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

ISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:
76874RRF.001A2

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

(*) Identification of item tested	Ultrasonic gas meter
(*) Trademark	Pietro Fiorentini S.p.a
(*) Model and /or type reference	SSM-iCON250-U7-NTC-004
Other identification of the product	FCC ID: 2BB84-SSMICON250 IC: 31434-SSMICON250
(*) Features	Features: Bluetooth LE HW version: 2.0 SW version: 1.0
Applicant	Pietro Fiorentini S.p.a Via Enrico Fermi 8/10, 36057 Arcugnano (VI) - ITALY
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 3 (August 2023). CANADA RSS-Gen Issue 5 amendment 2 (February 2021). Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05r02 dated April 2, 2019. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (C:A29507456)
Date of issue	2025-01-30
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.

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

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

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

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General conditions

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

Uncertainty

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

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

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

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

The total uncertainty of the measurement system for the conducted testing of EUT is:
RF Peak Output Power: Measurement uncertainty ≤ ± 0,80 dB
RF Average Output Power: Measurement uncertainty ≤ ± 0,99 dB
Power Spectral Density: Measurement uncertainty ≤ ± 0,99 dB
6dB Bandwidth: Measurement uncertainty ≤ ± 2,84 %
Occupied Channel Bandwidth: Measurement uncertainty ≤ ± 1,17 %
Conducted Band-edge spurious emissions: Measurement uncertainty ≤ ± 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 Ultrasonic gas meter. Ultrasonic gas meter for residential and light industrial environment; local communication by BLE interface; remote communication by LTE catM/NB modem in SSM-COM module.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial Nº	Date of Reception	Application
S/01	75903_1.1	Ultrasonic gas meter	SSM-iCON250-U7-NTC-004	--	2023-07-05	Element Under Test
S/01	75208B_13.1	Device Electronic	--	--	2023-05-02	Auxiliary Element
S/02	75208B_13.1	Device Electronic	--	--	2023-05-02	Element Under Test
S/02	75208B_7.1	Battery Lithium	ER34615M	--	2023-03-30	Element Under Test
S/02	75903_2.1	Ultrasonic gas meter	SSM-iCON250-U7-NTC-004	--	2023-07-05	Element Under Test
S/02	75903_3.1	Module circuit board with display Conducted	--		2023-08-02	Element Under Test

Notes referenced to samples during the project:

Id	Type
S/01	Radiated
S/02	Conducted

Test sample description

Ports…… :	Port name and description	Cable			
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)
	.....	.....	[ ]	[ ]	[ ]
Supplementary information to the ports…… :	.....				

Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[ ]	AC:	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	AC:	[ ]	[ ]	[ ]	[ ]	[ ]
	[X]	DC: 3.6V LiSOCl Primary battery, non-rechargeable, non-replaceable					
	[ ]	DC:					
Rated Power .....:	.....						
Clock frequencies.....:	38.4MHz (BLE chipset)						
Other parameters .....:	.....						
Software version .....:	.....						
Hardware version .....:	.....						
Dimensions in cm (W x H x D) ....:	22,5X15X12,5						
Mounting position .....:	[ ]	Table top equipment					
	[X]	Wall/Ceiling mounted equipment					
	[ ]	Floor standing equipment					
	[ ]	Hand-held equipment					
	[ ]	Other:					

Modules/parts.....:	Module/parts of test item	Type	Manufacturer
	.....	.....	.....
Accessories (not part of the test item) .....:	Description	Type	Manufacturer
	.....	.....	.....
	Description	File name	Issue date

Documents as provided by the applicant.....:	BLE Chipset datasheet	EFR32BG22C112 Wireless Gecko SoC Data Sheet	June 2021 rev.1.1
	Antenna datasheet	FM13C25L-0050S	14/03/2023
	Modem datasheet	Quectel_BG95_Series_LPWA_Specification_V1.6-1	rev. 1.6
	.....	.....	.....

(3) Only for Medical Equipment

Identification of the client

Pietro Fiorentini S.p.a
Via Enrico Fermi 8/10, 36057 Arcugnano (VI) - ITALY

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2023-09-30
Date (finish)	2023-10-02

Document history

Report number	Date	Description
76874RRF.001	2023-10-27	First release.
76874RRF.001A1	2024-01-19	It is modified due to update of information and features. This modification test report cancels and replaces the test report 76874RRF.001
76874RRF.001A2	2025-01-30	It is modified due to typos and missing information. This modification test report cancels and replaces the test report 76874RRF.001A1

Environmental conditions

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

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

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

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

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

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

Remarks and comments

The tests have been performed by the technical personnel: Francisco Lopez Chamorro and José Manuel Jiménez González.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
6791	SEMIANECHOIC ABSORBER LINED CHAMBER	FACT 3 200 STP	ETS LINDGREN	N/A
6792	SHIELDED ROOM	S101	ETS LINDGREN	N/A
6143	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2023-10-29
6144	PRE-AMPLIFIER G>40dB 10MHz-6GHz	BLNA 0160-01N	BONN ELEKTRONIK	2024-07-25
7817	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2023-12-30
4611	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2026-01-16
3783	PRE-AMPLIFIER G>30dB 1GHz-18GHz	BLMA 0118-3A	BONN ELEKTRONIK	2023-12-29
4848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	N/A
6793	SHIELDED ROOM	S101	ETS LINDGREN	N/A
4657	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK MESS-ELEKTRONIK	2026-06-12
8856	PRE-AMPLIFIER G>30dB 18GHz – 40GHZ	BLMA 1840-4A	BONN ELEKTRONIK	2023-11-02
7796	EXTENSION FOR OPEN SWITCH UNIT UP TO 40GHz	OSP-B157Wx	ROHDE AND SCHWARZ	2024-03-16
8848	OPEN SWITCH UNIT UP TO 7.5 GHz	OSP-B157W8 PLUS	ROHDE & SCHWARZ	2024-12-21
7798	SOFTWARE FOR 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

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	
Supplementary information and remarks: None			

Appendix A: Test results. Bluetooth Low Energy 5.0

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RSS-247 5.4 (d) / FCC 15.247 (b) (3) [Pkcp] Maximum Peak Conducted output power 37
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TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal:	3.6V LiSOCl Primary battery, non-rechargeable, non-replaceable V
Type of Power Supply:	Battery

ANTENNA (*):

Type of Antenna:	Custom Wideband passive antenna
Maximum Declared Antenna Gain:	-5dBi

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).

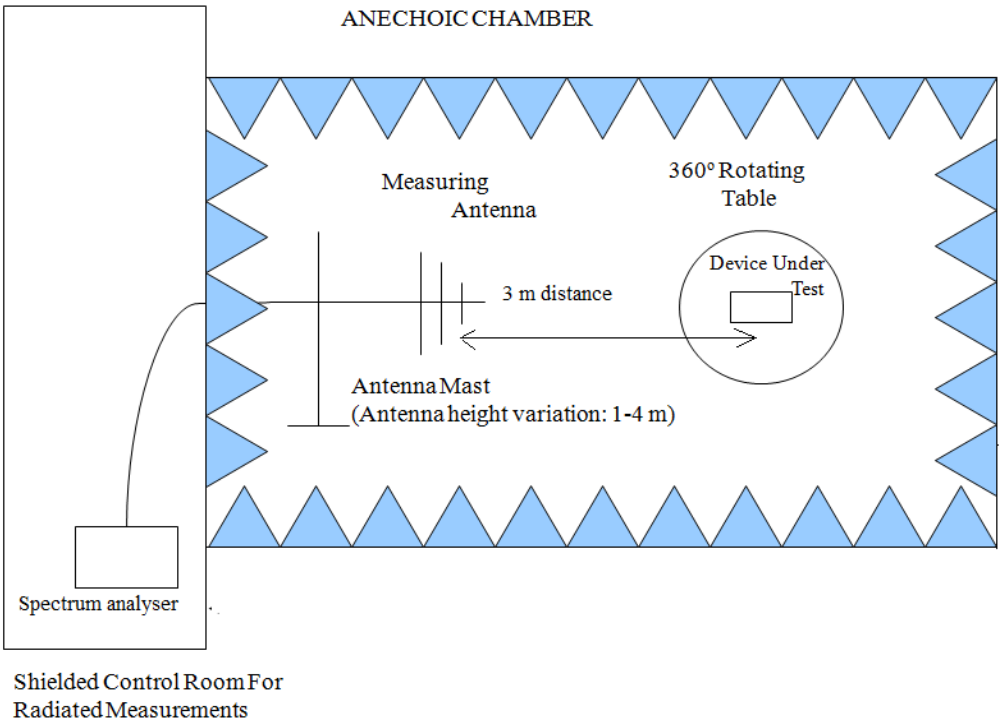
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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

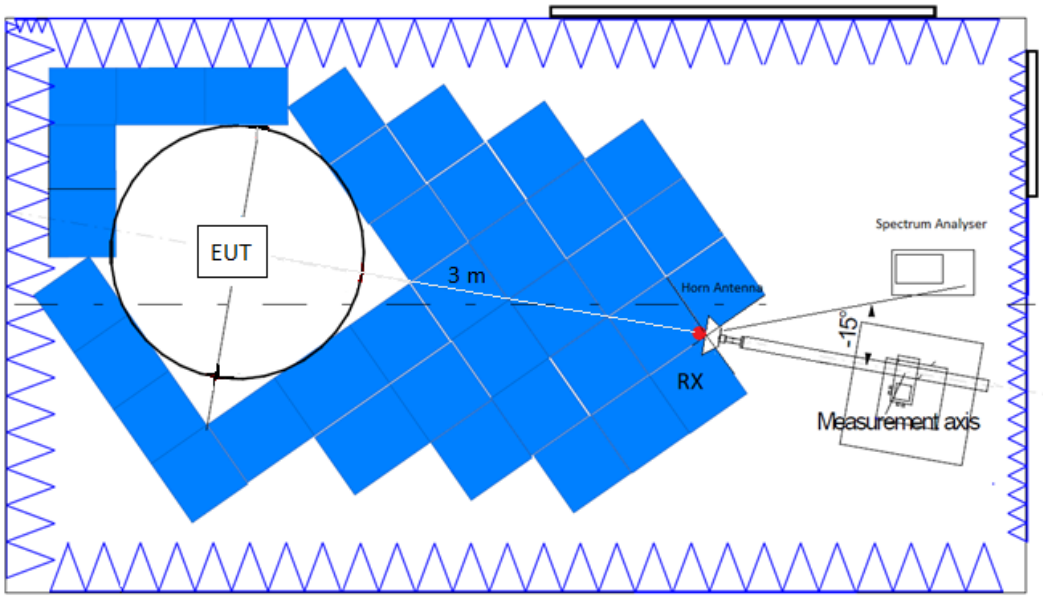
Measurements were made in both horizontal and vertical planes of polarization.

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

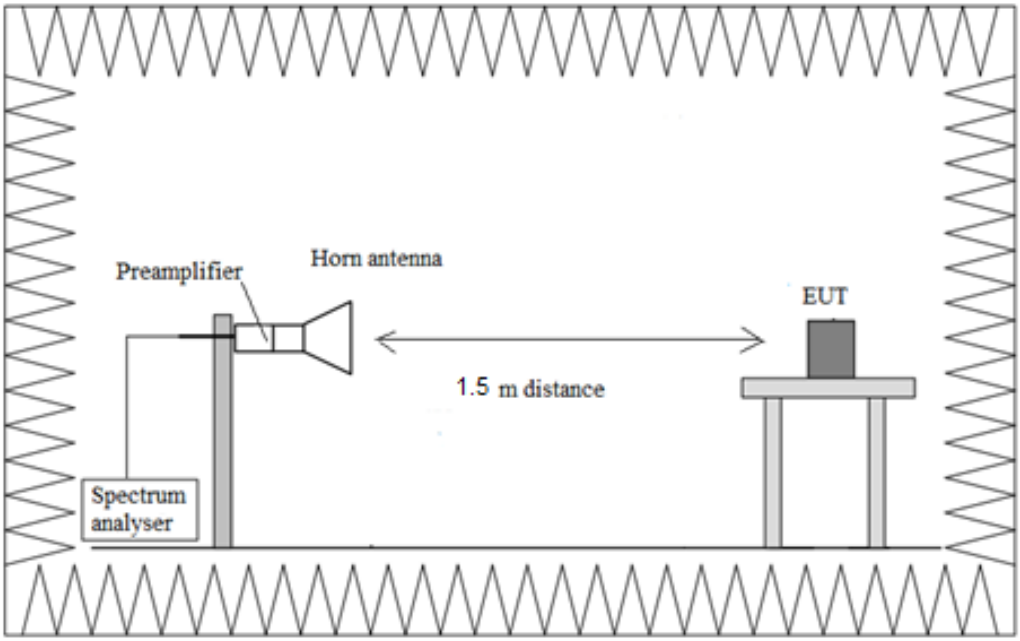
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup f > 17 GHz:



TEST CASES DETAILS

FCC 47 CFR Part 15.247 / RSS-247

99dBw Occupied Channel Bandwidth 99%

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

Equipment	BW (MHz)	Freq (MHz)	Port	Occ Ch BW (MHz)
Digital Transmission System (DTS)	1	2402.00000	1	1.020
		2440.00000		1.020
		2480.00000		1.020

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

Equipment	BW (MHz)	Freq (MHz)	Port	Occ Ch BW (MHz)
Digital Transmission System (DTS)	2	2402.00000	1	2.059
		2440.00000		2.059
		2480.00000		2.059

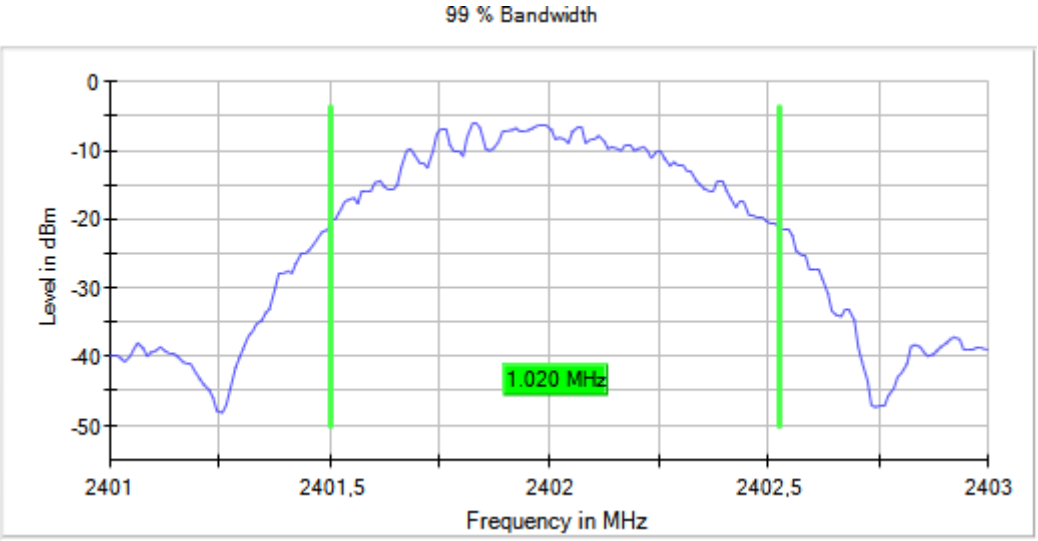
Verdict

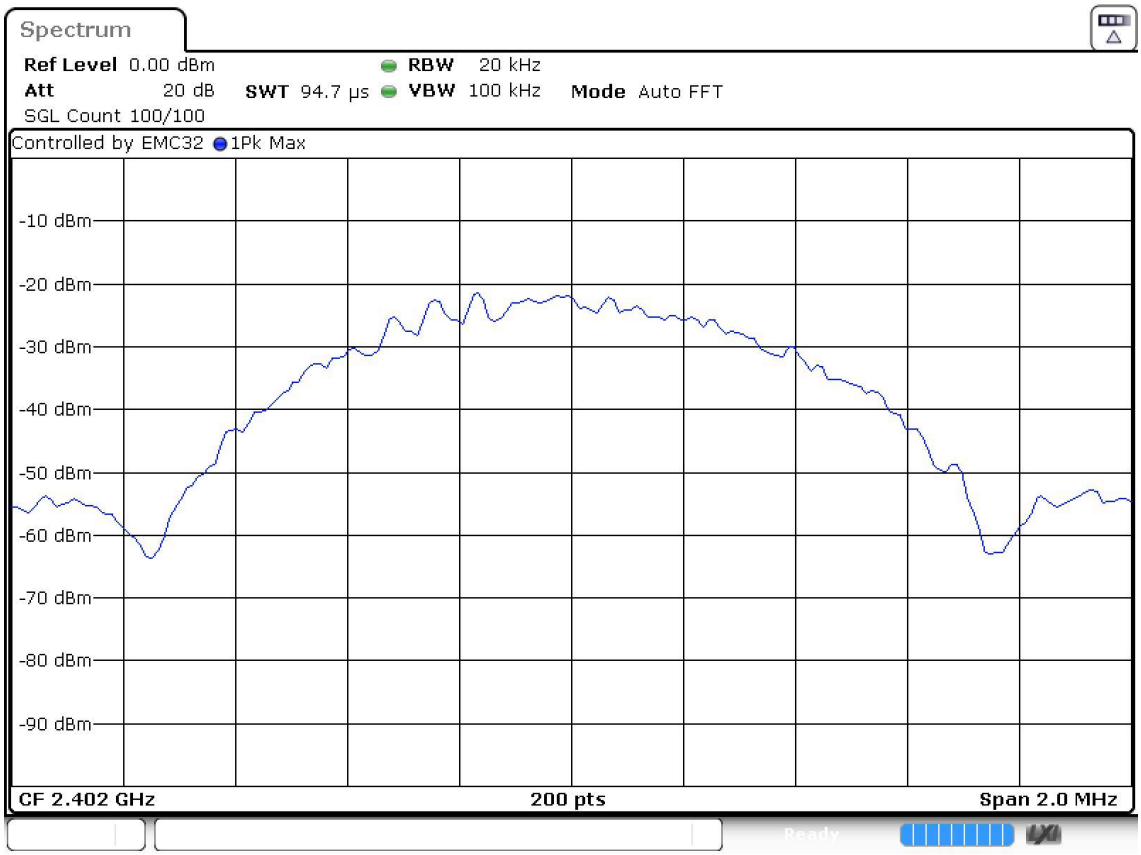
Pass

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:



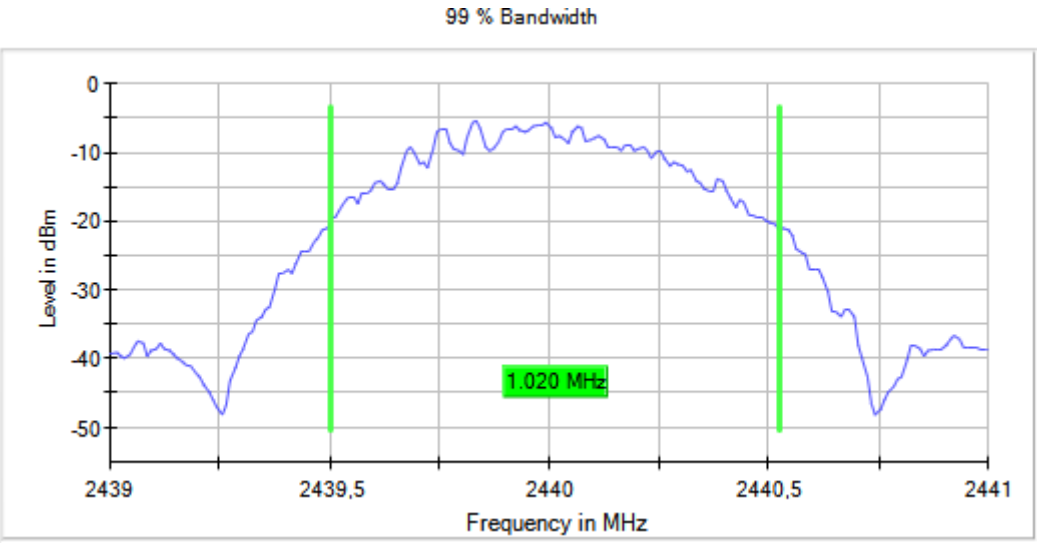


Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1

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

MIMO Mode = SISO Active Port = 1

Images:

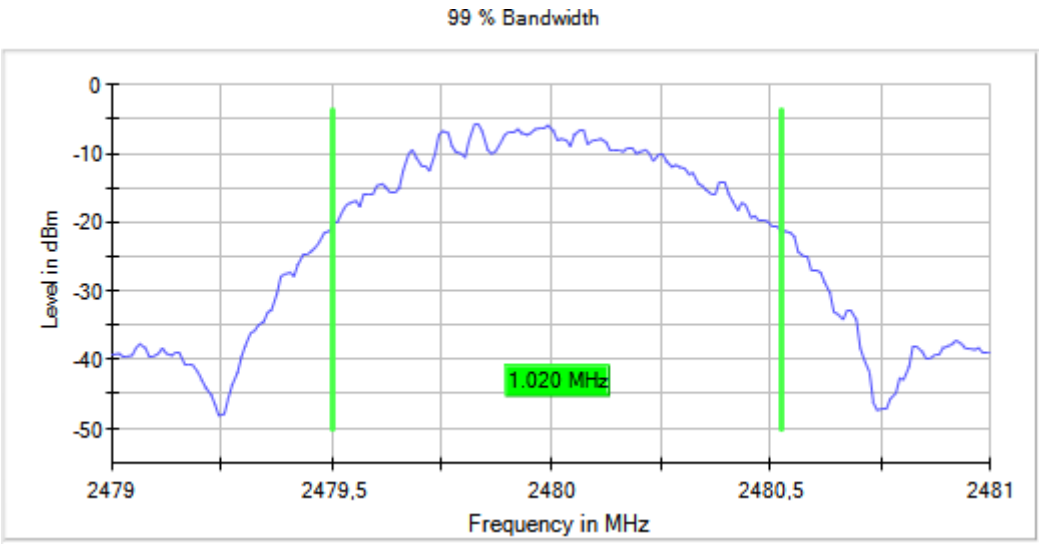


Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1

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

MIMO Mode = SISO Active Port = 1

Images:



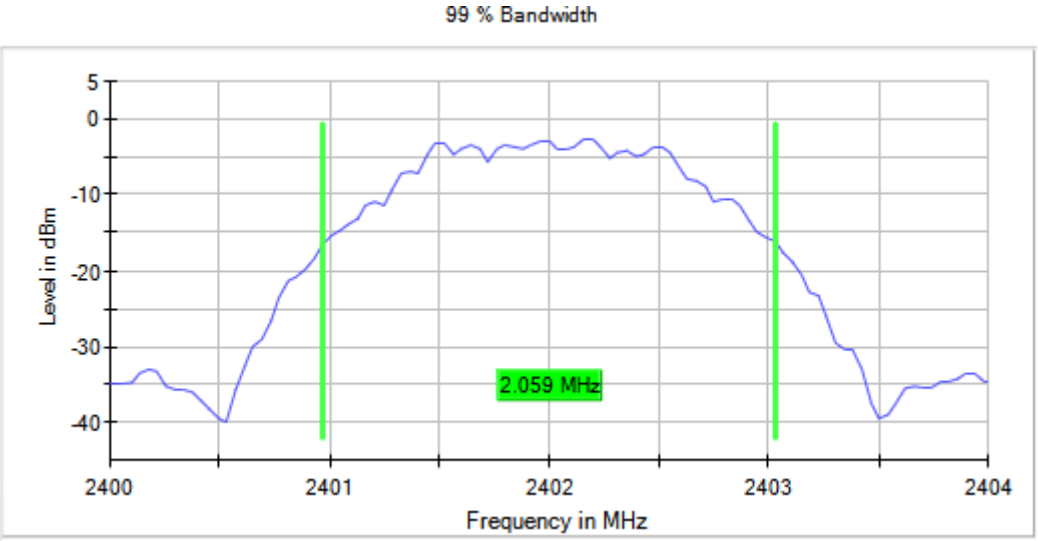
Attachments

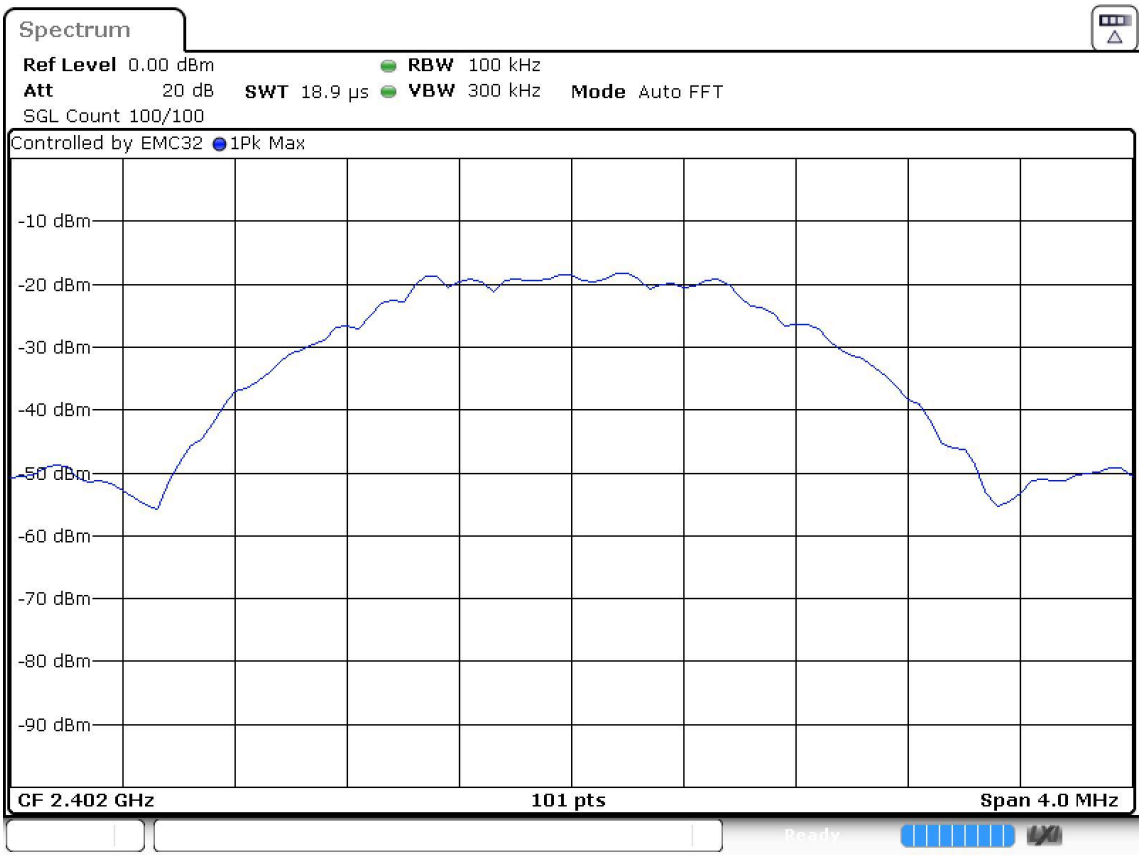
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2

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

MIMO Mode = SISO Active Port = 1

Images:



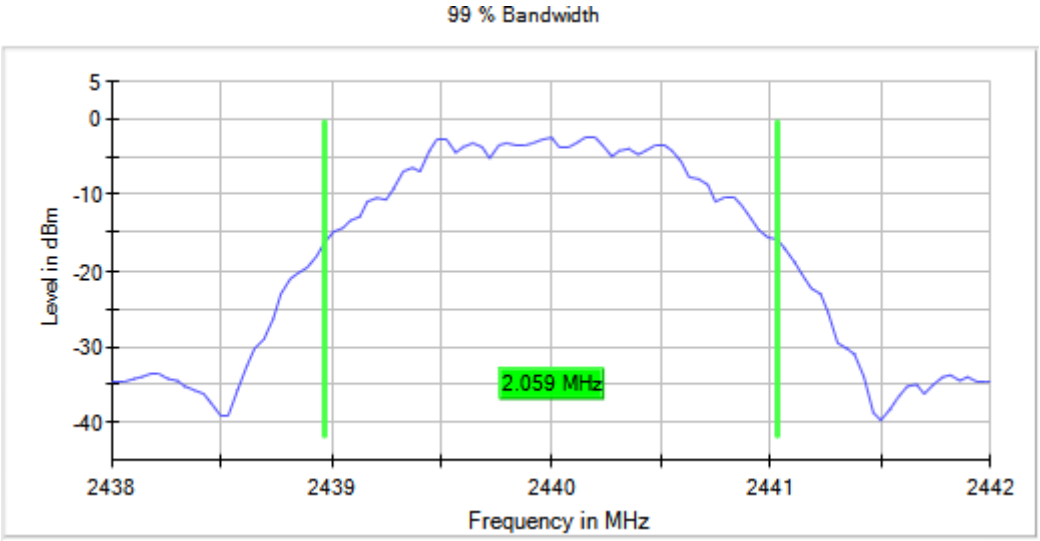


Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2

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

MIMO Mode = SISO Active Port = 1

Images:

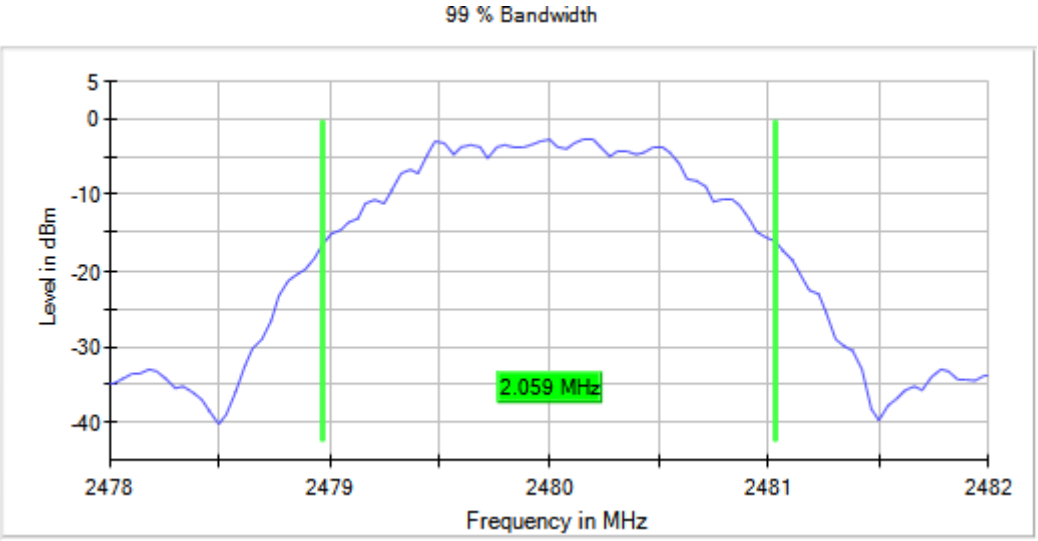


Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2

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

MIMO Mode = SISO Active Port = 1

Images:



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

Limits

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

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

BW (MHz)	Freq (MHz)	Port	Ebw (MHz)
1	2402.00000	1	0.693
	2440.00000		0.713
	2480.00000		0.693

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

BW (MHz)	Freq (MHz)	Port	Ebw (MHz)
2	2402.00000	1	1.426
	2440.00000		1.426
	2480.00000		1.426

Verdict

Pass

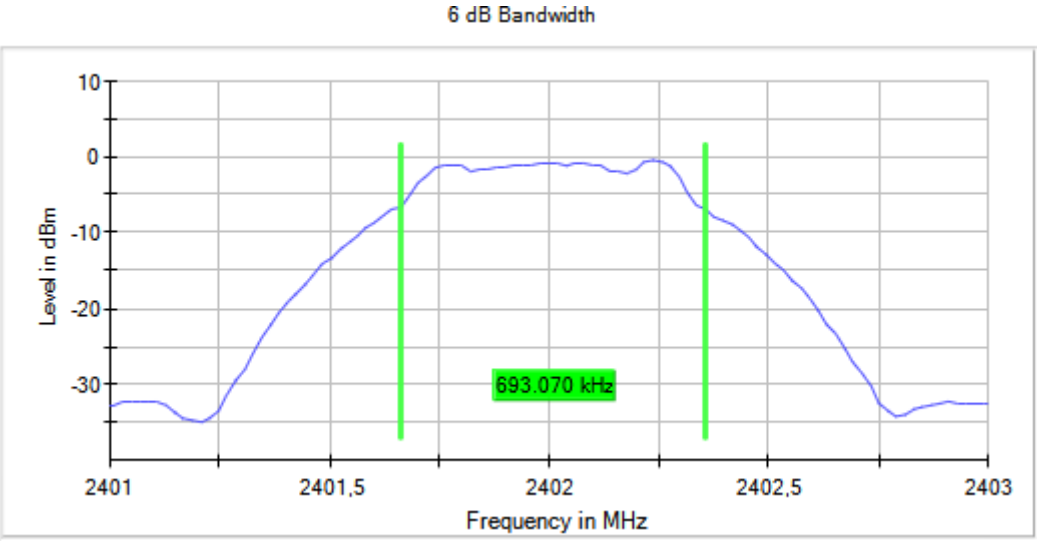
Attachments

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

Frequency MHz = 2402.00000 MIMO Mode = SISO

Active Port = 1

Images:

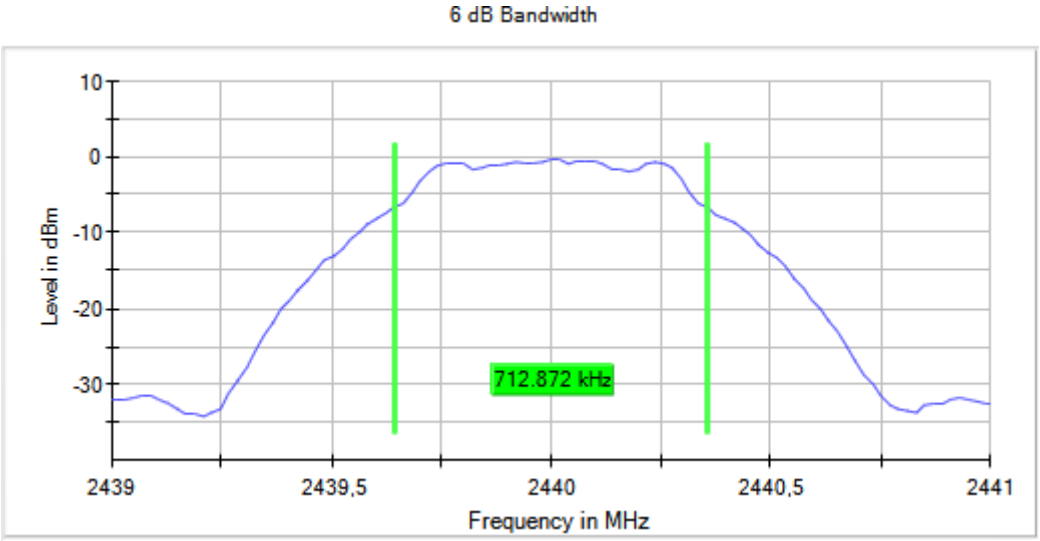


Bandwidth MHz = 1 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency MHz = 2440.00000 MIMO Mode = SISO

Active Port = 1

Images:

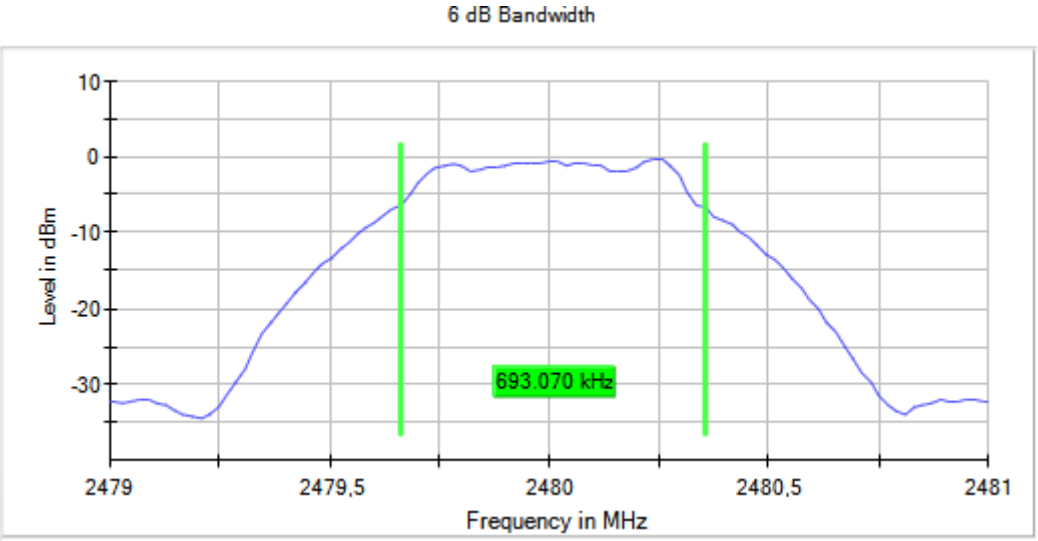


Bandwidth MHz = 1 Modulation = BTLE 5.0 (GFSK 1 Mbit/s)

Frequency MHz = 2480.00000 MIMO Mode = SISO

Active Port = 1

Images:



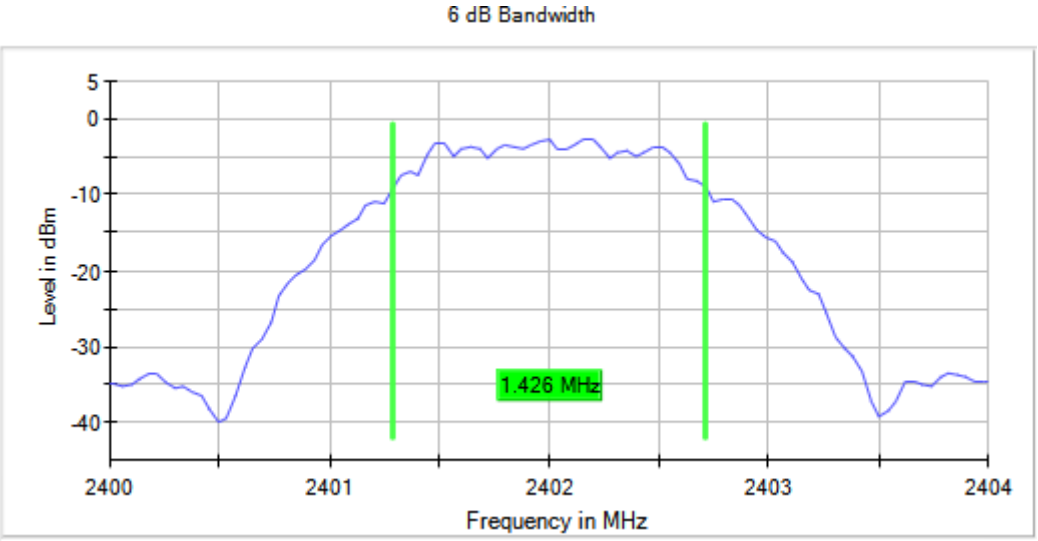
Attachments

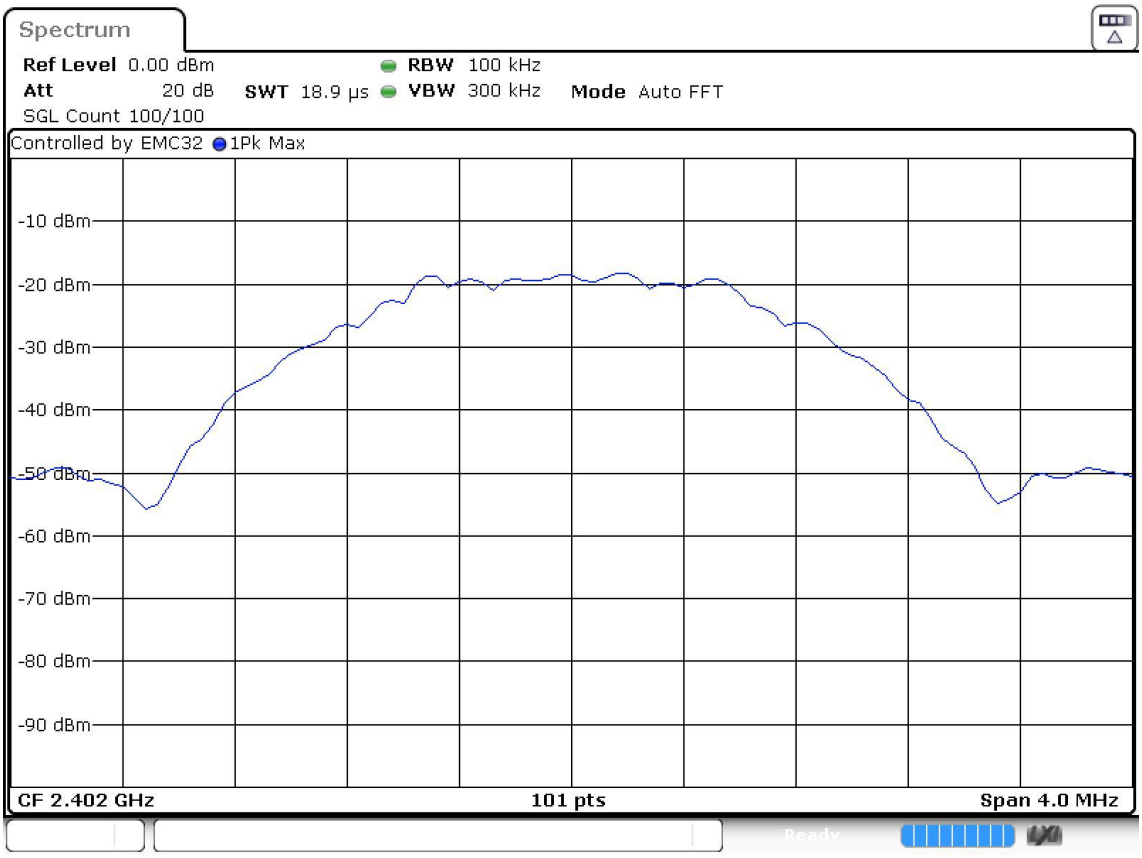
Bandwidth MHz = 2 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency MHz = 2402.00000 MIMO Mode = SISO

Active Port = 1

Images:



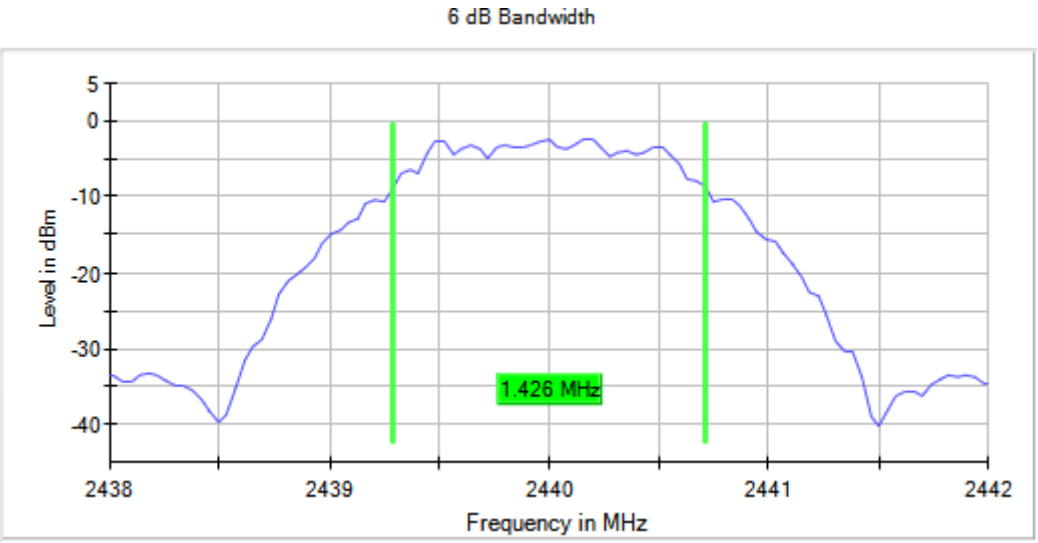


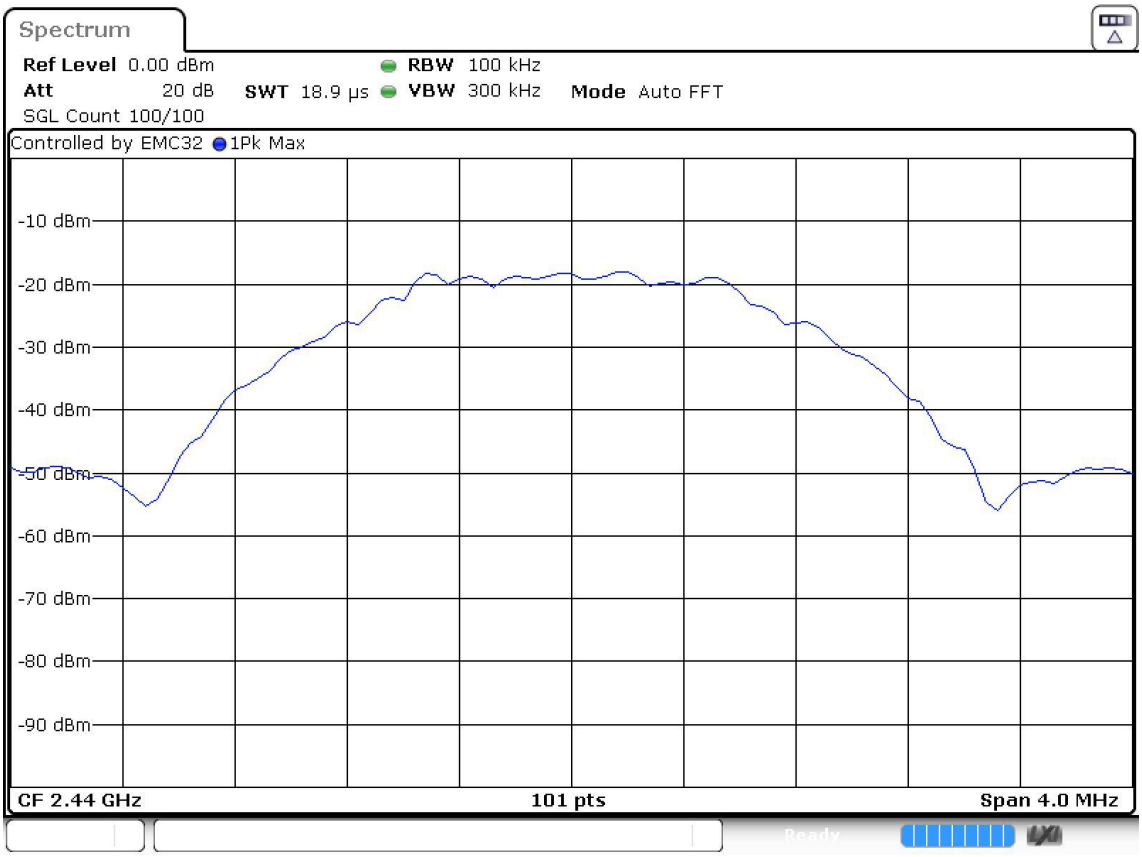
Bandwidth MHz = 2 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency MHz = 2440.00000 MIMO Mode = SISO

Active Port = 1

Images:



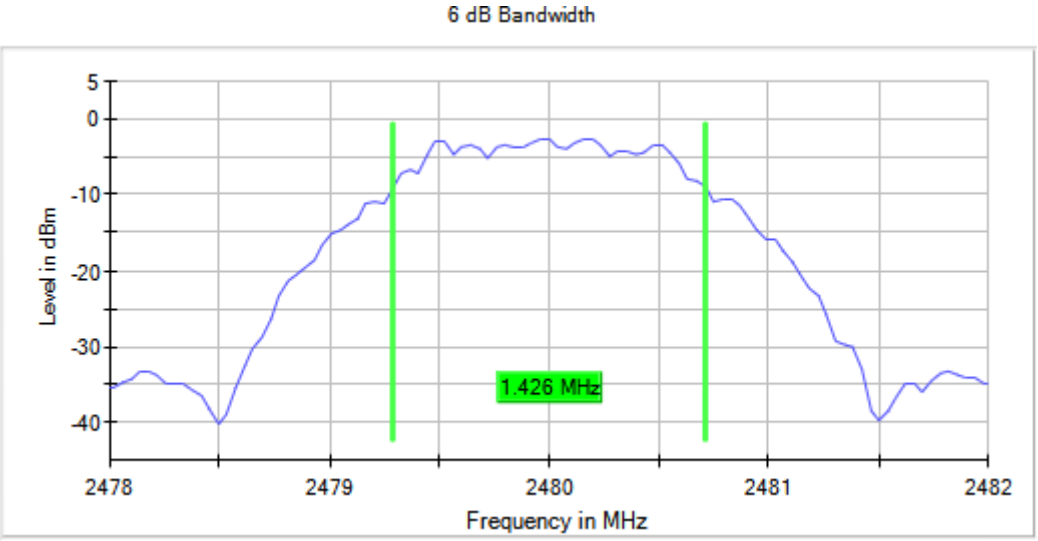


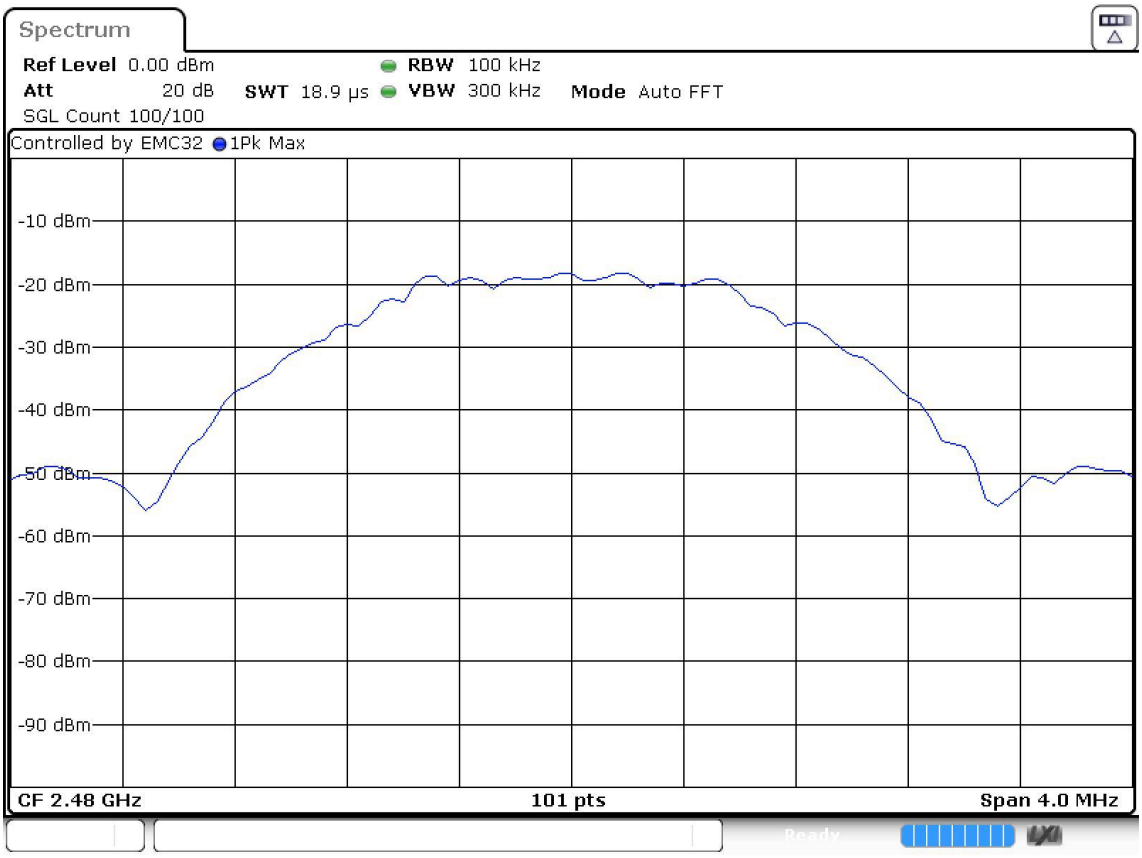
Bandwidth MHz = 2 Modulation = BTLE 5.0 (GFSK 2 Mbit/s)

Frequency MHz = 2480.00000 MIMO Mode = SISO

Active Port = 1

Images:





RSS-247 5.2 (b) / FCC 15.247 (e) [Psd] 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)

Equipment	BW (MHz)	Freq (MHz)	Port	PSD (dBm)
Digital Transmission System (DTS)	1	2402.00000	1	-9.52
		2440.00000		-9.12
		2480.00000		-9.37

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Equipment	BW (MHz)	Freq (MHz)	Port	PSD (dBm)
Digital Transmission System (DTS)	2	2402.00000	1	-13.21
		2440.00000		-12.84
		2480.00000		-13.09

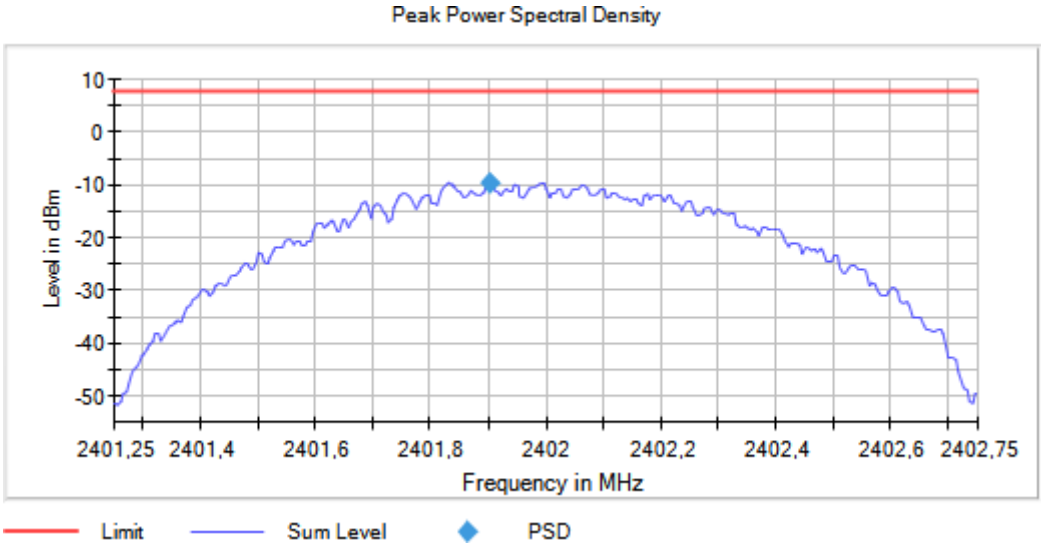
Verdict

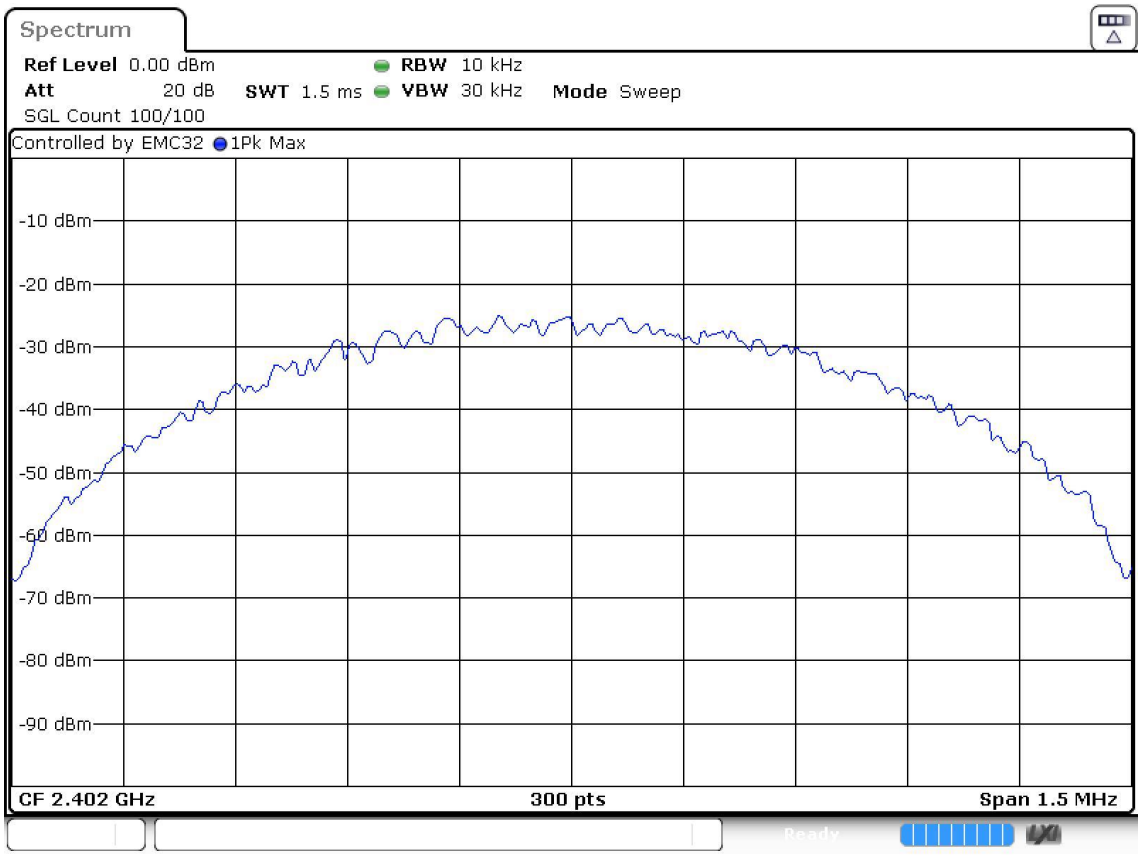
Pass

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:



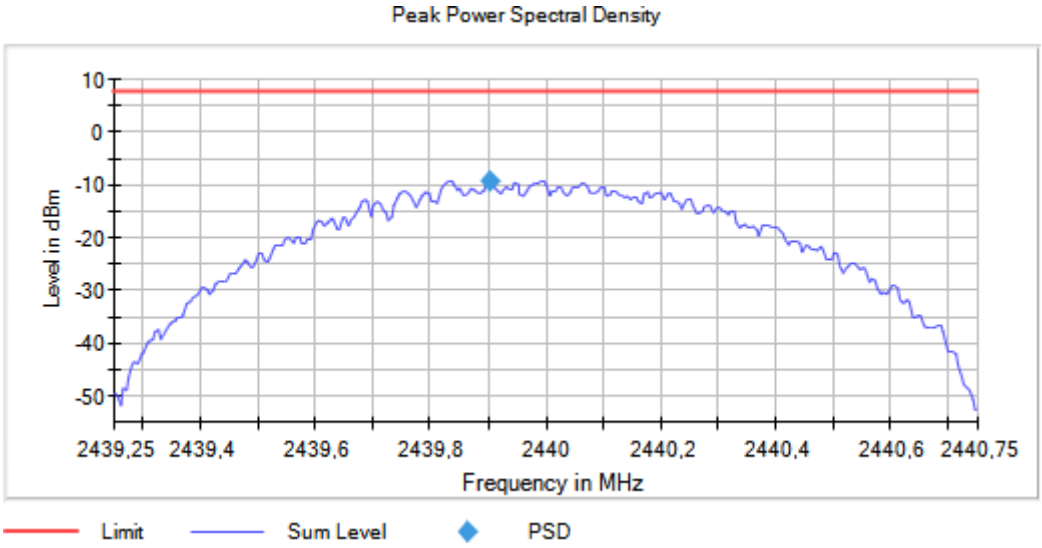


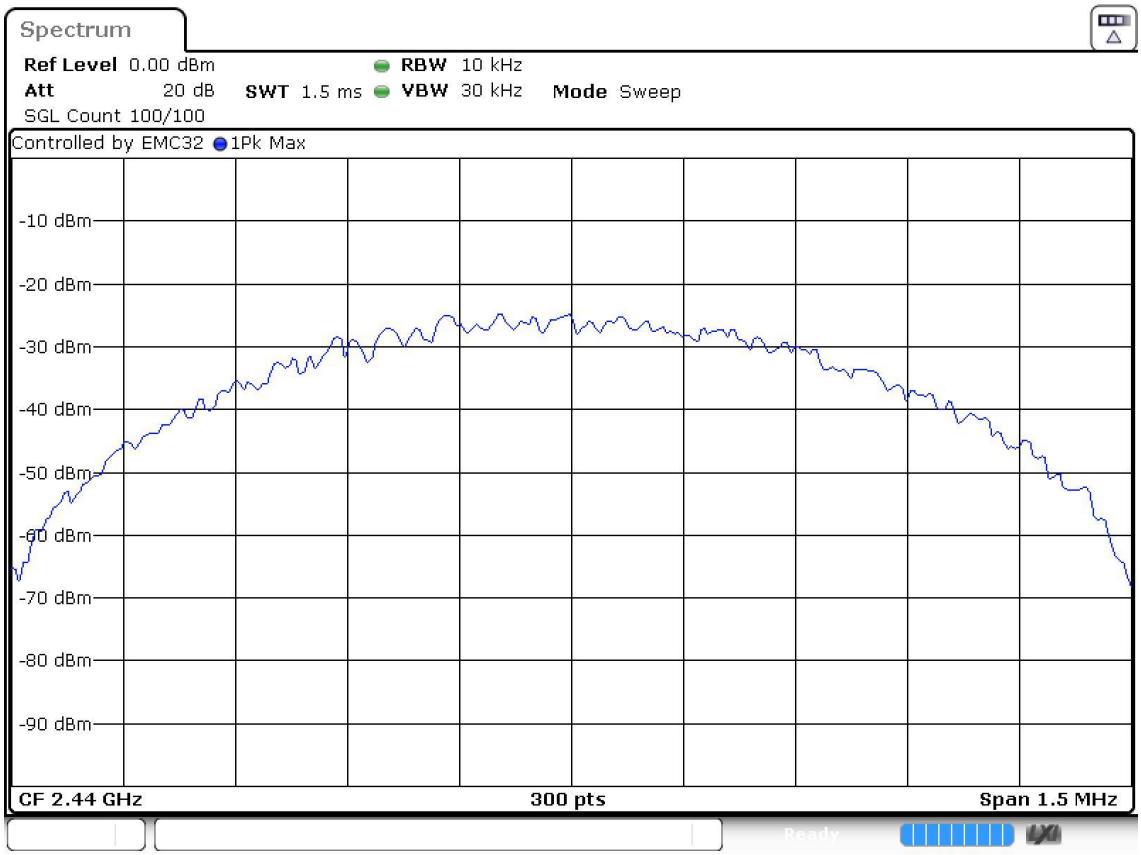
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1

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

MIMO Mode = SISO Active Port = 1

Images:



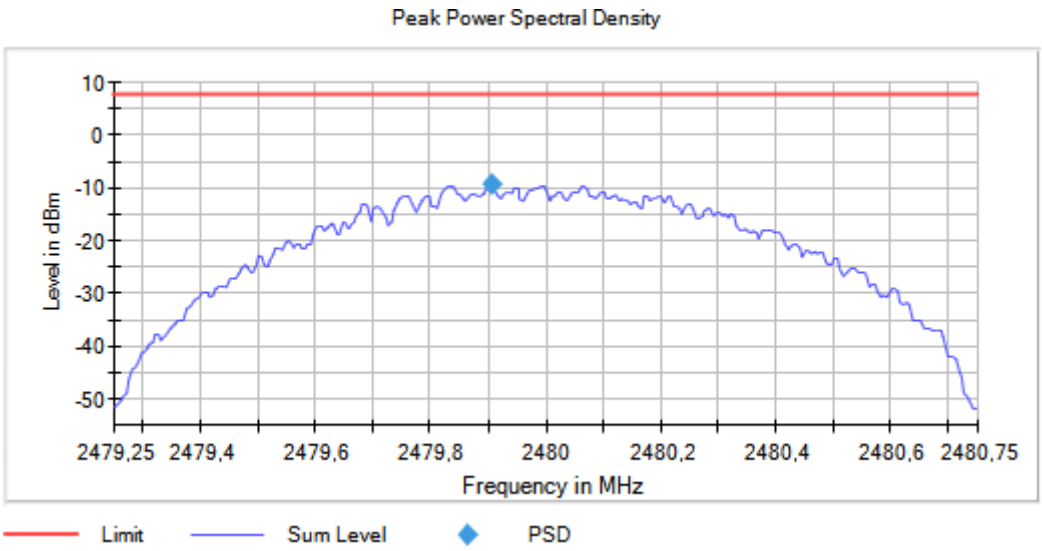


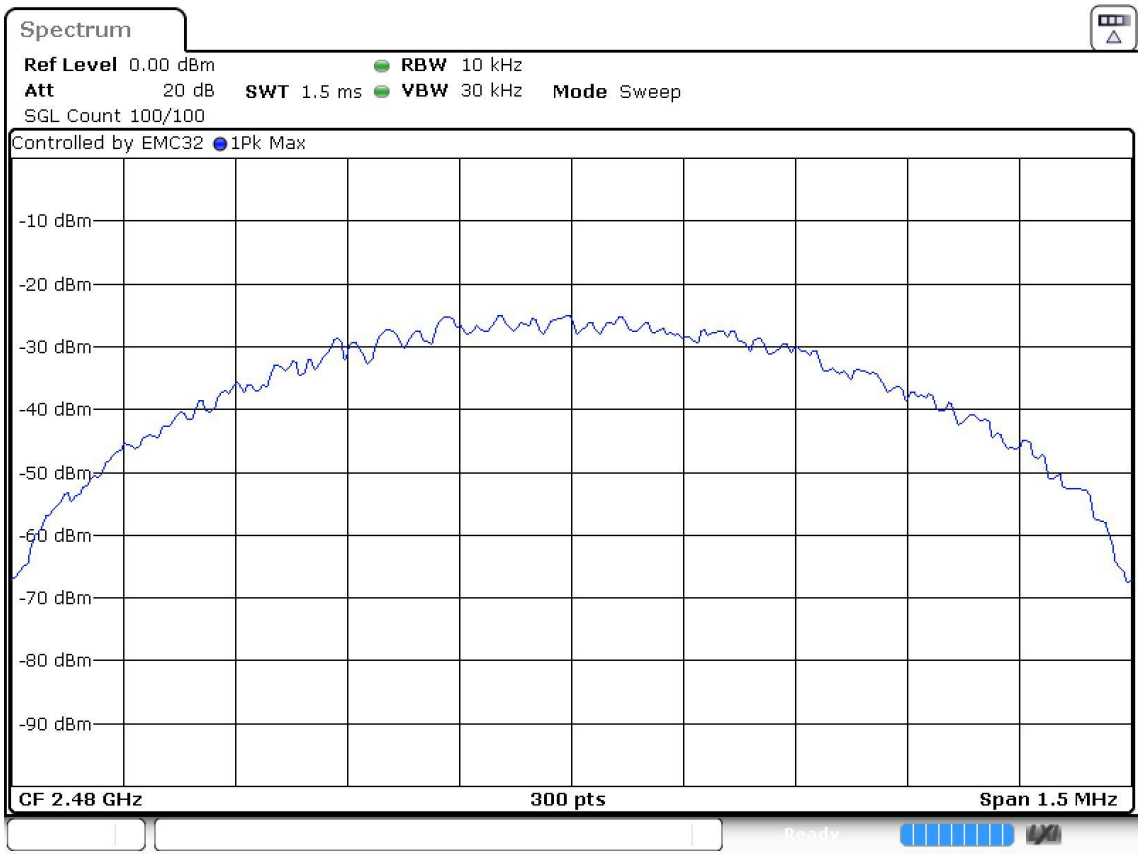
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1

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

MIMO Mode = SISO Active Port = 1

Images:

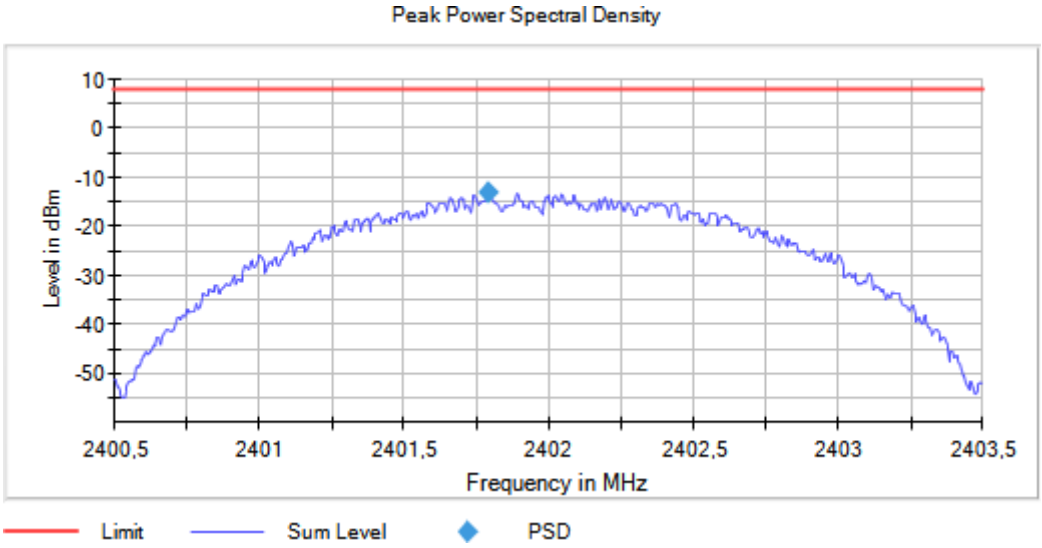


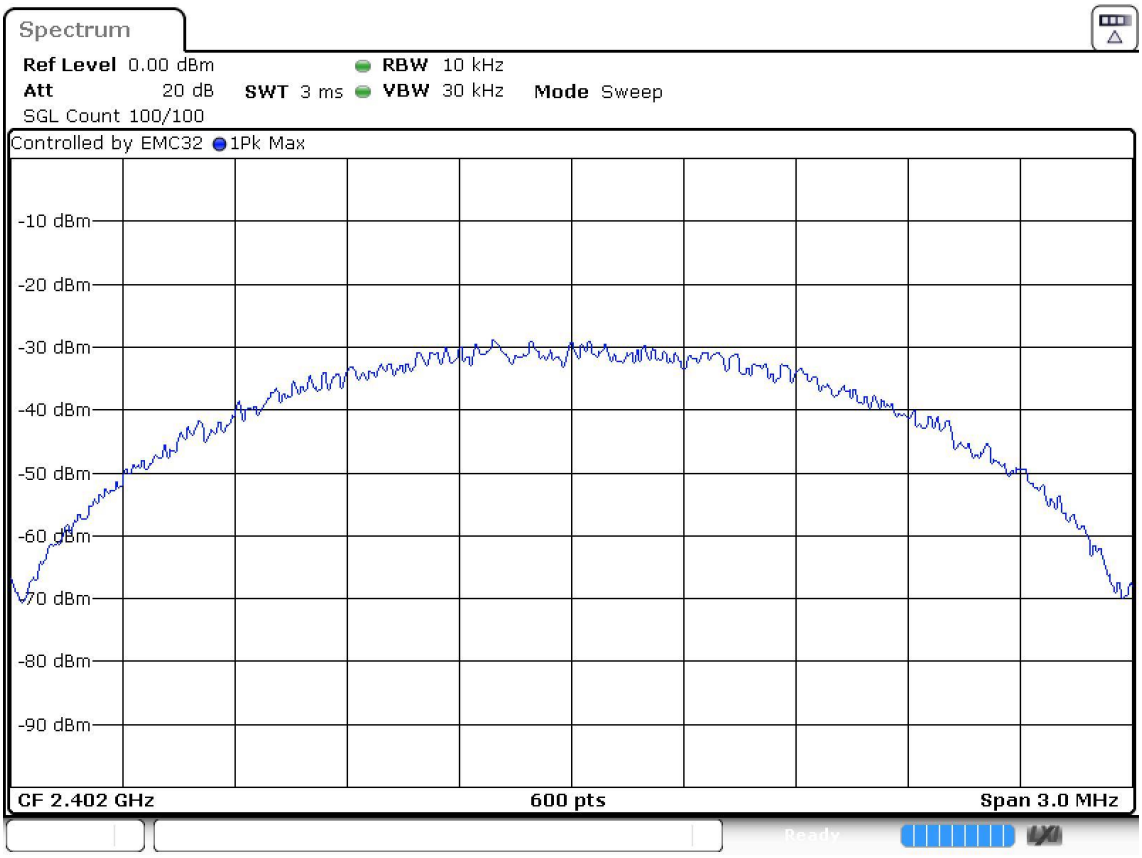


Attachments

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

Images:



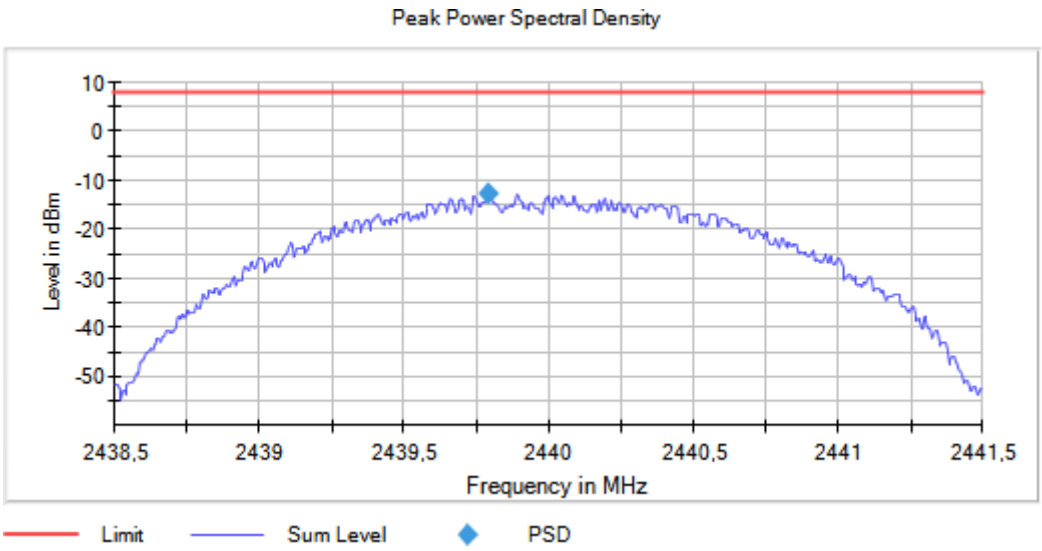


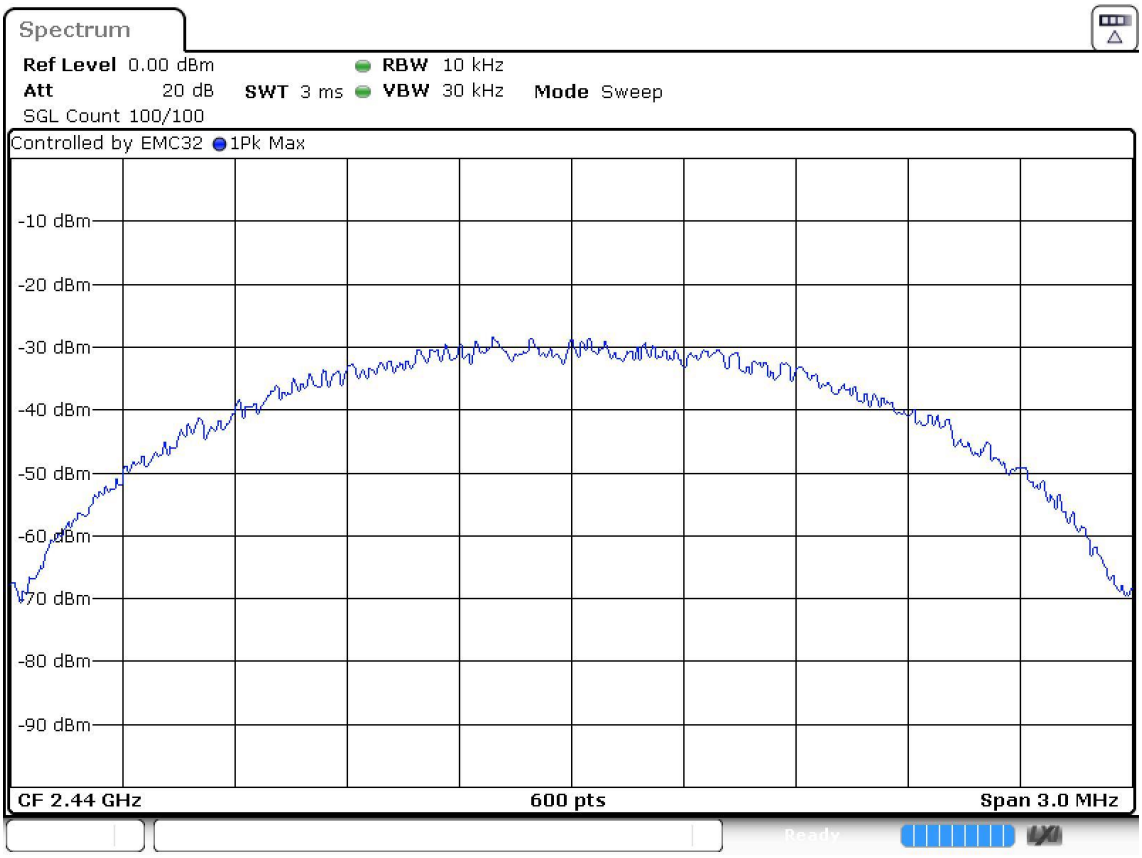
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2

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

MIMO Mode = SISO Active Port = 1

Images:



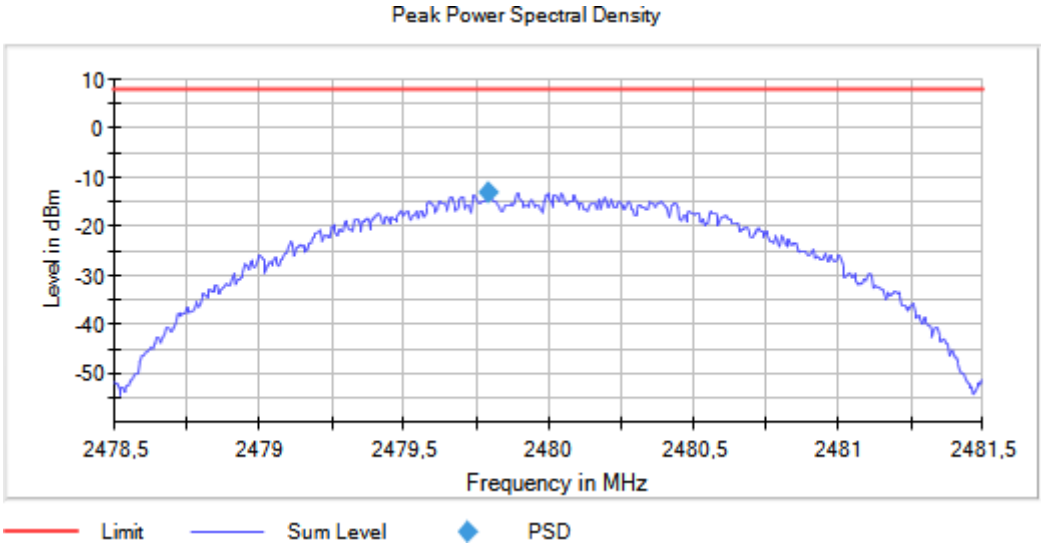


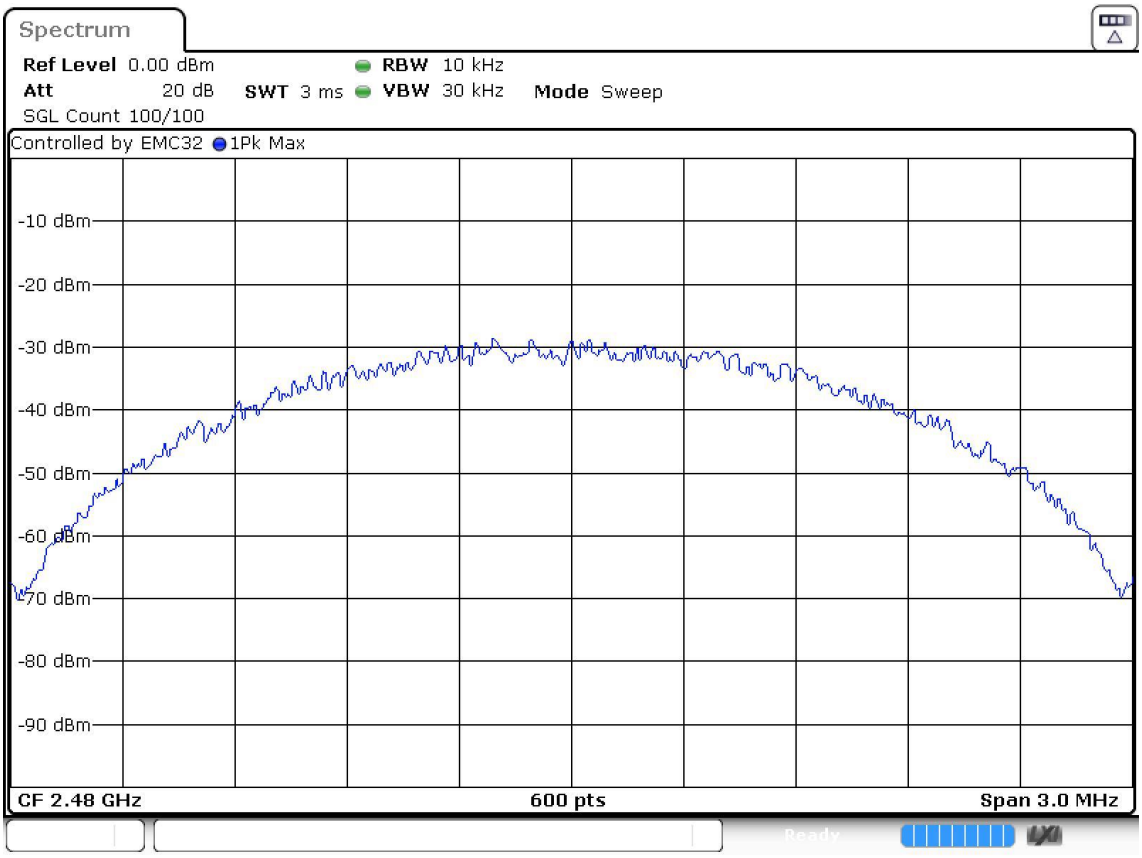
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2

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) [Pkcp] 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) (Canada).

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

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

Equipment	BW (MHz)	Freq (MHz)	Port	PeakPower (dBm)	EIRP Power (dBm)
Digital Transmission System (DTS)	1	2402.00000	1	0.4020	-4,598
Digital Transmission System (DTS)	1	2440.00000	1	0.7480	-4,252
Digital Transmission System (DTS)	1	2480.00000	1	0.5180	-4,482

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Equipment	BW (MHz)	Freq (MHz)	Port	PeakPower (dBm)	EIRP Power (dBm)
Digital Transmission System (DTS)	2	2402.00000	1	0.4530	-4,547
		2440.00000	1	0.8270	-4,173
		2480.00000	1	0.5890	-4,411

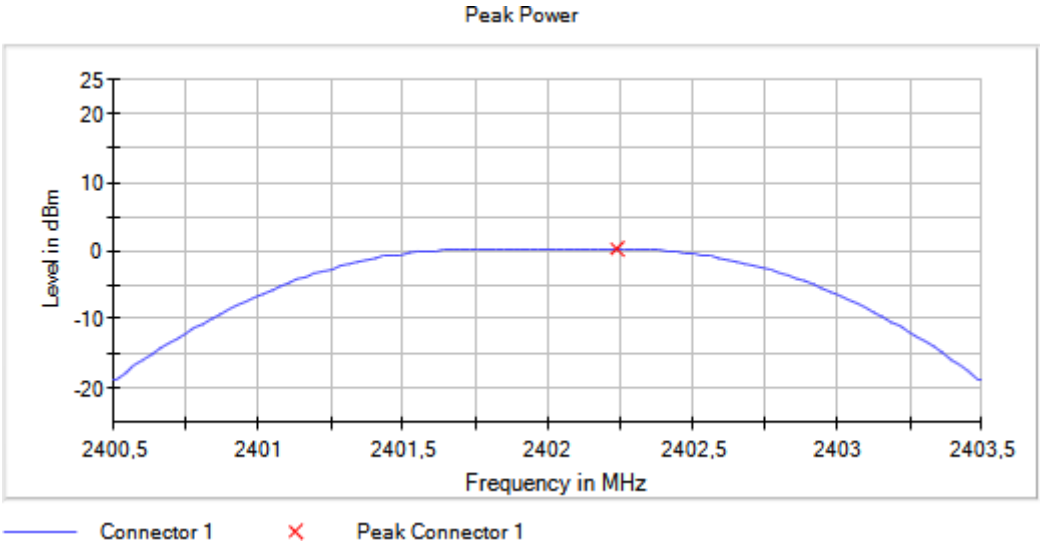
Verdict

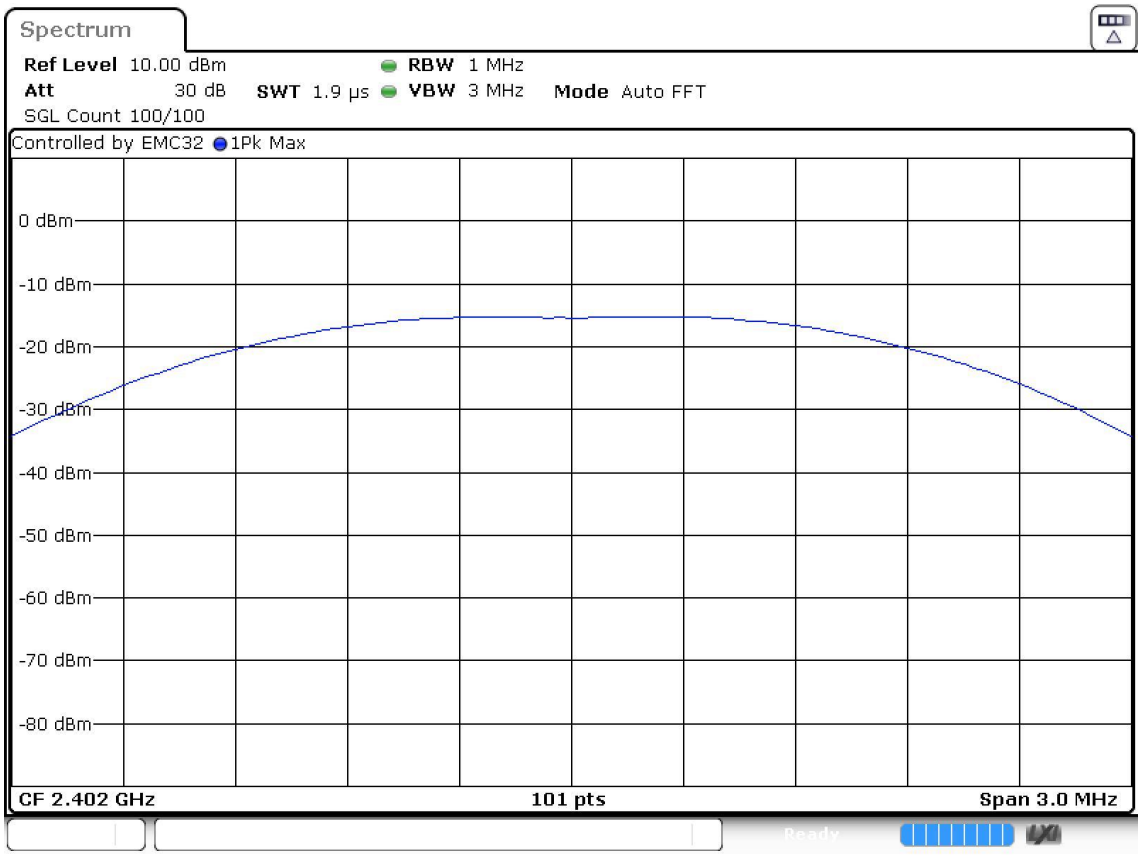
Pass

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:



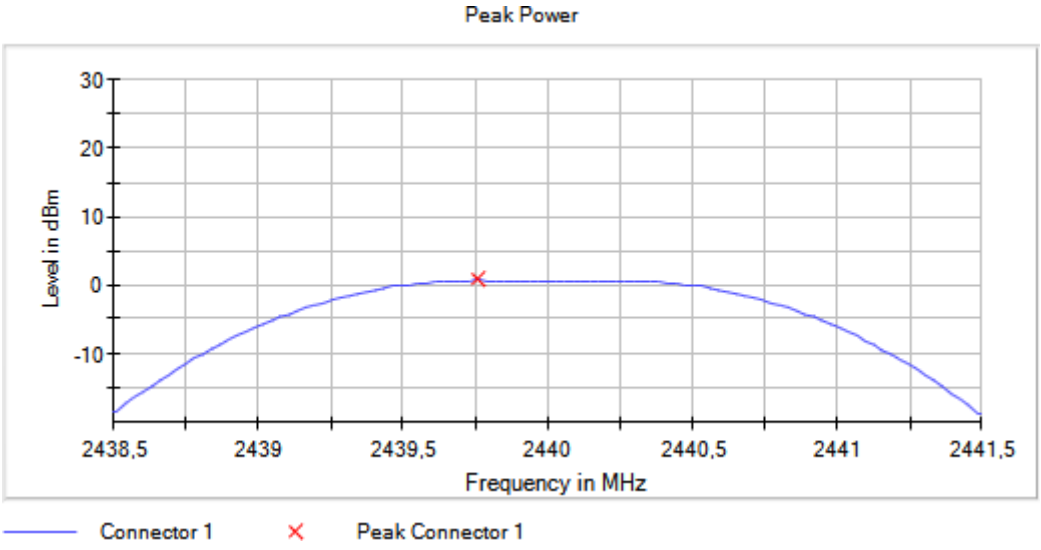


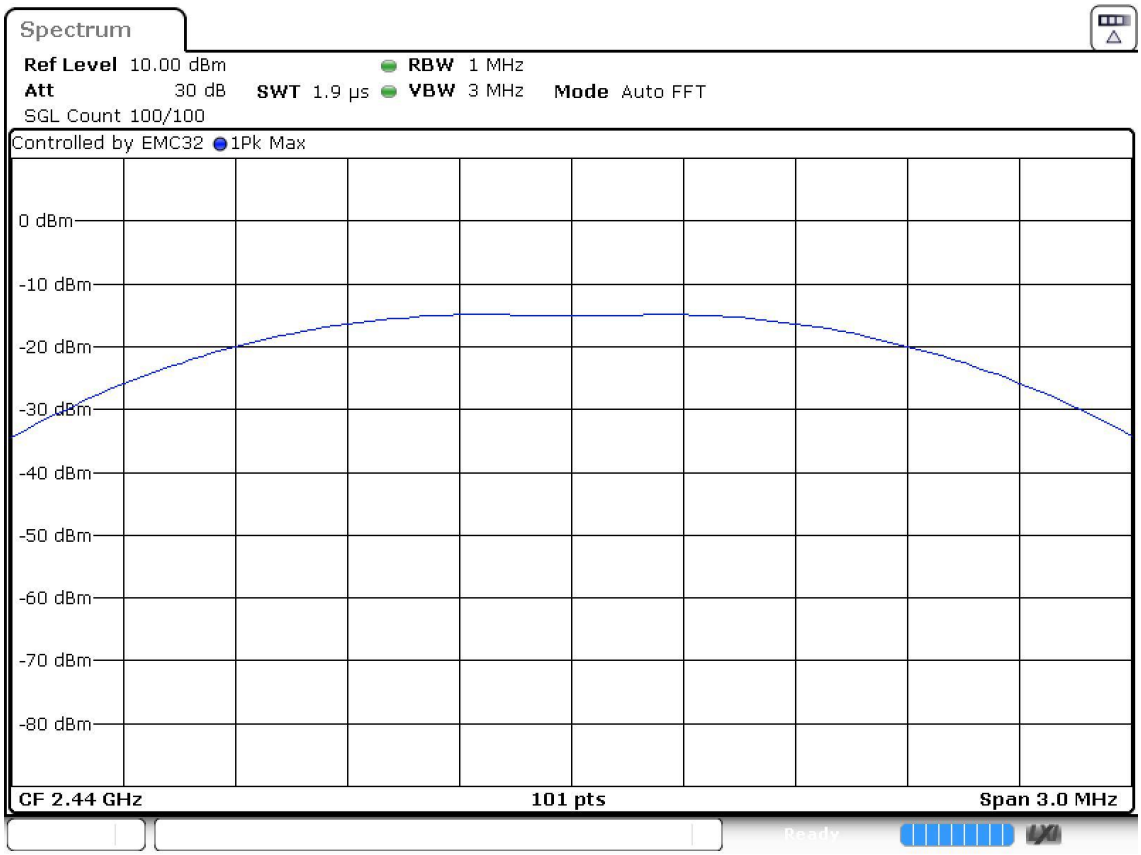
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1

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

MIMO Mode = SISO Active Port = 1

Images:

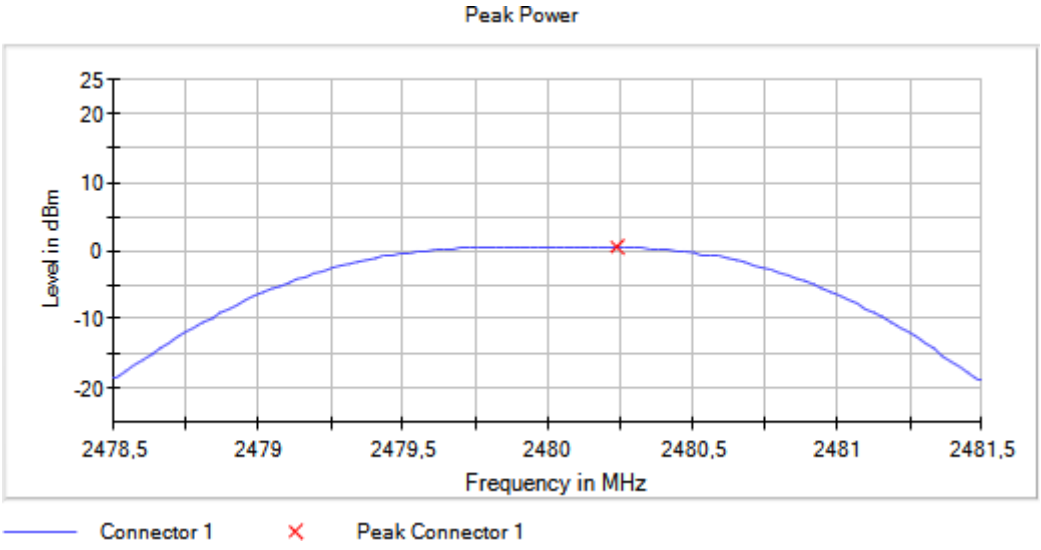


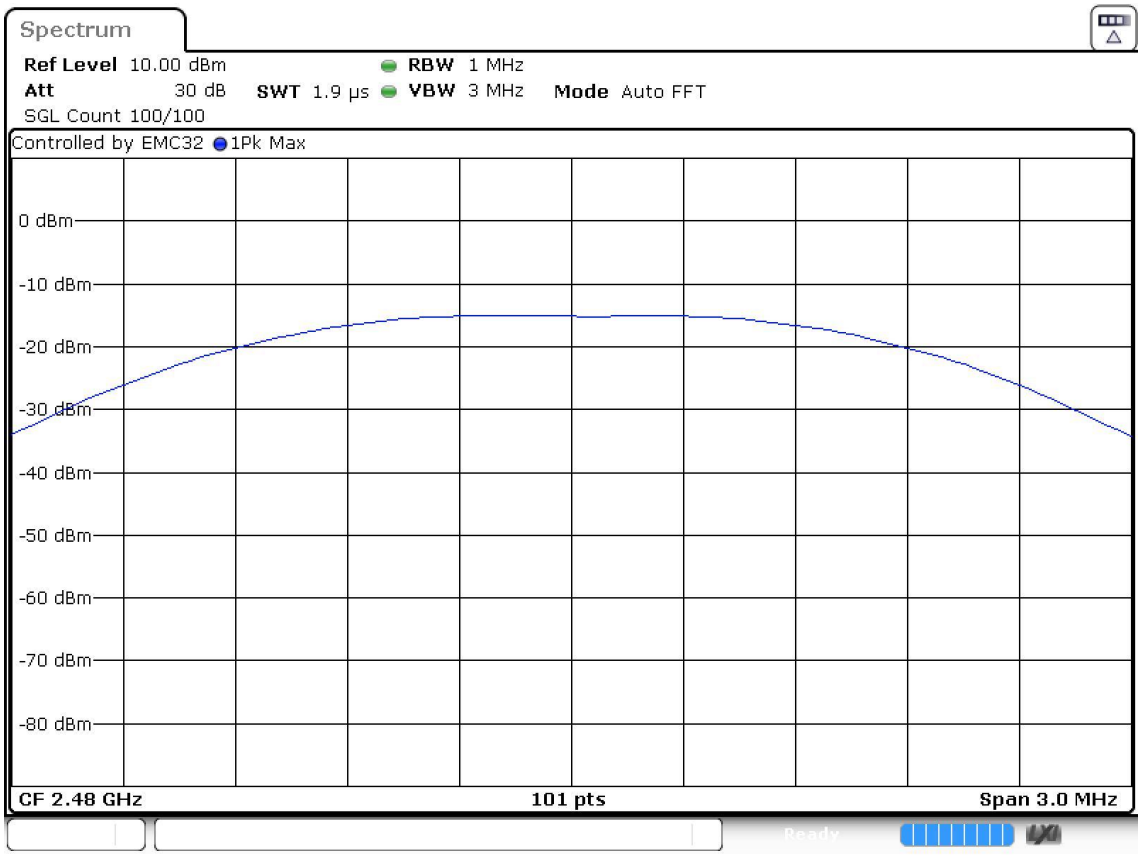


Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 1 Mbit/s)
MIMO Mode = SISO

Bandwidth MHz = 1
Frequency MHz = 2480.00000
Active Port = 1

Images:



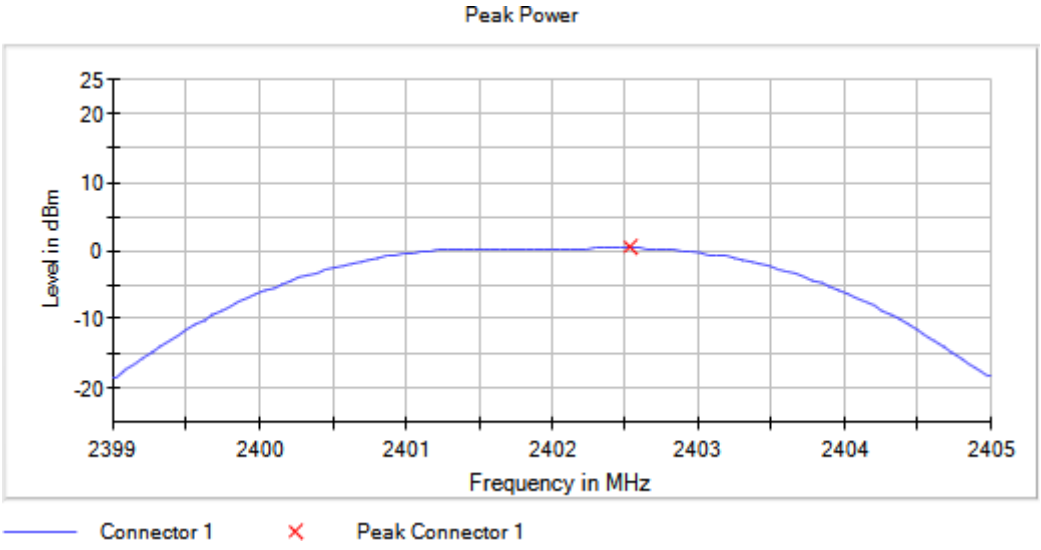


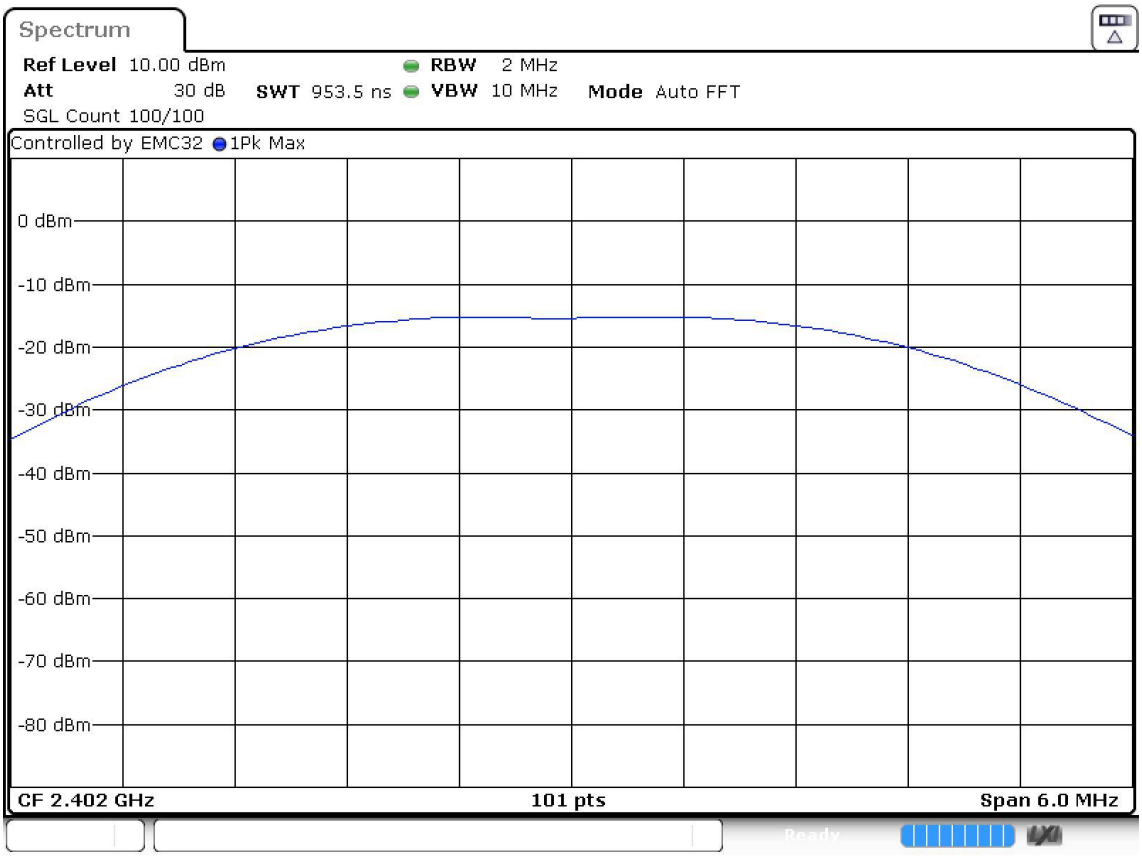
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2

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

MIMO Mode = SISO Active Port = 1

Images:



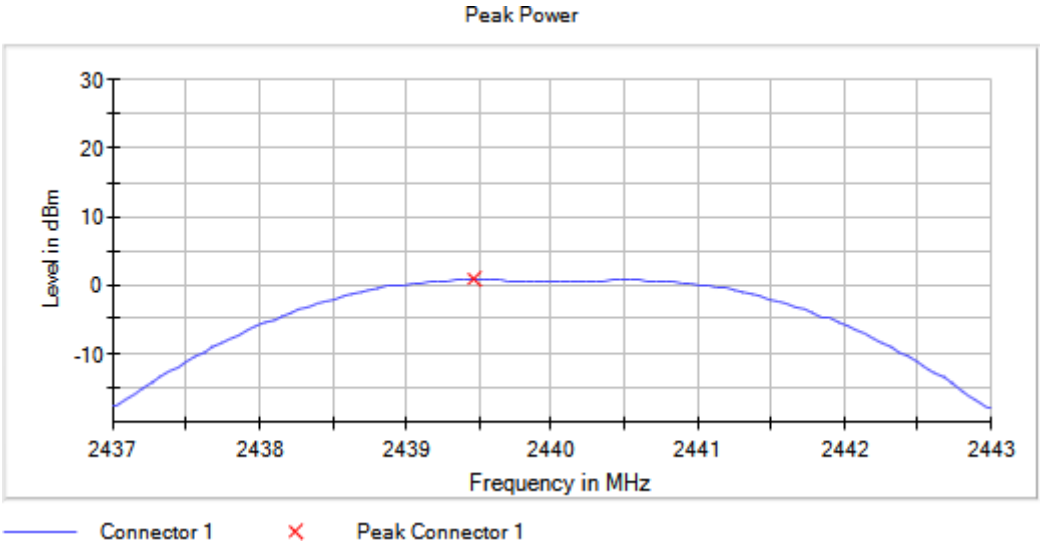


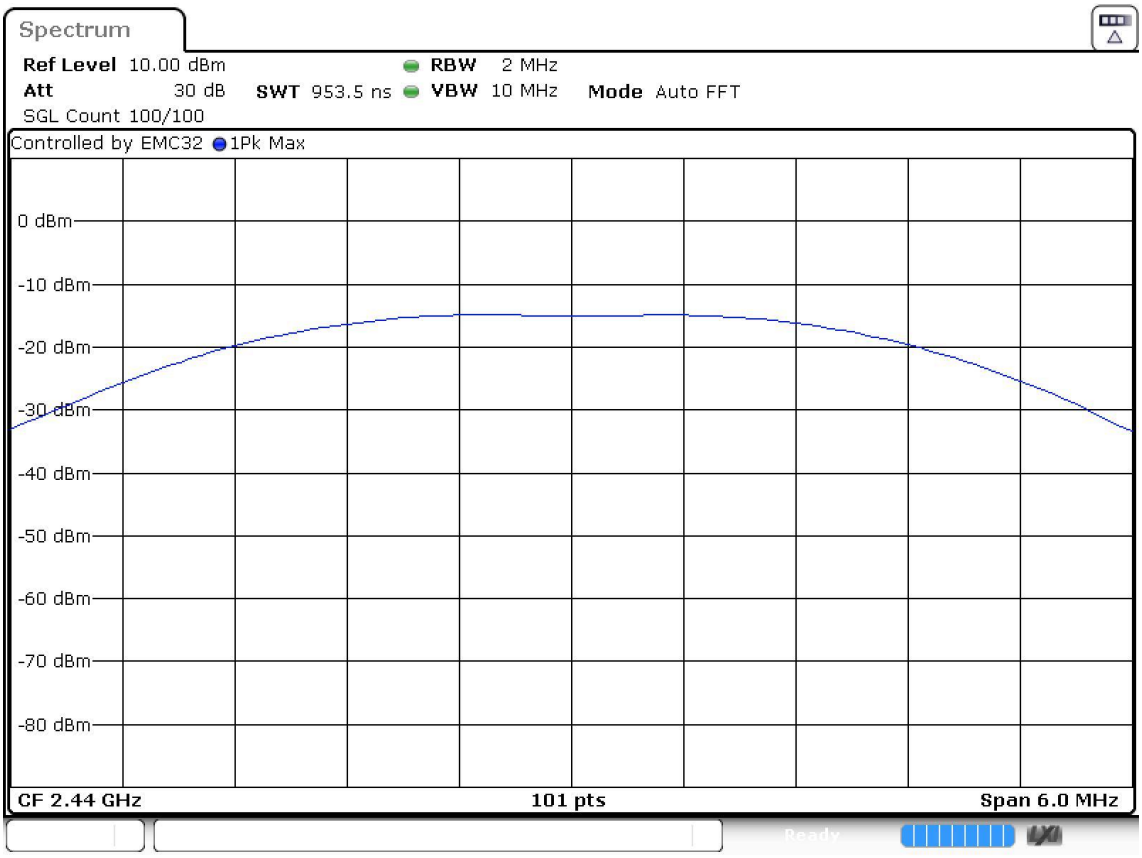
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2

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

MIMO Mode = SISO Active Port = 1

Images:



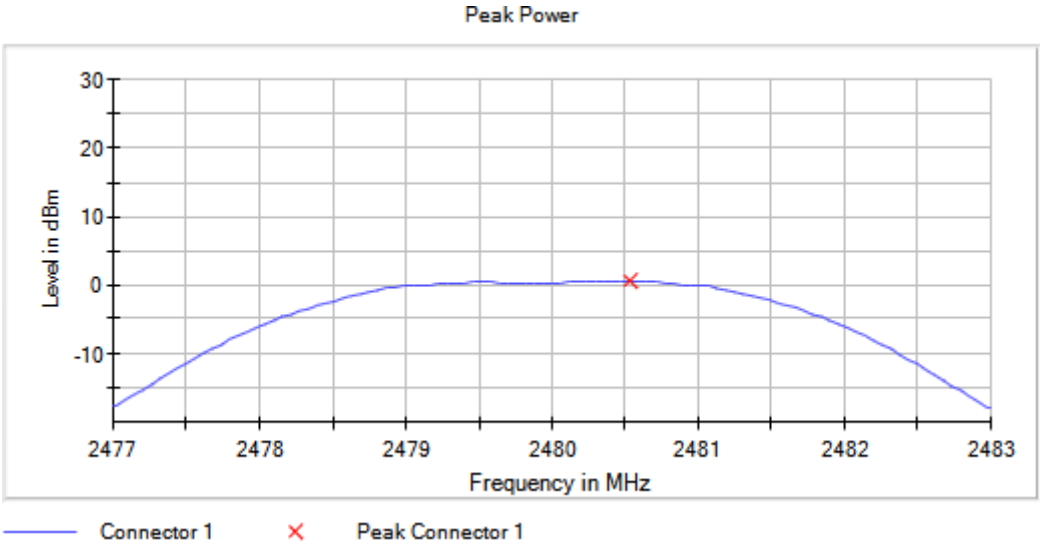


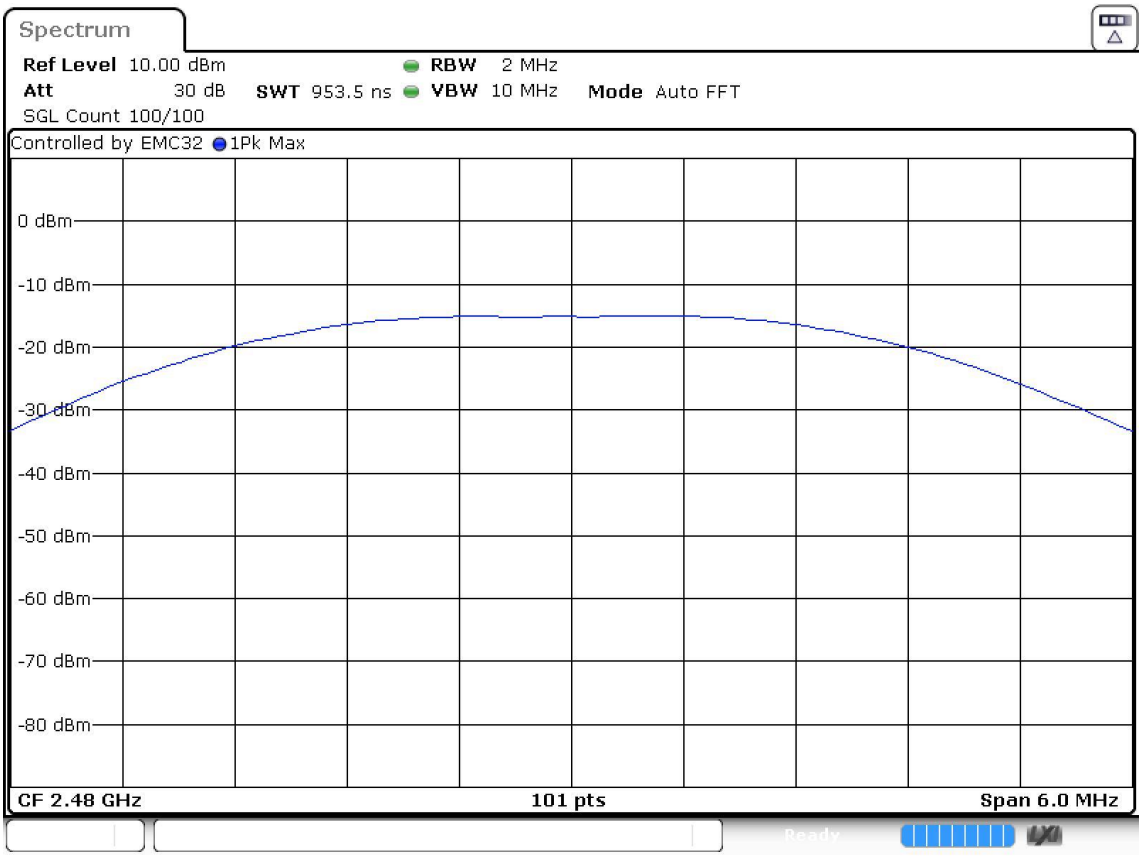
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2

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

MIMO Mode = SISO Active Port = 1

Images:





RSS-247 5.5 / FCC 15.247 (d) [Bndedge] 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.

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

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 2 Mbit/s)

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.

Verdict

Pass

Attachments

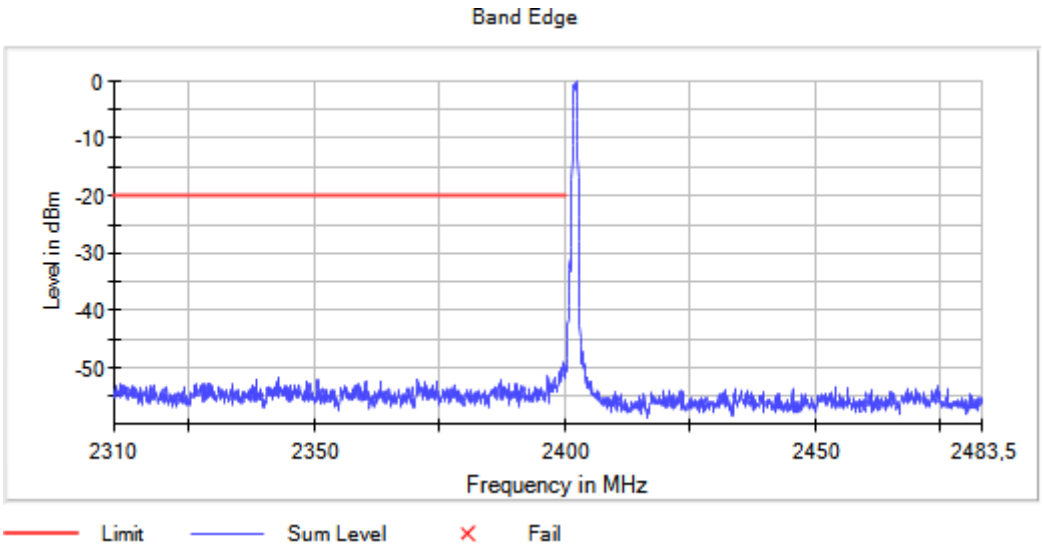
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 1

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

MIMO Mode = SISO Measurement Point = 1

Active Port = 1

Images:



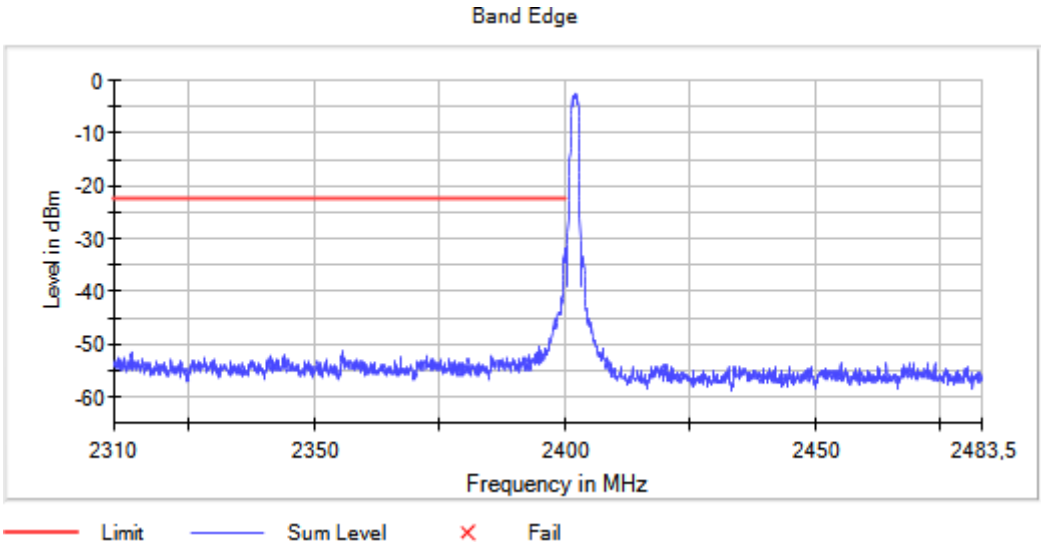
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 2

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

MIMO Mode = SISO Measurement Point = 1

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	10.000 dBm	10.000 dBm
Attenuation	30.000 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

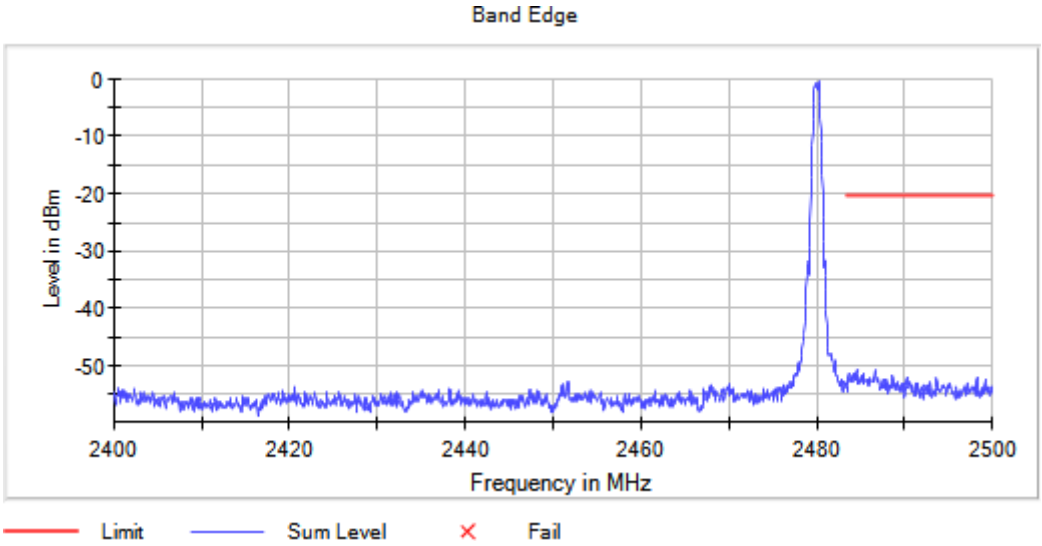
Spectrum Analyzer Parameters 2

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	10.000 dBm	10.000 dBm
Attenuation	30.000 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

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

Bandwidth MHz = 1
Frequency MHz = 2480.00000
Measurement Point = 1

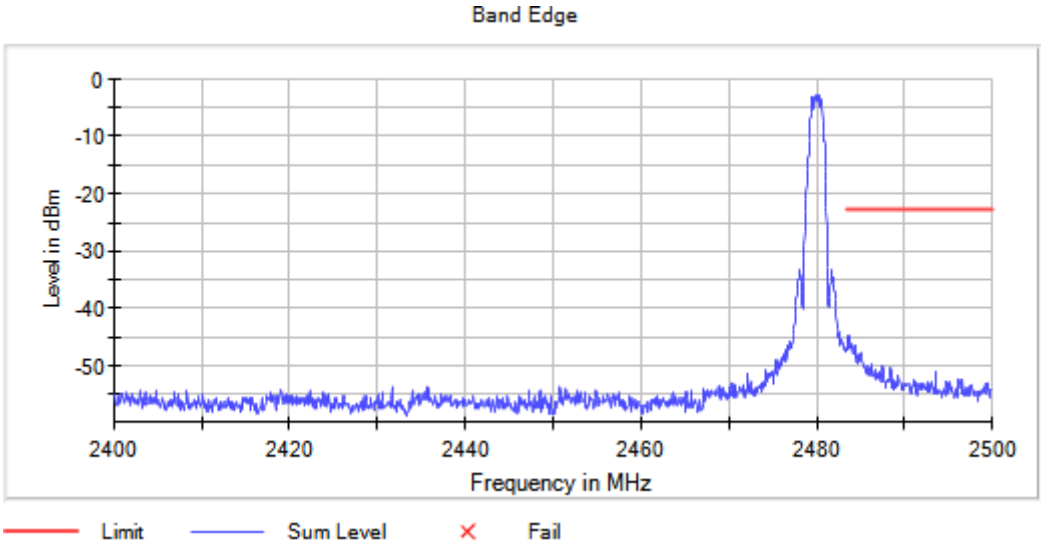
Images:



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

Bandwidth MHz = 2
Frequency MHz = 2480.00000
Measurement Point = 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	10.000 dBm	10.000 dBm
Attenuation	30.000 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

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	10.000 dBm	10.000 dBm
Attenuation	30.000 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

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

Limits

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

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	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.

Modulation: BTLE 5.0 (GFSK 1 Mbit/s)

Results

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

Verdict

Pass

Attachments

Frequency Range GHz = [0.03, 1]

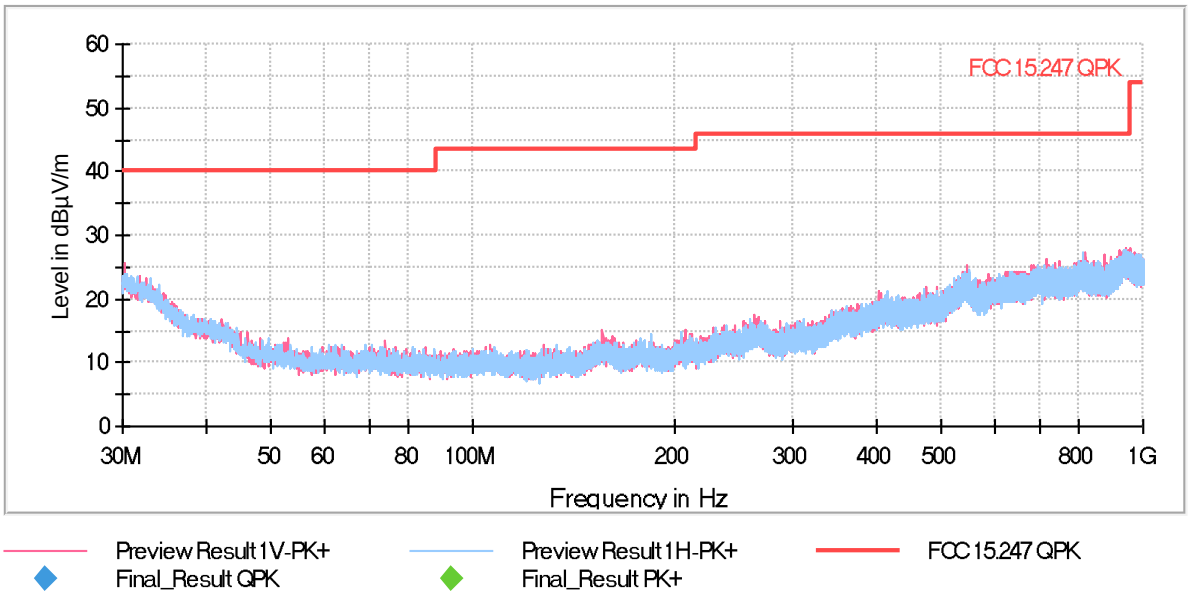
Equipment Type = Digital Transmission System (DTS)

Modulation : This plot is valid for all channel and all modulations

MIMO Mode = SISO

Measurement Point = 1

Active Port = 1



This plot is valid for all channel and all modulations

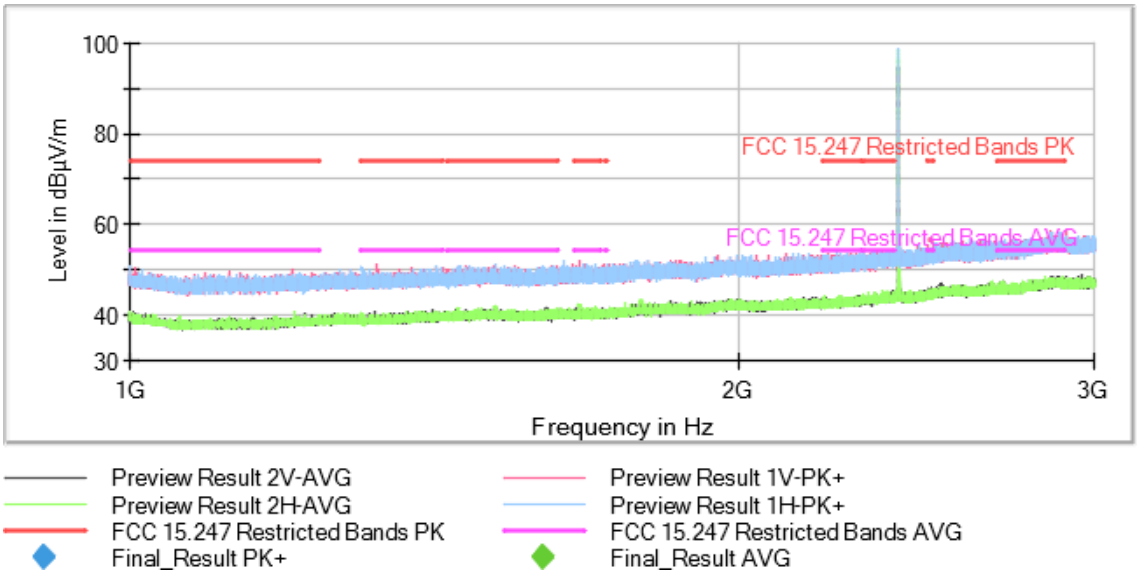
Tables:

Spectrum Analyzer Parameters

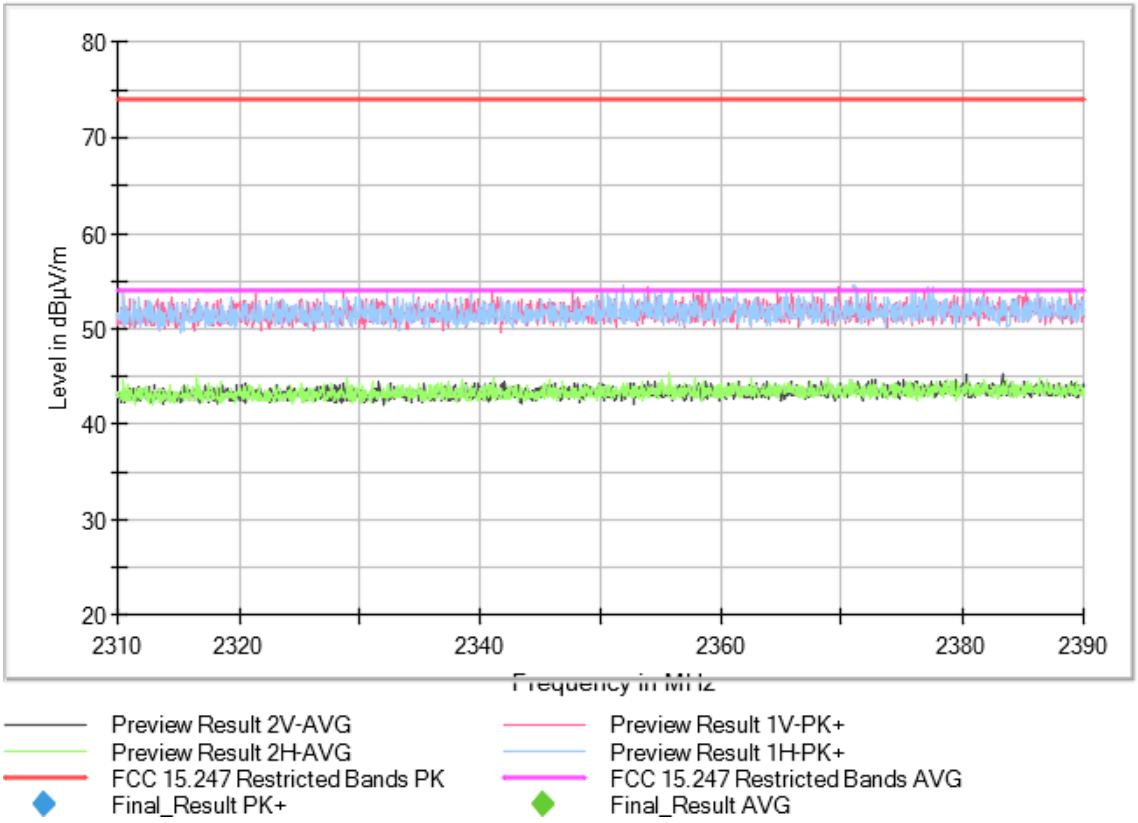
	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	30 MHz - 1 GHz	30,312 kHz	PK+	100 kHz	1 s	0 dB

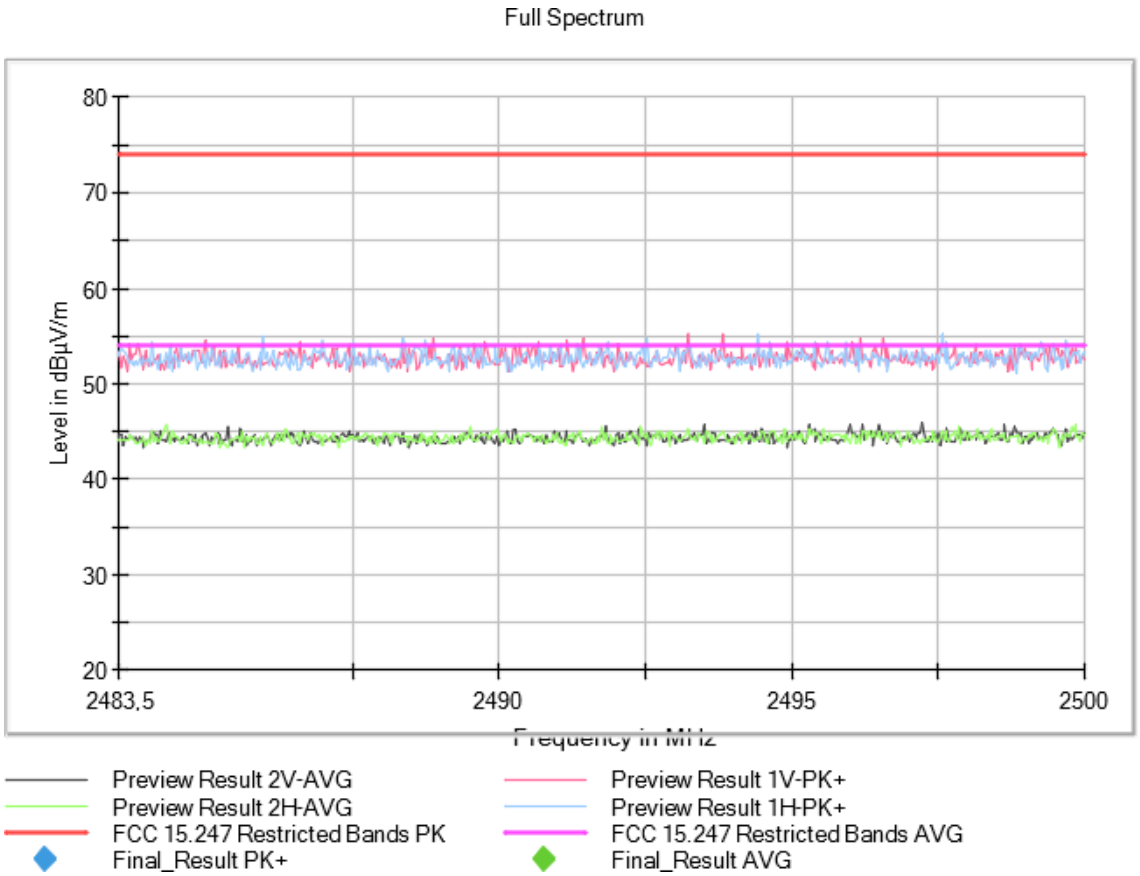
Frequency Range GHz = [1, 3]
Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 1 Mbit/s)
Frequency MHz = 2402.00000
MIMO Mode = SISO
Measurement Point = 1
Active Port = 1

Images:



Full Spectrum





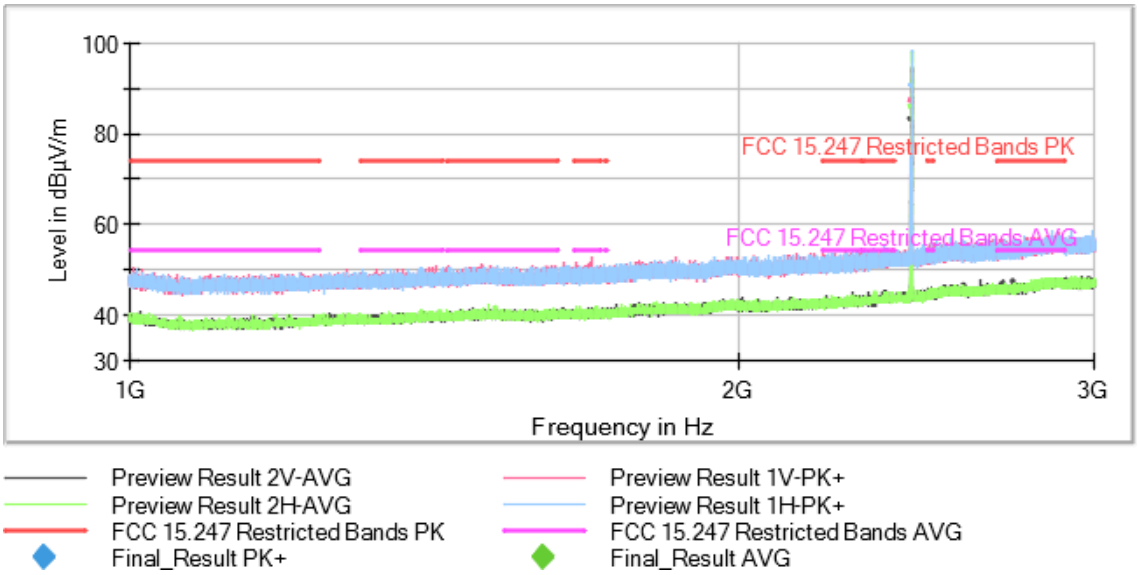
Tables:

Spectrum Analyzer Parameters

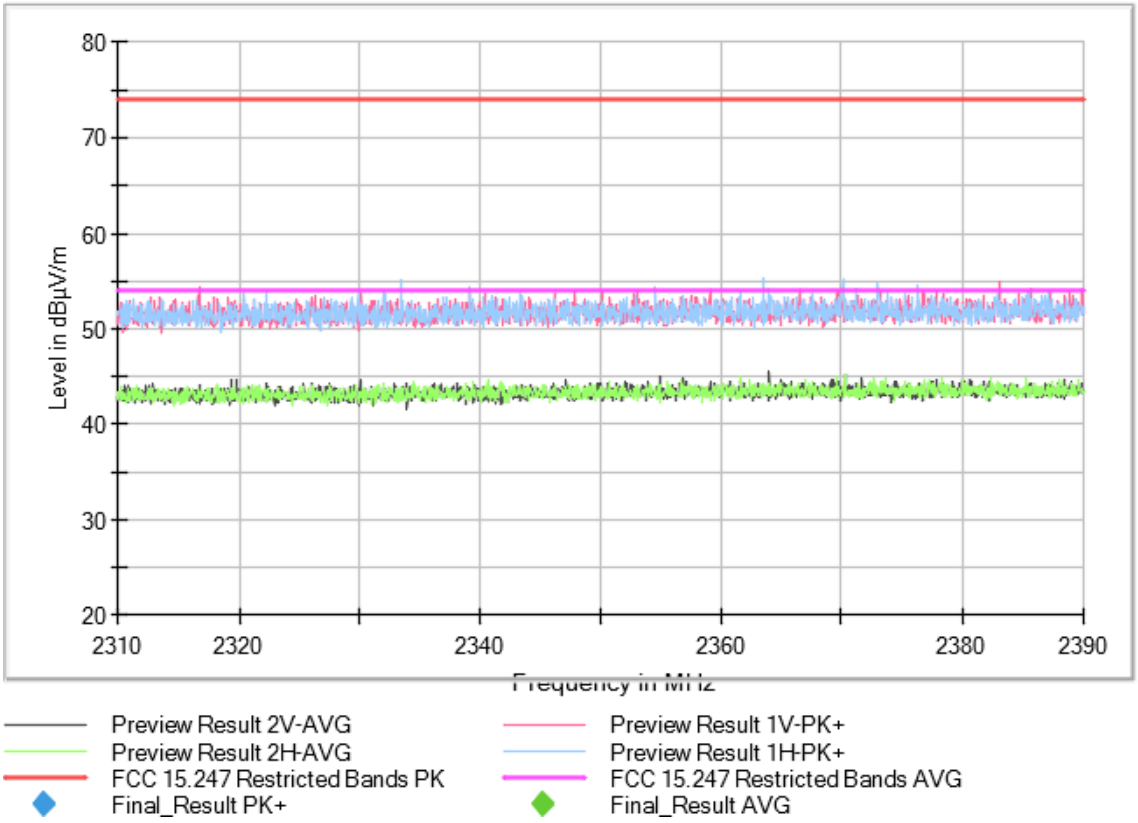
	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	1 GHz - 3 GHz	30,769 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

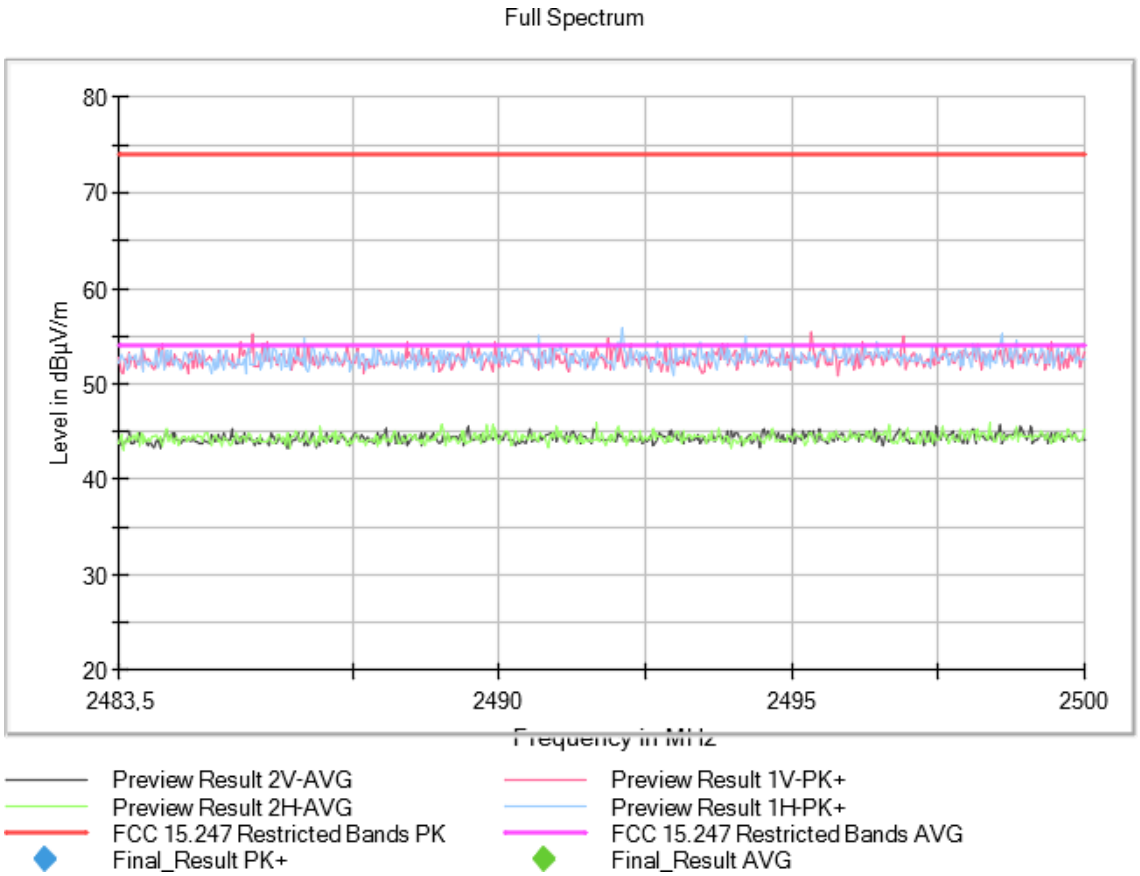
Frequency Range GHz = [1, 3]
Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 1 Mbit/s)
Frequency MHz = 2440.00000
MIMO Mode = SISO
Measurement Point = 1
Active Port = 1

Images:



Full Spectrum





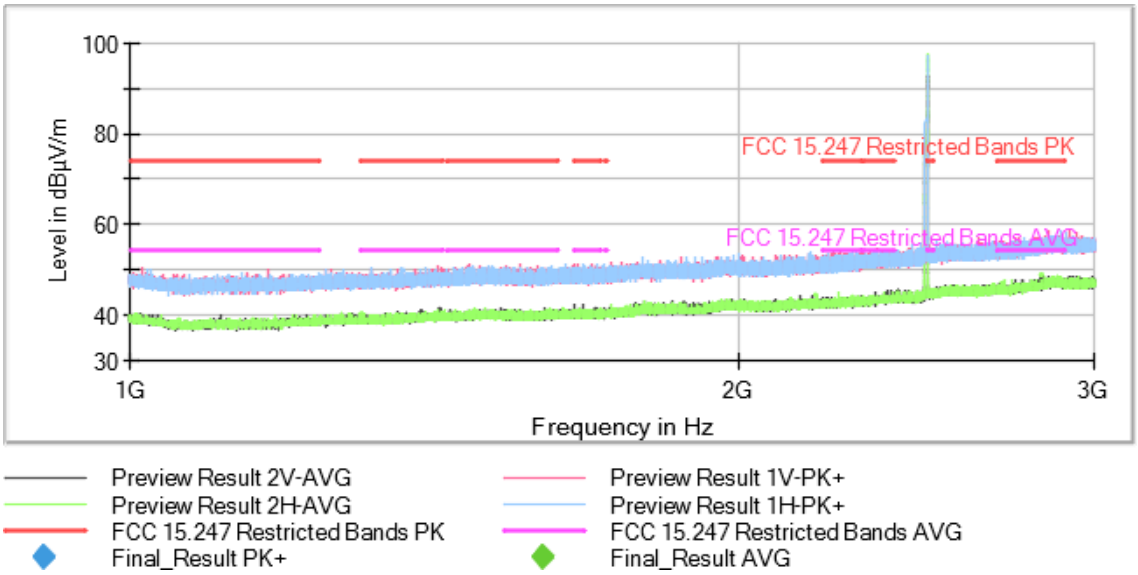
Tables:

Spectrum Analyzer Parameters

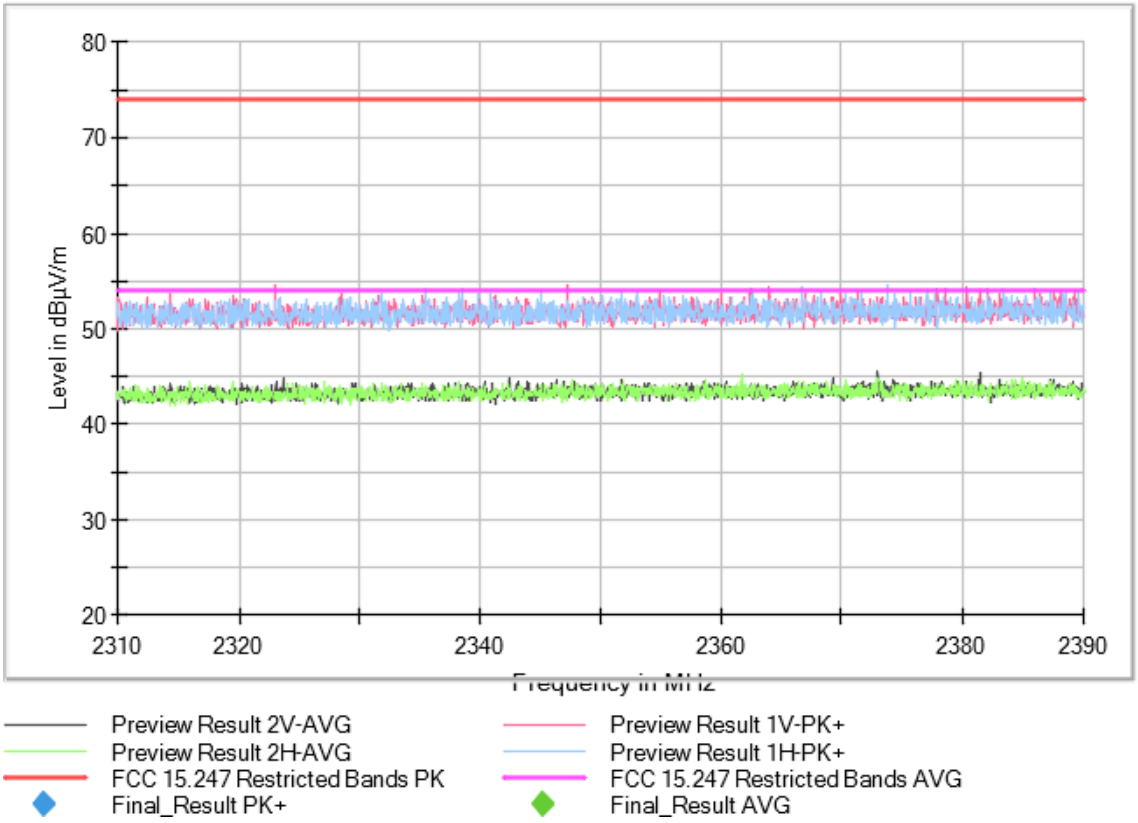
	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	1 GHz - 3 GHz	30,769 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

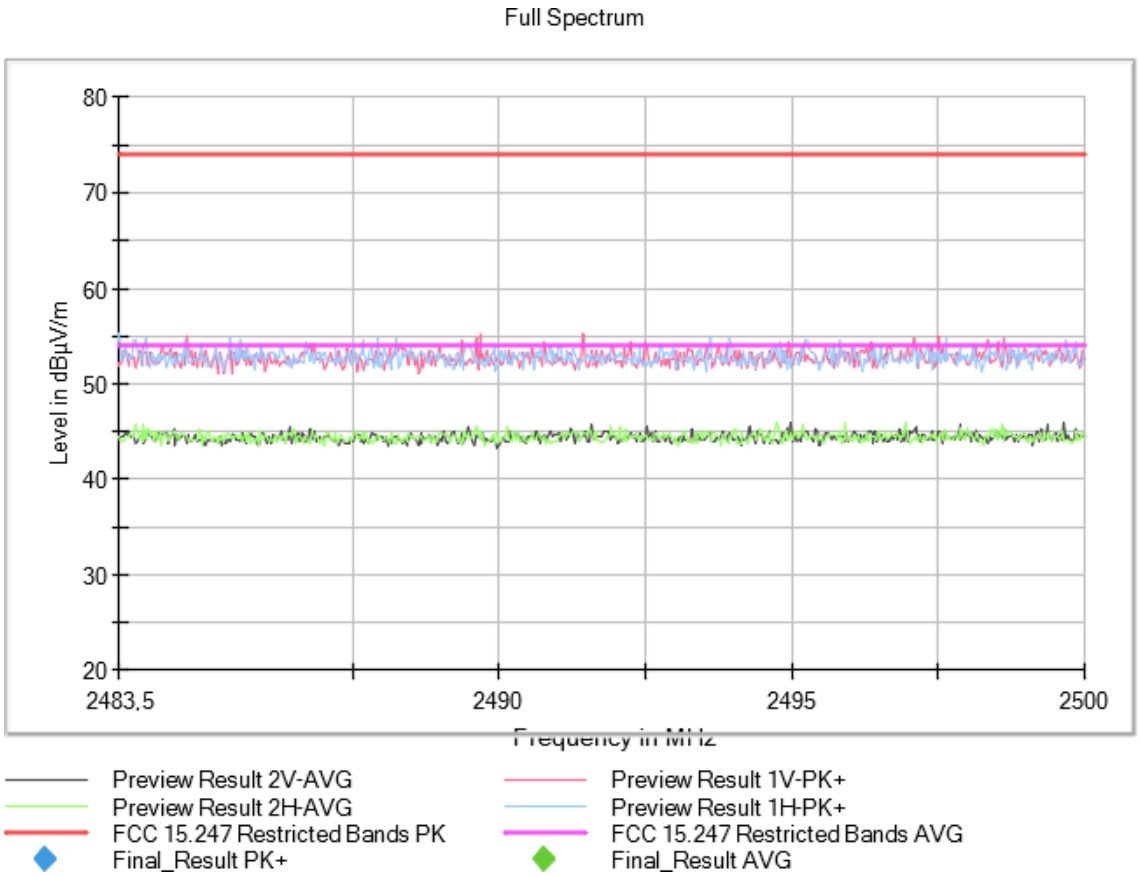
Frequency Range GHz = [1, 3]
Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 1 Mbit/s)
Frequency MHz = 2480.00000
MIMO Mode = SISO
Measurement Point = 1
Active Port = 1

Images:



Full Spectrum





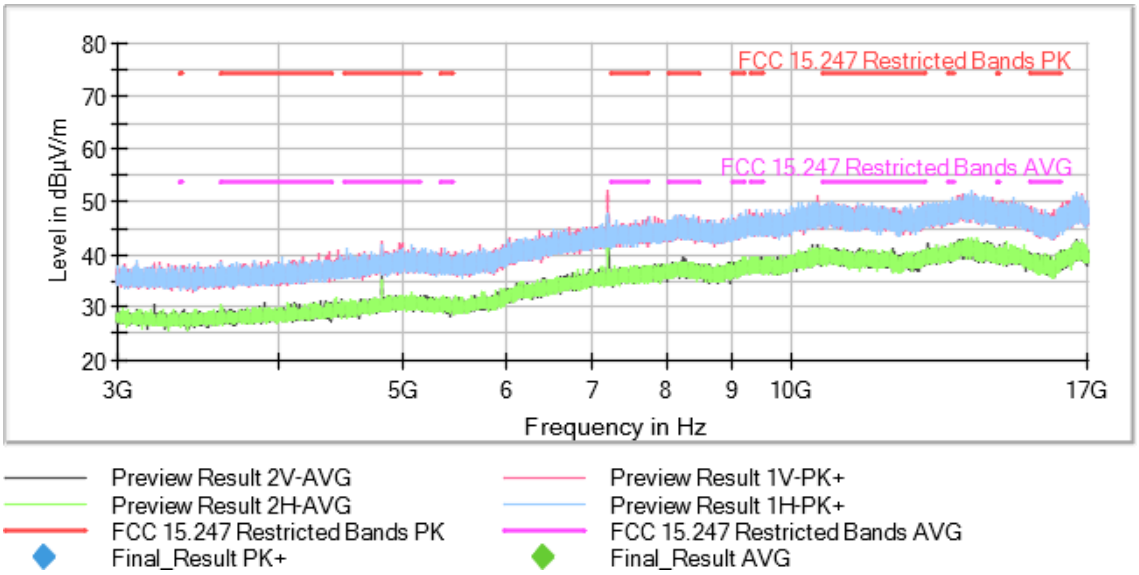
Tables:

Spectrum Analyzer Parameters

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

Frequency Range GHz = [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:

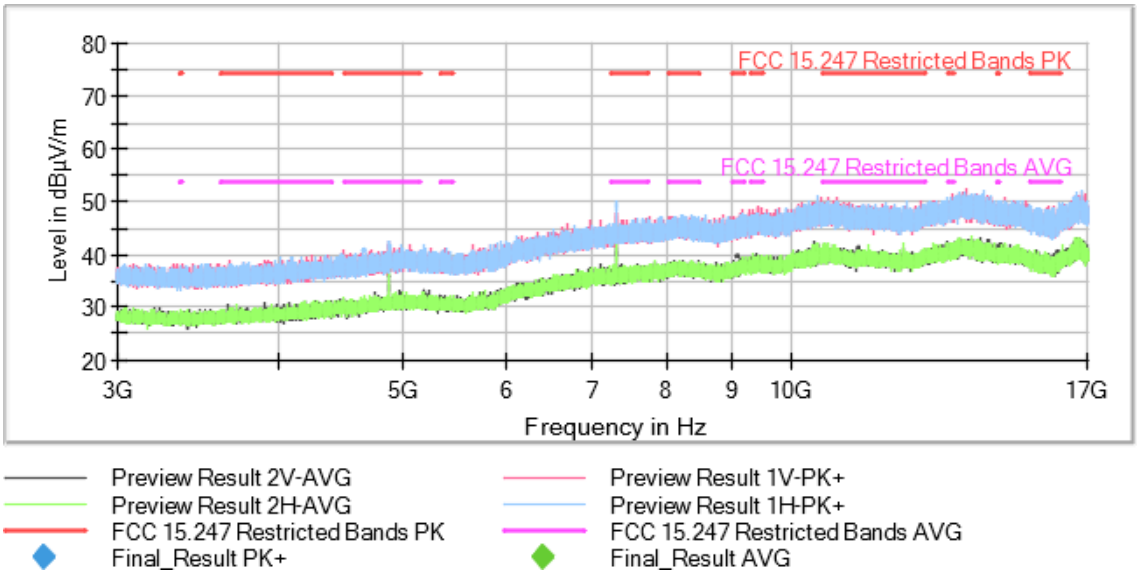


Tables:
Spectrum Analyzer Parameters

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

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

Images:

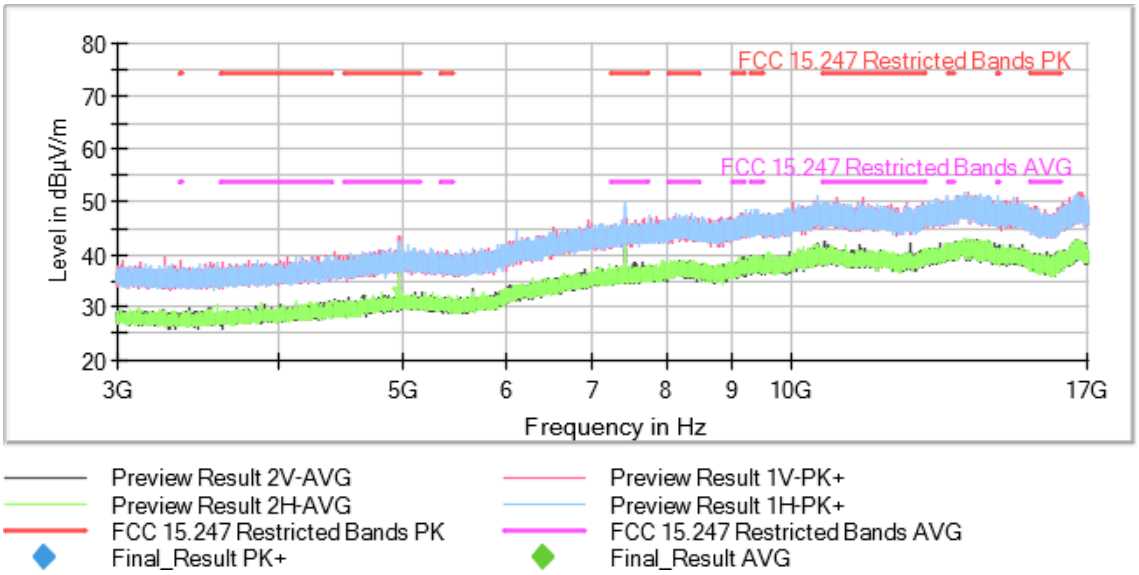


Tables:
Spectrum Analyzer Parameters

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

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

Images:



Tables:
Spectrum Analyzer Parameters

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

Frequency Range GHz = [17, 26]

Equipment Type = Digital Transmission System (DTS)

Modulation = This plot is valid for all channel and all modulations

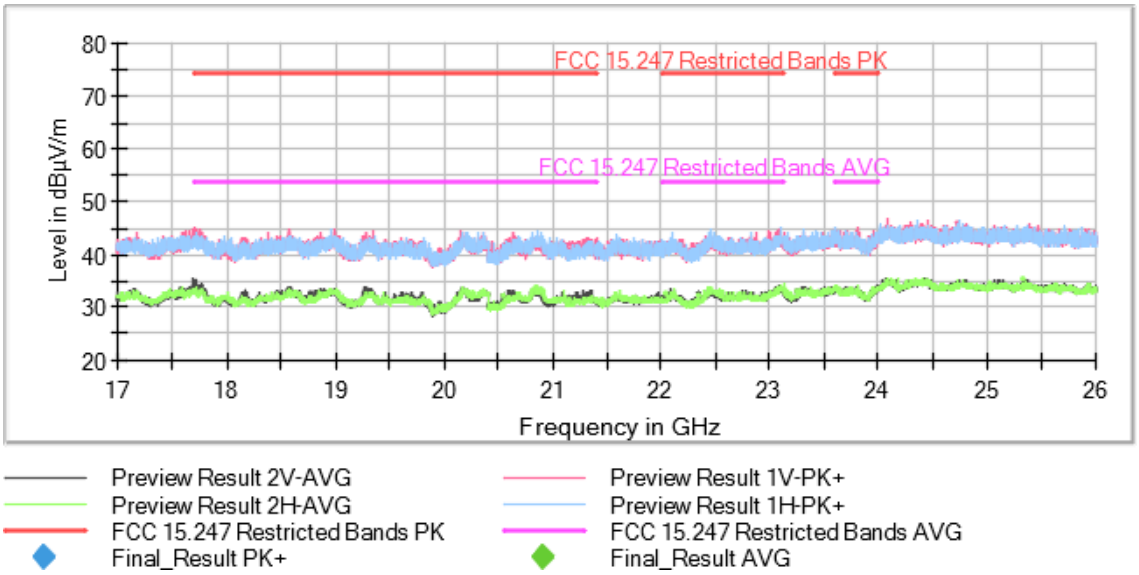
Frequency MHz = This plot is valid for all channel

MIMO Mode = SISO

Measurement Point = 1

Active Port = 1

Images:



This plot is valid for all channel and all modulations

Tables:

Spectrum Analyzer Parameters

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

Modulation: BTLE 5.0 (GFSK 2 Mbit/s)

Results

Freq Rng (GHz)	Equipment	Freq (MHz)	Port	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[1, 3]	Digital Transmission System (DTS)	2480.00000	1	2483.662	61.44	H	PK
				2483.662	51.26	H	AVG

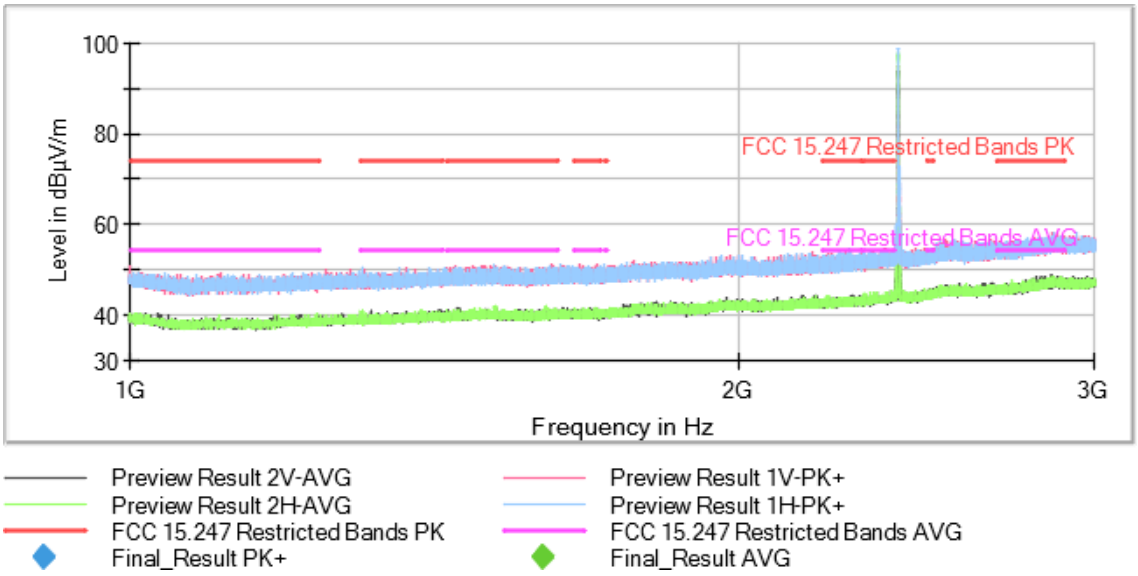
Verdict

Pass

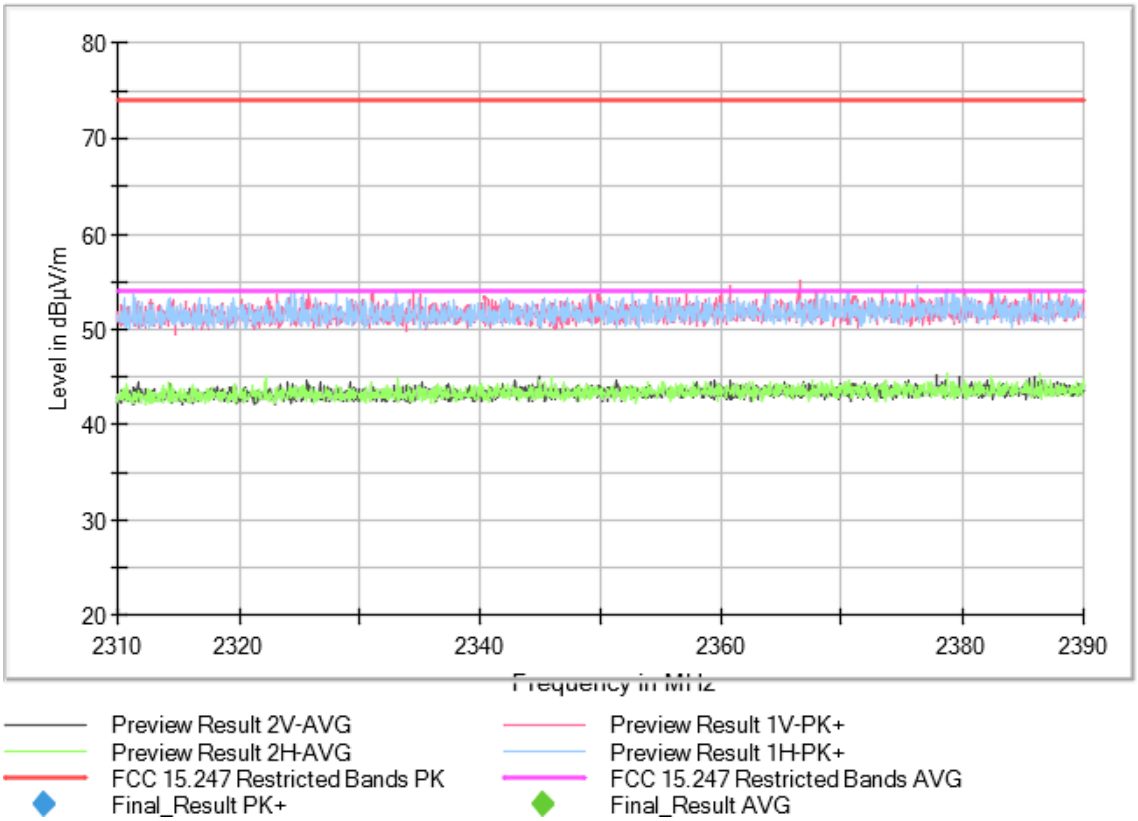
Attachments

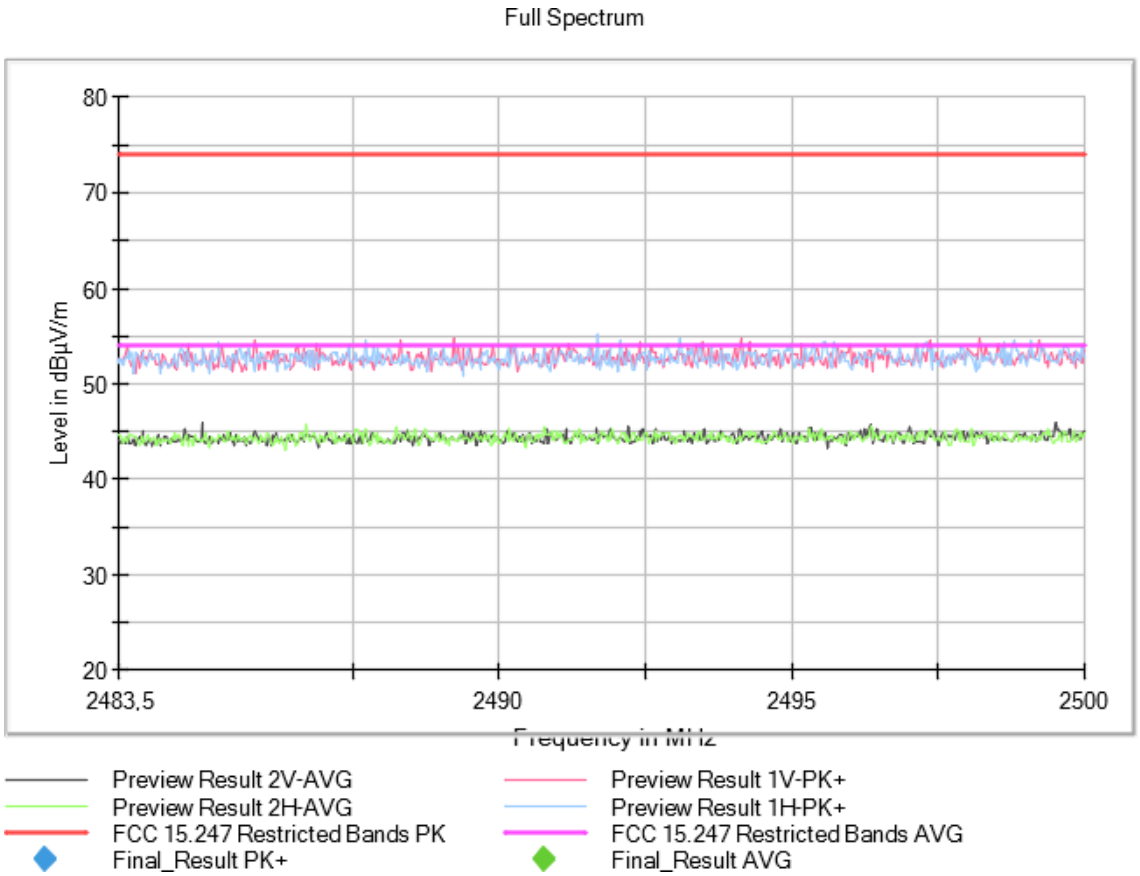
Frequency Range GHz = [1, 3]	Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 2 Mbit/s)	Frequency MHz = 2402.00000
MIMO Mode = SISO	Measurement Point = 1
Active Port = 1	

Images:



Full Spectrum





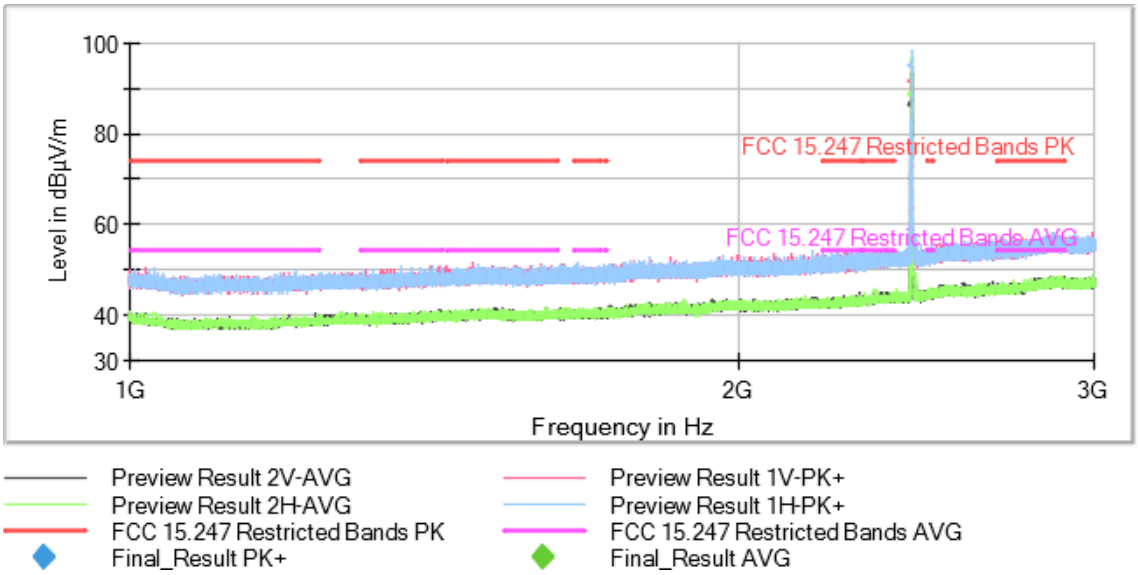
Tables:

Spectrum Analyzer Parameters

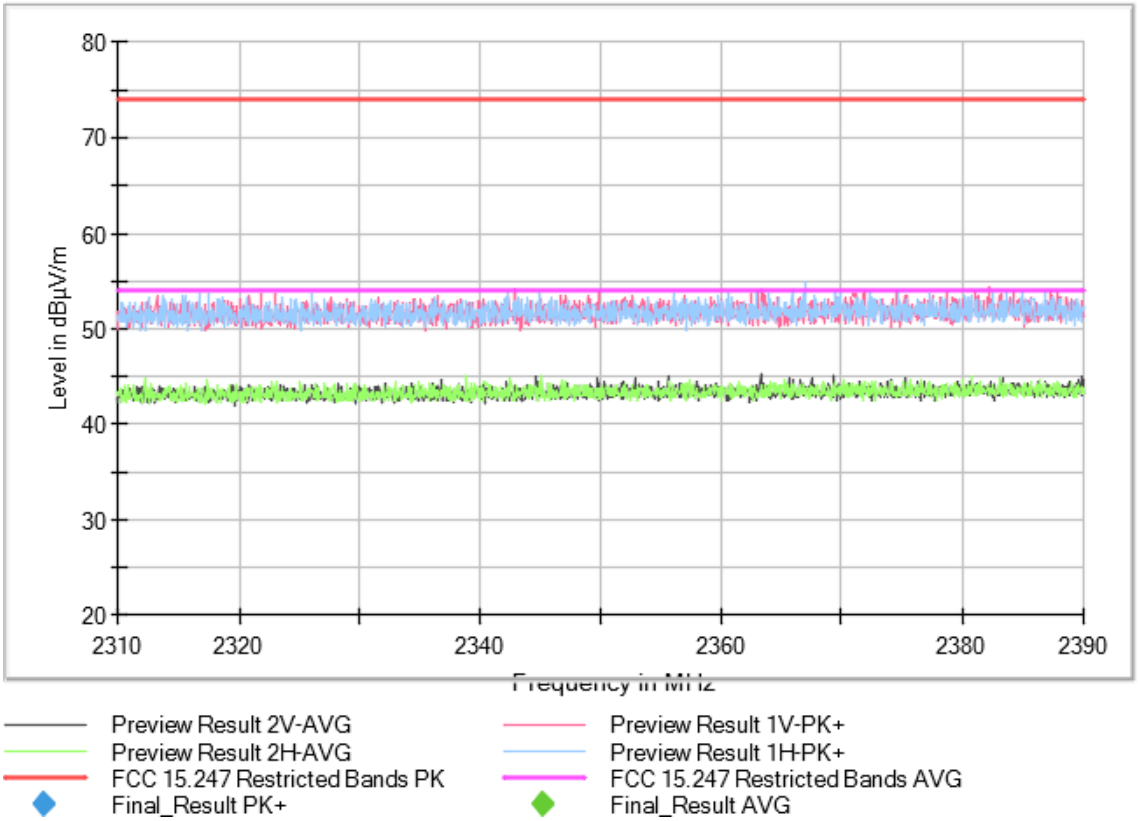
	Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
	Receiver: [ESW 44]					
	1 GHz - 3 GHz	30,769 kHz	PK+ ; AVG	1 MHz	1 s	0 dB

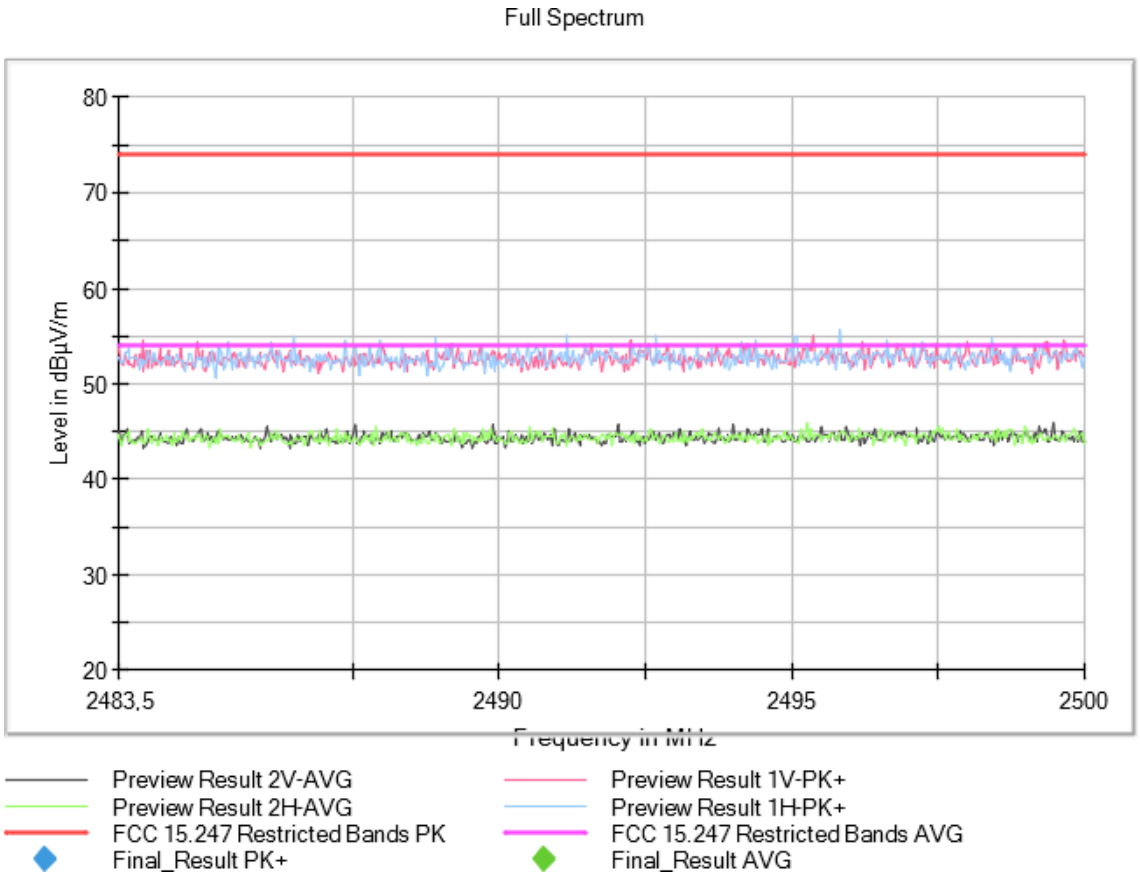
Frequency Range GHz = [1, 3]
Equipment Type = Digital Transmission System (DTS)
Modulation = BTLE 5.0 (GFSK 2 Mbit/s)
Frequency MHz = 2440.00000
MIMO Mode = SISO
Measurement Point = 1
Active Port = 1

Images:



Full Spectrum





Tables:

Spectrum Analyzer Parameters

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

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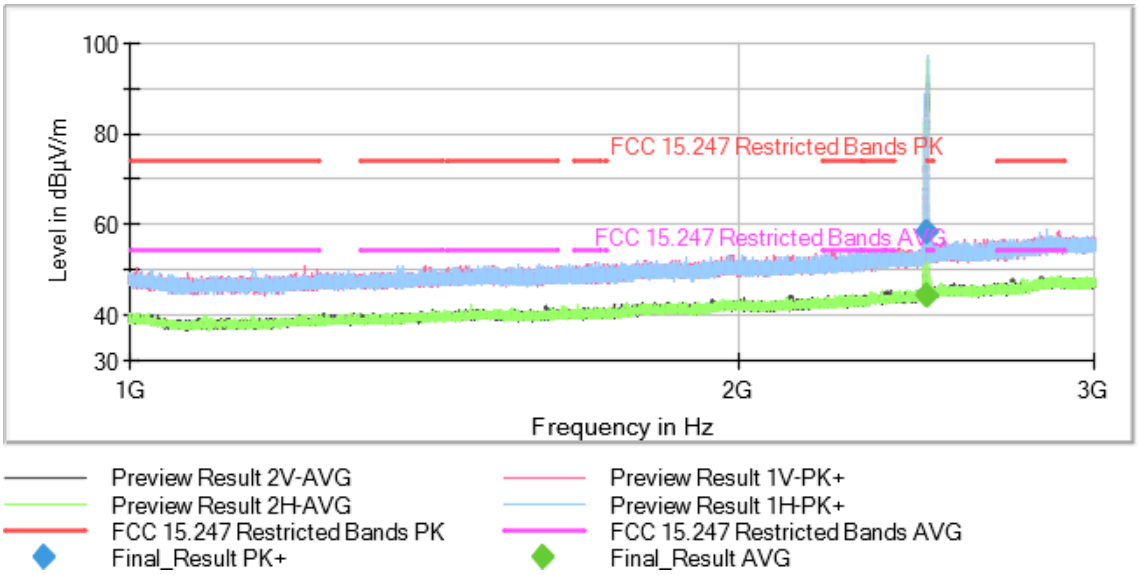
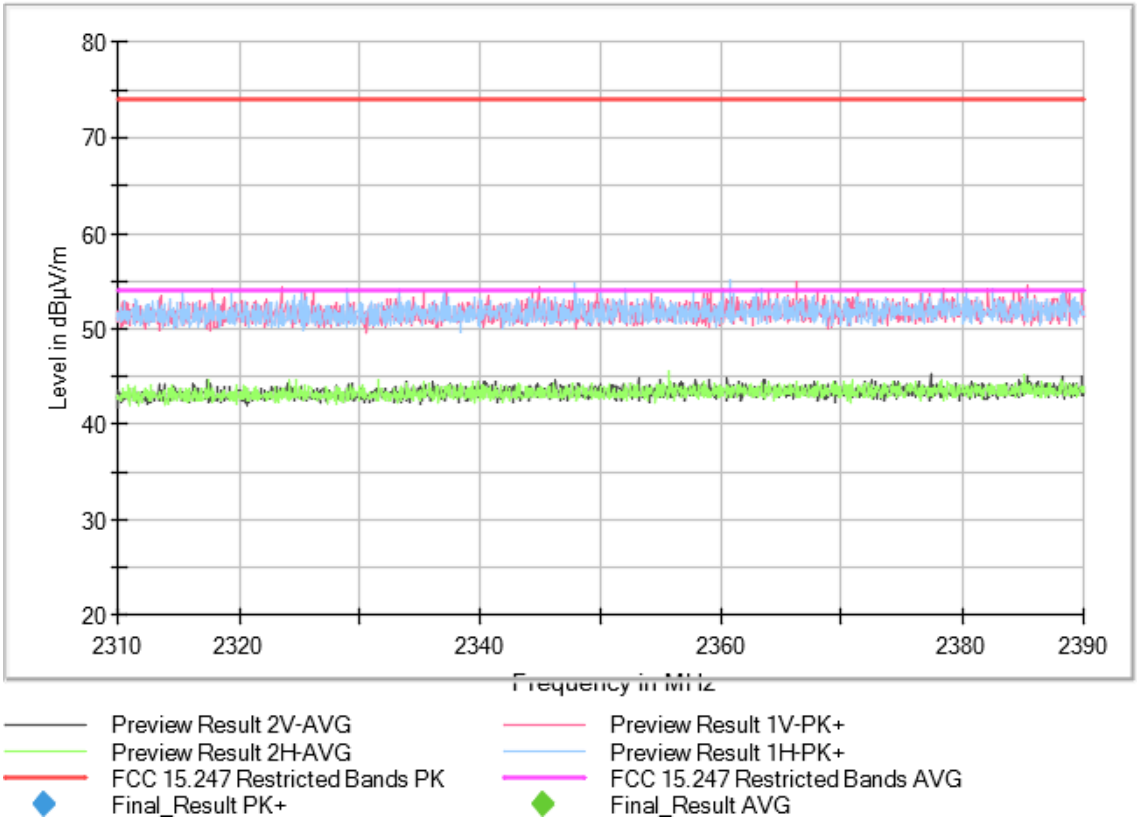
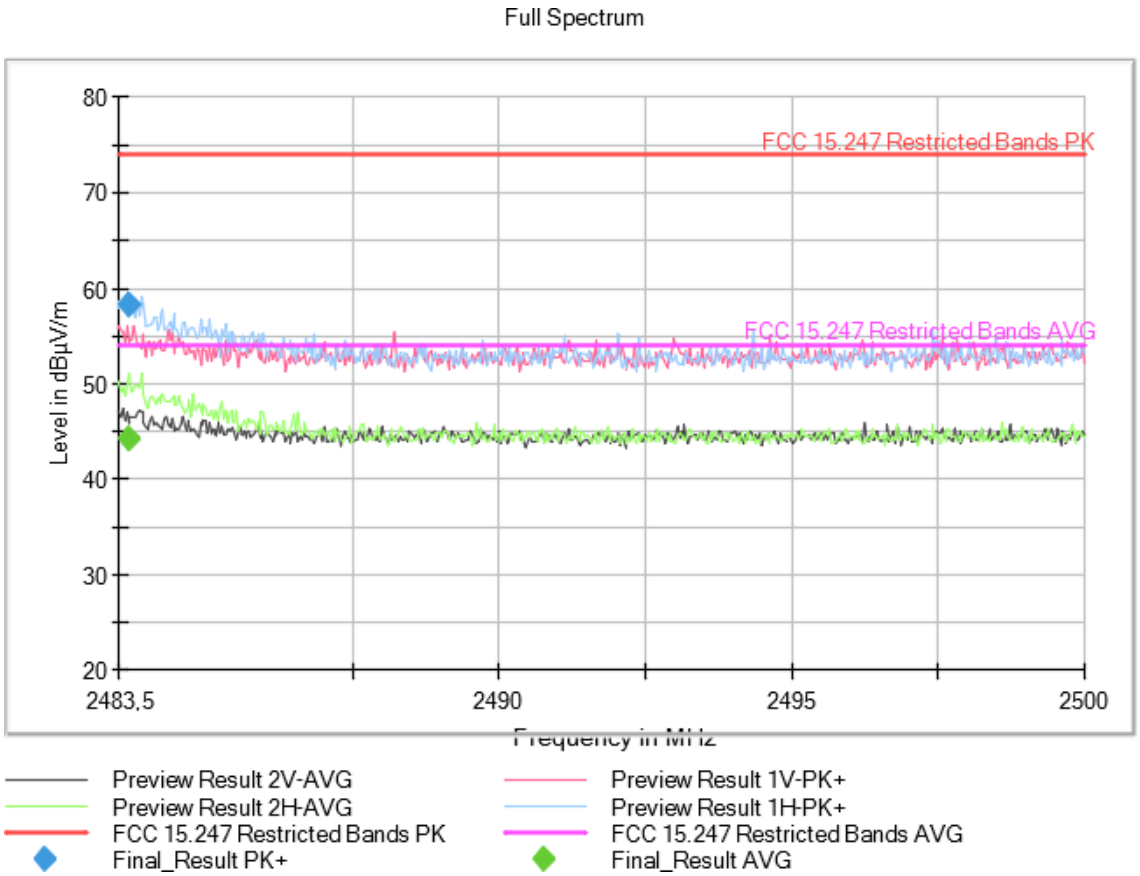
Images:



Full Spectrum





Tables:

Spectrum Analyzer Parameters

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

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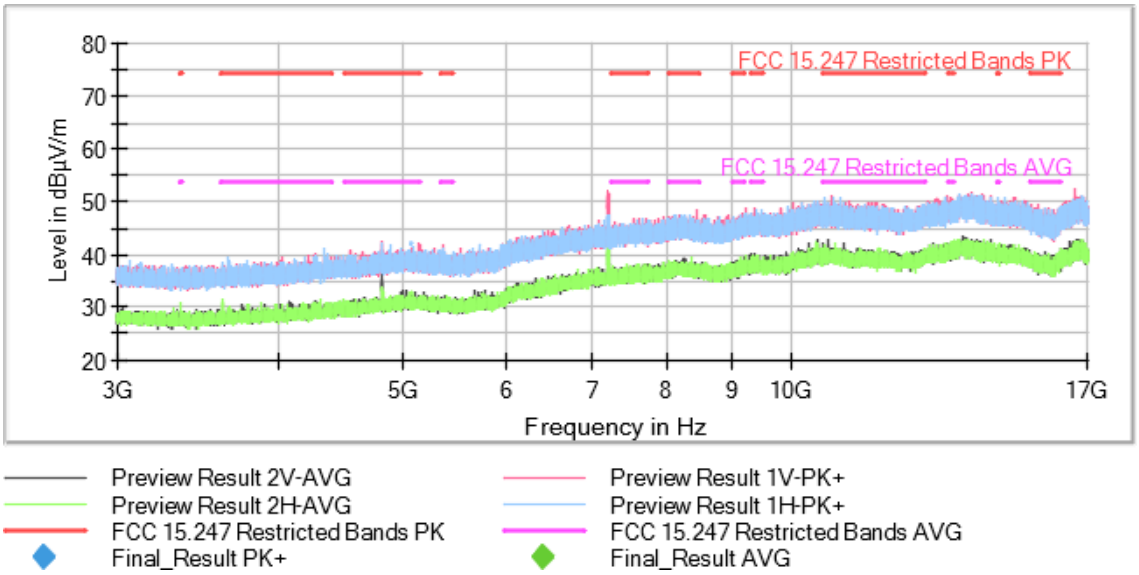
Modulation = BTLE 5.0 (GFSK 2 Mbit/s)
Frequency MHz = 2402.00000
MIMO Mode = SISO
Measurement Point = 1
Active Port = 1

Images:

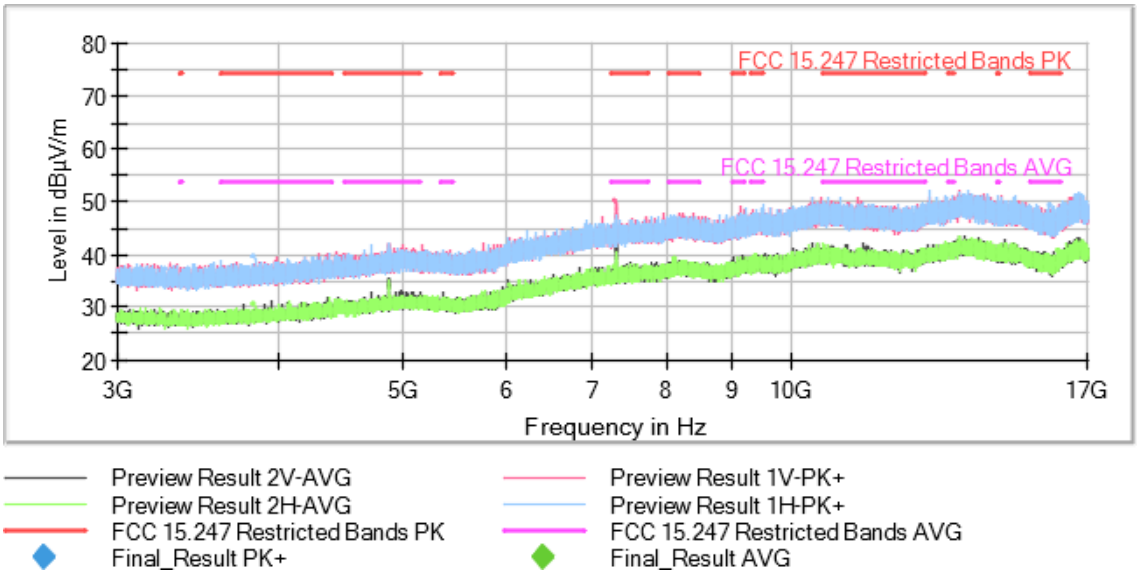


Tables:
Spectrum Analyzer Parameters

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

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

Images:



Tables:
Spectrum Analyzer Parameters

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

Frequency Range GHz = [3, 17]
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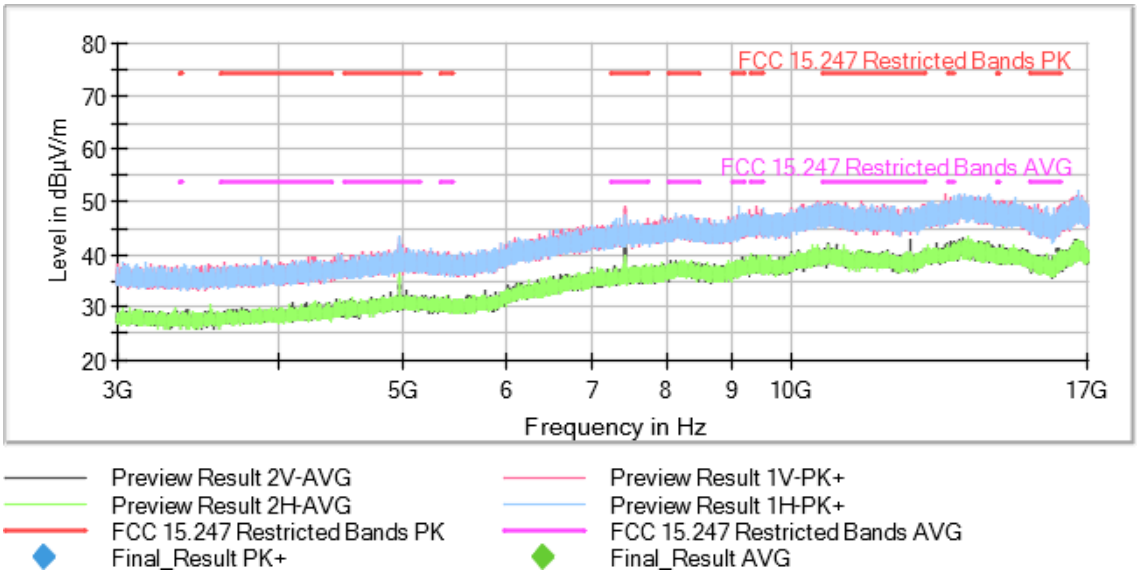
Images:



Tables:
Spectrum Analyzer Parameters

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