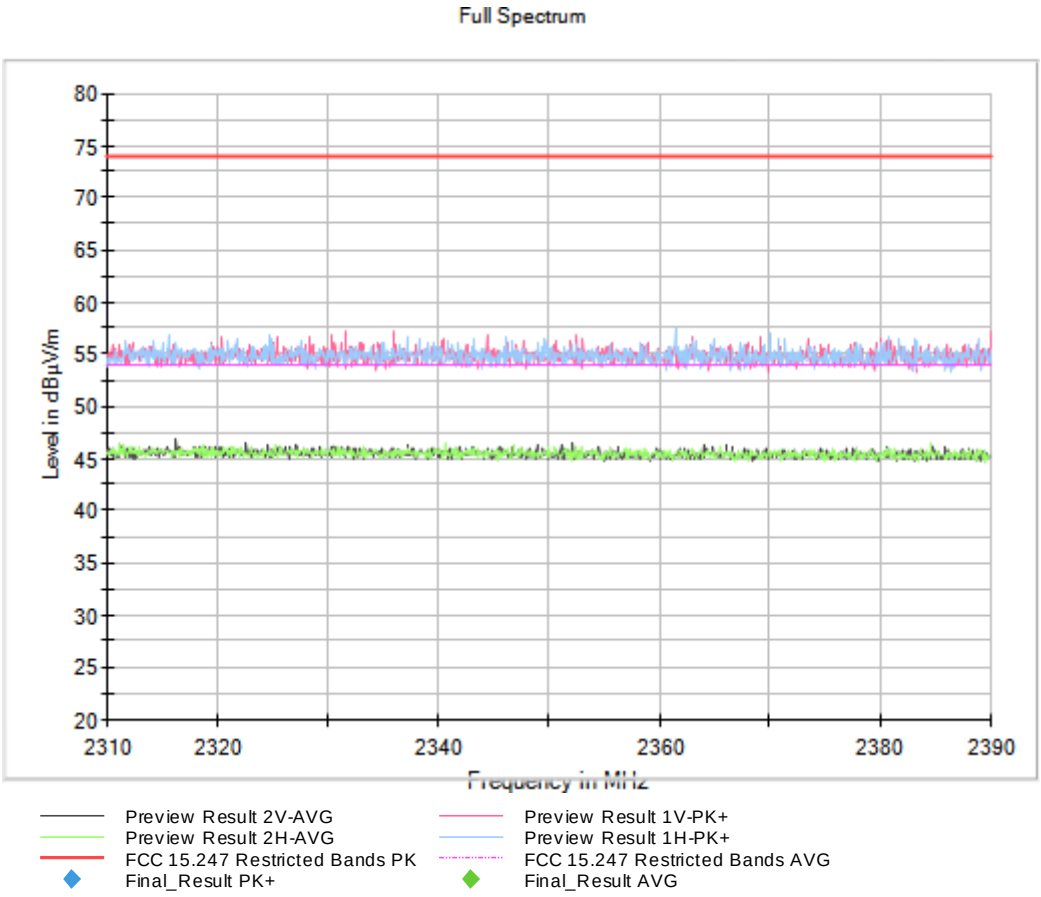
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

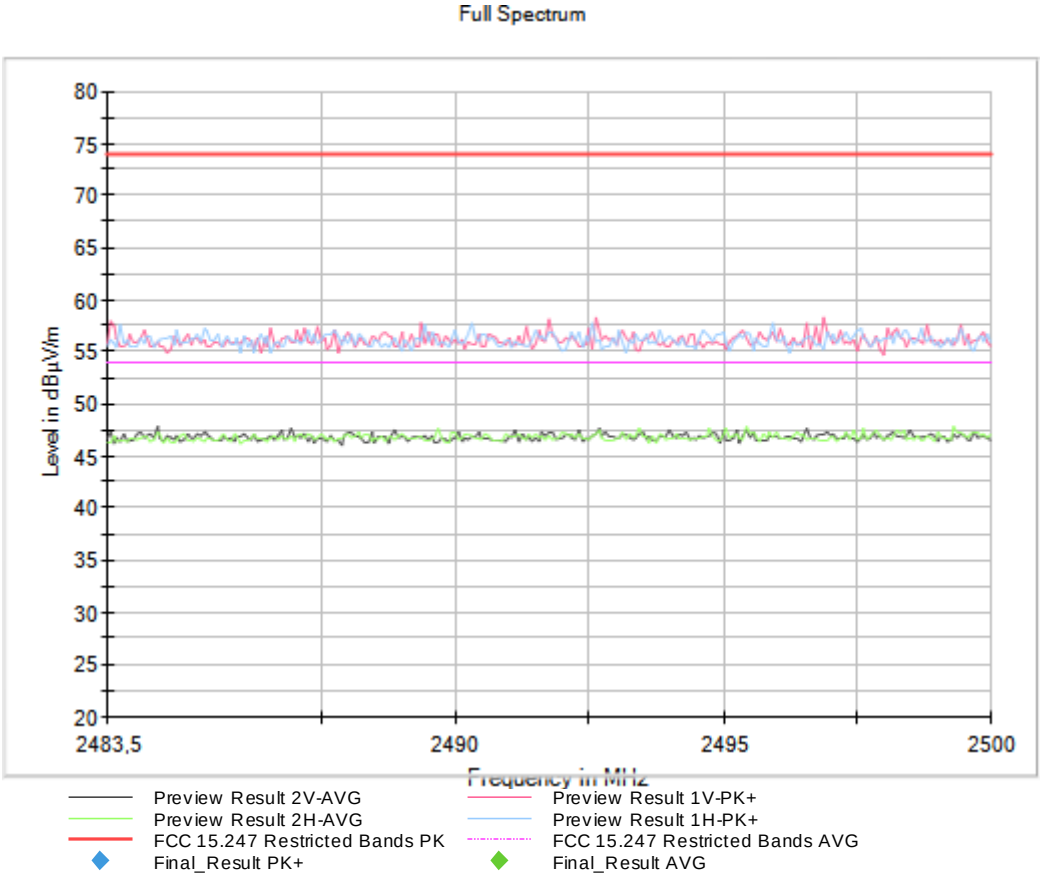
Frequency (MHz) = 2441.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
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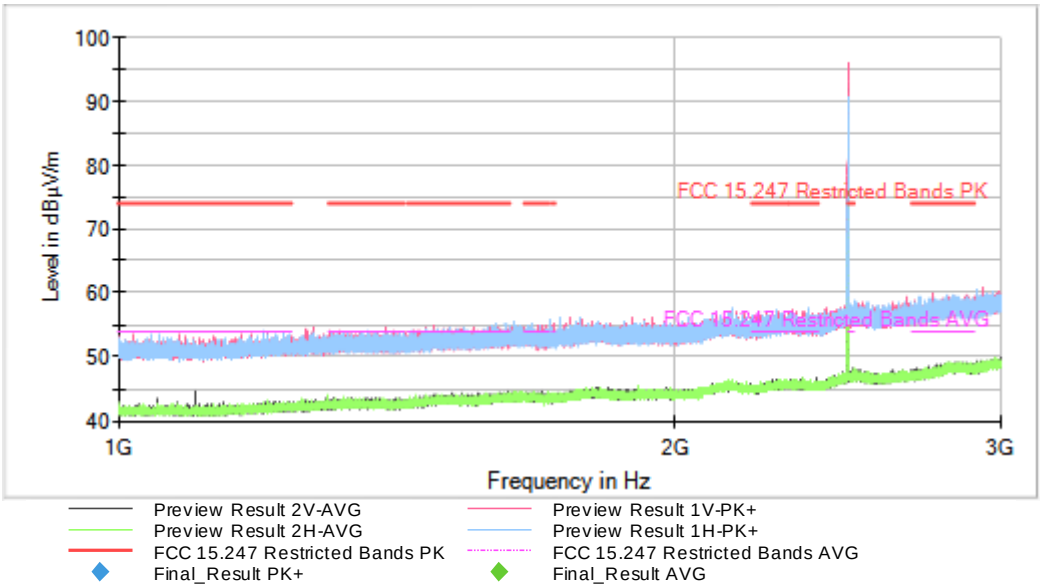
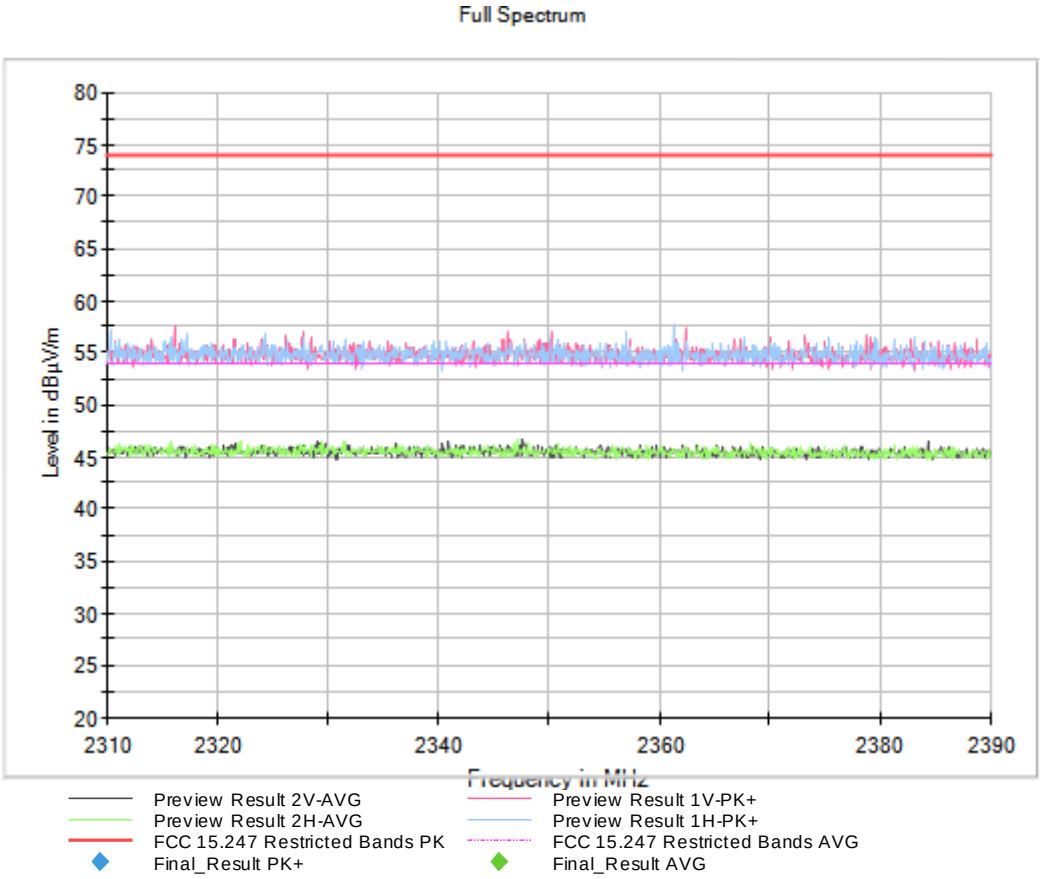
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Frequency (MHz) = 2480.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
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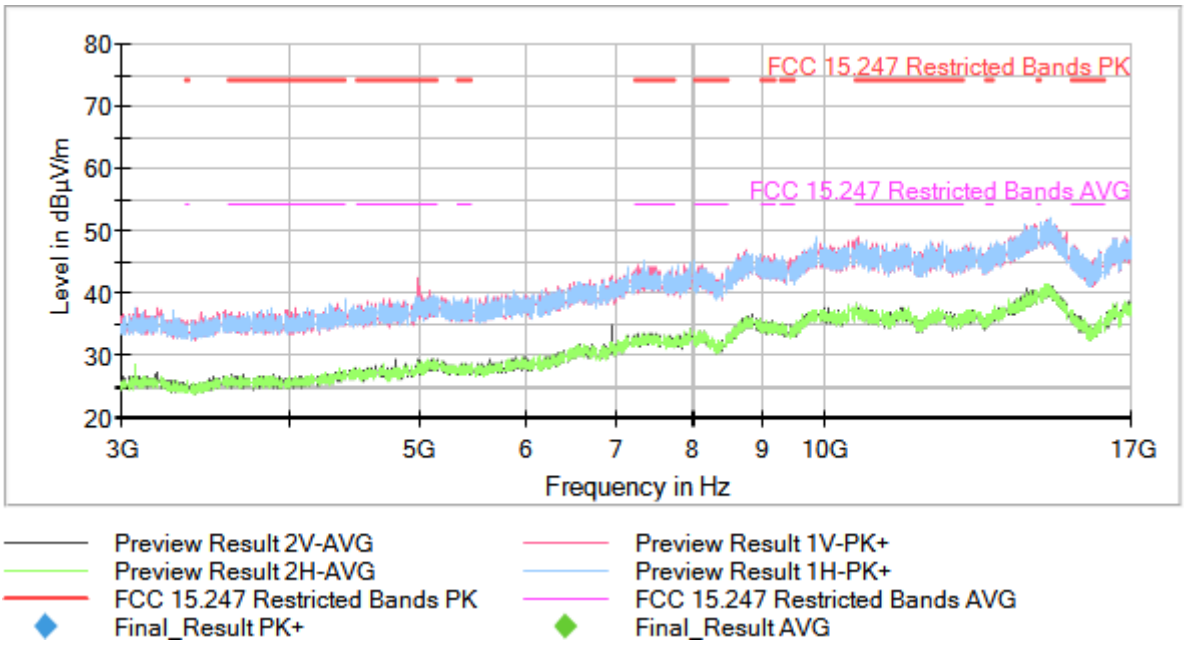
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Frequency (MHz) = 2402.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5), Frequency Range (GHz) = [3, 17]

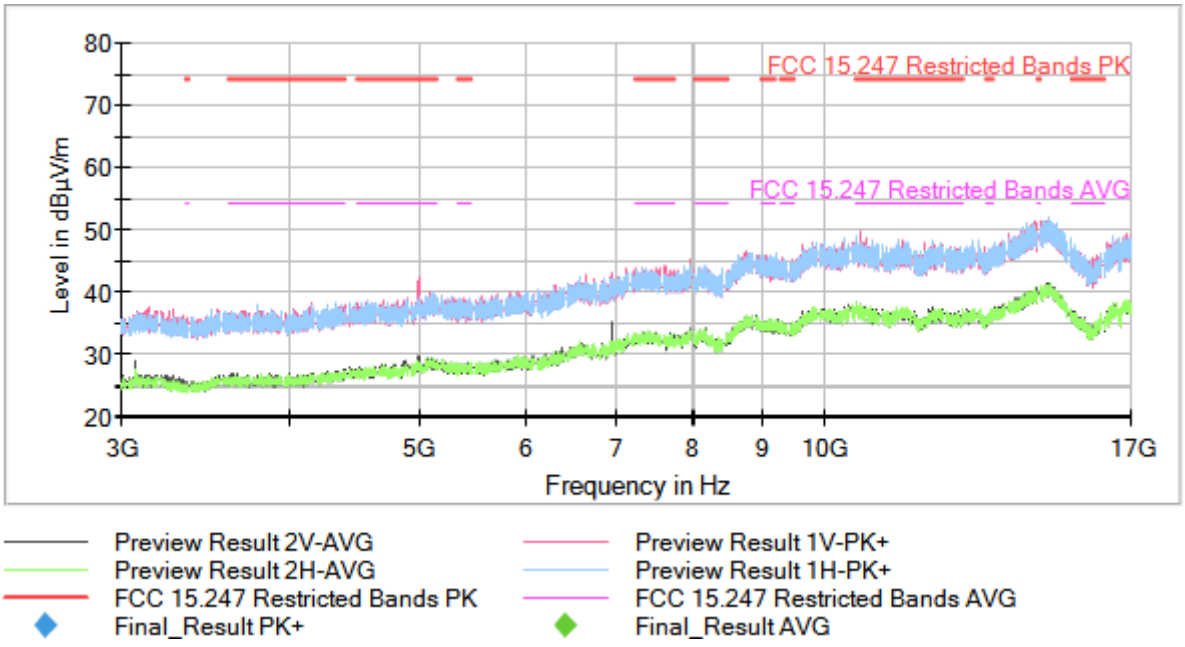
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2441.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5), Frequency Range (GHz) = [3, 17]

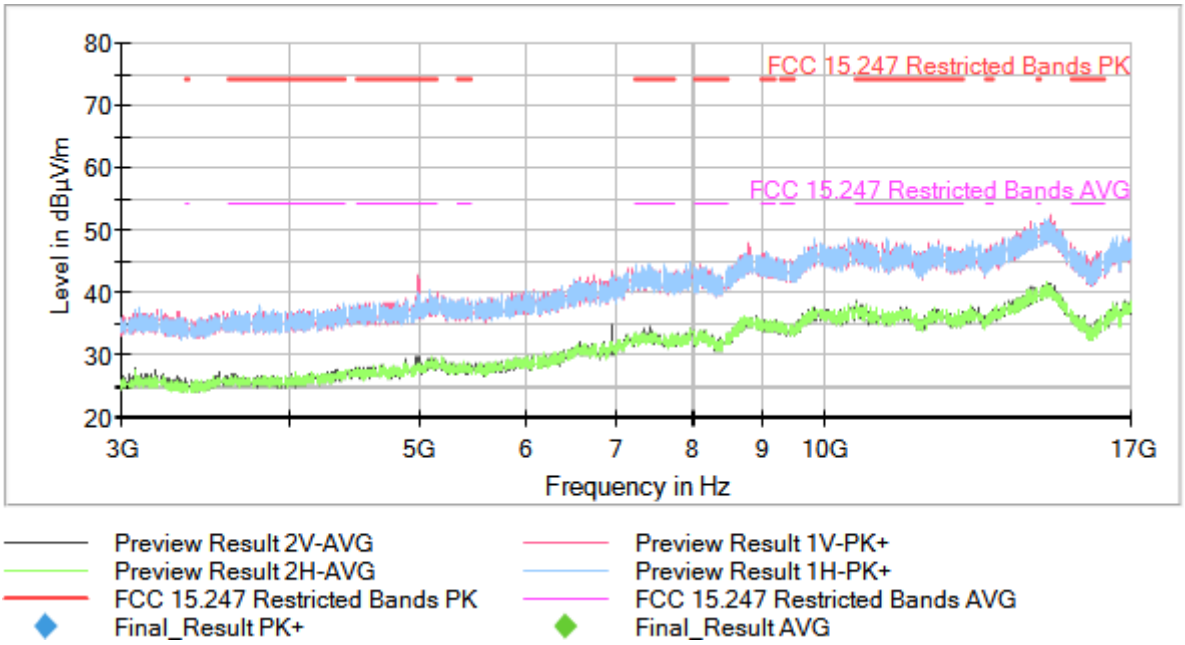
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2480.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5), Frequency Range (GHz) = [3, 17]

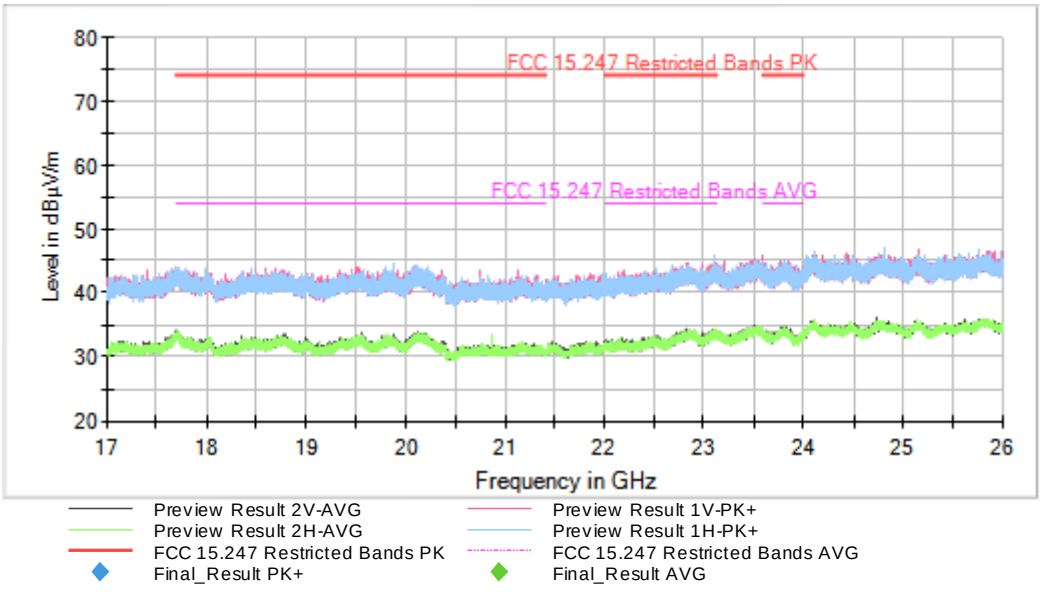
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (Pi/4 DQPSK 2-DH5), Frequency Range (GHz) = [17, 26]

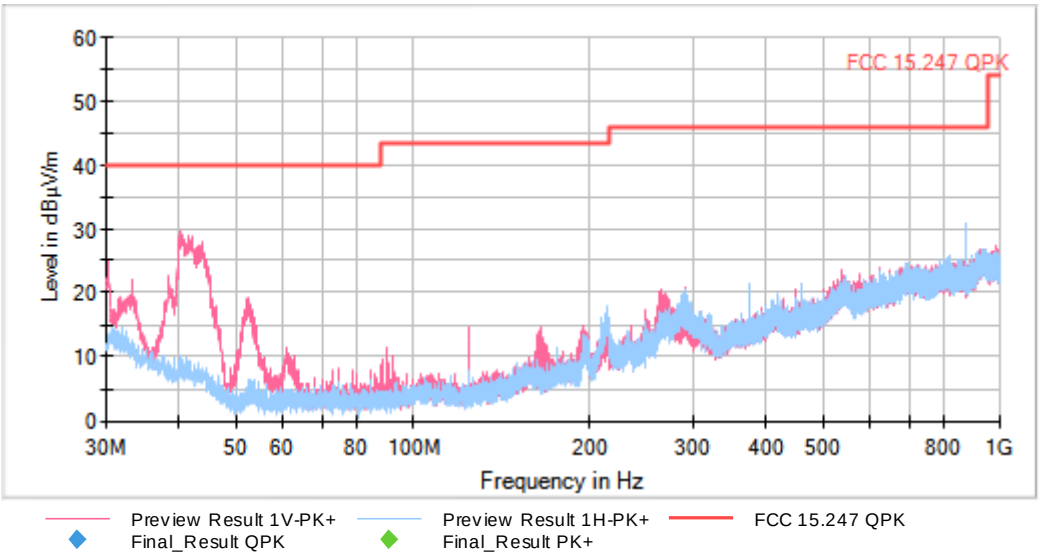
Plots:



This plot is valid for Low, Middle and High Channels.
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5), Frequency Range (GHz) = [0.03, 1]

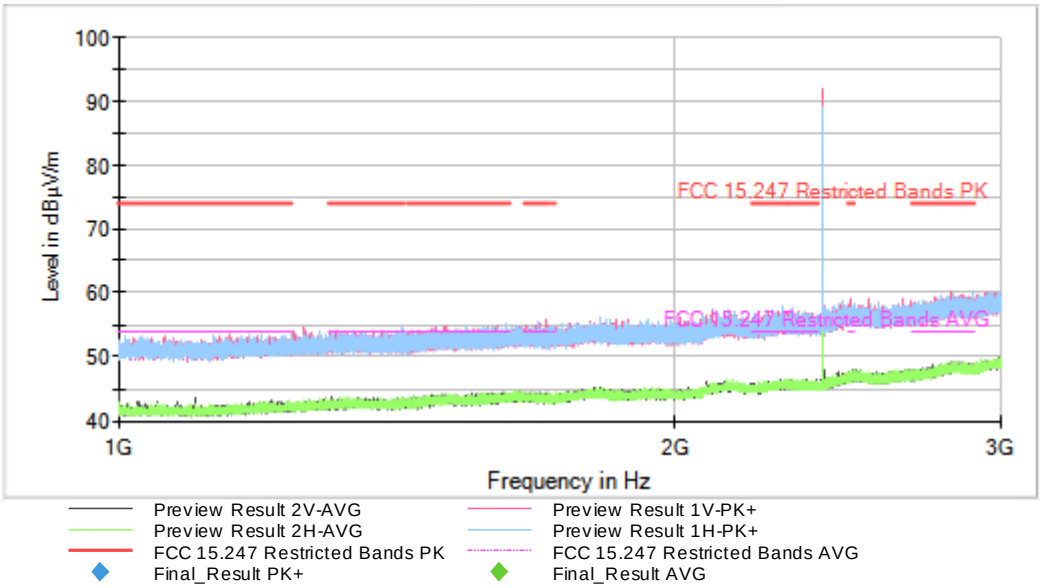
Plots:



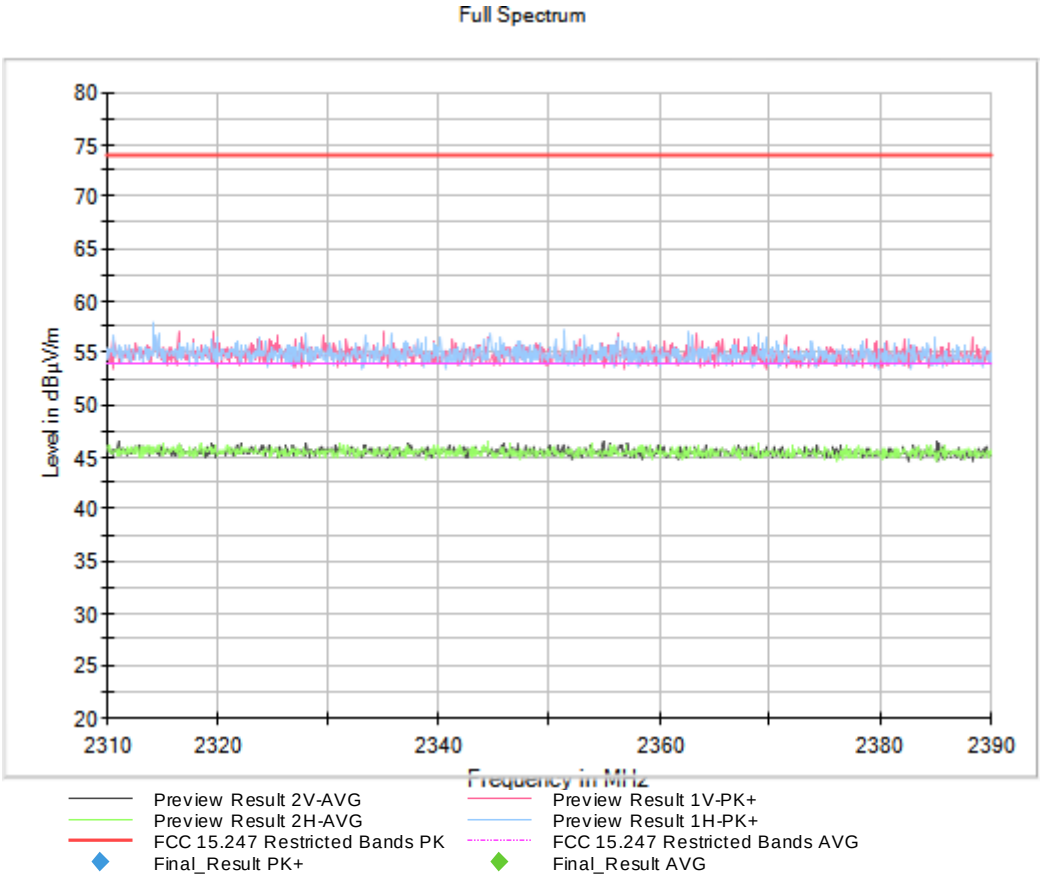
This plot is valid for Low, Middle and High Channels.
Settings: RBW = 100 kHz / VBW = 300 kHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2402.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
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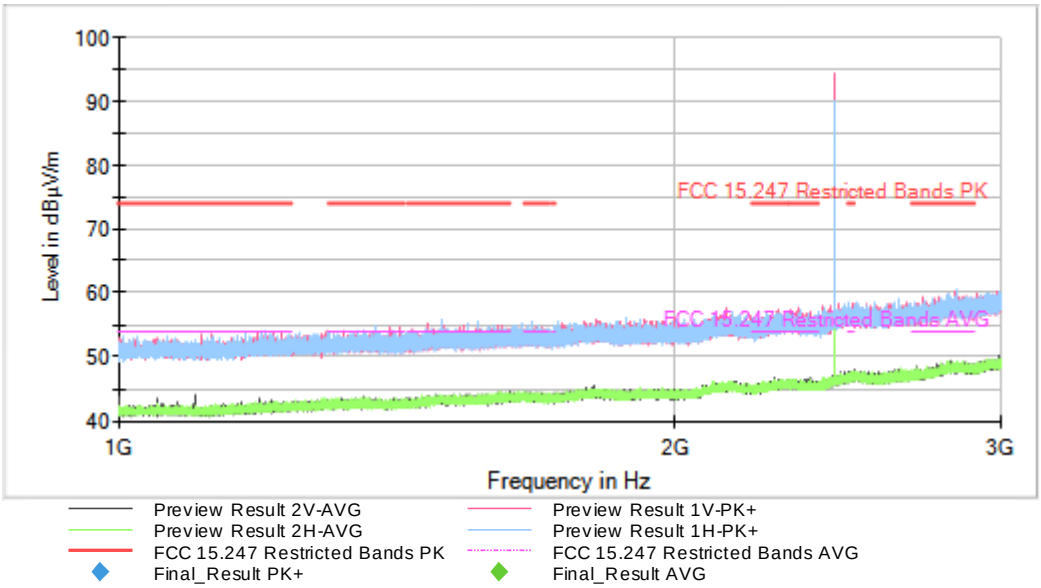
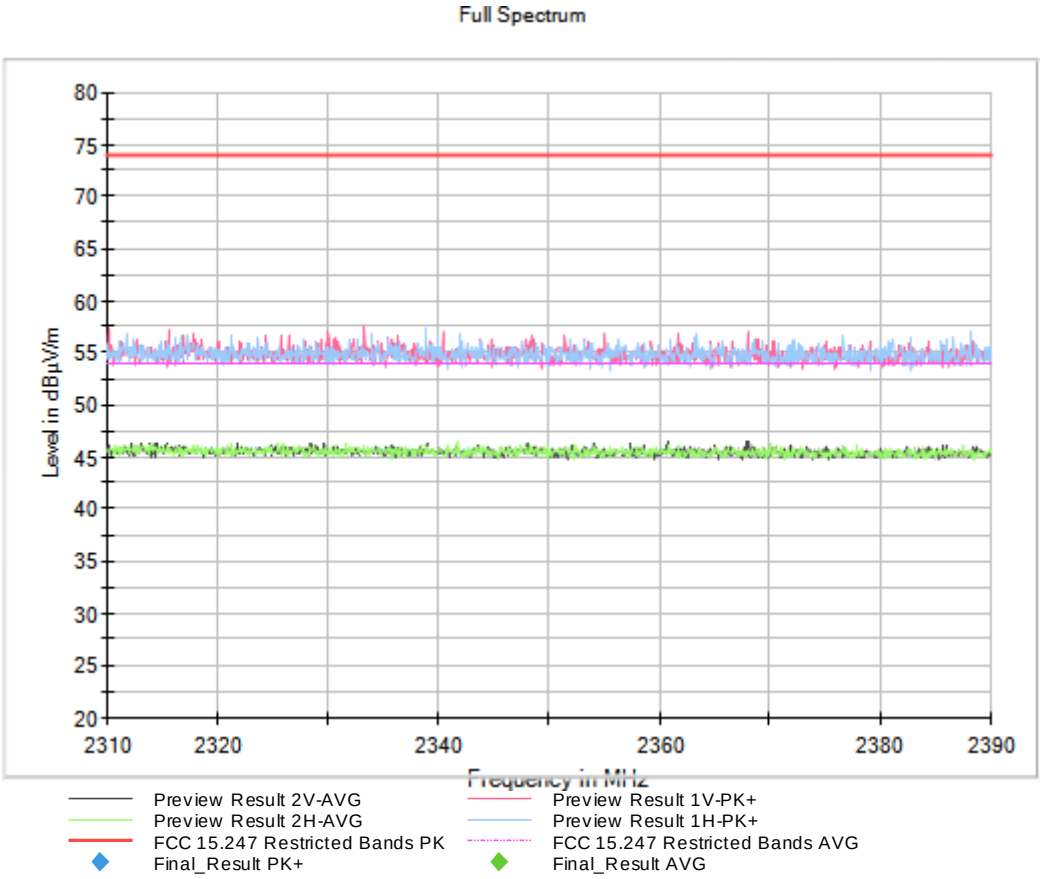
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Frequency (MHz) = 2441.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
65
60
55
50
45
40
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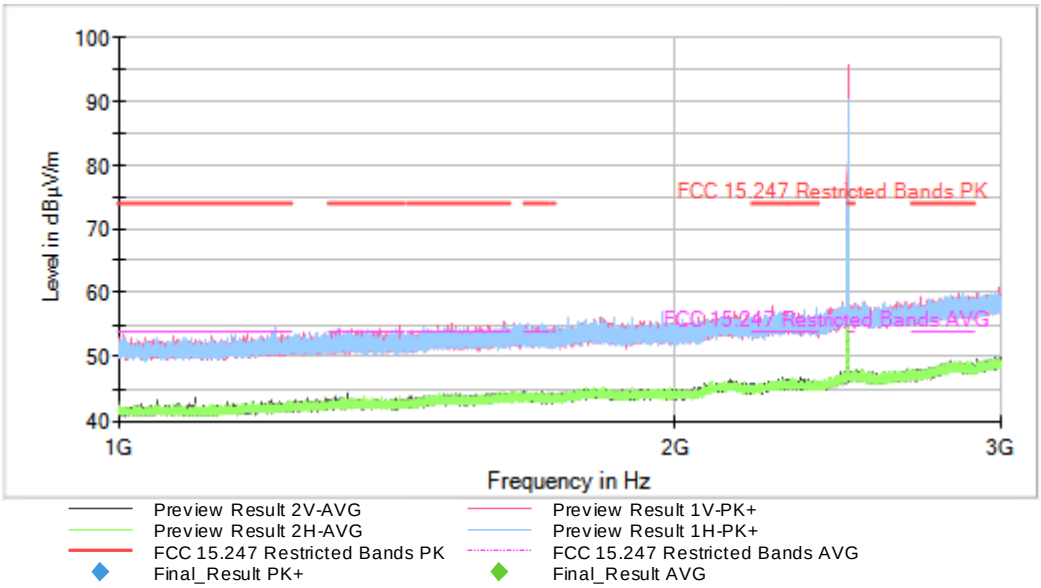
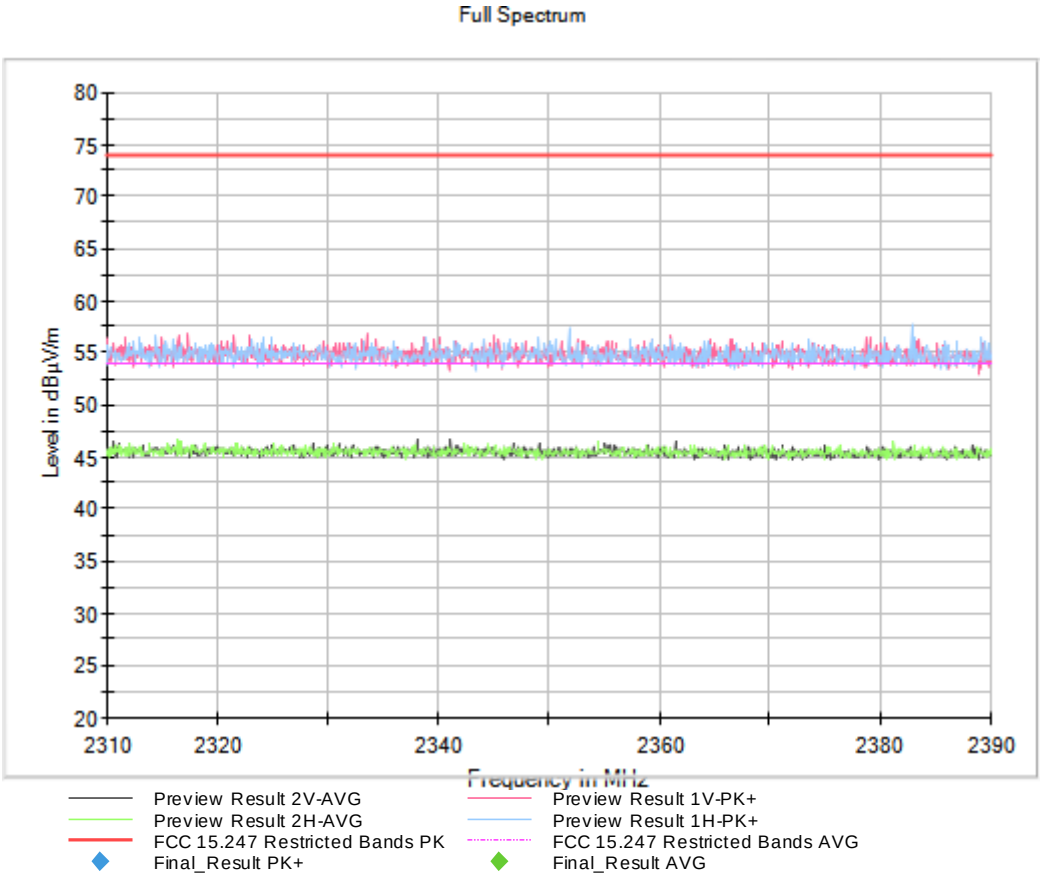
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

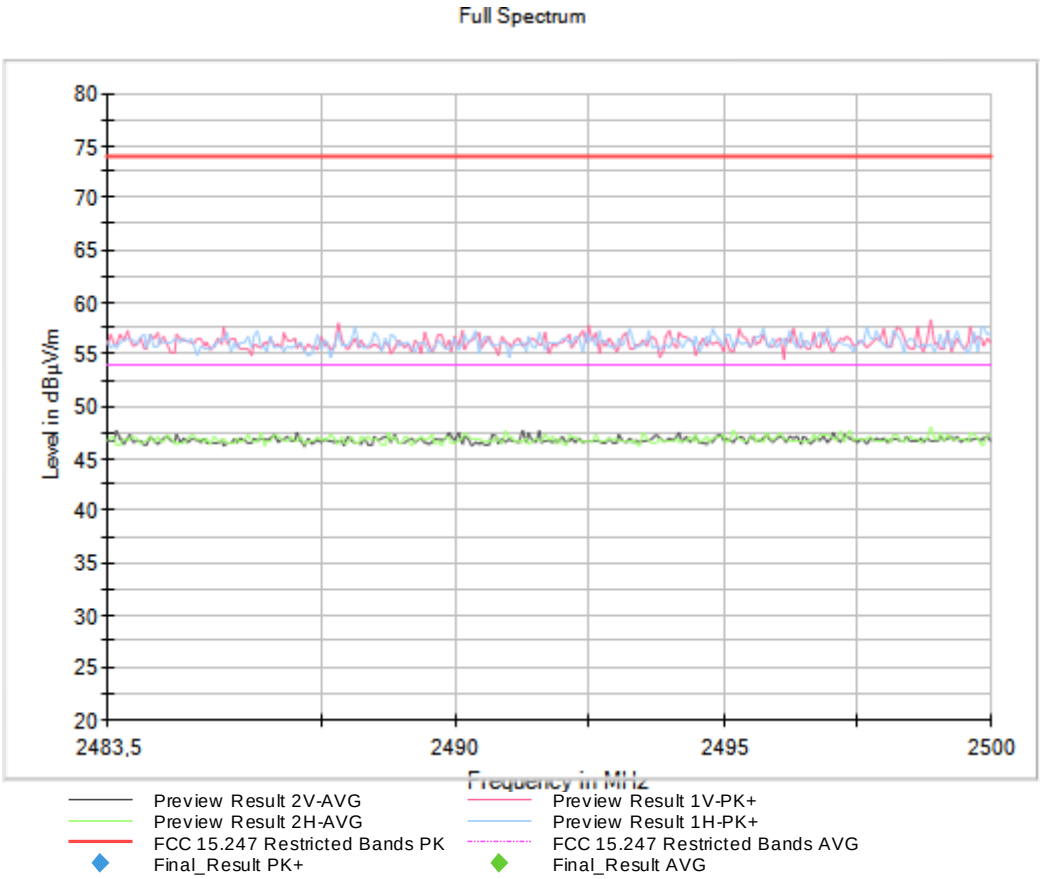
Frequency (MHz) = 2480.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
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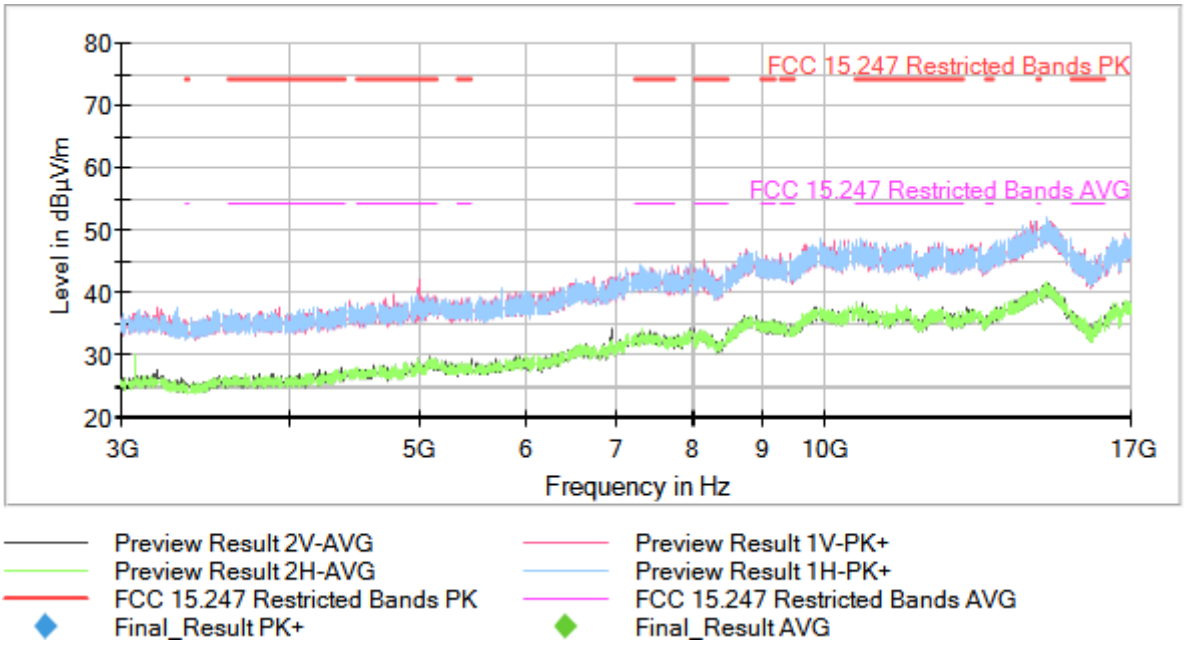
60
55
50
45
40
35
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Frequency (MHz) = 2402.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5), Frequency Range (GHz) = [3, 17]

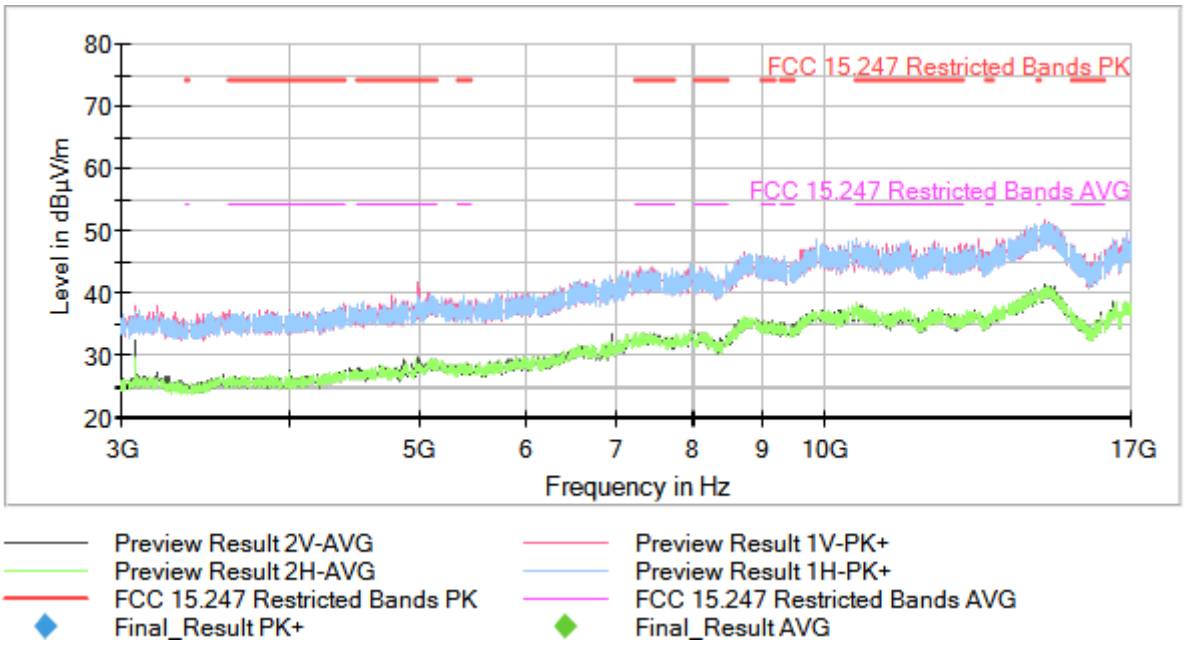
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2441.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5), Frequency Range (GHz) = [3, 17]

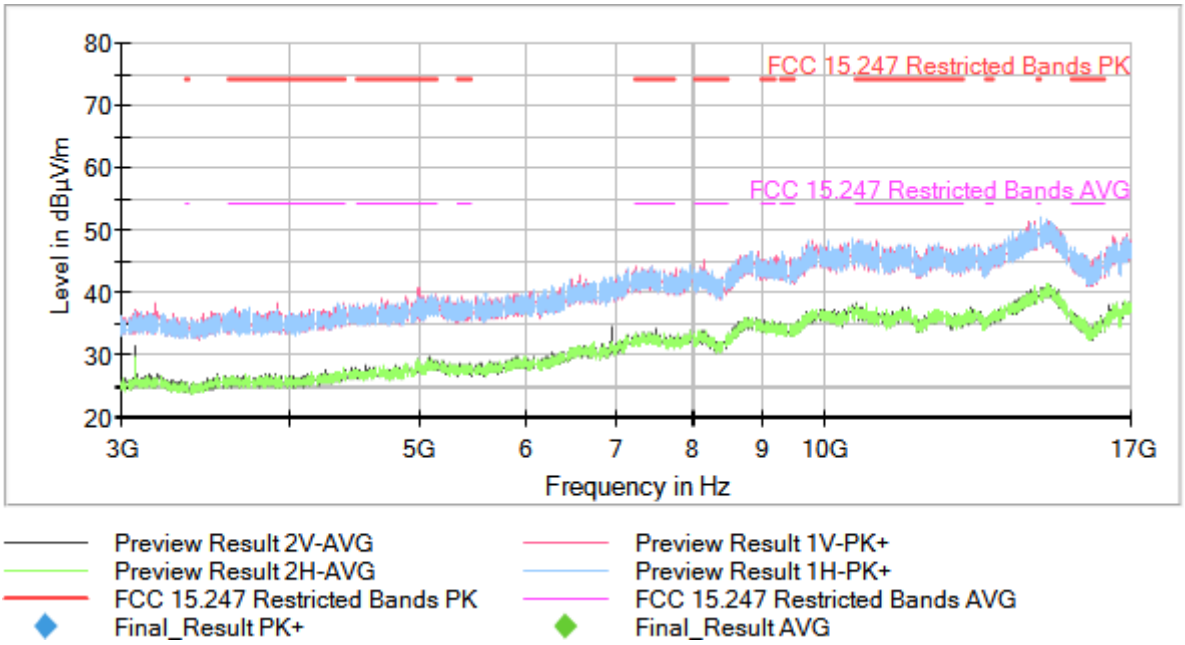
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2480.00000, Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5), Frequency Range (GHz) = [3, 17]

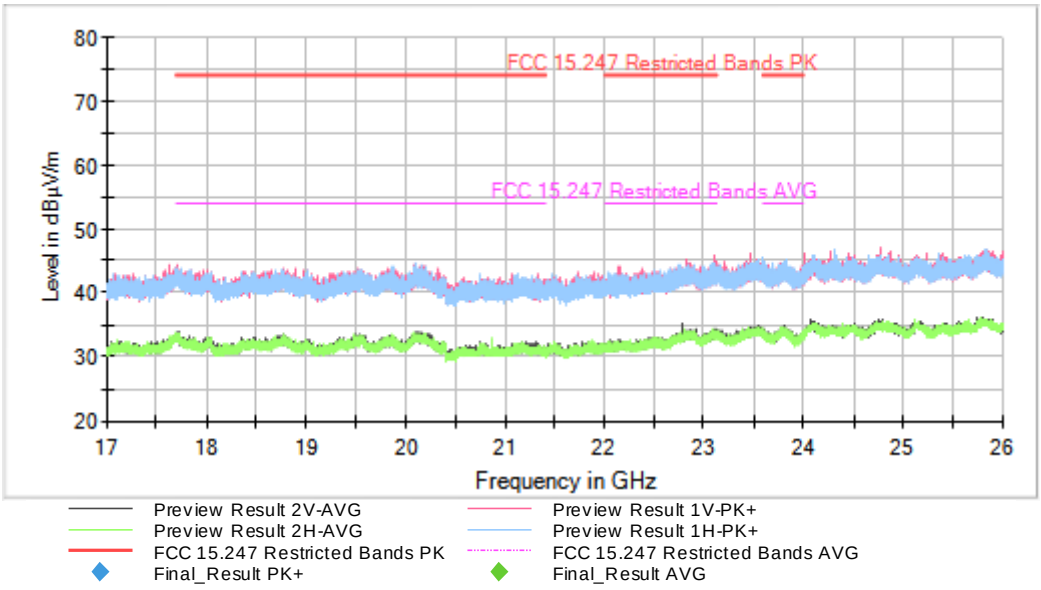
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Frequency Hopping Spread Spectrum systems (DSS), Modulation: BT (8DPSK 3-DH5), Frequency Range (GHz) = [17, 26]

Plots:



This plot is valid for Low, Middle and High Channels.
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Appendix B: Test results. 802.11 b/g/n20/n40 1x1

INDEX

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 12 Vdc

Type of Power Supply: External DC (vehicle battery).

ANTENNA:

Two antenna options (*):

- Internal antenna (Antenova SR4W030)

  Maximum Declared Antenna Gain: 5.2 dBi

- External antenna (PCTEL WV-COVDB2458-7FT-MSMA)

  Maximum Declared Antenna Gain: 6 dBi

Tests have been performed over External antenna configuration.

TEST FREQUENCIES FOR RADIATED TESTS (*):

Operating Channel Bandwidth:	20 MHz	
Transmission Channels:	Channel	Channel Frequency (MHz)
	Low	2412
	Middle	2437
	High	2462
Operating Channel Bandwidth:	40 MHz	
Transmission Channels:	Channel	Channel Frequency (MHz)
	Low	2422
	Middle	2437
	High	2452

POWER SETTINGS:

The EUT was tested in the following operating mode:

Continuous transmission with a modulated carrier on all required channels selecting the supported data rates/modulations types.

During transmitter test the EUT was being controlled by the SW tool to operate in a continuous transmit mode on the test channel as required and in each of the different modulation modes.

The following power settings were used to configure the EUT for the tests:

Modulation	Power setting
802.11b (DSSS 1 Mbit/s)	13 dBm
802.11g (OFDM 6 Mbit/s)	13 dBm
802.11n HT20 (OFDM MCS0 6.5 Mbit/s)	13 dBm
802.11n HT40 (OFDM MCS0 13.5 Mbit/s)	14 dBm

RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Bilog antenna for the range from 30 MHz to 1000 MHz and Double ridge horn antenna for the range from 1 GHz to 17 GHz) 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).

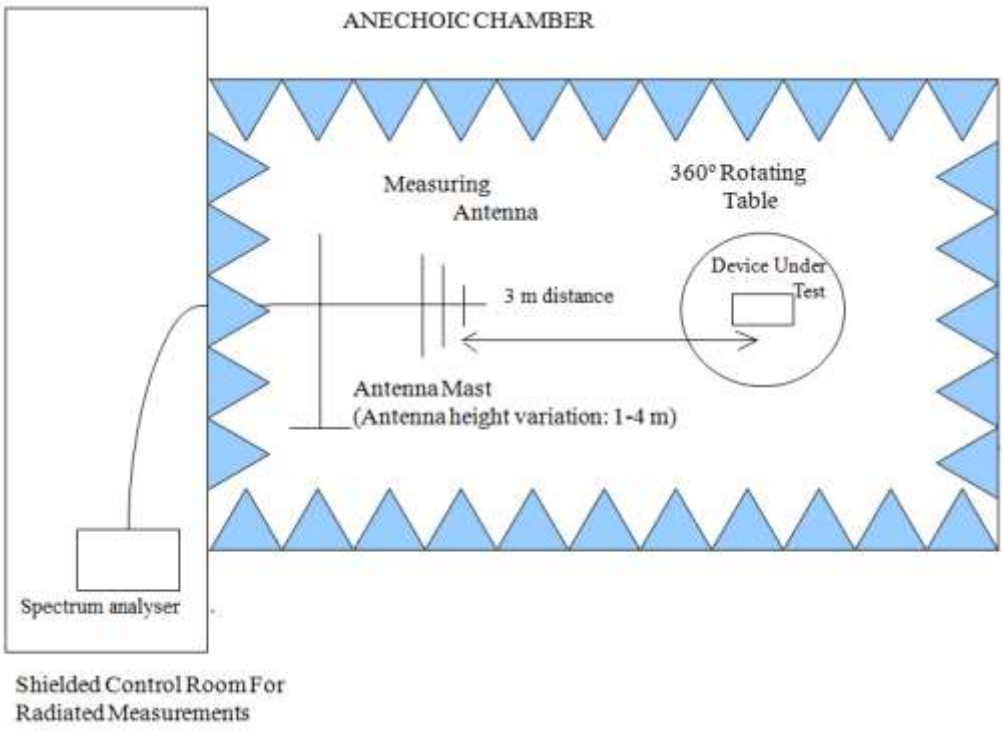
For radiated emissions in the range 17 GHz-26 GHz performed at a distance closer than the specified distance in the standard, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and its situation and orientation were 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.

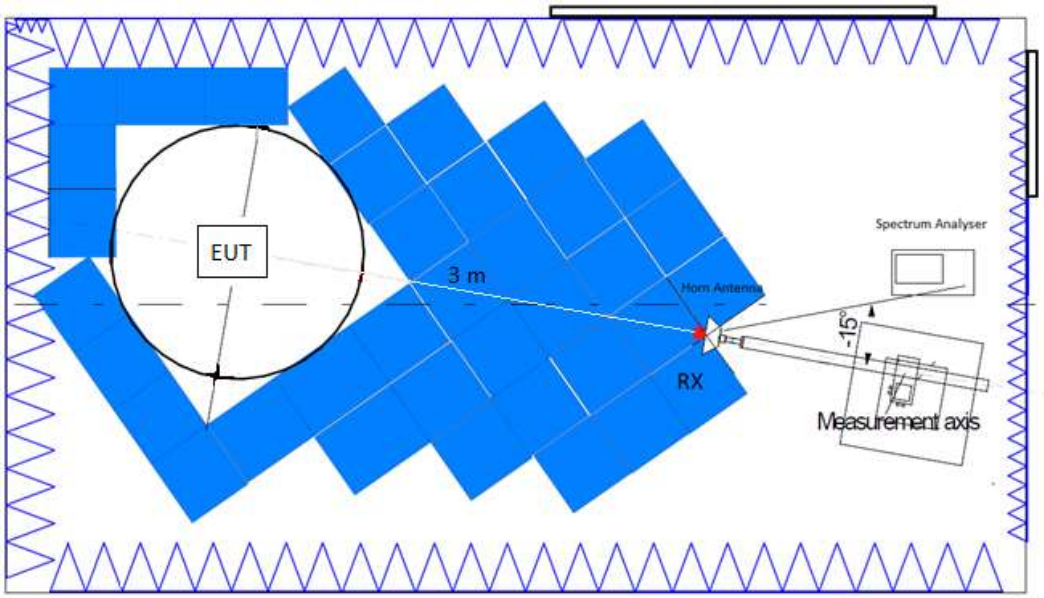
Measurements were made in both horizontal and vertical planes of polarization.

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.

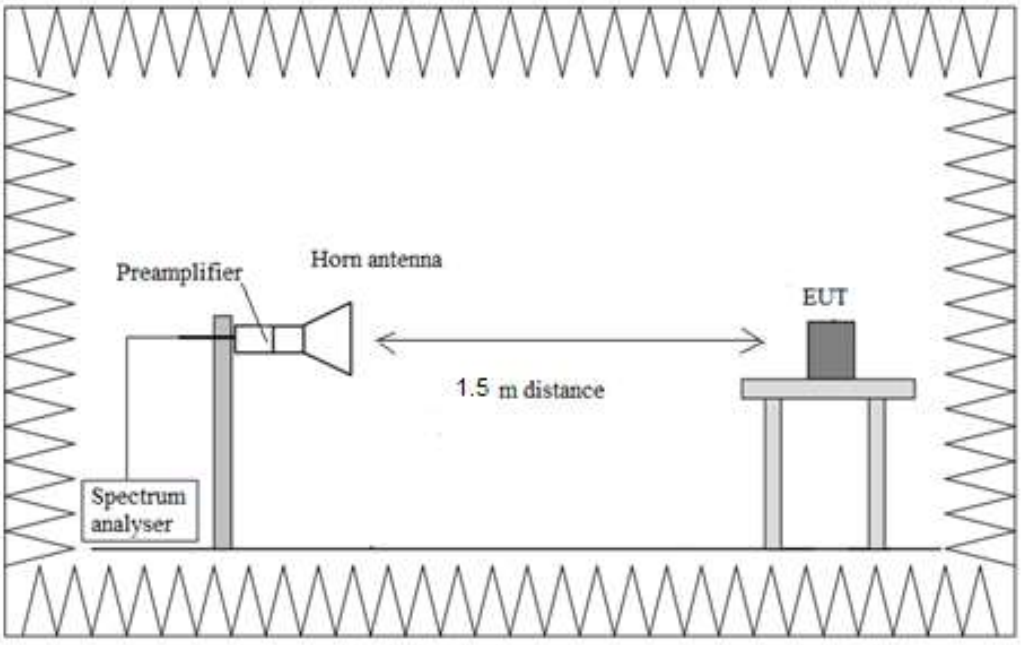
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup f > 17 GHz:



TEST CASES DETAILS

FCC 15.247 (b) / RSS-247 5.4 (d) Maximum Output Power and Antenna Gain

Limits

For systems using digital modulation in the 2400-2483.5 MHz band: 1 watt (30 dBm).
The e.i.r.p. shall not exceed 4 W (36 dBm) (RSS-247).

Results

The maximum peak conducted output power level of the fundamental emission was measured according to clause 11.9.2.3.2 “Method AVGPM-G” of ANSI C63.10-2013.

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

Maximum Declared Antenna Gain (external): +6.0 dBi

Modulation: 802.11b (DSSS 1 Mbit/s)

Operation Band (MHz)	Equipment	Avg Power Conducted (dBm)	Maximum EIRP Power (dBm)
2412.00	Digital Transmission System (DTS)	13.30	19.30
2437.00		12.38	18.38
2462.00		13.20	19.20

Modulation: 802.11g (OFDM 6 Mbit/s)

Operation Band (MHz)	Equipment	Avg Power Conducted (dBm)	Maximum EIRP Power (dBm)
2412.00	Digital Transmission System (DTS)	13.01	19.01
2437.00		12.15	18.15
2462.00		12.91	18.91

Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)

Operation Band (MHz)	Equipment	Avg Power Conducted (dBm)	Maximum EIRP Power (dBm)
2412.00	Digital Transmission System (DTS)	12.76	18.76
2437.00		11.90	17.90
2462.00		12.65	18.65

Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

Operation Band (MHz)	Equipment	Avg Power Conducted (dBm)	Maximum EIRP Power (dBm)
2422.00	Digital Transmission System (DTS)	13.42	19.42
2437.00		12.87	18.87
2452.00		13.11	19.11

Verdict: *Pass*

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 Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 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	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 specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.

RSS-247:

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

Results

Frequency range 30 MHz – 1 GHz:

The spurious frequencies detected do not depend either on the operating channel or the modulation.

Spurious frequencies detected at less than 20 dB below the limit:

Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
40.88219	24.90	V	Quasi-Peak
41.85219	25.60	V	Quasi-Peak
43.45875	24.01	V	Quasi-Peak
44.51969	22.50	V	Quasi-Peak

Verdict

Pass

Modulation: 802.11b (DSSS 1 Mbit/s)

Frequency range 1 GHz – 26 GHz:

Spurious frequencies detected at less than 20 dB below the limit:

Freq (MHz)	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
2412.00000	[3, 17]	3216.12500 (*)	40.96	V	PK
		4998.50000	49.59	H	PK
2437.00000	[3, 17]	3249.37500 (*)	40.01	V	PK
		4993.25000	49.92	H	PK
2462.00000	[3, 17]	4979.68750	51.52	V	PK

(*) This Spurious Frequency is outside the restricted bands as defined in §15.205(a). The peak spurious level is more than 20 dB below the peak carrier level.

Verdict

Pass

Modulation: 802.11g (OFDM 6 Mbit/s)

Frequency range 1 GHz – 26 GHz:

Spurious frequencies detected at less than 20 dB below the limit:

Freq (MHz)	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
2412.00000	[3, 17]	3216.12500 (*)	40.98	V	PK
		4995.43750	52.37	V	PK
2437.00000	[3, 17]	4984.06250	48.07	H	PK
2462.00000	[3, 17]	3282.62500 (*)	39.67	V	PK
		4991.93750	47.36	V	PK

(*) This Spurious Frequency is outside the restricted bands as defined in §15.205(a). The peak spurious level is more than 20 dB below the peak carrier level.

Verdict

Pass

Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)

Frequency range 1 GHz – 26 GHz:

Spurious frequencies detected at less than 20 dB below the limit:

Freq (MHz)	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
2412.00000	[3, 17]	3215.68750 (*)	41.70	V	PK
		4994.12500	51.57	V	PK
2437.00000	[3, 17]	3402.93750 (*)	41.27	H	PK
		4981.87500	47.84	V	PK

(*) This Spurious Frequency is outside the restricted bands as defined in §15.205(a). The peak spurious level is more than 20 dB below the peak carrier level.

Verdict

Pass

Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

Frequency range 1 GHz – 26 GHz:

Spurious frequencies with peak levels above the average limit (54dBuV/m at 3m) and which fall in the restricted bands are measured with an average detector for checking compliance with the average limit.

Reported average values include duty cycle correction factor.

Duty Cycle Correction factor: 0.39 dB

Spurious frequencies detected at less than 20 dB below the limit:

Freq (MHz)	Freq Rng (GHz)	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
2422.00000	[1, 3]	2389.24000	63.75	V	PK
			48.83		AVG
2452.0000	[1, 3]	2485.71900	63.34	V	PK
			49.85		AVG
2422.00000	[3, 17]	3228.81250 (*)	39.75	V	PK
		4991.93750	51.11	H	PK
2437.00000	[3, 17]	3186.37500 (*)	42.35	V	PK
		4980.12500	46.79	V	PK
2452.00000	[3, 17]	4997.62500	48.58	V	PK

(*) This Spurious Frequency is outside the restricted bands as defined in §15.205(a). The peak spurious level is more than 20 dB below the peak carrier level.

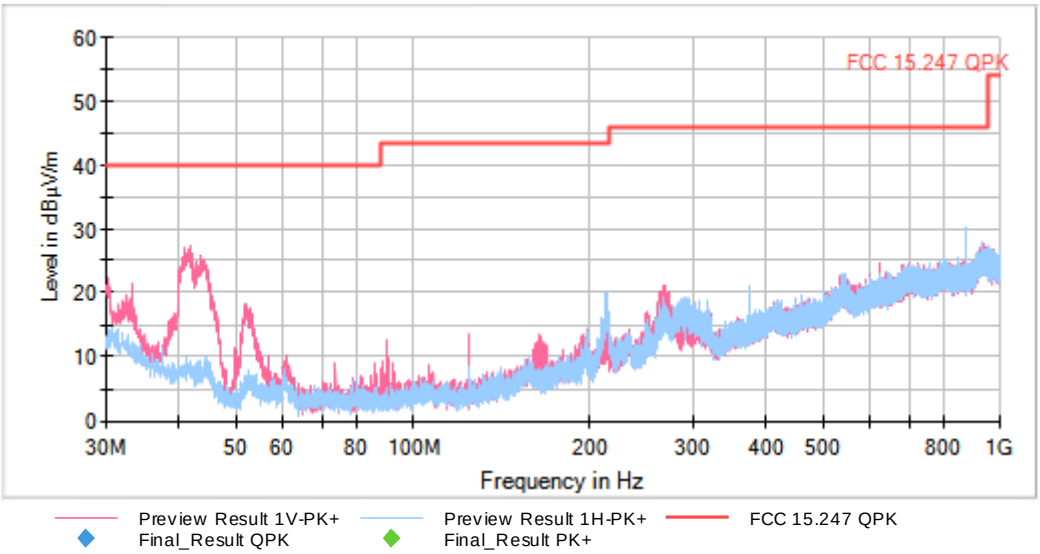
Verdict

Pass

Attachments

Equipment Type: Digital Transmission System (DTS), Modulation: 802.11b (DSSS 1 Mbit/s), Frequency Range (GHz) = [0.03, 1]

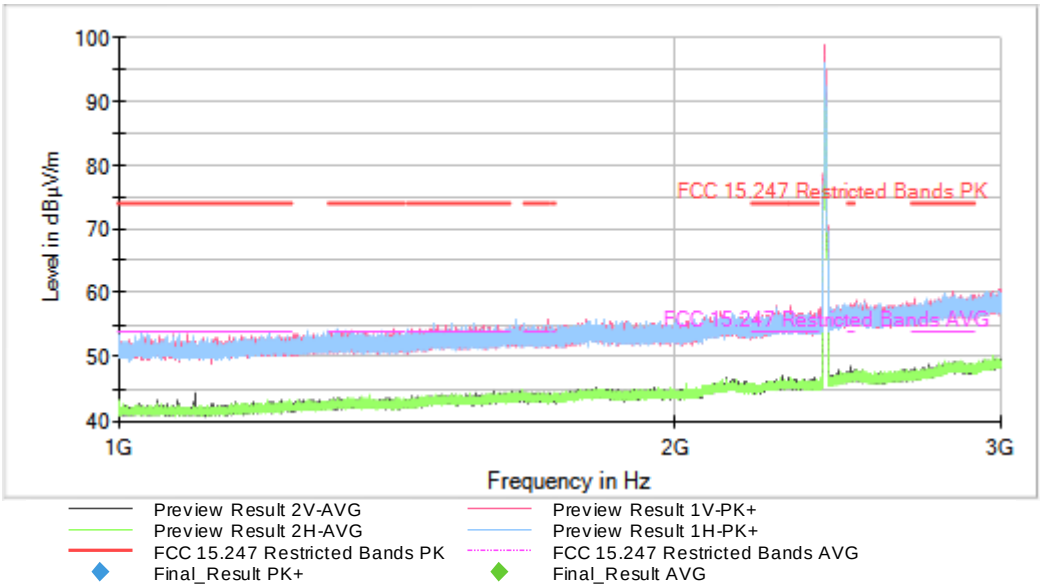
Plots:



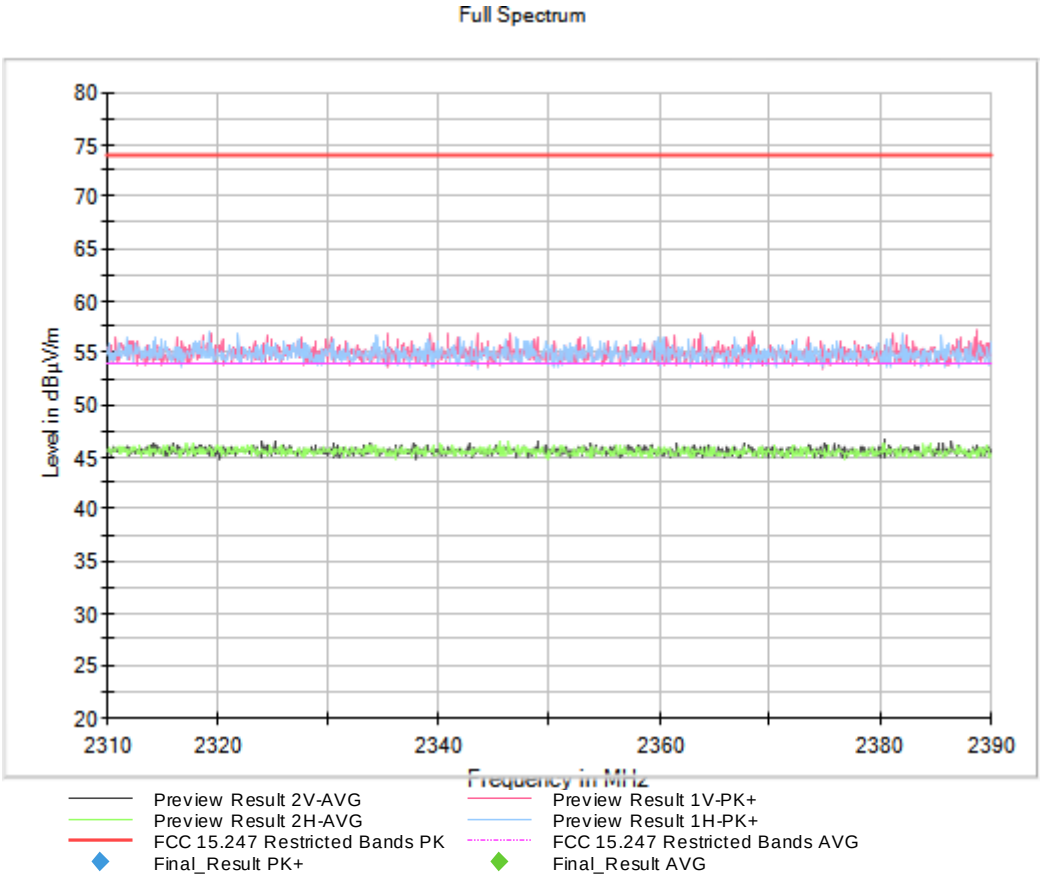
This plot is valid for Low, Middle and High Channels.
Settings: RBW = 100 kHz / VBW = 300 kHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2412.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11b (DSSS 1 Mbit/s), Frequency Range (GHz) = [1, 3]

Plots:



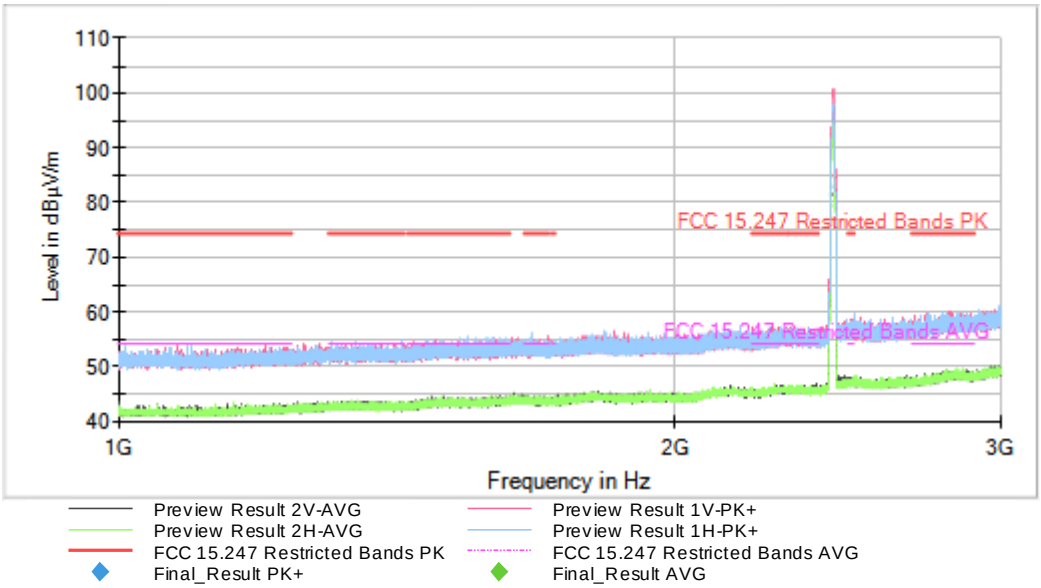
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000



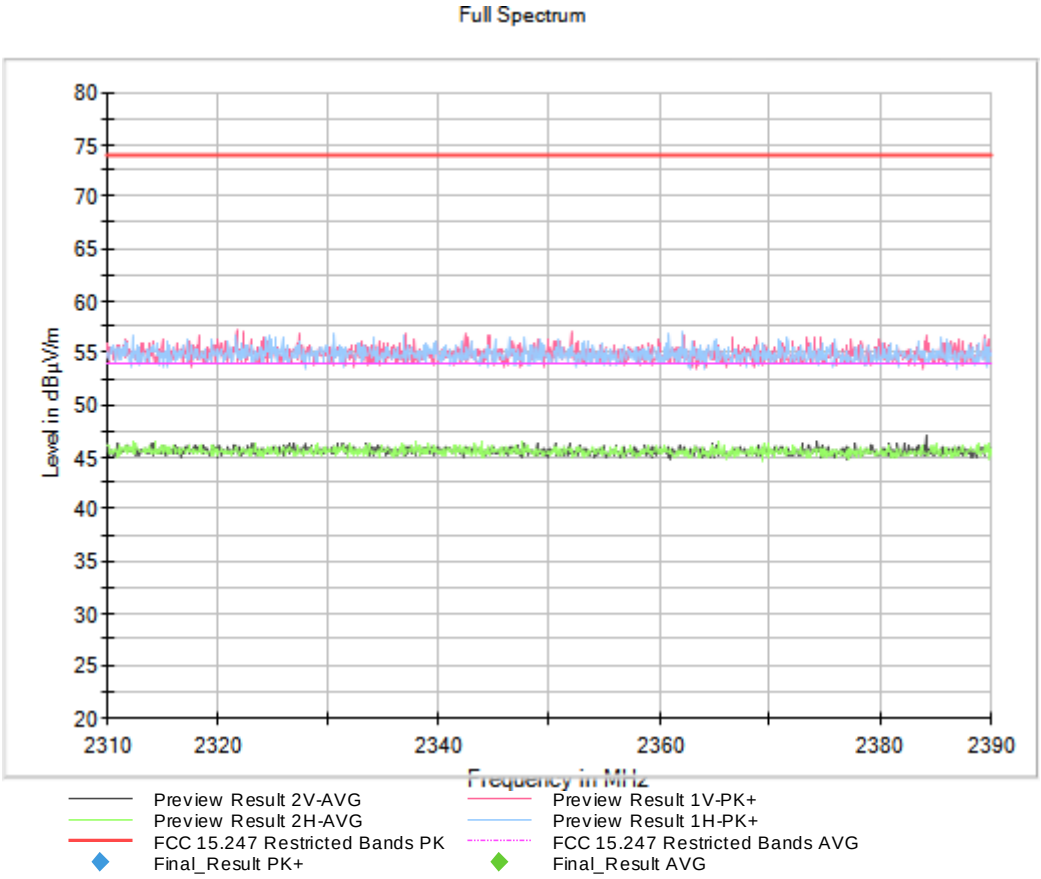

Full Spectrum
Level in dBµV/m
80
75
70
65
60
55
50
45
40
35
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

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

Plots:



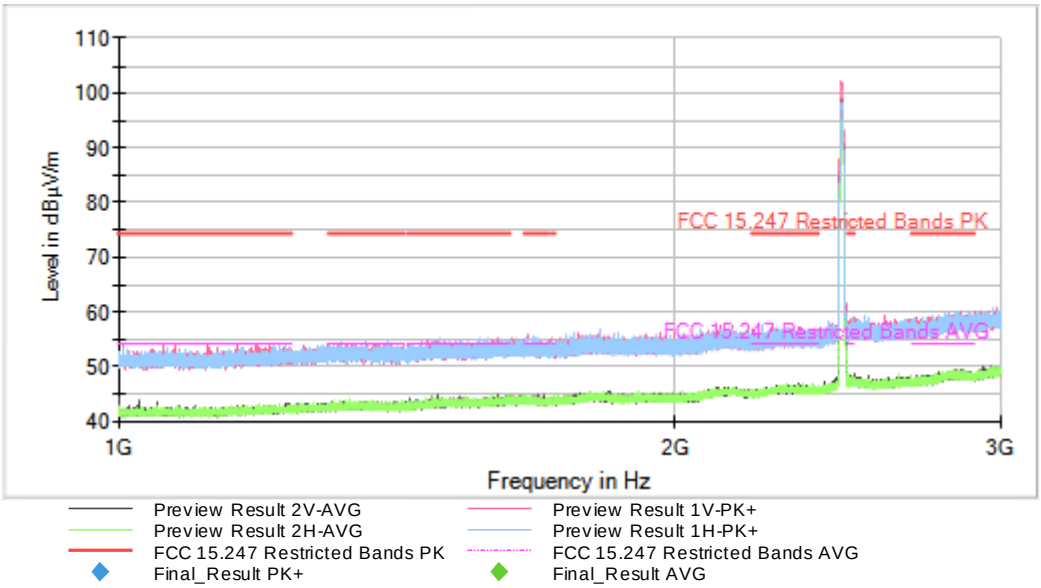
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000



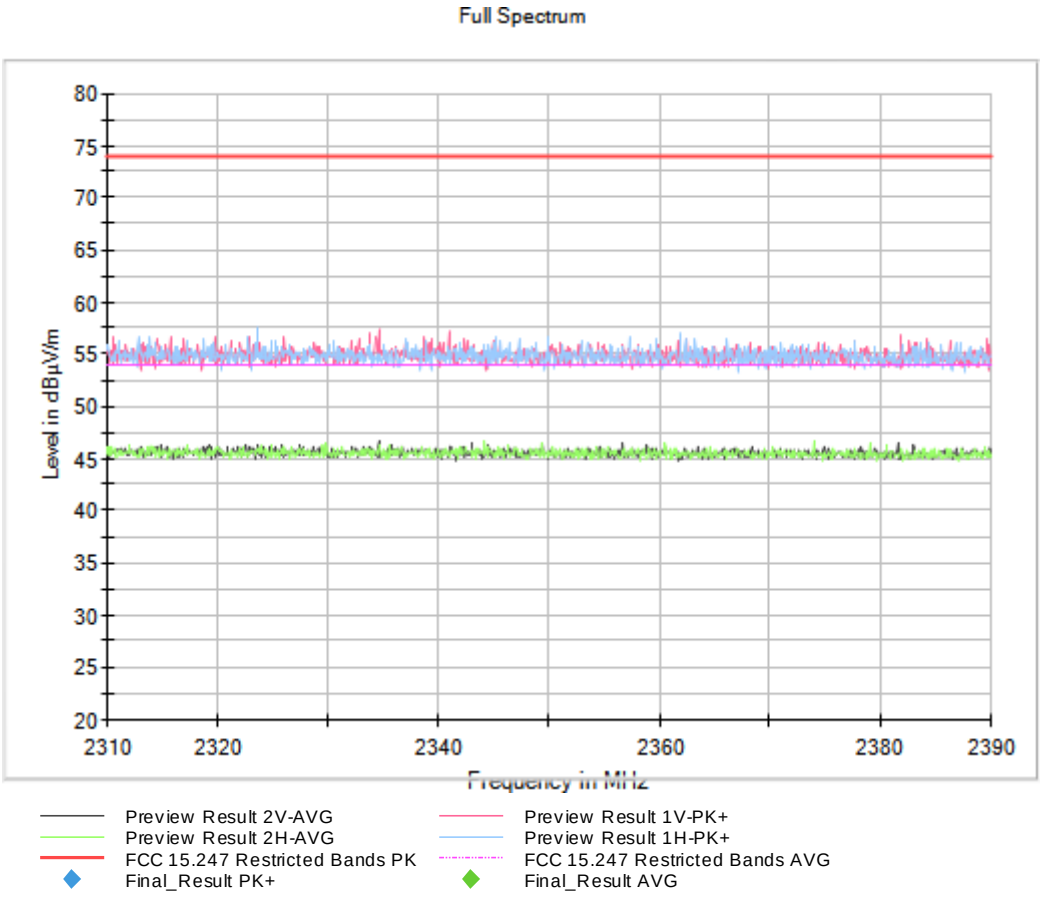

Full Spectrum
Level in dBµV/m
80
75
70
65
60
55
50
45
40
35
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

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

Plots:



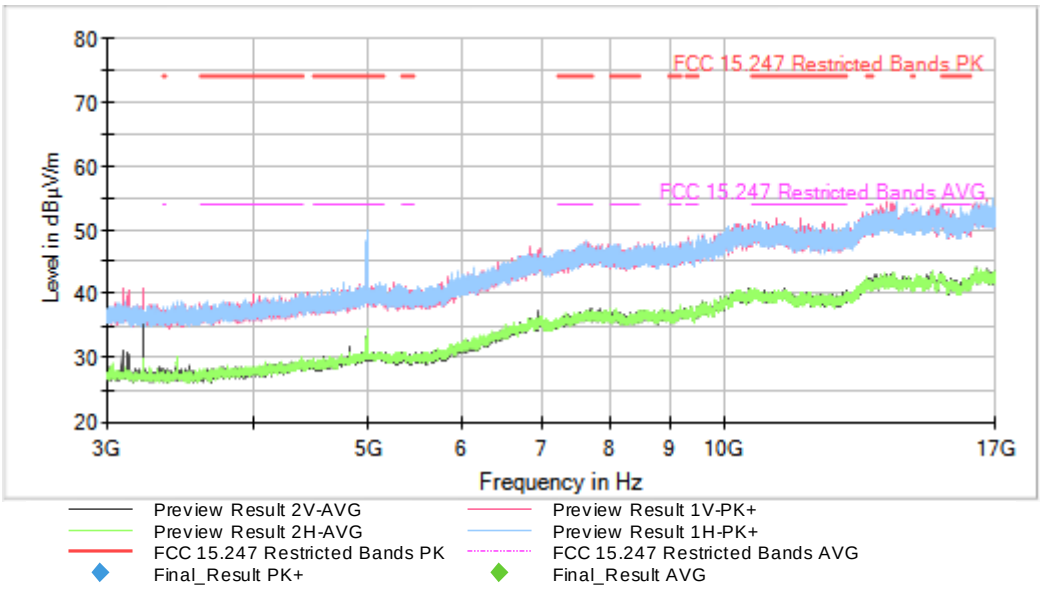
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
65
60
55
50
45
40
35
30
25
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

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

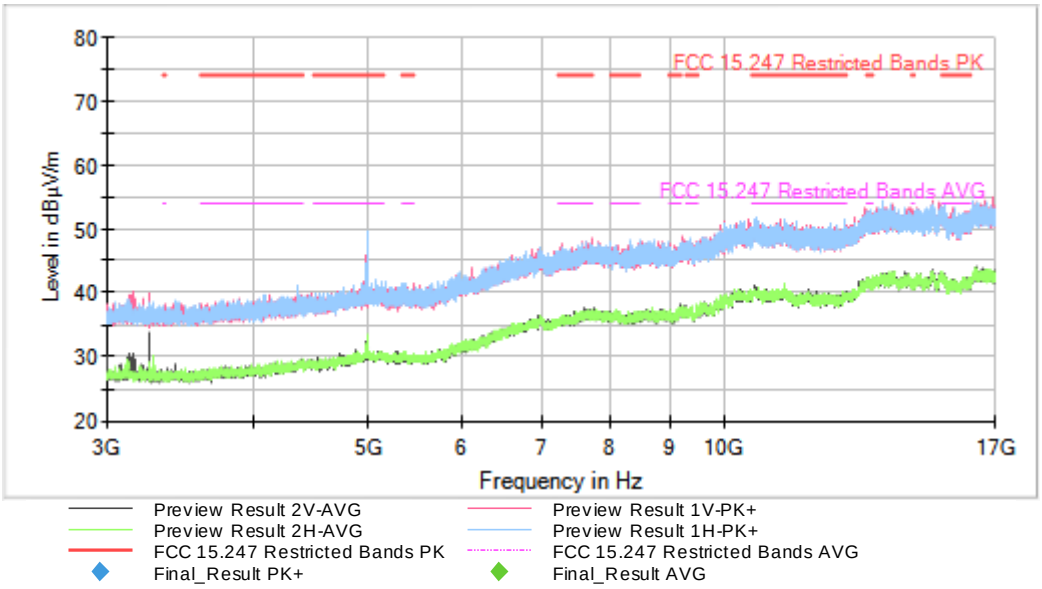
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

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

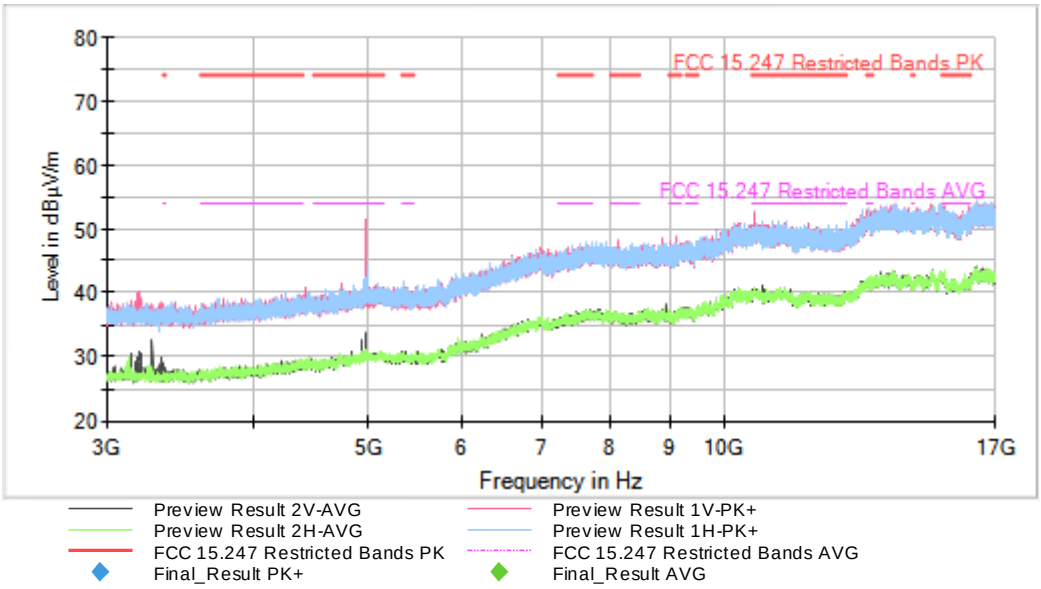
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

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

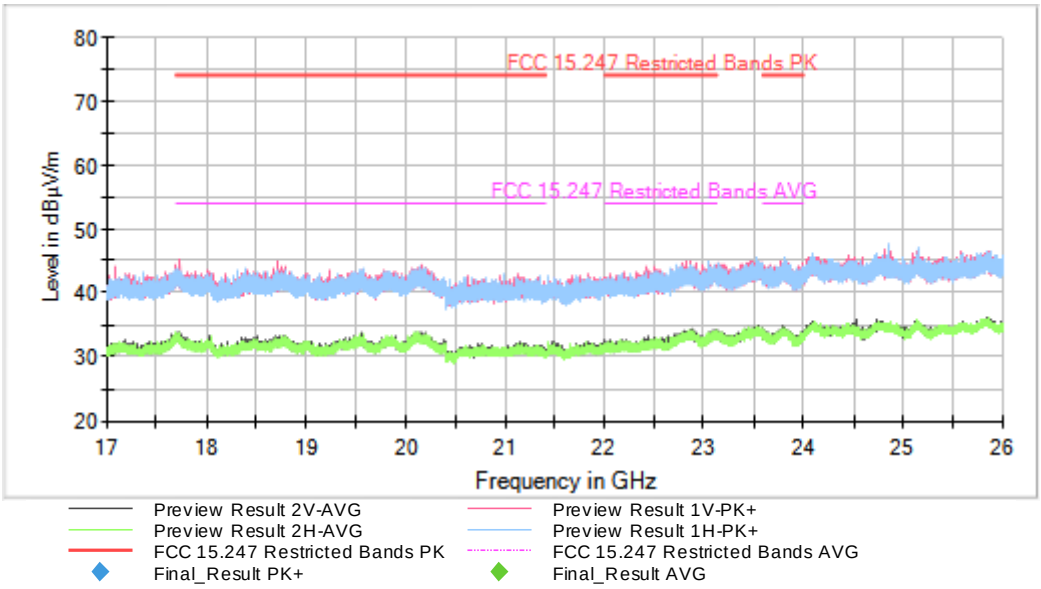
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Digital Transmission System (DTS), Modulation: 802.11b (DSSS 1 Mbit/s), Frequency Range (GHz) = [17, 26]

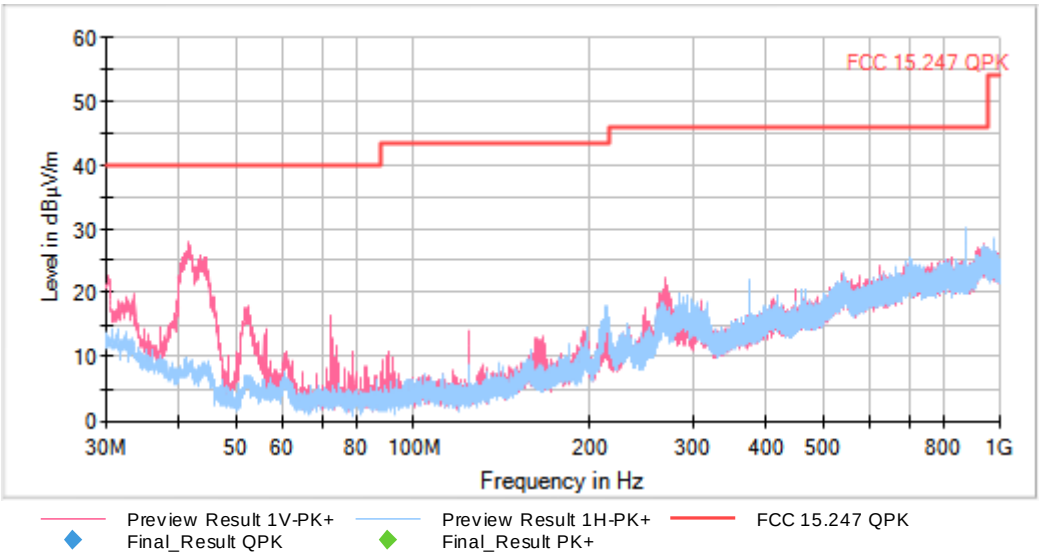
Plots:



This plot is valid for Low, Middle and High Channels.
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Digital Transmission System (DTS), Modulation: 802.11g (OFDM 6 Mbit/s), Frequency Range (GHz) = [0.03, 1]

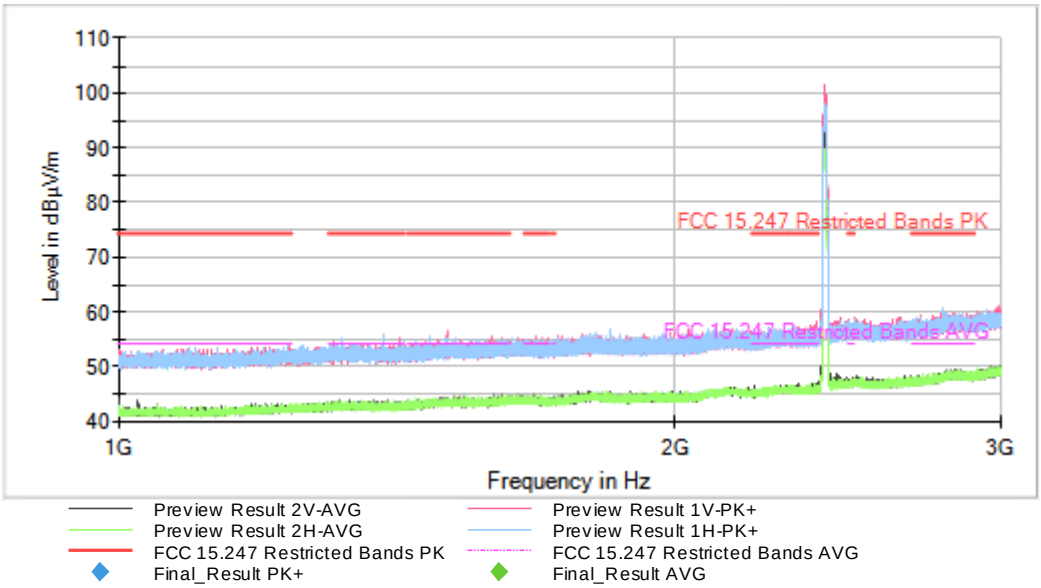
Plots:



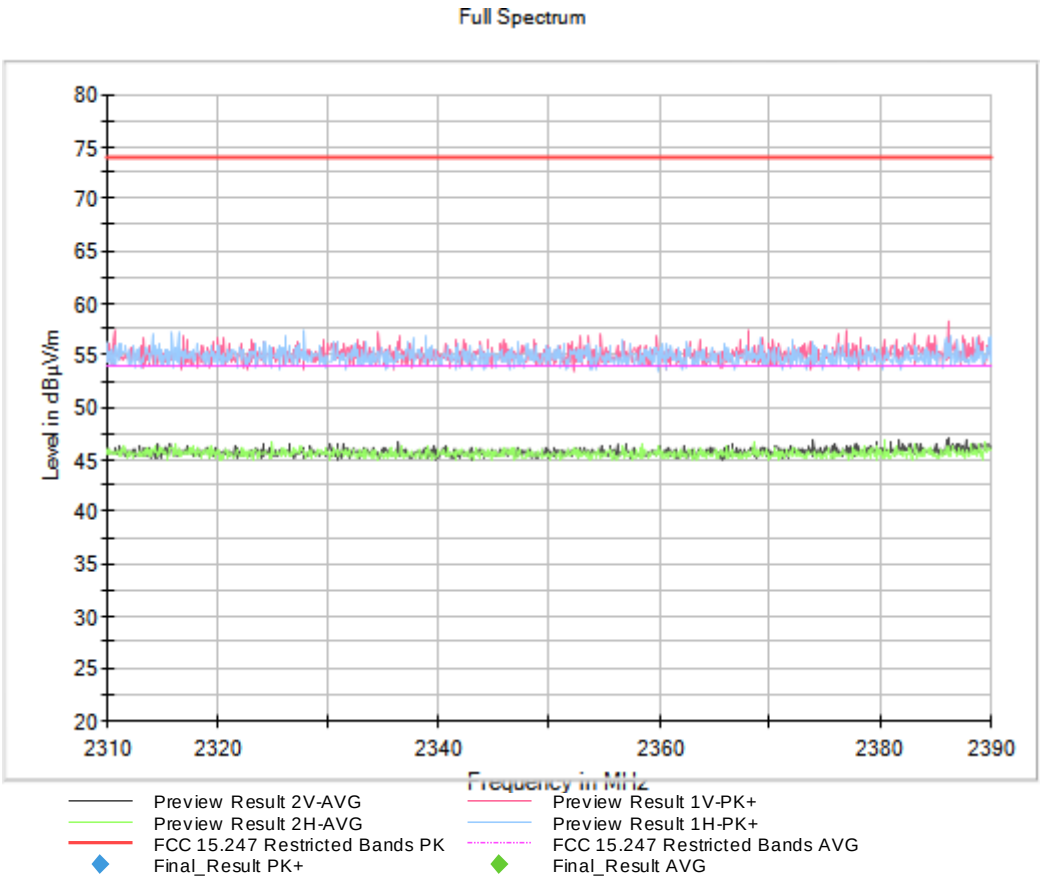
This plot is valid for Low, Middle and High Channels.
Settings: RBW = 100 kHz / VBW = 300 kHz / Sweep Time = 1s / Sweep points = 32000

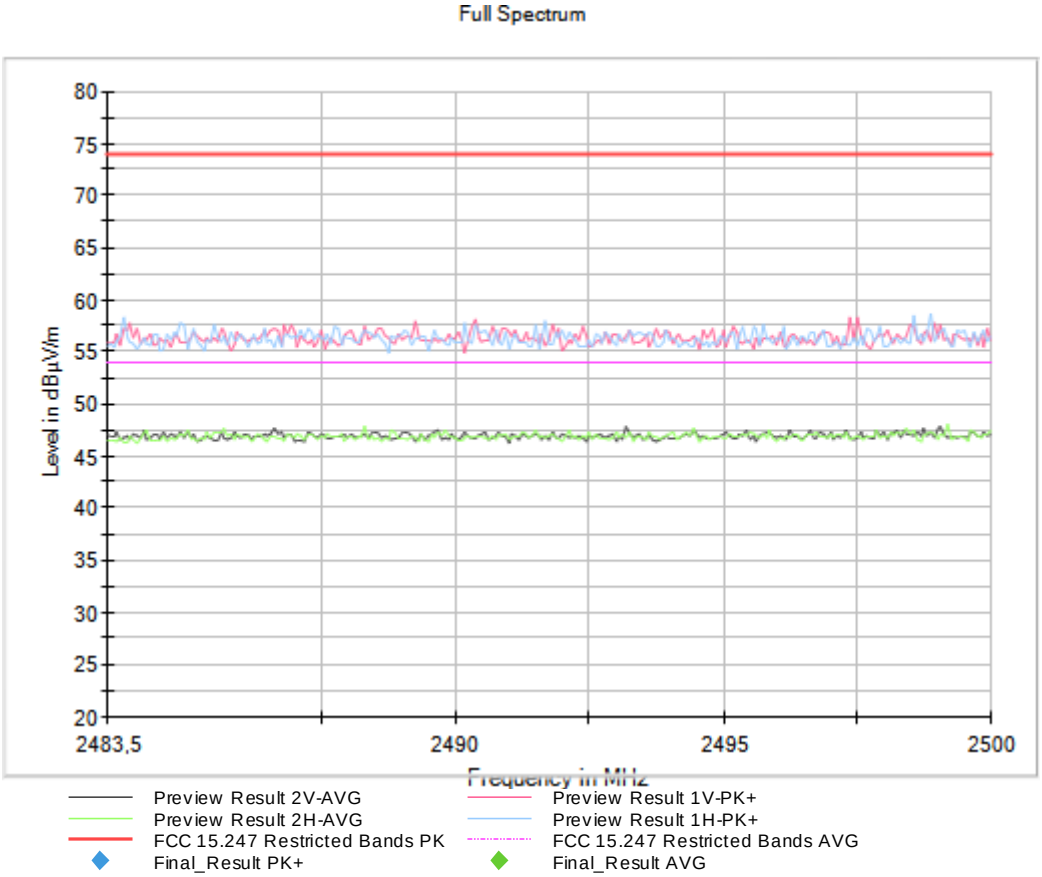
Frequency (MHz) = 2412.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11g (OFDM 6 Mbit/s), Frequency Range (GHz) = [1, 3]

Plots:



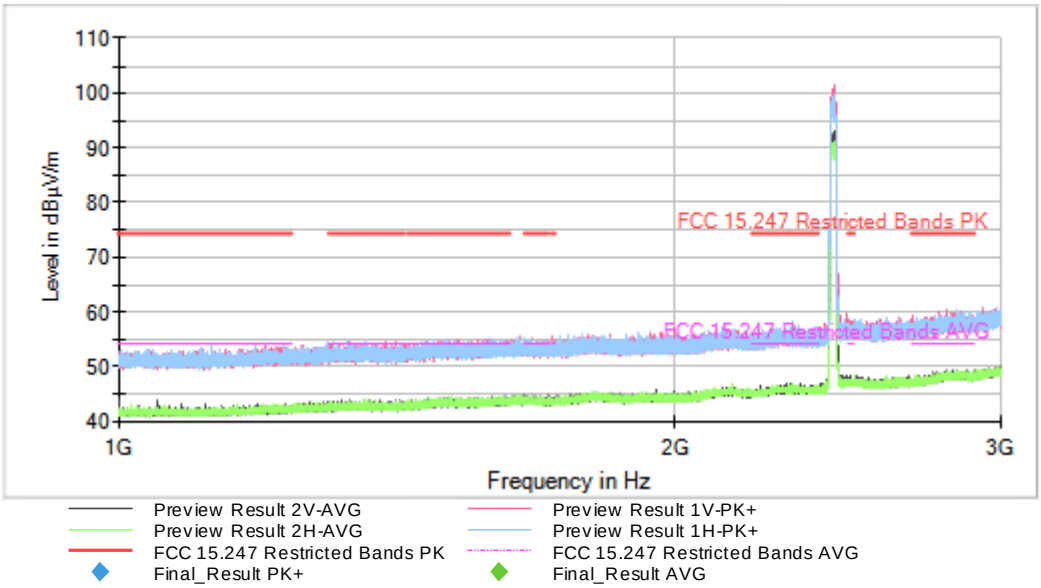
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000



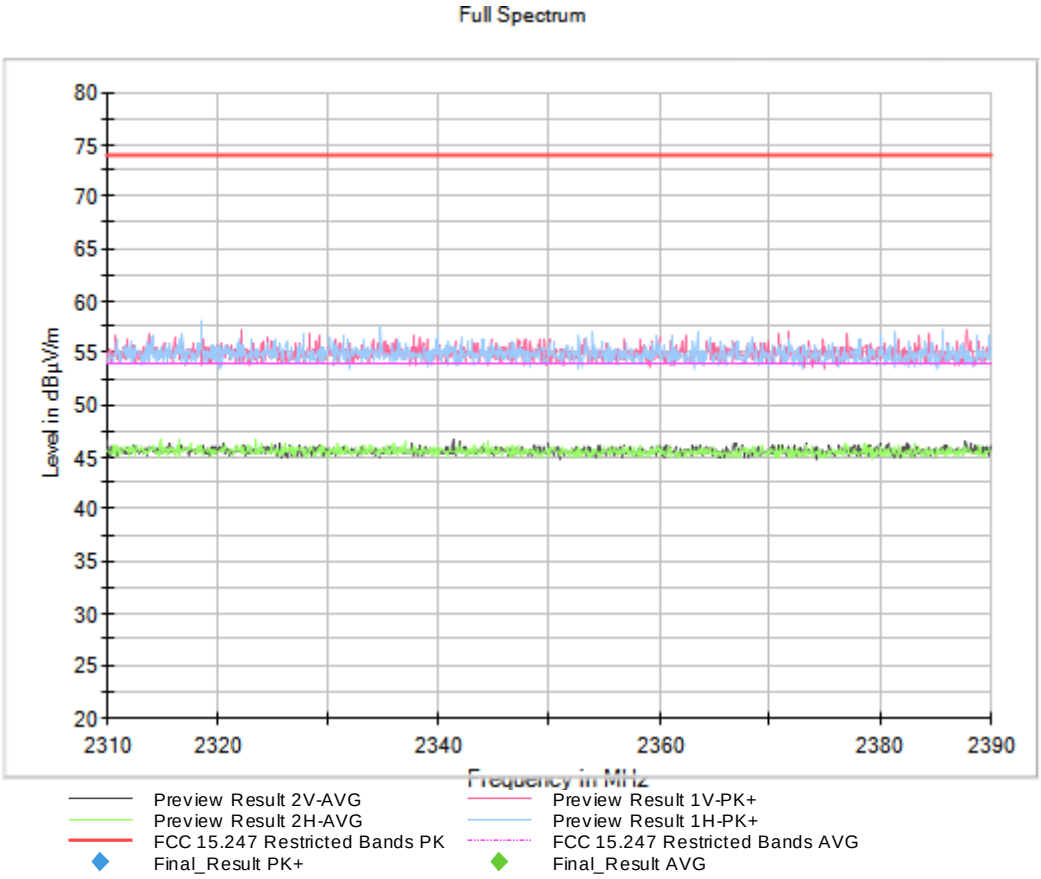

Full Spectrum
Level in dBµV/m
80
75
70
65
60
55
50
45
40
35
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

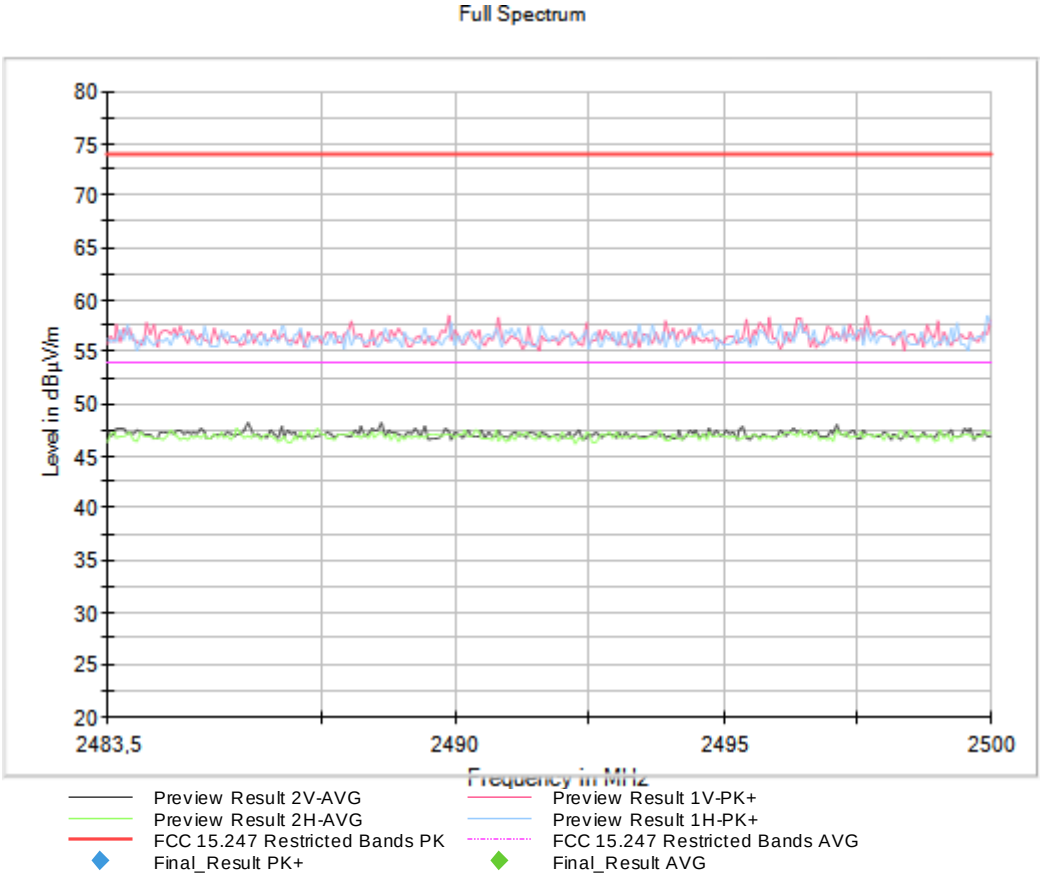
Frequency (MHz) = 2437.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11g (OFDM 6 Mbit/s), Frequency Range (GHz) = [1, 3]

Plots:



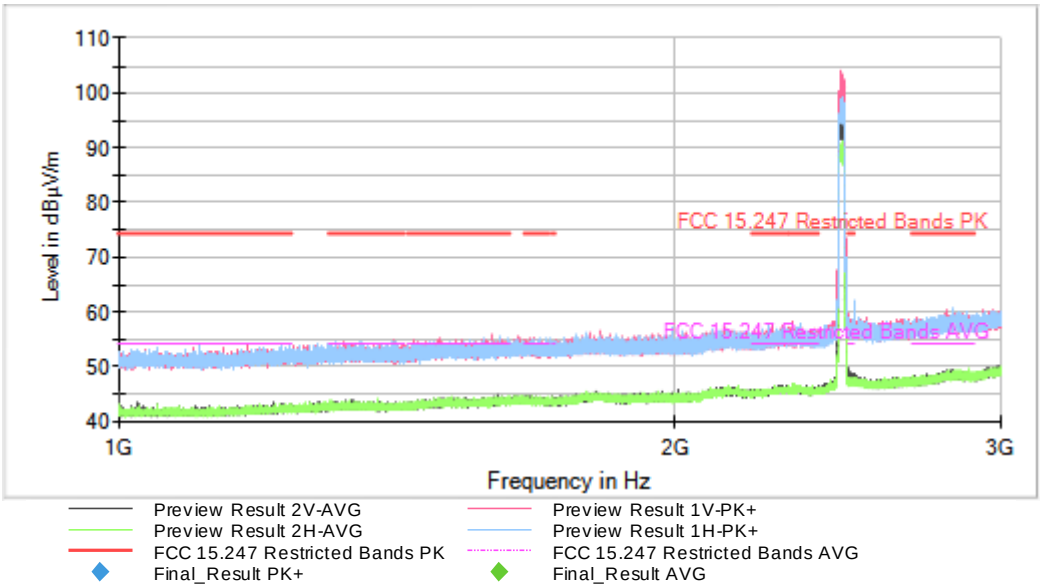
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000



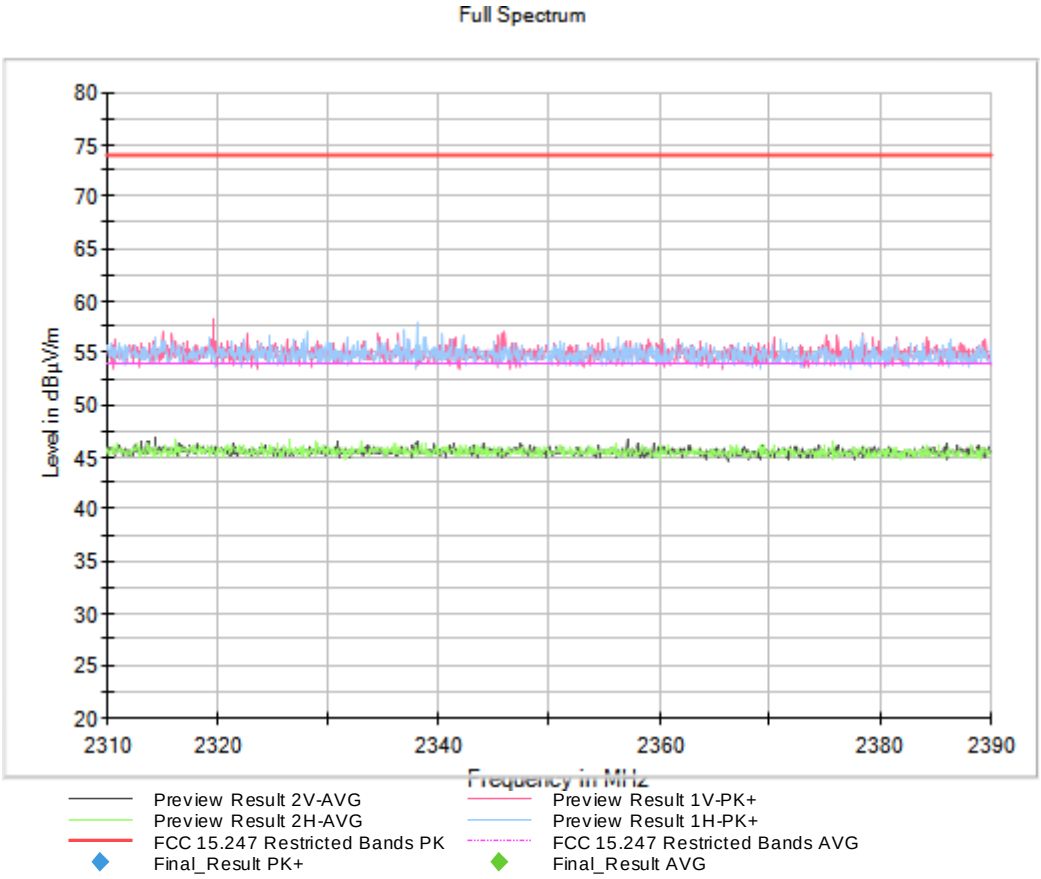

Full Spectrum
Level in dBµV/m
80
75
70
65
60
55
50
45
40
35
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

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

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
65
60
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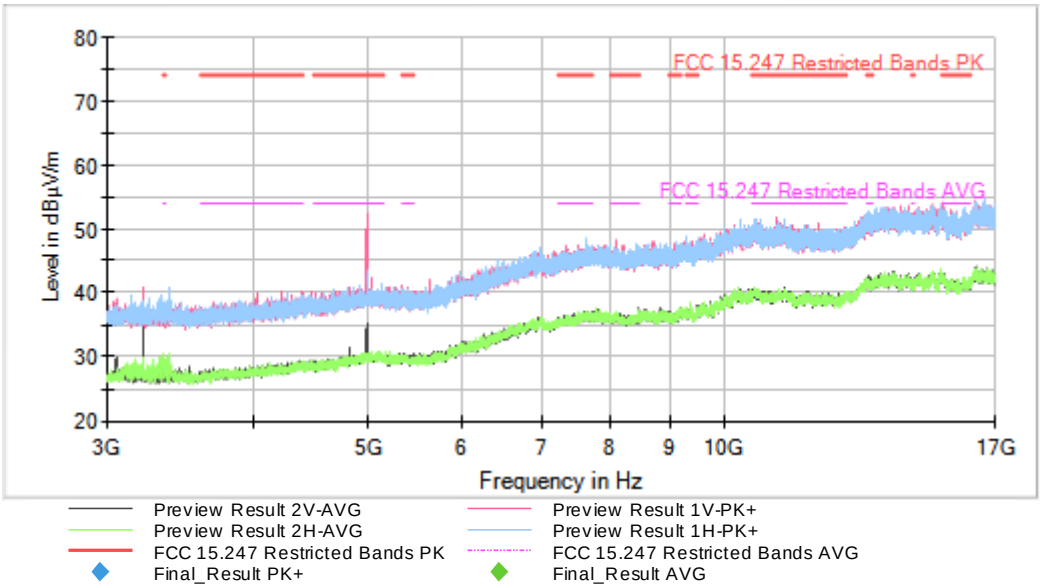
40
35
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Frequency (MHz) = 2412.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11g (OFDM 6 Mbit/s), Frequency Range (GHz) = [3, 17]

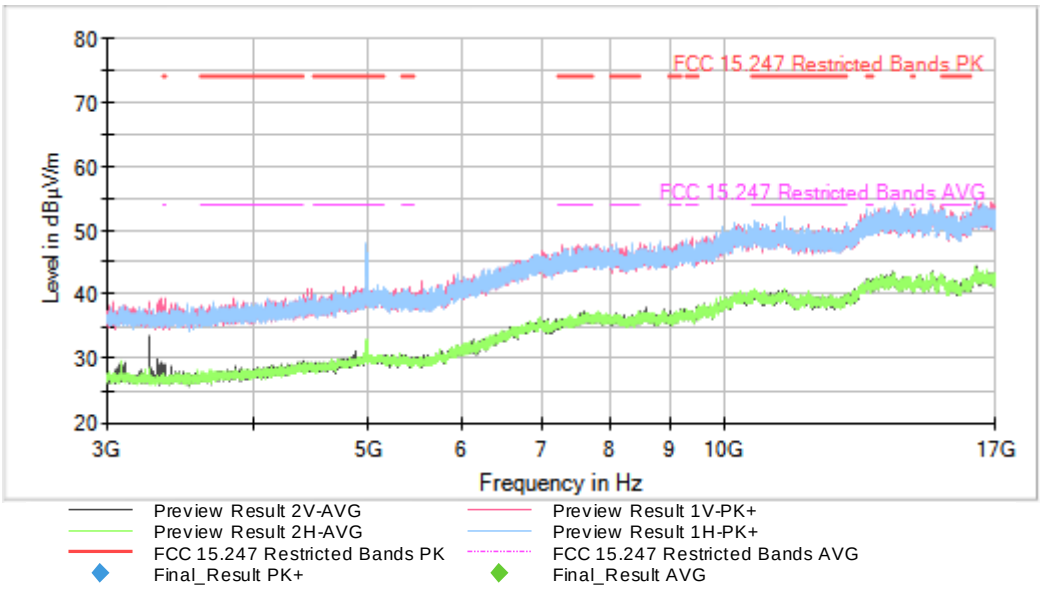
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2437.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11g (OFDM 6 Mbit/s), Frequency Range (GHz) = [3, 17]

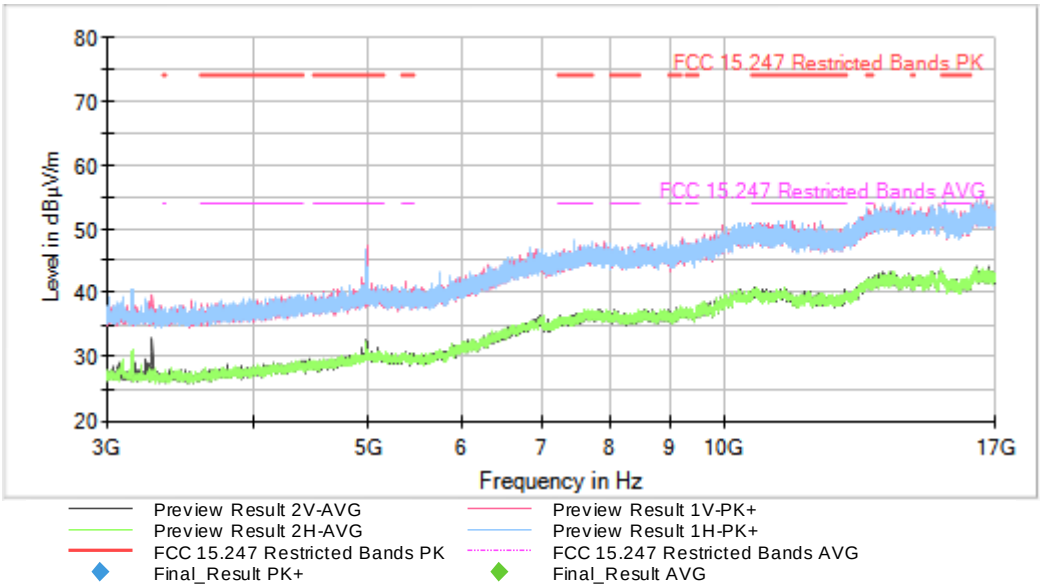
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2462.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11g (OFDM 6 Mbit/s), Frequency Range (GHz) = [3, 17]

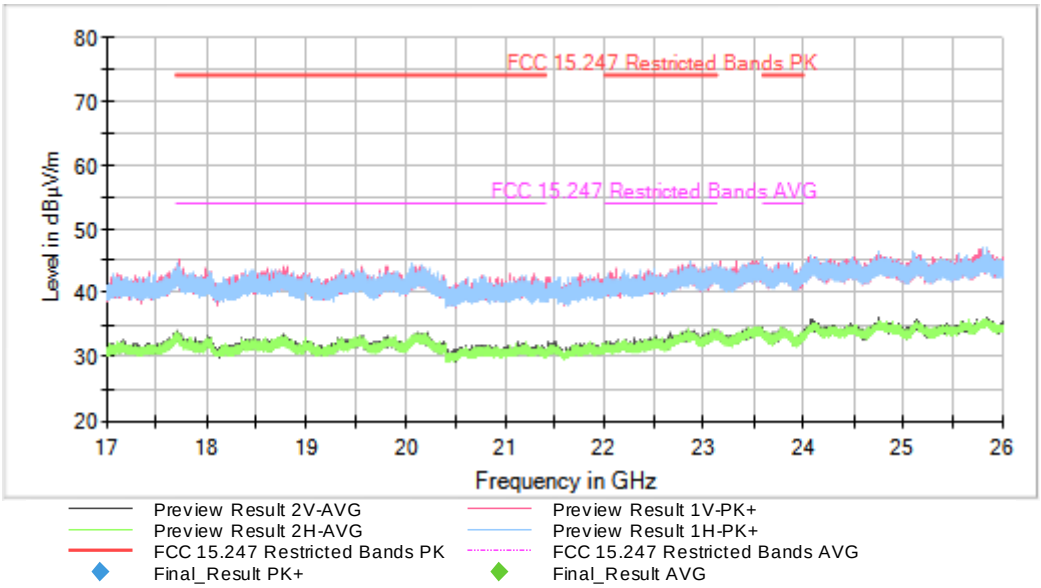
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Digital Transmission System (DTS), Modulation: 802.11g (OFDM 6 Mbit/s), Frequency Range (GHz) = [17, 26]

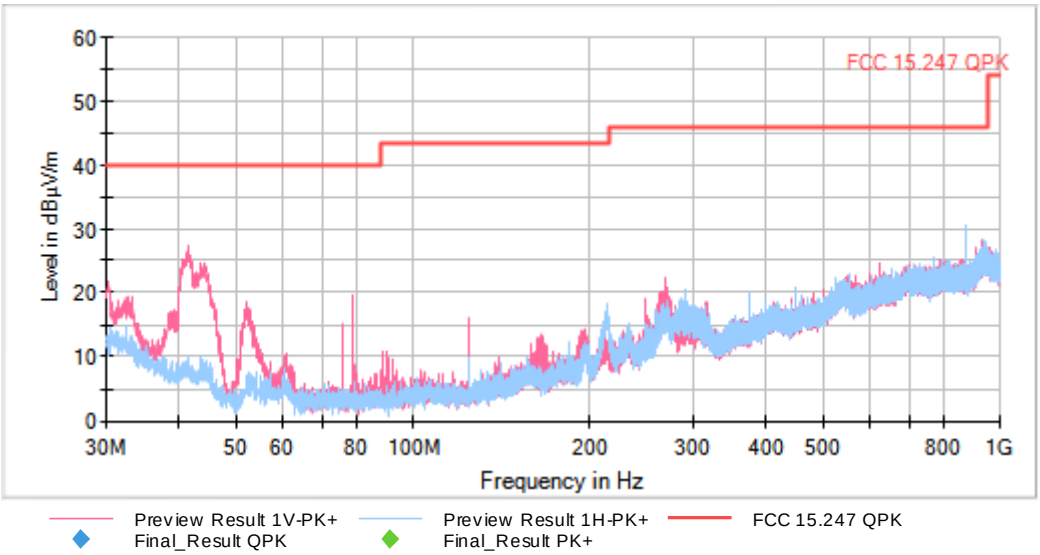
Plots:



This plot is valid for Low, Middle and High Channels.
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s), Frequency Range (GHz) = [0.03, 1]

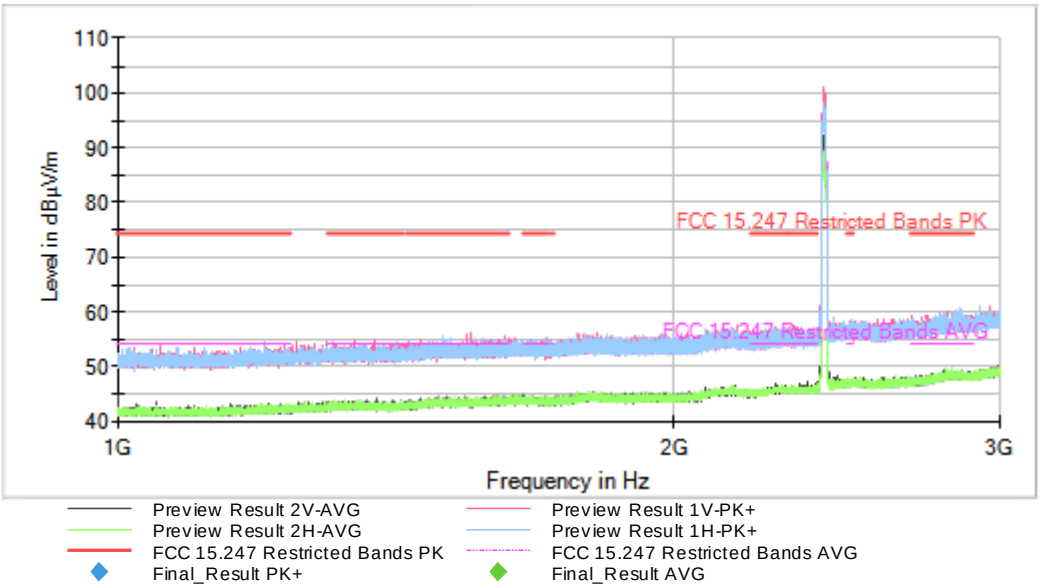
Plots:



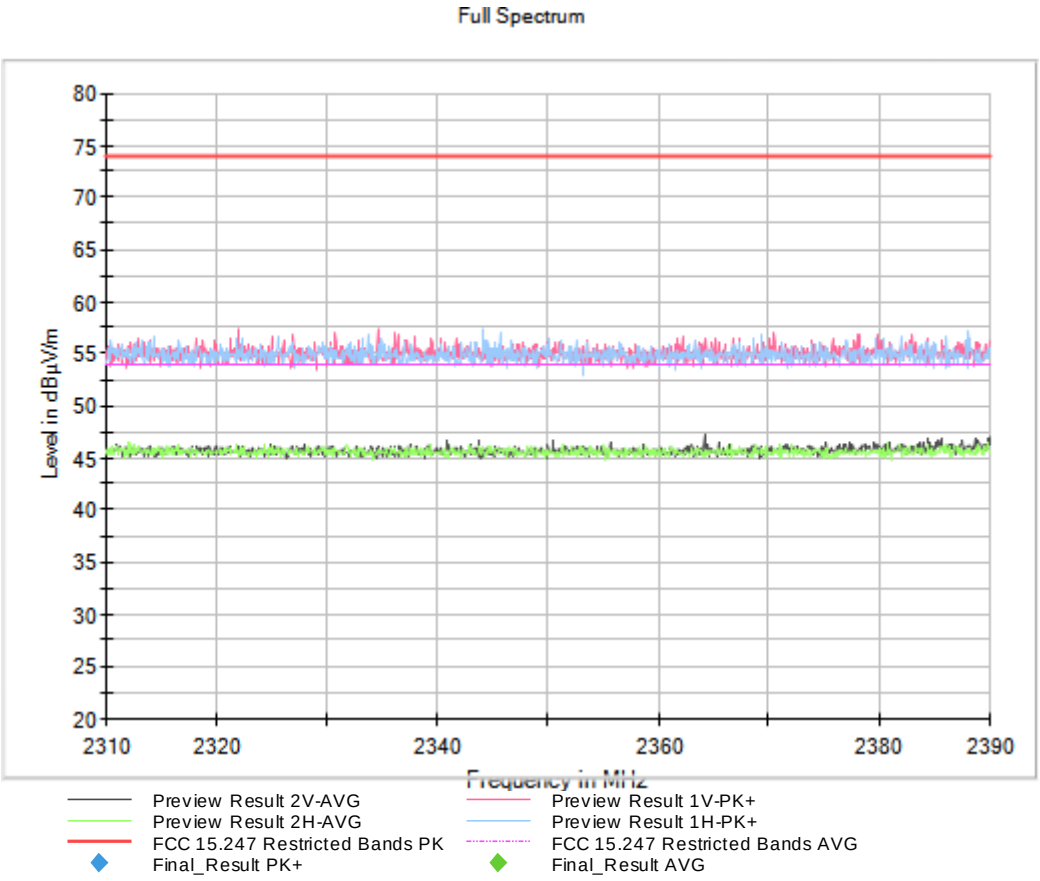
This plot is valid for Low, Middle and High Channels.
Settings: RBW = 100 kHz / VBW = 300 kHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2412.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
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65
60
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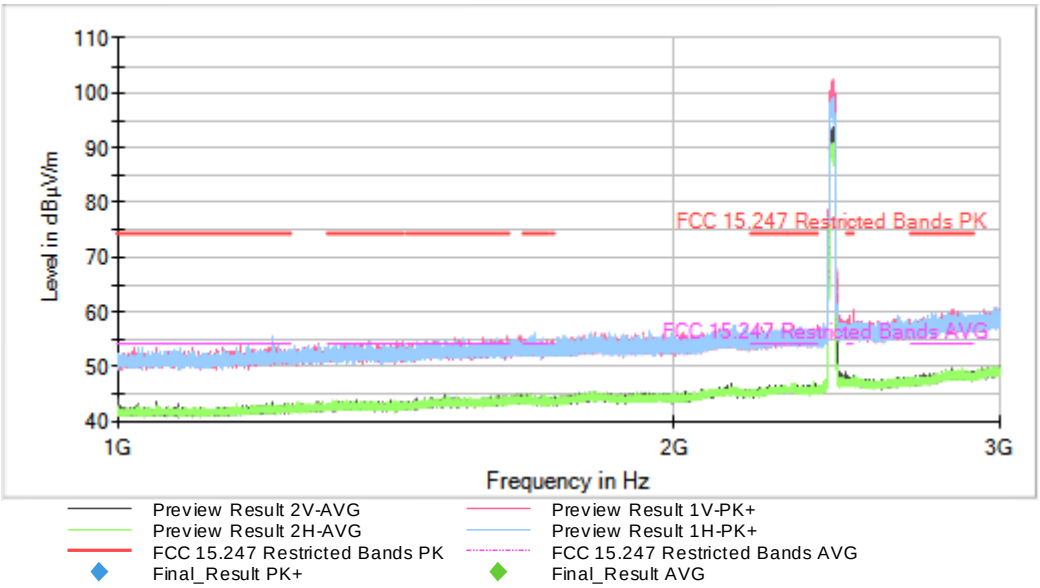
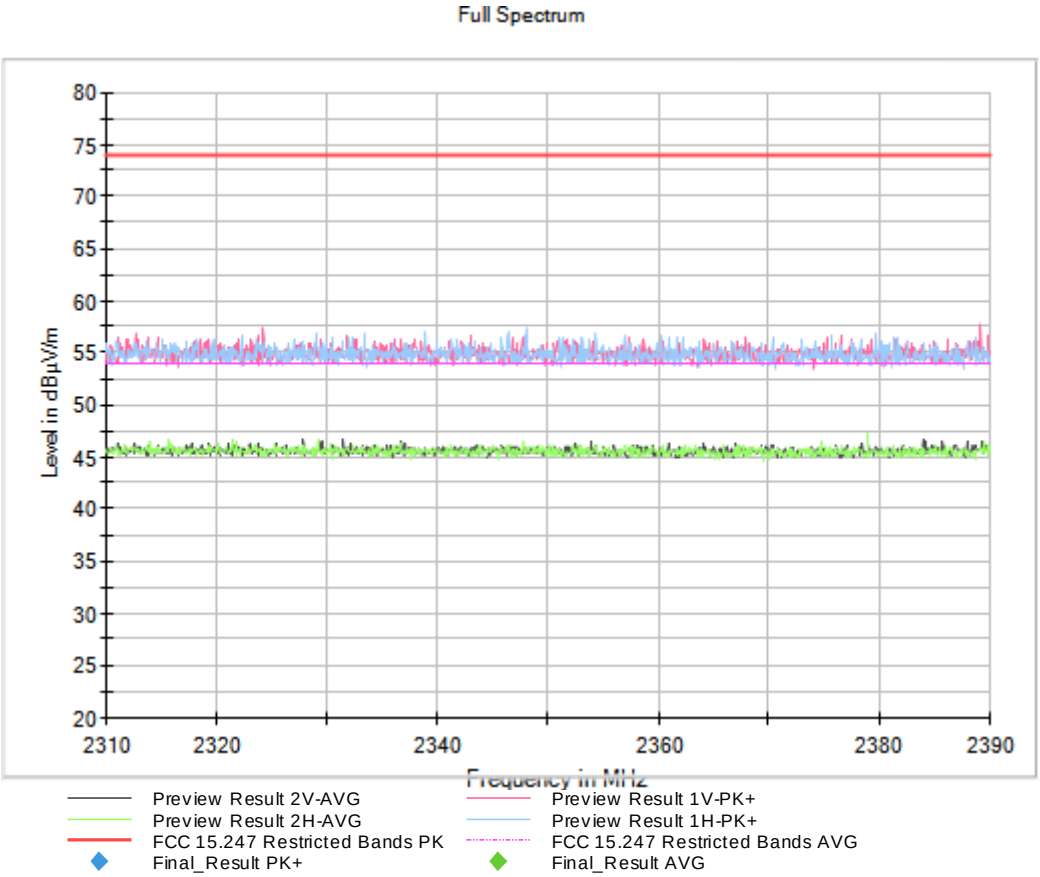
35
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

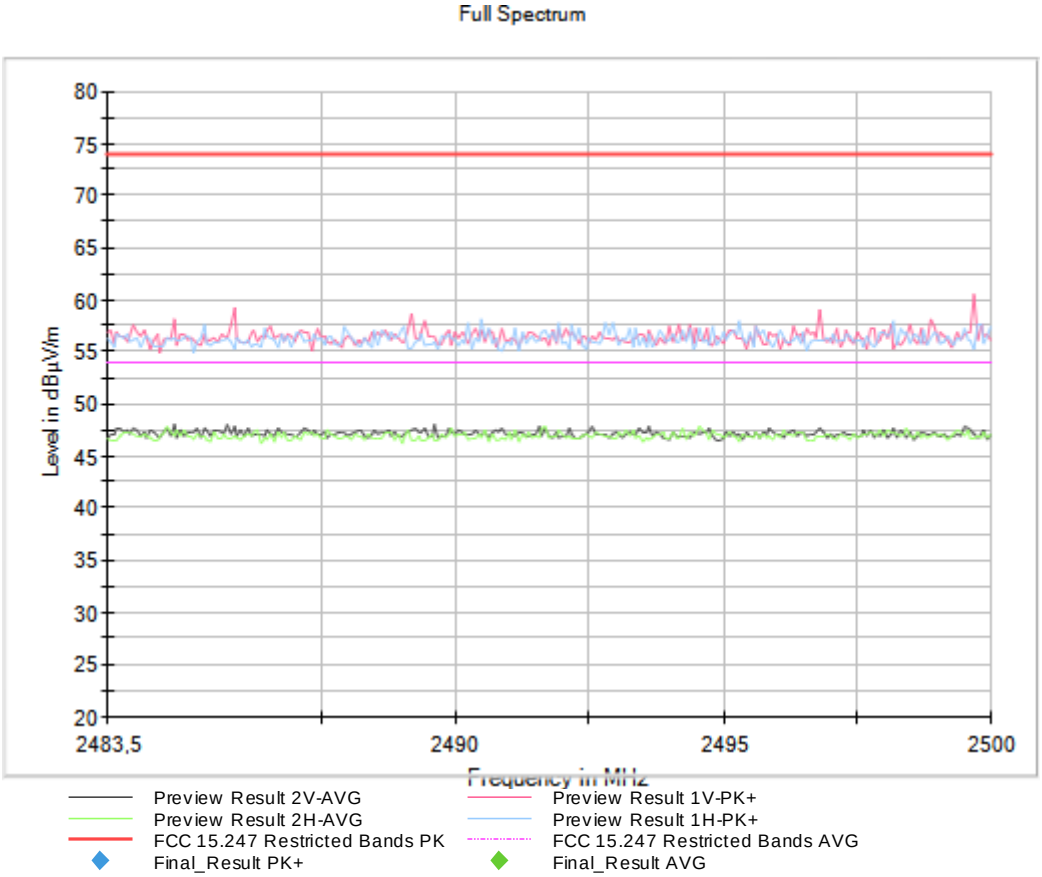
Frequency (MHz) = 2437.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
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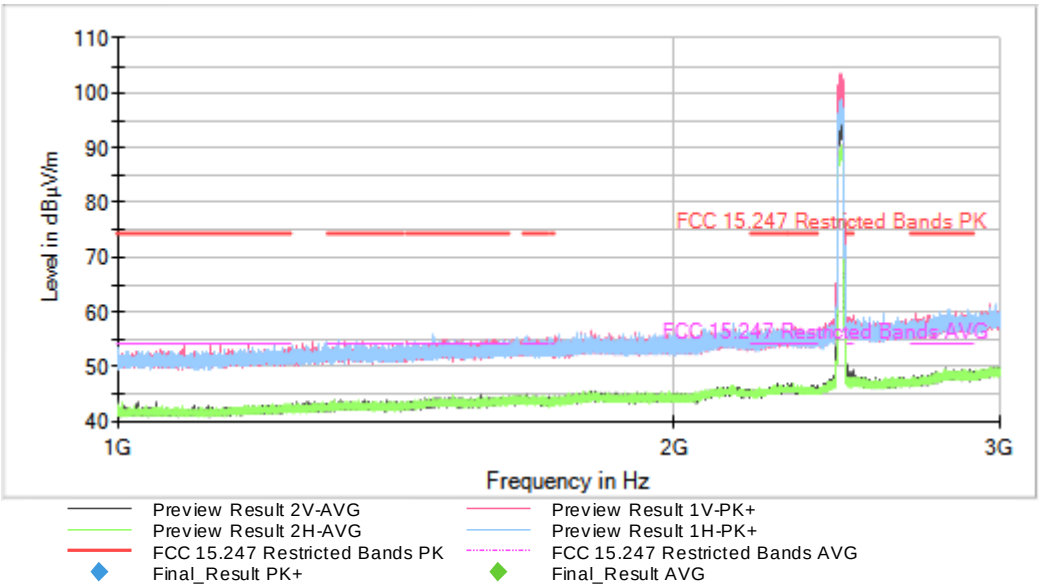
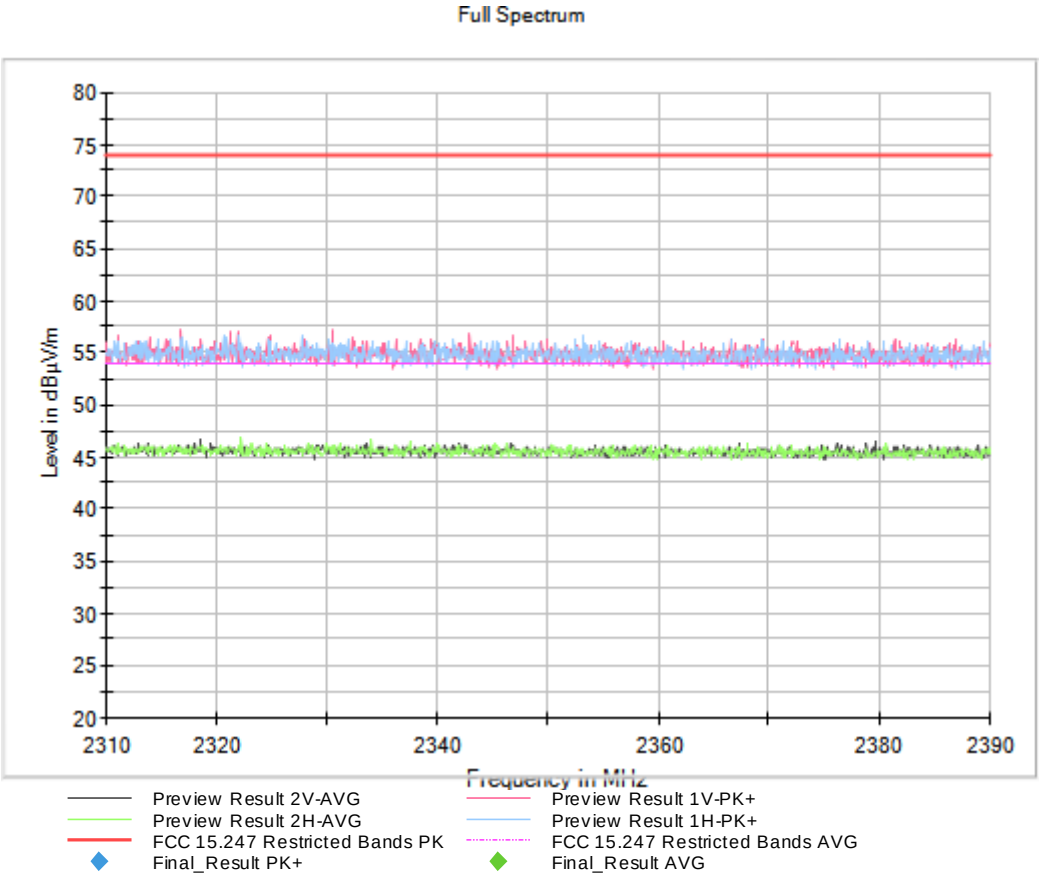
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

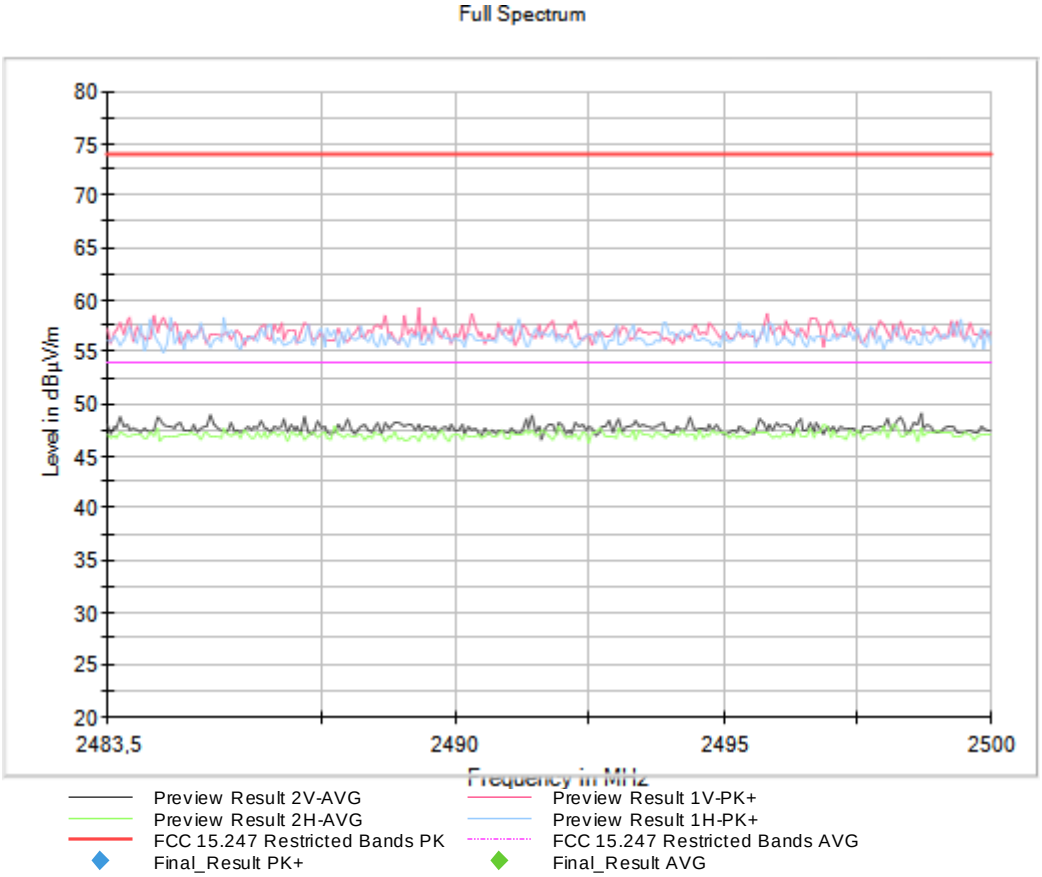
Frequency (MHz) = 2462.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
65
60
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40
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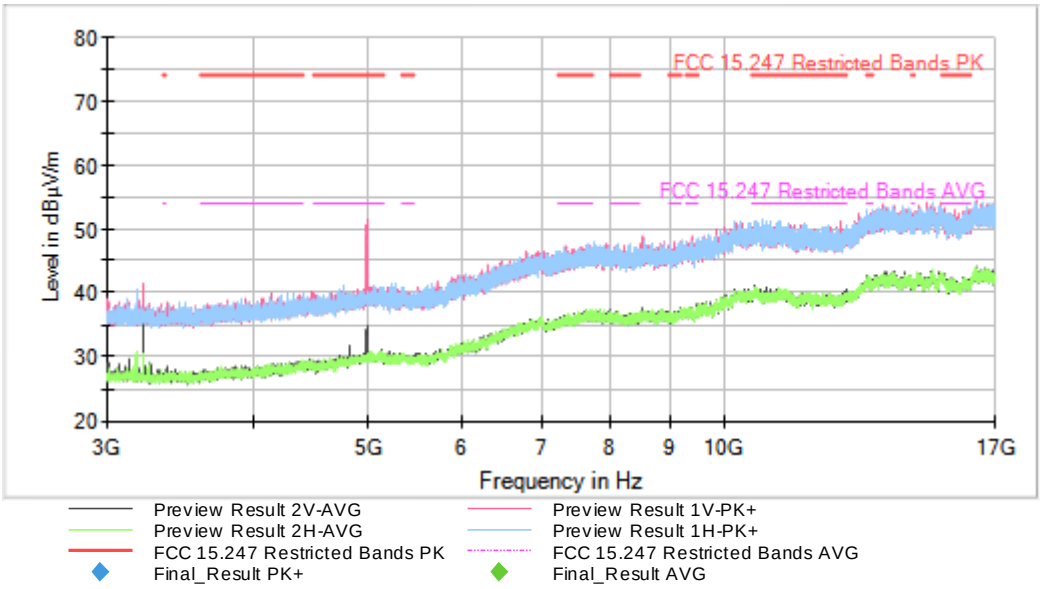
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Frequency (MHz) = 2412.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s), Frequency Range (GHz) = [3, 17]

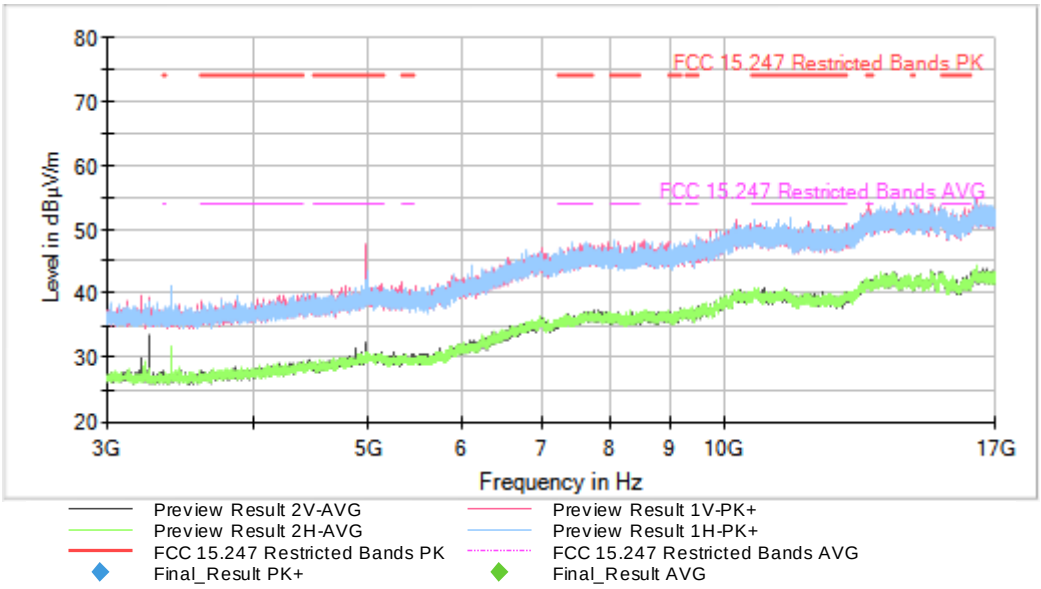
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2437.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s), Frequency Range (GHz) = [3, 17]

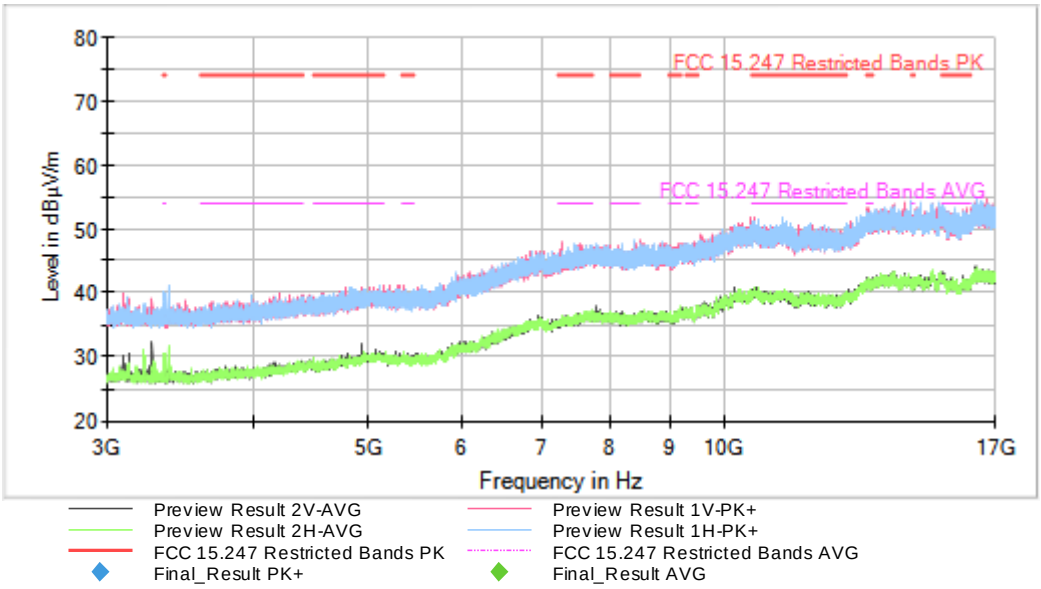
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2462.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s), Frequency Range (GHz) = [3, 17]

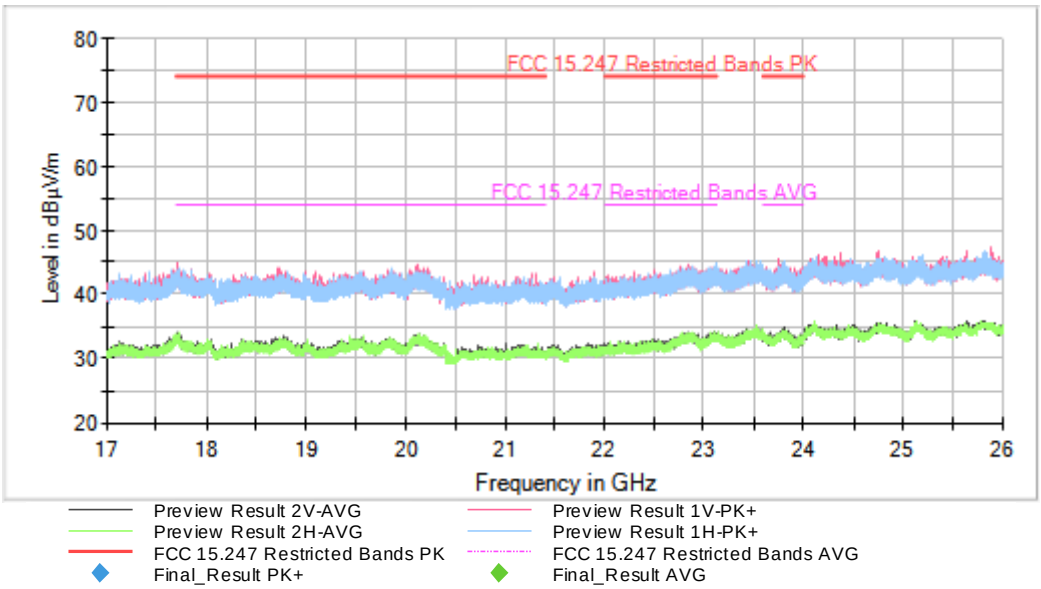
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s), Frequency Range (GHz) = [17, 26]

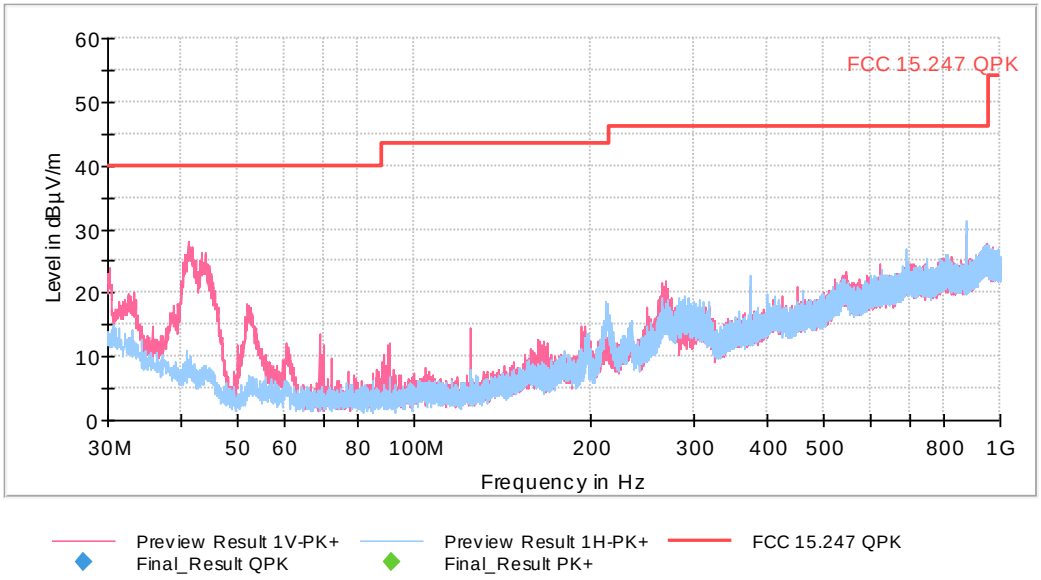
Plots:



This plot is valid for Low, Middle and High Channels.
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s), Frequency Range (GHz) = [0.03, 1]

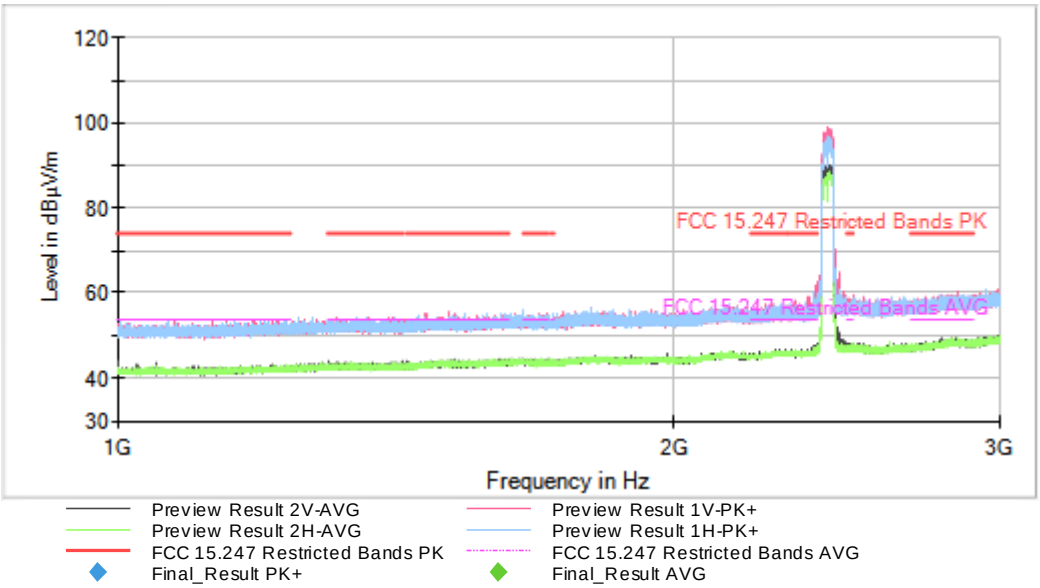
Plots:



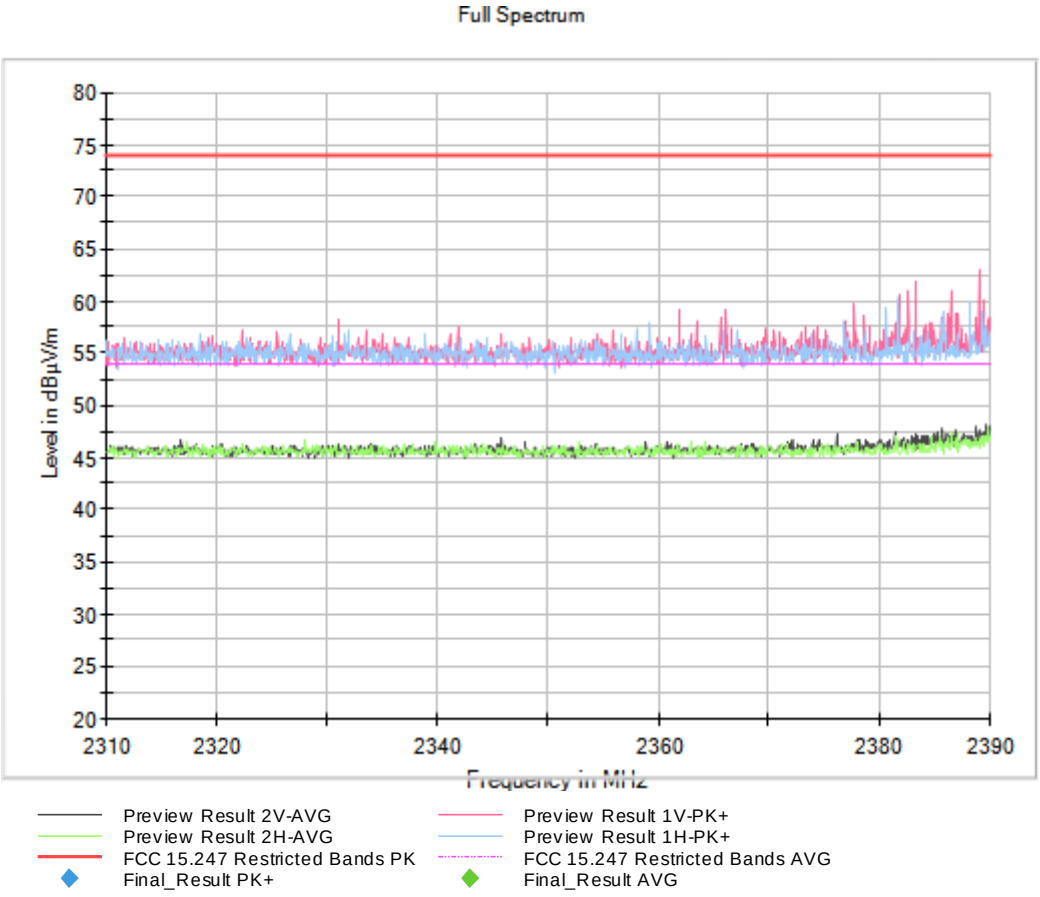
This plot is valid for Low, Middle and High Channels.
Settings: RBW = 100 kHz / VBW = 300 kHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2422.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
65
60
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45
40
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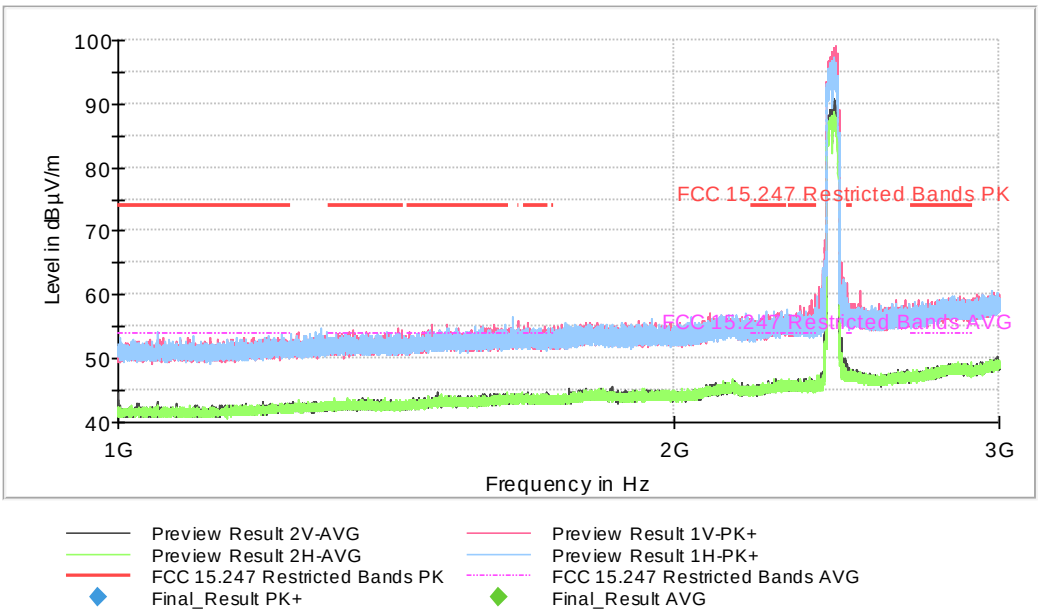
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

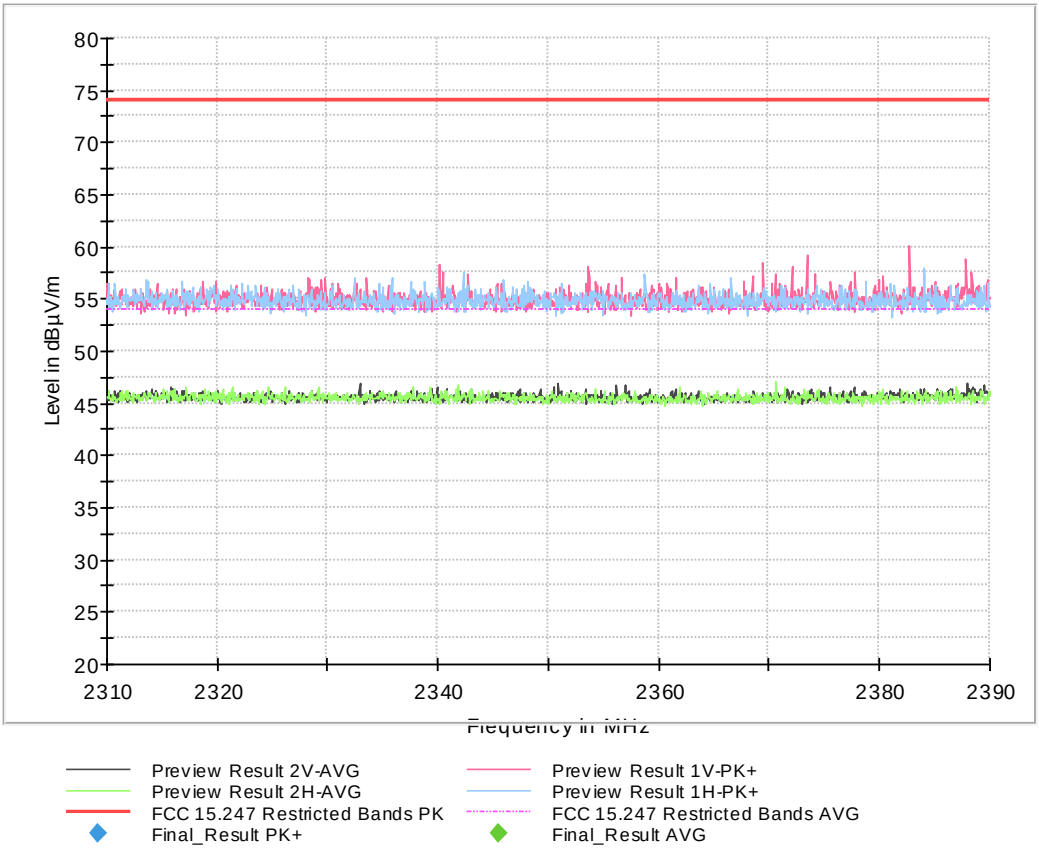
Frequency (MHz) = 2437.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s), Frequency Range (GHz) = [1, 3]

Plots:

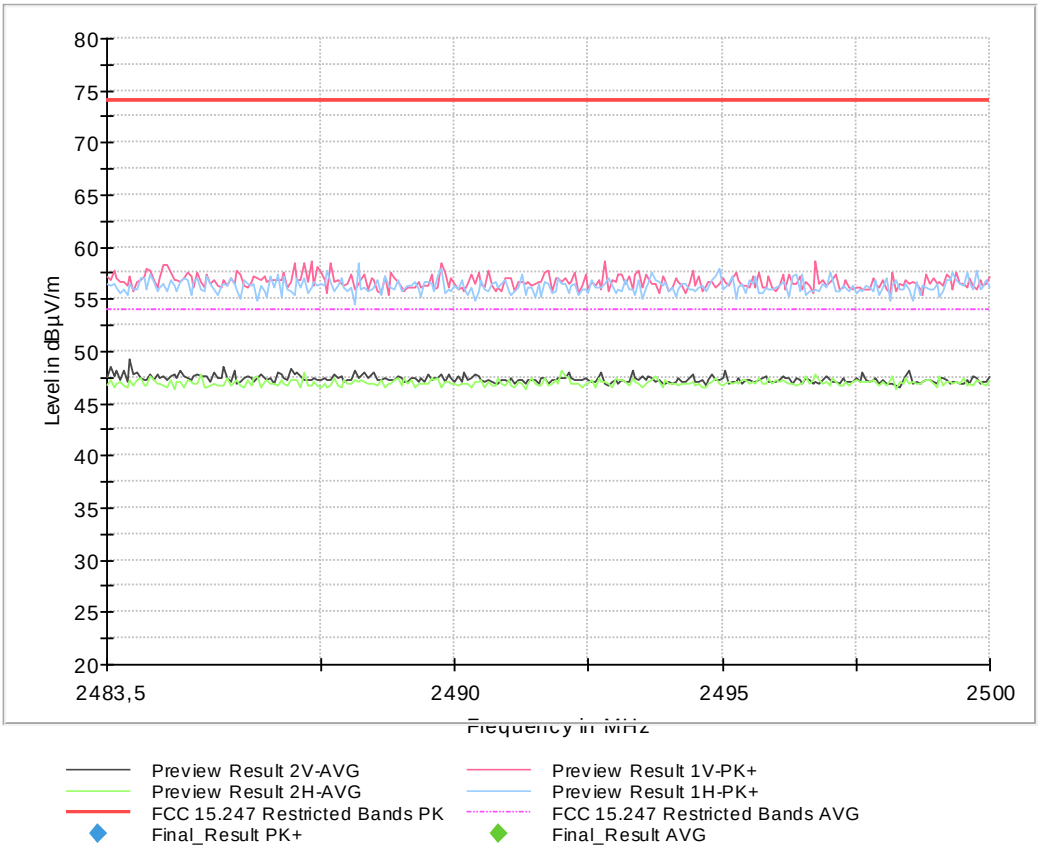


Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Full Spectrum

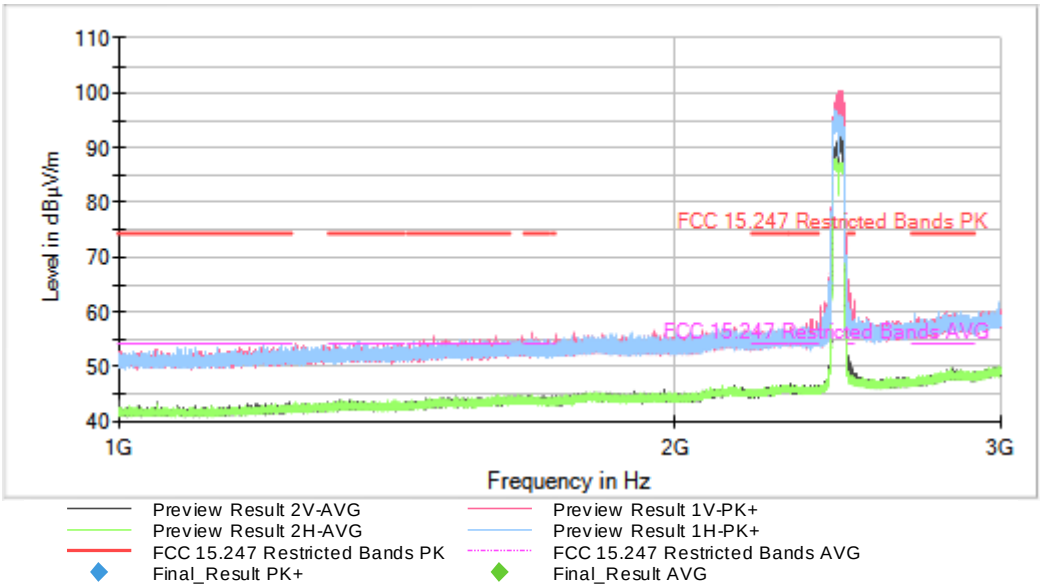


Full Spectrum

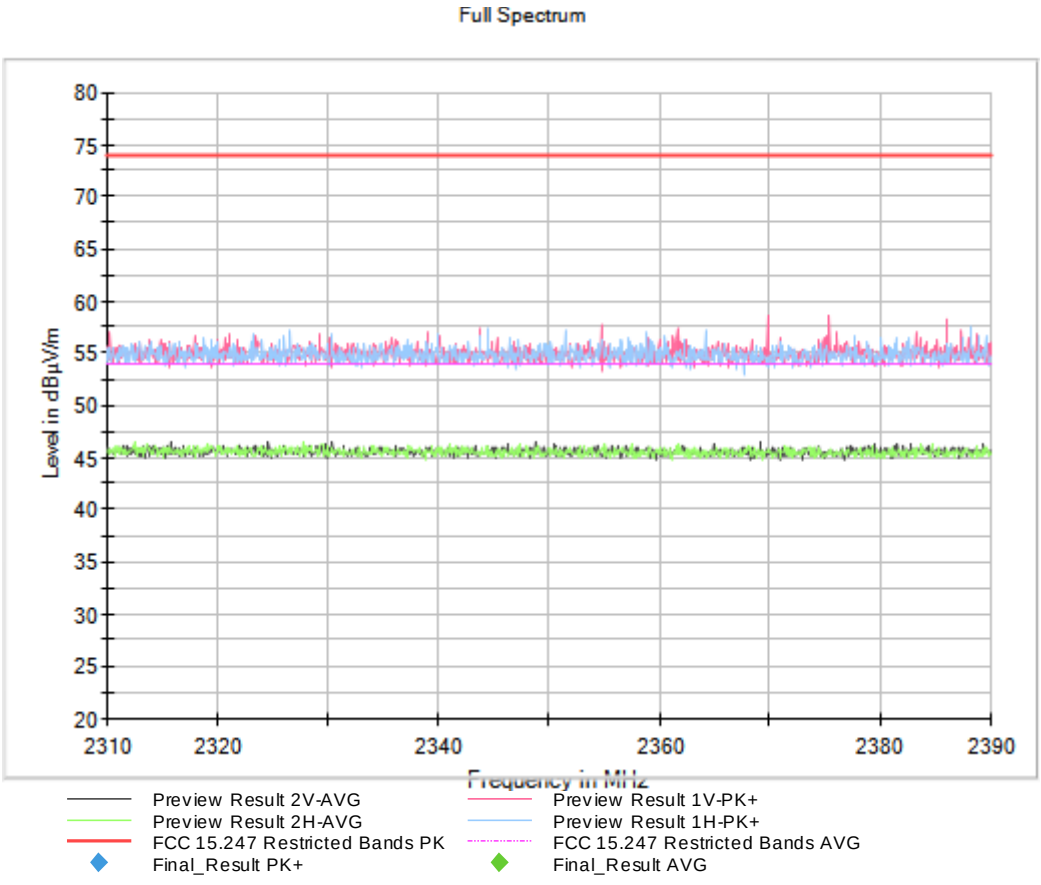


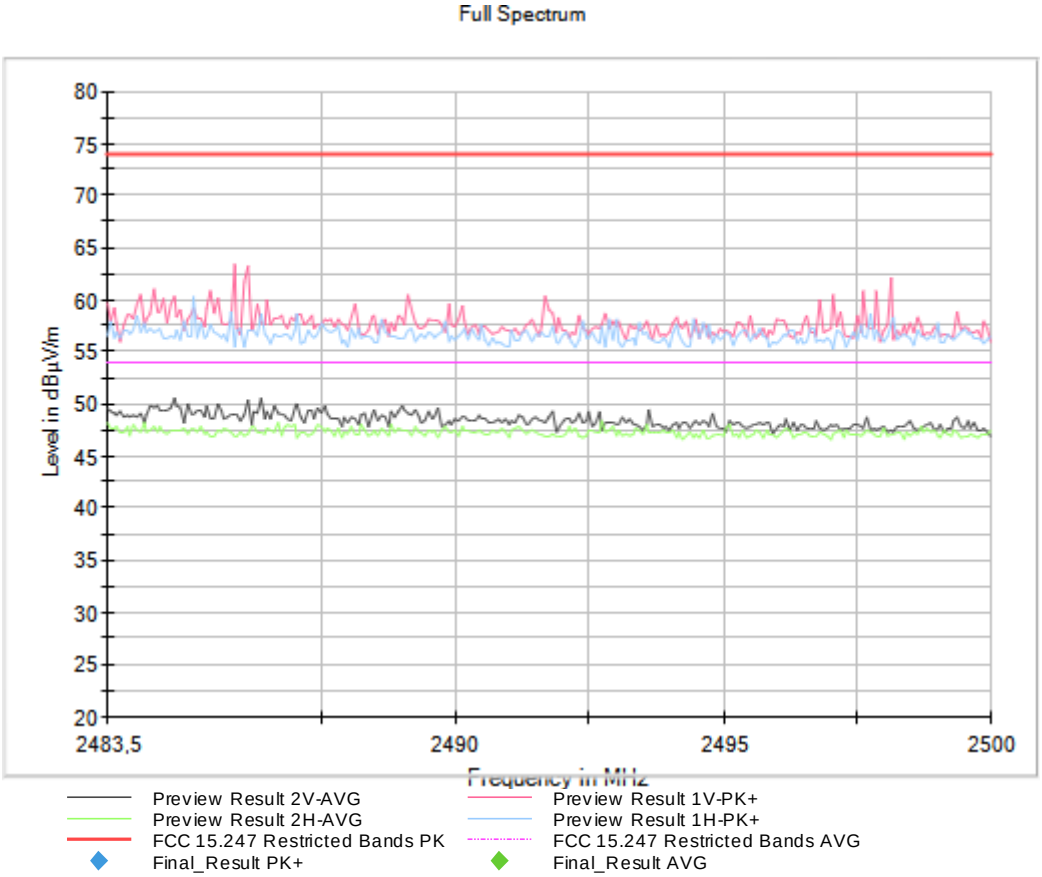
Frequency (MHz) = 2452.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s), Frequency Range (GHz) = [1, 3]

Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000




Full Spectrum
Level in dBµV/m
80
75
70
65
60
55
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45
40
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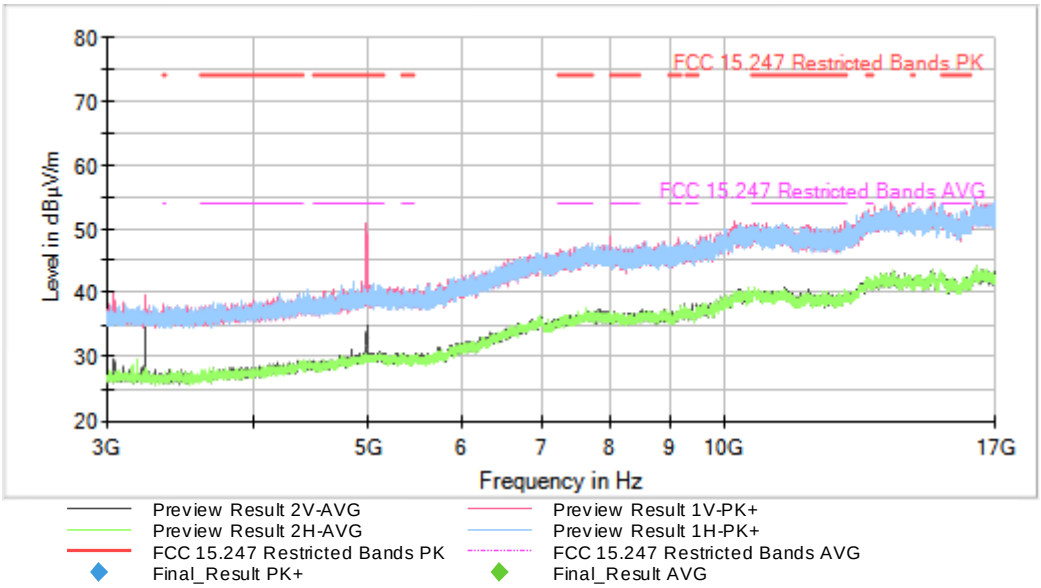
30
25
20
2483,5
2490
2495
2500
Frequency in MHz
Preview Result 2V-AVG
Preview Result 2H-AVG
FCC 15.247 Restricted Bands PK
Final_Result PK+
Preview Result 1V-PK+
Preview Result 1H-PK+
FCC 15.247 Restricted Bands AVG
Final_Result AVG

Frequency (MHz) = 2422.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s), Frequency Range (GHz) = [3, 17]

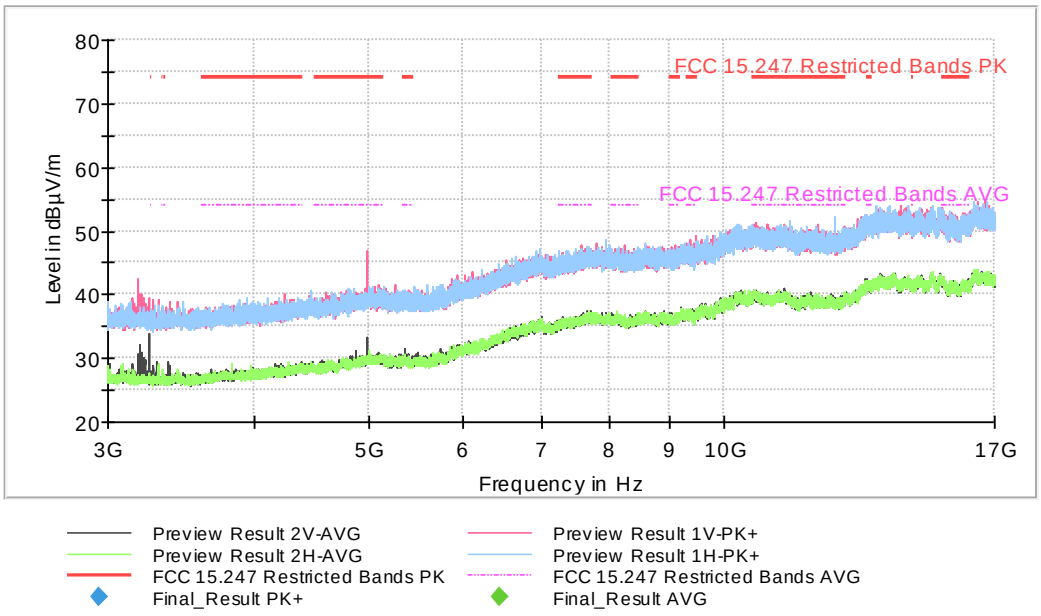
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2437.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s), Frequency Range (GHz) = [3, 17]

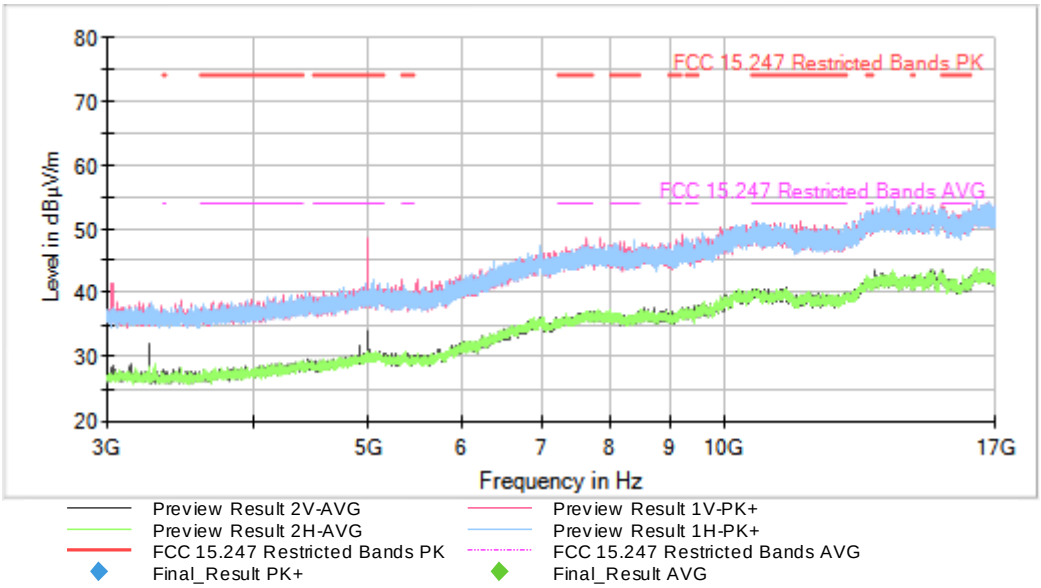
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Frequency (MHz) = 2452.00000, Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s), Frequency Range (GHz) = [3, 17]

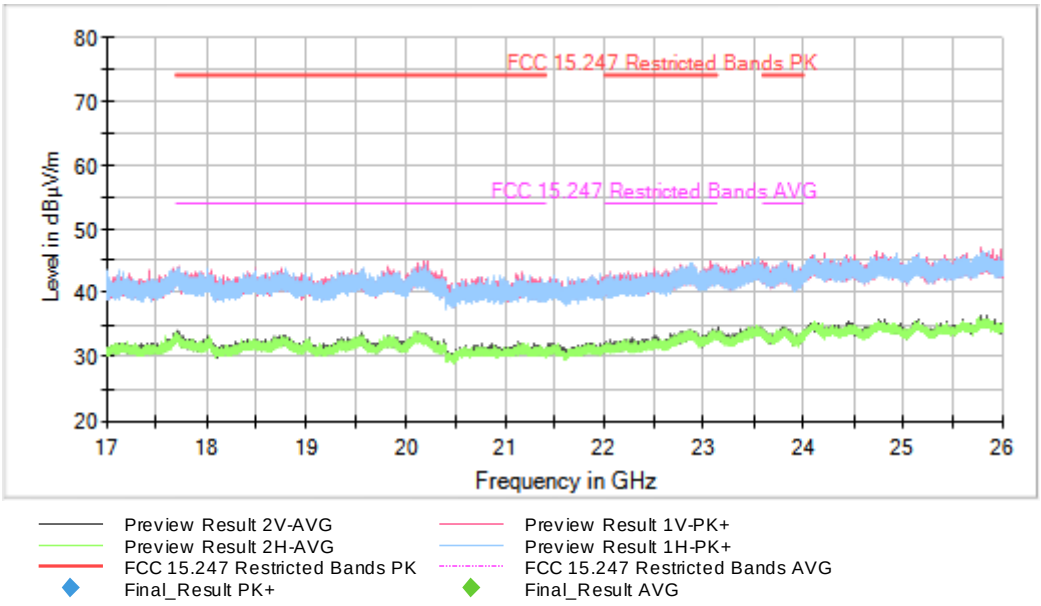
Plots:



Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000

Equipment Type: Digital Transmission System (DTS), Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s), Frequency Range (GHz) = [17, 26]

Plots:



This plot is valid for Low, Middle and High Channels.
Settings: RBW = 1 MHz / VBW = 3 MHz / Sweep Time = 1s / Sweep points = 32000