

ISED CABid: ES1909

Test Report No:

Lab. Company Number: 4621A

75415RRF.003

Test Report

USA FCC Part 15.247, 15.209

CANADA RSS-247, RSS-Gen

(*) Identification of item tested	Premium GPS Multisport Watch
(*) Trademark	Polar
(*) Model and /or type reference	Model name: 5P Commercial name: Vantage V3
Other identification of the product	FCC ID: INW5P IC: 6248A-5P
(*) Features	Features: Bluetooth LE, GNSS: Dual band GNSS (L1 & L5), GPS, Galileo, Glonass, BDS HW version: 007107625/B2.7 SW version: 0.15.0
Applicant	Polar Electro Oy Professorintie 5 90440, Kempele, FINLAND
Test method requested, standard	USA FCC Part 15.247 (10-1-21 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-21 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 2 (February 2017). CANADA RSS-Gen Issue 5 amendment 2 (February 2021). Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05r02 dated April 2, 2019. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager
Date of issue	2023-09-07
Report template No	FDT08_24 (* "Data provided by the client")

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Acronyms

Acronym ID	Acronym Description
BW	Bandwidth
Detector	Detector used
Ebw	Emission Bandwidth
Equipment	Equipment Type
Freq	Frequency
Freq Rng	Frequency Range
Inband Peak Lvl	Inband Peak Level
Lvl	Level
MP	Measurement Point
Mod	Modulation
Mode	MIMO Mode
Occ Ch BW	Occupied Channel Bandwidth
PSD	Power Spectrum Density
PeakPower	Maximum Peak Conducted Output Power
Pol	Polarization
Port	Active Port
Unwanted Freq	Unwanted Emissions Frequency
Unwanted Lvl	Unwanted Emissions Level

Competences and guarantees

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

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

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

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

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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 $\leq \pm 5,35$ dB with factor ($k = 2$).

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

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

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

RF Peak Output Power: Measurement uncertainty $\leq \pm 0,80$ dB

Power Spectral Density: Measurement uncertainty $\leq \pm 0,99$ dB

6dB Bandwidth: Measurement uncertainty $\leq \pm 2,84$ %

Occupied Channel Bandwidth: Measurement uncertainty $\leq \pm 1,17$ %

Conducted Band-edge spurious emissions: Measurement uncertainty $\leq \pm 1,76$ dB

Data provided by the client

The following data has been provided by the client:

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 Premium GPS Multisport Watch with Bluetooth low-energy connectivity and wrist-based optical heart rate.

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 N°	Date of Reception	Application
S/01	75415_18.1	Premium GPS Multisport Watch	5P	F3205P2300599	2023-05-25	Element Under Test
S/01	75415_15.1	USB cable	--	--	2023-05-25	Element Under Test
S/02	75415_12.1	Premium GPS Multisport Watch	5P	F3205P2300596	2023-05-25	Element Under Test

Notes referenced to samples during the project:

Id	Type
S/01	Sample used for radiated test
S/02	Sample used for conducted test

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
	USB port	0.6	[X]	[]	[]		
Supplementary information to the ports..... :						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[]	AC:	[]	[]	[]	[]	[]
	[X]	DC: 3,87 Vdc					
Rated Power	1,7 W						
Clock frequencies..... :	32 MHz, 26 MHz, 24 MHz, 32,768 kHz						
Other parameters						
Software version	0.15.0						
Hardware version	007107625/B2.7						
Dimensions in cm (W x H x D)						
Mounting position	[]	Table top equipment					
	[]	Wall/Ceiling mounted equipment					
	[]	Floor standing equipment					
	[X]	Hand-held equipment					
	[]	Other:					
Modules/parts..... :	Module/parts of test item		Type	Manufacturer			
			
Accessories (not part of the test item)	Description		Type	Manufacturer			
			
Documents as provided by the applicant..... :	Description		File name	Issue date			
			

⁽³⁾ Only for Medical Equipment

Identification of the client

Polar Electro Oy
Professorintie 5
90440, Kempele, FINLAND

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2023-06-05
Date (finish)	2023-06-12

Document history

Report number	Date	Description
75415RRF.003	2023-08-17	First release.

Environmental conditions

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

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

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

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

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

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

Remarks and comments

The tests have been performed by the technical personnel: Jia Hao Luo Chen and Victoria Olmedo.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
8130	SEMIANECHOIC ABSORBER LINED CHAMBER	P29419	ALBATROSS PROJECTS GMBH	N/A
8134	SHIELDED ROOM	P29419	ALBATROSS PROJECTS GMBH	N/A
2932	HYBRID BILOG ANTENNA 30MHz-6GHz	JB6	SUNOL SCIENCES CORPORATION	2023-10-29
7763	HORN ANTENNA 1-18GHz	BBHA 9120D	SCHWARZBECK MESS-ELEKTRONIK	2026-01-16
7769	PREAMPLIFIER 30dB 500MHz-18GHz	BBV 9718 C	SCHWARZBECK	2024-02-15
5862	EMI TEST RECEIVER 9kHz-7GHz	ESR7	ROHDE AND SCHWARZ	2025-02-15
6158	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2023-10-22
7862	PRE-AMPLIFIER G>30dB 18-40GHz	BLMA 1840-3G	BONN ELEKTRONIK	2024-03-14
6495	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2024-03-19
4848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	N/A
8661	SHIELDED ROOM	--	SIEPEL	N/A
8835	SIGNAL AND SPECTRUM ANALYZER 2Hz-50GHz	FSW50	ROHDE AND SCHWARZ	2025-02-08
7039	OPEN SWITCH UNIT UP TO 6 GHz	OSP-B157W8	ROHDE SCHWARZ &	2025-05-25
7040	EXTENSION FOR OPEN SWITCH UNIT UP TO 40GHz	OSP-B157Wx	ROHDE SCHWARZ &	2025-04-19
7702	DC POWER SUPPLY 30V/3A 90W	GPS-3030D	GW INSTEK	N/A
7755	DIGITAL MULTIMETER	179	FLUKE	2023-11-10
7798	SOFTWARE FOR EMC/RF TESTING	WMS32	ROHDE AND SCHWARZ	N/A

Testing verdicts

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

Summary

Bluetooth Low Energy 5.0 (2M, 1M)

FCC PART 15 PARAGRAPH/ RSS-247			
Requirement – Test case		Verdict	Remark
FCC 15.247 (a)(2) / RSS-247 5.2. (a)	6 dB Bandwidth	P	--
FCC 15.247 (b) / RSS-247 5.4. (d)	Maximum output power and antenna gain	P	--
FCC 15.247 (d) / RSS-247 5.5.	Band-edge emissions compliance (Transmitter)	P	--
FCC 15.247 (e) / RSS-247 5.2. (b)	Power spectral density	P	--
FCC 15.247 (d) / RSS-247 5.5.	Emission limitations radiated (Transmitter)	P	--
<u>Supplementary information and remarks:</u>			
None			

Appendix A: Test results. Bluetooth Low Energy 5.0 (2M, 1M)

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<i>RSS-247 5.5 / FCC 15.247 (d) Emission limitations radiated (Transmitter)</i>	50

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 3,87Vdc
Type of Power Supply: Internal battery

ANTENNA (*):

Type of Antenna: Integral antenna
Maximum Declared Antenna Gain: -5,0dBi

TEST FREQUENCIES (*):

Modulation	Data rates	Low Channel:	Middle Channel	High Channel
BTLE GFSK	1M 1 Mbit/s	2402 MHz	2440 MHz	2480 MHz
BTLE GFSK	2M 2 Mbit/s	2402 MHz	2440 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.

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).

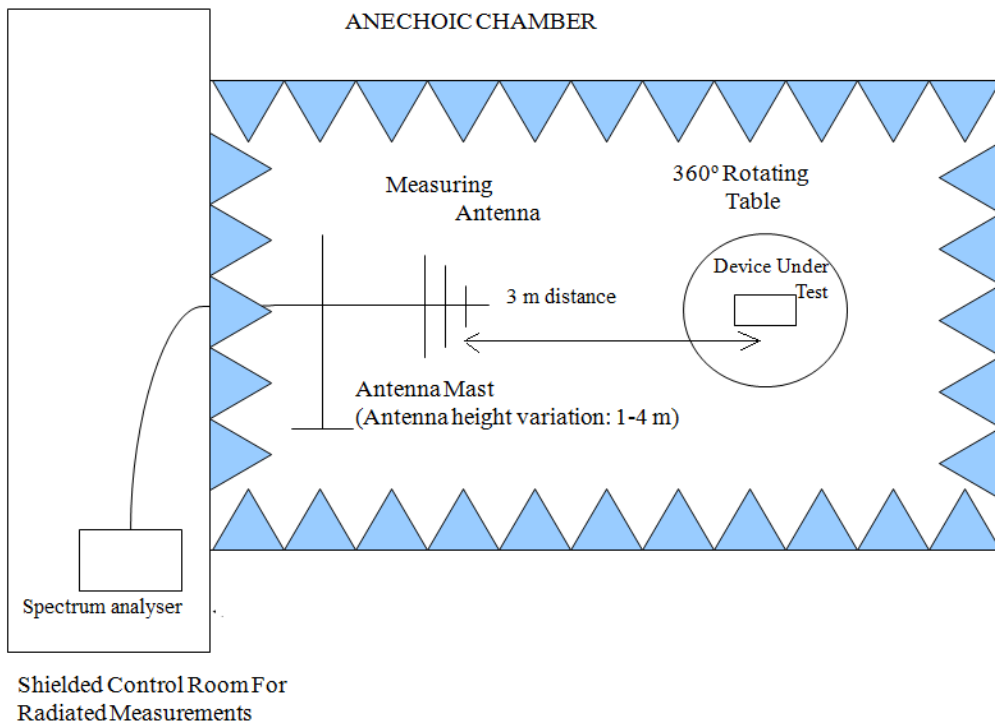
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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

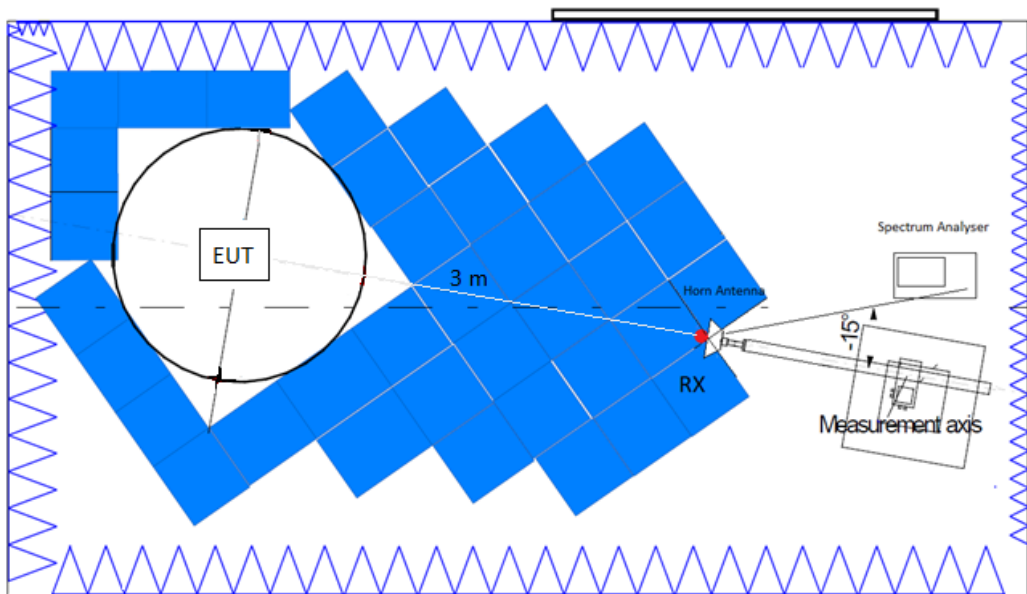
Measurements were made in both horizontal and vertical planes of polarization.

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

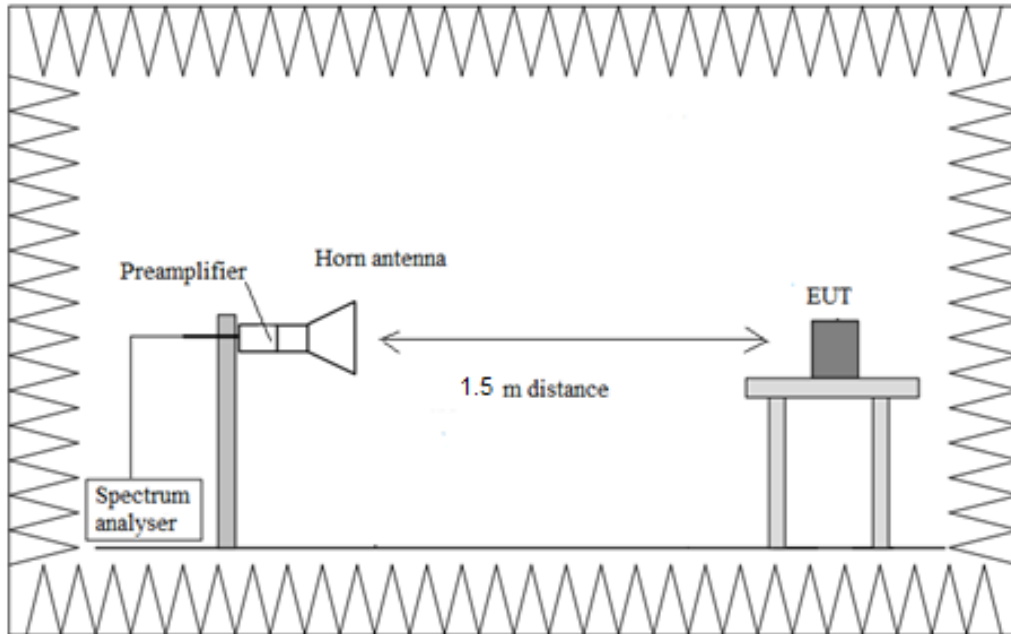
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup $f > 17$ GHz:



TEST CASES DETAILS

Occupied Channel Bandwidth 99%

Results

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Freq (MHz)	Occ Ch BW (MHz)
2402.00000	1.045
2440.00000	1.050
2480.00000	1.050

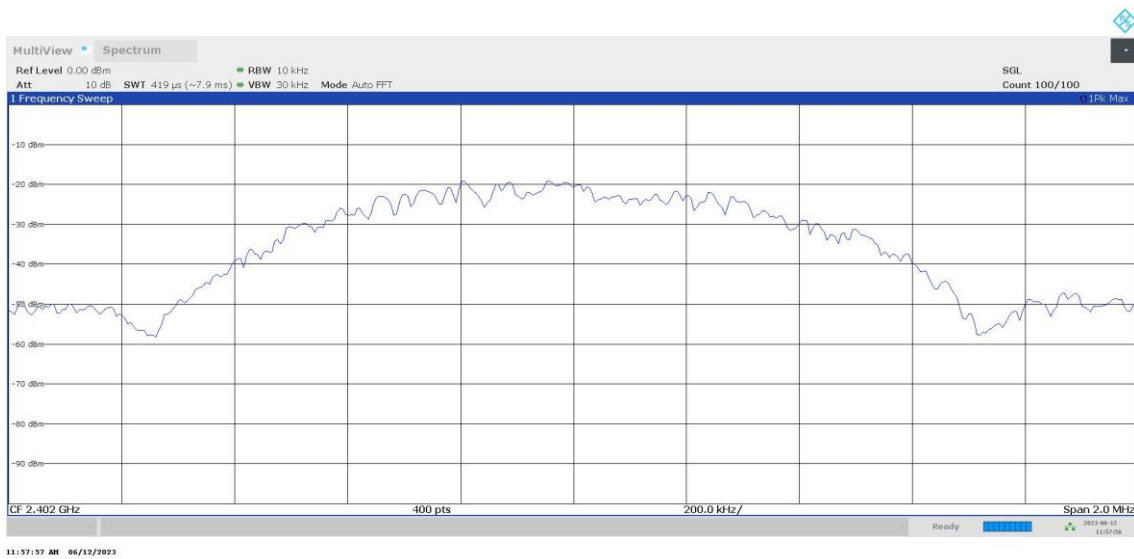
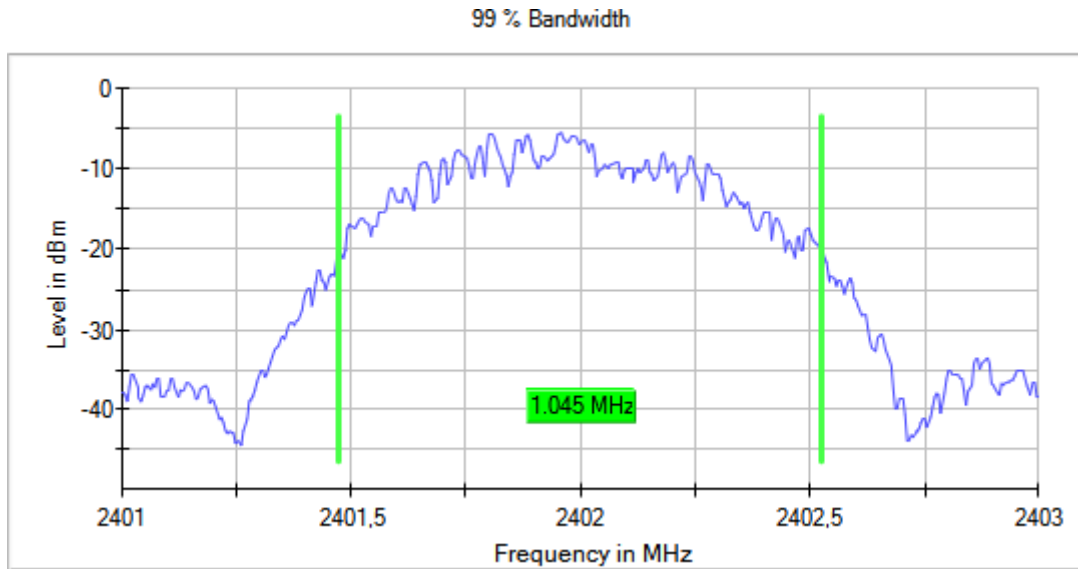
Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Freq (MHz)	Occ Ch BW (MHz)
2402.00000	2.030
2440.00000	2.040
2480.00000	2.040

Attachments

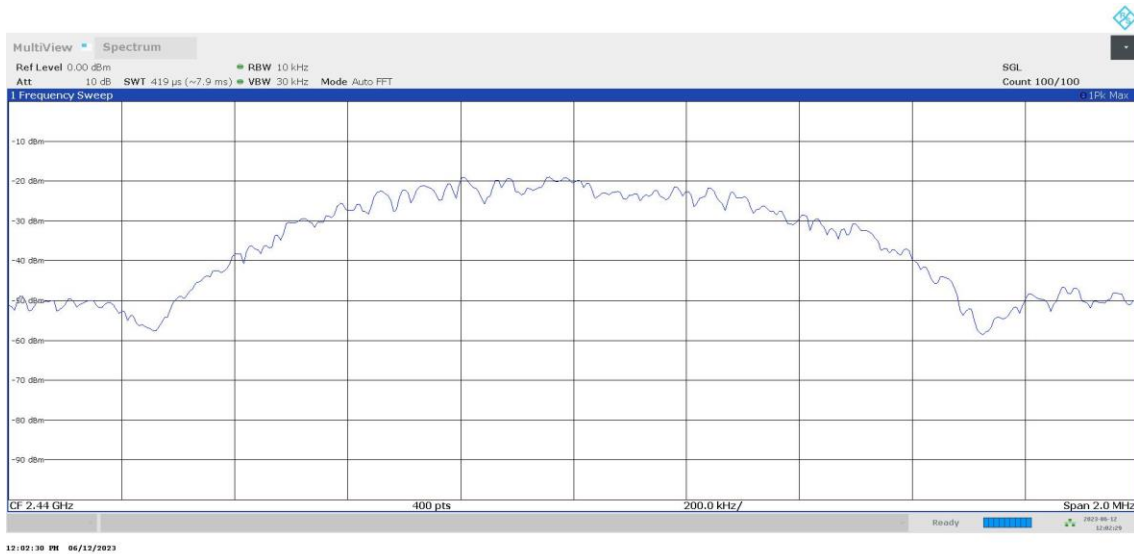
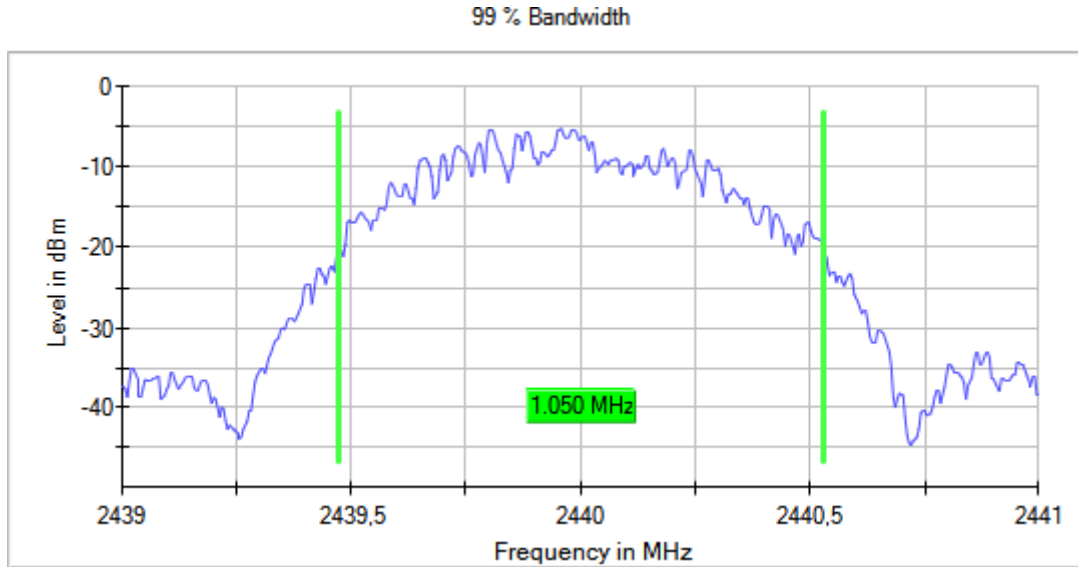
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images:



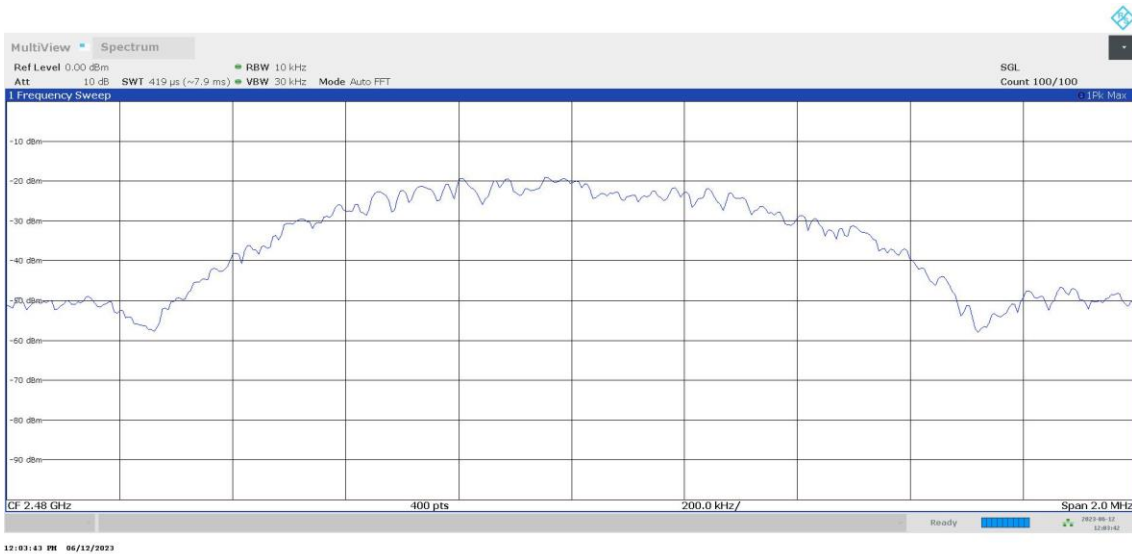
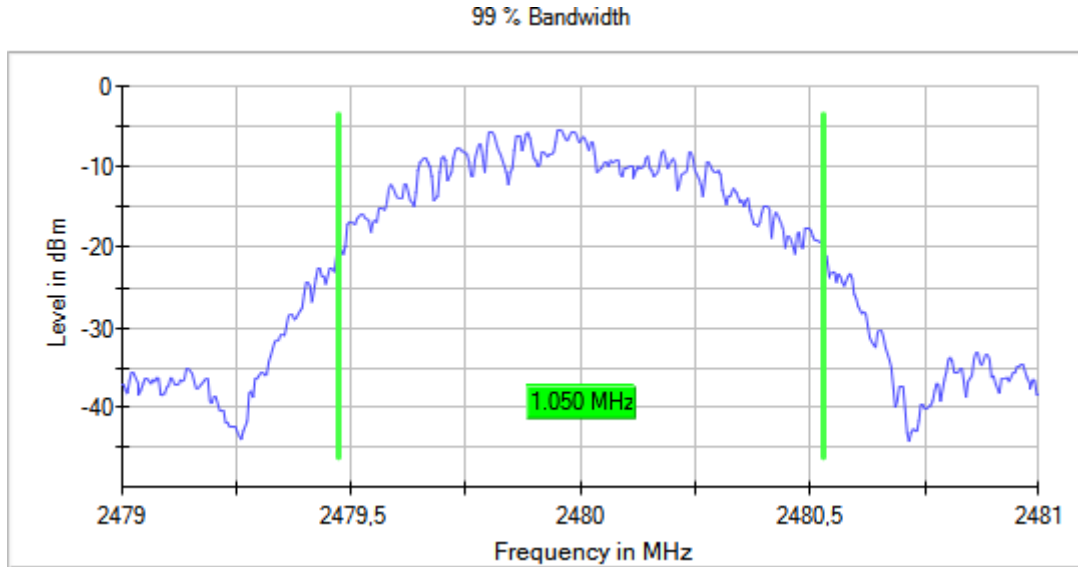
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Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images:



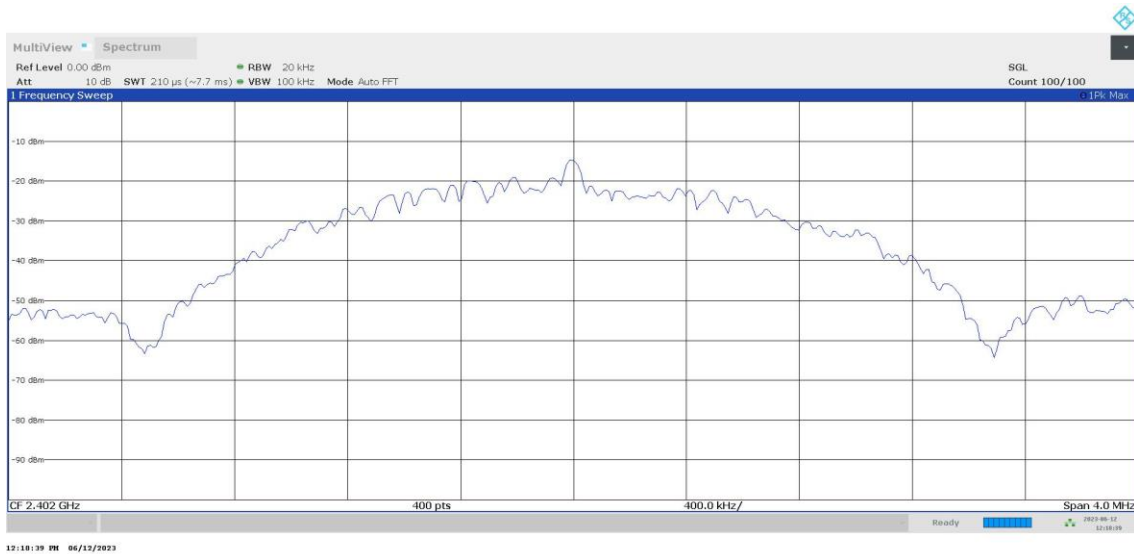
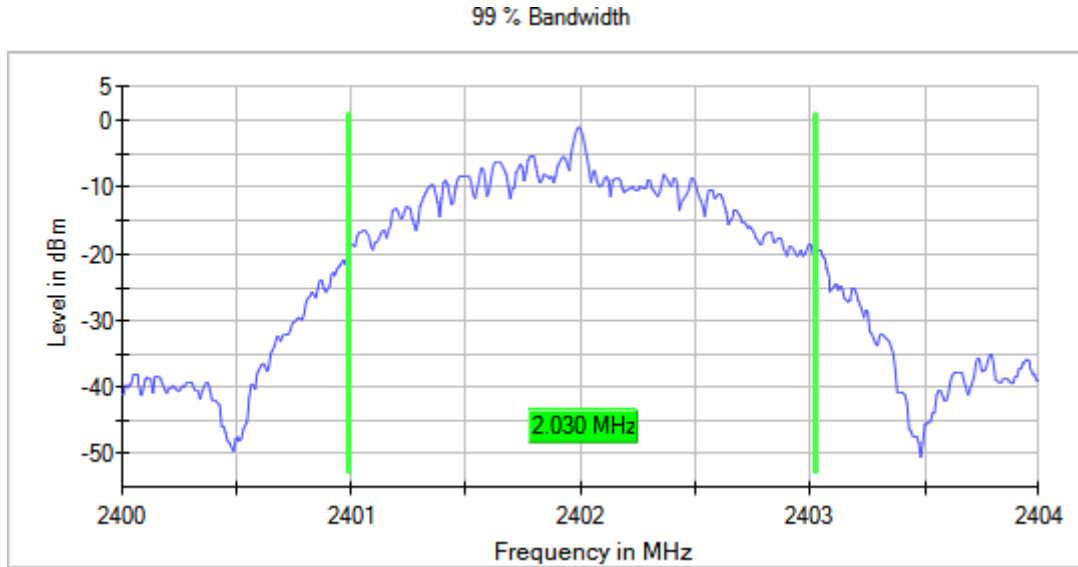
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Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images:



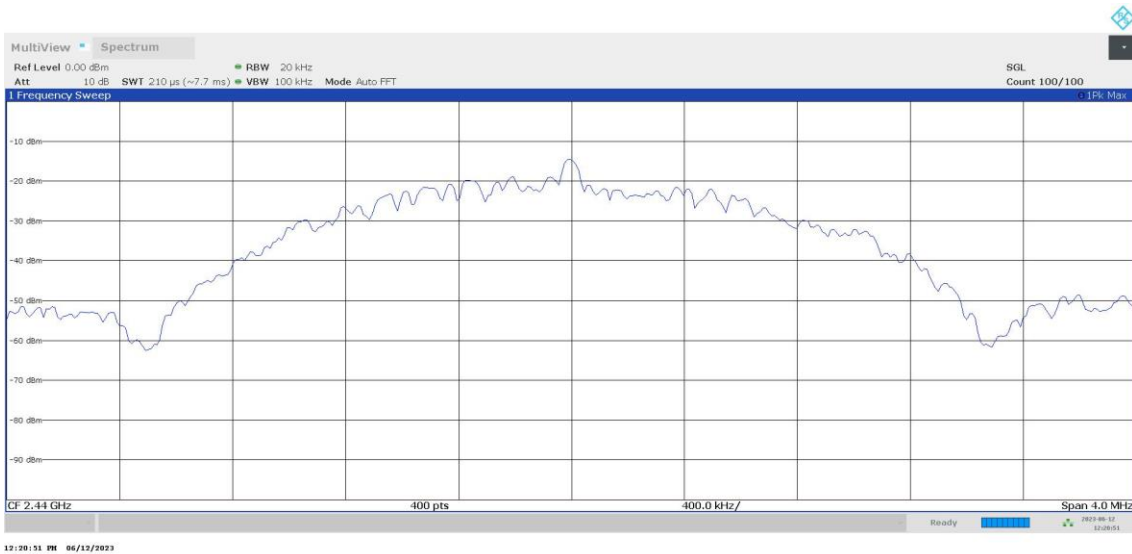
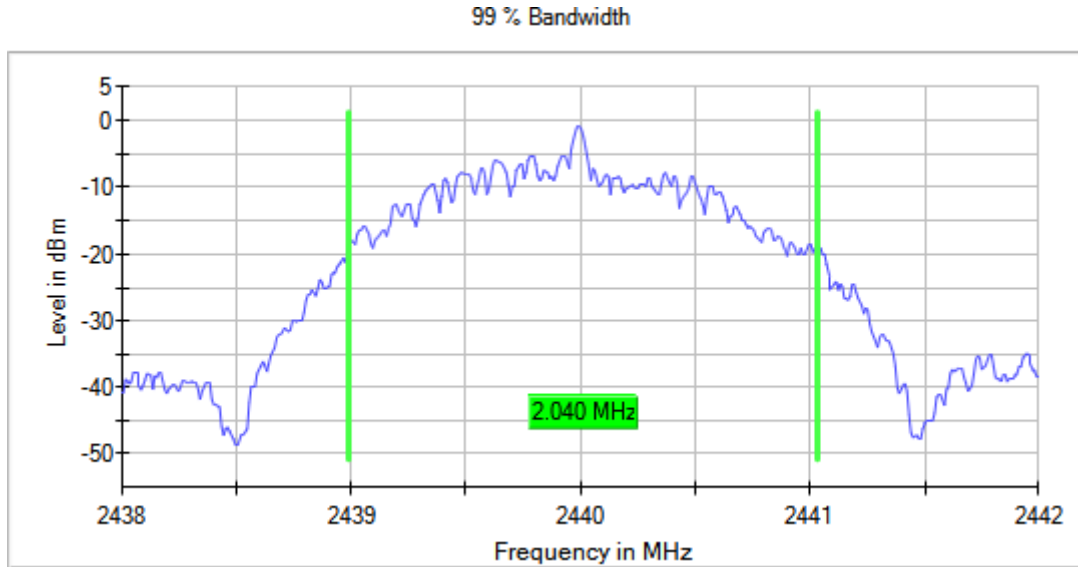
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images:



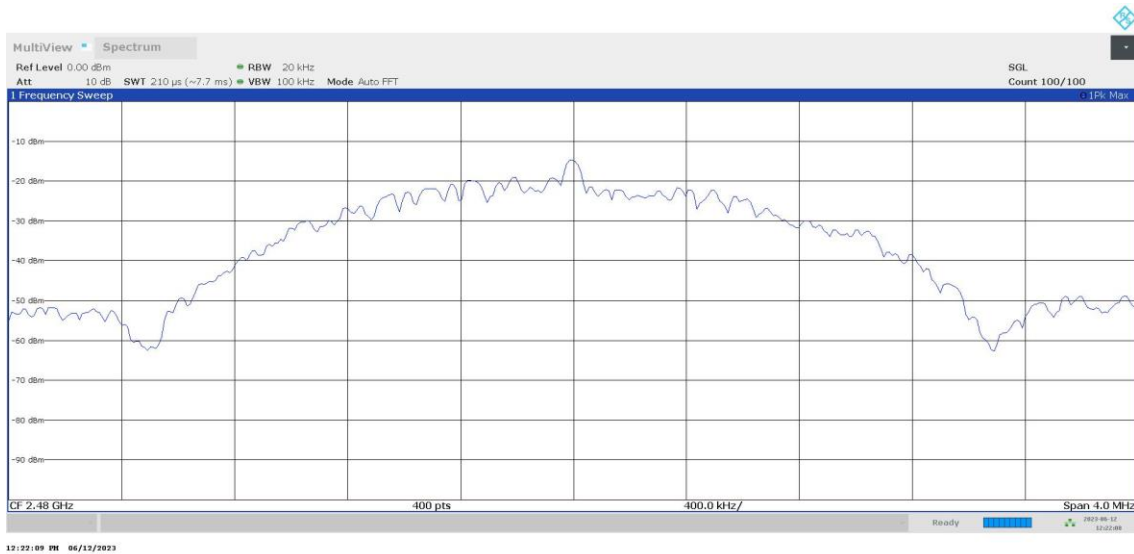
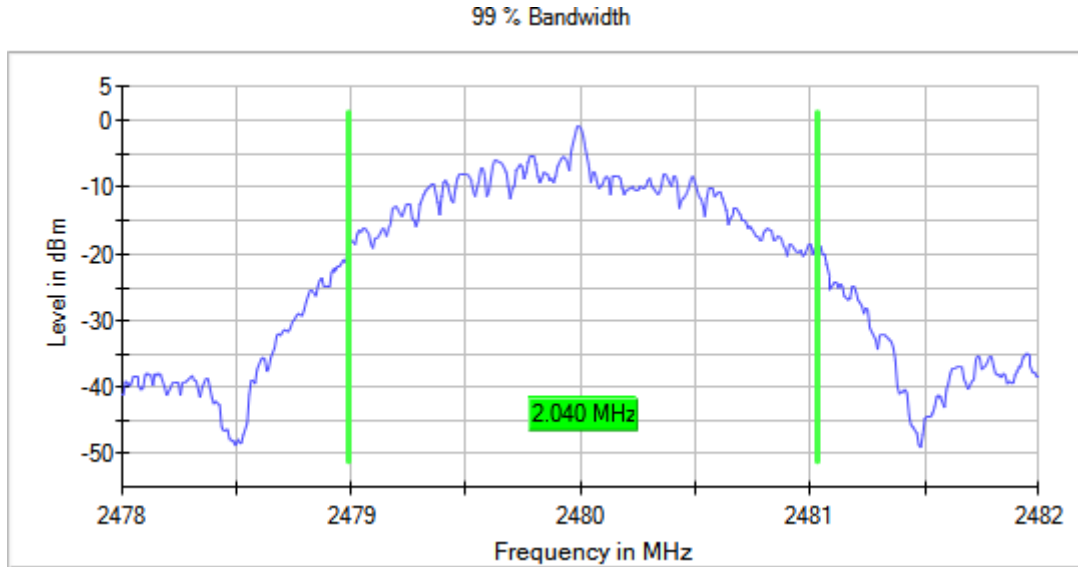
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Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images:



Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images:



RSS-247 5.2 (a) / FCC 15.247 (a) (2) 6 dB Bandwidth

Limits

The minimum 6 dB bandwidth shall be at least 500 kHz.

Results

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Freq (MHz)	6 dB Bandwidth (MHz)
2402.00000	0.812
2440.00000	0.792
2480.00000	0.812

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Freq (MHz)	6 dB Bandwidth (MHz)
2402.00000	1.465
2440.00000	1.465
2480.00000	1.465

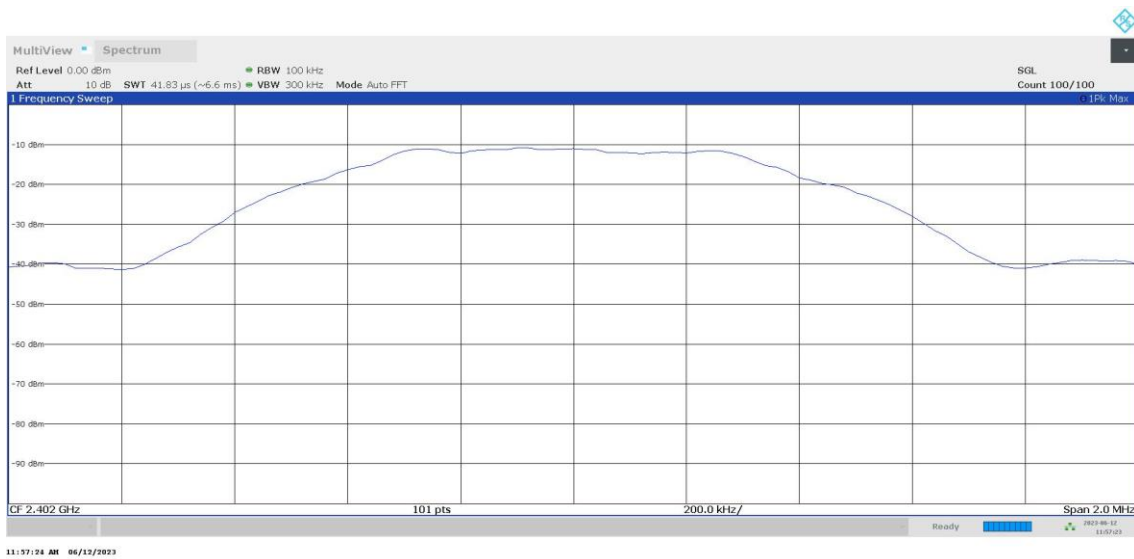
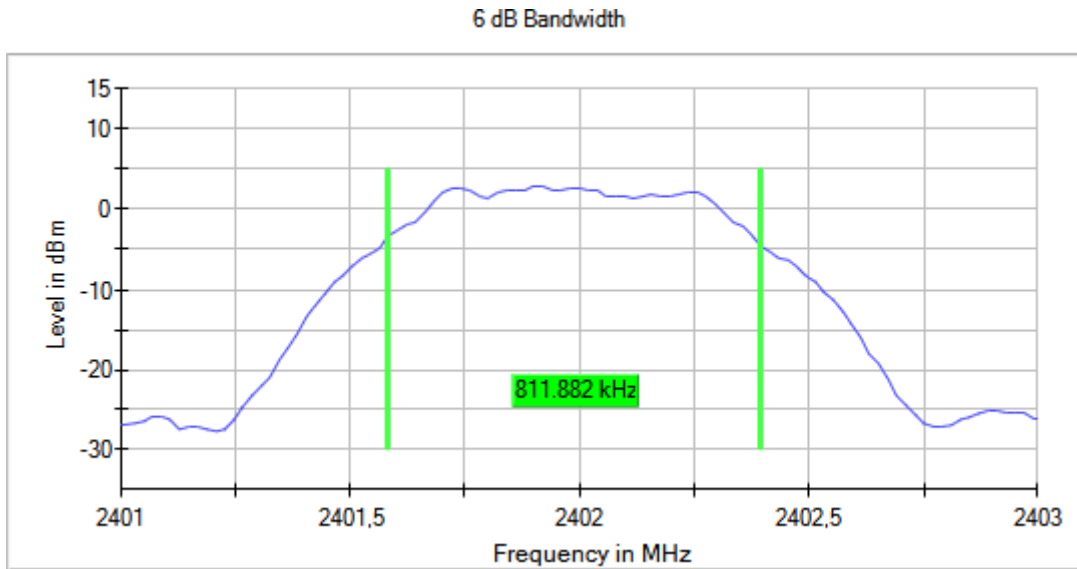
Verdict

Pass

Attachments

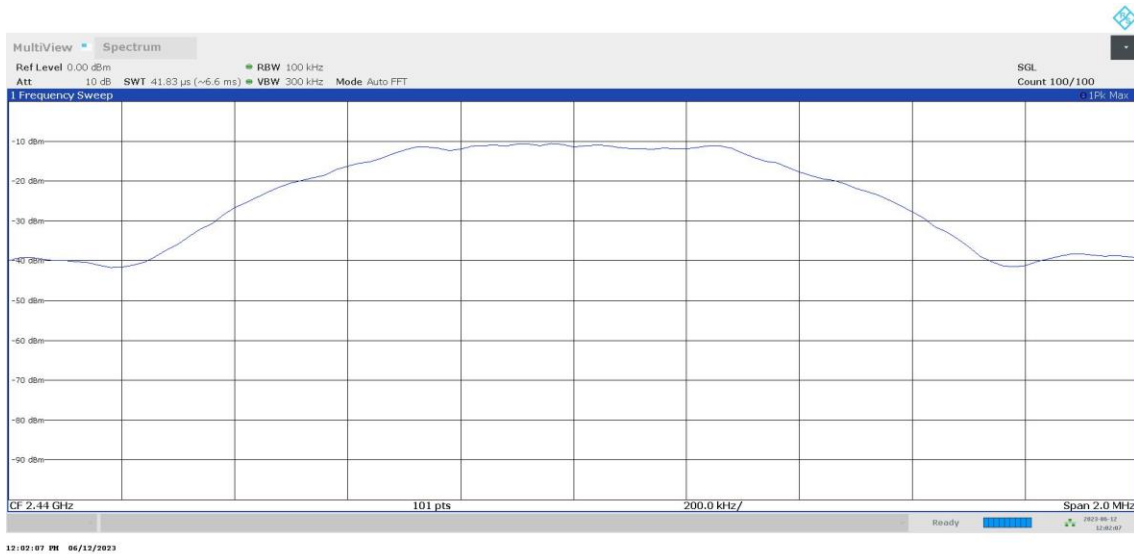
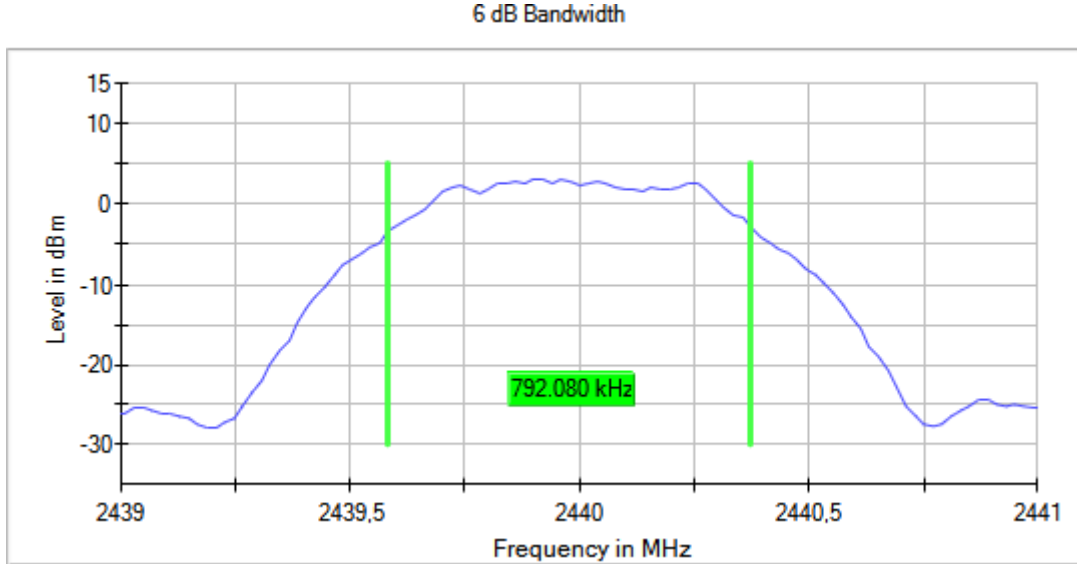
Bandwidth MHz = 1 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)
Frequency MHz = 2402.00000 MIMO Mode = SISO
Active Port = 1

Images:



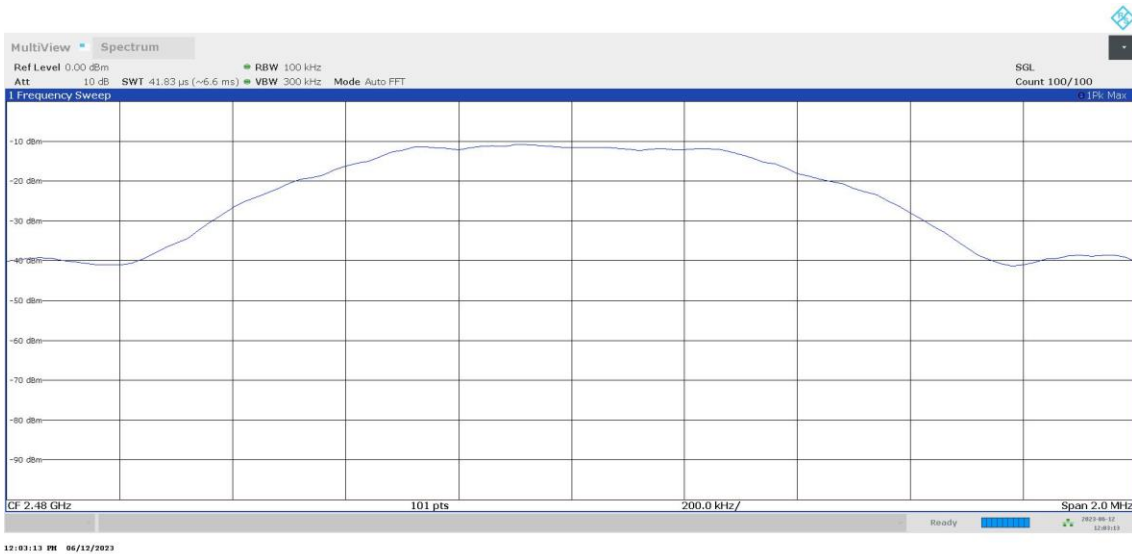
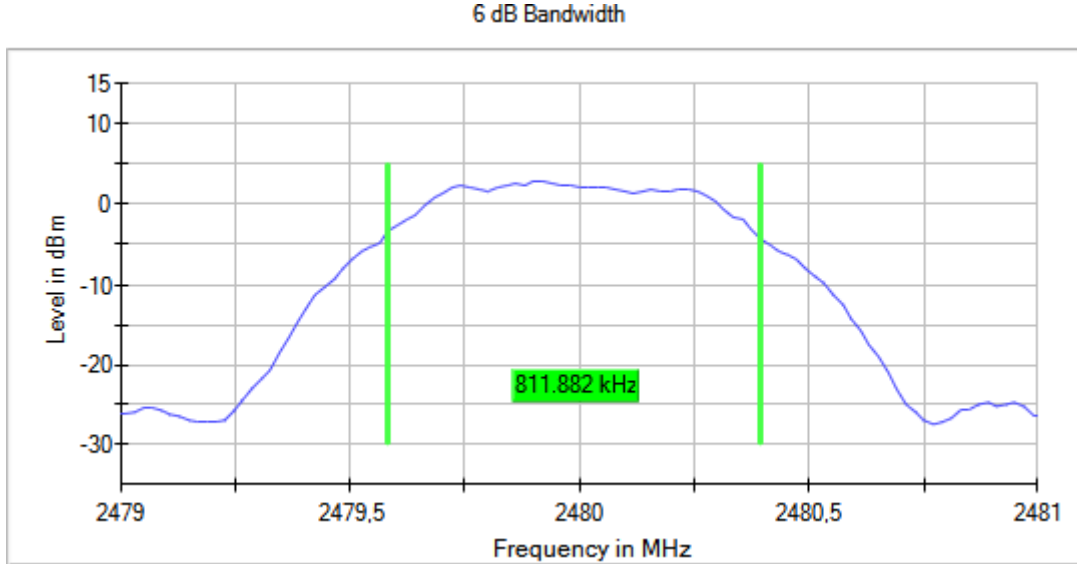
Bandwidth MHz = 1 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)
Frequency MHz = 2440.00000 MIMO Mode = SISO
Active Port = 1

Images:



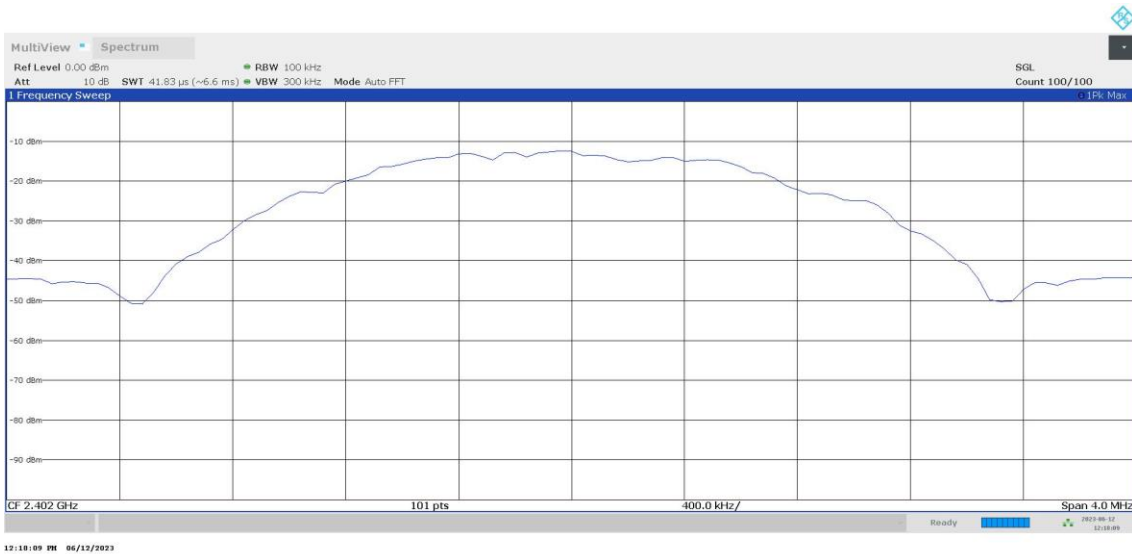
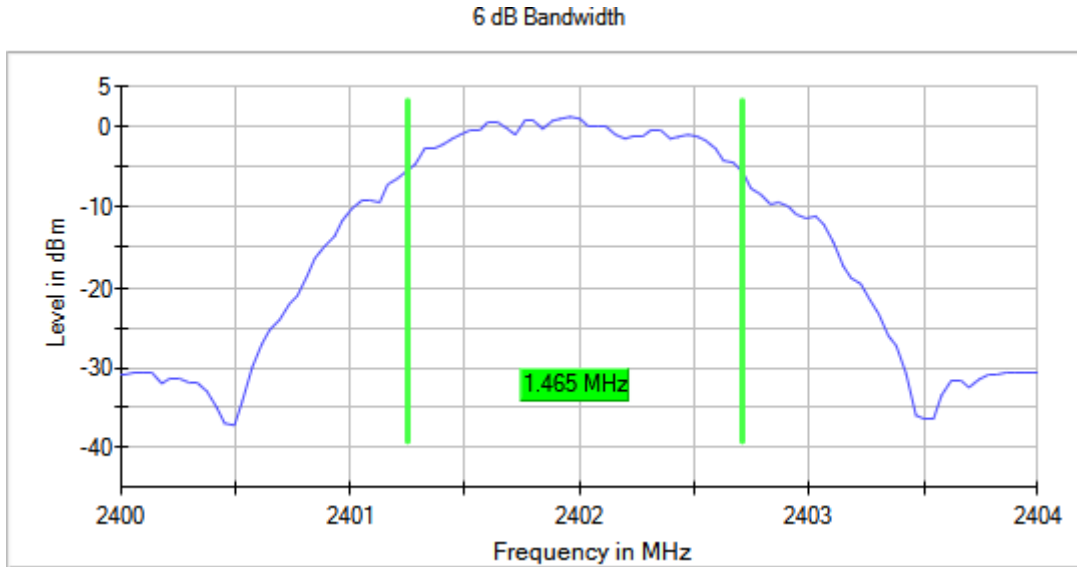
Bandwidth MHz = 1 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)
Frequency MHz = 2480.00000 MIMO Mode = SISO
Active Port = 1

Images:



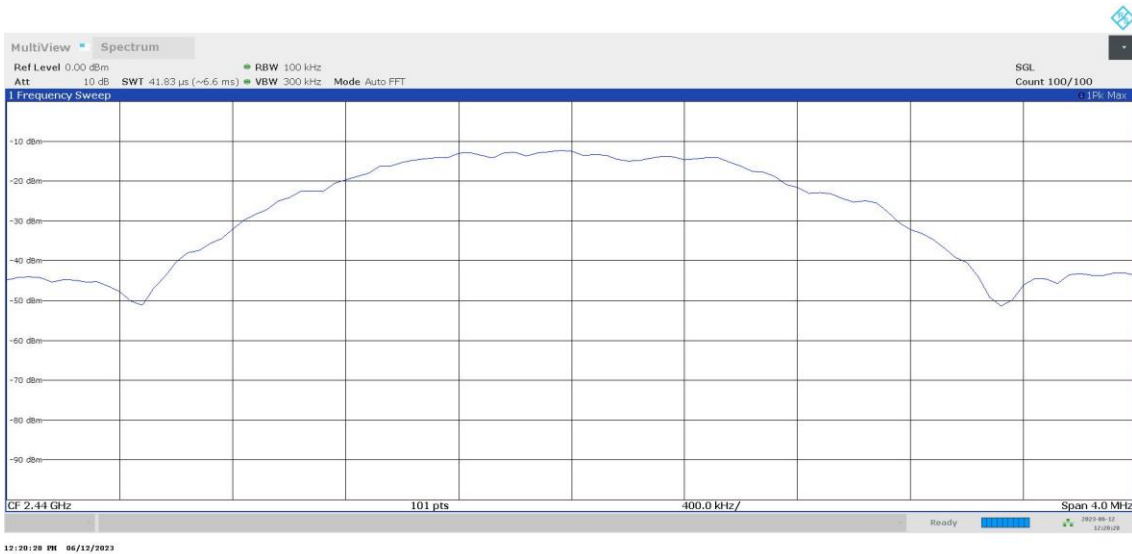
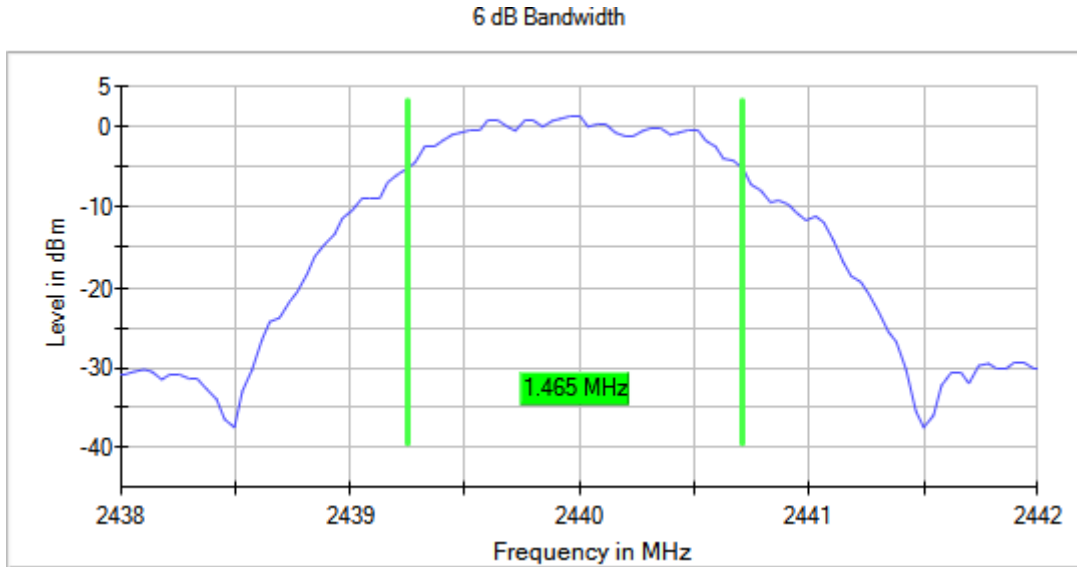
Bandwidth MHz = 2 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)
Frequency MHz = 2402.00000 MIMO Mode = SISO
Active Port = 1

Images:



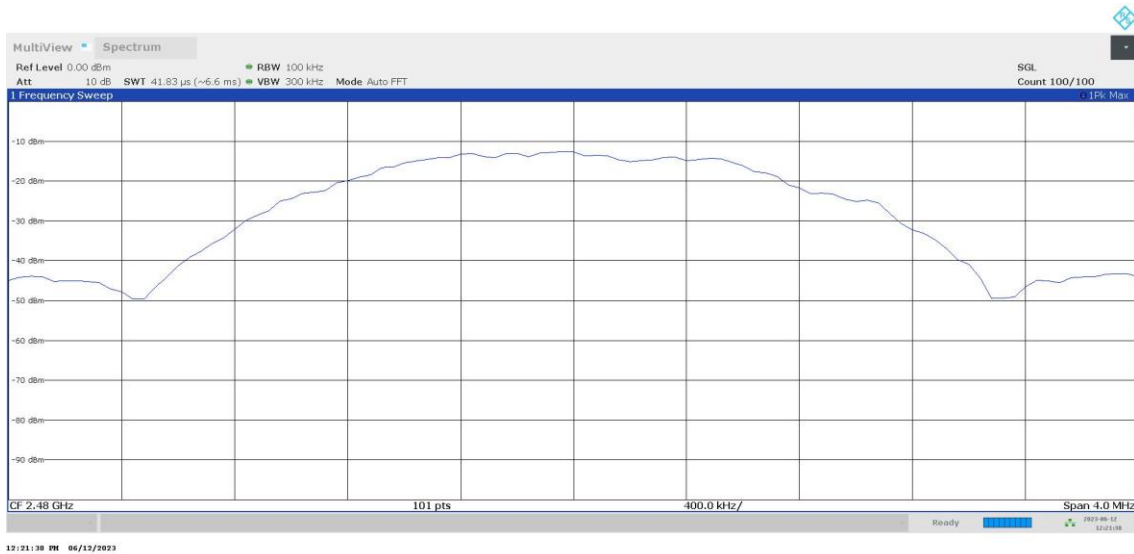
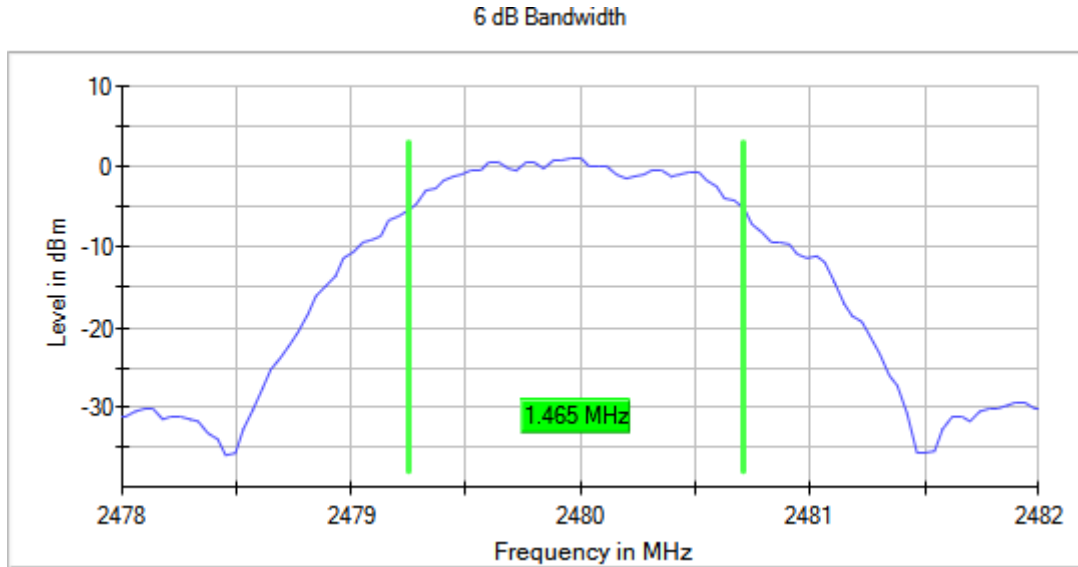
Bandwidth MHz = 2 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)
Frequency MHz = 2440.00000 MIMO Mode = SISO
Active Port = 1

Images:



Bandwidth MHz = 2 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)
Frequency MHz = 2480.00000 MIMO Mode = SISO
Active Port = 1

Images:



RSS-247 5.2 (b) / FCC 15.247 (e) Power spectral density

Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Results

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Freq (MHz)	Measured Freq (MHz)	PSD (dBm)
2402.00000	2401.95750	-5.49
2440.00000	2439.95250	-5.26
2480.00000	2479.95250	-5.39

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Freq (MHz)	Measured Freq (MHz)	PSD (dBm)
2402.00000	2401.99250	-5.91
2440.00000	2439.99250	-5.58
2480.00000	2479.98750	-5.74

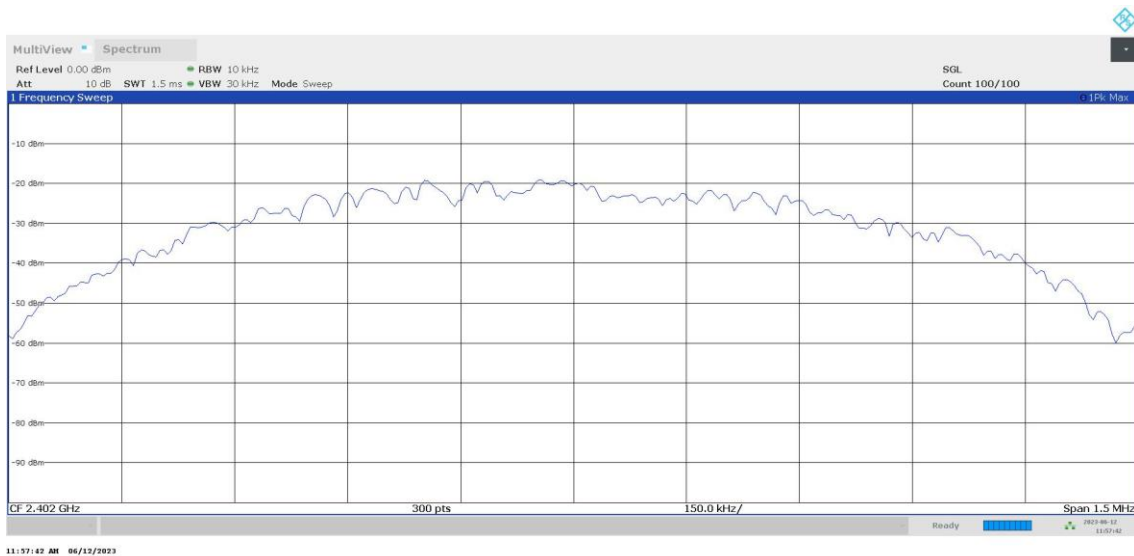
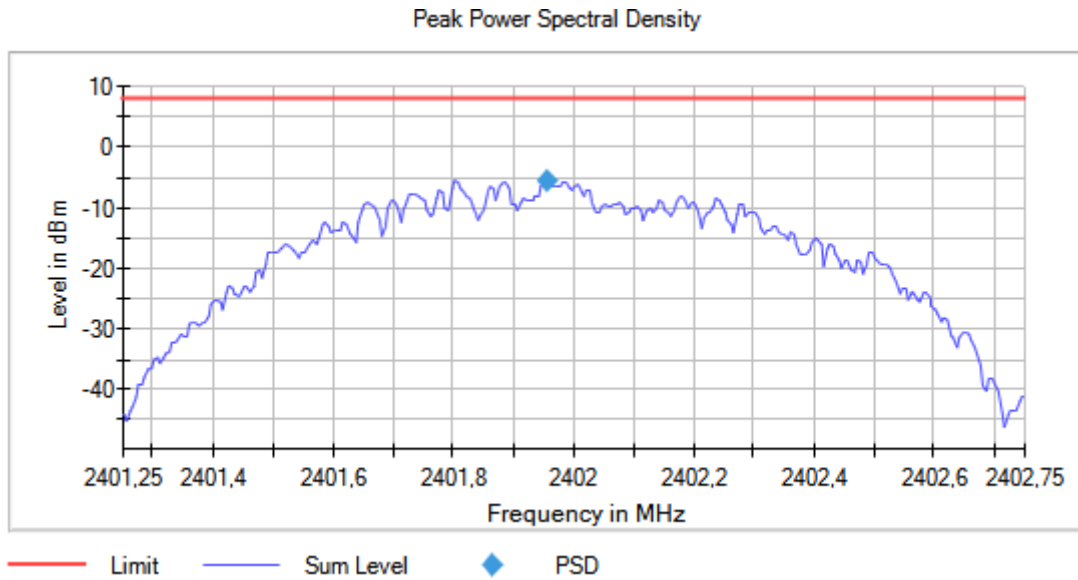
Verdict

Pass

Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
 MIMO Mode = SISO Active Port = 1

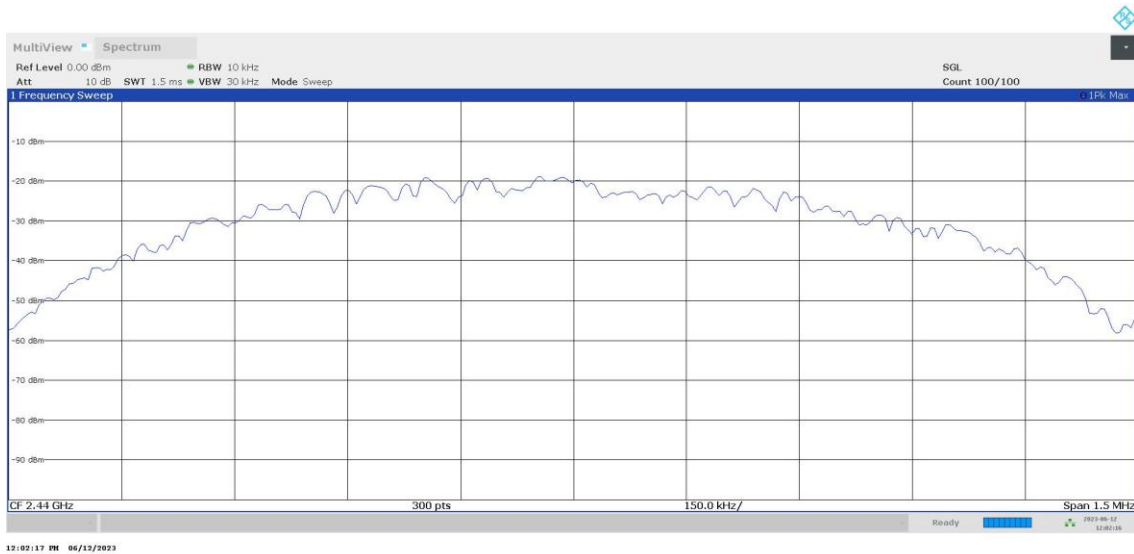
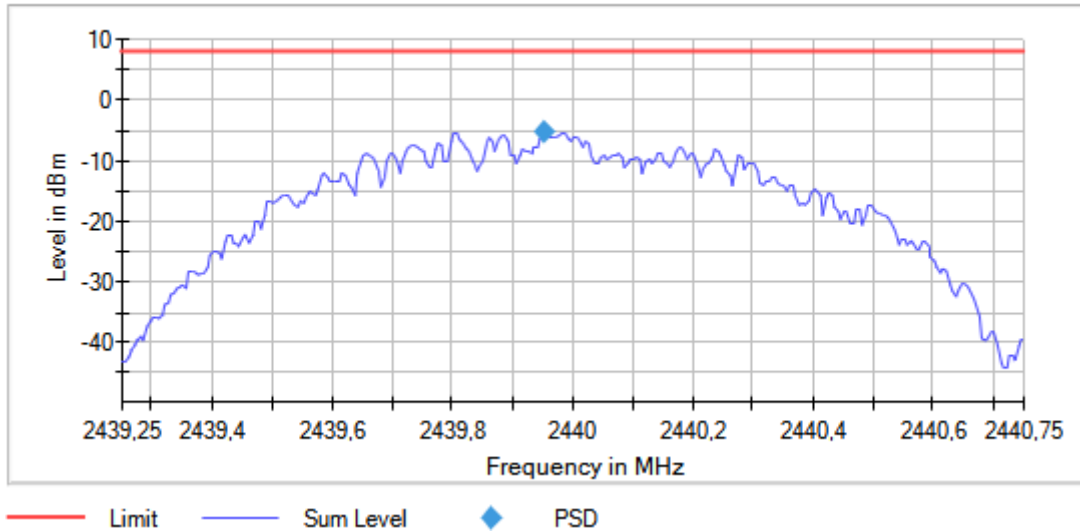
Images:



Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

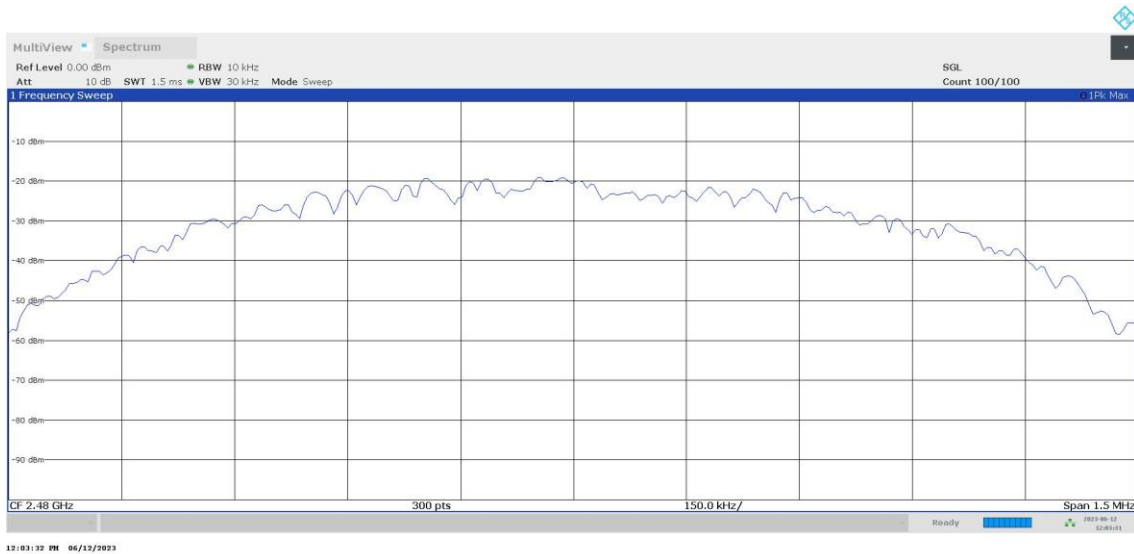
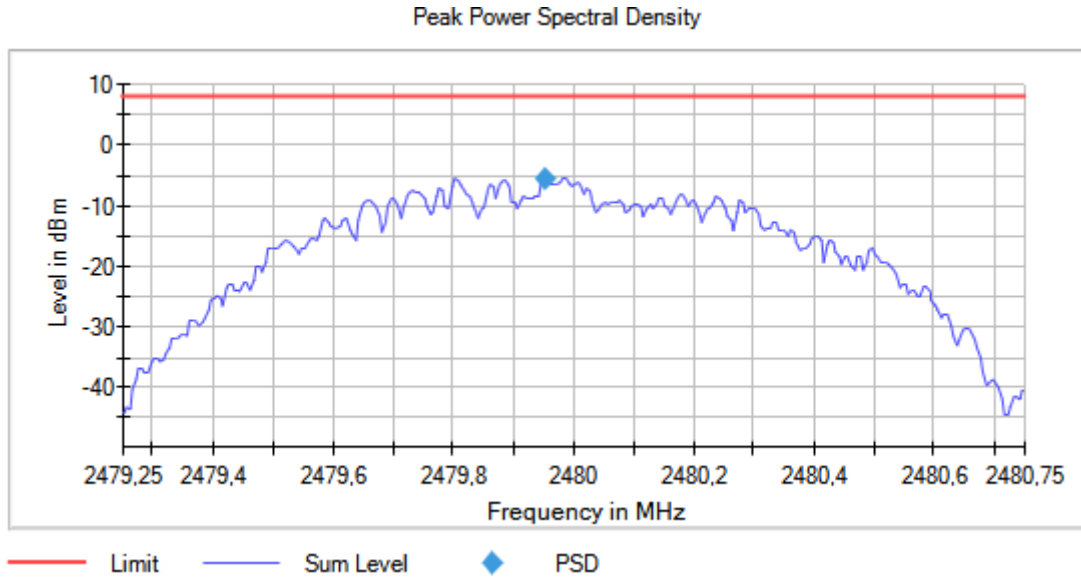
Images:

Peak Power Spectral Density



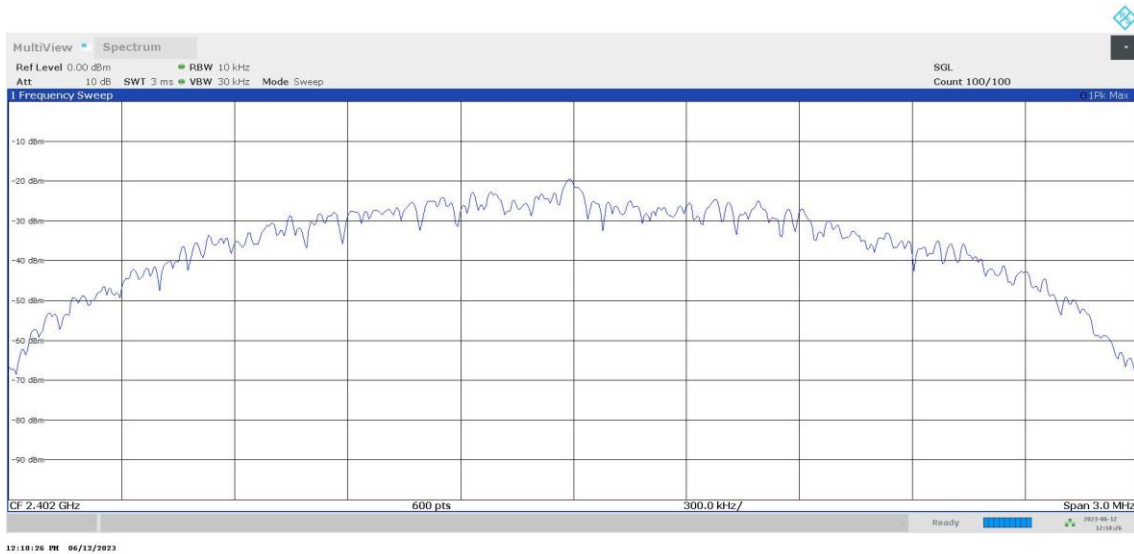
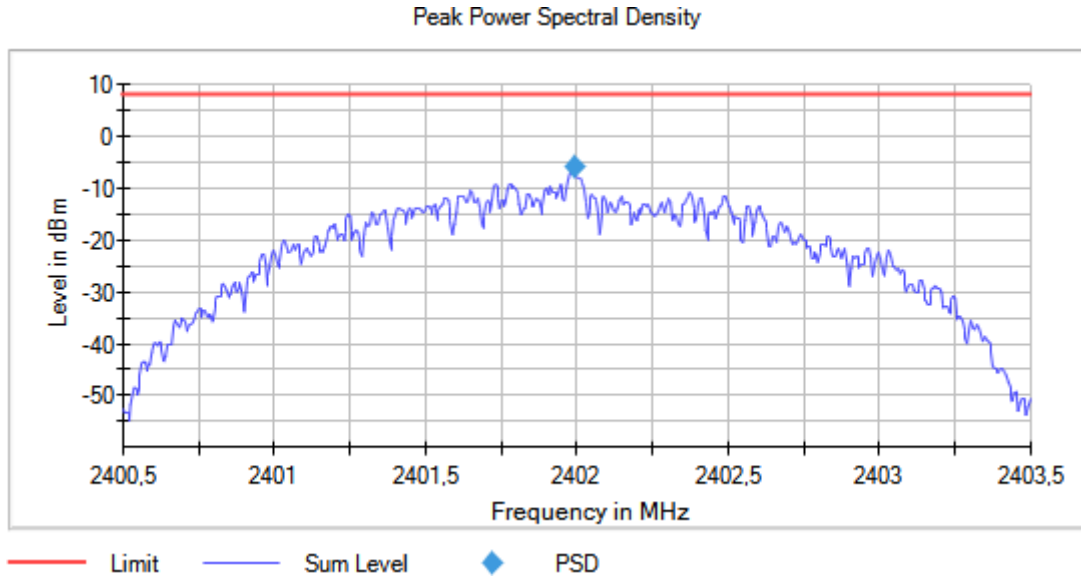
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Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images:



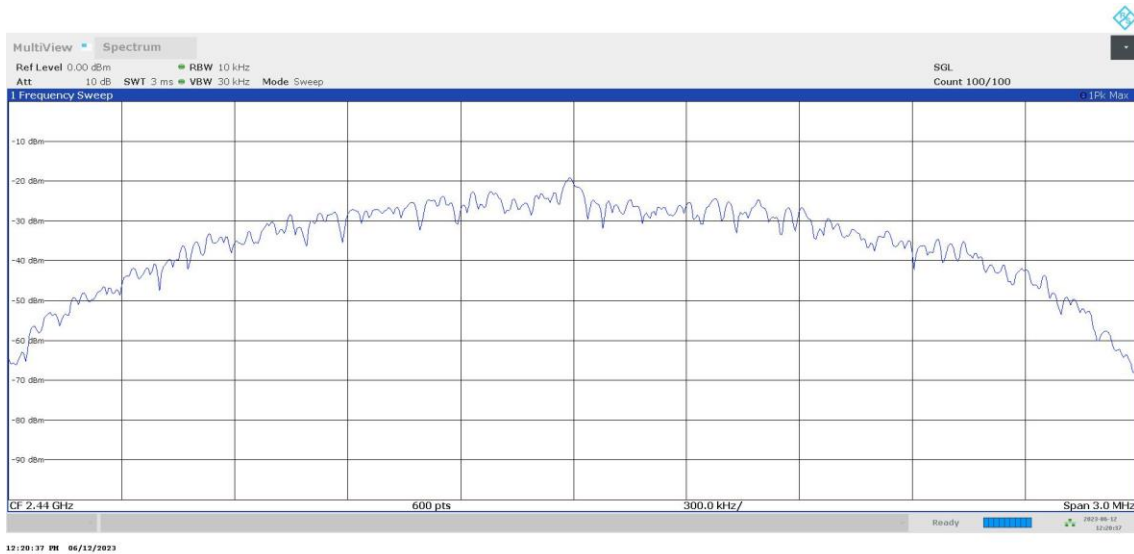
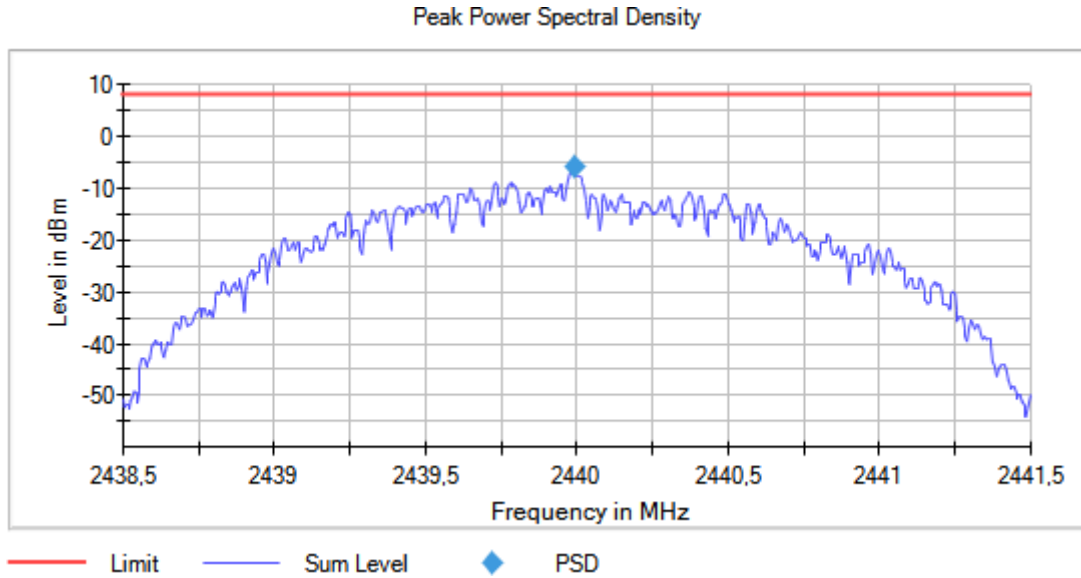
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images:



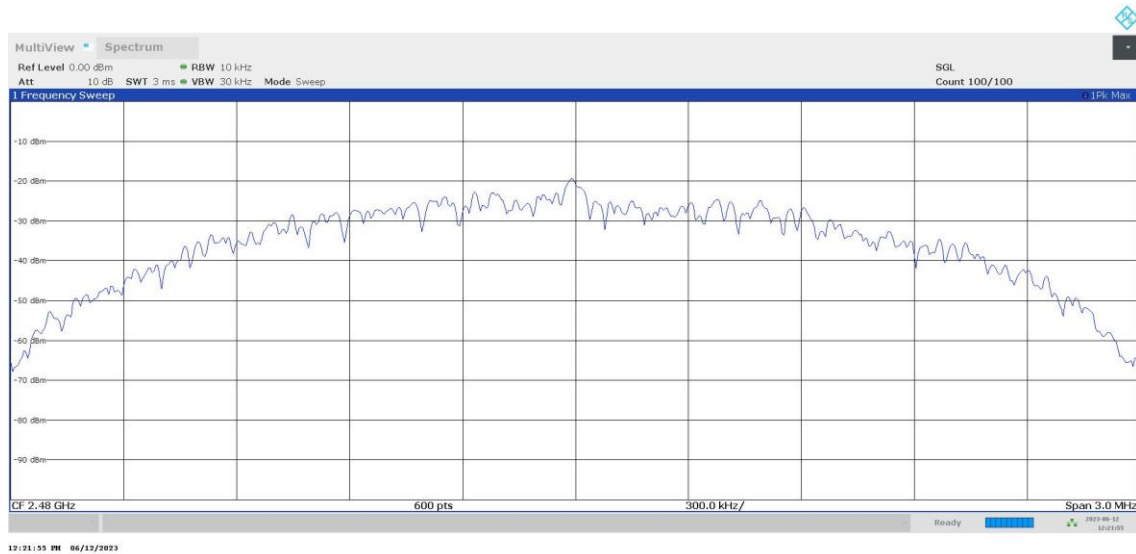
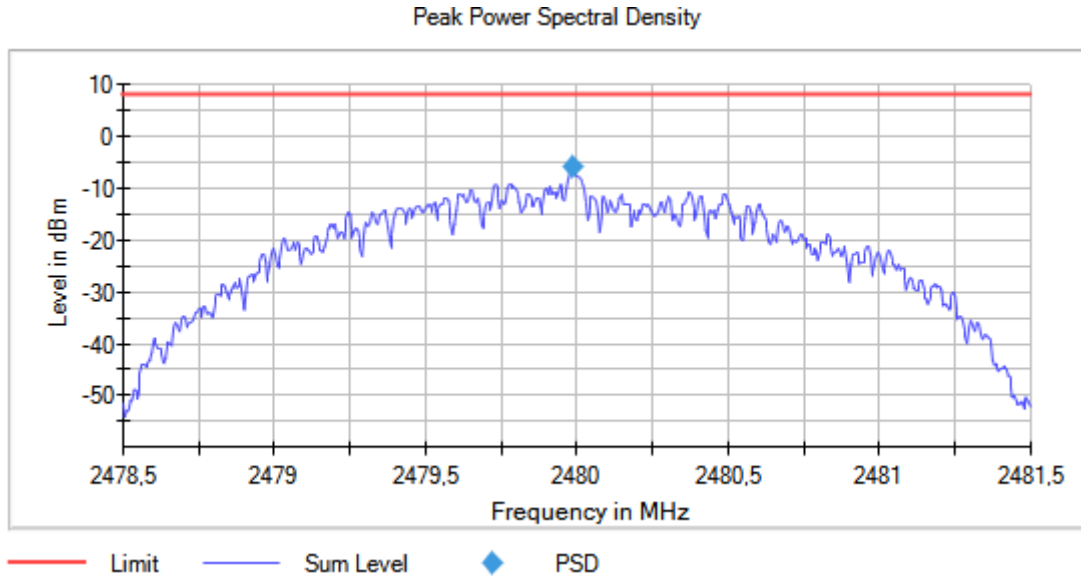
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images:



Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images:



RSS-247 5.4 (d) / FCC 15.247 (b) (3) Maximum Peak Conducted output power

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).

The maximum peak conducted output power level in the fundamental emission was measured using the method according to point 11.9.1.1 "RBW \geq DTS bandwidth" of ANSI C.63.10-2013.

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

Maximum Declared Antenna Gain: -5 dBi

Results

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Freq (MHz)	Maximum Conducted Power (dBm)	Maximum EIRP Power (dBm)
2402.00000	4.344	-0.656
2440.00000	4.626	-0.374
2480.00000	4.455	-0.545

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Freq (MHz)	Maximum Conducted Power (dBm)	Maximum EIRP Power (dBm)
2402.00000	4.351	-0.649
2440.00000	4.574	-0.426
2480.00000	4.439	-0.561

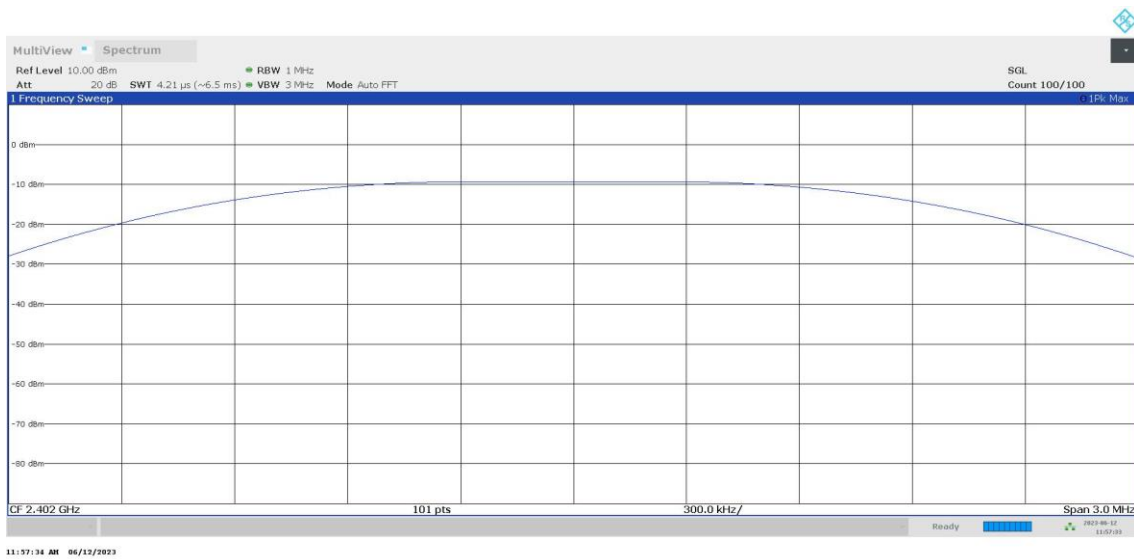
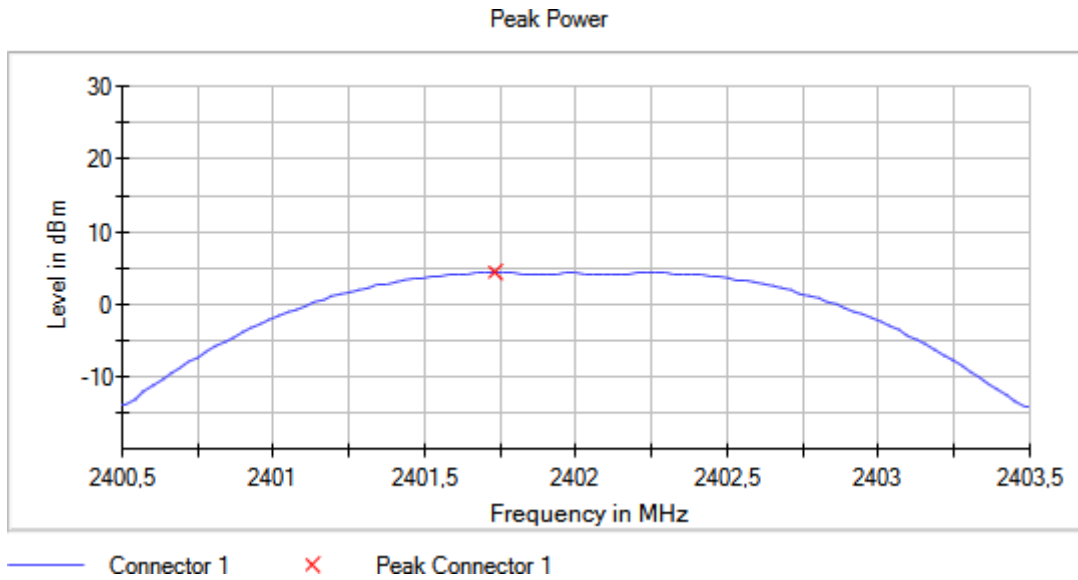
Verdict

Pass

Attachments

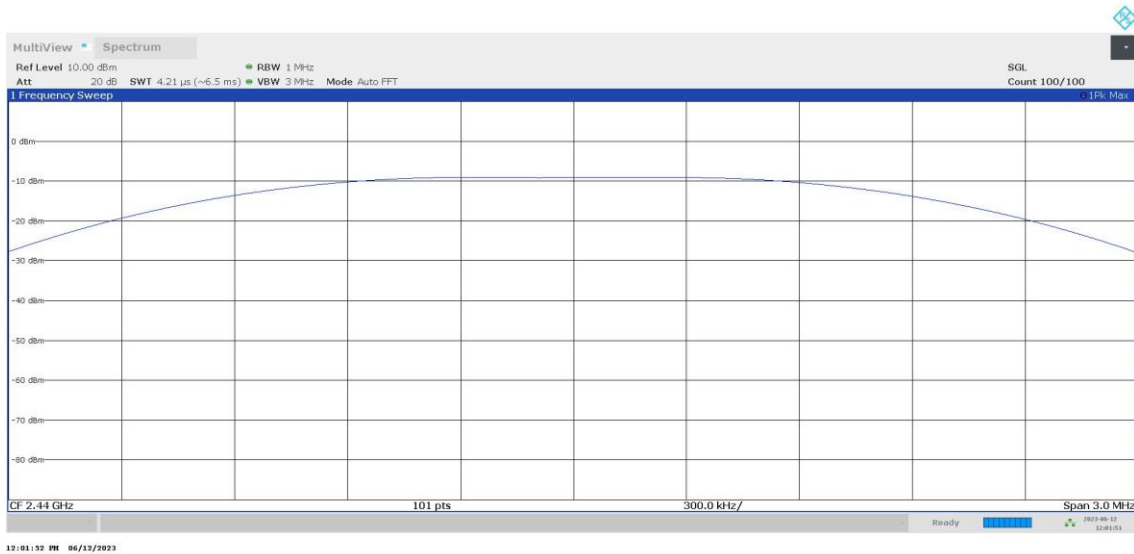
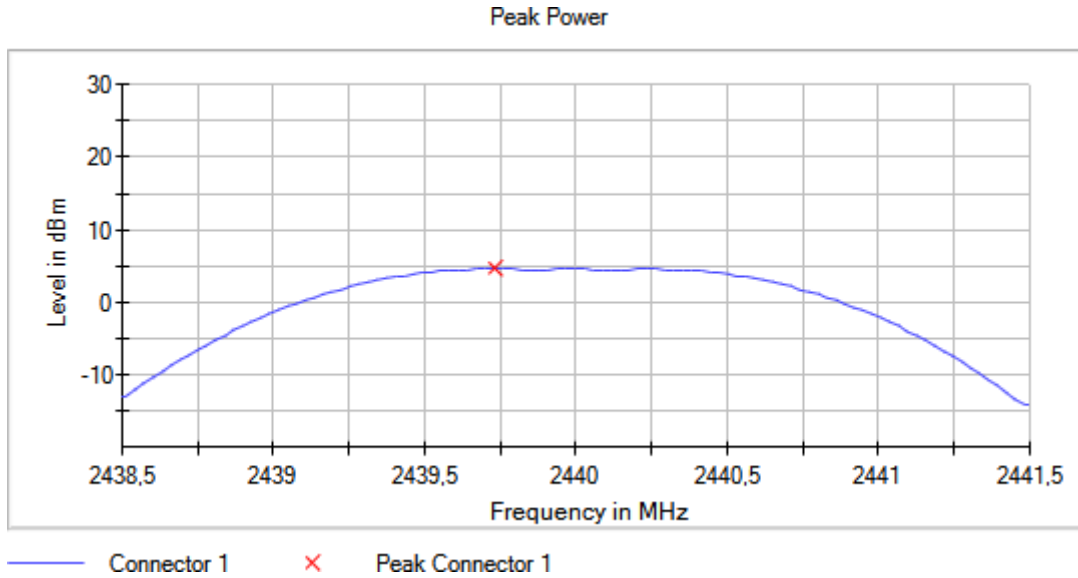
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images:



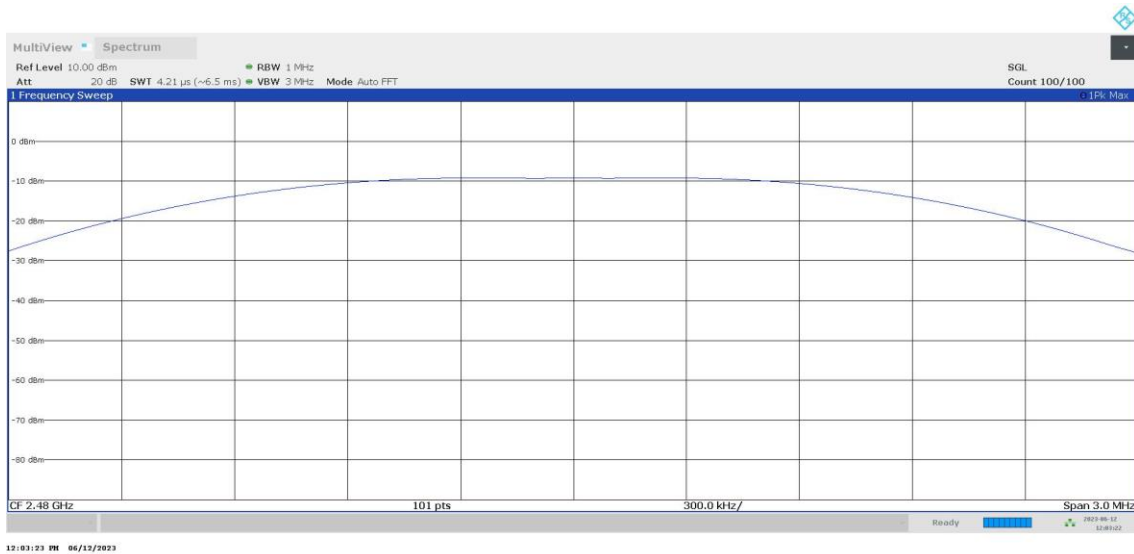
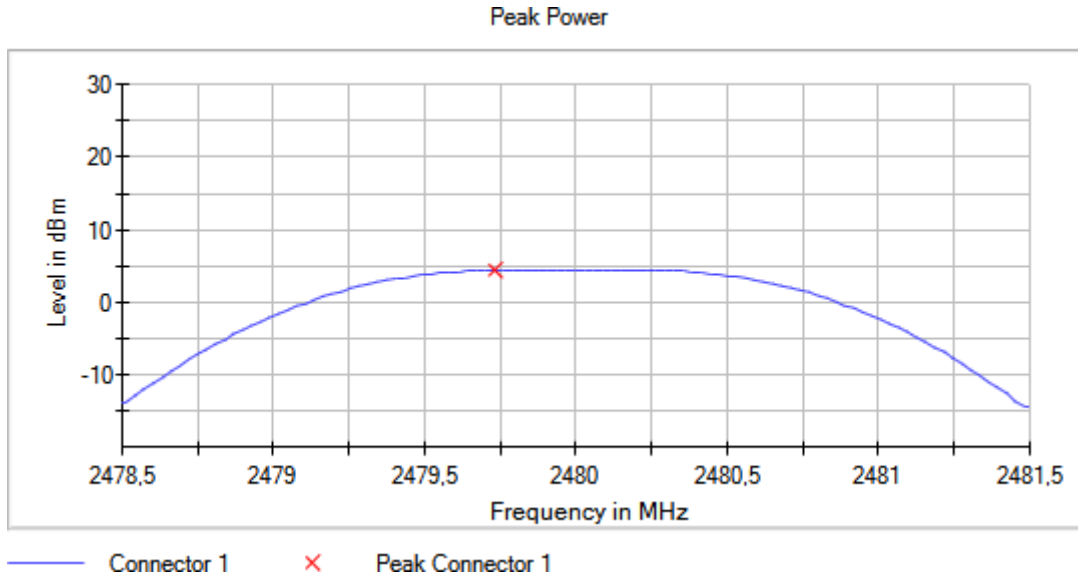
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
 MIMO Mode = SISO Active Port = 1

Images:



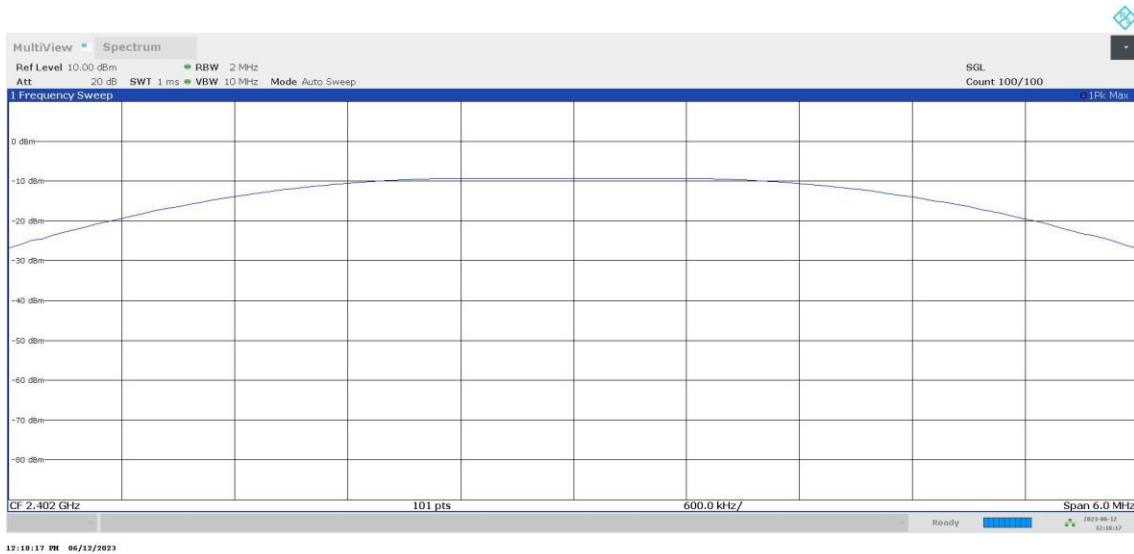
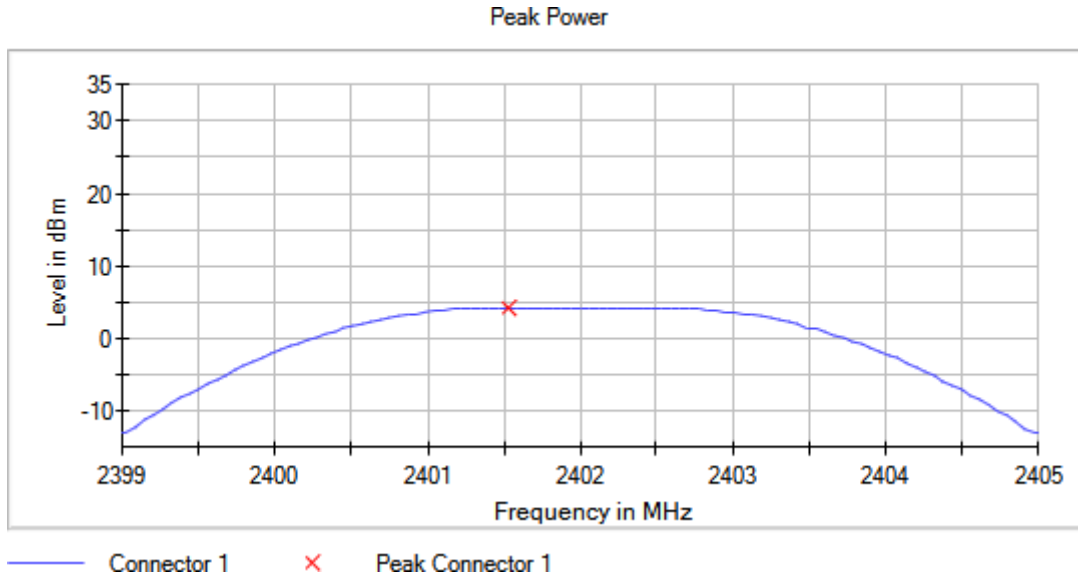
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 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
 MIMO Mode = SISO Active Port = 1

Images:



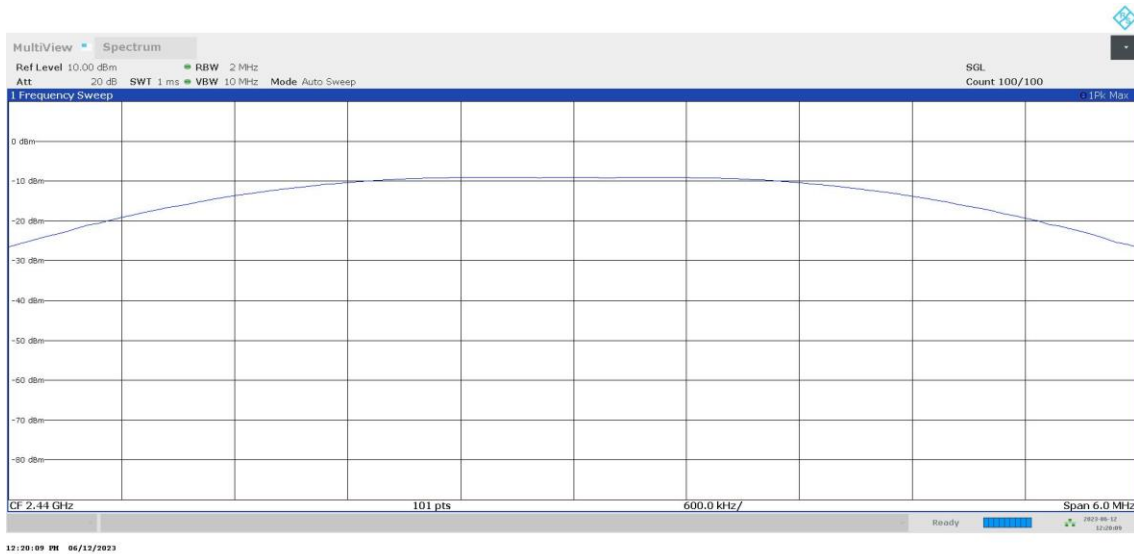
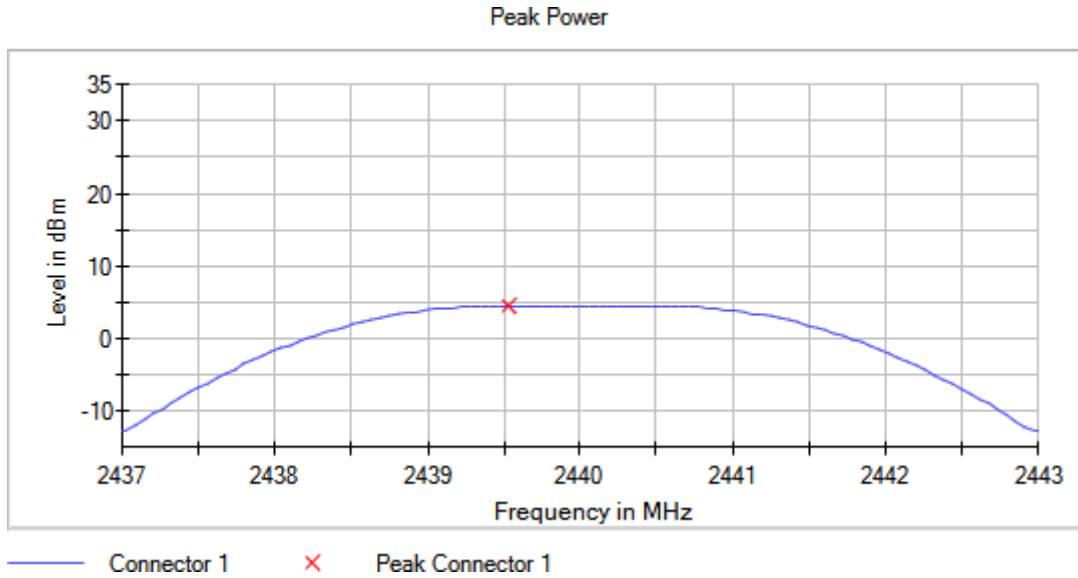
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 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
 MIMO Mode = SISO Active Port = 1

Images:



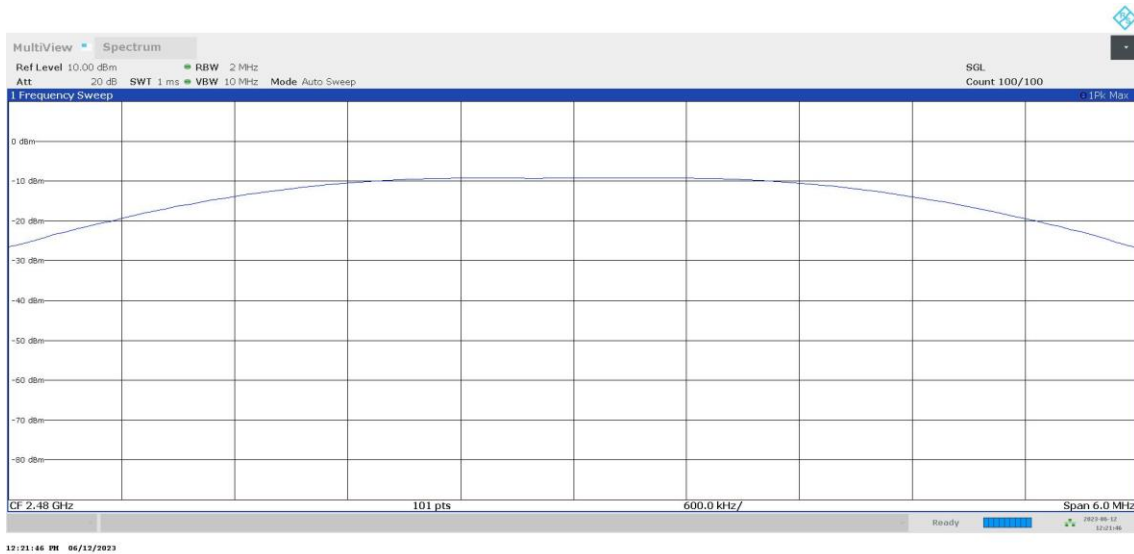
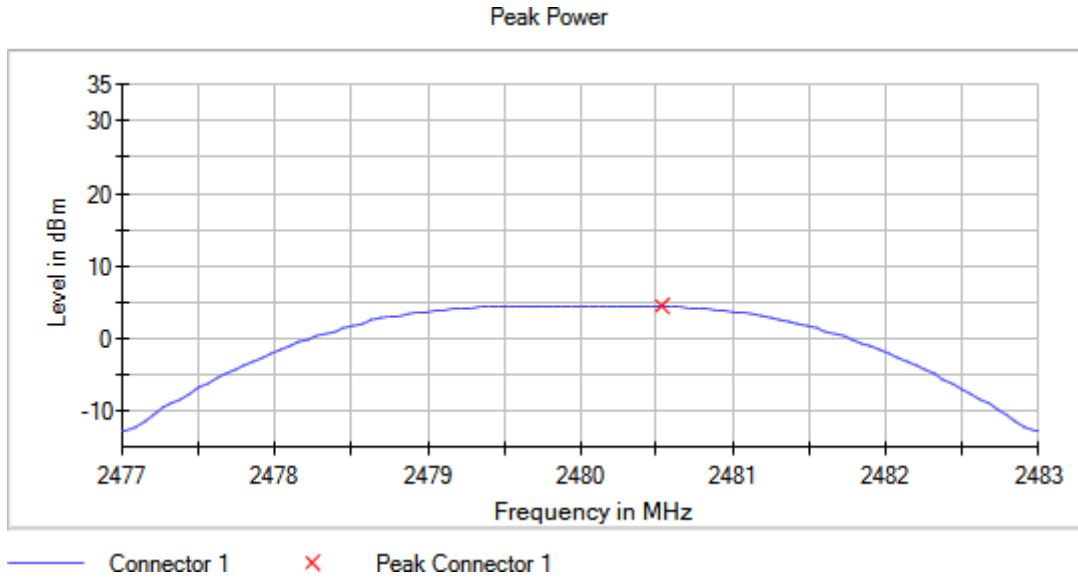
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images:



Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
 MIMO Mode = SISO Active Port = 1

Images:



RSS-247 5.5 / FCC 15.247 (d) Band-edge emissions compliance (Transmitter)

Limits

In any 100 kHz bandwidths outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Results

Radiated measurements were used to show compliance with the limits in the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Freq (MHz)	Measured Freq (MHz)	Level (dBm)	Limit (dBm)
2402.00000	2399.975000	-51.848	-19.599
	2399.925000	-52.954	
	2399.675000	-53.313	
	2399.725000	-53.512	
	2399.625000	-53.746	
	2399.875000	-54.072	
	2399.825000	-54.180	
	2399.575000	-54.692	
	2399.775000	-54.769	
	2399.525000	-55.047	
	2399.425000	-55.508	
	2399.475000	-55.689	
	2399.375000	-56.195	
	2399.325000	-56.756	
2399.275000	-57.212		

Freq (MHz)	Measured Freq (MHz)	Level (dBm)	Limit (dBm)
2480.00000	2483.525000	-59.580	-19.326
	2483.575000	-59.620	
	2483.625000	-61.087	
	2484.325000	-61.333	
	2484.275000	-61.562	
	2484.625000	-62.131	
	2484.025000	-62.212	
	2483.925000	-62.280	
	2484.675000	-62.301	
	2484.225000	-62.370	
	2483.825000	-62.448	
	2484.375000	-62.541	
	2484.725000	-62.581	
	2483.875000	-62.785	
2483.675000	-62.852		

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Freq (MHz)	Measured Freq (MHz)	Level (dBm)	Limit (dBm)
2402.00000	2399.975000	-32.156	-19.577
	2399.925000	-32.752	
	2399.875000	-35.138	
	2399.825000	-38.613	
	2399.775000	-40.201	
	2399.725000	-41.224	
	2399.675000	-43.123	
	2399.625000	-45.919	
	2399.575000	-47.835	
	2399.525000	-50.285	
	2399.175000	-51.365	
	2399.225000	-51.824	
	2399.075000	-52.446	
	2399.325000	-52.653	
2399.125000	-52.727		

Freq (MHz)	Measured Freq (MHz)	Level (dBm)	Limit (dBm)
2480.00000	2483.625000	-55.155	-19.360
	2483.725000	-55.164	
	2483.775000	-55.209	
	2483.675000	-55.600	
	2483.525000	-56.544	
	2483.575000	-56.902	
	2484.075000	-57.042	
	2484.125000	-57.655	
	2484.025000	-57.696	
	2484.175000	-57.906	
	2484.225000	-57.920	
	2484.575000	-58.001	
	2483.825000	-58.016	
	2483.925000	-58.433	
	2483.975000	-58.632	

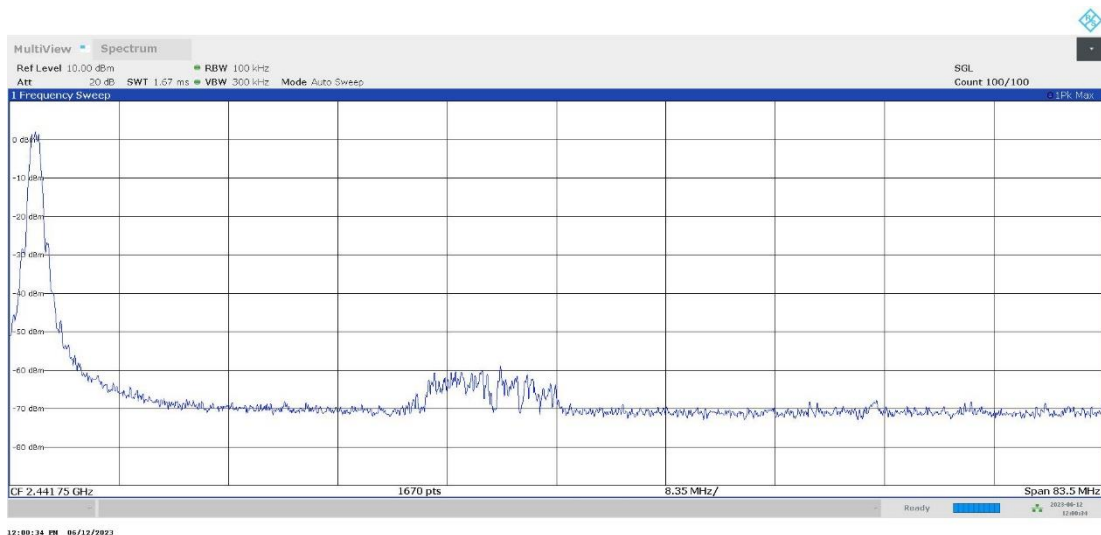
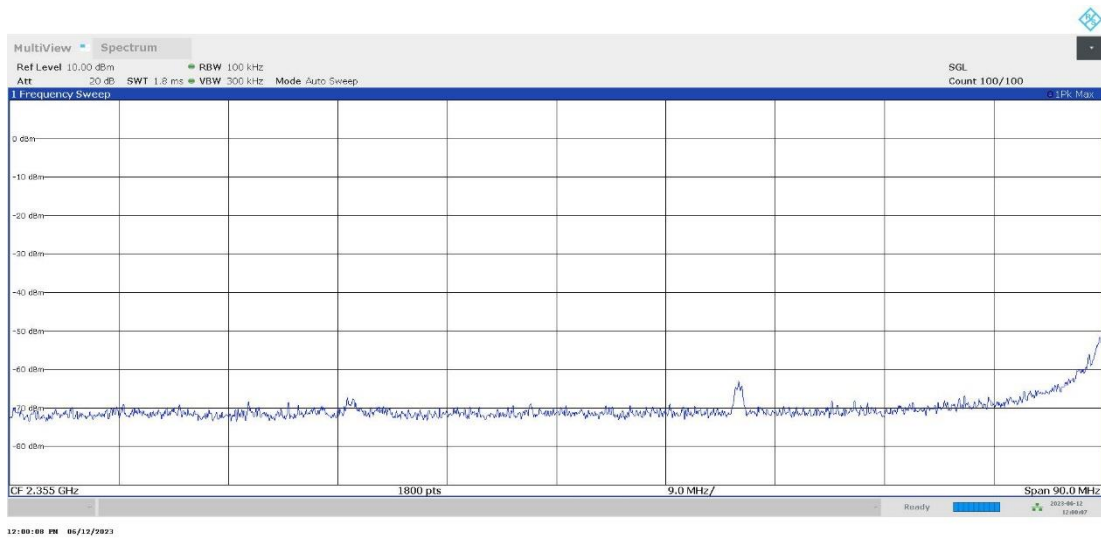
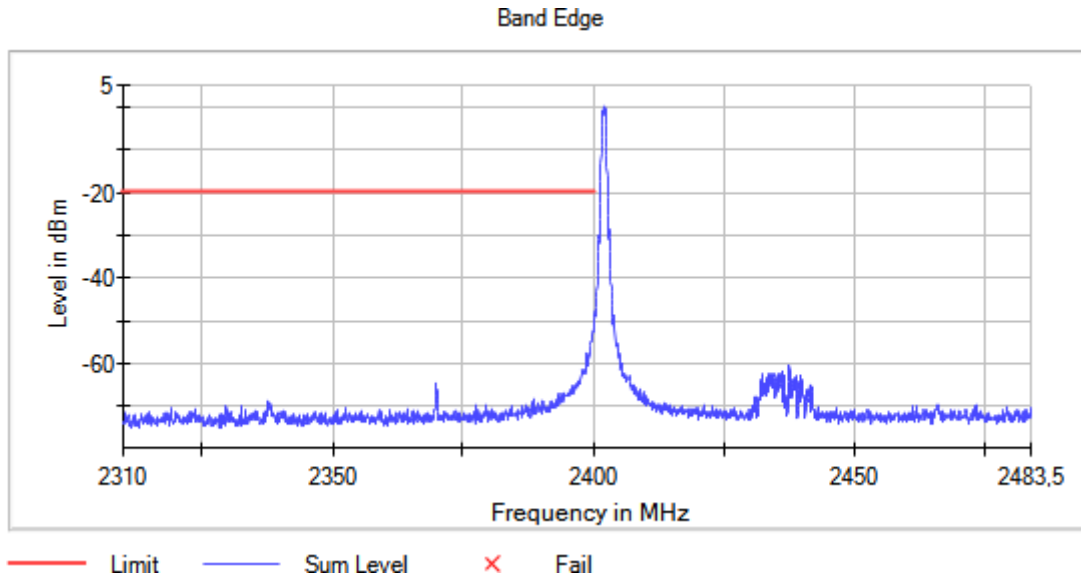
Verdict

Pass

Attachments

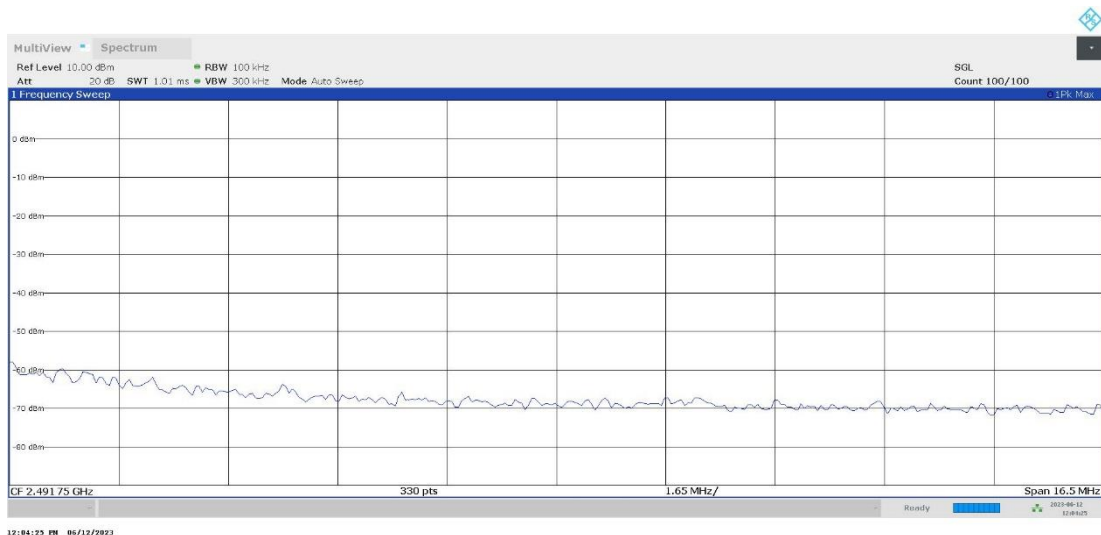
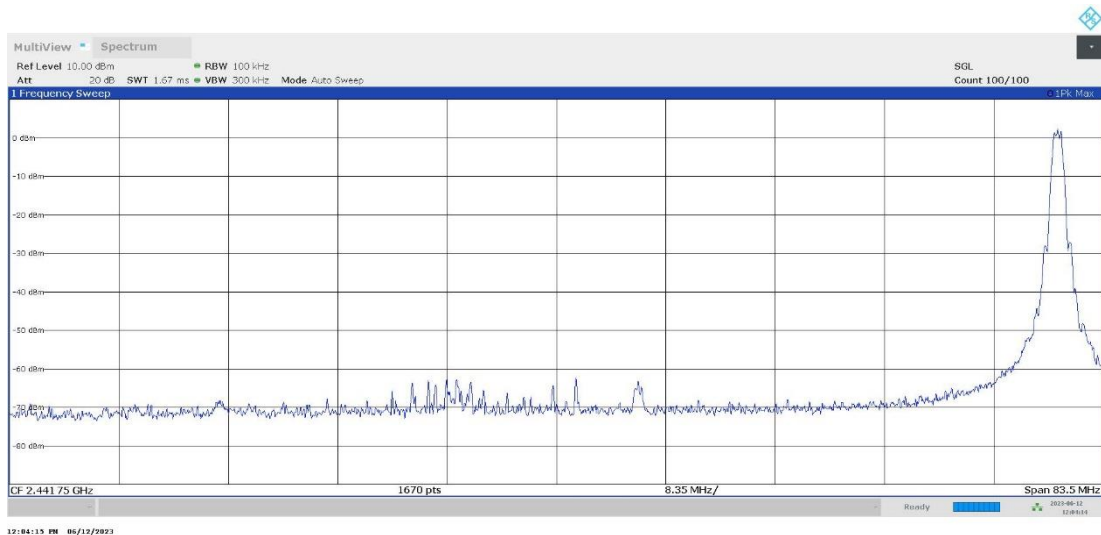
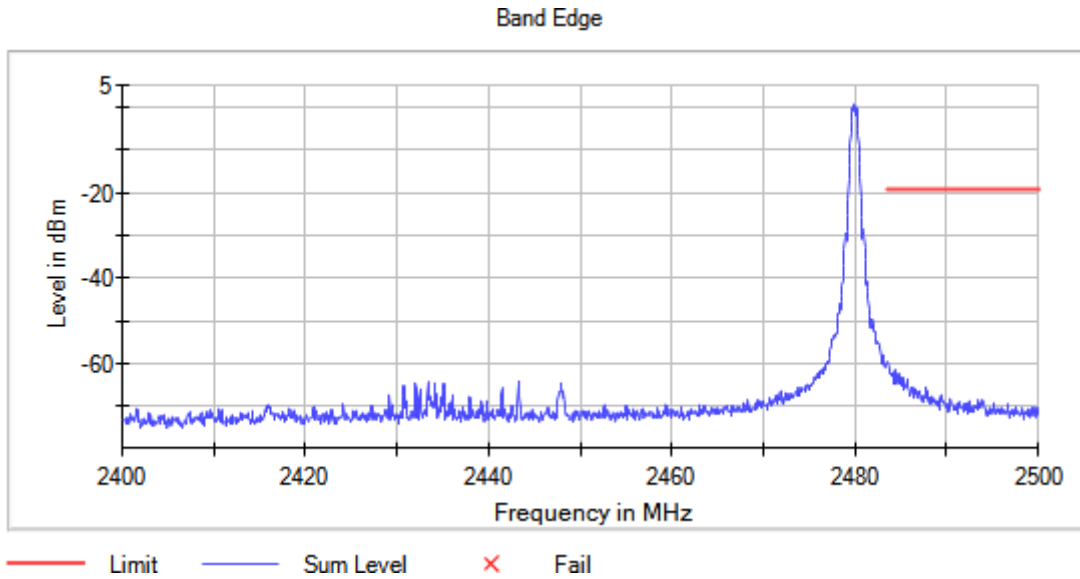
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000

Images:



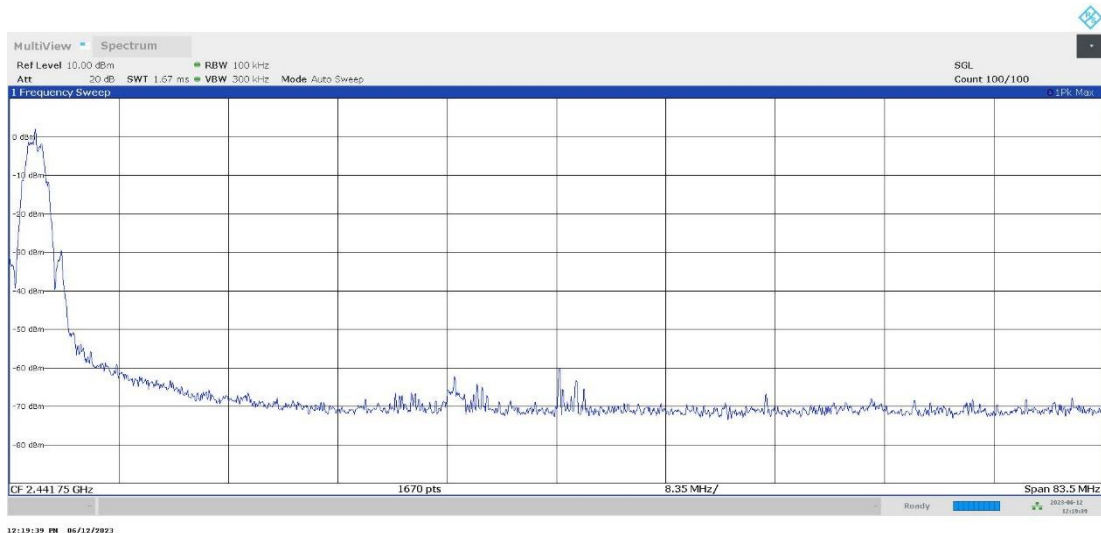
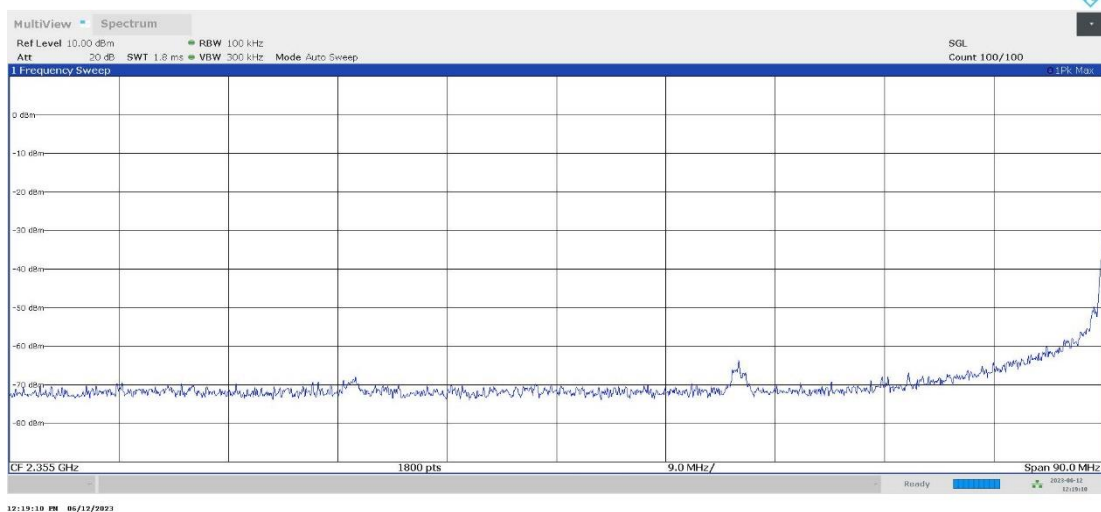
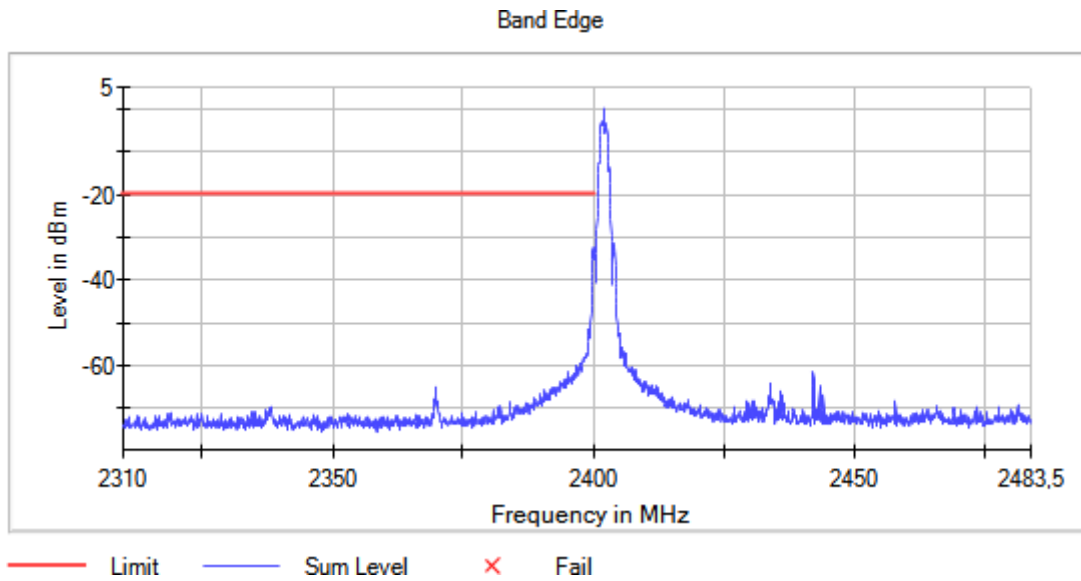
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000

Images:



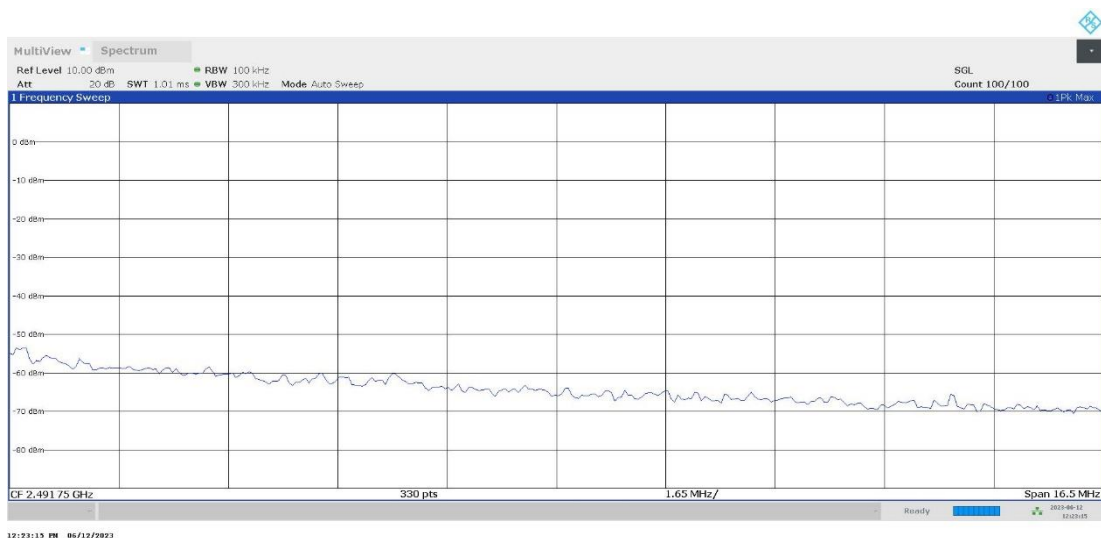
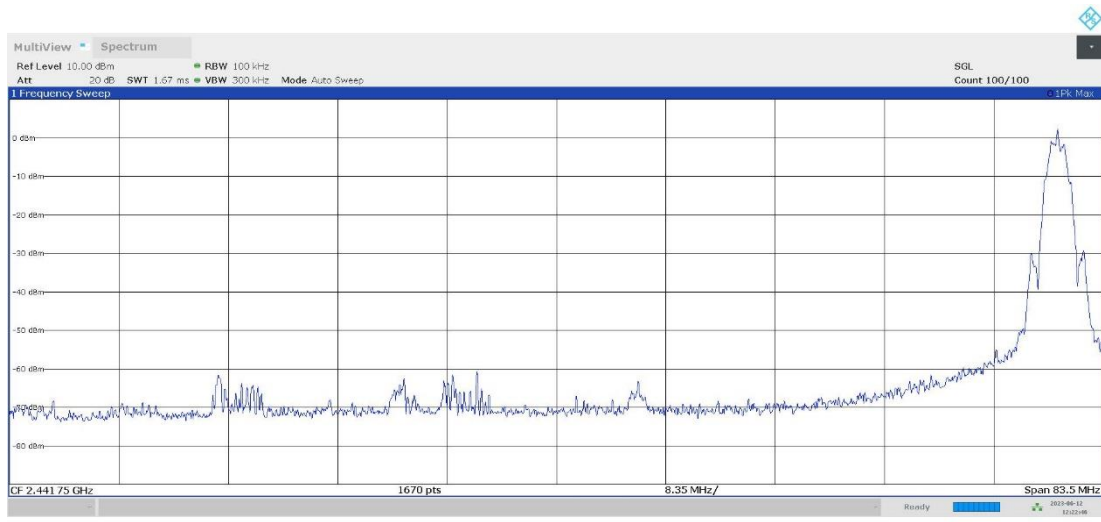
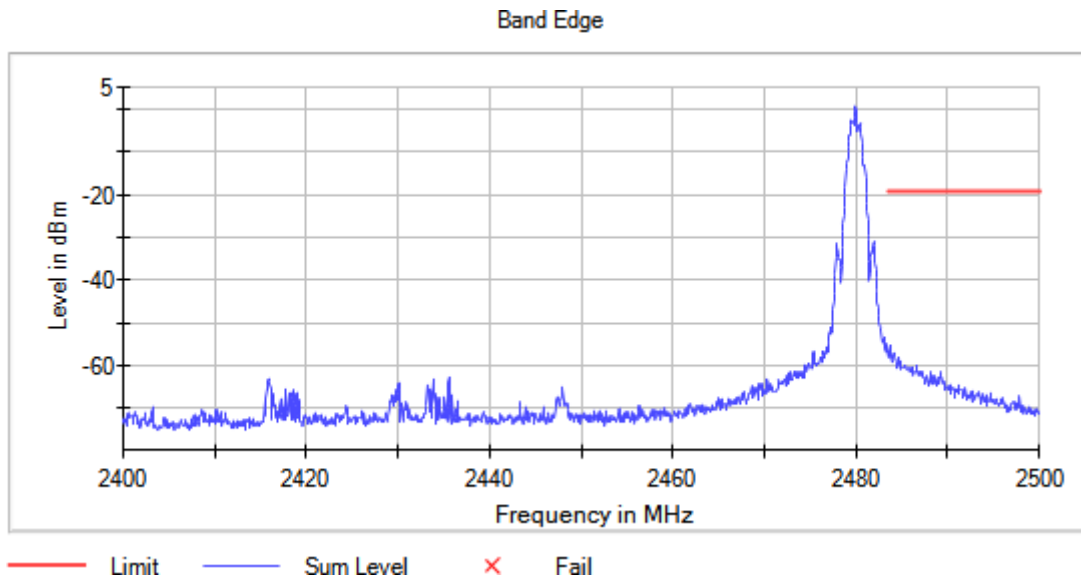
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000

Images:



Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000

Images:



RSS-247 5.5 / FCC 15.247 (d) 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 ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

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

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

RSS-247: Attenuation below the general field strength limits specified in RSS-Gen is not required.

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Frequency range 30 MHz – 1 GHz:

The spurious signals detected do not depend on the operating channel.

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

Frequency range 1 GHz – 26 GHz:

The results below show the maximum measured levels in the 1 – 26 GHz range including the restricted bands 2.31 – 2.39 GHz and 2.4835 – 2.5 GHz.

Spurious frequencies with peak levels above the average limit (54 $\text{dB}\mu\text{V/m}$ at 3 m) are measured with average detector for compliance checking with the average limit.

- Low Channel:

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

- Middle Channel:

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

- High Channel:

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

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Frequency range 30 MHz – 1 GHz:

The spurious signals detected do not depend on the operating channel.

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

Frequency range 1 GHz – 26 GHz:

The results below show the maximum measured levels in the 1 – 26 GHz range including the restricted bands 2.31 – 2.39 GHz and 2.4835 – 2.5 GHz.

Spurious frequencies with peak levels above the average limit (54 dB μ V/m at 3 m) are measured with average detector for compliance checking with the average limit.

- Low Channel:

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

- Middle Channel:

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

- High Channel:

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

Verdict

Pass

Attachments

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

Frequency Range GHz = [0.03, 1]

Equipment Type = Digital Transmission System (DTS)

Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

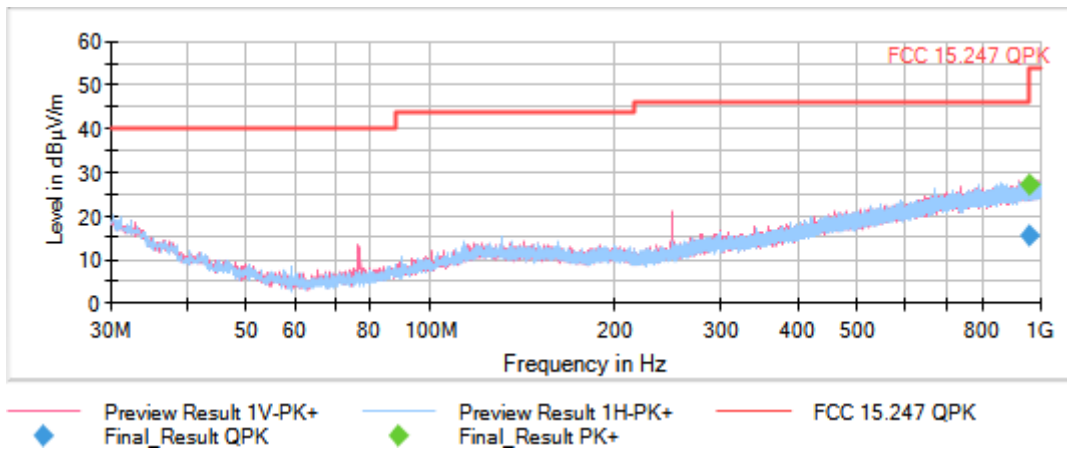
Frequency MHz = The spurious signals detected do not depend on the operating channel.

MIMO Mode = SISO

Measurement Point = 1

Active Port = 1

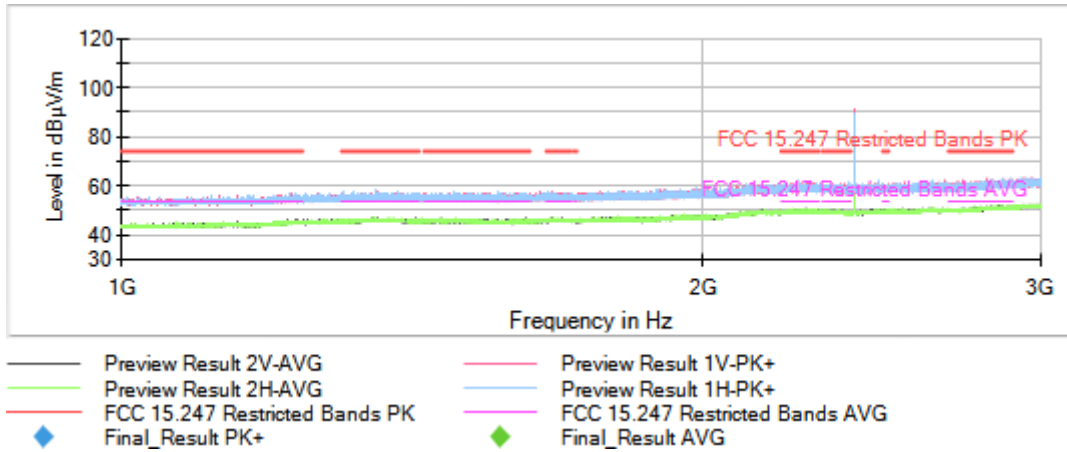
Images:



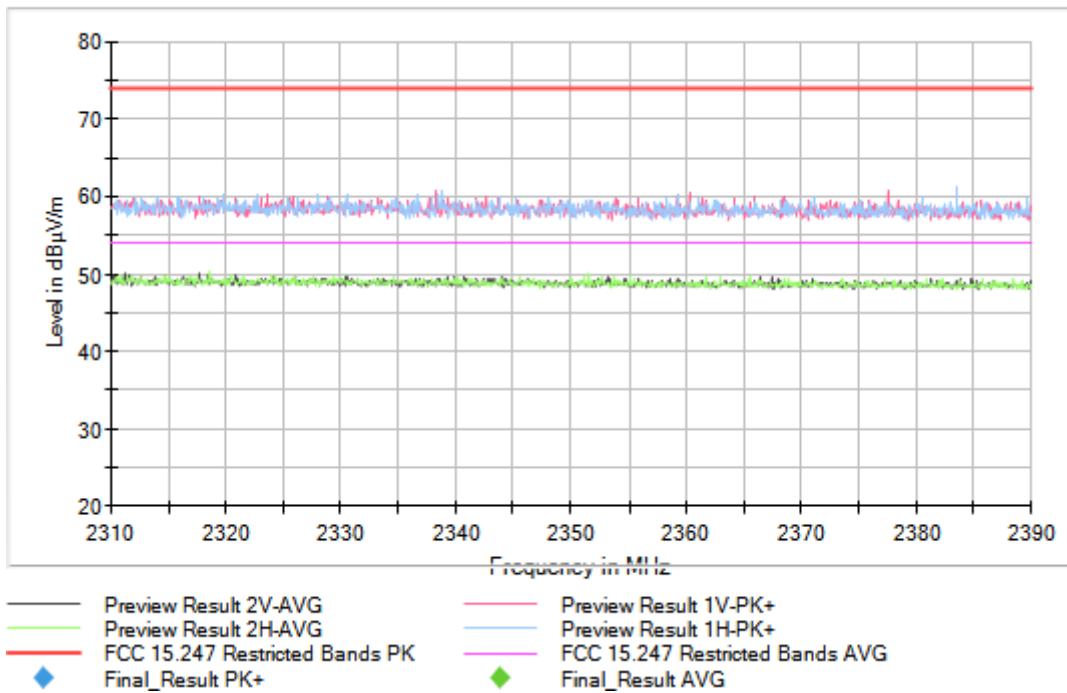
This plot is valid for all channels

Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

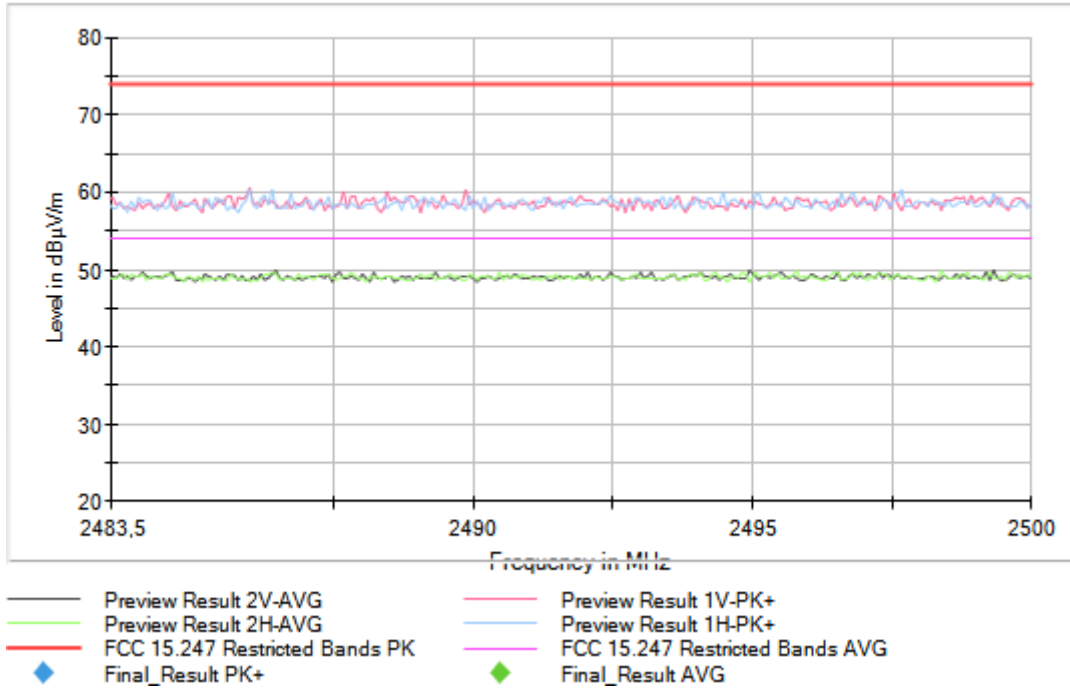
Images:



Full Spectrum

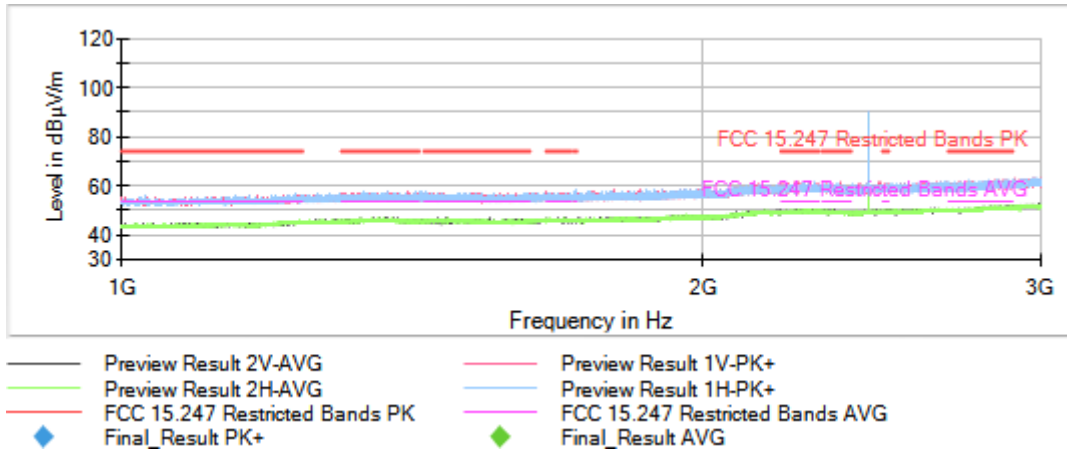


Full Spectrum

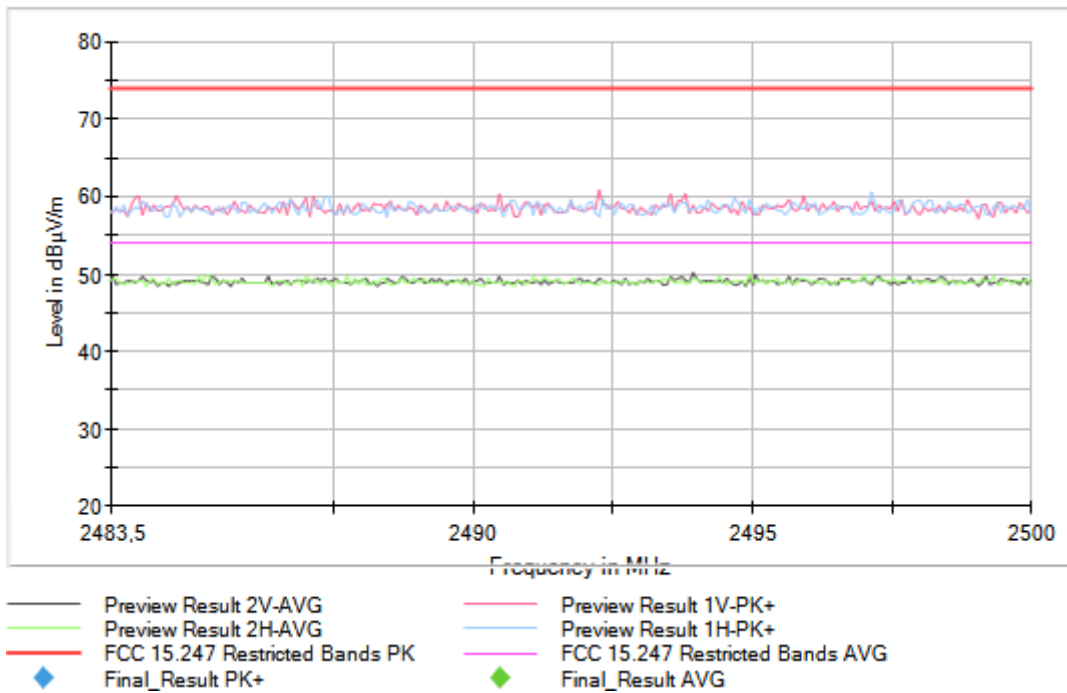


Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

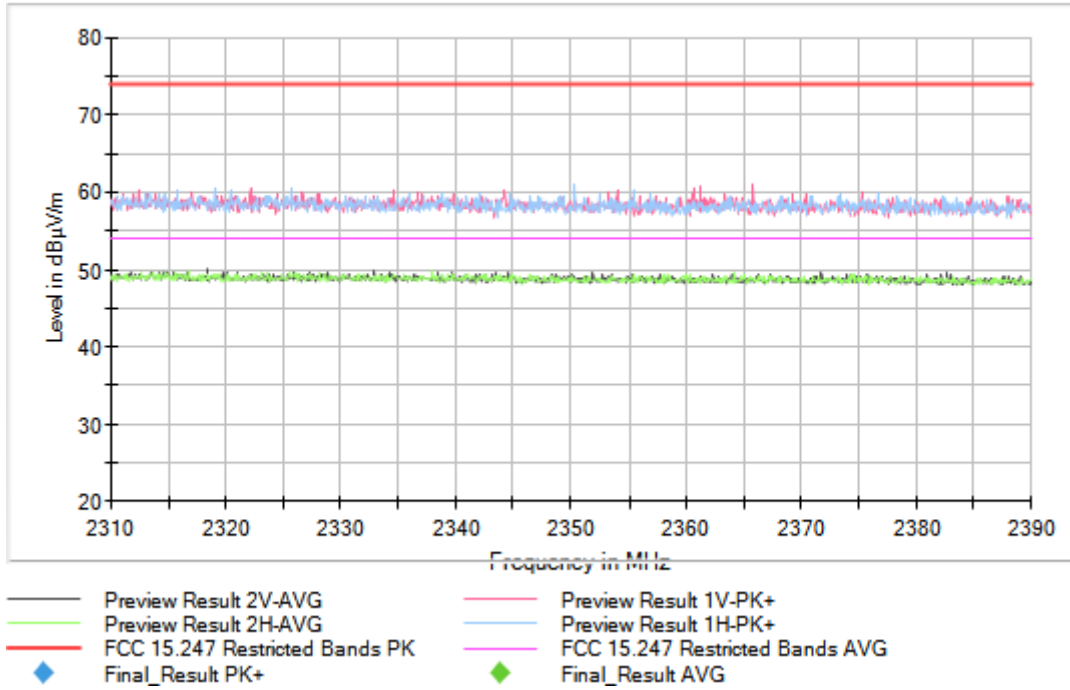
Images:



Full Spectrum

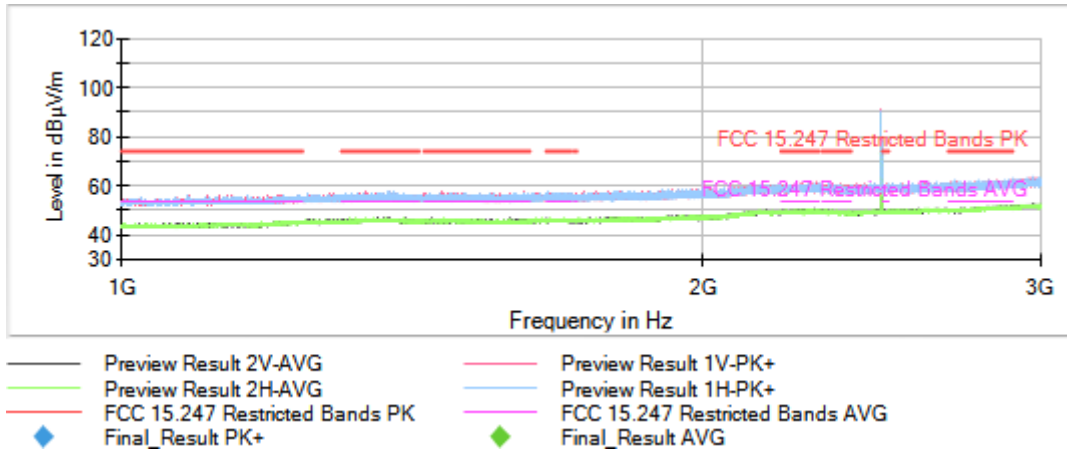


Full Spectrum

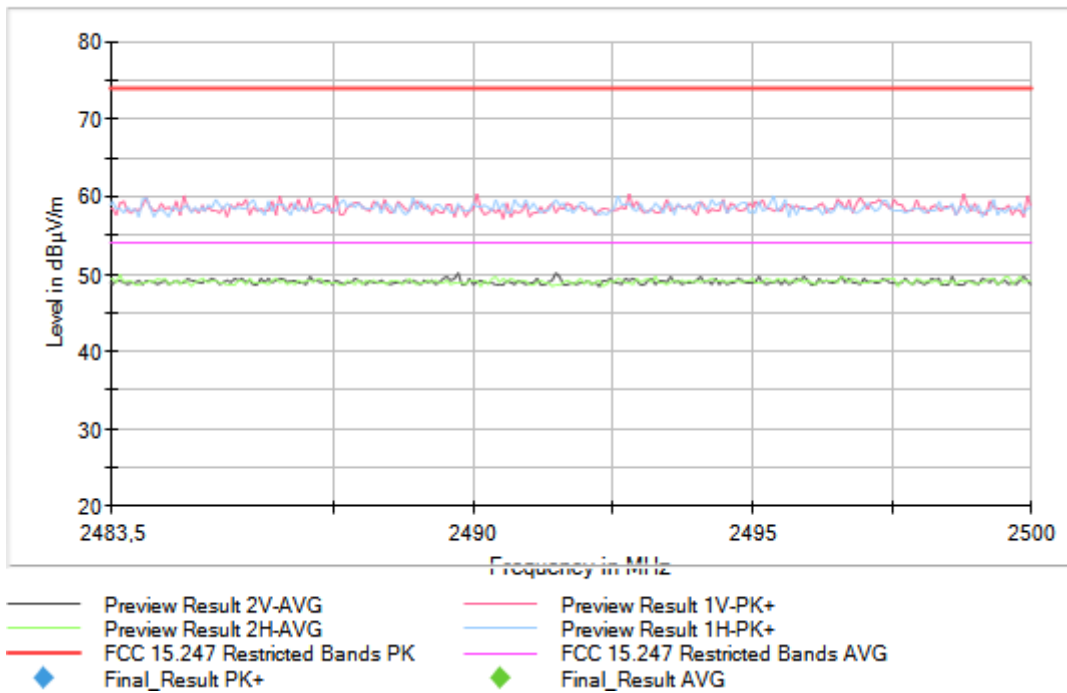


Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

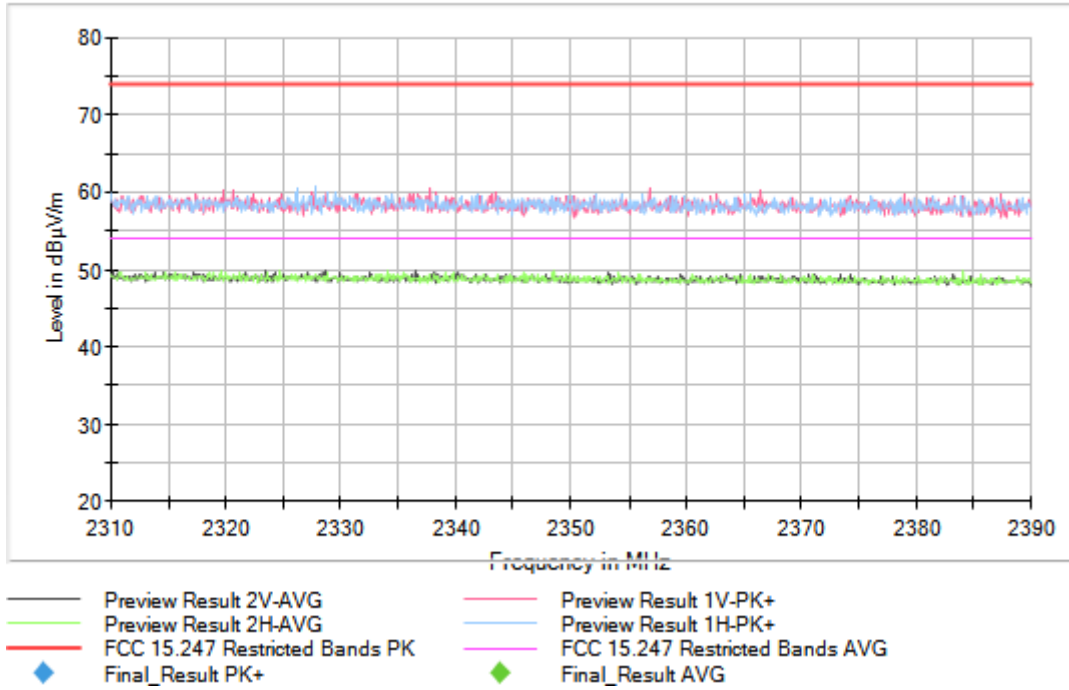
Images:



Full Spectrum

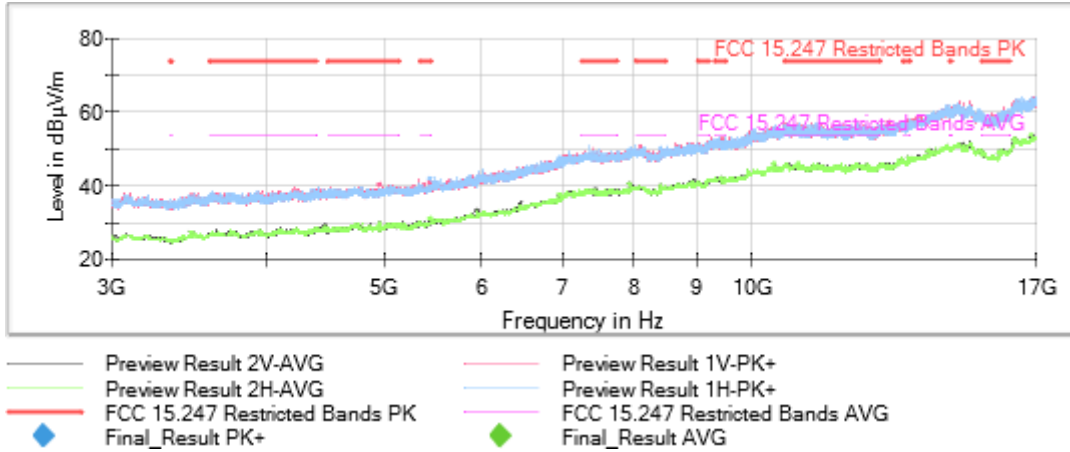


Full Spectrum



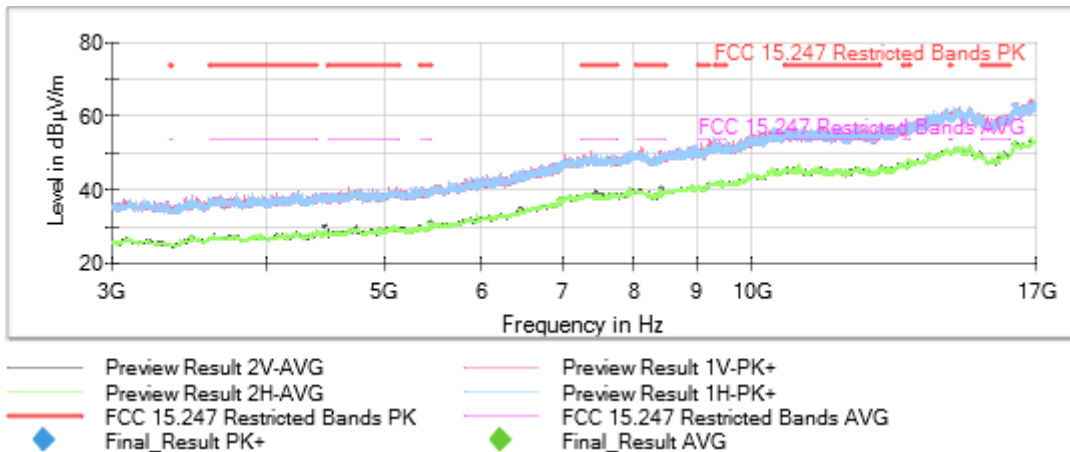
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

Images:



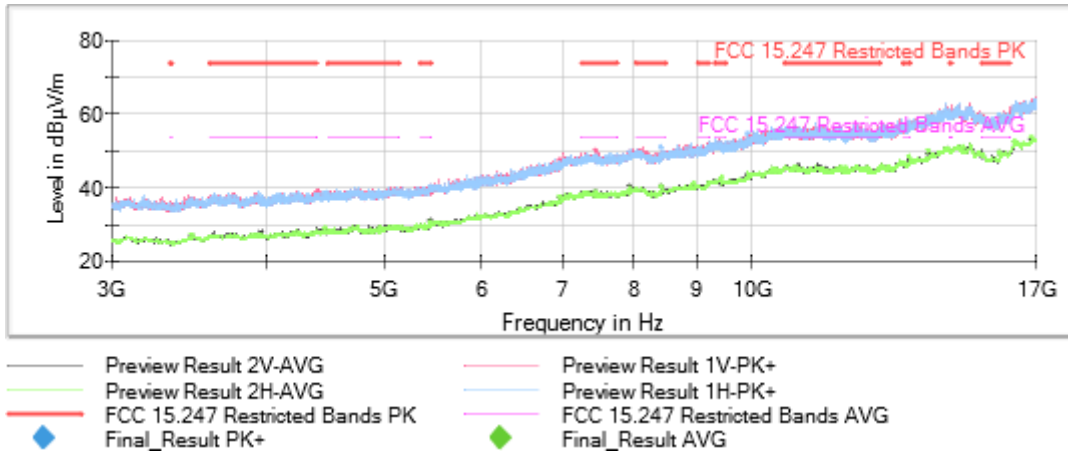
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

Images:



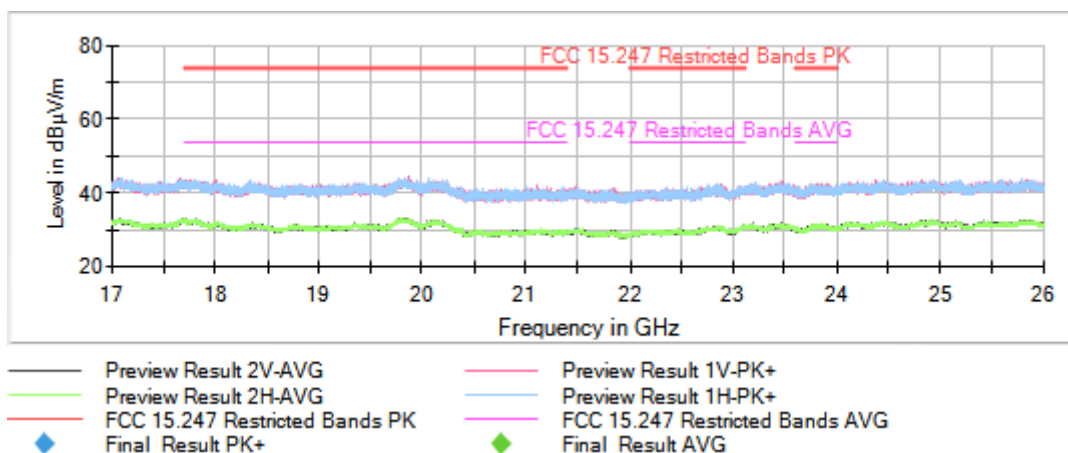
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

Images:



Frequency Range GHz = [17, 26] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 1 Mbit/s) Frequency MHz = The spurious signals detected do not depend on the operating channel.
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

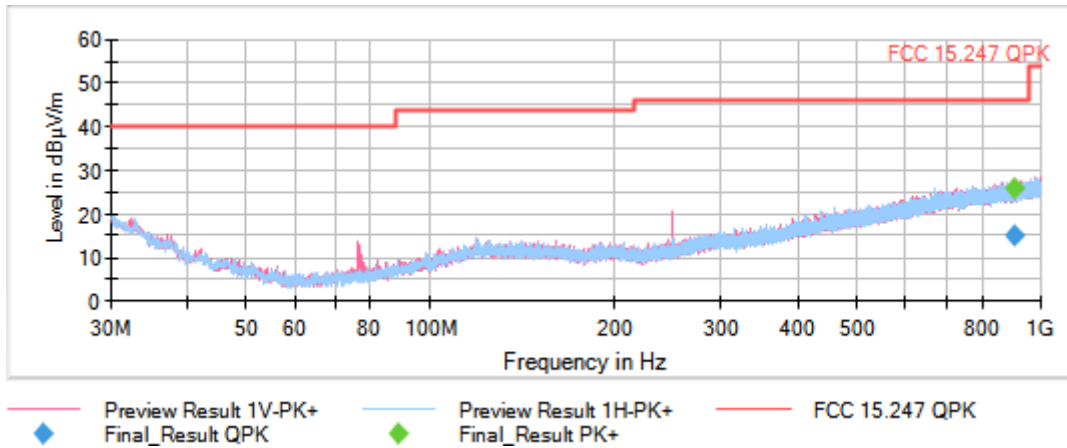
Images:



This plot is valid for all channels

Frequency Range GHz = [0.03, 1] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = The spurious signals detected do not depend on the operating channel.
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

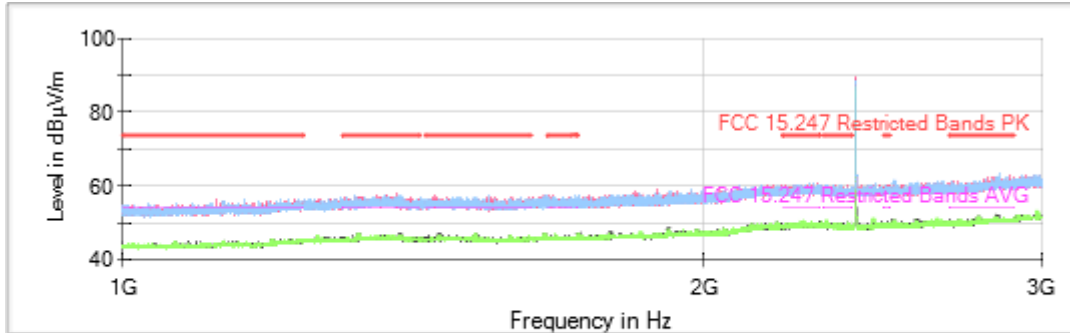
Images:



This plot is valid for all channels

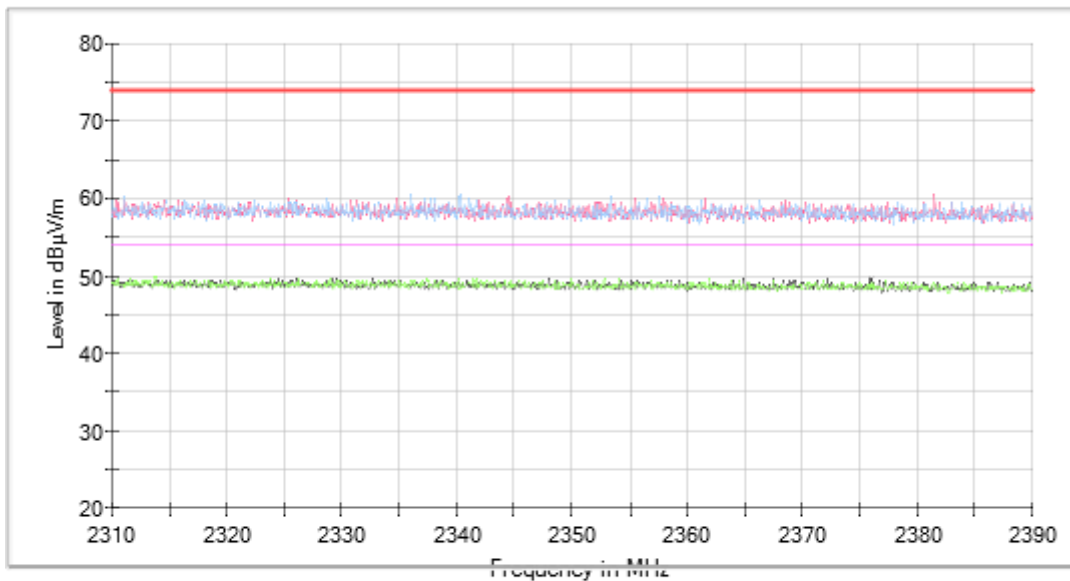
Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

Images:



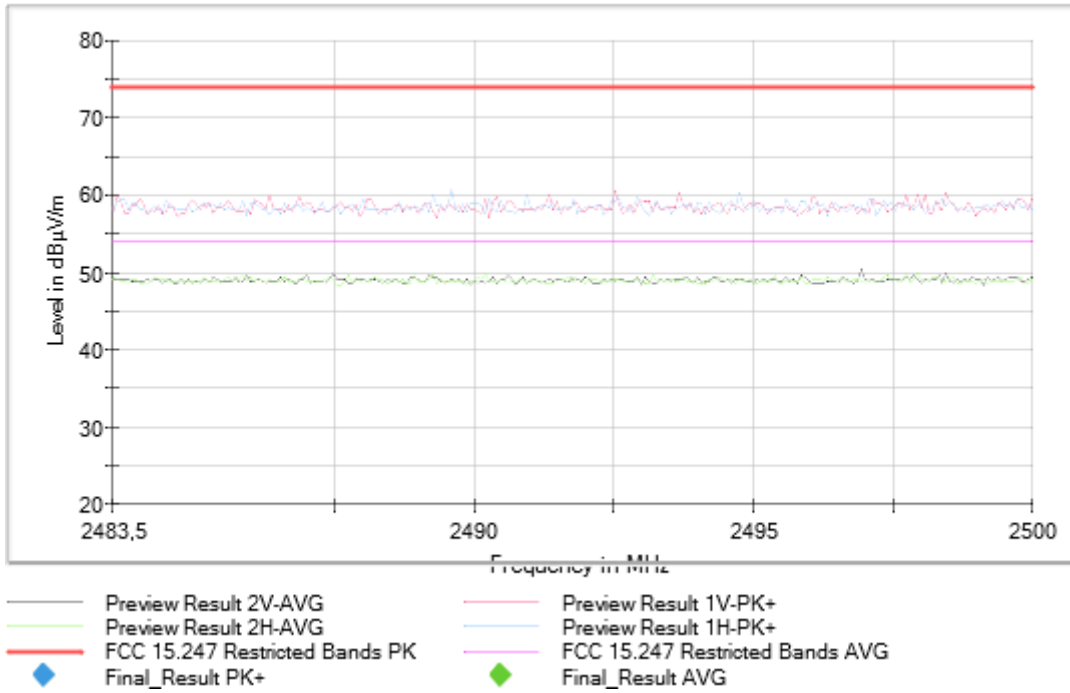
- Preview Result 2V-AVG
- Preview Result 2H-AVG
- FCC 15.247 Restricted Bands PK
- ◆ Final_Result PK+
- Preview Result 1V-PK+
- Preview Result 1H-PK+
- FCC 15.247 Restricted Bands AVG
- ◆ Final_Result AVG

Full Spectrum



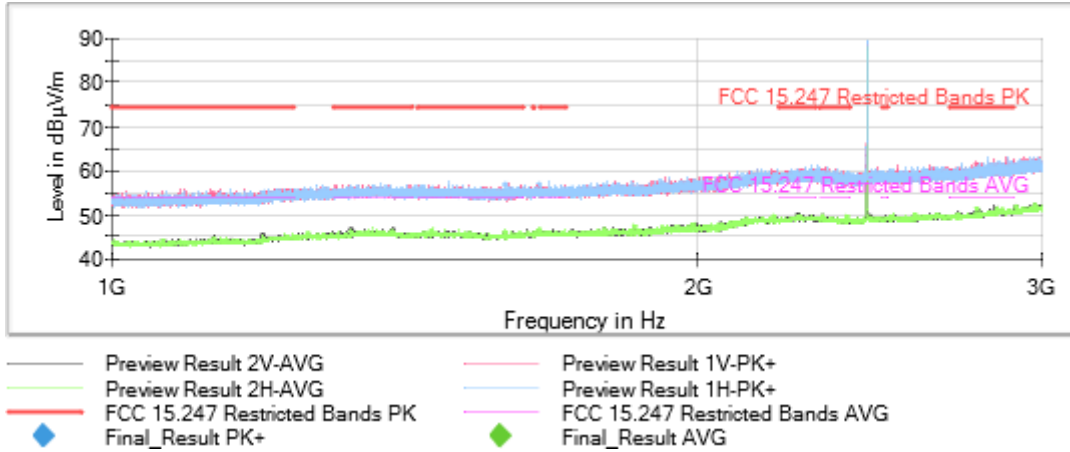
- Preview Result 2V-AVG
- Preview Result 2H-AVG
- FCC 15.247 Restricted Bands PK
- ◆ Final_Result PK+
- Preview Result 1V-PK+
- Preview Result 1H-PK+
- FCC 15.247 Restricted Bands AVG
- ◆ Final_Result AVG

Full Spectrum

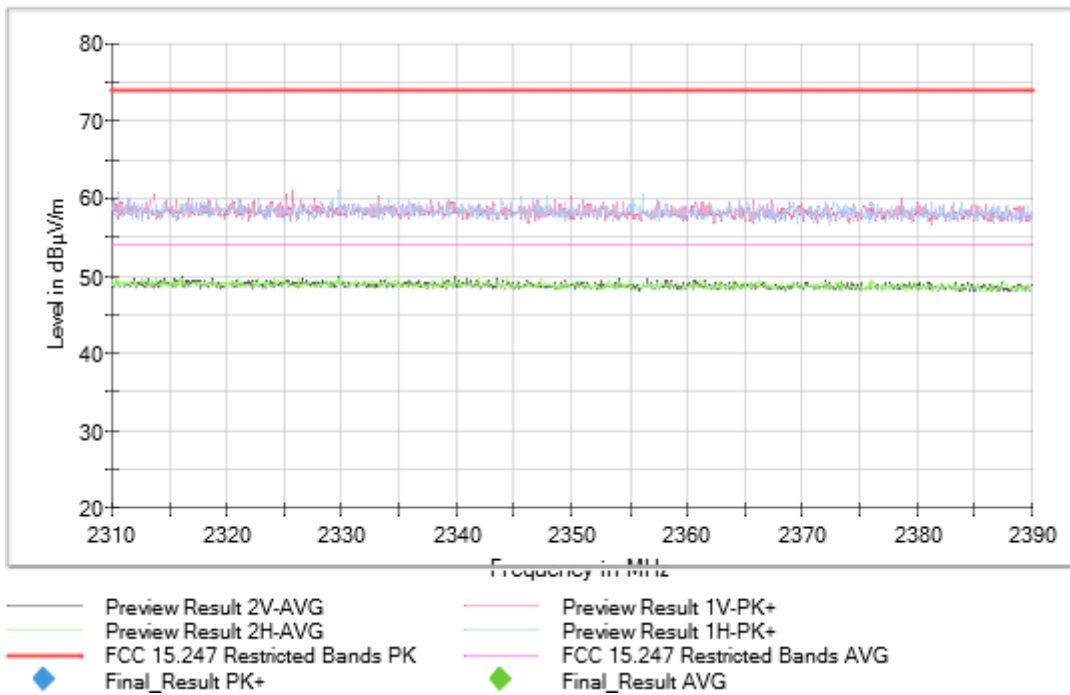


Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

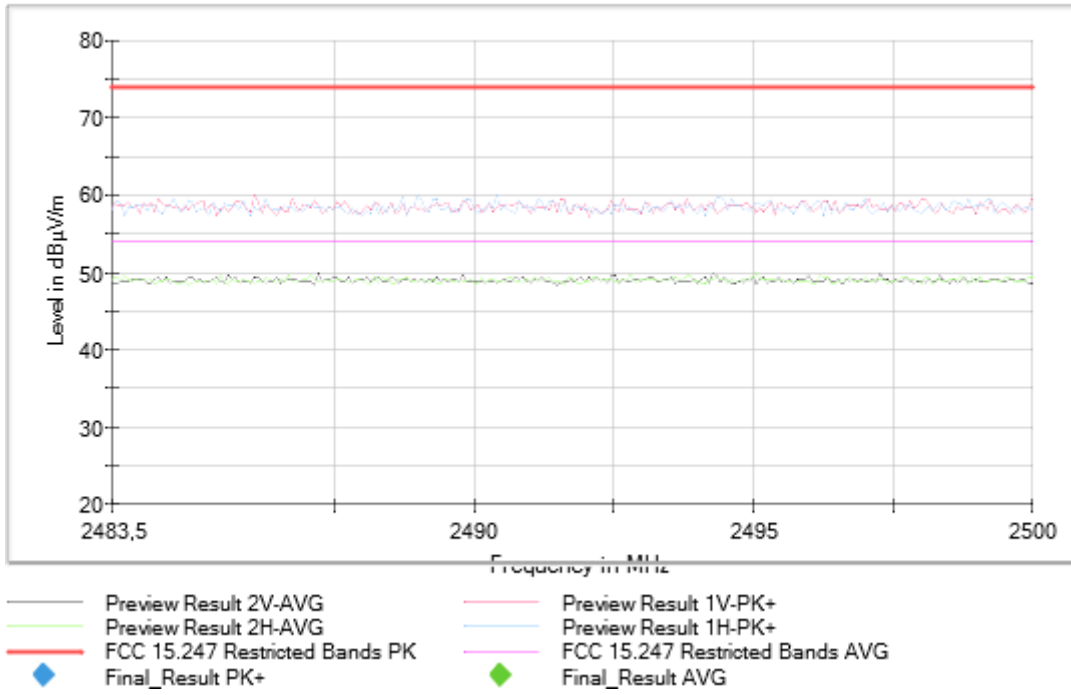
Images:



Full Spectrum

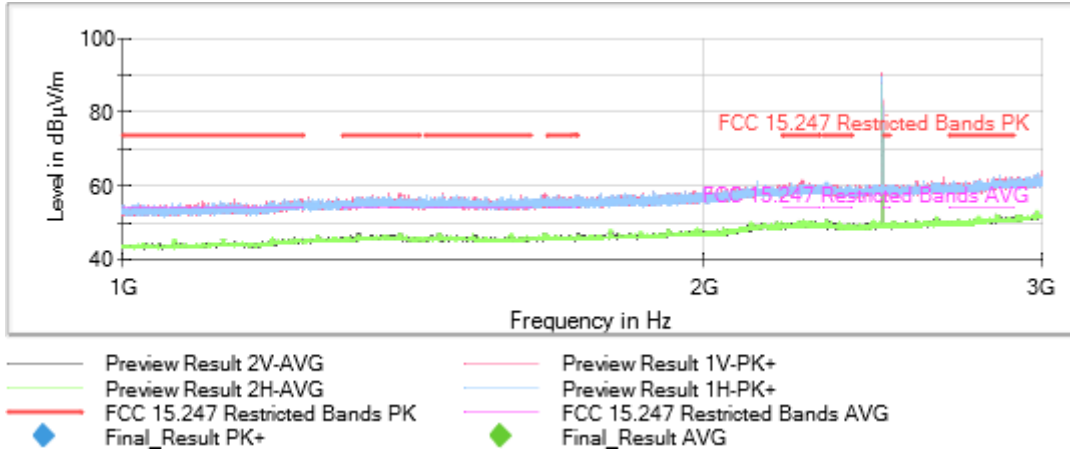


Full Spectrum

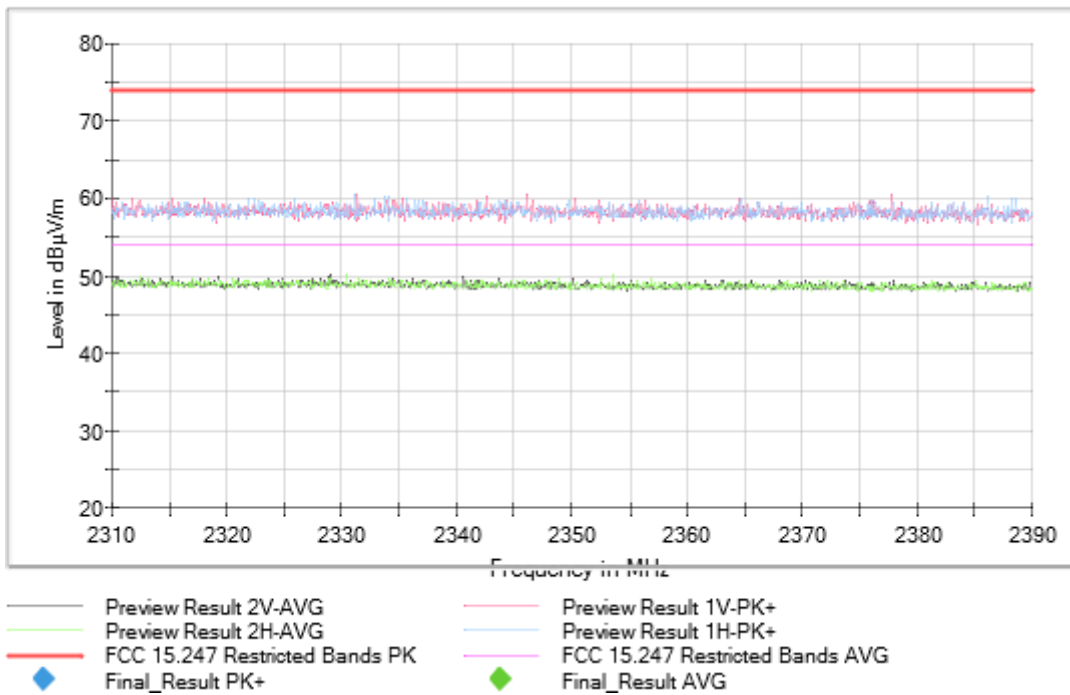


Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

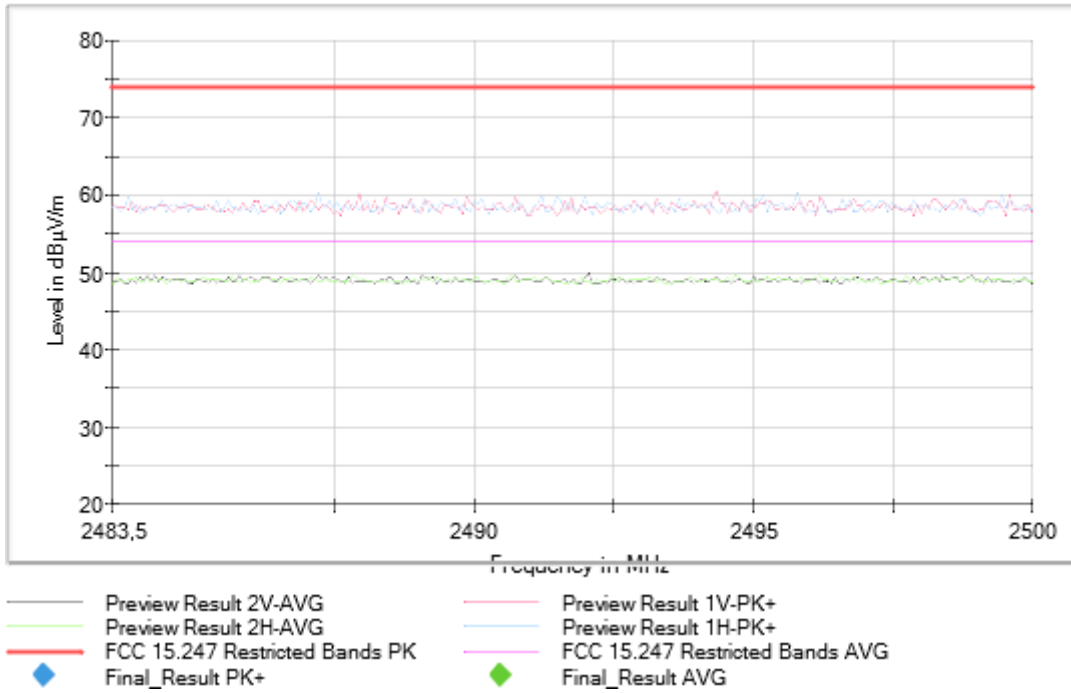
Images:



Full Spectrum

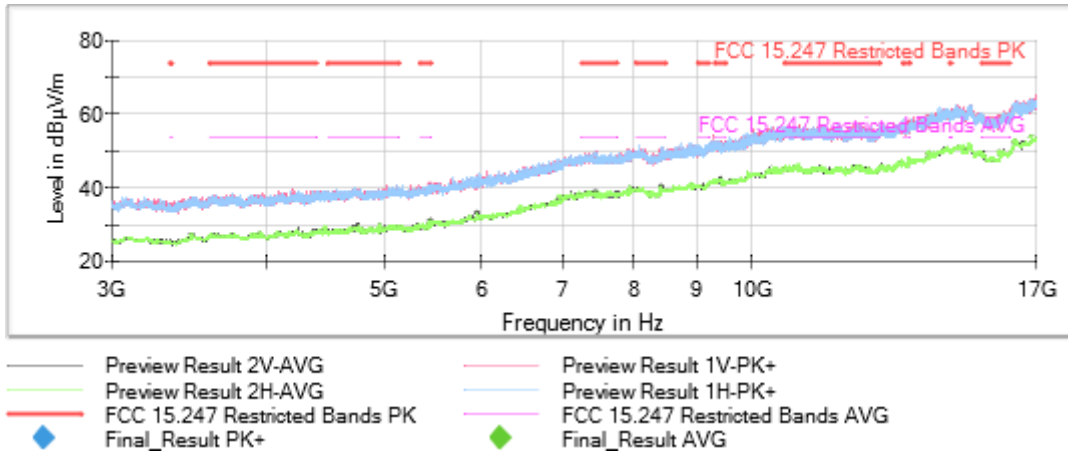


Full Spectrum



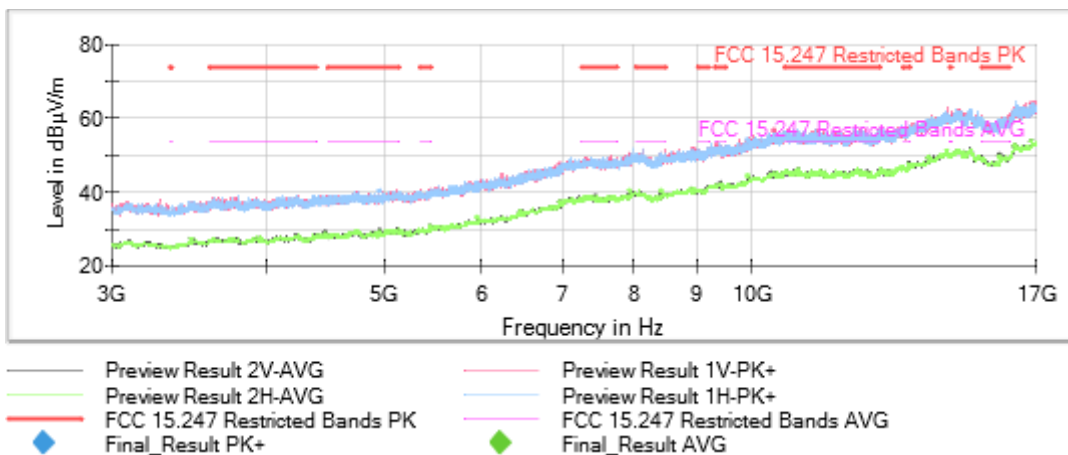
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

Images:



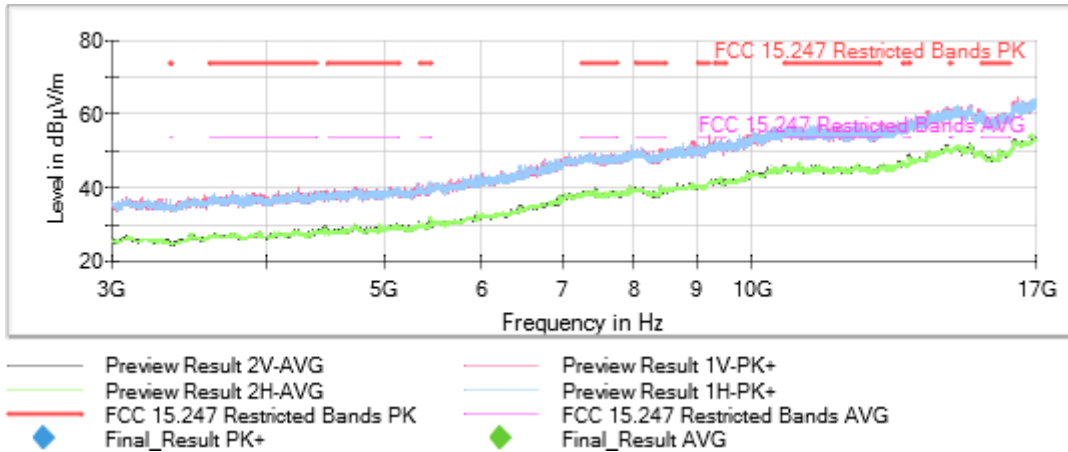
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

Images:



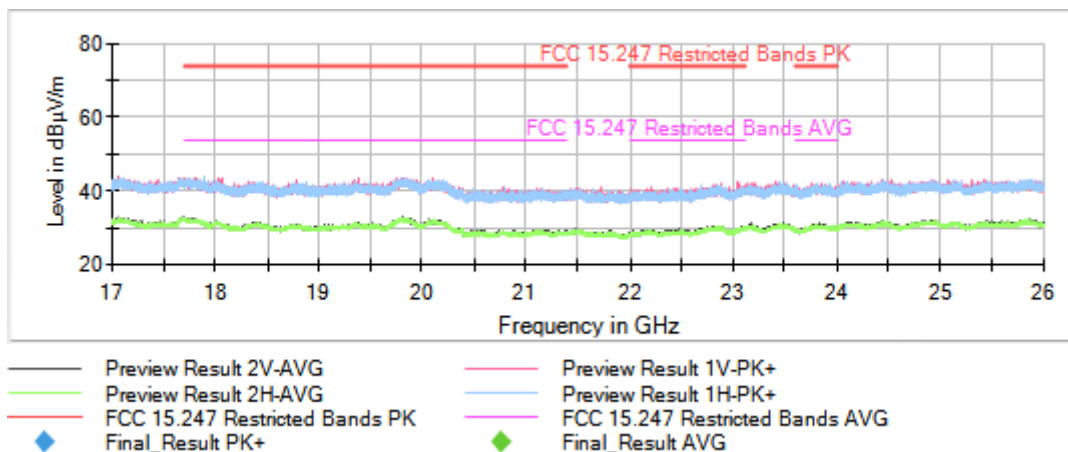
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

Images:



Frequency Range GHz = [17, 26] Equipment Type = Digital Transmission System (DTS)
 Modulation = BTLE 5.0 (GFSK 2 Mbit/s) Frequency MHz = The spurious signals detected do not depend on the operating channel.
 MIMO Mode = SISO Measurement Point = 1
 Active Port = 1

Images:



This plot is valid for all channels