

ISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:

79405RRF.015

Test Report

USA FCC Part 15.407, 15.209

CANADA RSS-247, RSS-Gen

(*) Identification of item tested	Rear Seat Entertainment
(*) Trademark	BMW
(*) Model and /or type reference	IDCEVO-RSE_EXBX
Other identification of the product	FCC ID: T8GIDCEVORSE IC: 6434A-IDCEVORSE
(*) Features	WLAN, Bluetooth HW version: 1.1.5 SW version: 25W46_2
(*) Manufacturer	Harman Becker Automotive Systems GMBH Becker-Goering-STR. 16; 76307 Karlsbad. GERMANY
Test method requested, standard	USA FCC Part 15.407 (10-1-23) Edition: Unlicensed National Information Infrastructure (U-NII) Devices. General technical requirements. USA FCC Part 15.209 (10-1-23) Edition: Radiated emission limits; general requirements. CANADA RSS-247 Issue 4 (July 2025). CANADA RSS-Gen Issue 5 Amendment 2 (February 2021). Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02 General U-NII Test Procedures New Rules v02r01 dated Dec 14, 2017. ANSI C63.10-2020 / Cor.1-2023 / C63.10a-2024 / Errata to C63.10a-2024: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager  Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (CA29507456) Fecha: 2026.04.30 07:12:46 +02'00'
Date of issue	2026-04-29
Report template No	FDT08_26 (*) "Data provided by the client"

Index

INDEX2

ACRONYMS3

COMPETENCES AND GUARANTEES3

GENERAL CONDITIONS4

UNCERTAINTY4

DATA PROVIDED BY THE CLIENT5

USAGE OF SAMPLES5

TEST SAMPLE DESCRIPTION6

IDENTIFICATION OF THE CLIENT7

TESTING PERIOD AND PLACE7

DOCUMENT HISTORY7

ENVIRONMENTAL CONDITIONS7

REMARKS AND COMMENTS8

TESTING VERDICTS9

SUMMARY.....10

APPENDIX A: TEST COMMON REQUIREMENTS FOR ALL BANDS.....11

APPENDIX B: TESTS RESULTS FOR THE U-NII-1 BAND 5.15–5.25 GHZ241

APPENDIX C: TESTS RESULTS FOR THE U-NII-3 BAND 5.725–5.85 GHZ476

Acronyms

Acronym ID	Acronym Description
Avg Power	Maximum Average Conducted Output Power
DC	Duty Cycle
Detector	Detector used
Ebw	Emission Bandwidth
Freq	Frequency
Freq Rng	Frequency Range
MP	Measurement Point
Max EIRP	Maximum Burst EIRP
Mod	Modulation
Occ Ch BW	Occupied Channel Bandwidth
Operation Band	Operation Band
PSD	Power Spectral Density
Pol	Polarization
Port	Active Port
RU	Resource Unit
TPC	TPC
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.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification S.A.U.

General conditions

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

Uncertainty

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

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

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

The total uncertainty of the measurement system for the radiated emissions of EUT from 17 GHz to 40 GHz is:
Measurement uncertainty $\leq \pm 5,55$ dB with factor ($k = 2$).

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

RF Average Output Power: Measurement uncertainty $\leq \pm 2,01$ dB

Duty Cycle: Measurement uncertainty $\leq \pm 0,84$ ms

Power Spectral Density: Measurement uncertainty $\leq \pm 2,01$ dB

Occupied/26 dBc Bandwidth: Measurement uncertainty

$\leq \pm 57,76$ kHz for BW 20MHz;

$\leq \pm 115,53$ kHz for BW 40MHz; and

$\leq \pm 231,06$ kHz for BW 80MHz.

6 dB Bandwidth: Measurement uncertainty

$\leq \pm 34,67$ kHz for BW 20MHz;

$\leq \pm 46,22$ kHz for BW 40MHz; and

$\leq \pm 80,90$ kHz for BW 80MHz.

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", "Manufacturer").
2. The sample consists of a Rear Seat Entertainment.

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	79405_482.1	Headunit	IDCEVO-RSE_EXBX	HBB513S94YA263	2025-12-12	Element Under Test
	79405_490.1	Módulo Circuit Board			2025-12-12	Auxiliary Element
	79405_505.1	Harness			2025-12-12	Auxiliary Element
	79405_513.1	OABR Adapter Cable			2025-12-12	Auxiliary Element
S/02	79405_485.1	Headunit (4 Antenna port)	IDCEVO-RSE_EXBX	HBB513S94YA277	2025-12-12	Auxiliary Element
	79405_49.1	OABR Adapter			2025-01-21	Auxiliary Element
	79405_506.1	Harness			2025-12-12	Auxiliary Element
	79405_513.1	OABR Adapter Cable			2025-12-12	Auxiliary Element

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			
		HDMI	-	X	-		
		USB	-	X	-		
		Main 16 pol. (Car Connector)	-	X	-		
		CONM 2POL ROS E6S20A-40MT5-D	-	X	-		
CONM 2POL ROS E6S20A-40MT5-D	-	X	-				
Supplementary information to the ports..... :	-						
Rated power supply :	Voltage and Frequency		Reference poles				
		AC:	L1	L2	L3	N	PE
	X	DC: 13.2 V					
Rated Power..... :	-						
Clock frequencies..... :	-						
Other parameters :	-						
Software version..... :	-						
Hardware version :	-						
Dimensions in cm (W x H x D) ... :	170.4 x 41 x 167.45 cm						
Mounting position :	Table top equipment						
	Wall/Ceiling mounted equipment						
	Floor standing equipment						
	Hand-held equipment						
	X	Other: automotive dashboard					
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			
	-		-	-			

Identification of the client

Harman Becker Automotive Systems GMBH
Becker-Goering-STR. 16; 76307 Karlsbad. GERMANY

Testing period and place

Test Location	DEKRA TESTING AND CERTIFICATION S.A.U. C/ Margarita Salas Boulevard, 26 - Parque Tecnológico de Andalucía; 29590 Campanillas (Málaga) (Location D)
Date (start)	2026-02-09
Date (finish)	2026-02-26

Document history

Report number	Date	Description
79405RRF.015	2026-04-29	First release.

Environmental conditions

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

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

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

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

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

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

Remarks and comments

The tests have been performed by the technical personnel: Karla Castilla Alcalde, Rubén Mora Fernandez, Victoria Olmedo Villalba and Álvaro Borrego Robles.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
10304	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2026-10-01
07040	EXTENSION FOR OPEN SWITCH UNIT UP TO 40GHz	OSP-B157Wx	ROHDE AND SCHWARZ	2027-08-26
07763	HORN ANTENNA 1-18GHz	BBHA 9120D	SCHWARZBECK MESS-ELEKTRONIK	2029-03-11
06495	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2027-07-11
07862	PRE-AMPLIFIER G>30dB 17-40GHz	BLMA 1840-3G	BONN ELEKTRONIK	2026-07-09
10574	PRE-AMPLIFIER G>50dB 1-18 GHz	BLMA 0118-M	BONN ELEKTRONIK	2027-04-09
07039	Rohde&Schwarz	OSP-B157W8	ROHDE AND SCHWARZ	2027-08-14
08130	SEMIANECHOIC ABSORBER LINED CHAMBER	P29419	ALBATROSS	--
08134	SHIELDED ROOM	P29419	ALBATROSS PROJECTS GMBH	--
08661	SHIELDED ROOM	-	SIEPEL	--
07794	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2027-06-10
04848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	--
07550	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2026-04-23
07549	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2026-04-23
07552	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	HW GROUP	2026-04-23
07798	WMS32	WMS32	ROHDE AND SCHWARZ	--

Testing verdicts

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

Summary

Common requirements for all bands

FCC PART 15 PARAGRAPH / RSS-247		
Requirement – Test case	Verdict	Remark
Duty Cycle	P	
99% Occupied Bandwidth	P	
26 dB Emission Bandwidth (EBW)	P	
<u>Supplementary information and remarks:</u> (1) None.		

U-NII-1 Band: 5.15 - 5.25 GHz

FCC PART 15 PARAGRAPH / RSS-247		
Requirement – Test case	Verdict	Remark
FCC 15.407 (a)(1)(iv) Transmitter Maximum conducted Output Power	P	
RSS-247 7.3.1.2 Transmitter Maximum Equivalent Isotropically Radiated Power EIRP	P	
FCC 15.407 (a)(1)(iv) Transmitter Maximum Power Spectral Density	P	
RSS-247 7.3.1.2 Transmitter EIRP Spectral Density	P	
FCC 15.407 (b)(1)(6) / RSS-247 7.3.1.3 Transmitter Out of Band Radiated Emissions	P	
FCC 15.407 (b)(1) / RSS-247 7.3.1.3 Transmitter Band Edge Radiated Emissions	P	
<u>Supplementary information and remarks:</u> None.		

U-NII-3: 5.725 GHz – 5.85 GHz Band:

FCC PART 15 PARAGRAPH / RSS-247		
Requirement – Test case	Verdict	Remark
FCC 15.407 (e) / RSS-247 7.3.4.2 6 dB Bandwidth	P	
FCC 15.407 (a)(3)(i) / RSS-247 7.3.4.3 Transmitter Maximum Conducted Output Power	P	
FCC 15.407 (a)(3)(i) / RSS-247 7.3.4.3 Transmitter Maximum Power Spectral Density	P	
FCC 15.407 (b)(4) / RSS-247 7.3.4.4 Transmitter Out of Band Radiated Emissions	P	
FCC 15.407 (b)(4) / RSS-247 7.3.4.4 Transmitter Band Edge Radiated Emissions	P	
<u>Supplementary information and remarks:</u> None.		

Appendix A: Test Common requirements for all Bands

TEST CONDITIONS	13
SAMPLE CALCULATION	20
TEST CASES DETAILS	21
<i>Transmitter. Duty Cycle</i>	21
<i>Transmitter. 99% Occupied Bandwidth</i>	27
<i>Transmitter. 26 dB Emission Bandwidth (EBW)</i>	134

TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 12Vdc

Type of Power Supply: External power supply (Vehicle Battery)

ANTENNA (*):

Type of Antenna: Internal antenna.

Maximum Declared Antenna Gain:

WLAN 5 GHz: Port 1: 5.54 dBi
Port 2: 5.46dBi

Directional Antenna Gain Calculations for CDD MIMO In-Band Measurements:

For 2Tx CDD MIMO modes, in accordance with KDB 662911 D01 v02r01 Section F)2)f)(ii) y F)2)e)ii), directional gain, directional gain was calculated as follows:

$$\begin{aligned}
 N_{SS} &= 1, N_{ANT} = 2, G_{ANT0} = , G_{ANT1} = \\
 \text{Directional Gain} &= 10 \log \left[\frac{\sum_{j=1}^{N_{SS}} \left(\sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right] = 10 \log \left[\frac{\sum_{j=1}^1 \left(\sum_{k=1}^2 g_{j,k} \right)^2}{2} \right] \\
 &= 10 \log \left[\frac{(g_{1,1} + g_{1,2})^2}{2} \right] = 10 \log \left[\frac{(10^{\frac{G_1}{20}} + 10^{\frac{G_2}{20}})^2}{2} \right] = 10 \log \left[\frac{(10^{\frac{x}{20}} + 10^{\frac{y}{20}})^2}{2} \right] = z
 \end{aligned}$$

TEST FREQUENCIES (*):
UNII-1:

Technology Tested:	WLAN (IEEE 802.11 a,n,ac,ax) 2x2 / U-NII-1	
	802.11a OFDM 6 Mbit/s SISO	
	802.11 n HT20: MCS0 to MCS23 SISO & MIMO 2x2	
	802.11 n HT40: MCS0 to MCS23 SISO & MIMO 2x2	
	802.11 ac VHT20: MCS0 to MCS9 SISO & MIMO 2x2	
	802.11 ac VHT40: MCS0 to MCS9 SISO & MIMO 2x2	
	802.11 ac VHT80: MCS0 to MCS9 SISO & MIMO 2x2	
	802.11 ax HE20: MCS0 to MCS11 SISO & MIMO 2x2 – SU/RU	
	802.11 ax HE40: MCS0 to MCS11 SISO & MIMO 2x2– SU/RU	
	802.11 ax HE80: MCS0 to MCS11 SISO & MIMO 2x2– SU/RU	
Setting of cores / ports:	1+2	
Beamforming:	No.	
Frequency Range:	5150 MHz to 5250 MHz	
Channel Spacing:	20 MHz	
Transmit Channels	Channel	Channel Frequency (MHz)
	Low: 36	5180
	Middle: 40	5200
	High: 48	5240
Channel Spacing:	40 MHz	
Transmit Channels	Channel	Channel Frequency (MHz)
	Low: 38	5190
	High: 46	5230
Channel Spacing:	80 MHz	
Transmit Channels	Middle: 42	5210

UNII-3:

Technology Tested:	WLAN (IEEE 802.11 a,n,ac,ax) 2x2 / U-NII-3	
	802.11a OFDM 6 Mbit/s SISO	
	802.11 n HT20: MCS0 to MCS23 SISO & MIMO 2x2	
	802.11 n HT40: MCS0 to MCS23 SISO & MIMO 2x2	
	802.11 ac VHT20: MCS0 to MCS9 SISO & MIMO 2x2	
	802.11 ac VHT40: MCS0 to MCS9 SISO & MIMO 2x2	
	802.11 ac VHT80: MCS0 to MCS9 SISO & MIMO 2x2	
	802.11 ax HE20: MCS0 to MCS11 SISO & MIMO 2x2 – SU/RU	
	802.11 ax HE40: MCS0 to MCS11 SISO & MIMO 2x2– SU/RU	
	802.11 ax HE80: MCS0 to MCS11 SISO & MIMO 2x2– SU/RU	
Setting of cores / ports:	1+2	
Beamforming:	No.	
	5725 MHz to 5850 MHz	
Operating Channel Bandwidth:	20 MHz	
Transmission Channels:	Channel	Channel Frequency (MHz)
	Low (149)	5745
	Middle (157)	5785
	High (165)	5825
Operating Channel Bandwidth:	40 MHz	
Transmission Channels:	Channel	Channel Frequency (MHz)
	Low (151)	5755
	High (159)	5795
Operating Channel Bandwidth:	80 MHz	
Transmission Channels:	Single (155)	5775

The test set-up was made in accordance to the general provisions of FCC Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02 General U-NII Test Procedures New Rules v02r01 dated Dec 14, 2017.

The EUT was tested in the following operating mode:

- Continuously transmitting with a modulated carrier at maximum power in all required channels using the supported data rates/modulations types.

The field strength at the band edges was evaluated for each mode on the lowest and highest channels at the rated power for the channel under test.

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 document containing the setup instructions.

WORST CASE DETERMINATION

The RF output power has been measured to determine the highest power level between both ports. As a result, the **worst case is Port 1, for UNII-1, SISO mode and Port 2, for UNII-3, SISO mode.**

The worst cases for testing were identified for output power and spurious levels at the band edges which were selected based on preliminary testing that correspond to next data rates:

- 802.11a OFDM 6 Mbit/s
- 802.11 n HT20: MCS0
- 802.11 n HT40: MCS0
- 802.11 ac VHT20: MCS0
- 802.11 ac VHT40: MCS0
- 802.11 ac VHT80: MCS0
- 802.11 ax HE20: MCS0
- 802.11 ax HE40: MCS0
- 802.11 ax HE80: MCS0

CONDUCTED MEASUREMENTS:

The equipment under test was set up in a shielded room and it is connected to the TS8997 using a low loss RF cable. The reading of the spectrum analyser is corrected taking into account the cable loss.



RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Bilog antenna for the range between 30 MHz to 1000 MHz and 1 GHz-17 GHz Double ridge horn antenna) is situated at a distance of 3 m and at a distance of 1.5 m for the frequency range 17 GHz-26 GHz (17 GHz-40 GHz horn antenna).

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

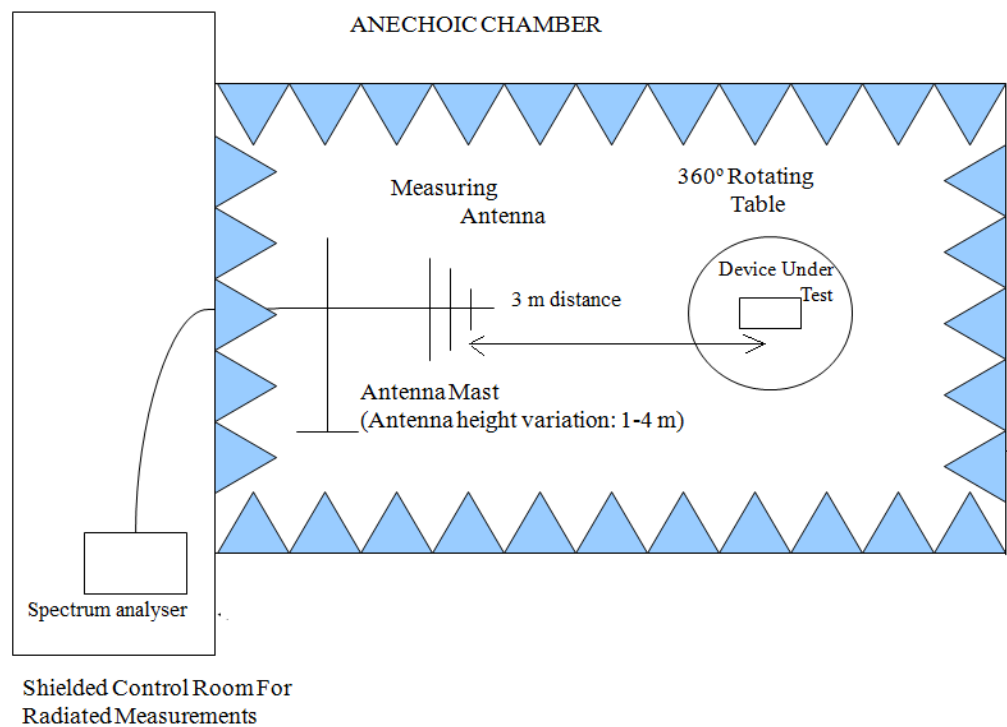
The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height (Bilog antenna and Double ridge horn antenna) was varied from 1 to 4 meters to find the maximum radiated emission.

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

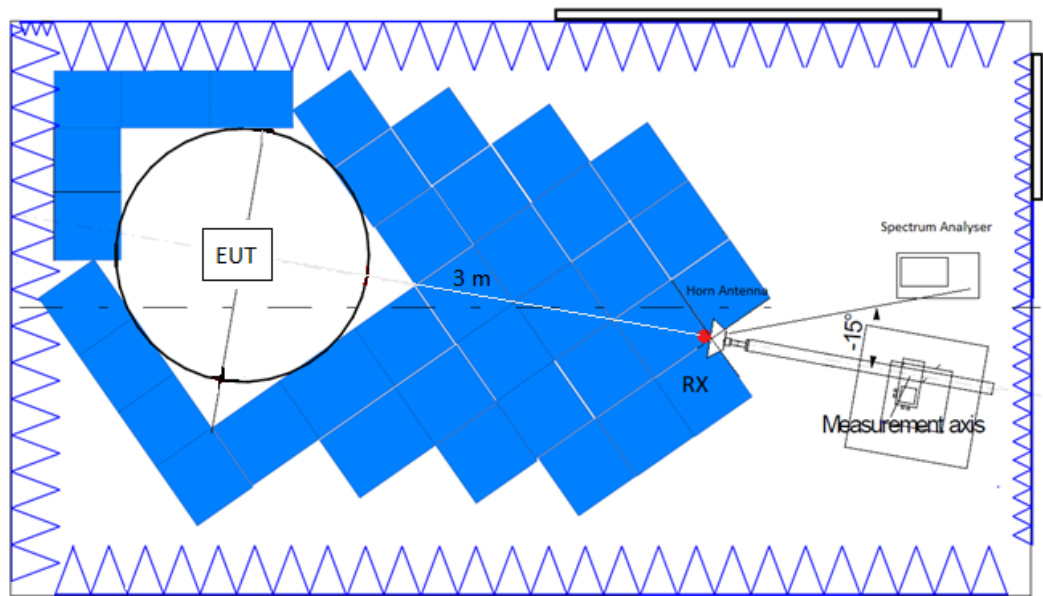
The final measured value, for the given emission, in the tables below incorporates the calibrated antenna factor and cable loss.

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

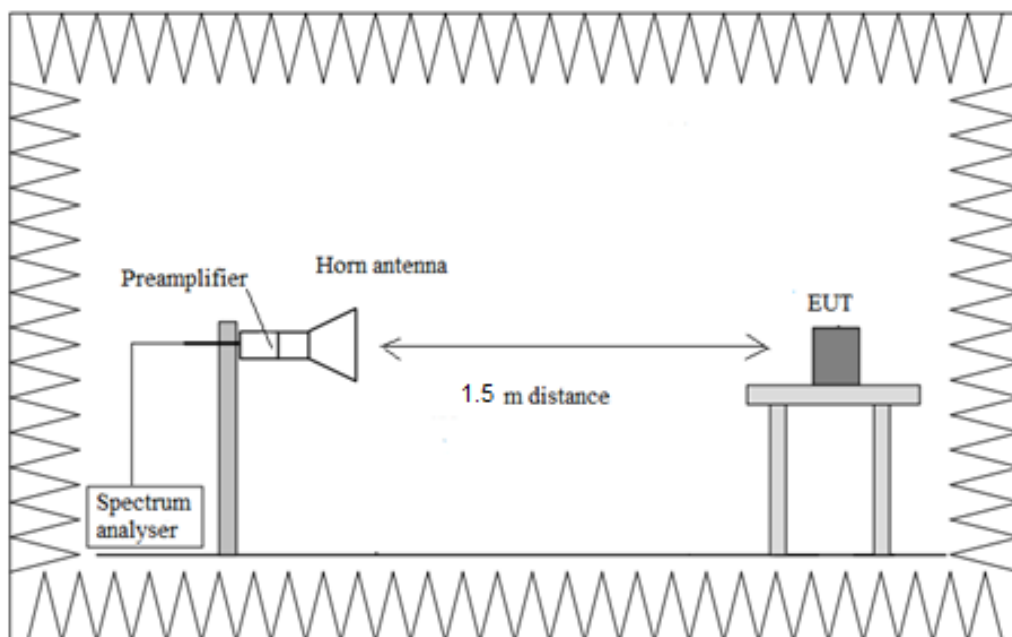
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup $f > 17$ GHz:



SAMPLE CALCULATION

For radiated measurements:

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

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

Where,

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

Preamp (dB): Path loses due to preamplifier

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

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

Cable loss (dB): Cable loss

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

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

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

TEST CASES DETAILS

Transmitter. Duty Cycle

Limits

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

Modulation: 802.11a (OFDM 6 Mbit/s)

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5180.00000	65.00
		5200.00000	65.00
		5240.00000	65.01
[5725, 5850]	2	5745.00000	64.97
		5785.00000	64.99
		5825.00000	64.98

Modulation: 802.11n HT20 (OFDM MCS0)

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5180.00000	63.42
		5200.00000	63.42
		5240.00000	63.42
[5725, 5850]	2	5745.00000	63.40
		5785.00000	63.42
		5825.00000	63.41
[5150, 5250]	1+2	5180.00000	52.94
		5200.00000	52.93
		5240.00000	52.94
[5725, 5850]		5745.00000	52.91
		5785.00000	52.92
		5825.00000	52.91

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

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5190.00000	50.96
		5230.00000	50.94
[5725, 5850]	2	5755.00000	50.91
		5795.00000	50.93
[5150, 5250]	1+2	5190.00000	42.94
		5230.00000	42.96
[5725, 5850]		5755.00000	43.00
		5795.00000	43.02

Modulation: 802.11ac VHT20 (OFDM MCS0)

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5180.00000	61.09
		5200.00000	61.08
		5240.00000	61.09
[5725, 5850]	2	5745.00000	61.06
		5785.00000	61.06
		5825.00000	61.05
[5150, 5250]	1+2	5180.00000	51.02
		5200.00000	51.02
		5240.00000	51.02
[5725, 5850]		5745.00000	51.00
		5785.00000	51.02
		5825.00000	51.01

Modulation: 802.11ac VHT40 (OFDM MCS0)

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5190.00000	47.84
		5230.00000	47.84
[5725, 5850]	2	5755.00000	47.79
		5795.00000	47.79
[5150, 5250]	1+2	5190.00000	41.59
		5230.00000	41.61
[5725, 5850]		5755.00000	41.66
		5795.00000	41.67

Modulation: 802.11ac VHT80 (OFDM MCS0)

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5210.00000	40.14
[5725, 5850]	2	5775.00000	40.16
[5150, 5250]	1+2	5210.00000	37.11
[5725, 5850]		5775.00000	37.16

Modulation: 802.11ax HE20 (OFDMA MCS0) SU

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5180.00000	98.05
		5200.00000	98.04
		5240.00000	98.06
[5725, 5850]	2	5745.00000	89.52
		5785.00000	89.54
		5825.00000	89.53
[5150, 5250]	1+2	5180.00000	89.63
		5200.00000	89.61
		5240.00000	89.60
[5725, 5850]		5745.00000	89.61
		5785.00000	89.63
		5825.00000	89.58

Modulation: 802.11ax HE20 (OFDMA MCS0) RU

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5180.00000	98.05
		5200.00000	98.04
		5240.00000	98.06
[5725, 5850]	2	5745.00000	98.05
		5785.00000	98.04
		5825.00000	98.05
[5150, 5250]	1+2	5180.00000	98.08
		5200.00000	98.08
		5240.00000	98.08
[5725, 5850]		5745.00000	98.08
		5785.00000	98.08
		5825.00000	98.07

Modulation: 802.11ax HE40 (OFDMA MCS0)

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5190.00000	85.90
		5230.00000	85.92
[5725, 5850]	2	5755.00000	85.86
		5795.00000	85.83
[5150, 5250]	1+2	5190.00000	85.86
		5230.00000	85.88
[5725, 5850]		5755.00000	85.93
		5795.00000	85.95

Modulation: 802.11ax HE40 (OFDMA MCS0)

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5190.00000	98.04
		5230.00000	98.04
[5725, 5850]	2	5755.00000	98.03
		5795.00000	98.03
[5150, 5250]	1+2	5190.00000	98.05
		5230.00000	98.05
[5725, 5850]		5755.00000	98.06
		5795.00000	98.06

Modulation: 802.11ax HE80 (OFDMA MCS0) SU

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5210.00000	83.22
[5725, 5850]	2	5775.00000	83.23
[5150, 5250]	1+2	5210.00000	83.31
[5725, 5850]		5775.00000	83.38

Modulation: 802.11ax HE80 (OFDMA MCS0) SU

Results

Operation Band (MHz)	Port	Freq (MHz)	DC (%)
[5150, 5250]	1	5210.00000	98.02
[5725, 5850]	2	5775.00000	98.01
[5150, 5250]	1+2	5210.00000	98.04
[5725, 5850]		5775.00000	98.03

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

Transmitter. 99% Occupied Bandwidth

Limits

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

The following conditions shall be observed for measuring the occupied bandwidth:

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

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: 802.11a (OFDM 6 Mbit/s)

Results

Operation Band (MHz)	Port	Freq (MHz)	Occ Ch BW (MHz)
[5150, 5250]	1	5180.00000	16.600
		5200.00000	16.600
		5240.00000	16.600
[5725, 5850]	2	5745.00000	16.700
		5785.00000	16.700
		5825.00000	16.600

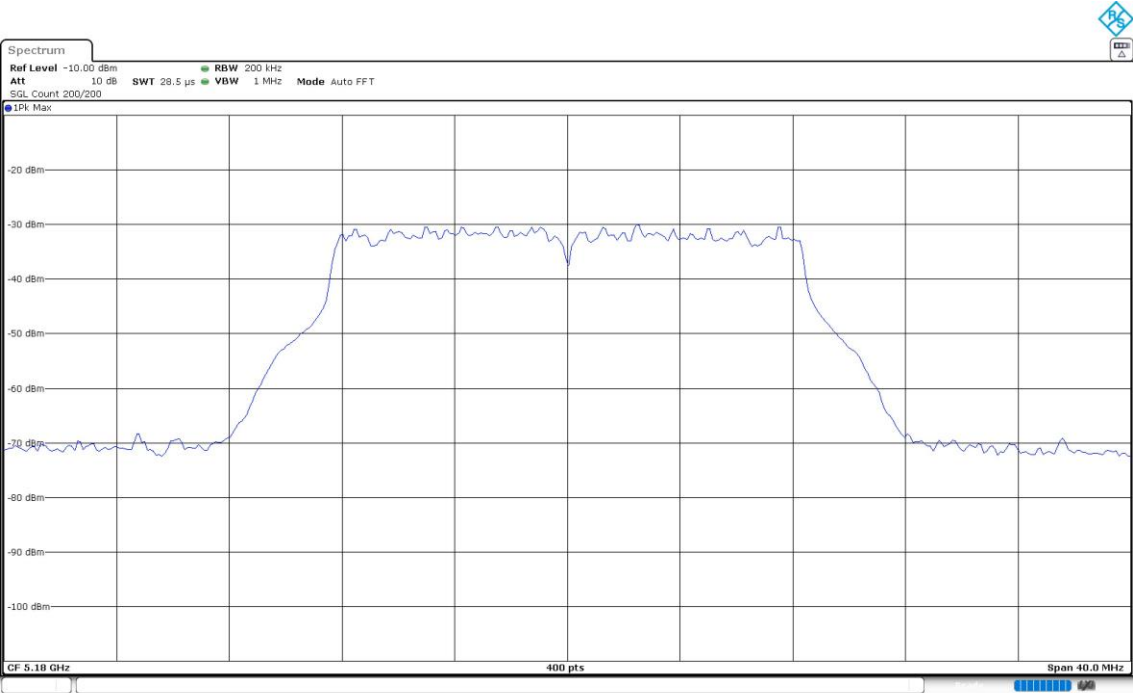
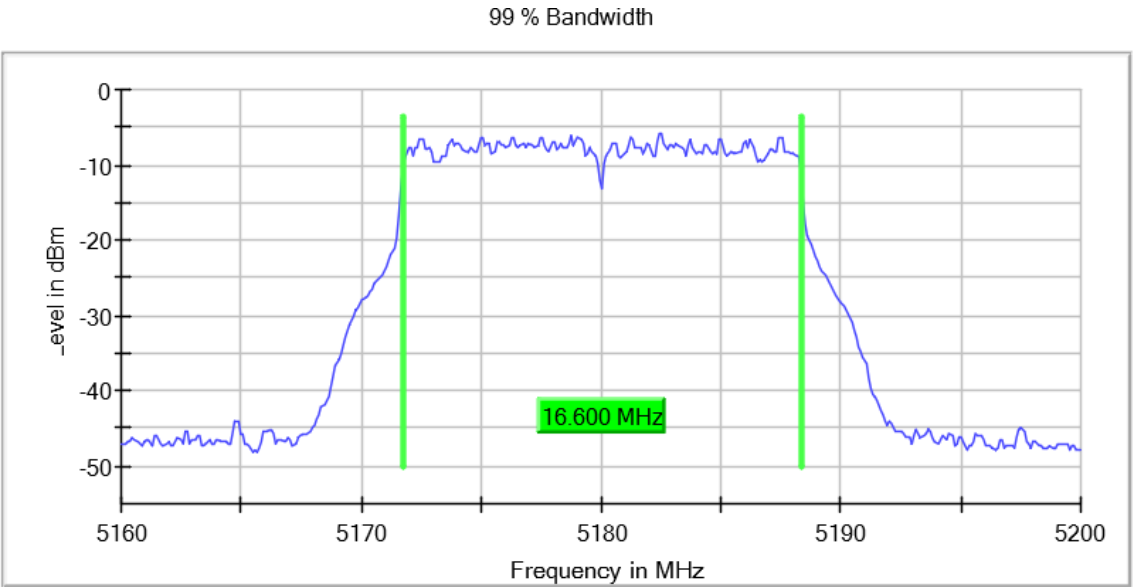
Verdict

Pass

Attachments

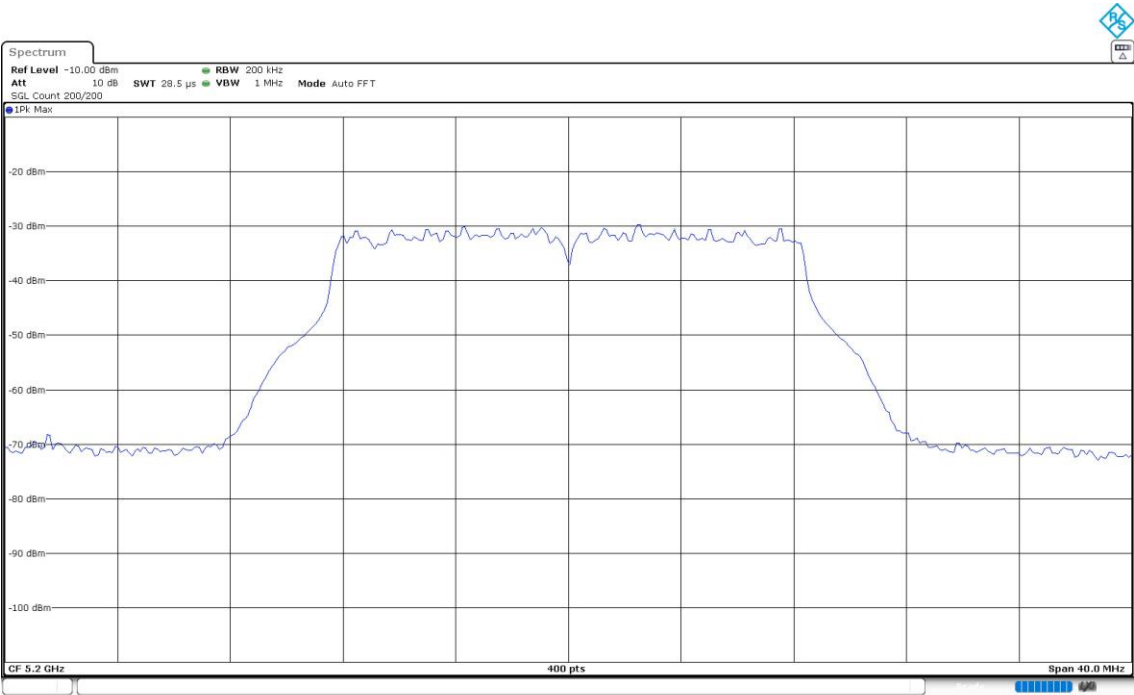
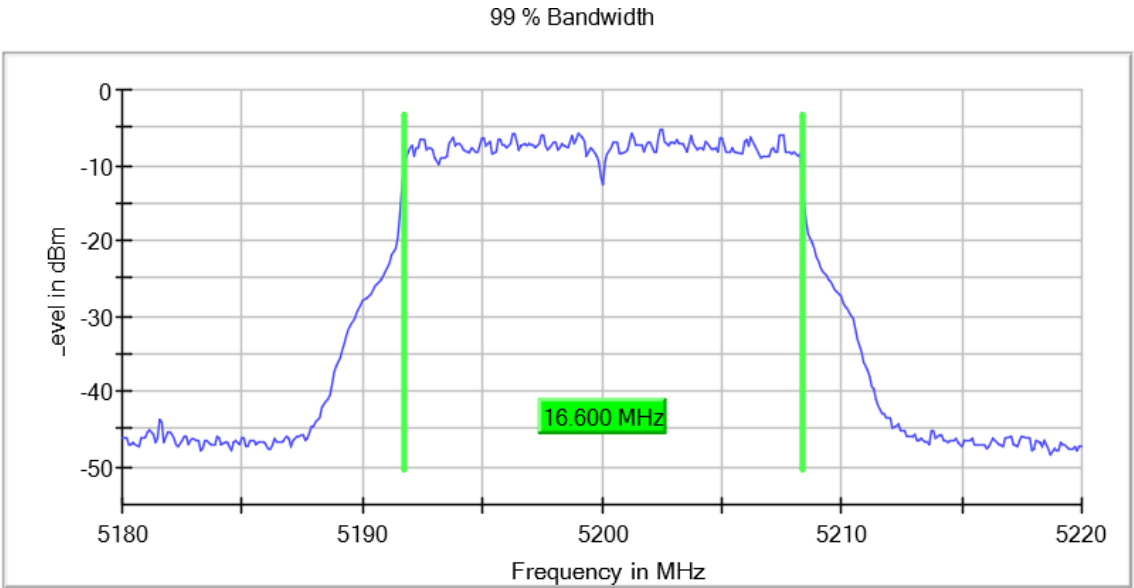
Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5180.00000 Modulation = 802.11a (OFDM 6 Mbit/s)

Images:



Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5200.00000 Modulation = 802.11a (OFDM 6 Mbit/s)

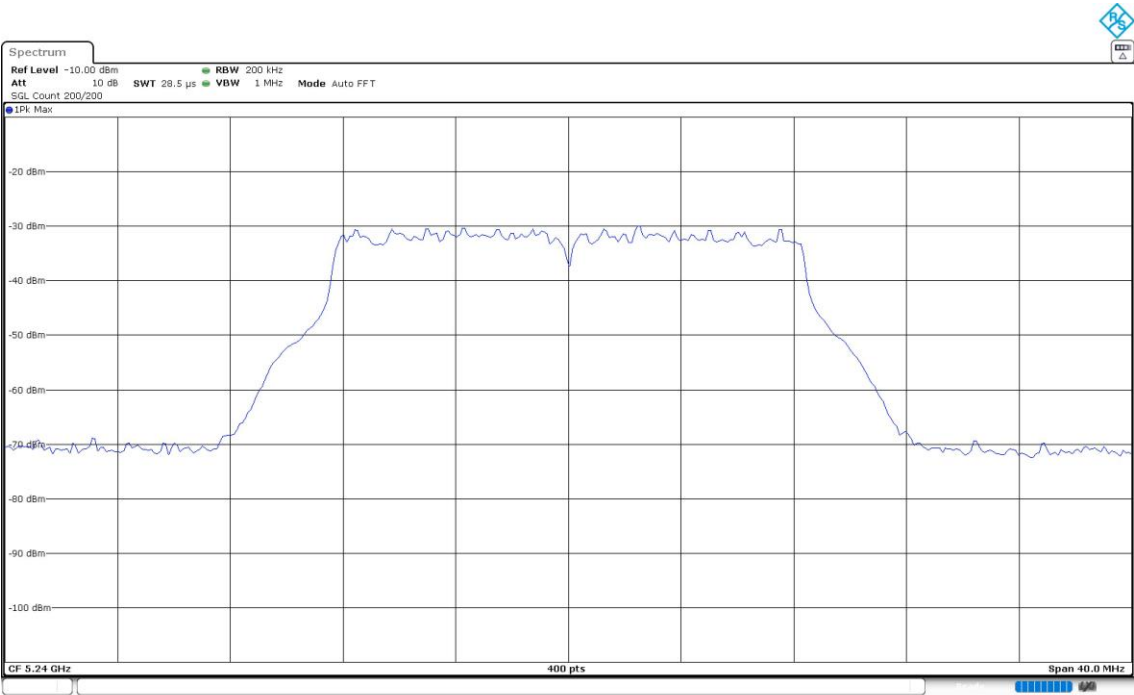
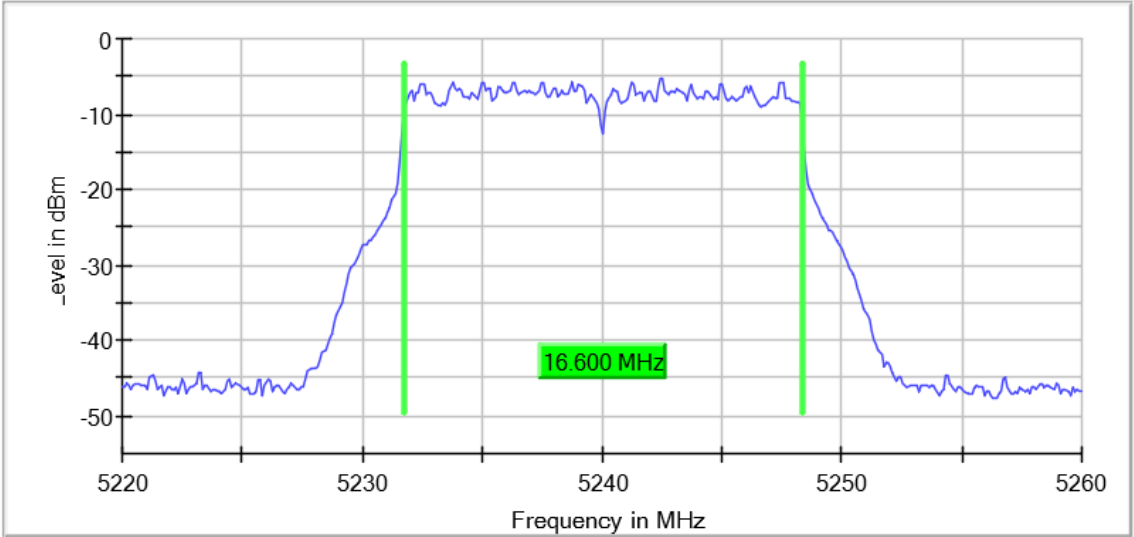
Images:



Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5240.00000 Modulation = 802.11a (OFDM 6 Mbit/s)

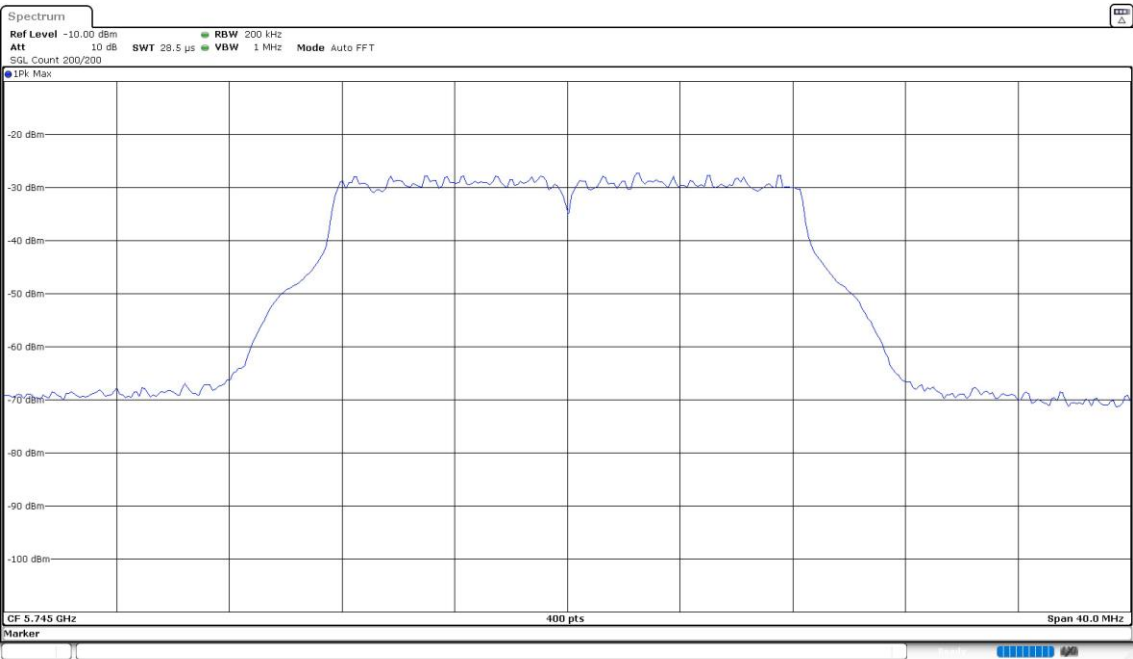
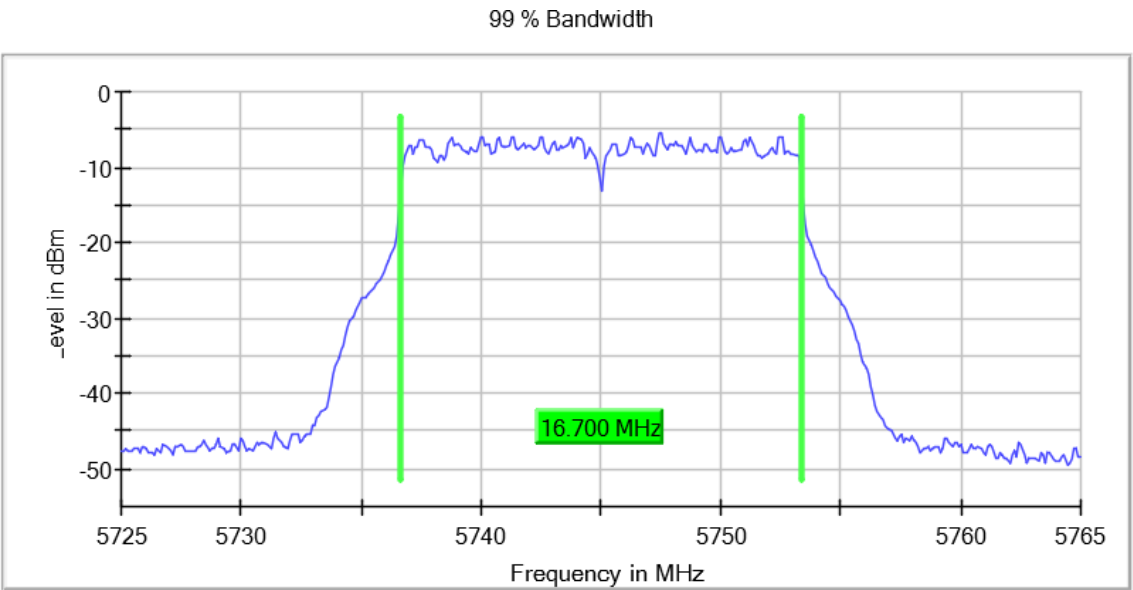
Images:

99 % Bandwidth



Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5745.00000 Modulation = 802.11a (OFDM 6 Mbit/s)

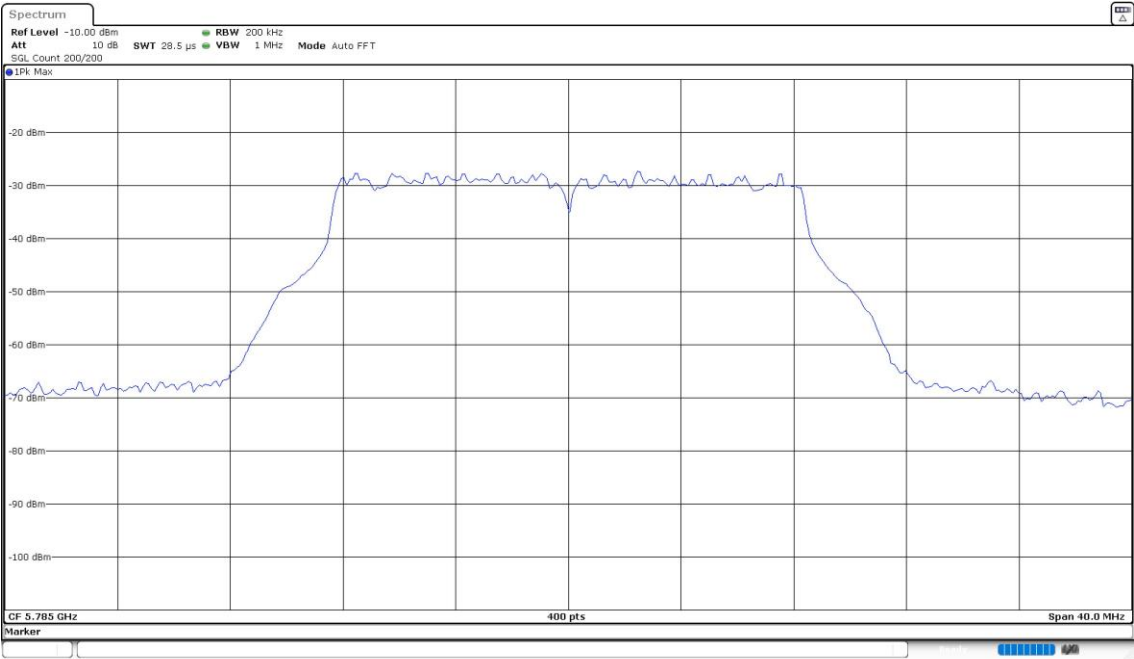
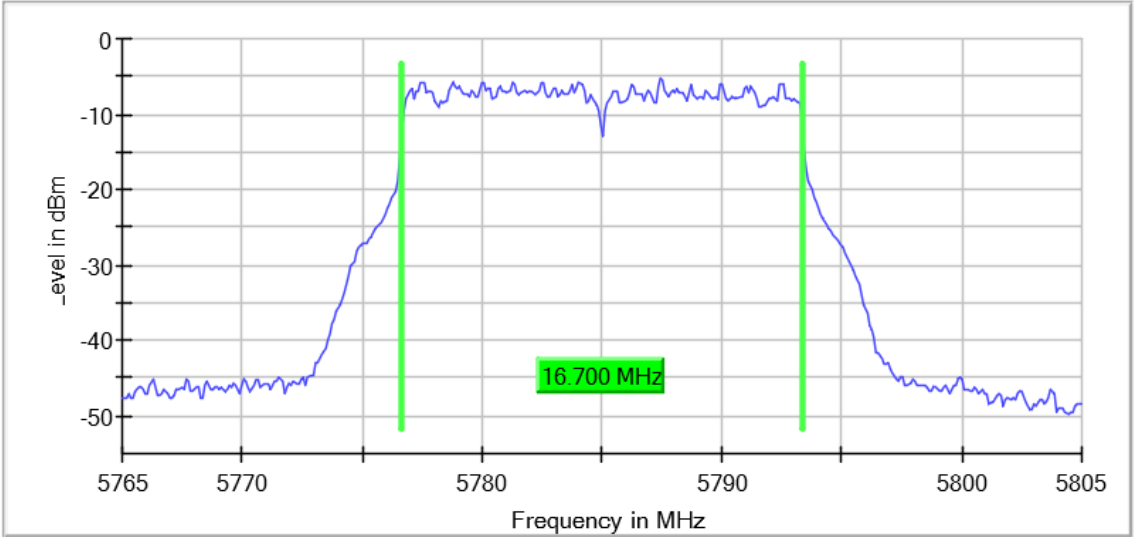
Images:



Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5785.00000 Modulation = 802.11a (OFDM 6 Mbit/s)

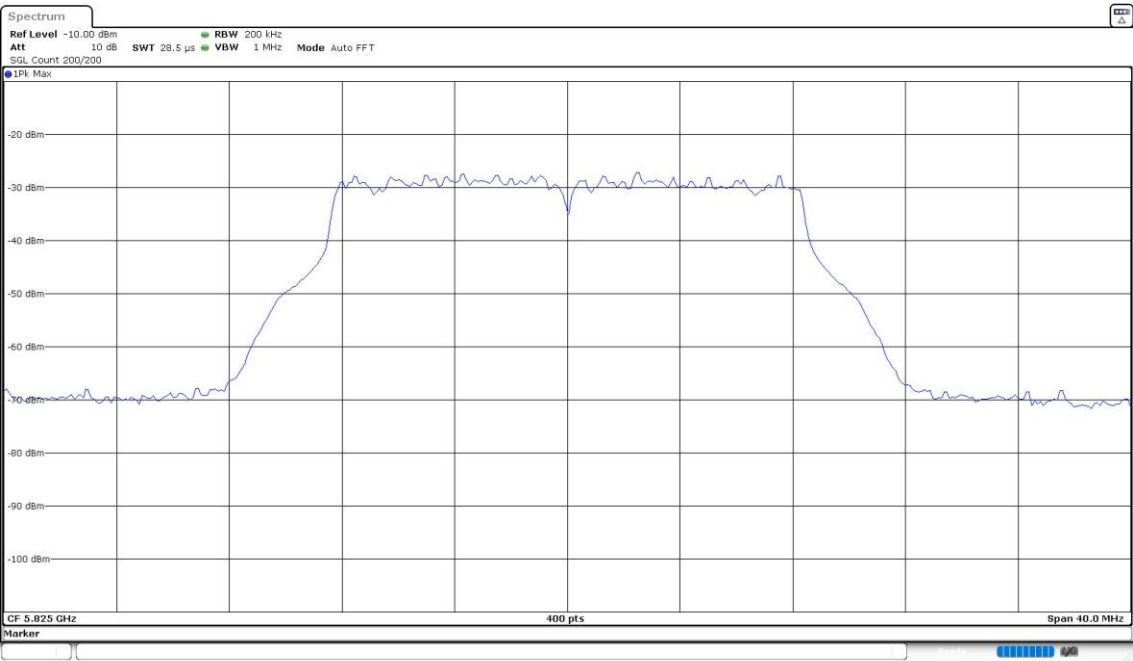
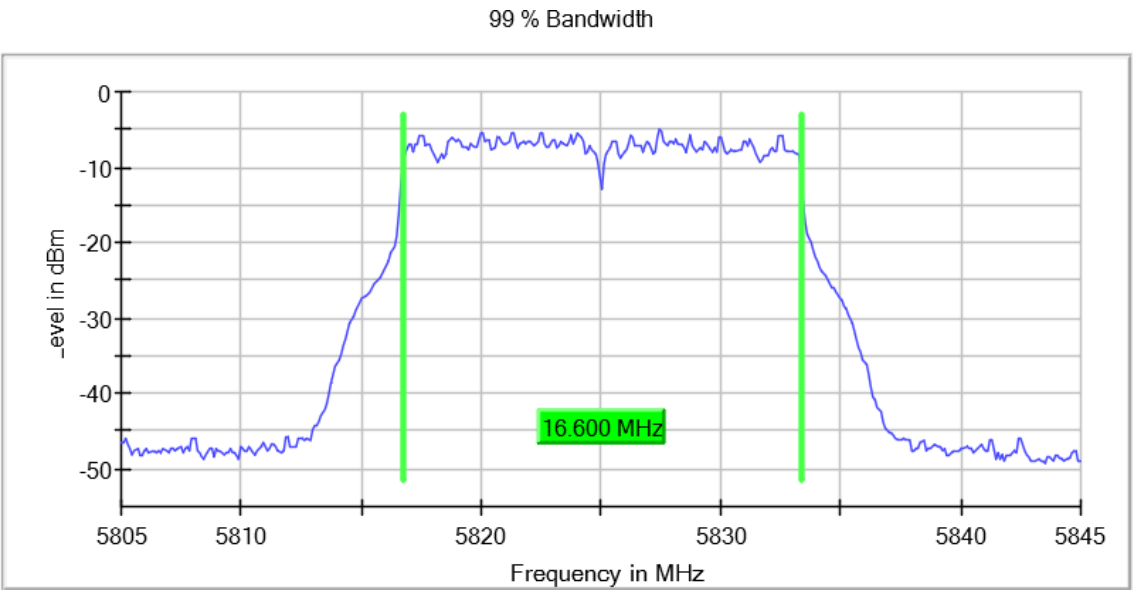
Images:

99 % Bandwidth



Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5825.00000 Modulation = 802.11a (OFDM 6 Mbit/s)

Images:



Modulation: 802.11n HT20 (OFDM MCS0)

Results

Operation Band (MHz)	Port	Freq (MHz)	Occ Ch BW (MHz)
[5150, 5250]	1	5180.00000	17.900
		5200.00000	17.900
		5240.00000	17.900
[5725, 5850]	2	5745.00000	17.900
		5785.00000	17.900
		5825.00000	17.900
[5150, 5250]	1+2	5180.00000	17.900
		5200.00000	17.900
		5240.00000	17.900
[5725, 5850]		5745.00000	17.900
		5785.00000	17.900
		5825.00000	17.900

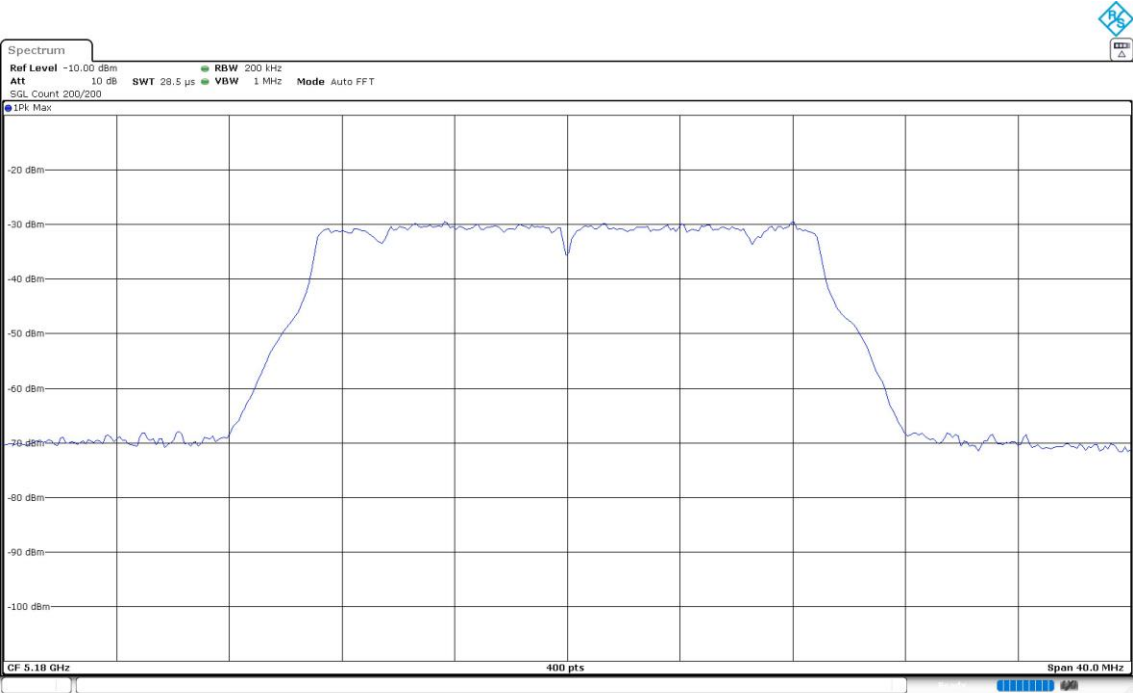
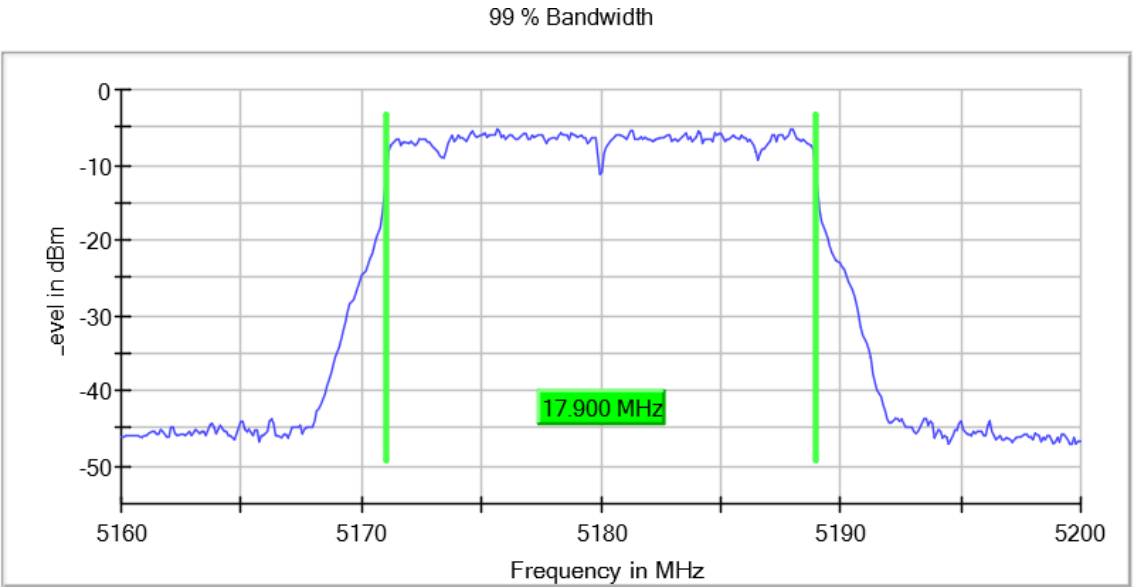
Verdict

Pass

Attachments

Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5180.00000 Modulation = 802.11n HT20 (OFDM MCS0)

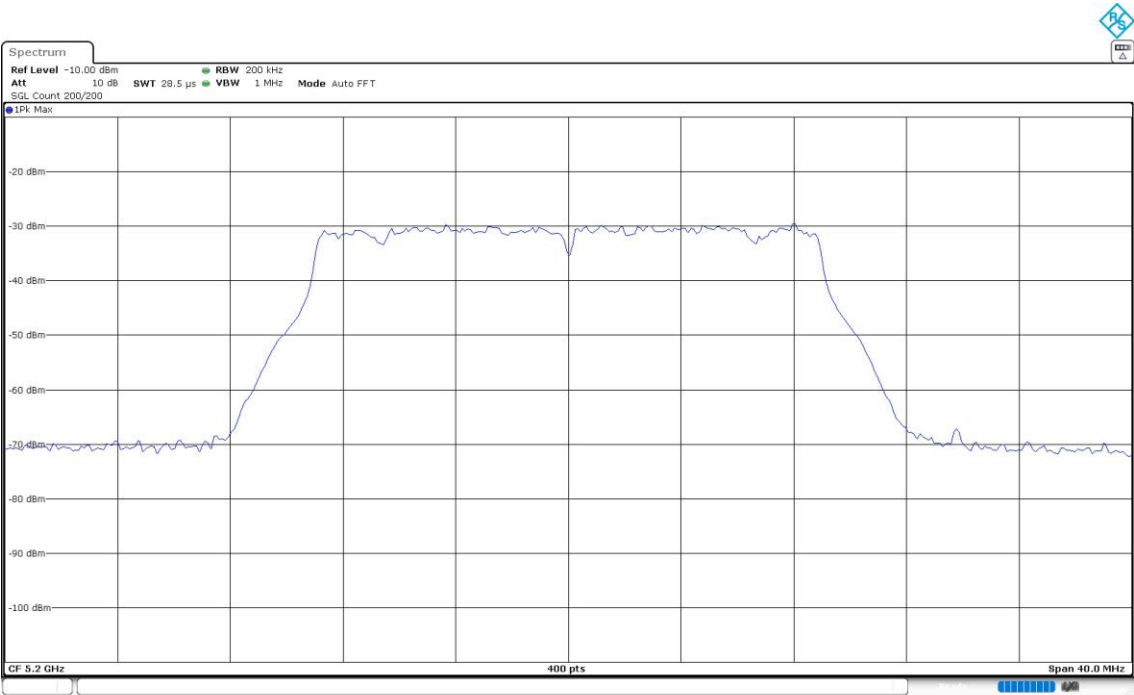
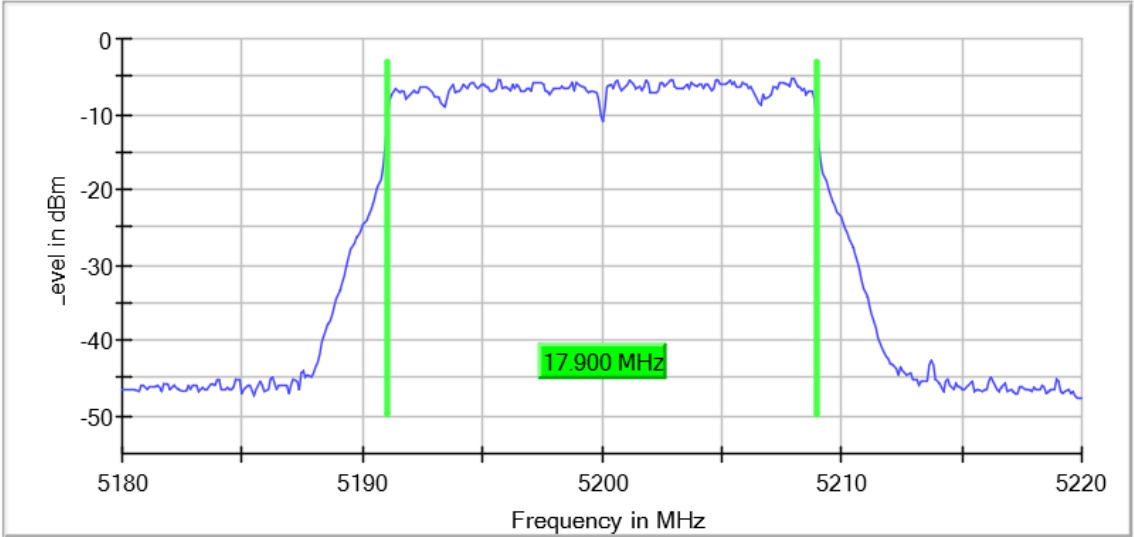
Images:



Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5200.00000 Modulation = 802.11n HT20 (OFDM MCS0)

Images:

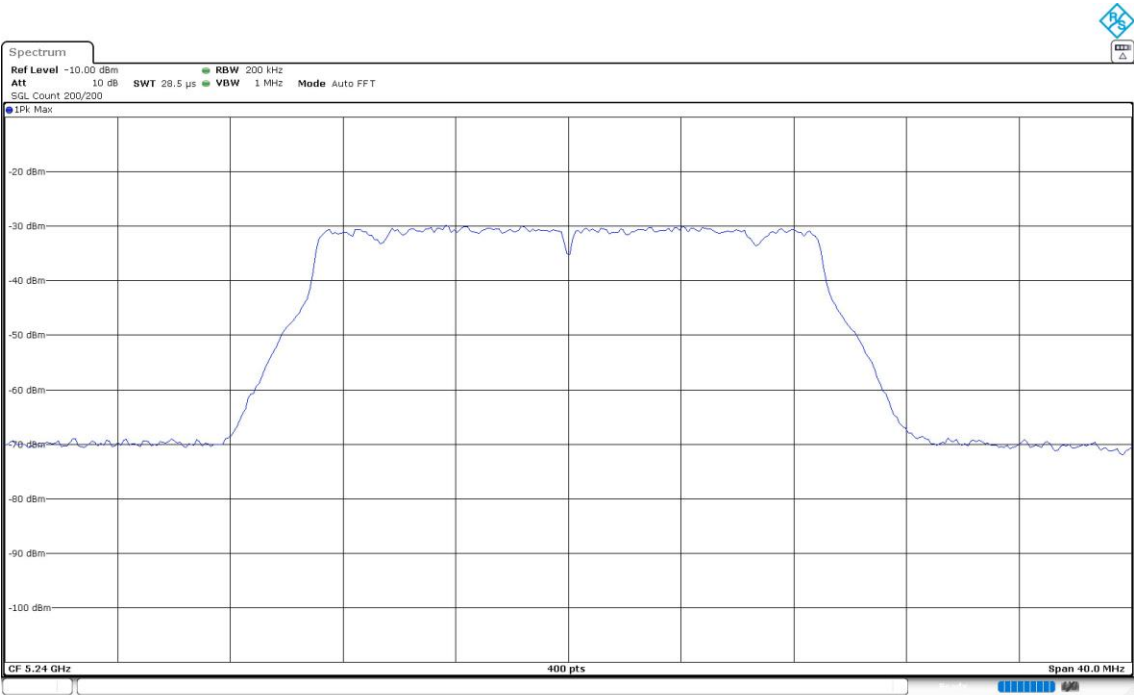
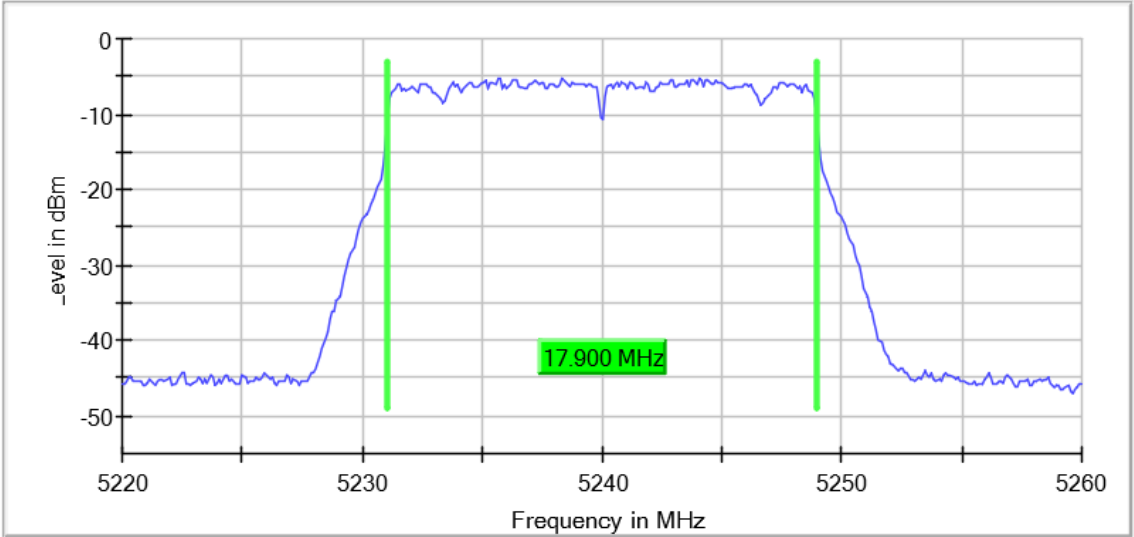
99 % Bandwidth



Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5240.00000 Modulation = 802.11n HT20 (OFDM MCS0)

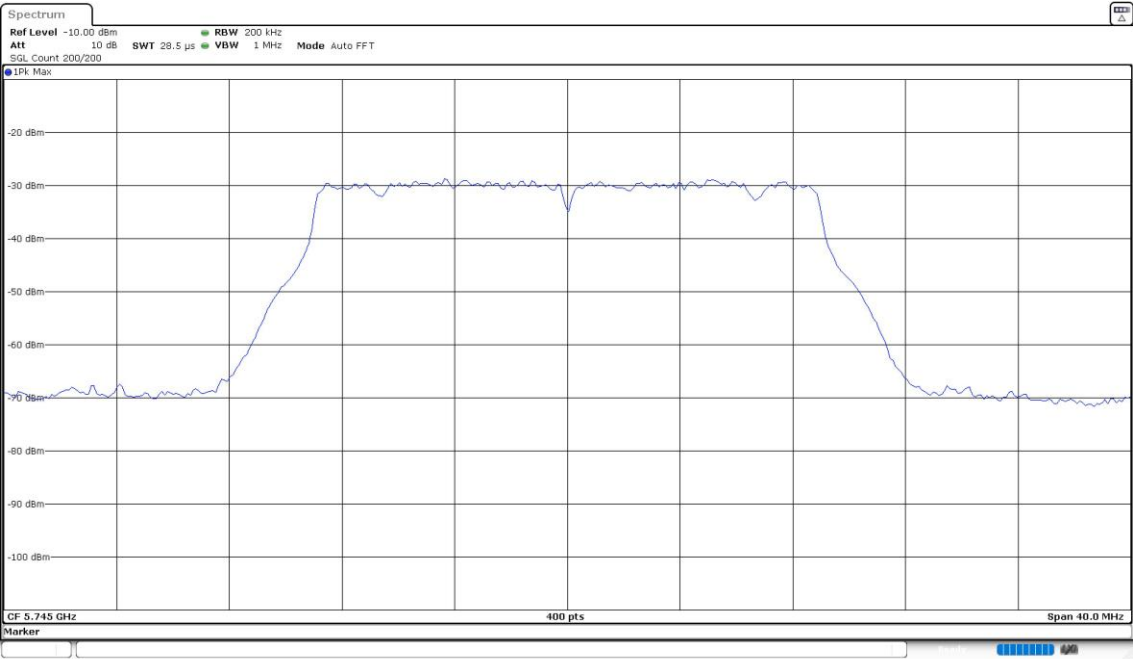
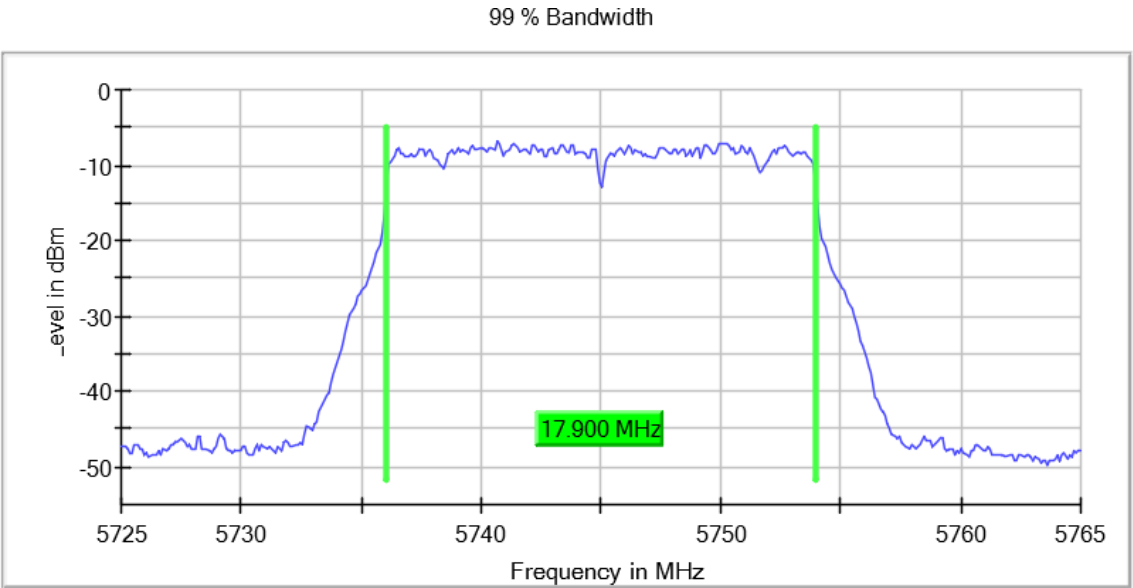
Images:

99 % Bandwidth



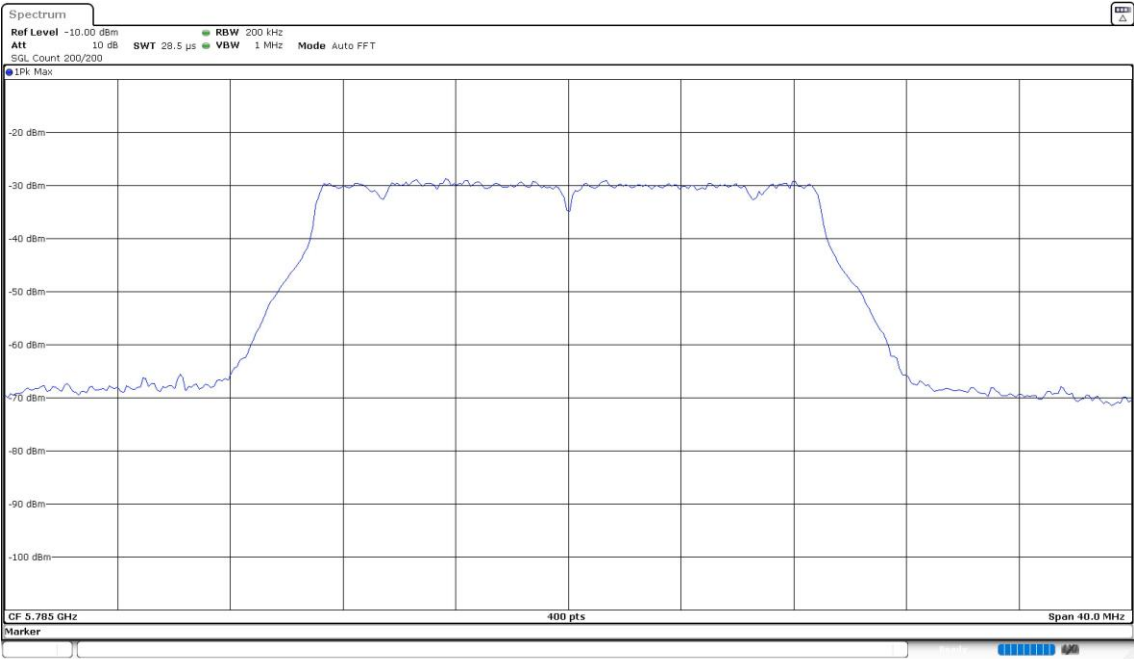
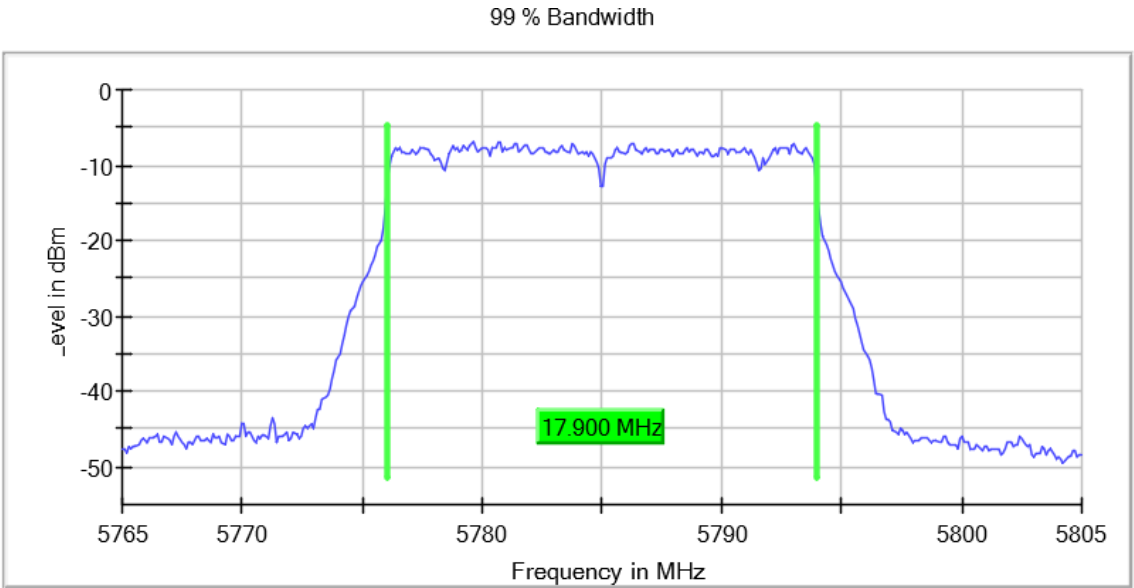
Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5745.00000 Modulation = 802.11n HT20 (OFDM MCS0)

Images:



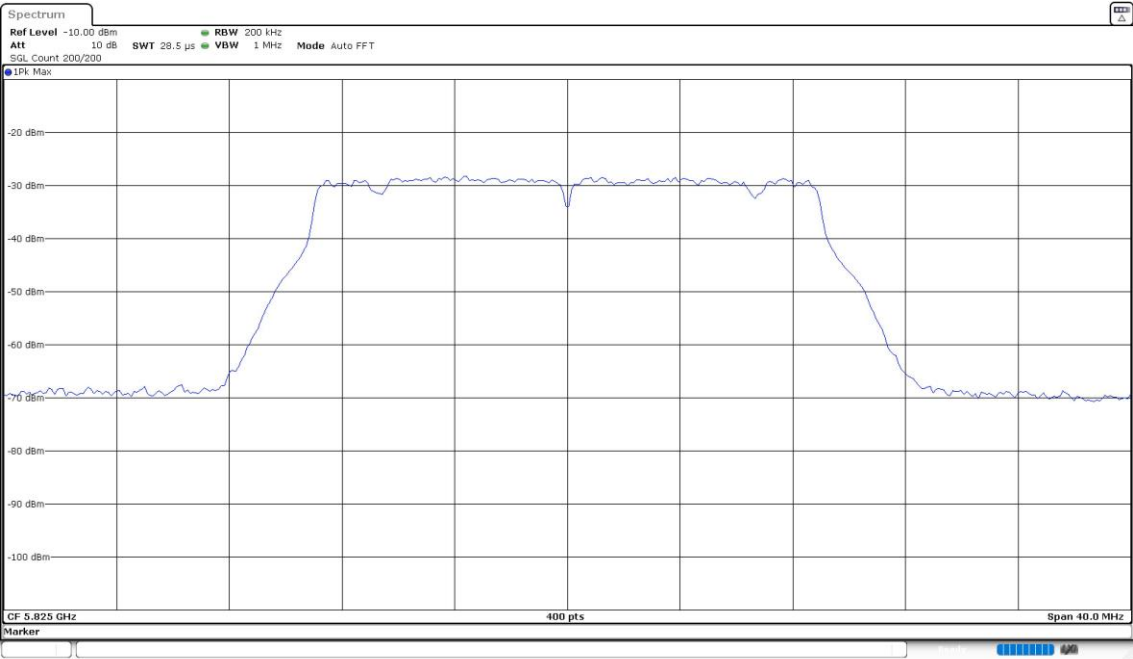
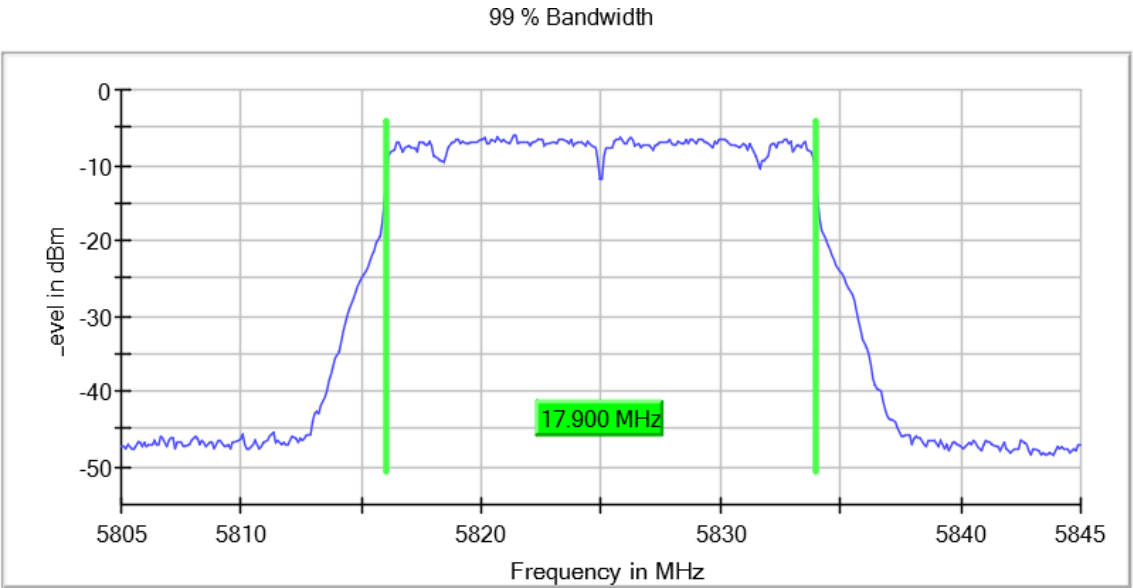
Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5785.00000 Modulation = 802.11n HT20 (OFDM MCS0)

Images:



Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5825.00000 Modulation = 802.11n HT20 (OFDM MCS0)

Images:



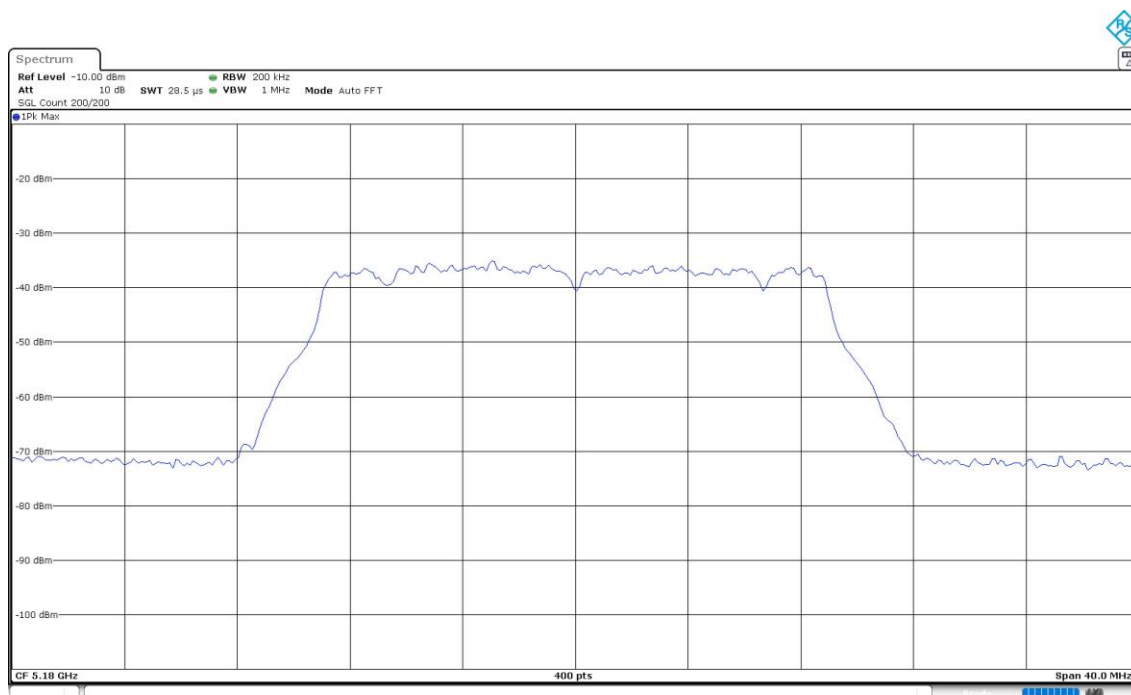
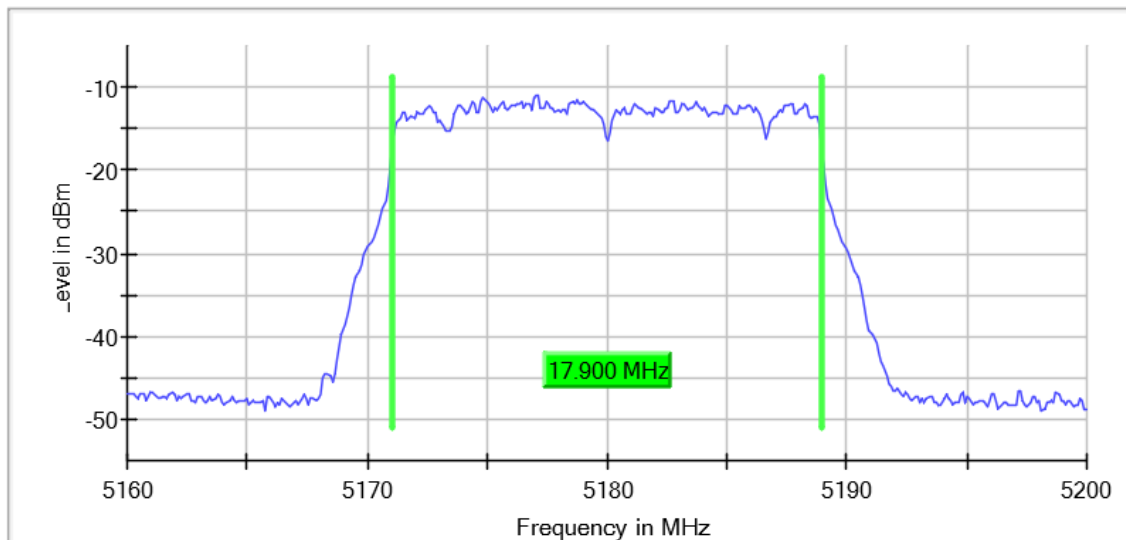
Operation Band MHz = [5150, 5250] Active Port = 1+2

Frequency MHz = 5180.00000

Modulation = 802.11n HT20 (OFDM MCS0)

Images:

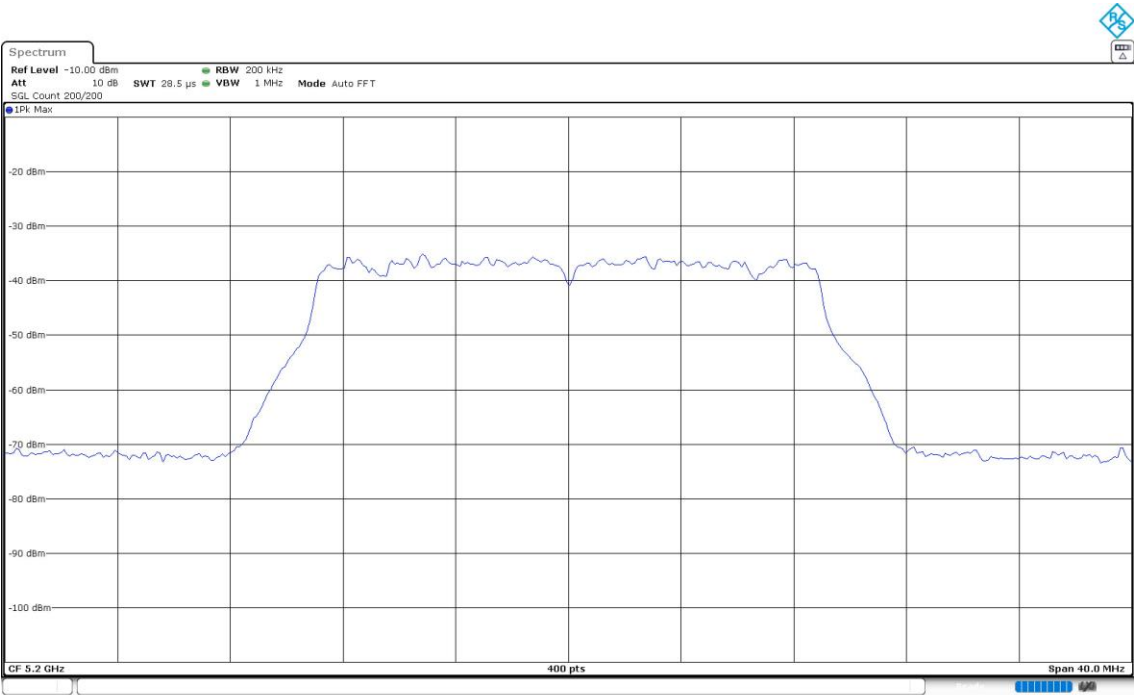
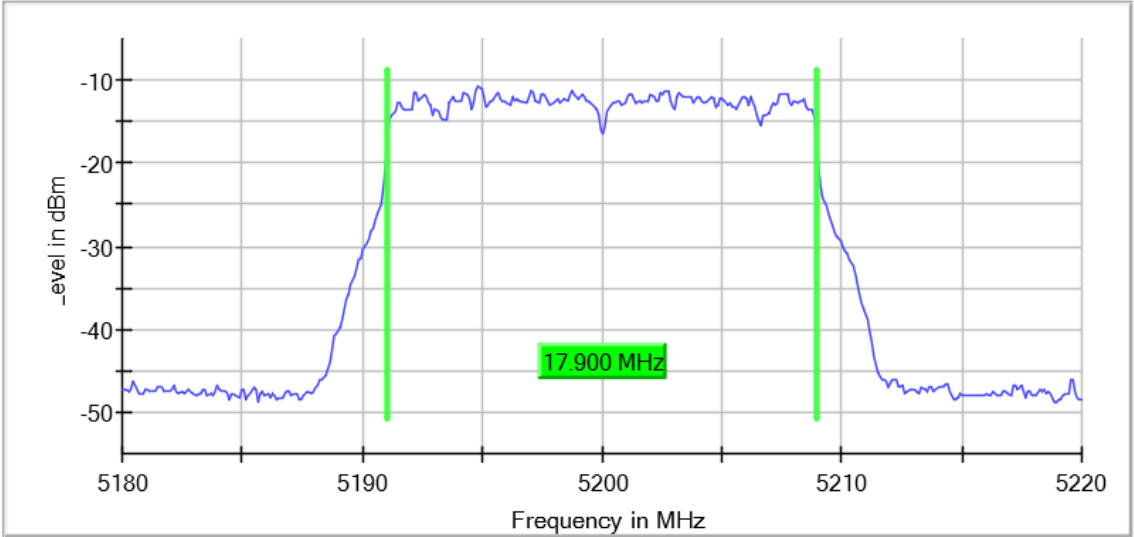
99 % Bandwidth



Operation Band MHz = [5150, 5250] Active Port = 1+2
Frequency MHz = 5200.00000 Modulation = 802.11n HT20 (OFDM MCS0)

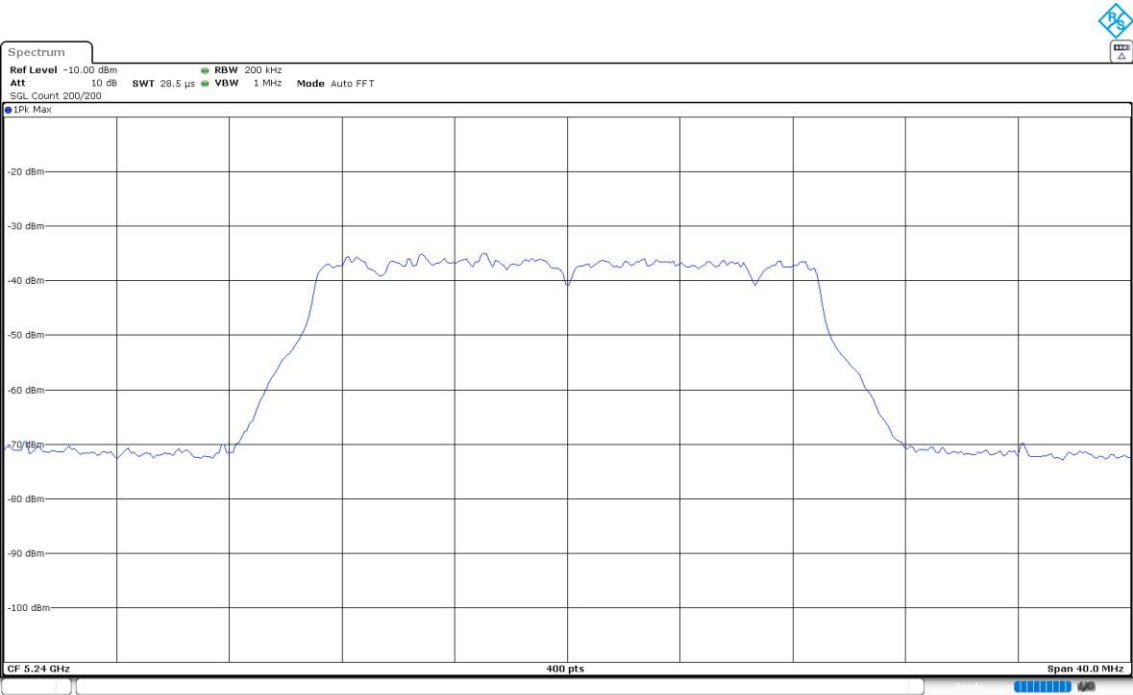
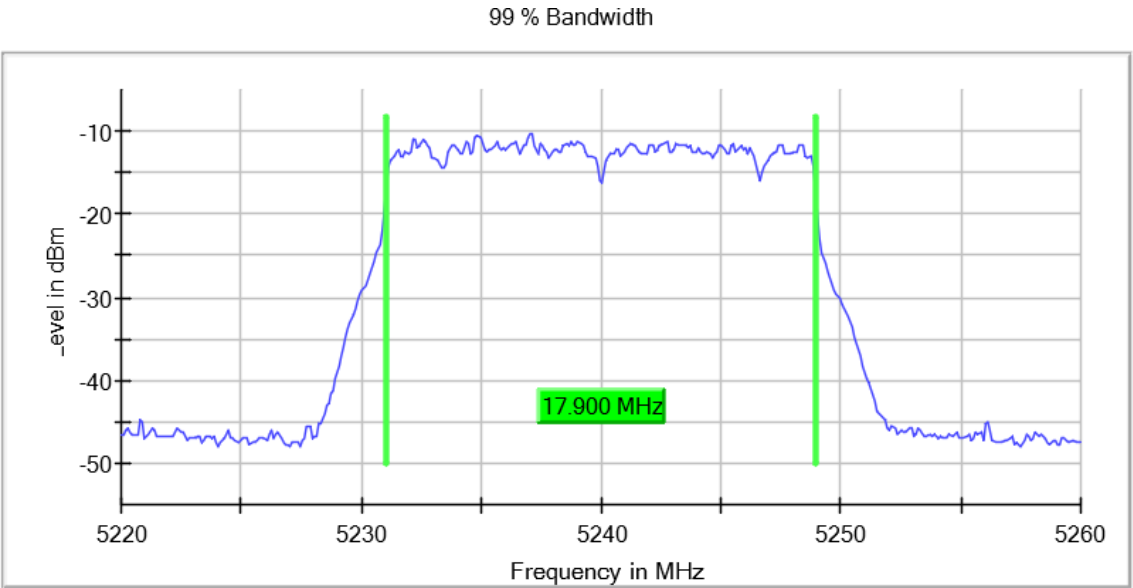
Images:

99 % Bandwidth



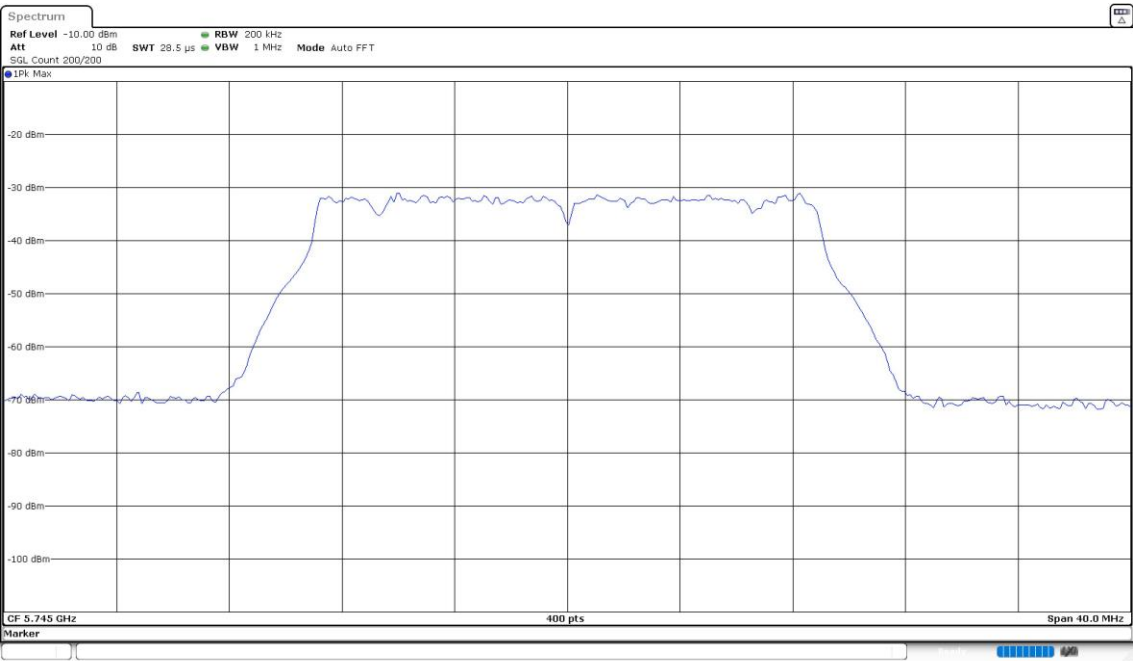
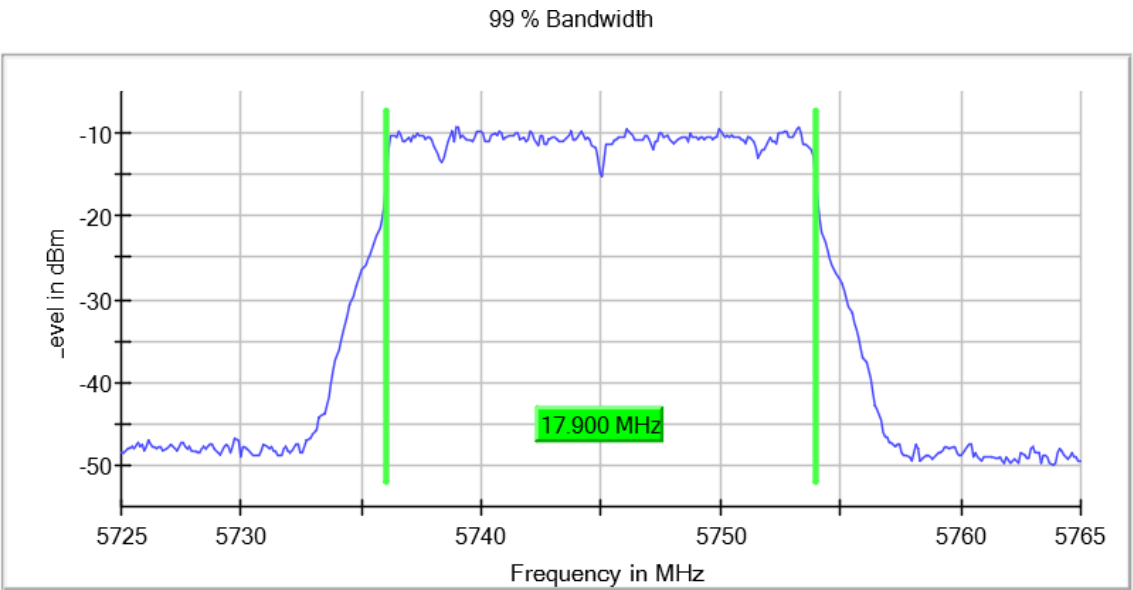
Operation Band MHz = [5150, 5250] Active Port = 1+2
Frequency MHz = 5240.00000 Modulation = 802.11n HT20 (OFDM MCS0)

Images:



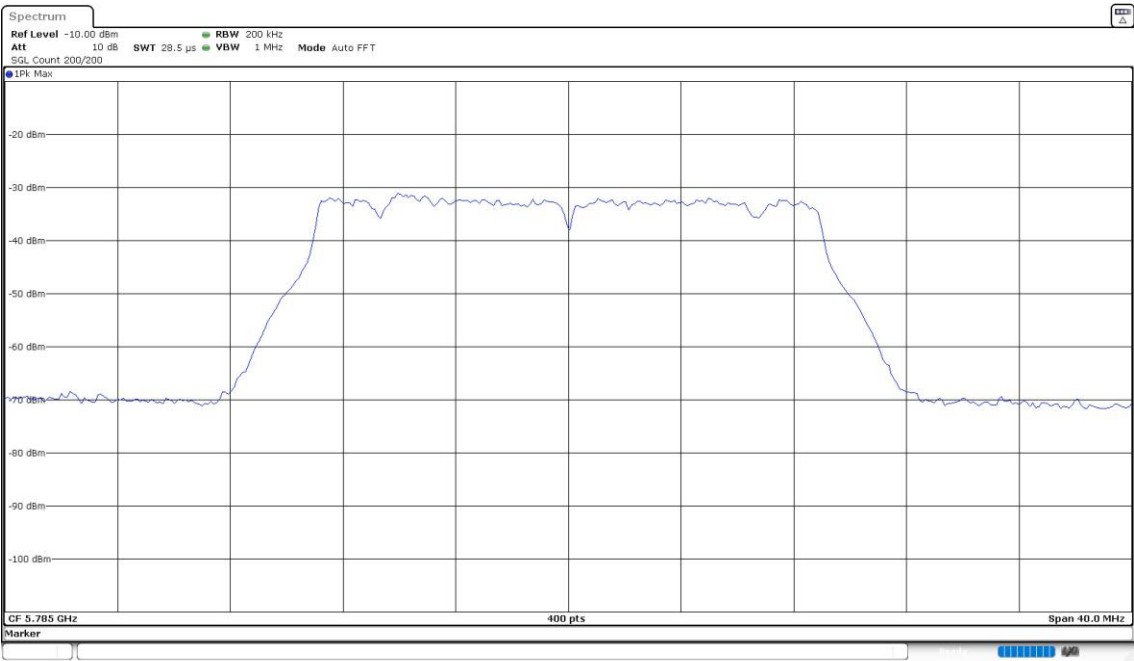
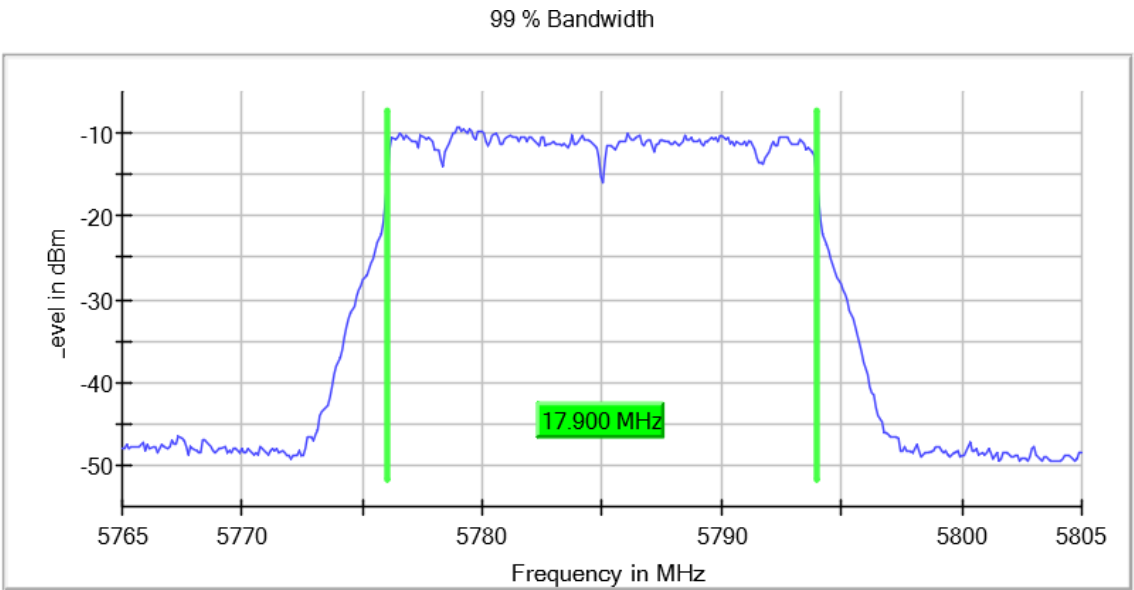
Operation Band MHz = [5725, 5850] Active Port = 1+2
Frequency MHz = 5745.00000 Modulation = 802.11n HT20 (OFDM MCS0)

Images:



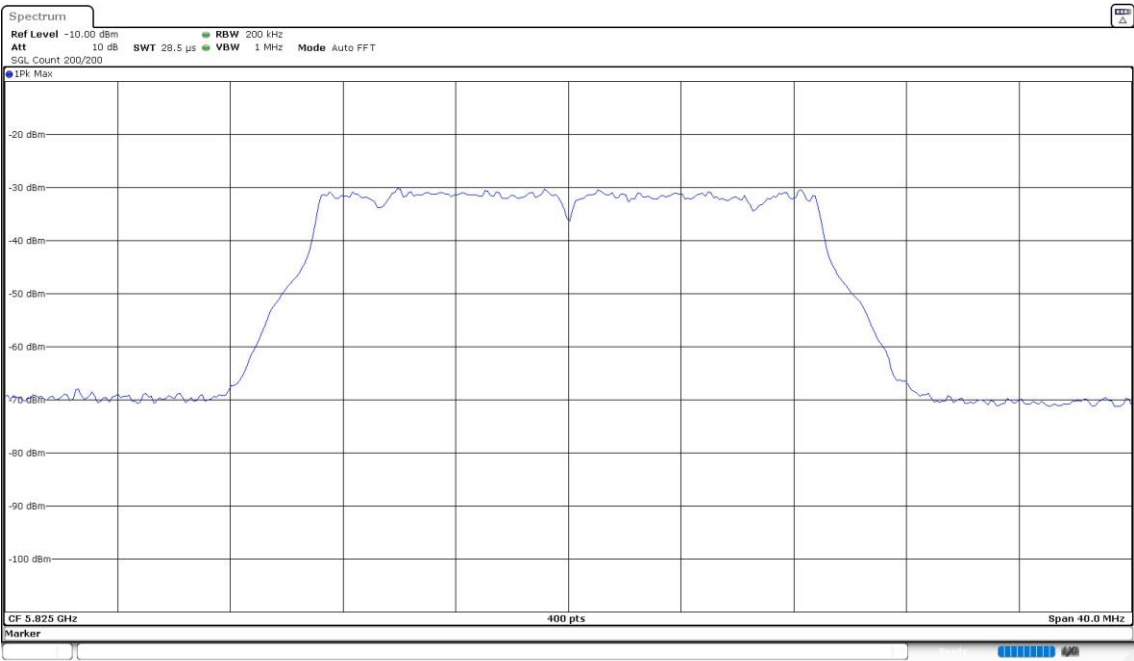
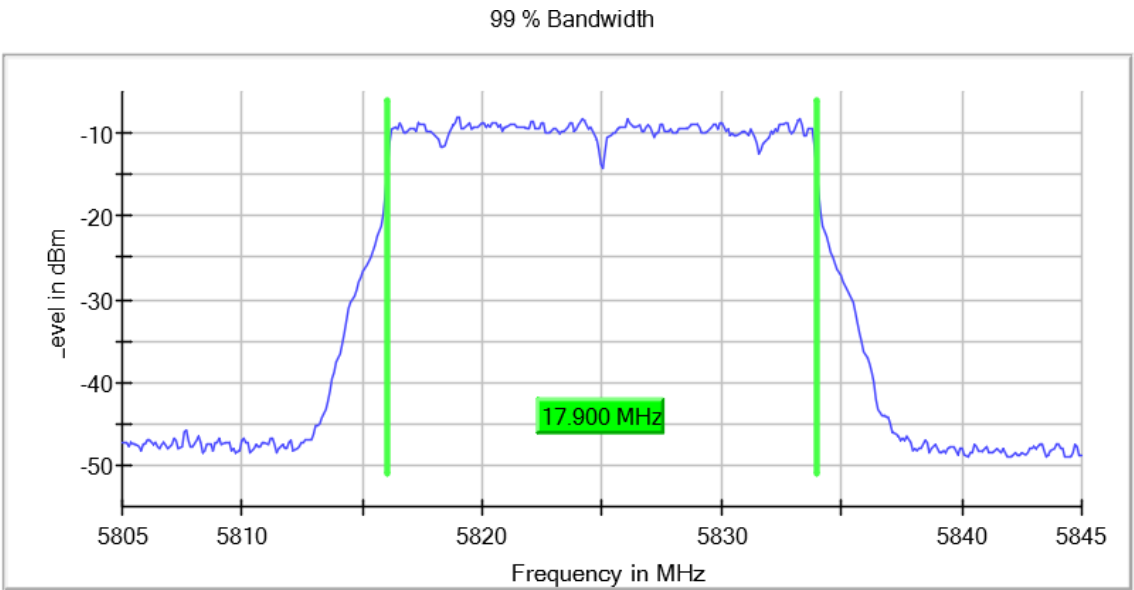
Operation Band MHz = [5725, 5850] Active Port = 1+2
Frequency MHz = 5785.00000 Modulation = 802.11n HT20 (OFDM MCS0)

Images:



Operation Band MHz = [5725, 5850] Active Port = 1+2
Frequency MHz = 5825.00000 Modulation = 802.11n HT20 (OFDM MCS0)

Images:



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

Results

Operation Band (MHz)	Port	Freq (MHz)	Occ Ch BW (MHz)
[5150, 5250]	1	5190.00000	36.500
		5230.00000	36.250
[5725, 5850]	2	5755.00000	36.500
		5795.00000	36.500
[5150, 5250]	1+2	5190.00000	36.750
		5230.00000	36.500
[5725, 5850]		5755.00000	36.250
		5795.00000	36.750

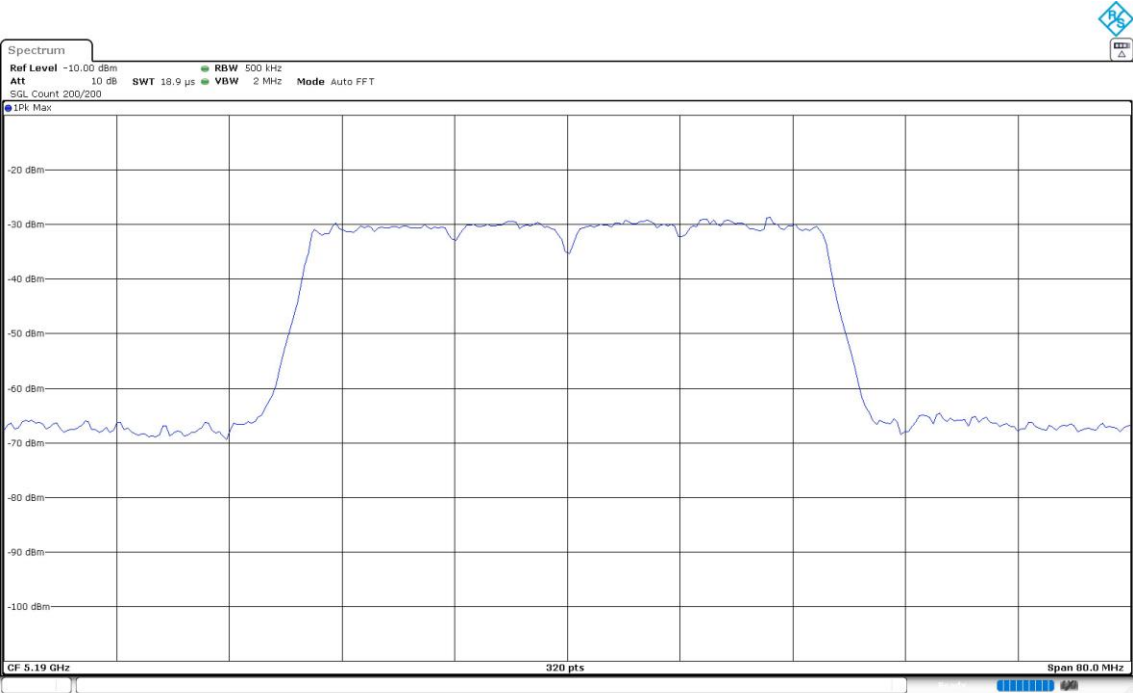
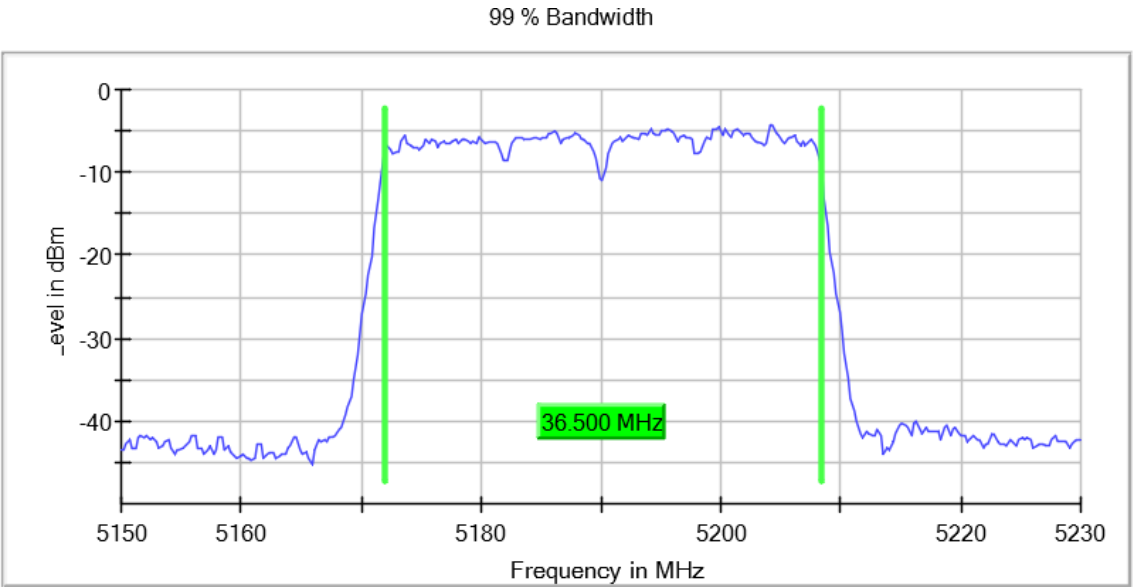
Verdict

Pass

Attachments

Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5190.00000 Modulation = 802.11n HT40 (OFDM MCS0)

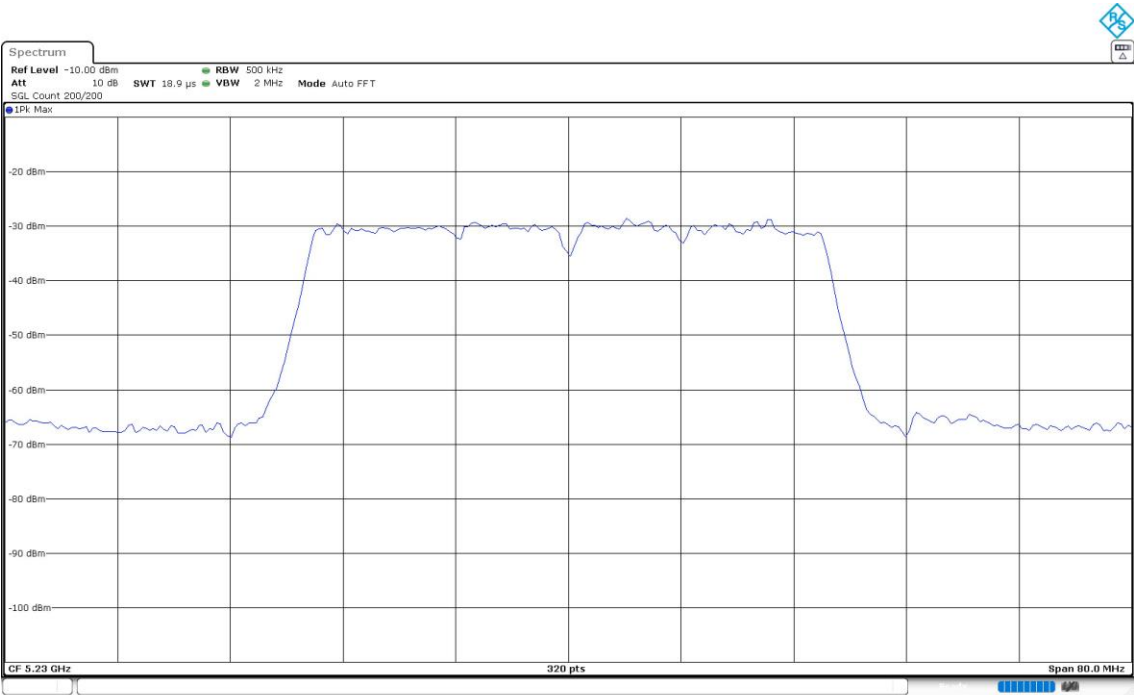
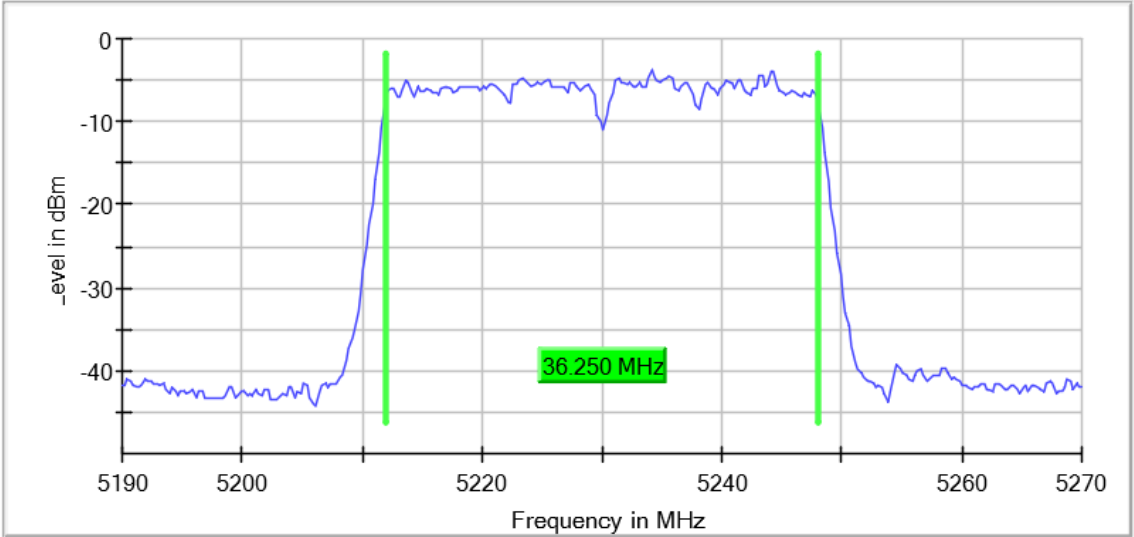
Images:



Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5230.00000 Modulation = 802.11n HT40 (OFDM MCS0)

Images:

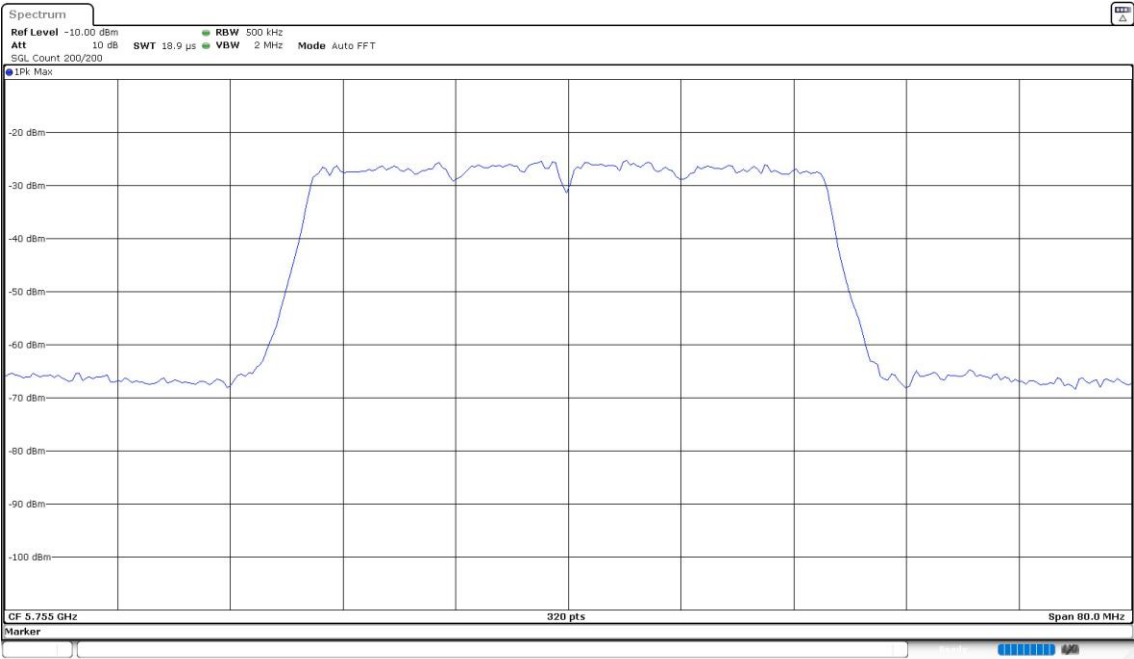
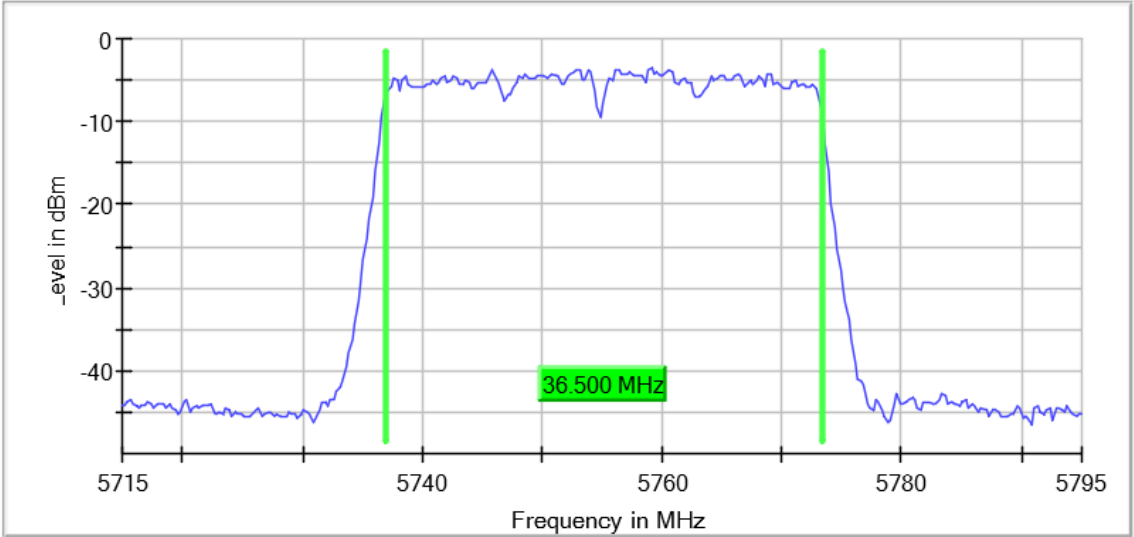
99 % Bandwidth



Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5755.00000 Modulation = 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

Images:

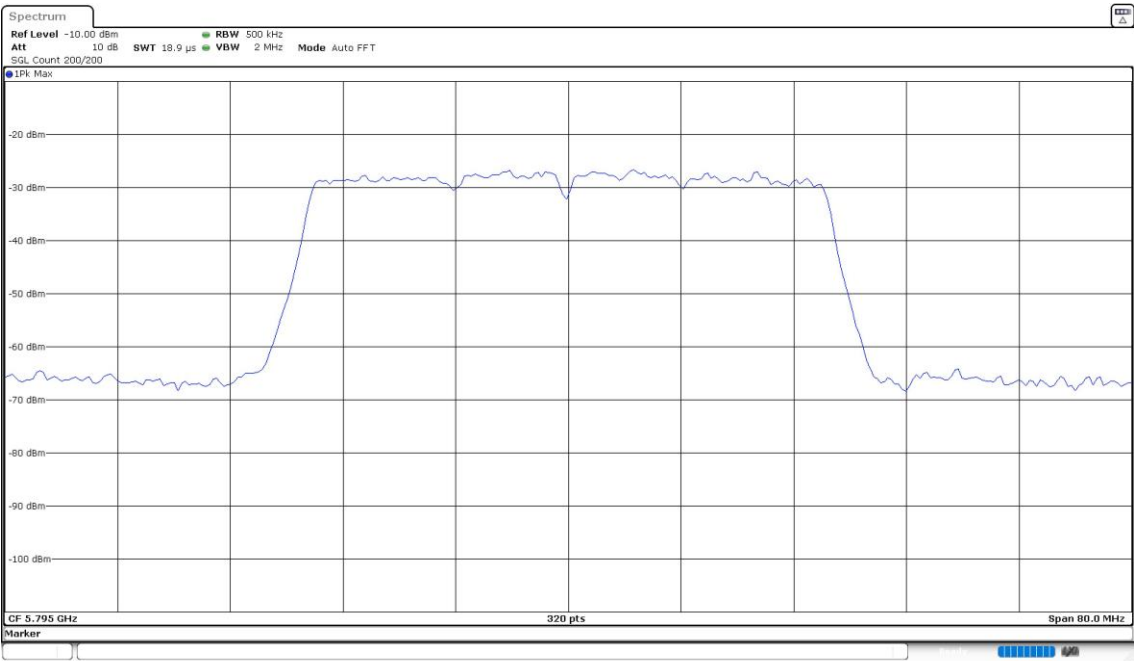
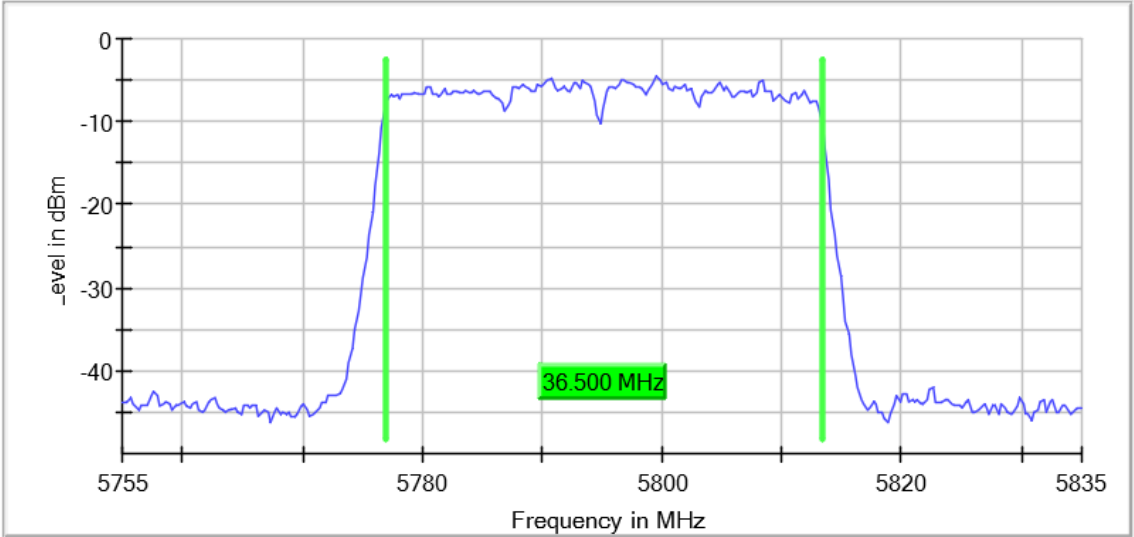
99 % Bandwidth



Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5795.00000 Modulation = 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

Images:

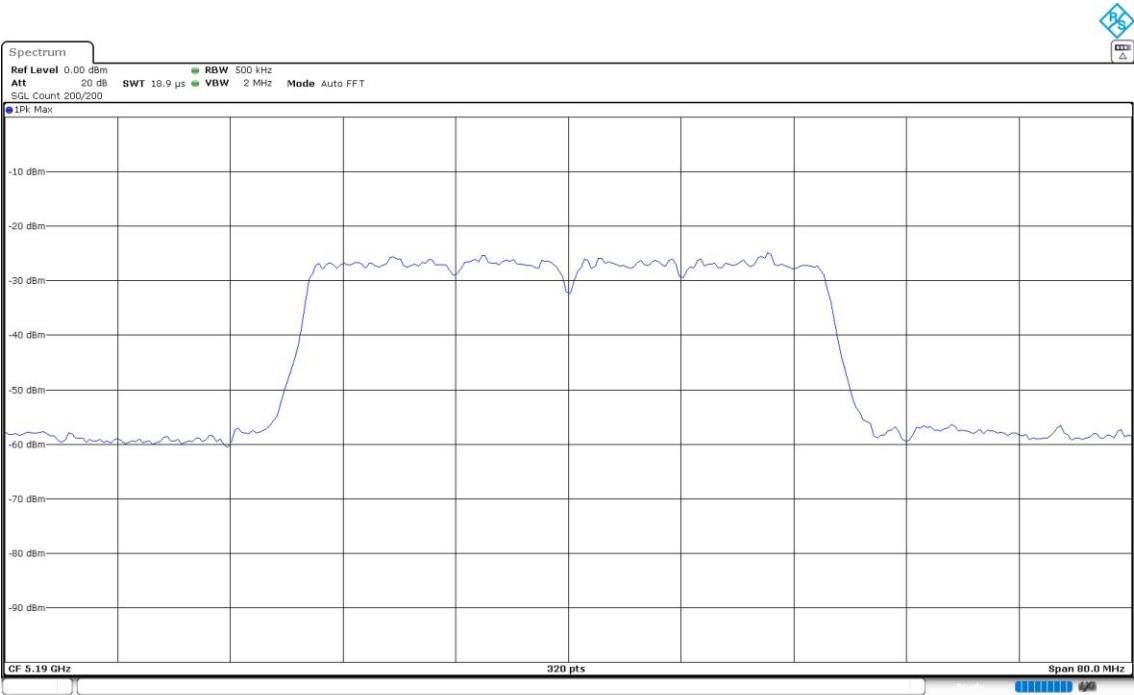
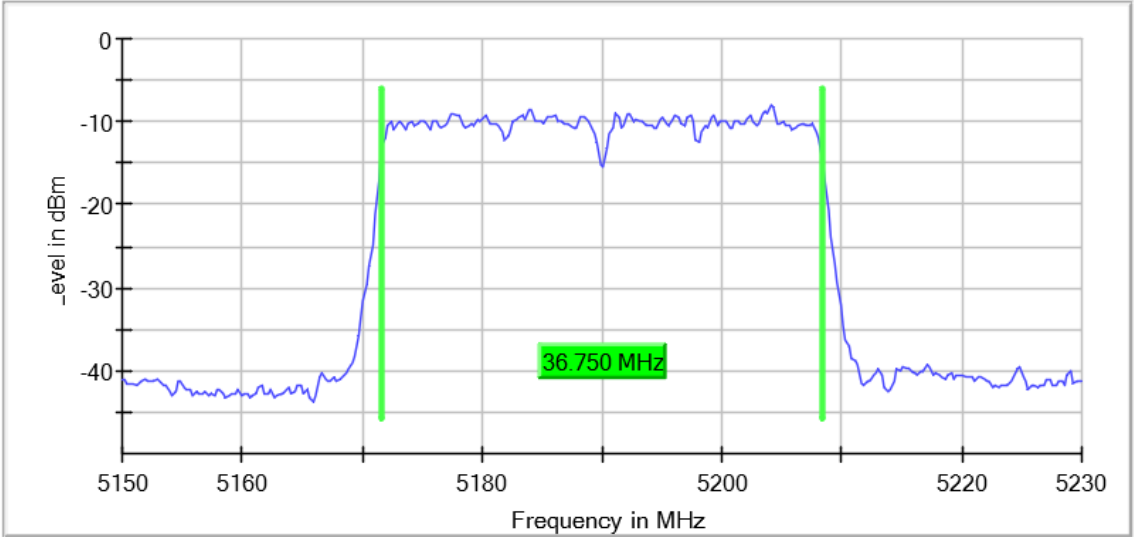
99 % Bandwidth



Operation Band MHz = [5150, 5250] Active Port = 1+2
Frequency MHz = 5190.00000 Modulation = 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

Images:

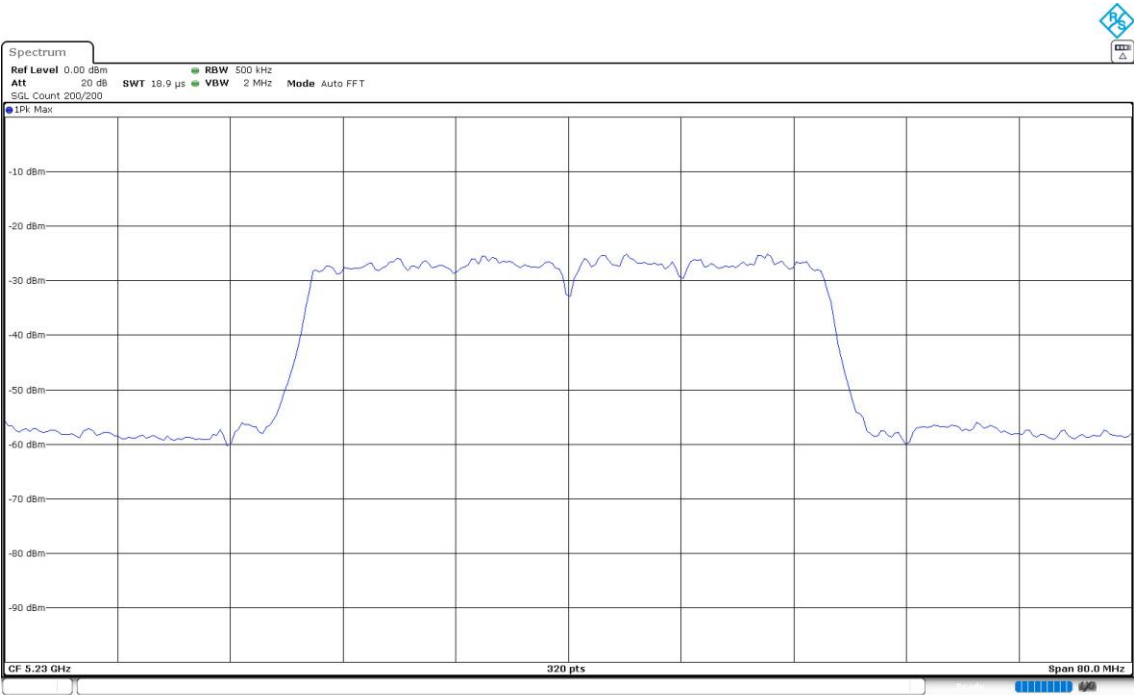
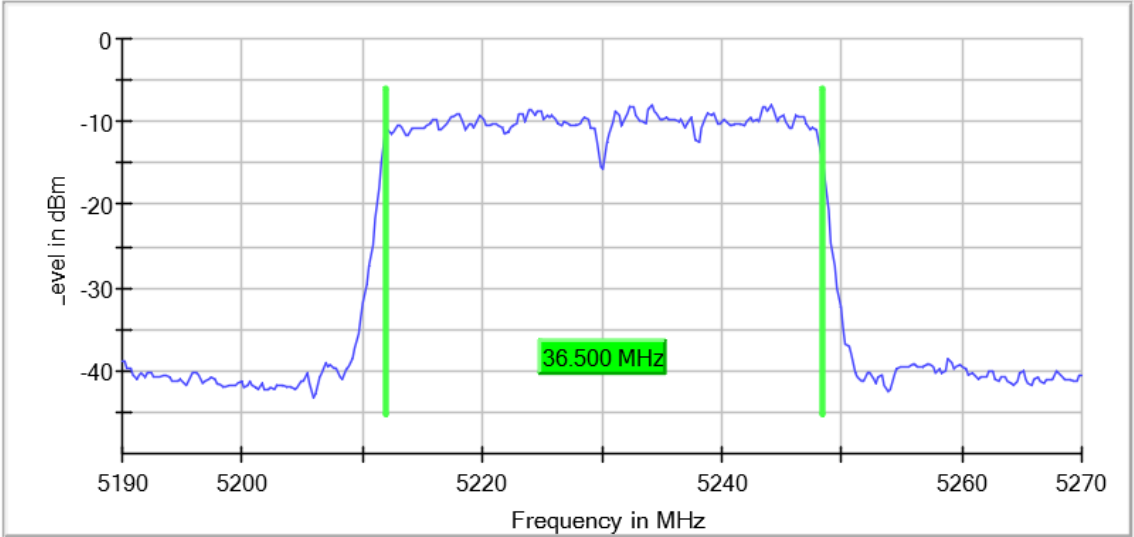
99 % Bandwidth



Operation Band MHz = [5150, 5250] Active Port = 1+2
Frequency MHz = 5230.00000 Modulation = 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

Images:

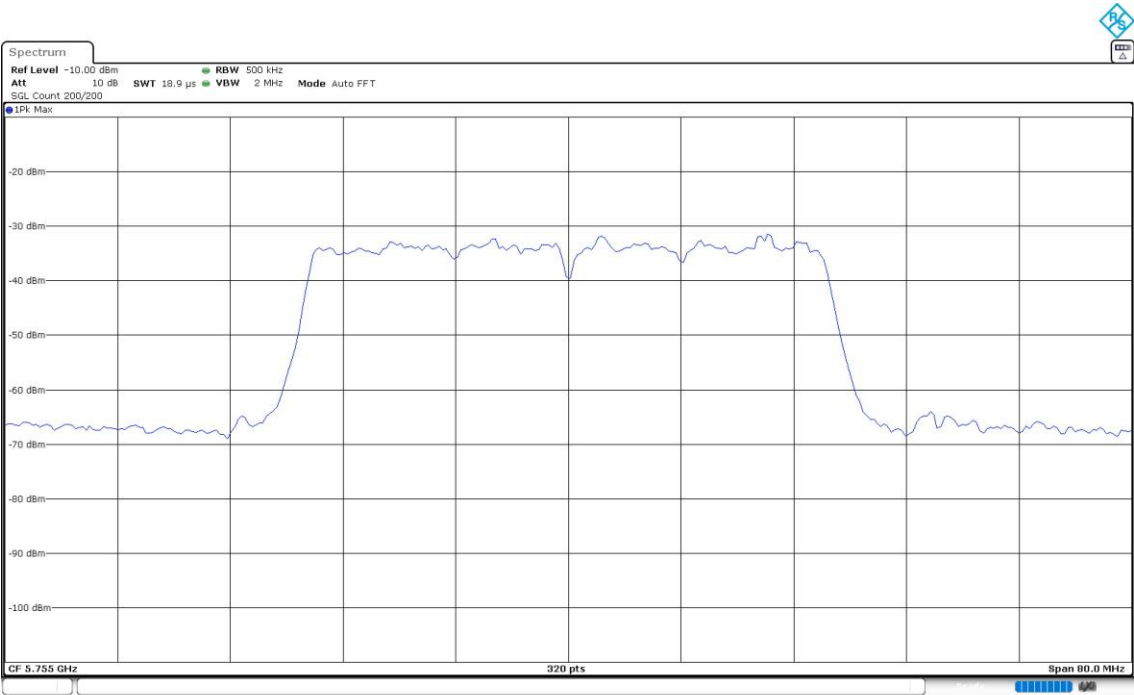
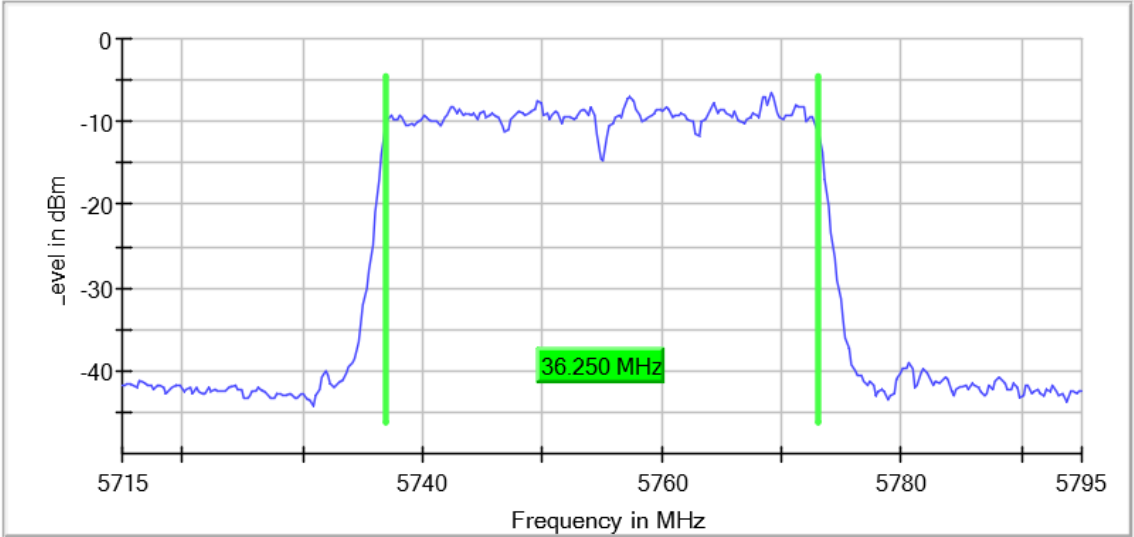
99 % Bandwidth



Operation Band MHz = [5725, 5850] Active Port = 1+2
Frequency MHz = 5755.00000 Modulation = 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

Images:

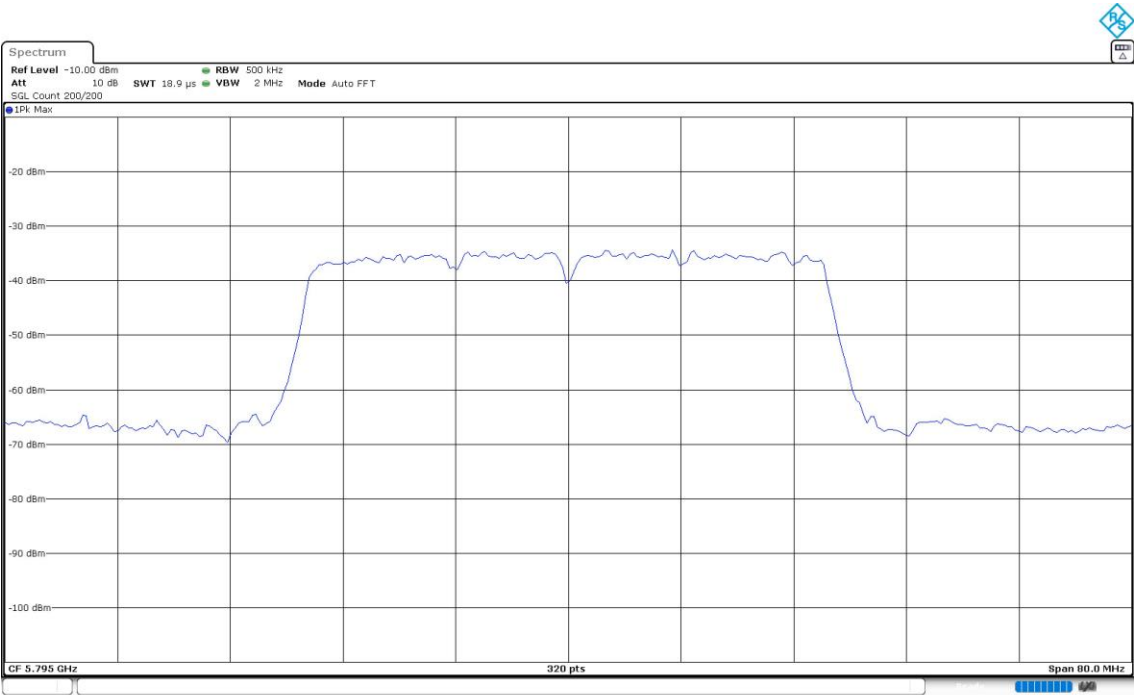
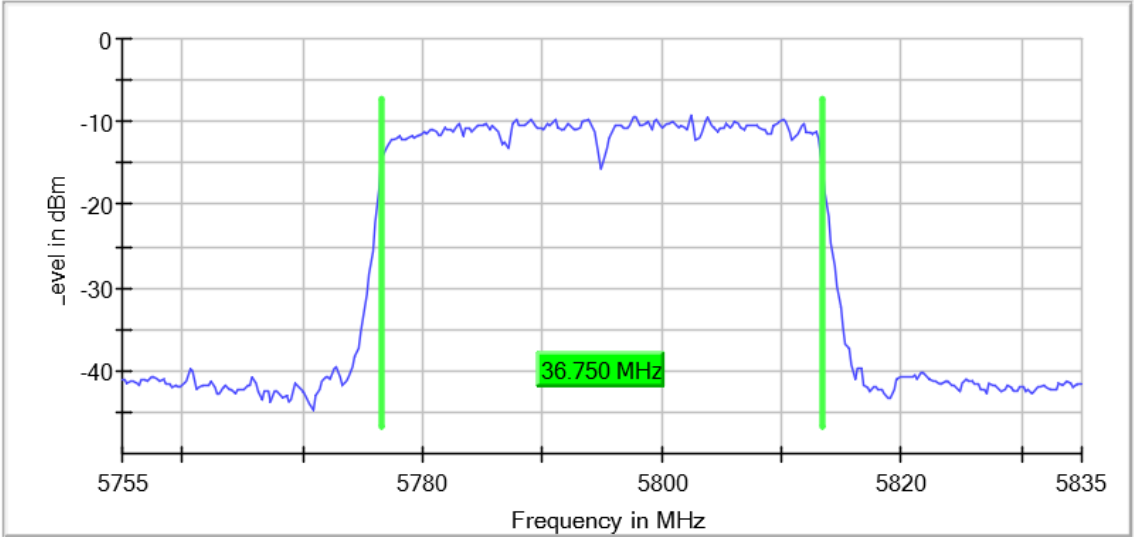
99 % Bandwidth



Operation Band MHz = [5725, 5850] Active Port = 1+2
Frequency MHz = 5795.00000 Modulation = 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

Images:

99 % Bandwidth



Modulation: 802.11ac VHT20 (OFDM MCS0)

Results

Operation Band (MHz)	Port	Freq (MHz)	Occ Ch BW (MHz)
[5150, 5250]	1	5180.00000	17.900
		5200.00000	17.800
		5240.00000	17.800
[5725, 5850]	2	5745.00000	17.900
		5785.00000	17.900
		5825.00000	17.800
[5150, 5250]	1+2	5180.00000	17.900
		5200.00000	18.000
		5240.00000	17.900
[5725, 5850]		5745.00000	17.900
		5785.00000	17.900
		5825.00000	17.900

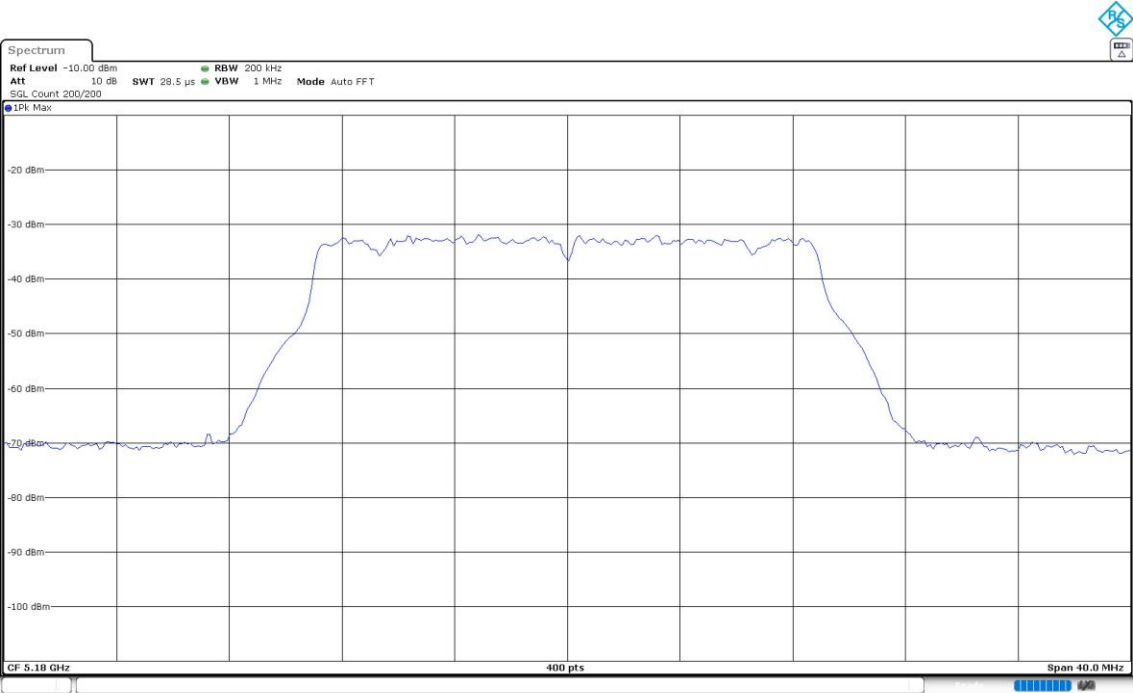
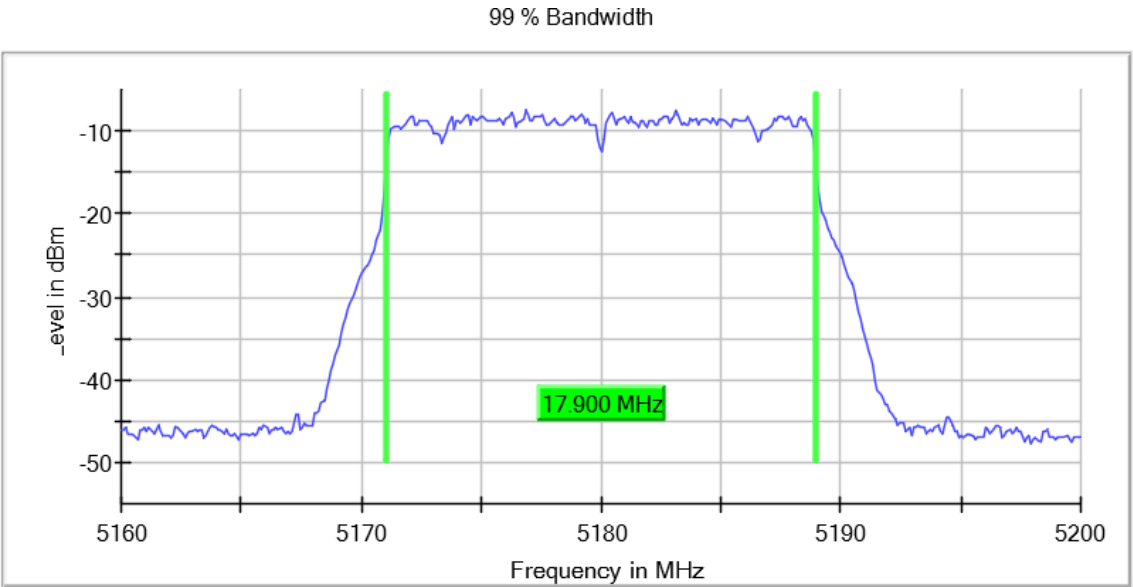
Verdict

Pass

Attachments

Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5180.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

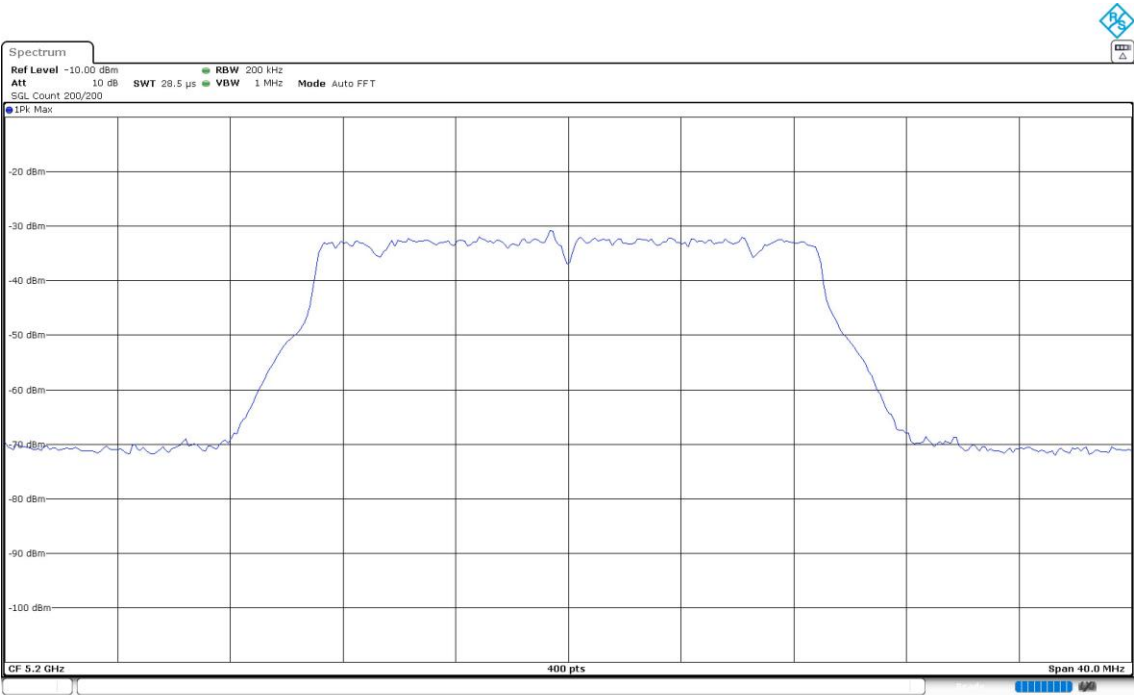
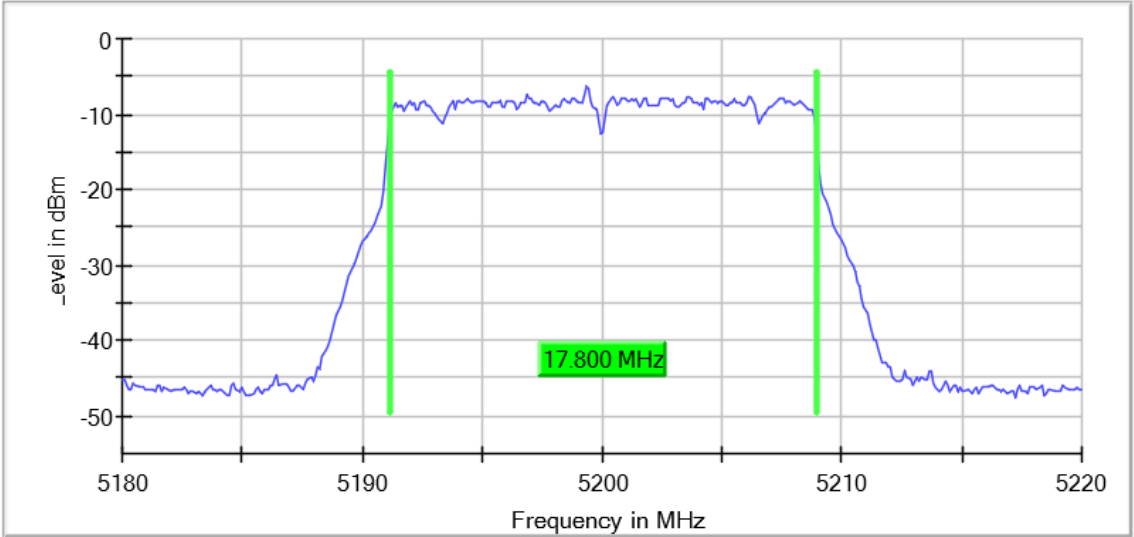
Images:



Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5200.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

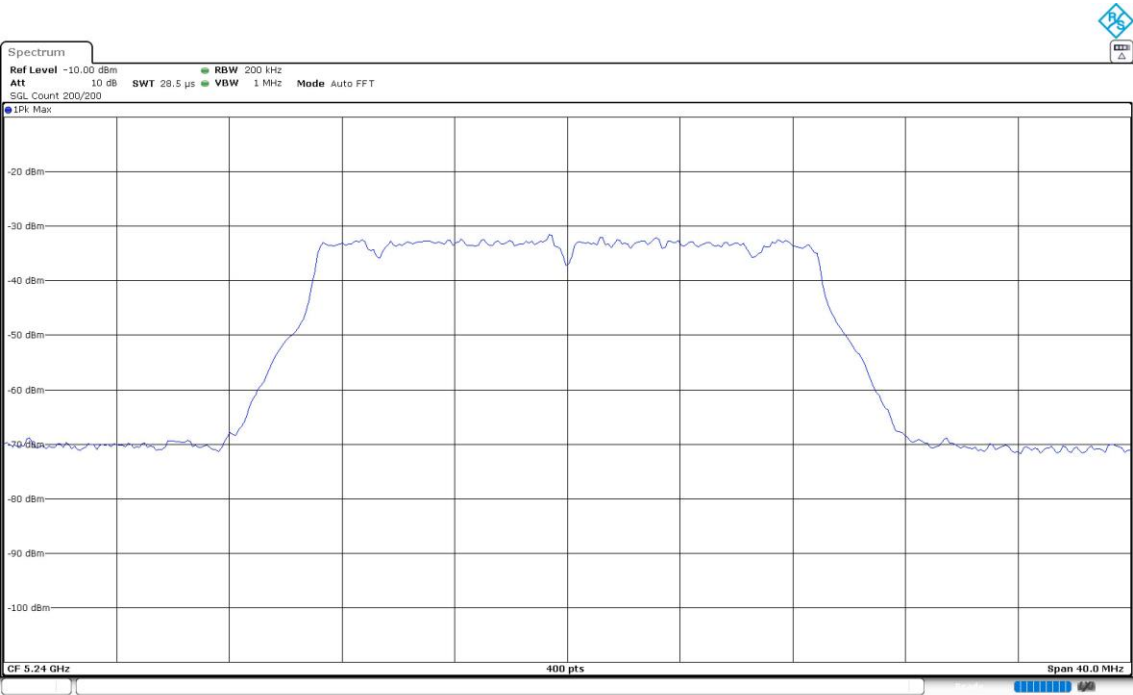
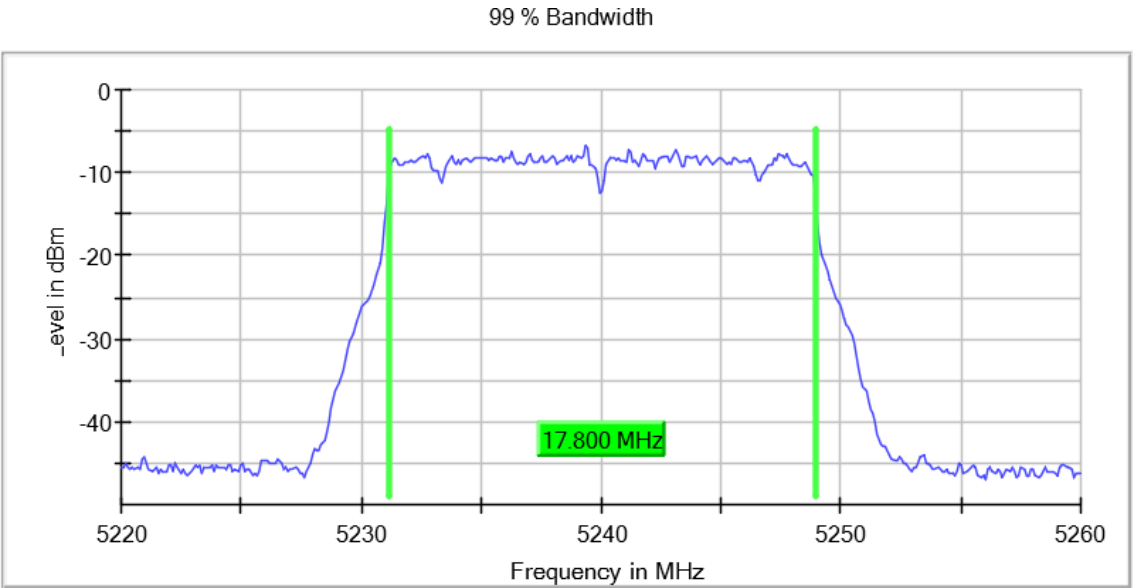
Images:

99 % Bandwidth



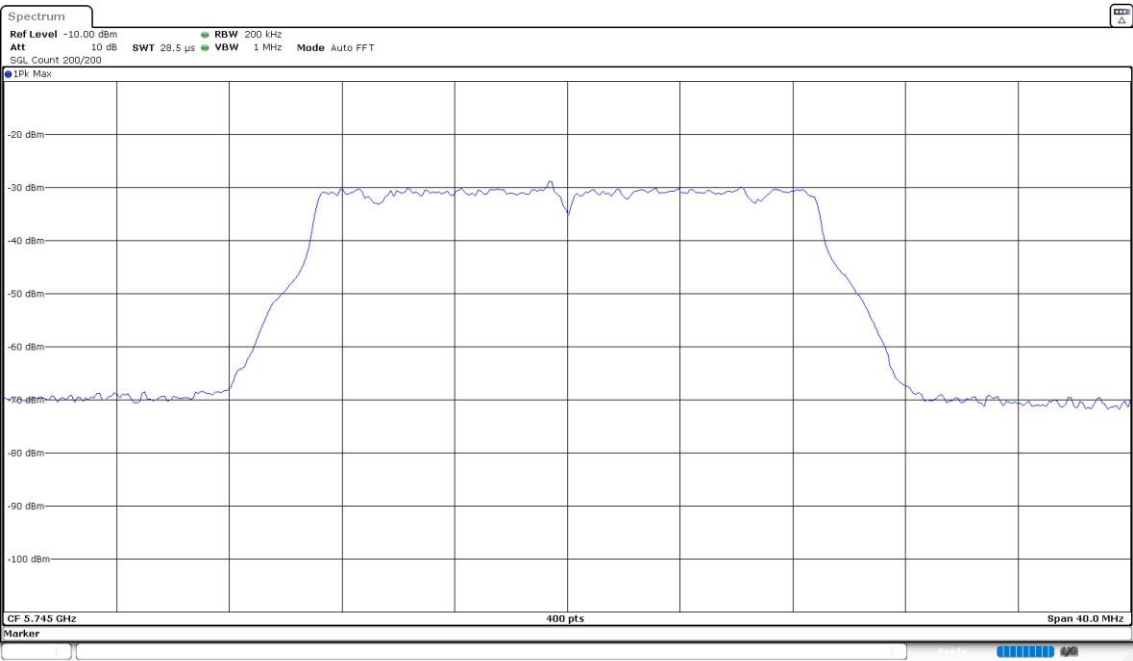
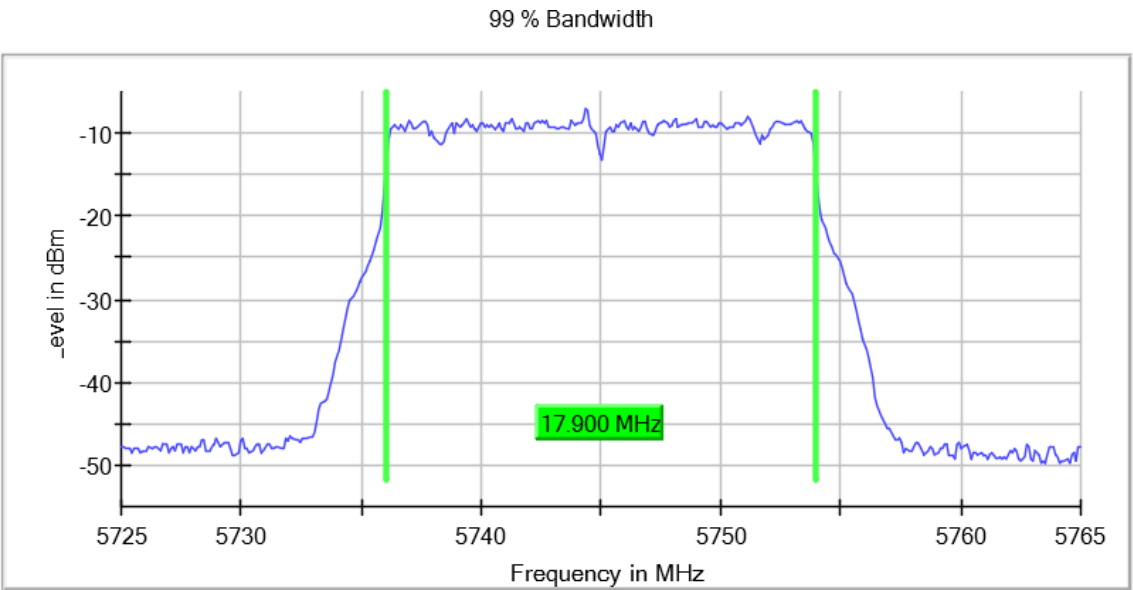
Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5240.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

Images:



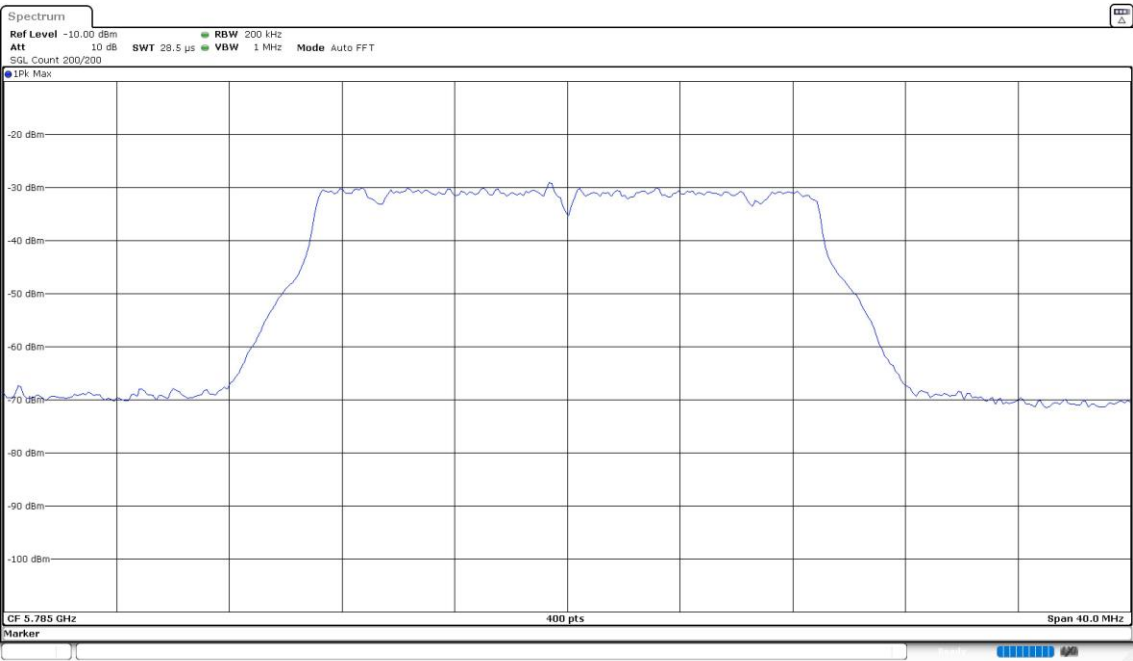
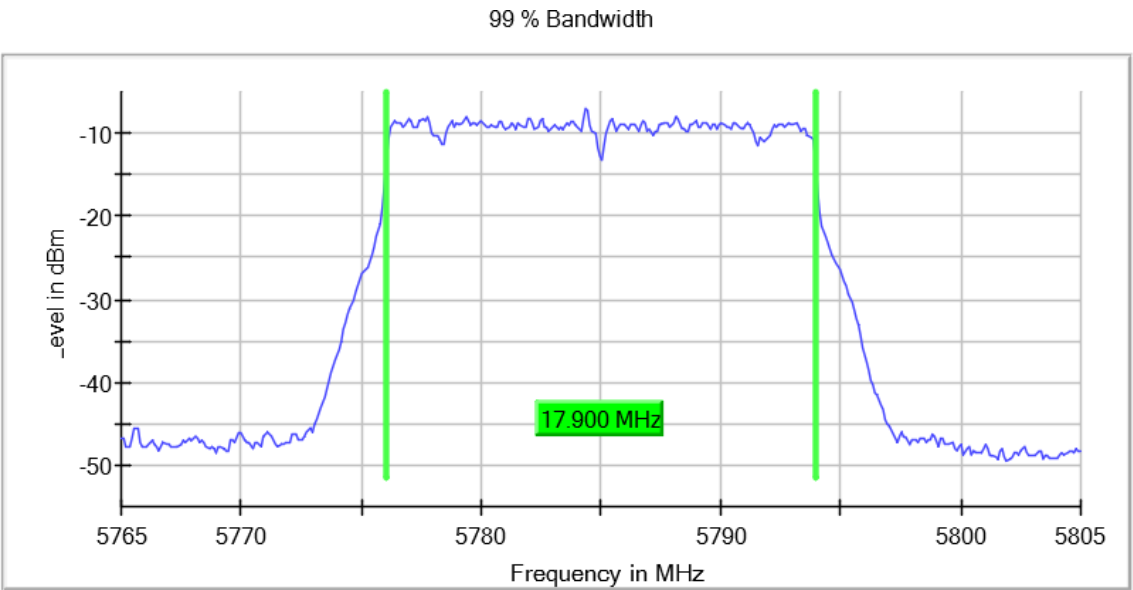
Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5745.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

Images:



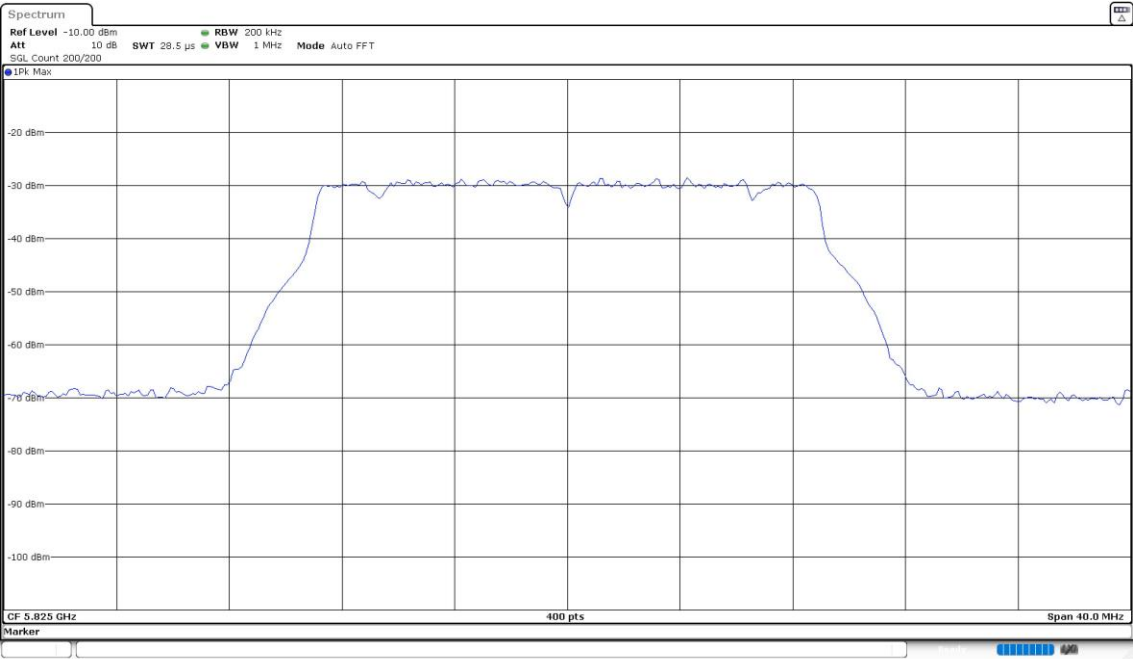
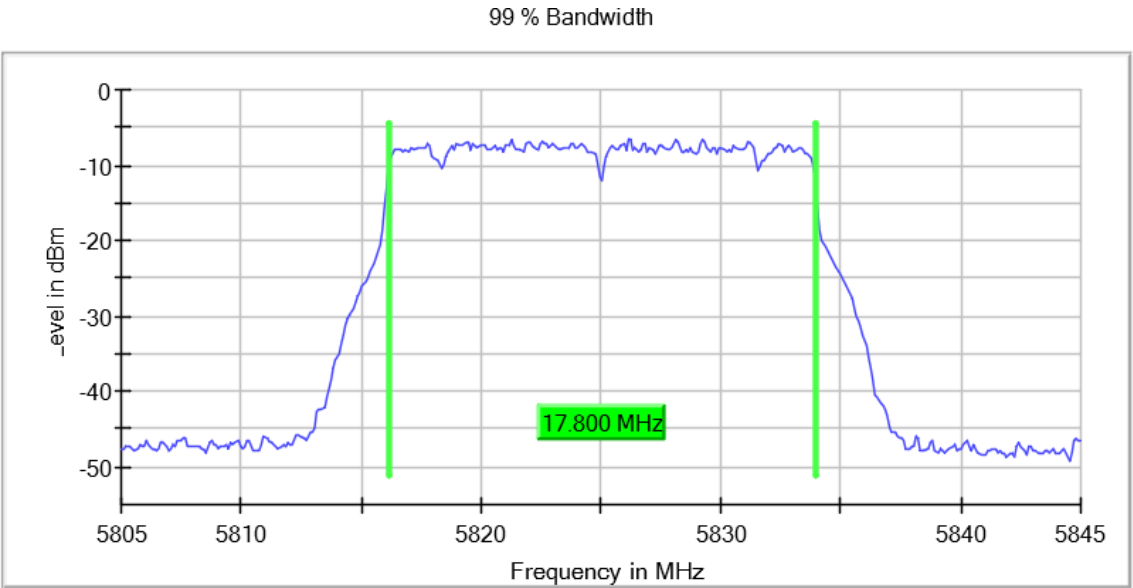
Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5785.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

Images:



Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5825.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

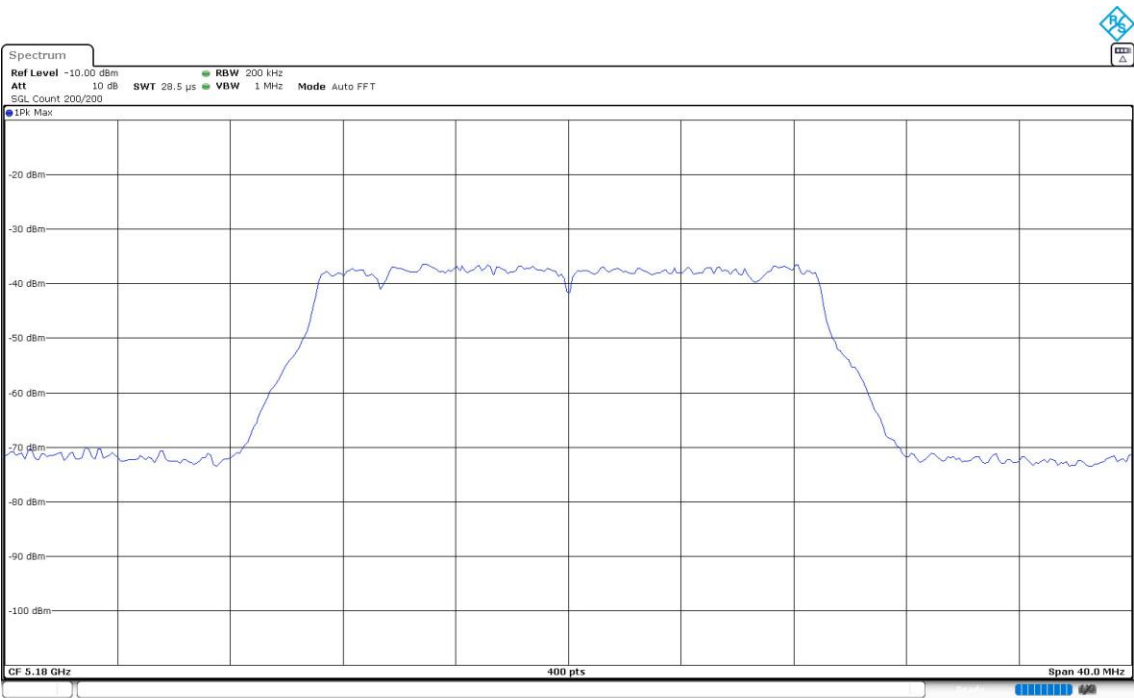
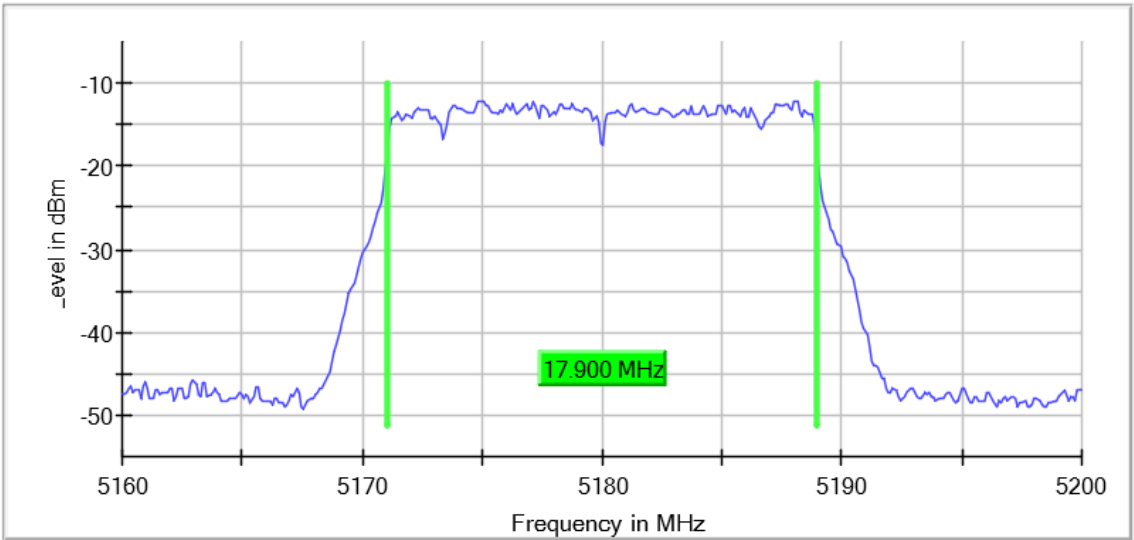
Images:



Operation Band MHz = [5150, 5250] Active Port = 1+2
Frequency MHz = 5180.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

Images:

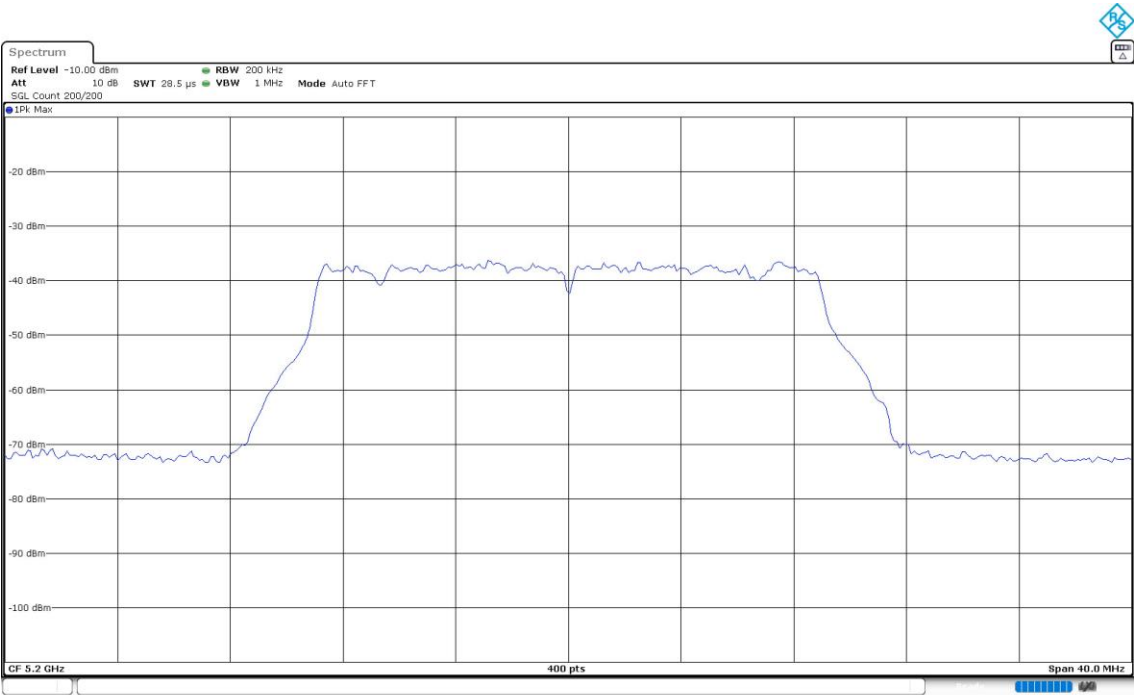
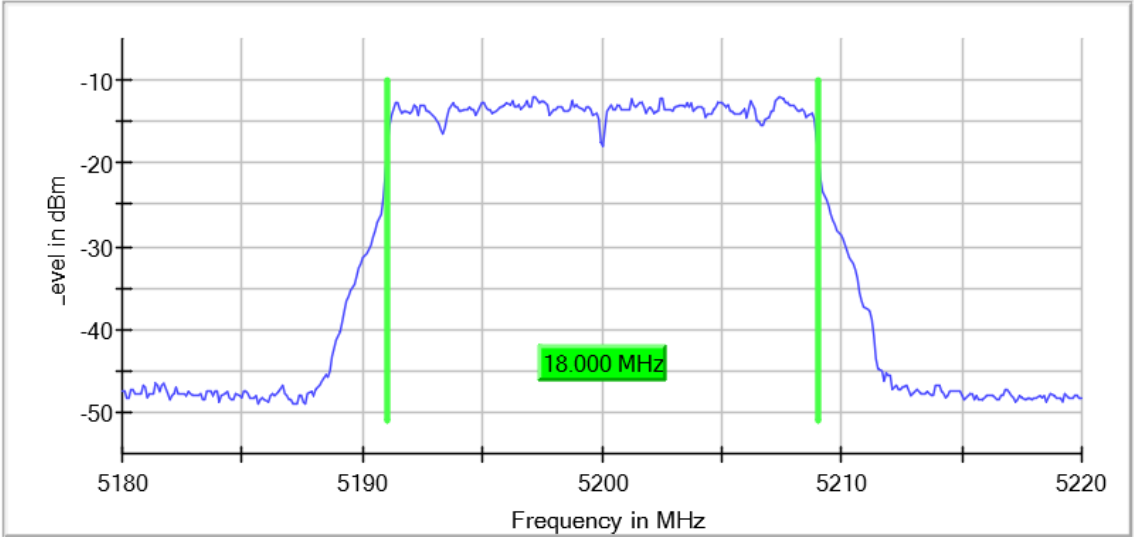
99 % Bandwidth



Operation Band MHz = [5150, 5250] Active Port = 1+2
Frequency MHz = 5200.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

Images:

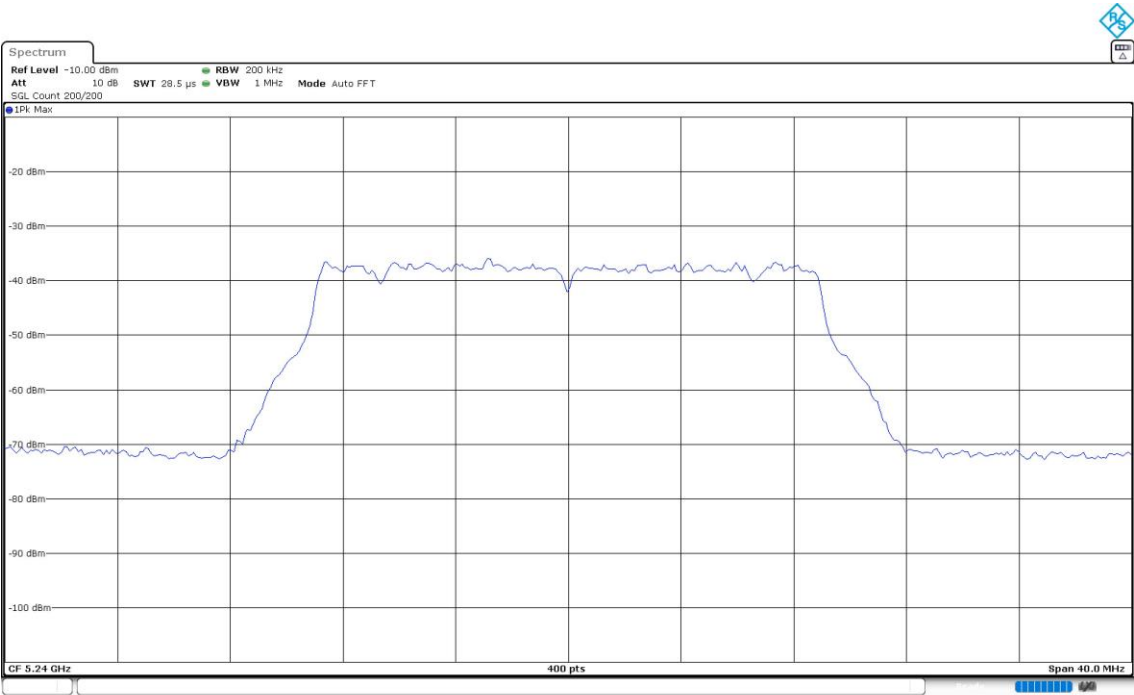
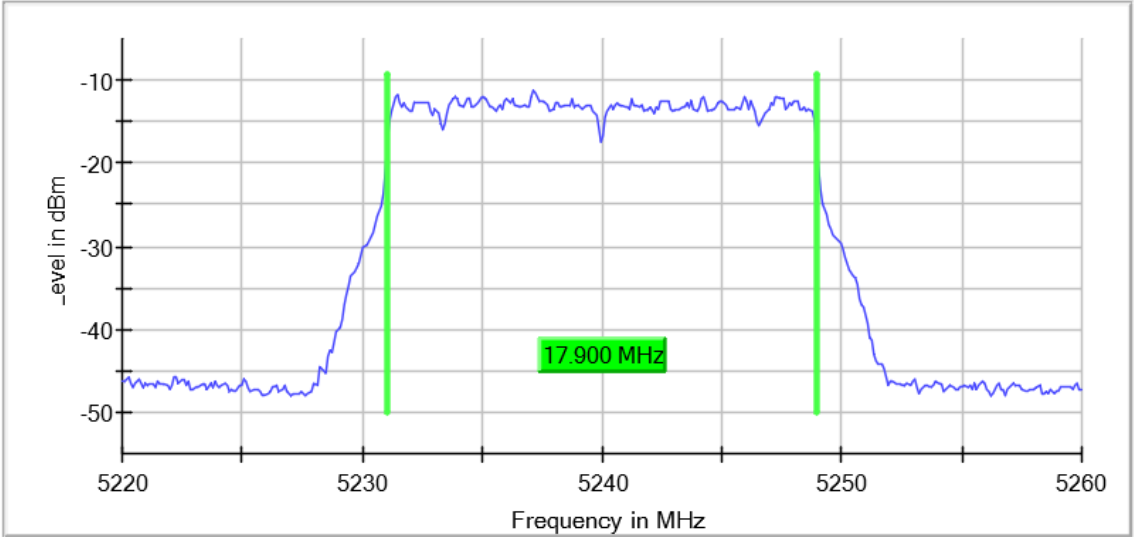
99 % Bandwidth



Operation Band MHz = [5150, 5250] Active Port = 1+2
Frequency MHz = 5240.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

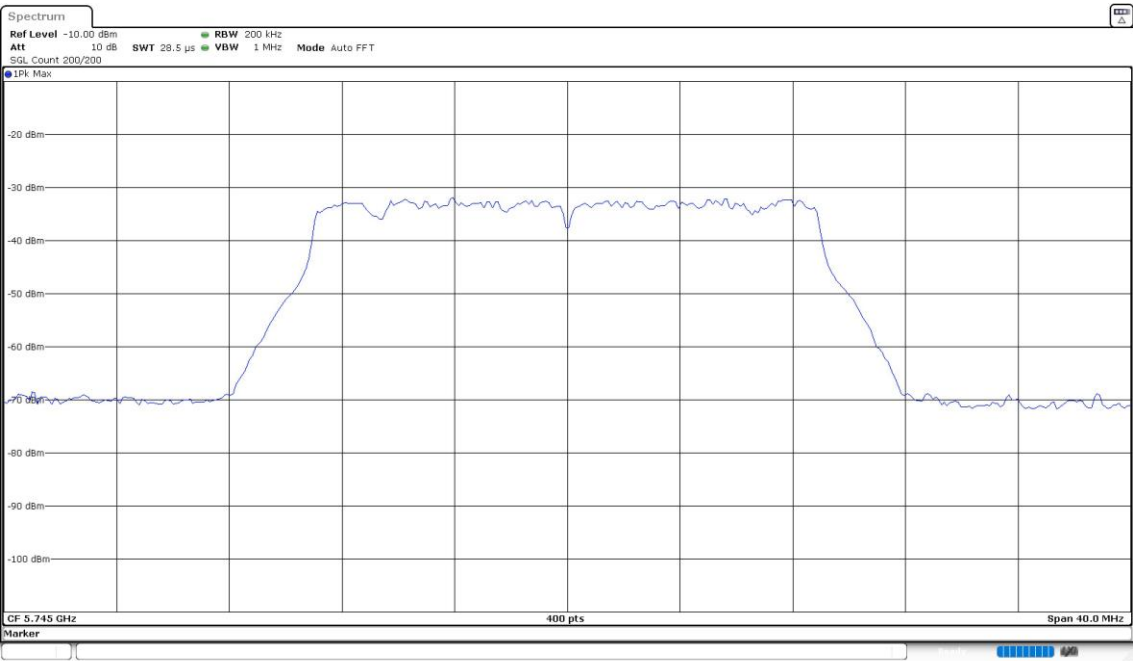
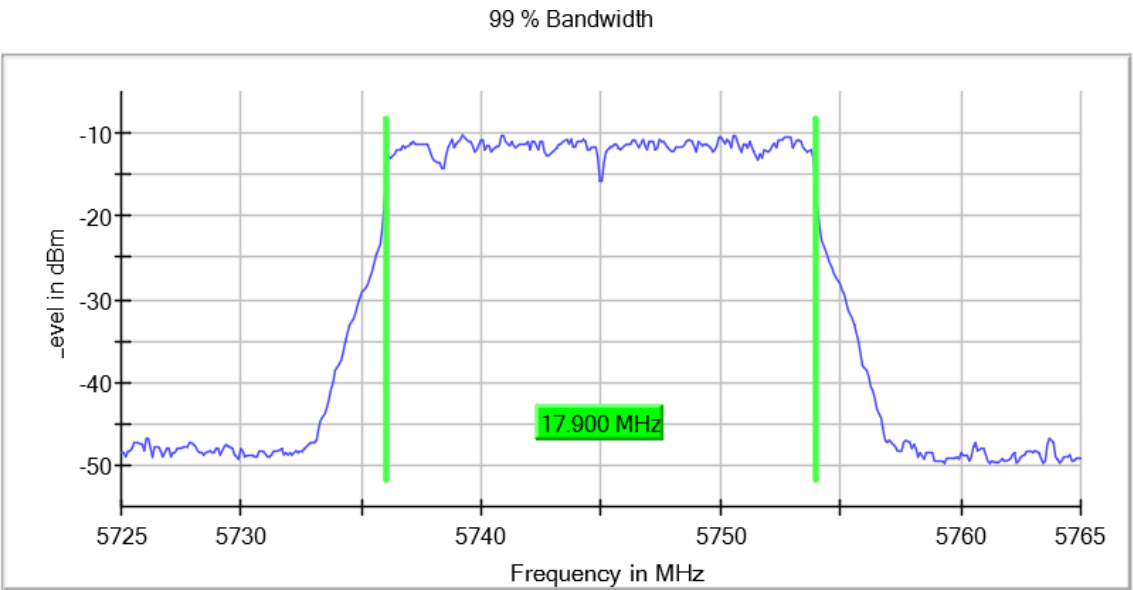
Images:

99 % Bandwidth



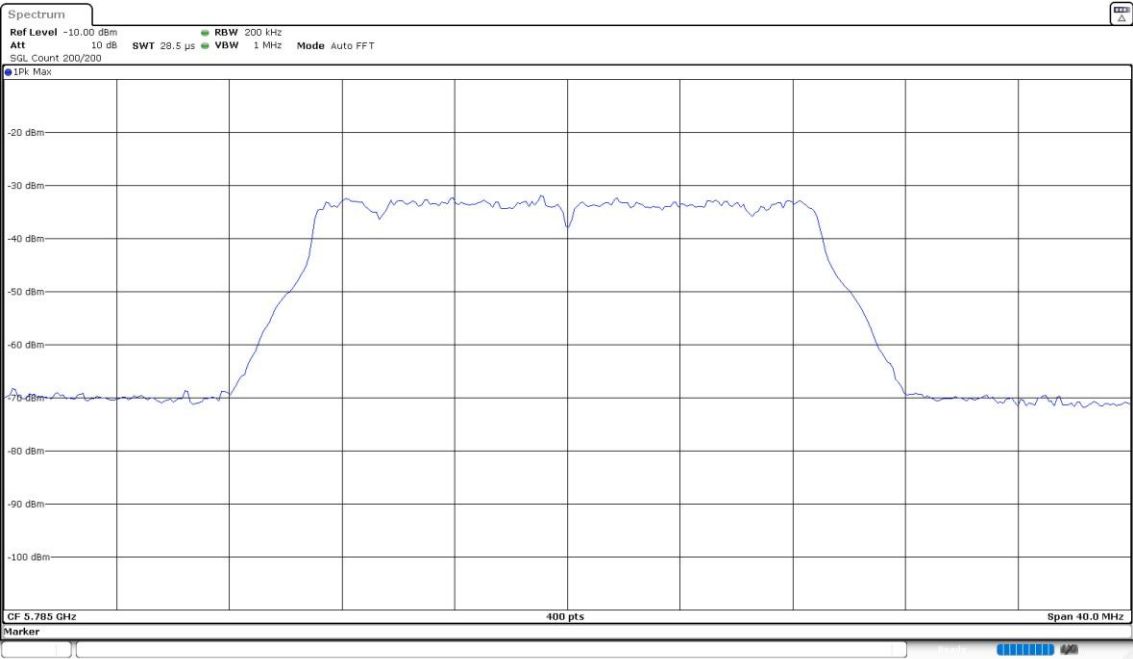
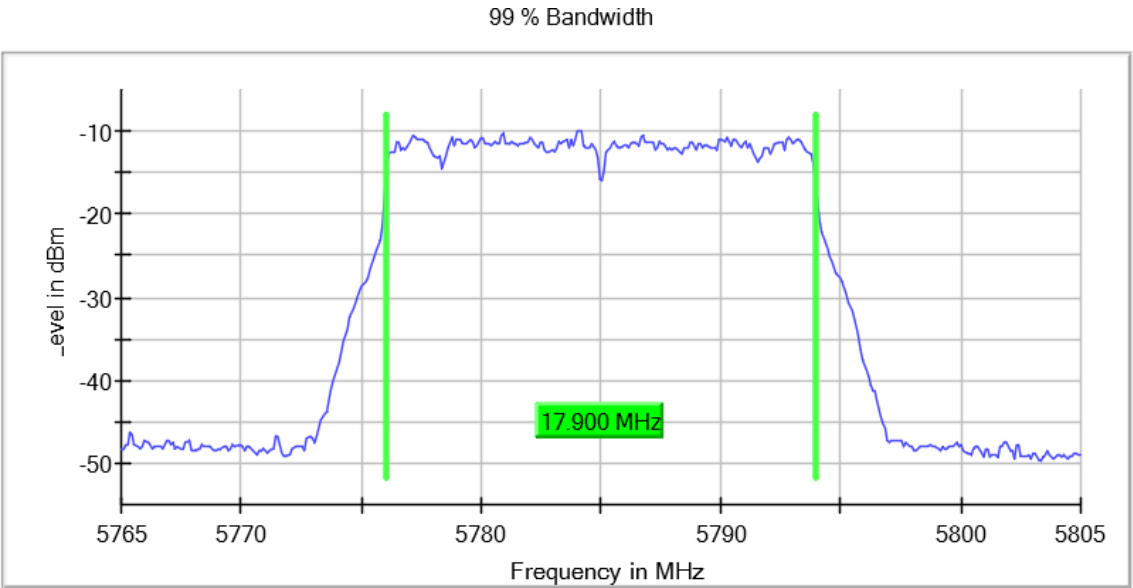
Operation Band MHz = [5725, 5850] Active Port = 1+2
Frequency MHz = 5745.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

Images:



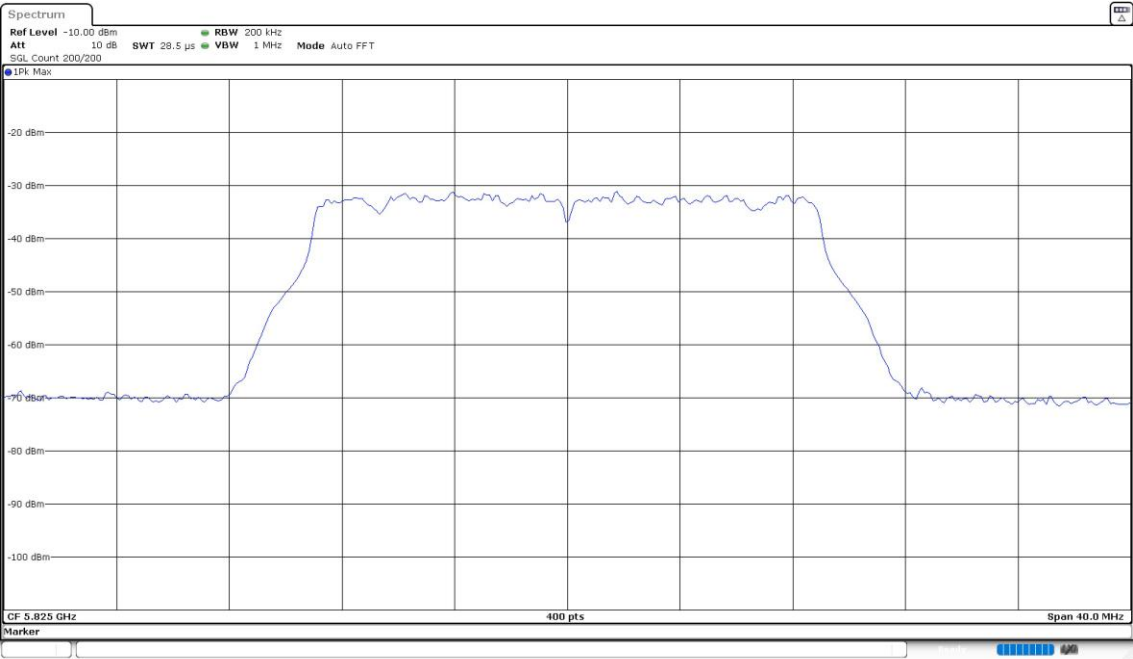
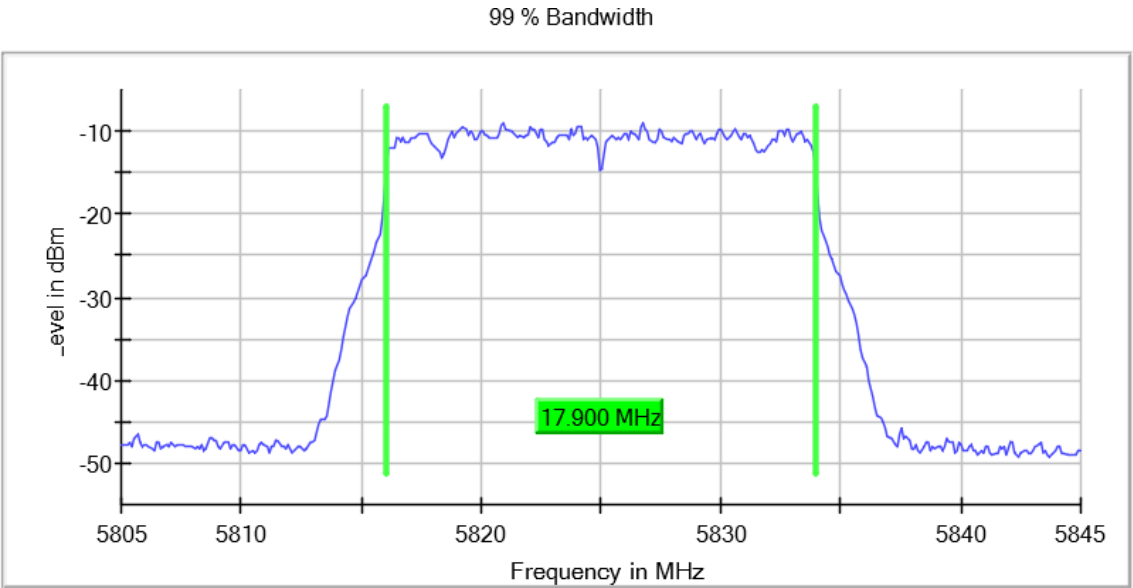
Operation Band MHz = [5725, 5850] Active Port = 1+2
Frequency MHz = 5785.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

Images:



Operation Band MHz = [5725, 5850] Active Port = 1+2
Frequency MHz = 5825.00000 Modulation = 802.11ac VHT20 (OFDM MCS0)

Images:



Modulation: 802.11ac VHT40 (OFDM MCS0)

Results

Operation Band (MHz)	Port	Freq (MHz)	Occ Ch BW (MHz)
[5150, 5250]	1	5190.00000	36.750
		5230.00000	36.750
[5725, 5850]	2	5755.00000	36.750
		5795.00000	36.750
[5150, 5250]	1+2	5190.00000	36.750
		5230.00000	36.750
[5725, 5850]		5755.00000	36.500
		5795.00000	36.500

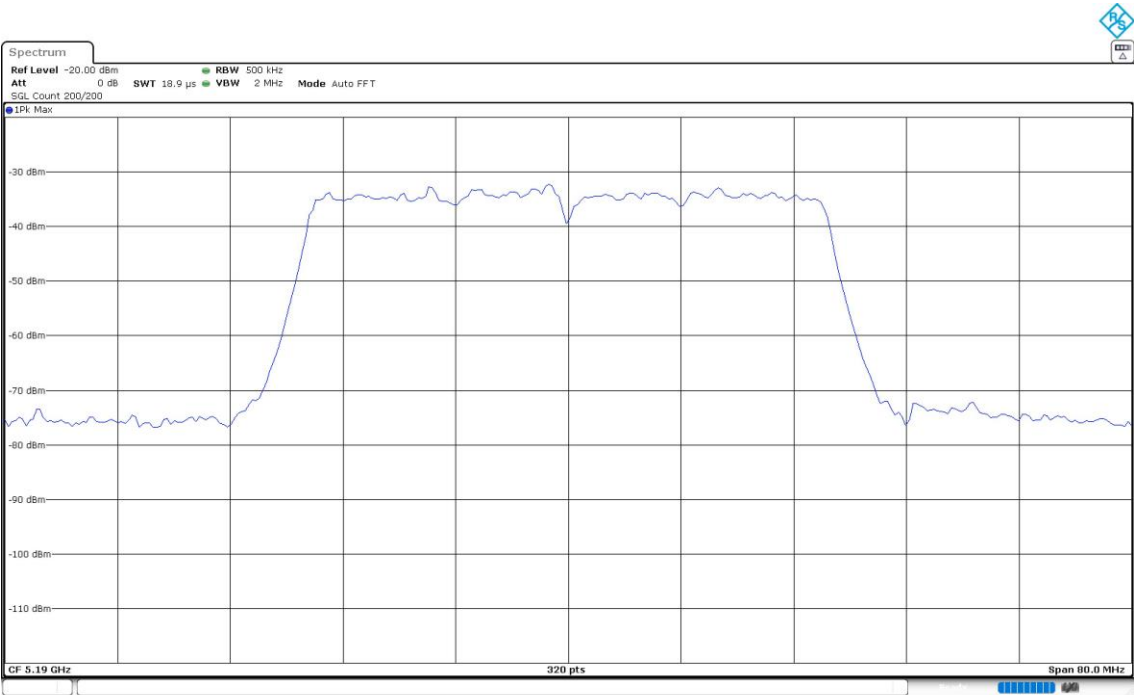
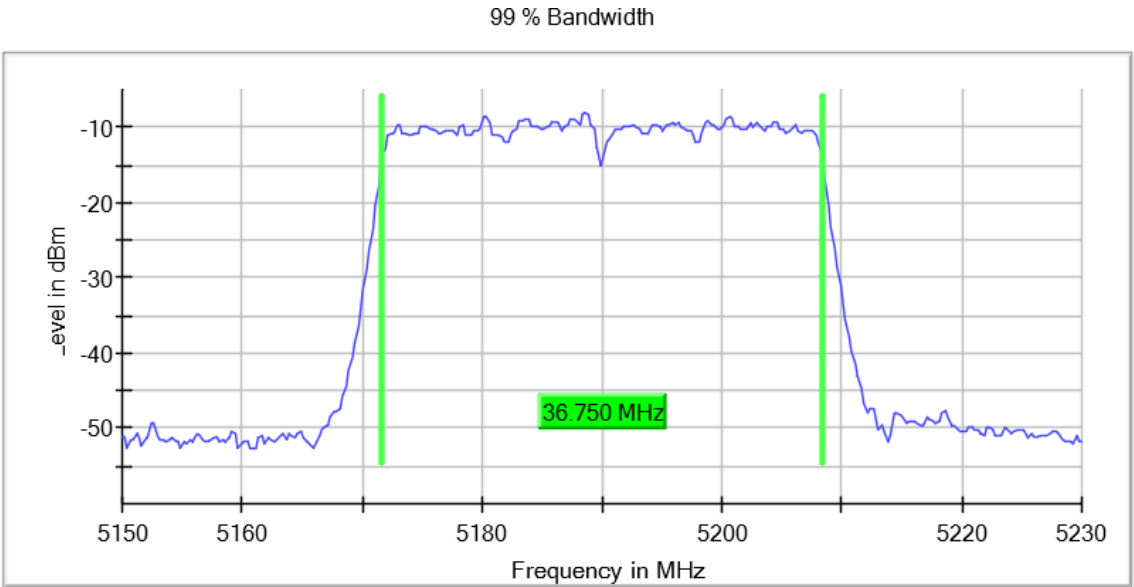
Verdict

Pass

Attachments

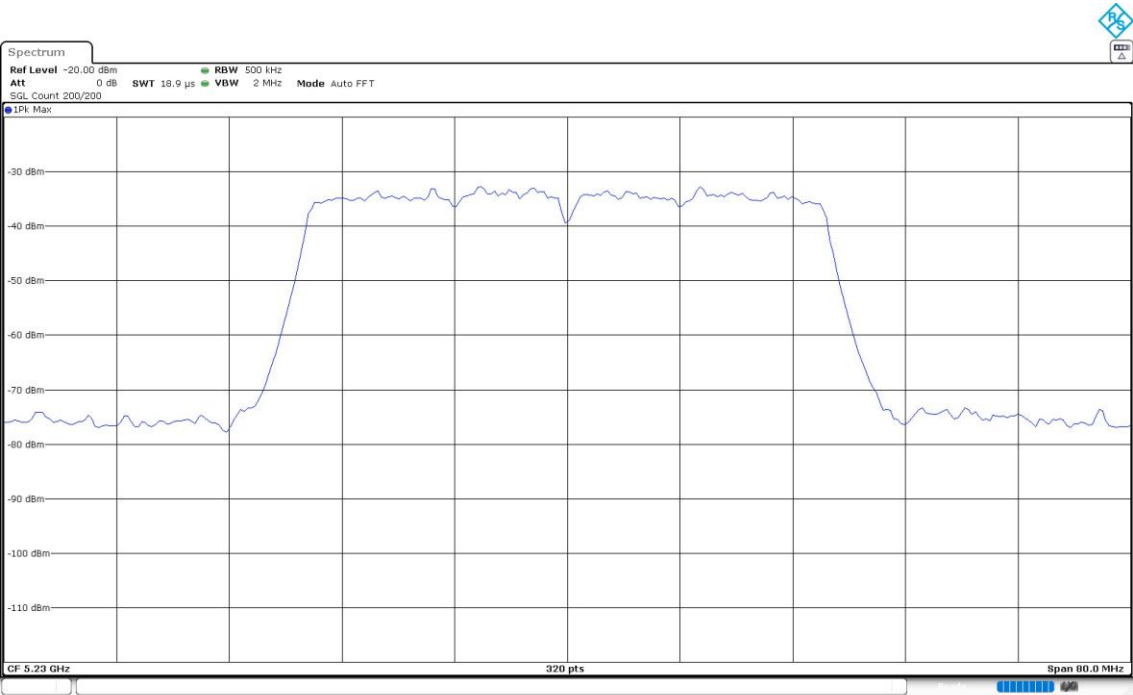
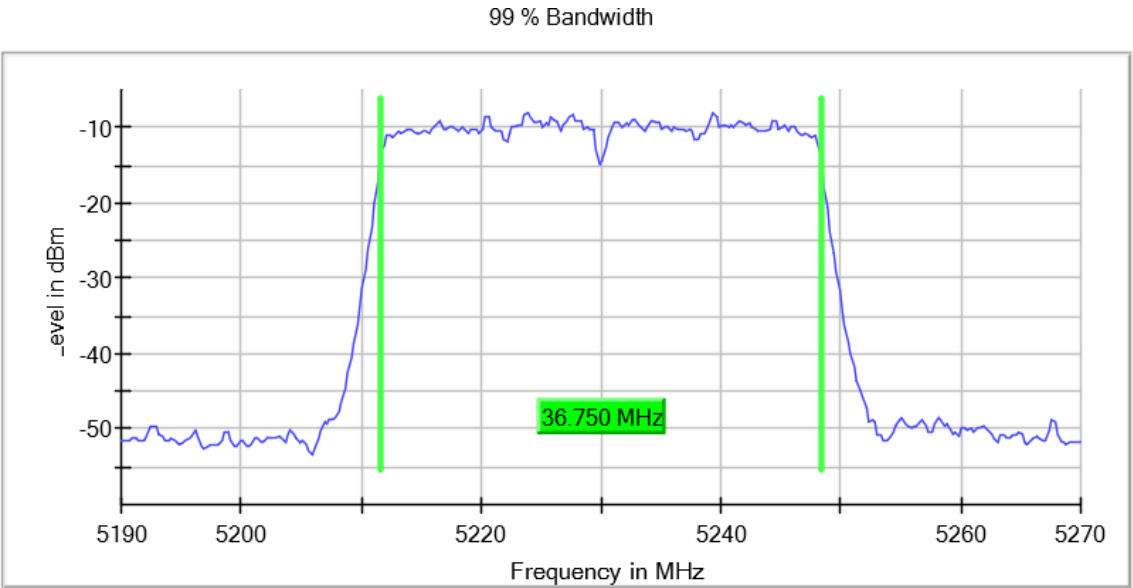
Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5190.00000 Modulation = 802.11ac VHT40 (OFDM MCS0)

Images:



Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5230.00000 Modulation = 802.11ac VHT40 (OFDM MCS0)

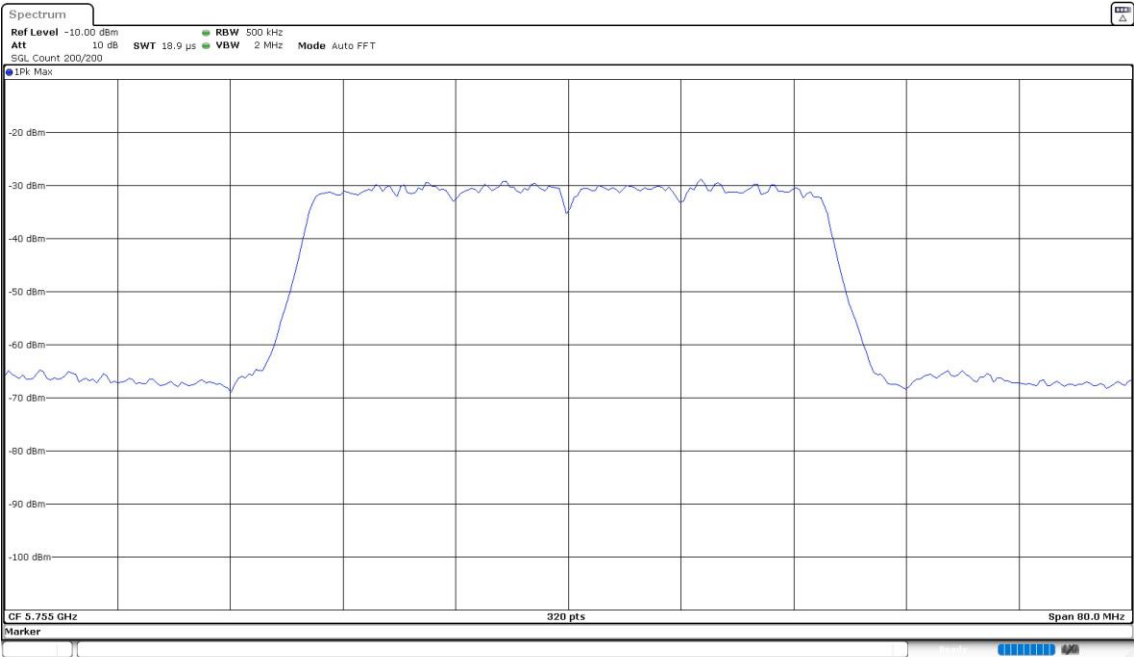
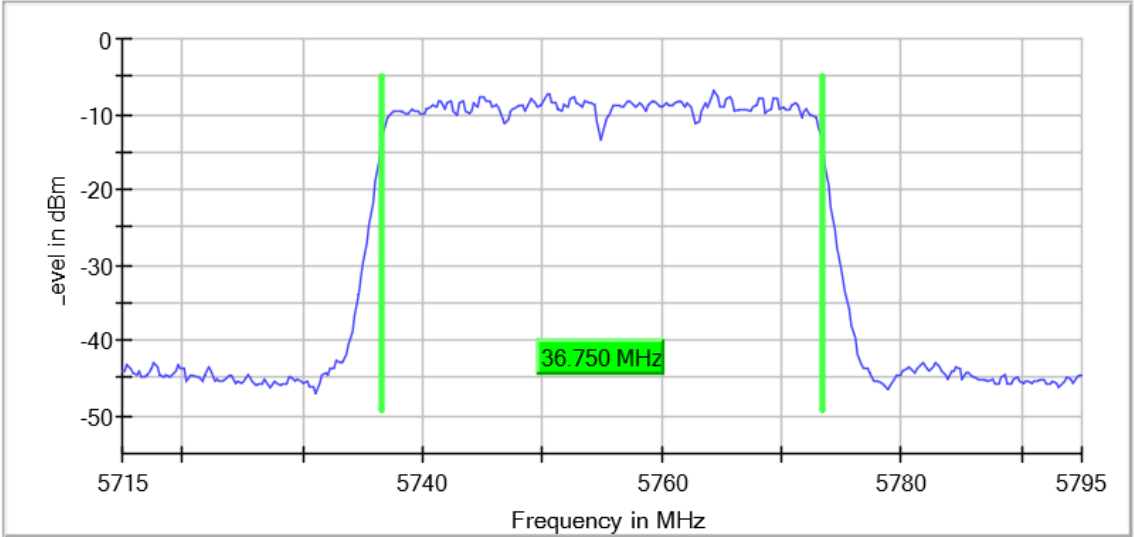
Images:



Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5755.00000 Modulation = 802.11ac VHT40 (OFDM MCS0)

Images:

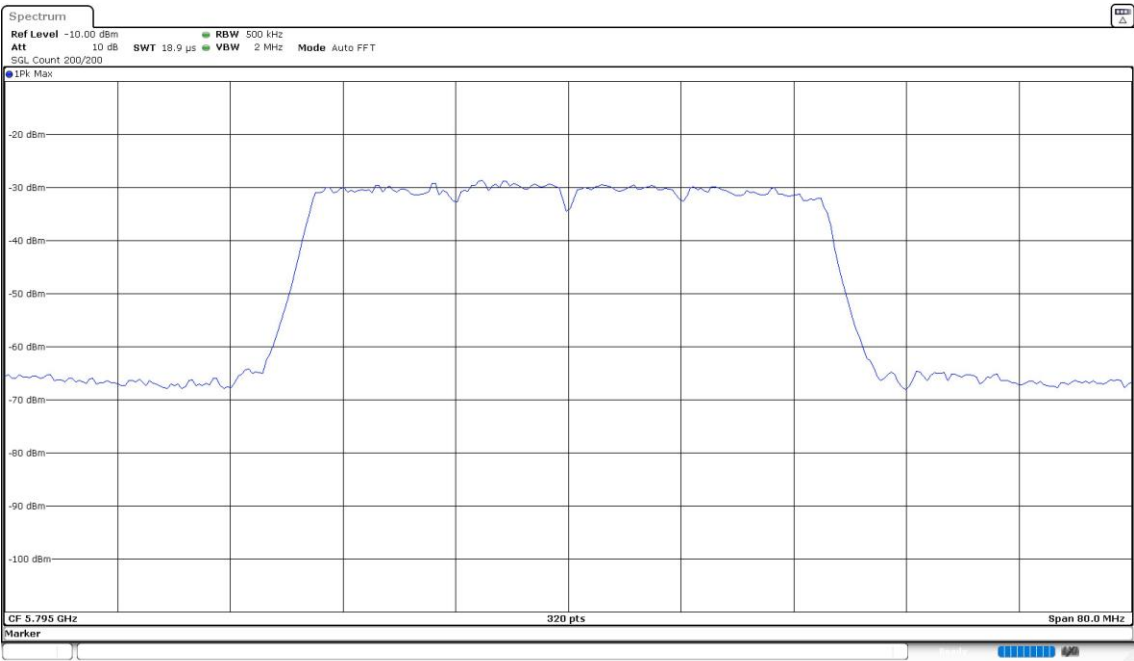
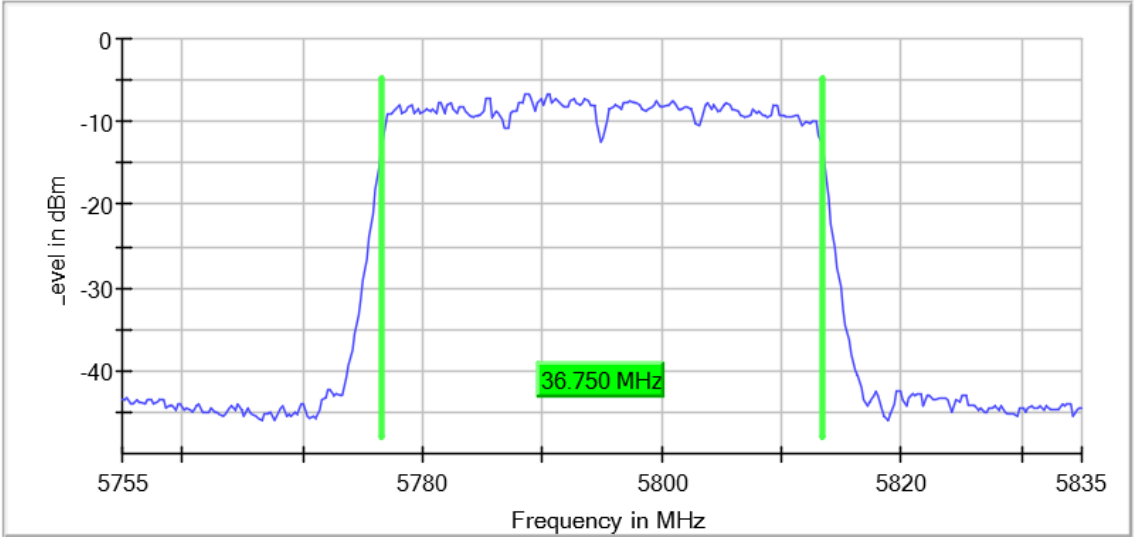
99 % Bandwidth



Operation Band MHz = [5725, 5850] Active Port = 2
Frequency MHz = 5795.00000 Modulation = 802.11ac VHT40 (OFDM MCS0)

Images:

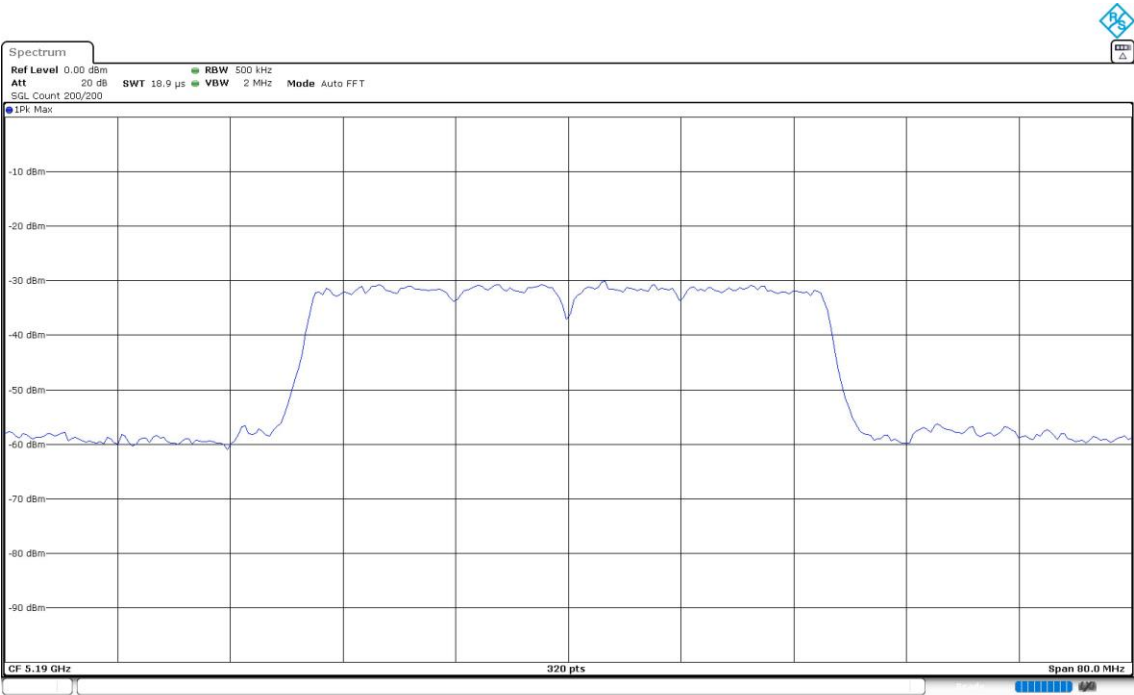
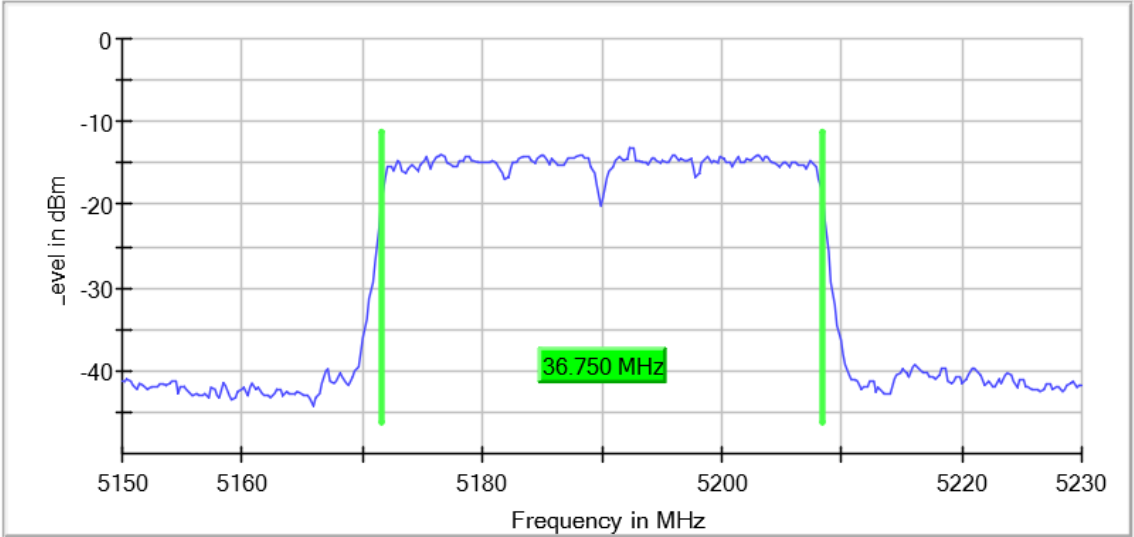
99 % Bandwidth



Operation Band MHz = [5150, 5250] Active Port = 1+2
Frequency MHz = 5190.00000 Modulation = 802.11ac VHT40 (OFDM MCS0)

Images:

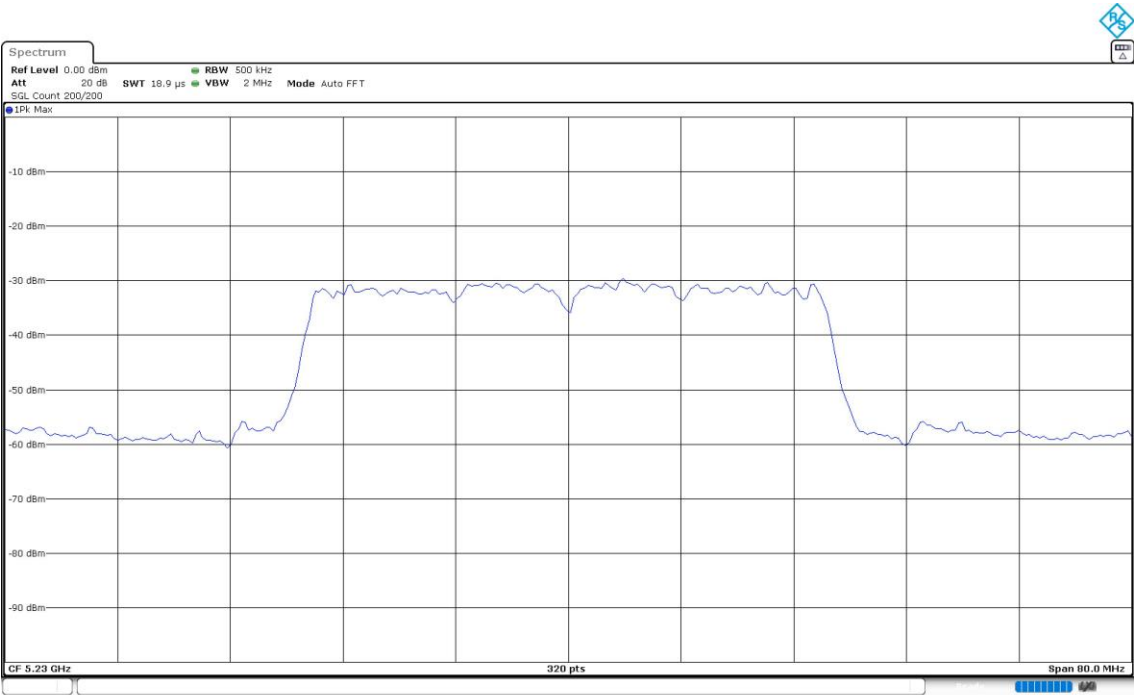
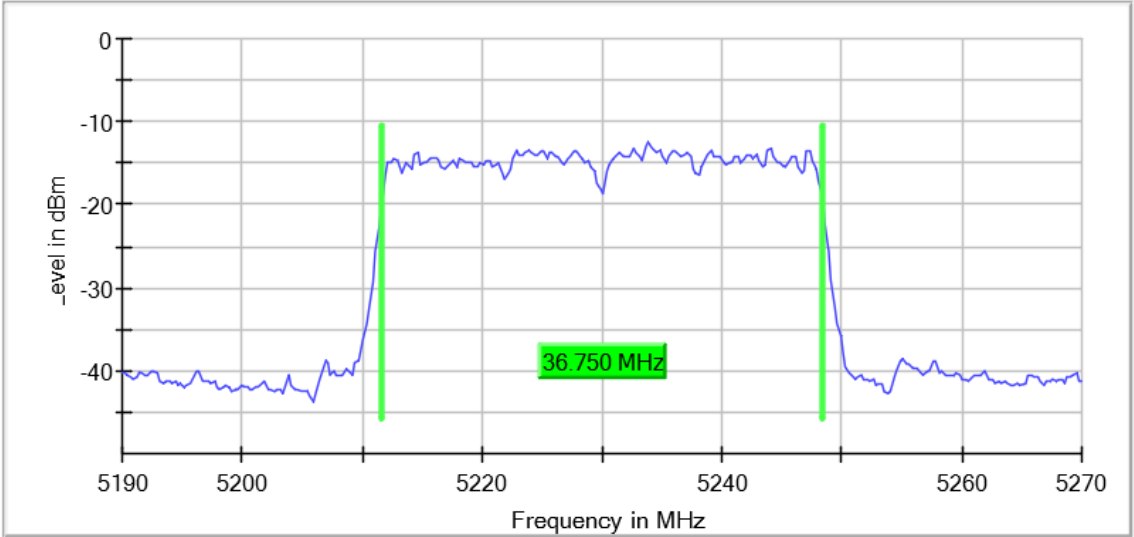
99 % Bandwidth



Operation Band MHz = [5150, 5250] Active Port = 1+2
Frequency MHz = 5230.00000 Modulation = 802.11ac VHT40 (OFDM MCS0)

Images:

99 % Bandwidth



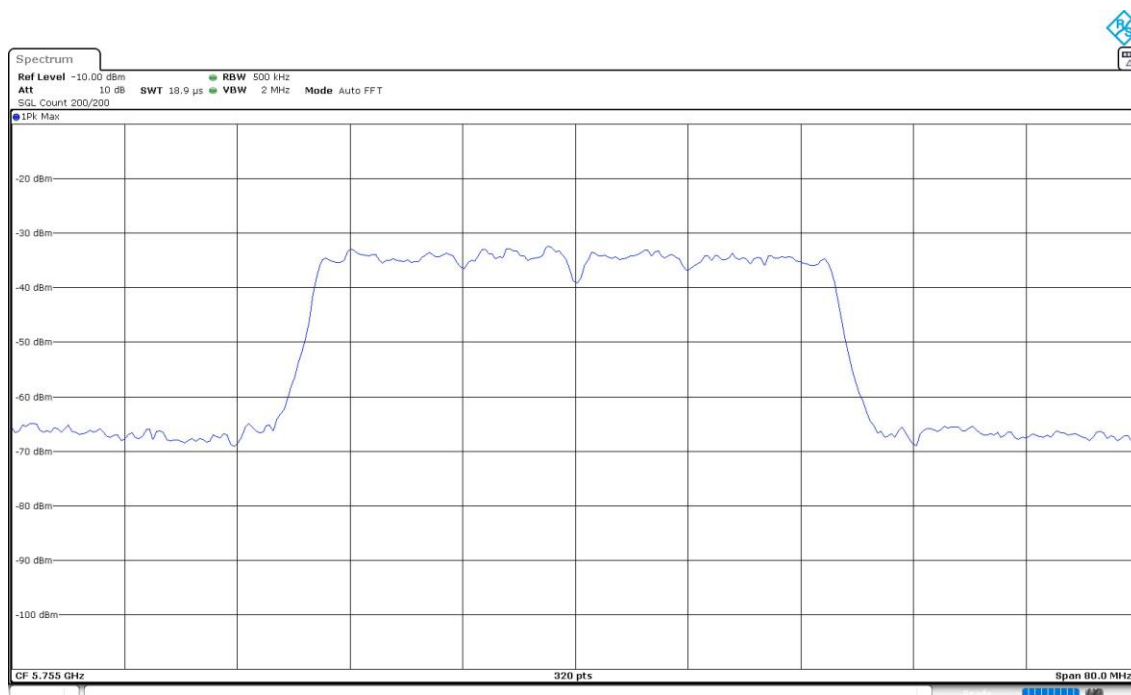
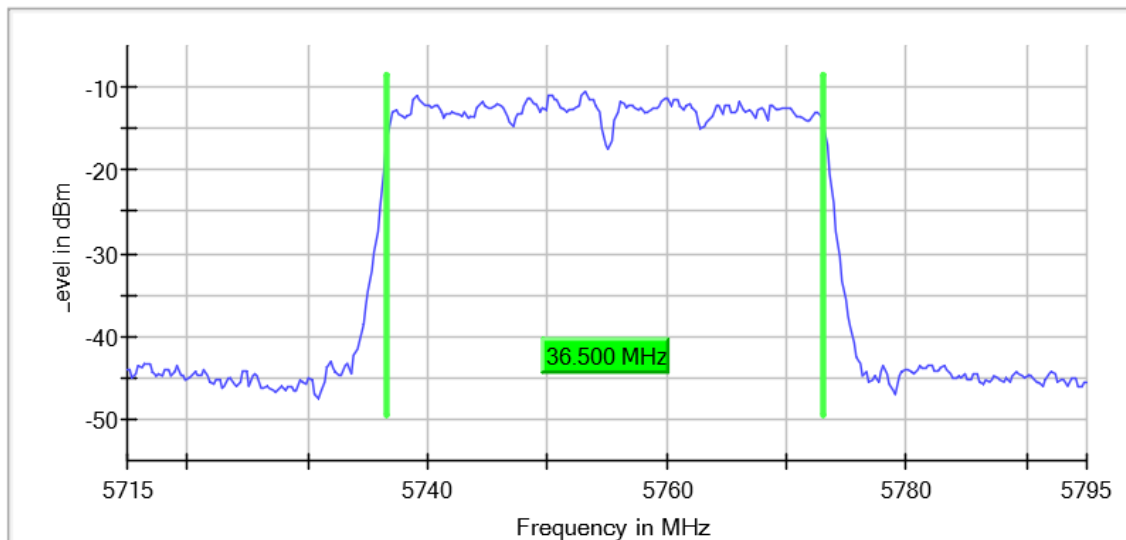
Operation Band MHz = [5725, 5850] Active Port = 1+2

Frequency MHz = 5755.00000

Modulation = 802.11ac VHT40 (OFDM MCS0)

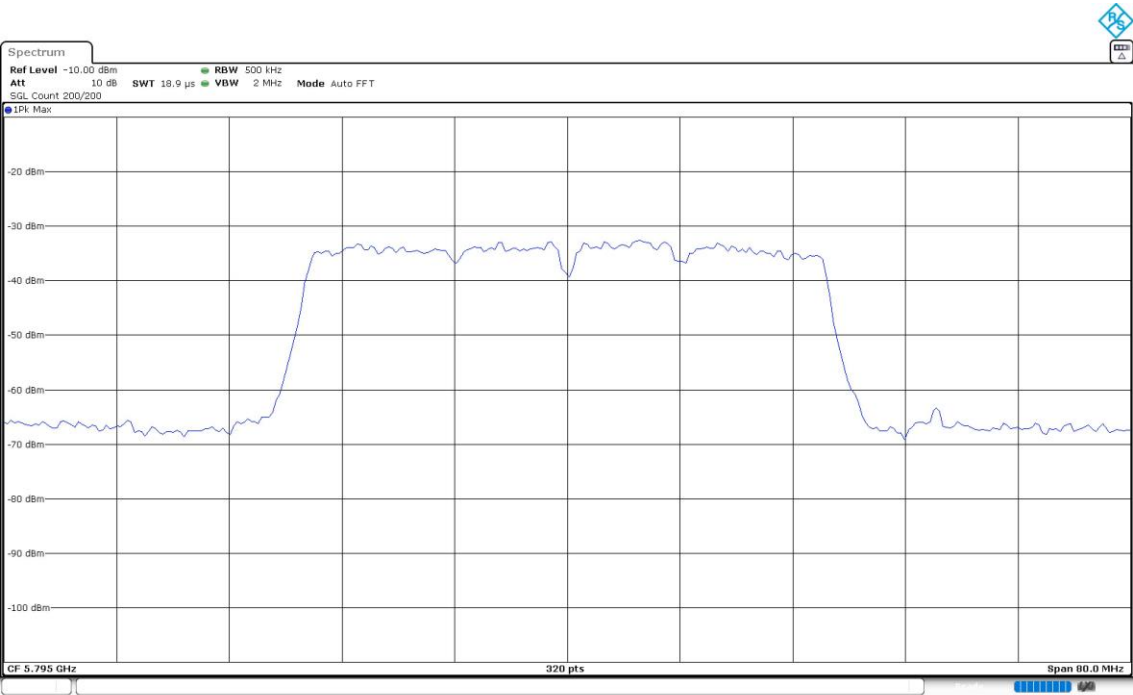
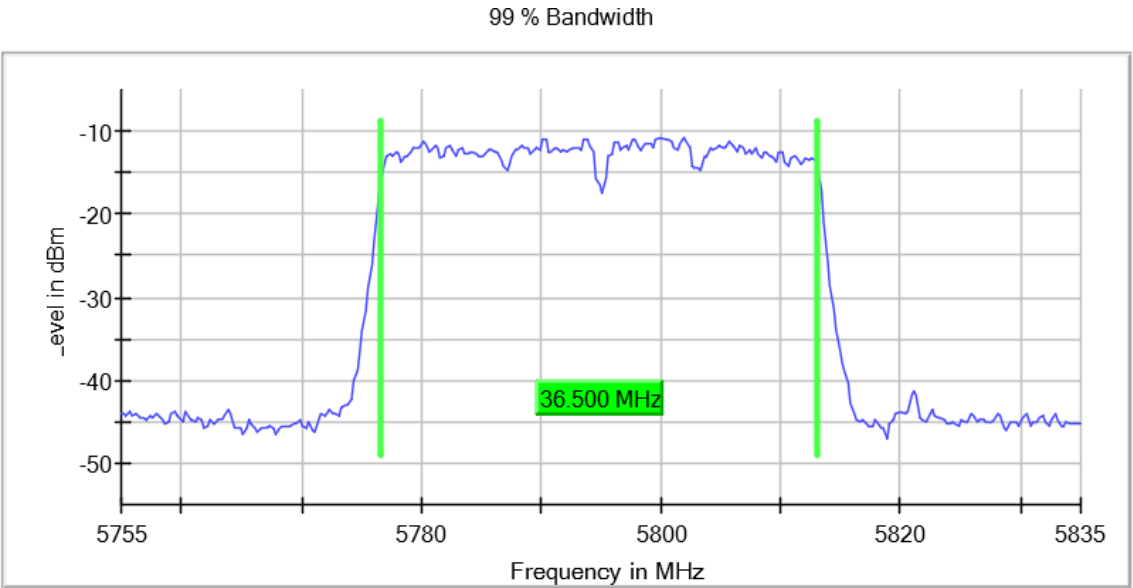
Images:

99 % Bandwidth



Operation Band MHz = [5725, 5850] Active Port = 1+2
Frequency MHz = 5795.00000 Modulation = 802.11ac VHT40 (OFDM MCS0)

Images:



Modulation: 802.11ac VHT80 (OFDM MCS0)

Results

Operation Band (MHz)	Port	Freq (MHz)	Occ Ch BW (MHz)
[5150, 5250]	1	5210.00000	76.000
[5725, 5850]	2	5775.00000	76.000
[5150, 5250]	1+2	5210.00000	76.000
[5725, 5850]		5775.00000	76.000

Verdict

Pass

Attachments

Operation Band MHz = [5150, 5250] Active Port = 1
Frequency MHz = 5210.00000 Modulation = 802.11ac VHT80 (OFDM MCS0)

Images:

