Report on the FCC and IC Testing of:
Frontier Smart Technologies Limited

Minuet 2 Module (FS5352) and Minuet 2 Voice Reference Platform (FS6626)

In accordance with FCC 47 CFR Part 15E, ISEDC RSS-247 and ISEDC RSS-GEN

Prepared for: Frontier Smart Technologies Limited
Ashwell Point
Babraham Road,
Sawston,
Cambridge,
CB22 3LJ
UNITED KINGDOM

Add value.
Inspire trust.

FCC ID: YYX-FS5352 IC: 11458A-FS5352

COMMERCIAL-IN-CONFIDENCE

Document Number: 75946124-09 | Issue: 02

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Matthew Russell	RF Team Leader	Authorised Signatory	25 September 2019

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15E, ISEDC RSS-247 and ISEDC RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
George Porter	Test Engineer	Testing	25 September 2019
Matthew Dawkins	Test Engineer	Testing	25 September 2019
Connor Lee	Test Engineer	Testing	25 September 2019
Graeme Lawler	Test Engineer	Testing	25 September 2019
Daniel Bishop	Test Engineer	Testing	25 September 2019

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

ISEDC Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15E: 2018, ISEDC RSS-247: Issue 2 (2017-02) and ISEDC RSS-GEN: Issue 5 (2018-04) for the tests detailed in section 1.3.

TÜV SÜD
is a trading name of TUV SUD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TUV SUD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuv-sud.co.uk

TÜV SÜD
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom

Contents

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	13 September 2019
2	To amend a typographical error	25 September 2019

Table 1

1.2 Introduction

Applicant	Frontier Smart Technologies Limited
Manufacturer	Frontier Smart Technologies Limited
Model Number(s)	Minuet 2 Module FS5352 Minuet 2 Voice Reference Platform FS6626
Serial Number(s)	RAD113219 - Minuet 2 Module (FS5352) FCC Radiated Test Sample RAD113255 - Minuet 2 Module (FS5352) Conducted Test Sample RAD113528 - Minuet 2 Voice Reference Platform (FS6626), ETSI receiver blocking test sample RAD113257 - Minuet 2 Module (FS5352) Blocking Test Sample (plugged on to Minuet 2 Voice Reference Platform RAD113528)
Hardware Version(s)	Minuet 2 Module: Rev4 Minuet 2 Voice Reference Platform: ES1
Software Version(s)	NS2
Number of Samples Tested	4
Test Specification/Issue/Date	FCC 47 CFR Part 15E: 2018 ISEDC RSS-247: Issue 2 (2017-02) ISEDC RSS-GEN: Issue 5 (2018-04)
Order Number Date	FS190532 22-May-2019
Date of Receipt of EUT	11-June-2019
Start of Test	06-June-2019
Finish of Test	10-August-2019
Name of Engineer(s)	George Porter, Matthew Dawkins, Connor Lee, Graeme Lawler and Daniel Bishop
Related Document(s)	ANSI C63.10 (2013) KDB 662911 D01 v02r02 KDB 905462 D02 v02 KDB 789033 D02 v02r01

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15E, ISEDC RSS-247 and ISEDC RSS-GEN is shown below.

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15E	RSS-247	RSS-GEN			
Configuration and Mode: 5 GHz WLAN - 802.11a						
2.2	15.407 (a)	6.2	-	Maximum Conducted Output Power	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.3	15.407 (a)	6.2	-	Maximum Conducted Power Spectral Density	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.4	15.407 (a)(e)	6.2	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2013)
2.5	15.407 (b)	6.2	-	Authorised Band Edges	Pass	ANSI C63.10 (2013)
2.6	15.205	-	8.10	Restricted Band Edges	Pass	ANSI C63.10 (2013)
wConfiguration and Mode: 5 GHz WLAN - 802.11n 20 MHz Bandwidth						
2.2	15.407 (a)	6.2	-	Maximum Conducted Output Power	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.3	15.407 (a)	6.2	-	Maximum Conducted Power Spectral Density	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.4	15.407 (a)(e)	6.2	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2013)
2.5	15.407 (b)	6.2	-	Authorised Band Edges	Pass	ANSI C63.10 (2013)
2.6	15.205	-	8.10	Restricted Band Edges	Pass	ANSI C63.10 (2013)

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15E	RSS-247	RSS-GEN			
Configuration and Mode: 5 GHz WLAN - 802.11n 40 MHz Bandwidth						
2.2	15.407 (a)	6.2	-	Maximum Conducted Output Power	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.3	15.407 (a)	6.2	-	Maximum Conducted Power Spectral Density	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.4	15.407 (a)(e)	6.2	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2013)
2.5	15.407 (b)	6.2	-	Authorised Band Edges	Pass	ANSI C63.10 (2013)
2.6	15.205	-	8.10	Restricted Band Edges	Pass	ANSI C63.10 (2013)
Configuration and Mode: 5 GHz WLAN - 802.11ac 20 MHz Bandwidth						
2.1	15.207	-	8.8	AC Power Line Conducted Emissions	Pass	ANSI C63.10 (2013)
2.2	15.407 (a)	6.2	-	Maximum Conducted Output Power	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.3	15.407 (a)	6.2	-	Maximum Conducted Power Spectral Density	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.4	15.407 (a)(e)	6.2	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2013)
2.7	15.407 (b) and 15.205	6.2	6.13	Spurious Radiated Emissions	Pass	ANSI C63.10 (2013)
Configuration and Mode: 5 GHz WLAN - 802.11ac 40 MHz Bandwidth						
2.2	15.407 (a)	6.2	-	Maximum Conducted Output Power	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.3	15.407 (a)	6.2	-	Maximum Conducted Power Spectral Density	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.4	15.407 (a)(e)	6.2	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2013)

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15E	RSS-247	RSS-GEN			
Configuration and Mode: 5 GHz WLAN - 802.11ac 80 MHz Bandwidth						
2.2	15.407 (a)	6.2	-	Maximum Conducted Output Power	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.3	15.407 (a)	6.2	-	Maximum Conducted Power Spectral Density	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.4	15.407 (a)(e)	6.2	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2013)
2.5	15.407 (b)	6.2	-	Authorised Band Edges	Pass	ANSI C63.10 (2013)
2.6	15.205	-	8.10	Restricted Band Edges	Pass	ANSI C63.10 (2013)
2.7	15.407(h)(2)(iii)(iv)	6.3.2 (c)(d)(e)	-	Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Pass	KDB 905462 D02

Table 2

1.4 Application Form

Equipment Description

Technical Description: *(Please provide a brief description of the intended use of the equipment)*	Minuet 2 is a module, which when installed in a consumer audio product enables high-quality audio streaming over Wi-Fi, Bluetooth, Ethernet and can be activated via voice commands. Where appropriate the Minuet 2 module is tested in the Minuet 2 Voice Reference Platform.
Manufacturer:	Frontier Smart Technologies Limited
Model:	Minuet 2 module (FS5352)
Part Number:	Minuet 2 module: HA-FS5352-xxxxxx (where xxxxxxx denotes the customer variant e.g. HA-FS5352-000001)
Hardware Version:	Minuet 2 module: Rev4
Software Version:	NS2
FCC ID (if applicable)	YYX-FS5352
IC ID (if applicable)	11458A-FS5352

Intentional Radiators

Technology	Bluetooth	WLAN 2.4GHz	WLAN 5GHz
Frequency Band (MHz)	2400-2483.5	2402-2482	5150-5350, 5470-5825
Conducted Declared Output Power (dBm)	6.5	16.5	16.5
Antenna Gain (dBi)	2.3	2.3	2.2 (5150-5250) 3.5 (5250-5350 MHz) 4.6 (5470-5725 MHz) 3.1 (5725-5825 MHz)
Supported Bandwidth(s) (MHz)	1, 2	20	20,40, 80
Modulation Scheme(s)	GFSK, DQPSK, 8-DPSK	BPSK, QPSK, 16-QAM, 64-QAM	BPSK, QPSK, 16-QAM, 64-QAM
ITU Emission Designator	1M00D, 2M00D	20M00D	20M00D, 40M00D, 80M00D
Bottom Frequency (MHz)	2400	2412	5180
Middle Frequency (MHz)	2441	2437	5500
Top Frequency (MHz)	2480	2472	5825

Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	5825 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	2402 MHz
Class A Digital Device (Use in commercial, industrial or business environment) ☑ Class B Digital Device (Use in residential environment only) ☑	

AC Power Source

AC supply frequency: 50 or 60 (Hz)	
100 - 240 V	Max current: 0.8 A
Single Phase ☑ Three Phase ☐	

DC Power Source

Nominal voltage: 5 V
Extreme upper voltage: 5.25 V
Extreme lower voltage: 4.75 V
Max current: 2 A

Battery Power Source

Voltage: 11.1 V
End-point voltage: 8.1 V *(Point at which the battery will terminate)*
Alkaline ☐ Leclanche ☐ Lithium ☐ Nickel Cadmium ☐ Lead Acid* ☐ **(Vehicle regulated)*
Other ☑ Please detail: Lithium-ion Polymer

Charging

Can the EUT transmit whilst being charged	Yes ☑ No ☐

Temperature

Minimum temperature: 0 °C	Maximum temperature: 70 °C

Antenna Characteristics

Antenna connector ☑ State impedance 50 Ohm
Temporary antenna connector ☐ State impedance N/A Ohm
Integral antenna ☐ Type N/A State impedance N/A Ohm
External antenna ☑ Type PCB antenna State impedance 50 Ohm

Ancillaries (if applicable)

Manufacturer: Southstar	Part Number: N12-2128-R0A
Model: SW700M（SW750M)	Country of Origin: China

I hereby declare that the information supplied is correct and complete.

Name: Abdul Wahed Dewan
Position held: Principal RF Engineer
Date: 29/08/2019

1.5 Product Information

1.5.1 Technical Description

Minuet 2 is a module, which when installed in a consumer audio product enables high-quality audio streaming over Wi-Fi, Bluetooth and Ethernet and can be activated via voice commands. Where appropriate the Minuet 2 module is tested in the Minuet 2 Voice Reference Platform.

1.5.2 Test Setup Diagram(s)

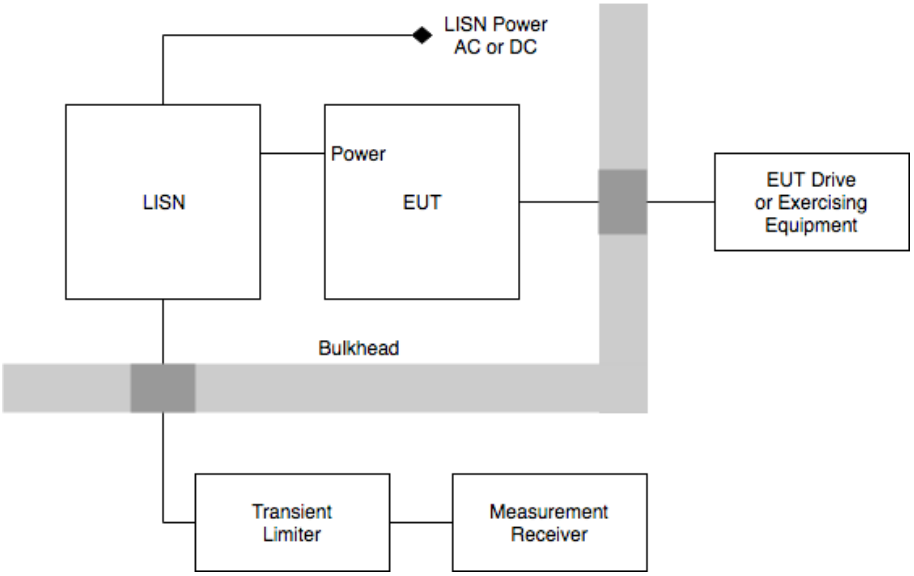

Figure 1 - AC Line Conducted Emissions Test Setup Diagram

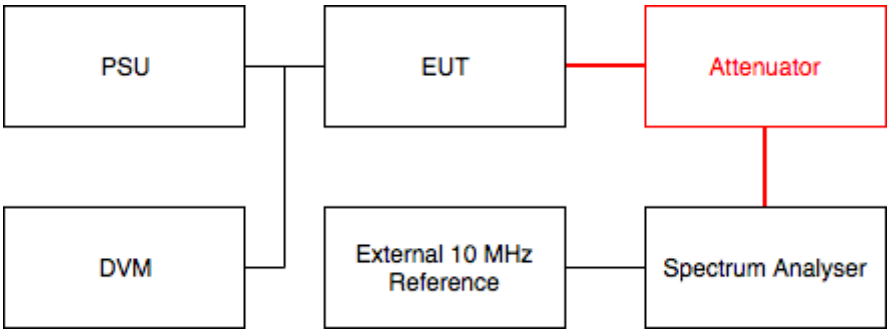

Figure 2 - Test Setup Diagram for Conducted Tests

All other test were performed on a bench in a laboratory environment. Only peripherals that were necessary to operate the EUT in the required modes of operation for testing were connected as it was considered for conducted measurements at the RF antenna port that such cabling and peripherals did not impact the test results.

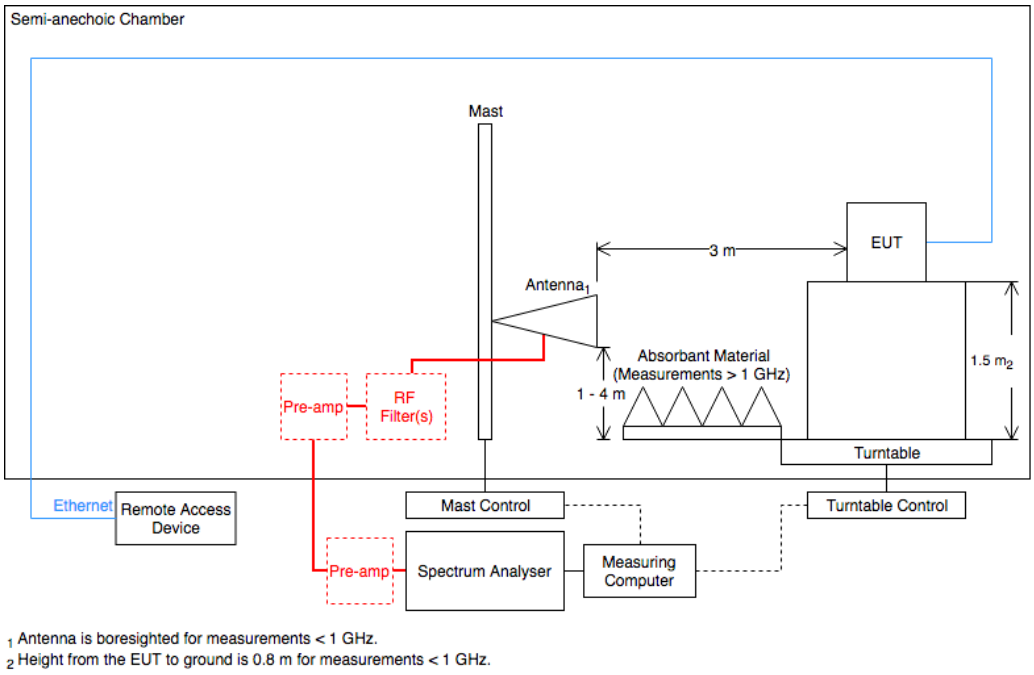

Figure 3 - Test Setup Diagram for Radiated Emissions

1.5.1 EUT Configuration and Rationale for Radiated Spurious Emissions

The EUT was placed on the non-conducting platform in a manner typical of a normal installation. Pre-scans were performed with the EUT orientated in X, Y and Z planes with reference to the ground plane.

Photographs of the EUT test setup can be found in section 3.1 of this report.

Ports on the EUT were terminated with loads as described in ANSI C63.4, clause 6.2.4.

1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: RAD113219			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: RAD113255			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number RAD113528			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number RAD113257			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.8 Test Location

TÜV SÜD conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 5 GHz WLAN - 802.11a		
AC Power Line Conducted Emissions	Graeme Lawler	UKAS
Maximum Conducted Output Power	George Porter	UKAS
Maximum Conducted Power Spectral Density	George Porter	UKAS
Emission Bandwidth	George Porter	UKAS
Authorised Band Edges	Matthew Dawkins and Connor Lee	UKAS
Restricted Band Edges	Connor Lee	UKAS
Configuration and Mode: 5 GHz WLAN - 802.11n 20 MHz Bandwidth		
Maximum Conducted Output Power	George Porter	UKAS
Maximum Conducted Power Spectral Density	George Porter	UKAS
Emission Bandwidth	George Porter	UKAS
Authorised Band Edges	Matthew Dawkins and Connor Lee	UKAS
Restricted Band Edges	Connor Lee	UKAS
Spurious Radiated Emissions	Graeme Lawler	UKAS
Configuration and Mode: 5 GHz WLAN - 802.11n 40 MHz Bandwidth		
Maximum Conducted Output Power	George Porter	UKAS
Maximum Conducted Power Spectral Density	George Porter	UKAS
Emission Bandwidth	George Porter	UKAS
Authorised Band Edges	Matthew Dawkins, Cristian Onaca and Connor Lee	UKAS
Restricted Band Edges	Cristian Onaca and Connor Lee	UKAS
Configuration and Mode: 5 GHz WLAN - 802.11ac 80 MHz Bandwidth		
Maximum Conducted Output Power	George Porter	UKAS
Maximum Conducted Power Spectral Density	George Porter	UKAS
Emission Bandwidth	George Porter	UKAS
Authorised Band Edges	Matthew Dawkins, Cristian Onaca and Connor Lee	UKAS
Restricted Band Edges	Cristian Onaca and Connor Lee	UKAS
Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Daniel Bishop	UKAS

Table 4

Office Address:

Octagon House
Concorde Way
Segensworth North
Fareham, Hampshire
PO15 5RL
United Kingdom

2 Test Details

2.1 AC Power Line Conducted Emissions

2.1.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.207
ISEDC RSS-GEN, Clause 8.8

2.1.2 Equipment Under Test and Modification State

Minuet 2 Module (FS5352), S/N: RAD113219 - Modification State 0

2.1.3 Date of Test

21-July-2019

2.1.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.2.

The EUT was setup according to ANSI C63.4, clause 5.2.

A Line Impedance Stabilisation Network (LISN) is directly bonded to the ground-plane with a resistance of less than 2.5 mΩ. The EUT is located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 metres.

Interconnecting cables that hang closer than 40 cm to the ground plane were folded back and forth in the centre forming a bundle 30 cm to 40 cm long. Input/output (I/O) cables that were not connected to a peripheral were bundled in the centre. The end of the cable was terminated. The overall length was less than 1 m.

The configuration of the EUT was manipulated to increase the level of emissions as follows; For EUT's with multiple connectors of the same type, additional interconnecting cables were connected, and pre-scans performed to determine whether the level of the emissions were increased by >2 dB. The EUT was configured to give the highest level of emissions within reason of a typical installation as described by the manufacturer.

2.1.5 Environmental Conditions

Ambient Temperature	17.3 °C
Relative Humidity	76.5 %

2.1.6 Test Results

5 GHz WLAN - 802.11ac 20

Applied supply voltage: 120V
Applied supply frequency: 60 Hz

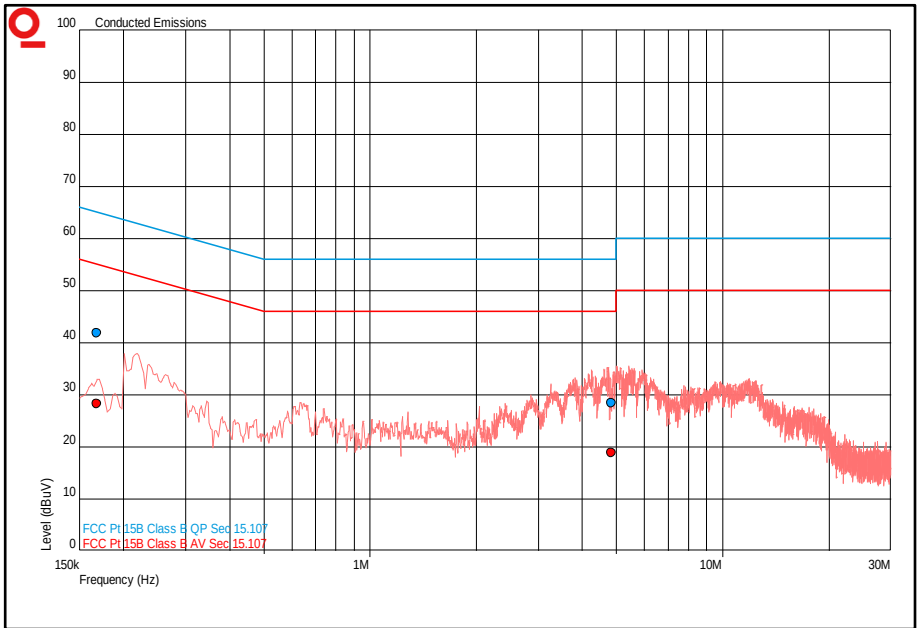

Figure 4- Live Line - 150 kHz to 30 MHz

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.168	41.8	65.1	23.2	28.3	55.1	26.8
4.850	28.4	56.0	27.6	18.9	46.0	27.1

Table 5 - Live Line Emissions Results

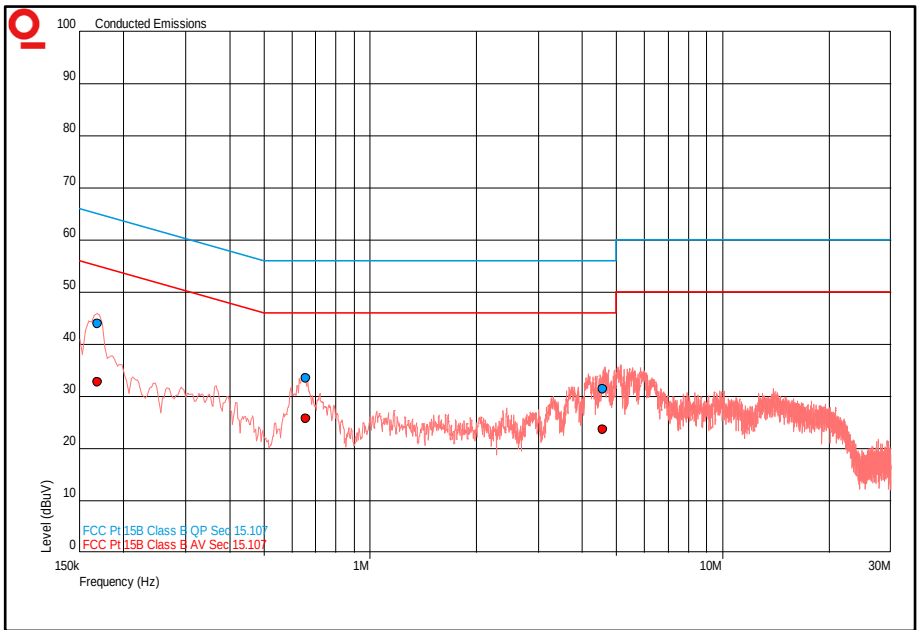

Figure 5- Neutral Line - 150 kHz to 30 MHz

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.169	43.9	65.0	21.1	32.8	55.0	22.2
0.658	33.6	56.0	22.4	25.7	46.0	20.3
4.587	31.5	56.0	24.5	23.7	46.0	22.3

Table 6 - Neutral Line Emissions Results

FCC 47 CFR Part 15, Limit Clause 15.207 and ISEDC RSS-GEN, Limit Clause 8.8

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

Table 7

*Decreases with the logarithm of the frequency.

2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Transient Limiter	Hewlett Packard	11947A	15	12	26-Jul-2019
LISN	Rohde & Schwarz	ESH3-Z5	1390	12	20-Nov-2019
Screened Room (5)	Rainford	Rainford	1545	36	23-Jan-2021
Hygromer	Rotronic	A1	2677	12	20-Feb-2020
Digital Multimeter	Iso-tech	IDM-101	2895	12	04-Oct-2019
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	17-Dec-2019

Table 8

2.2 Maximum Conducted Output Power

2.2.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.407 (a)
ISEDC RSS-247, Clause 6.2
ISEDC RSS-GEN, Clause 6.12

2.2.2 Equipment Under Test and Modification State

Minuet 2 Module (FS5352), S/N: RAD113255 - Modification State 0

2.2.3 Date of Test

24-June-2019 to 23-July-2019

2.2.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 12.3.3.2 and KDB 789033 D02 using method PM-G.

The gated power meter was used for method PM-G. The EUT was measured only while transmitting and hence no duty cycle correction was necessary.

MIMO output port summing was performed in accordance with KDB 662911 D01.

2.2.5 Environmental Conditions

Ambient Temperature	22.9 – 23.7 °C
Relative Humidity	63.7 - 70.3 %

2.2.6 Test Results

U-NII-1

5 GHz WLAN - 802.11a

Data Rate: 54 Mbps

The duty cycle of the EUT was measured as 91.63%

Port	5180 MHz		5220 MHz		5240 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	15.23	17.43	14.68	16.88	14.71	16.91
1	15.61	17.81	15.43	17.63	15.42	17.62

Table 9 - SISO

5 GHz WLAN - 802.11n 20 MHz Bandwidth

Modulation Coding Scheme: MCS5

Port	5180 MHz		5220 MHz		5240 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	15.16	17.36	14.85	17.05	14.91	17.11
1	15.92	18.12	15.52	17.72	15.57	17.77

Table 10 - SISO

Modulation Coding Scheme: MCS0

Port	5180 MHz		5220 MHz		5240 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	11.84	-	11.72	-	11.72	-
1	11.76	-	11.63	-	11.51	-
Total Power	14.81	17.01	14.69	16.89	14.63	16.83

Table 11 – MIMO CDD

5 GHz WLAN - 802.11n 40 MHz Bandwidth

Modulation Coding Scheme: MCS6

Port	5190 MHz		5230 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.54	16.74	15.20	17.40
1	15.70	17.90	15.58	17.78

Table 12 - SISO

Modulation Coding Scheme: MCS0

Port	5190 MHz		5230 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.87	-	14.72	-
1	14.58	-	14.49	-
Total Power	17.74	19.94	17.62	19.82

Table 13 – MIMO CDD

5 GHz WLAN - 802.11ac 20 MHz Bandwidth

Modulation Coding Scheme: MCS7

Port	5180 MHz		5220 MHz		5240 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	15.11	17.31	15.02	17.22	15.03	17.23
1	15.71	17.91	15.58	17.78	15.76	17.96

Table 14 - SISO

Modulation Coding Scheme: MCS0

Port	5180 MHz		5220 MHz		5240 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	11.83	-	11.78	-	11.75	-
1	11.70	-	11.65	-	11.58	-
Total Power	14.77	16.97	14.73	16.93	14.67	16.87

Table 15 – MIMO CDD

5 GHz WLAN - 802.11ac 40 MHz Bandwidth

Modulation Coding Scheme: MCS9

Port	5190 MHz		5230 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	15.12	17.32	14.97	17.17
1	15.42	17.62	15.60	17.80

Table 16 - SISO

Modulation Coding Scheme: MCS0

Port	5190 MHz		5230 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.88	-	14.82	-
1	14.57	-	14.48	-
Total Power	17.74	19.94	17.67	19.87

Table 17 – MIMO CDD

5 GHz WLAN - 802.11ac 80 MHz Bandwidth

Modulation Coding Scheme: MCS5

Port	5210 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)
0	8.71	10.91
1	9.45	11.65

Table 18 - SISO

Modulation Coding Scheme: MCS0

Port	5180 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)
0	8.47	-
1	8.27	-
Total Power	11.38	13.58

Table 19 – MIMO CDD

U-NII-2A

5 GHz WLAN - 802.11a

Data Rate: 54 Mbps

Port	5260 MHz		5300 MHz		5320 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.71	18.21	14.31	17.81	14.34	17.84
1	15.49	18.99	14.96	18.46	14.98	18.48

Table 20 - SISO

5 GHz WLAN - 802.11n 20 MHz Bandwidth

Modulation Coding Scheme: MCS5

Port	5260 MHz		5300 MHz		5320 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.90	18.40	14.52	18.02	14.54	18.04
1	15.64	19.14	15.14	18.64	15.09	18.59

Table 21 - SISO

Modulation Coding Scheme: MCS0

Port	5260 MHz		5300 MHz		5320 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.86	-	14.56	-	14.57	-
1	14.47	-	14.15	-	14.20	-
Total Power	17.68	21.18	17.37	20.87	17.40	20.90

Table 22 – MIMO CDD

5 GHz WLAN - 802.11n 40 MHz Bandwidth

Modulation Coding Scheme: MCS6

Port	5270 MHz		5310 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.95	18.45	14.79	18.29
1	15.46	18.96	15.12	18.62

Table 23 - SISO

Modulation Coding Scheme: MCS0

Port	5270 MHz		5310 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.72	-	14.48	-
1	14.39	-	14.07	-
Total Power	17.57	21.07	17.29	20.79

Table 24 – MIMO CDD

5 GHz WLAN - 802.11ac 20 MHz Bandwidth

Modulation Coding Scheme: MCS7

Port	5260 MHz		5300 MHz		5320 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.92	18.42	14.65	18.15	14.54	18.04
1	15.58	19.08	15.08	18.58	15.12	18.62

Table 25 - SISO

Modulation Coding Scheme: MCS0

Port	5260 MHz		5300 MHz		5320 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.79	-	14.54	-	14.58	-
1	14.54	-	14.16	-	14.21	-
Total Power	17.68	21.18	17.36	20.86	17.41	20.91

Table 26 – MIMO CDD

5 GHz WLAN - 802.11ac 40 MHz Bandwidth

Modulation Coding Scheme: MCS9

Port	5270 MHz		5310 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.92	18.42	14.62	18.12
1	15.46	18.96	15.12	18.62

Table 27 - SISO

Modulation Coding Scheme: MCS0

Port	5270 MHz		5310 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.73	-	14.41	-
1	14.49	-	14.14	-
Total Power	17.62	21.12	17.29	20.79

Table 28 – MIMO CDD

5 GHz WLAN - 802.11ac 80 MHz Bandwidth

Modulation Coding Scheme: MCS5

Port	5290 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)
0	8.19	11.69
1	8.95	12.45

Table 29 - SISO

Modulation Coding Scheme: MCS0

Port	5290 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)
0	8.16	-
1	7.87	-
Total Power	11.03	14.53

Table 30 – MIMO CDD

U-NII-2C

5 GHz WLAN - 802.11a

Data Rate: 54 Mbps

Port	5500 MHz		5600 MHz		5700 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.60	19.20	14.06	18.66	13.19	17.79
1	14.40	19.00	14.03	18.63	13.62	18.22

Table 31 - SISO

5 GHz WLAN - 802.11n 20 MHz Bandwidth

Modulation Coding Scheme: MCS5

Port	5500 MHz		5600 MHz		5700 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.68	19.28	14.19	18.79	13.59	18.19
1	14.59	19.19	14.17	18.77	13.80	18.40

Table 32 - SISO

Modulation Coding Scheme: MCS0

Port	5500 MHz		5600 MHz		5700 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.40	-	13.93	-	13.38	-
1	13.79	-	13.44	-	12.95	-
Total Power	17.12	21.72	16.71	21.31	16.19	20.79

Table 33 – MIMO CDD

5 GHz WLAN - 802.11n 40 MHz Bandwidth

Modulation Coding Scheme: MCS6

Port	5510 MHz		5590 MHz		5670 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.52	19.12	14.31	18.91	13.68	18.28
1	14.36	18.96	14.34	18.94	13.77	18.37

Table 34 - SISO

Modulation Coding Scheme: MCS0

Port	5510 MHz		5590 MHz		5670 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.34	-	14.17		13.45	
1	13.58	-	13.51		13.05	
Total Power	16.99	21.59	16.86	21.46	16.26	20.86

Table 35 – MIMO CDD

5 GHz WLAN - 802.11ac 20 MHz Bandwidth

Modulation Coding Scheme: MCS7

Port	5500 MHz		5600 MHz		5700 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.77	19.37	14.21	18.81	13.59	18.19
1	14.69	19.29	14.24	18.84	13.69	18.29

Table 36 - SISO

Modulation Coding Scheme: MCS0

Port	5500 MHz		5600 MHz		5700 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.56	-	14.03	-	13.40	-
1	13.80	-	13.50	-	12.92	-
Total Power	17.21	21.81	16.78	21.38	16.18	20.78

Table 37 – MIMO CDD

5 GHz WLAN - 802.11ac 40 MHz Bandwidth

Modulation Coding Scheme: MCS9

Port	5510 MHz		5590 MHz		5670 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.50	19.10	14.36	18.96	13.76	18.36
1	14.47	19.07	14.39	18.99	13.92	18.52

Table 38 - SISO

Modulation Coding Scheme: MCS0

Port	5510 MHz		5590 MHz		5670 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	14.34	-	14.17	-	13.54	-
1	13.77	-	13.58	-	13.12	-
Total Power	17.07	21.67	16.90	21.50	16.35	20.95

Table 39 – MIMO CDD

5 GHz WLAN - 802.11ac 80 MHz Bandwidth

Modulation Coding Scheme: MCS5

Port	5530 MHz		5610 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	7.89	12.49	7.75	12.35
1	7.97	12.57	7.89	12.49

Table 40 - SISO

Modulation Coding Scheme: MCS0

Port	5530 MHz		5610 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	7.75	-	7.29	-
1	7.01	-	6.93	-
Total Power	10.41	15.01	10.13	14.73

Table 41 – MIMO CDD

U-NII-3

5 GHz WLAN - 802.11a

Data Rate: 54 Mbps

Port	5745 MHz		5785 MHz		5825 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	15.24	18.34	13.22	16.32	12.83	15.93
1	13.62	16.72	13.47	16.57	13.27	16.37

Table 42 - SISO

5 GHz WLAN - 802.11n 20 MHz Bandwidth

Modulation Coding Scheme: MCS5

Port	5745 MHz		5785 MHz		5825 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	13.58	16.68	13.38	16.48	12.97	16.07
1	13.80	16.90	13.64	16.74	13.27	16.37

Table 43 - SISO

Modulation Coding Scheme: MCS0

Port	5745 MHz		5785 MHz		5825 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	13.34	-	13.21	-	12.79	-
1	12.82	-	12.74	-	12.51	-
Total Power	16.10	19.20	16.00	19.10	15.66	18.76

Table 44 – MIMO CDD

5 GHz WLAN - 802.11n 40 MHz Bandwidth

Modulation Coding Scheme: MCS6

Port	5755 MHz		5795 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	13.37	16.47	13.15	16.25
1	13.62	16.72	13.54	16.64

Table 45 - SISO

Modulation Coding Scheme: MCS0

Port	5755 MHz		5795 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	13.10	-	13.07	-
1	12.82	-	12.76	-
Total Power	15.97	19.07	15.93	19.03

Table 46 – MIMO CDD

5 GHz WLAN - 802.11ac 20 MHz Bandwidth

Modulation Coding Scheme: MCS7

Port	5745 MHz		5785 MHz		5825 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	13.55	16.65	13.37	16.47	12.98	16.08
1	13.78	16.88	13.72	16.82	13.33	16.43

Table 47 - SISO

Modulation Coding Scheme: MCS0

Port	5745 MHz		5785 MHz		5825 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	13.39	-	13.24	-	12.78	-
1	12.81	-	12.74	-	12.52	-
Total Power	16.12	19.22	16.01	19.11	15.66	18.76

Table 48 – MIMO CDD

5 GHz WLAN - 802.11ac 40 MHz Bandwidth

Modulation Coding Scheme: MCS9

Port	5755 MHz		5795 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	13.48	16.58	13.33	16.43
1	13.71	16.81	13.55	16.65

Table 49 - SISO

Modulation Coding Scheme: MCS0

Port	5755 MHz		5795 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)	Conducted Power (dBm)	EIRP Power (dBm)
0	13.25	-	13.04	-
1	12.80	-	12.68	-
Total Power	16.04	19.14	15.87	18.97

Table 50 – MIMO CDD

5 GHz WLAN - 802.11ac 80 MHz Bandwidth

Modulation Coding Scheme: MCS5

Port	5775 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)
0	6.98	10.08
1	7.23	10.33

Table 51 - SISO

Modulation Coding Scheme: MCS0

Port	5290 MHz	
	Conducted Power (dBm)	EIRP Power (dBm)
0	6.77	-
1	6.34	-
Total Power	9.57	12.67

Table 52 – MIMO CDD

FCC 47 CFR Part 15E, Limit Clause 15.407(a)

Condition of Operation	Frequency Range (MHz)			
	5150-5250	5250-5350	5470-5725	5725-5850
Max Conducted TX Power	30 dBm (1W) for master device 24 dBm (250 mW) for client device	24 dBm (250 mW) or 11 dBm + 10 Log B, whichever is lower (B = 26 dB emission BW)		30 dBm (1 W)
Max EIRP	4W (36 dBm) with 6 dBi antenna 200 W (53 dBm) for fixed P-t-P application with 23 dBi antenna Additional rule for outdoor operation: Max_EIRP < 125 mW (21 dBm) at any elevation angle > 30° from horizon.	1 W (30 dBm) with 6 dBi antenna		4 W (36 dBm) with 6 dBi antenna. No EIRP limit for fixed P-t-P application (i.e. no antenna gain limit)

Table 53

ISEDC RSS-247, Limit Clause 6.2.1.1, 6.2.2.1, 6.2.3.1 and 6.2.4.1

Device	Frequency Range (MHz)			
	5150-5250	5250-5350	5470-5725	5725-5850
OEM installed in vehicles	30 mW or 1.76 + 10 $\log_{10}$B, dBm (EIRP); whichever is less	30 mW or 1.76 + 10 $\log_{10}$B, dBm (EIRP); whichever is less	-	-
Other	200 mW or 10 + 10$\log_{10}$B dBm (EIRP); whichever is less	250 mW or 11 + 10 $\log_{10}$B); whichever is less 1.0 W or 17 + 10$\log_{10}$B dBm EIRP; whichever is less	250 mW or 11 + 10 $\log_{10}$B); whichever is less 1.0 W or 17 + 10$\log_{10}$B dBm EIRP; whichever is less	1W 4W EIRP

Table 54

2.2.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Power Divider	Weinschel	1506A	603	12	23-Apr-2020
Hygrometer	Rotronic	I-1000	3220	12	13-Sep-2019
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	17-Oct-2019
1 Metre SMA Cable	Rhophase	3PS-1801A-1000-3PS	4101	-	O/P Mon
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	22-Oct-2019
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	15-Oct-2019
PXA Signal Analyser	Keysight Technologies	N9030A	4653	12	06-Feb-2020
EXA	Keysight Technologies	N9010B	4968	24	21-Dec-2019
Cable (18 GHz)	Rosenberger	LU7-071-1000	5097	12	04-Oct-2019
Cable (18GHz SMA 1m)	Rosenberger	LU7-071-1000	5164	12	06-Dec-2019
USB Power Sensor	Boonton	RTP5006	5184	12	12-Dec-2019

Table 55

O/P Mon – Output Monitored using calibrated equipment

2.3 Maximum Conducted Power Spectral Density

2.3.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.407 (a)
ISEDC RSS-247, Clause 6.2
ISEDC RSS-GEN, Clause 6.12

2.3.2 Equipment Under Test and Modification State

Minuet 2 Module (FS5352), S/N: RAD113255 - Modification State 0

2.3.3 Date of Test

24-June-2019 to 23-July-2019

2.3.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 12.5 and KDB 789033 D02 SA-1.

MIMO output port summing was performed in accordance with KDB 662911 D01

2.3.5 Environmental Conditions

Ambient Temperature	22.9 - 23.7 °C
Relative Humidity	63.7 - 70.3 %

2.3.6 Test Results

U-NII-1

5 GHz WLAN - 802.11a

Data Rate: 54 Mbps

Antenna Port	Power Spectral Density (dBm/MHz)					
	5180 MHz		5220 MHz		5240 MHz	
	Conducted	EIRP	Conducted	EIRP	Conducted	EIRP
0	3.72	5.92	3.23	5.43	3.30	5.50
1	3.99	6.19	3.86	6.06	3.79	5.99

Table 56 – SISO

5 GHz WLAN - 802.11n 20 MHz Bandwidth

Modulation Coding Scheme: MCS5

Antenna Port	Power Spectral Density (dBm/MHz)					
	5180 MHz		5220 MHz		5240 MHz	
	Conducted	EIRP	Conducted	EIRP	Conducted	EIRP
0	3.44	5.64	3.12	5.32	3.23	5.43
1	4.31	6.51	3.67	5.87	3.89	6.09

Table 57 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)					
	5180 MHz		5220 MHz		5240 MHz	
	Conducted	EIRP	Conducted	EIRP	Conducted	EIRP
0	1.30	-	1.27	-	1.49	-
1	0.80	-	1.12	-	1.23	-
Total Power	4.07	9.28	4.20	9.41	4.37	9.58

Table 58 – MIMO CDD

5 GHz WLAN - 802.11n 40 MHz Bandwidth

Modulation Coding Scheme: MCS6

Antenna Port	Power Spectral Density (dBm/MHz)			
	5190 MHz		5230 MHz	
	Conducted	EIRP	Conducted	EIRP
0	0.91	3.11	0.79	2.99
1	1.34	3.54	1.29	3.49

Table 59 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)			
	5190 MHz		5230 MHz	
	Conducted	EIRP	Conducted	EIRP
0	0.35	-	0.16	-
1	-0.05	-	-0.05	-
Total Power	3.28	8.49	3.19	8.40

Table 60 – MIMO CDD

5 GHz WLAN - 802.11ac 20 MHz Bandwidth

Modulation Coding Scheme: MCS7

Antenna Port	Power Spectral Density (dBm/MHz)					
	5180 MHz		5220 MHz		5240 MHz	
	Conducted	EIRP	Conducted	EIRP	Conducted	EIRP
0	3.43	5.63	3.30	5.50	3.73	5.93
1	4.20	6.40	3.89	6.09	4.11	6.31

Table 61 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)					
	5180 MHz		5220 MHz		5240 MHz	
	Conducted	EIRP	Conducted	EIRP	Conducted	EIRP
0	0.96	-	1.33	-	1.58	-
1	0.80	-	0.93	-	1.54	-
Total Power	3.89	9.10	4.15	9.36	4.57	9.78

Table 62 – MIMO CDD

5 GHz WLAN - 802.11ac 40 MHz Bandwidth

Modulation Coding Scheme: MCS9

Antenna Port	Power Spectral Density (dBm/MHz)			
	5190 MHz		5230 MHz	
	Conducted	EIRP	Conducted	EIRP
0	0.79	2.99	0.61	2.81
1	1.40	3.60	1.95	4.15

Table 63 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)			
	5190 MHz		5230 MHz	
	Conducted	EIRP	Conducted	EIRP
0	0.25	-	0.21	-
1	0.28	-	0.15	-
Total Power	3.39	8.60	3.31	8.52

Table 64 – MIMO CDD

5 GHz WLAN - 802.11ac 80 MHz Bandwidth

Modulation Coding Scheme: MCS5

Antenna Port	Power Spectral Density (dBm/MHz)	
	5210 MHz	
	Conducted	EIRP
0	8.91	-6.71
1	-7.96	-5.76

Table 65 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)	
	5210 MHz	
	Conducted	EIRP
0	-9.63	-
1	-9.88	-
Total Power	-6.51	-1.30

Table 66 – MIMO CDD

U-NII-2A

5 GHz WLAN - 802.11a

Data Rate: 54 Mbps

Antenna Port	Power Spectral Density (dBm/MHz)		
	5260 MHz	5300 MHz	5320 MHz
	Conducted	Conducted	Conducted
0	3.32	3.66	4.01
1	4.17	4.11	4.27

Table 67 – SISO

5 GHz WLAN - 802.11n 20 MHz Bandwidth

Modulation Coding Scheme: MCS5

Antenna Port	Power Spectral Density (dBm/MHz)		
	5260 MHz	5300 MHz	5320 MHz
	Conducted	Conducted	Conducted
0	3.08	3.68	3.57
1	4.23	4.20	3.96

Table 68 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)		
	5260 MHz	5300 MHz	5320 MHz
	Conducted	Conducted	Conducted
0	3.22	3.54	3.43
1	2.72	2.72	2.80
Total Power	5.99	6.16	6.14

Table 69 – MIMO CDD

5 GHz WLAN - 802.11n 40 MHz Bandwidth

Modulation Coding Scheme: MCS6

Antenna Port	Power Spectral Density (dBm/Mhz)	
	5270 MHz	5310 MHz
	Conducted	Conducted
0	1.24	1.04
1	1.91	1.74

Table 70 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)	
	5270 MHz	5310 MHz
	Conducted	Conducted
0	0.74	0.66
1	0.26	0.18
Total Power	3.64	3.56

Table 71 – MIMO CDD

5 GHz WLAN - 802.11ac 20 MHz Bandwidth

Modulation Coding Scheme: MCS7

Antenna Port	Power Spectral Density (dBm/MHz)		
	5260 MHz	5300 MHz	5320 MHz
	Conducted	Conducted	Conducted
0	3.69	3.45	3.89
1	4.05	4.29	4.13

Table 72 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)		
	5260 MHz	5300 MHz	5320 MHz
	Conducted	Conducted	Conducted
0	3.18	3.23	3.41
1	2.84	2.88	2.94
Total Power	6.02	6.07	6.19

Table 73 – MIMO CDD

5 GHz WLAN - 802.11ac 40 MHz Bandwidth

Modulation Coding Scheme: MCS9

Antenna Port	Power Spectral Density (dBm/MHz)	
	5270 MHz	5310 MHz
	Conducted	Conducted
0	0.71	0.93
1	1.52	3.28

Table 74 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)	
	5270 MHz	5310 MHz
	Conducted	Conducted
0	0.72	0.43
1	-0.08	0.21
Total Power	3.47	3.45

Table 75 – MIMO CDD

5 GHz WLAN - 802.11ac 80 MHz Bandwidth

Modulation Coding Scheme: MCS5

Antenna Port	Power Spectral Density (dBm/MHz)
	5210 MHz
	Conducted Power (dBm/MHz)
0	-8.85
1	-7.88

Table 76 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)
	5210 MHz
	Conducted Power (dBm/MHz)
0	-9.07
1	-9.77
Total Power	-6.17

Table 77 – MIMO CDD

U-NII-2C

5 GHz WLAN - 802.11a

Data Rate: 54 Mbps

Antenna Port	Power Spectral Density (dBm/MHz)		
	5500 MHz	5600 MHz	5700 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	4.32	4.32	3.28
1	3.73	4.11	3.62

Table 78 – SISO

5 GHz WLAN - 802.11n 20 MHz Bandwidth

Modulation Coding Scheme: MCS5

Antenna Port	Power Spectral Density (dBm/MHz)		
	5500 MHz	5600 MHz	5700 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	3.89	4.12	3.58
1	3.91	4.12	3.73

Table 79 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)		
	5500 MHz	5600 MHz	5700 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	2.59	2.91	3.13
1	2.67	3.19	2.83
Total Power	5.64	6.06	5.99

Table 80 – MIMO CDD

5 GHz WLAN - 802.11n 40 MHz Bandwidth

Modulation Coding Scheme: MCS6

Antenna Port	Power Spectral Density (dBm/MHz)		
	5510 MHz	5590 MHz	5670 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	1.38	1.29	1.12
1	1.66	1.28	1.53

Table 81 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)		
	5510 MHz	5590 MHz	5670 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	1.07	0.73	0.54
1	0.27	0.32	-0.10
Total Power	3.82	3.66	3.37

Table 82 – MIMO CDD

5 GHz WLAN - 802.11ac 20 MHz Bandwidth

Modulation Coding Scheme: MCS7

Antenna Port	Power Spectral Density (dBm/MHz)		
	5500 MHz	5600 MHz	5700 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	3.95	4.20	3.73
1	3.68	3.39	3.40

Table 83 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)		
	5500 MHz	5600 MHz	5700 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	3.75	3.64	3.53
1	3.15	3.17	2.64
Total Power	6.47	6.42	6.12

Table 84 – MIMO CDD

5 GHz WLAN - 802.11ac 40 MHz Bandwidth

Modulation Coding Scheme: MCS9

Antenna Port	Power Spectral Density (dBm/MHz)		
	5510 MHz	5590 MHz	5670 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	1.26	1.41	1.08
1	1.26	1.65	1.96

Table 85 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)		
	5510 MHz	5590 MHz	5670 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	1.08	0.85	0.69
1	-0.22	-0.56	0.12
Total Power	3.60	3.33	3.55

Table 86 – MIMO CDD

5 GHz WLAN - 802.11ac 80 MHz Bandwidth

Modulation Coding Scheme: MCS5

Antenna Port	Power Spectral Density (dBm/MHz)	
	5530 MHz	5610 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	-8.25	-8.44
1	-8.29	-8.31

Table 87 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)	
	5530 MHz	5610 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	-9.01	-8.94
1	-9.43	-9.70
Total Power	-5.97	-6.06

Table 88 – MIMO CDD

U-NII-3

5 GHz WLAN - 802.11a

Data Rate: 54 Mbps

Antenna Port	Power Spectral Density (dBm/MHz)		
	5745 MHz	5785 MHz	5825 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	-0.14	0.49	0.26
1	-0.05	0.64	-0.32

Table 89 – SISO

5 GHz WLAN - 802.11n 20 MHz Bandwidth

Modulation Coding Scheme: MCS5

Antenna Port	Power Spectral Density (dBm/MHz)		
	5745 MHz	5785 MHz	5825 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	-0.05	0.82	0.67
1	-0.30	0.39	0.55

Table 90 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)		
	5745 MHz	5785 MHz	5825 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	-0.23	-0.49	-0.31
1	-0.46	-0.77	-0.82
Total Power	2.67	2.38	2.46

Table 91 – MIMO CDD

5 GHz WLAN - 802.11n 40 MHz Bandwidth

Modulation Coding Scheme: MCS6

Antenna Port	Power Spectral Density (dBm/MHz)	
	5755 MHz	5795 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	-3.15	-2.28
1	-3.03	-1.69

Table 92 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)	
	5755 MHz	5795 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	-3.41	-3.60
1	-3.56	-3.53
Total Power	-0.36	-0.43

Table 93 – MIMO CDD

5 GHz WLAN - 802.11ac 20 MHz Bandwidth

Modulation Coding Scheme: MCS7

Antenna Port	Power Spectral Density (dBm/MHz)		
	5745 MHz	5785 MHz	5825 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	0.13	0.32	0.25
1	1.23	-0.27	-0.07

Table 94 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)		
	5745 MHz	5785 MHz	5825 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	0.25	-0.54	-0.70
1	-0.33	-1.03	-0.39
Total Power	2.98	2.23	2.47

Table 95 – MIMO CDD

5 GHz WLAN - 802.11ac 40 MHz Bandwidth

Modulation Coding Scheme: MCS9

Antenna Port	Power Spectral Density (dBm/MHz)	
	5755 MHz	5795 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	-4.08	-2.31
1	-2.35	-1.91

Table 96 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)	
	5755 MHz	5795 MHz
	Conducted Power (dBm/MHz)	Conducted Power (dBm/MHz)
0	-3.16	-3.61
1	-3.57	-3.77
Total Power	-0.23	-0.56

Table 97 – MIMO CDD

5 GHz WLAN - 802.11ac 80 MHz Bandwidth

Modulation Coding Scheme: MCS5

Antenna Port	Power Spectral Density (dBm/MHz)
	5775 MHz
	Conducted Power (dBm/MHz)
0	-11.16
1	-10.70

Table 98 – SISO

Modulation Coding Scheme: MCS0

Antenna Port	Power Spectral Density (dBm/MHz)
	5775 MHz
	Conducted Power (dBm/MHz)
0	-12.67
1	-13.35
Total Power	-9.76

Table 99 – MIMO CDD

FCC 47 CFR Part 15E, Limit Clause 15.407(a)

Condition of Operation	Frequency Range (MHz)			
	5150-5250	5250-5350	5470-5725	5725-5850
Max Conducted Power Spectral Density	17 dBm/MHz for master device 11 dBm/MHz for mobile/portable client device	11 dBm/MHz		30 dBm/500 kHz

Table 100

ISEDC RSS-247, Limit Clause 6.2.1.1, 6.2.2.1, 6.2.3.1 and 6.2.4.1

Device	Frequency Range (MHz)			
	5150-5250	5250-5350	5470-5725	5725-5850
OEM installed in vehicles	-	-	-	-
Other	≤10 dBm/MHz EIRP	≤11 dBm/MHz	≤11 dBm/MHz	≤30 dBm/500kHz

Table 101

2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Power Divider	Weinschel	1506A	603	12	23-Apr-2020
Hygrometer	Rotronic	I-1000	3220	12	13-Sep-2019
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	17-Oct-2019
1 Metre SMA Cable	Rhophase	3PS-1801A-1000-3PS	4101	-	O/P Mon
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	22-Oct-2019
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	15-Oct-2019
PXA Signal Analyser	Keysight Technologies	N9030A	4653	12	06-Feb-2020
EXA	Keysight Technologies	N9010B	4968	24	21-Dec-2019
Cable (18 GHz)	Rosenberger	LU7-071-1000	5097	12	04-Oct-2019

Table 102

O/P Mon – Output Monitored using calibrated equipment

2.4 Emission Bandwidth

2.4.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.407 (a)
ISEDC RSS-247, Clause 6.2
ISEDC RSS-GEN, Clause 6.7

2.4.2 Equipment Under Test and Modification State

Minuet 2 Module (FS5352), S/N: RAD113255 - Modification State 0

2.4.3 Date of Test

24-June-2019 to 04-July-2019

2.4.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 12.4.1.

For MIMO measurements were made on both antenna ports, only the results for the antenna port that gave the widest bandwidth are documented in this report.

2.4.5 Environmental Conditions

Ambient Temperature	22.9 - 23.7 °C
Relative Humidity	63.7 - 70.3 %

2.4.6 Test Results

U-NII-1

5 GHz WLAN - 802.11a

Data Rate: 54 Mbps

	5180 MHz	520 MHz	5240 MHz
26 dB Bandwidth (MHz)	20.160	20.580	20.220
99% Occupied Bandwidth (MHz)	16.504	16.506	16.509

Table 103 – SISO – Antenna Port 0

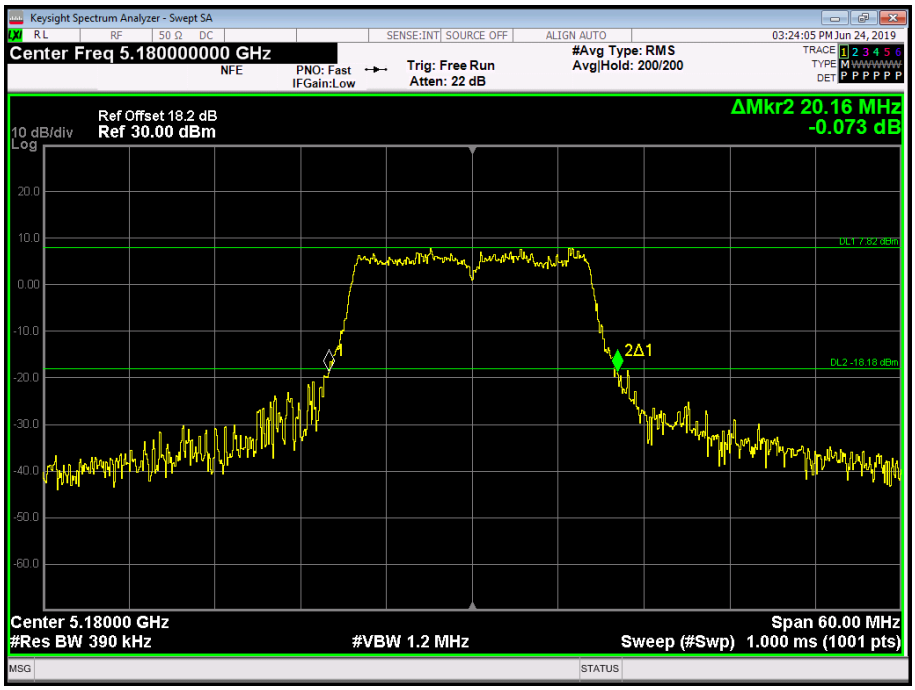

Figure 6 - 5180 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

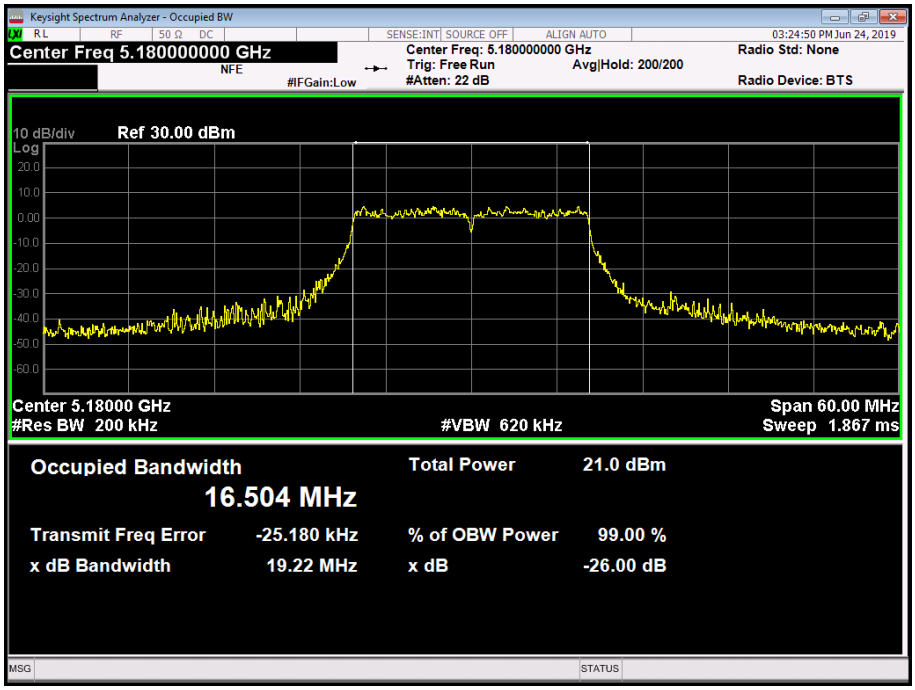

Figure 7 - 5180 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

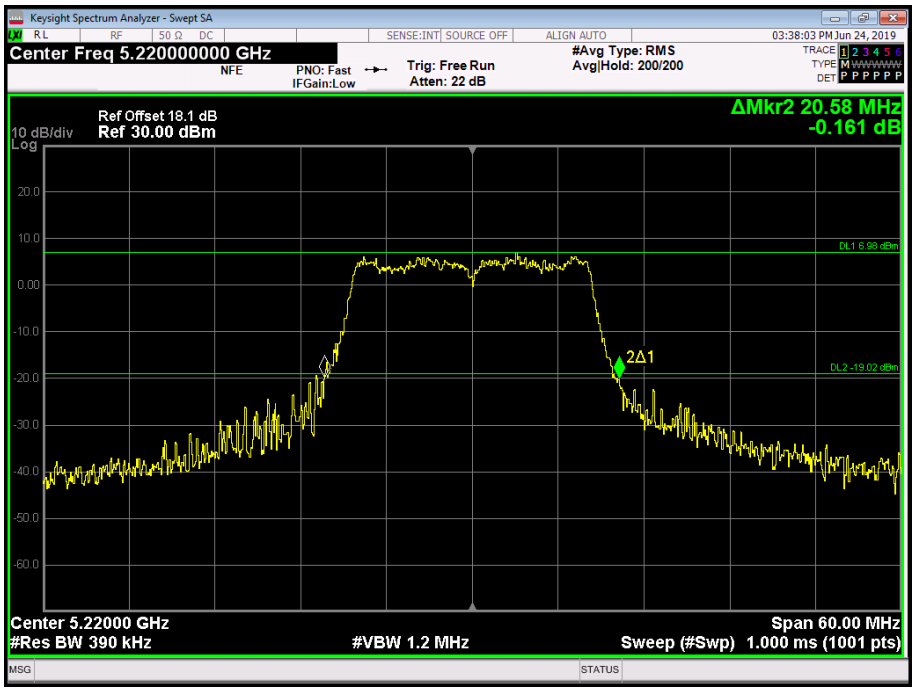

Figure 8 - 5220 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

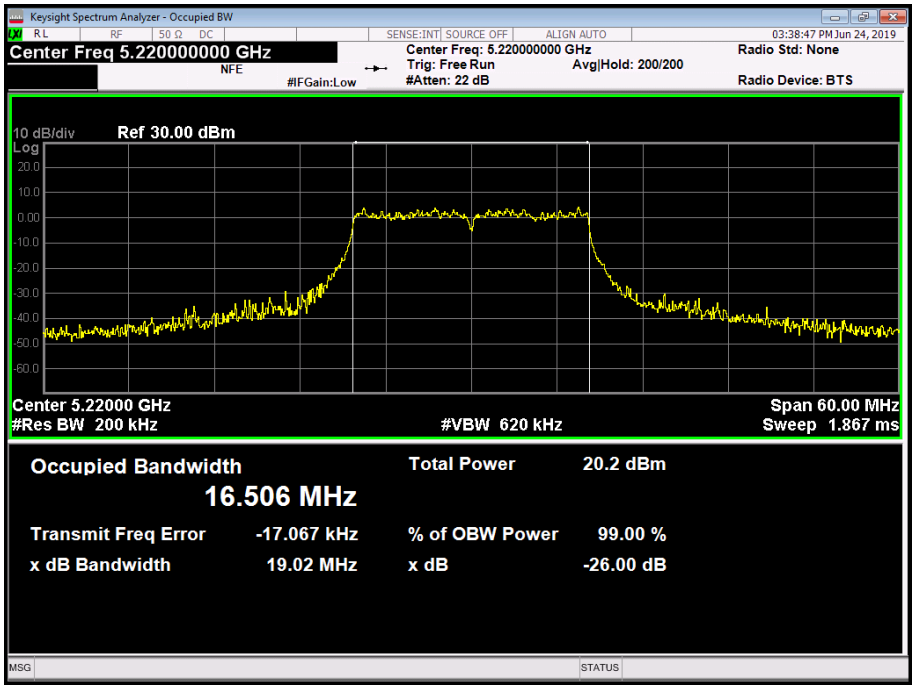

Figure 9 - 5220 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

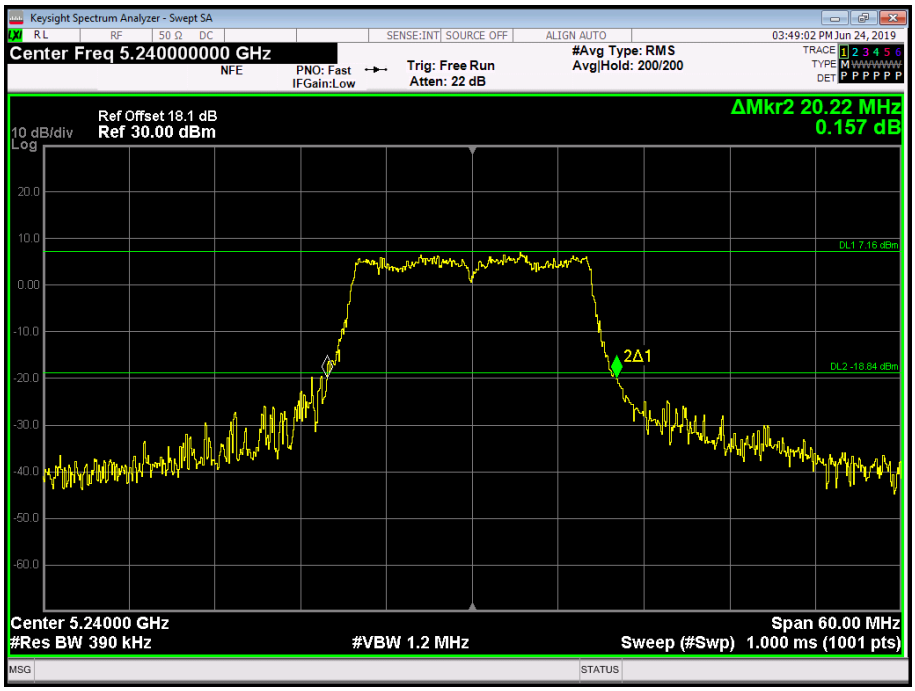

Figure 10 - 5240 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

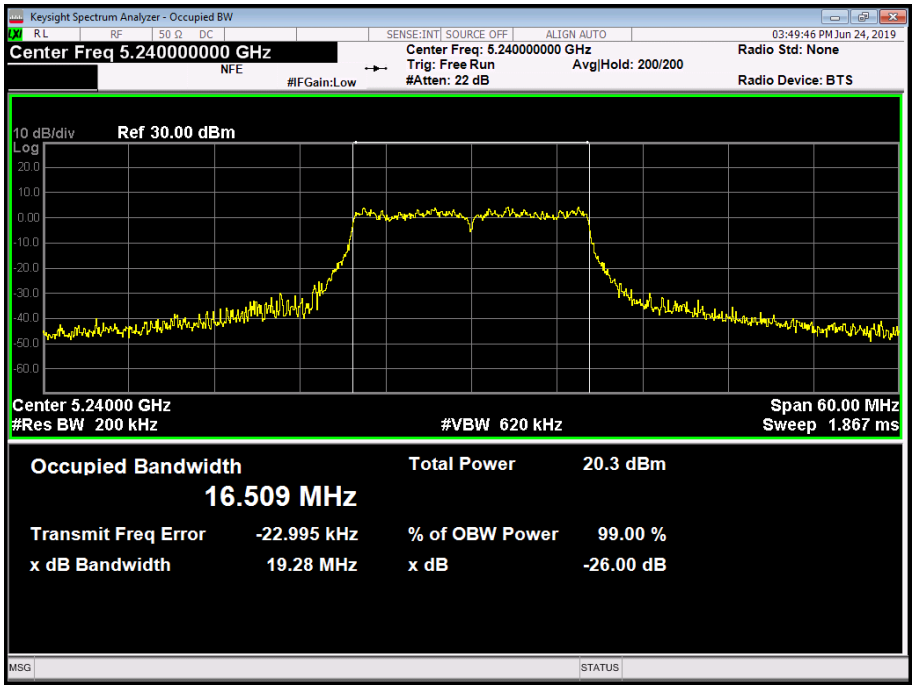

Figure 11 - 5240 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

	5180 MHz	5220 MHz	5240 MHz
26 dB Bandwidth (MHz)	20.520	20.340	20.700
99% Occupied Bandwidth (MHz)	16.506	16.516	16.517

Table 104 – SISO – Antenna Port 1

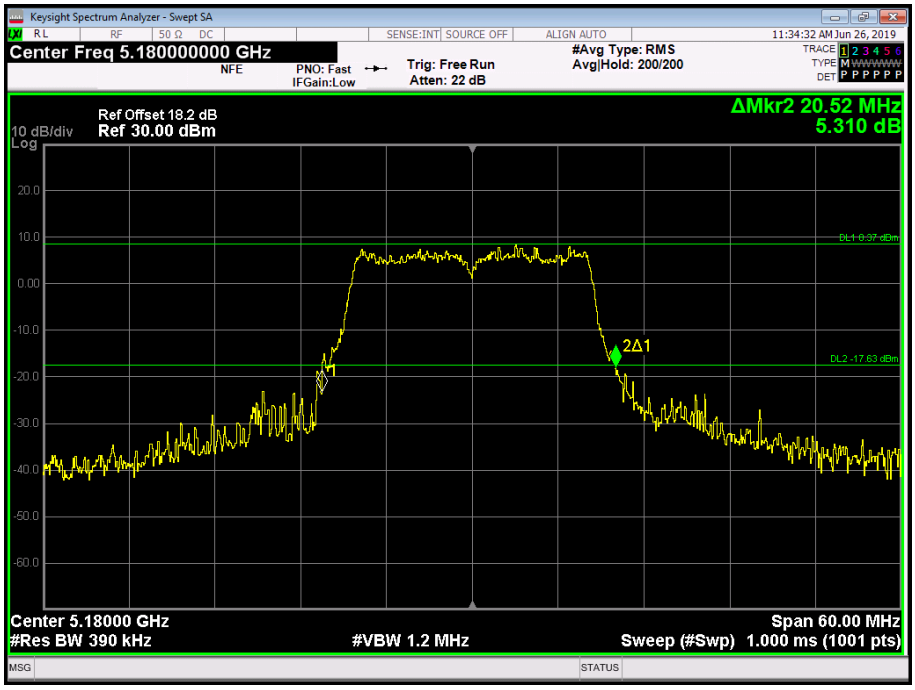

Figure 12 - 5180 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

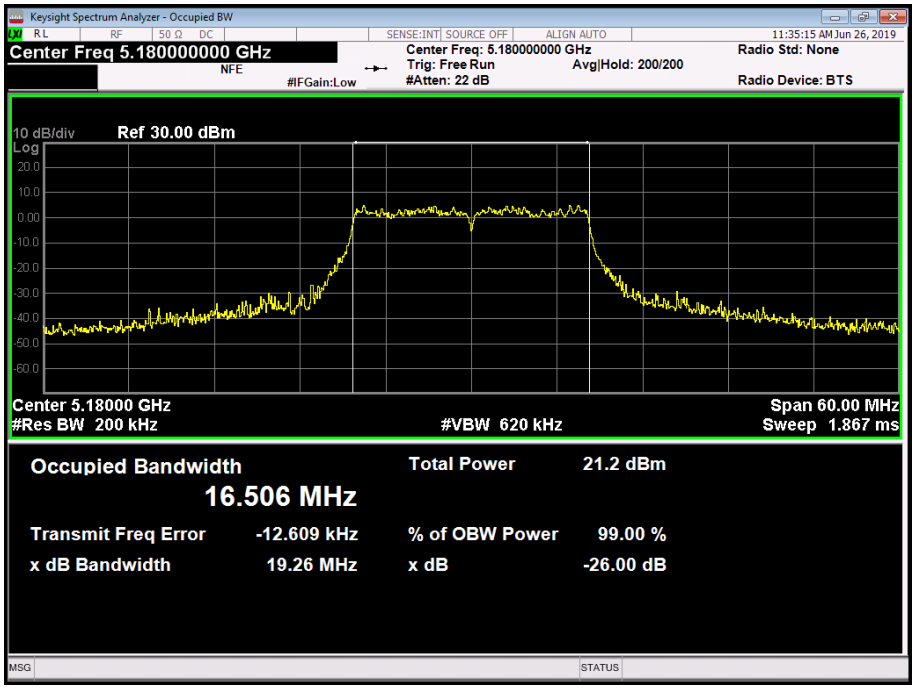

Figure 13 - 5180 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

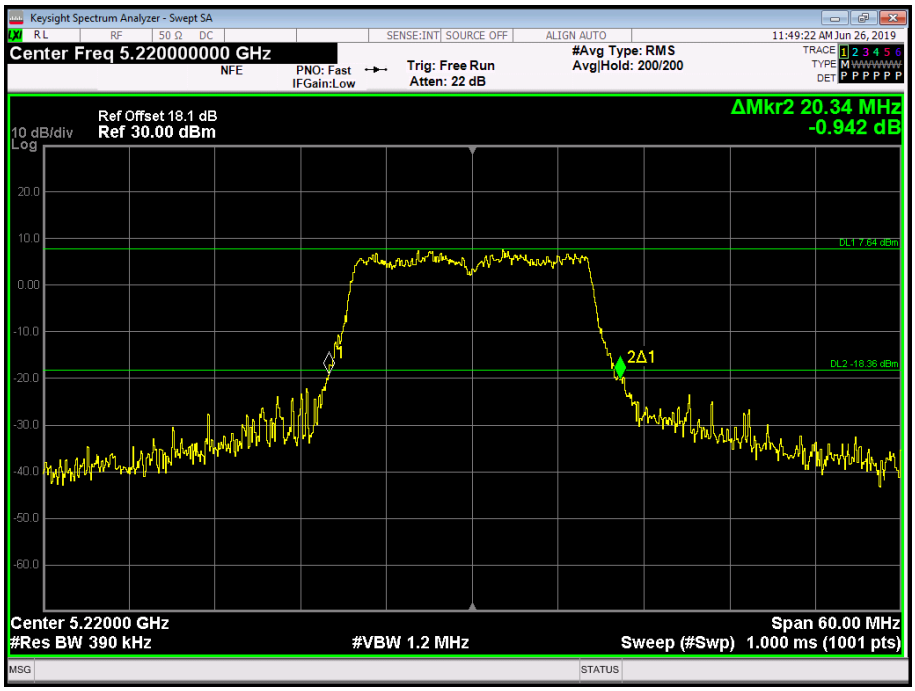

Figure 14 - 5220 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

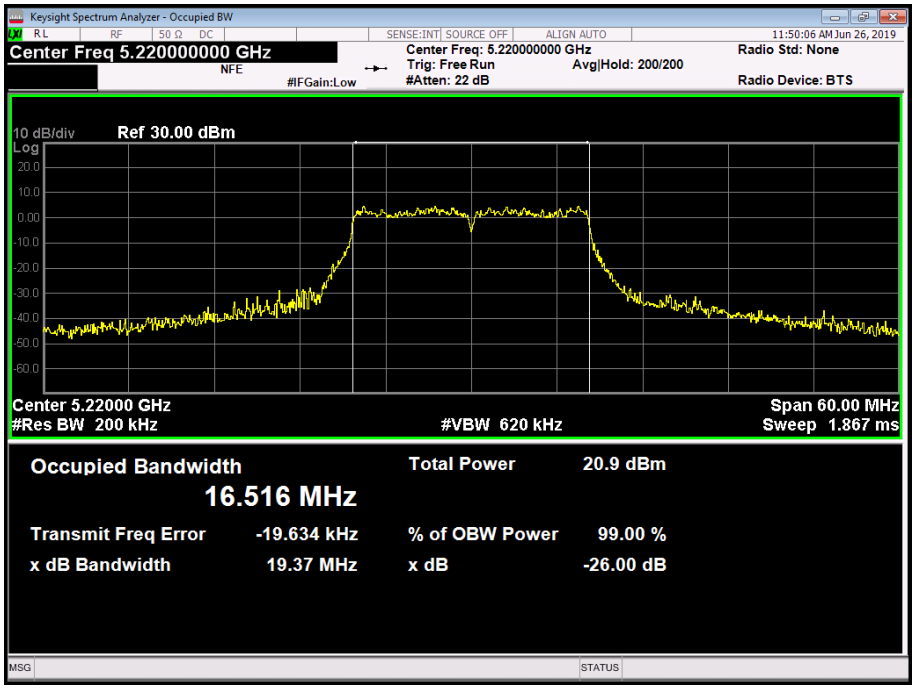

Figure 15 - 5220 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

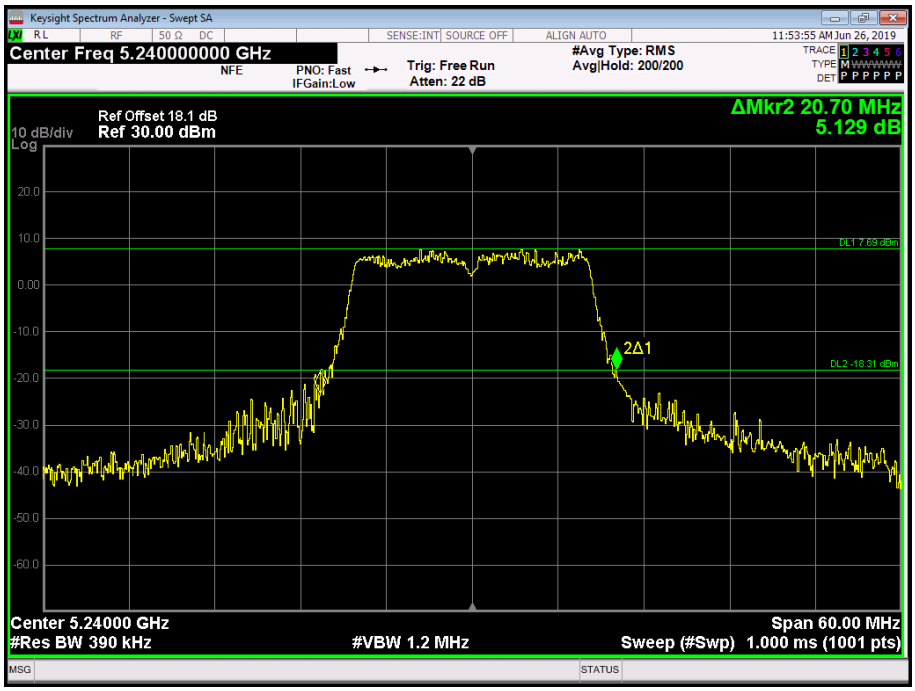

Figure 16 - 5240 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

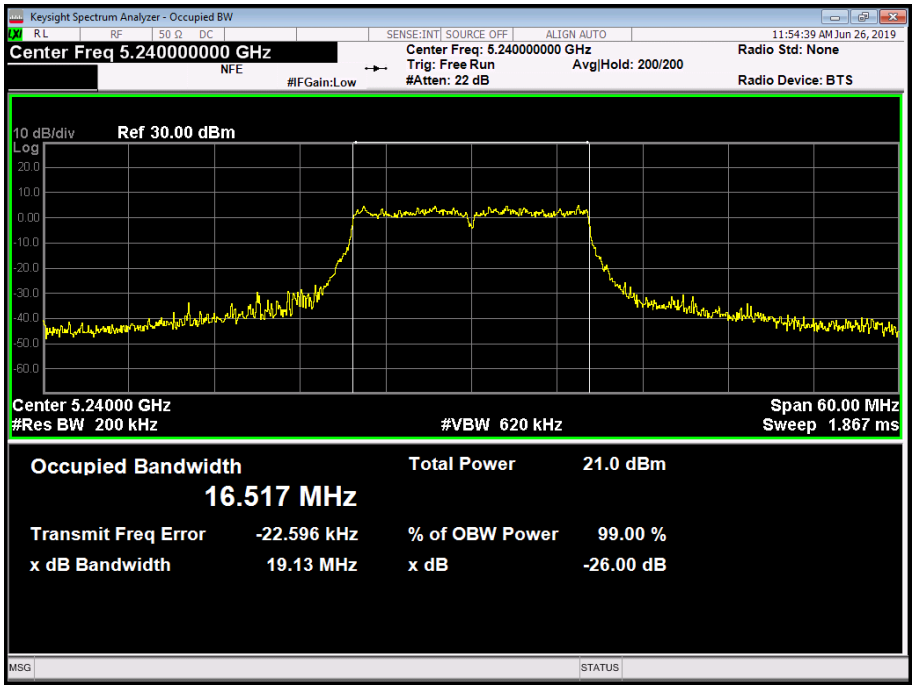

Figure 17 - 5240 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

5 GHz WLAN - 802.11n 20 MHz Bandwidth

Modulation Coding Scheme: MCS5

	5180 MHz	5220 MHz	5240 MHz
26 dB Bandwidth (MHz)	21.120	20.400	20.520
99% Occupied Bandwidth (MHz)	17.641	17.640	17.627

Table 105 – SISO – Antenna Port 0

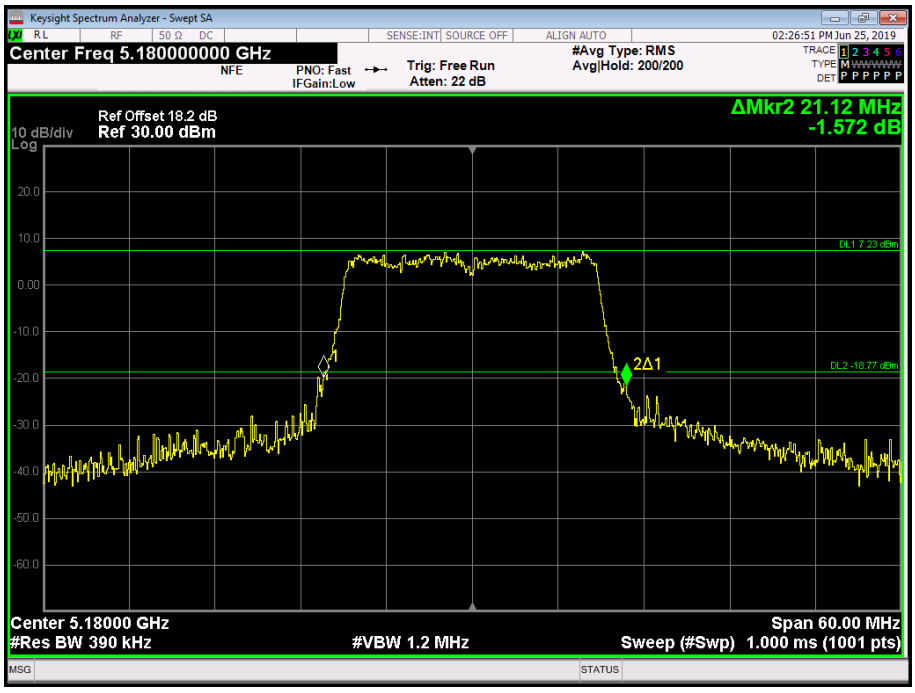

Figure 18 - 5180 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

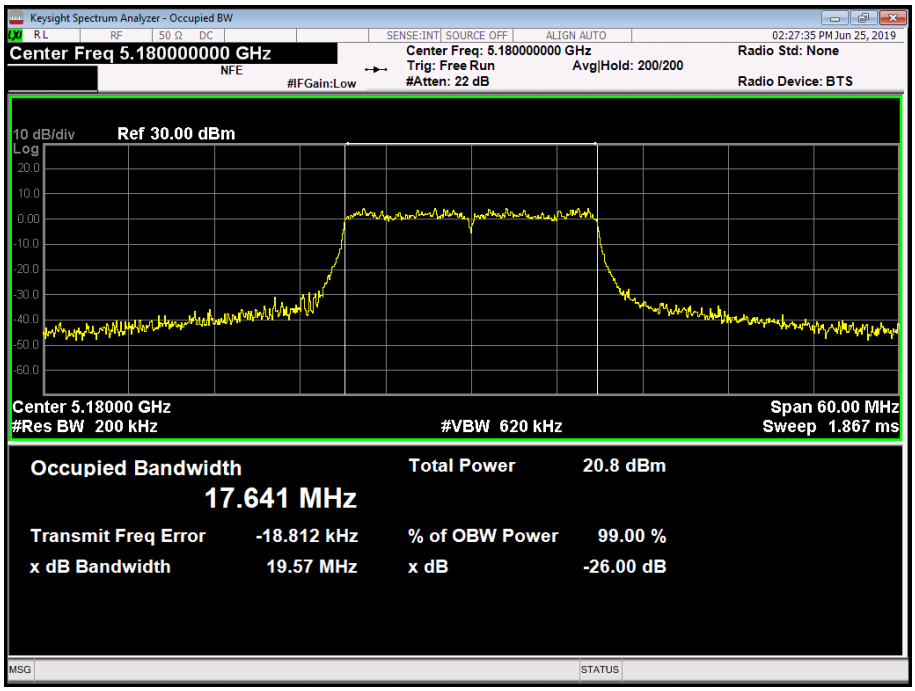

Figure 19 - 5180 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

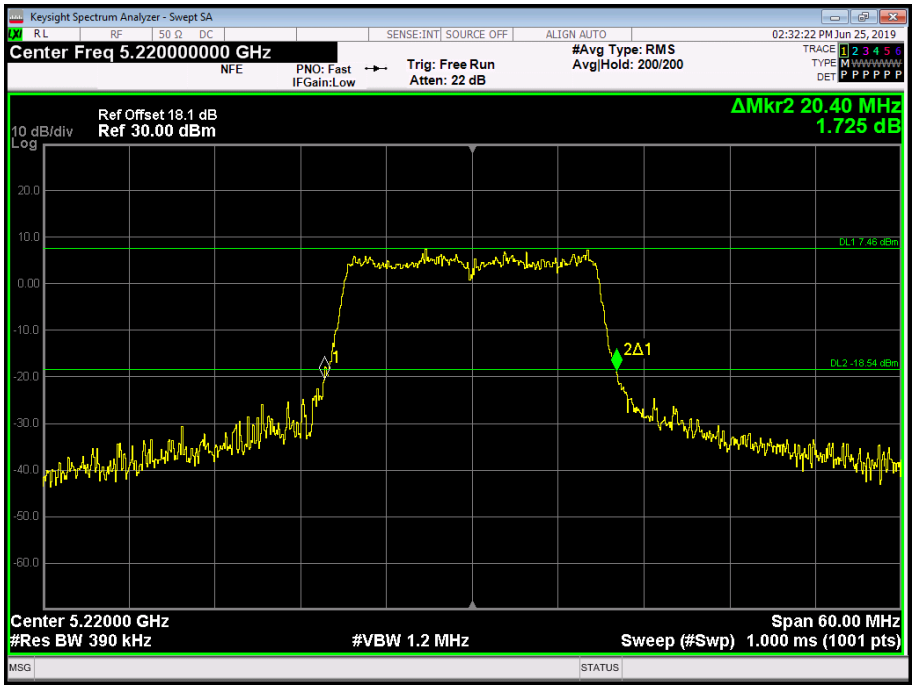

Figure 20 - 5220 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

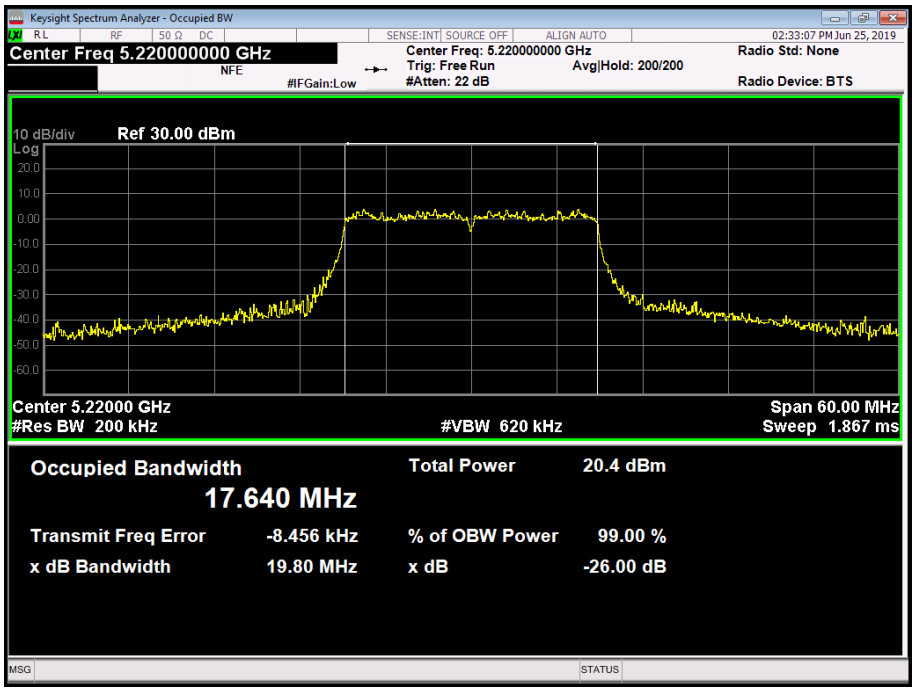

Figure 21 - 5220 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

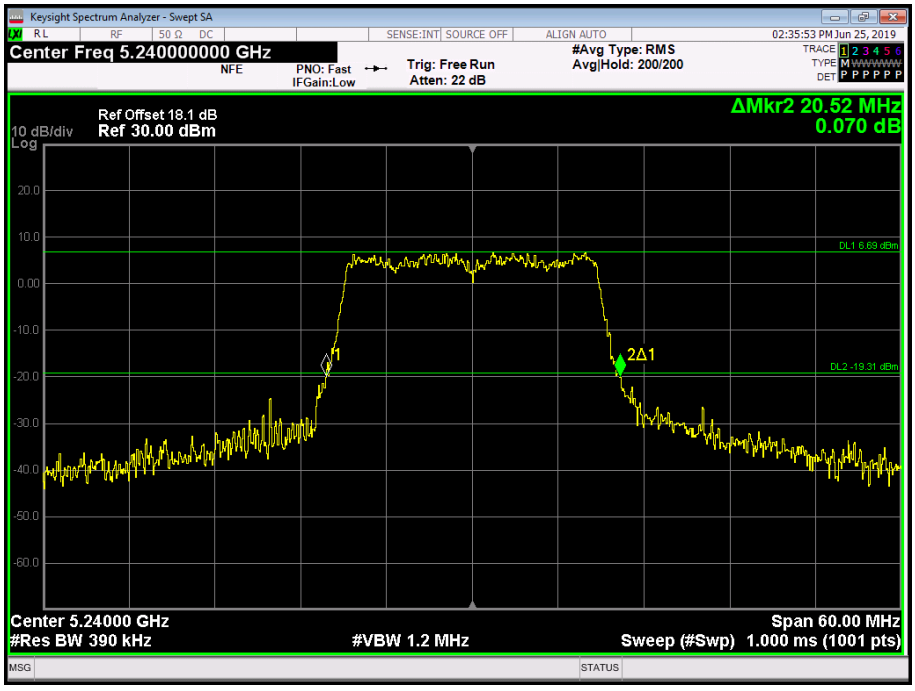

Figure 22 - 5240 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

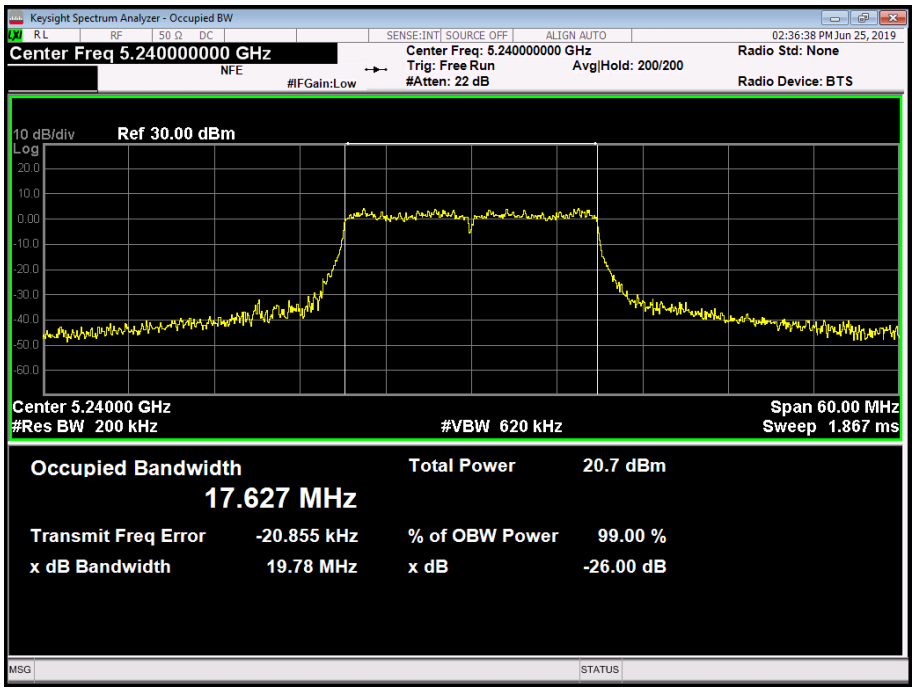

Figure 23 - 5240 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

	5180 MHz	5220 MHz	5240 MHz
26 dB Bandwidth (MHz)	20.280	20.280	20.340
99% Occupied Bandwidth (MHz)	17.640	17.651	17.645

Table 106 – SISO – Antenna Port 1

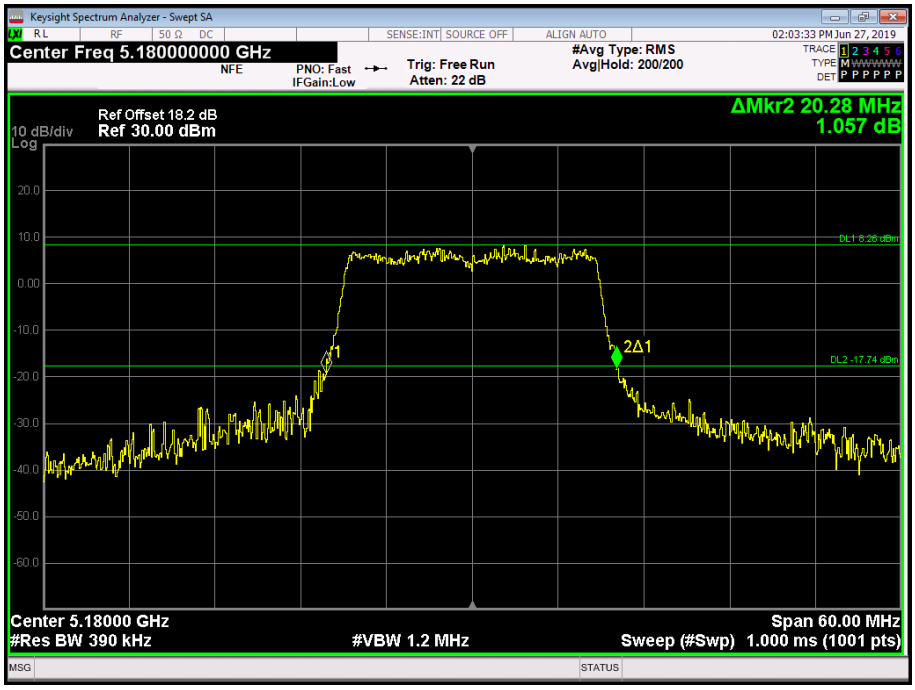

Figure 24 - 5180 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

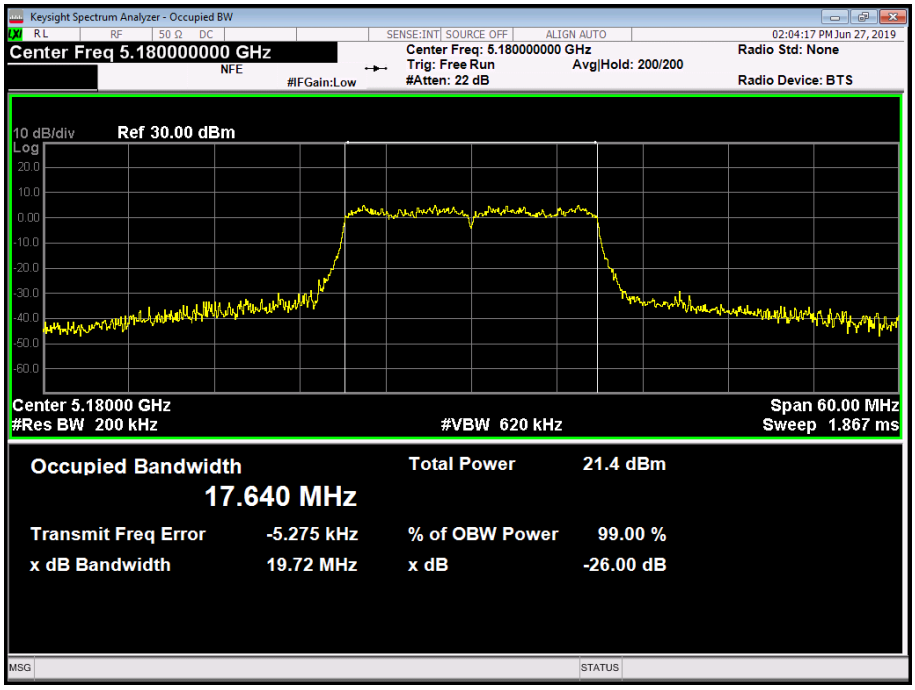

Figure 25 - 5180 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

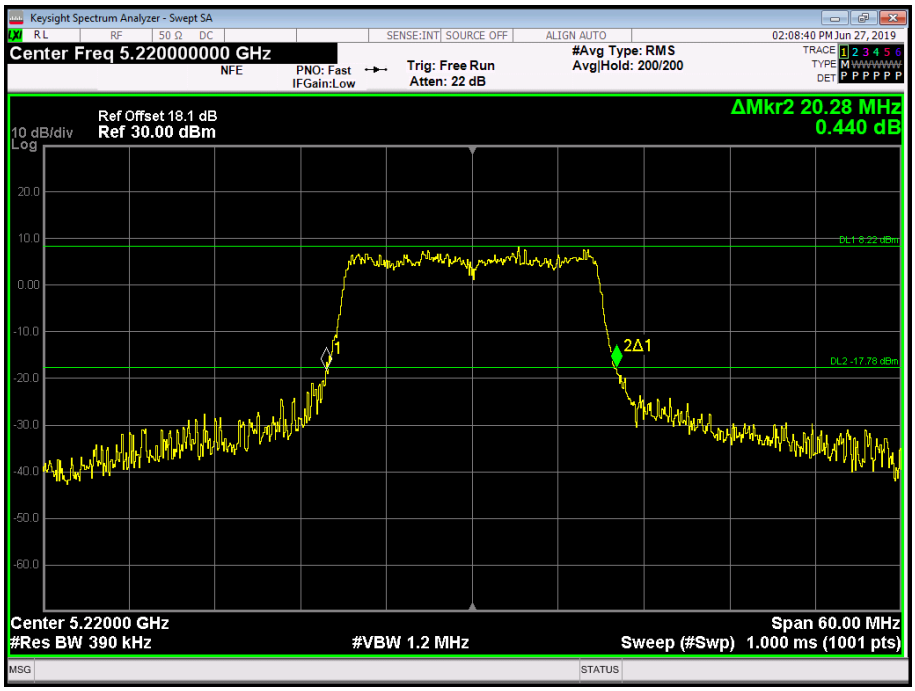

Figure 26 - 5220 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

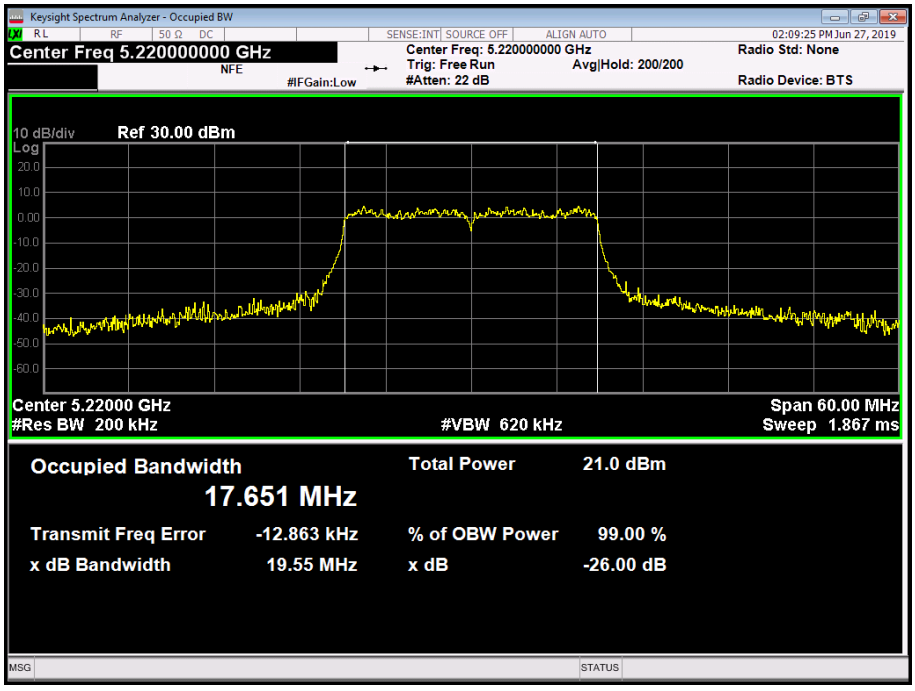

Figure 27 - 5220 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

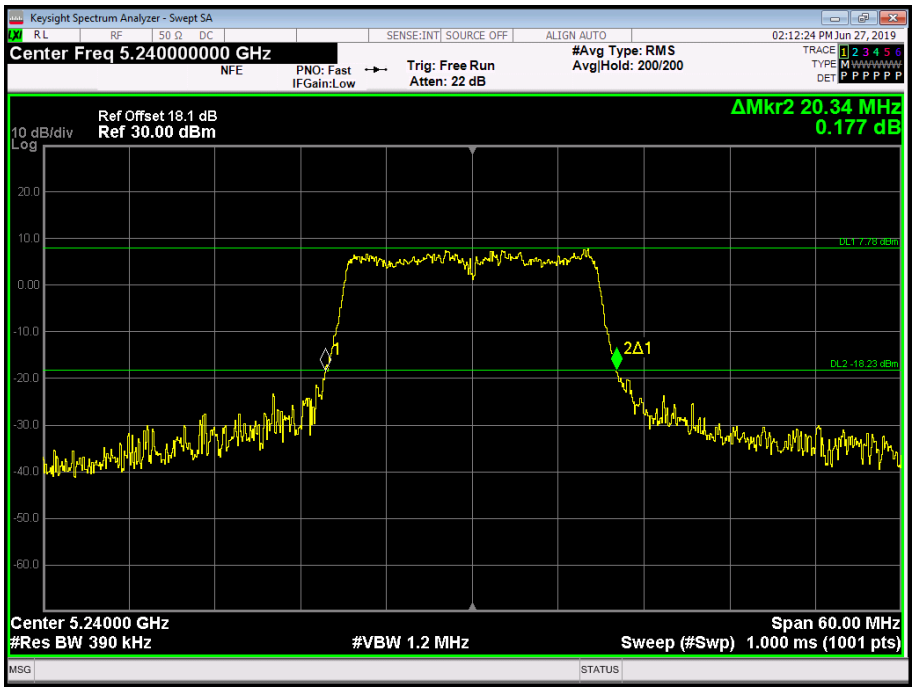

Figure 28 - 5240 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

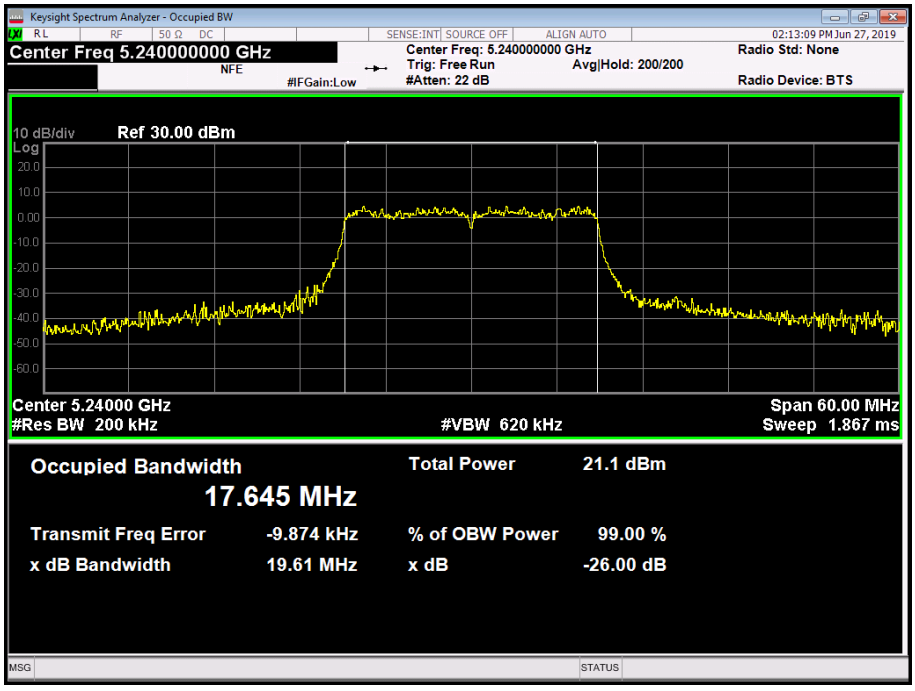

Figure 29 - 5240 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

Modulation Coding Scheme: MCS0

	5180 MHz	5220 MHz	5240 MHz
26 dB Bandwidth (MHz)	20.700	20.400	20.700
99% Occupied Bandwidth (MHz)	17.681	17.683	17.695

Table 107 – Worst-case Antenna Port – MIMO CDD

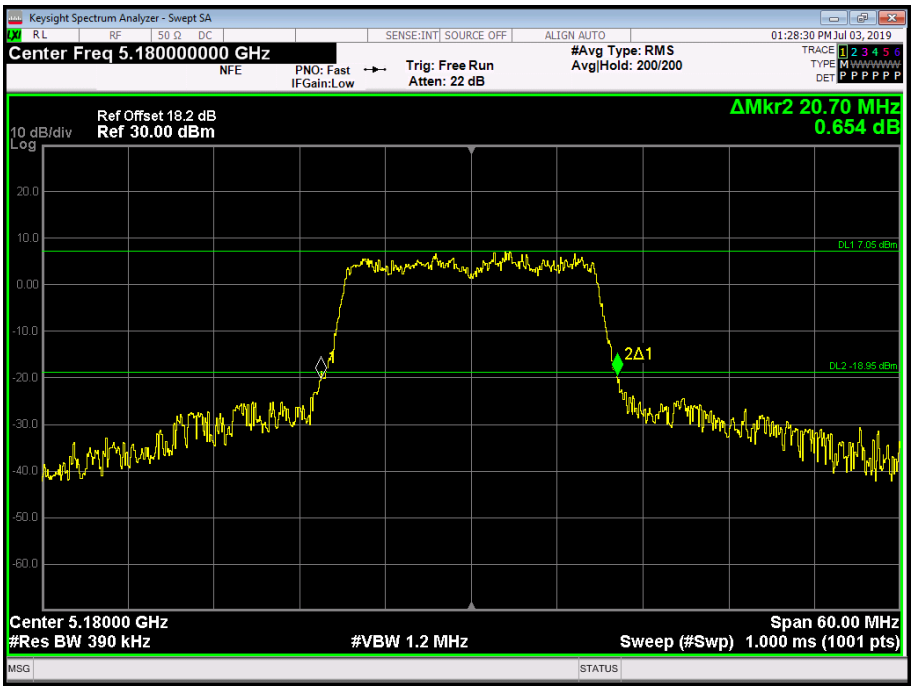

Figure 30 - 5180 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

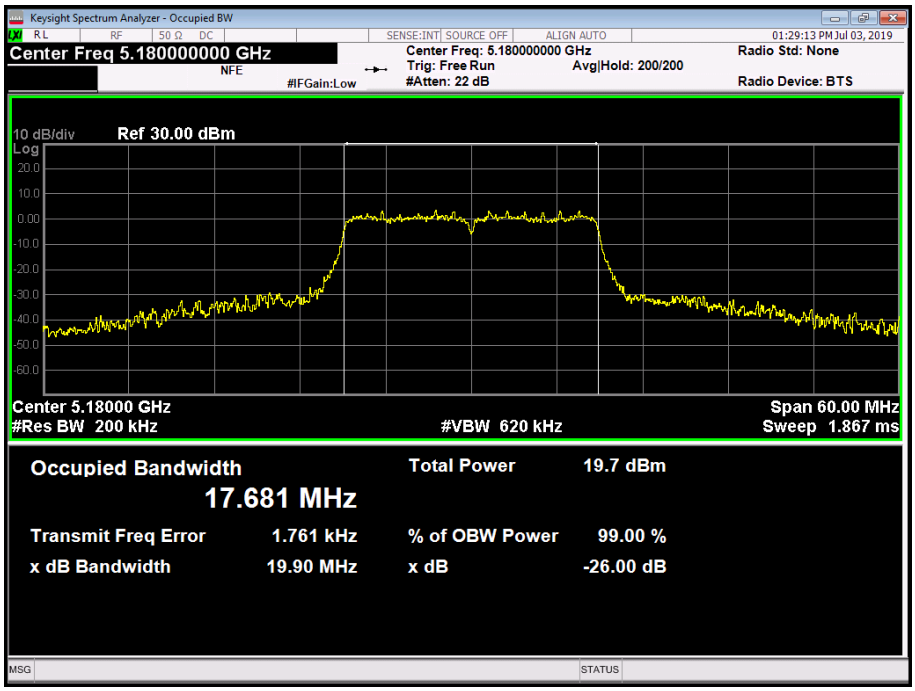

Figure 31 - 5180 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

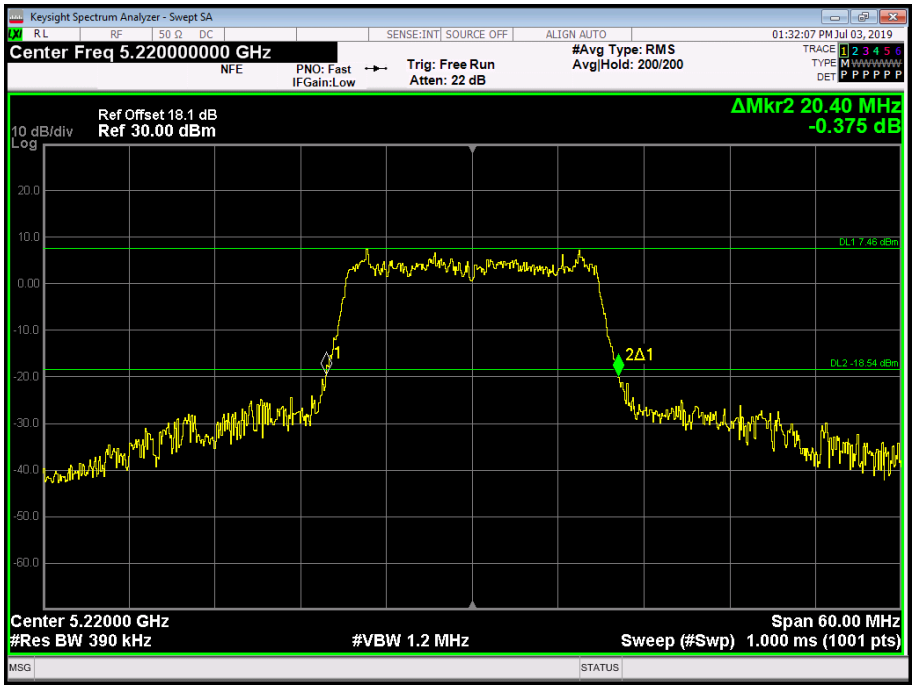

Figure 32 - 5220 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

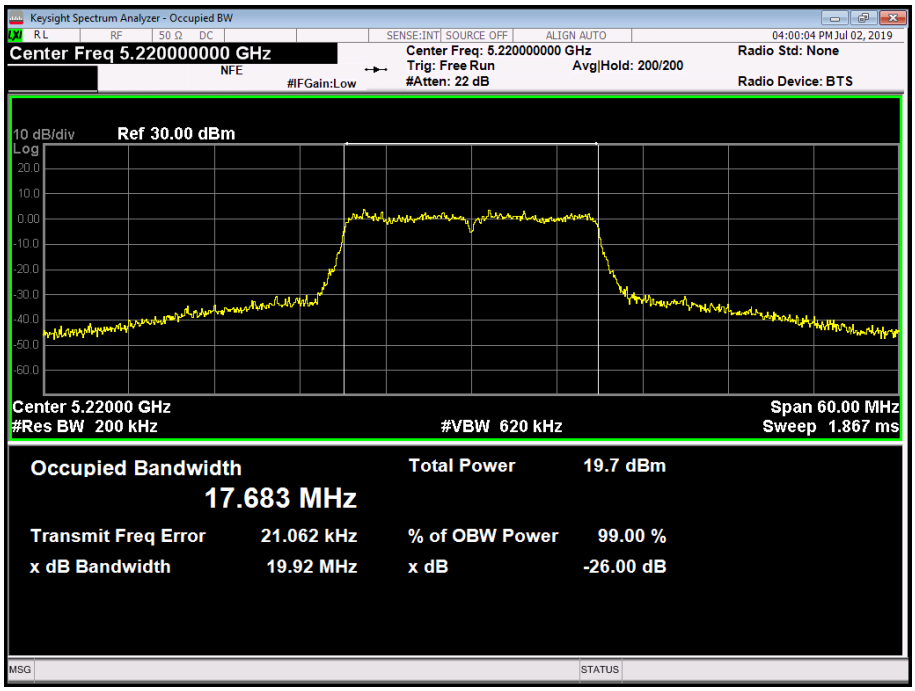

Figure 33 - 5220 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

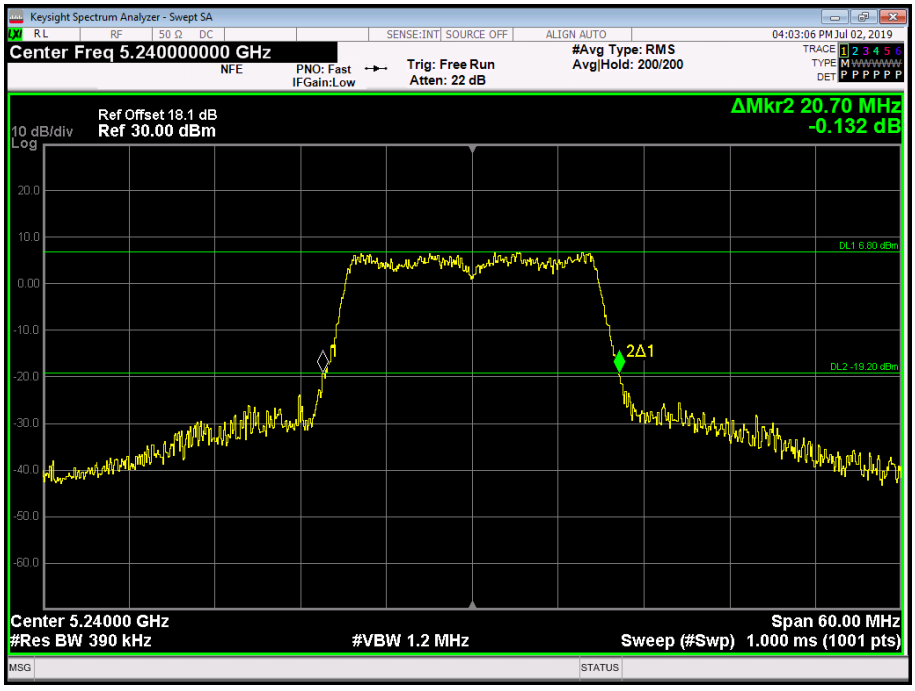

Figure 34 - 5240 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

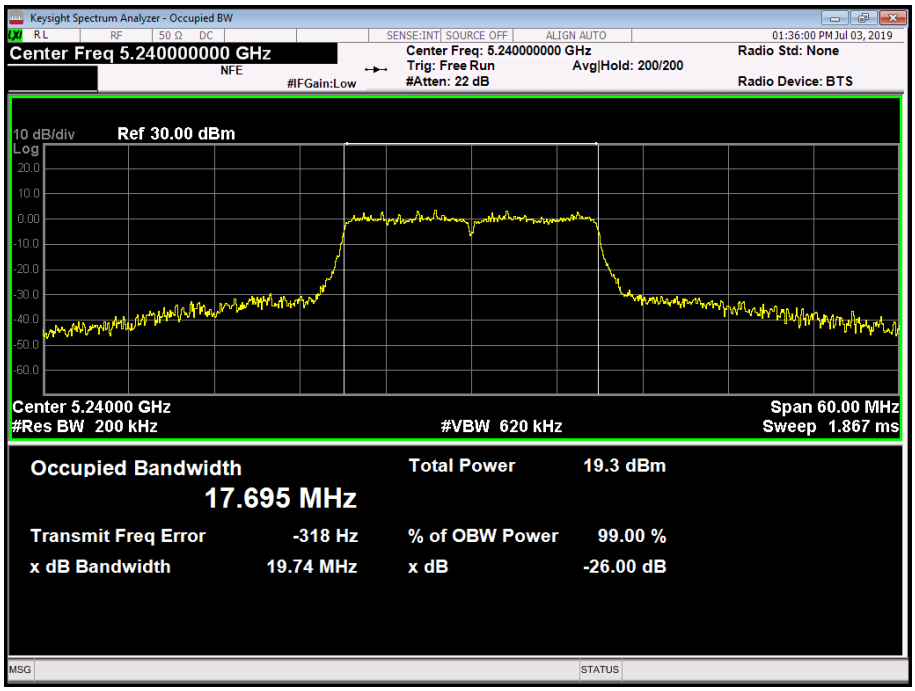

Figure 35 - 5240 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

5 GHz WLAN - 802.11n 40 MHz Bandwidth

Modulation Coding Scheme: MCS6

	5190 MHz	5230 MHz
26 dB Bandwidth (MHz)	42.360	41.640
99% Occupied Bandwidth (MHz)	36.239	36.241

Table 108 – SISO – Antenna Port 0

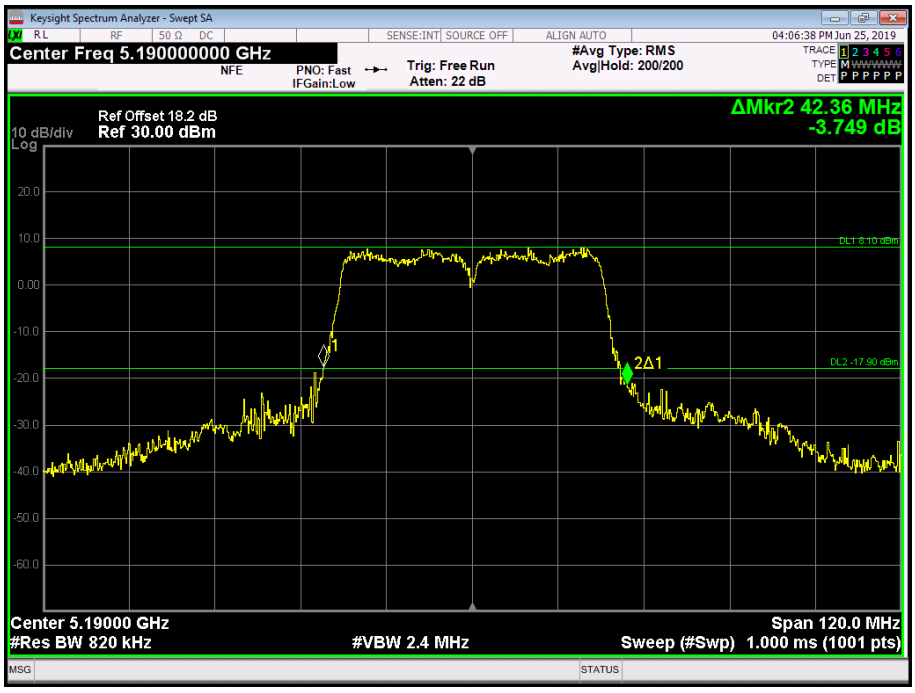

Figure 36 - 5190 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

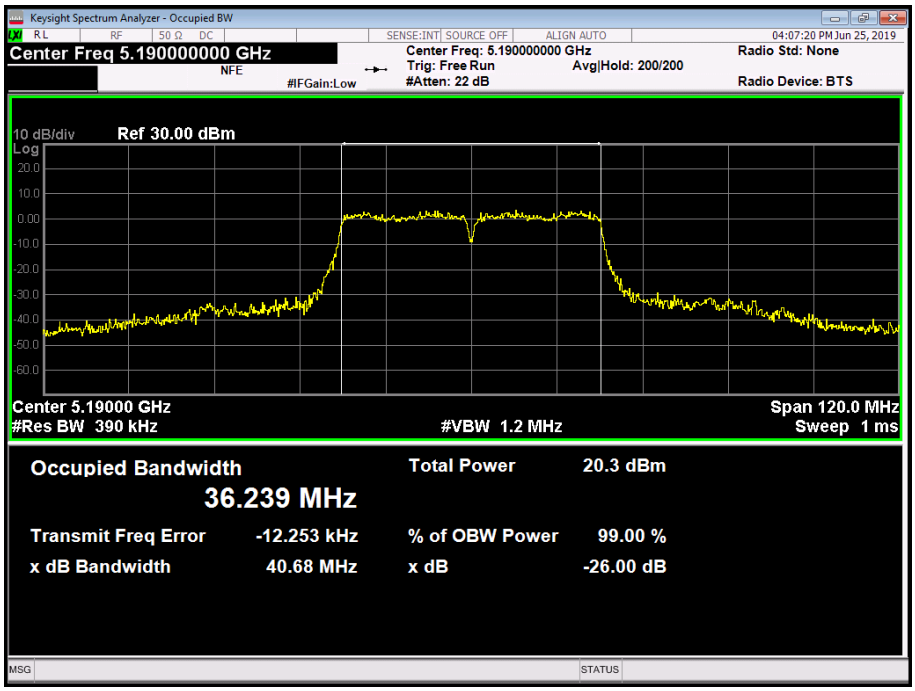

Figure 37 - 5190 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

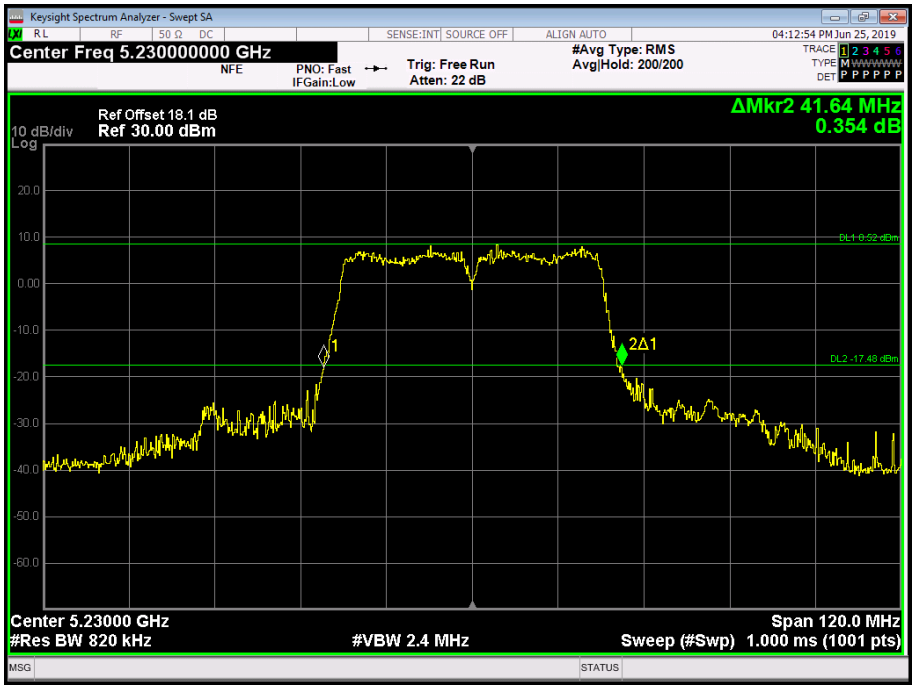

Figure 38 - 5230 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

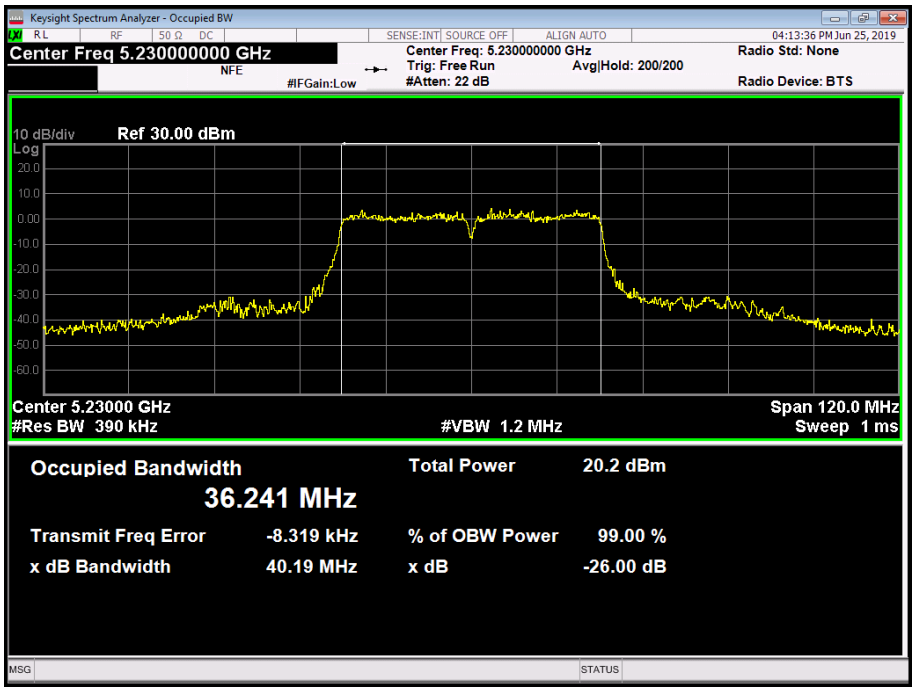

Figure 39 - 5230 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

	5190 MHz	5230 MHz
26 dB Bandwidth (MHz)	42.960	41.040
99% Occupied Bandwidth (MHz)	36.241	36.229

Table 109 – SISO – Antenna Port 1

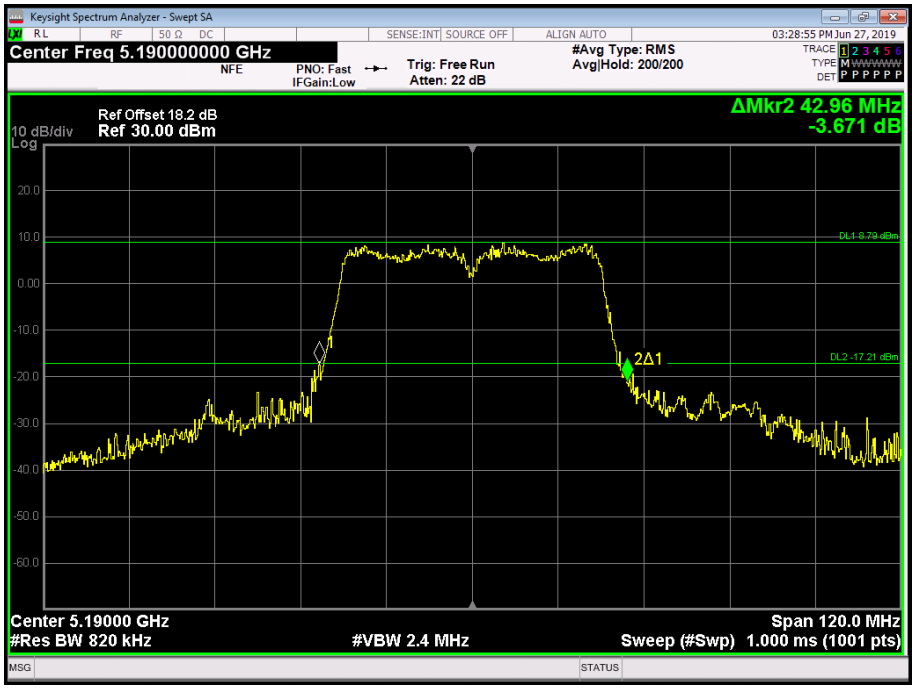

Figure 40 - 5190 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

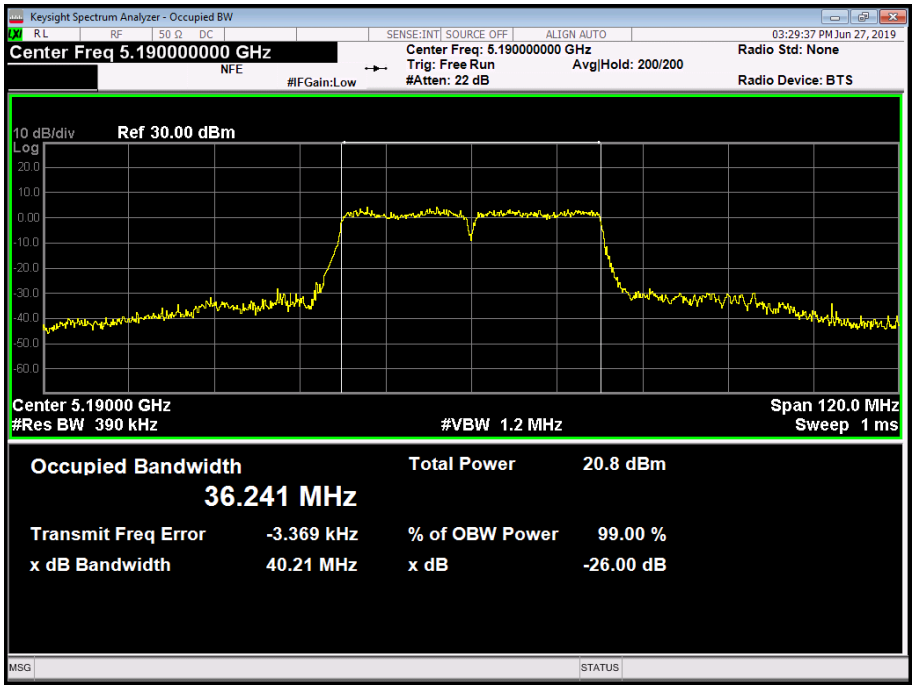

Figure 41 - 5190 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

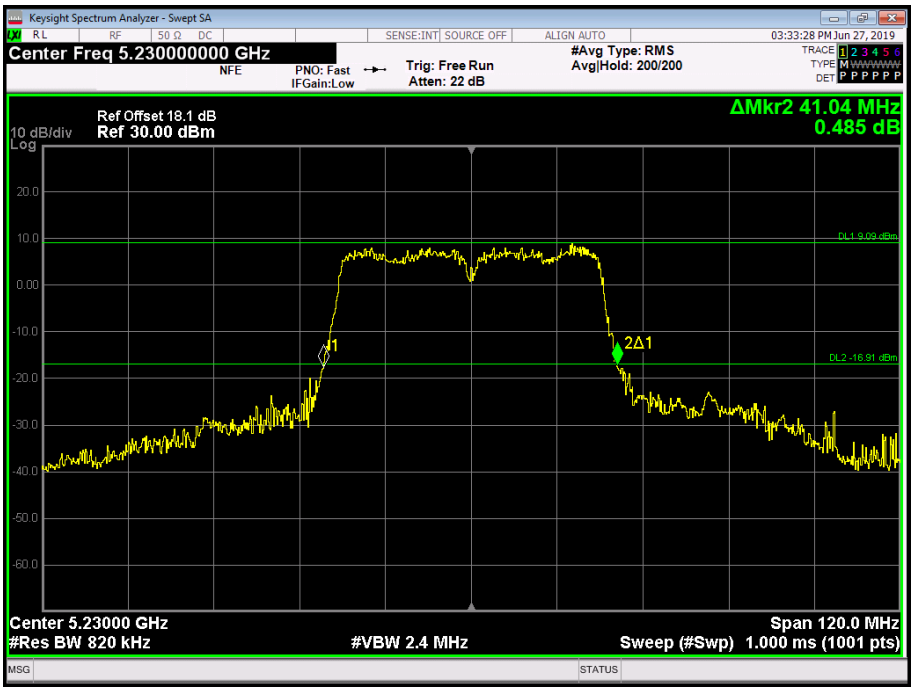

Figure 42 - 5230 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

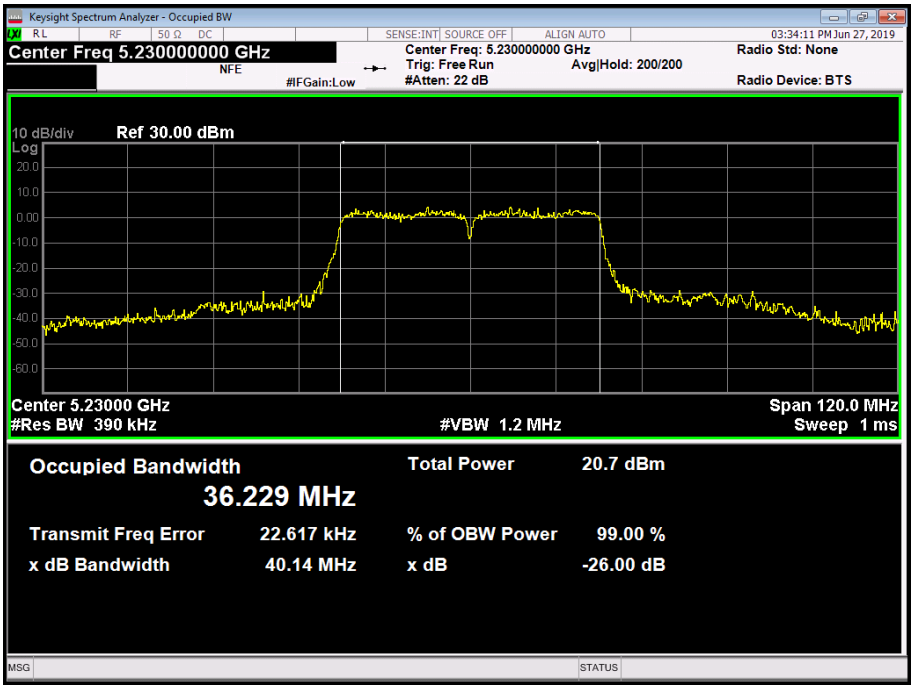

Figure 43 - 5230 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

Modulation Coding Scheme: MCS0

	5190 MHz	5230 MHz
26 dB Bandwidth (MHz)	40.920	41.040
99% Occupied Bandwidth (MHz)	36.303	36.338

Table 110 – Worst-case Antenna Port – MIMO CDD

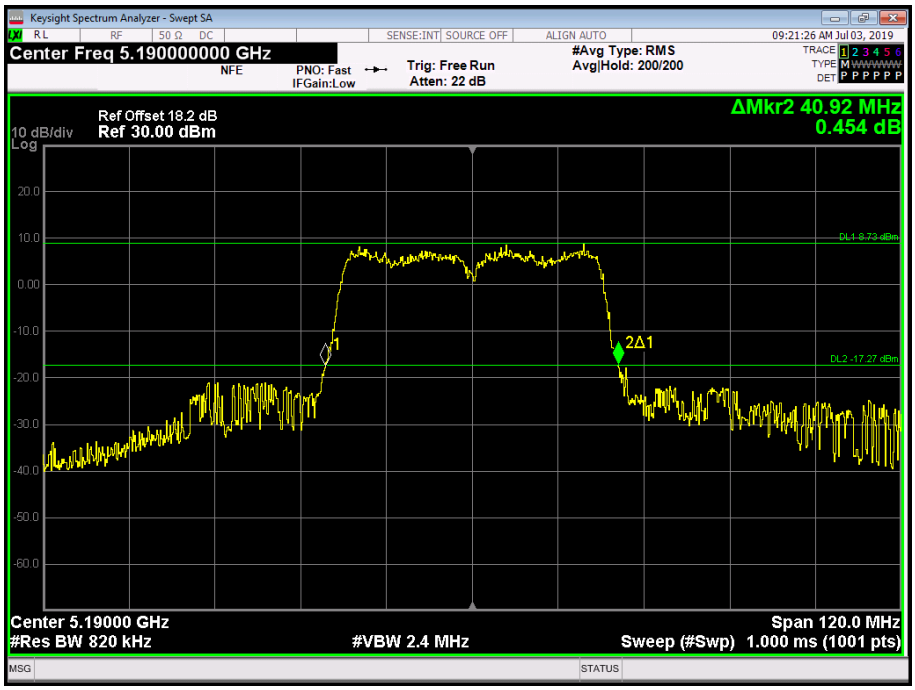

Figure 44 - 5190 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

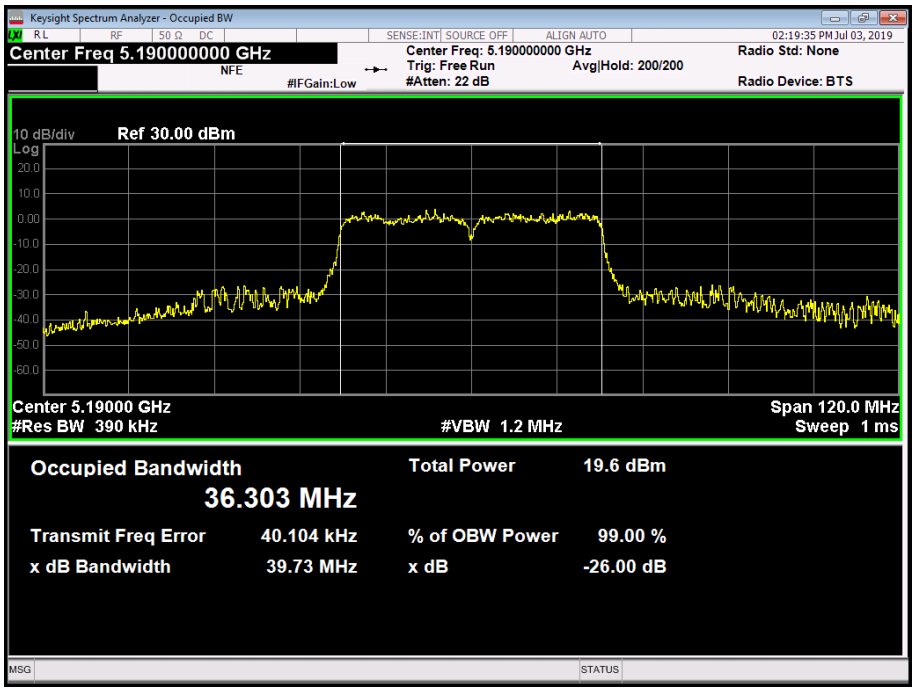

Figure 45 - 5190 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

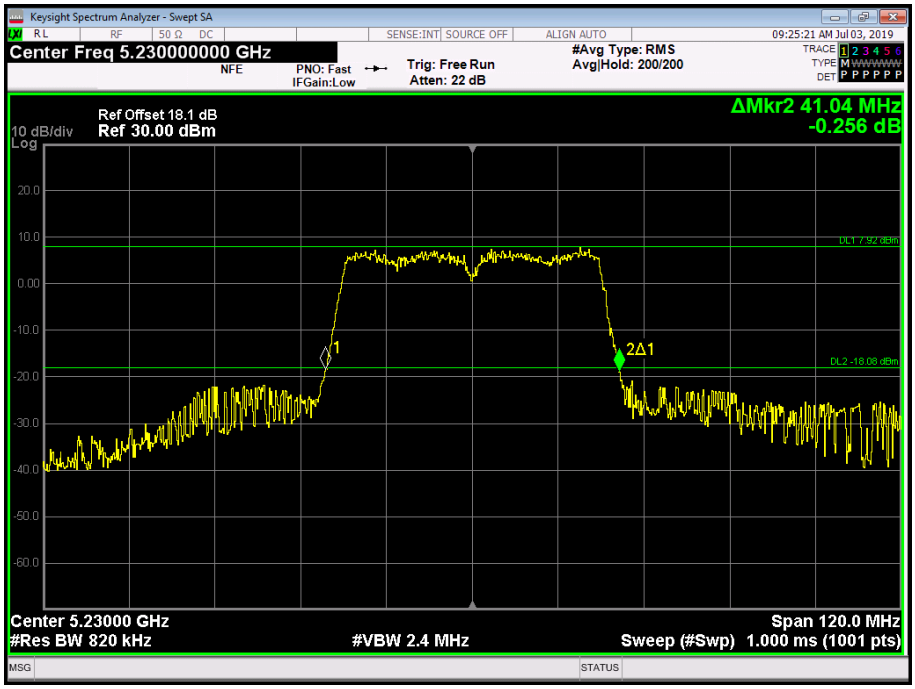

Figure 46 - 5230 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

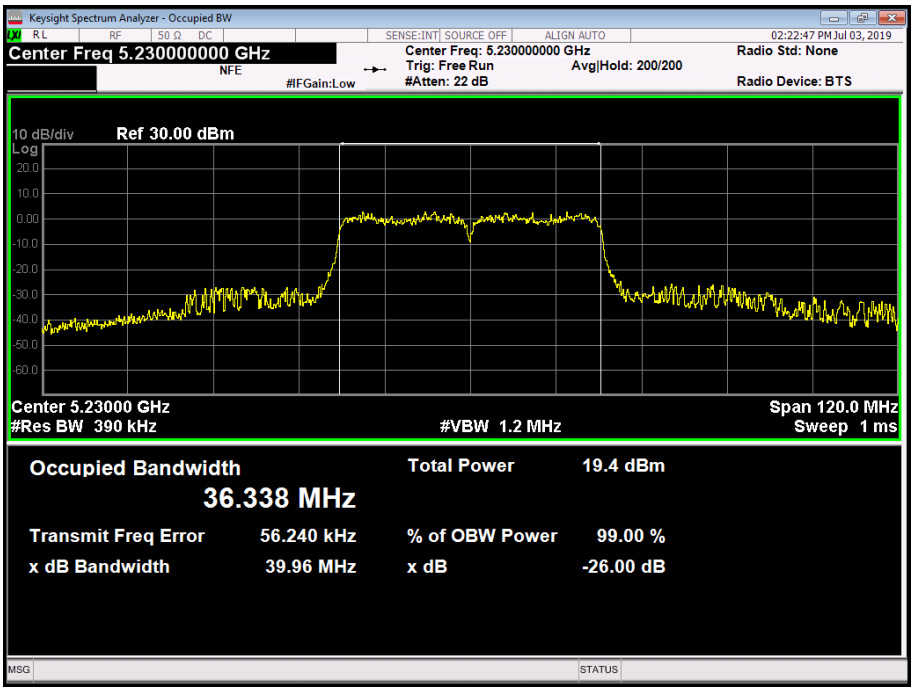

Figure 47 - 5230 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

5 GHz WLAN - 802.11ac 20 MHz Bandwidth

Modulation Coding Scheme: MCS7

	5180 MHz	5220 MHz	5240 MHz
26 dB Bandwidth (MHz)	20.340	20.520	20.700
99% Occupied Bandwidth (MHz)	17.660	17.668	17.683

Table 111 – SISO – Antenna Port 0

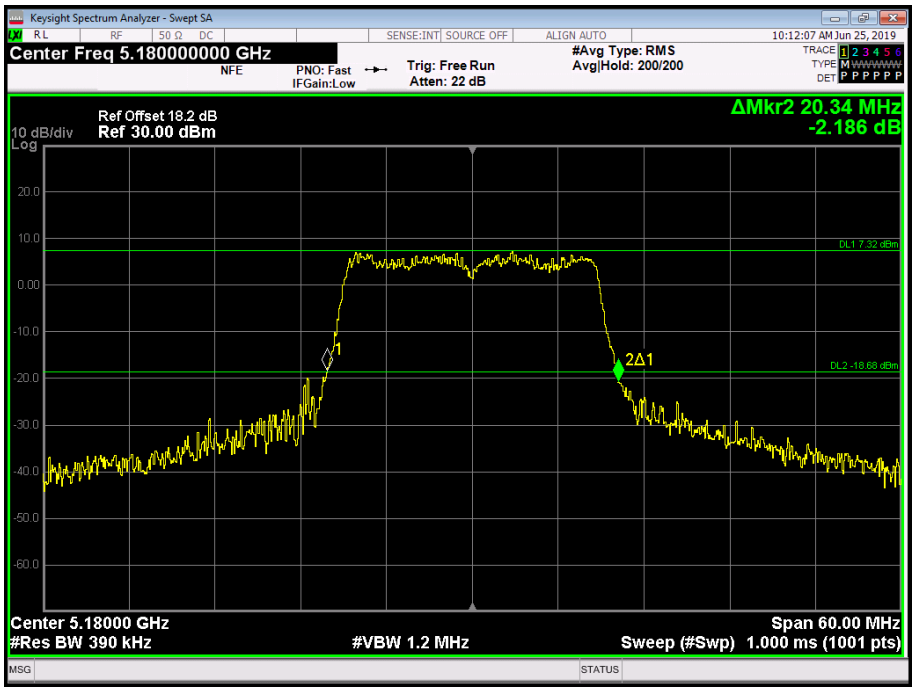

Figure 48 - 5180 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

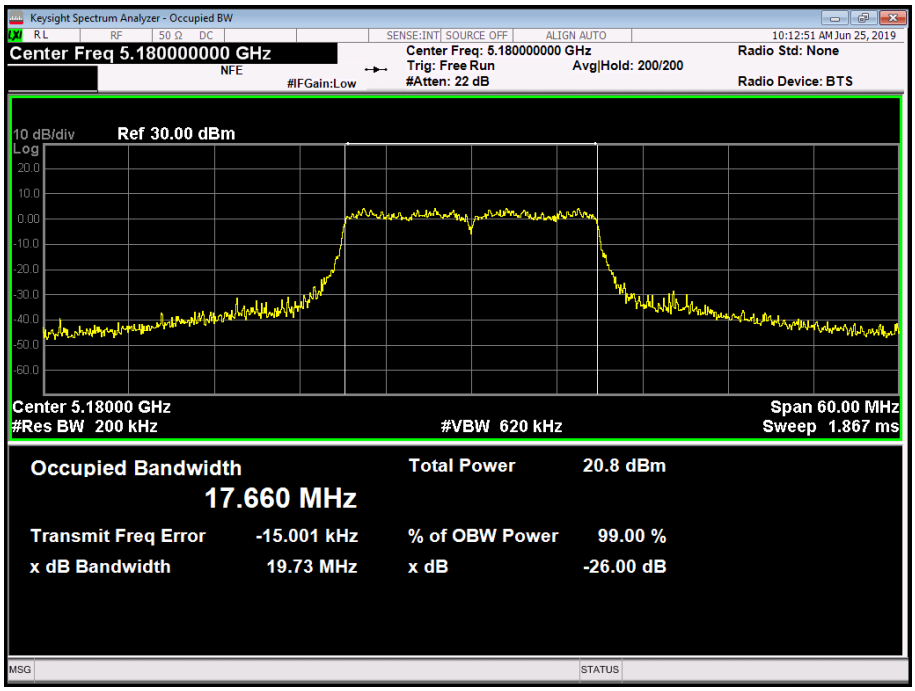

Figure 49 - 5180 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

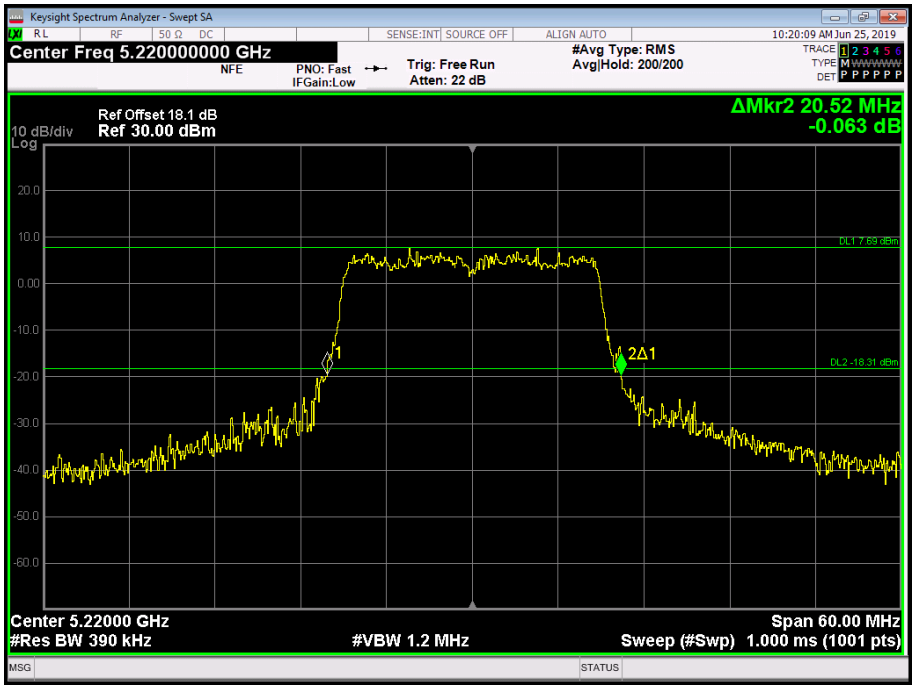

Figure 50 - 5220 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

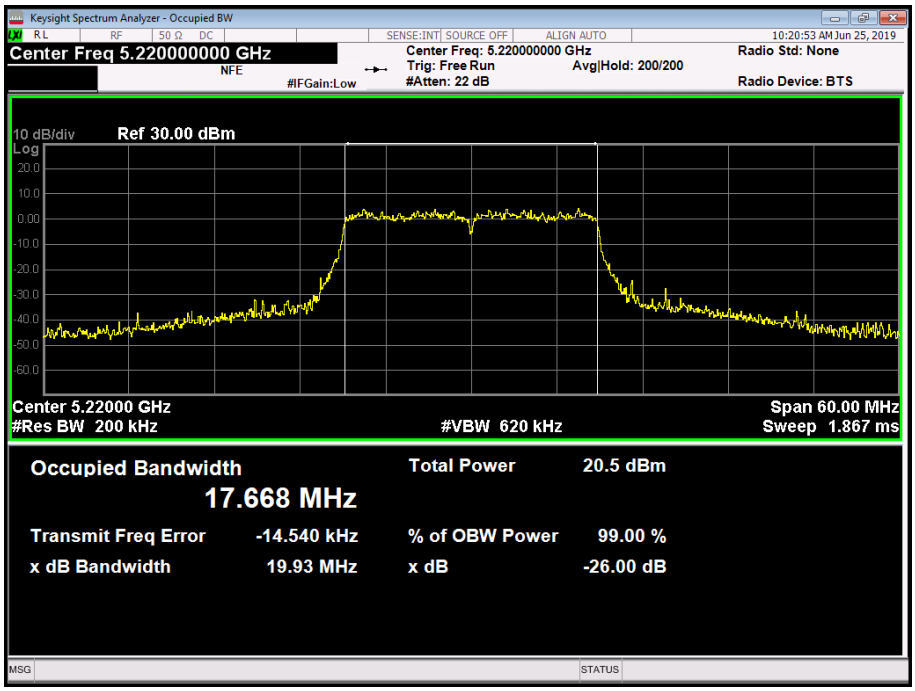

Figure 51 - 5220 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

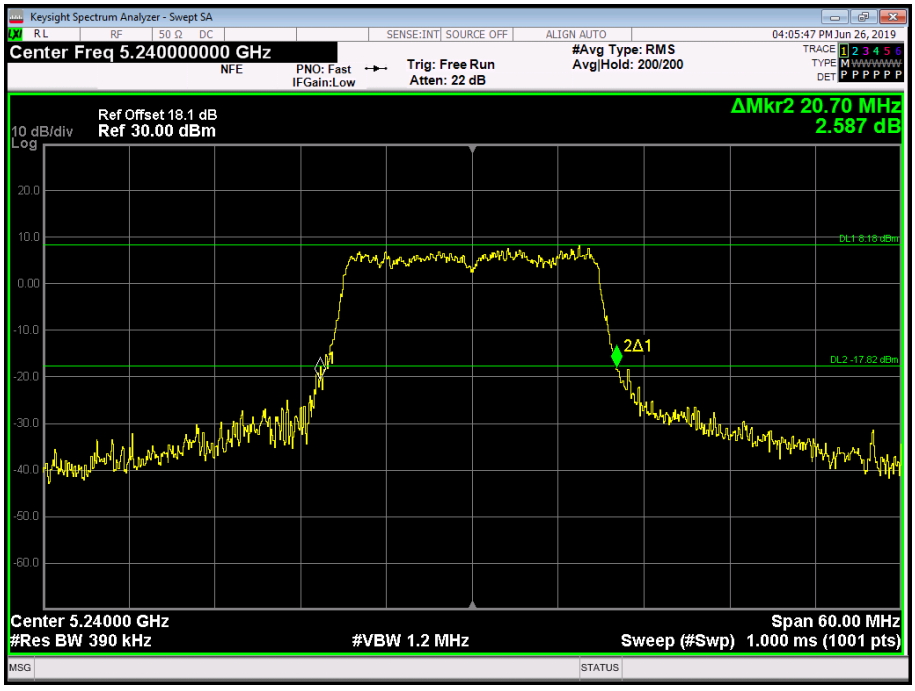

Figure 52 - 5240 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

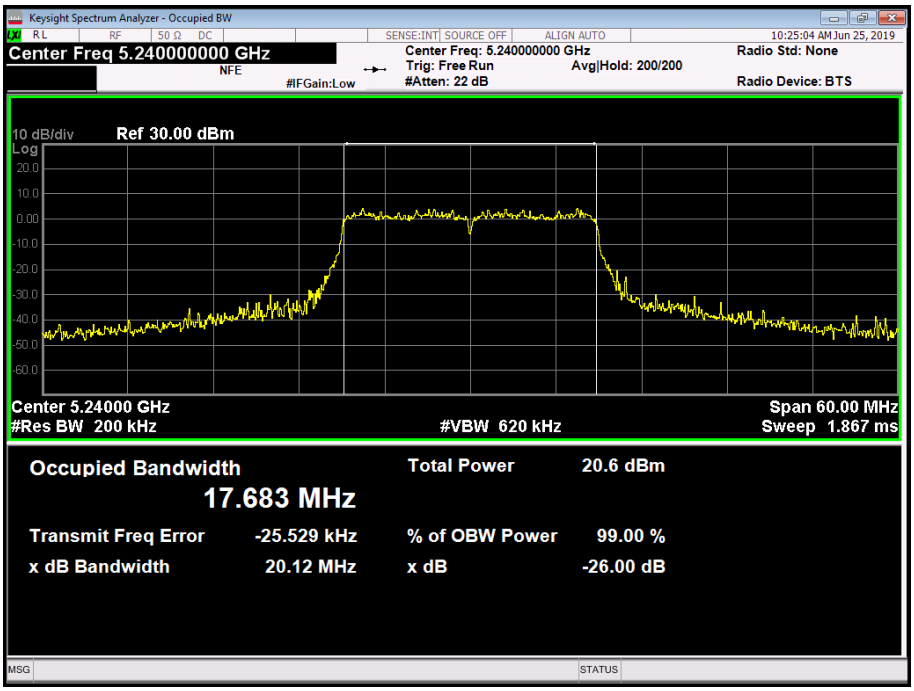

Figure 53 - 5240 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

	5180 MHz	5220 MHz	5240 MHz
26 dB Bandwidth (MHz)	21.300	21.240	20.700
99% Occupied Bandwidth (MHz)	17.670	17.674	17.682

Table 112 – SISO – Antenna Port 1

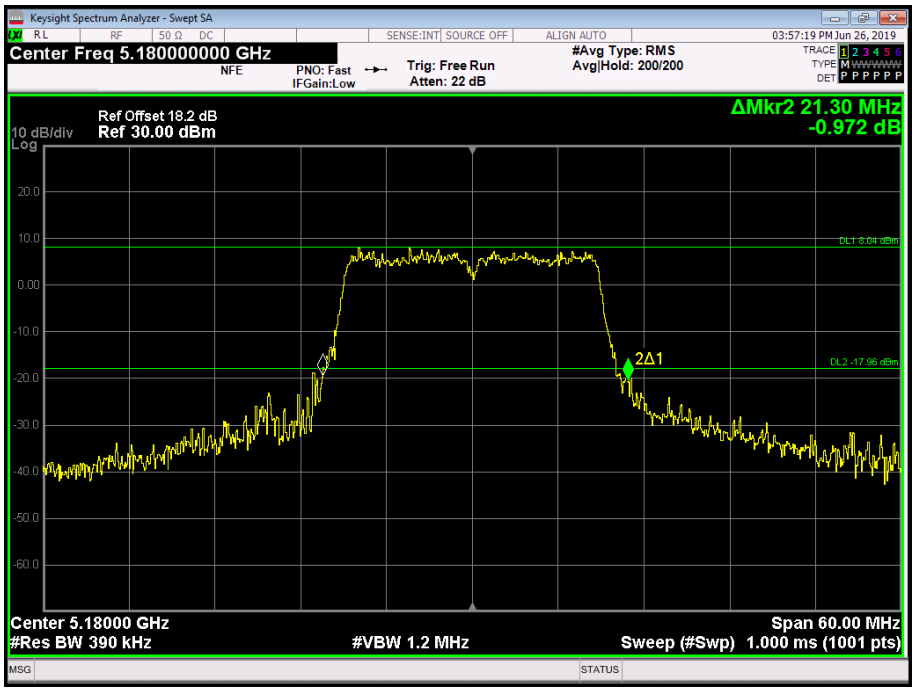

Figure 54 - 5180 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

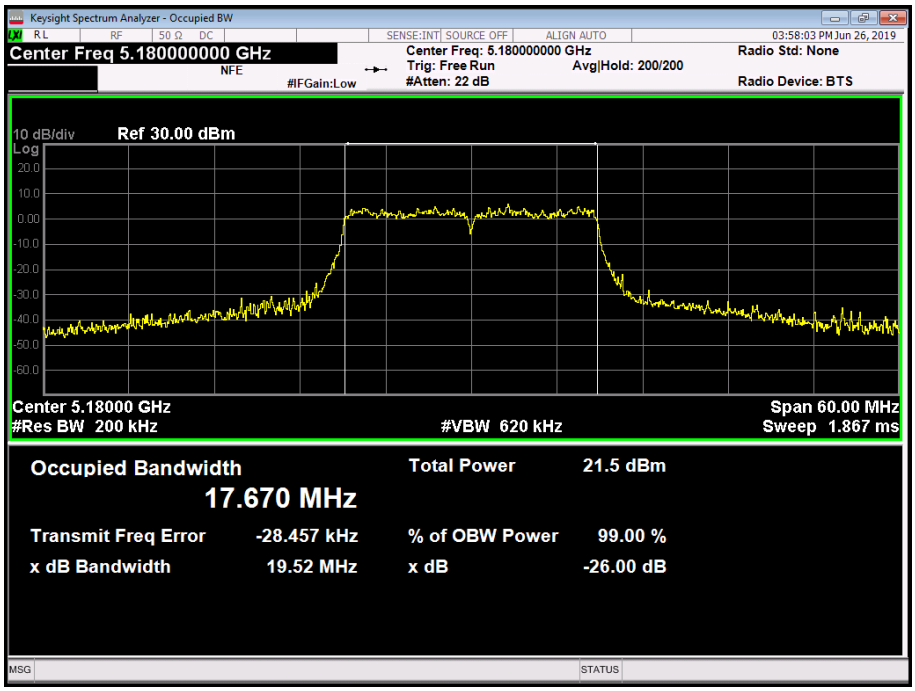

Figure 55 - 5180 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

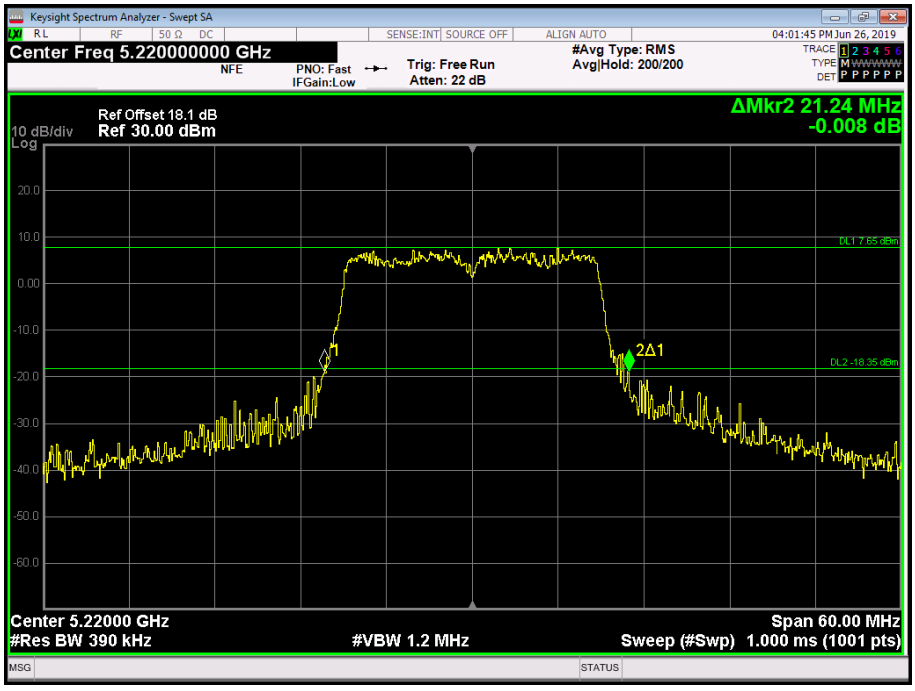

Figure 56 - 5220 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

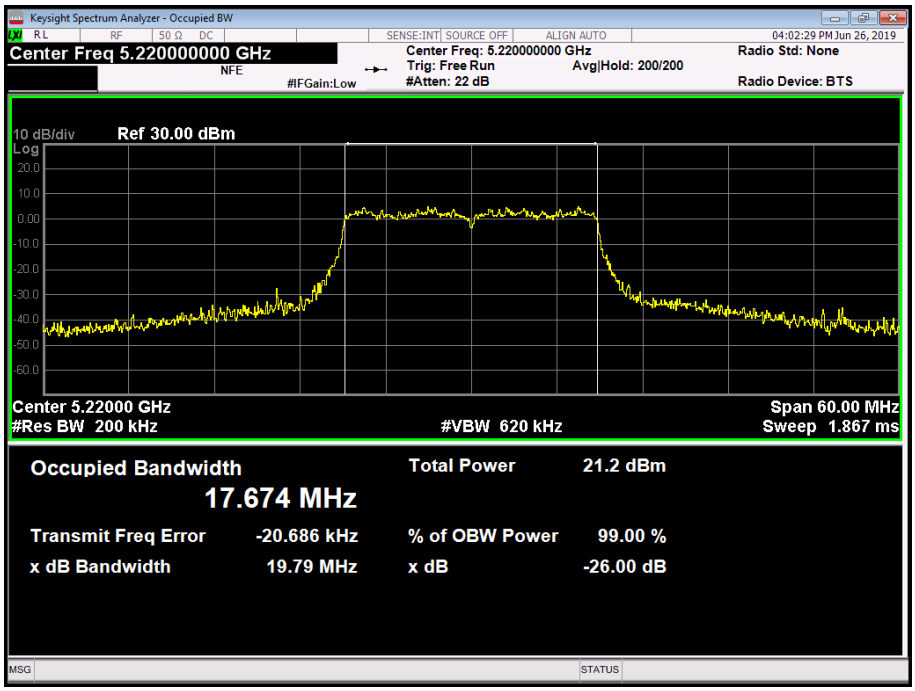

Figure 57 - 5220 MHz - 99% Occupied Bandwidth– Antenna Port 1

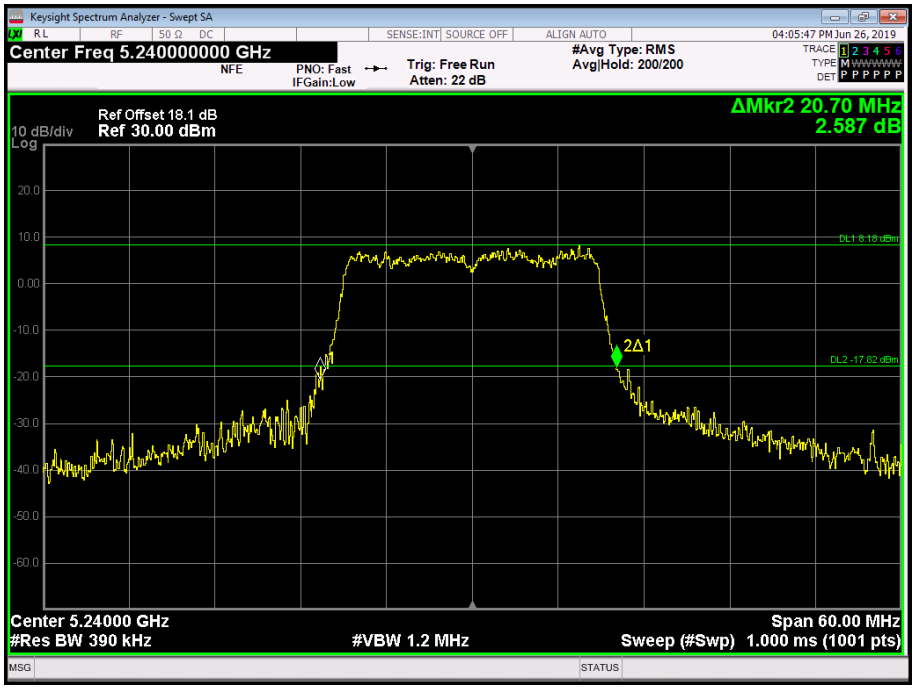

Figure 58 - 5240 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

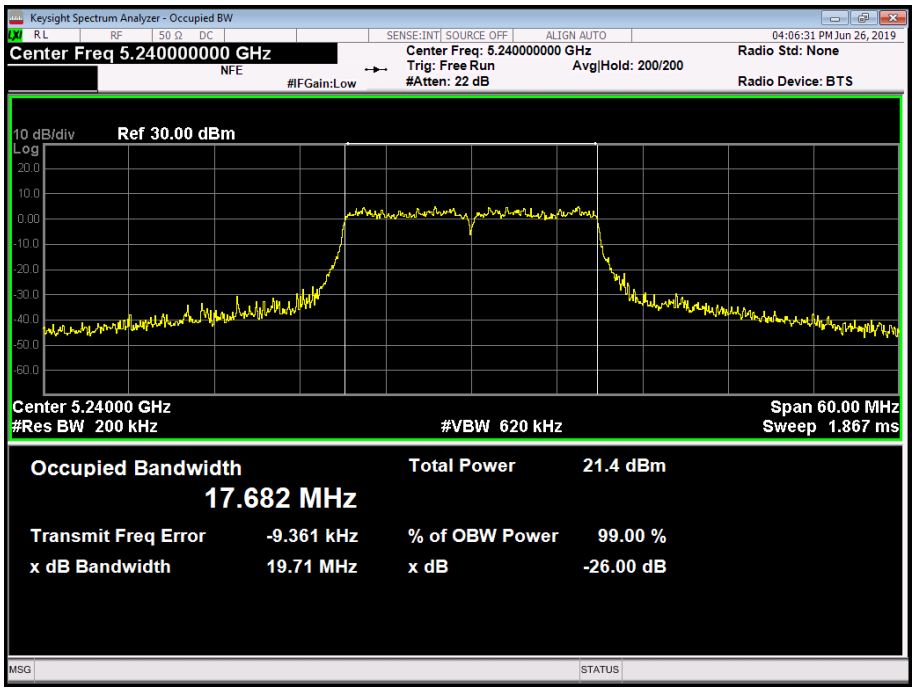

Figure 59 - 5240 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

Modulation Coding Scheme: MCS0

	5180 MHz	5220 MHz	5240 MHz
26 dB Bandwidth (MHz)	20.640	20.340	21.120
99% Occupied Bandwidth (MHz)	17.671	17.676	17.695

Table 113 – Worst-case Antenna Port – MIMO CDD

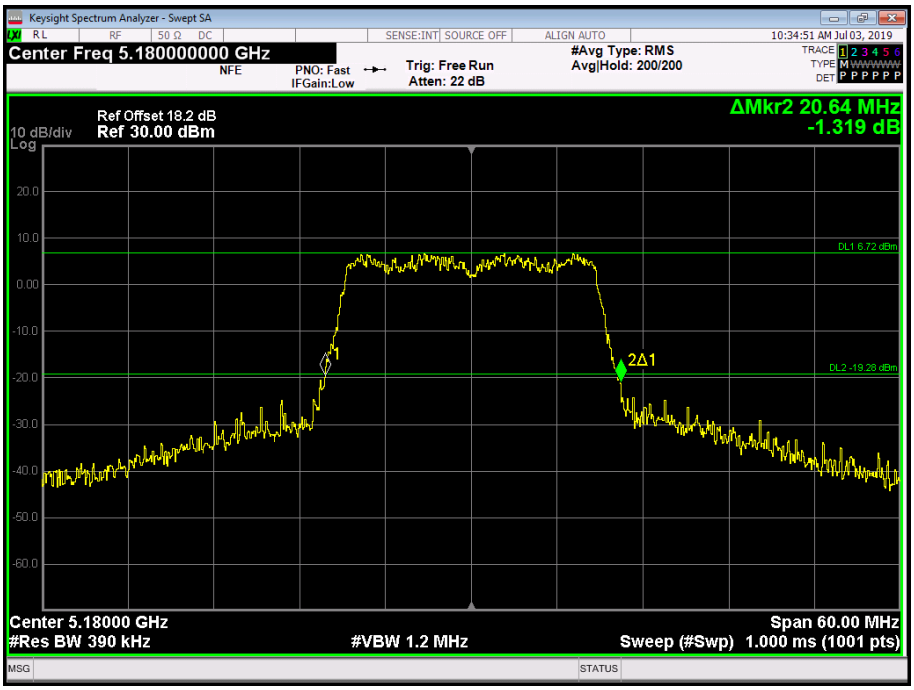

Figure 60 - 5180 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

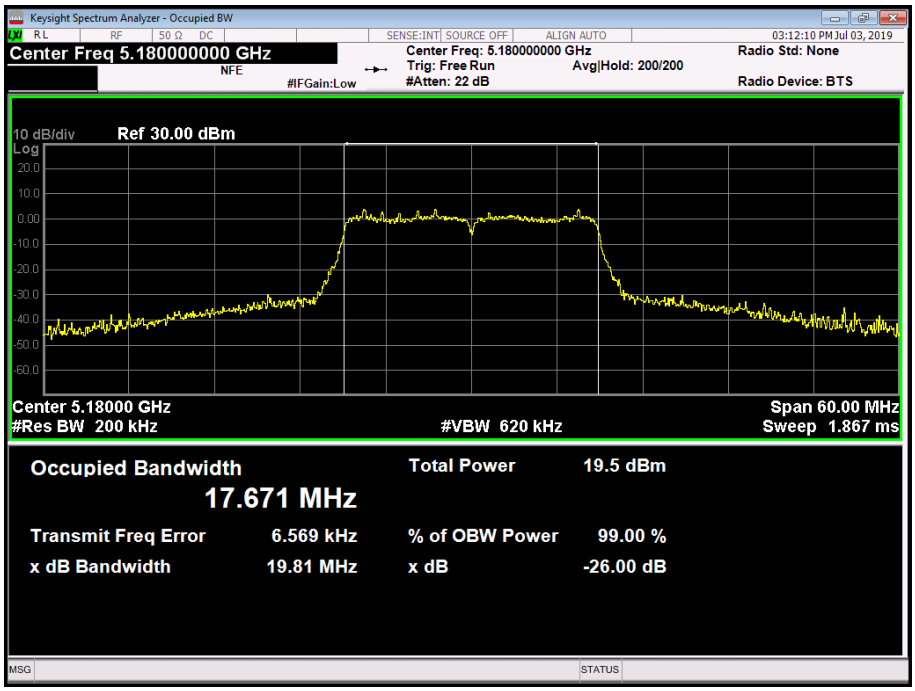

Figure 61 - 5180 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

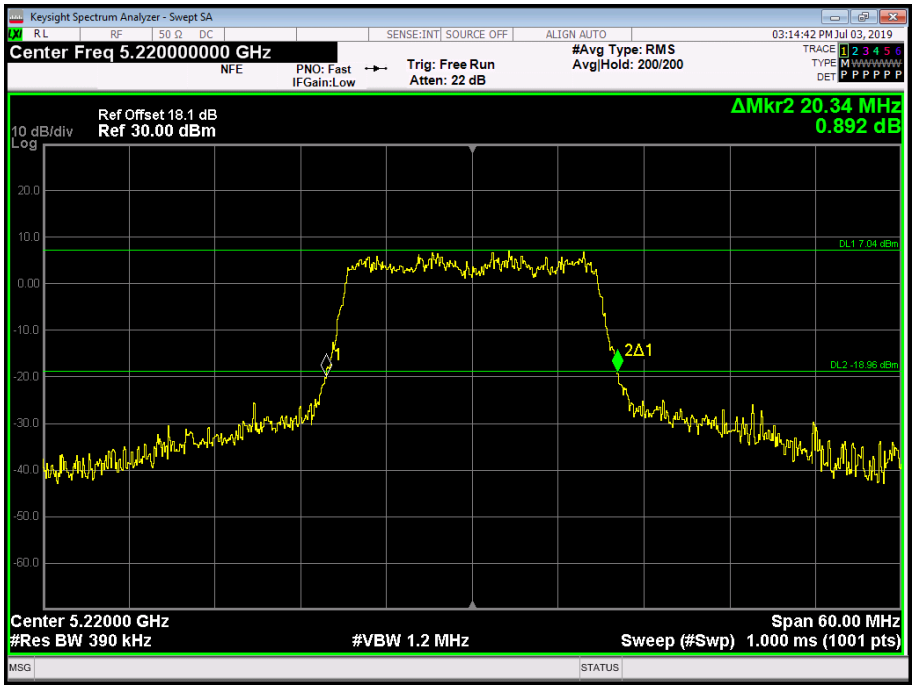

Figure 62 - 5220 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

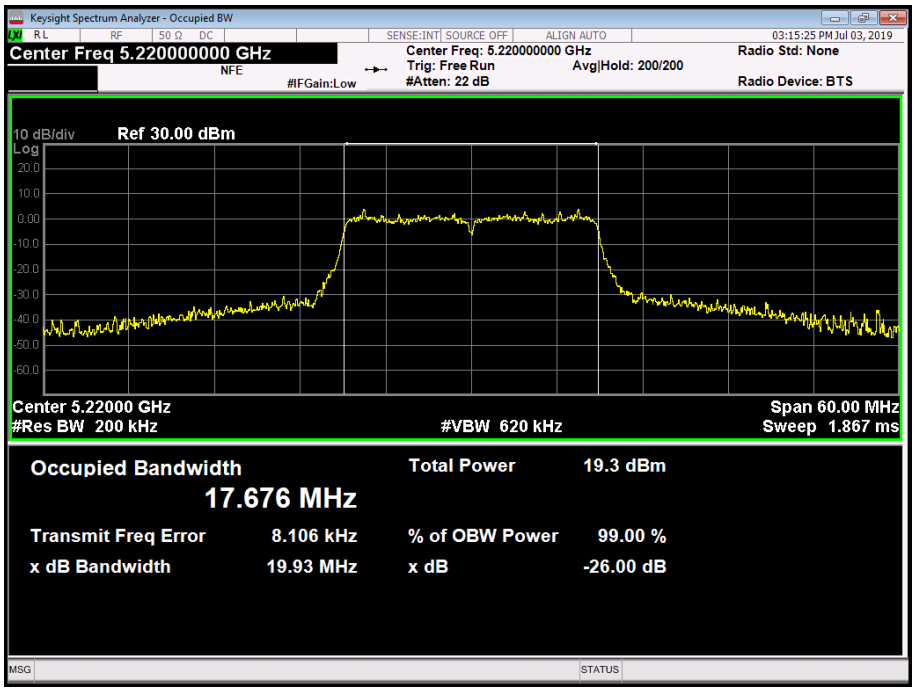

Figure 63 - 5220 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

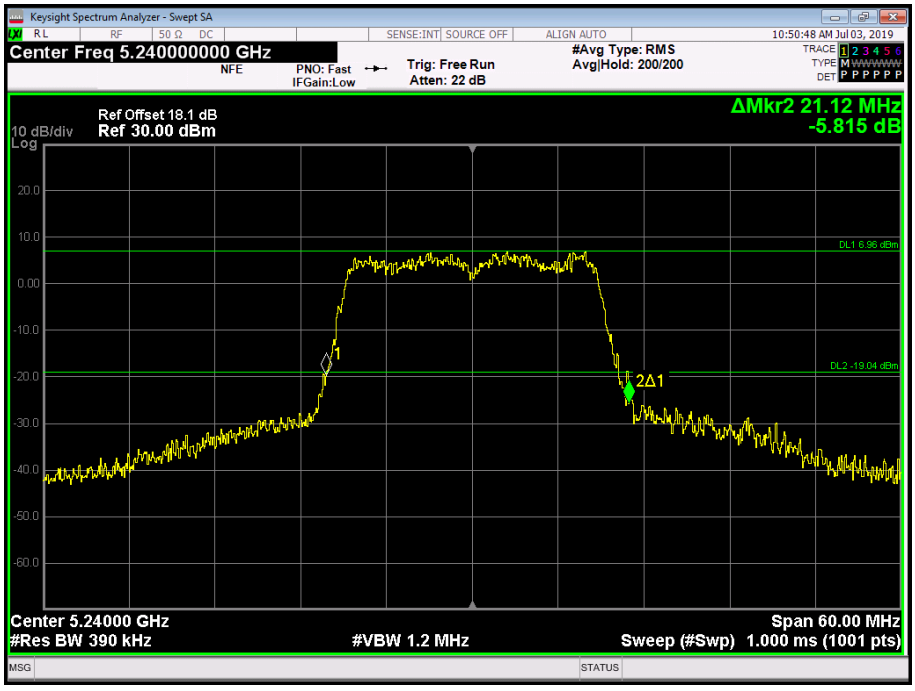

Figure 64 - 5240 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

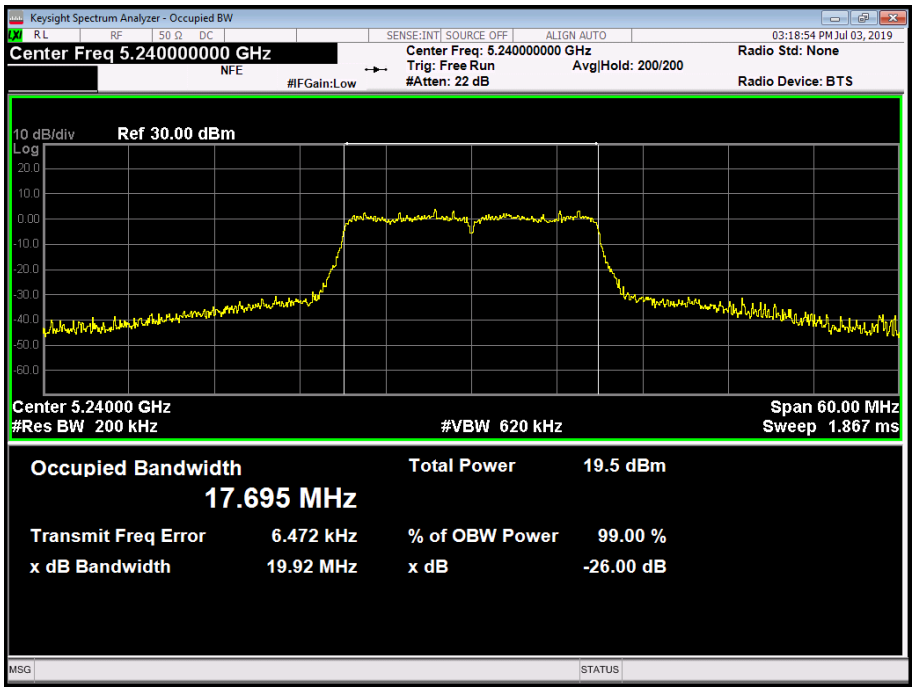

Figure 65 - 5240 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

5 GHz WLAN - 802.11ac 40 MHz Bandwidth

Modulation Coding Scheme: MCS9

	5190 MHz	5230 MHz
26 dB Bandwidth (MHz)	41.520	41.760
99% Occupied Bandwidth (MHz)	36.394	36.346

Table 114 – SISO – Antenna Port 0

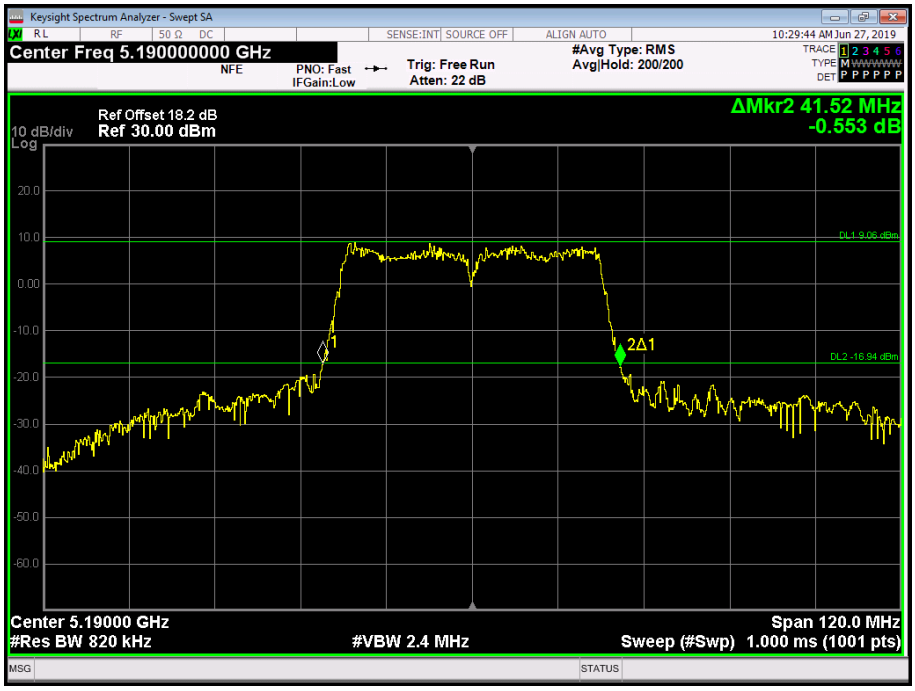

Figure 66 - 5190 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

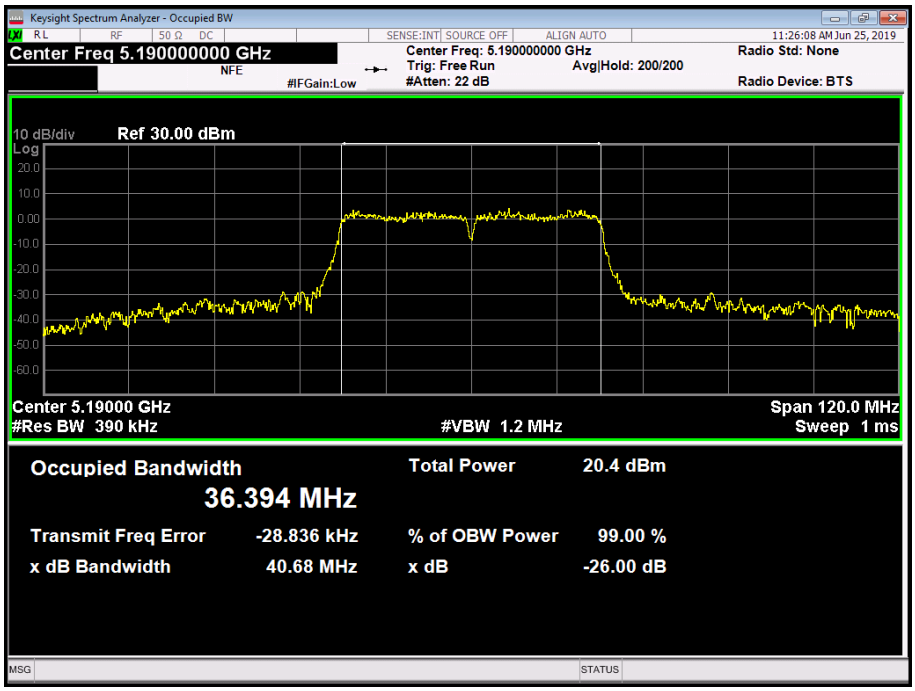

Figure 67 - 5190 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

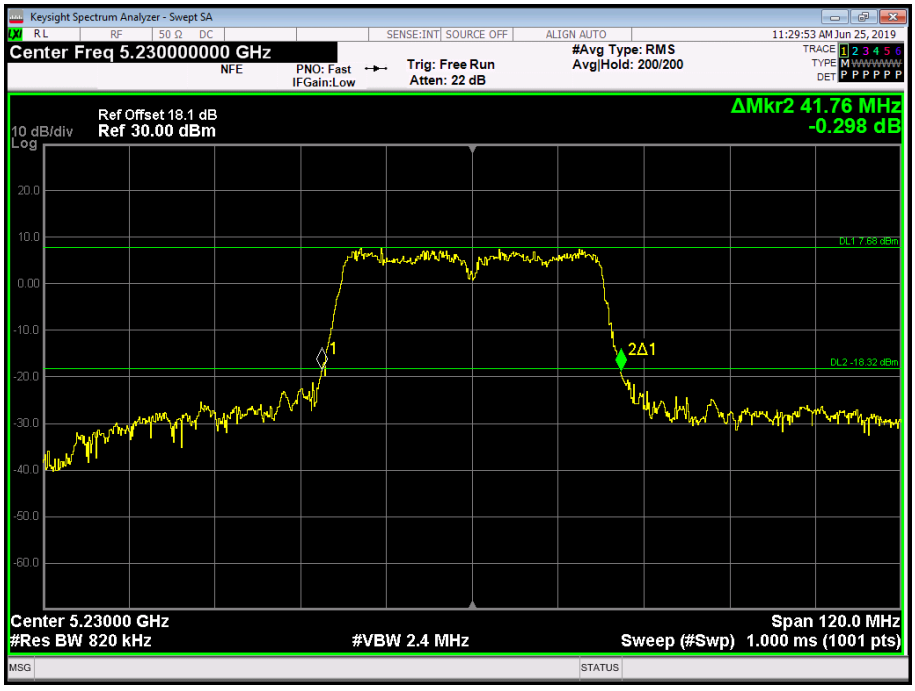

Figure 68 - 5230 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

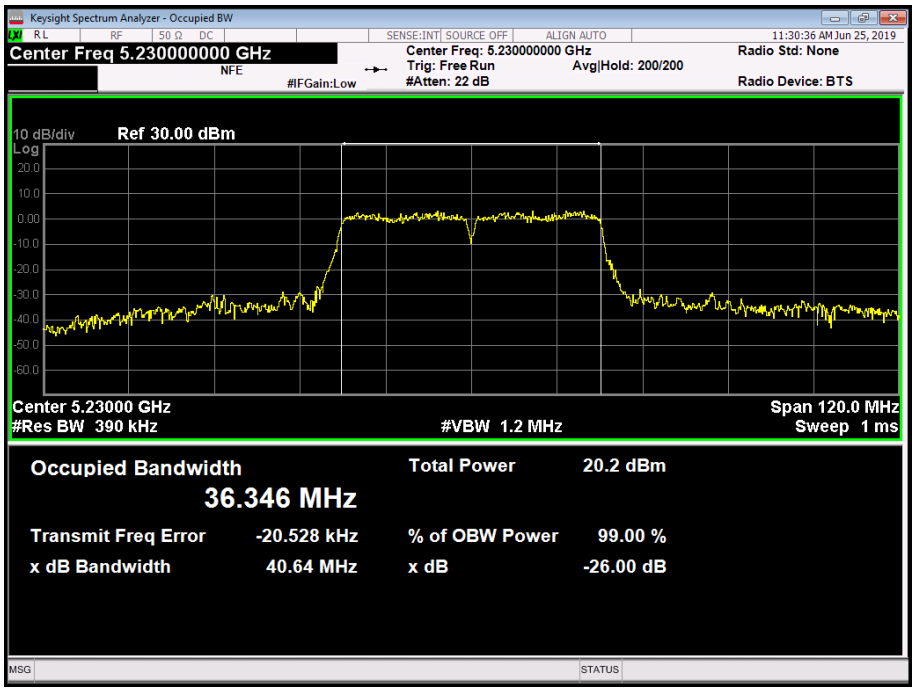

Figure 69 - 5230 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

	5190 MHz	5230 MHz
26 dB Bandwidth (MHz)	41.520	41.640
99% Occupied Bandwidth (MHz)	36.321	36.349

Table 115 – SISO – Antenna Port 1

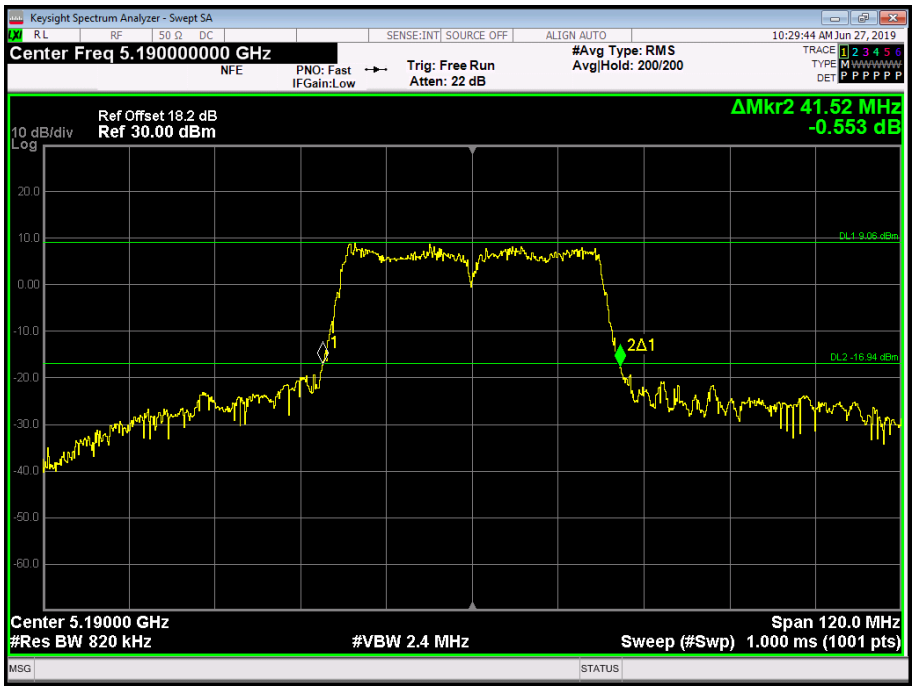

Figure 70 - 5190 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

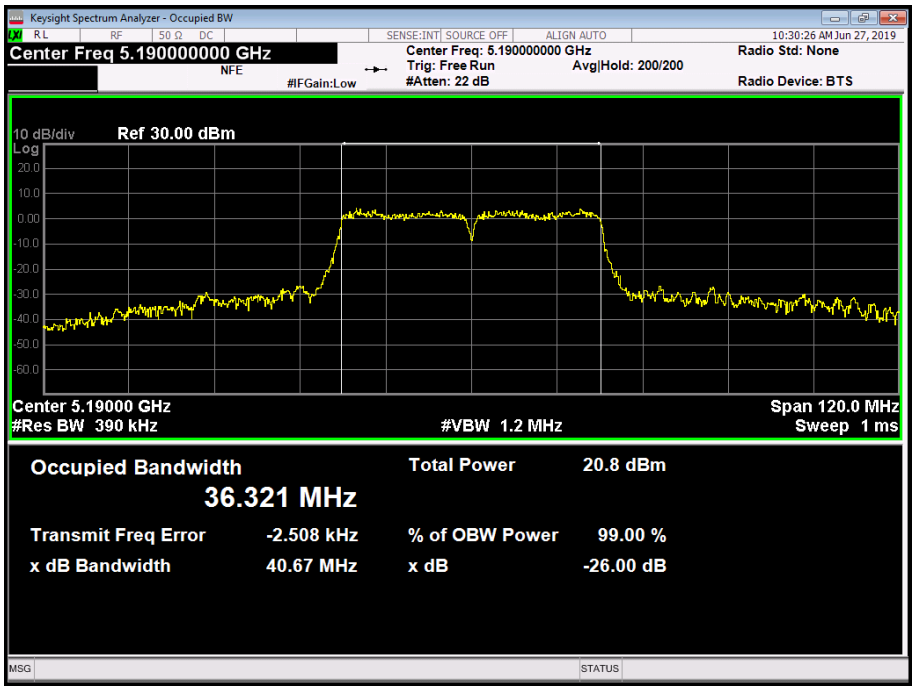

Figure 71 - 5190 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

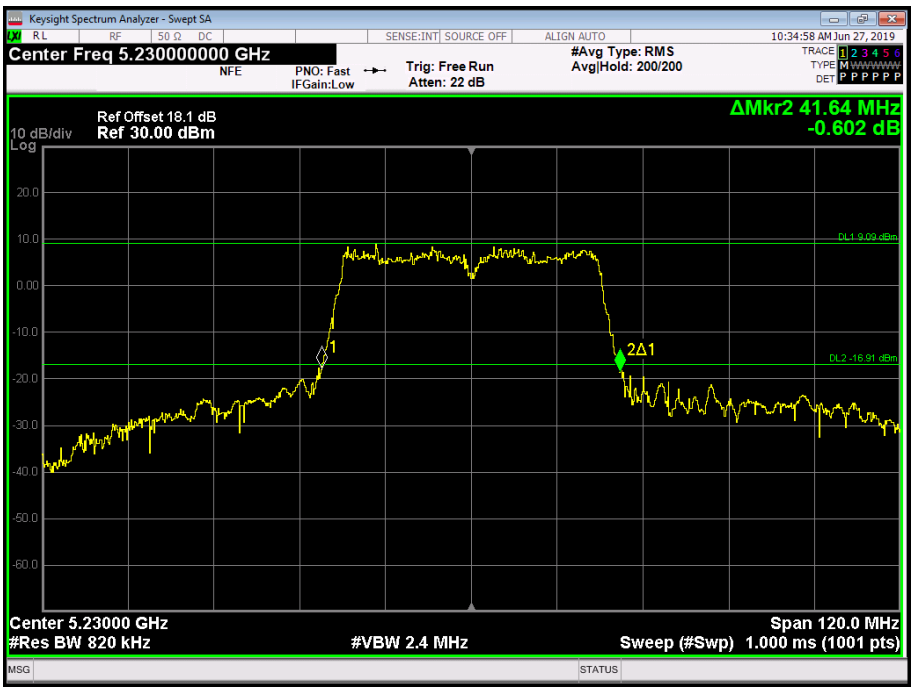

Figure 72 - 5230 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

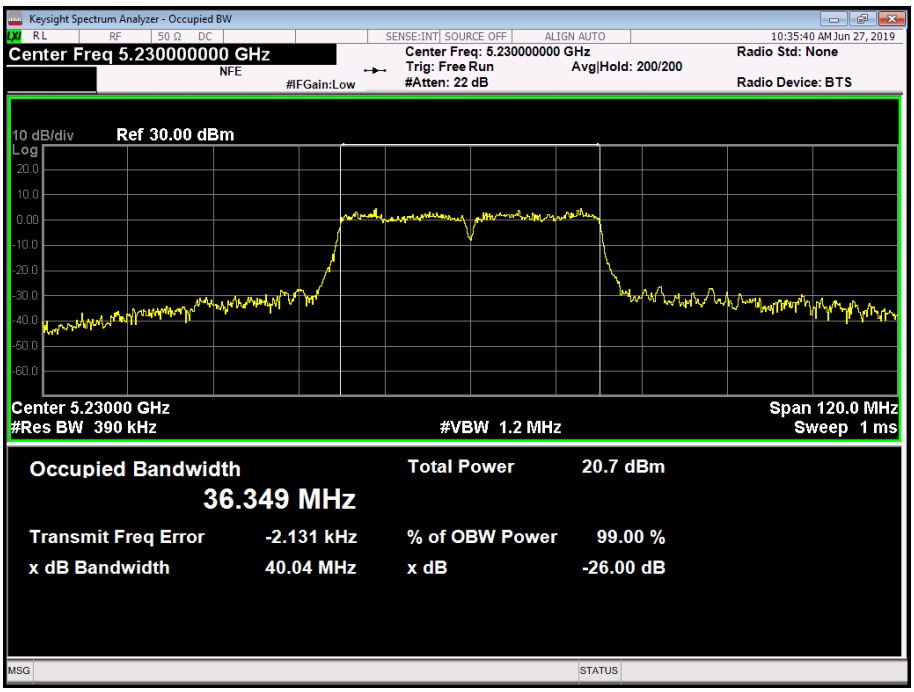

Figure 73 - 5230 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

Modulation Coding Scheme: MCS0

	5190 MHz	5230 MHz
26 dB Bandwidth (MHz)	42.360	41.160
99% Occupied Bandwidth (MHz)	36.257	36.286

Table 116 – Worst-case Antenna Port – MIMO CDD

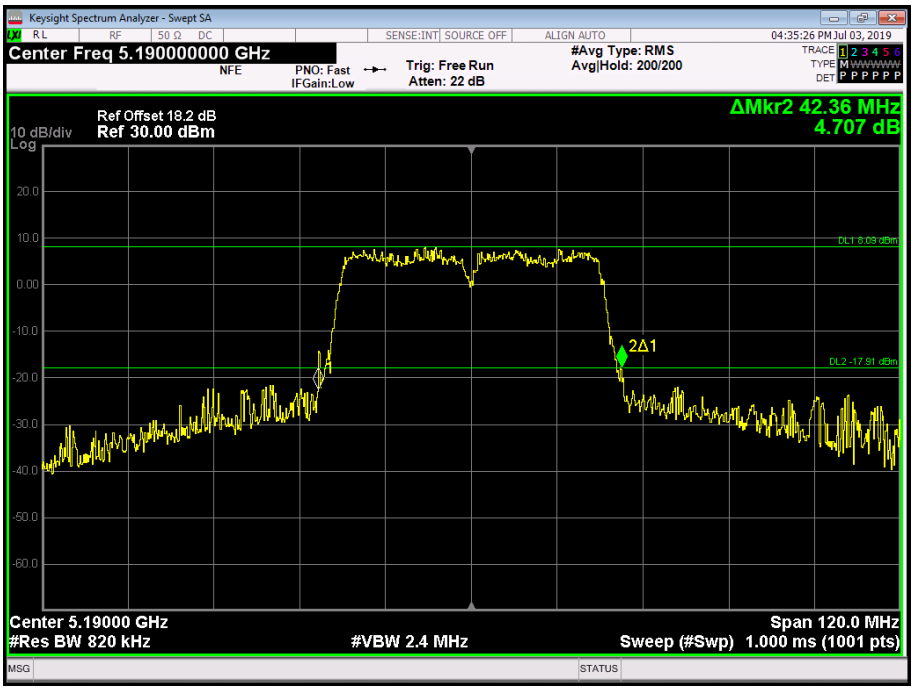

Figure 74 - 5190 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

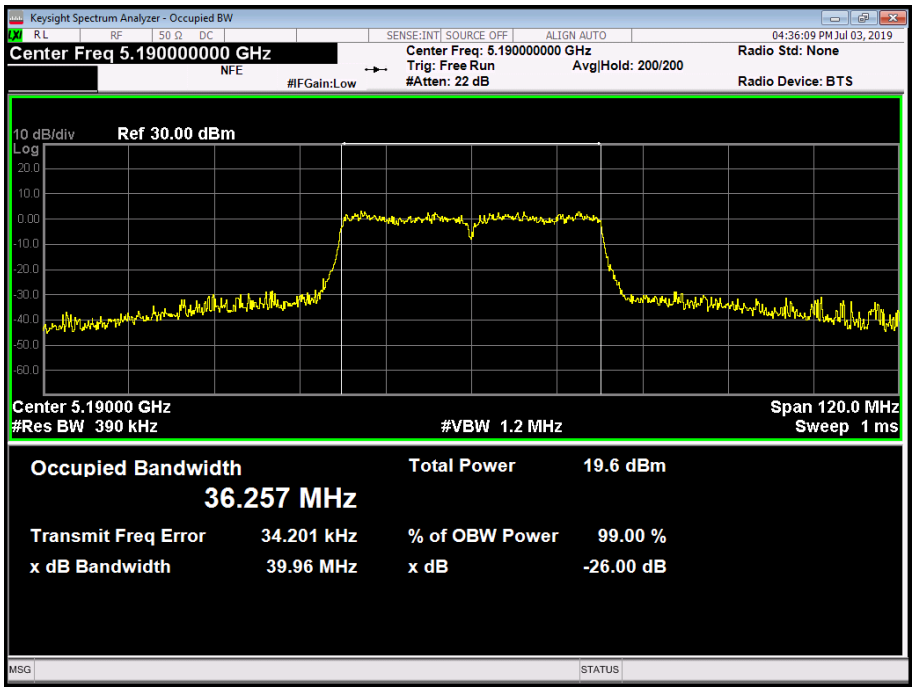

Figure 75 - 5190 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

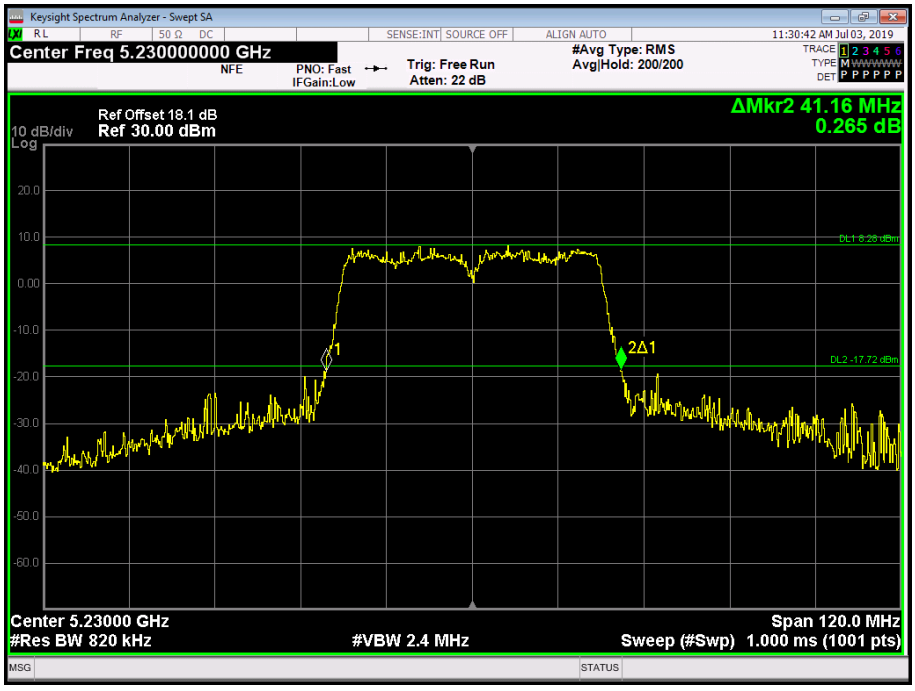

Figure 76 - 5230 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

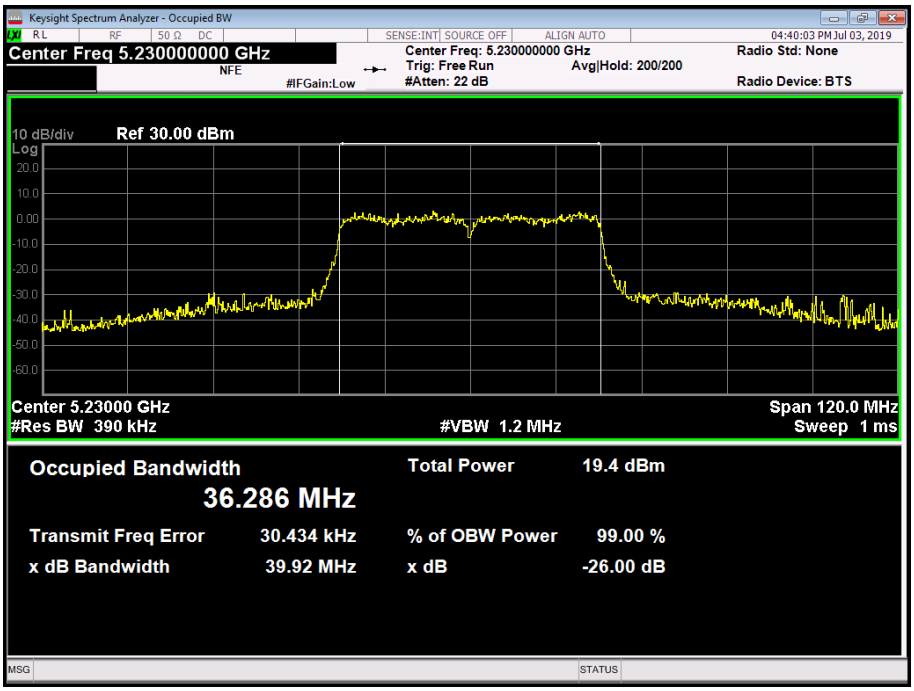

Figure 77 - 5230 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

5 GHz WLAN - 802.11n 80 MHz Bandwidth

Modulation Coding Scheme: MCS5

	5210 MHz
26 dB Bandwidth (MHz)	83.040
99% Occupied Bandwidth (MHz)	76.156

Table 117 – SISO – Antenna Port 0

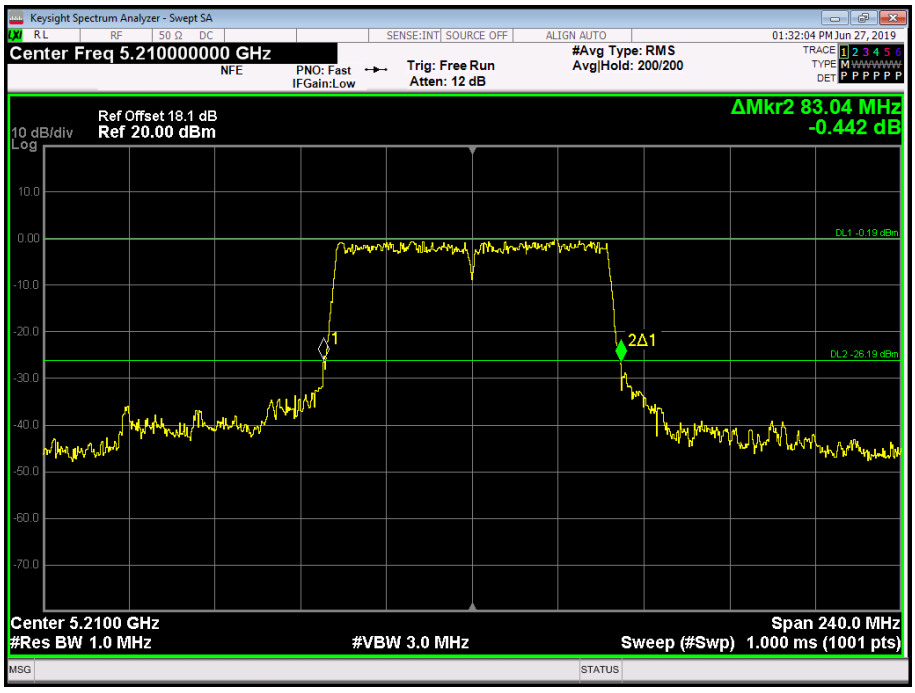

Figure 78 - 5210 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

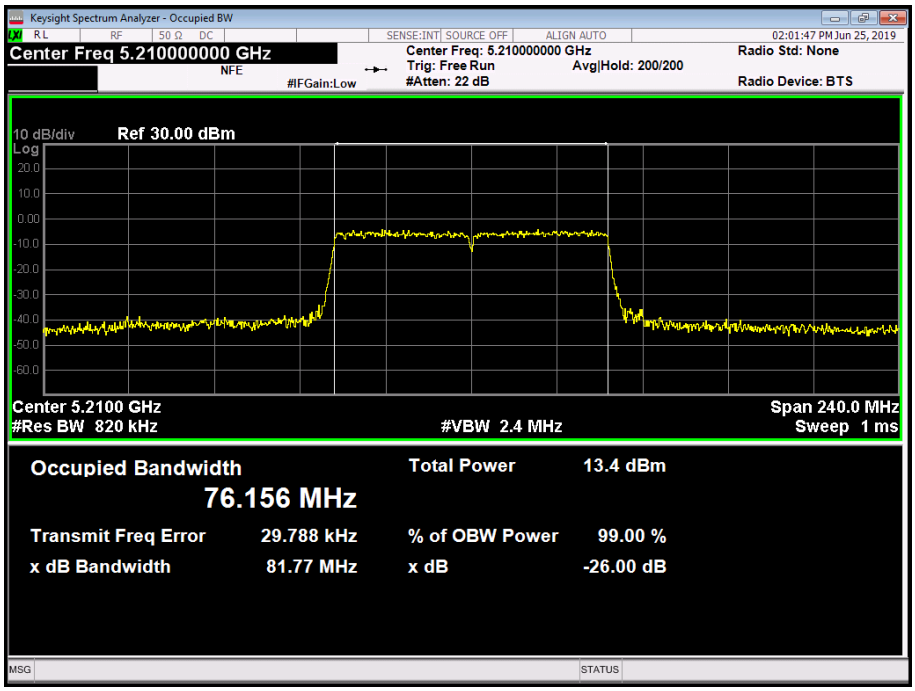

Figure 79 - 5210 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

	5210 MHz
26 dB Bandwidth (MHz)	83.040
99% Occupied Bandwidth (MHz)	76.025

Table 118 – SISO – Antenna Port 1

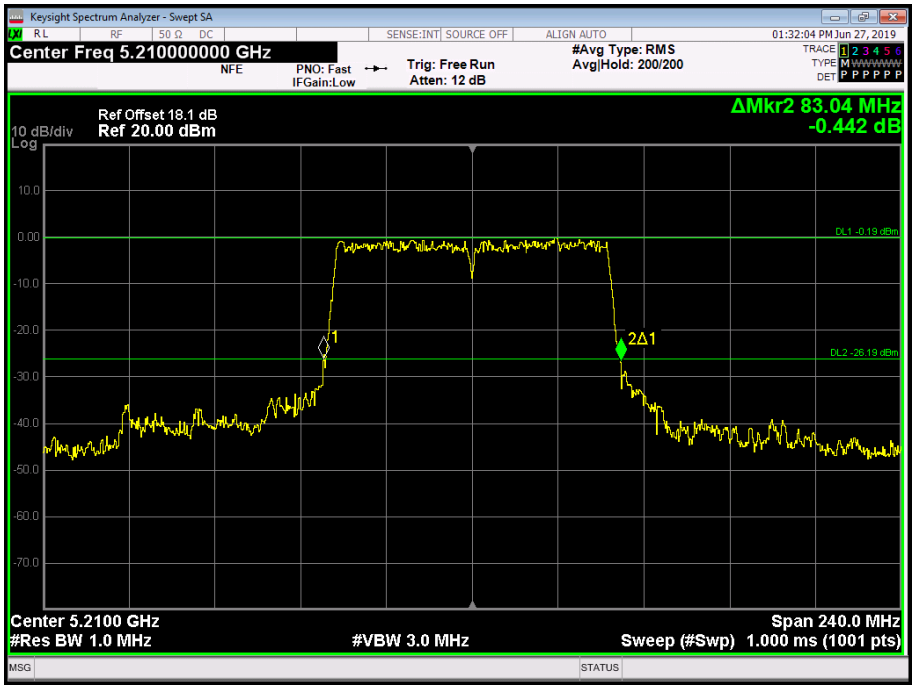

Figure 80 - 5210 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

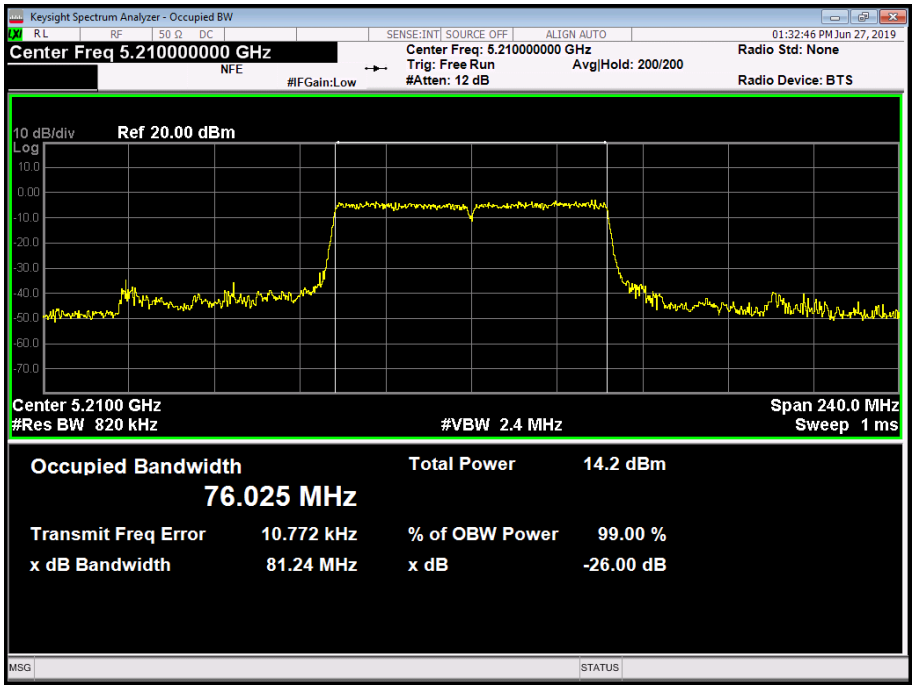

Figure 81 - 5210 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

Modulation Coding Scheme: MCS0

	5210 MHz
26 dB Bandwidth (MHz)	82.320
99% Occupied Bandwidth (MHz)	76.095

Table 119 – Worst-case Antenna Port – MIMO CDD

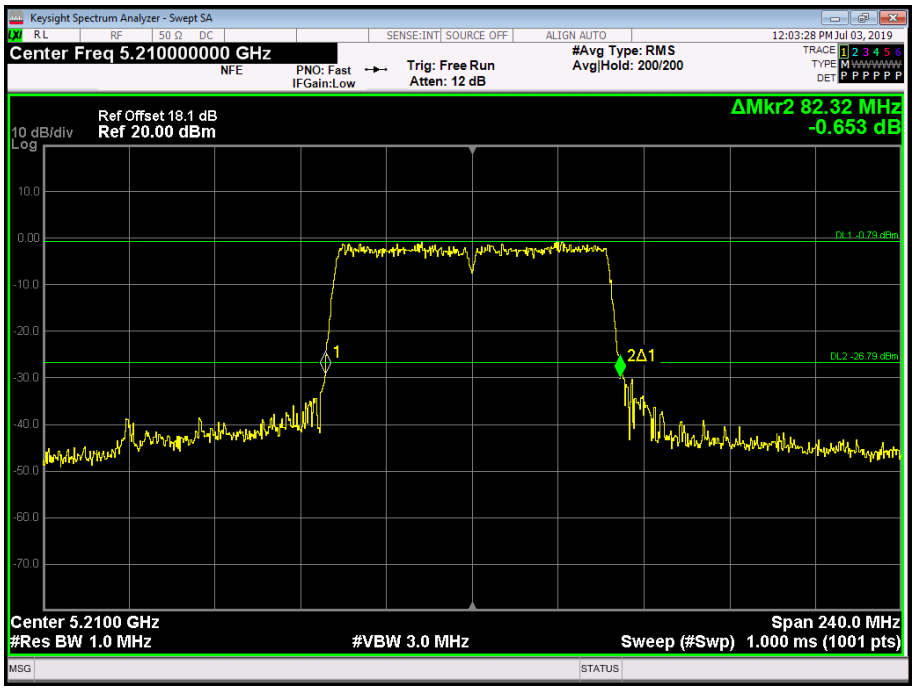

Figure 82 - 5210 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

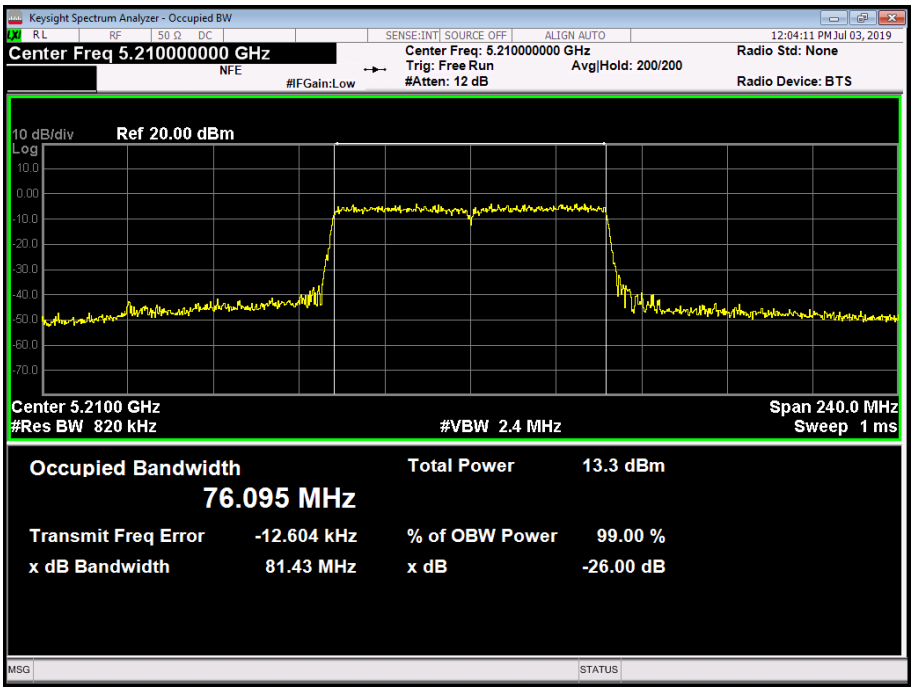

Figure 83 - 5210 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

U-NII-2A

5 GHz WLAN - 802.11a

Data Rate: 54 Mbps

	5260 MHz	5300 MHz	5320 MHz
26 dB Bandwidth (MHz)	21.360	20.760	20.460
99% Occupied Bandwidth (MHz)	16.519	16.520	16.532

Table 120 – SISO – Antenna Port 0

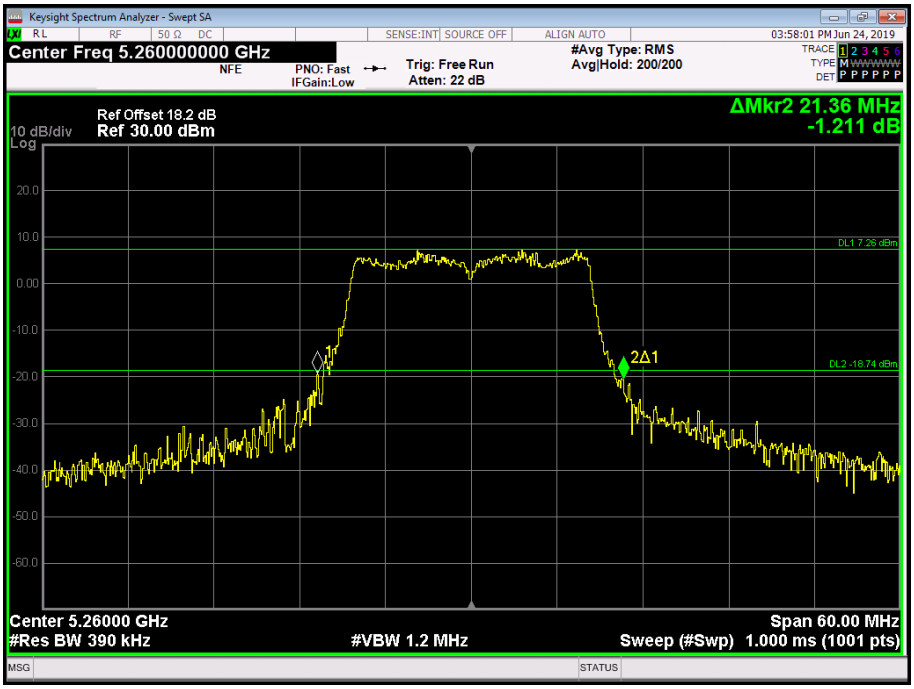

Figure 84 - 5260 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

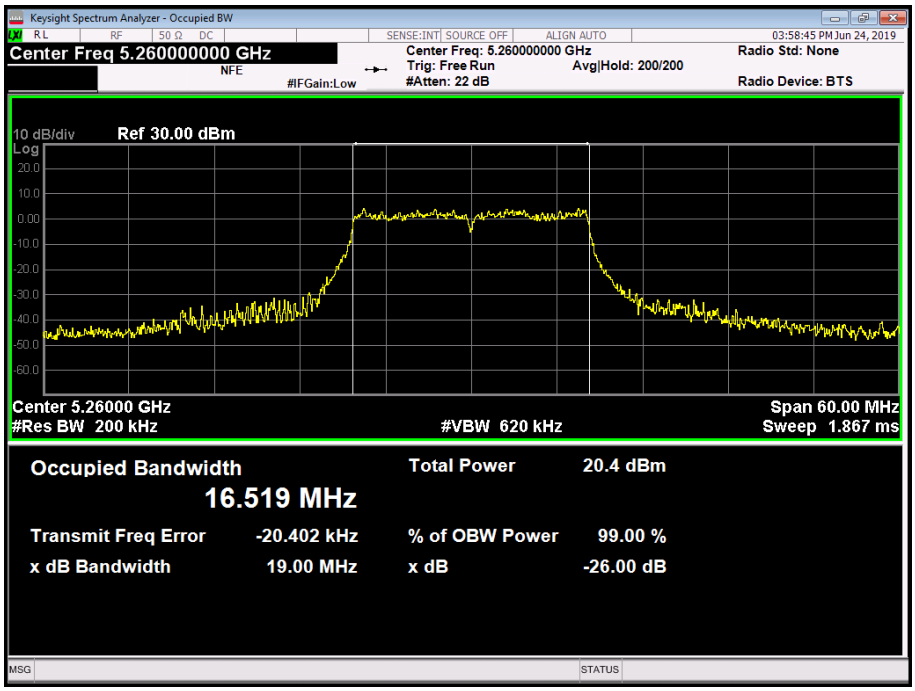

Figure 85 - 5260 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

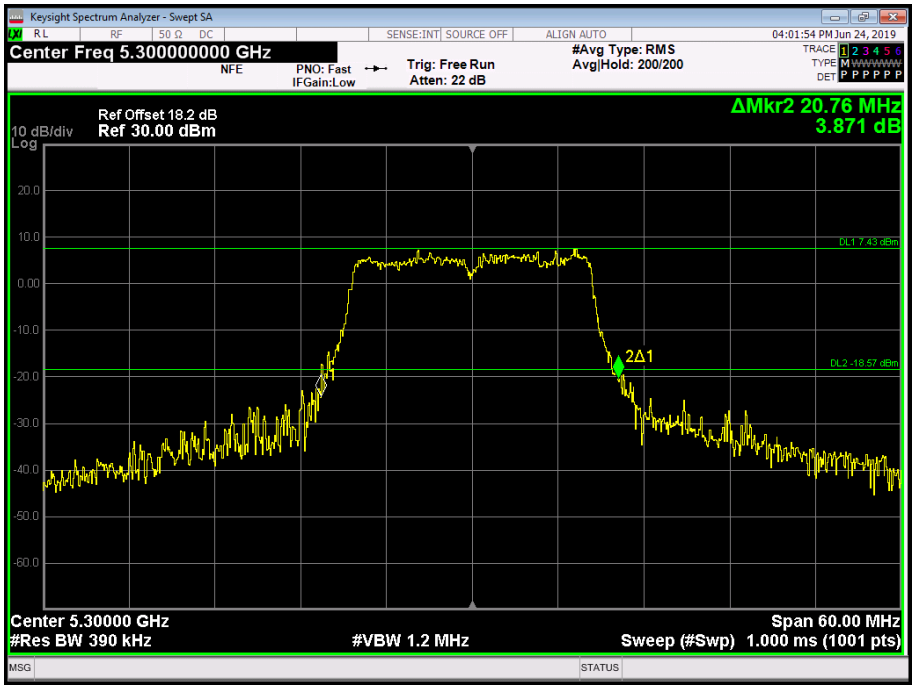

Figure 86 - 5300 MHz - 26 dB Emission Bandwidth– Antenna Port 0

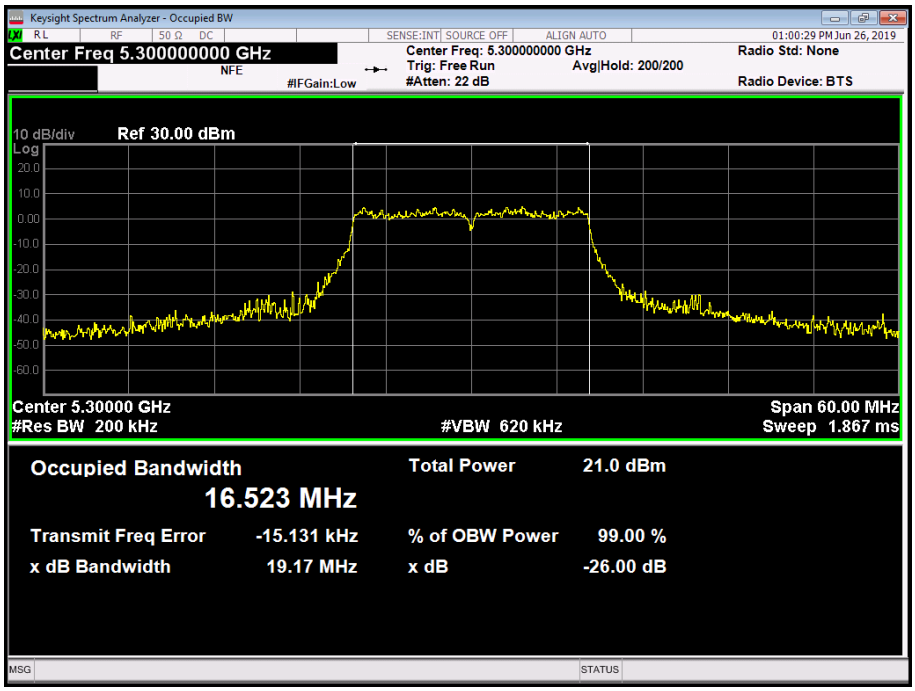

Figure 87 - 5300 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

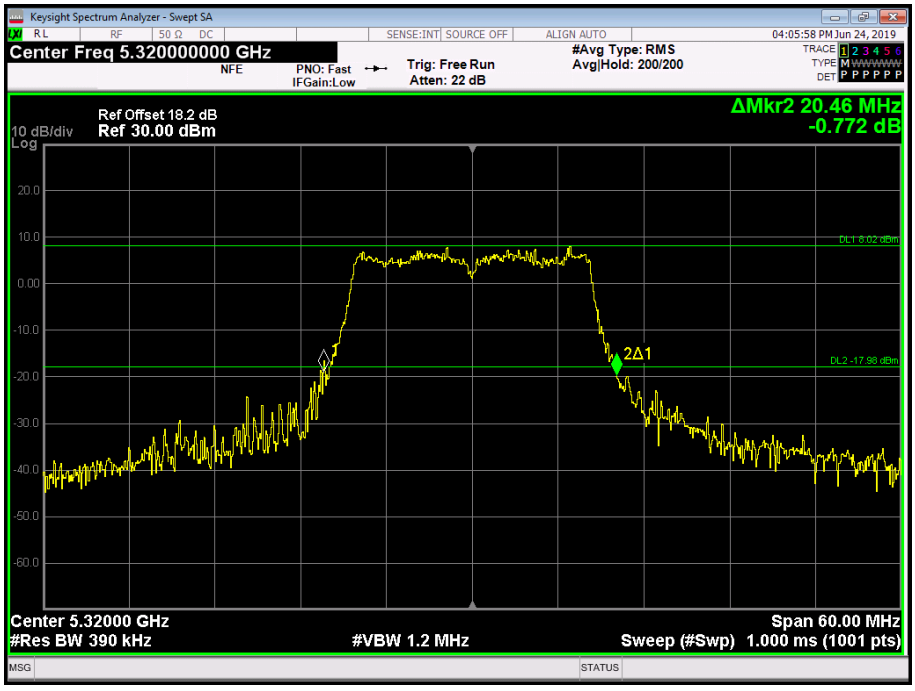

Figure 88 - 5320 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

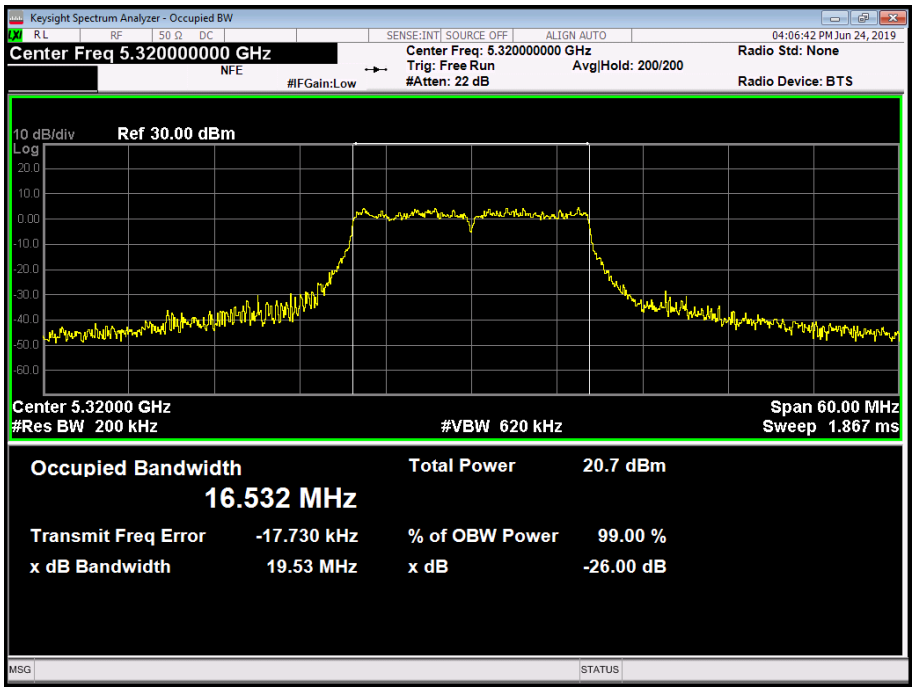

Figure 89 - 5320 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

	5260 MHz	5300 MHz	5320 MHz
26 dB Bandwidth (MHz)	20.280	20.400	21.120
99% Occupied Bandwidth (MHz)	16.513	16.523	16.530

Table 121 – SISO – Antenna Port 1

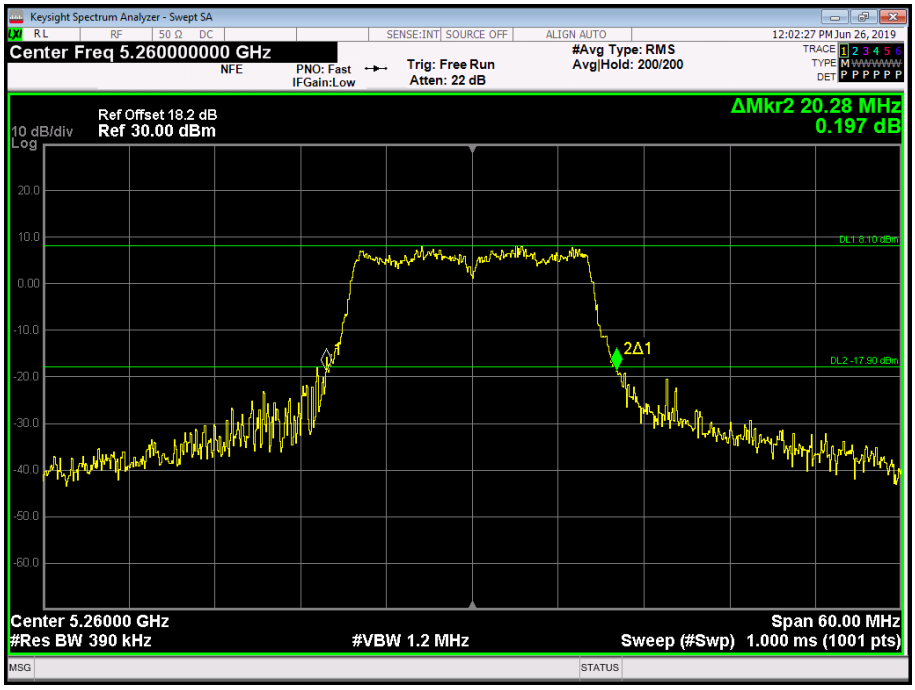

Figure 90 - 5260 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

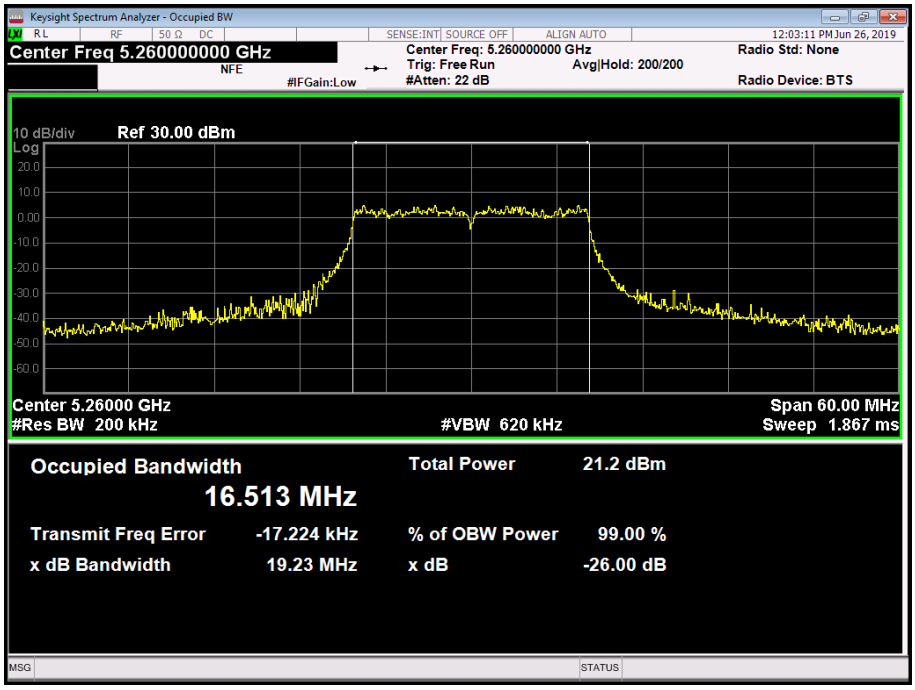

Figure 91 - 5260 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

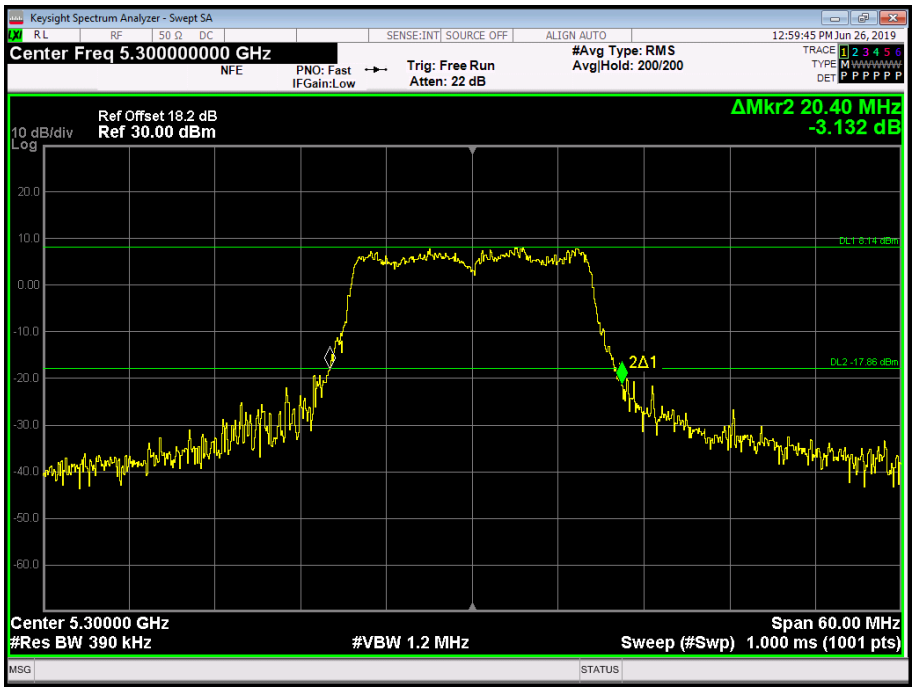

Figure 92 - 5300 MHz - 26 dB Emission Bandwidth– Antenna Port 1

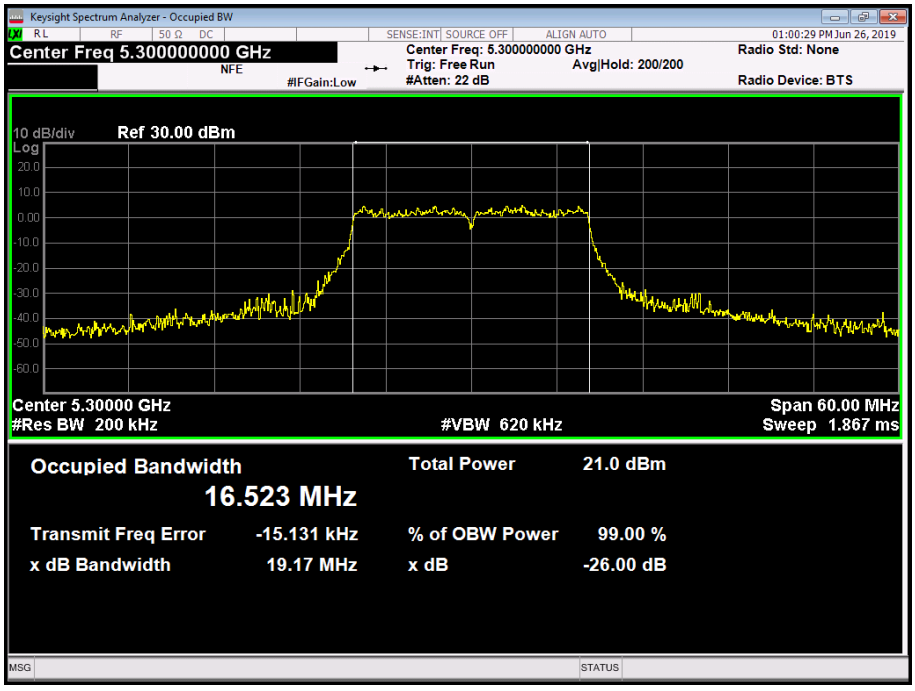

Figure 93 - 5300 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

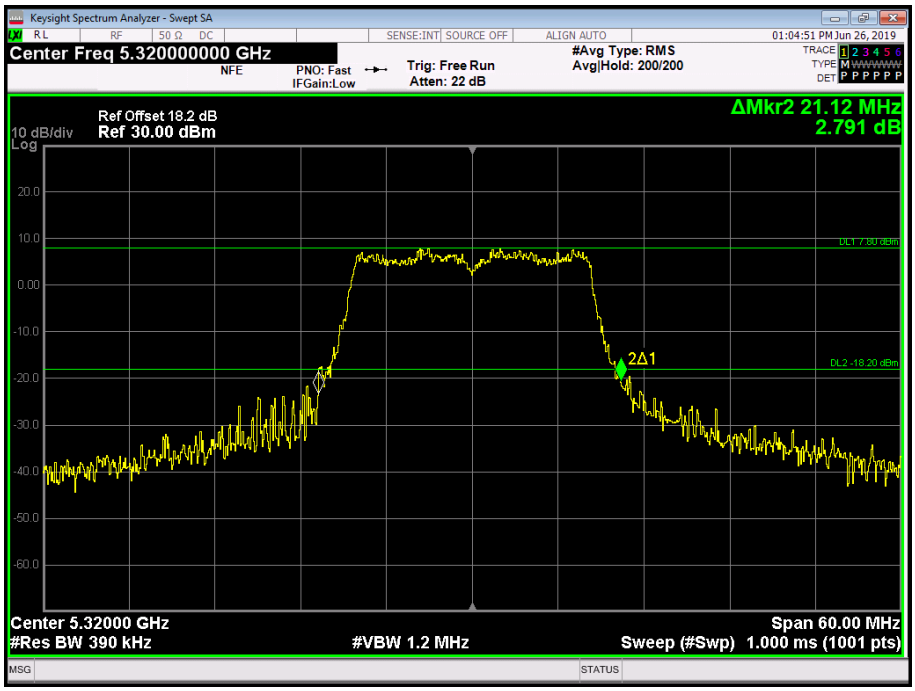

Figure 94 - 5320 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

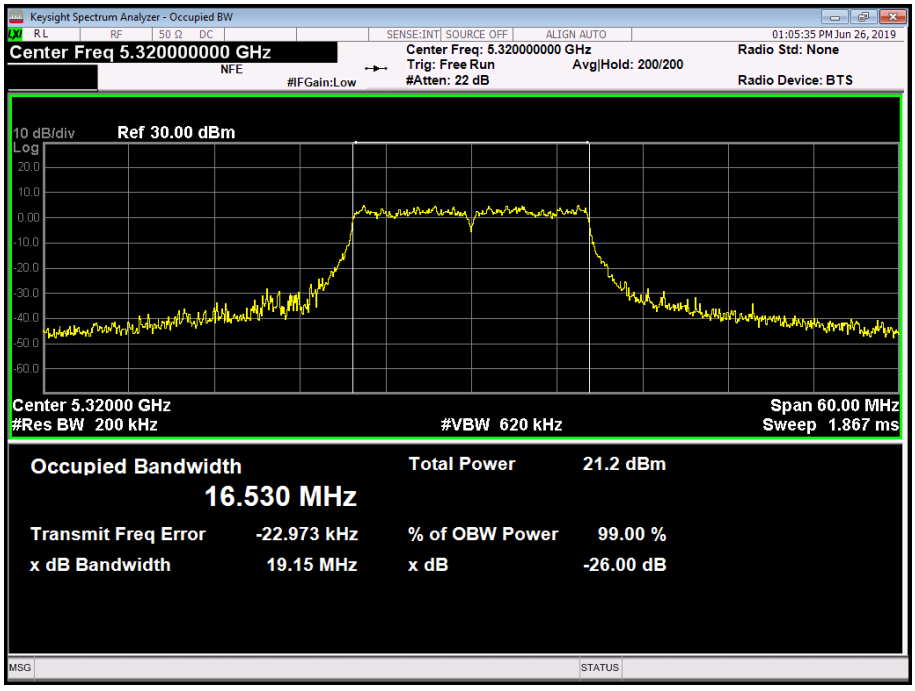

Figure 95 - 5320 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

5 GHz WLAN - 802.11n 20 MHz Bandwidth

Modulation Coding Scheme: MCS5

	5260 MHz	5300 MHz	5320 MHz
26 dB Bandwidth (MHz)	20.520	20.640	20.220
99% Occupied Bandwidth (MHz)	17.637	17.647	17.630

Table 122 – SISO – Antenna Port 0

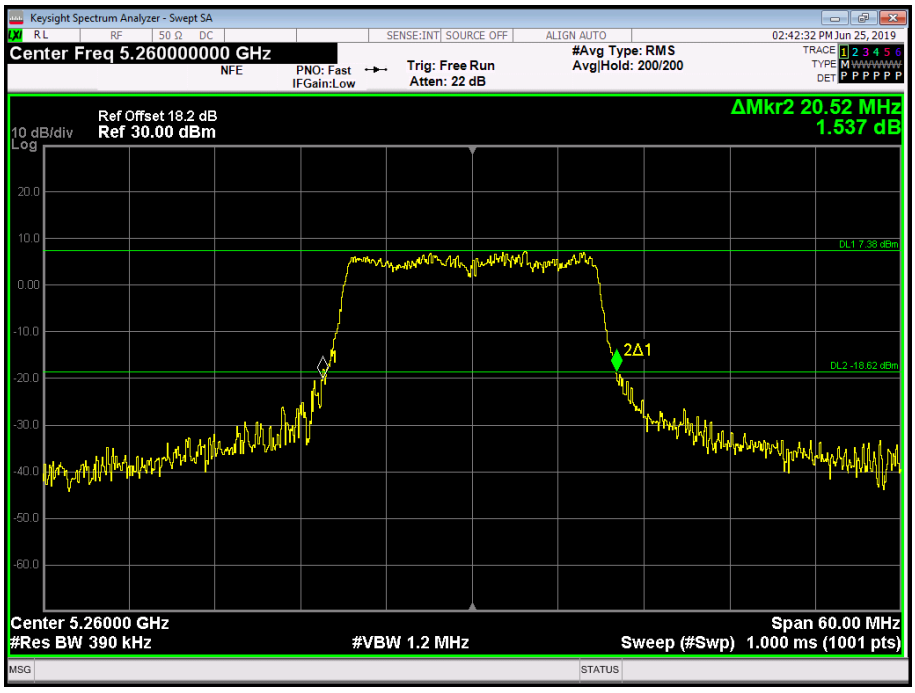

Figure 96 - 5260 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

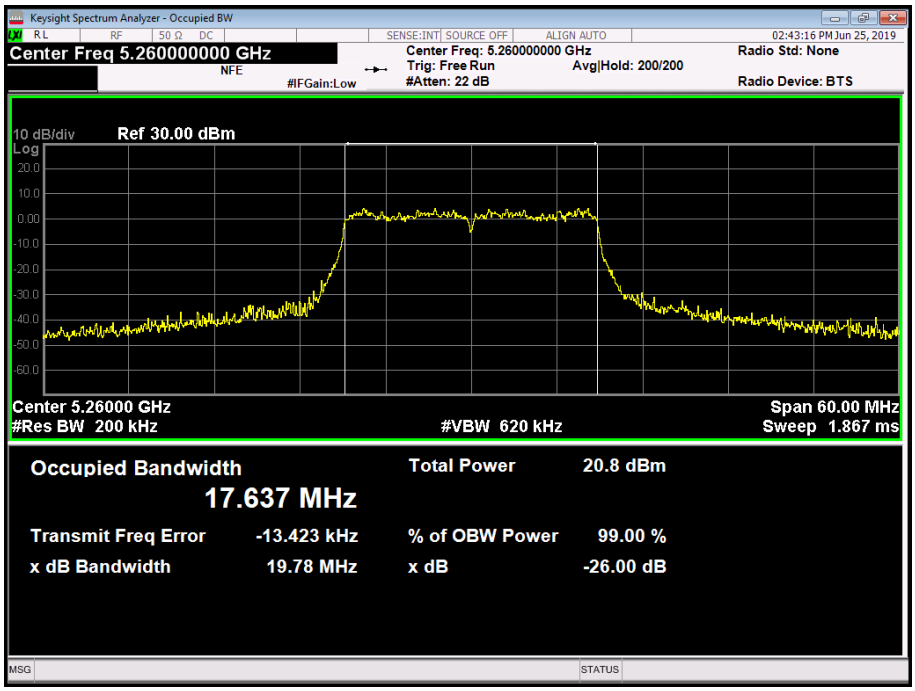

Figure 97 - 5260 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

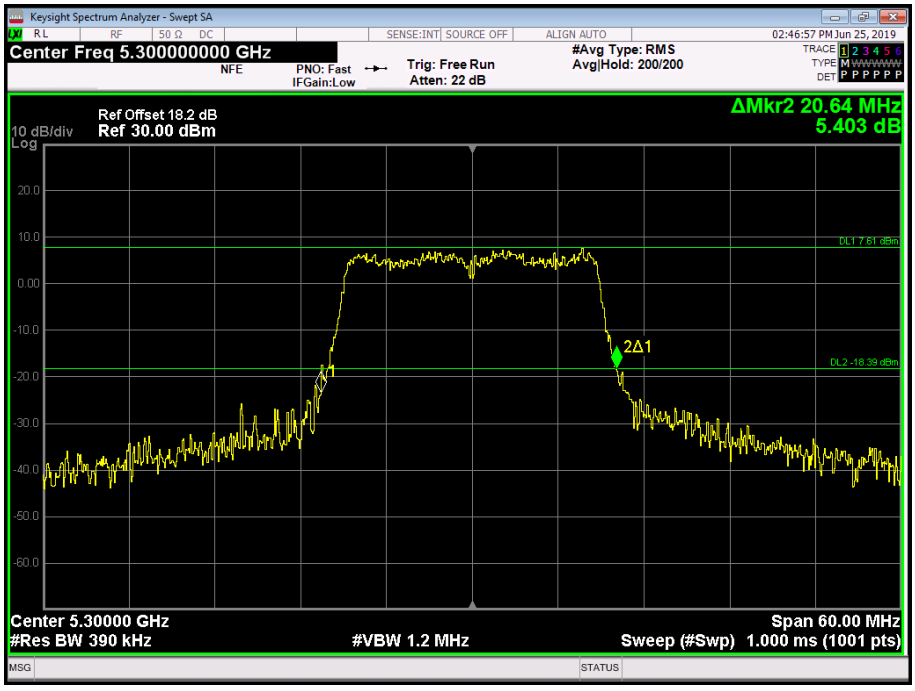

Figure 98 - 5300 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

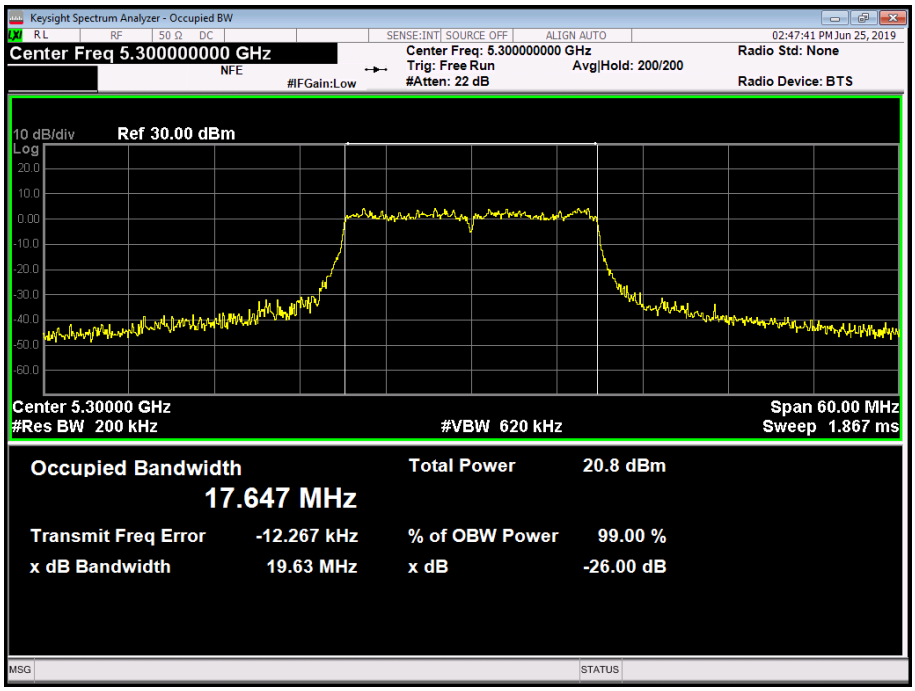

Figure 99 - 5300 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

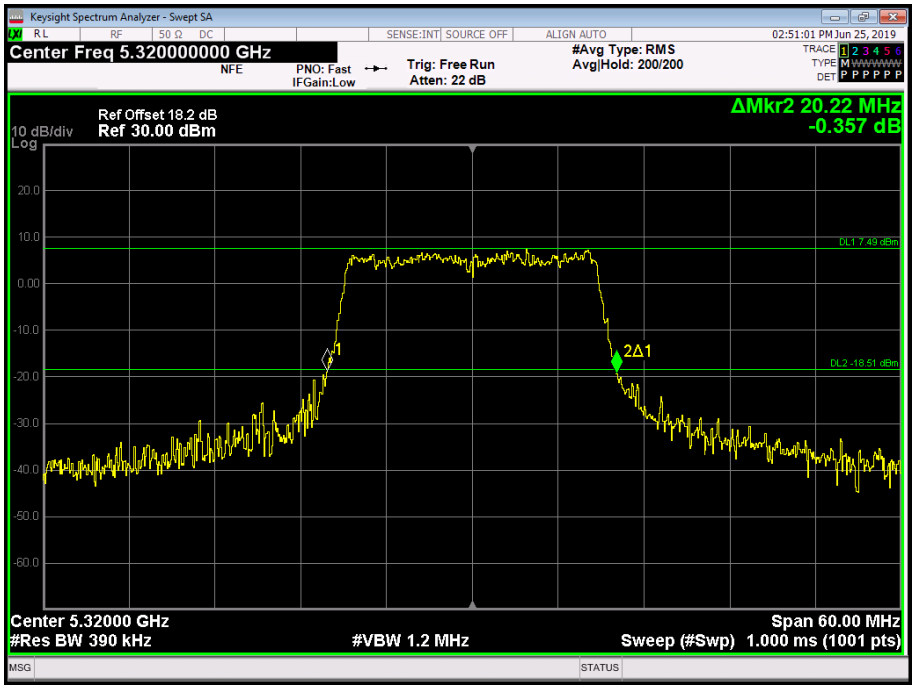

Figure 100 - 5320 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

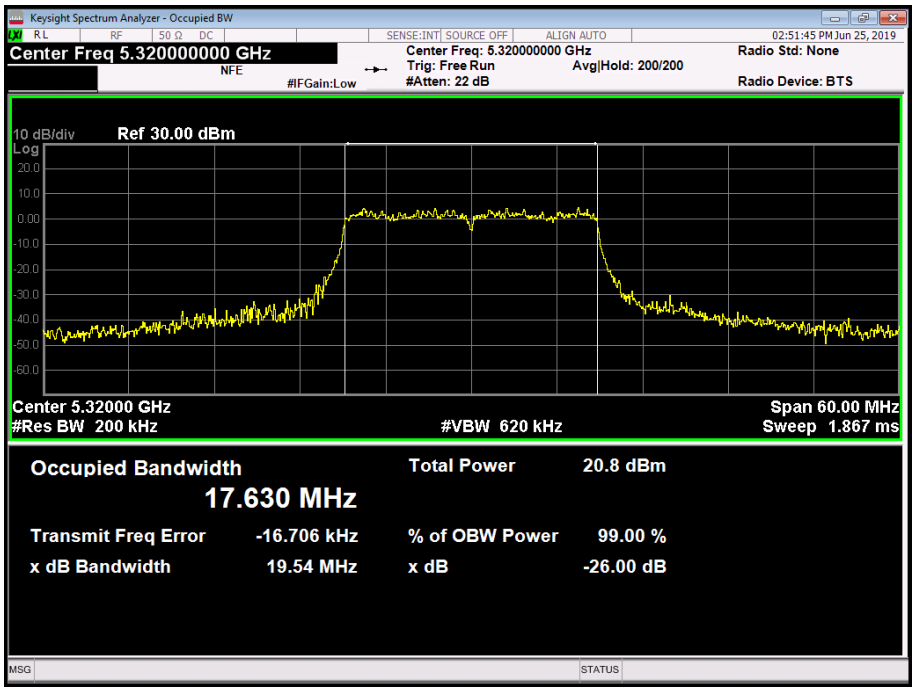

Figure 101 - 5320 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

	5260 MHz	5300 MHz	5320 MHz
26 dB Bandwidth (MHz)	20.460	20.160	20.400
99% Occupied Bandwidth (MHz)	17.629	17.633	17.651

Table 123 – SISO – Antenna Port 1

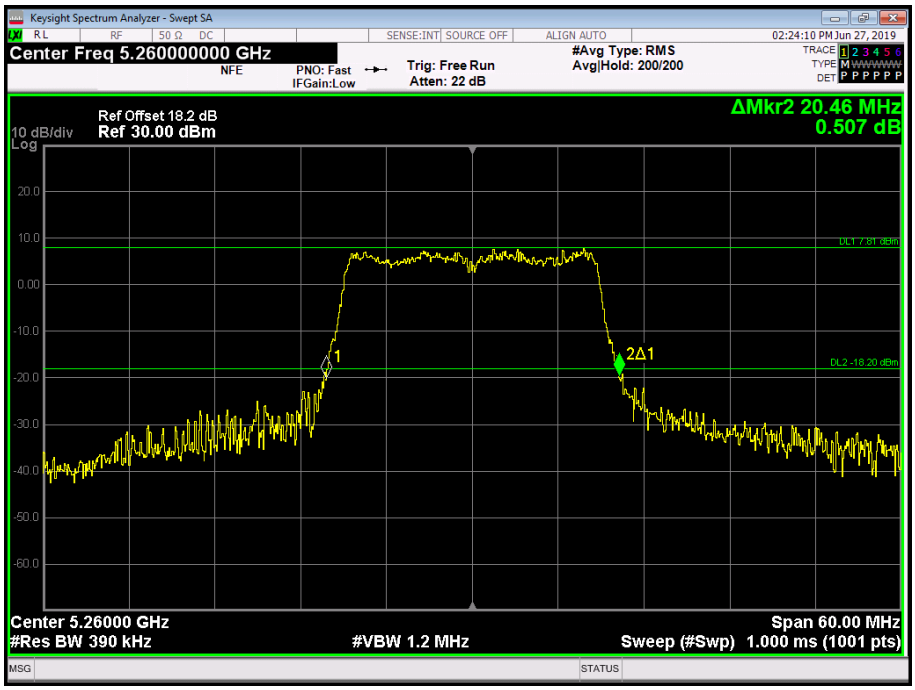

Figure 102 - 5260 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

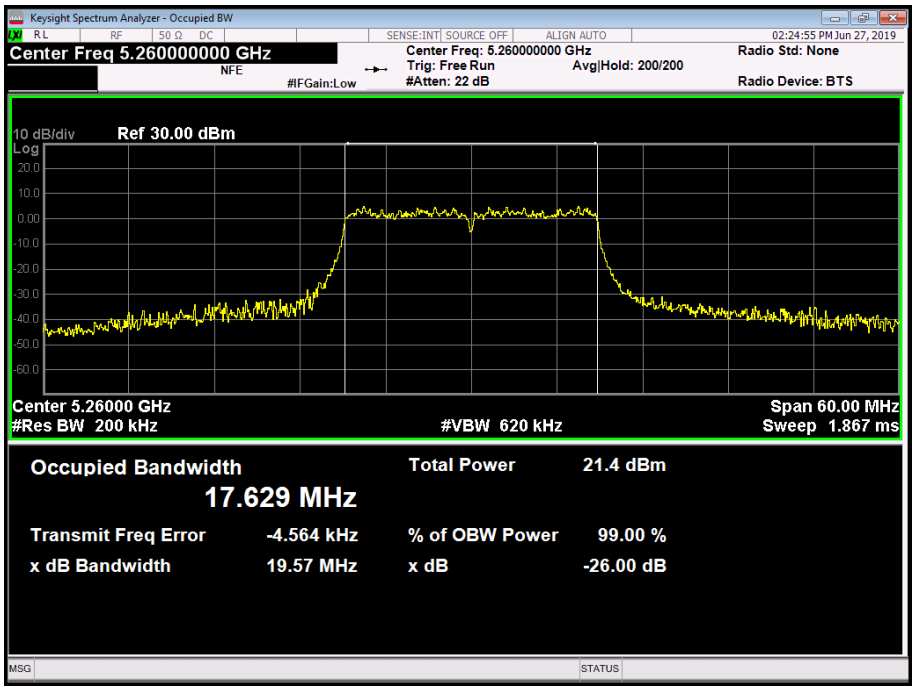

Figure 103 - 5260 MHz - 99% Occupied Bandwidth– Antenna Port 1

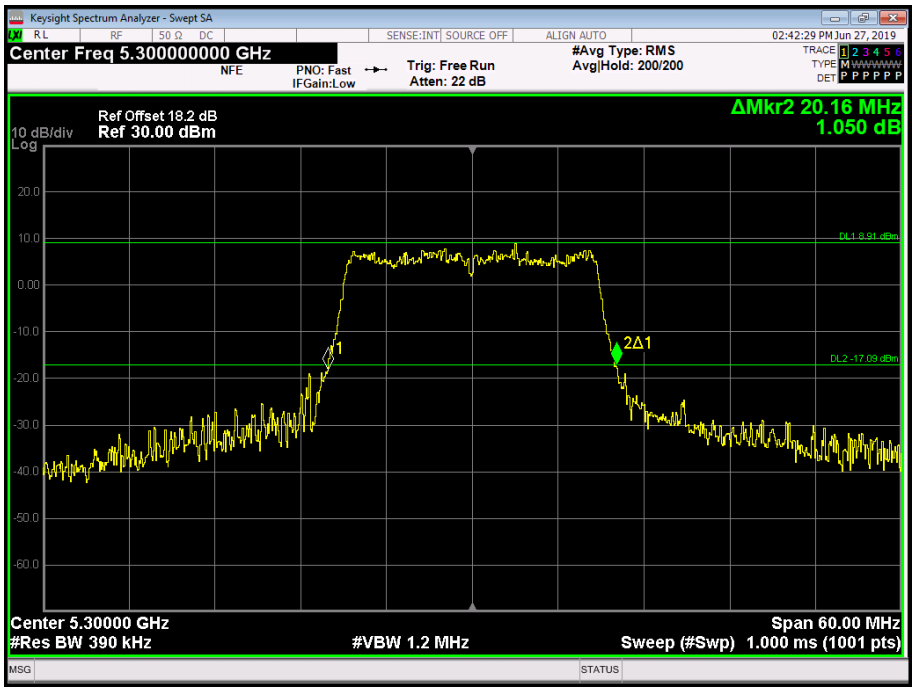

Figure 104 - 5300 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

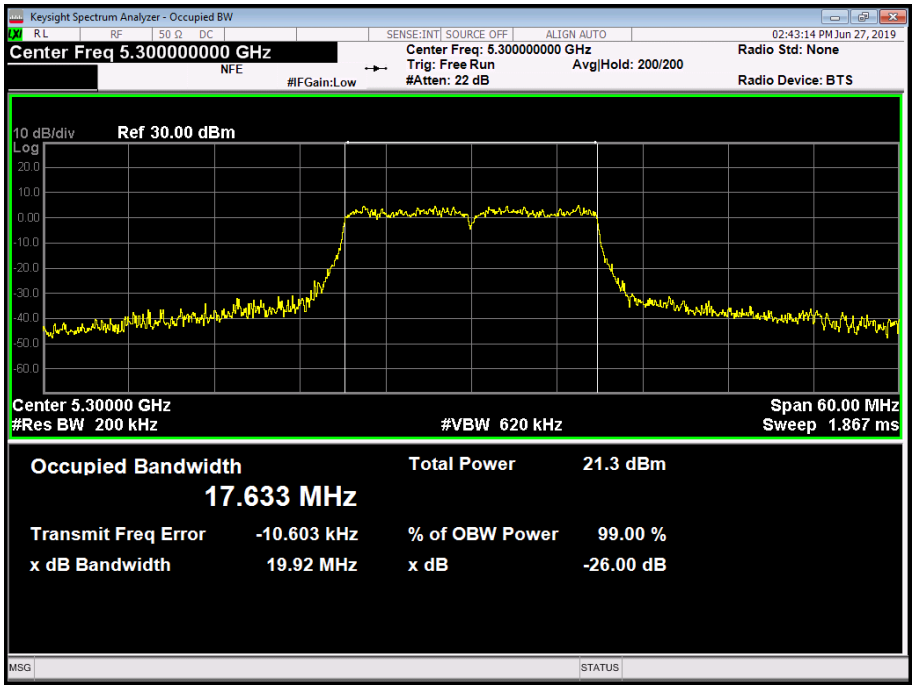

Figure 105 - 5300 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

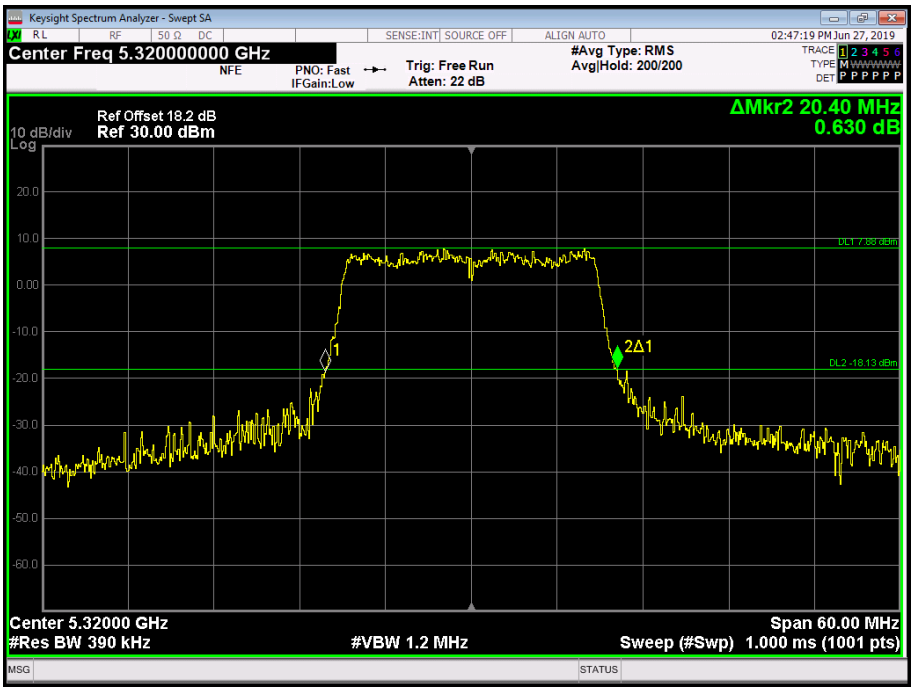

Figure 106 - 5320 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

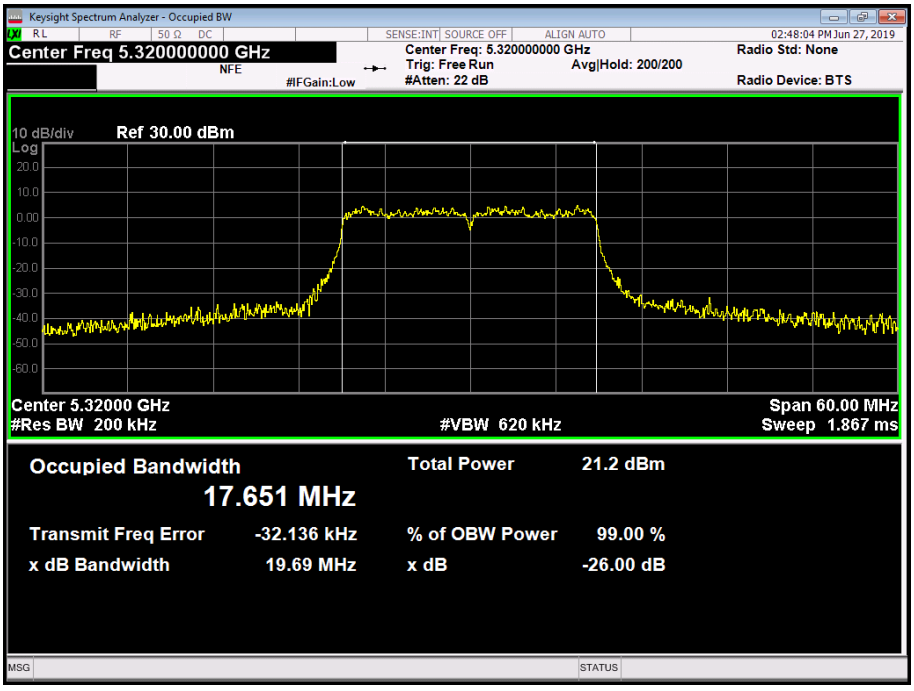

Figure 107 - 5320 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

Modulation Coding Scheme: MCS0

	5260 MHz	5300 MHz	5320 MHz
26 dB Bandwidth (MHz)	20.640	20.460	20.520
99% Occupied Bandwidth (MHz)	17.670	17.672	17.695

Table 124 – Worst-case Antenna Port – MIMO CDD

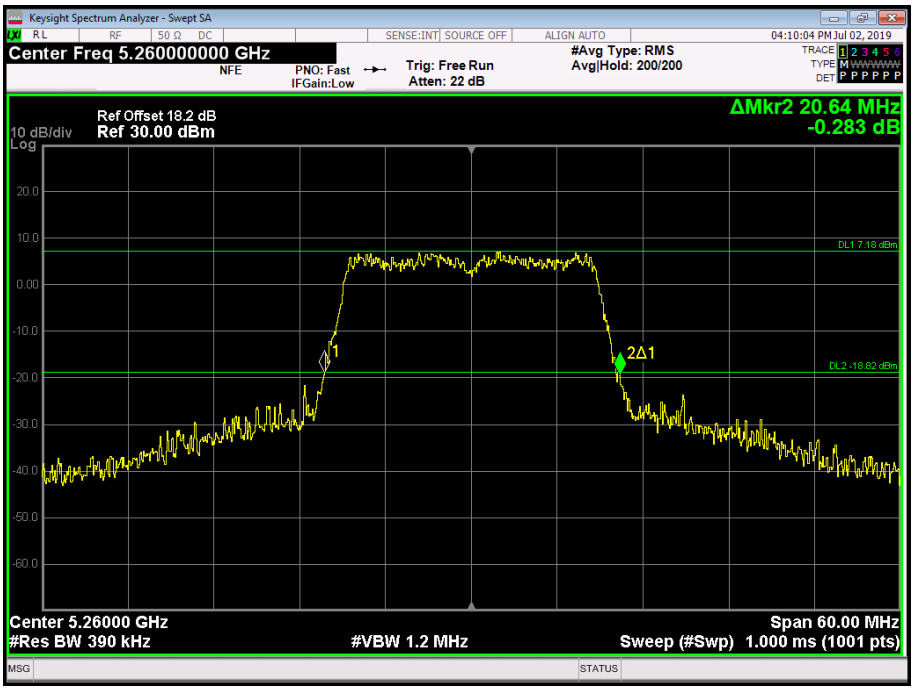

Figure 108 - 5260 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

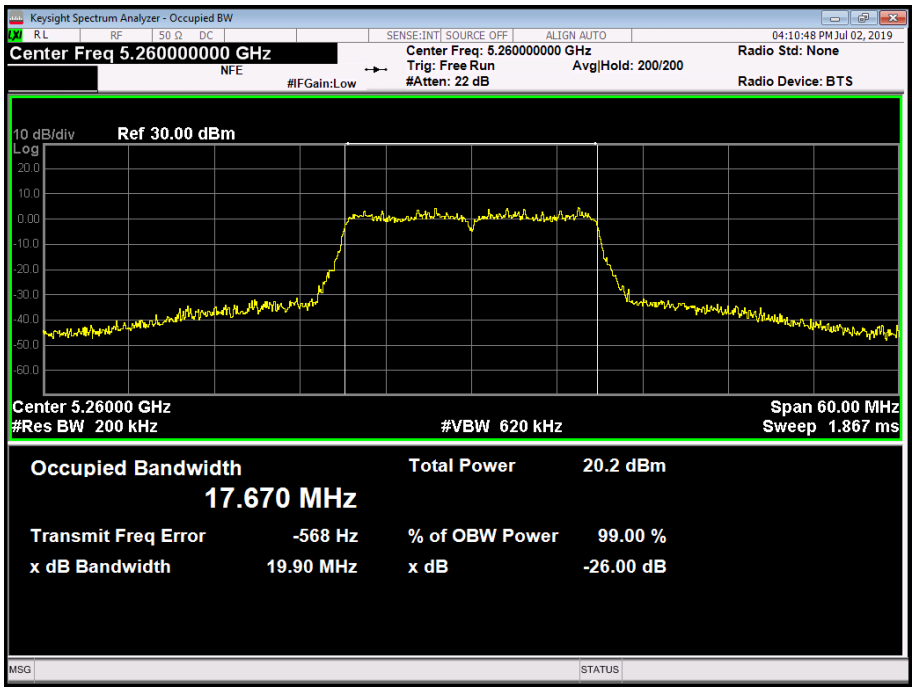

Figure 109 - 5260 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

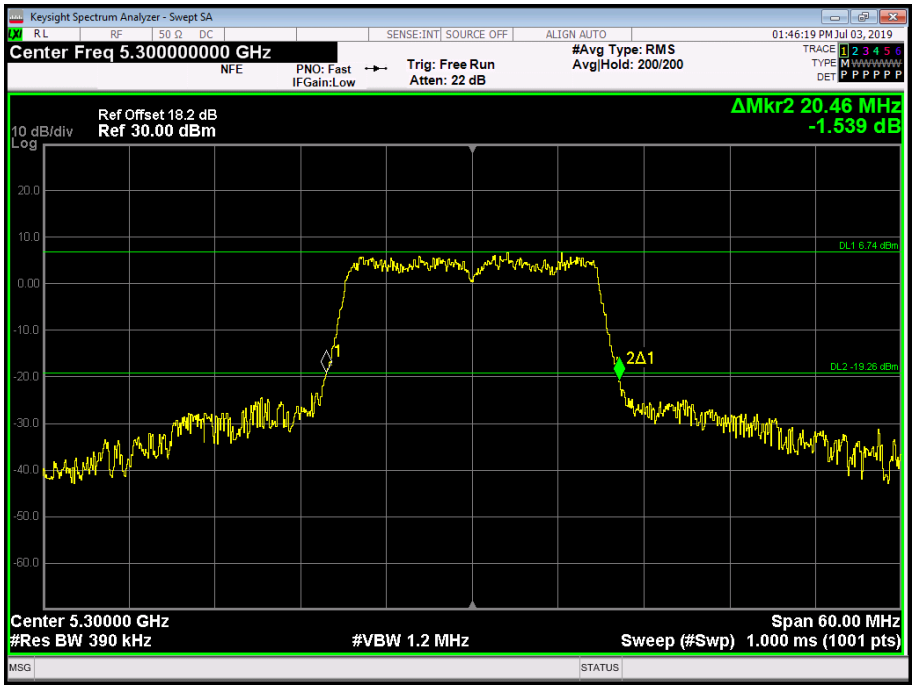

Figure 110 - 5300 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

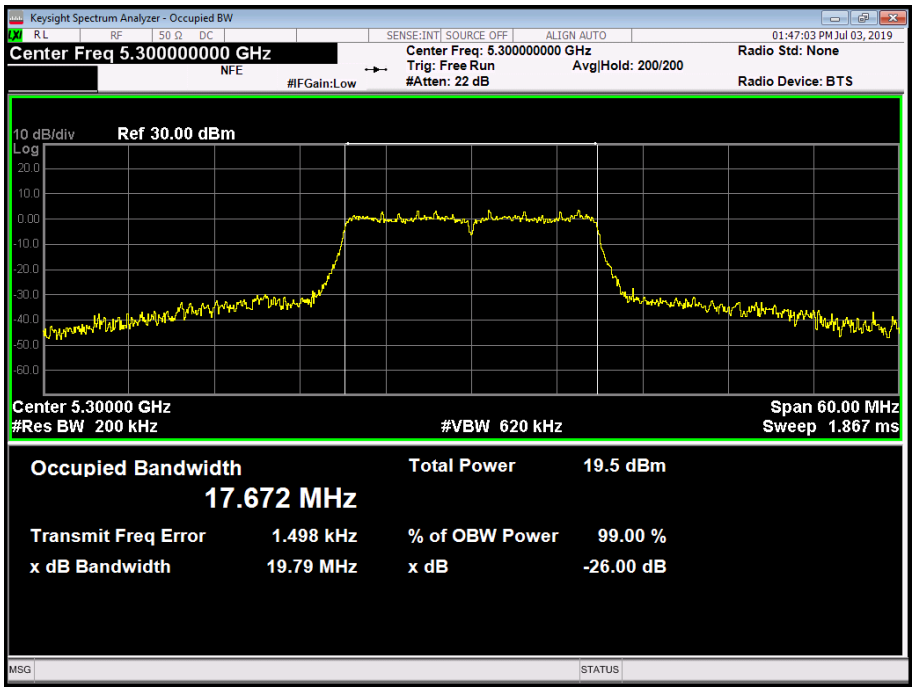

Figure 111 - 5300 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

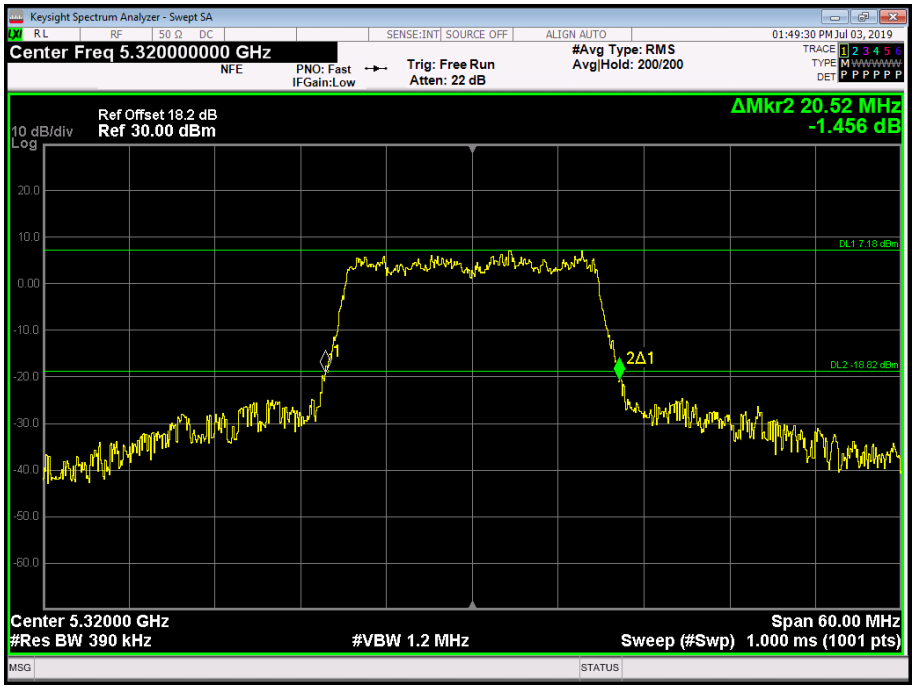

Figure 112 - 5320 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

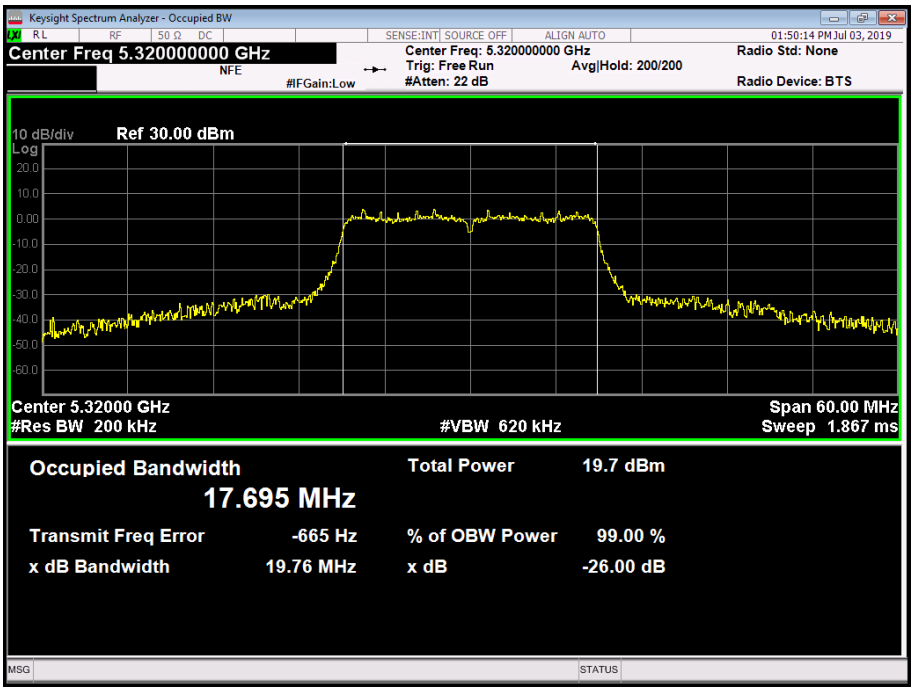

Figure 113 - 5320 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

5 GHz WLAN - 802.11n 40 MHz Bandwidth

Modulation Coding Scheme: MCS6

	5270 MHz	5310 MHz
26 dB Bandwidth (MHz)	41.280	41.400
99% Occupied Bandwidth (MHz)	36.267	36.256

Table 125 – SISO – Antenna Port 0

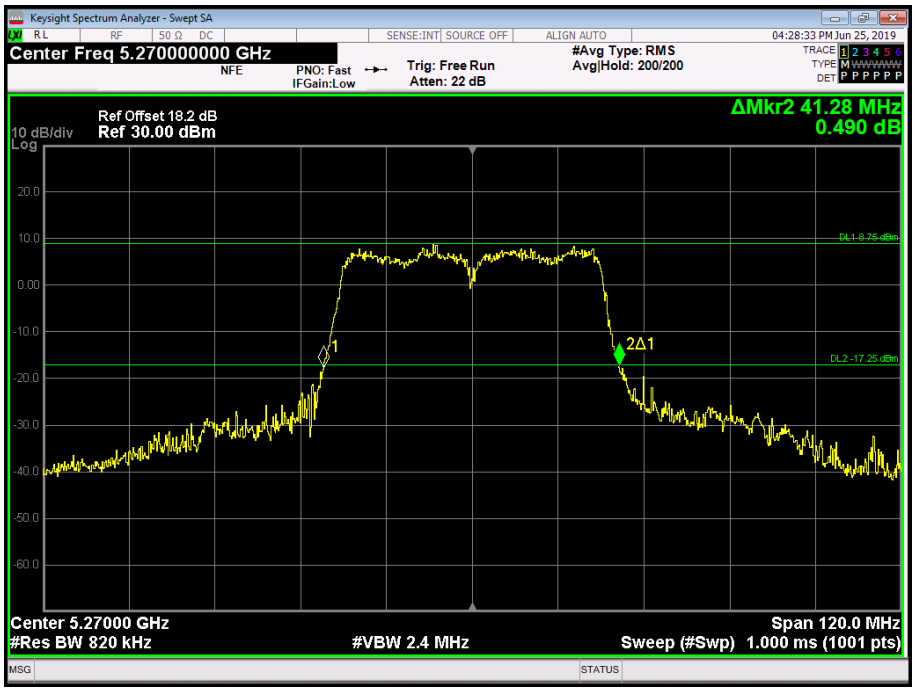

Figure 114 - 5270 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

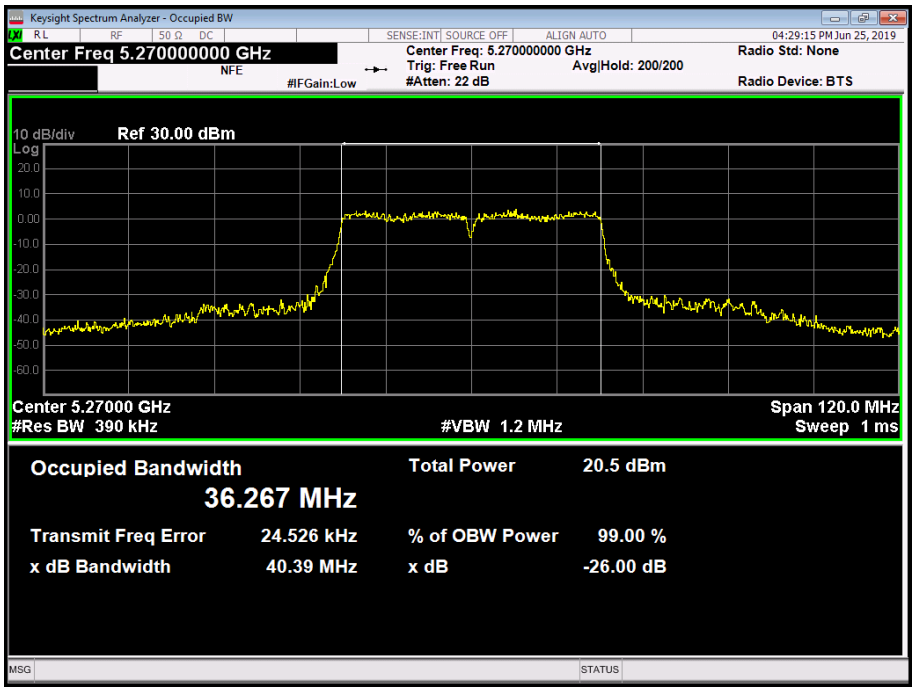

Figure 115 - 5270 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

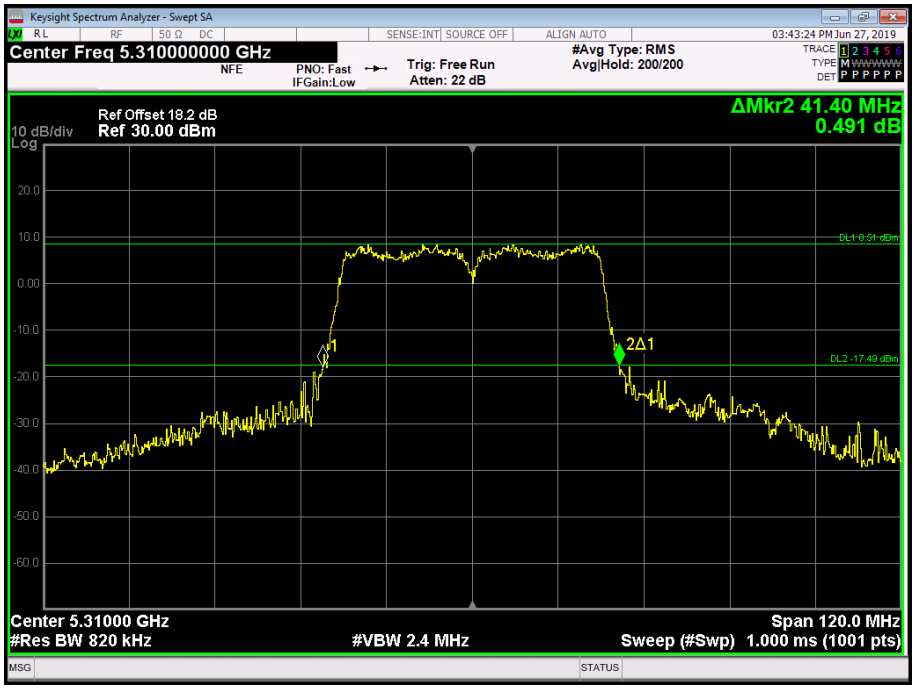

Figure 116 - 5310 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 0

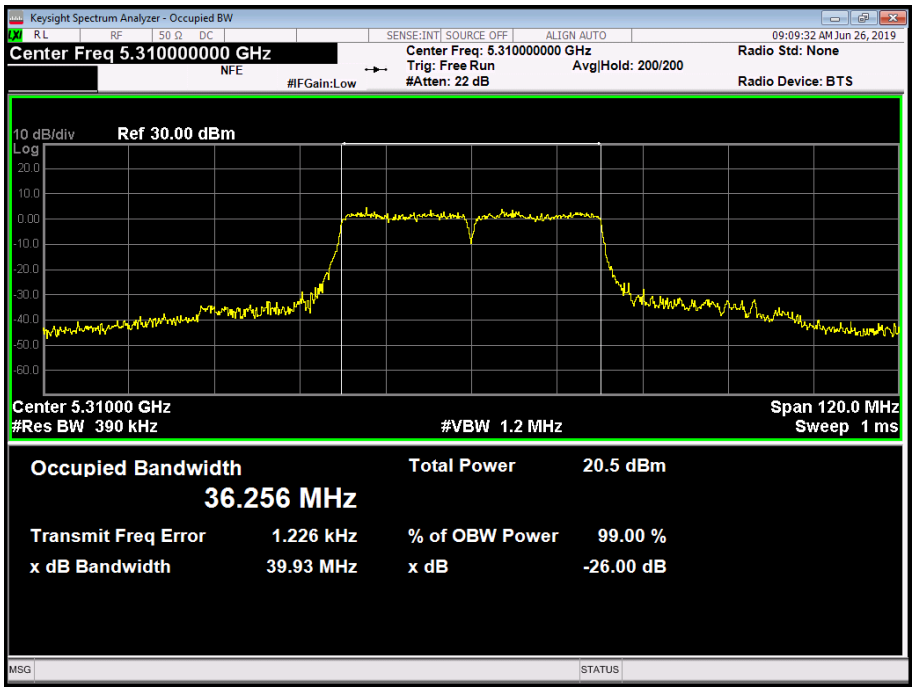

Figure 117 - 5310 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 0

	5270 MHz	5310 MHz
26 dB Bandwidth (MHz)	42.000	41.400
99% Occupied Bandwidth (MHz)	36.302	36.267

Table 126 – SISO – Antenna Port 1

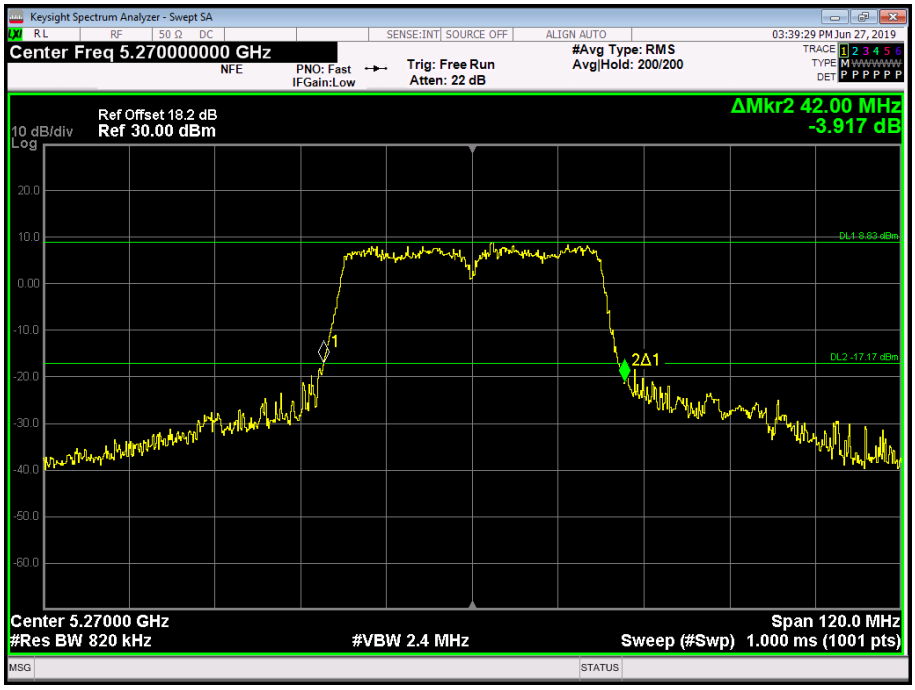

Figure 118 - 5270 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

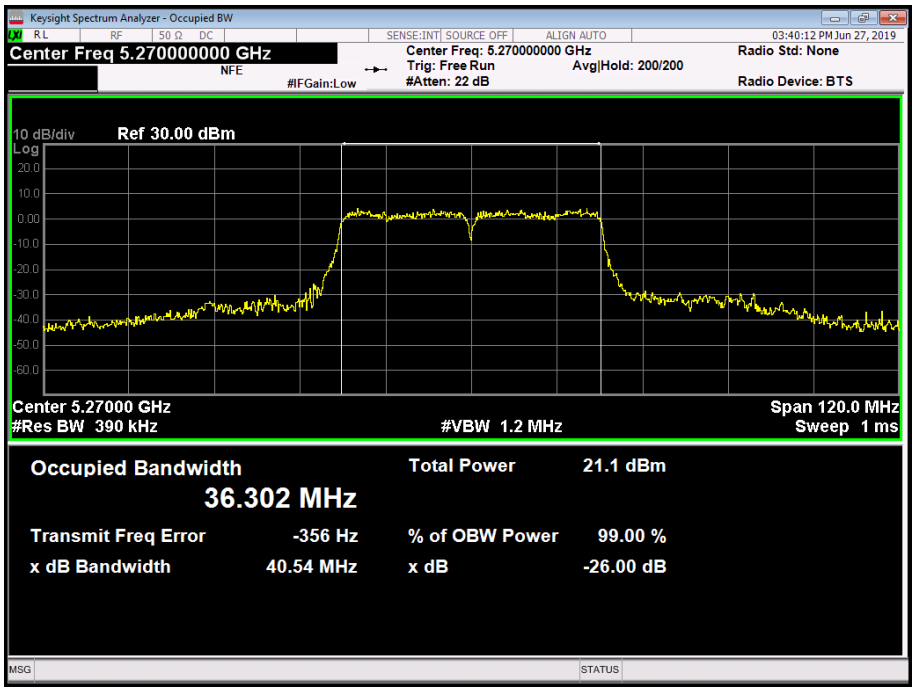

Figure 119 - 5270 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

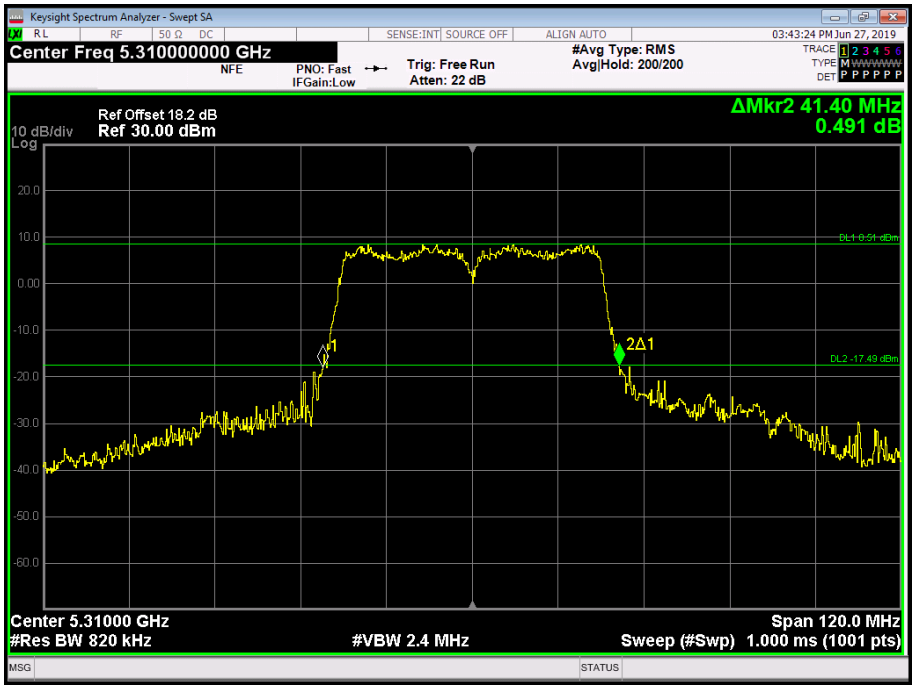

Figure 120 - 5310 MHz - 26 dB Emission Bandwidth – SISO – Antenna Port 1

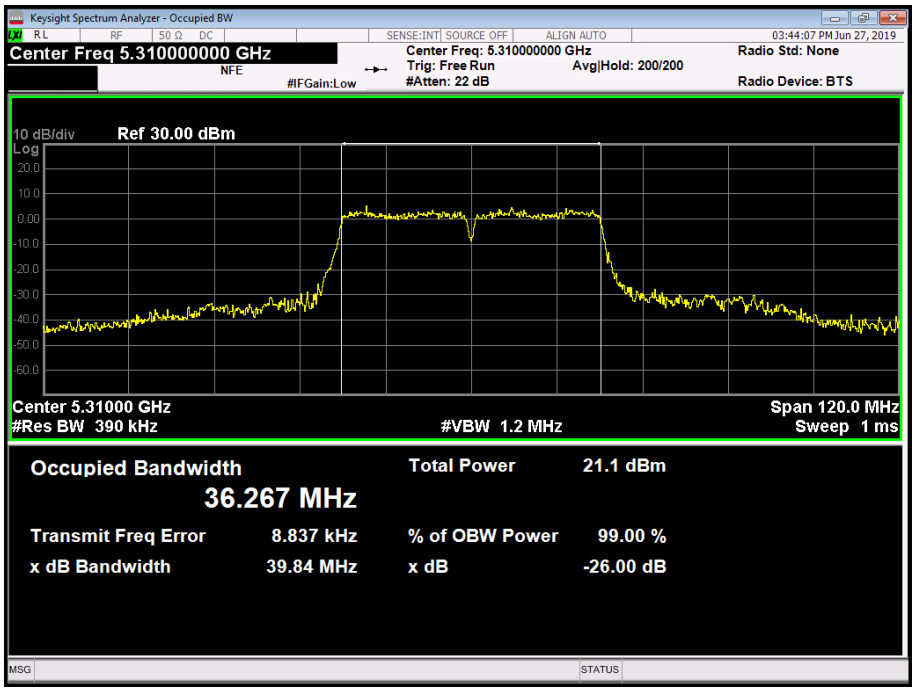

Figure 121 - 5310 MHz - 99% Occupied Bandwidth – SISO – Antenna Port 1

Modulation Coding Scheme: MCS0

	5270 MHz	5310 MHz
26 dB Bandwidth (MHz)	41.160	41.640
99% Occupied Bandwidth (MHz)	36.319	36.284

Table 127 – Worst-case Antenna Port – MIMO CDD

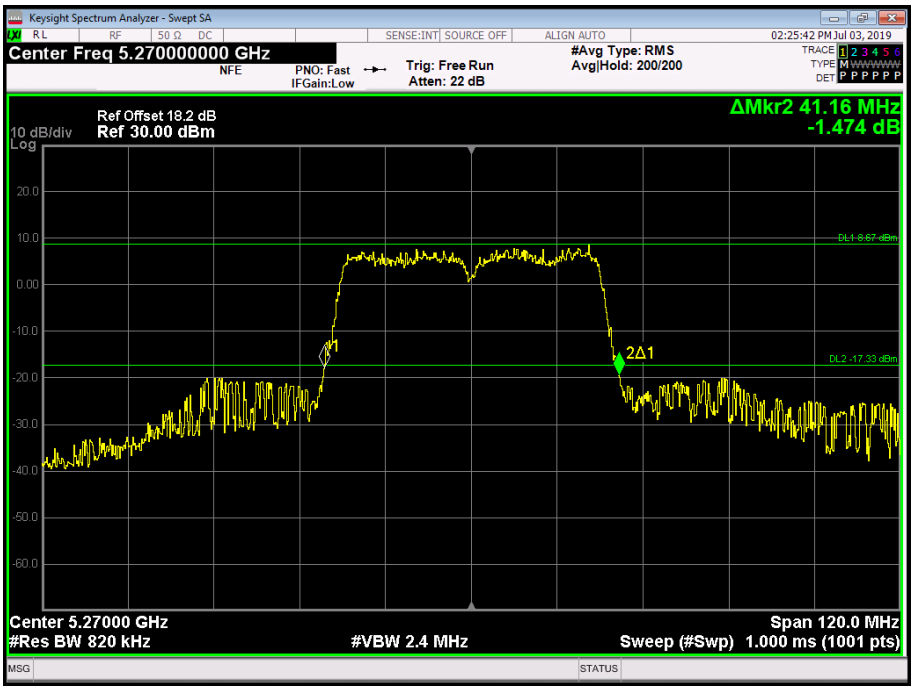

Figure 122 - 5270 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

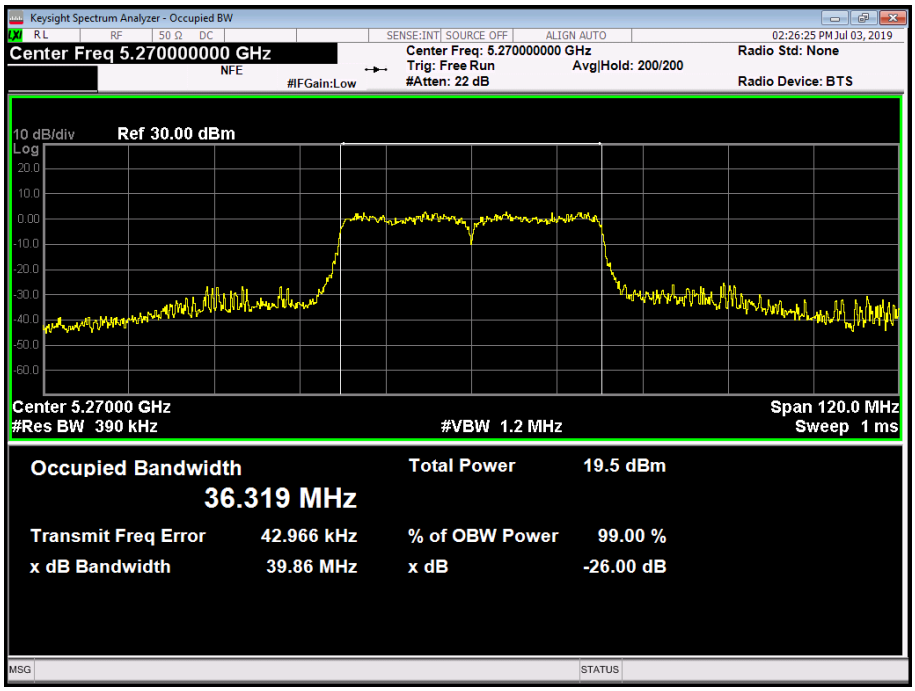

Figure 123 - 5270 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port

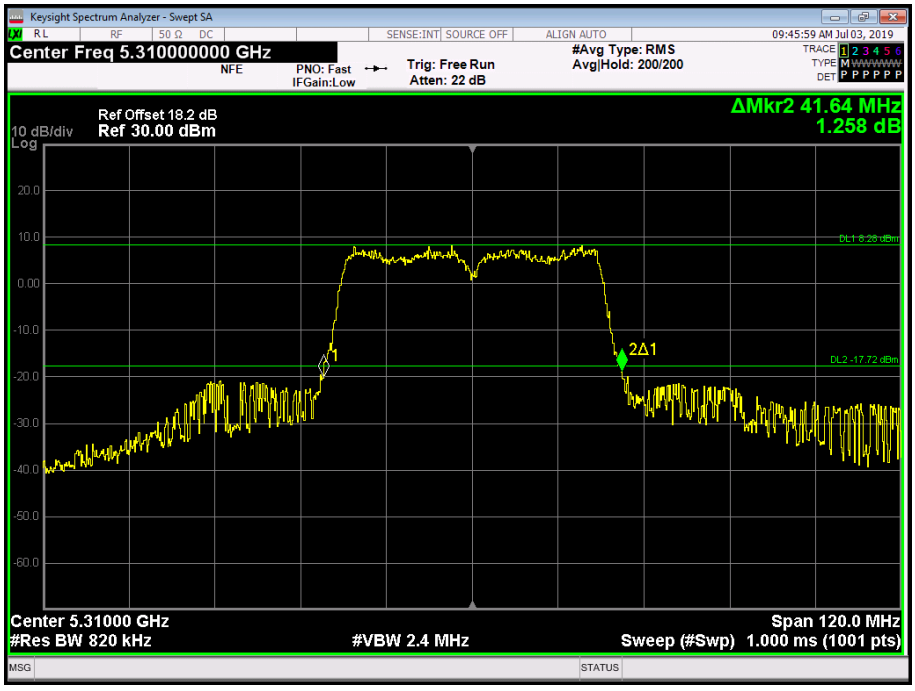

Figure 124 - 5310 MHz - 26 dB Emission Bandwidth – Worst-case Antenna Port

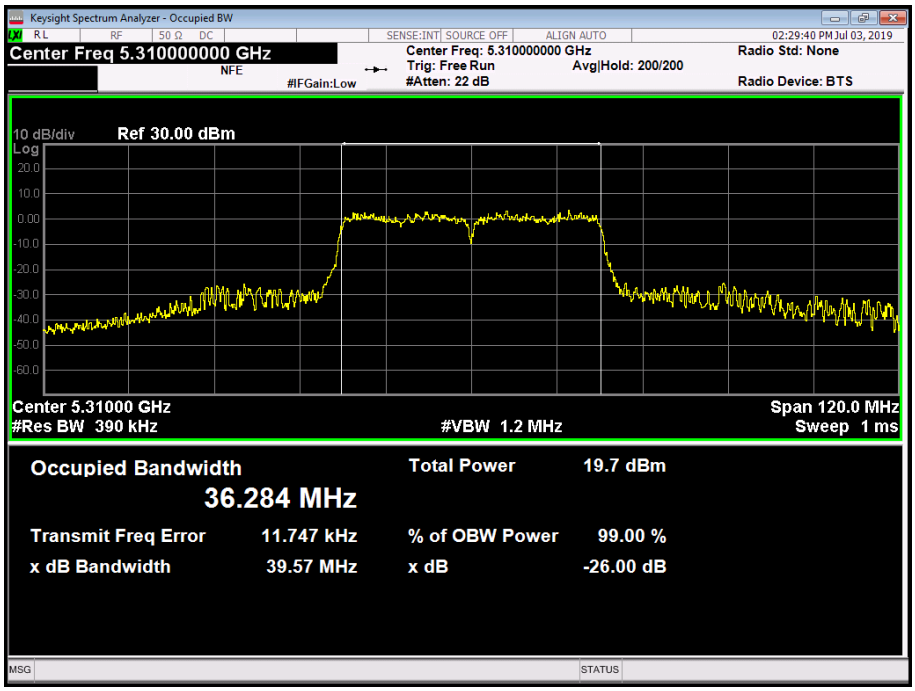

Figure 125 - 5310 MHz - 99% Occupied Bandwidth – Worst-case Antenna Port