

ISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:
84605RRF.003

Test Report

USA FCC Part 15.247, 15.209

CANADA RSS-247, RSS-Gen

(*) Identification of item tested	OMNI MAX +
(*) Trademark	DATAMARS
(*) Model and /or type reference	OMNI MAX +
Other identification of the product	FCC ID: NDX-OMNIMAX2 IC: 4678A-OMNIMAX2
(*) Features	HW version: 1V1 SW version: 2.0.0
(*) Manufacturer	DATAMARS SA via Industria 16, 6814 Lamone, Switzerland
Test method requested, standard	USA FCC Part 15.247 (10-1-24 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (10-1-24 Edition): Radiated emission limits; general requirements. CANADA RSS-247 Issue 4 (July 2025). 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 C63.10-2020 + Cor.1-2023 + C63.10a-2024 + Errata to C63.10a-2024: 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	2026-03-26
Report template No	FDT08_27 (*) "Data provided by the client"

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Acronyms

Acronym ID	Acronym Description
EUT	Equipment Under Test
Freq Rng	Frequency Range
Unwanted Lvl	Unwanted Emissions Level
Pol	Polarization

Competences and guarantees

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

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

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

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

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

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

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

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General conditions

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

Uncertainty

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

The total uncertainty of the measurement system for the radiated emissions of EUT from 30 MHz to 1 GHz is: Measurement uncertainty $\leq \pm 5,35$ 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 $\leq \pm 4,28$ dB with factor ($k = 2$).

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

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

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

RF Average Output Power: Measurement uncertainty $\leq \pm 0,99$ dB

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

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

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

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

Data provided by the client

The following data has been provided by the client:

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 Portable Bluetooth® Reader for Animal Identification.

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

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial N°	Date of Reception	Application
S/01	84605_5.1	Portable Bluetooth® Reader for Animal Identification	OMNI MAX +	S005	2025-12-10	Element Under Test
S/02	84605_3.1	Portable Bluetooth® Reader for Animal Identification	OMNI MAX +	S007	2025-12-10	Element Under Test

Notes referenced to samples during the project:

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

Test sample description

Ports..... :	Port name and description		Cable				
			Specified max length [m]	Attached during test	Shielded		
	USB type C			[]	[]		
Enclosure (plastic+LCD)			[]	[]			
Supplementary information to the ports..... :							
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[X]	AC: Wall mount adapter 5V 10W	[]	[]	[]	[]	[]
[X]		DC: 2x Li-ion polymer 3.7V, 1800 mAh, series					
Rated Power	Battery: 6 Vdc (min), 7.4 Vdc (nominal), 8.4 Vdc (max)						
Clock frequencies.....	32 MHz main Main CPU						
Other parameters							
Software version	2.0.0						
Hardware version	1V1						
Dimensions in cm (W x H x D)	27mm x 150mm x 266mm						
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		
	MCU which contains BT		STM32WB55		STM		
Accessories (not part of the test item)	Description		Type		Manufacturer		
							
Documents as provided by the applicant	Description		File name		Issue date		
							

Identification of the client

DATAMARS SA
via Industria 16, 6814 Lamone, Switzerland

Testing period and place

Test Location	DEKRA TESTING AND CERTIFICATION S.A.U. C/ Severo Ochoa, 6 - Parque Tecnológico de Andalucía; 29590 Campanillas (Málaga) (Location B)
Date (start)	2026-02-19
Date (finish)	2026-03-18

Document history

Report number	Date	Description
84605RRF.003	2026-03-26	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: Fernando Chito, Salvador Cuellar and Carmen Vázquez Perez.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
06064	SEMIANECHOIC ABSORBER LINED CHAMBER	SAC-3	FRANKONIA	N/A
06329	SHIELDED ROOM	--	FRANKONIA	N/A
06126	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2026-04
06132	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2026-04
05641	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2027-10
08788	PREAMPLIFIER 30dB 500MHz-18GHz	BBV 9718 C	SCHWARZBECK	2027-02
04657	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2026-06-12
10573	PRE-AMPLIFIER G>46dB 18GHz-40GHz	BLMA 1840-5G	BONN ELEKTRONIK	2026-03-07
08866	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2026-06
07759	DIGITAL MULTIMETER	175	FLUKE	2026-11
04848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	N/A
06793	SHIELDED ROOM	S101	ETS LINDGREN	N/A
06611	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2026-04
07791	SIGNAL GENERATOR 8kHz-6GHz	SMB100B	ROHDE AND SCHWARZ	2026-03
07793	SIGNAL GENERATOR 8kHz-6GHz	SMBV100B	ROHDE AND SCHWARZ	2026-03
06668	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2027-04
07798	WMS32	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 (2M, 1M)

FCC PART 15 PARAGRAPH/ RSS-247		
Requirement – Test case	Verdict	Remark
FCC 15.247 (a)(2) / RSS-247 6.3.1. (a) 6 dB Bandwidth	P	
FCC 15.247 (b) / RSS-247 6.3.2. Maximum output power and antenna gain	P	
FCC 15.247 (d) / RSS-247 6.6 Band-edge emissions compliance (Transmitter)	P	
FCC 15.247 (e) / RSS-247 6.3.1. (b) Power spectral density	P	
FCC 15.247 (d) / RSS-247 6.6. Emission limitations radiated (Transmitter)	P	
<u>Supplementary information and remarks:</u> None		

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

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<i>RSS-247 6.6 / FCC 15.247 (d) Emissions limitations radiated (Transmitter)</i>	<i>52</i>

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 7.4 Vdc
Vminimum: 6.0 Vdc
Vmaximum: 8.4 Vdc
Type of Power Supply: Battery

ANTENNA (*):

Type of Antenna: PCB antenna
Maximum Declared Antenna Gain: -1.8 dBi

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).

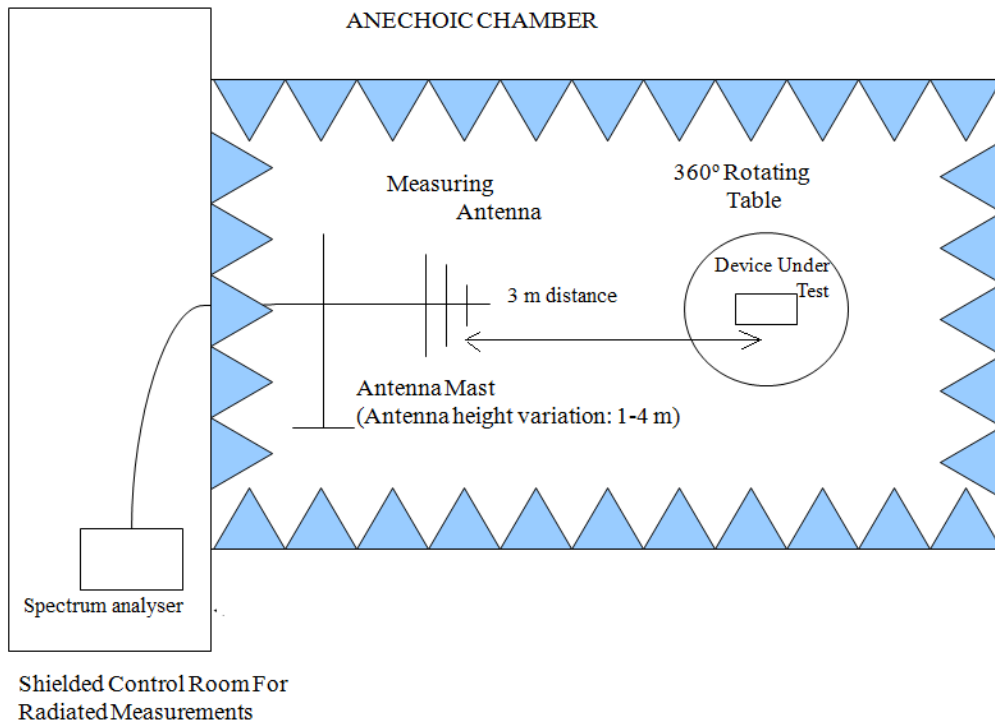
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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.

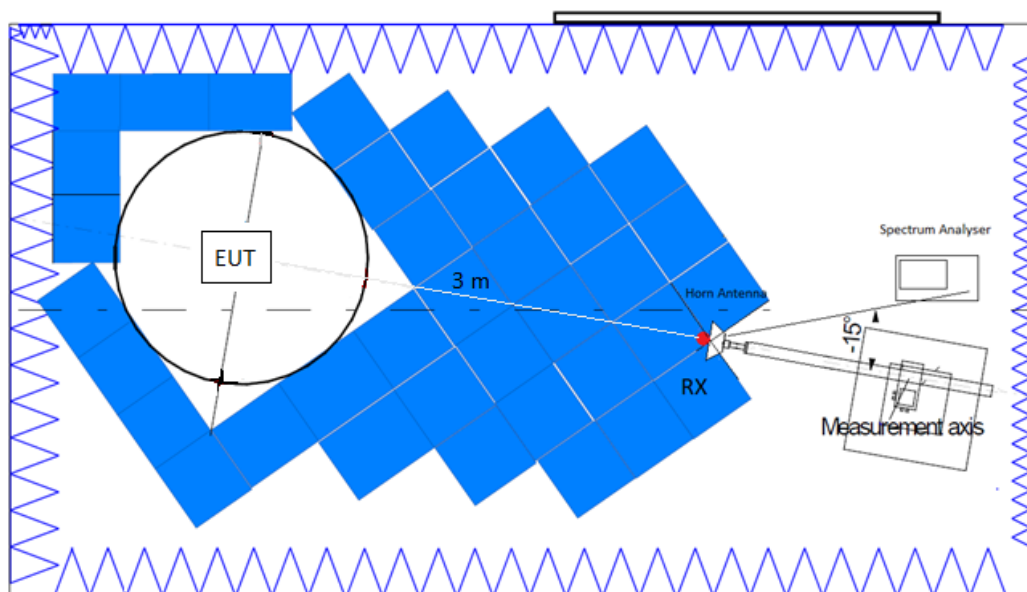
Measurements were made in both horizontal and vertical planes of polarization.

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.

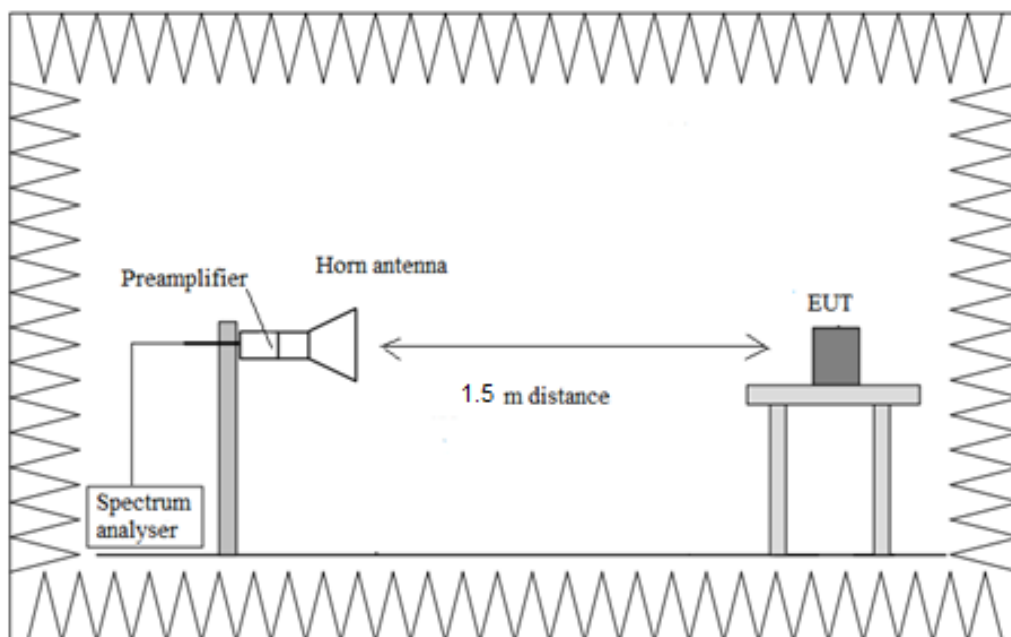
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup $f > 17$ GHz:



SAMPLE CALCULATION

For radiated measurements:

Values measures by the test receiver / analyzer are converted to field strength, in dBuV/m, at the regulatory distance using the following calculation:

$$\text{Unwanted Lvl (dBuV/m)} = \text{Raw Rec (dBuV)} + \text{Preamp (dB)} + \text{Trd Corre. (dB/m)} + \text{SigPath (dB)}$$

Where,

Raw Rec (dBuV): Measured voltage in the receiver / spectrum analyzer in dBuV

Preamp (dB): Path loses due to preamplifier

Trd Corr. (dB/m): Antenna factor in dB/m

SigPath (dB) = Cable loss (dB) – External Gain amplifier (dB) – Distance factor (dB)

Cable loss (dB): Cable loss

External Gain amplifier (dB): Gain from external amplifier (when used)

Distance factor (dB): Distance factor in dB. When measurement distance is different to limit distance

The field strength, calculated by this way is compared with the regulatory limit.

TEST CASES DETAILS

Occupied Channel Bandwidth 99%

Specification

RSS-Gen 6.7 / FCC 2.1049 - Occupied Channel Bandwidth 99%

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained.

Results

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Operation Band (MHz)	Equipment	BW (MHz)	Freq (MHz)	Occ Ch BW (MHz)
[2400, 2483.5]	Digital Transmission System (DTS)	1	2402.00000	1.050
			2440.00000	1.070
			2480.00000	1.060

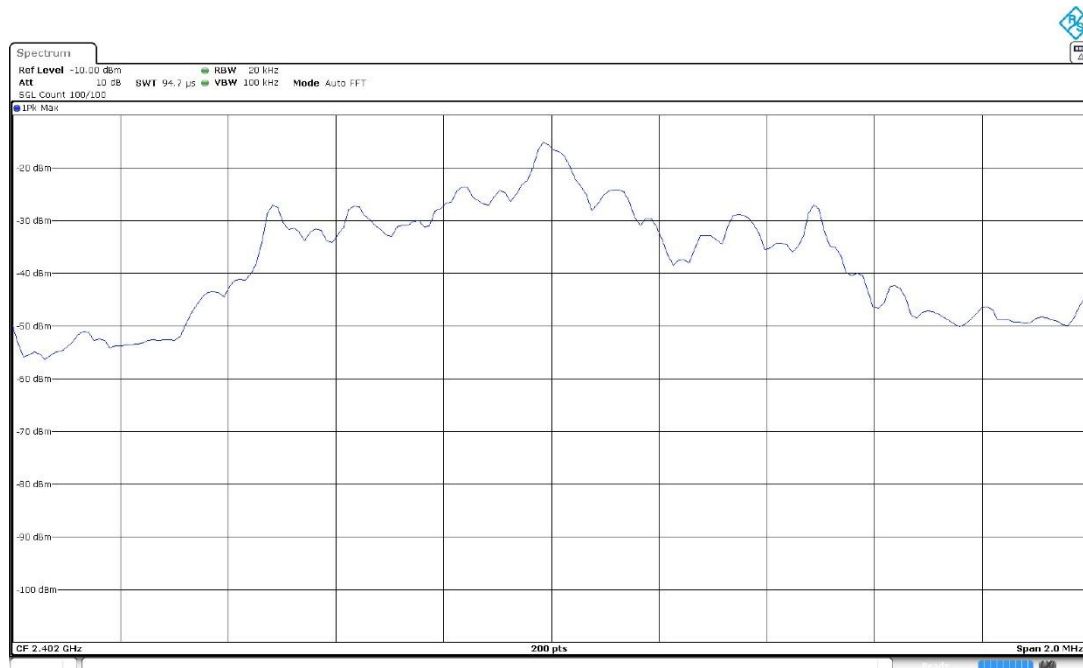
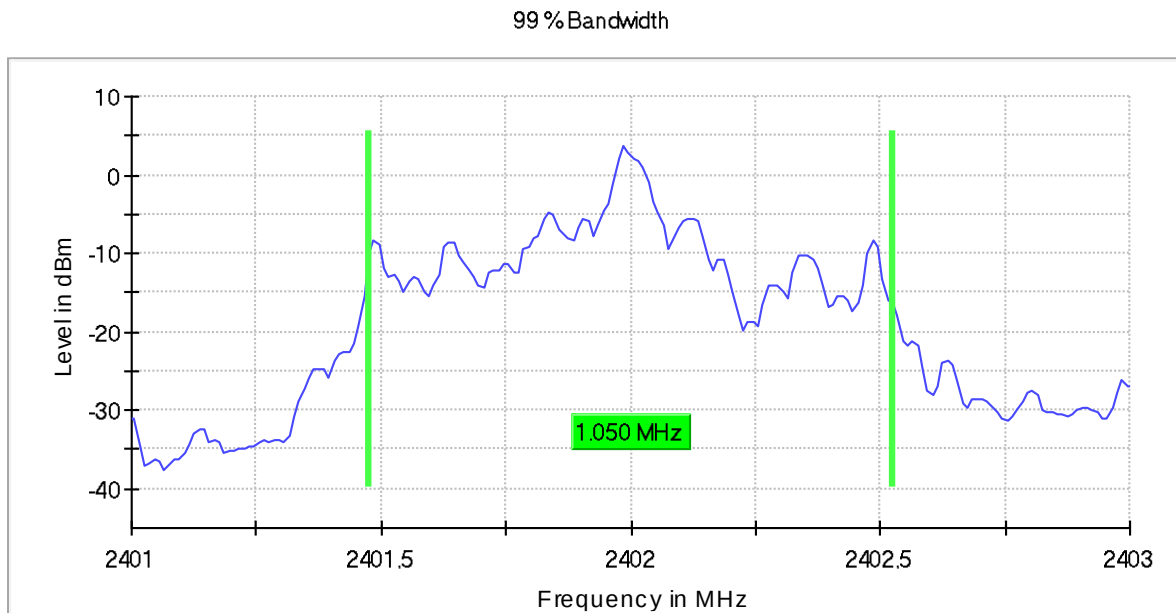
Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Operation Band (MHz)	Equipment	BW (MHz)	Freq (MHz)	Occ Ch BW (MHz)
[2400, 2483.5]	Digital Transmission System (DTS)	2	2402.00000	2.100
			2440.00000	2.075
			2480.00000	2.075

Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
 Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
 MIMO Mode = SISO Active Port = 1

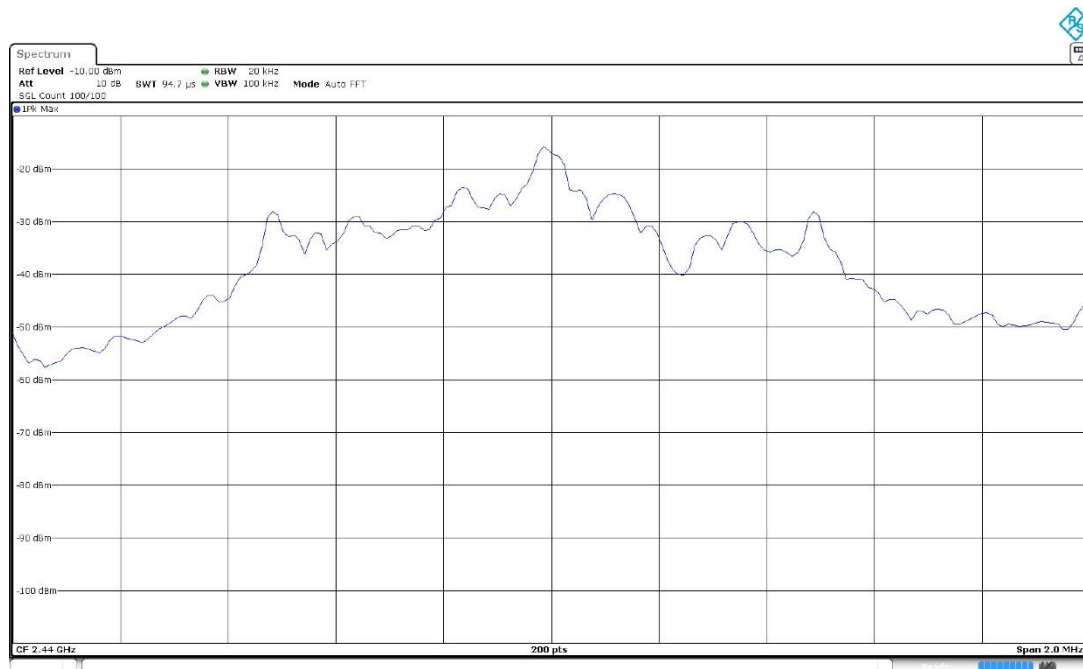
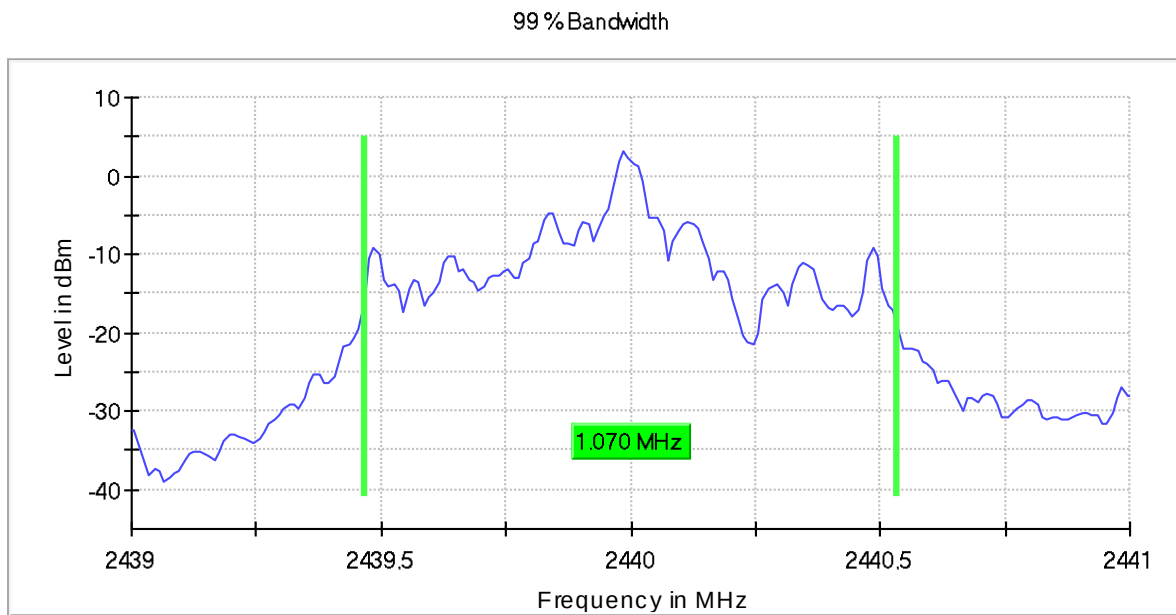
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images

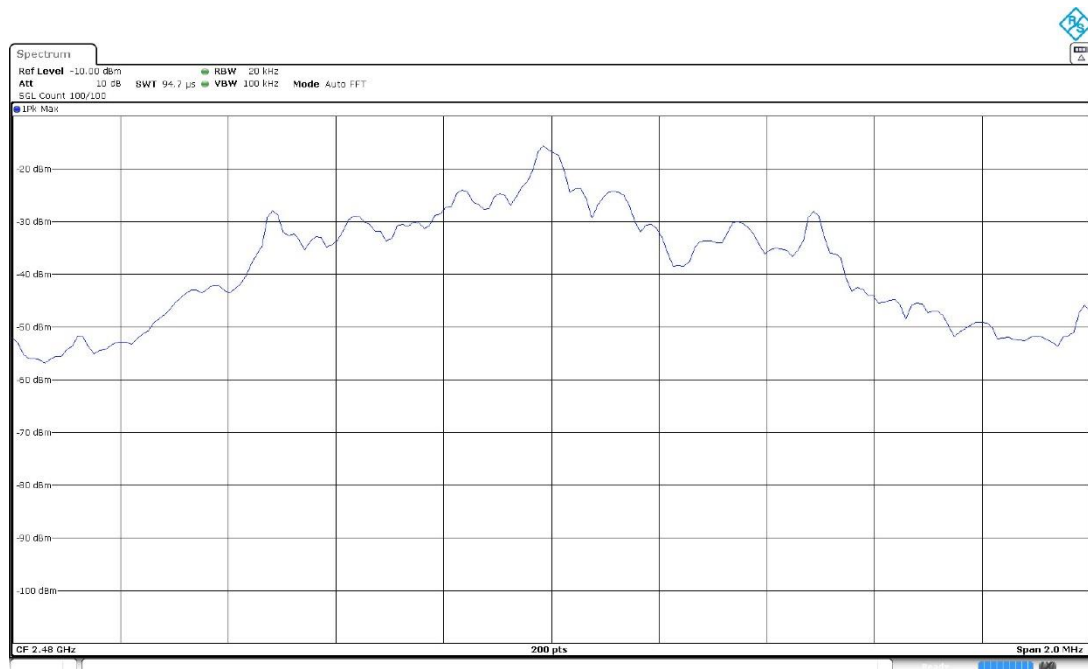
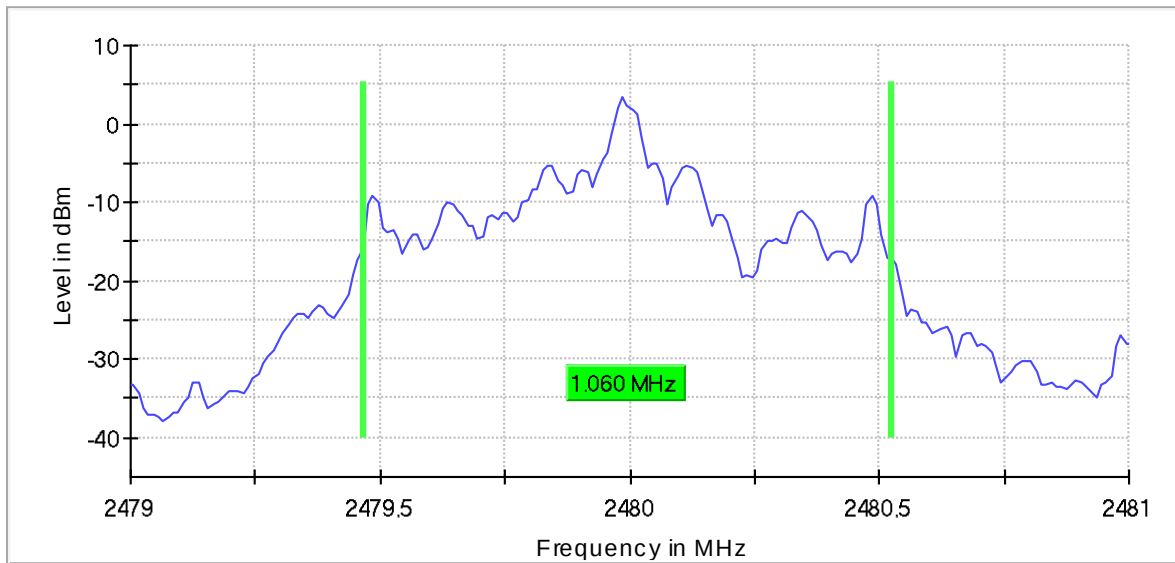


Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
 Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
 MIMO Mode = SISO Active Port = 1

Images

99 % Bandwidth

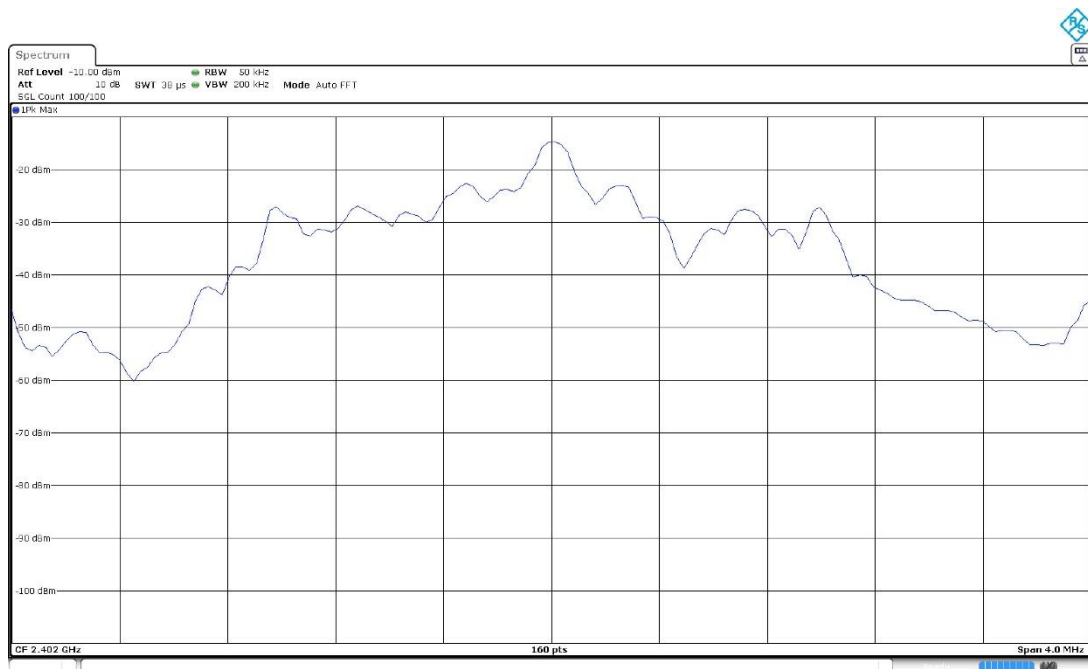
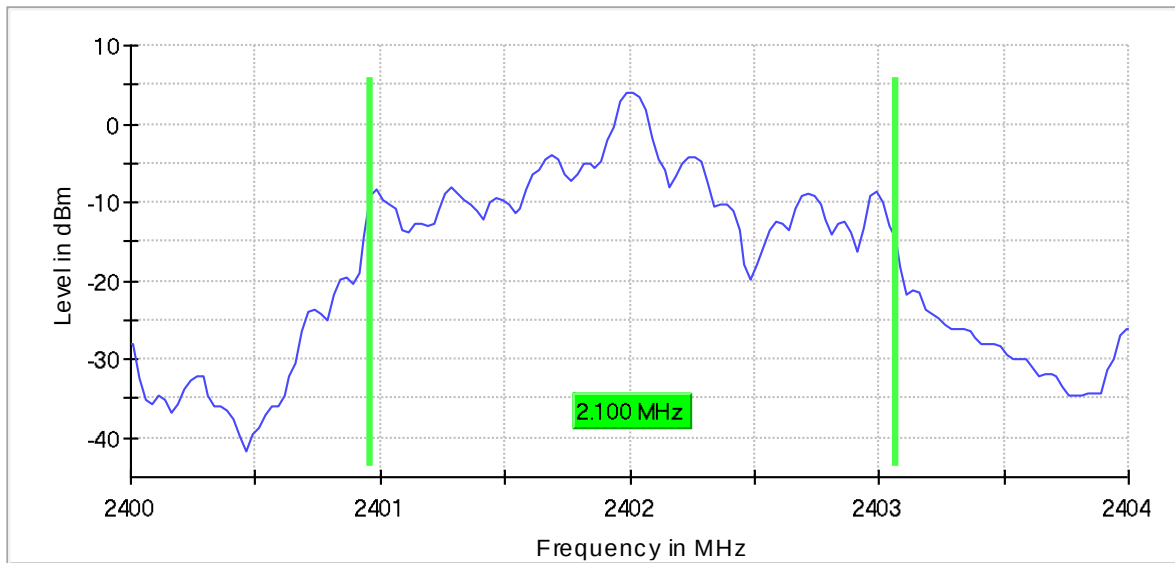


Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
 Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
 MIMO Mode = SISO Active Port = 1

Images

99 % Bandwidth

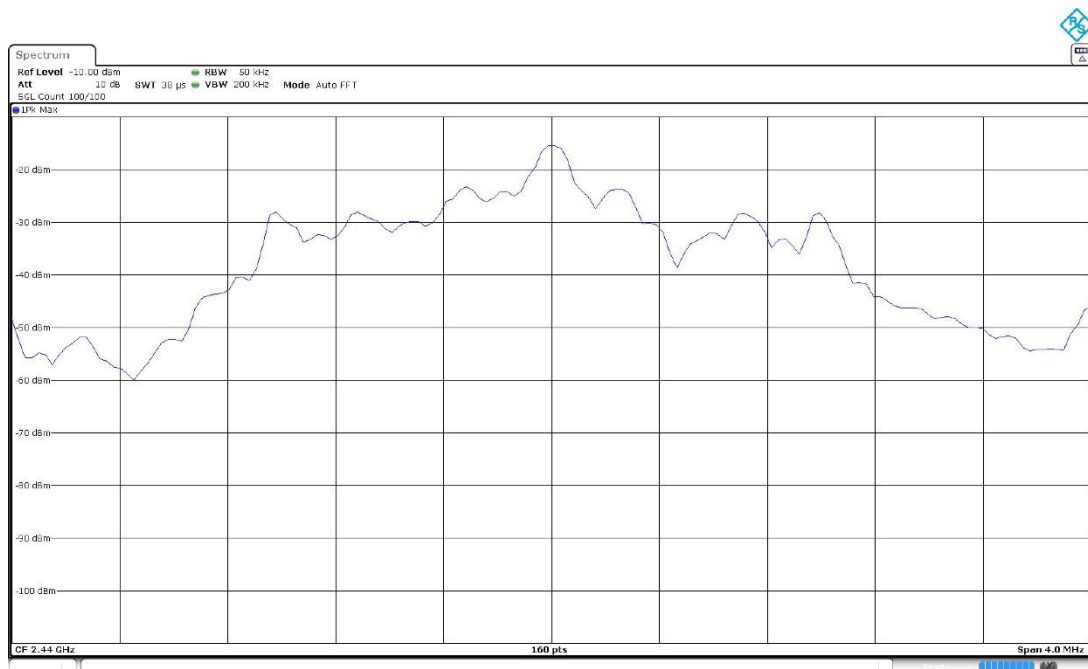
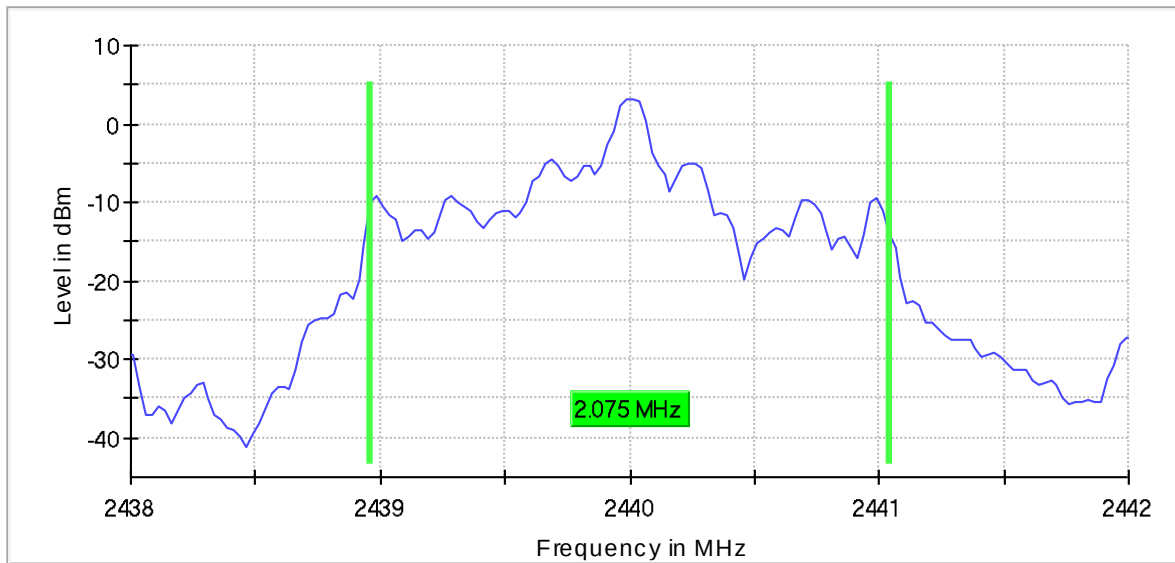


Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images

99 % Bandwidth

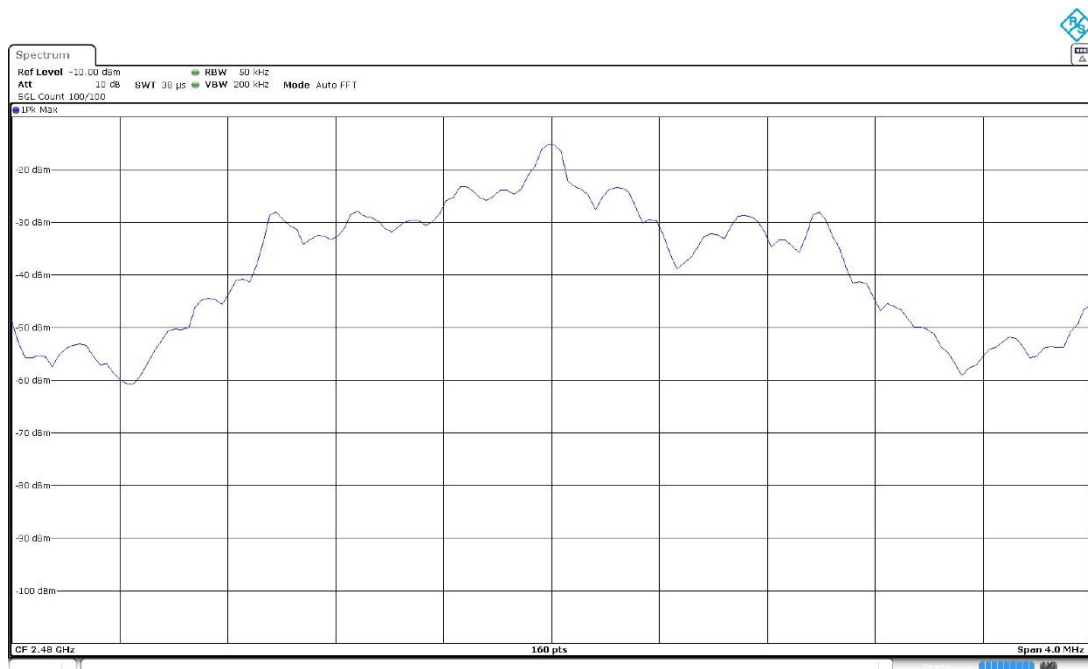
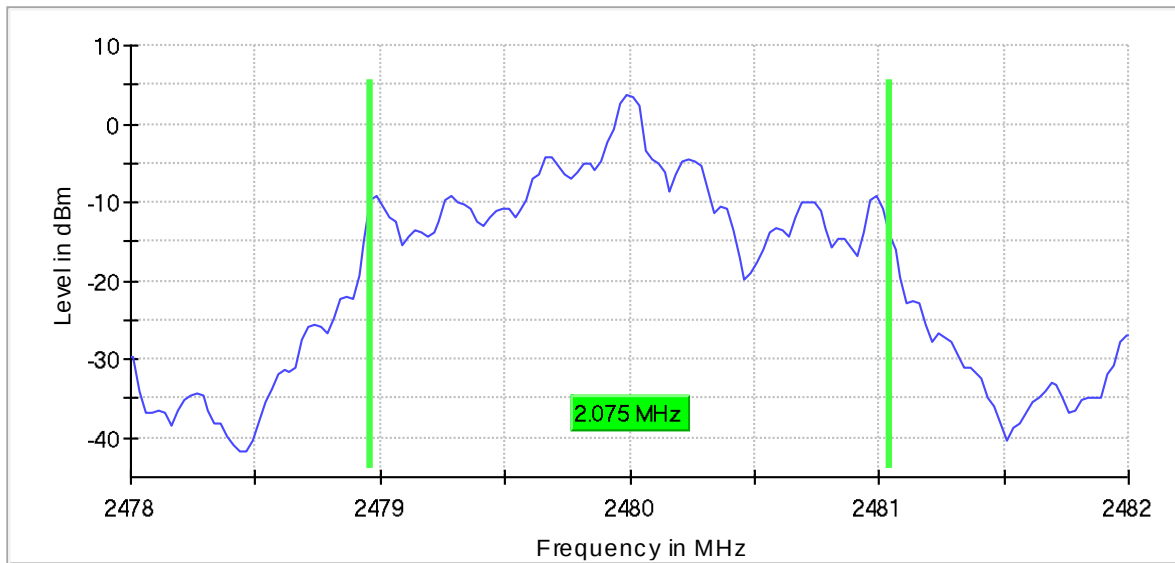


Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
 Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
 MIMO Mode = SISO Active Port = 1

Images

99 % Bandwidth



RSS-247 6.3.1 (a) / FCC 15.247 (a) 6dB Bandwidth

Limits

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Results

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Operation Band (MHz)	Equipment	BW (MHz)	Freq (MHz)	Ebw (kHz)
[2400, 2483.5]	Digital Transmission System (DTS)	1	2402.00000	534.654
			2440.00000	534.654
			2480.00000	534.654

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Operation Band (MHz)	Equipment	BW (MHz)	Freq (MHz)	Ebw (kHz)
[2400, 2483.5]	Digital Transmission System (DTS)	2	2402.00000	712.872
			2440.00000	712.872
			2480.00000	712.872

Verdict

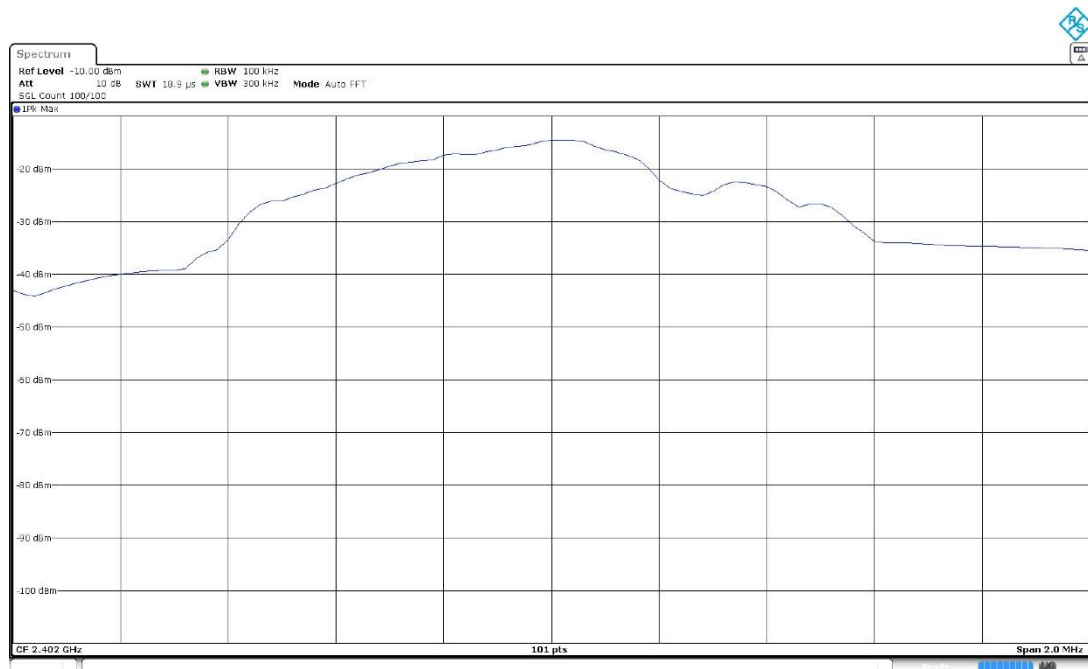
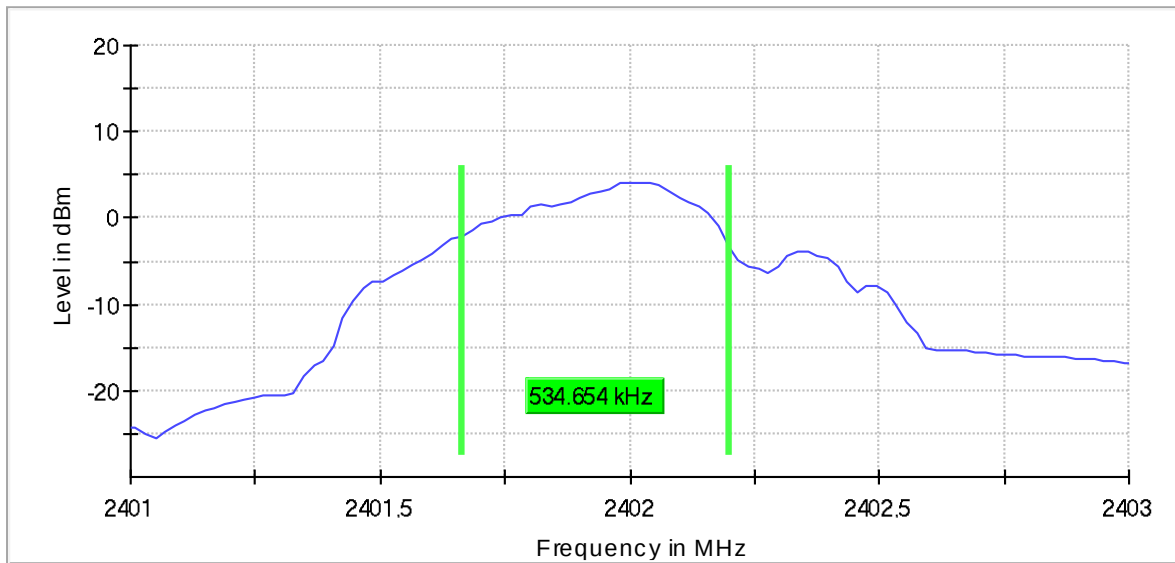
PASS

Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images

6 dB Bandwidth

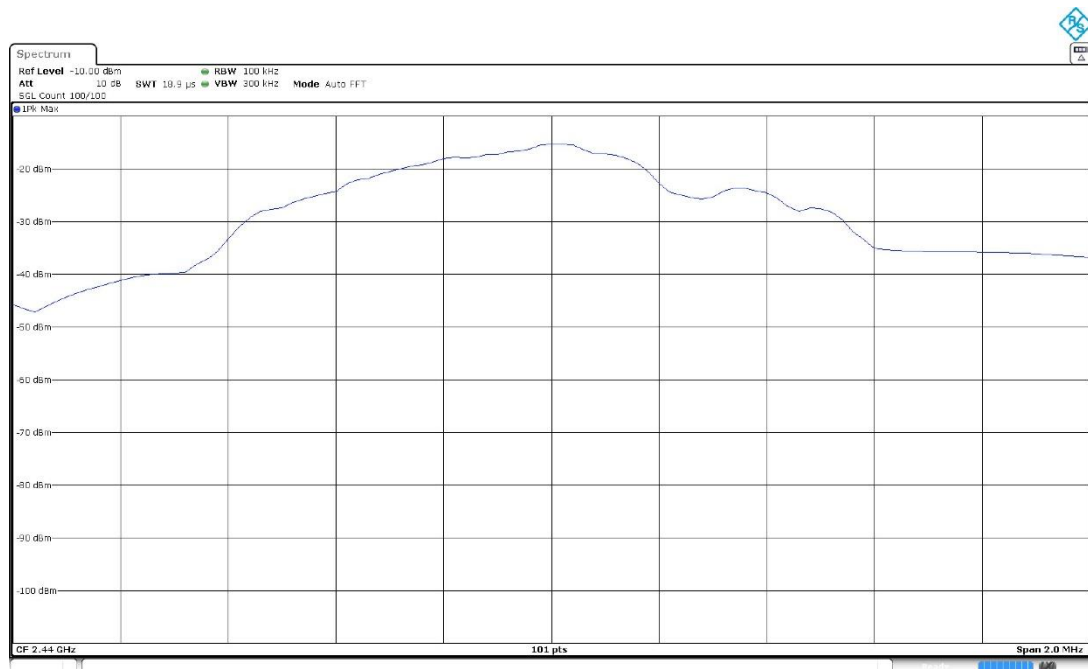
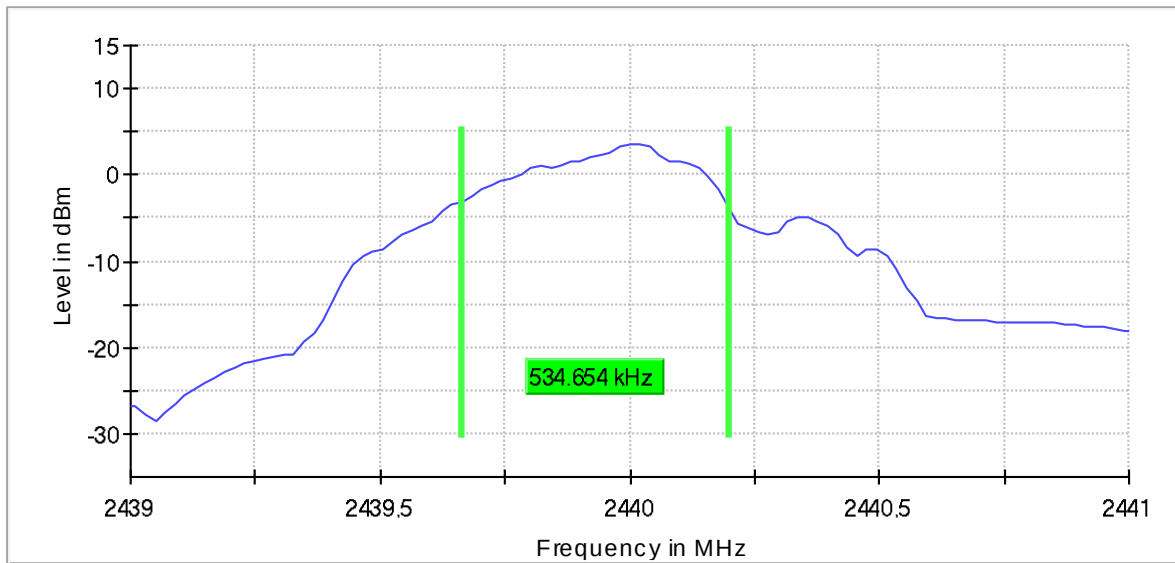


Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
 Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
 MIMO Mode = SISO Active Port = 1

Images

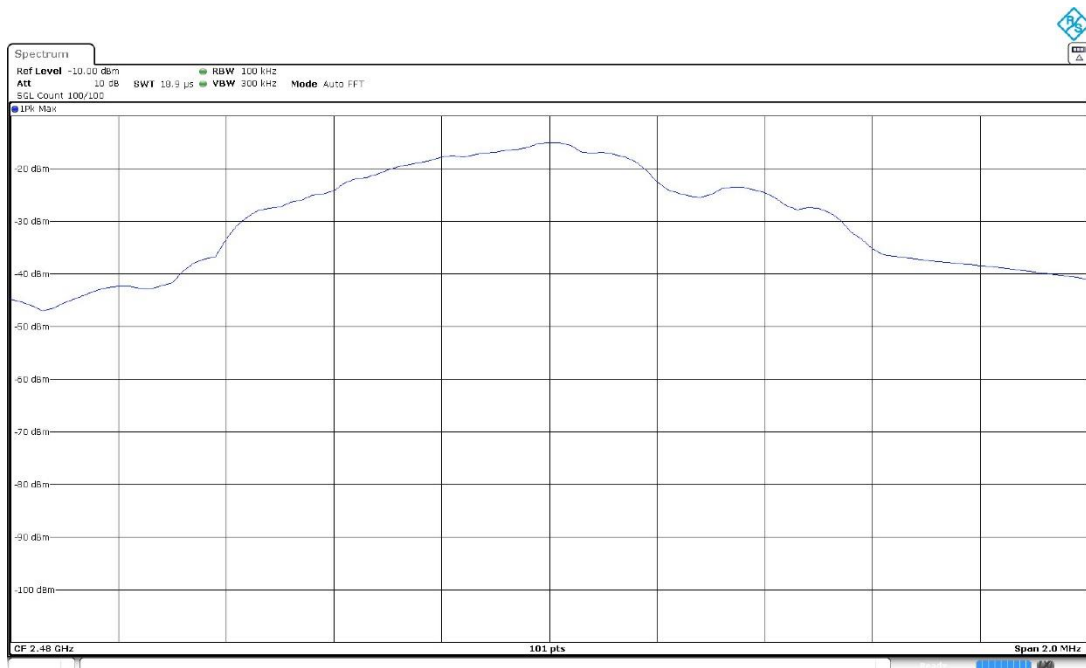
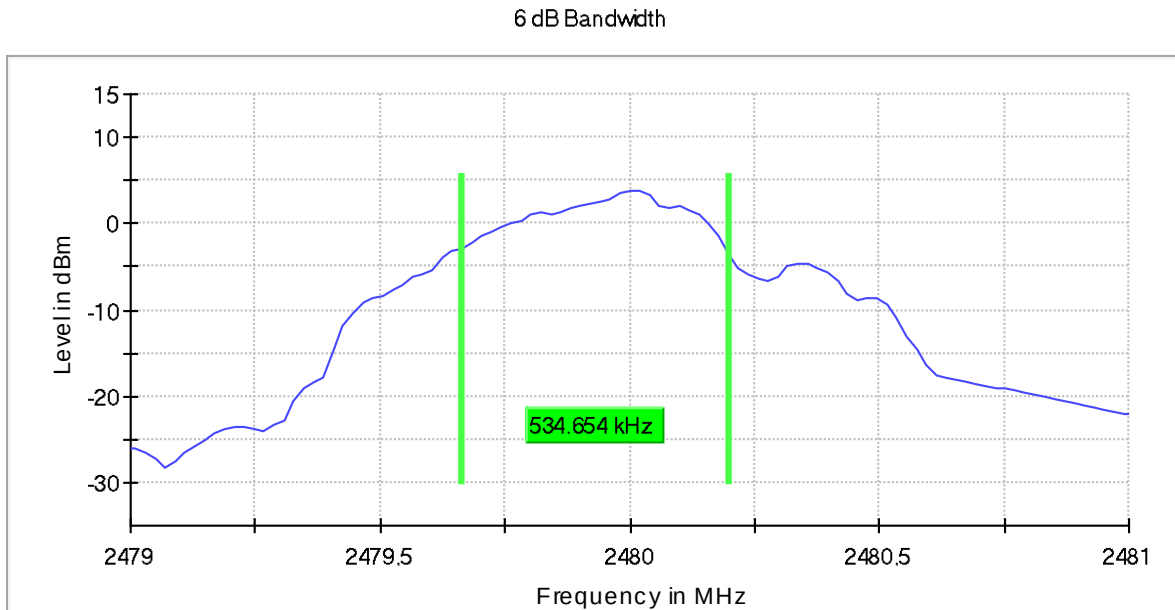
6 dB Bandwidth



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
 Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
 MIMO Mode = SISO Active Port = 1

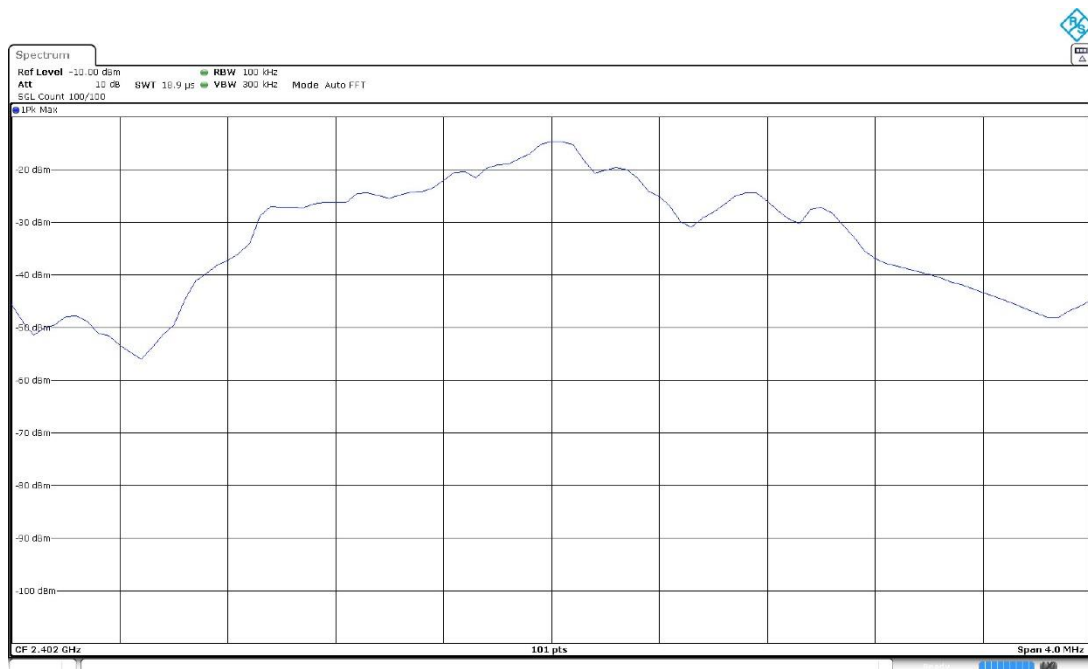
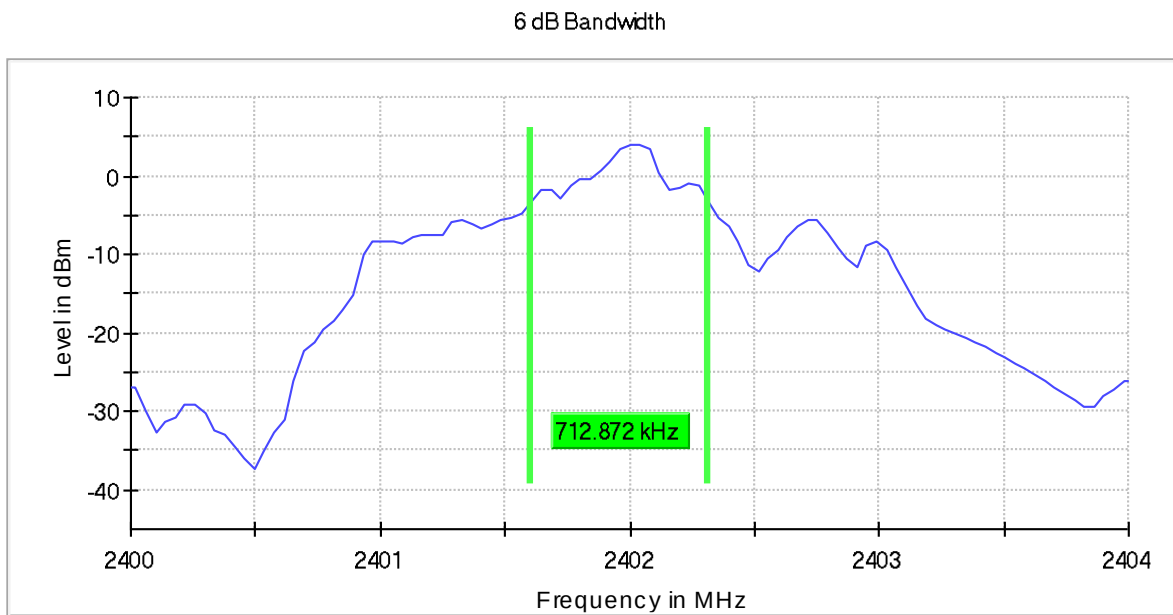
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

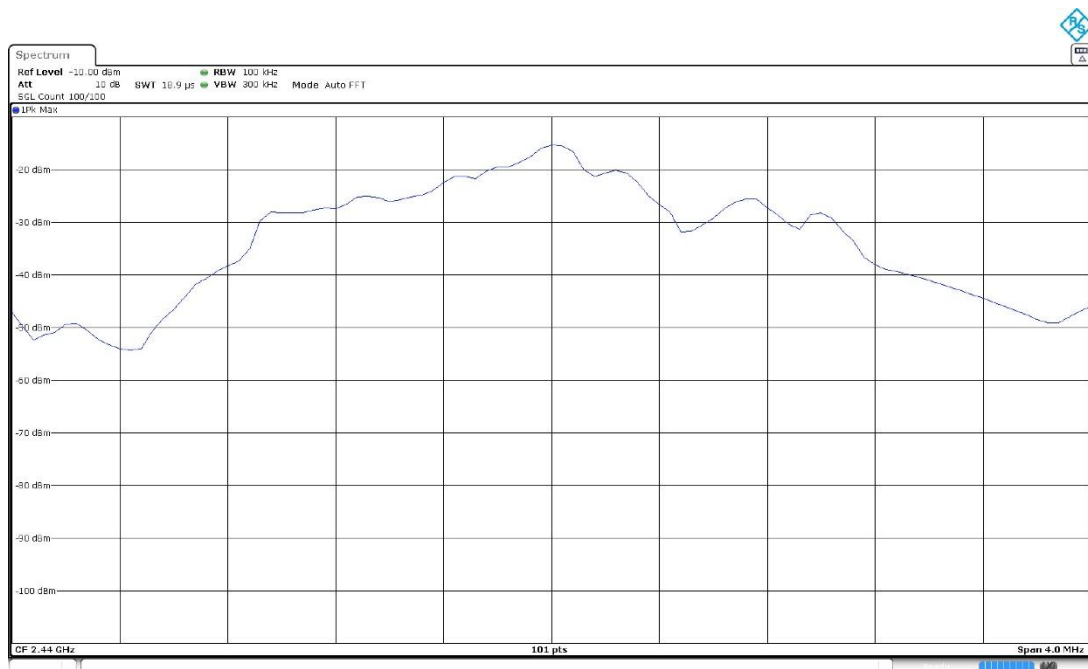
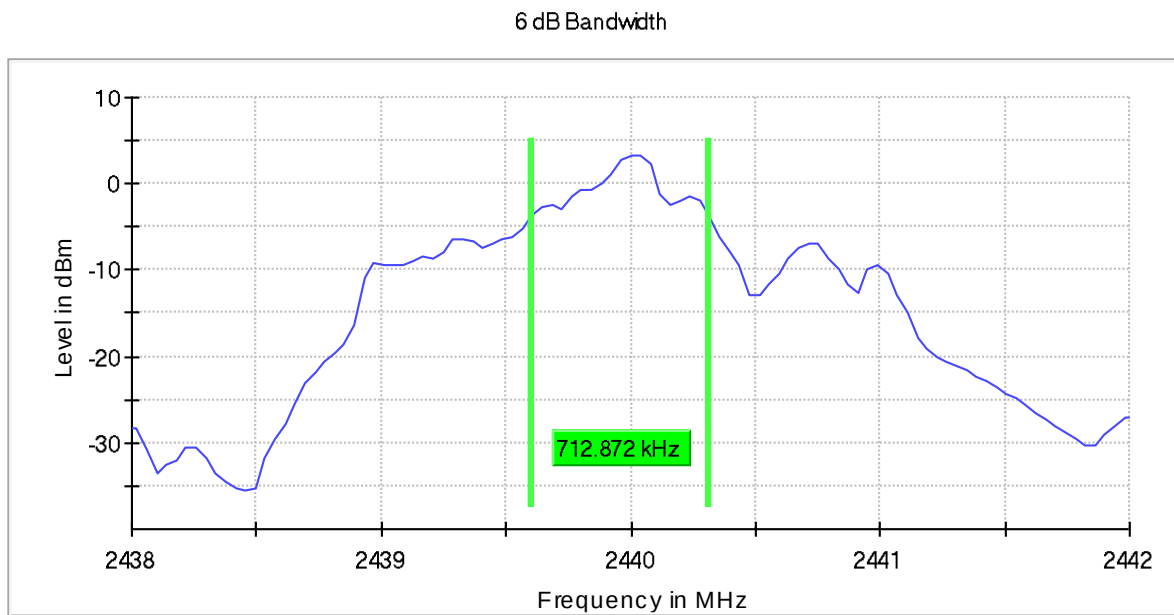
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
 Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
 MIMO Mode = SISO Active Port = 1

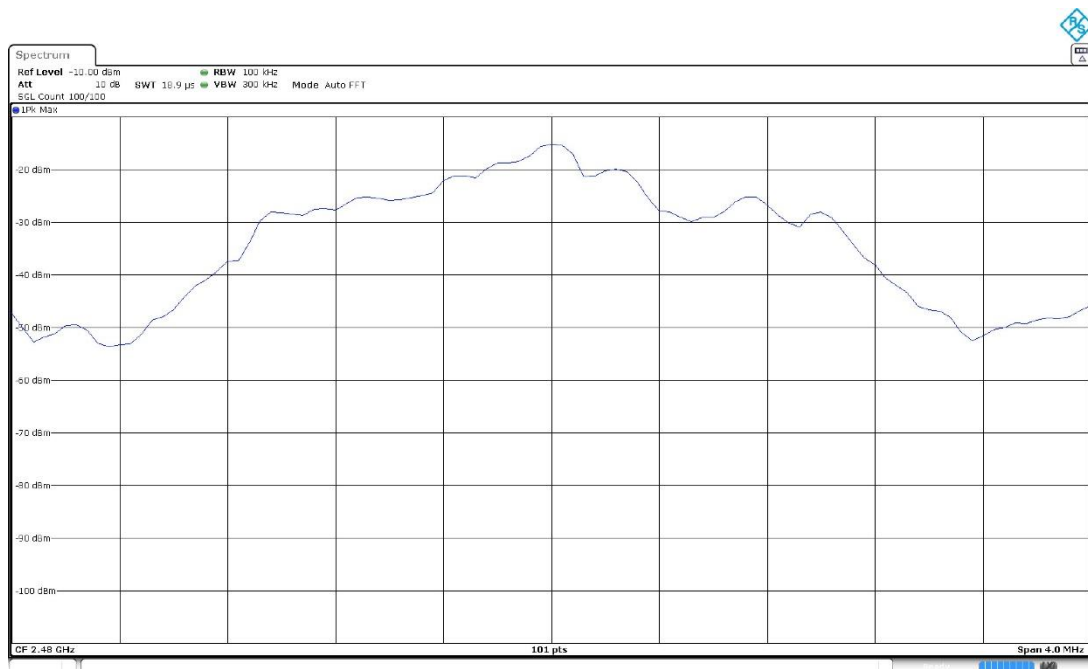
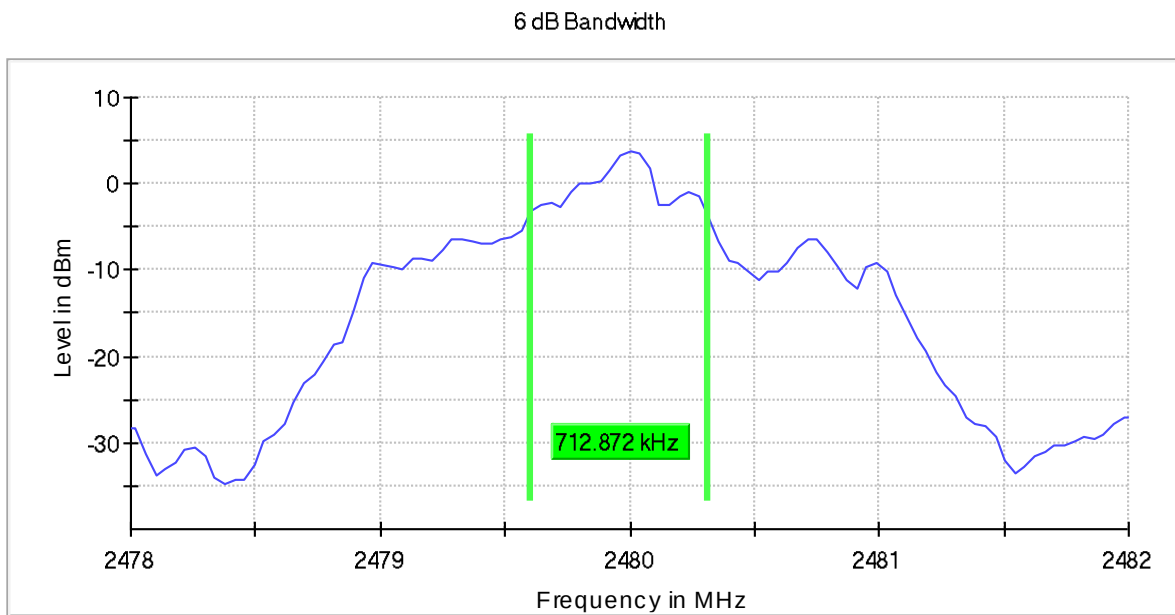
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images



RSS-247 6.3.1 (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 5.2 (GFSK 1 Mbit/s)

Operation Band (MHz)	Equipment	BW (MHz)	Freq (MHz)	PSD (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	1	2402.00000	3.751
			2440.00000	3.128
			2480.00000	3.439

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Operation Band (MHz)	Equipment	BW (MHz)	Freq (MHz)	PSD (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	2	2402.00000	3.605
			2440.00000	2.992
			2480.00000	3.250

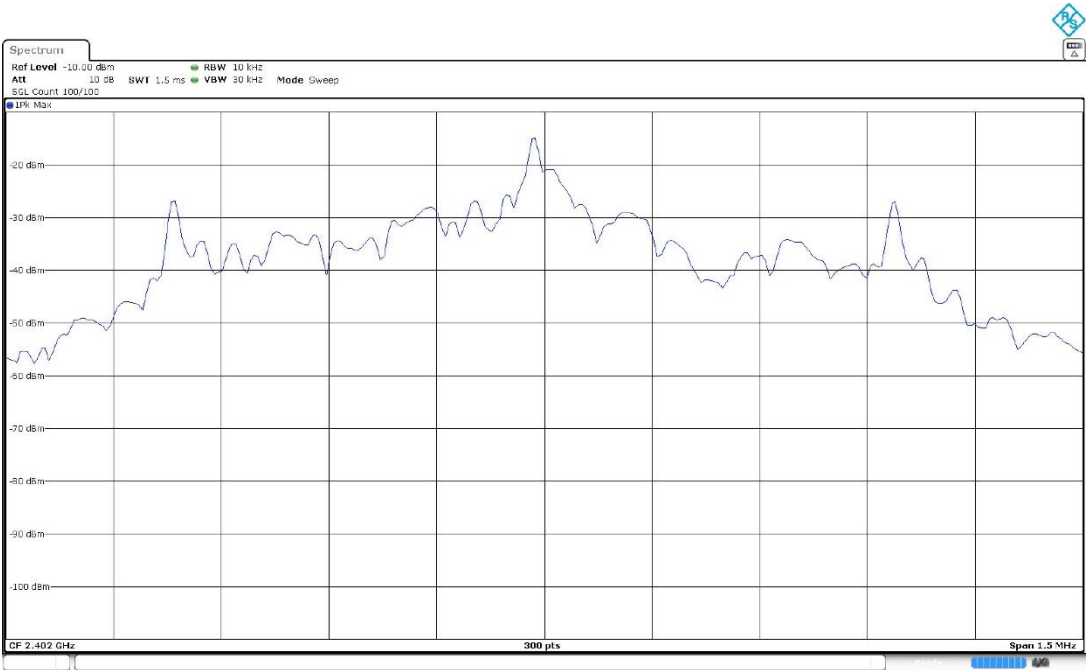
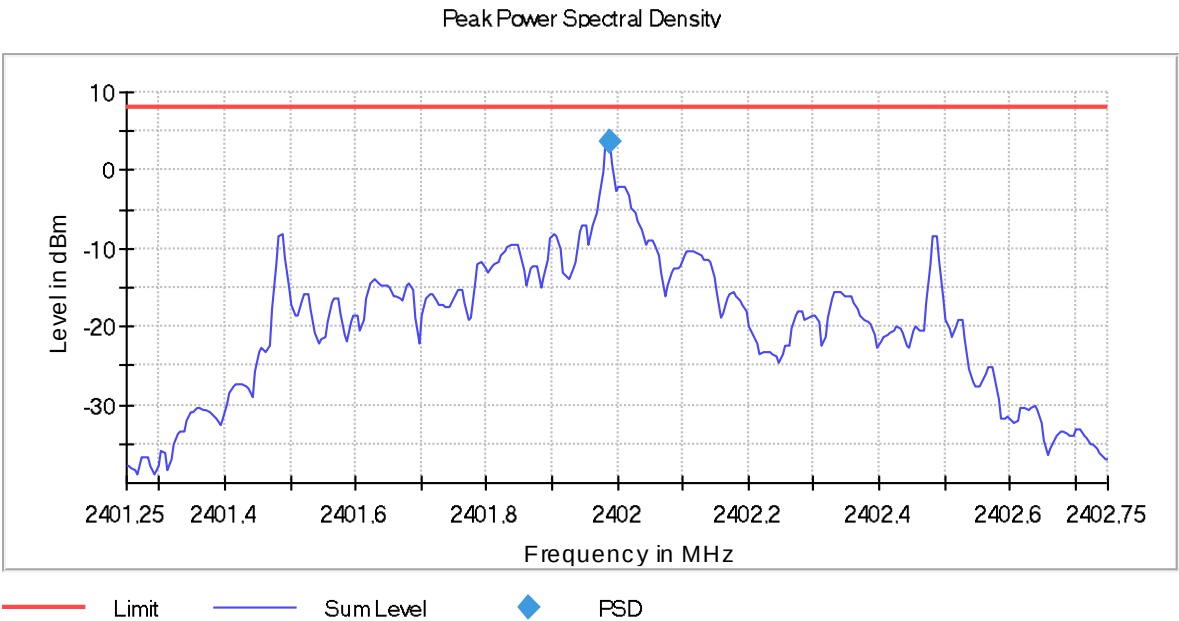
Verdict

PASS

Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

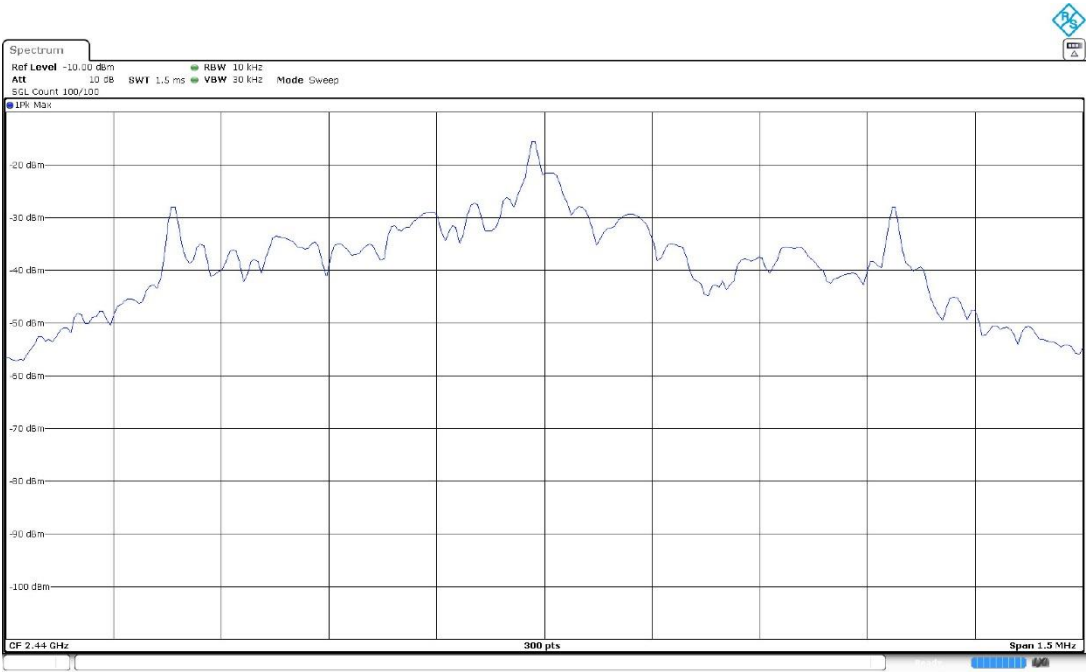
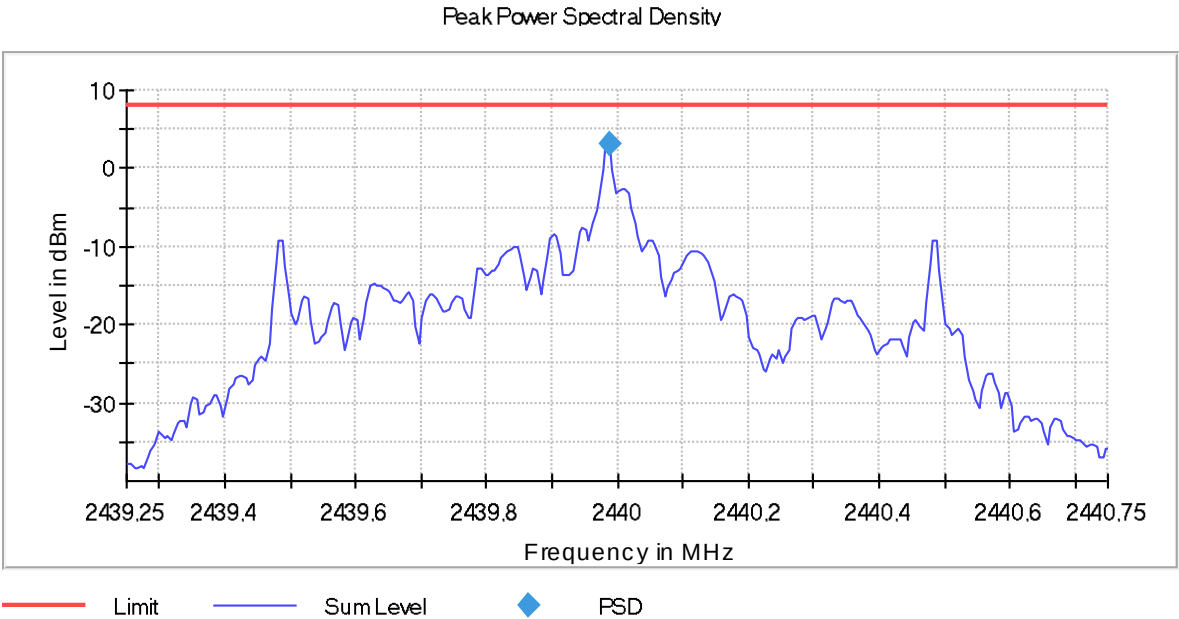
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

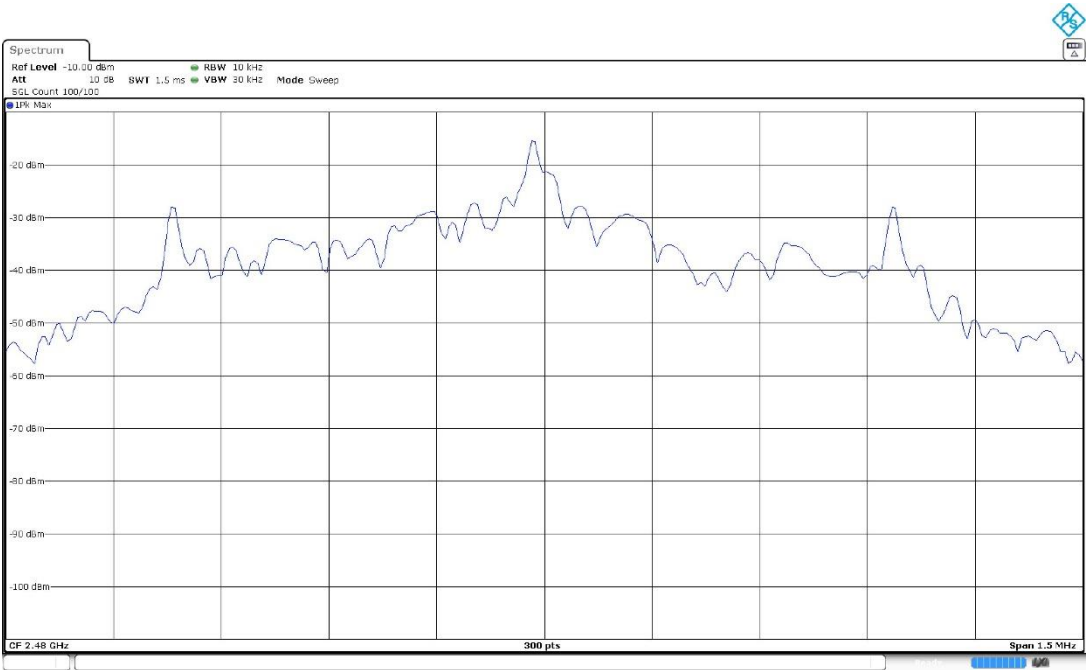
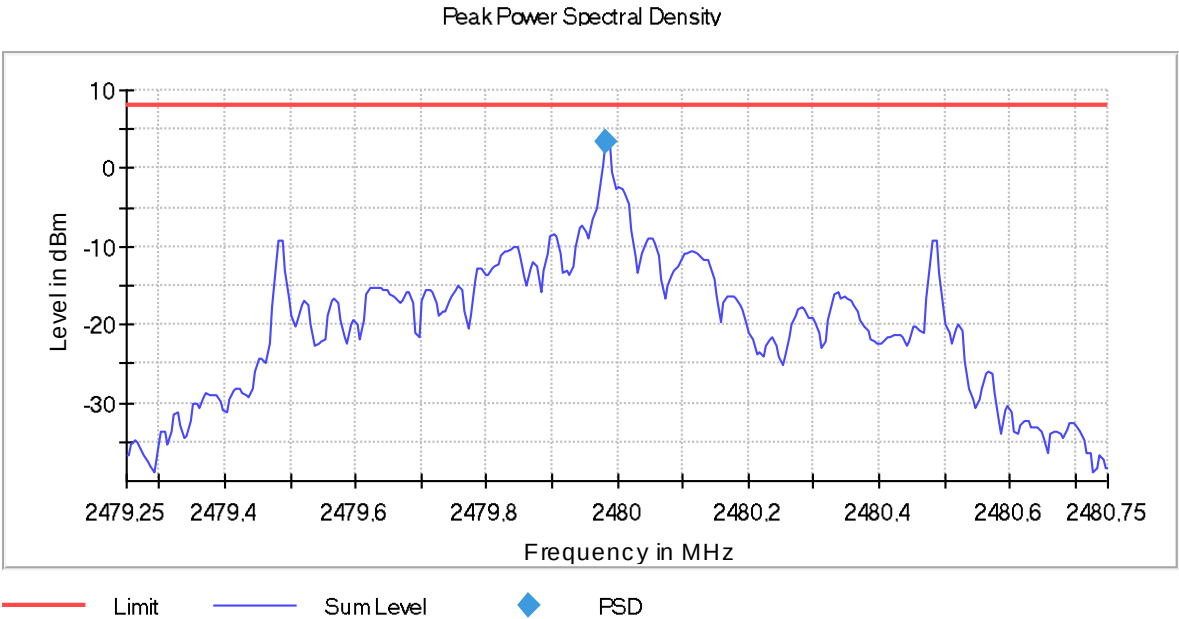
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

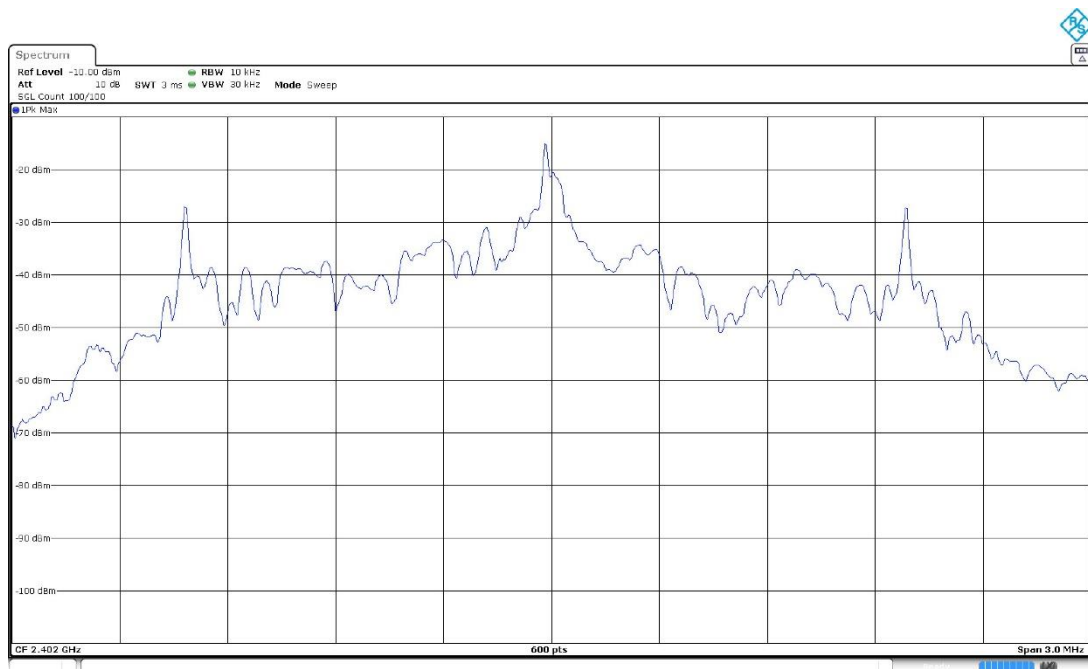
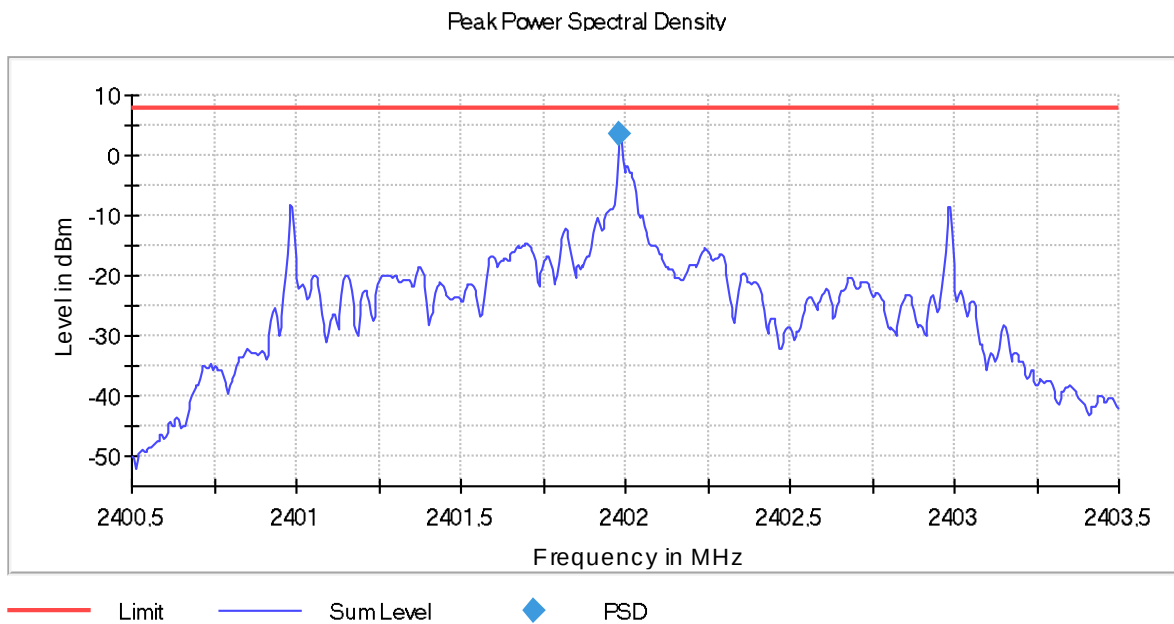
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

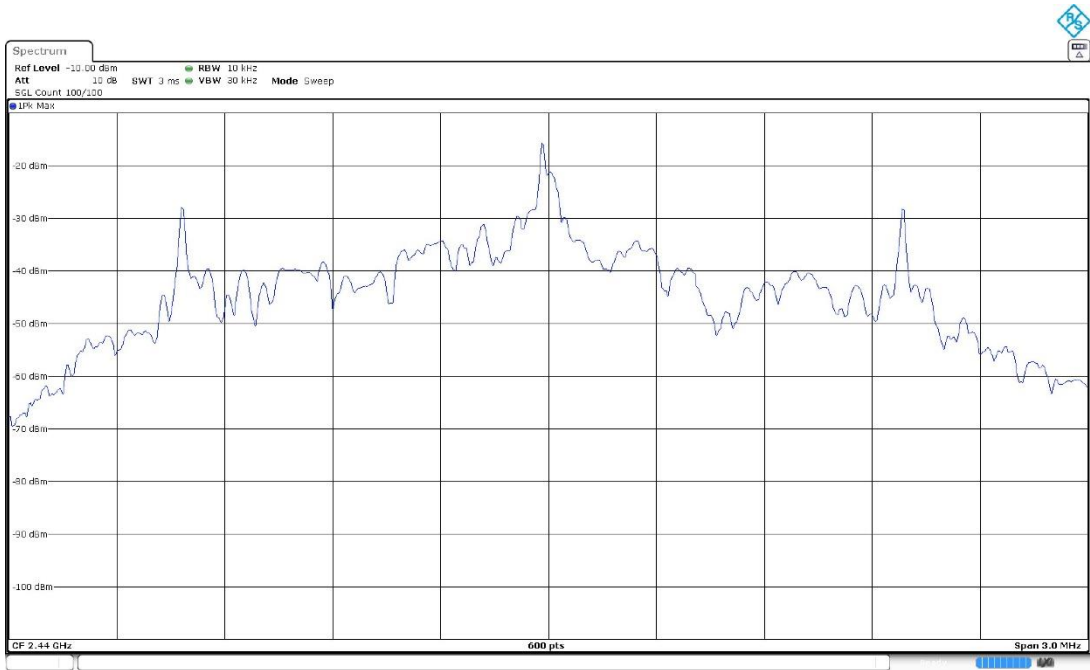
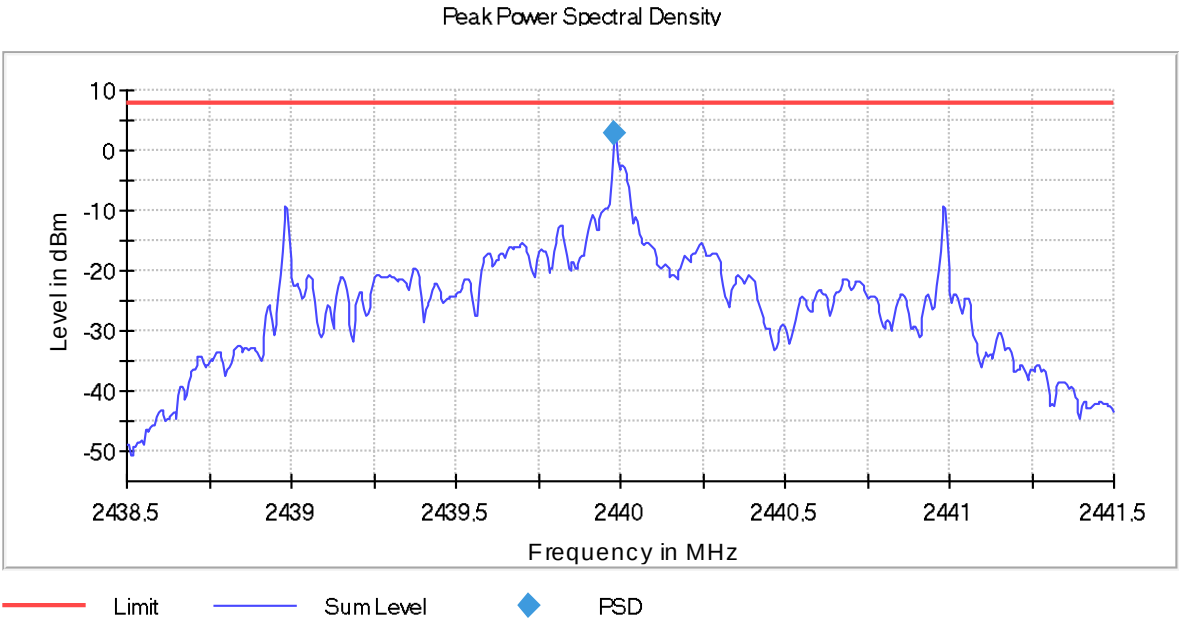
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

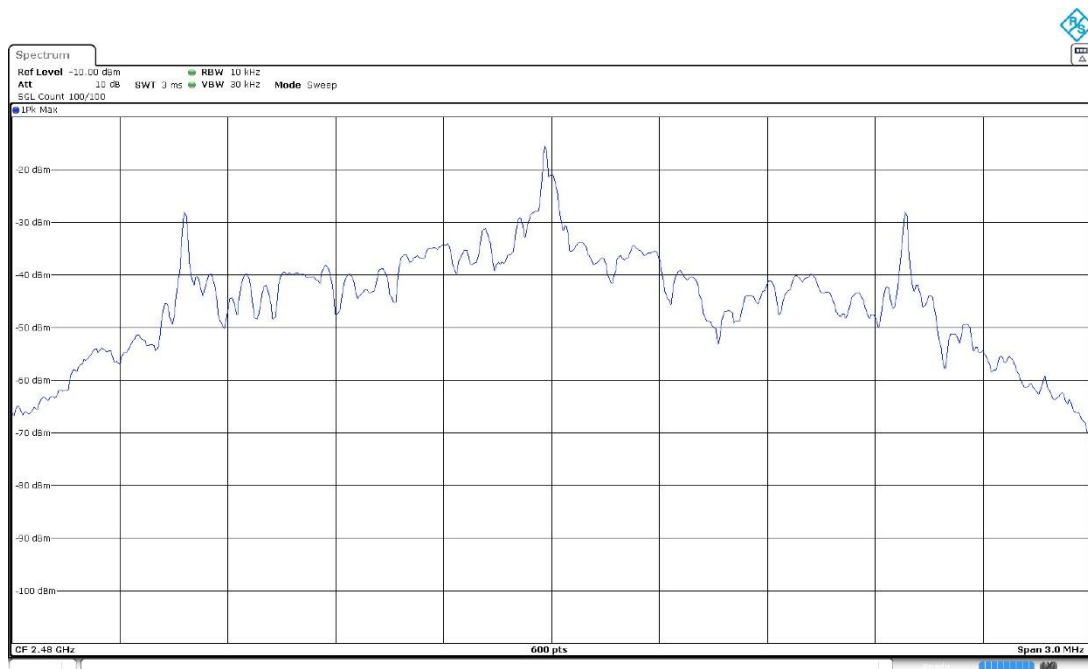
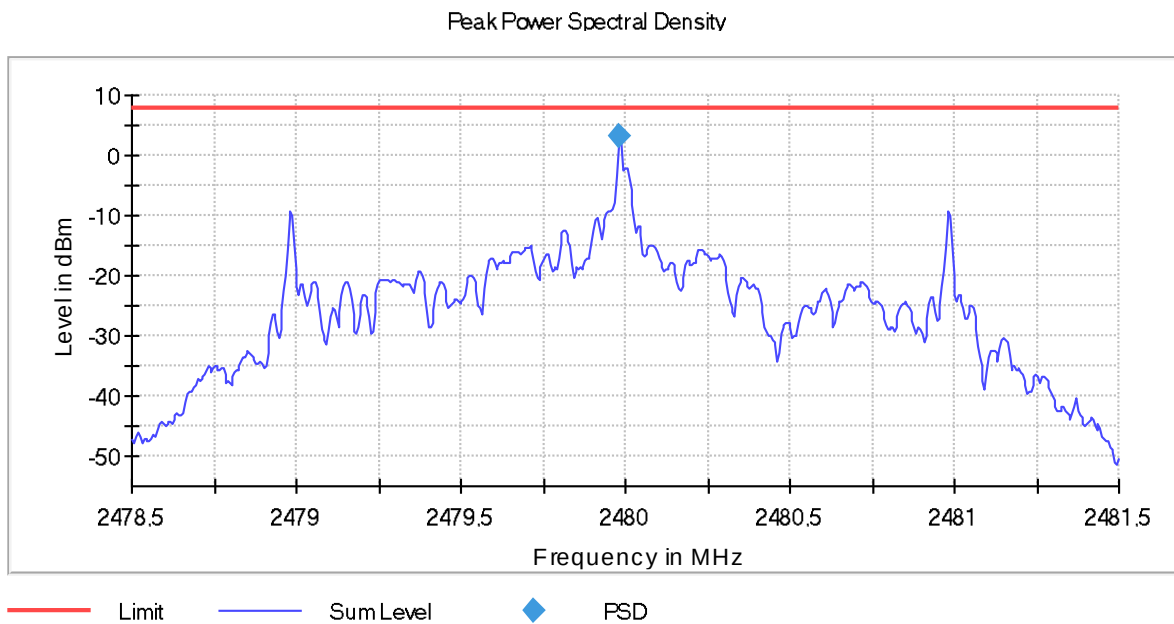
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images



RSS-247 6.3.2 / FCC 15.247 (b) Maximum Peak Conducted Output Power

Limits

FCC 15.247 (b) (3)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

RSS 6.3.2

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 6.5 (a) and (b).

Results

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Operation Band (MHz)	Equipment	BW (MHz)	Freq (MHz)	Peak Power (dBm)	E.I.R.P. (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	1	2402.00000	4.201	2.401
			2440.00000	3.455	1.655
			2480.00000	3.738	1.938

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Operation Band (MHz)	Equipment	BW (MHz)	Freq (MHz)	Peak Power (dBm)	E.I.R.P. (dBm)
[2400, 2483.5]	Digital Transmission System (DTS)	2	2402.00000	4.125	2.325
			2440.00000	3.396	1.596
			2480.00000	3.651	1.851

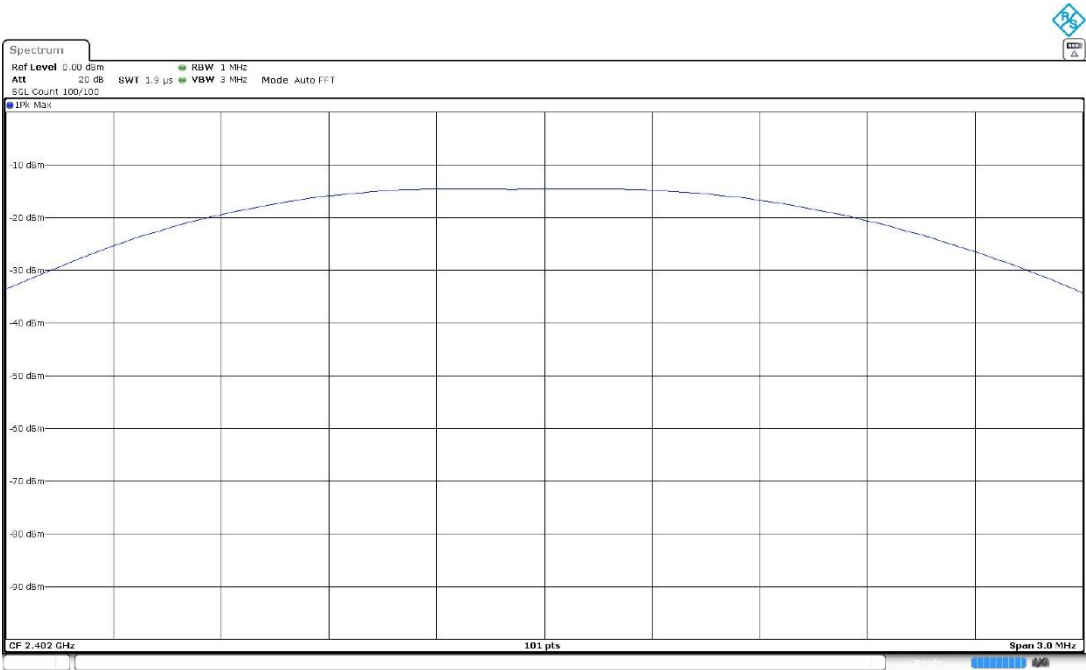
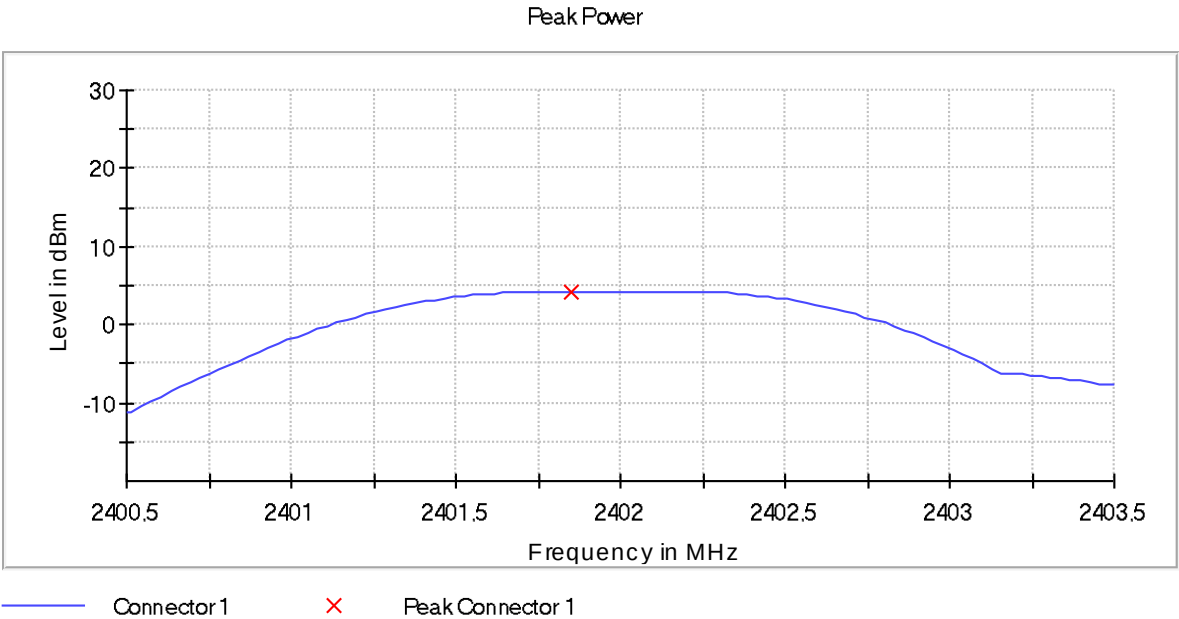
Verdict

PASS

Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

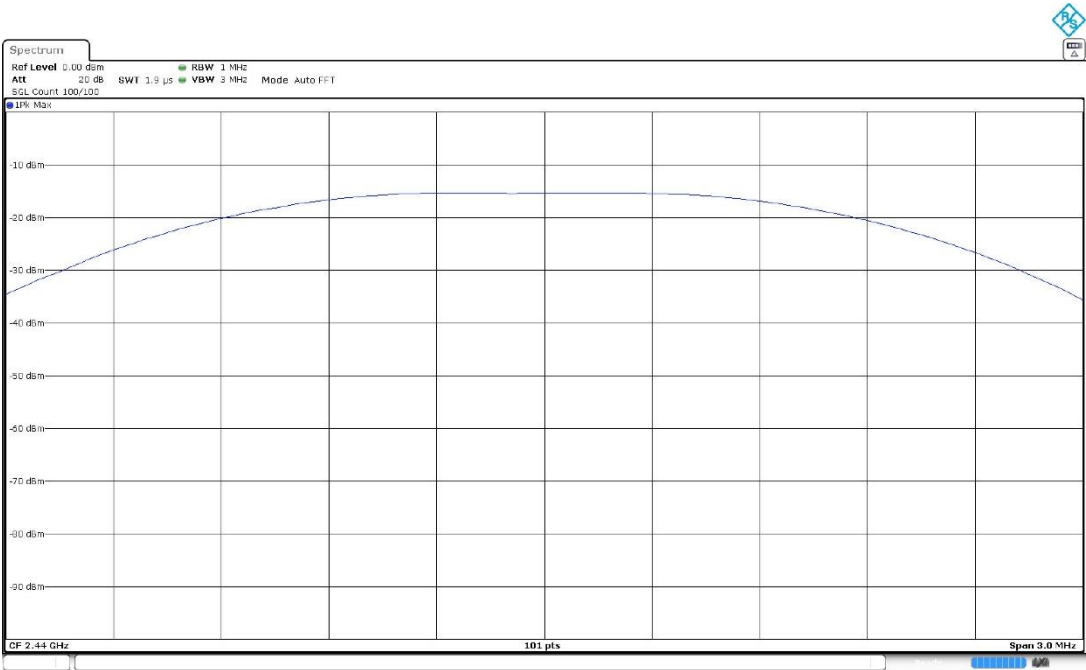
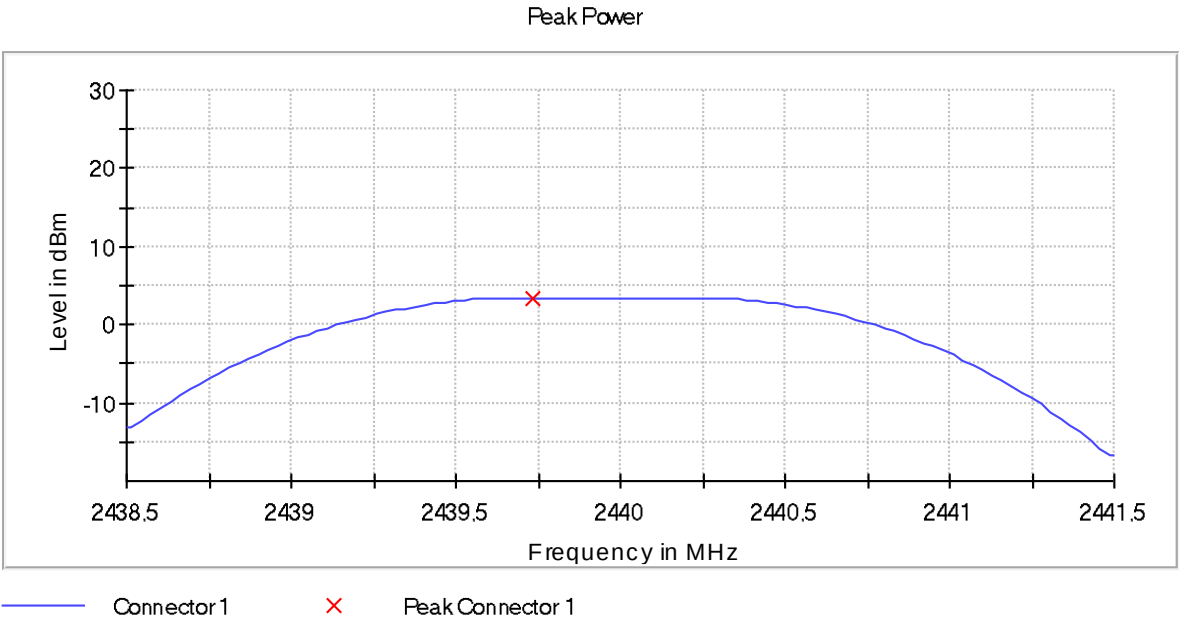
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

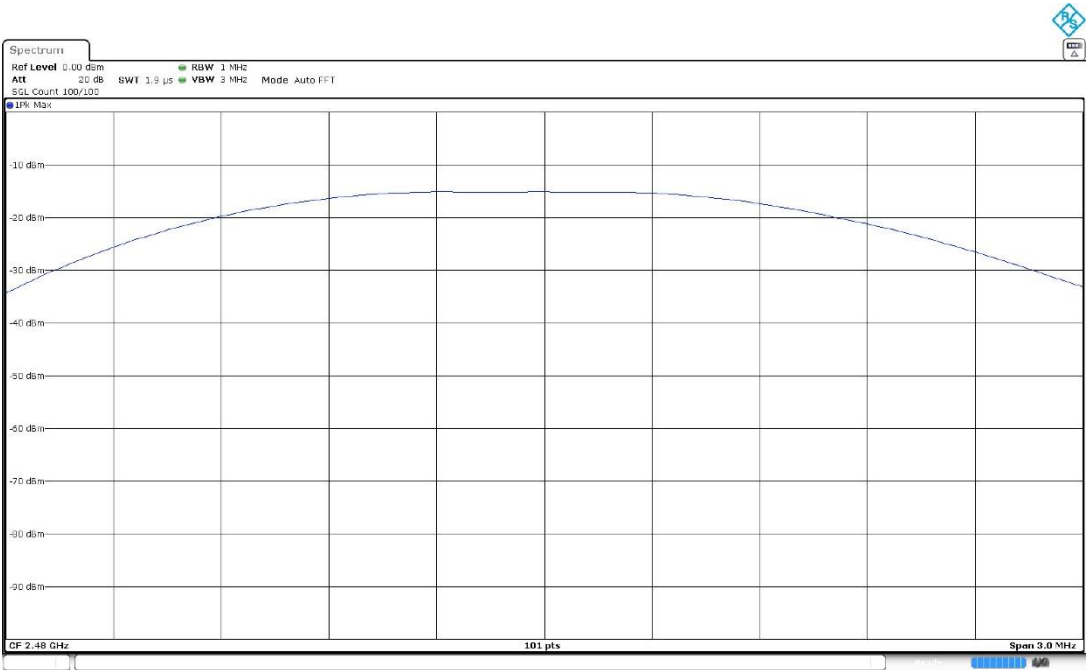
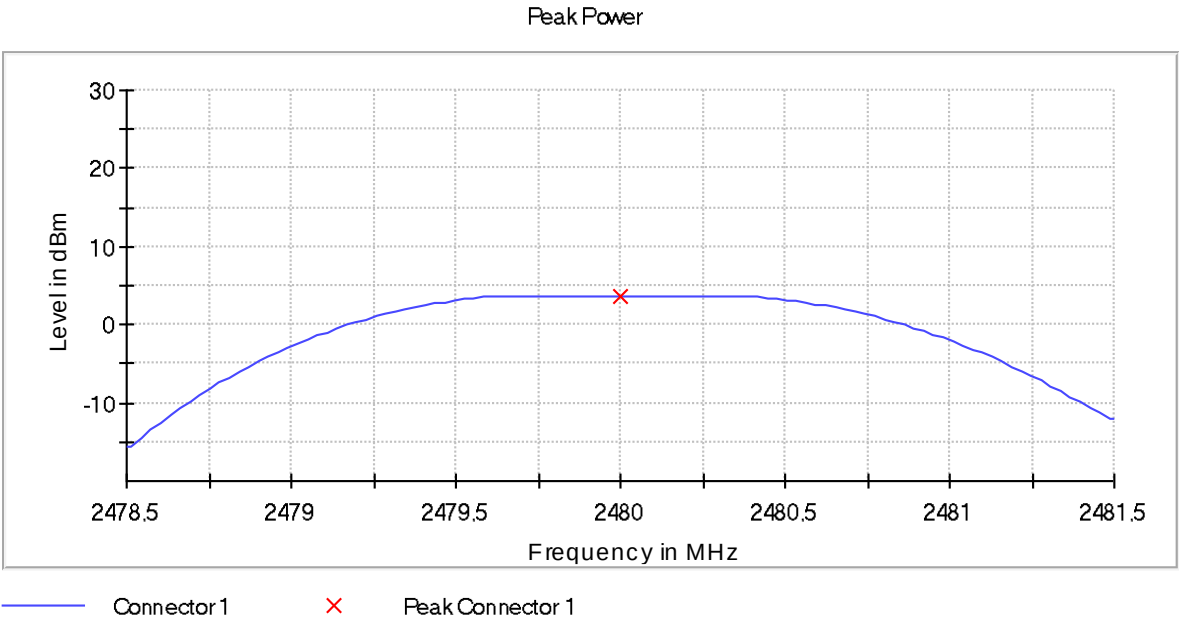
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

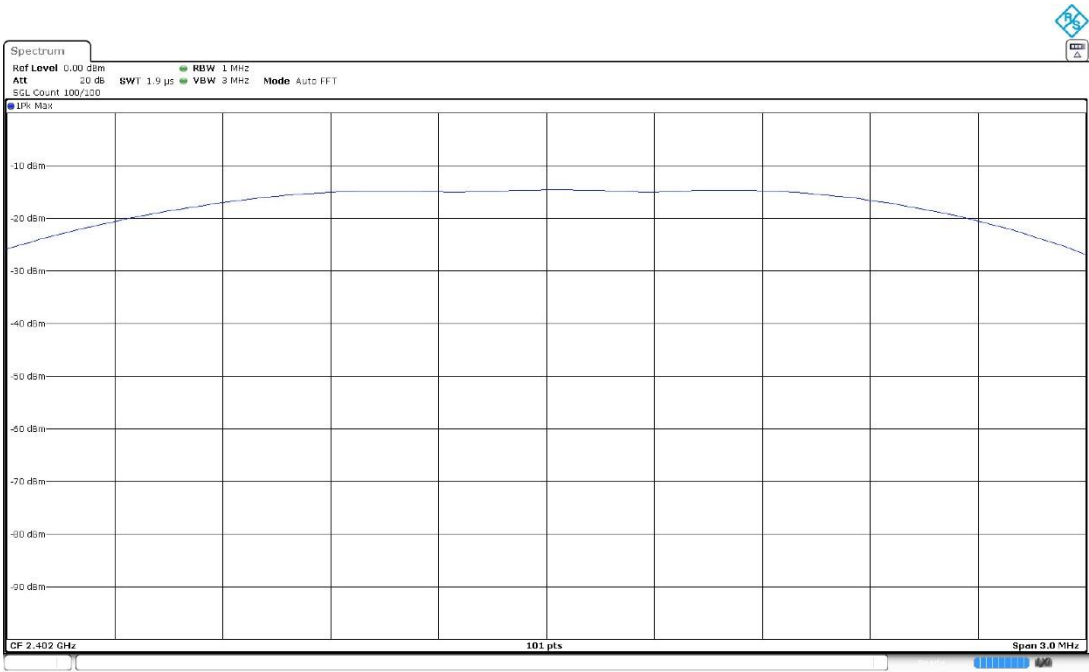
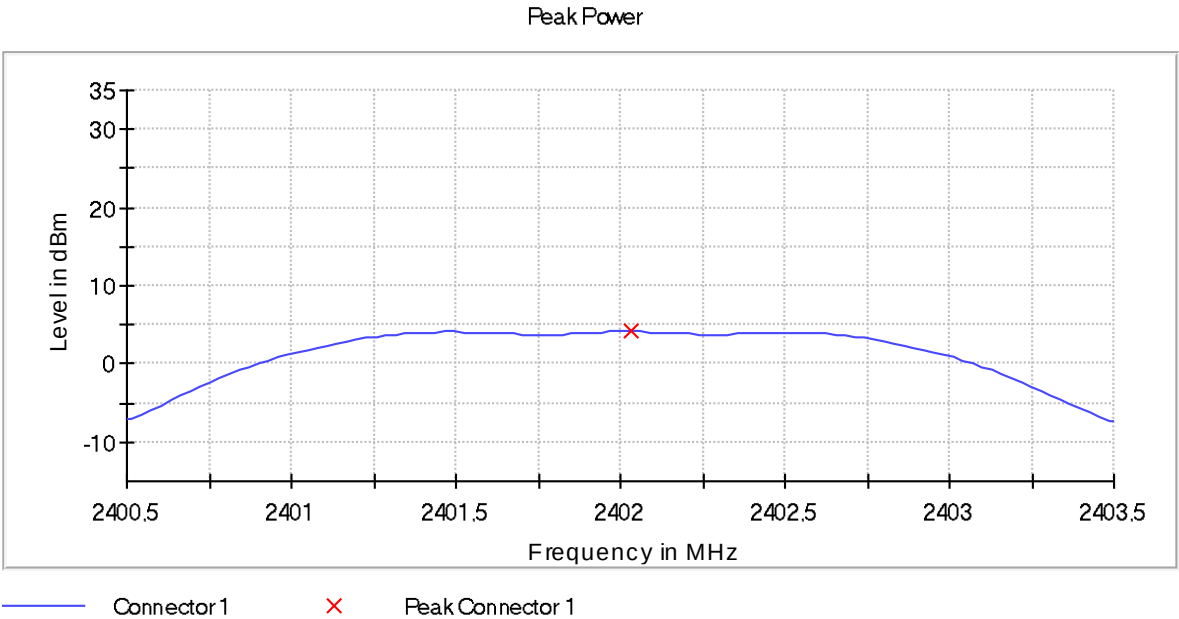
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

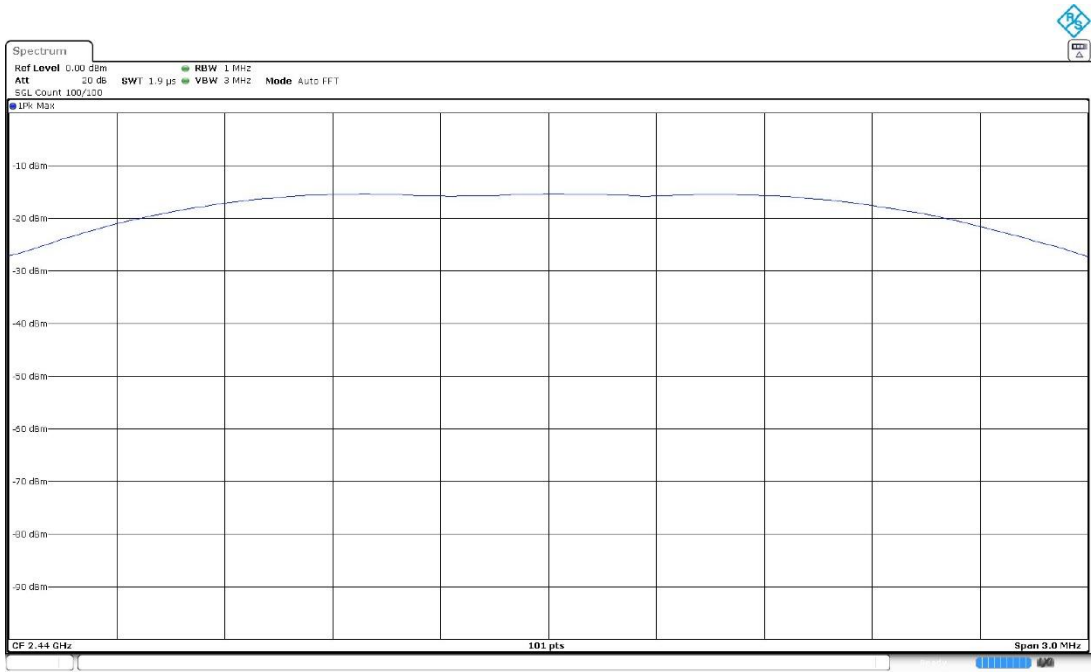
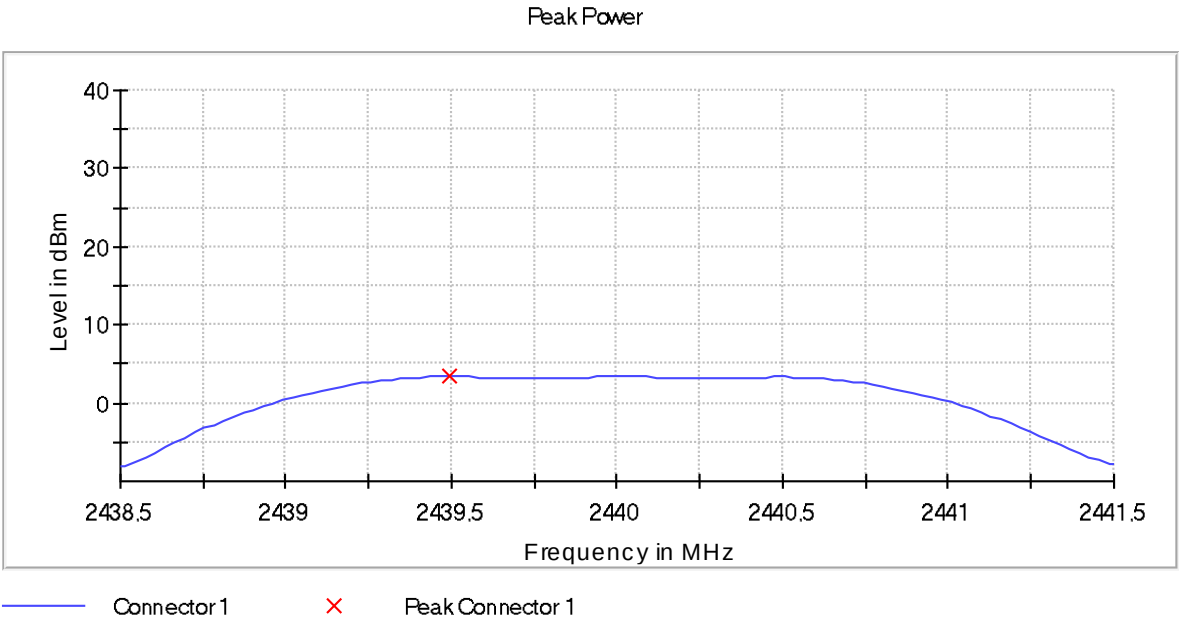
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

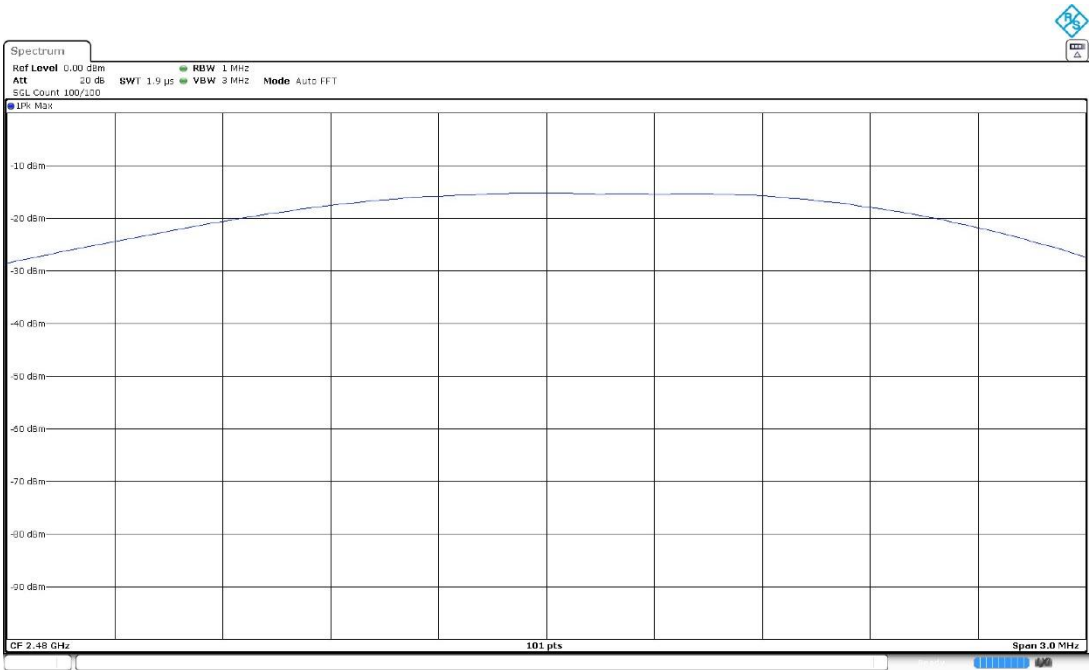
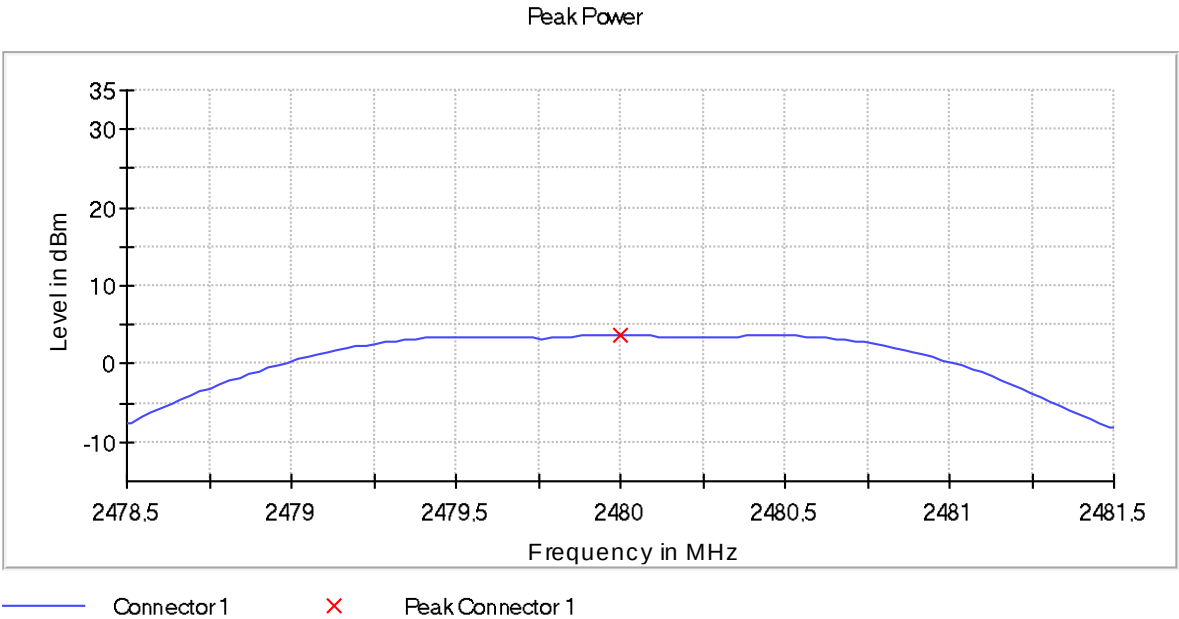
Images



Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images



RSS-247 6.6 / 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.

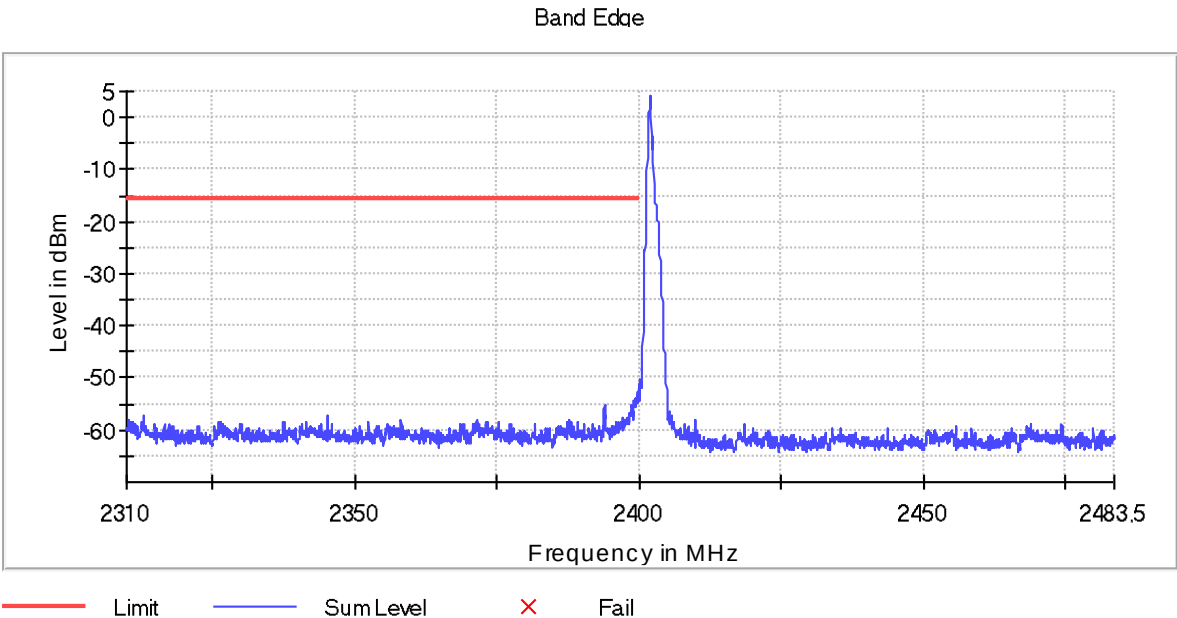
Verdict

PASS

Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
SweepTime	113.672 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

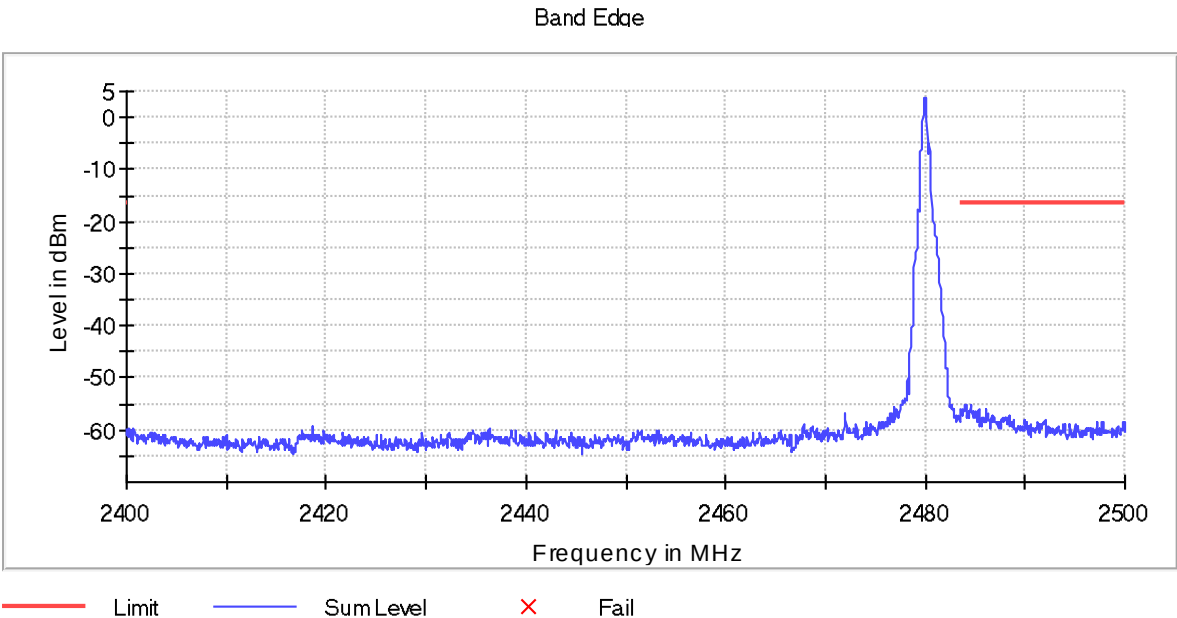
Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	94.727 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	6 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.38 dB	0.50 dB

Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	94.727 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	7 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.01 dB	0.50 dB

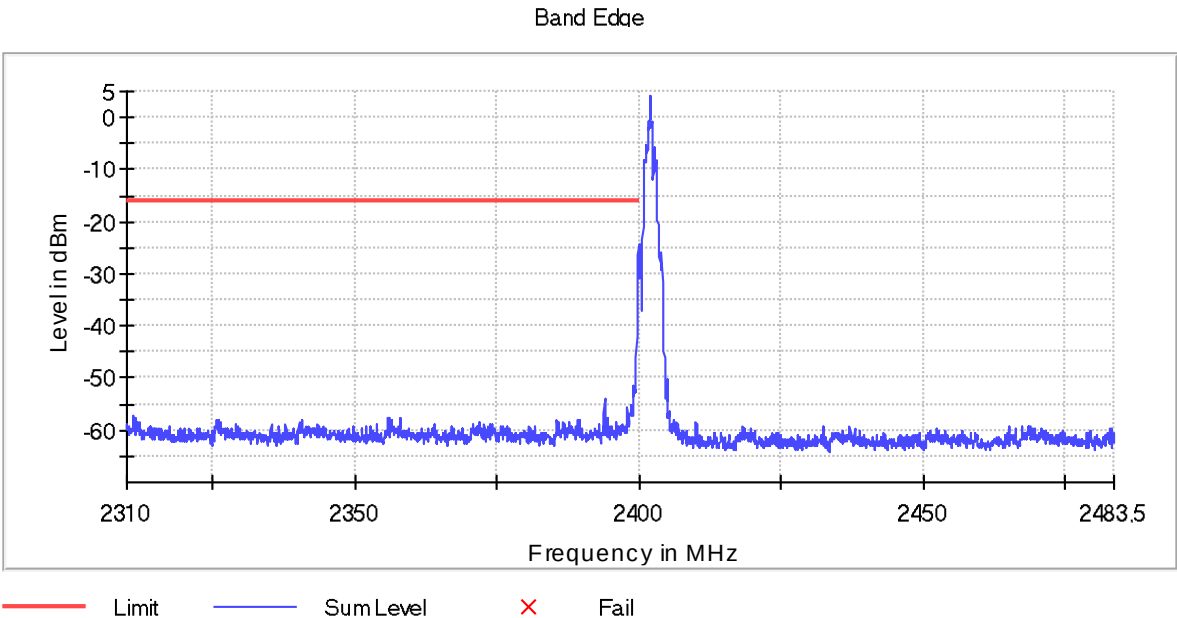
Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.48350 GHz	2.48350 GHz
Stop Frequency	2.50000 GHz	2.50000 GHz
Span	16.500 MHz	16.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	330	~ 330
SweepTime	18.945 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
SweepTime	113.672 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	5 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.01 dB	0.50 dB

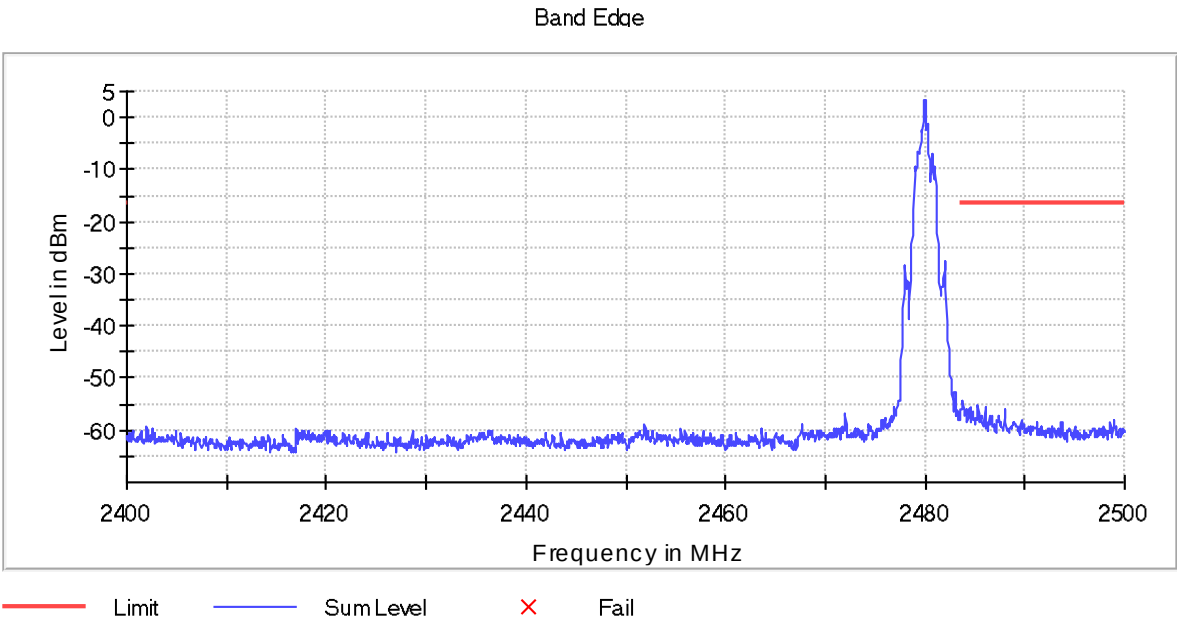
Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	94.727 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	8 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images



Tables:

Spectrum Analyzer Parameters 1

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
SweepTime	94.727 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	8 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Spectrum Analyzer Parameters 2

Setting	Instrument Value	Target Value
Start Frequency	2.48350 GHz	2.48350 GHz
Stop Frequency	2.50000 GHz	2.50000 GHz
Span	16.500 MHz	16.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	330	~ 330
SweepTime	18.945 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

RSS-247 6.6 / FCC 15.247 (d) Emissions 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.

Frequency range tested for Radiated emissions:

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

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

Results

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

Frequency range 30MHz – 1 GHz

No spurious frequencies at less than 20 dB below the limit:

Frequency range 1 GHz – 26GHz

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

Frequency (MHz)	Unwanted Lvl (dBµV/m)	Detector	Pol	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)	Raw Rec (dBµV)
12009.00	55.49	Peak	H	-27.8	0	39.0	44.9
12009.00	46.66	AVG	H	-27.8	0	39.0	33.7

Verdict

PASS

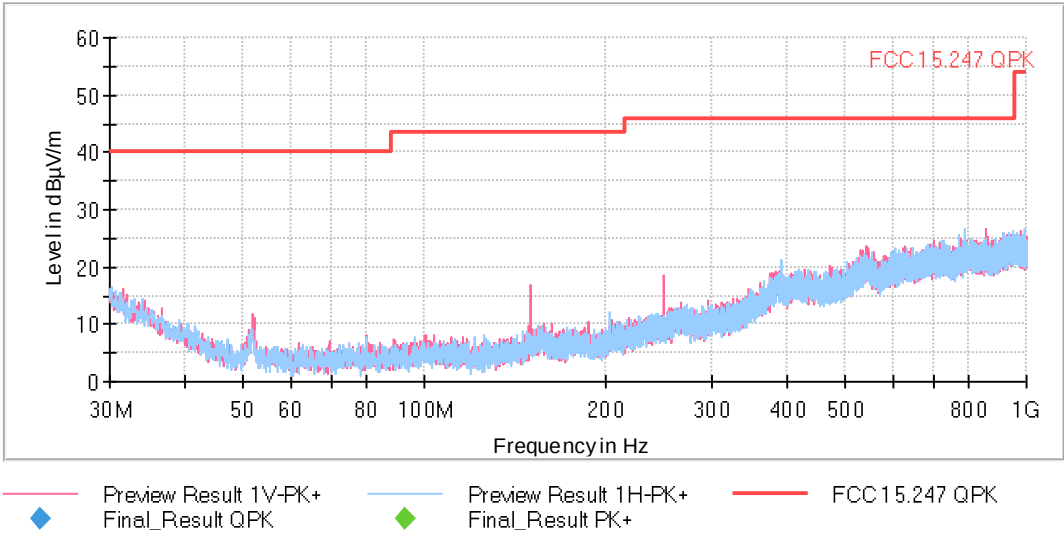
Attachments

Spectrum Analyzer Parameters:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	32.333 kHz	PK+	100 kHz	Coupled	0 dB
1 GHz - 3 GHz	200 kHz	PK+; AVG	1 MHz	1 s	0 dB
3 GHz - 17 GHz	466.667 kHz	PK+; AVG	1 MHz	1 s	0 dB
17 GHz - 26 GHz	300 kHz	PK+; AVG	1 MHz	1 s	0 dB

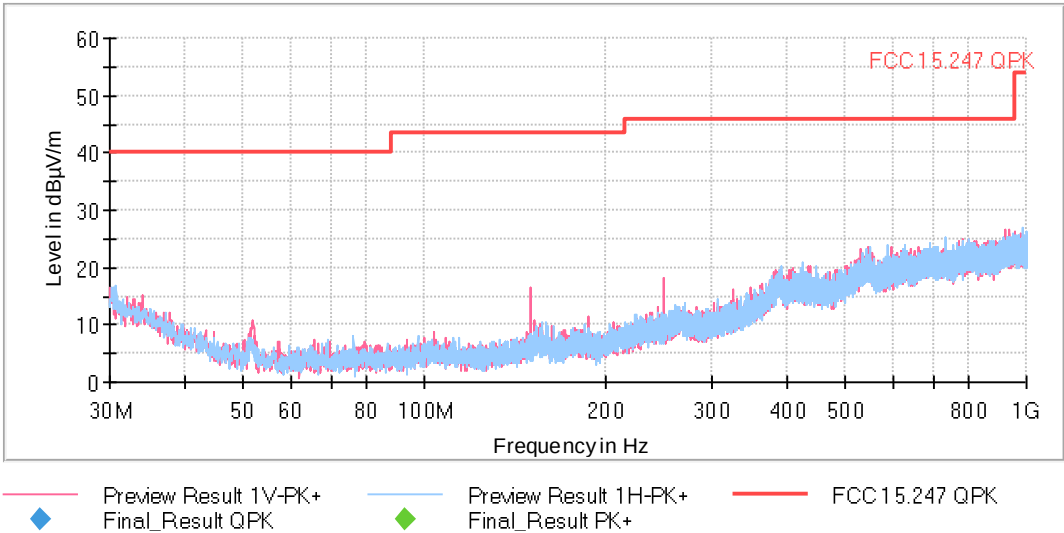
Frequency Range GHz = [0.03, 1] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images



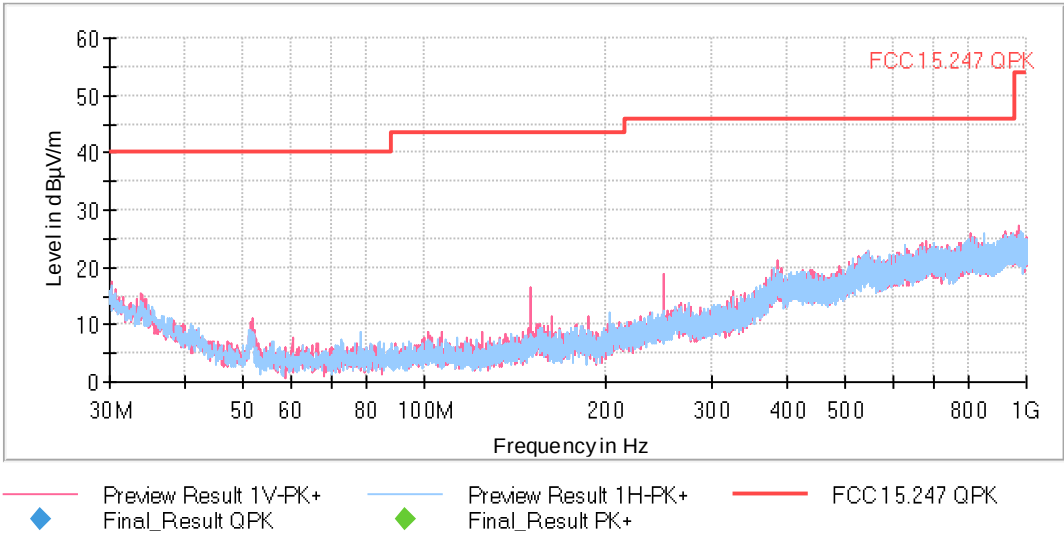
Frequency Range GHz = [0.03, 1] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images



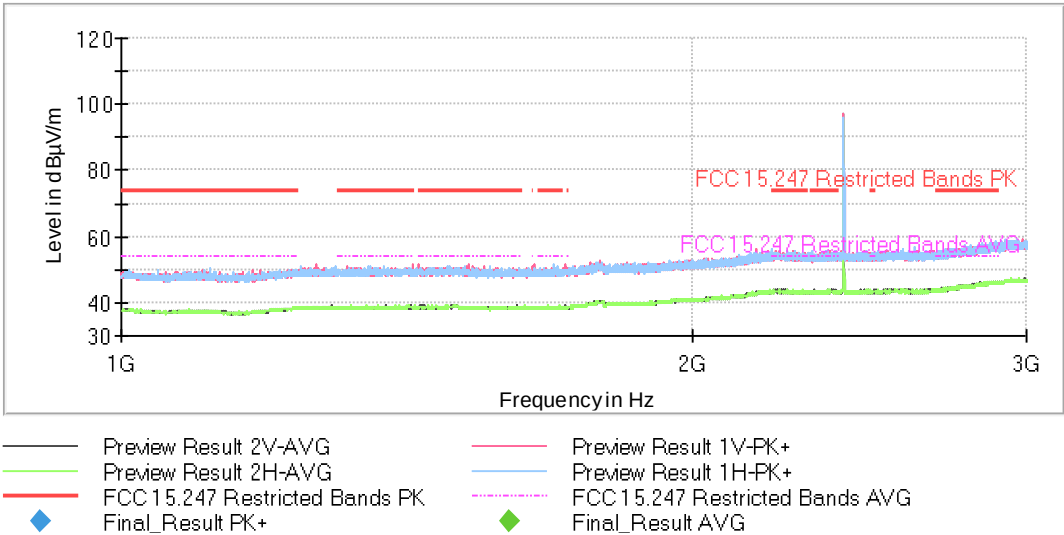
Frequency Range GHz = [0.03, 1] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images

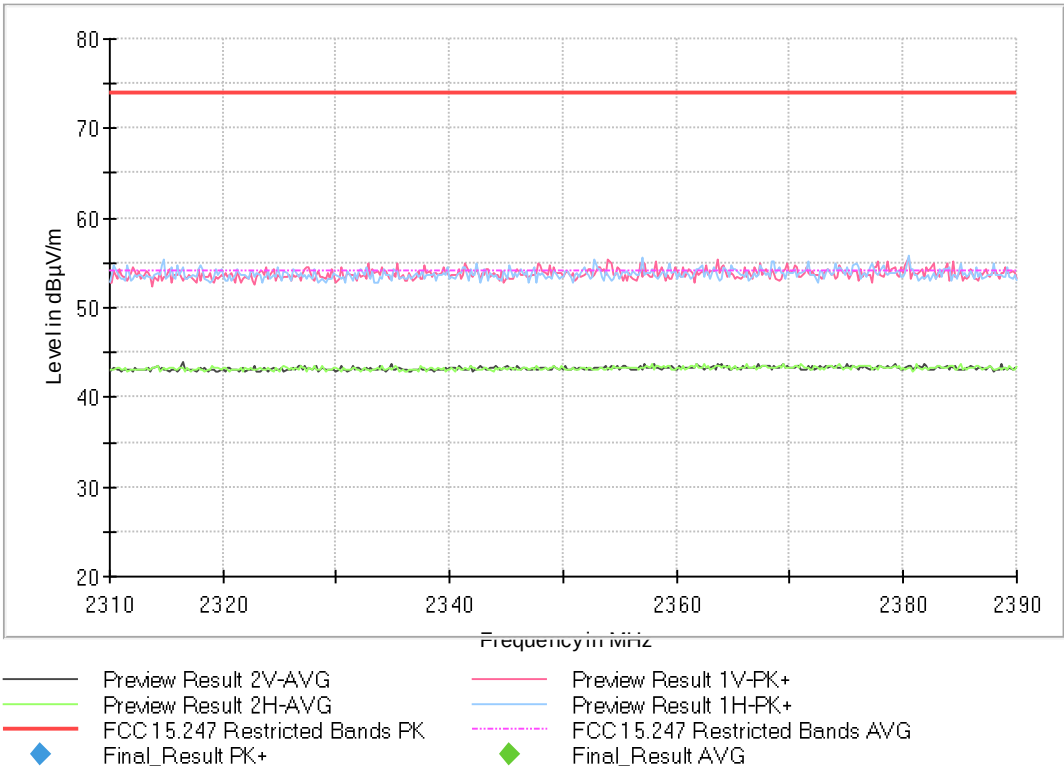


Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

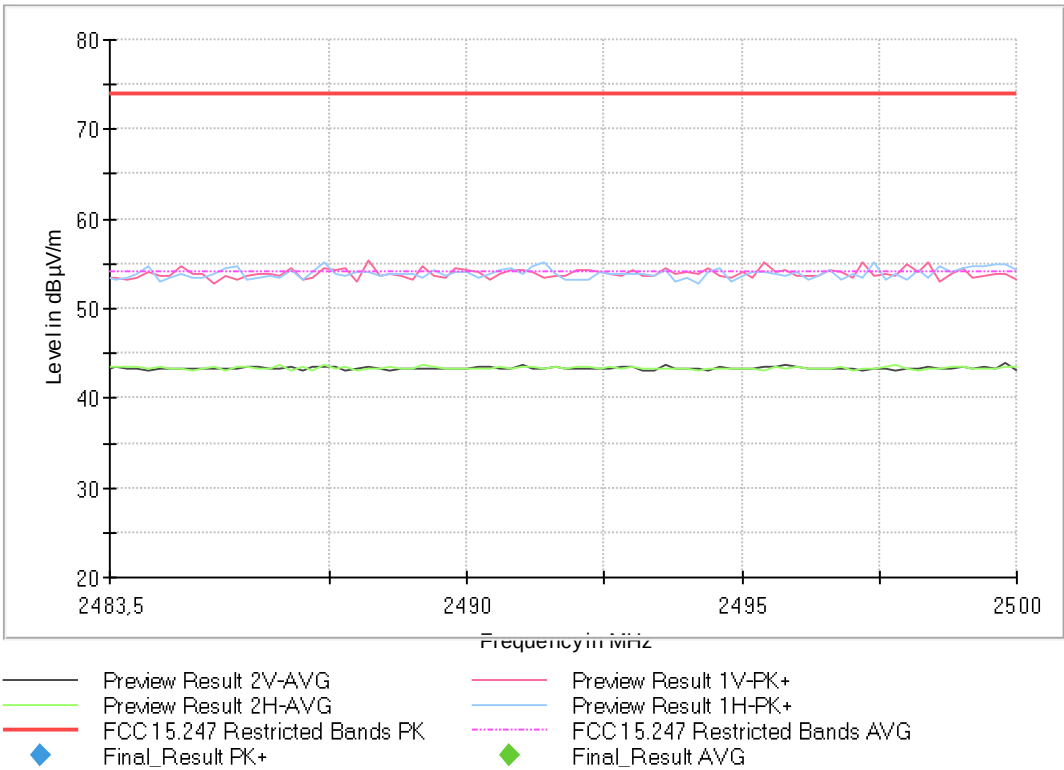
Images



Full Spectrum



Full Spectrum



Frequency Range GHz = [1, 3]

Equipment Type = Digital Transmission System (DTS)

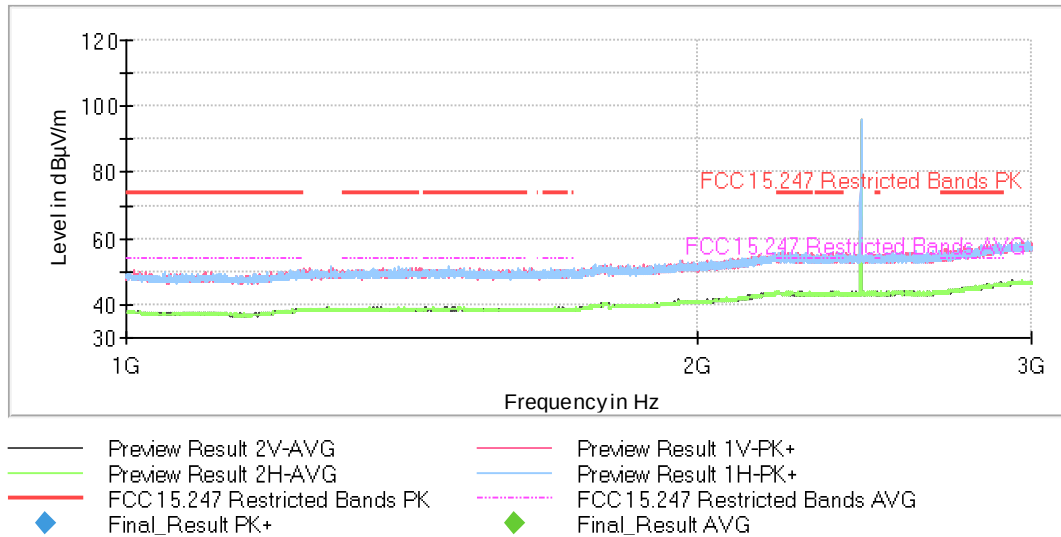
Modulation = BTLE 5.2 (GFSK 1 Mbit/s)

Frequency MHz = 2440.00000

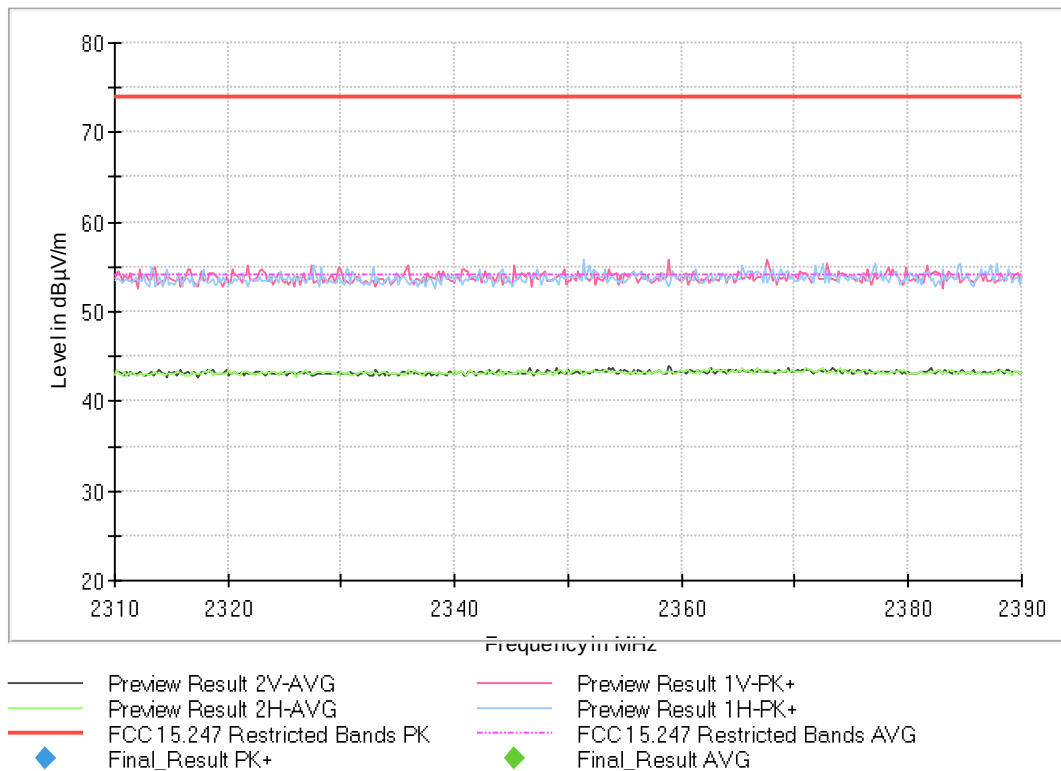
MIMO Mode = SISO

Active Port = 1

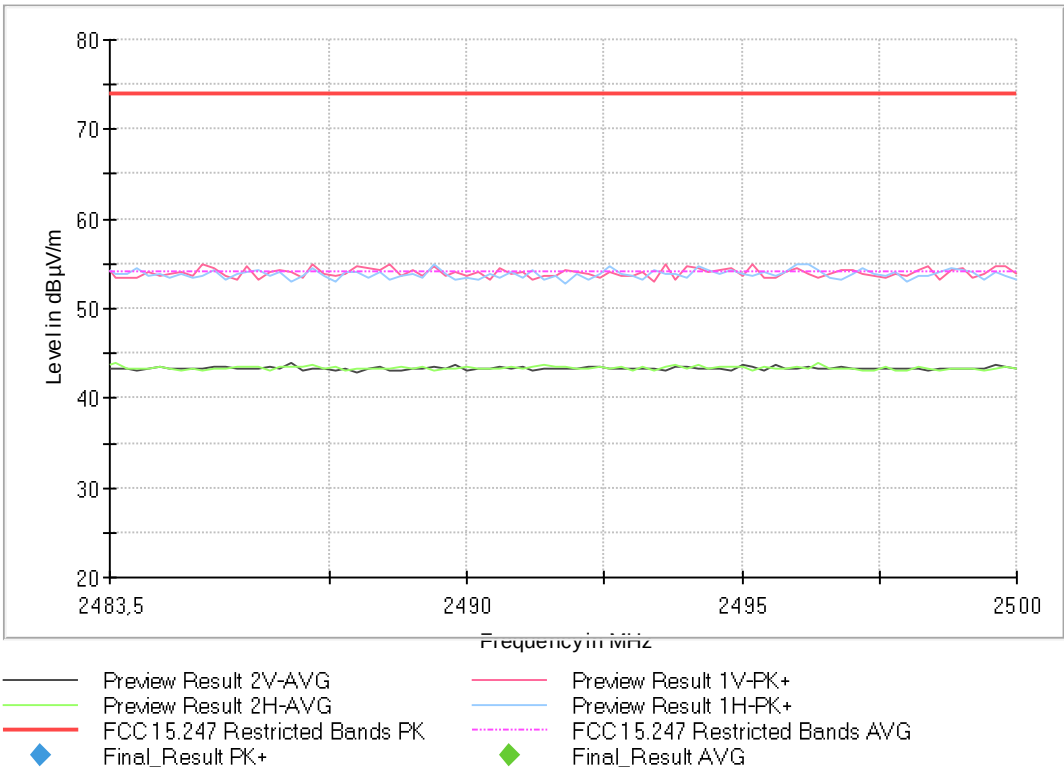
Images



Full Spectrum

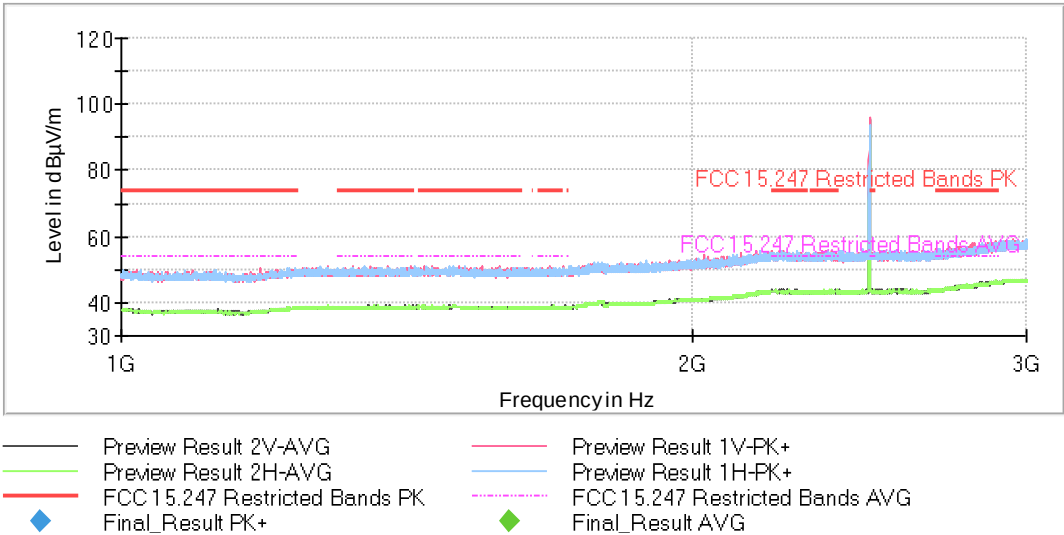


Full Spectrum

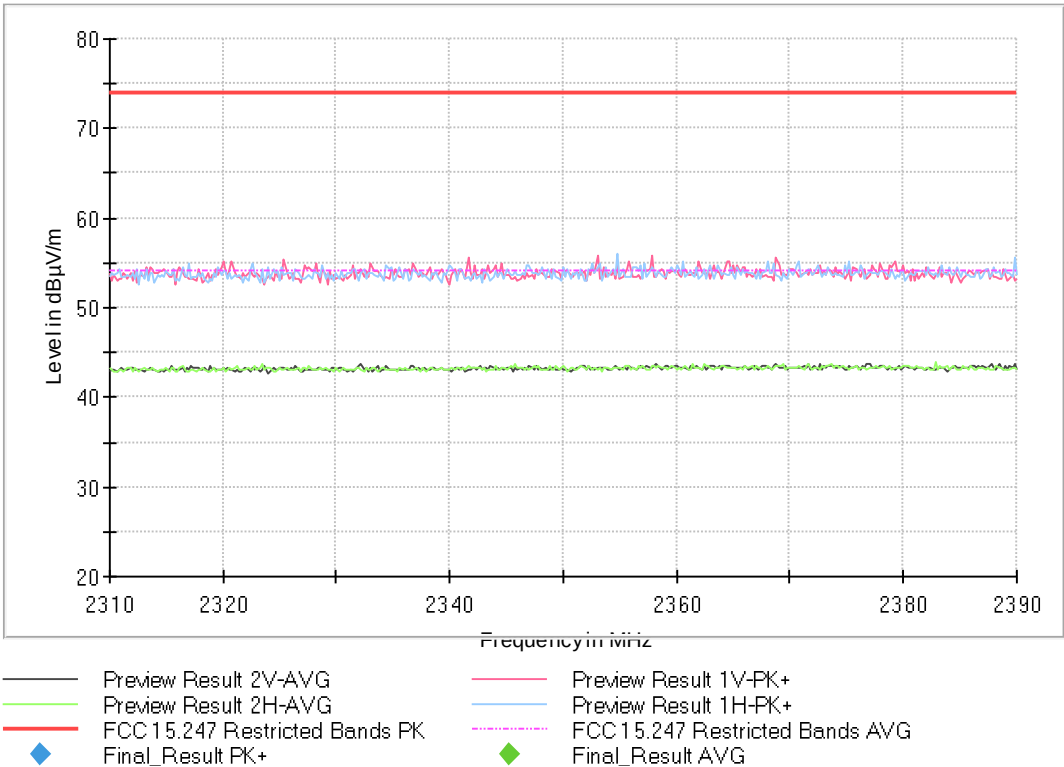


Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

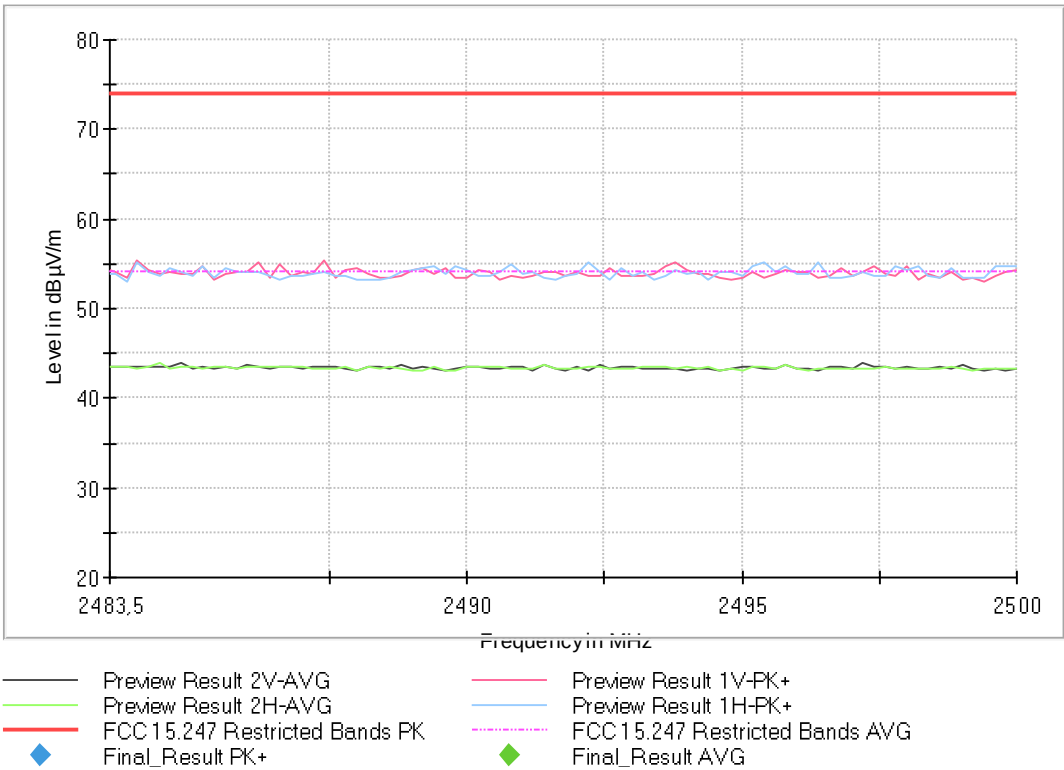
Images



Full Spectrum

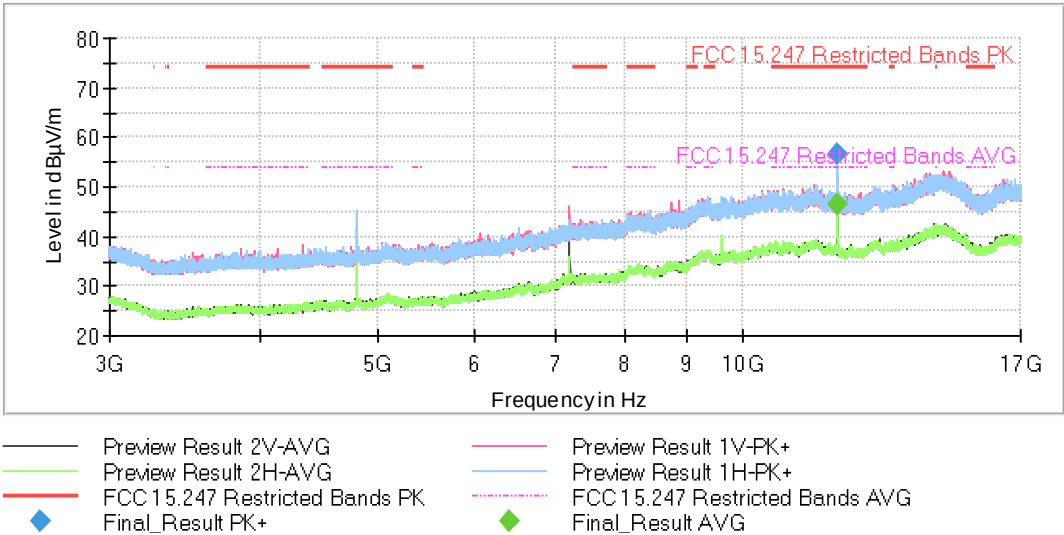


Full Spectrum



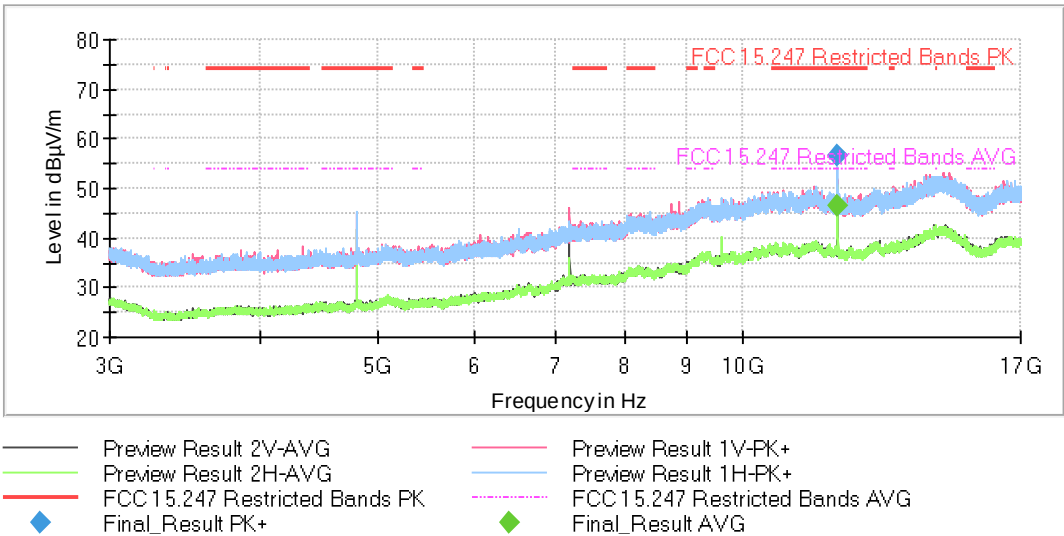
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images



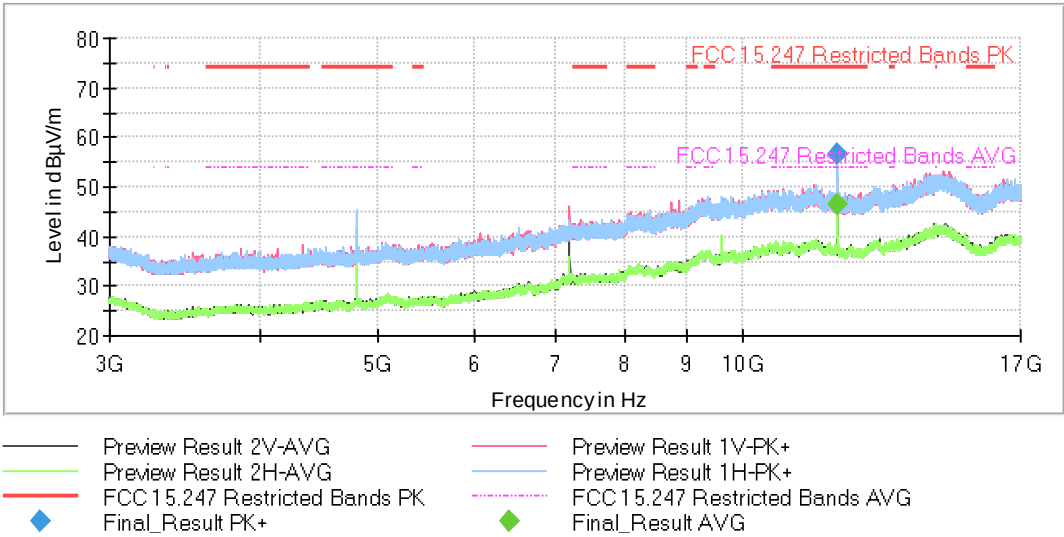
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images



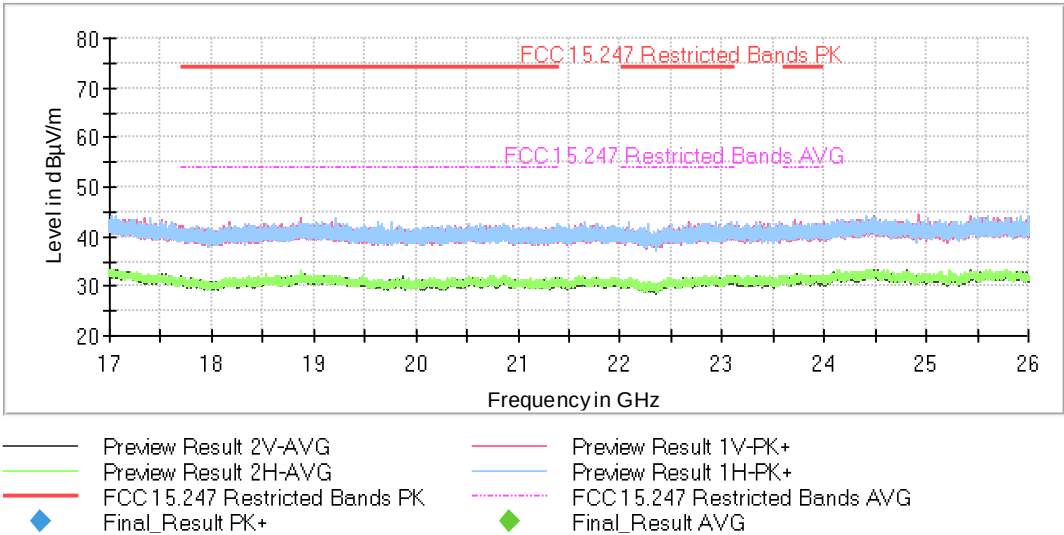
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images



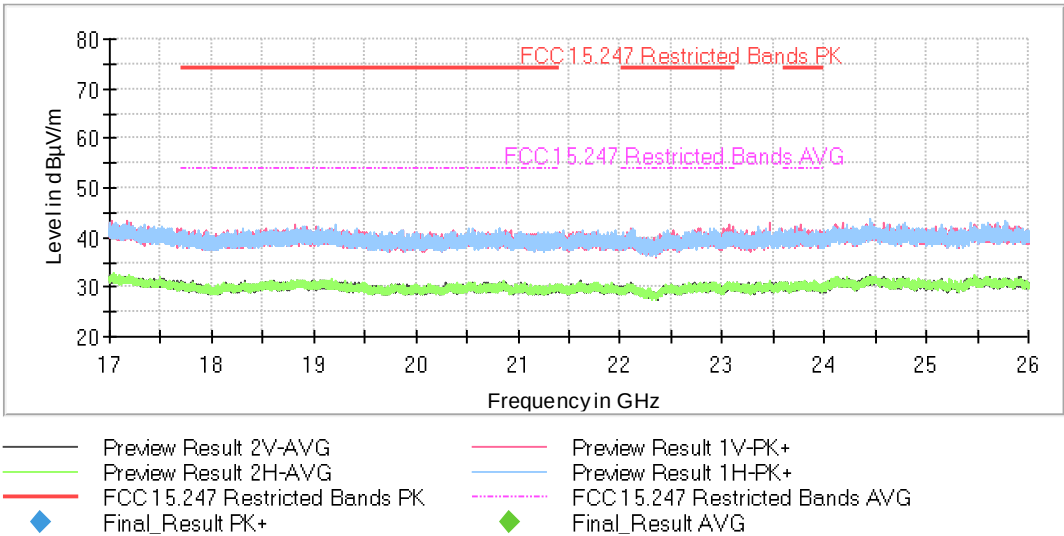
Frequency Range GHz = [17, 26] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images



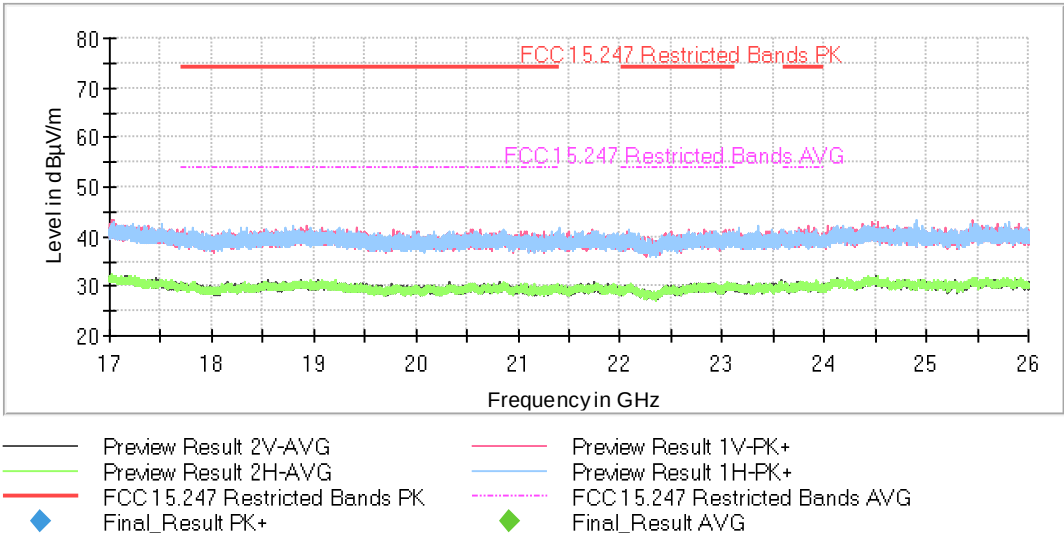
Frequency Range GHz = [17, 26] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images



Frequency Range GHz = [17, 26] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images



Modulation: BTLE 5.2 (GFSK 2 Mbit/s)

Frequency range 30MHz – 1 GHz

No spurious frequencies at less than 20 dB below the limit:

Frequency range 1 GHz – 26GHz

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

Frequency (MHz)	Unwanted Lvl (dBµV/m)	Detector	Pol	Sig Path (dB)	Preamp (dB)	Trd Corr. (dB/m)	Raw Rec (dBµV)
12009.00	56.16	Peak	H	-27.8	0	39.0	45.0
12009.00	44.90	AVG	H	-27.8	0	39.0	33.7

Verdict
PASS

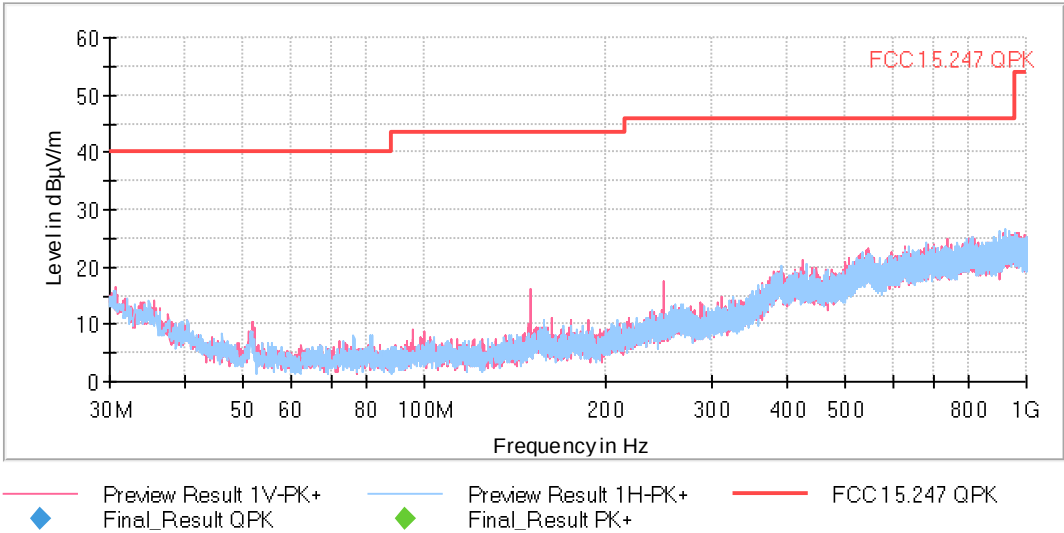
Attachments

Spectrum Analyzer Parameters:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	32.333 kHz	PK+	100 kHz	Coupled	0 dB
1 GHz - 3 GHz	200 kHz	PK+; AVG	1 MHz	1 s	0 dB
3 GHz - 17 GHz	466.667 kHz	PK+; AVG	1 MHz	1 s	0 dB
17 GHz - 26 GHz	300 kHz	PK+; AVG	1 MHz	1 s	0 dB

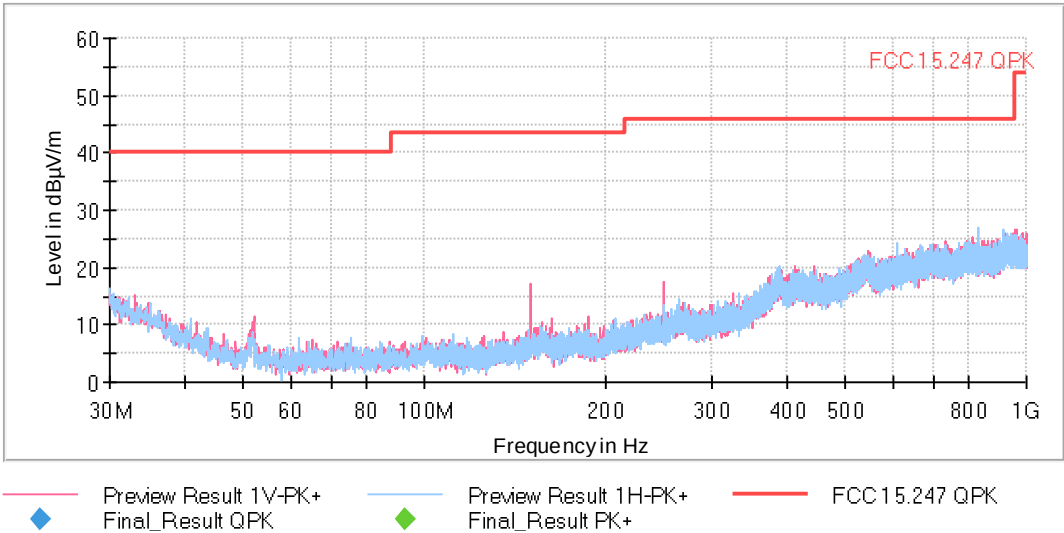
Frequency Range GHz = [0.03, 1] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images



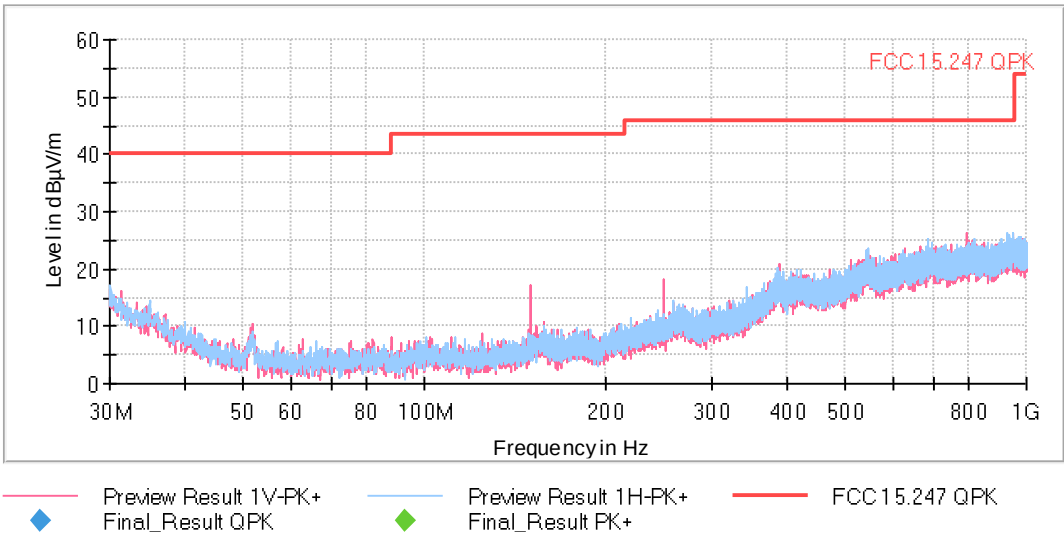
Frequency Range GHz = [0.03, 1] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images



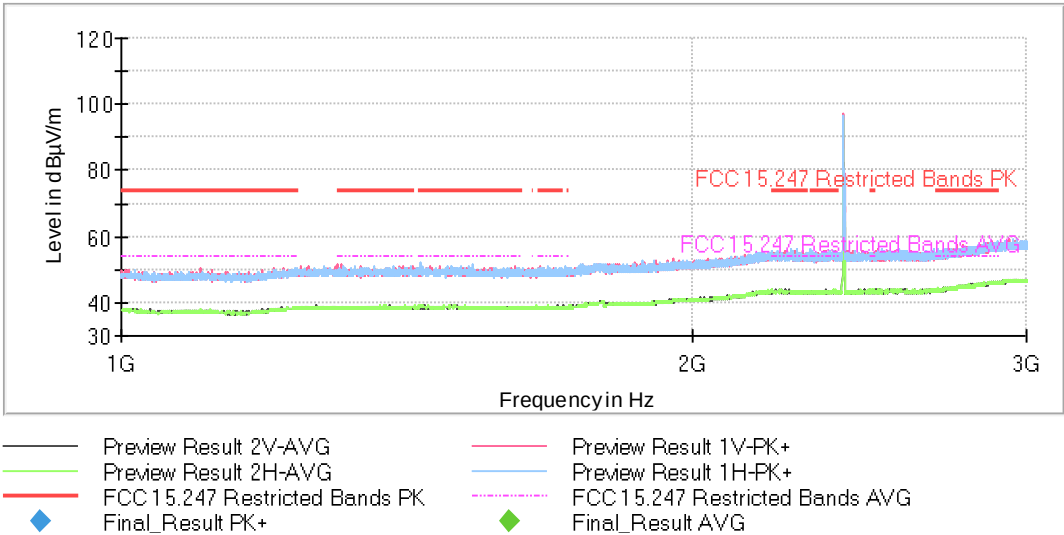
Frequency Range GHz = [0.03, 1] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images

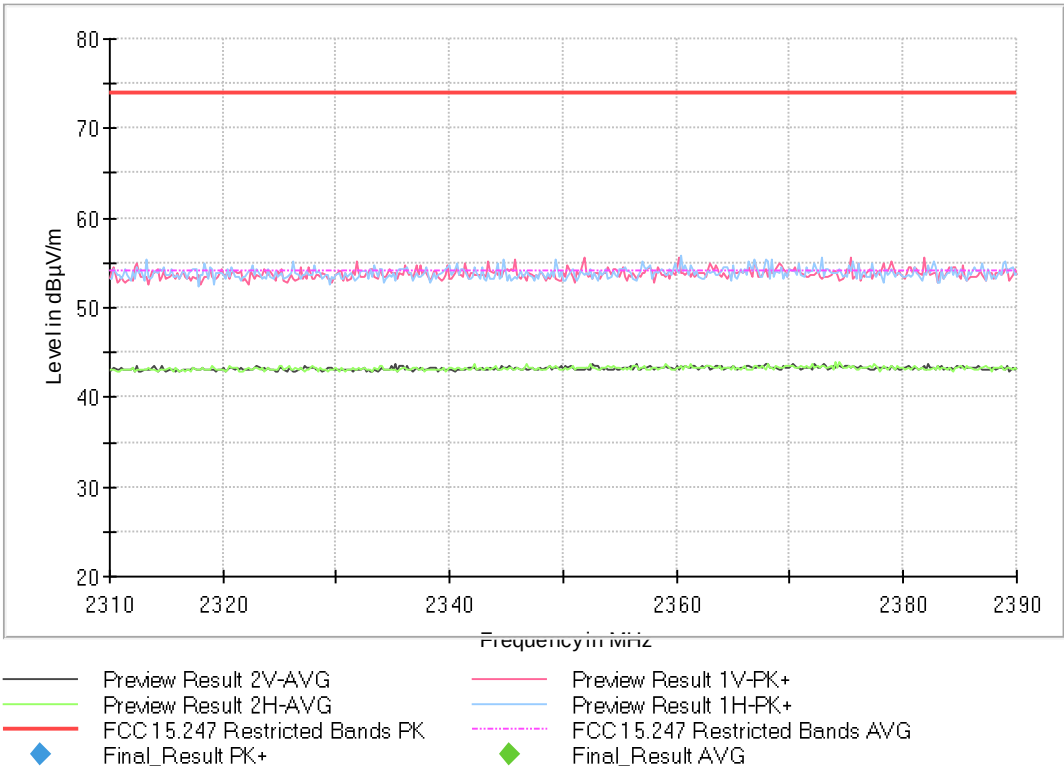


Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

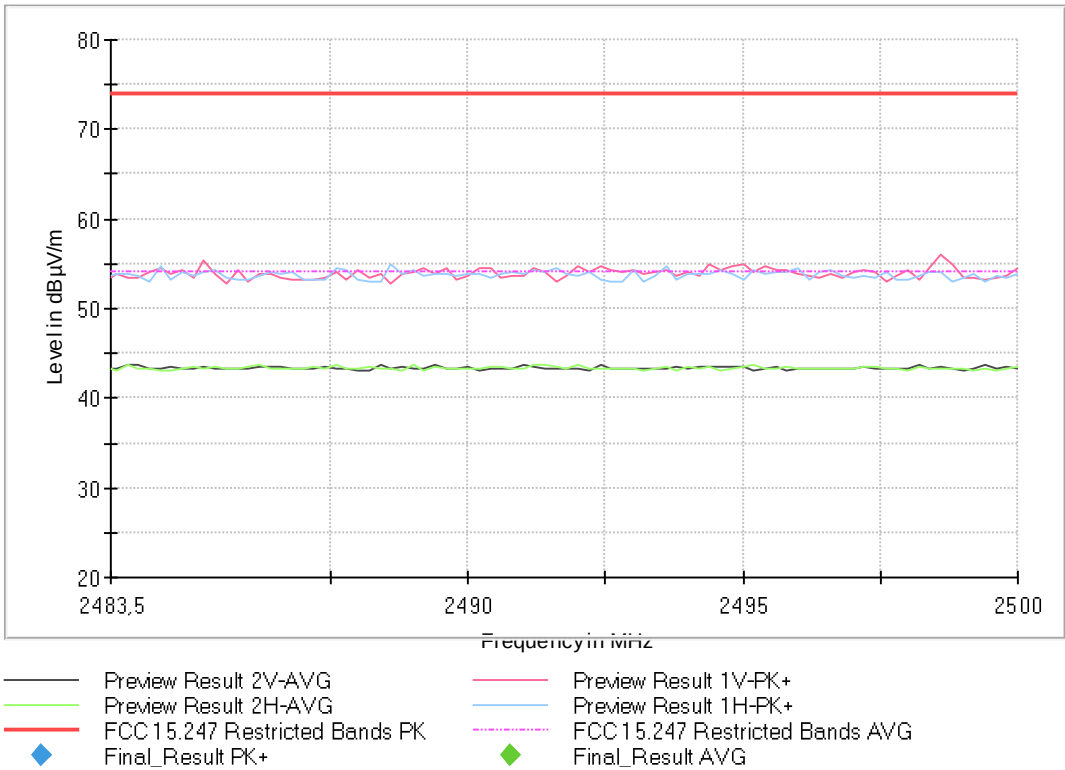
Images



Full Spectrum

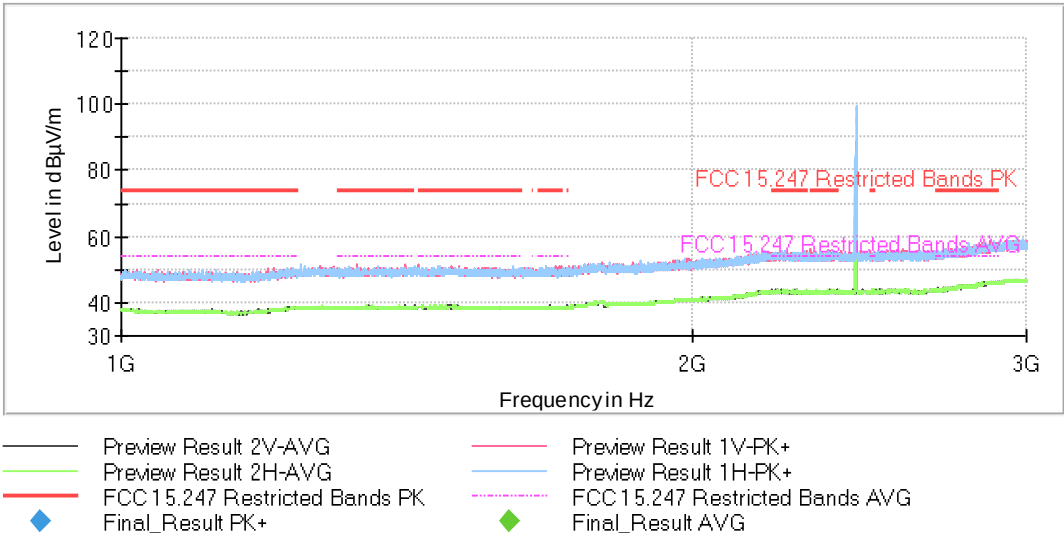


Full Spectrum

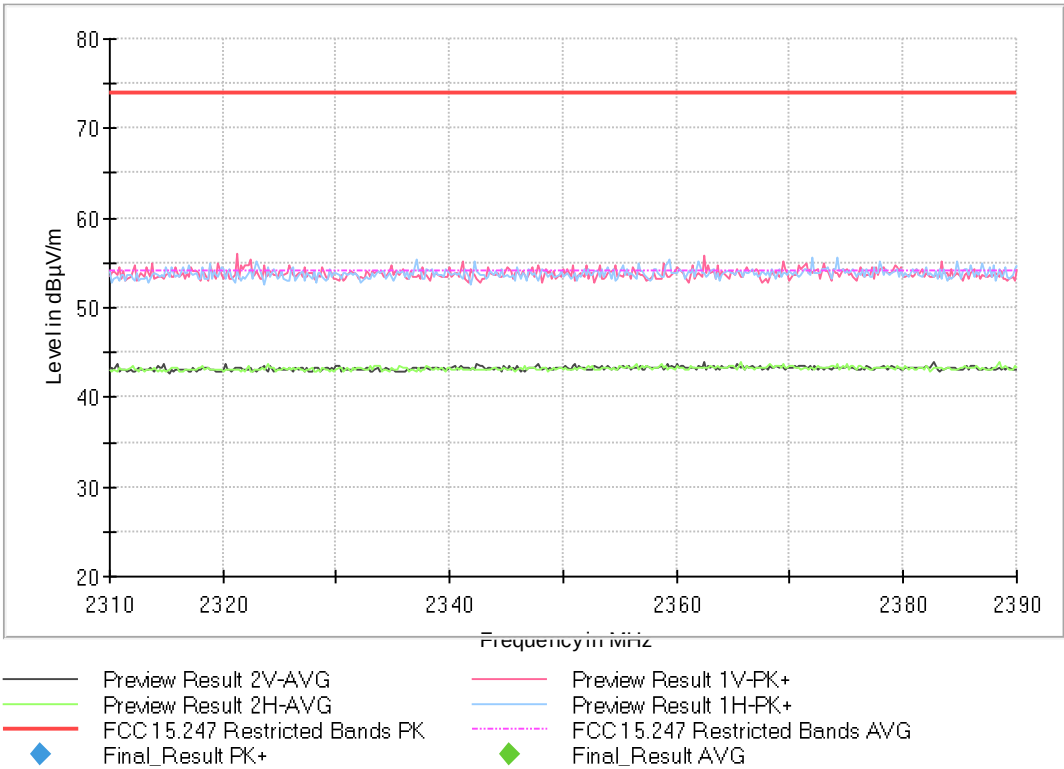


Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

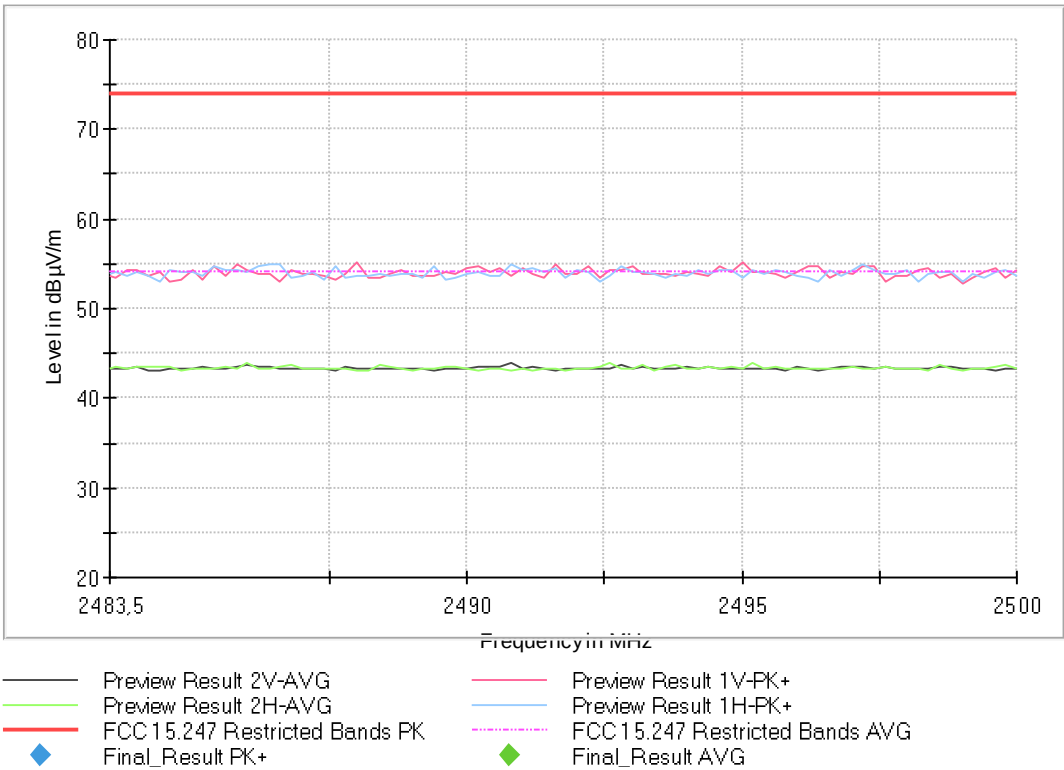
Images



Full Spectrum

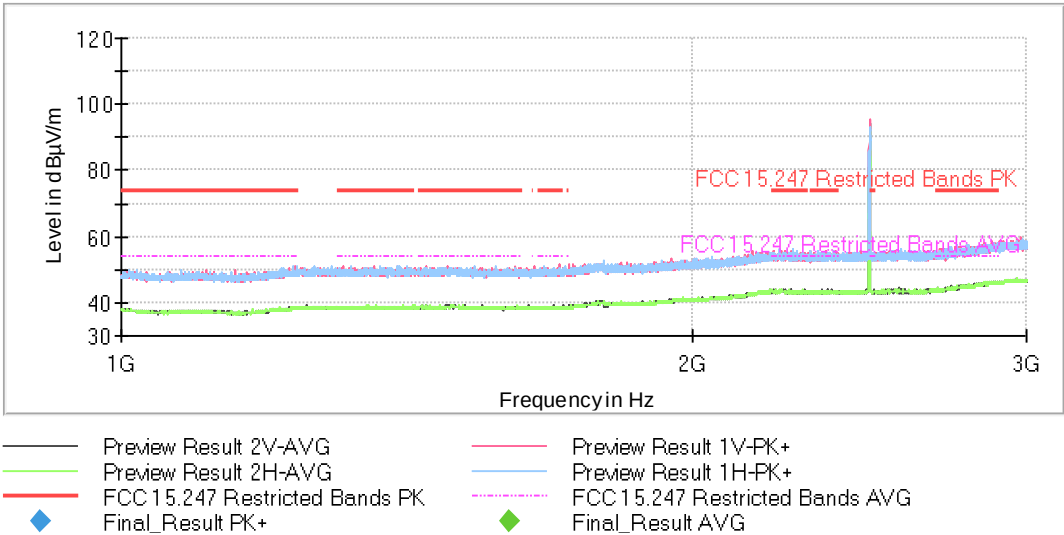


Full Spectrum

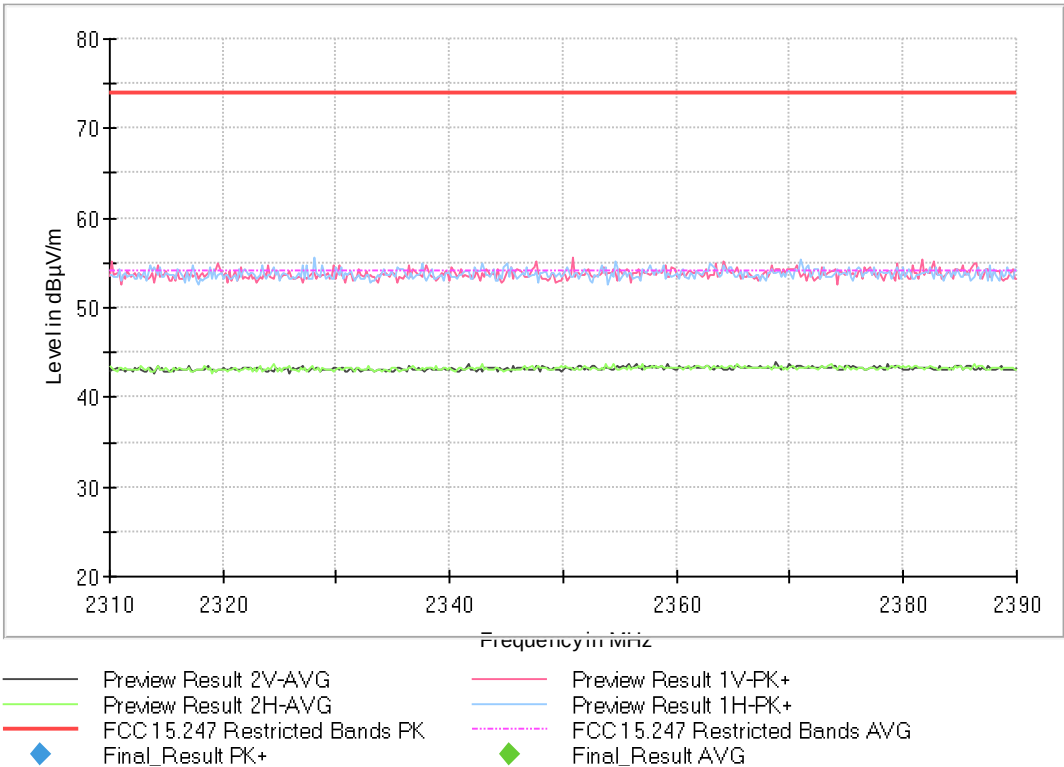


Frequency Range GHz = [1, 3] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

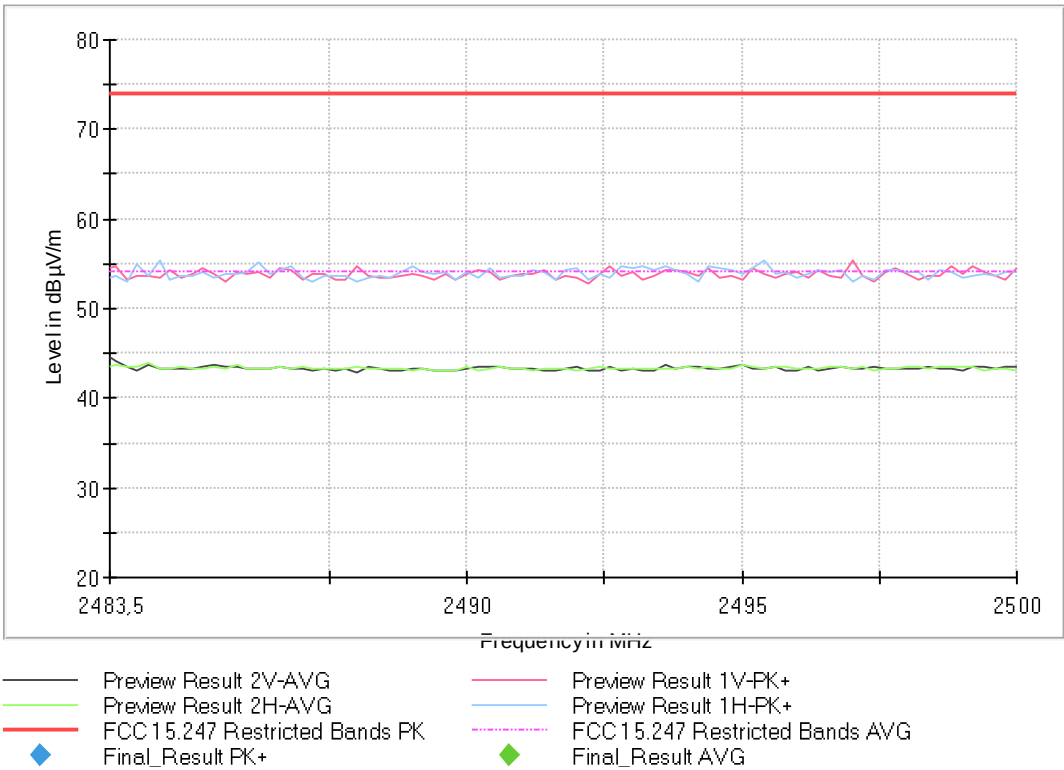
Images



Full Spectrum

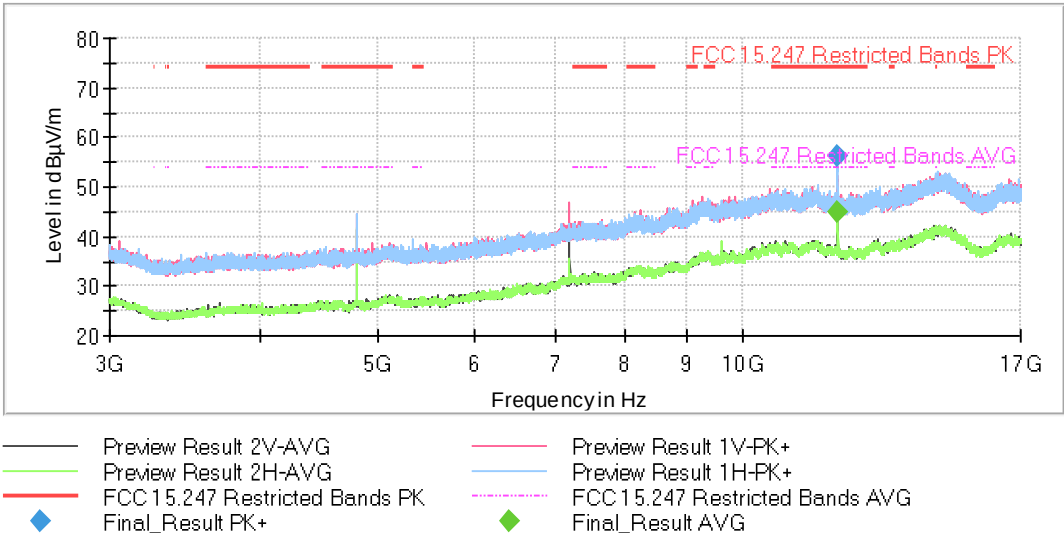


Full Spectrum



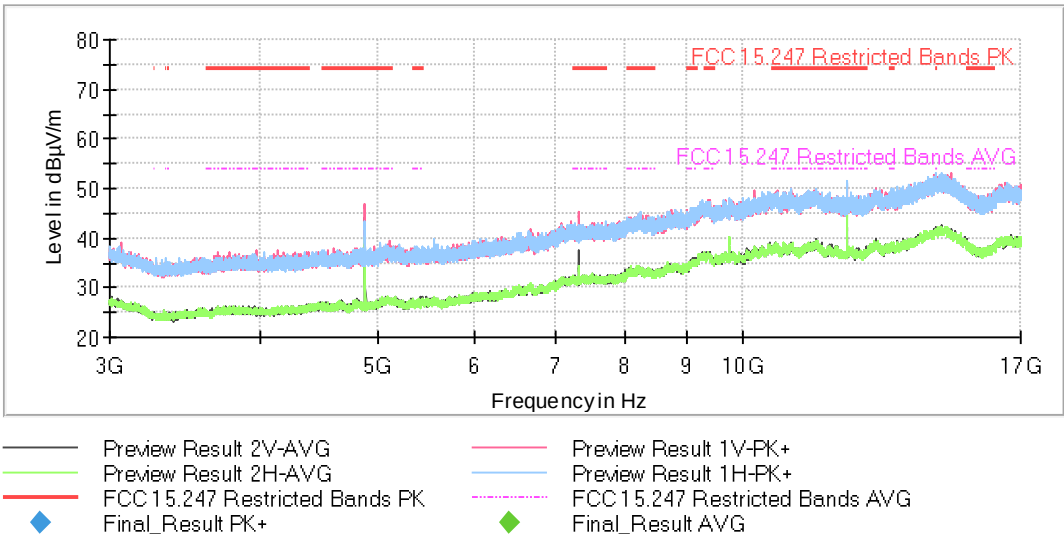
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images



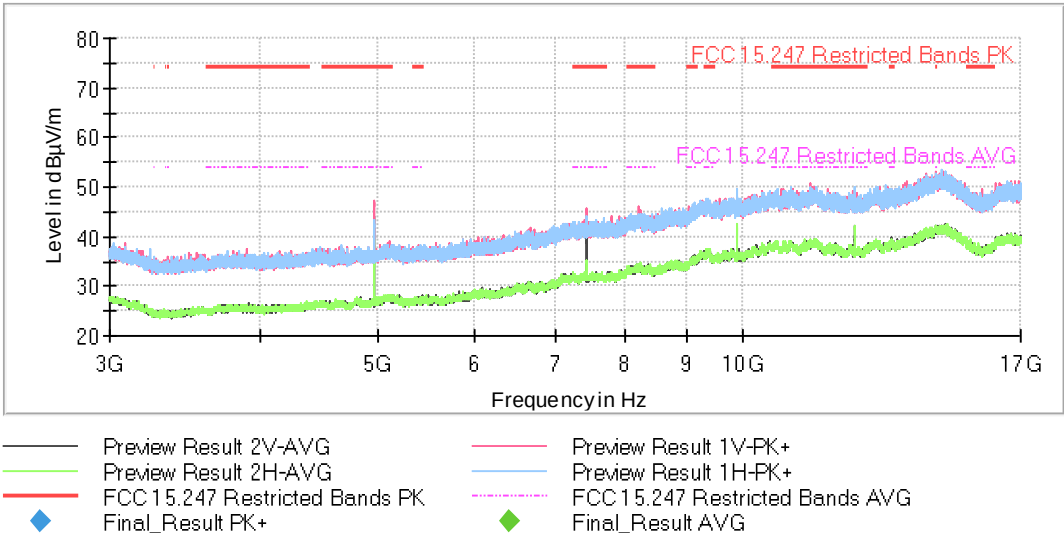
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
MIMO Mode = SISO Active Port = 1

Images



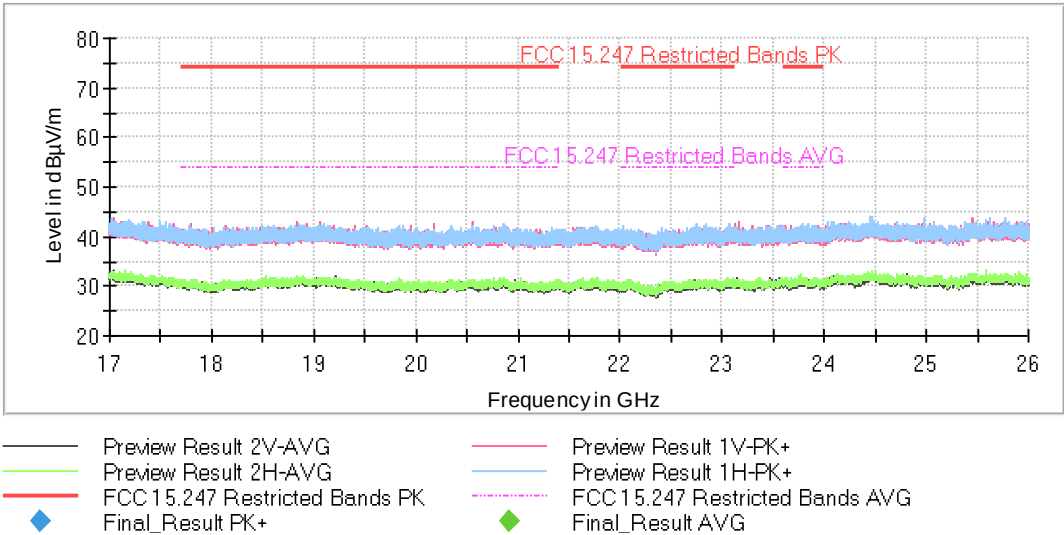
Frequency Range GHz = [3, 17] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2480.00000
MIMO Mode = SISO Active Port = 1

Images



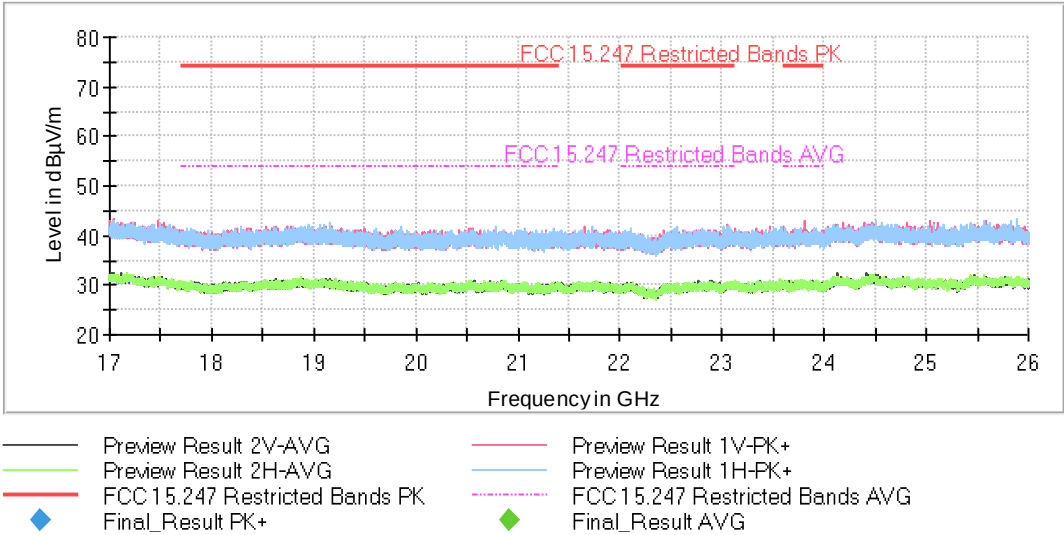
Frequency Range GHz = [17, 26] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2402.00000
MIMO Mode = SISO Active Port = 1

Images



Frequency Range GHz = [17, 26] Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.2 (GFSK 2 Mbit/s) Frequency MHz = 2440.00000
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Images



Frequency Range GHz = [17, 26] Equipment Type = Digital Transmission System (DTS)
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Images

