Index

Acronyms

Acronym ID	Acronym Description
	E.I.R.P.
Avg Power	Maximum Average Conducted Output Power
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 Spectral Density
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.

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 ≤ ± 1,14 %
Occupied Channel Bandwidth: Measurement uncertainty ≤ ± 1,40 %
Conducted Band-edge spurious emissions: Measurement uncertainty ≤ ± 1,76 dB
Accumulated Dwell Time: Measurement uncertainty ≤ ± 0,16 %
Minimum Frequency Occupation Time: Measurement uncertainty ≤ ± 0,53 %

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 an ASOG device.

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 Nº	Date of Reception	Application
S/01	80539B_5.1	Mobile Network Equipment	ASOG 476254A	L124290545	2024-10-03	Element Under Test

Notes referenced to samples during the project:

Id	Type
S/01	Samples used for Conducted and radiated tests.

Test sample description

Ports..... :

Port name and description	Cable			
	Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)
LMP RJ45	100m	[X]	[X]	[ ]
-48V PSU Connector	-	[X]	[X]	[ ]
EIF1-2 SFP	optical	[ ]	[X]	[ ]
EIF3 RJ45	100m	[ ]	[X]	[ ]
SEI SFP	optical	[ ]	[X]	[ ]
RF1-15 SFP	optical	[ ]	[X]	[ ]
EAC 19-pin	-	[ ]	[X]	[ ]
SIN 19-pin	-	[ ]	[X]	[ ]
SOUT 19-pin	-	[ ]	[X]	[ ]

Rated power supply..... :

Voltage and Frequency		Reference poles				
		L1	L2	L3	N	PE
[X]	DC: -48V					
[ ]	DC: -					

Rated Power..... :	396.88 W
Clock frequencies ..... :	-
Other parameters..... :	-
Software version..... :	SW version: MB_PS_REL_2024_07_0021

Hardware version..... :	HW version: ASOG A102			
Dimensions in cm (W x H x D)..... :	440mm x 365mm x 43.5mm (1U)			
Mounting position..... :	[X]	Table top equipment		
	[X]	Wall/Ceiling mounted equipment		
	[ ]	Floor standing equipment		
	[ ]	Hand-held equipment		
	[X]	Other: Server rack, mobile tower		
Modules/parts ..... :	**Module/parts of test item**		**Type**	**Manufacturer**
	.....		.....	.....
Accessories (not part of the test item) .....:	**Description**		**Type**	**Manufacturer**
	.....		.....	.....
Documents as provided by the applicant .....:	**Description**		**File name**	**Issue date**
	.....		.....	.....

(3) Only for Medical Equipment

Identification of the client

Nokia Solutions and Networks GmbH & Co. KG
Lise-Meitner-Straße 7/1-2, 89081 Ulm, Germany

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2024-10-22
Date (finish)	2024-10-30

Document history

Report number	Date	Description
80539RRF.004	2024-11-14	First release.
80539RRF.004A1	2025-01-17	Second release. Modification due to typos and it was corrected the antenna gain value. This modification test report cancels and replaces the test report 80539RRF.004.

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: Carmen Vazquez Perez.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
07445	DC POWER SUPPLY 30V/5A	U8002A	KEYSIGHT TECHNOLOGIES	N/A
07760	DIGITAL MULTIMETER	175	FLUKE	2024-11-08
07817	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2026-07-01
06615	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2025-04-04
06609	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2025-04-22
04953	HIGH PASS FILTER 1.1-8GHz	WHK10-990-1100-8000-40SS	WAINWRIGHT INSTRUMENTS	2025-02-14
09029	HIGH PASS FILTER 17-40 GHZ	STHP-17-40G-92	TEMSTRON/TEMWELL	2025-03-29
08770	HIGH PASS FILTER 3-18 GHZ	ST-3GA2833-HS	TEMSTRON/TEMWELL	2025-08-02
06496	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK	2026-12-01
04657	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2026-06-12
06143	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2027-01-22
07656	LOW PASS FILTER TEMSTRON/TEMWELL DC - 1 GHZ	ST-1GA3250-LS	TEMSTRON/TEMWELL	2025-02-02
07193	MULTI-DEVICE CONTROLLER	CO3000	INNCO	N/A
08848	OPEN SWITCH UNIT UP TO 7.5 GHz	OSP-B157W8 PLUS	ROHDE & SCHWARZ	2024-12-21
00922	POWER SUPPLY DC 40 V / 40 A	Type 4231	BRüEL & KJæR	2027-10-02
08856	PRE-AMPLIFIER G>30dB 18-40GHz	BLMA 1840-4A	BONN ELEKTRONIK	2025-02-27
03783	PRE-AMPLIFIER G>30dB 1GHz-18GHz	BLMA 0118-3A	BONN ELEKTRONIK	2025-03-15
06142	PRE-AMPLIFIER G>38dB 30MHz-6GHz	BLNA 0360-01N	BONN ELEKTRONIK	2025-07-25
06144	PRE-AMPLIFIER G>40dB 10MHz-6GHz	BLNA 0160-01N	BONN ELEKTRONIK	2025-07-22
06791	SEMIANECHOIC ABSORBER LINED CHAMBER IV	FACT 3 200 STP	ETS LINDGREN	N/A

Control No.	Equipment	Model	Manufacturer	Next Calibration
06793	SHIELDED ROOM	S101	ETS LINDGREN	N/A
07794	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2025-04-21
06668	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2024-12-14
07791	SIGNAL GENERATOR 8kHz-6GHz	SMB100B	ROHDE AND SCHWARZ	2026-03-15
07793	SIGNAL GENERATOR 8kHz-6GHz	SMBV100B	ROHDE AND SCHWARZ	2026-03-11
04848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	N/A
06611	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2025-04-04
08847	VECTOR SIGNAL GENERATOR 100kHz-7.5GHz	SMW200A	ROHDE AND SCHWARZ	2025-09-29
07795	WIRELESS CONNECTIVITY TESTER BW 160 MHz	CMW270	ROHDE AND SCHWARZ	2025-03-13
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

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

INDEX

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal:	-48V DC
Type of Power Supply:	External power supply

ANTENNA (*):

Type of Antenna:	Rod Antenna
Maximum Declared Antenna Gain:	3.03 dBi

TEST FREQUENCIES (*):

Modulation	Data rates	Low Channel:	Middle Channel	High Channel
802.11b:	1 Mbit/s	2412 MHz	2437 MHz	2462 MHz
802.11g:	6 Mbit/s	2412 MHz	2437 MHz	2462 MHz
802.11n:	HT20 MCS0 6.5 Mbit/s	2412 MHz	2437 MHz	2462 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.

POWER SETTING (*):
For all modes, the EUT was configured in test mode using a software application. The application was used to enable a continuous transmission and to select the test channels as required. The client supplied instructions to configure the EUT. The customer supplied a power setting table with the maximum level for each mode and band:

Mode	POWER SETTING		
	CH1	CH6	CH11
11b	18	18	18
11g	19	19	19
11n-20	19	19	19

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).

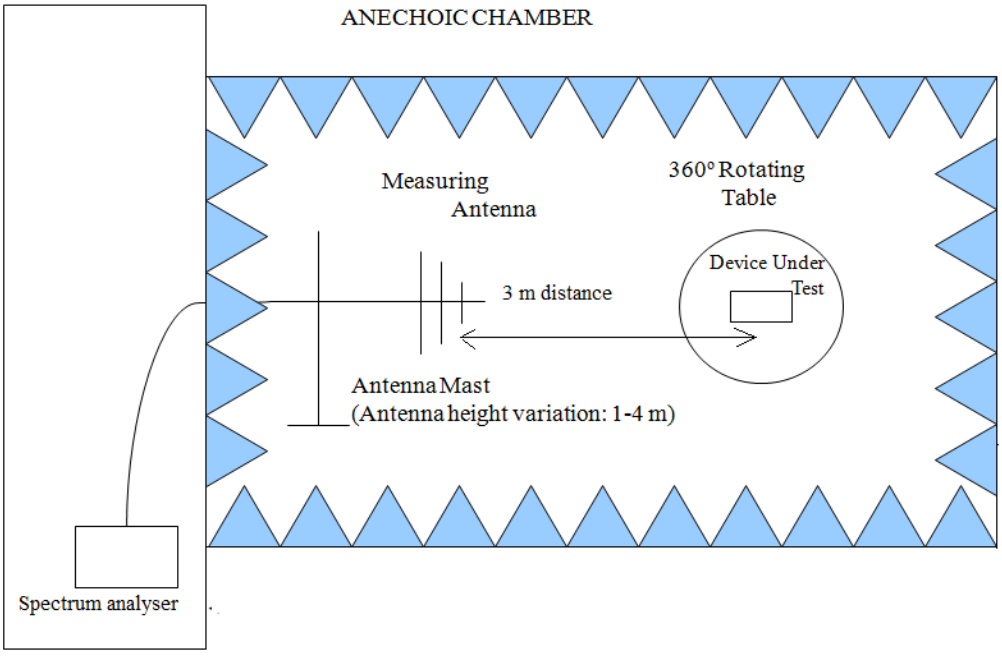
For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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.

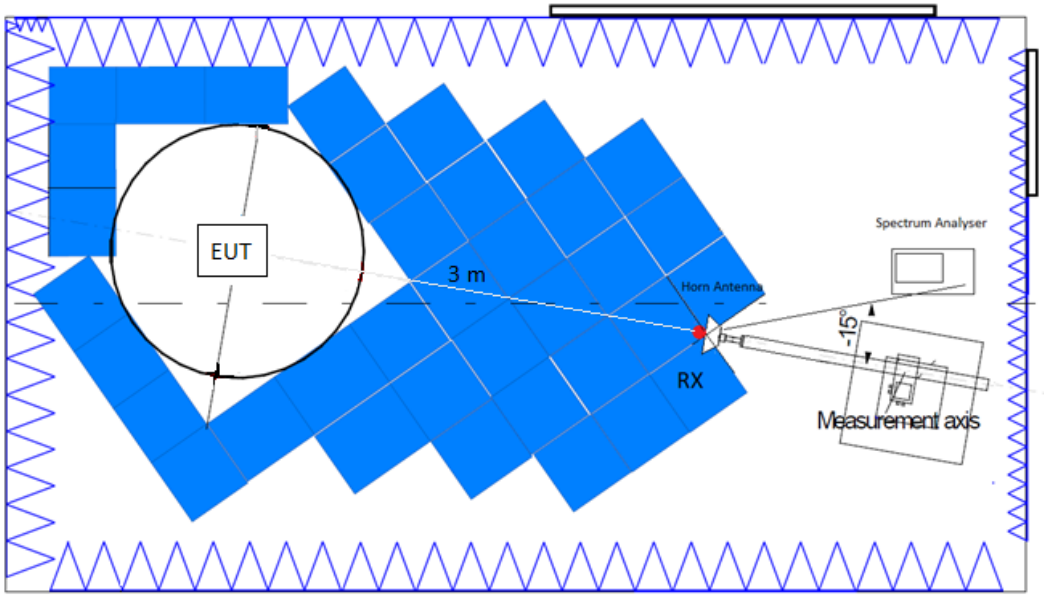
A resolution bandwidth/video bandwidth of 100 kHz / 300 kHz was used for frequencies below 1 GHz and 1 MHz / 3 MHz for frequencies above 1 GHz.

Radiated measurements setup from 30 MHz to 1 GHz:

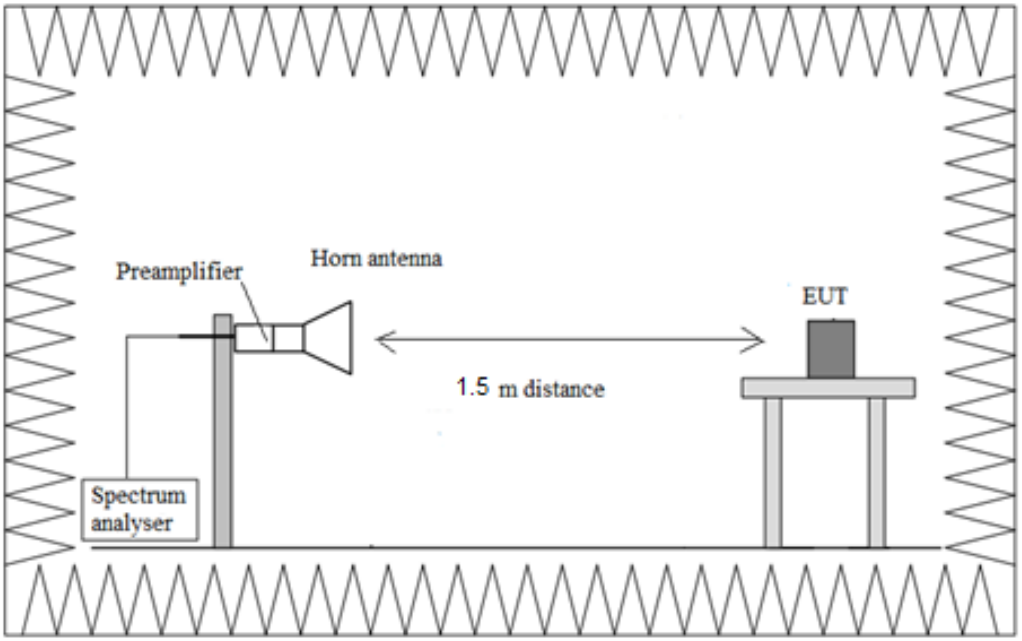


Shielded Control Room For Radiated Measurements

Radiated measurements setup from 1 GHz to 17 GHz:


EUT
3 m
Horn Antenna
RX
Spectrum Analyser
-15°
Measurement axis

Radiated measurements setup f > 17 GHz:



TEST CASES DETAILS

FCC 47 CFR Part 15.247 / RSS-247

99dBw Occupied Channel Bandwidth 99%

Limits:

- **FCC Rules and Regulations 47 CFR Part 2, Secs. 2.1049:**

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

- **RSS-Gen Issue 5, Secs. 6.7:**

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

Modulation: 802.11b (DSSS 1 Mbit/s)

MIMO Mode: SISO

Results

Equipment	BW (MHz)	Freq (MHz)	Port	Occ Ch BW (MHz)
Digital Transmission System (DTS)	20	2412.00000	1	10.300
		2437.00000		10.200
		2462.00000		10.100

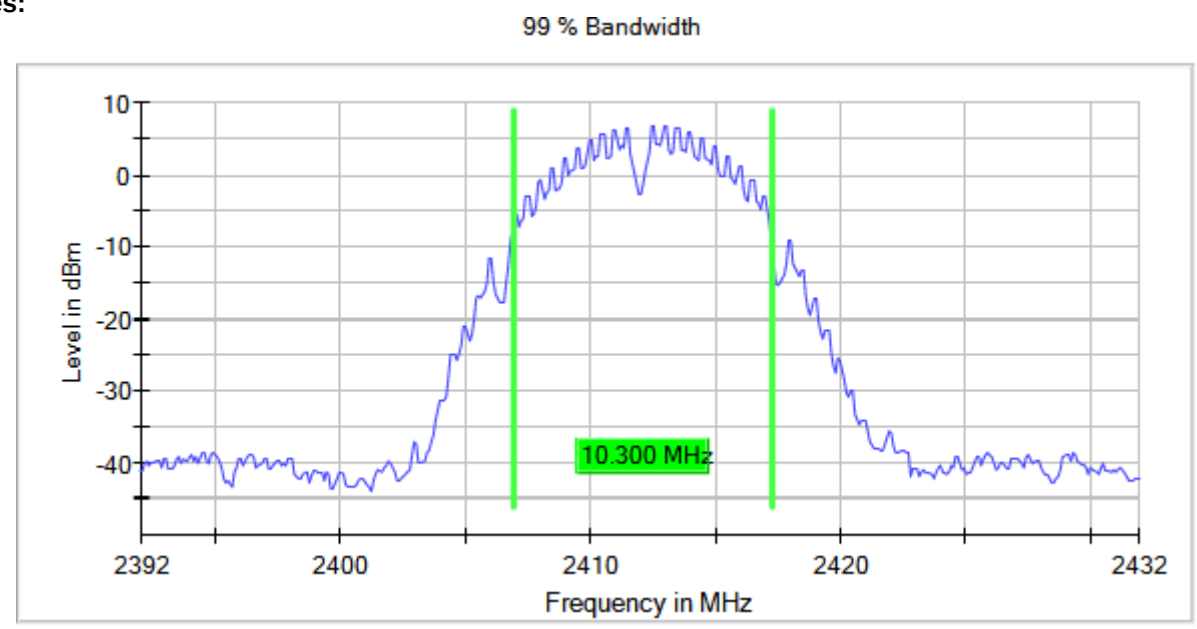
Verdict

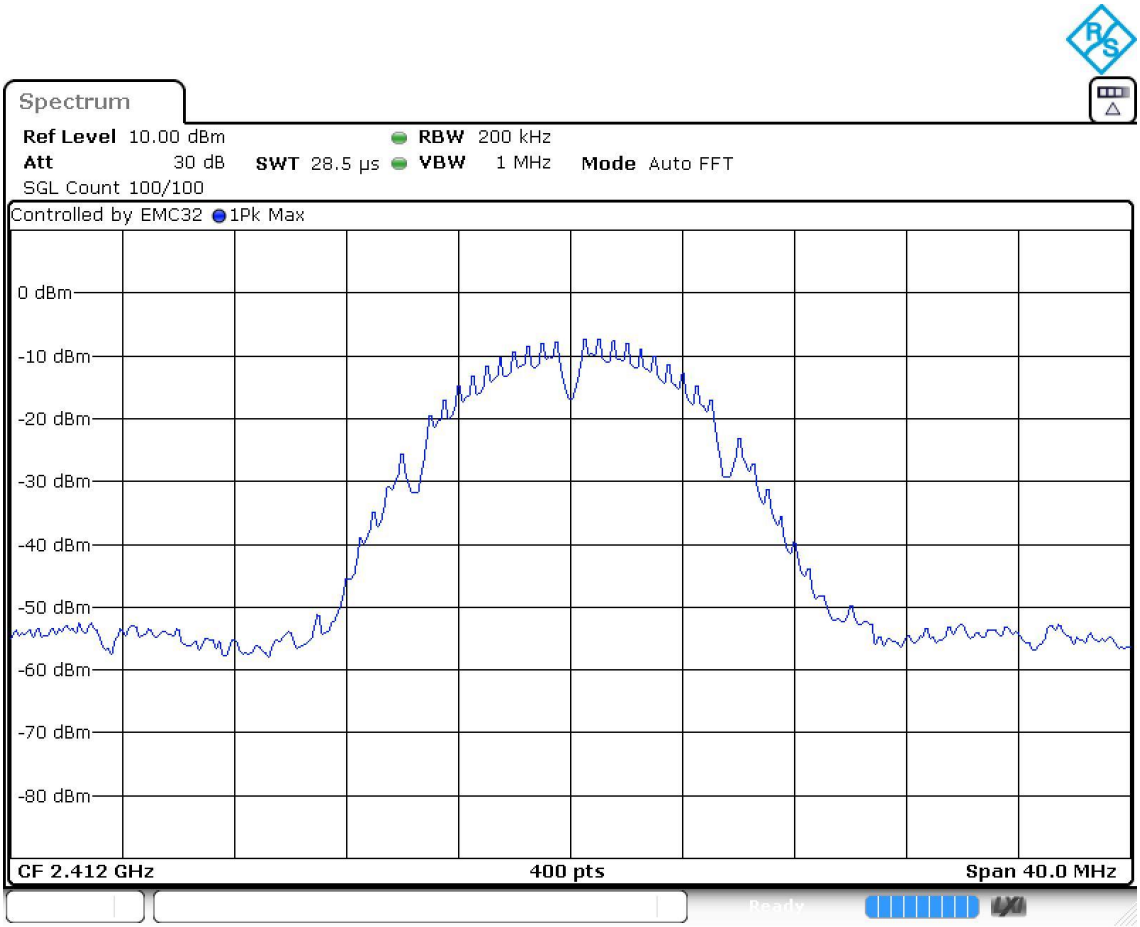
Pass

Attachments

Equipment Type = Digital Transmission System (DTS)
Bandwidth MHz = 20
Modulation = 802.11b (DSSS 1 Mbit/s)
Frequency MHz = 2412.00000
MIMO Mode = SISO
Active Port = 1

Images:



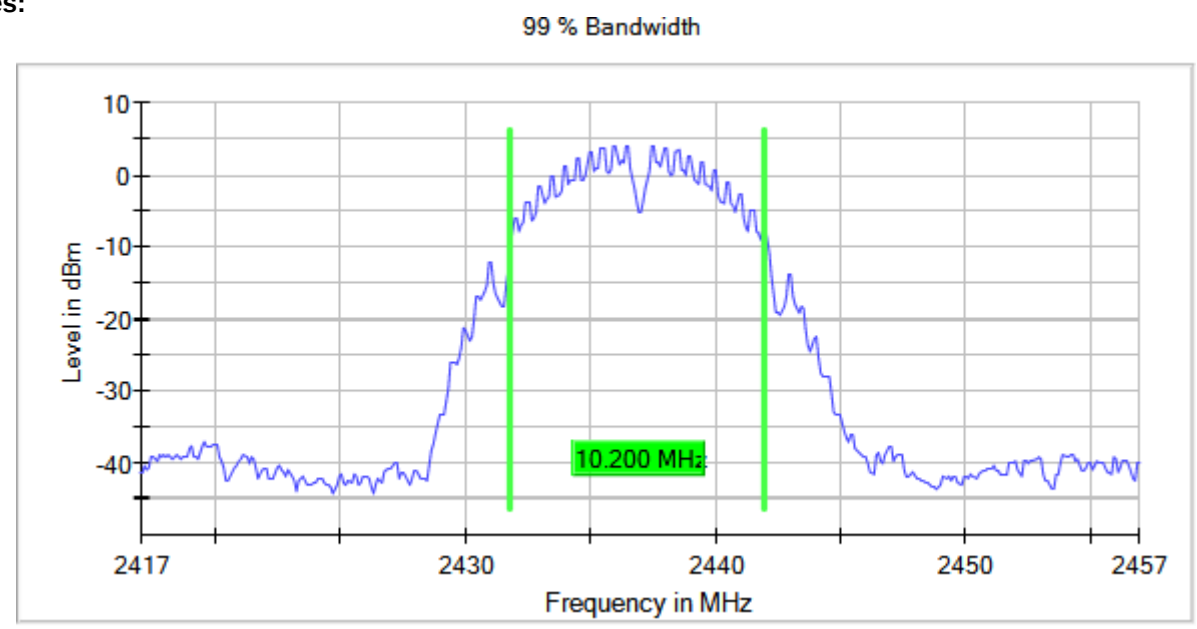


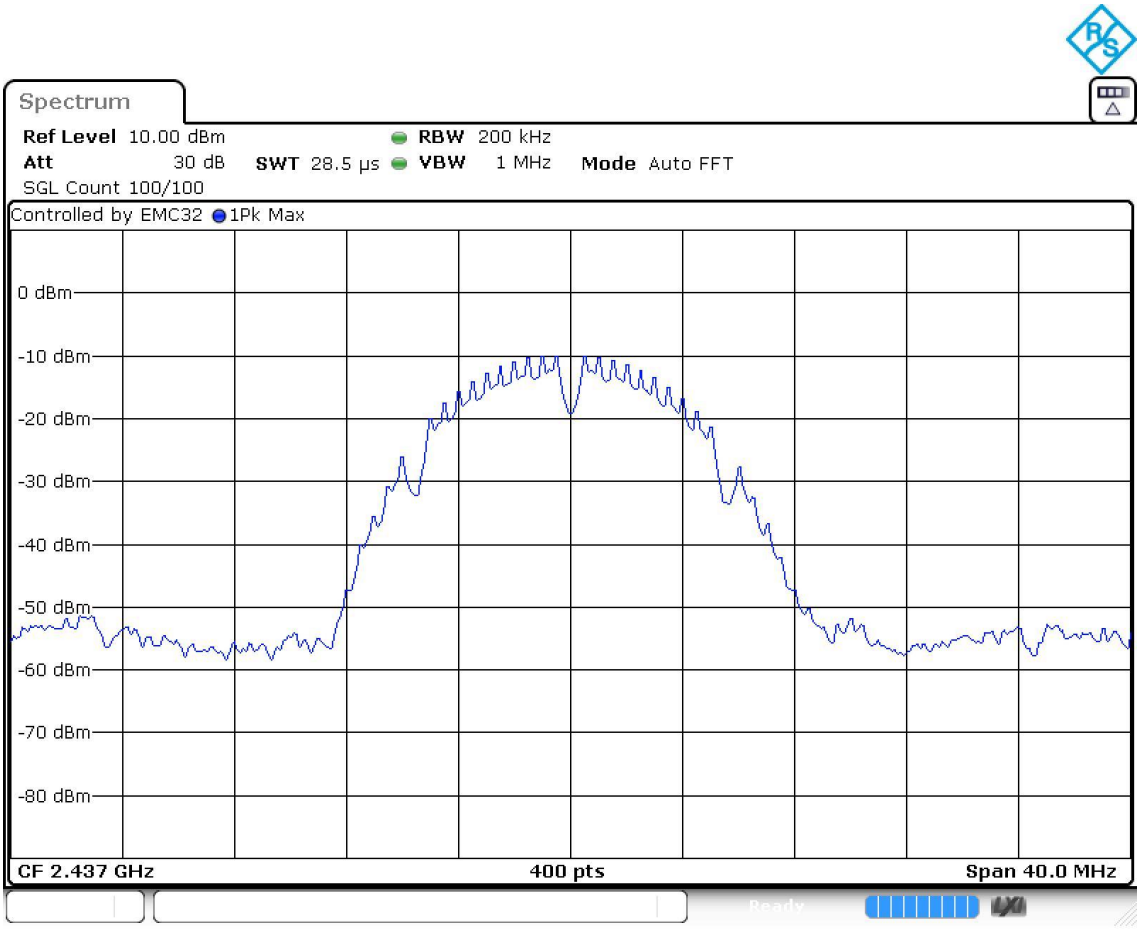
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2437.00000

MIMO Mode = SISO Active Port = 1

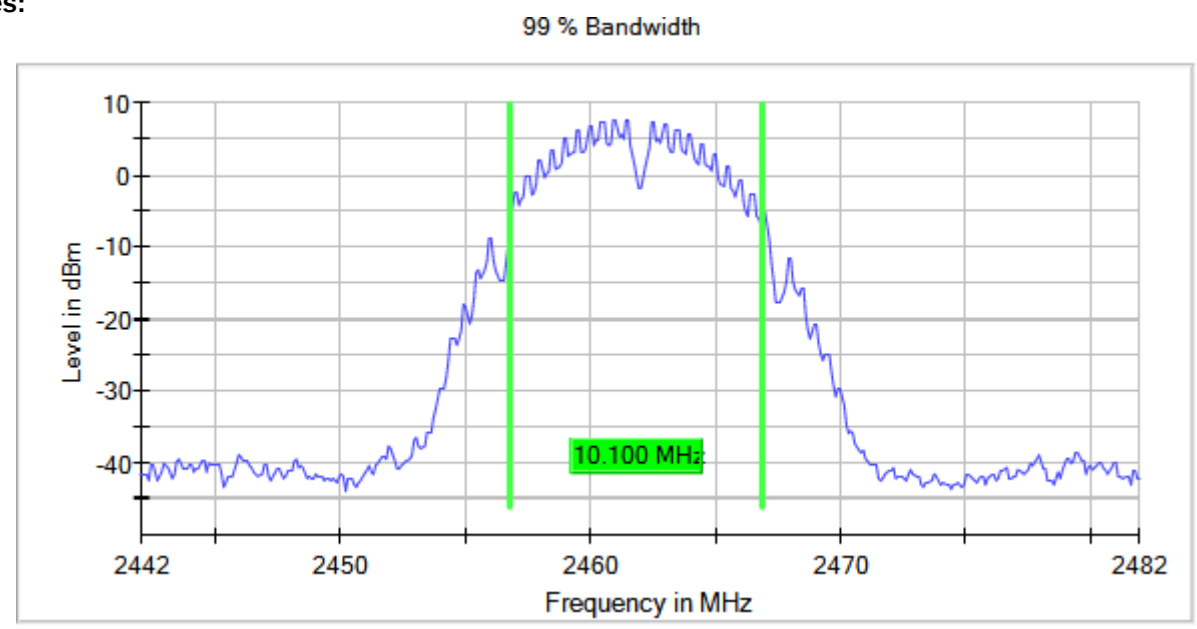
Images:

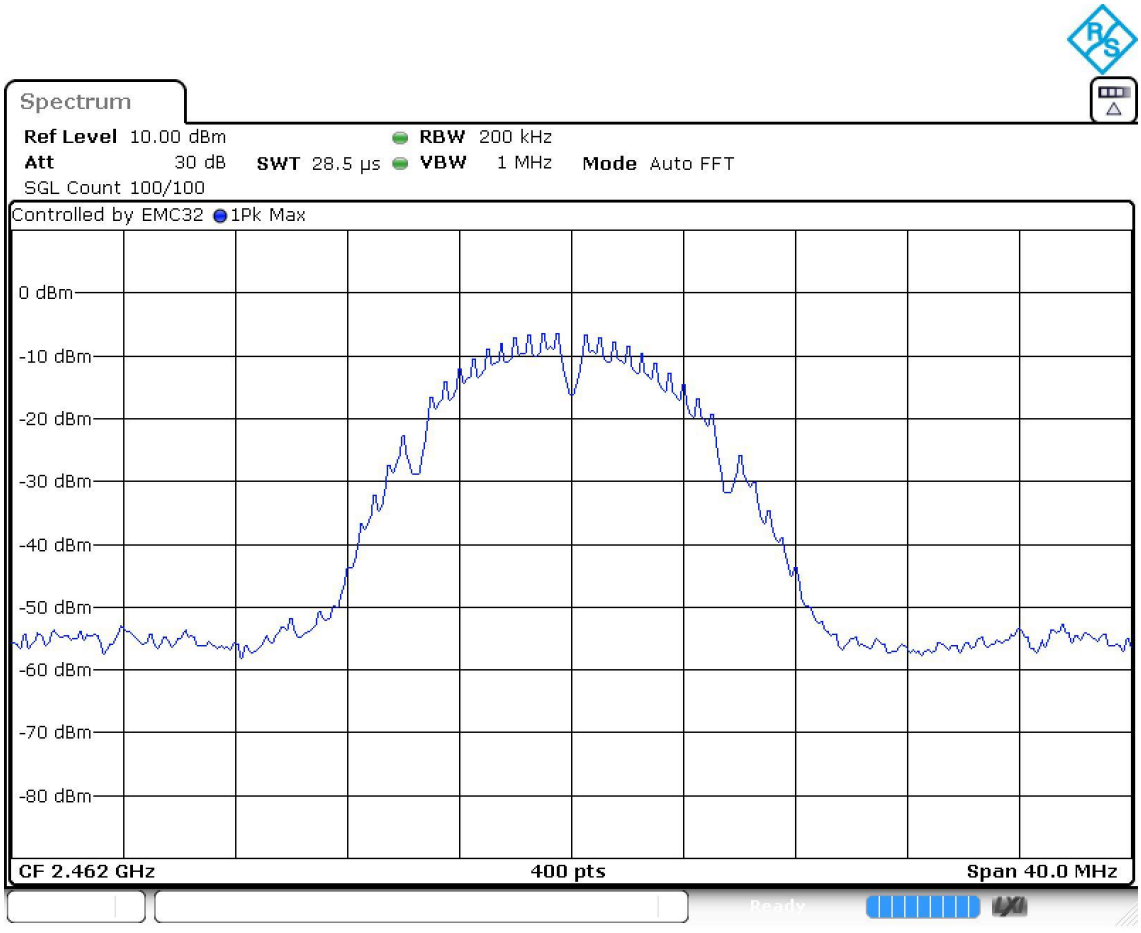




Equipment Type = Digital Transmission System (DTS)	Bandwidth MHz = 20
Modulation = 802.11b (DSSS 1 Mbit/s)	Frequency MHz = 2462.00000
MIMO Mode = SISO	Active Port = 1

Images:





Modulation: 802.11g (OFDM 6 Mbit/s)

MIMO Mode: SISO

Results

Equipment	BW (MHz)	Freq (MHz)	Port	Occ Ch BW (MHz)
Digital Transmission System (DTS)	20	2412.00000	1	16.600
		2437.00000		16.900
		2462.00000		16.400

Verdict

Pass

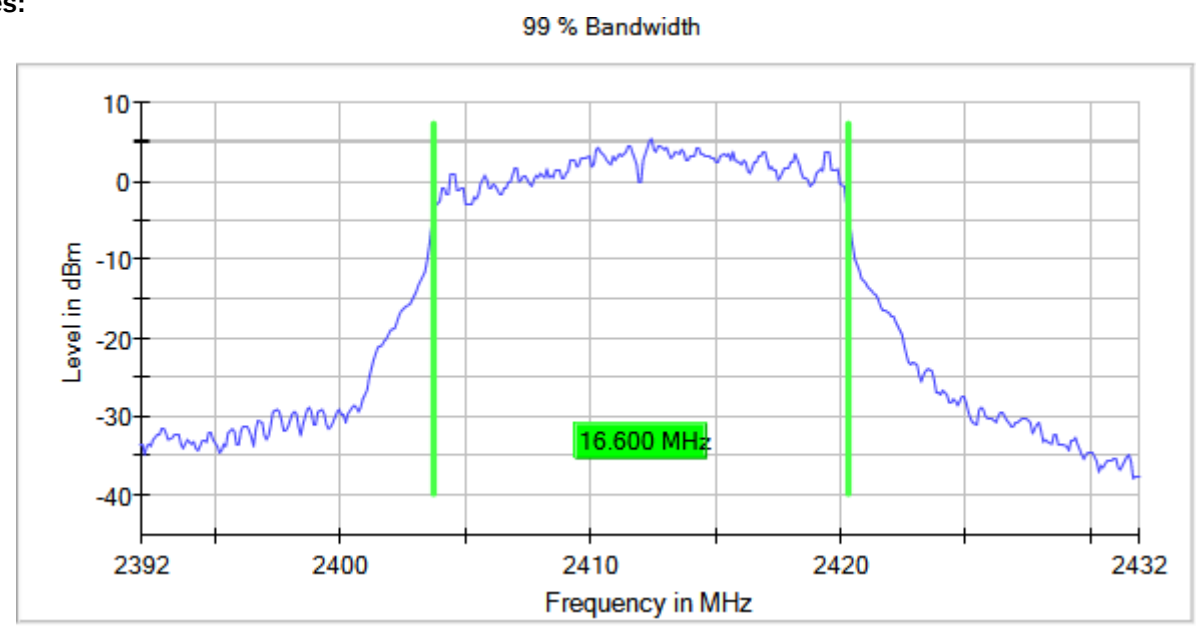
Attachments

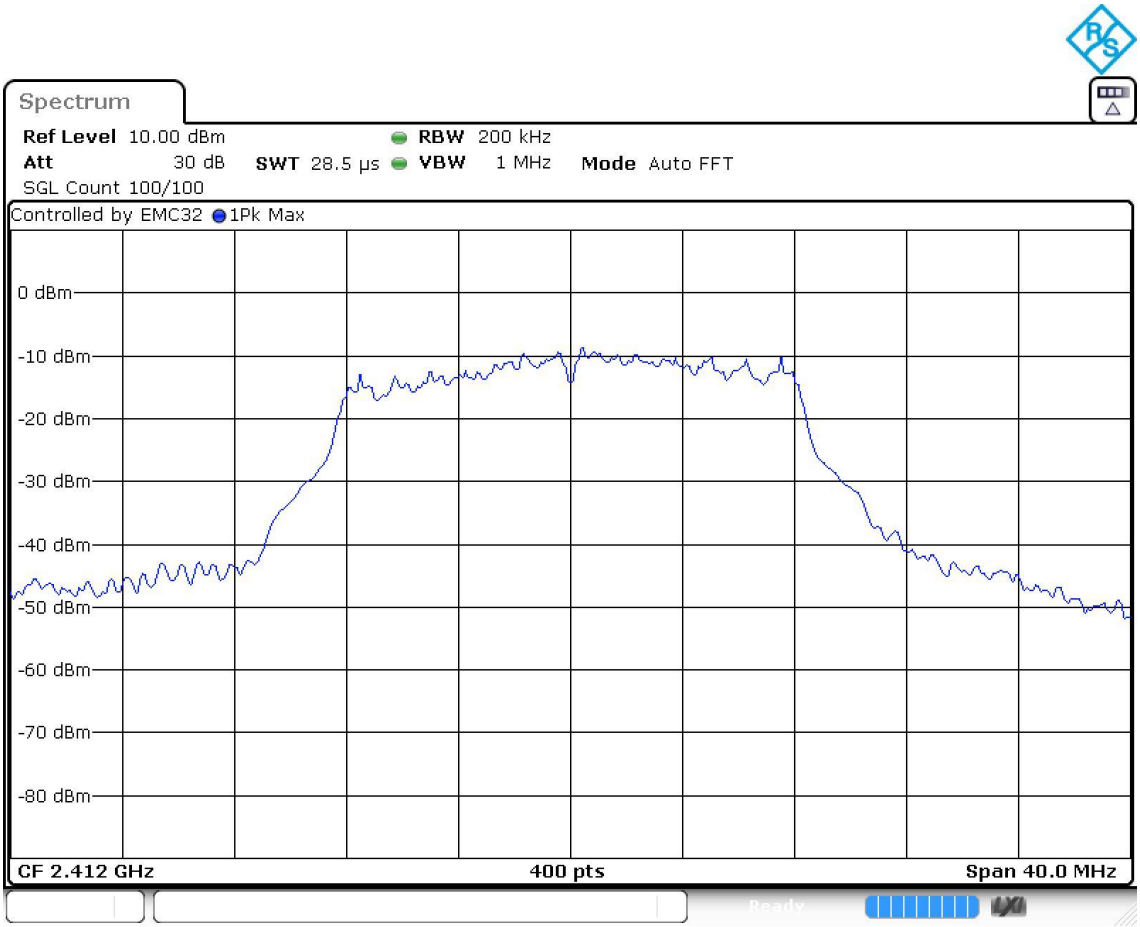
Equipment Type = Digital Transmission System (DTS) | Bandwidth MHz = 20

Modulation = 802.11g (OFDM 6 Mbit/s) | Frequency MHz = 2412.00000

MIMO Mode = SISO | Active Port = 1

Images:



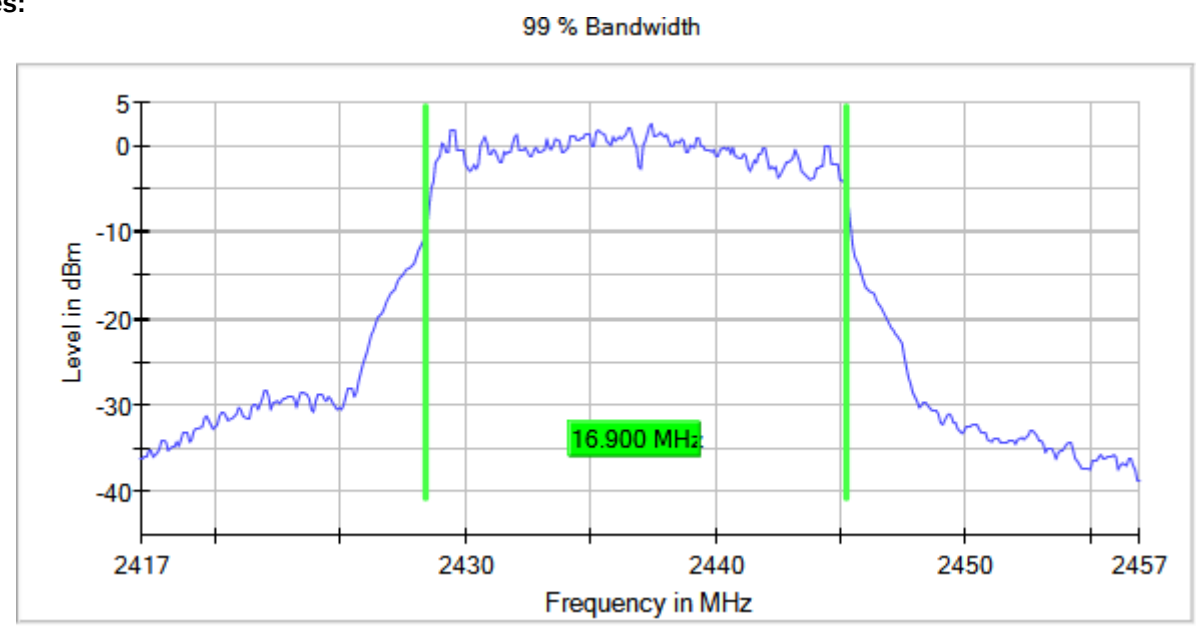


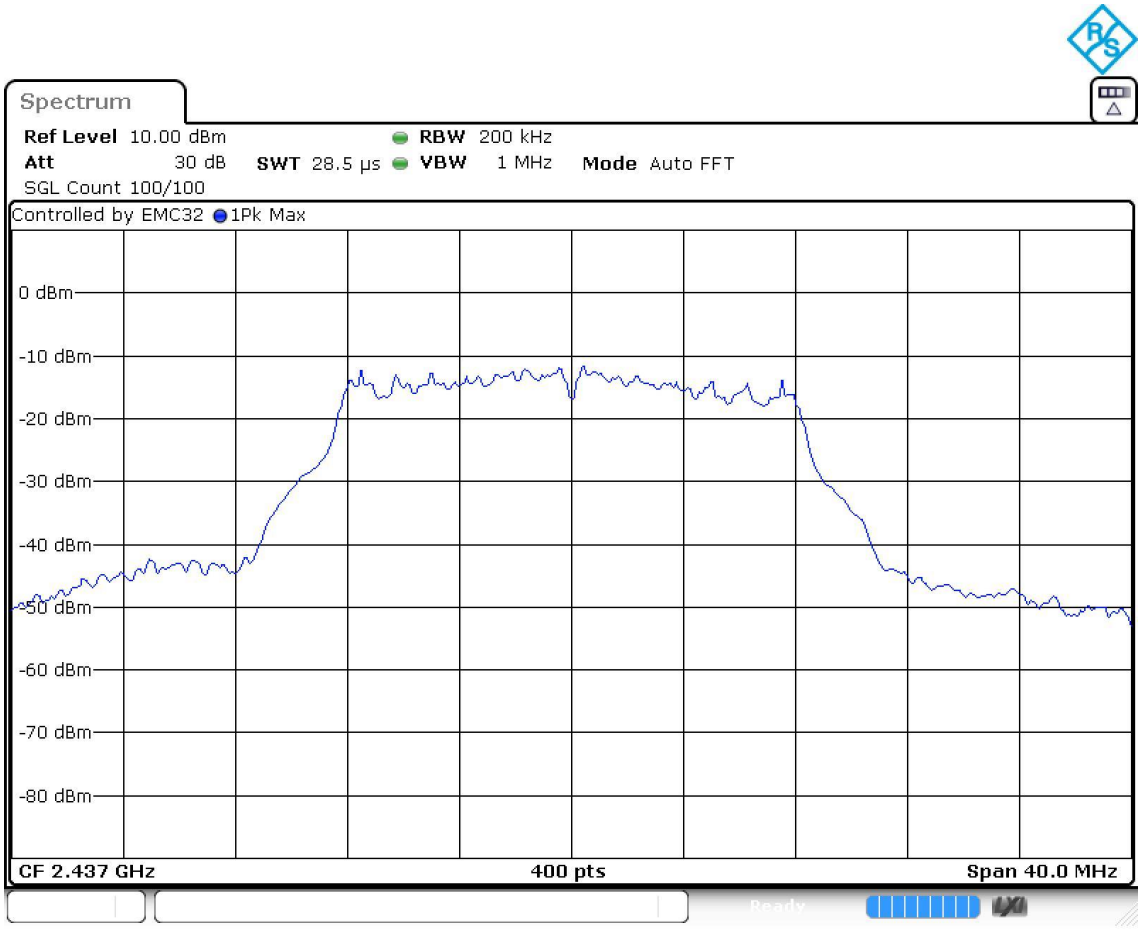
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11g (OFDM 6 Mbit/s) Frequency MHz = 2437.00000

MIMO Mode = SISO Active Port = 1

Images:



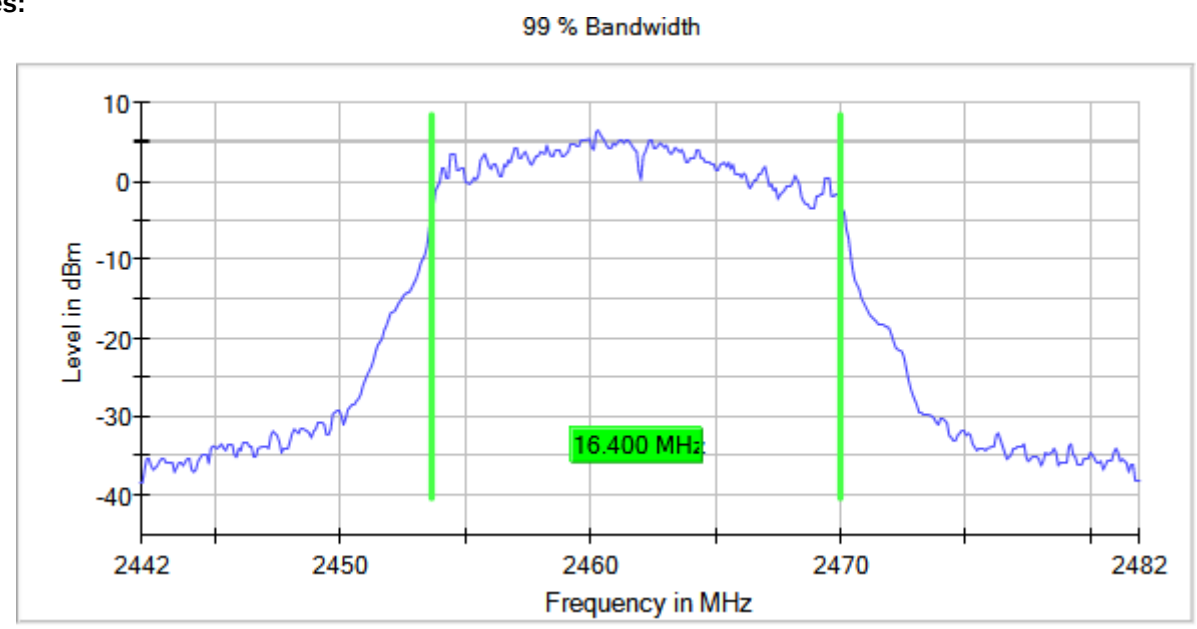


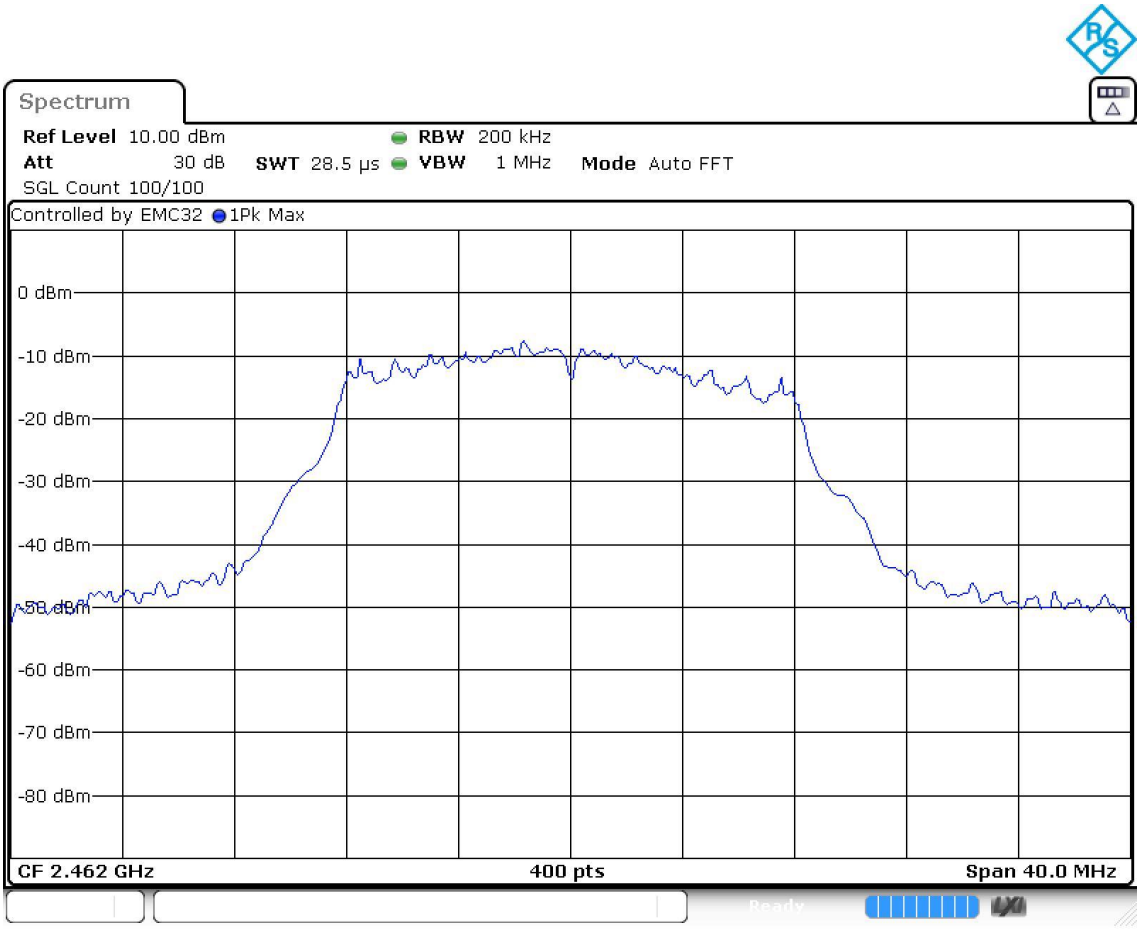
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11g (OFDM 6 Mbit/s) Frequency MHz = 2462.00000

MIMO Mode = SISO Active Port = 1

Images:





Modulation: 802.11n HT20 (OFDM MCS0)

MIMO Mode: SISO

Results

Equipment	BW (MHz)	Freq (MHz)	Port	Occ Ch BW (MHz)
Digital Transmission System (DTS)	20	2412.00000	1	17.700
		2437.00000		18.100
		2462.00000		17.500

Verdict

Pass

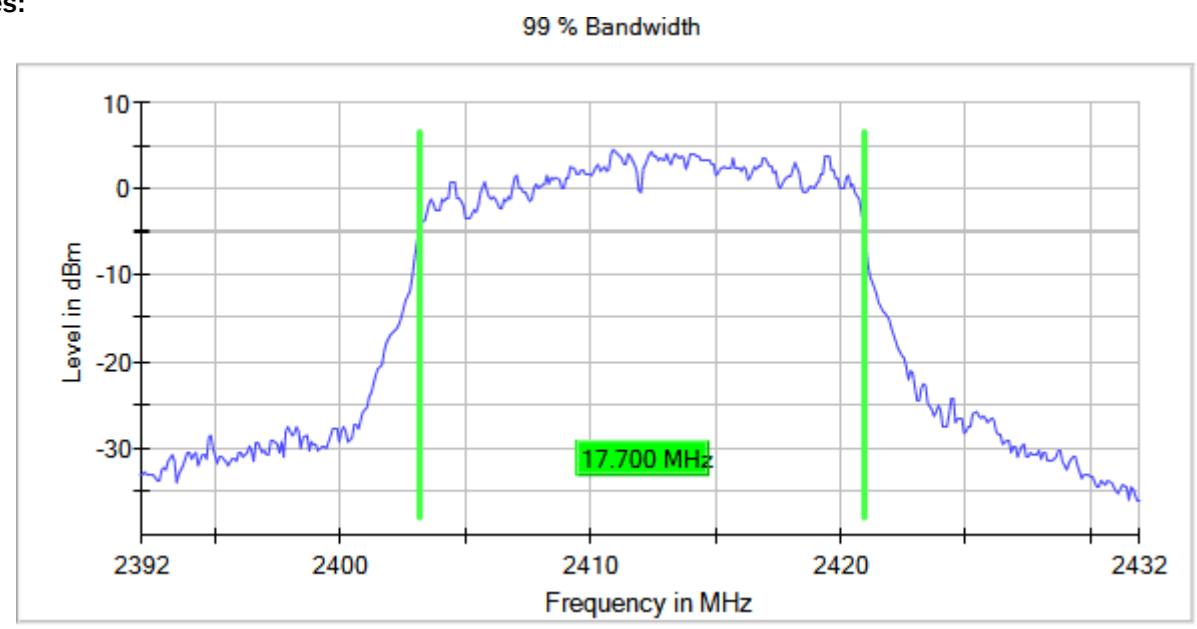
Attachments

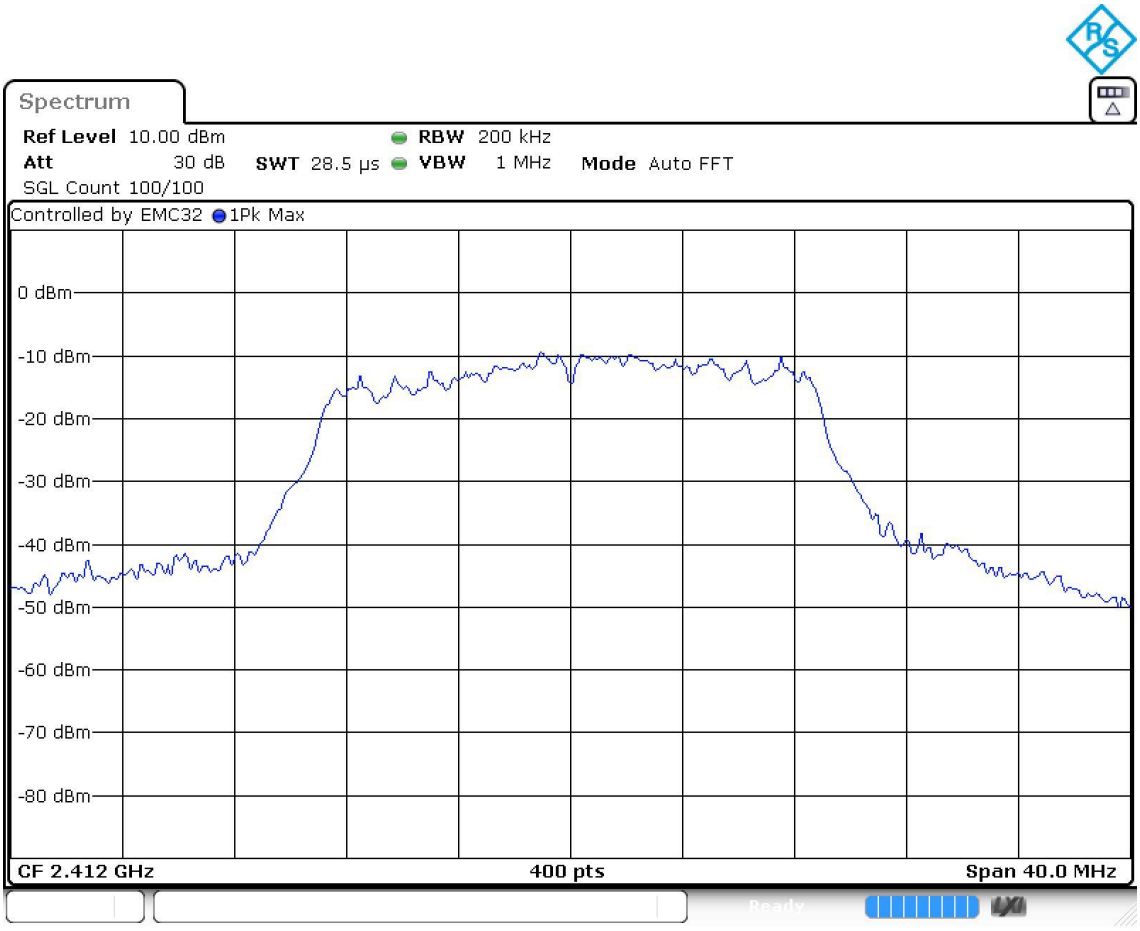
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11n HT20 (OFDM MCS0) Frequency MHz = 2412.00000

MIMO Mode = SISO Active Port = 1

Images:



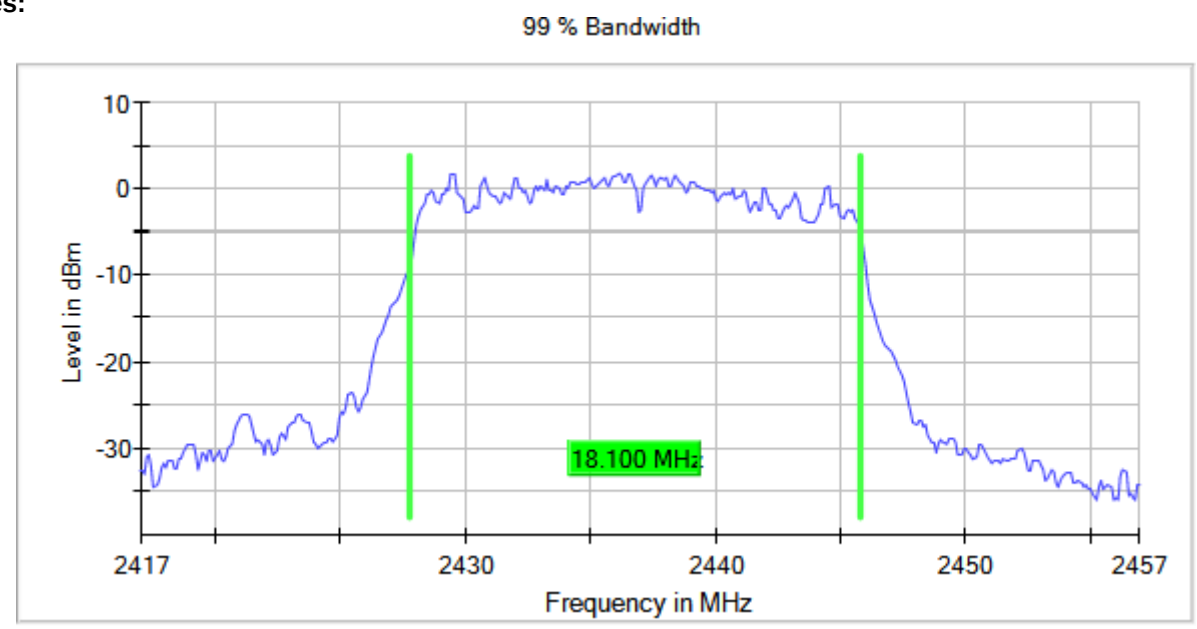


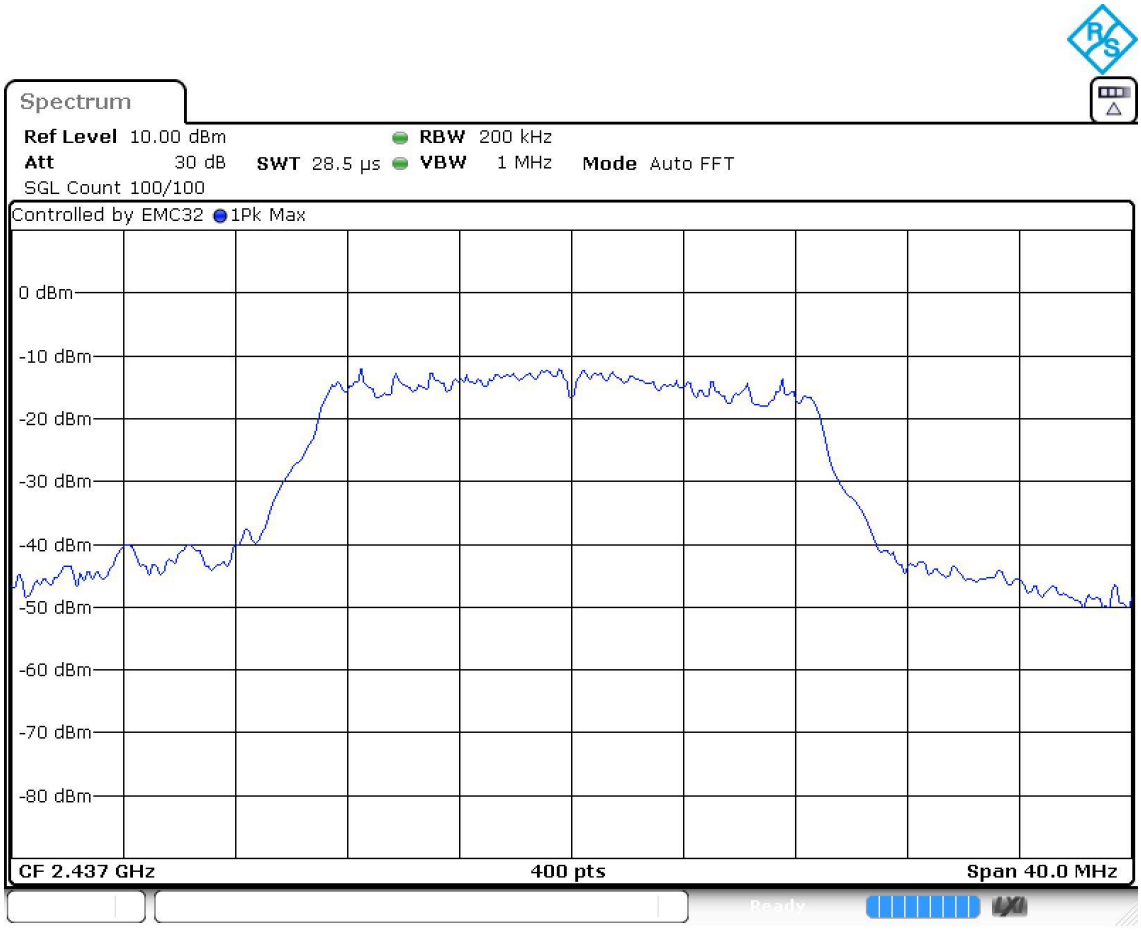
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11n HT20 (OFDM MCS0) Frequency MHz = 2437.00000

MIMO Mode = SISO Active Port = 1

Images:



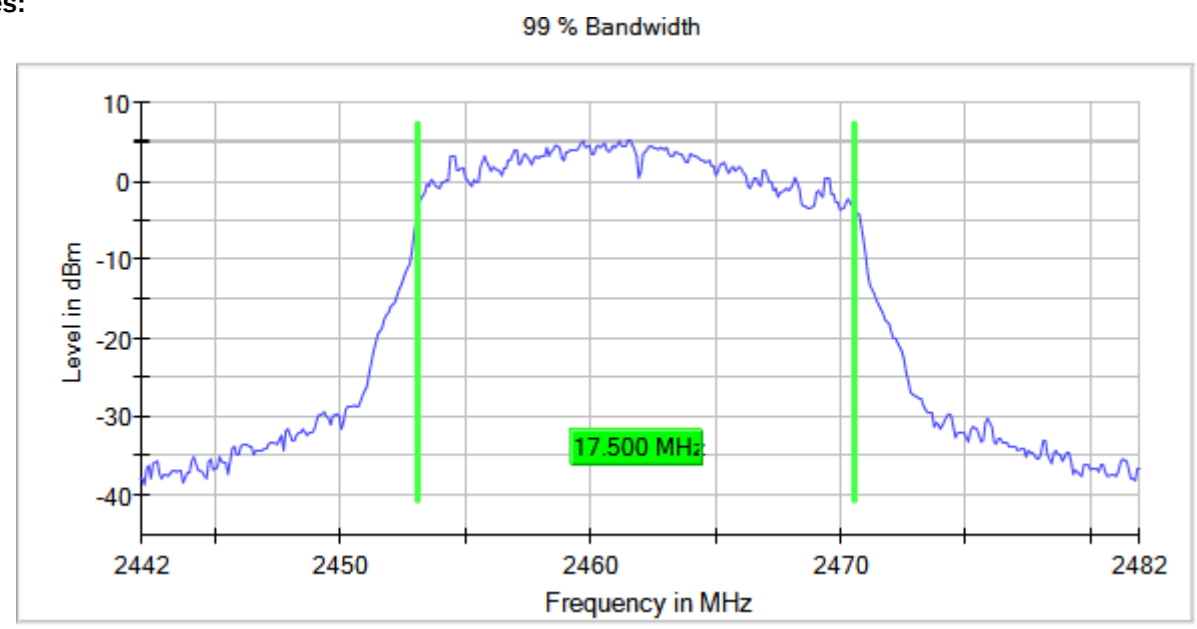


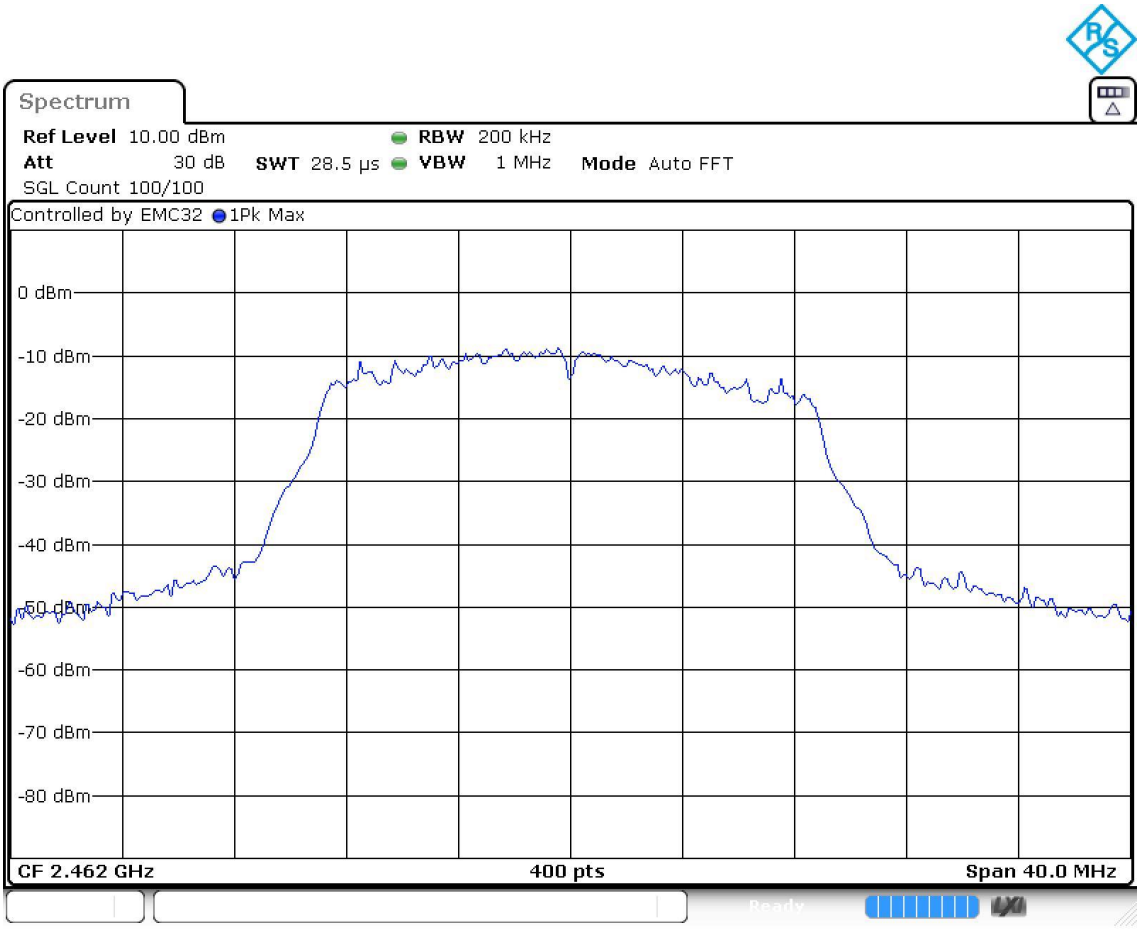
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11n HT20 (OFDM MCS0) Frequency MHz = 2462.00000

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: 802.11b (DSSS 1 Mbit/s)

MIMO Mode: SISO

Results

BW (MHz)	Freq (MHz)	Port	Ebw (MHz)
20	2412.00000	1	7.150
	2437.00000		7.650
	2462.00000		7.150

Verdict

Pass

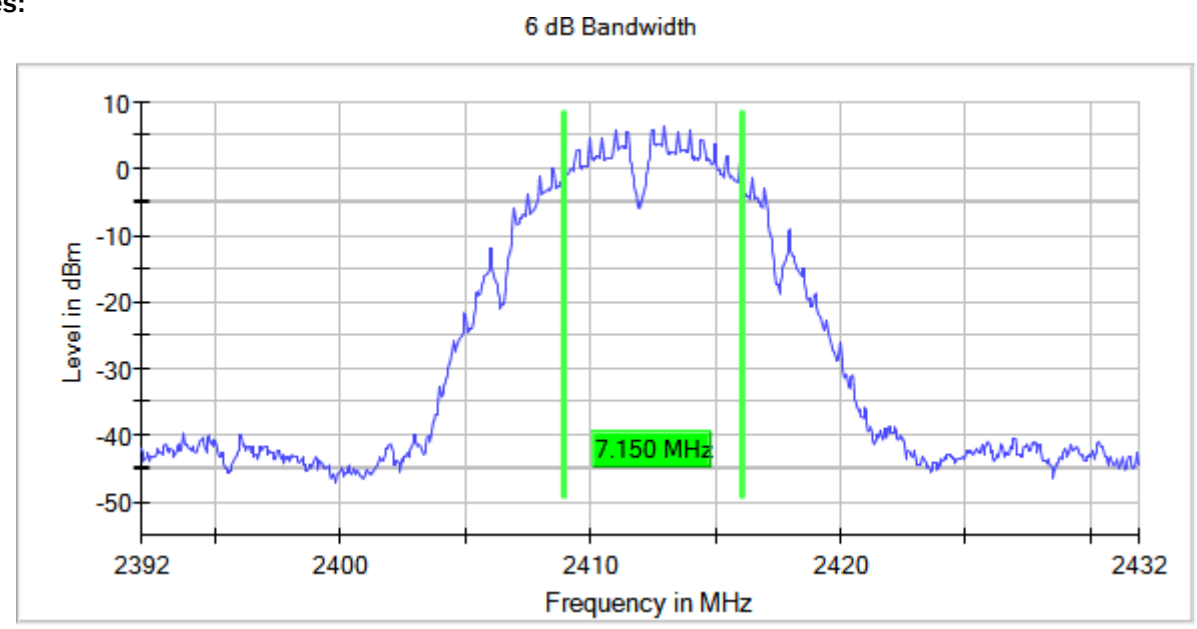
Attachments

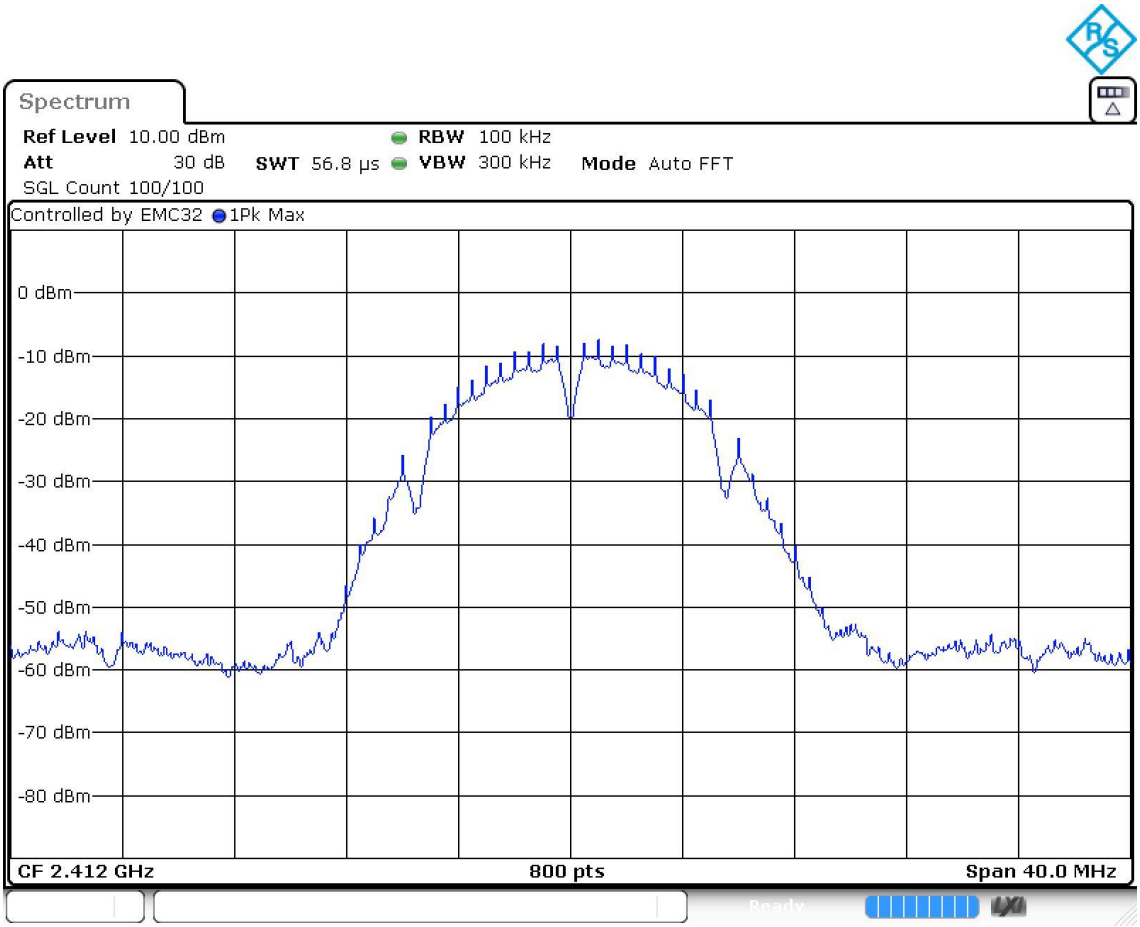
Bandwidth MHz = 20 Modulation = 802.11b (DSSS 1 Mbit/s)

Frequency MHz = 2412.00000 MIMO Mode = SISO

Active Port = 1

Images:



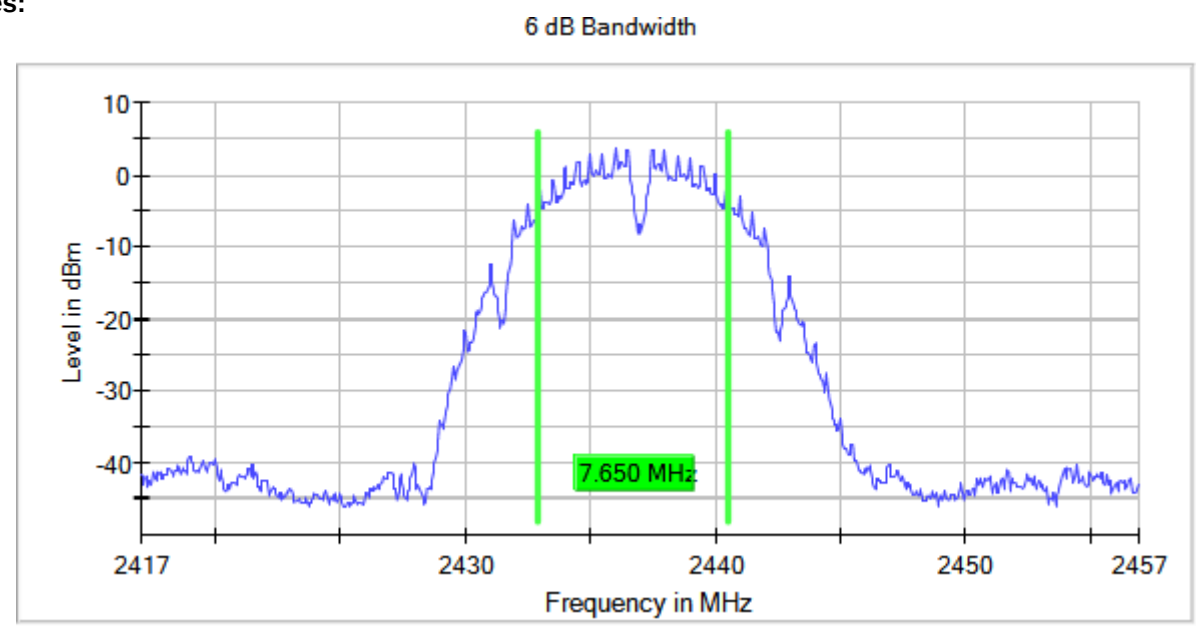


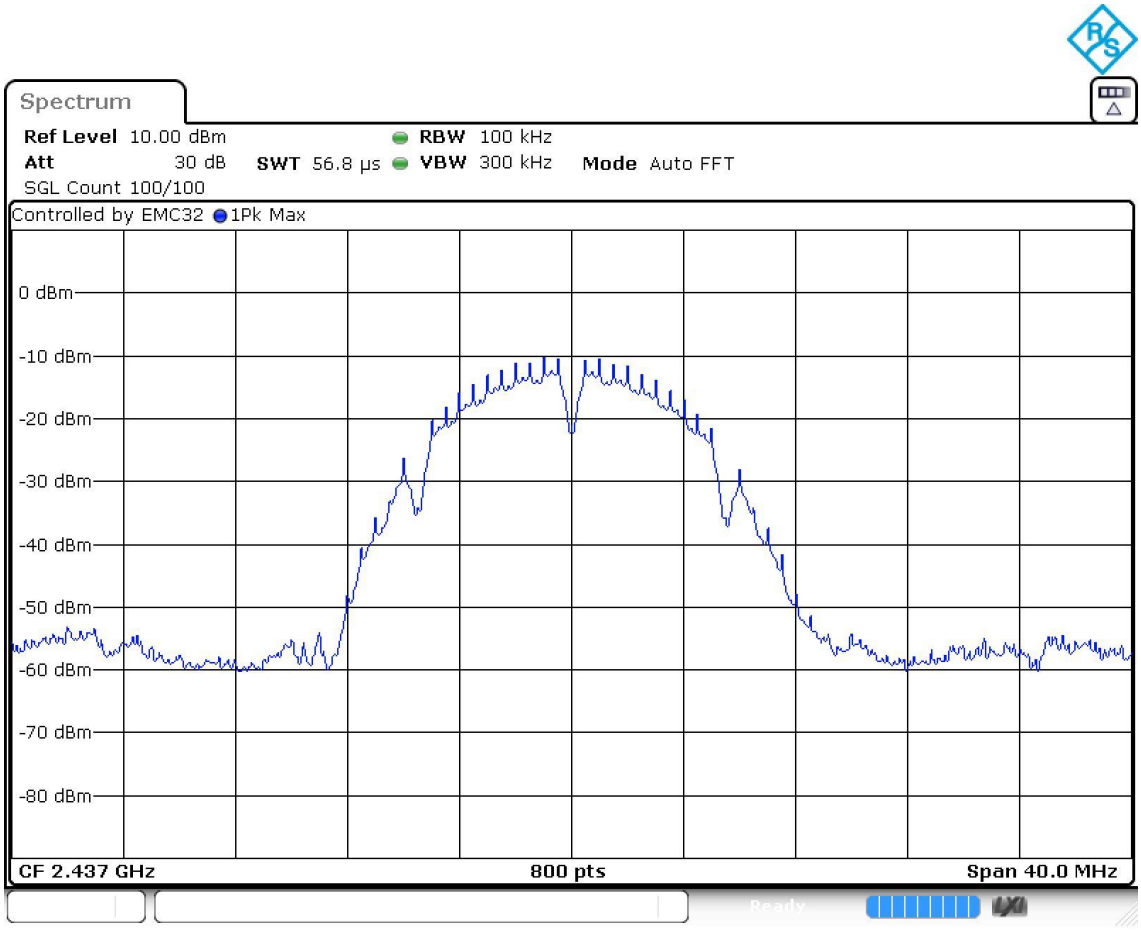
Bandwidth MHz = 20 Modulation = 802.11b (DSSS 1 Mbit/s)

Frequency MHz = 2437.00000 MIMO Mode = SISO

Active Port = 1

Images:



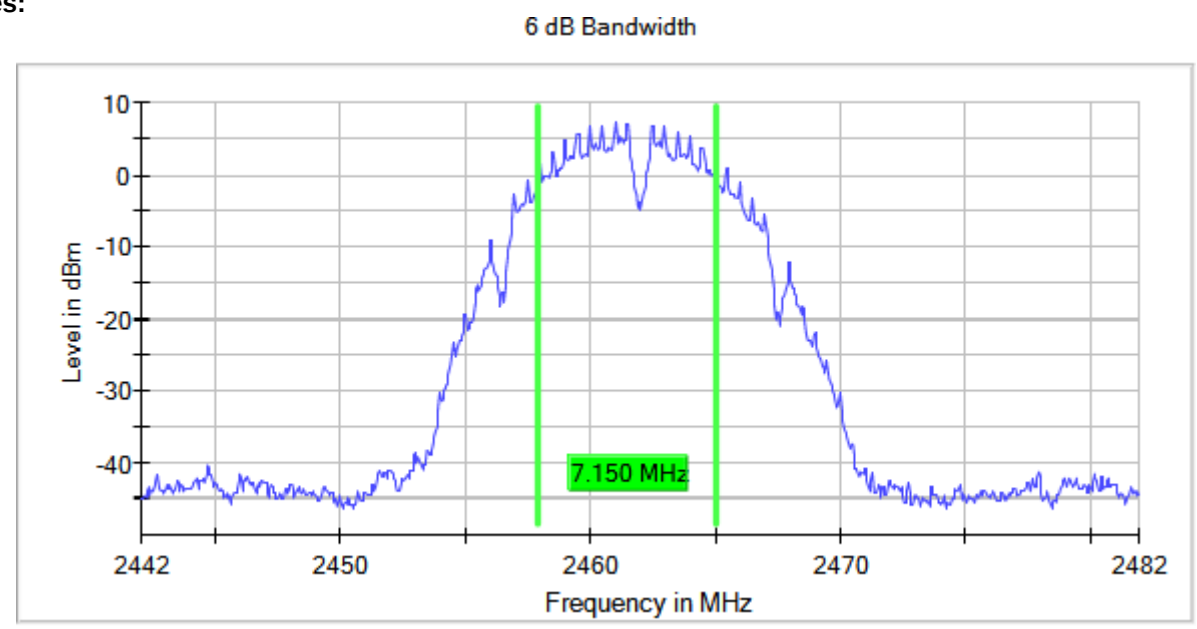


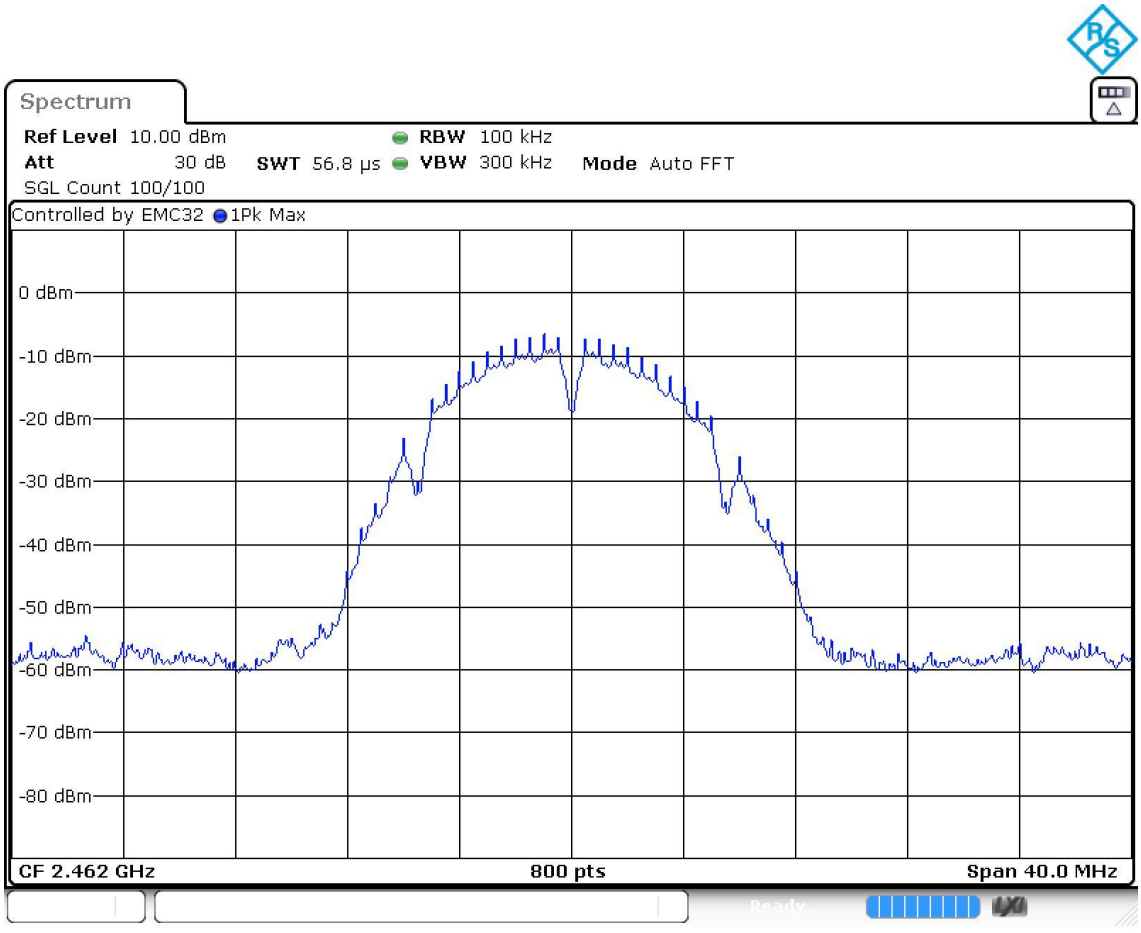
Bandwidth MHz = 20 Modulation = 802.11b (DSSS 1 Mbit/s)

Frequency MHz = 2462.00000 MIMO Mode = SISO

Active Port = 1

Images:





Modulation: 802.11g (OFDM 6 Mbit/s)

MIMO Mode: SISO

Results

BW (MHz)	Freq (MHz)	Port	Ebw (MHz)
20	2412.00000	1	15.750
	2437.00000		16.200
	2462.00000		15.550

Verdict

Pass

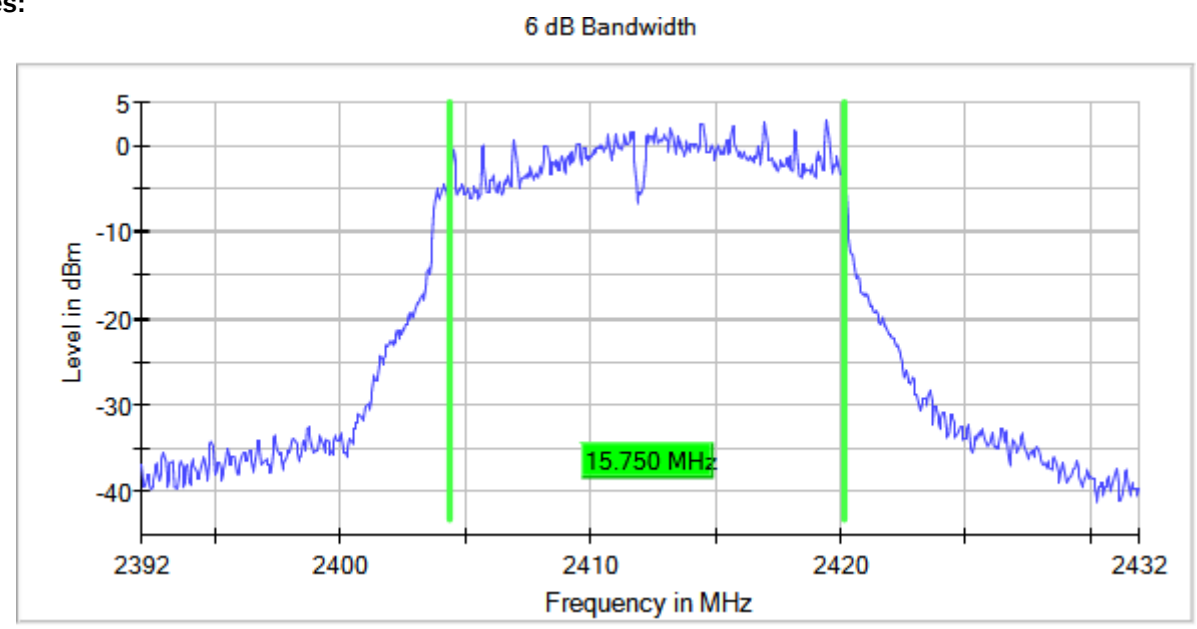
Attachments

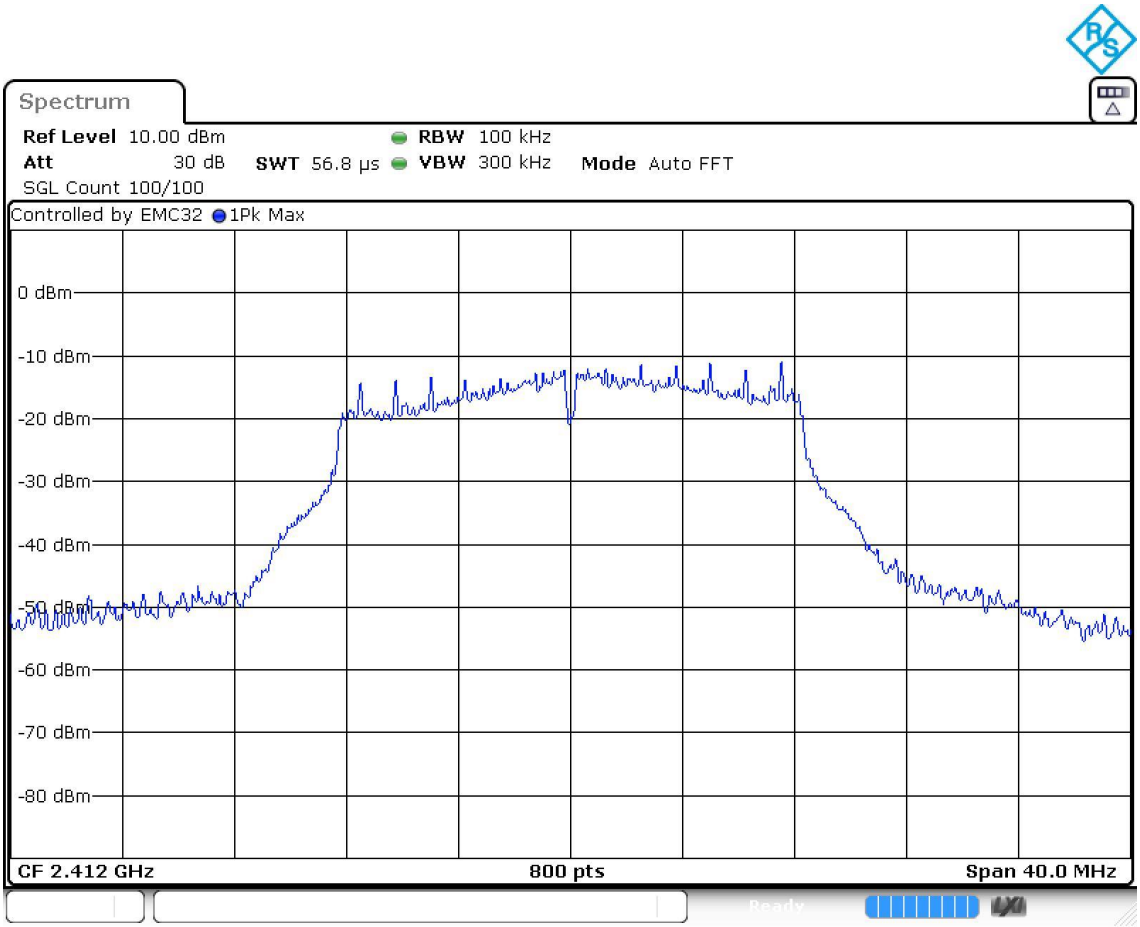
Bandwidth MHz = 20 Modulation = 802.11g (OFDM 6 Mbit/s)

Frequency MHz = 2412.00000 MIMO Mode = SISO

Active Port = 1

Images:



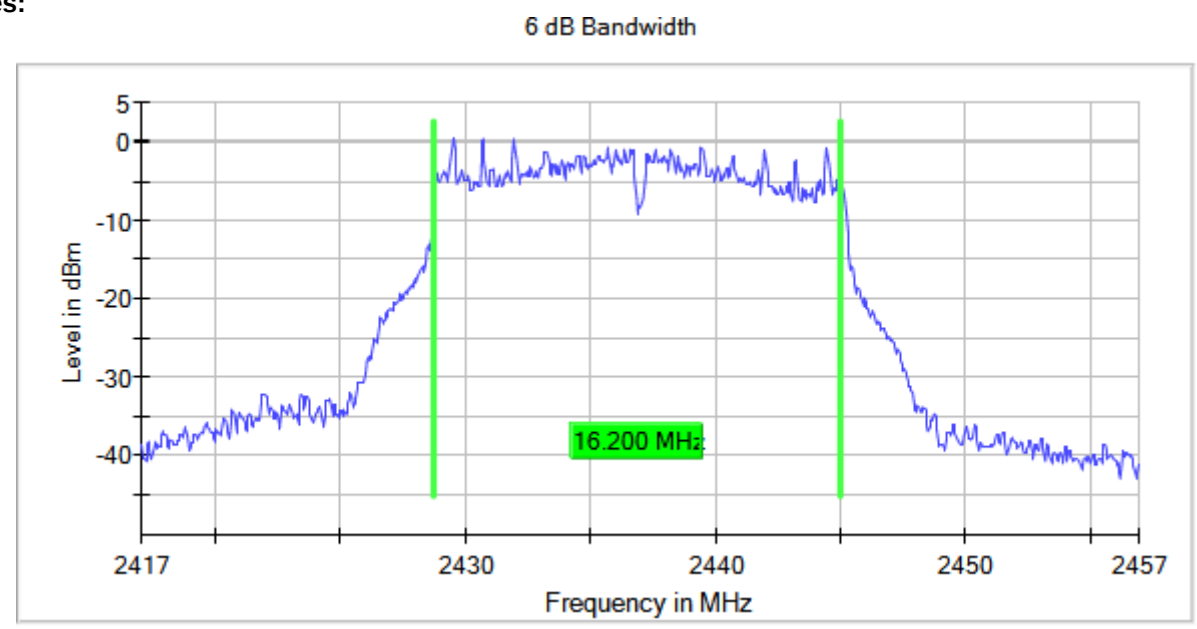


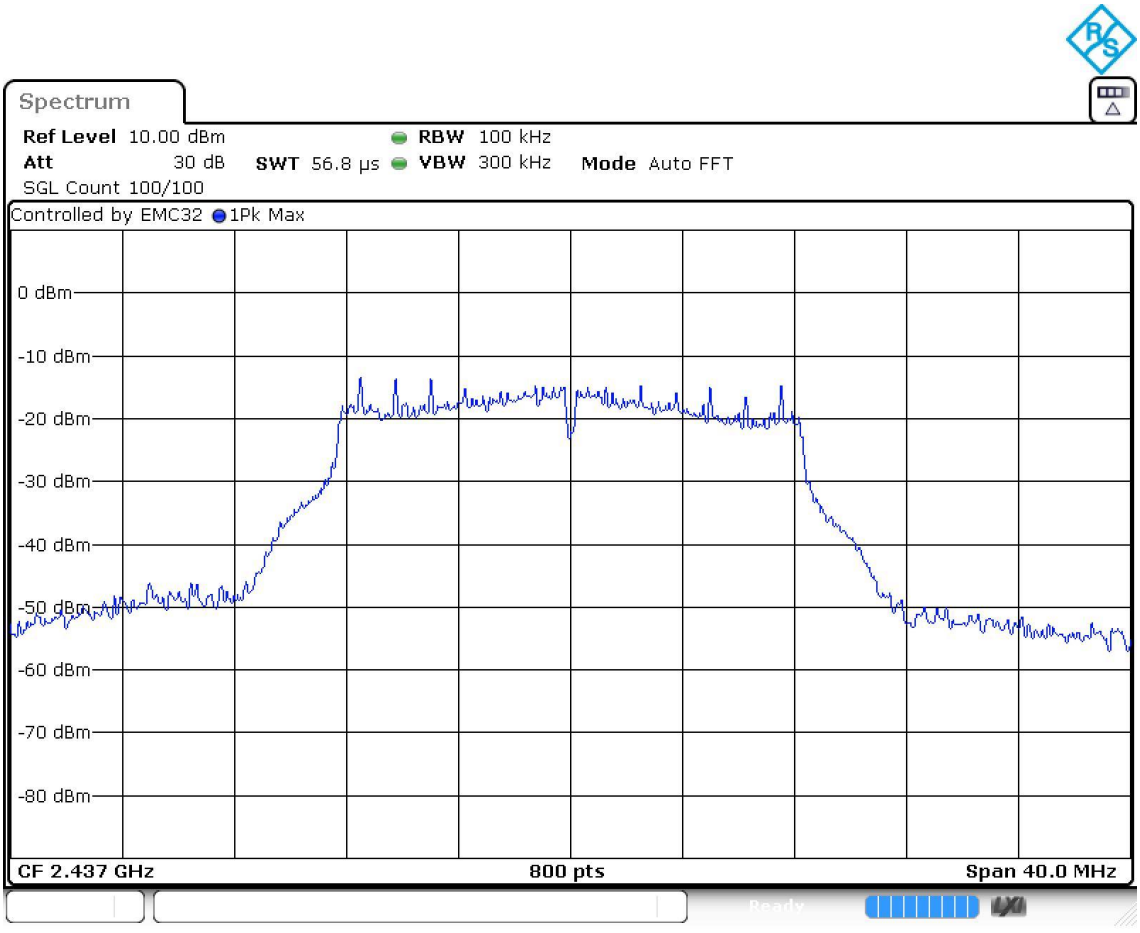
Bandwidth MHz = 20 Modulation = 802.11g (OFDM 6 Mbit/s)

Frequency MHz = 2437.00000 MIMO Mode = SISO

Active Port = 1

Images:



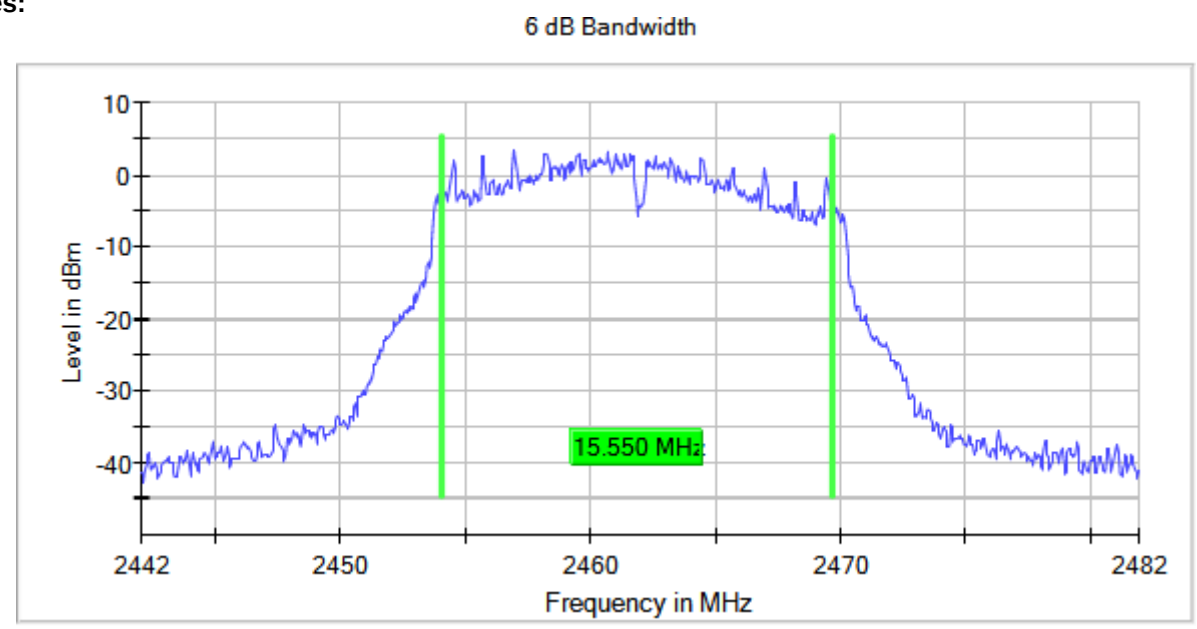


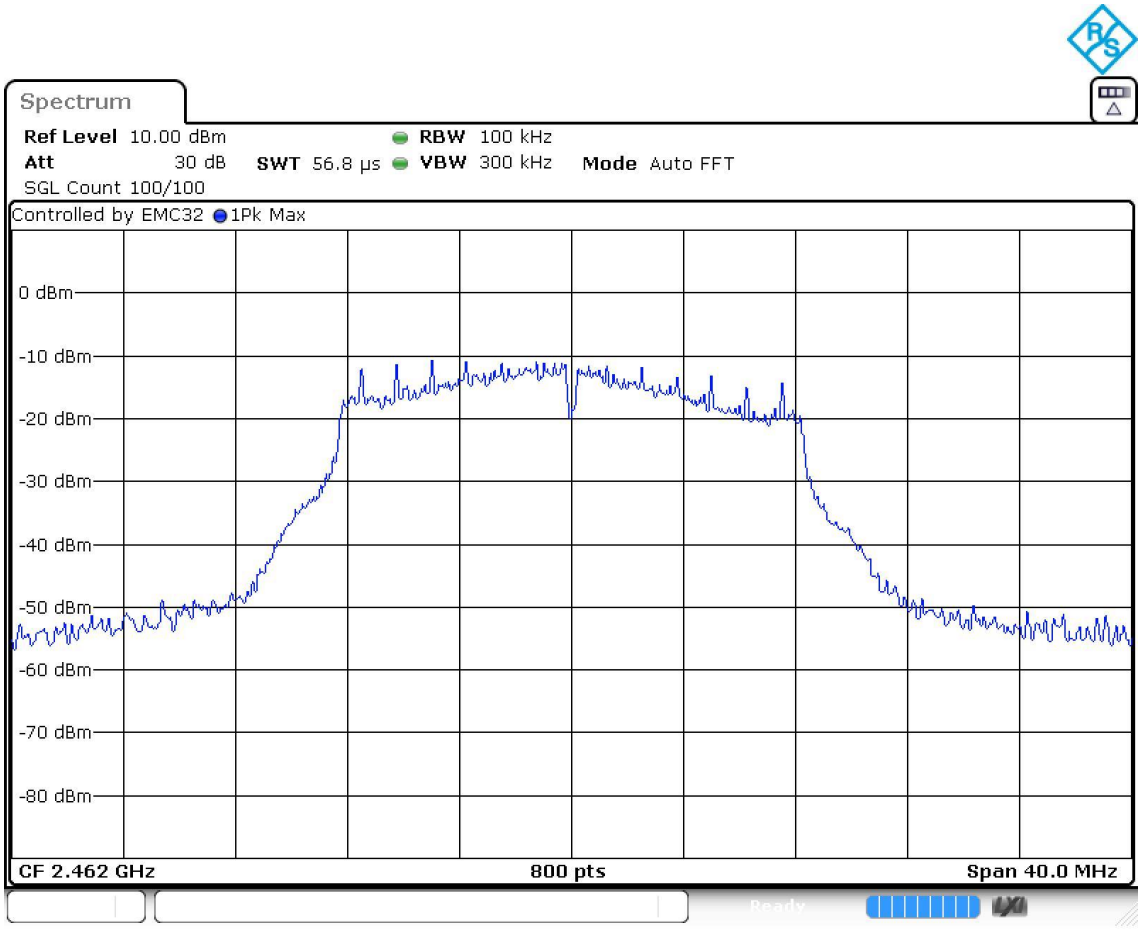
Bandwidth MHz = 20 Modulation = 802.11g (OFDM 6 Mbit/s)

Frequency MHz = 2462.00000 MIMO Mode = SISO

Active Port = 1

Images:





Modulation: 802.11n HT20 (OFDM MCS0)

MIMO Mode: SISO

Results

BW (MHz)	Freq (MHz)	Port	Ebw (MHz)
20	2412.00000	1	16.450
	2437.00000		17.400
	2462.00000		16.050

Verdict

Pass

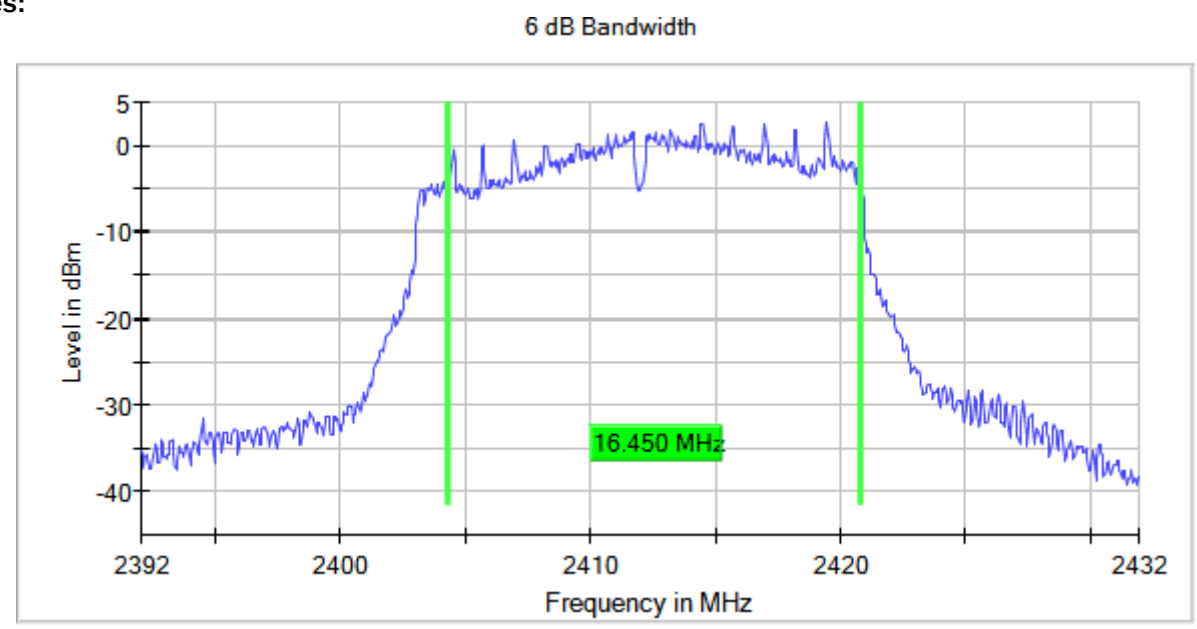
Attachments

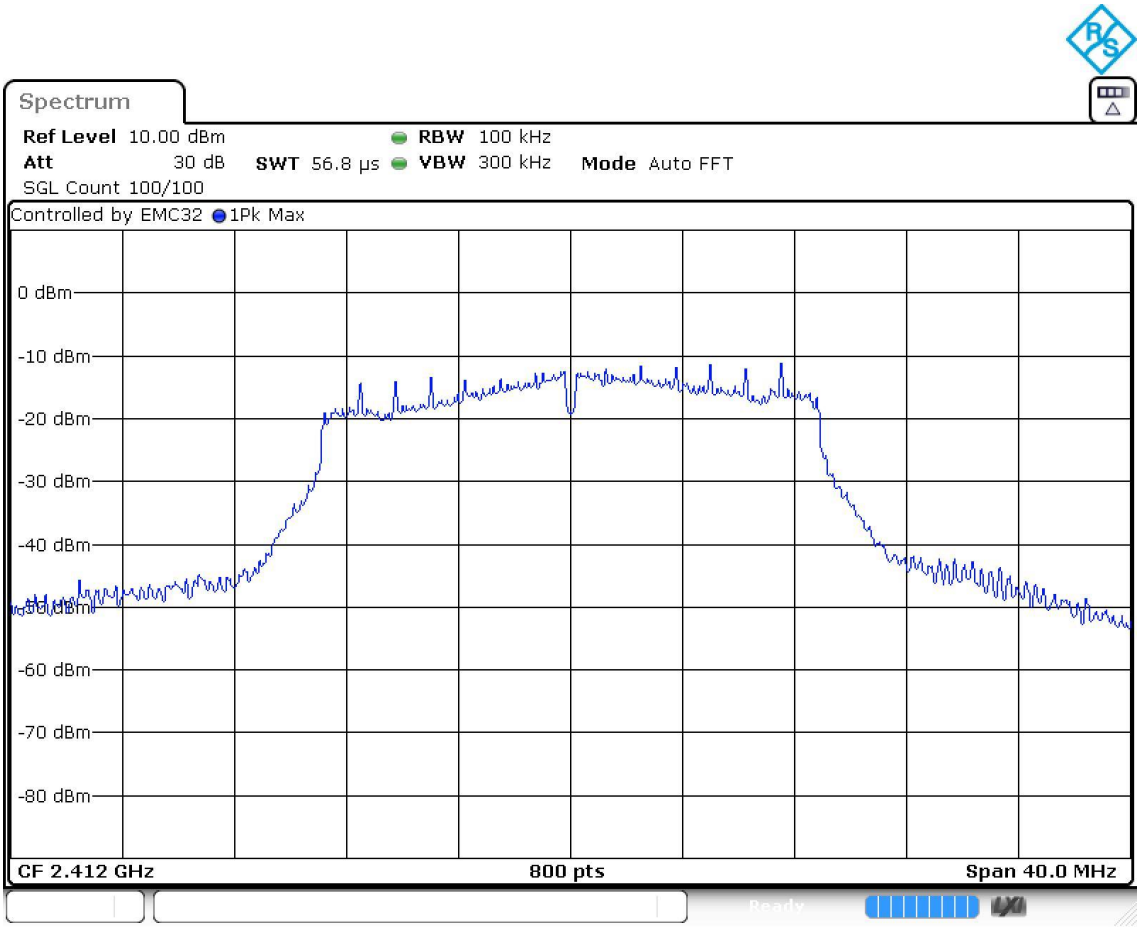
Bandwidth MHz = 20 Modulation = 802.11n HT20 (OFDM MCS0)

Frequency MHz = 2412.00000 MIMO Mode = SISO

Active Port = 1

Images:



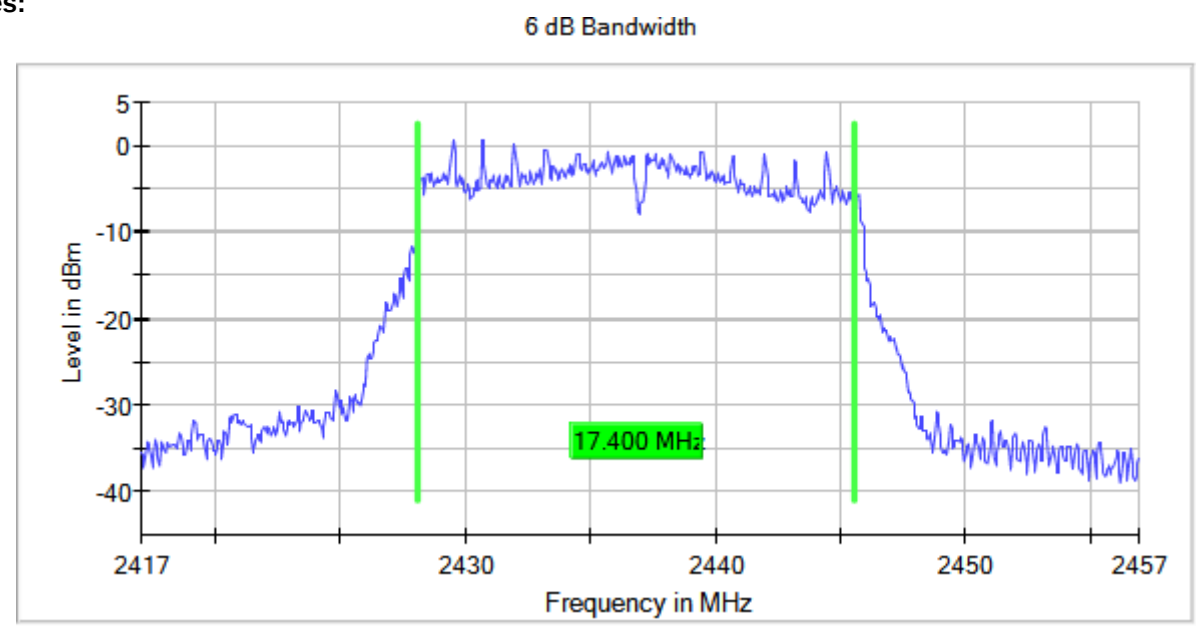


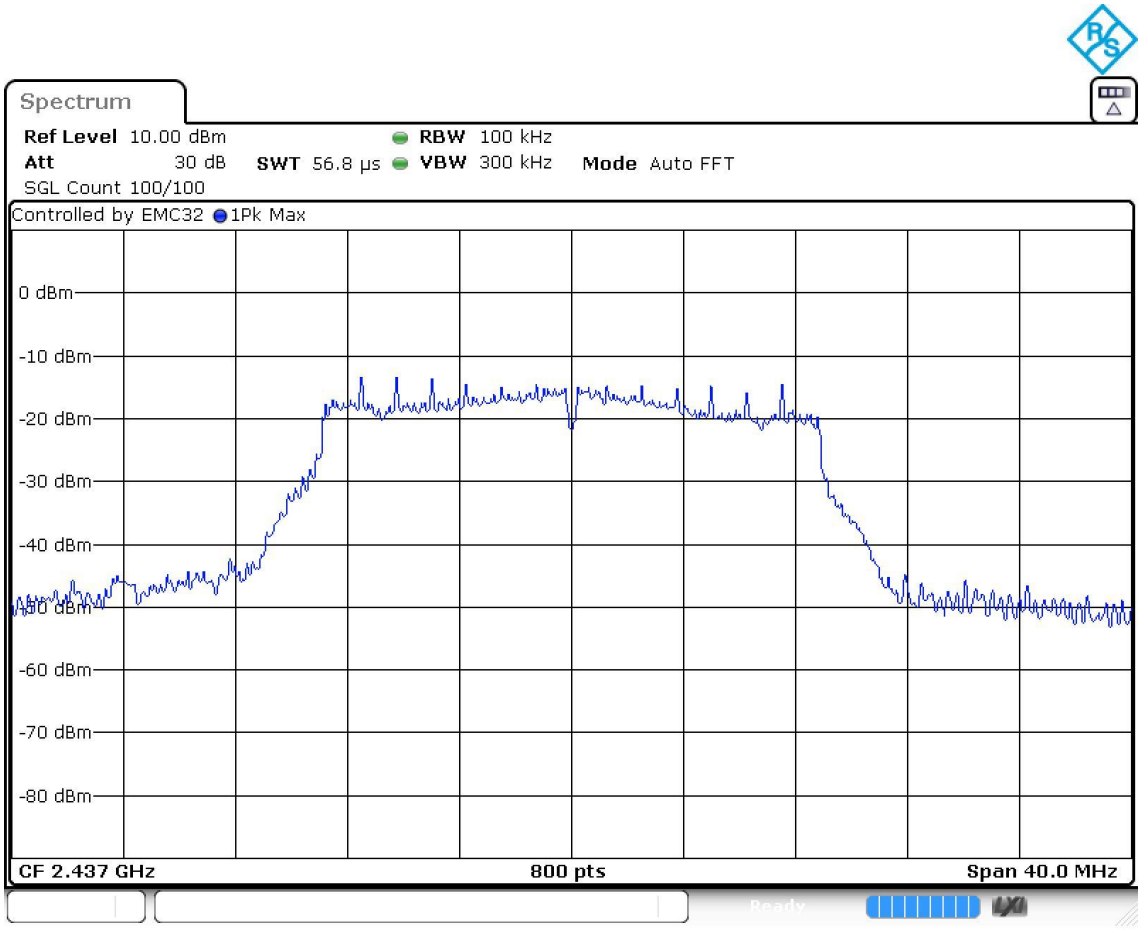
Bandwidth MHz = 20 Modulation = 802.11n HT20 (OFDM MCS0)

Frequency MHz = 2437.00000 MIMO Mode = SISO

Active Port = 1

Images:



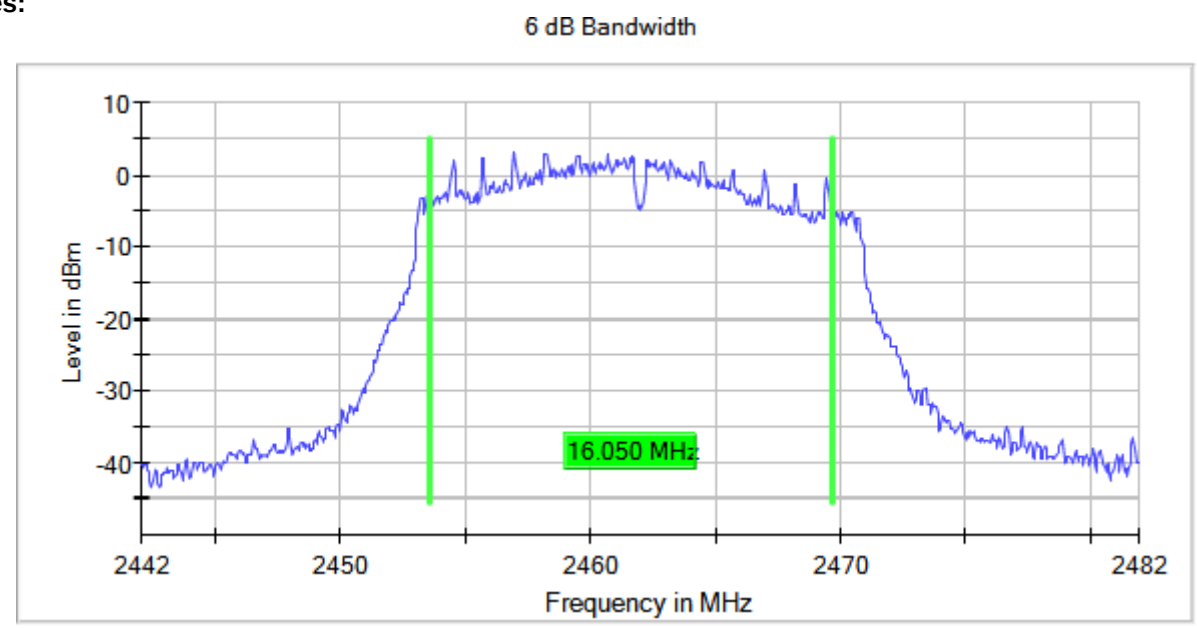


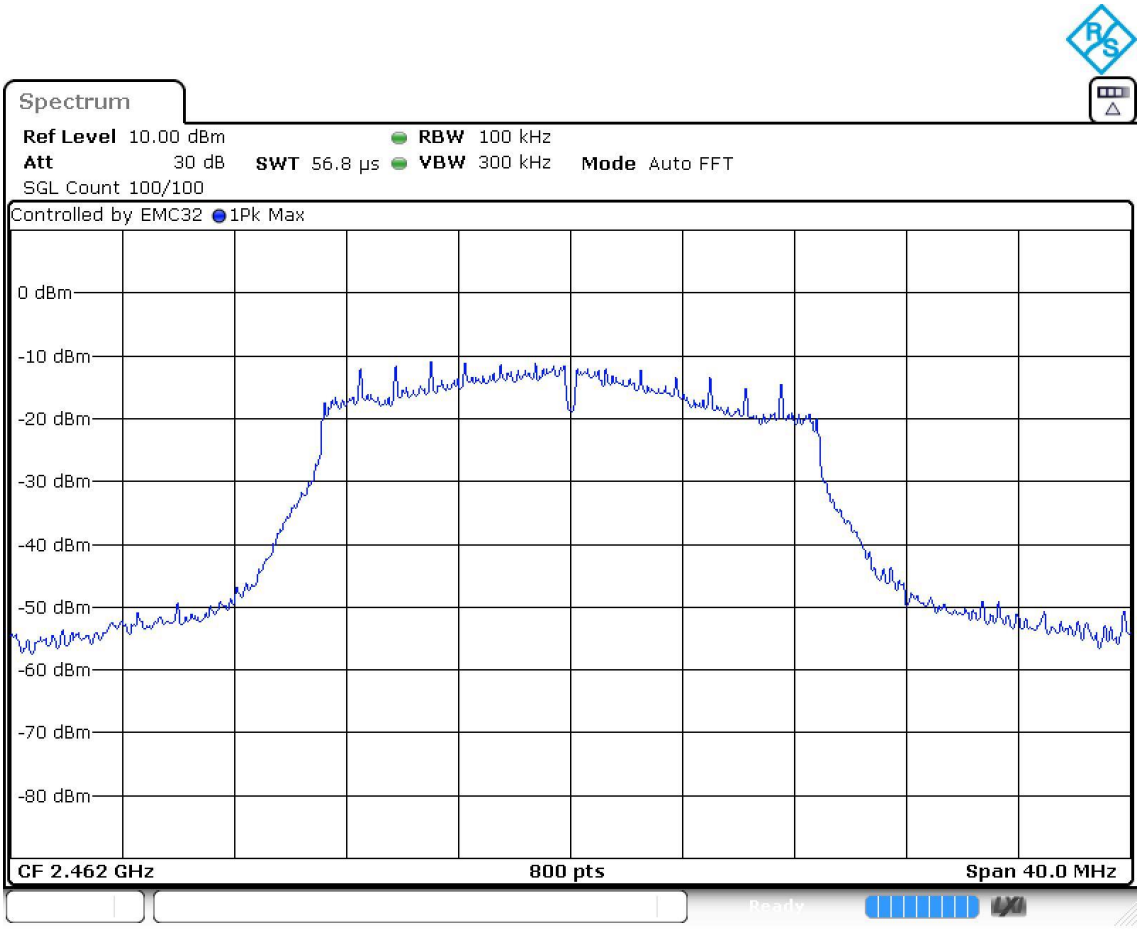
Bandwidth MHz = 20 Modulation = 802.11n HT20 (OFDM MCS0)

Frequency MHz = 2462.00000 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.

Modulation: 802.11b (DSSS 1 Mbit/s)

MIMO Mode: SISO

Results

Equipment	BW (MHz)	Freq (MHz)	Port	PSD (dBm)
Digital Transmission System (DTS)	20	2412.00000	1	-2.13
		2437.00000		-4.57
		2462.00000		-1.30

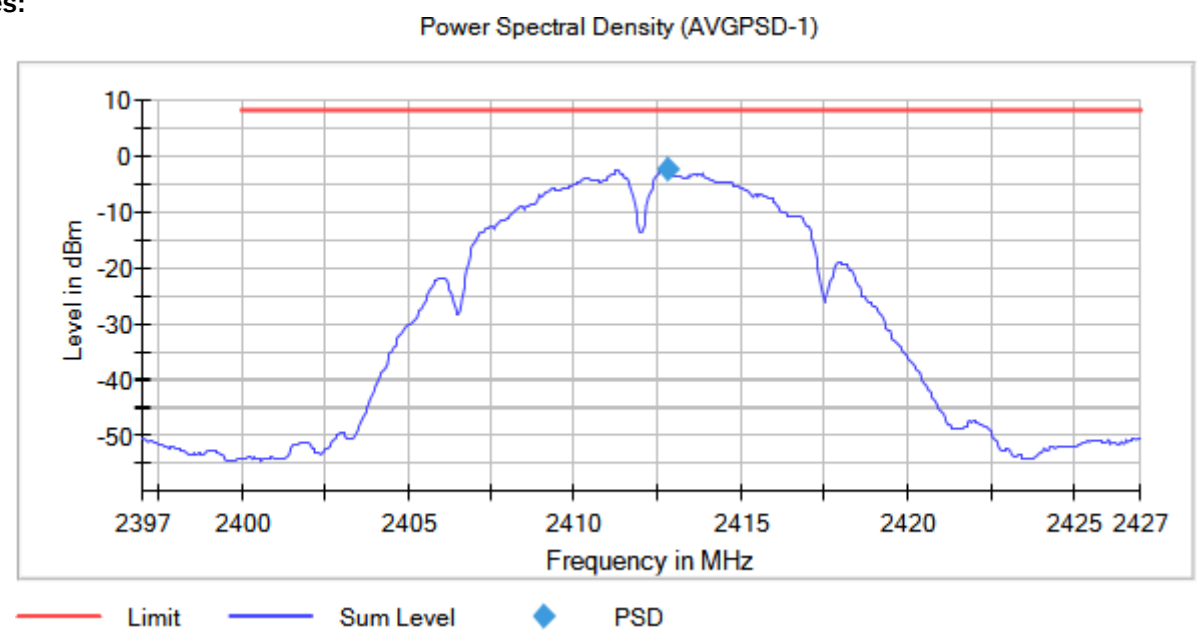
Verdict

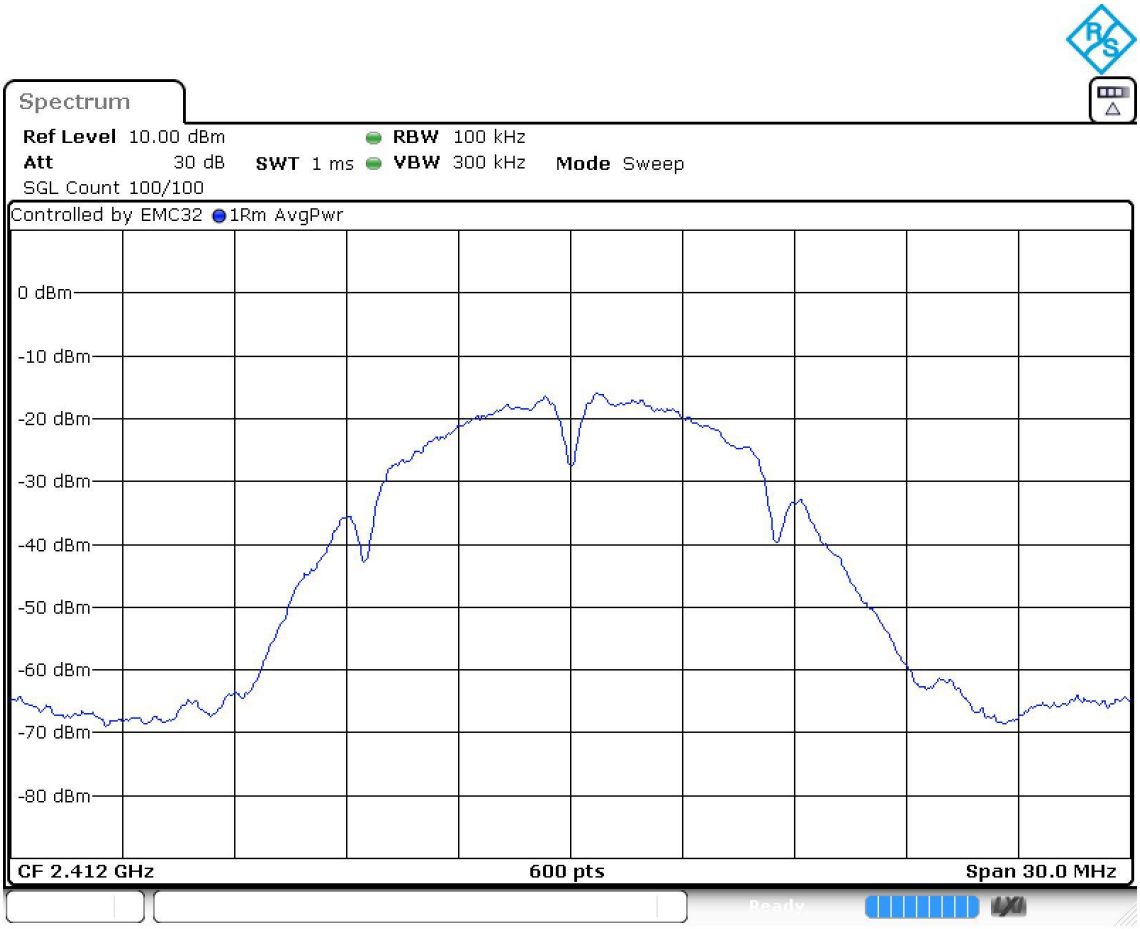
Pass

Attachments

Equipment Type = Digital Transmission System (DTS)	Bandwidth MHz = 20
Modulation = 802.11b (DSSS 1 Mbit/s)	Frequency MHz = 2412.00000
MIMO Mode = SISO	Active Port = 1

Images:



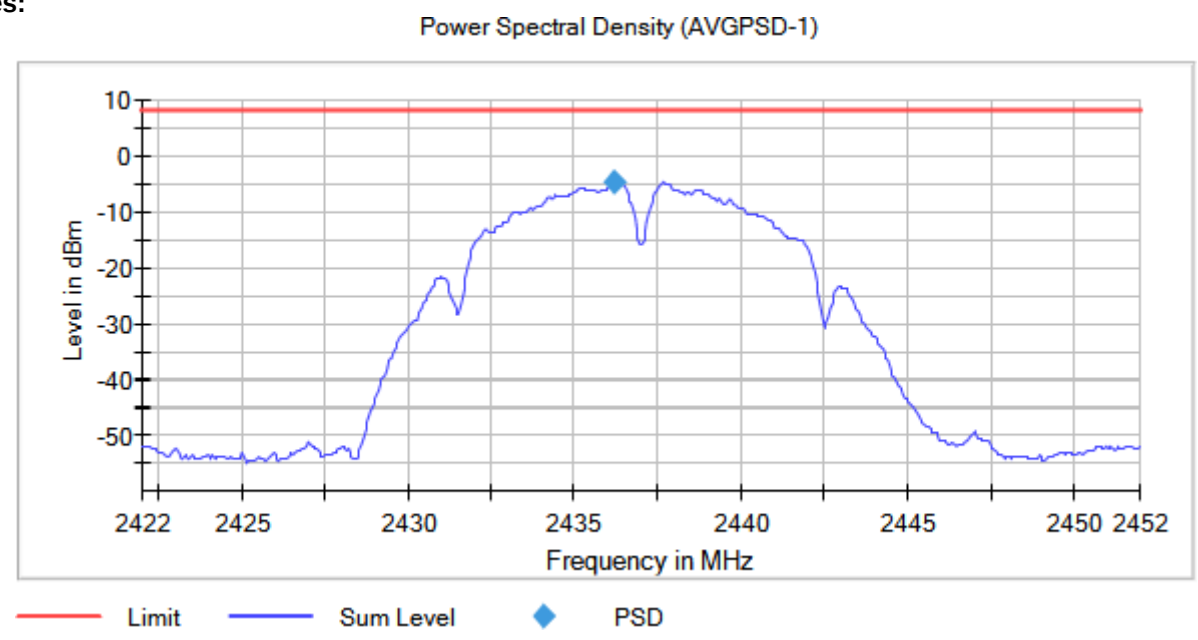


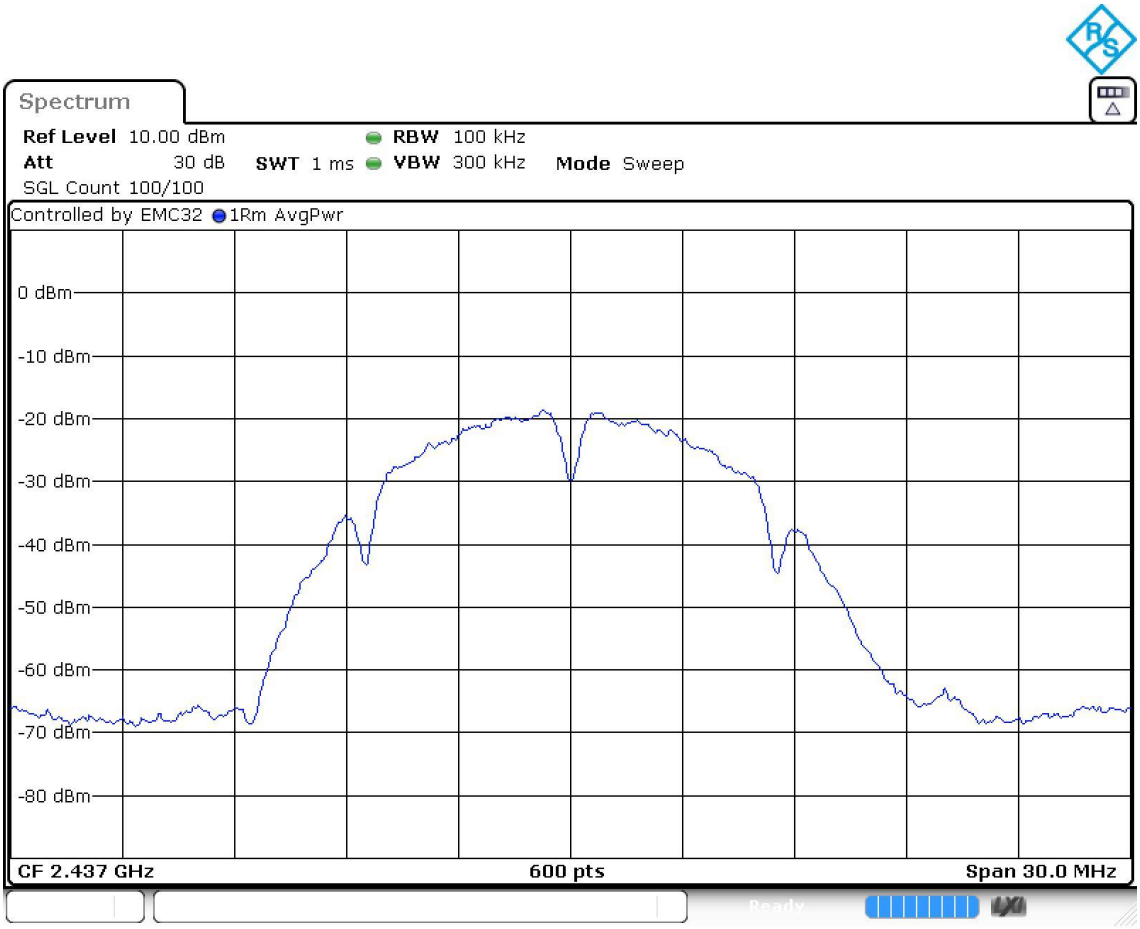
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2437.00000

MIMO Mode = SISO Active Port = 1

Images:



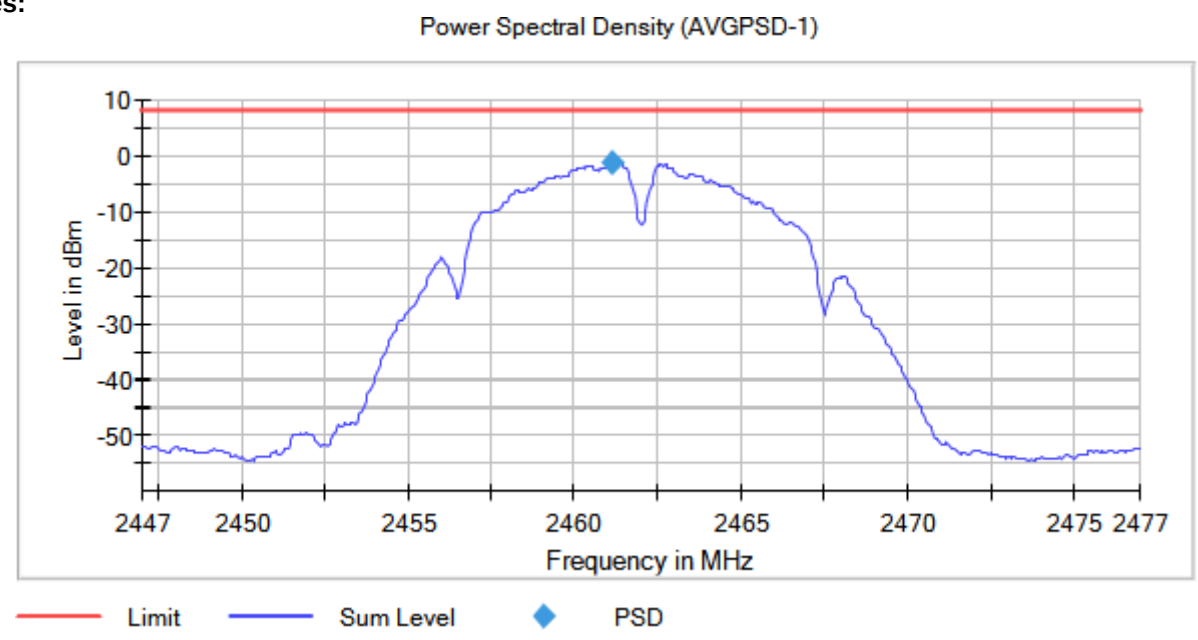


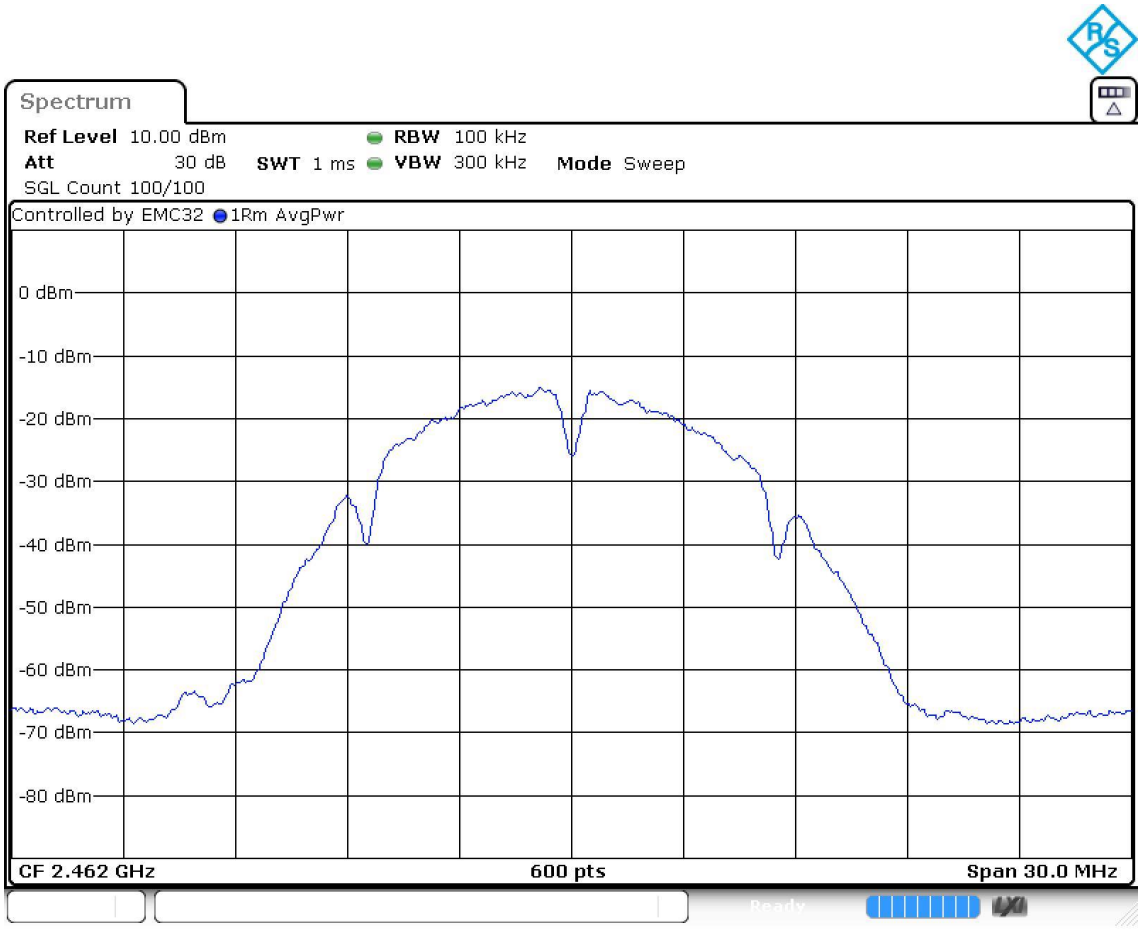
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2462.00000

MIMO Mode = SISO Active Port = 1

Images:





Modulation: 802.11g (OFDM 6 Mbit/s)

MIMO Mode: SISO

Results

Equipment	BW (MHz)	Freq (MHz)	Port	PSD (dBm)
Digital Transmission System (DTS)	20	2412.00000	1	-3.89
		2437.00000		-6.51
		2462.00000		-2.97

Verdict

Pass

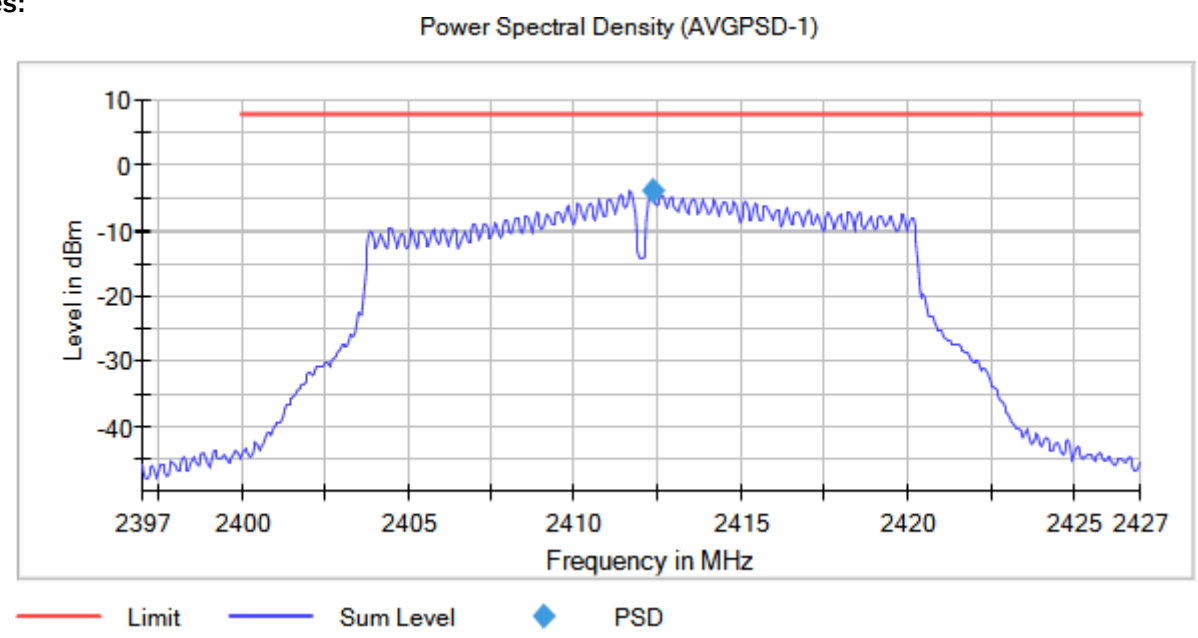
Attachments

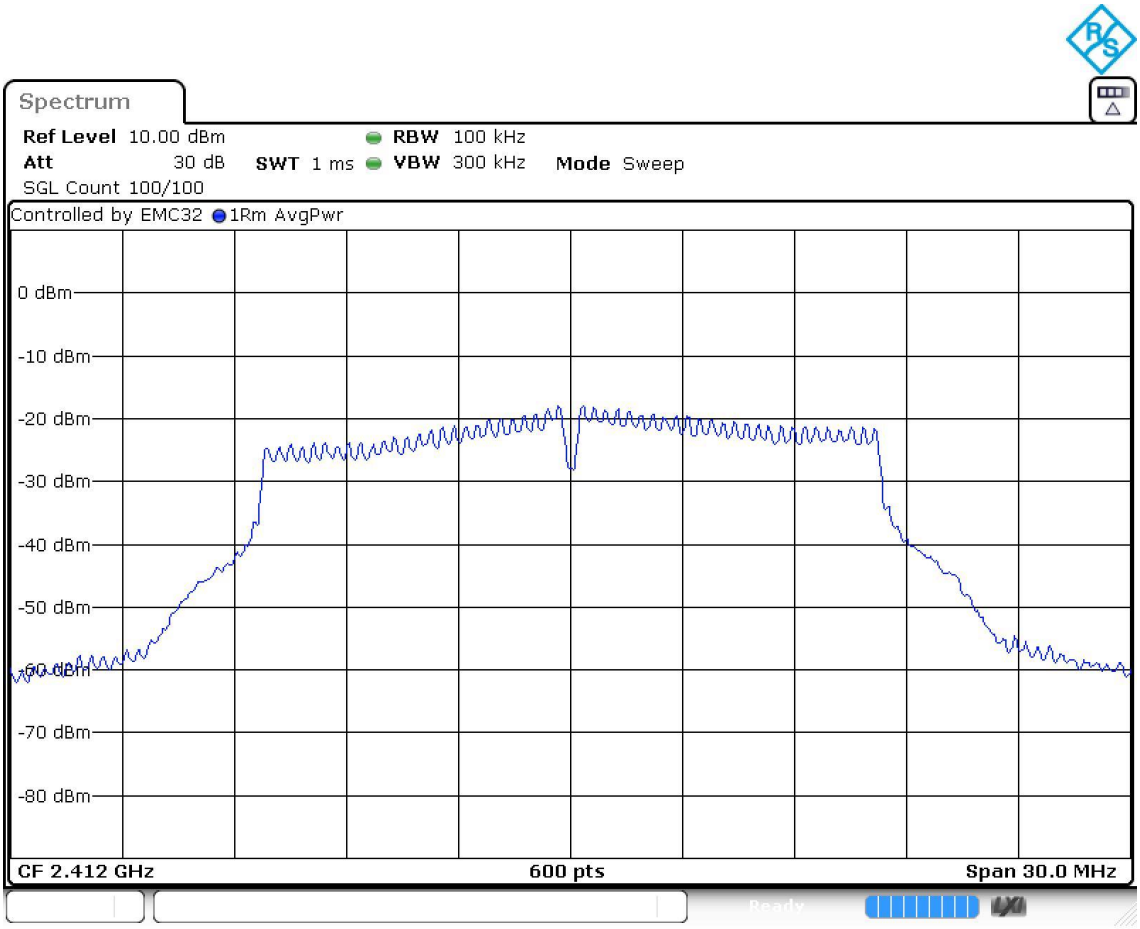
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11g (OFDM 6 Mbit/s) Frequency MHz = 2412.00000

MIMO Mode = SISO Active Port = 1

Images:



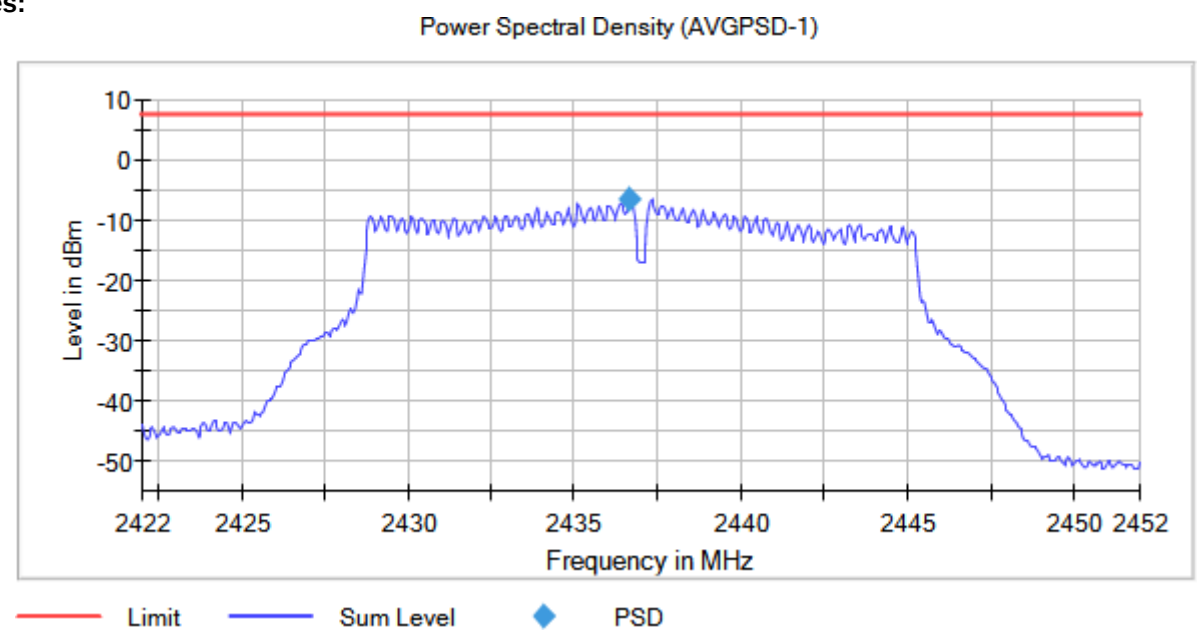


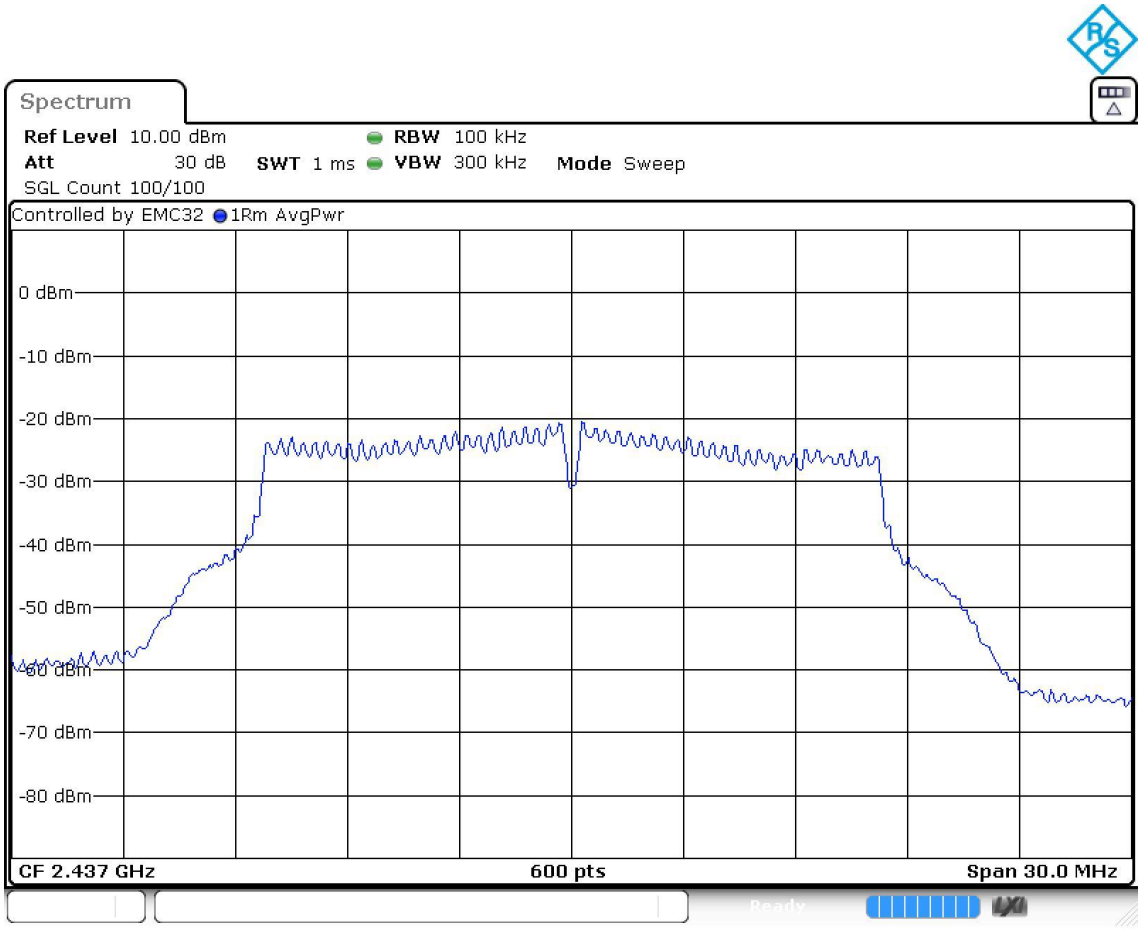
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11g (OFDM 6 Mbit/s) Frequency MHz = 2437.00000

MIMO Mode = SISO Active Port = 1

Images:



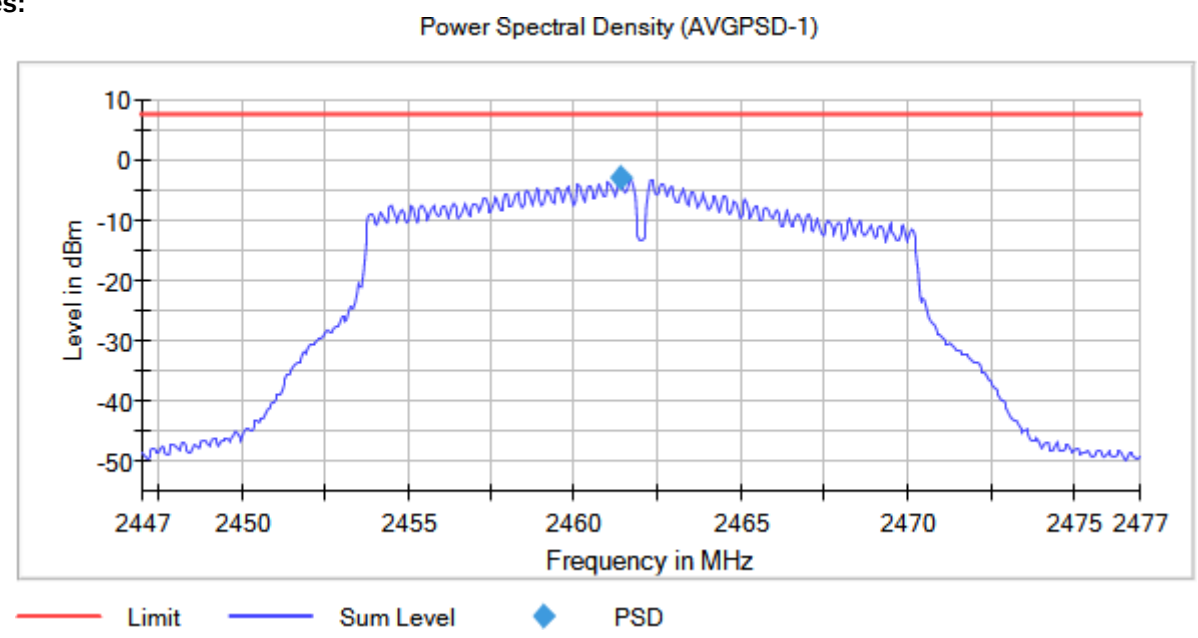


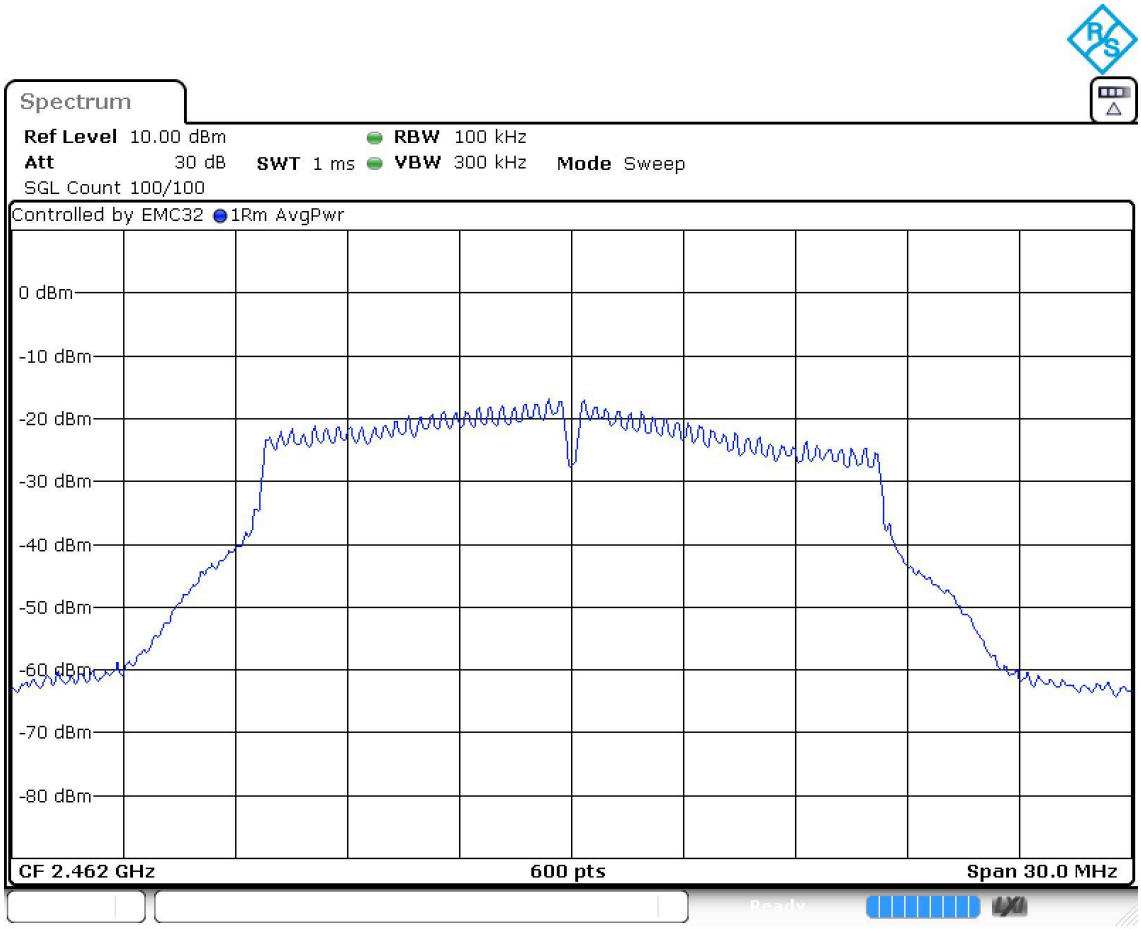
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11g (OFDM 6 Mbit/s) Frequency MHz = 2462.00000

MIMO Mode = SISO Active Port = 1

Images:





Modulation: 802.11n HT20 (OFDM MCS0)

MIMO Mode: SISO

Results

Equipment	BW (MHz)	Freq (MHz)	Port	PSD (dBm)
Digital Transmission System (DTS)	20	2412.00000	1	-4.29
		2437.00000		-6.88
		2462.00000		-3.51

Verdict

Pass

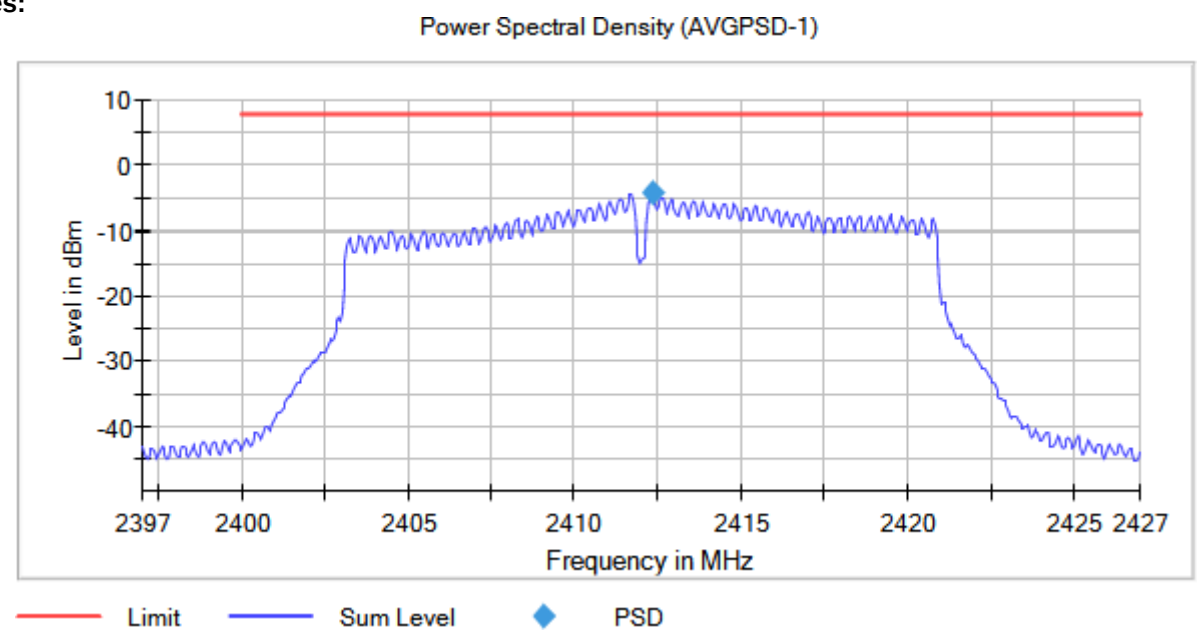
Attachments

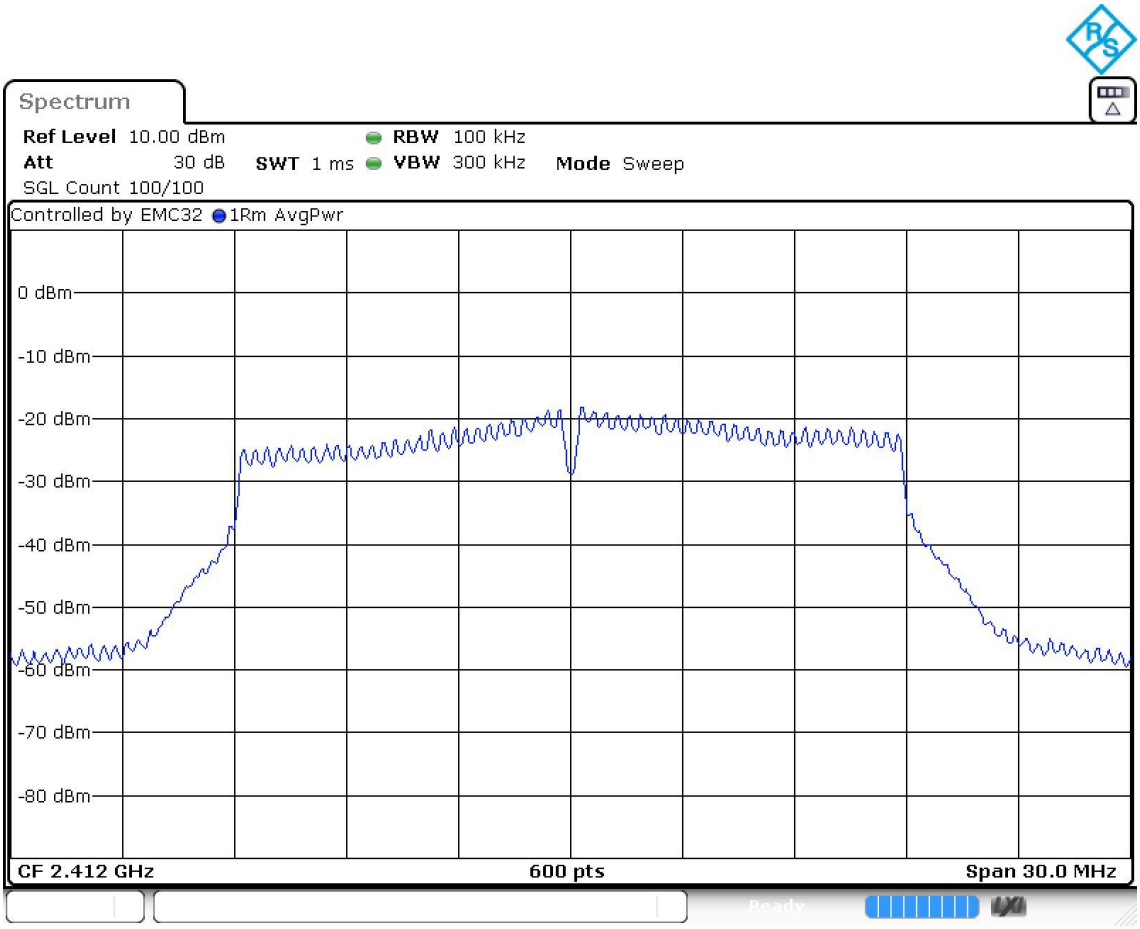
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11n HT20 (OFDM MCS0) Frequency MHz = 2412.00000

MIMO Mode = SISO Active Port = 1

Images:



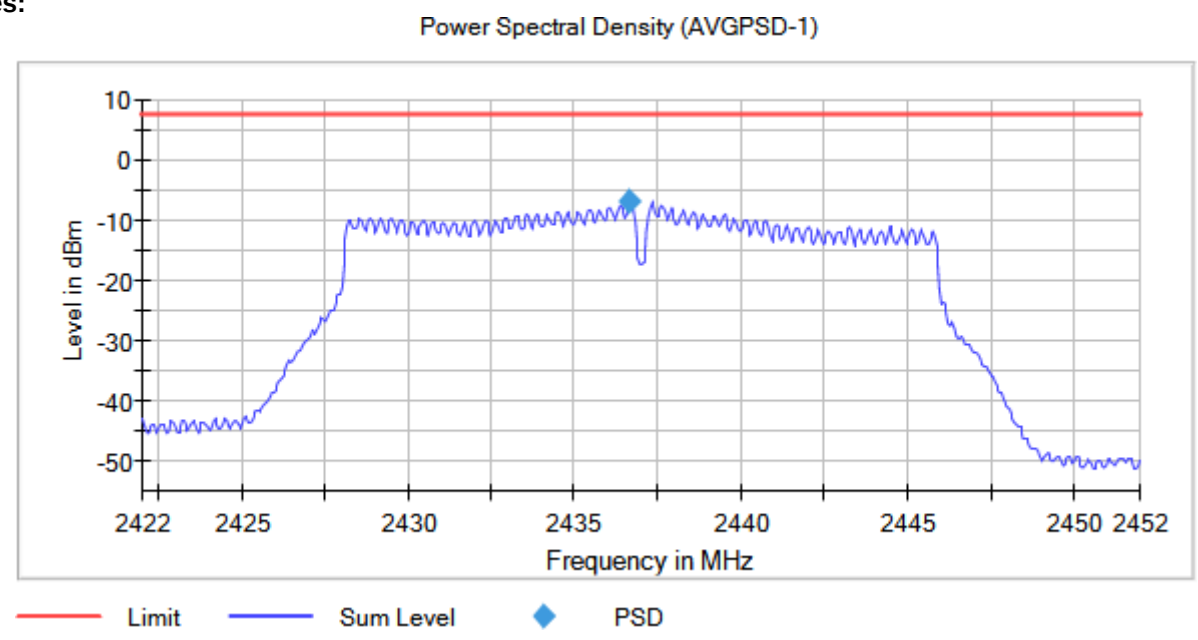


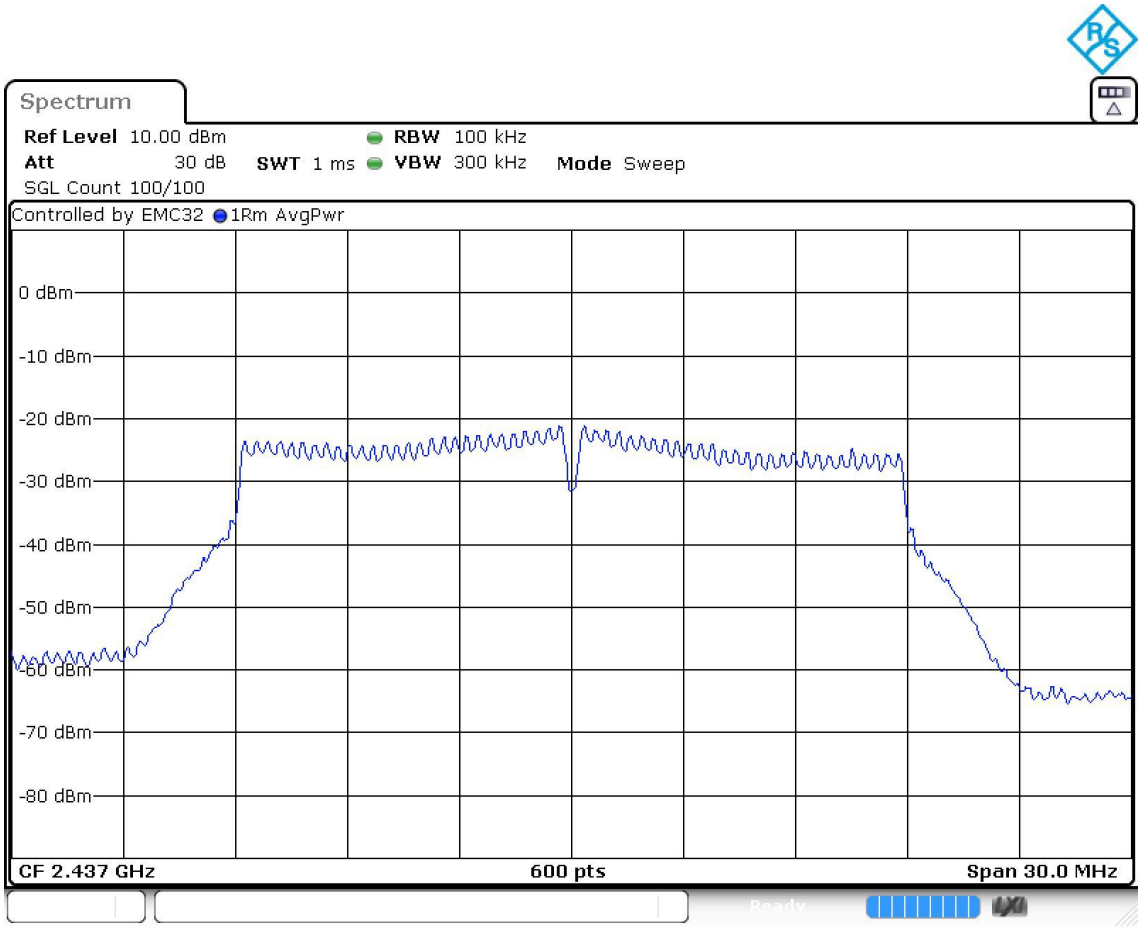
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11n HT20 (OFDM MCS0) Frequency MHz = 2437.00000

MIMO Mode = SISO Active Port = 1

Images:



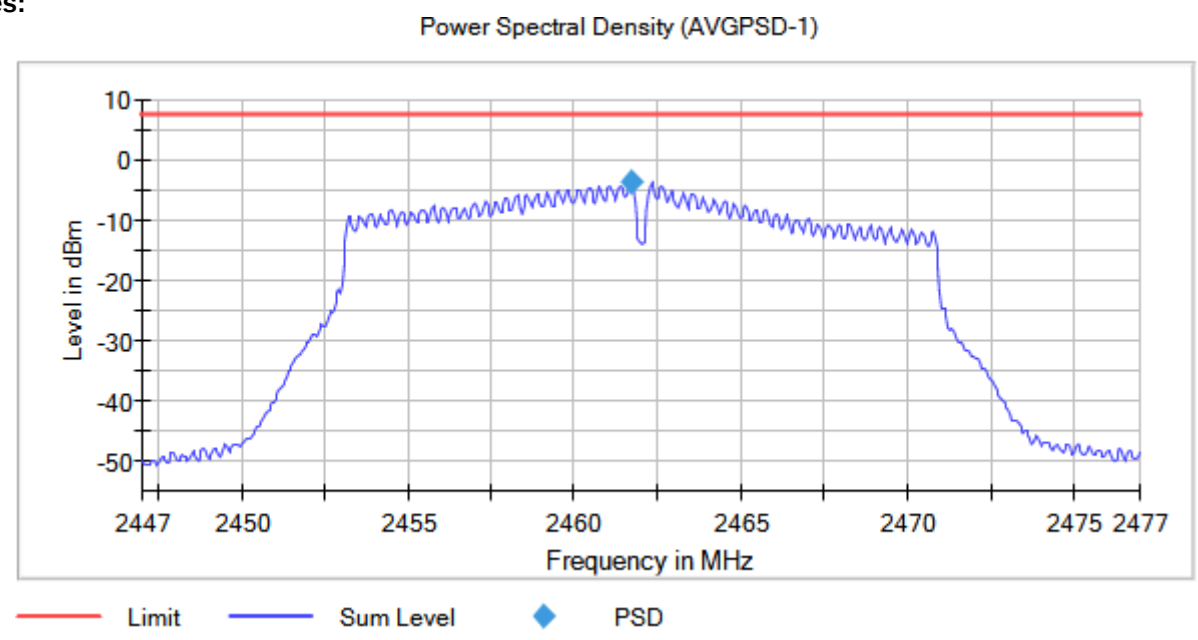


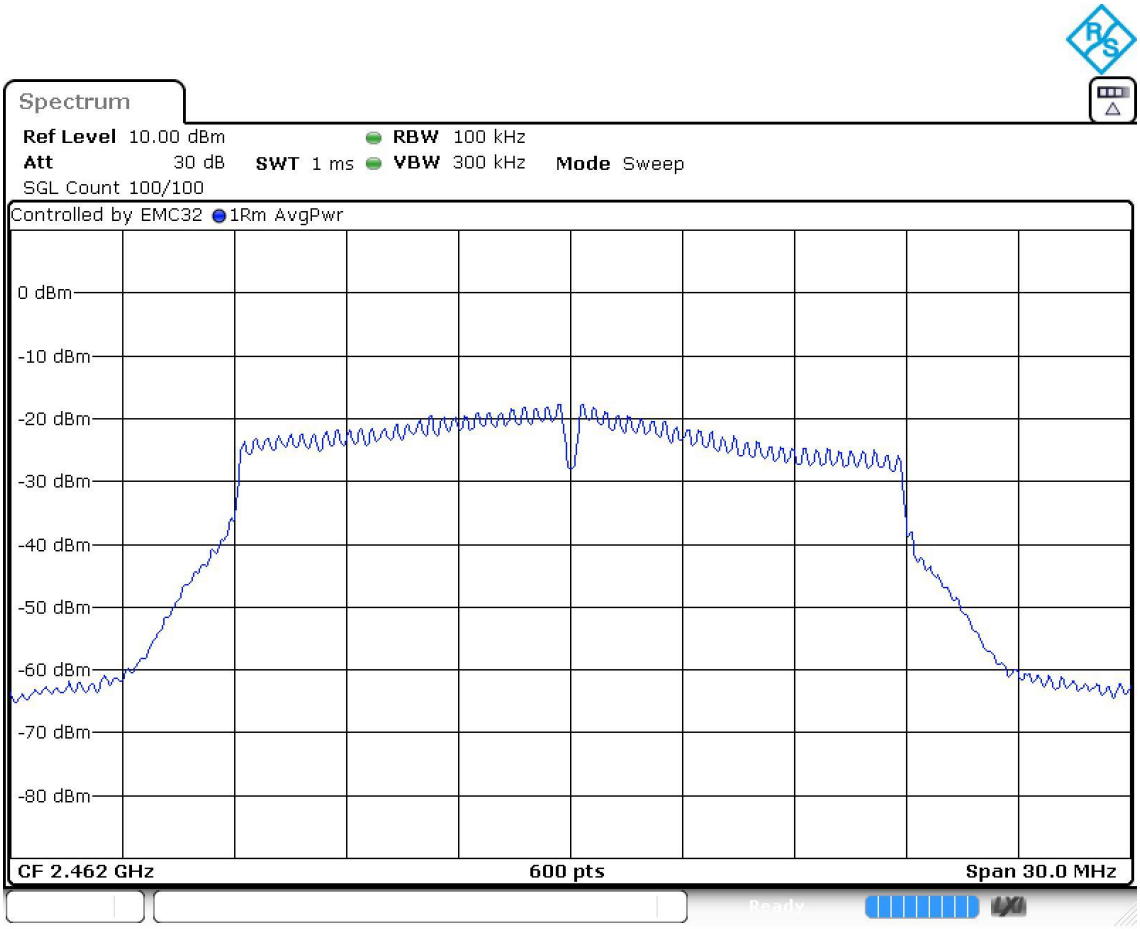
Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11n HT20 (OFDM MCS0) Frequency MHz = 2462.00000

MIMO Mode = SISO Active Port = 1

Images:





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

Limits

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

Modulation: 802.11b (DSSS 1 Mbit/s)

MIMO Mode: SISO

Results

Maximum Declared Antenna Gain: +3.03 dBi
The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

Equipment	BW (MHz)	Freq (MHz)	Port	Avg Power (dBm)	E.I.R.P. (dBm)
Digital Transmission System (DTS)	20	2412.00000	1	14.07	17.10
Digital Transmission System (DTS)	20	2437.00000	1	11.66	14.69
Digital Transmission System (DTS)	20	2462.00000	1	14.93	17.96

Verdict

Pass

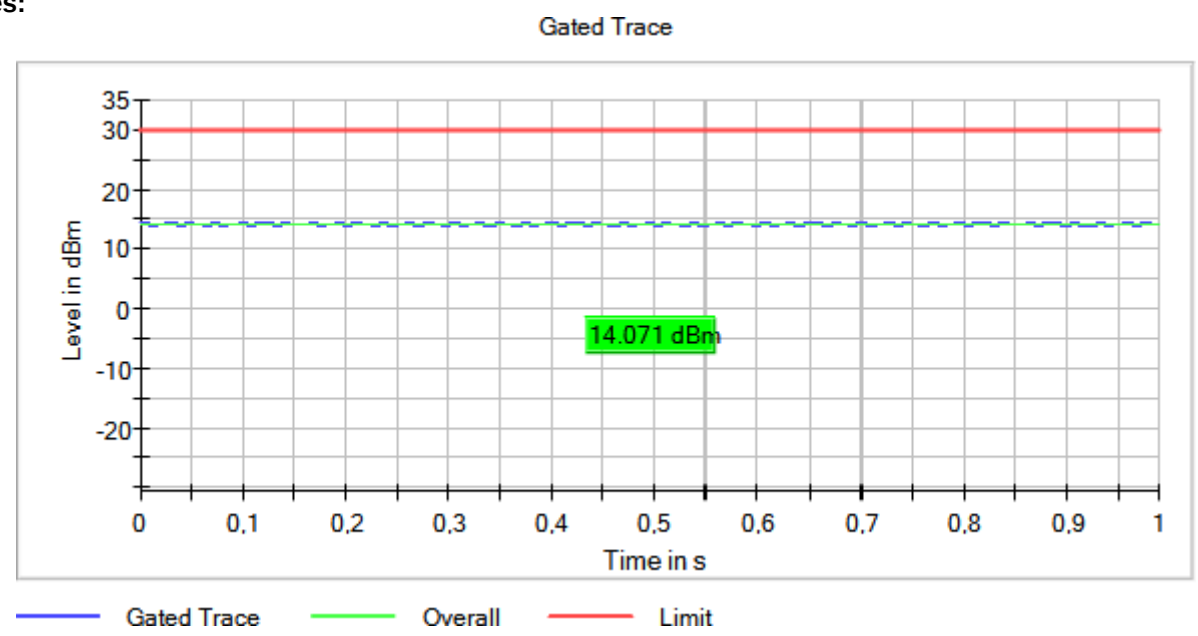
Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2412.00000

MIMO Mode = SISO Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters

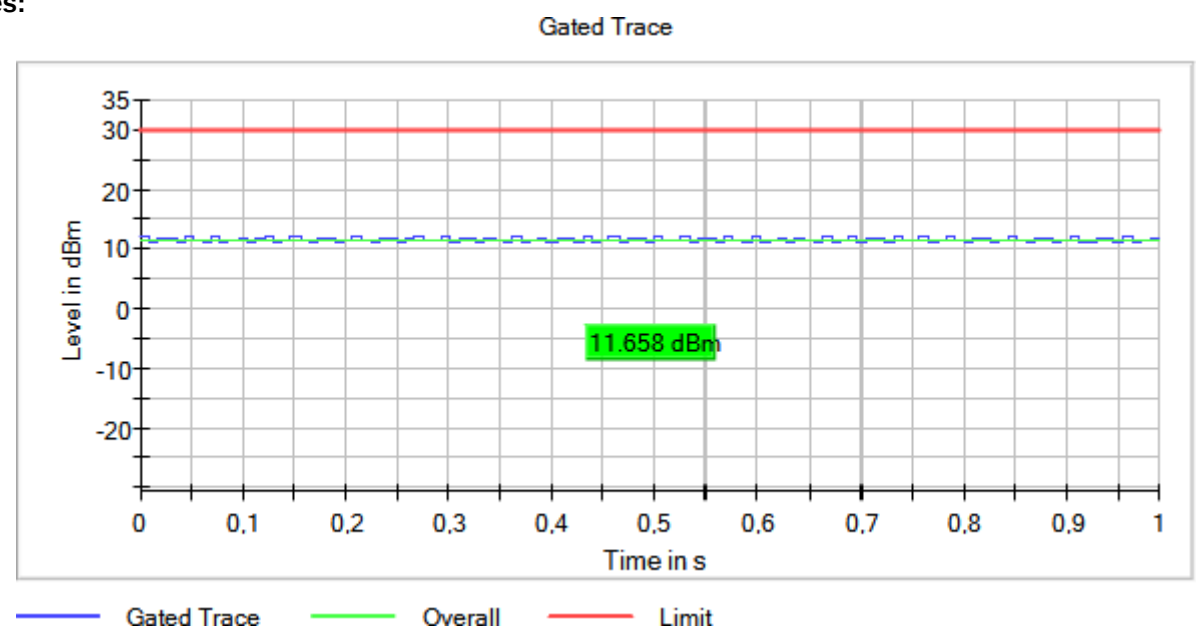
Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2437.00000

MIMO Mode = SISO Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters

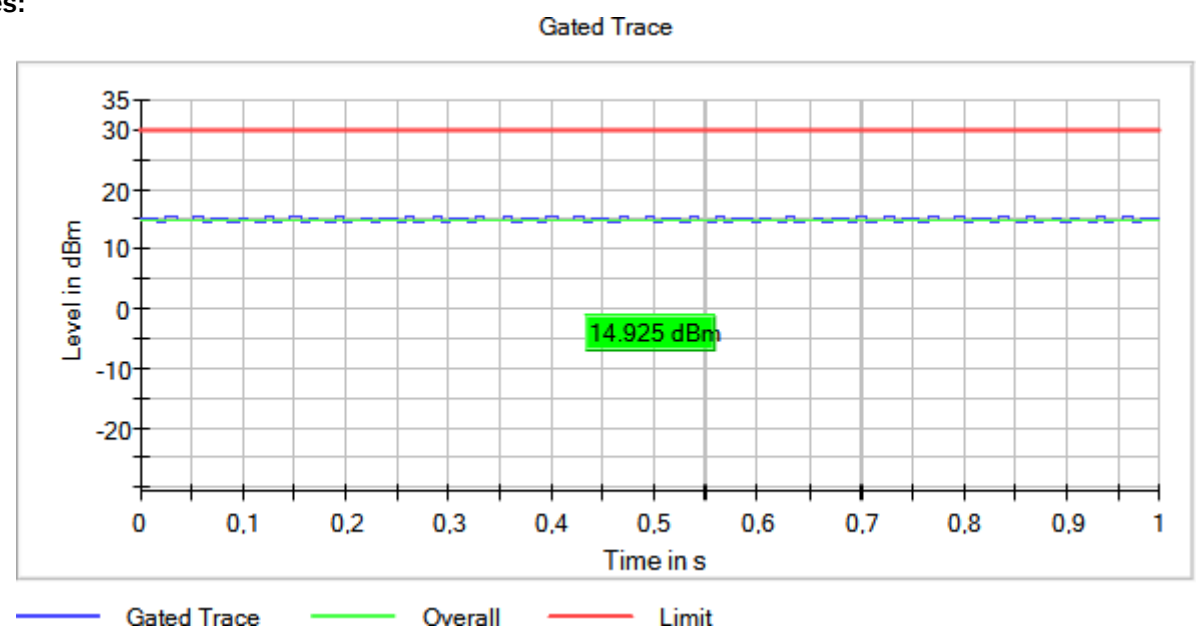
Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2462.00000

MIMO Mode = SISO Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Modulation: 802.11g (OFDM 6 Mbit/s)

MIMO Mode: SISO

Results

Maximum Declared Antenna Gain: +3.03 dBi
The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

Equipment	BW (MHz)	Freq (MHz)	Port	Avg Power (dBm)	E.I.R.P. (dBm)
Digital Transmission System (DTS)	20	2412.00000	1	14.14	17.17
Digital Transmission System (DTS)	20	2437.00000	1	11.84	14.87
Digital Transmission System (DTS)	20	2462.00000	1	14.59	17.62

Verdict

Pass

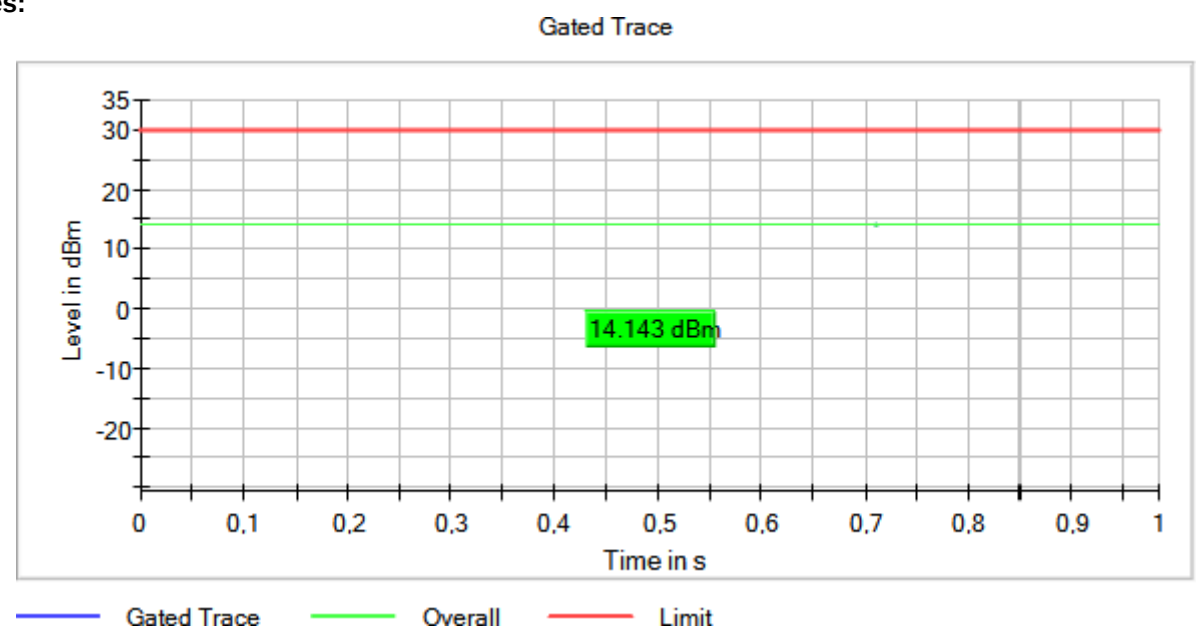
Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11g (OFDM 6 Mbit/s) Frequency MHz = 2412.00000

MIMO Mode = SISO Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters

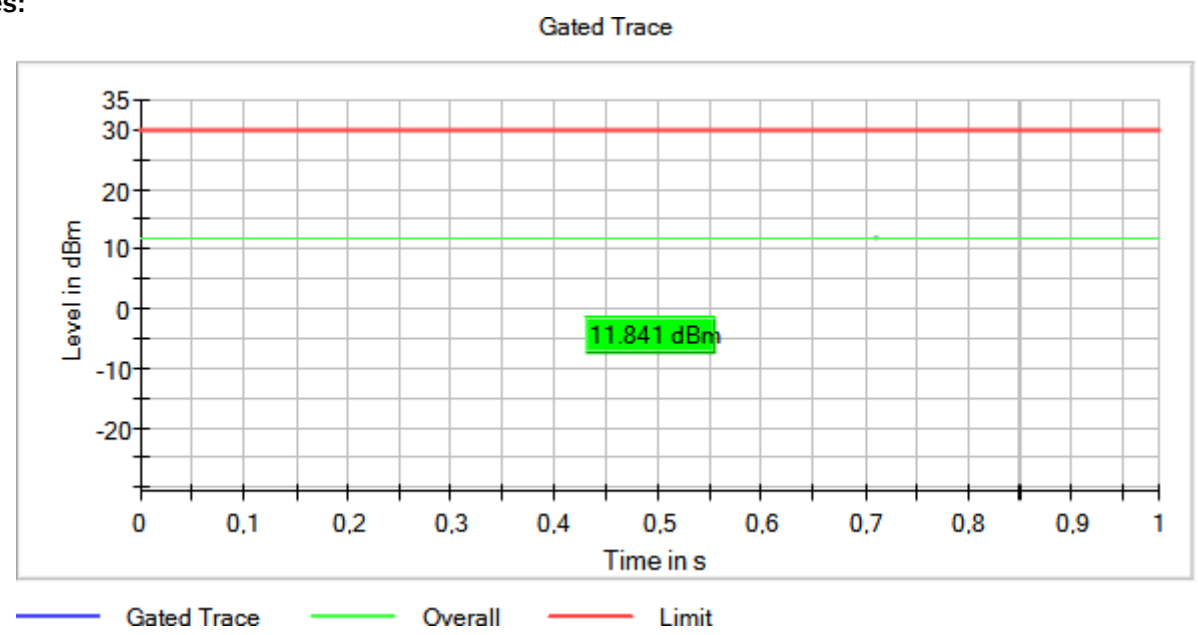
Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11g (OFDM 6 Mbit/s) Frequency MHz = 2437.00000

MIMO Mode = SISO Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters

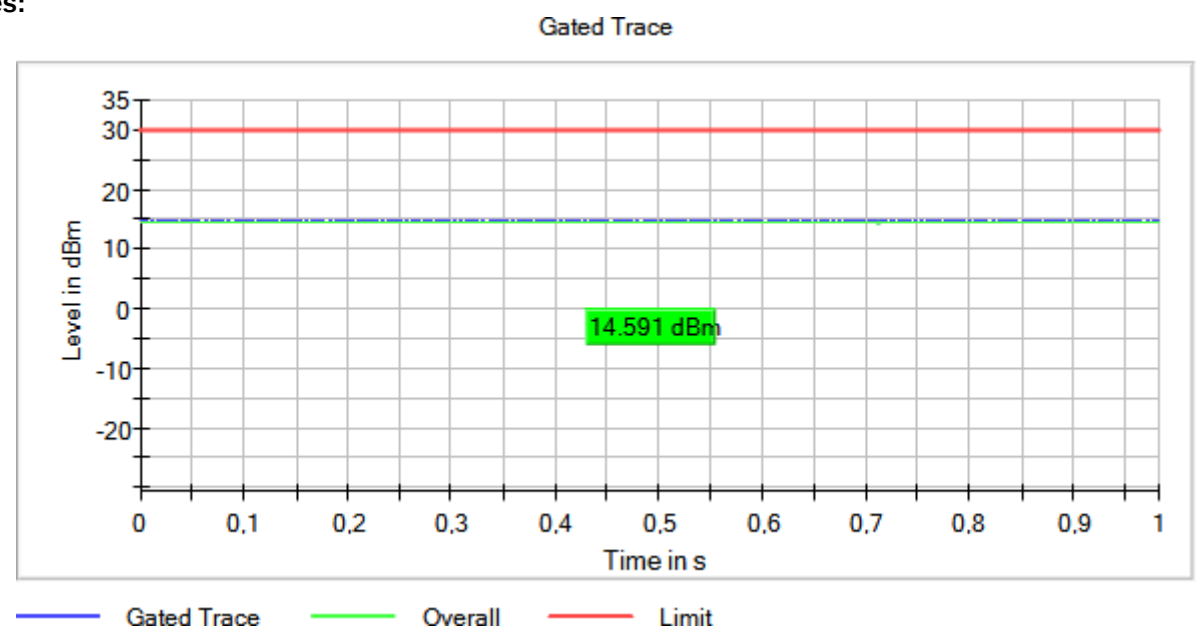
Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11g (OFDM 6 Mbit/s) Frequency MHz = 2462.00000

MIMO Mode = SISO Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Modulation: 802.11n HT20 (OFDM MCS0)

MIMO Mode: SISO

Results

Maximum Declared Antenna Gain: +3.03 dBi
The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

Equipment	BW (MHz)	Freq (MHz)	Port	Avg Power (dBm)	E.I.R.P. (dBm)
Digital Transmission System (DTS)	20	2412.00000	1	13.97	17.00
Digital Transmission System (DTS)	20	2437.00000	1	11.77	14.80
Digital Transmission System (DTS)	20	2462.00000	1	14.24	17.27

Verdict

Pass

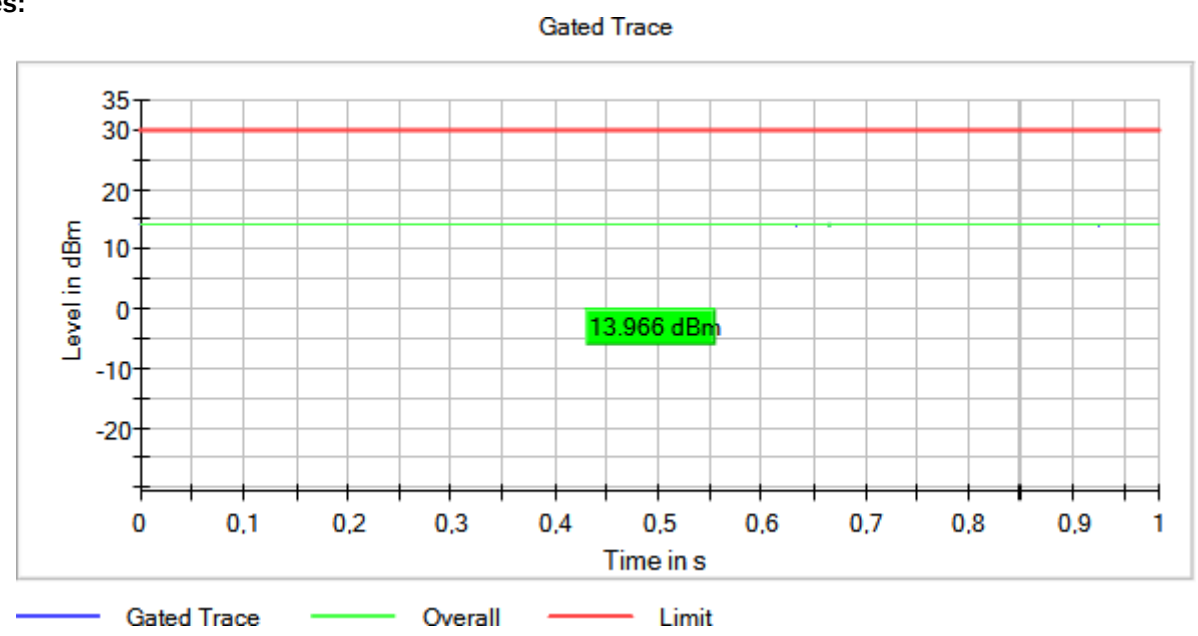
Attachments

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11n HT20 (OFDM MCS0) Frequency MHz = 2412.00000

MIMO Mode = SISO Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters

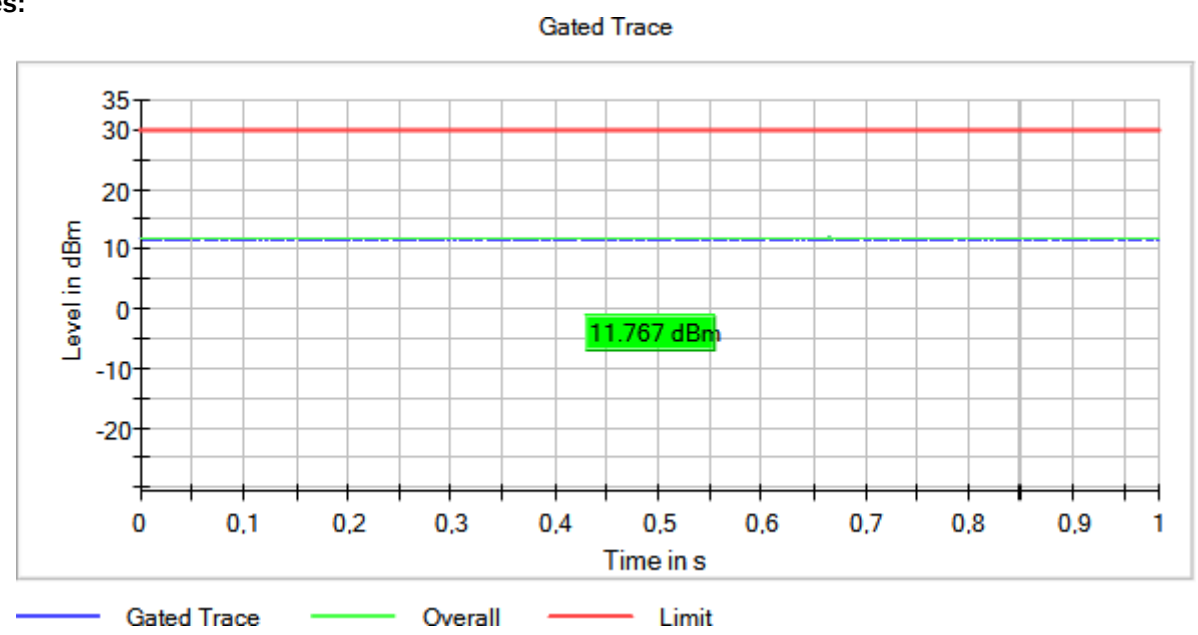
Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11n HT20 (OFDM MCS0) Frequency MHz = 2437.00000

MIMO Mode = SISO Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters

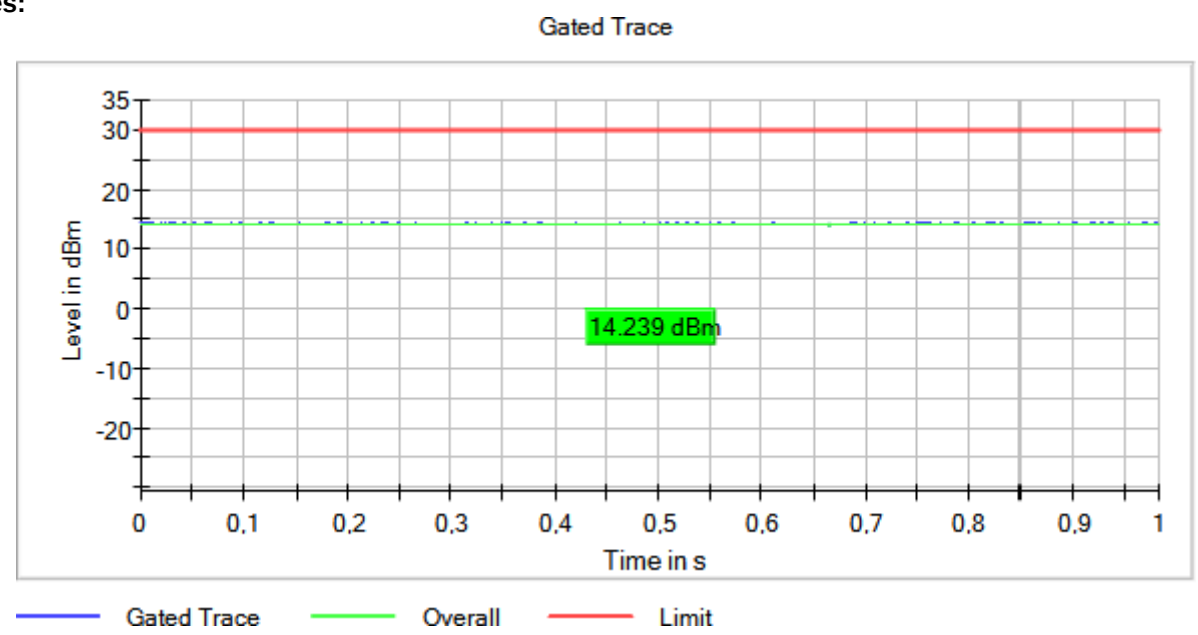
Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11n HT20 (OFDM MCS0) Frequency MHz = 2462.00000

MIMO Mode = SISO Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

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: 802.11b (DSSS 1 Mbit/s)

MIMO Mode: SISO

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.

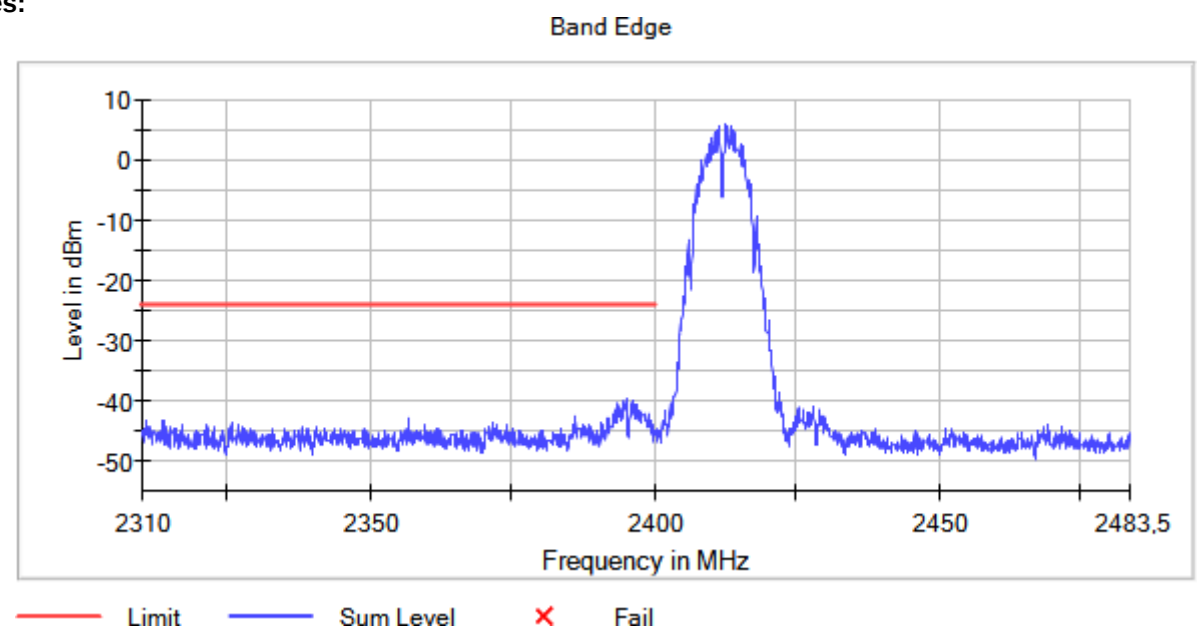
Verdict

Pass

Attachments

Equipment Type = Digital Transmission System (DTS)	Bandwidth MHz = 20
Modulation = 802.11b (DSSS 1 Mbit/s)	Frequency MHz = 2412.00000
MIMO Mode = SISO	Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters 1

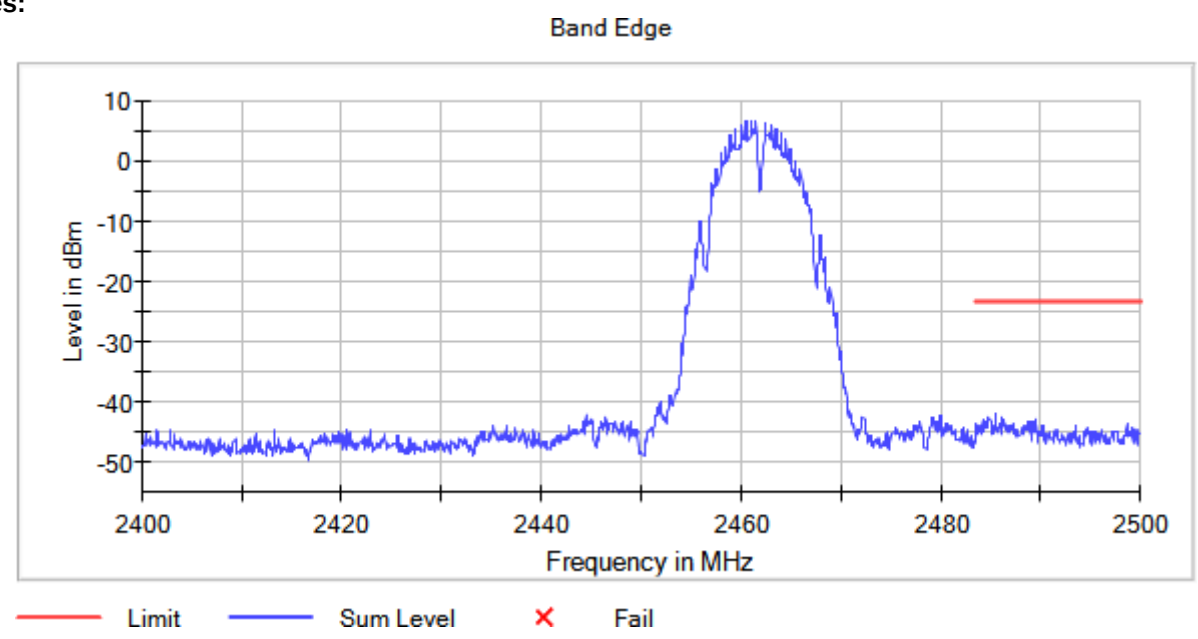
Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	113.672 µs	AUTO
Reference Level	20.000 dBm	20.000 dBm
Attenuation	40.000 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	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11b (DSSS 1 Mbit/s) Frequency MHz = 2462.00000

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	20.000 dBm	20.000 dBm
Attenuation	40.000 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	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Modulation: 802.11g (OFDM 6 Mbit/s)

MIMO Mode: SISO

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.

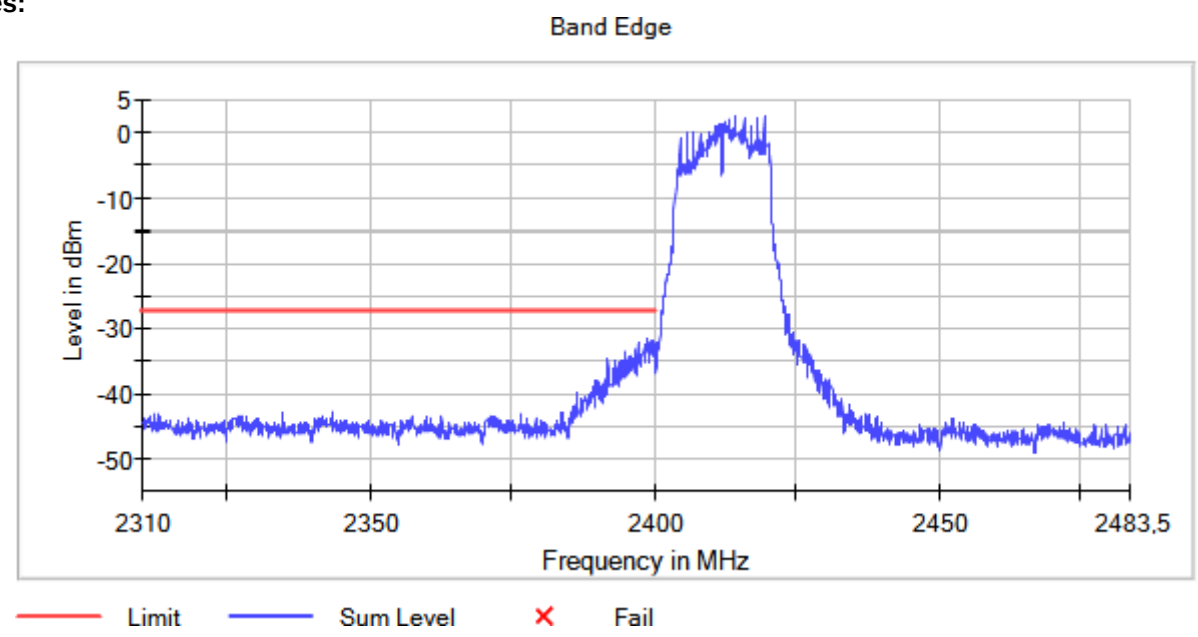
Verdict

Pass

Attachments

Equipment Type = Digital Transmission System (DTS)	Bandwidth MHz = 20
Modulation = 802.11g (OFDM 6 Mbit/s)	Frequency MHz = 2412.00000
MIMO Mode = SISO	Active Port = 1

Images:



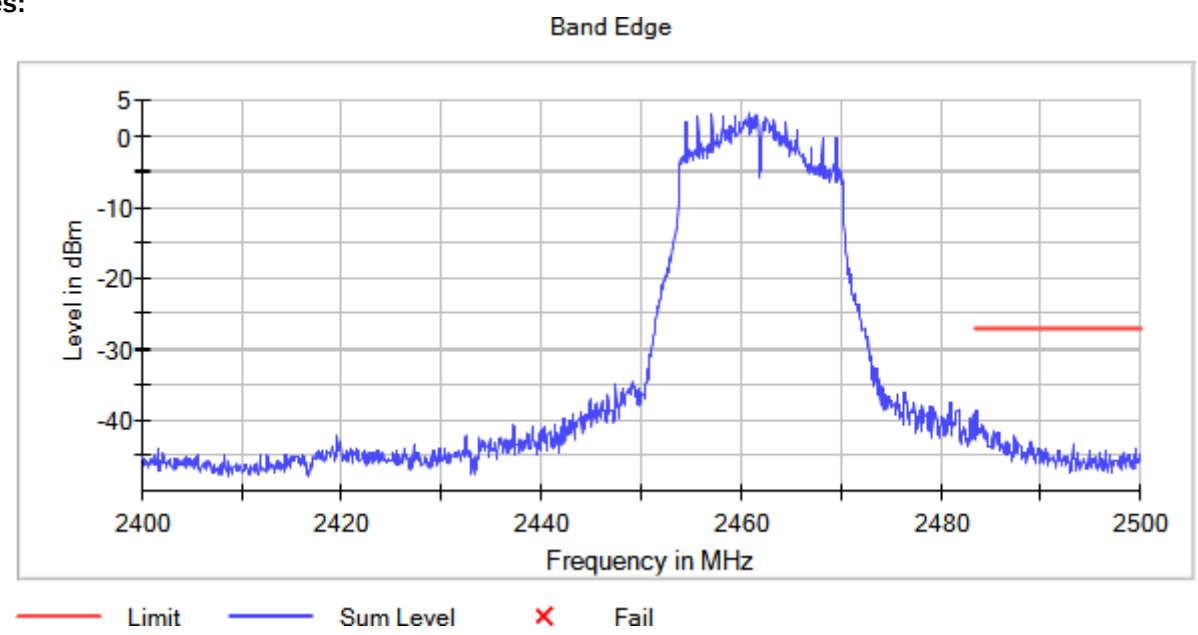
Tables:

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	20.000 dBm	20.000 dBm
Attenuation	40.000 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	22 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.38 dB	0.50 dB

Equipment Type = Digital Transmission System (DTS)
Bandwidth MHz = 20
Modulation = 802.11g (OFDM 6 Mbit/s)
Frequency MHz = 2462.00000
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	20.000 dBm	20.000 dBm
Attenuation	40.000 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	22 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.38 dB	0.50 dB

Modulation: 802.11n HT20 (OFDM MCS0)

MIMO Mode: SISO

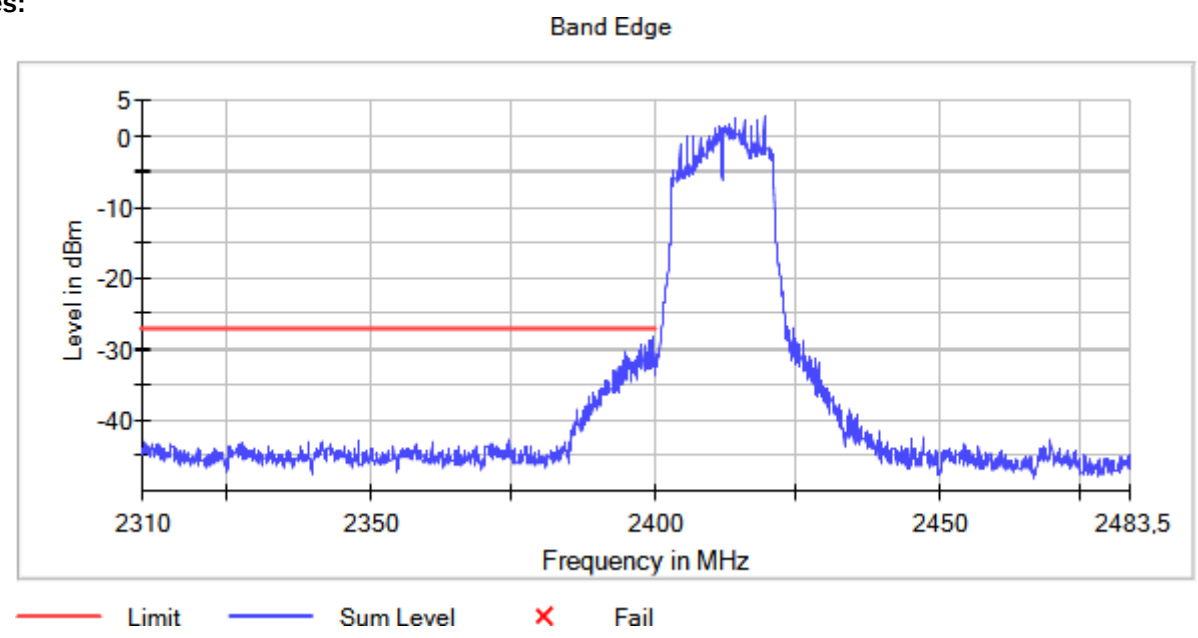
Results

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.

Attachments

Equipment Type = Digital Transmission System (DTS)	Bandwidth MHz = 20
Modulation = 802.11n HT20 (OFDM MCS0)	Frequency MHz = 2412.00000
MIMO Mode = SISO	Active Port = 1

Images:



Tables:

Spectrum Analyzer Parameters 1

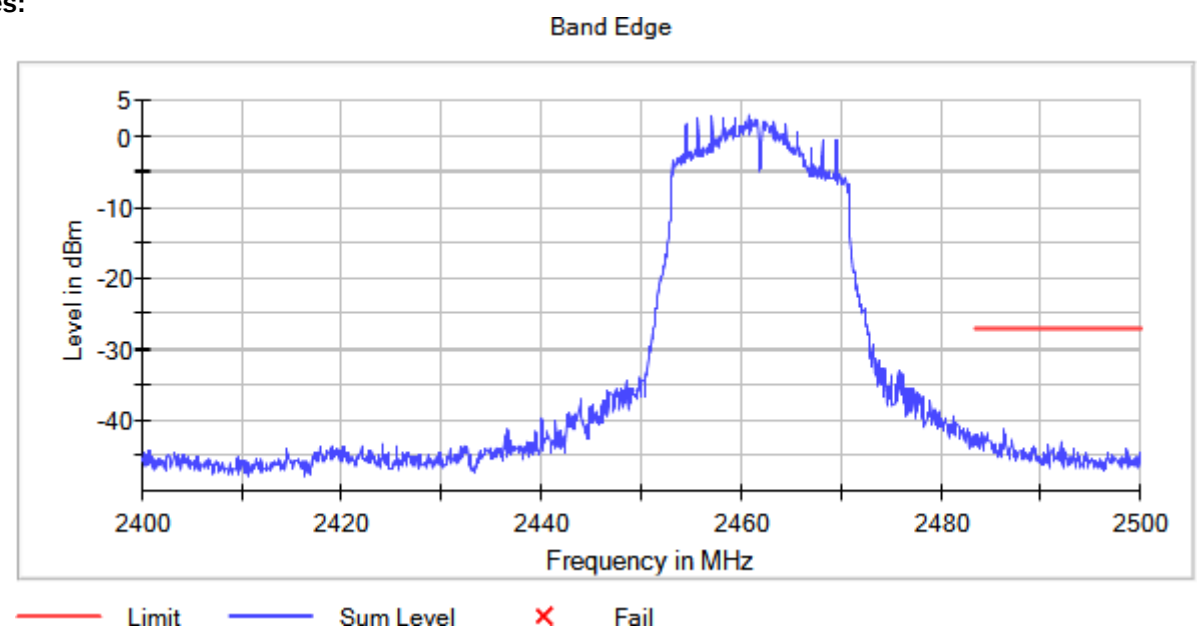
Setting	Instrument Value	Target Value
Start Frequency	2.31000 GHz	2.31000 GHz
Stop Frequency	2.40000 GHz	2.40000 GHz
Span	90.000 MHz	90.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	113.672 µs	AUTO
Reference Level	20.000 dBm	20.000 dBm
Attenuation	40.000 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	33 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Equipment Type = Digital Transmission System (DTS) Bandwidth MHz = 20

Modulation = 802.11n HT20 (OFDM MCS0) Frequency MHz = 2462.00000

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
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VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1800	~ 1800
Sweeptime	113.672 µs	AUTO
Reference Level	20.000 dBm	20.000 dBm
Attenuation	40.000 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	33 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.00 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: 802.11b (DSSS 1 Mbit/s)

MIMO Mode: SISO

Results

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Margin (dB)	Pol
31.940000	20.91	---	19.09	V
31.940000	---	24.42	---	V
33.152500	28.83	---	11.17	V
33.152500	---	31.66	---	V
34.316500	23.19	---	16.81	V
34.316500	---	26.61	---	V
47.993500	---	28.55	---	V
47.993500	27.56	---	12.44	V
450.834500	---	36.09	---	H
450.834500	30.29	---	15.71	H

Verdict

Pass

Attachments

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
Receiver: [ESW 44]					
30 MHz - 1 GHz	40 kHz	PK+	100 kHz	0,01 s	0 dB
1 GHz - 2,39 GHz	400 kHz	PK+	1 MHz	0,01 s	0 dB
2,484 GHz - 3 GHz	400 kHz	PK+	1 MHz	0,01 s	0 dB
3 GHz - 17 GHz	400 kHz	PK+	1 MHz	0,01 s	0 dB
17 GHz - 26 GHz	400 kHz	PK+	1 MHz	0,01 s	0 dB

Frequency Range GHz = [0.03, 1]

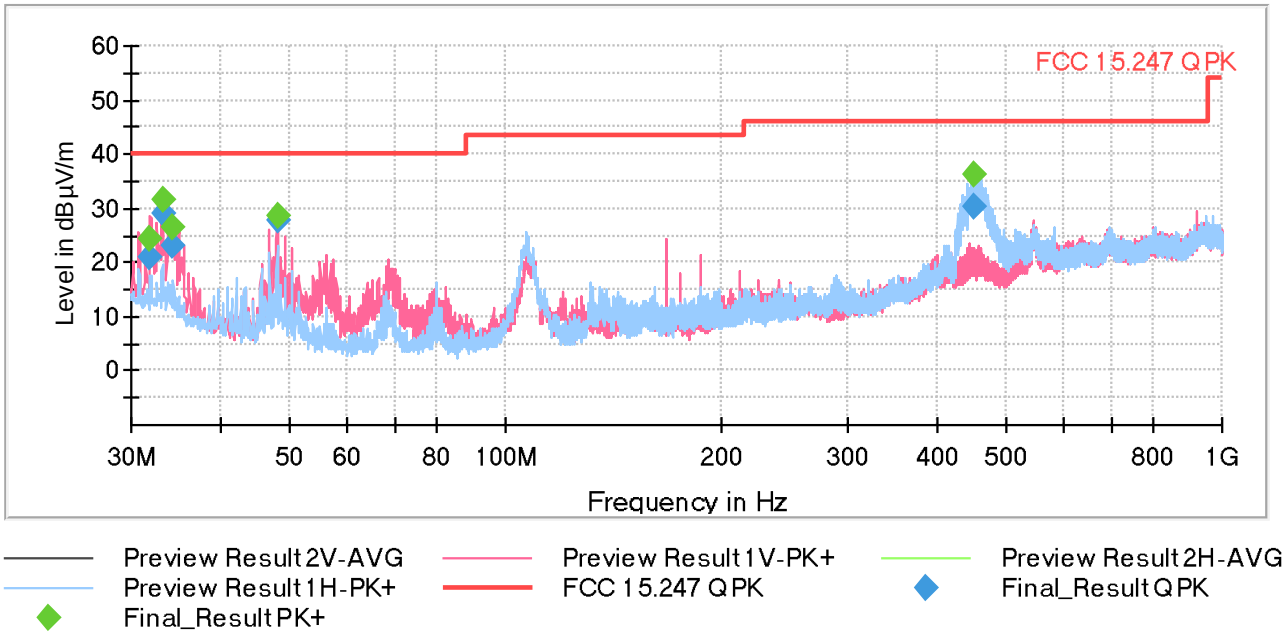
Equipment Type = Digital Transmission System (DTS)

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

MIMO Mode = SISO

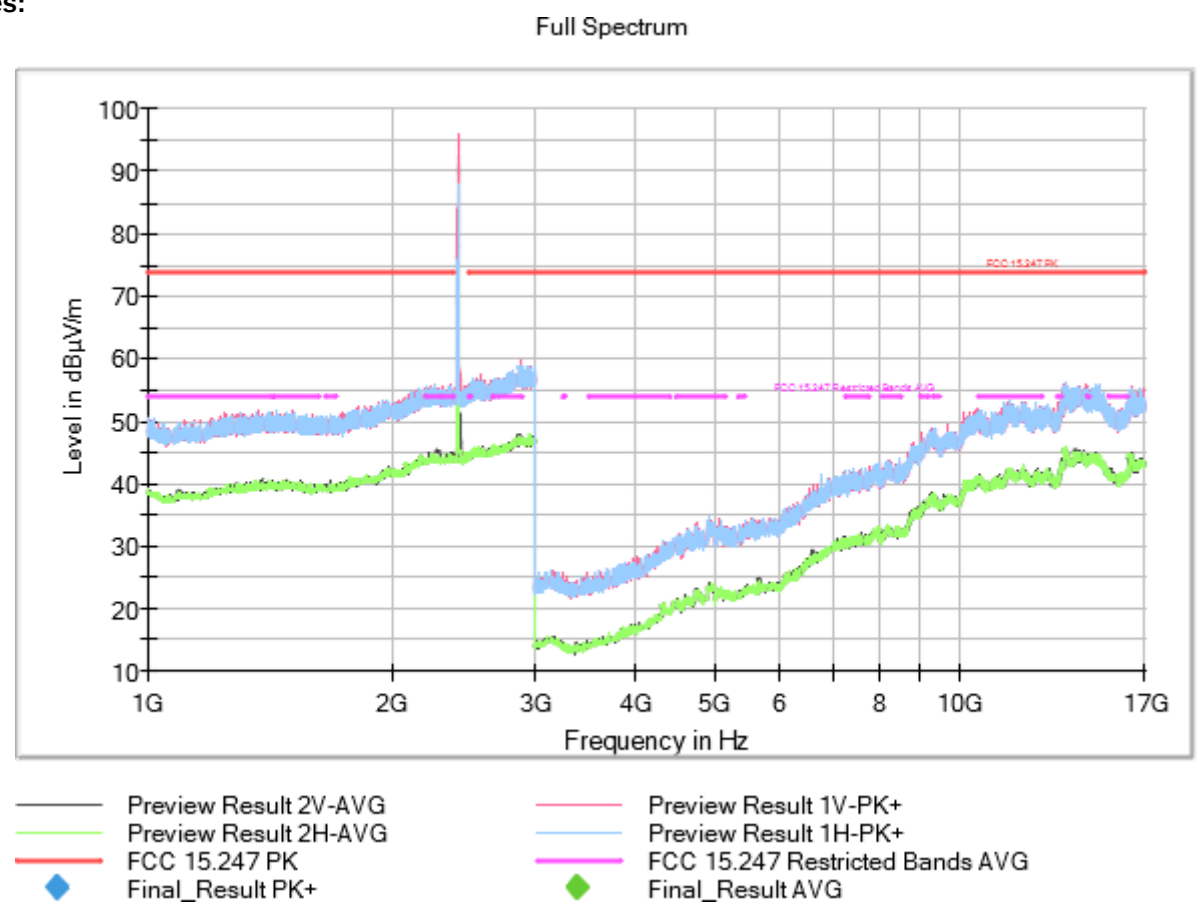
Active Port = 1

Images:



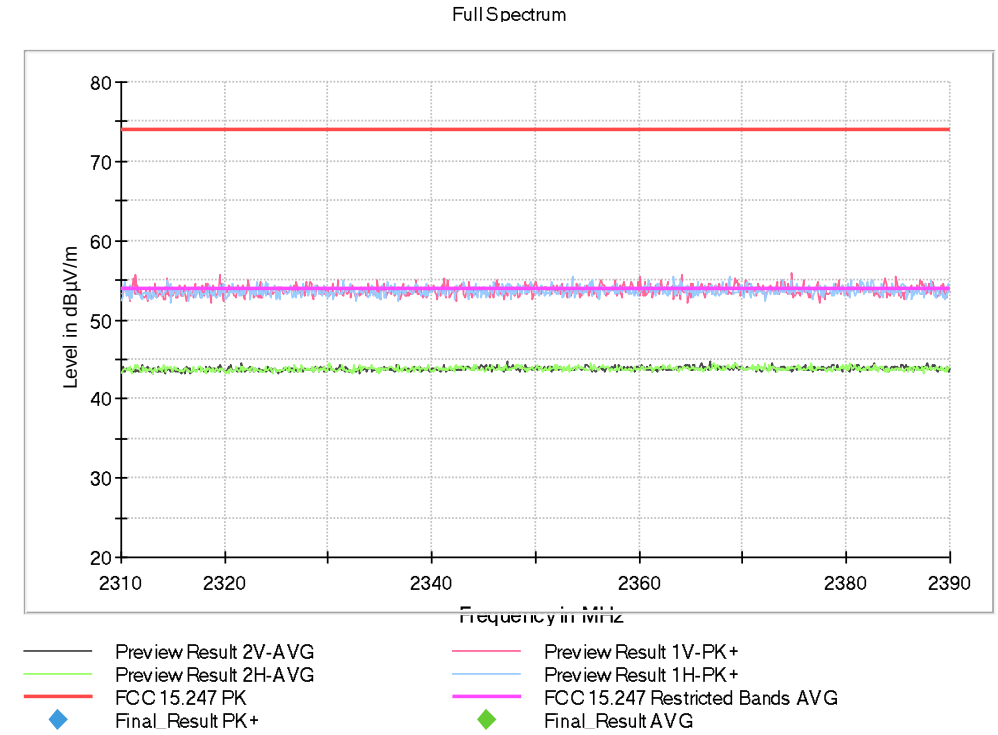
Frequency Range GHz = [1, 17]	Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s)	Frequency MHz = 2412.00000
MIMO Mode = SISO	Active Port = 1

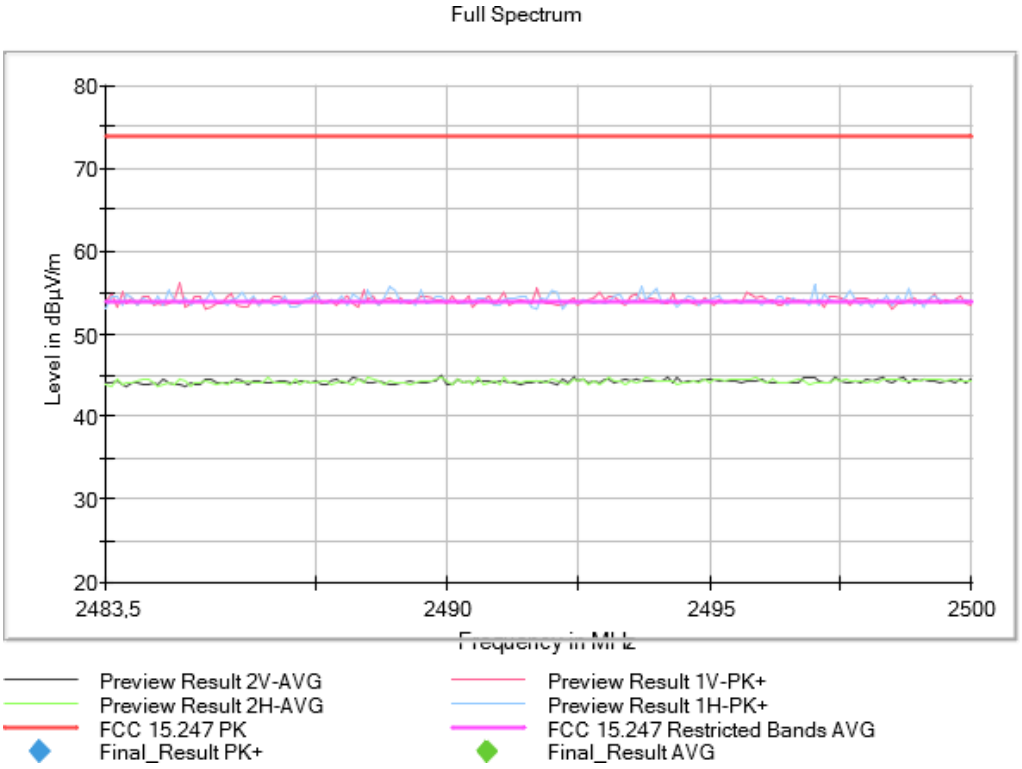
Images:



Frequency Range GHz = [1, 17]	Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s)	Frequency MHz = 2412.00000
MIMO Mode = SISO	Active Port = 1

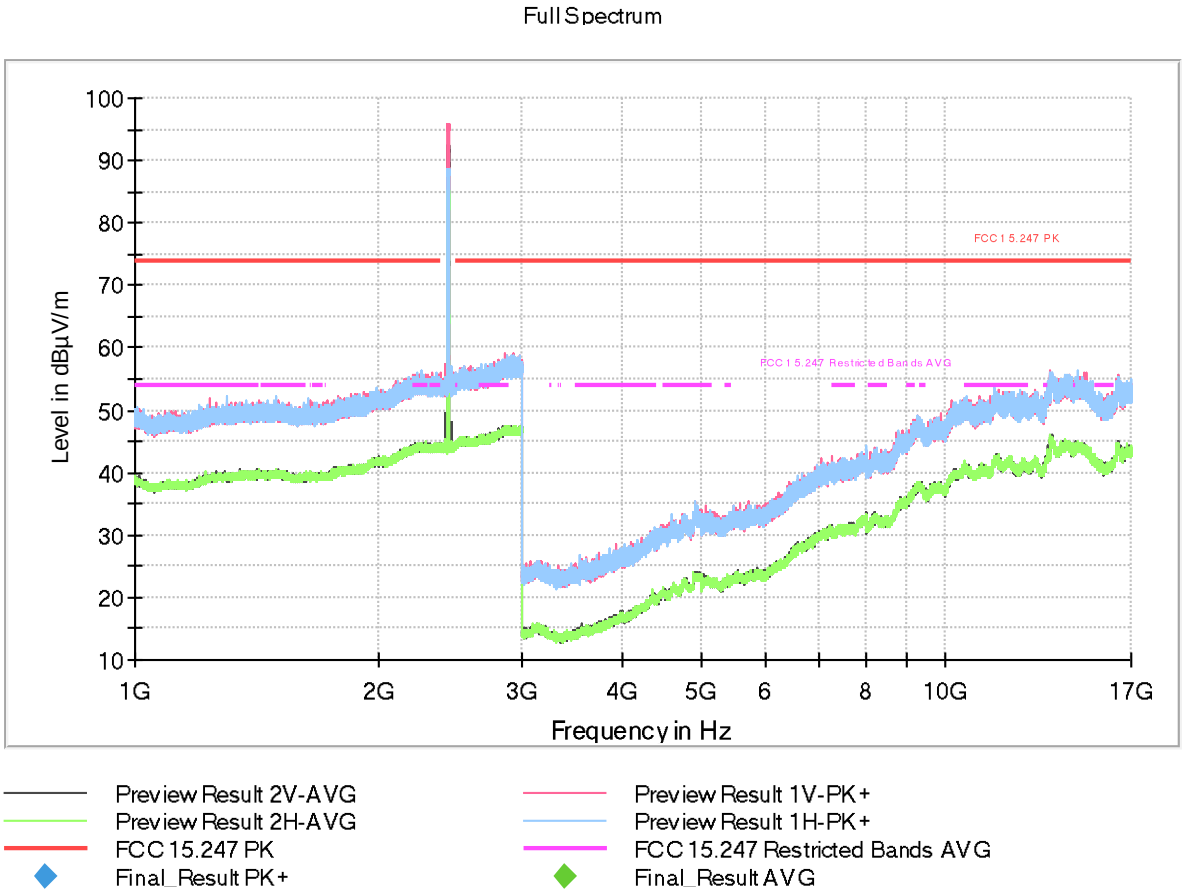
Images:





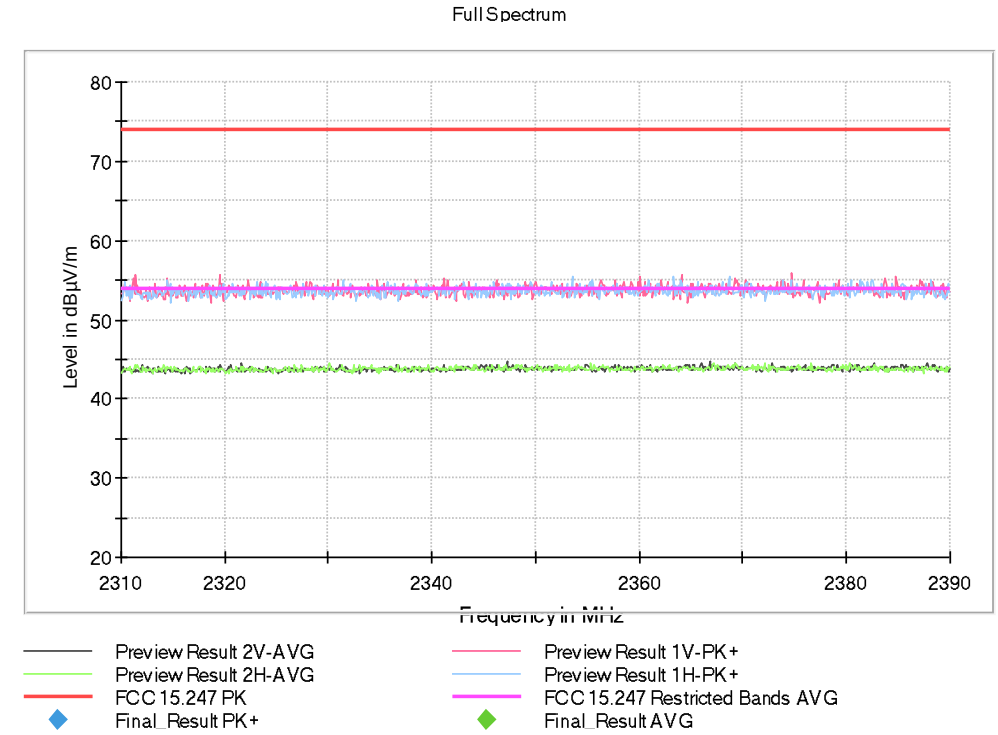
Frequency Range GHz = [1, 17]	Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s)	Frequency MHz = 2437.00000
MIMO Mode = SISO	Active Port = 1

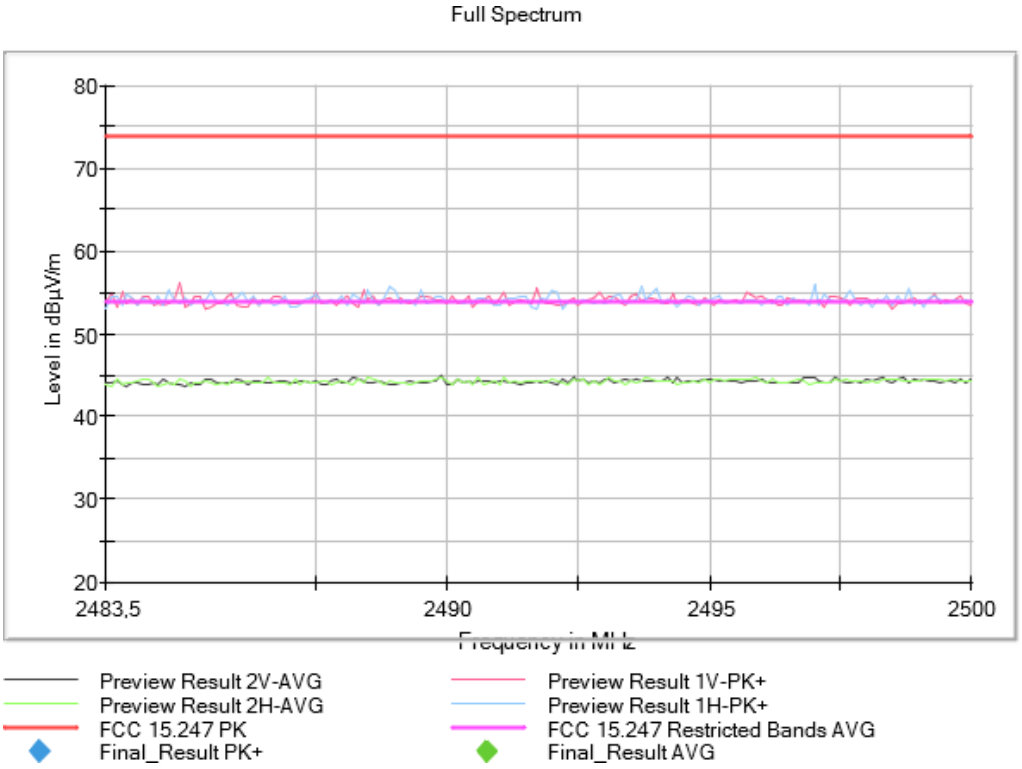
Images:



Frequency Range GHz = [1, 17]	Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s)	Frequency MHz = 2437.00000
MIMO Mode = SISO	Active Port = 1

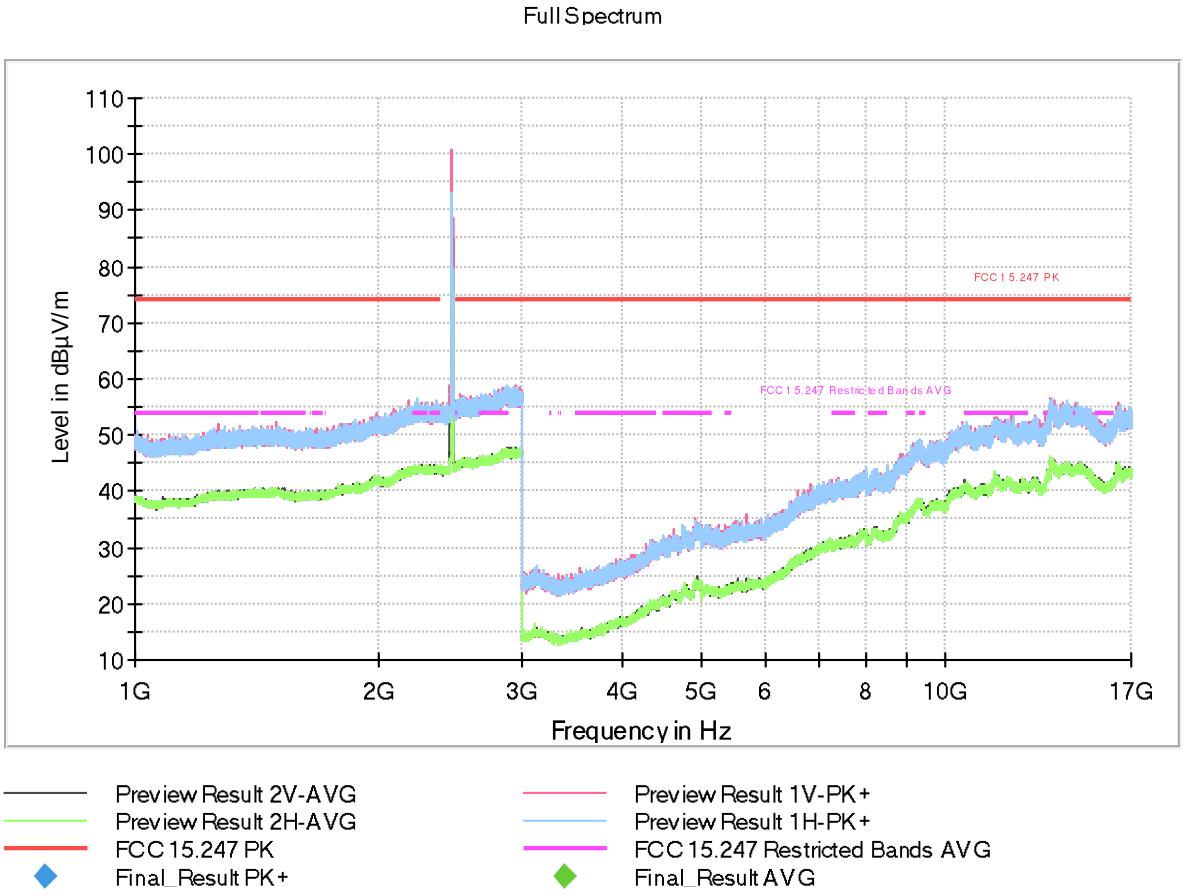
Images:





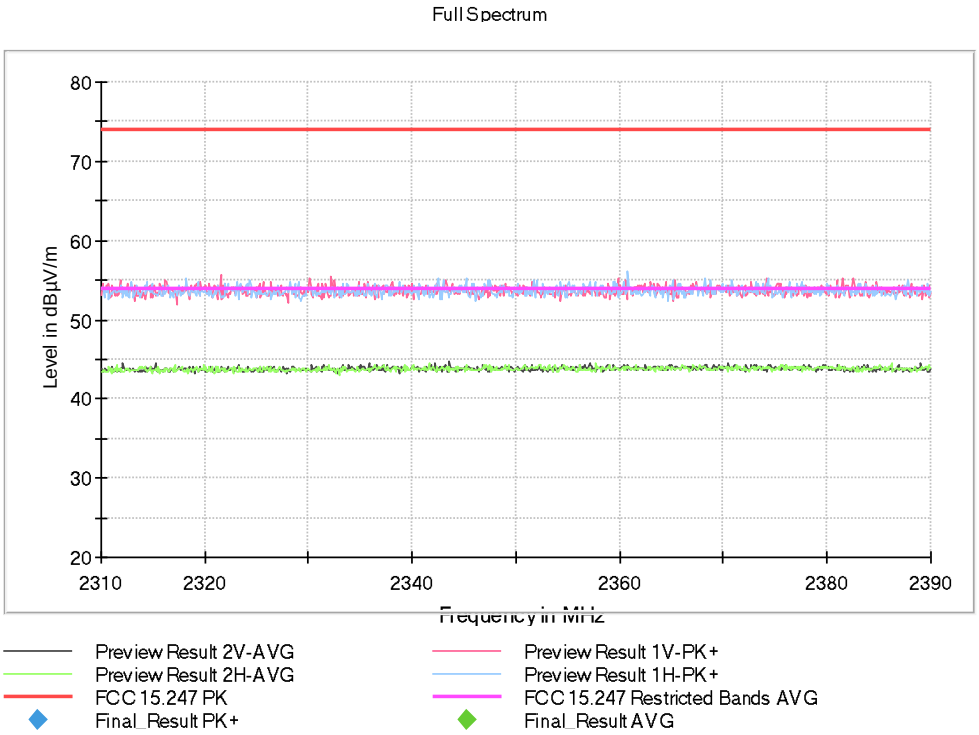
Frequency Range GHz = [1, 17]	Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s)	Frequency MHz = 2462.00000
MIMO Mode = SISO	Active Port = 1

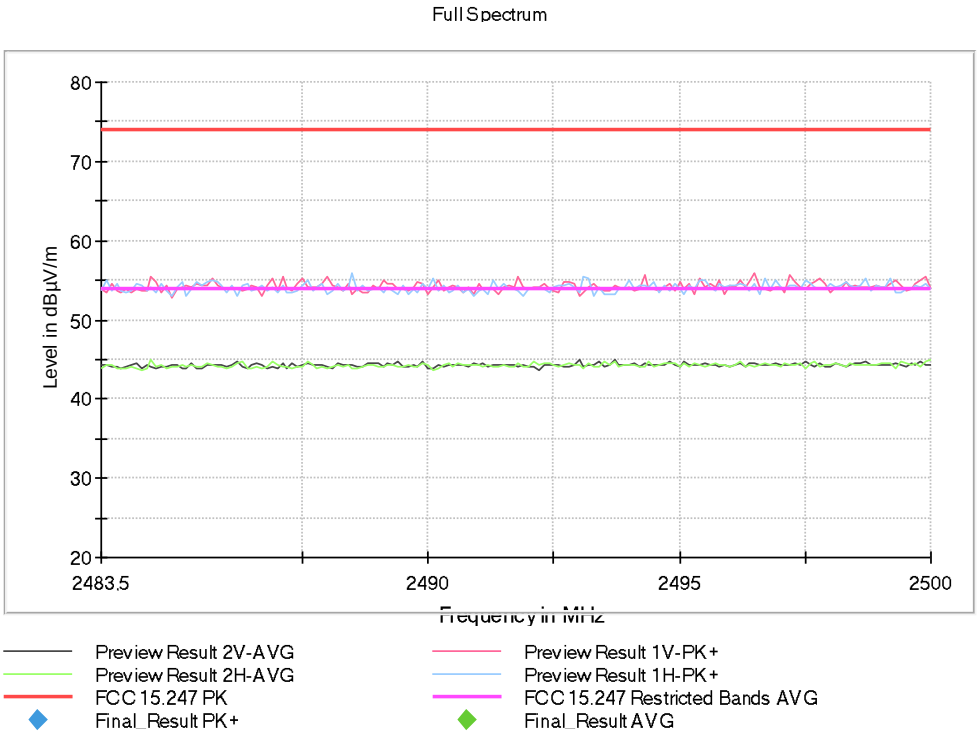
Images:



Frequency Range GHz = [1, 17]	Equipment Type = Digital Transmission System (DTS)
Modulation = 802.11b (DSSS 1 Mbit/s)	Frequency MHz = 2462.00000
MIMO Mode = SISO	Active Port = 1

Images:





Modulation: 802.11g (OFDM 6 Mbit/s)

MIMO Mode: SISO

Results

Freq Rng (GHz)	Equipment	Freq (MHz)	Port	Unwanted Freq (MHz)	Unwanted Lvl (dBµV/m)	Pol	Detector
[1, 17]	Digital Transmission System (DTS)	2412.00000	1	2388.400	47.94	V	AVG
				2388.400	62.82	V	PK

Verdict

Pass