

FCC and ISEDC Test Report

Apple Inc, Model: A2304

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

Prepared for: Apple Inc.
One Apple Park Way, Cupertino,
California 95014, USA

FCC ID: BCGA2304 IC: 579C-A2304

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Document 75945250-12 Issue 01



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NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Matthew Russell	RF Team Leader	Authorised Signatory	27 November 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 15C and ISEDC RSS-247 and ISEDC RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Philip Harrison	27 November 2019	
Testing	Malik Mohammad	27 November 2019	
Testing	Cristian Onaca	27 November 2019	
Testing	Jay Balendrarajah	27 November 2019	
Testing	Ahmad Javid	27 November 2019	
Testing	Faisal Malyar	27 November 2019	
Testing	Matthew Dawkins	27 November 2019	
Testing	Connor Lee	27 November 2019	

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

ISEDC Accreditation
12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C: 2018, ISEDC RSS-247: Issue 2 (2017-02) and ISEDC RSS-GEN: Issue 5 A1 (2019-03) for the tests detailed in section 1.3.



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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	27 November 2019

Table 1

1.2 Introduction

Applicant	Apple Inc.
Manufacturer	Apple Inc.
Model Number(s)	A2304
Serial Number(s)	C02Z1003N0GT, C02Z1006N5VL and C02Z1007N5VN
Hardware Version(s)	REV1.0
Software Version(s)	19A556 and 19A507
Number of Samples Tested	3
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2018 ISED RSS-247: Issue 2 (2017-02) ISED RSS-GEN: Issue 5 A1 (2019-03)
Order Number	0540176069
Date	25-February-2019
Date of Receipt of EUT	21-October-2019
Start of Test	12-August-2019
Finish of Test	06-November-2019
Name of Engineer(s)	Philip Harrison, Malik Mohammad, Cristian Onaca, Jay Balendrarajah, Ahmad Javid, Faisal Malyar, Matthew Dawkins and Connor Lee
Related Document(s)	ANSI C63.10 (2013) KDB 662911 D01 v02r02



1.3 Brief Summary of Results

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

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15C	RSS-247	RSS-GEN			
Configuration and Mode: 2.4 GHz WLAN						
2.1	15.247 (b)	5.4	6.12	Maximum Conducted Output Power	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.2	15.247 (e)	5.2	6.12	Power Spectral Density	Pass	ANSI C63.10 (2013) KDB 662911 D01 v02r02
2.3	15.247 (a)(2)	5.2	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2013)
2.4	15.247 (d)	5.5	-	Authorised Band Edges	Pass	ANSI C63.10 (2013)
2.5	15.205	-	8.10	Restricted Band Edges	Pass	ANSI C63.10 (2013)
2.6	15.247 (d) and 15.205,	5.5	6.13	Spurious Radiated Emissions	Pass	ANSI C63.10 (2013)

Table 2



1.4 Product Information

1.4.1 Technical Description

The Equipment Under Test (EUT) was a rack mounted computer, with Bluetooth, Bluetooth Low Energy and 802.11 a/b/g/n/ac capabilities in the 2.4 GHz and 5 GHz bands.

1.4.2 Test Modes

The EUT's main radio supports SISO, 2x2 MIMO and 3x3 MIMO. The Auxillary radio supports only SISO modes. Main and Aux radios are limited to transmitting only one-at-a-time in the 2.4 GHz band (the other only operating simultaneously in the 5 GHz bands). Hence no conformity tests apply for both radios simultaneously transmitting in the 2.4 GHz band. Both radios support 802.11b, g and n modes with a 20 MHz channel bandwidth.

The EUT uses different output powers per core dependent on how many cores are used. The EUT also uses different power tables for Cyclic Delay Diversity (CDD), Space Division Multiplexing (SDM), and transmit beamforming (TxBF) modes. It uses the same conducted power across all cores in any given mode, but due to the different antenna gains the radiated powers per core differs.

After preliminary investigations were performed, the EUT was therefore tested in the following worst-case modes:

- Main SISO Modes (Core 2):
 - 802.11b
 - 802.11g
 - 802.11n HT20
- Main 2x2 MIMO Modes (Cores 1+2):
 - 802.11b – CDD
 - 802.11g – CDD
 - 802.11n HT20 – CDD, SDM and TxBF
- Main 3x3 MIMO Modes (Cores 0+1+2):
 - 802.11b – CDD
 - 802.11g – CDD
 - 802.11n HT20 – CDD, SDM and TxBF
- AUX Modes (SISO only on Core 2):
 - 802.11b
 - 802.11g
 - 802.11n HT20



1.4.3 Antenna Gain Table

Core 0

Frequency (MHz)	Peak Gain (dBi)	Conducted Cable Loss (dB)
2400 - 2480	4.41	0.7

Table 3

Core 1

Frequency (MHz)	Peak Gain (dBi)	Conducted Cable Loss (dB)
2400 - 2480	5.13	0.7

Table 4

Core 2 / Aux

Frequency (MHz)	Peak Gain (dBi)	Conducted Cable Loss (dB)
2400 - 2480	5.31	0.7

Table 5

1.5 Deviations from the Standard

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

1.6 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
Model: A2304: Serial Number: C02Z1003N0GT			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2304: Serial Number: C02Z1007N5VN			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A2304: Serial Number: C02Z1006N5VL			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 6



1.7 Test Location

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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 2.4 GHz WLAN		
Maximum Conducted Output Power	Philip Harrison	UKAS
Power Spectral Density	Philip Harrison	UKAS
Emission Bandwidth	Philip Harrison	UKAS
Authorised Band Edges	Malik Mohammad, Cristian Onaca, Jay Balendrarajah, Ahmad Javid, Faisal Malyar, Matthew Dawkins and Connor Lee	UKAS
Restricted Band Edges	Malik Mohammad, Cristian Onaca, Jay Balendrarajah, Ahmad Javid, Faisal Malyar, Matthew Dawkins and Connor Lee	UKAS
Spurious Radiated Emissions	Malik Mohammad, Cristian Onaca, Jay Balendrarajah, Ahmad Javid, Faisal Malyar, Matthew Dawkins and Connor Lee	UKAS

Table 7

Office Address:

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



2 Test Details

2.1 Maximum Conducted Output Power

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (b)
ISED RSS-247, Clause 5.4
ISED RSS-GEN, Clause 6.12

2.1.2 Equipment Under Test and Modification State

A2304, S/N: C02Z1003N0GT - Modification State 0

2.1.3 Date of Test

23-October-2019 to 01-November-2019

2.1.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 11.9.2.3.2 Method AVGPM-G

The output power was verified as being the same from each transmit core, but the antenna gains were not identical, therefore the modes reported for SISO or 2x2 MIMO operation are those giving the highest EIRP and/or lowest conducted limit based on the combination of antennas giving highest total directional gain.

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

- For the CDD results the Directional Gain was calculated in accordance with clause F)2)f)(ii) using the calculations from F)2)f)(i) with worst-case individual gain and an array gain of zero.
- For SDM modes Directional Gain was calculated in accordance with clause F)2)d)(ii).
- For transmit beamforming (TxBF) mode it was calculated in accordance with clause F)2)d)(i).

2.1.5 Environmental Conditions

Ambient Temperature	22.0 - 26.0 °C
Relative Humidity	29.6 - 49.6 %



2.1.6 Test Results

2.4 GHz WLAN

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Conducted Power (dBm)	18.70	22.76	12.42
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	24.01	28.07	17.73

Table 8 - 802.11b / 1 Mbps / SISO / Core 2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted Power Core 1 (dBm)	16.92	21.79	11.86
Conducted Power Core 2 (dBm)	16.85	21.81	11.71
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Total Conducted Power (dBm)	19.89	24.81	14.80
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	25.20	30.12	20.11

Table 9 - 802.11b / 1 Mbps / MIMO CDD / Cores 1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted Power Core 0 (dBm)	16.28	20.66	9.73
Conducted Power Core 1 (dBm)	16.44	20.54	9.69
Conducted Power Core 2 (dBm)	16.15	20.66	9.78
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Total Conducted Power (dBm)	21.06	25.39	14.51
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	26.37	30.70	19.82

Table 10 - 802.11b / 1 Mbps / MIMO CDD / Cores 0+1+2



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Conducted Power (dBm)	17.97	22.90	13.61
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	23.28	28.21	18.92

Table 11 - 802.11b / 1 Mbps / Aux Core

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Conducted Power (dBm)	13.78	21.91	-0.08
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	19.09	27.22	5.24

Table 12 - 802.11g / 6 Mbps / SISO / Core 2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted Power Core 1 (dBm)	11.77	19.84	11.74
Conducted Power Core 2 (dBm)	11.80	19.95	11.74
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Total Conducted Power (dBm)	14.80	22.91	14.75
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	20.11	28.22	20.06

Table 13 - 802.11g / 6 Mbps / MIMO CDD / Cores 1+2



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted Power Core 0 (dBm)	11.77	19.92	-2.02
Conducted Power Core 1 (dBm)	11.89	19.81	-2.08
Conducted Power Core 2 (dBm)	11.84	19.97	-1.97
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Total Conducted Power (dBm)	16.60	24.67	2.75
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	21.91	29.98	8.06

Table 14 - 802.11g / 6 Mbps / MIMO CDD / Cores 0+1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Conducted Power (dBm)	10.83	17.86	-0.25
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	16.14	23.17	5.06

Table 15 - 802.11g / 6 Mbps / Aux Core

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Conducted Power (dBm)	13.84	21.74	0.01
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	19.15	27.05	5.32

Table 16 - 802.11n / HT20 MCS0 / SISO / Core 2



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted Power Core 1 (dBm)	11.70	19.73	11.95
Conducted Power Core 2 (dBm)	11.97	19.69	11.88
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Total Conducted Power (dBm)	14.85	22.72	14.93
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	20.16	28.03	20.24

Table 17 - 802.11n / HT20 MCS0 / MIMO CDD / Cores 1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted Power Core 1 (dBm)	11.73	19.82	11.82
Conducted Power Core 2 (dBm)	11.92	19.98	11.78
Antenna Directional Gain (dBi)	5.22	5.22	5.22
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Total Conducted Power (dBm)	14.83	22.91	14.81
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	20.05	28.13	20.03

Table 18 - 802.11n / HT20 MCS8 / MIMO SDM / Cores 1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted Power Core 1 (dBm)	10.84	18.70	-1.16
Conducted Power Core 2 (dBm)	10.94	18.97	-1.14
Antenna Directional Gain (dBi)	8.23	8.23	8.23
15.247 Conducted Power Limit (dBm)	27.77	27.77	27.77
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Total Conducted Power (dBm)	13.90	21.85	1.86
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	22.13	30.08	10.09

Table 19 - 802.11n / HT20 MCS0 / MIMO TxBF / Cores 1+2



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted Power Core 0 (dBm)	11.84	19.87	-1.53
Conducted Power Core 1 (dBm)	11.82	19.90	-1.51
Conducted Power Core 2 (dBm)	11.91	19.68	-1.90
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Total Conducted Power (dBm)	16.63	24.59	3.13
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	21.94	29.90	8.44

Table 20 - 802.11n / HT20 MCS0 / MIMO CDD / Cores 0+1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted Power Core 0 (dBm)	11.91	19.96	-1.42
Conducted Power Core 1 (dBm)	11.94	19.97	-1.54
Conducted Power Core 2 (dBm)	11.95	19.72	-1.82
Antenna Directional Gain (dBi)	4.97	4.97	4.97
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Total Conducted Power (dBm)	16.71	24.66	3.18
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	21.67	29.63	8.15

Table 21 - 802.11n / HT20 MCS16 / MIMO SDM / Cores 0+1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted Power Core 0 (dBm)	10.23	18.39	-3.55
Conducted Power Core 1 (dBm)	10.26	18.35	-3.01
Conducted Power Core 2 (dBm)	10.40	18.33	-3.48
Antenna Directional Gain (dBi)	9.73	9.73	9.73
15.247 Conducted Power Limit (dBm)	26.27	26.27	26.27
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Total Conducted Power (dBm)	15.07	23.13	1.43
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	24.80	32.86	11.16

Table 22 - 802.11n / HT20 MCS0 / MIMO TxBF / Cores 0+1+2



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Antenna Directional Gain (dBi)	5.31	5.31	5.31
15.247 Conducted Power Limit (dBm)	30.00	30.00	30.00
RSS-247 Conducted Power Limit (dBm)	30.00	30.00	30.00
Conducted Power (dBm)	10.88	17.96	0.02
RSS-247 EIRP Limit (dBm)	36.00	36.00	36.00
EIRP Power (dBm)	16.19	23.27	5.34

Table 23 - 802.11n / HT20 MCS0 / Aux Core

FCC 47 CFR Part 15, Limit Clause 15.247 (b)(3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

ISED RSS-247, Limit Clause 5.4 (b)

For DTSSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e) of the specification.



2.1.7 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
Multimeter	Fluke	79 Series III	611	12	11-Sep-2020
Hygrometer	Rotronic	I-1000	3220	12	25-Sep-2020
1800-6000 MHz Power Splitter	Mini-Circuits	ZN2PD-63-S+	4055	-	O/P Mon
Power splitter - 2 port	Mini-Circuits	ZN2PD-63-S+	4743	12	23-Sep-2020
EXA	Keysight Technologies	N9010B	4968	24	21-Dec-2019
Network Analyser	Keysight Technologies	E5063A	5018	12	20-May-2020
USB Power Sensor	Boonton	RTP5006	5184	12	12-Dec-2019
Electronic Calibration Module	Keysight Technologies	85093C	5188	12	21-May-2020
AC Programmable Power Supply	iTech	IT7324	5227	-	O/P Mon
Power Splitter, 4 way	Mini-Circuits	ZN4PD1-63-S+	5235	-	O/P Mon
Power Splitter, 4 way	Mini-Circuits	ZN4PD1-63-S+	5236	-	O/P Mon
10 dB Attenuator	Telegartner	J01156A0031	Not Serialised	-	O/P Mon
10 dB Attenuator	Telegartner	J01156A0031	Not Serialised	-	O/P Mon
10 dB Attenuator	Telegartner	J01156A0031	Not Serialised	-	O/P Mon
10 dB Attenuator	Telegartner	J01156A0031	Not Serialised	-	O/P Mon

Table 24

O/P Mon – Output monitored using calibrated equipment.



2.2 Power Spectral Density

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (e)
ISED RSS-247, Clause 5.2
ISED RSS-GEN, Clause 6.12

2.2.2 Equipment Under Test and Modification State

A2304, S/N: C02Z1003N0GT - Modification State 0

2.2.3 Date of Test

23-October-2019 to 01-November-2019

2.2.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.10.3 (AVGPPSD-1), 11.10.5 (AVGPPSD-2) or 11.10.7 (AVGPPSD-3).

Where the EUT duty cycle was < 98 % and repeatable within 2%, the spectrum analyser was set to trace (power) averaging and a duty cycle correction was added as calculated in the result tables below (Method AVGPPSD-2). Where the duty cycle was = 98 % the spectrum analyser was set to trace (power) averaging and no duty cycle correction made (Method AVGPPSD-1). In all other cases the spectrum analyser trace was set to max hold (Method AVGPPSD-3).

The output power was verified as being the same from each transmit core (within negligible tolerances), but the antenna gains were not identical. Therefore, the modes reported here for SISO or 2x2 MIMO operation are those giving the highest EIRP and/or lowest conducted limit based on the combination of antennas giving highest total directional gain.

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

- For the CDD results the Directional Gain was calculated in accordance with the equation given in clause F)2)f)(ii) summed for a single spatial stream.
- For SDM modes Directional Gain was calculated in accordance with clause F)2)d)(ii).
- For transmit beamforming (TxBF) mode it was calculated in accordance with clause F)2)d)(i).

2.2.5 Environmental Conditions

Ambient Temperature	22.0 - 26.0 °C
Relative Humidity	29.6 - 49.6 %



2.2.6 Test Results

2.4 GHz WLAN

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Raw Conducted PSD (dBm/30kHz)	-2.24	1.49	-8.80
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-2.24	1.49	-8.80

Table 25 - 802.11b / 1 Mbps / SISO / Core 2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted PSD Core 1 (dBm/30kHz)	-4.62	0.83	-9.38
Conducted PSD Core 2 (dBm/30kHz)	-4.22	0.61	-9.24
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-1.41	3.73	-6.30

Table 26 - 802.11b / 1 Mbps / MIMO CDD / Cores 1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted PSD Core 0 (dBm/30kHz)	-5.45	-0.93	-12.07
Conducted PSD Core 1 (dBm/30kHz)	-4.82	-0.51	-11.54
Conducted PSD Core 2 (dBm/30kHz)	-4.97	-0.18	-11.50
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-0.30	4.24	-6.93

Table 27 - 802.11b / 1 Mbps / MIMO CDD / Cores 0+1+2



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Raw Conducted PSD (dBm/30kHz)	-3.58	1.87	-7.66
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-3.58	1.87	-7.66

Table 28 - 802.11b / 1 Mbps / Aux Core

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Raw Conducted PSD (dBm/30kHz)	-8.32	-0.45	-22.67
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-8.32	-0.45	-22.67

Table 29 - 802.11g / 6 Mbps / SISO / Core 2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted PSD Core 1 (dBm/30kHz)	-10.60	-2.60	-10.73
Conducted PSD Core 2 (dBm/30kHz)	-10.57	-2.46	-10.70
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-7.57	0.48	-7.70

Table 30 - 802.11g / 6 Mbps / MIMO CDD / Cores 1+2



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted PSD Core 0 (dBm/30kHz)	-11.13	-2.57	-25.65
Conducted PSD Core 1 (dBm/30kHz)	-10.52	-2.14	-25.15
Conducted PSD Core 2 (dBm/30kHz)	-10.35	-2.04	-25.16
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-5.88	2.53	-20.54

Table 31 - 802.11g / 6 Mbps / MIMO CDD / Cores 0+1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Raw Conducted PSD (dBm/30kHz)	-13.00	-5.87	-24.46
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-13.00	-5.87	-24.46

Table 32 - 802.11g / 6 Mbps / Aux Core

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Raw Conducted PSD (dBm/30kHz)	-9.41	-1.04	-22.80
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-9.41	-1.04	-22.80

Table 33 - 802.11n / HT20 MCS0 / SISO / Core 2



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted PSD Core 1 (dBm/30kHz)	-11.07	-2.51	-10.94
Conducted PSD Core 2 (dBm/30kHz)	-10.90	-3.05	-11.13
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-7.98	0.24	-8.03

Table 34 - 802.11n / HT20 MCS0 / MIMO CDD / Cores 1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted PSD Core 1 (dBm/30kHz)	-10.93	-2.26	-11.00
Conducted PSD Core 2 (dBm/30kHz)	-10.93	-2.58	-11.02
Duty Cycle Correction (dB)	0.10	0.10	0.10
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-7.82	0.69	-7.90

Table 35 - 802.11n / HT20 MCS8 / MIMO SDM / Cores 1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted PSD Core 1 (dBm/30kHz)	-15.56	-5.00	-25.32
Conducted PSD Core 2 (dBm/30kHz)	-13.47	-5.51	-26.05
Duty Cycle Correction (dB)	0.37	0.32	0.32
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-11.01	-1.92	-22.34

Table 36 - 802.11n / HT20 MCS0 / MIMO TxBF / Cores 1+2



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted PSD Core 0 (dBm/30kHz)	-11.84	-3.53	-25.77
Conducted PSD Core 1 (dBm/30kHz)	-11.41	-2.88	-25.32
Conducted PSD Core 2 (dBm/30kHz)	-11.32	-3.11	-25.39
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-6.74	1.61	-20.72

Table 37 - 802.11n / HT20 MCS0 / MIMO CDD / Cores 0+1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted PSD Core 0 (dBm/30kHz)	-11.49	-3.29	-25.48
Conducted PSD Core 1 (dBm/30kHz)	-11.35	-2.53	-25.34
Conducted PSD Core 2 (dBm/30kHz)	-10.62	-2.44	-25.01
Duty Cycle Correction (dB)	0.14	0.14	0.14
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-6.23	2.17	-20.36

Table 38 - 802.11n / HT20 MCS16 / MIMO SDM / Cores 0+1+2

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Conducted PSD Core 0 (dBm/30kHz)	-13.86	-5.48	-28.02
Conducted PSD Core 1 (dBm/30kHz)	-14.94	-5.85	-27.13
Conducted PSD Core 2 (dBm/30kHz)	-15.00	-5.95	-28.92
Duty Cycle Correction (dB)	0.55	0.42	0.36
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-9.25	-0.56	-22.83

Table 39 - 802.11n / HT20 MCS0 / MIMO TxBF / Cores 0+1+2



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
Raw Conducted PSD (dBm/30kHz)	-13.28	-5.73	-23.93
Duty Cycle Correction (dB)	N/A SA-1	N/A SA-1	N/A SA-1
15.247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
RSS-247 Conducted PSD Limit (dBm/3kHz)	8.00	8.00	8.00
Conducted PSD Result (dBm/30kHz)	-13.28	-5.73	-23.93

Table 40 - 802.11n / HT20 MCS0 / Aux Core

FCC 47 CFR Part 15, Limit Clause 15.247 (e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

ISED RSS-247, Limit Clause 5.2(b)

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission



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
Multimeter	Fluke	79 Series III	611	12	11-Sep-2020
Hygrometer	Rotronic	I-1000	3220	12	25-Sep-2020
1800-6000 MHz Power Splitter	Mini-Circuits	ZN2PD-63-S+	4055	-	O/P Mon
Power splitter - 2 port	Mini-Circuits	ZN2PD-63-S+	4743	12	23-Sep-2020
EXA	Keysight Technologies	N9010B	4968	24	21-Dec-2019
Network Analyser	Keysight Technologies	E5063A	5018	12	20-May-2020
Electronic Calibration Module	Keysight Technologies	85093C	5188	12	21-May-2020
AC Programmable Power Supply	iTech	IT7324	5227	-	O/P Mon
Power Splitter, 4 way	Mini-Circuits	ZN4PD1-63-S+	5235	-	O/P Mon
Power Splitter, 4 way	Mini-Circuits	ZN4PD1-63-S+	5236	-	O/P Mon
10 dB Attenuator	Telegartner	J01156A0031	Not Serialised	-	O/P Mon
10 dB Attenuator	Telegartner	J01156A0031	Not Serialised	-	O/P Mon
10 dB Attenuator	Telegartner	J01156A0031	Not Serialised	-	O/P Mon
10 dB Attenuator	Telegartner	J01156A0031	Not Serialised	-	O/P Mon

Table 41

O/P Mon – Output monitored using calibrated equipment.



2.3 Emission Bandwidth

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (a)(2)
ISED RSS-247, Clause 5.2
ISED RSS-GEN, Clause 6.7

2.3.2 Equipment Under Test and Modification State

A2304, S/N: C02Z1003N0GT - Modification State 0

2.3.3 Date of Test

23-October-2019 to 01-November-2019

2.3.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.8.2

For modes of operation using multiple cores, measurements were made on each core but only the worst case results are reported. Worst case was considered as the narrowest results for 6 dB bandwidth and the widest result for 99% occupied bandwidth.

2.3.5 Environmental Conditions

Ambient Temperature 19.0 - 26.0 °C
Relative Humidity 29.6 - 48.8 %

2.3.6 Test Results

2.4 GHz WLAN

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	8.16	8.64	8.16
99% Bandwidth (MHz)	10.747	11.733	10.365

Table 42 - 802.11b / 1 Mbps / SISO / Core 2

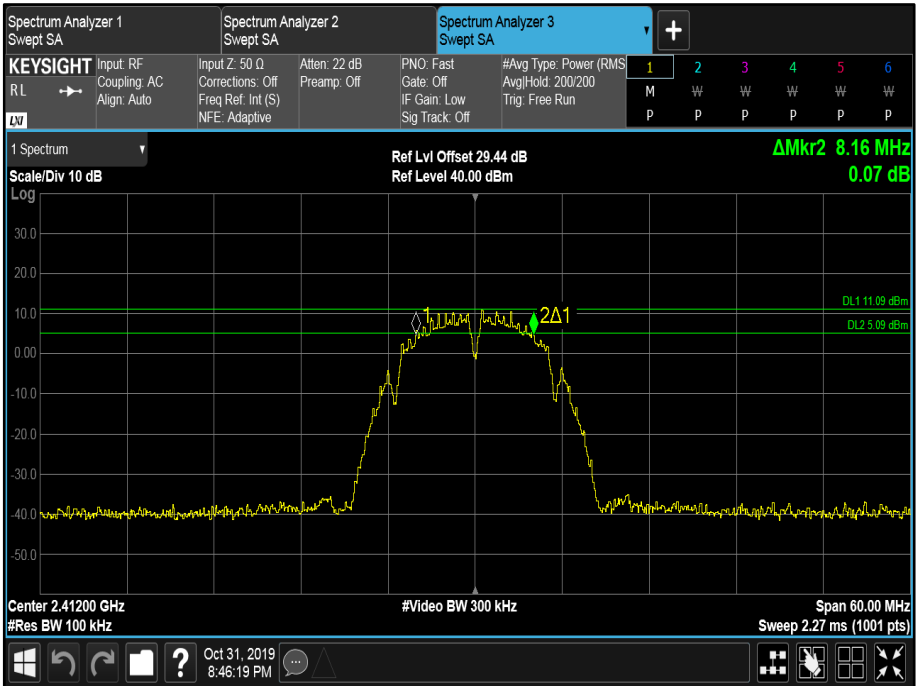


Figure 1 - 2412 MHz - 6 dB DTS Bandwidth

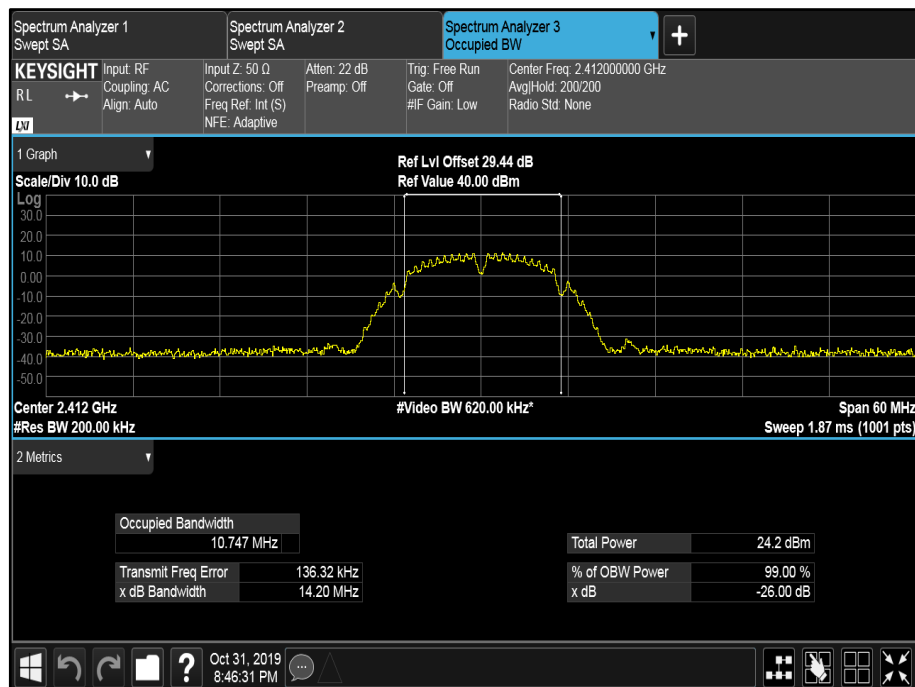


Figure 2 - 2412 MHz - 99% Occupied Bandwidth

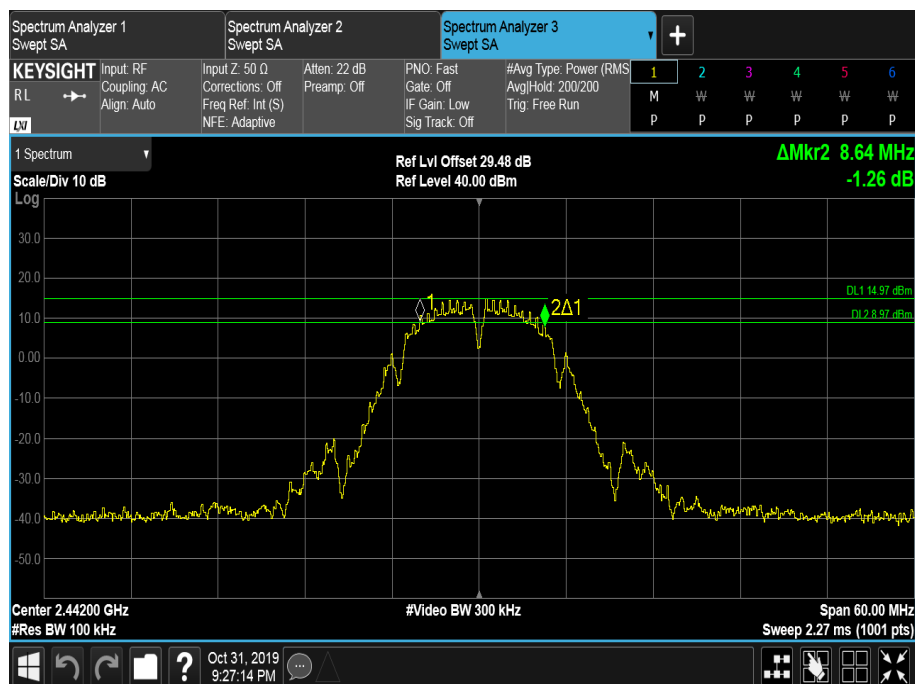


Figure 3 - 2442 MHz - 6 dB DTS Bandwidth

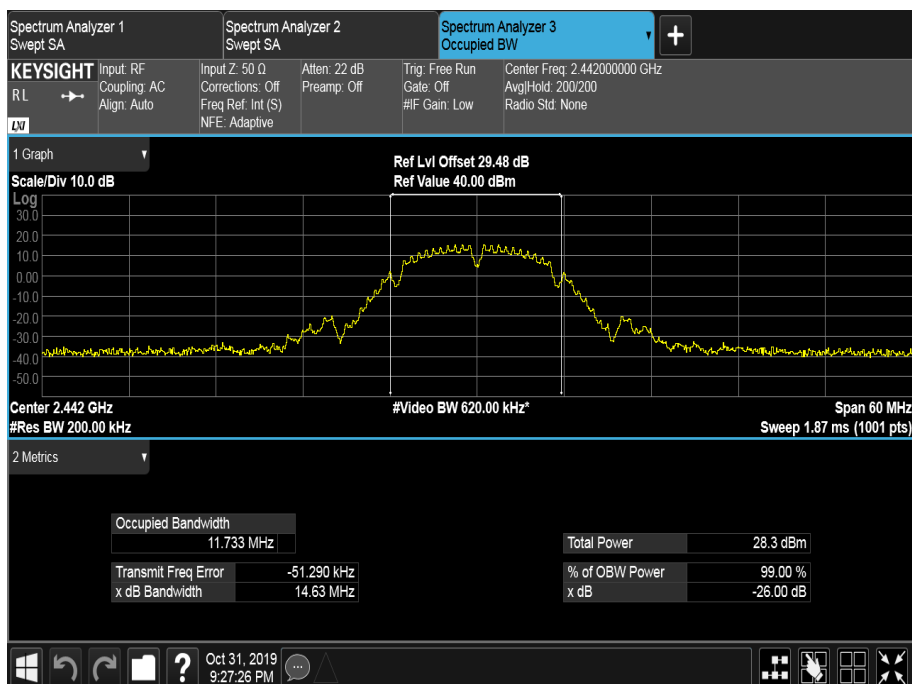


Figure 4 - 2442 MHz - 99% Occupied Bandwidth

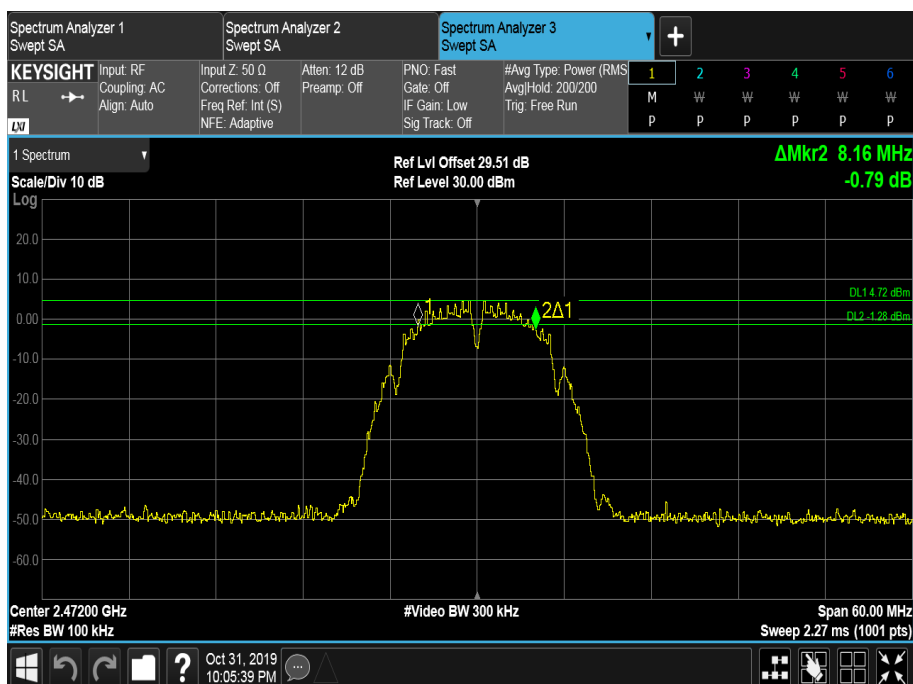


Figure 5 - 2472 MHz - 6 dB DTS Bandwidth

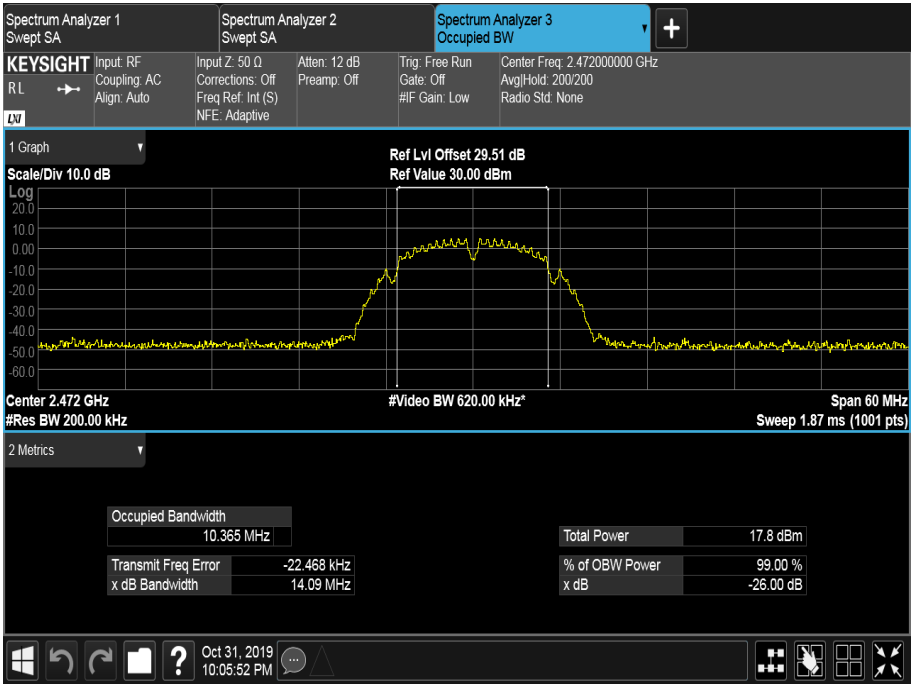


Figure 6 - 2472 MHz - 99% Occupied Bandwidth



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	7.68	8.16	8.16
99% Bandwidth (MHz)	10.650	11.296	10.370

Table 43 - 802.11b / 1 Mbps / MIMO CDD / Cores 1+2

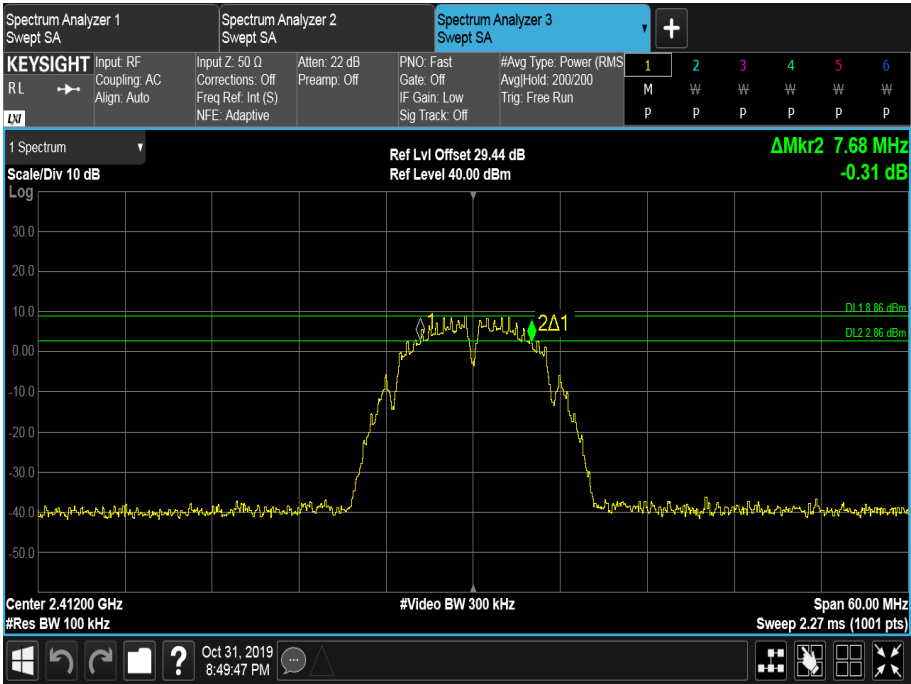


Figure 7 - 2412 MHz - 6 dB DTS Bandwidth

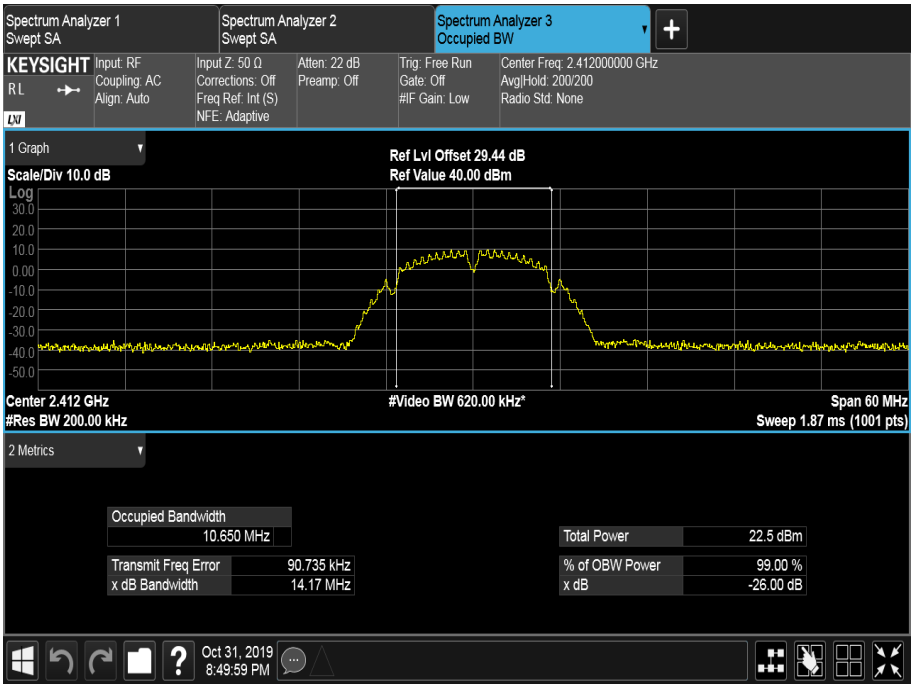


Figure 8 - 2412 MHz - 99% Occupied Bandwidth

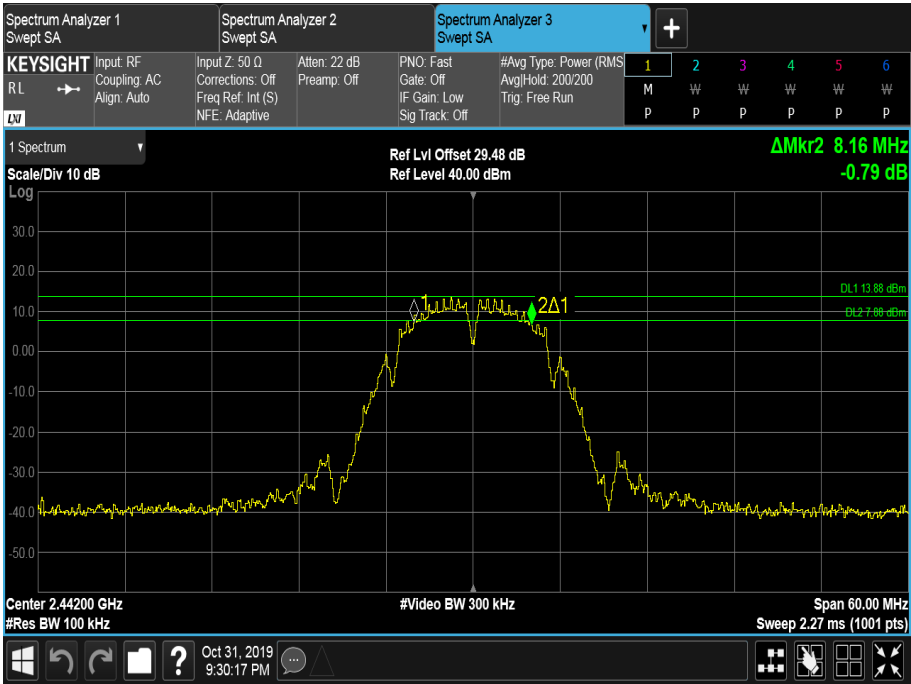


Figure 9 - 2442 MHz - 6 dB DTS Bandwidth

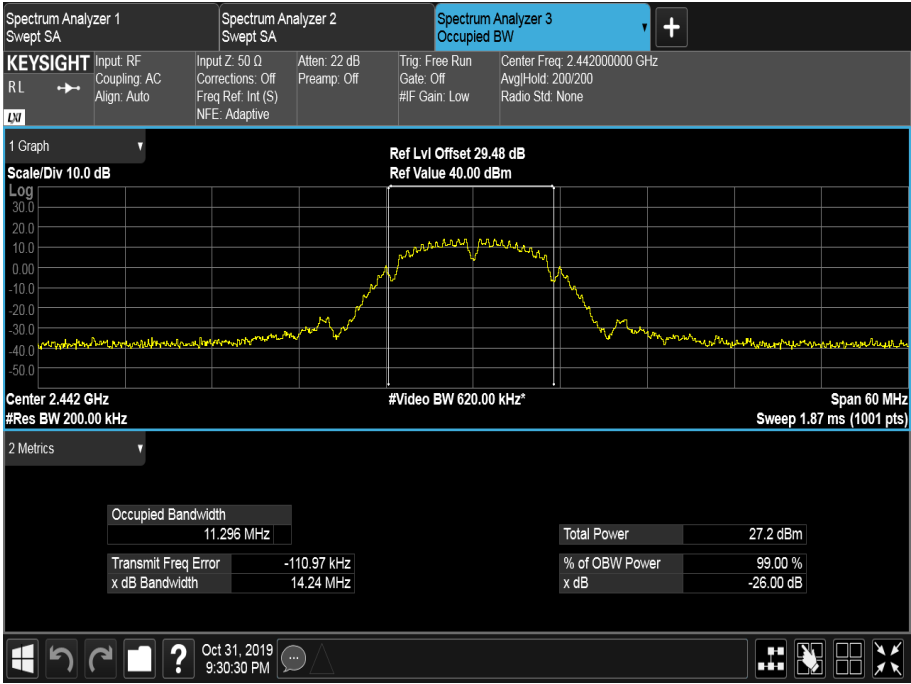


Figure 10 - 2442 MHz - 99% Occupied Bandwidth

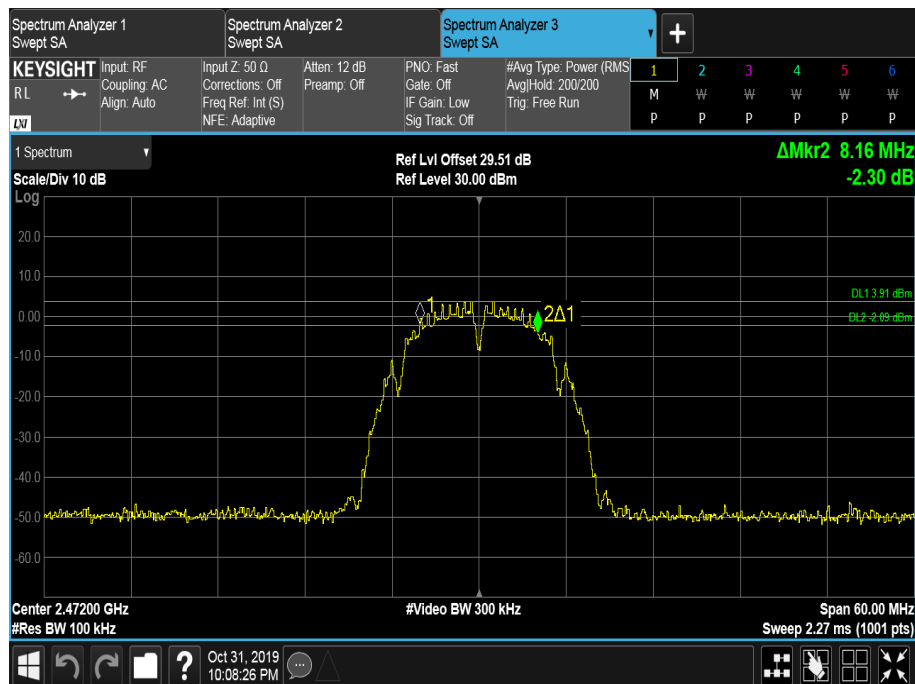


Figure 11 - 2472 MHz - 6 dB DTS Bandwidth

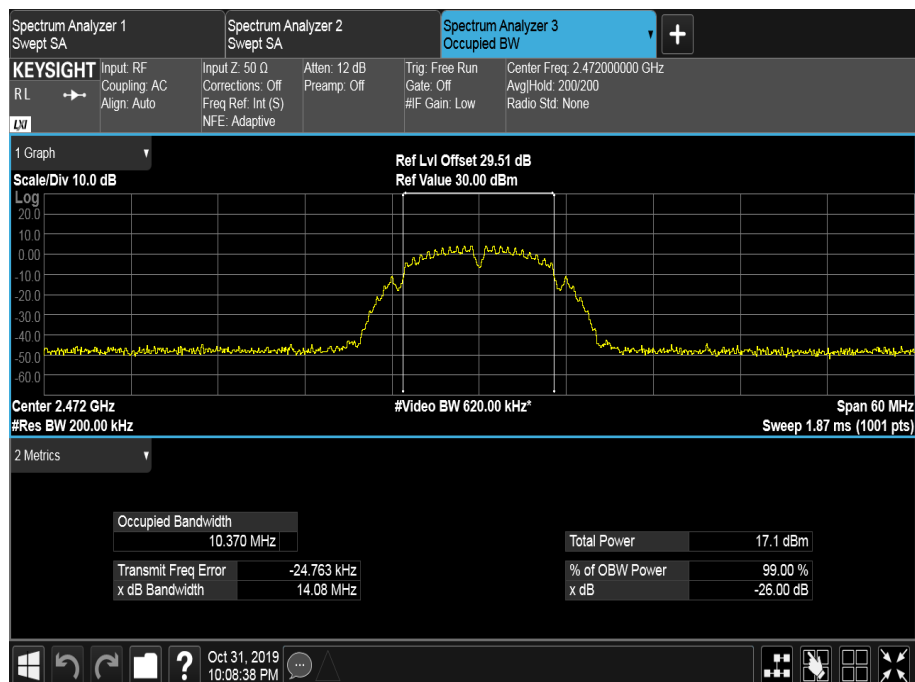


Figure 12 - 2472 MHz - 99% Occupied Bandwidth

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	8.16	8.16	8.16
99% Bandwidth (MHz)	10.645	11.078	10.627

Table 44 - 802.11b / 1 Mbps / MIMO CDD / Cores 0+1+2

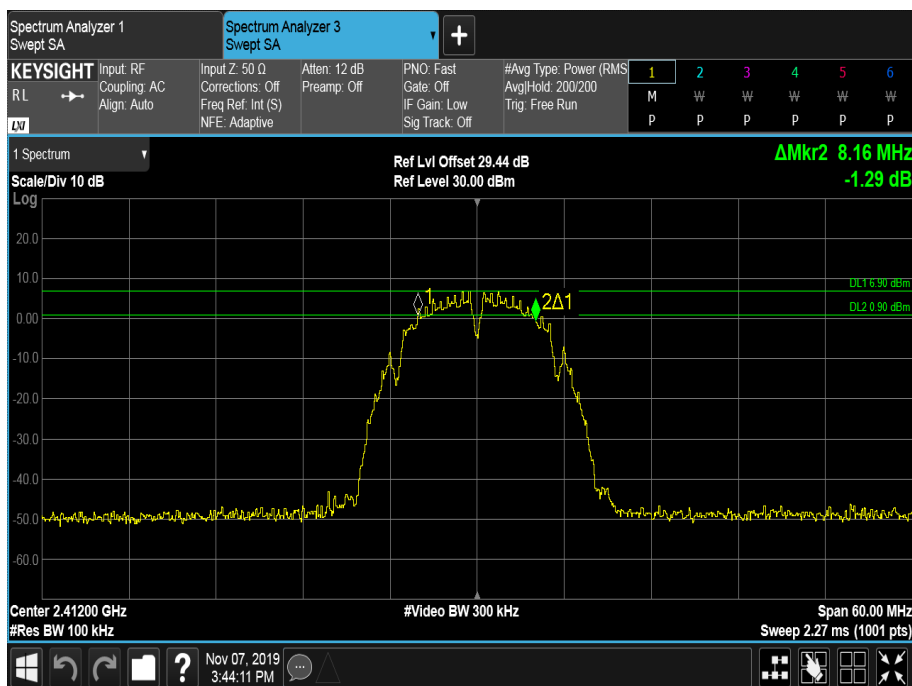


Figure 13 - 2412 MHz - 6 dB DTS Bandwidth

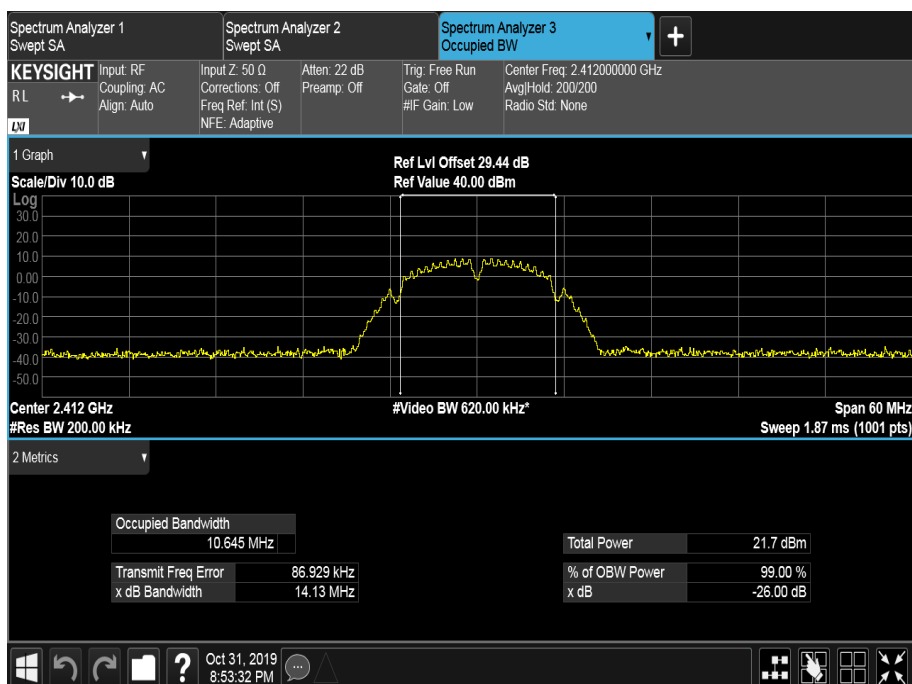


Figure 14 - 2412 MHz - 99% Occupied Bandwidth

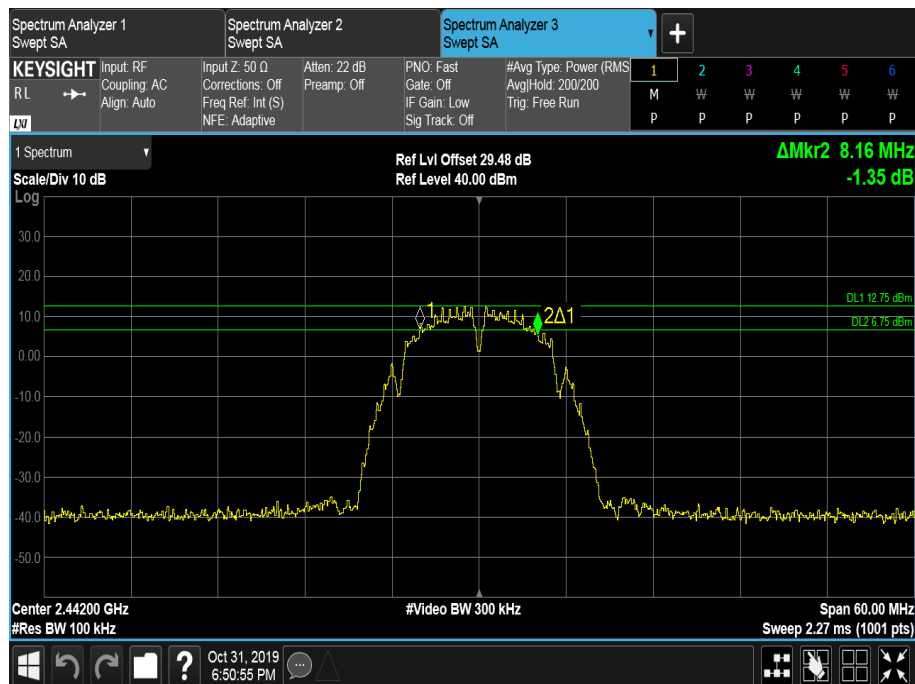


Figure 15 - 2442 MHz - 6 dB DTS Bandwidth

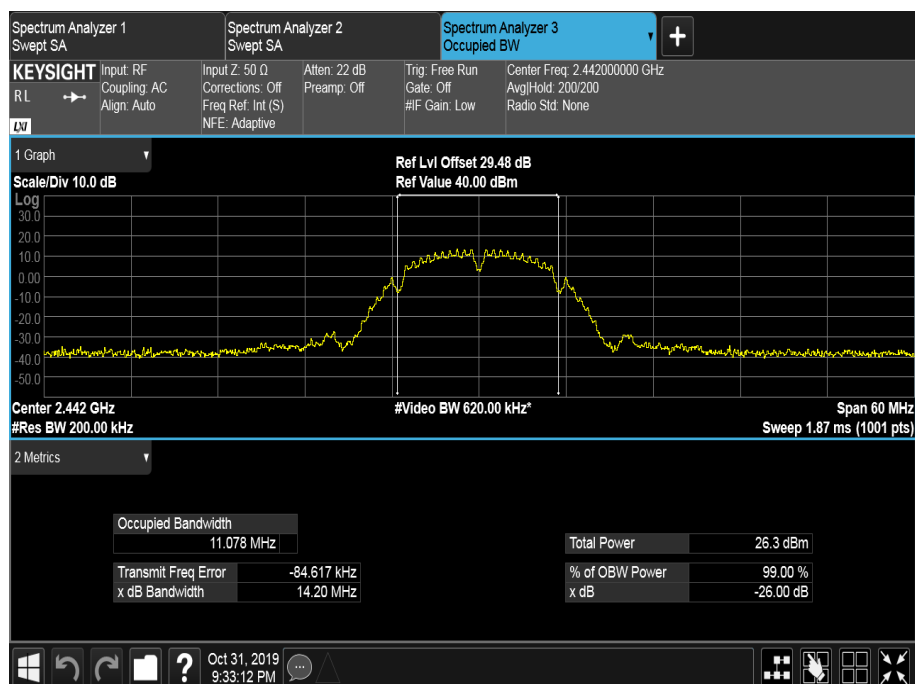


Figure 16 - 2442 MHz - 99% Occupied Bandwidth

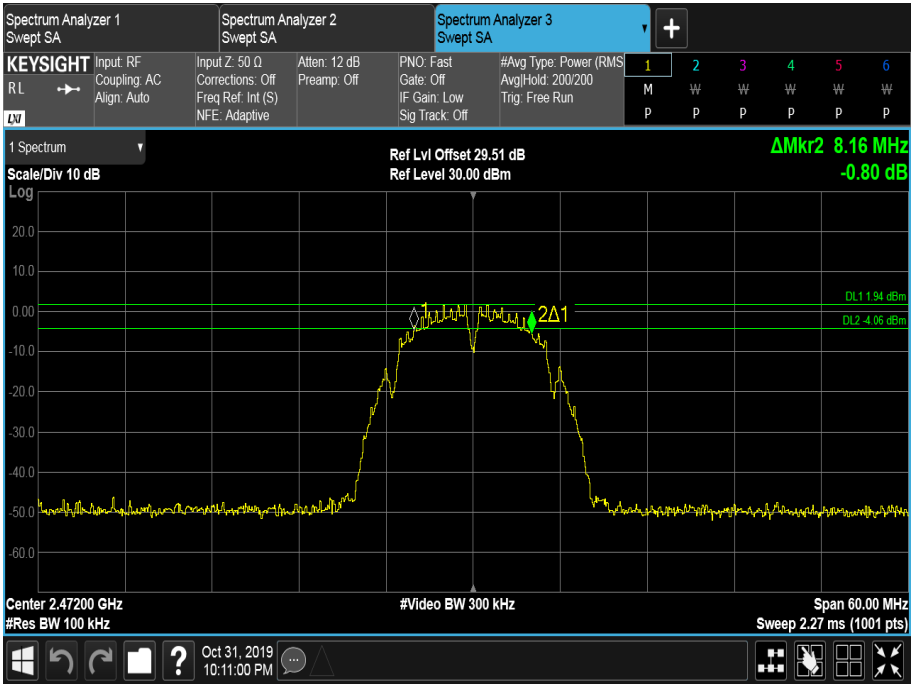


Figure 17 - 2472 MHz - 6 dB DTS Bandwidth

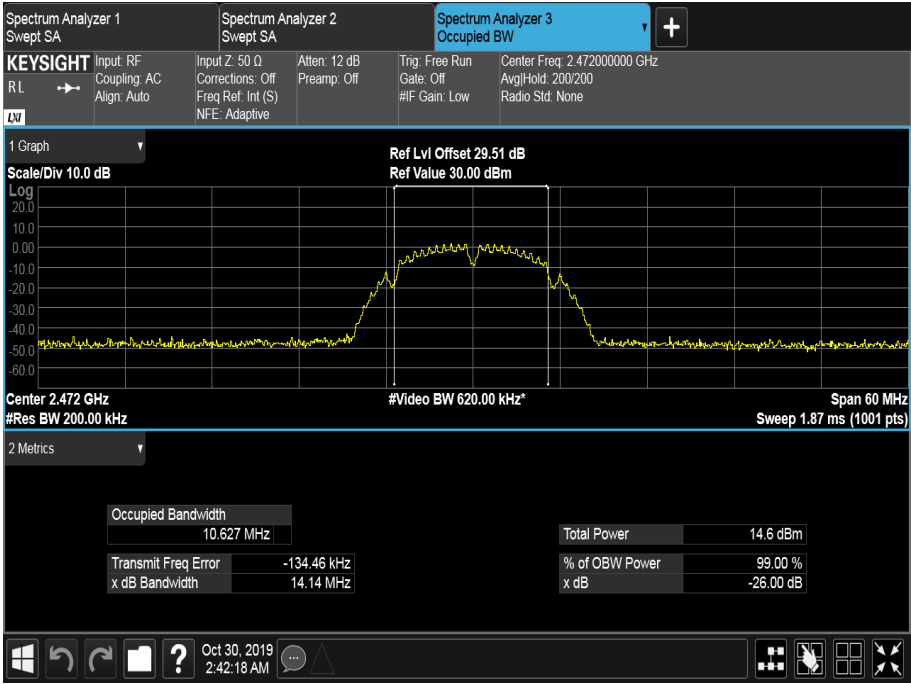


Figure 18 - 2472 MHz - 99% Occupied Bandwidth

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	8.16	8.64	8.16
99% Bandwidth (MHz)	11.107	11.887	10.601

Table 45 - 802.11b / 1 Mbps / Aux Core

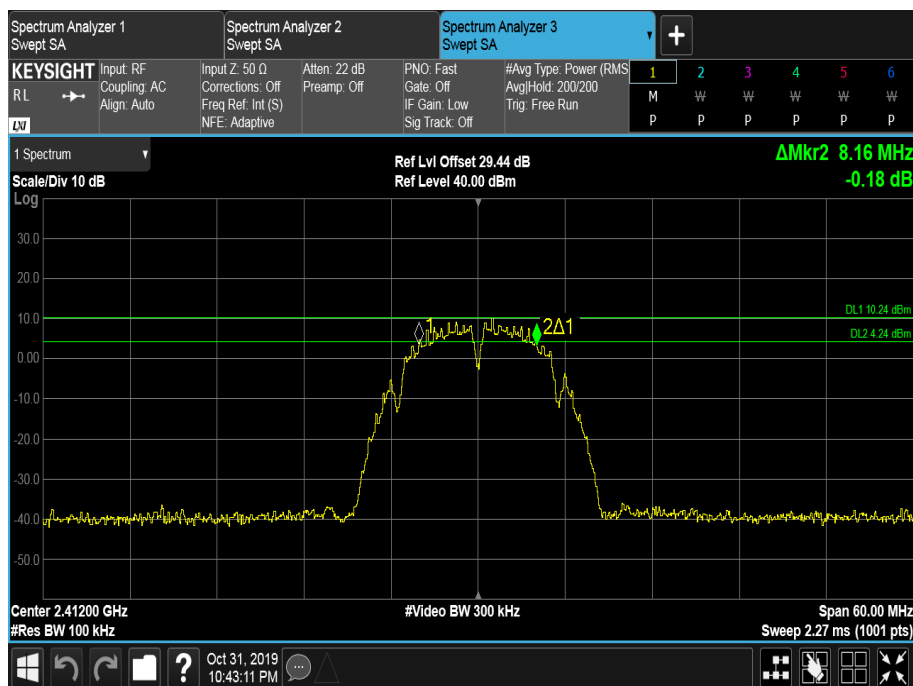


Figure 19 - 2412 MHz - 6 dB DTS Bandwidth

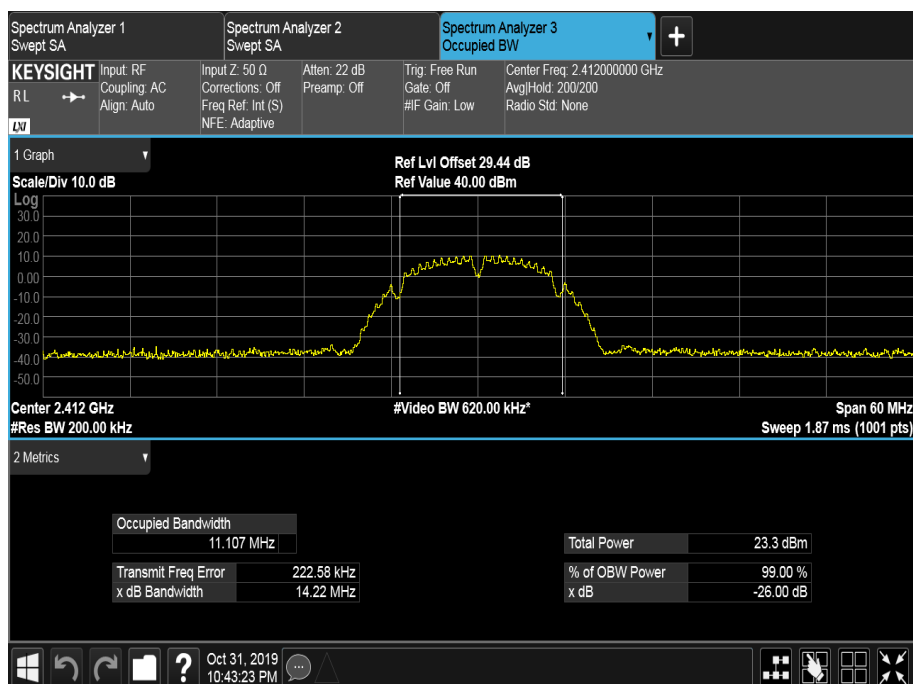


Figure 20 - 2412 MHz - 99% Occupied Bandwidth

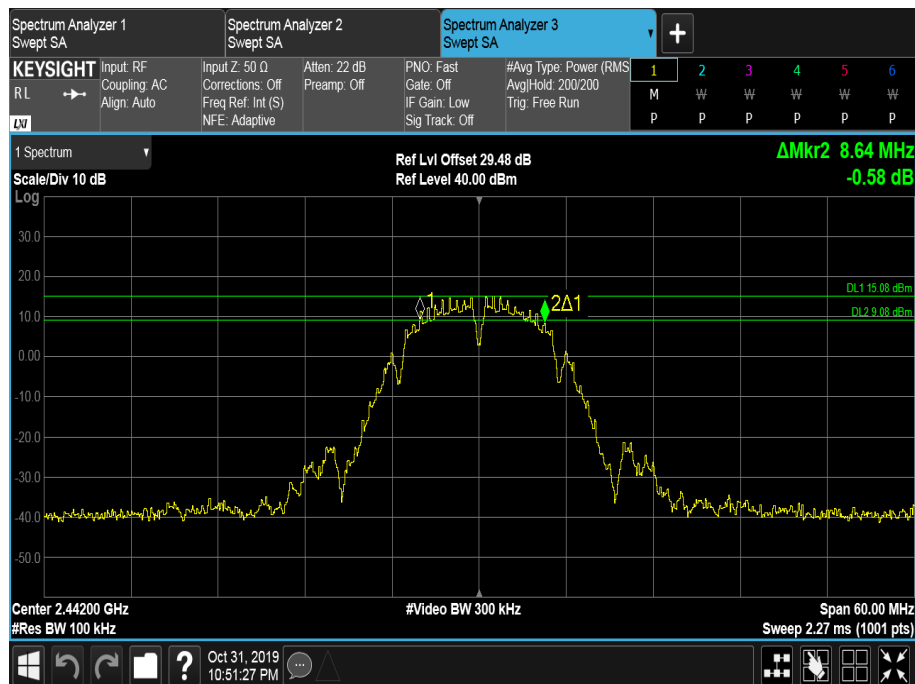


Figure 21 - 2442 MHz - 6 dB DTS Bandwidth

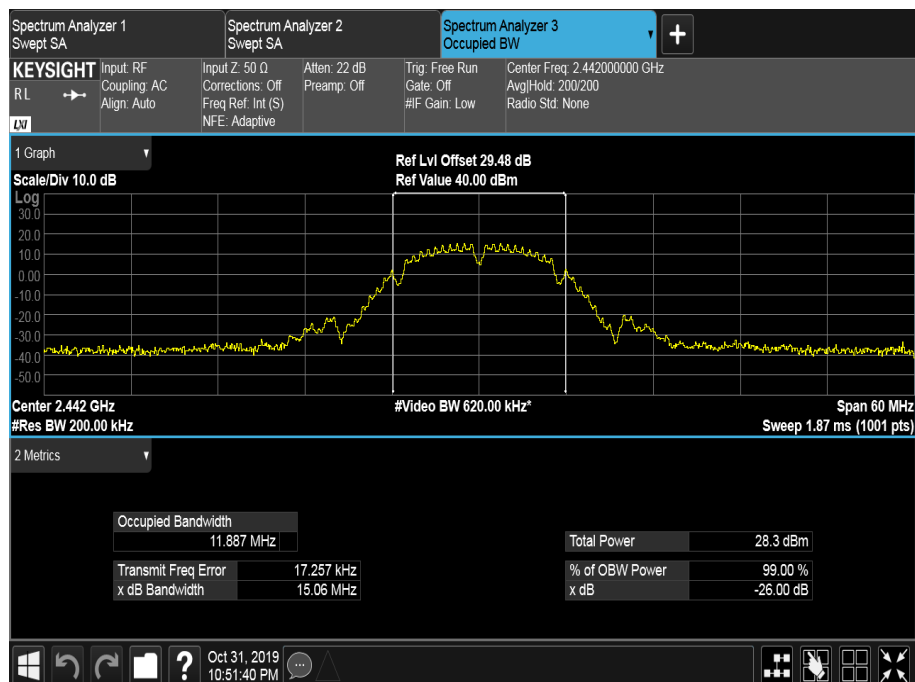


Figure 22 - 2442 MHz - 99% Occupied Bandwidth

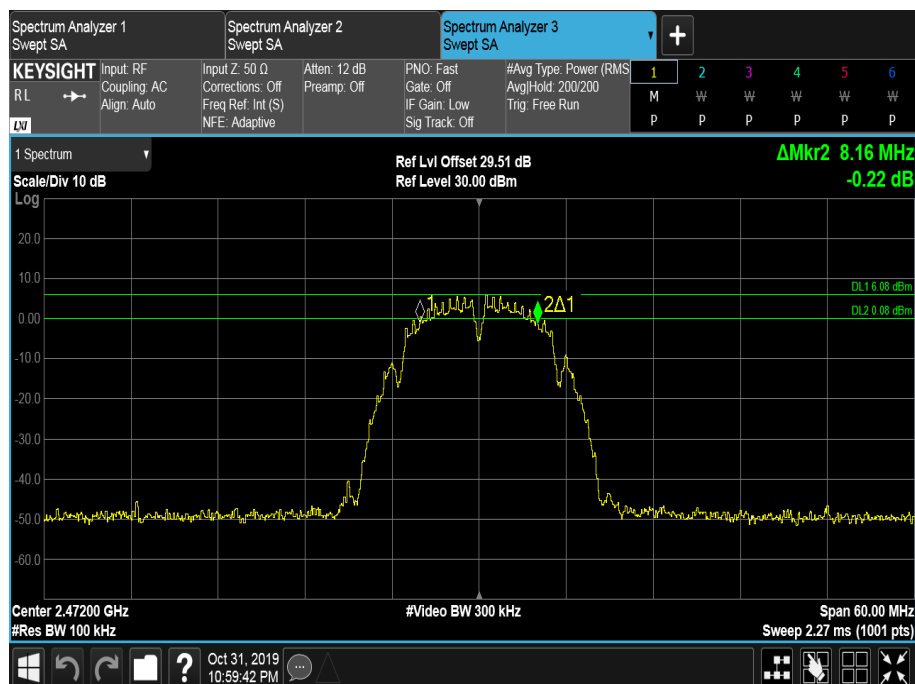


Figure 23 - 2472 MHz - 6 dB DTS Bandwidth

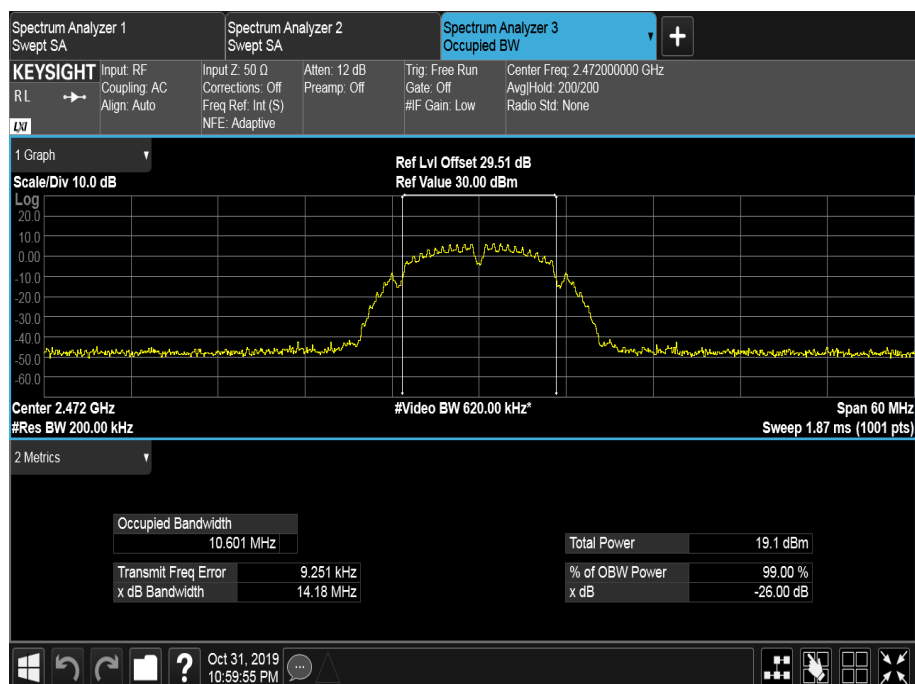


Figure 24 - 2472 MHz - 99% Occupied Bandwidth

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	15.48	14.22	13.92
99% Bandwidth (MHz)	16.387	16.472	16.372

Table 46 - 802.11g / 6 Mbps / SISO / Core 2

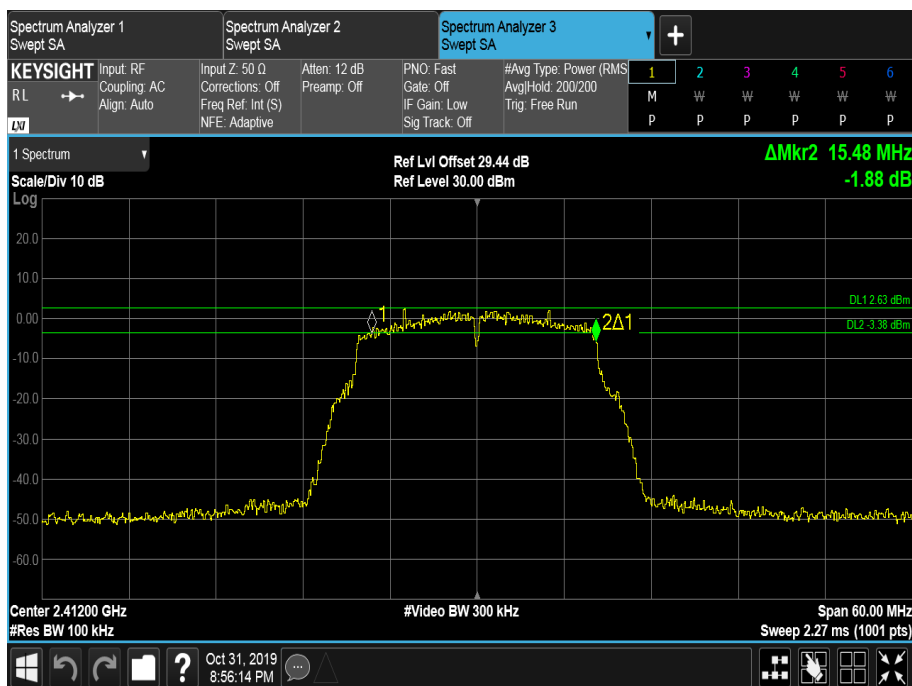


Figure 25 - 2412 MHz - 6 dB DTS Bandwidth

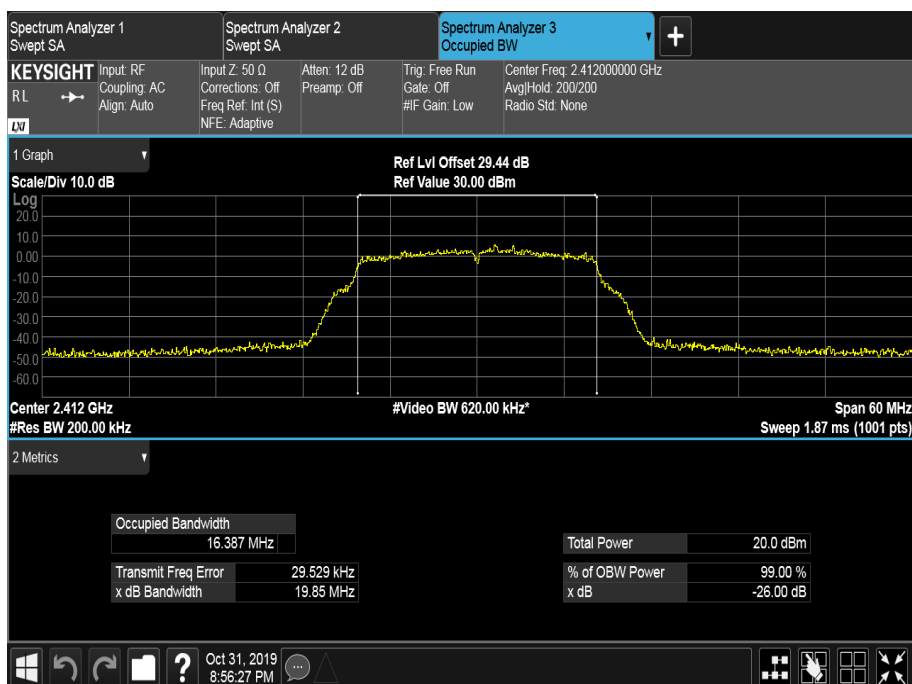


Figure 26 - 2412 MHz - 99% Occupied Bandwidth

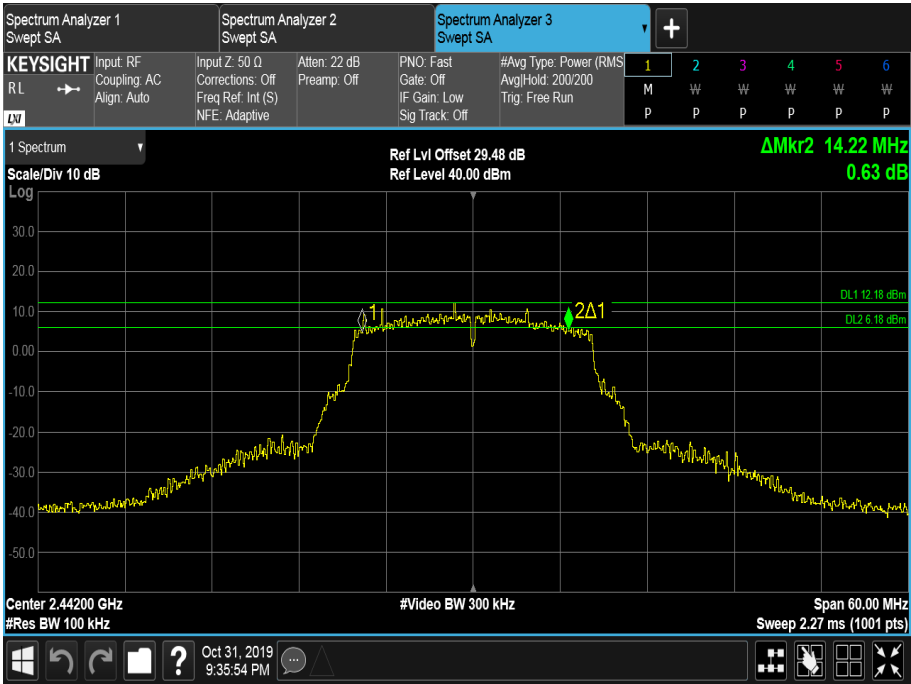


Figure 27 - 2442 MHz - 6 dB DTS Bandwidth

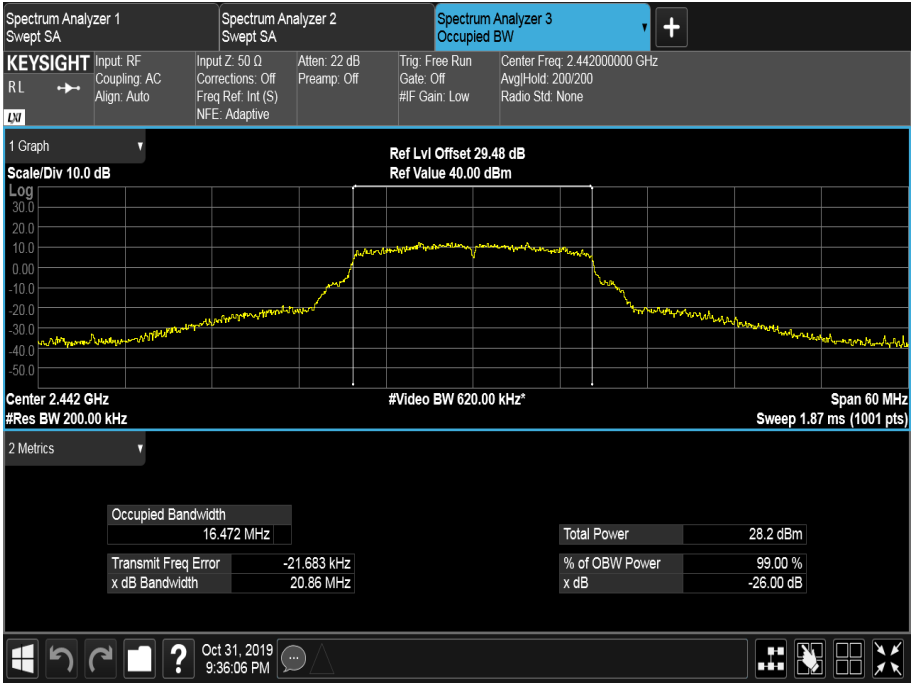


Figure 28 - 2442 MHz - 99% Occupied Bandwidth

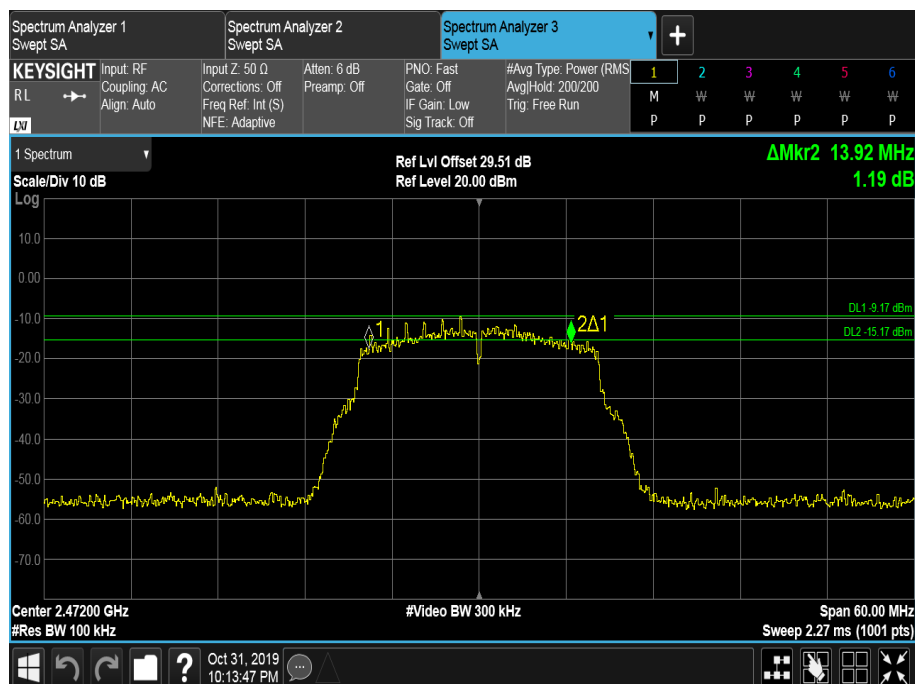


Figure 29 - 2472 MHz - 6 dB DTS Bandwidth

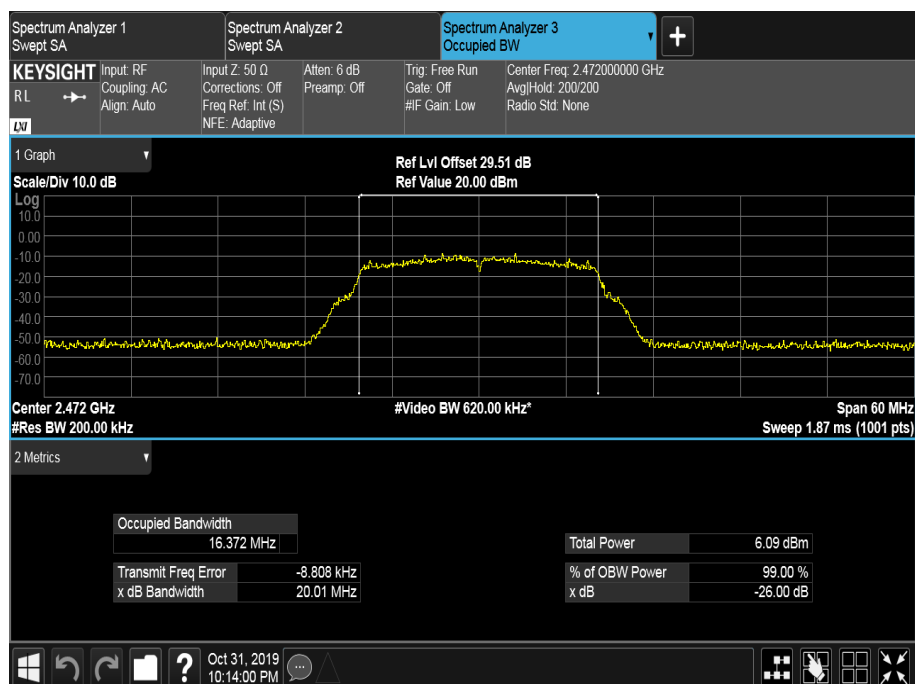


Figure 30 - 2472 MHz - 99% Occupied Bandwidth



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	13.32	13.92	12.72
99% Bandwidth (MHz)	16.395	16.454	16.342

Table 47 - 802.11g / 6 Mbps / MIMO CDD / Cores 1+2

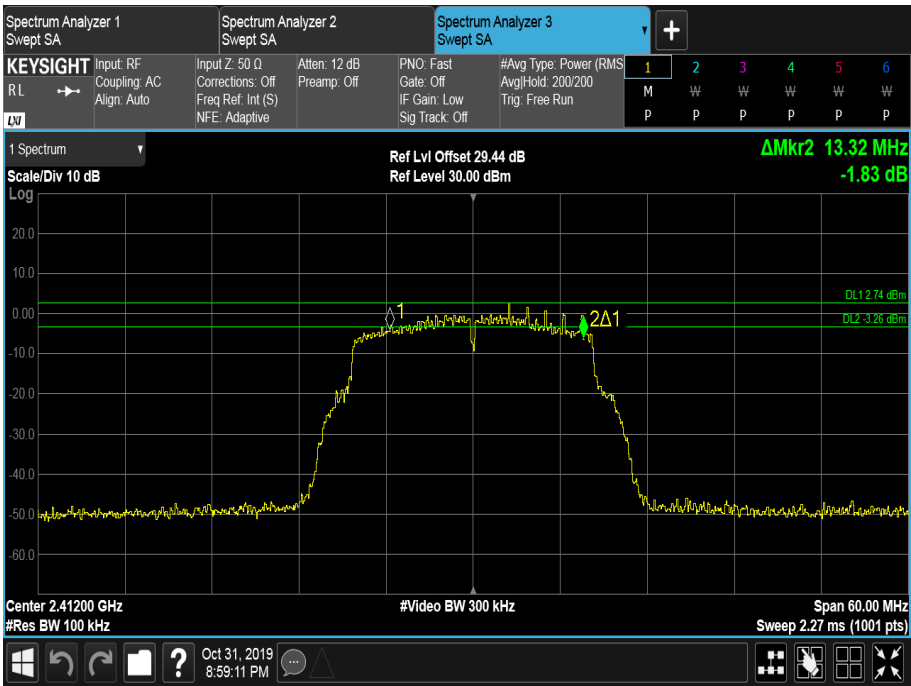


Figure 31 - 2412 MHz - 6 dB DTS Bandwidth

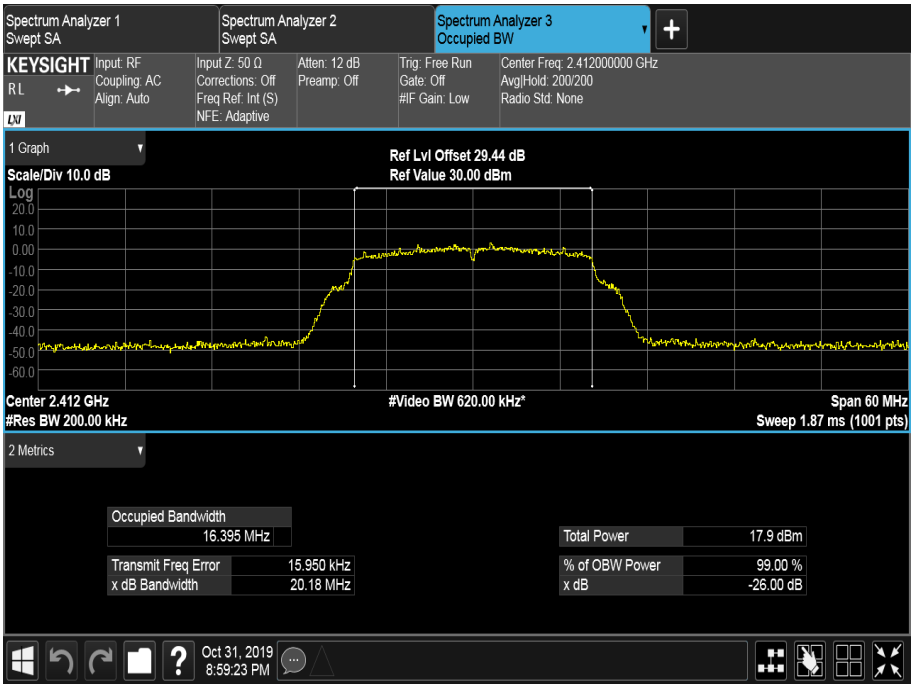


Figure 32 - 2412 MHz - 99% Occupied Bandwidth

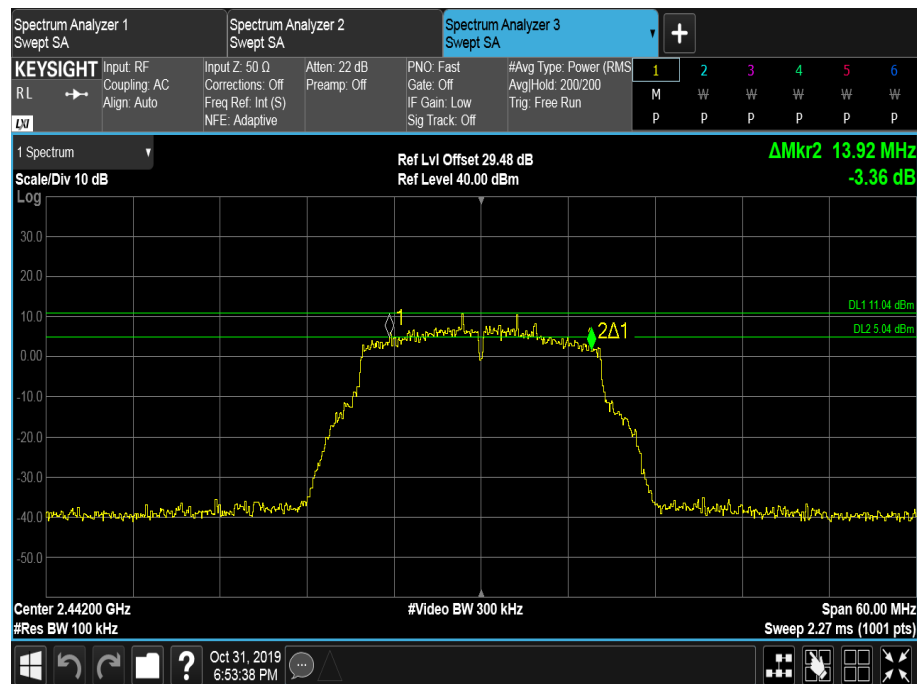


Figure 33 - 2442 MHz - 6 dB DTS Bandwidth

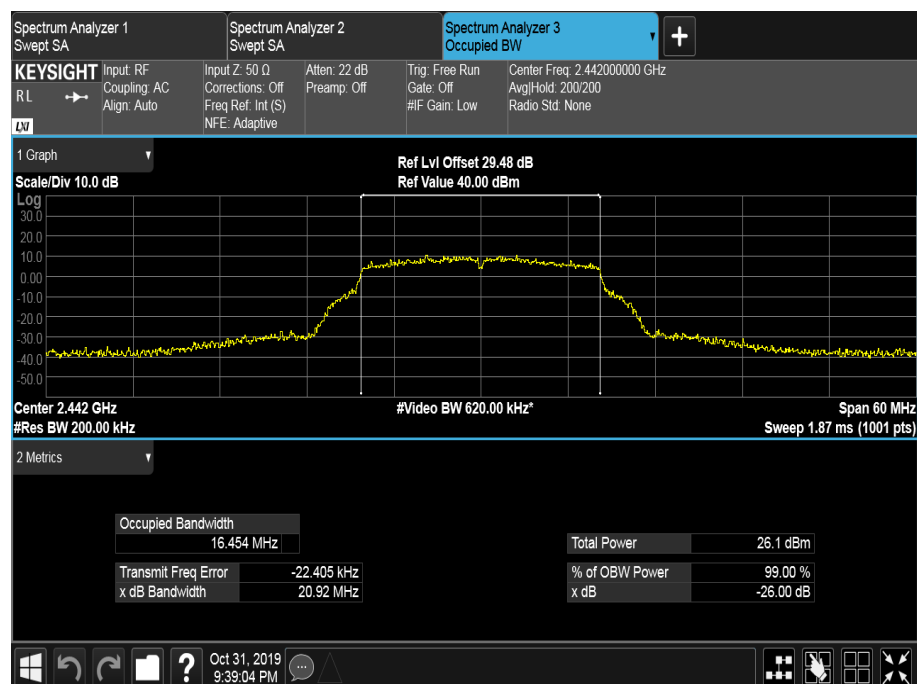


Figure 34 - 2442 MHz - 99% Occupied Bandwidth

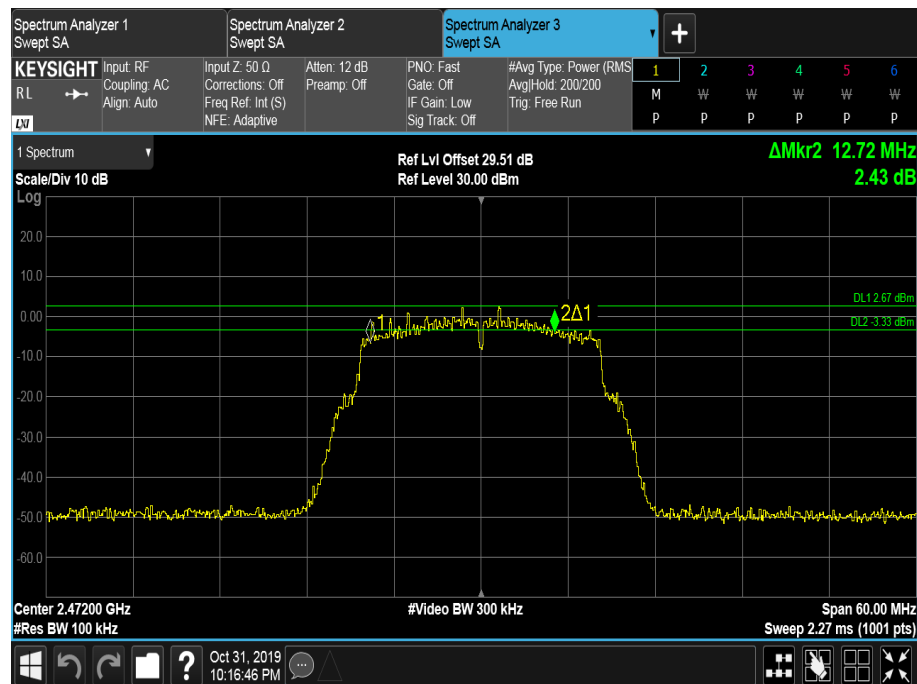


Figure 35 - 2472 MHz - 6 dB DTS Bandwidth

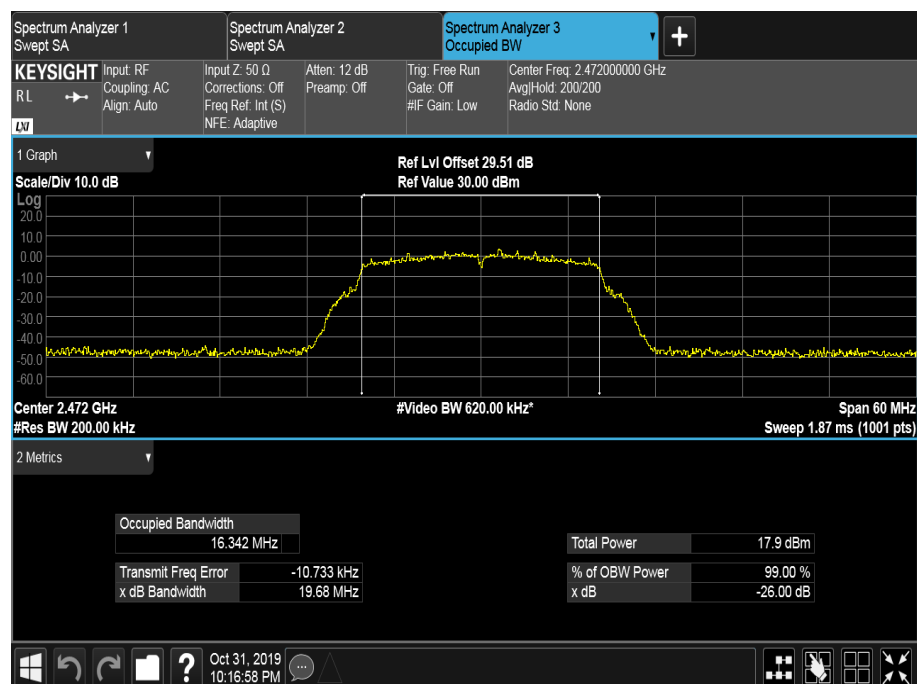


Figure 36 - 2472 MHz - 99% Occupied Bandwidth

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	12.90	13.92	11.82
99% Bandwidth (MHz)	16.393	16.474	16.412

Table 48 - 802.11g / 6 Mbps / MIMO CDD / Cores 0+1+2

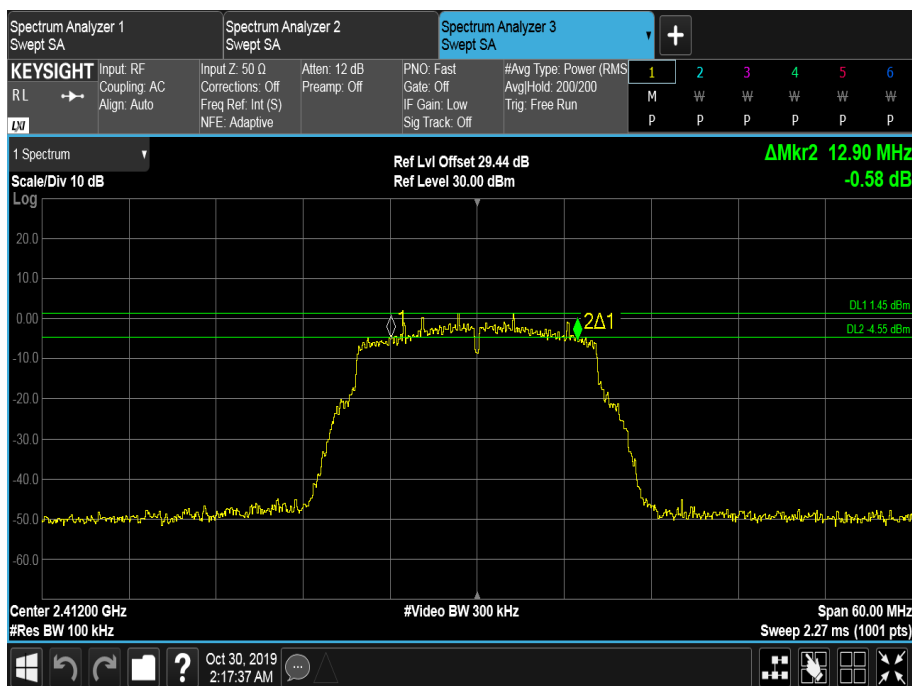


Figure 37 - 2412 MHz - 6 dB DTS Bandwidth

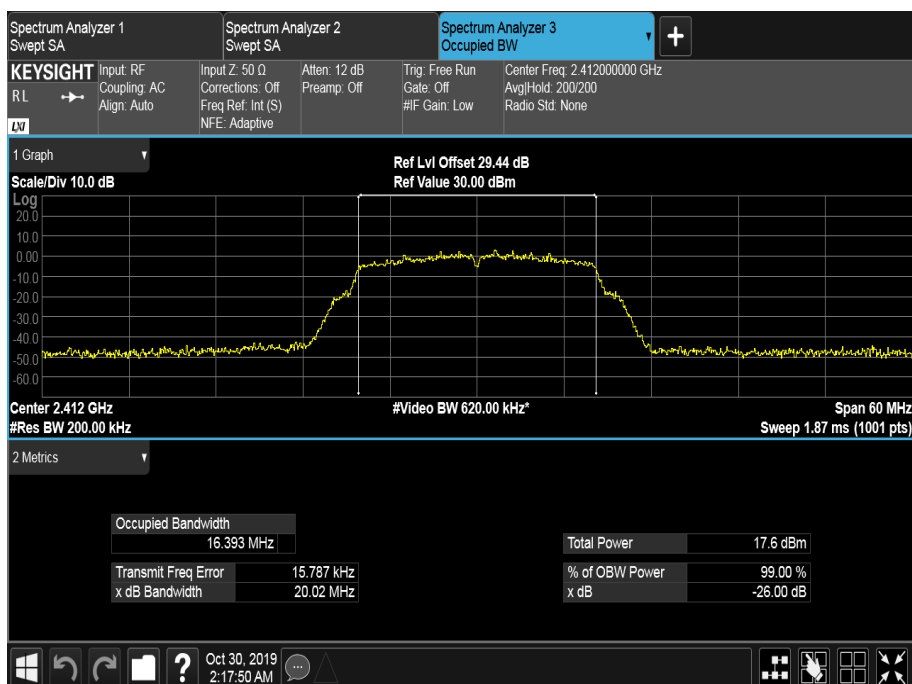


Figure 38 - 2412 MHz - 99% Occupied Bandwidth

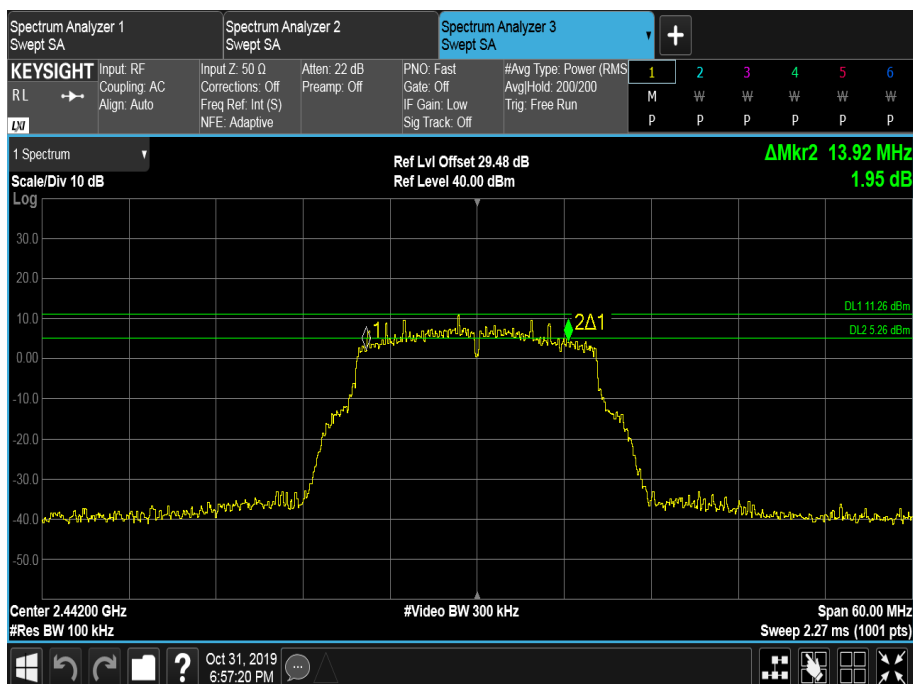


Figure 39 - 2442 MHz - 6 dB DTS Bandwidth

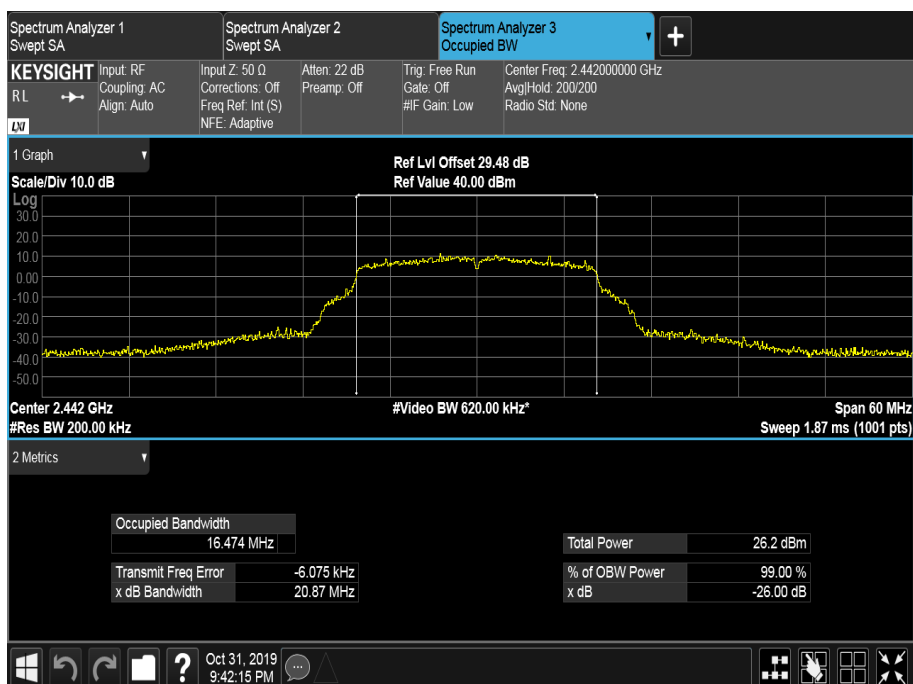


Figure 40 - 2442 MHz - 99% Occupied Bandwidth

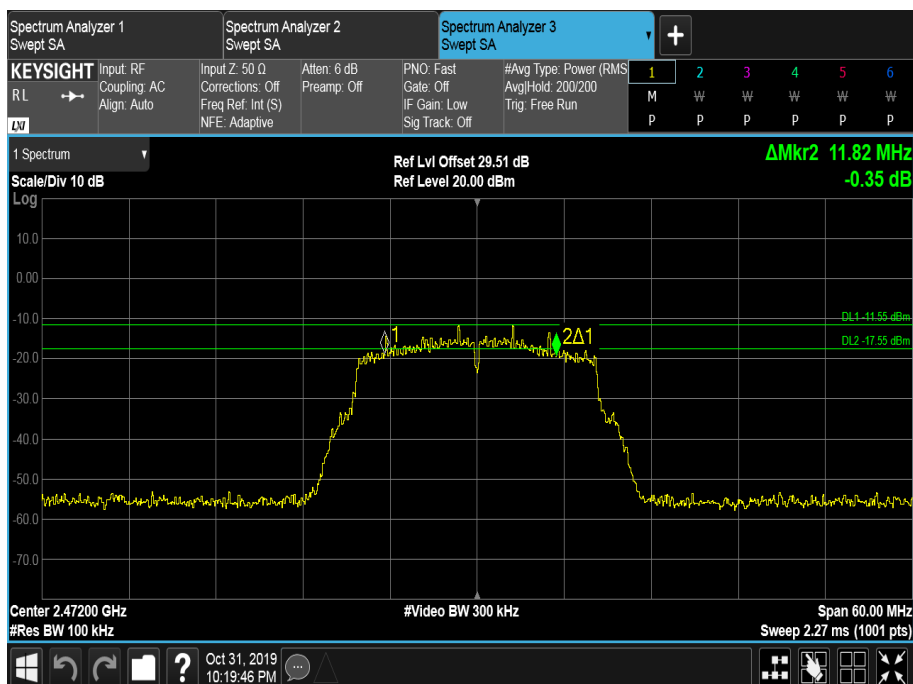


Figure 41 - 2472 MHz - 6 dB DTS Bandwidth

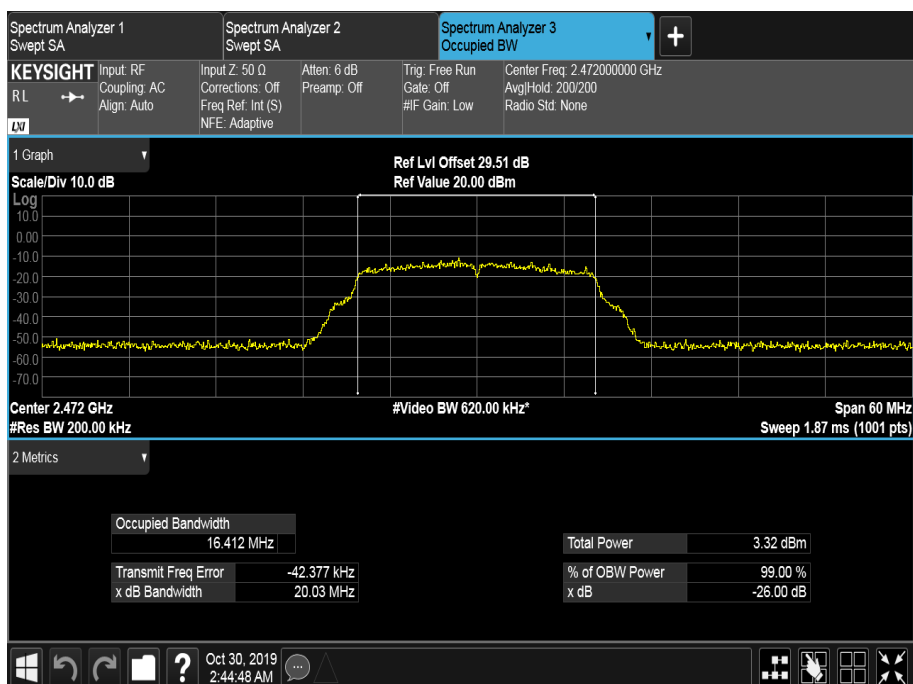


Figure 42 - 2472 MHz - 99% Occupied Bandwidth

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	16.44	16.44	16.44
99% Bandwidth (MHz)	16.626	16.691	16.629

Table 49 - 802.11g / 6 Mbps / Aux Core

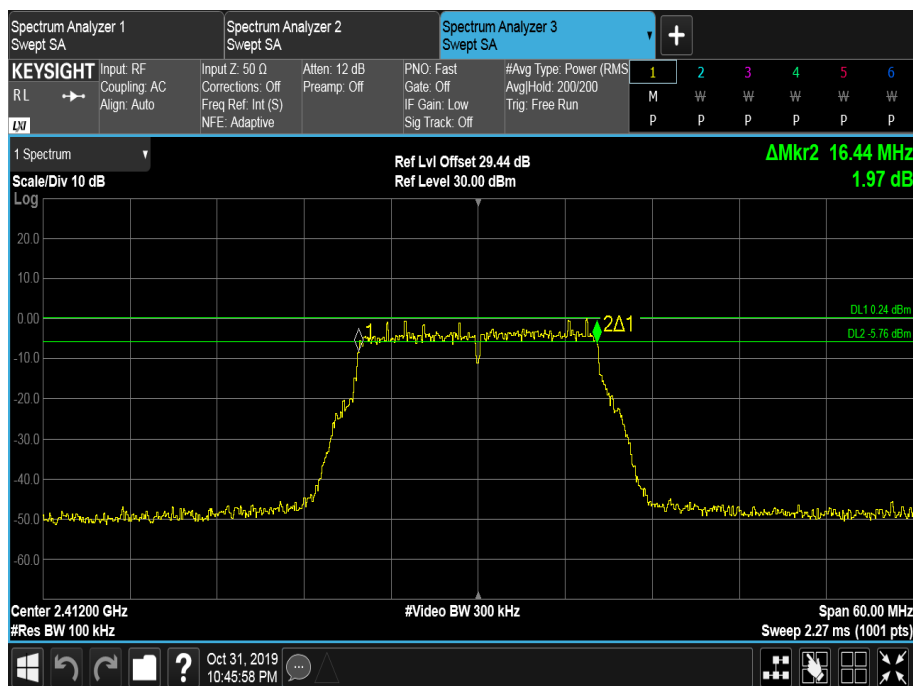


Figure 43 - 2412 MHz - 6 dB DTS Bandwidth

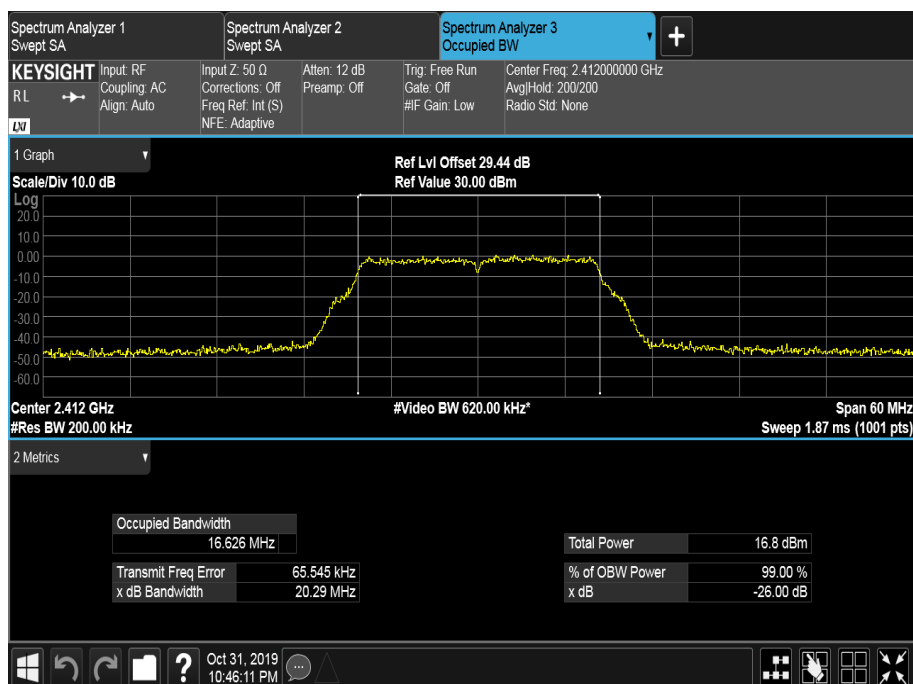


Figure 44 - 2412 MHz - 99% Occupied Bandwidth

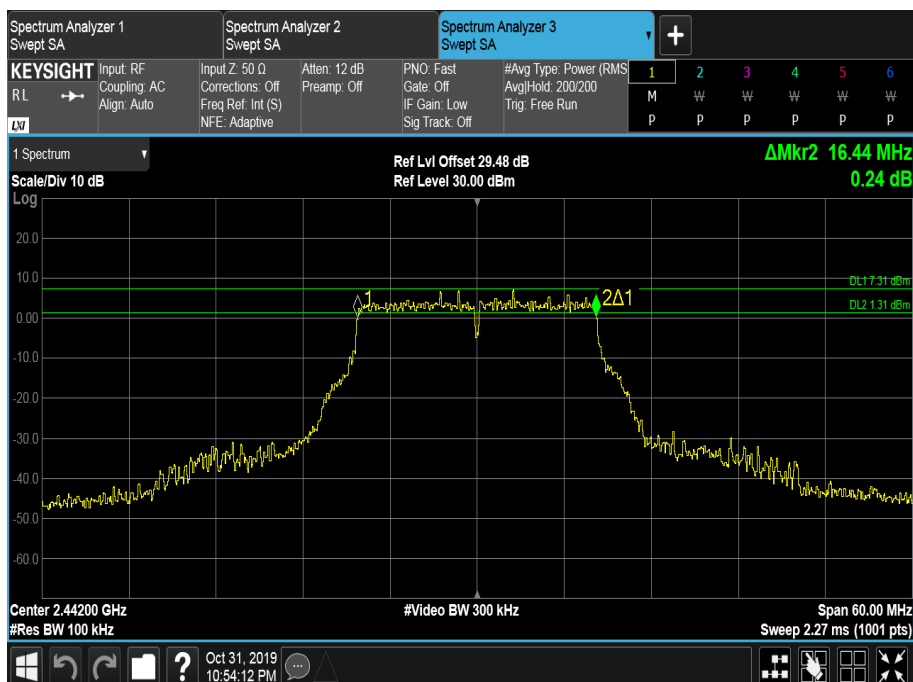


Figure 45 - 2442 MHz - 6 dB DTS Bandwidth

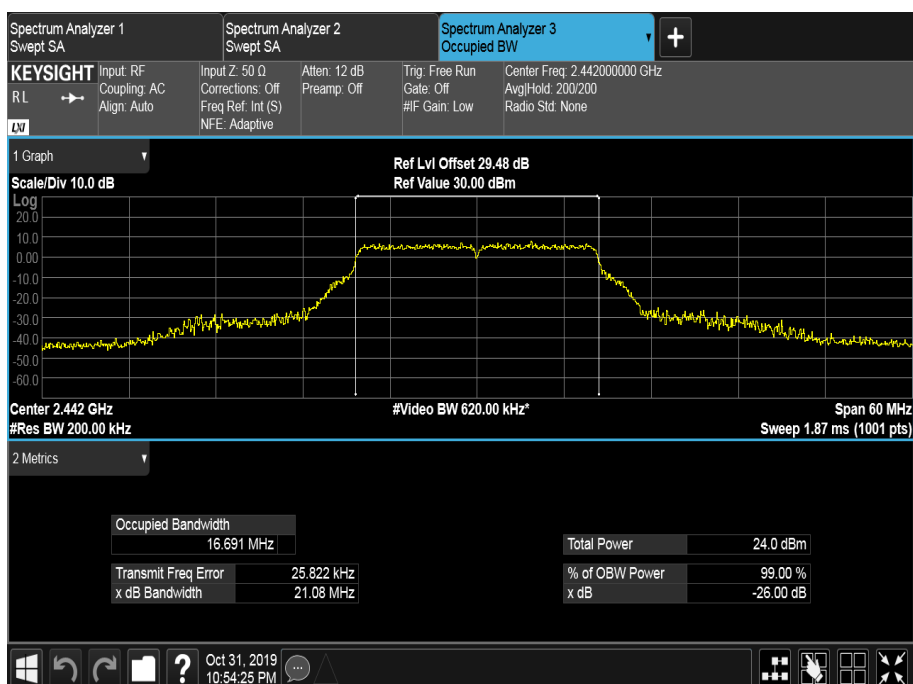


Figure 46 - 2442 MHz - 99% Occupied Bandwidth

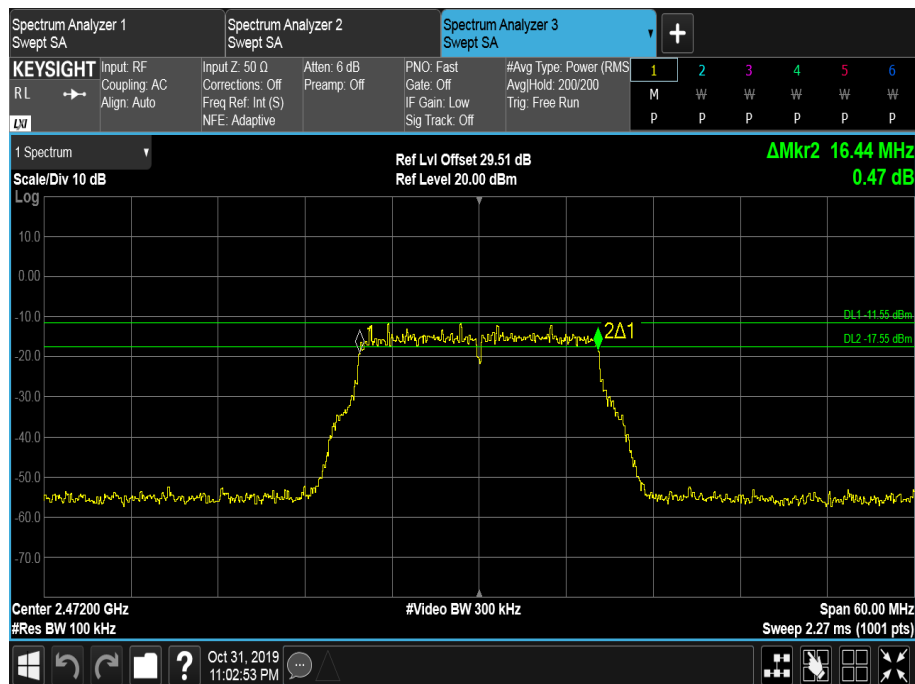


Figure 47 - 2472 MHz - 6 dB DTS Bandwidth

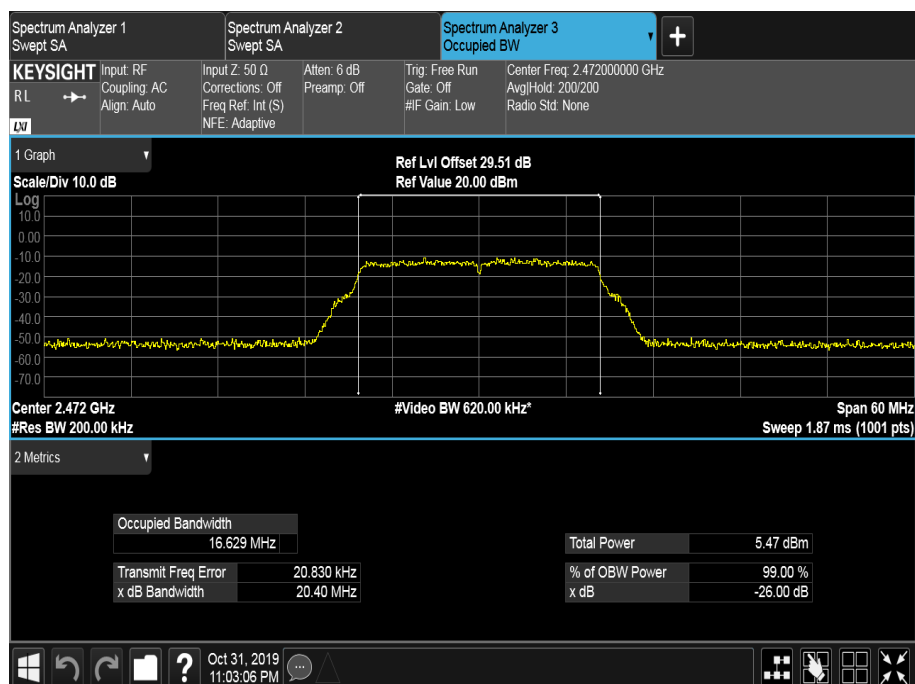


Figure 48 - 2472 MHz - 99% Occupied Bandwidth



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	15.24	13.92	13.98
99% Bandwidth (MHz)	17.525	17.606	17.536

Table 50 - 802.11n / HT20 MCS0 / SISO / Core 2

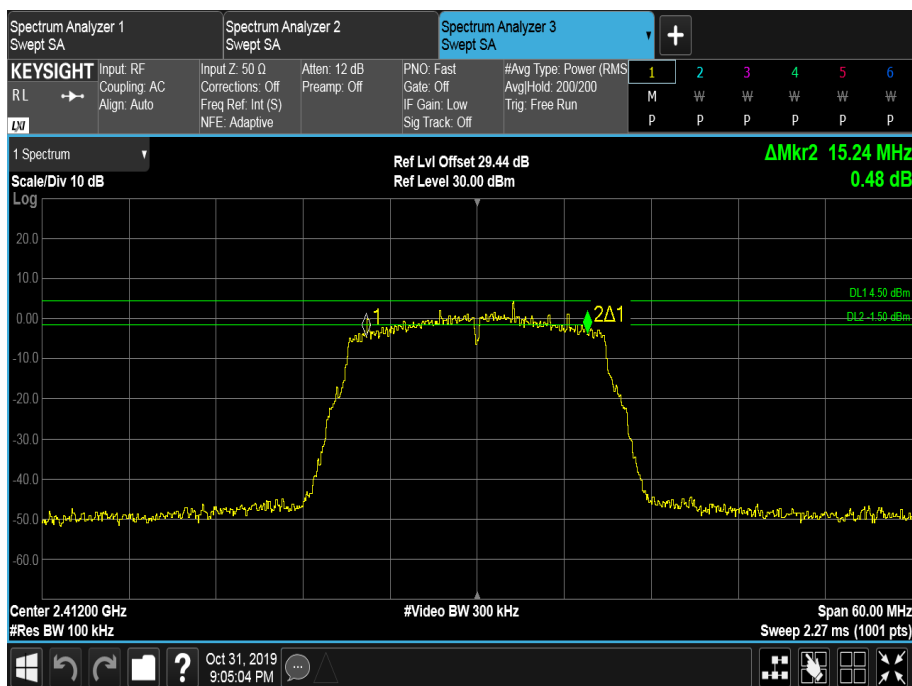


Figure 49 - 2412 MHz - 6 dB DTS Bandwidth

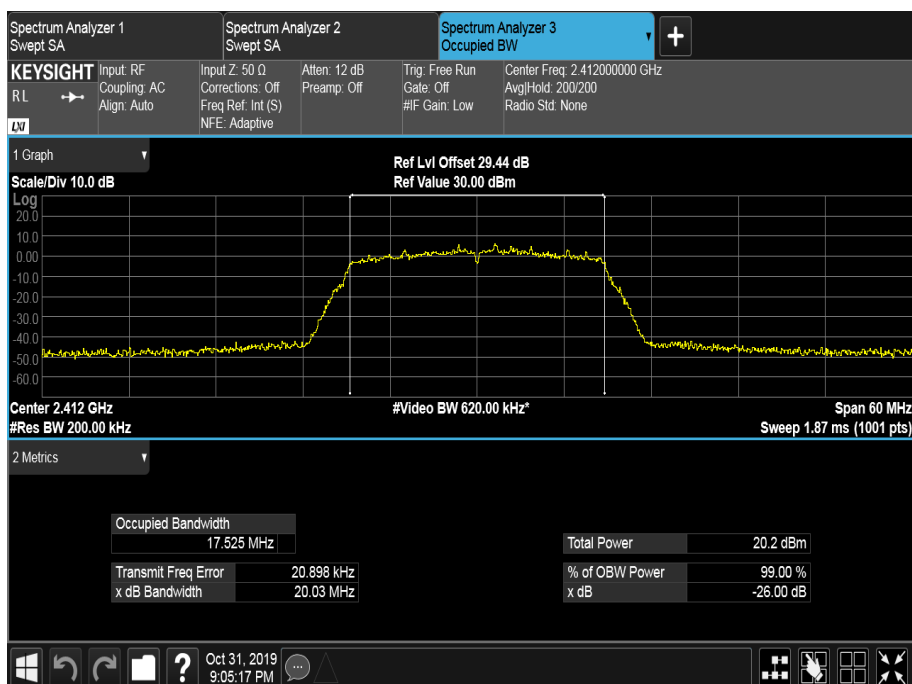


Figure 50 - 2412 MHz - 99% Occupied Bandwidth

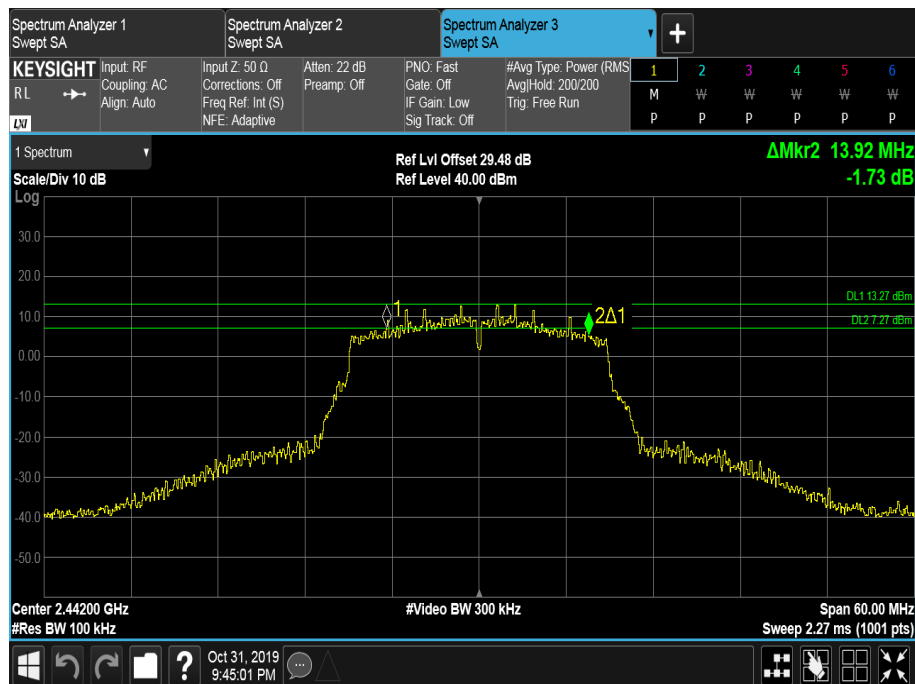


Figure 51 - 2442 MHz - 6 dB DTS Bandwidth

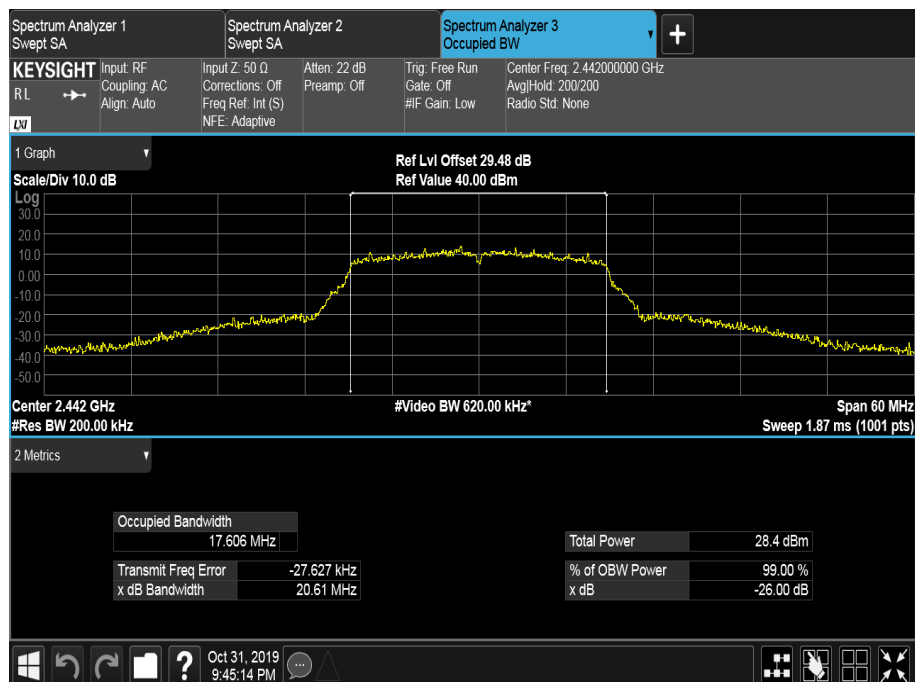


Figure 52 - 2442 MHz - 99% Occupied Bandwidth

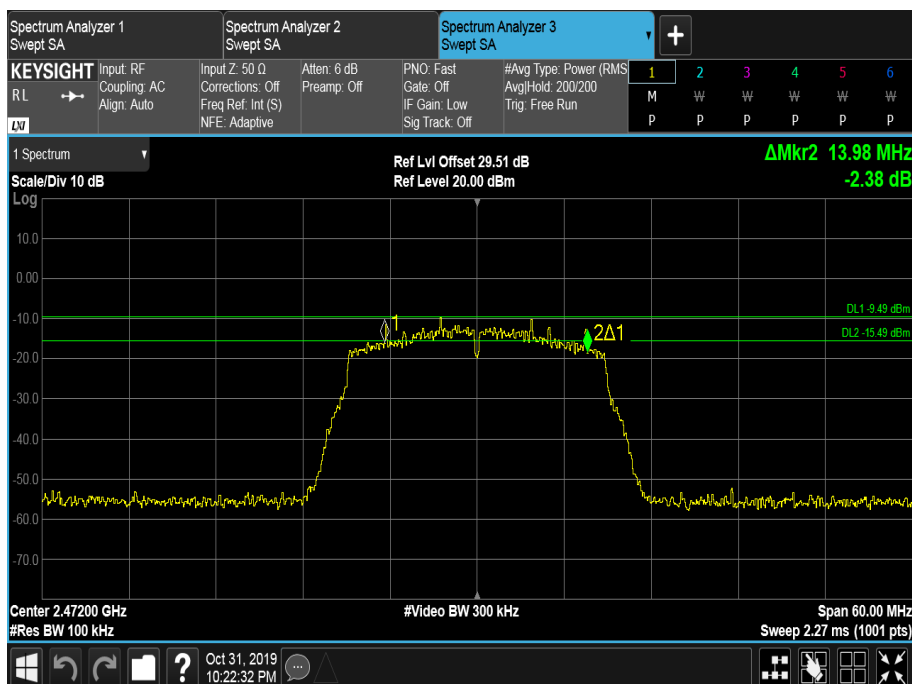


Figure 53 - 2472 MHz - 6 dB DTS Bandwidth

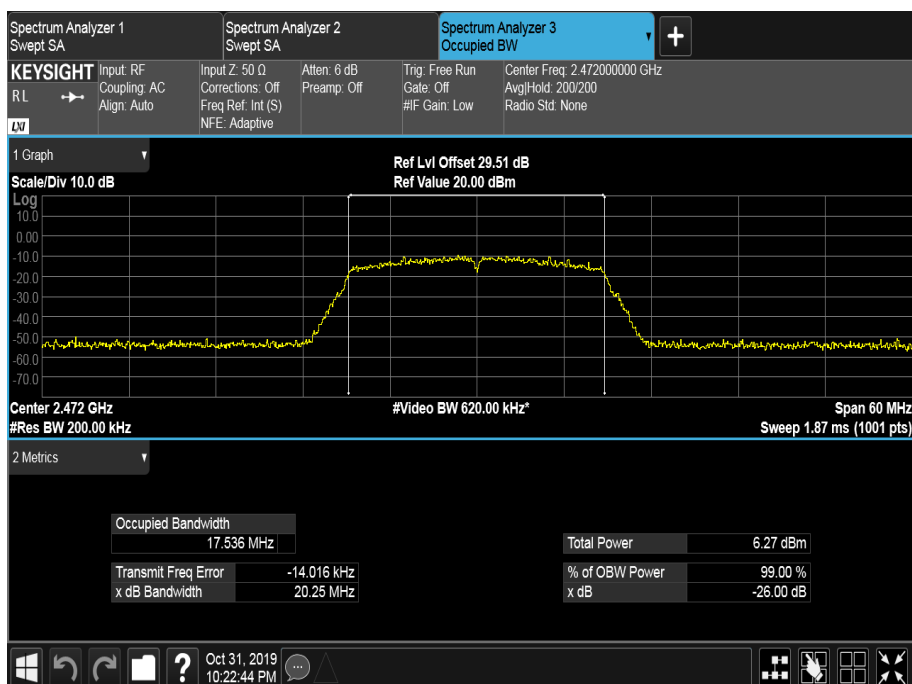


Figure 54 - 2472 MHz - 99% Occupied Bandwidth



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	11.52	12.60	13.98
99% Bandwidth (MHz)	17.562	17.586	17.503

Table 51 - 802.11n / HT20 MCS0 / MIMO CDD / Cores 1+2

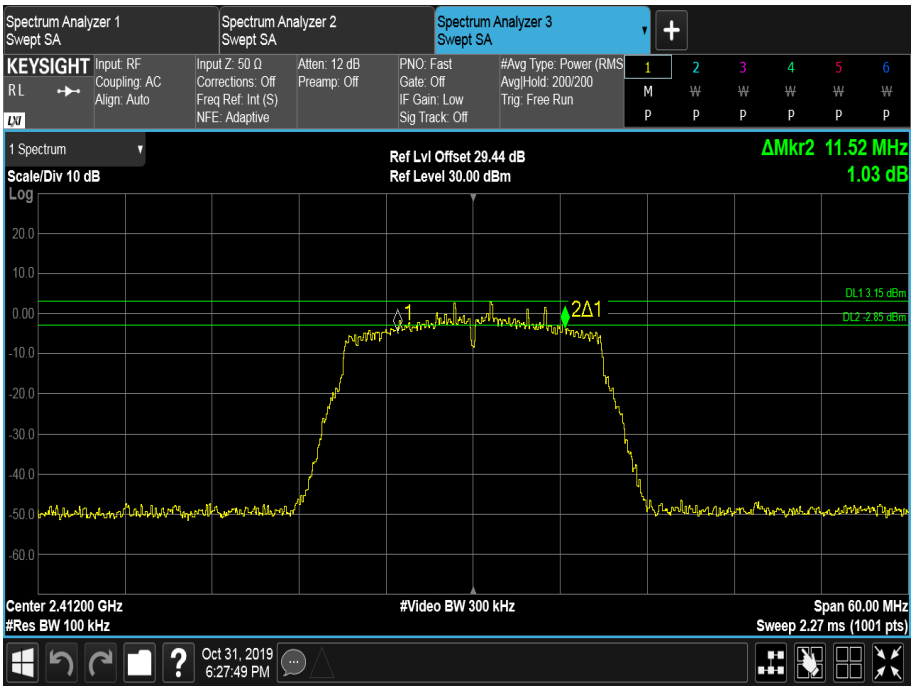


Figure 55 - 2412 MHz - 6 dB DTS Bandwidth

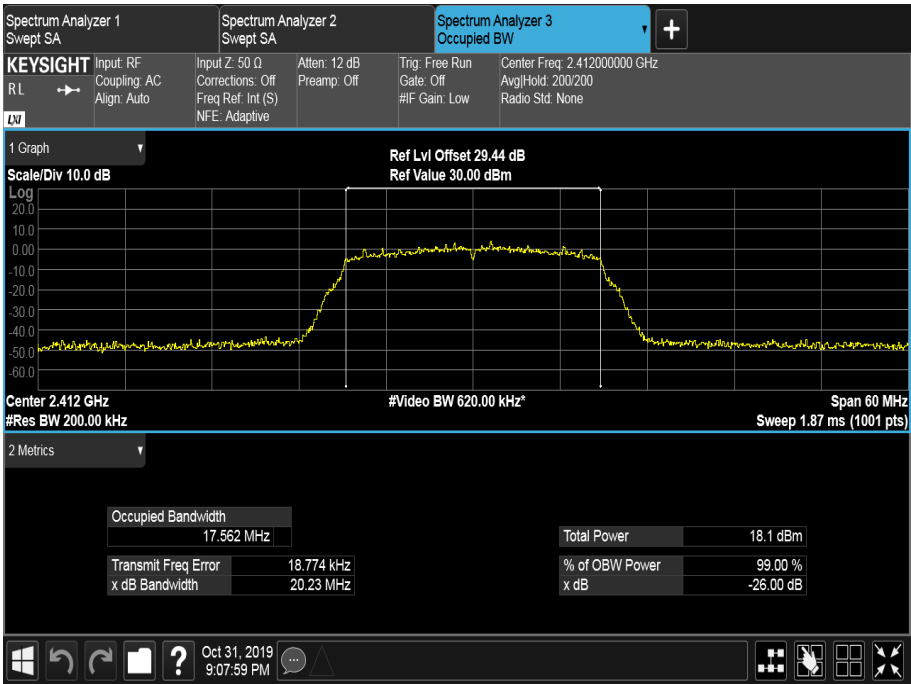


Figure 56 - 2412 MHz - 99% Occupied Bandwidth

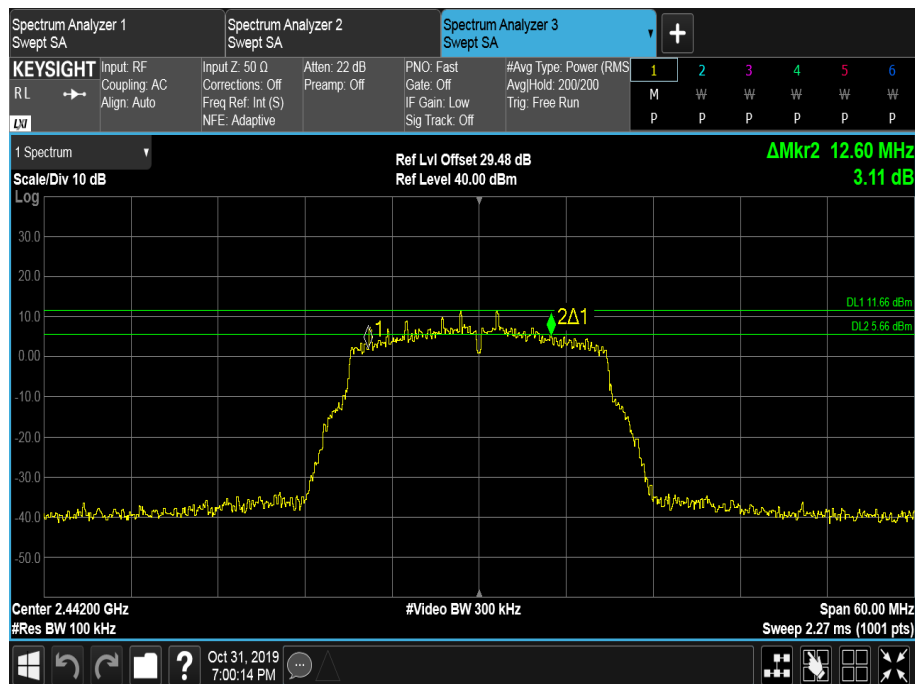


Figure 57 - 2442 MHz - 6 dB DTS Bandwidth

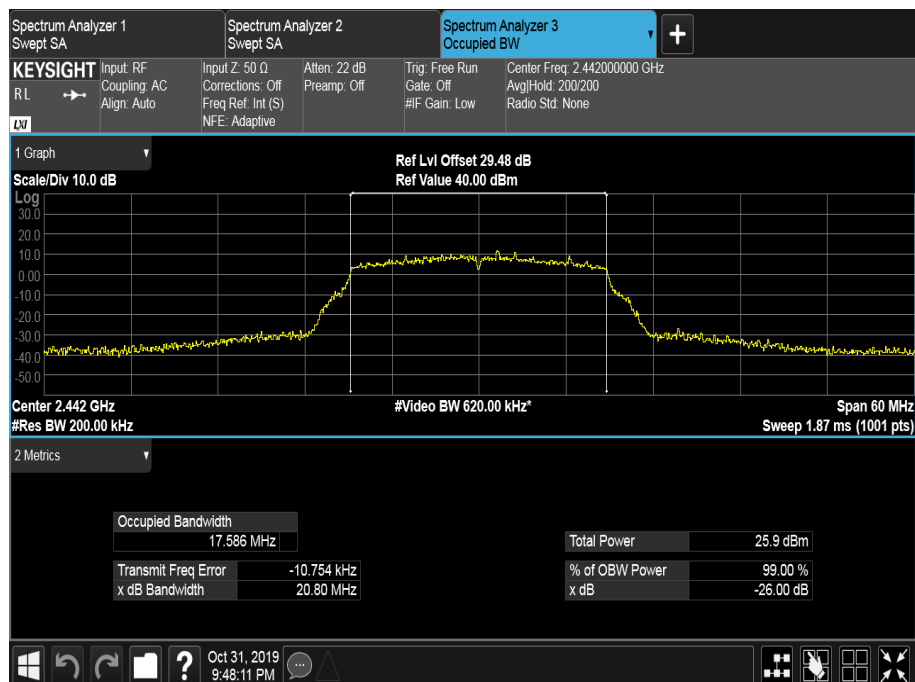


Figure 58 - 2442 MHz - 99% Occupied Bandwidth

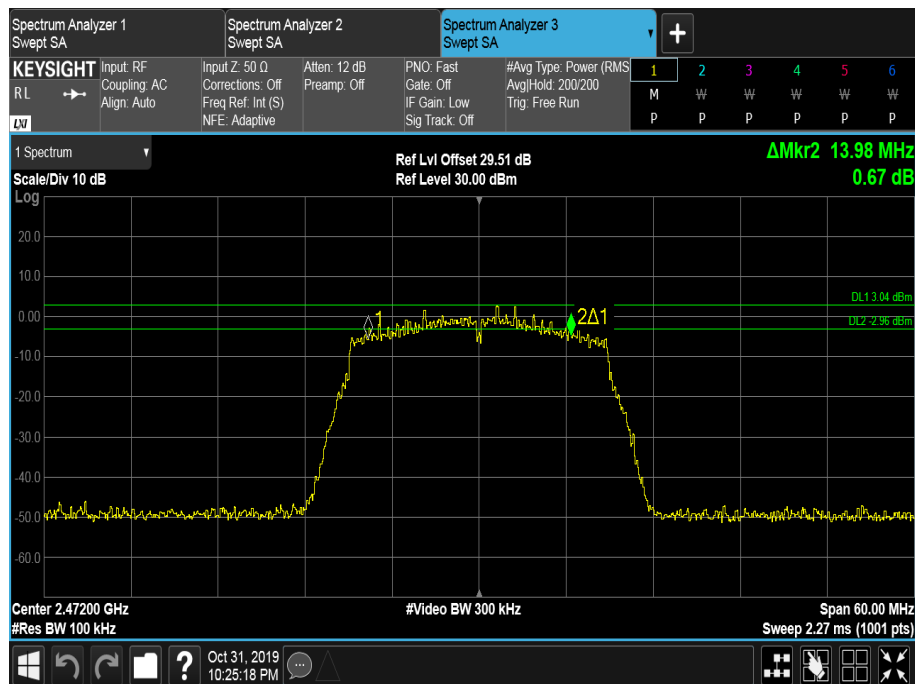


Figure 59 - 2472 MHz - 6 dB DTS Bandwidth

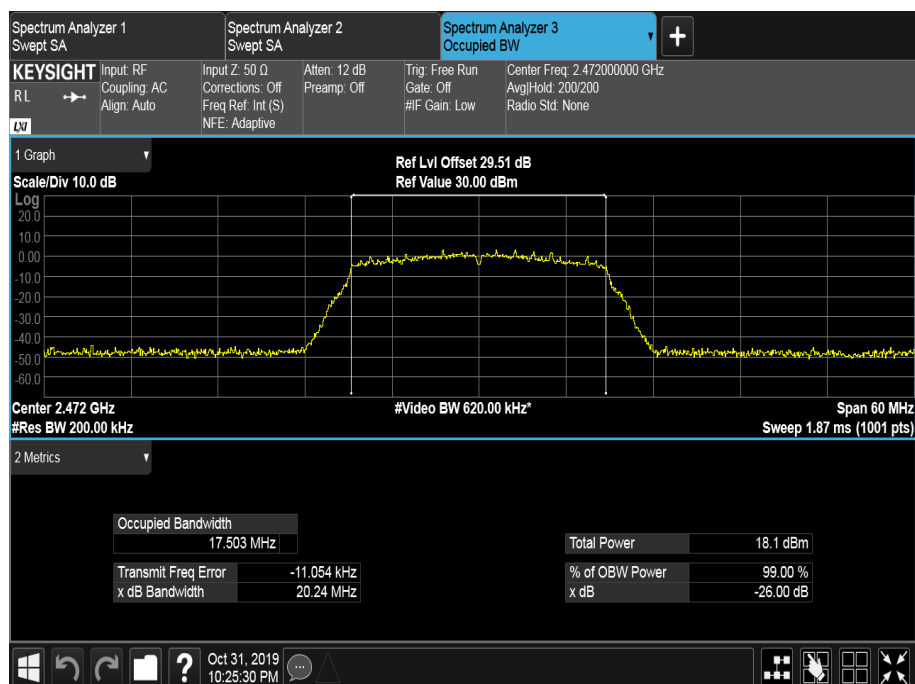


Figure 60 - 2472 MHz - 99% Occupied Bandwidth



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	12.78	14.58	15.18
99% Bandwidth (MHz)	17.521	17.585	17.516

Table 52 - 802.11n / HT20 MCS8 / MIMO SDM / Cores 1+2

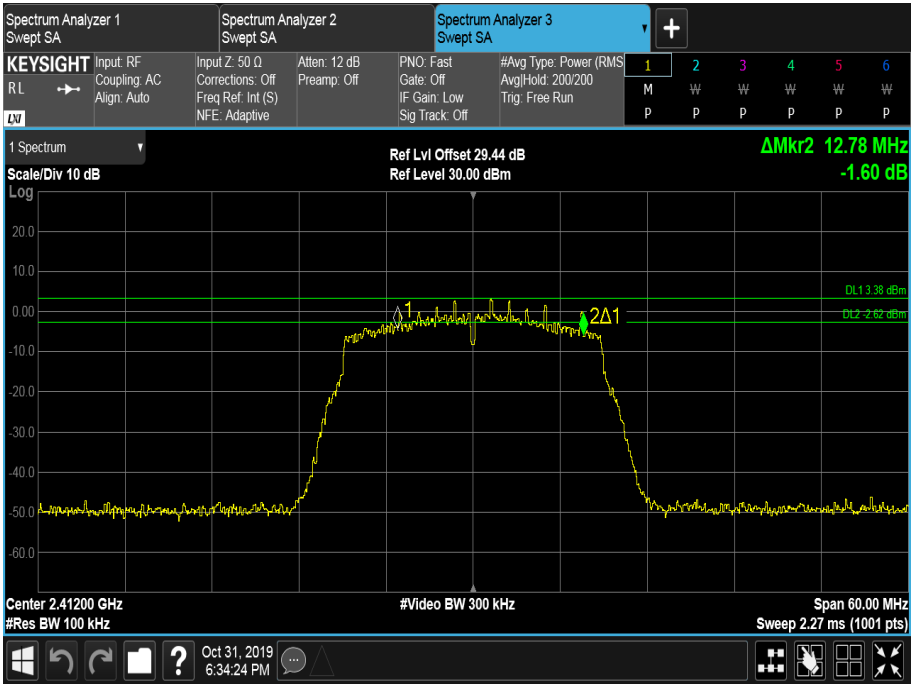


Figure 61 - 2412 MHz - 6 dB DTS Bandwidth

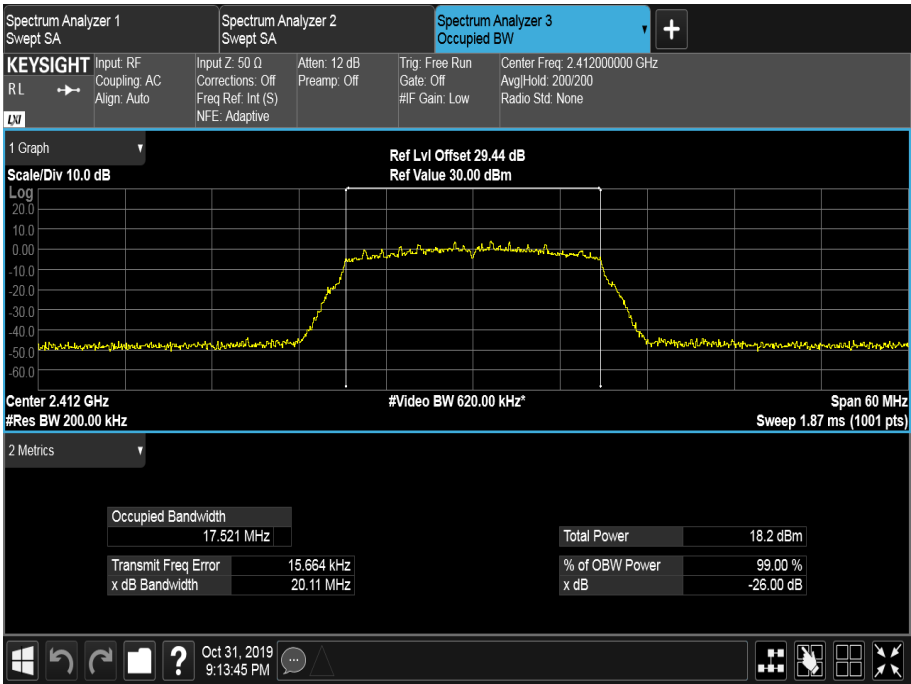


Figure 62 - 2412 MHz - 99% Occupied Bandwidth

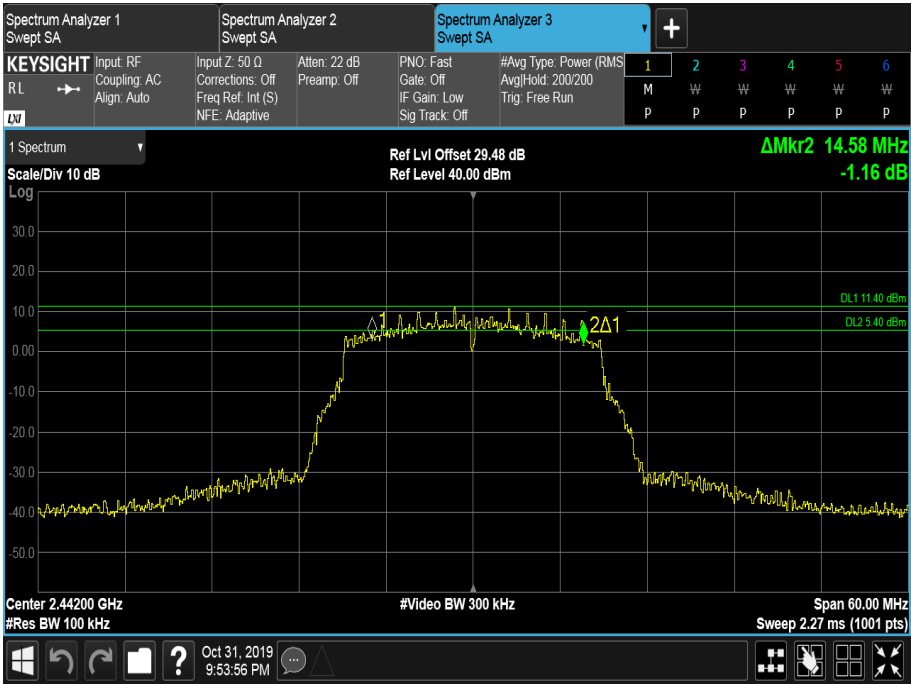


Figure 63 - 2442 MHz - 6 dB DTS Bandwidth

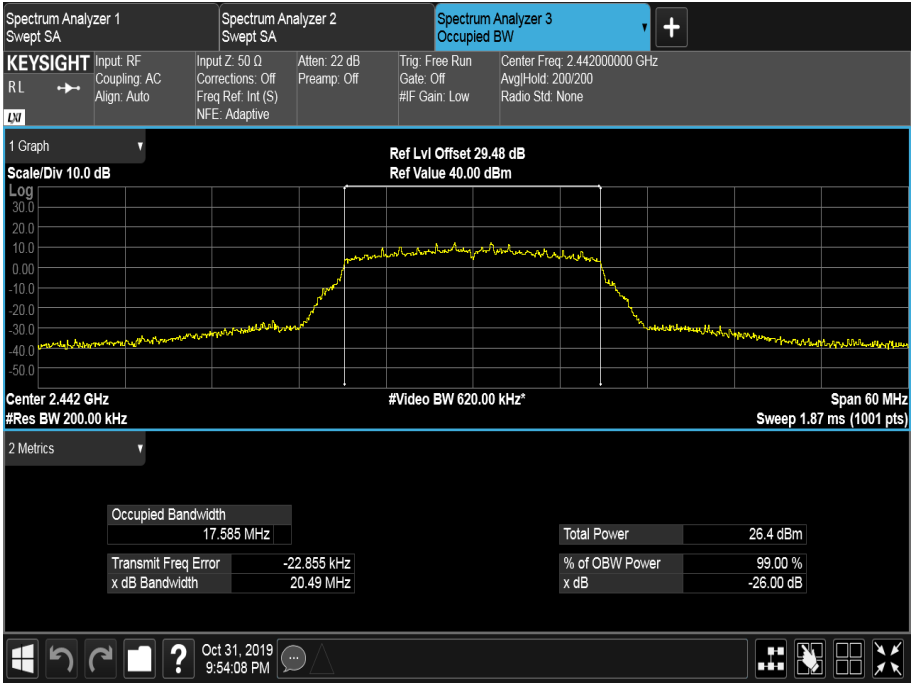


Figure 64 - 2442 MHz - 99% Occupied Bandwidth

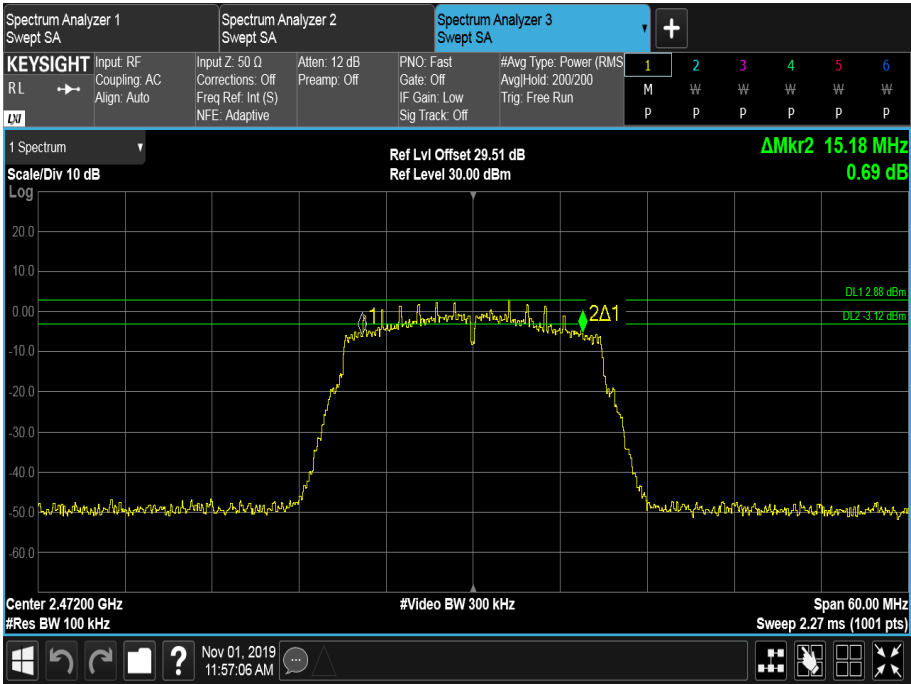


Figure 65 - 2472 MHz - 6 dB DTS Bandwidth

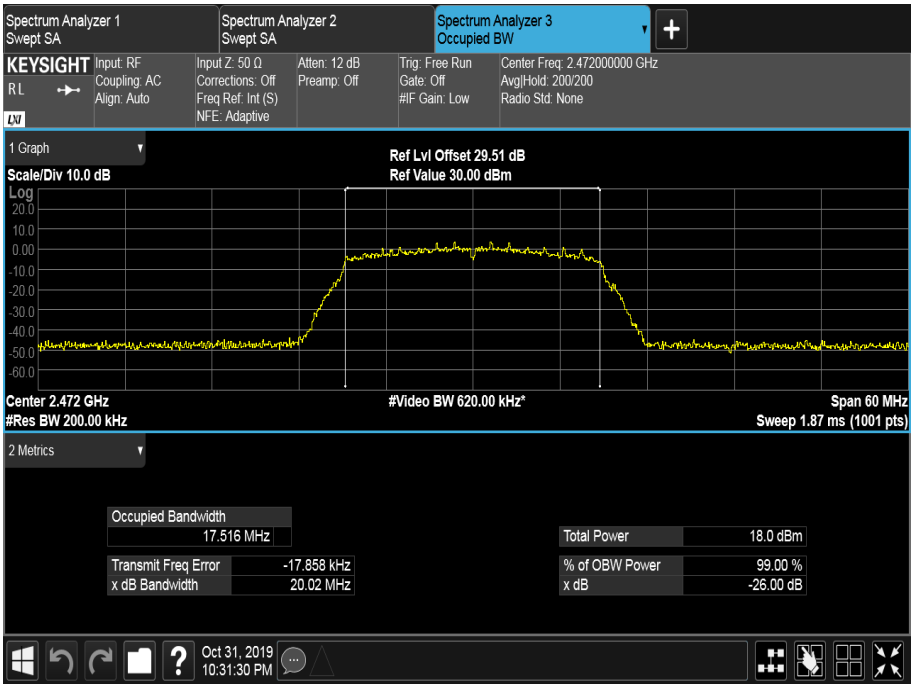


Figure 66 - 2472 MHz - 99% Occupied Bandwidth



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	13.86	13.50	12.72
99% Bandwidth (MHz)	17.569	17.584	17.547

Table 53 - 802.11n / HT20 MCS0 / MIMO TxBF / Cores 1+2

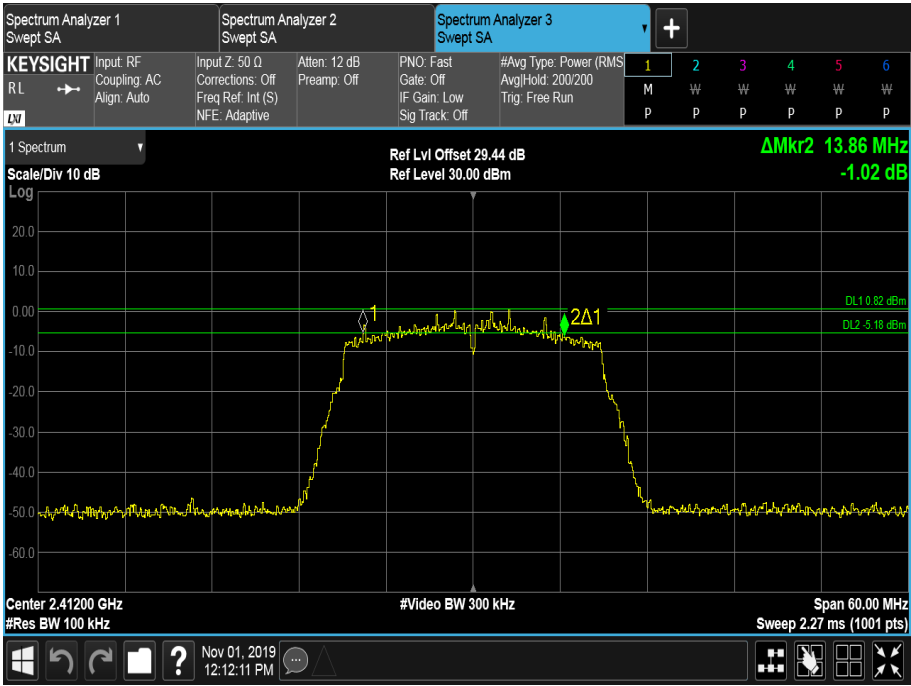


Figure 67 - 2412 MHz - 6 dB DTS Bandwidth

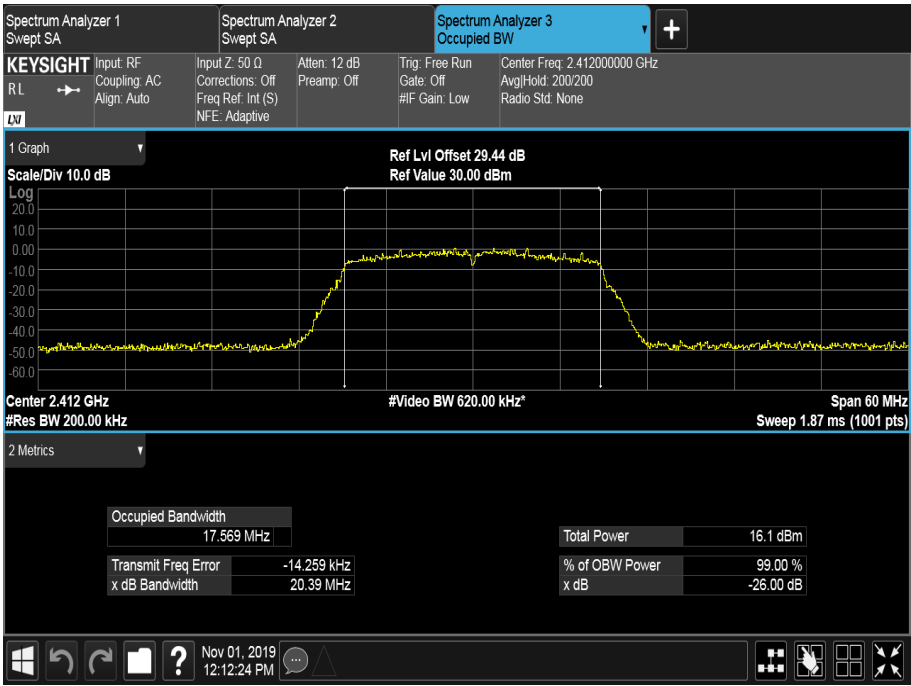


Figure 68 - 2412 MHz - 99% Occupied Bandwidth

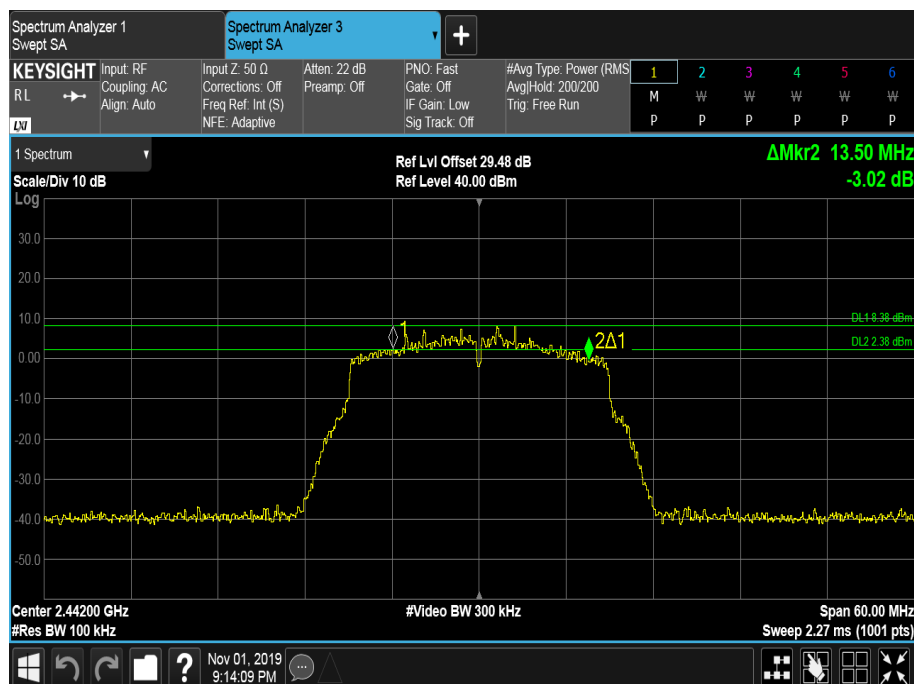


Figure 69 - 2442 MHz - 6 dB DTS Bandwidth

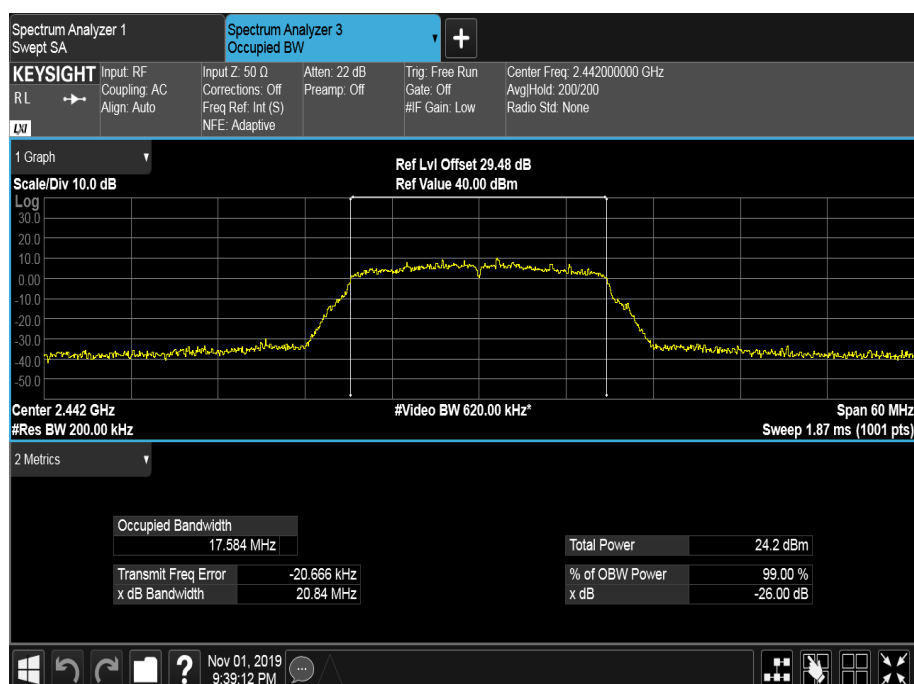


Figure 70 - 2442 MHz - 99% Occupied Bandwidth

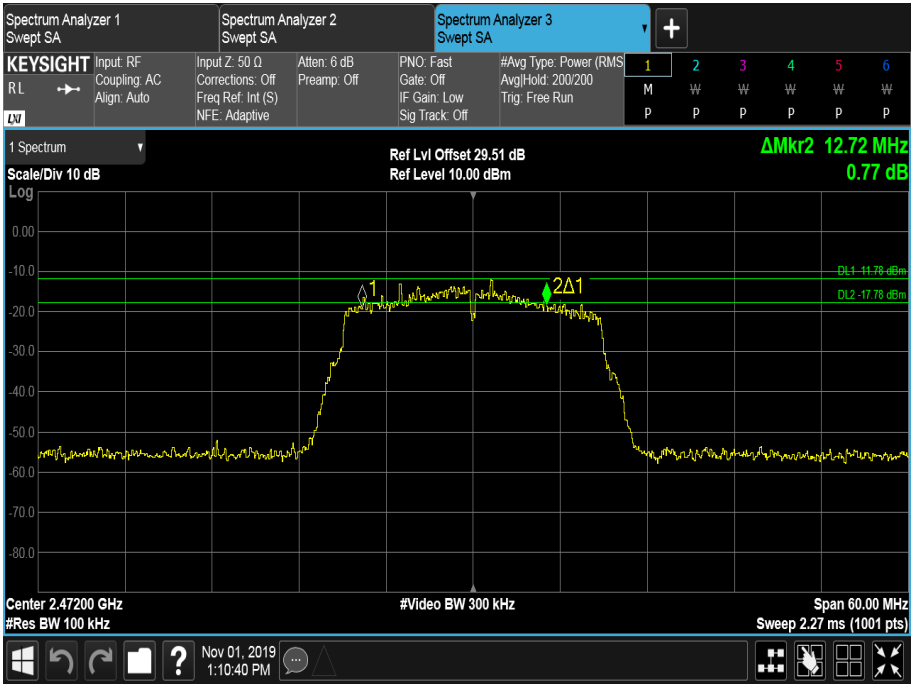


Figure 71 - 2472 MHz - 6 dB DTS Bandwidth

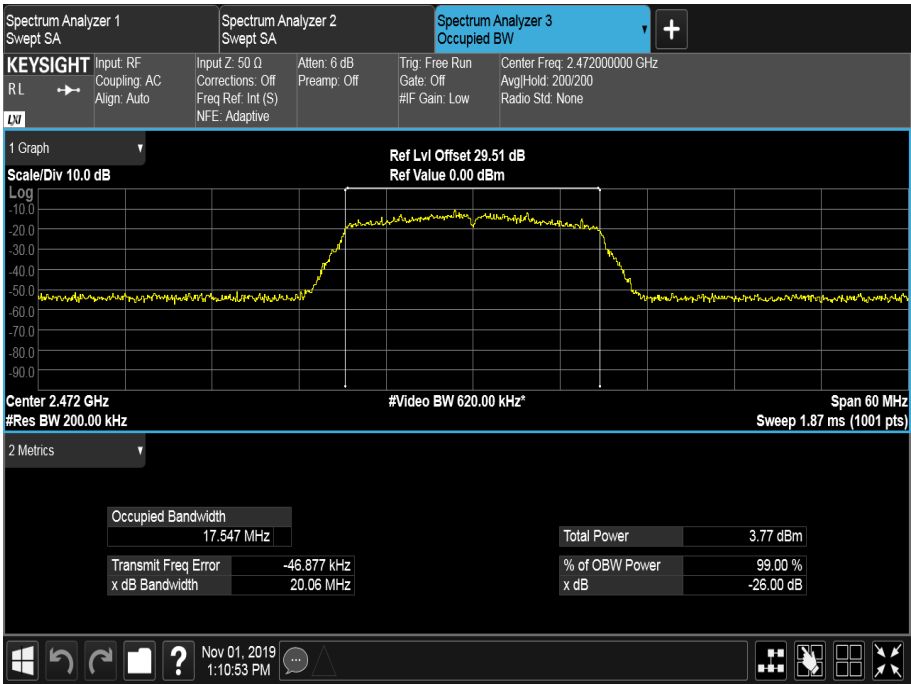


Figure 72 - 2472 MHz - 99% Occupied Bandwidth



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	12.72	13.92	13.98
99% Bandwidth (MHz)	17.550	17.555	17.543

Table 54 - 802.11n / HT20 MCS0 / MIMO CDD / Cores 0+1+2

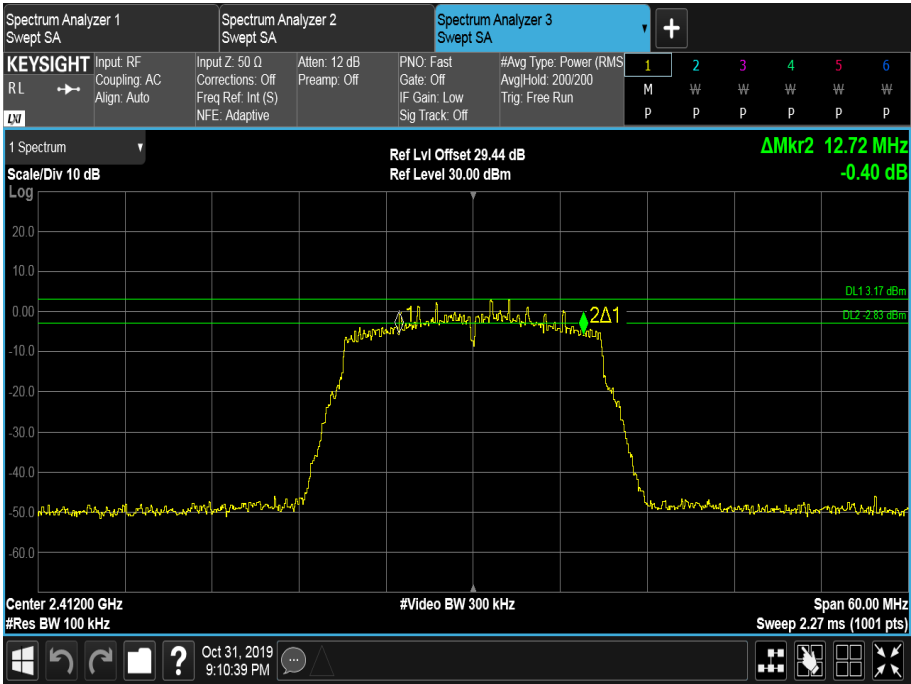


Figure 73 - 2412 MHz - 6 dB DTS Bandwidth

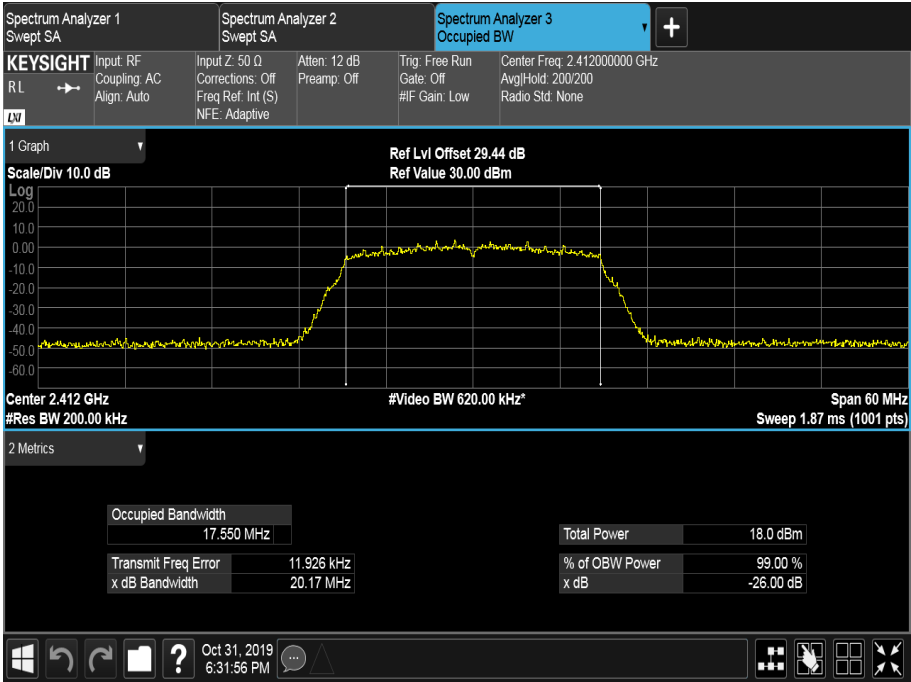


Figure 74 - 2412 MHz - 99% Occupied Bandwidth

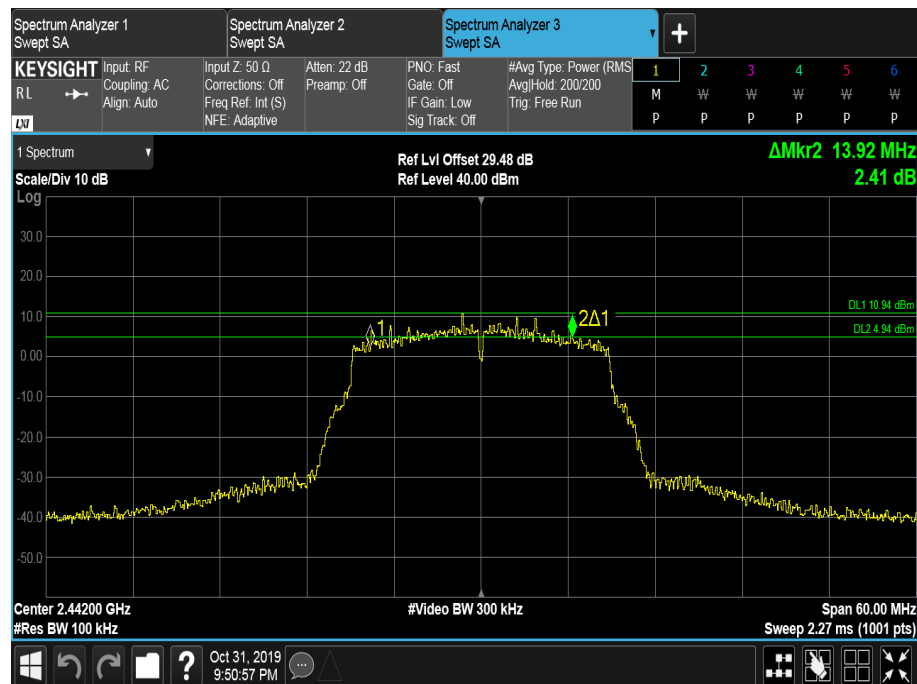


Figure 75 - 2442 MHz - 6 dB DTS Bandwidth

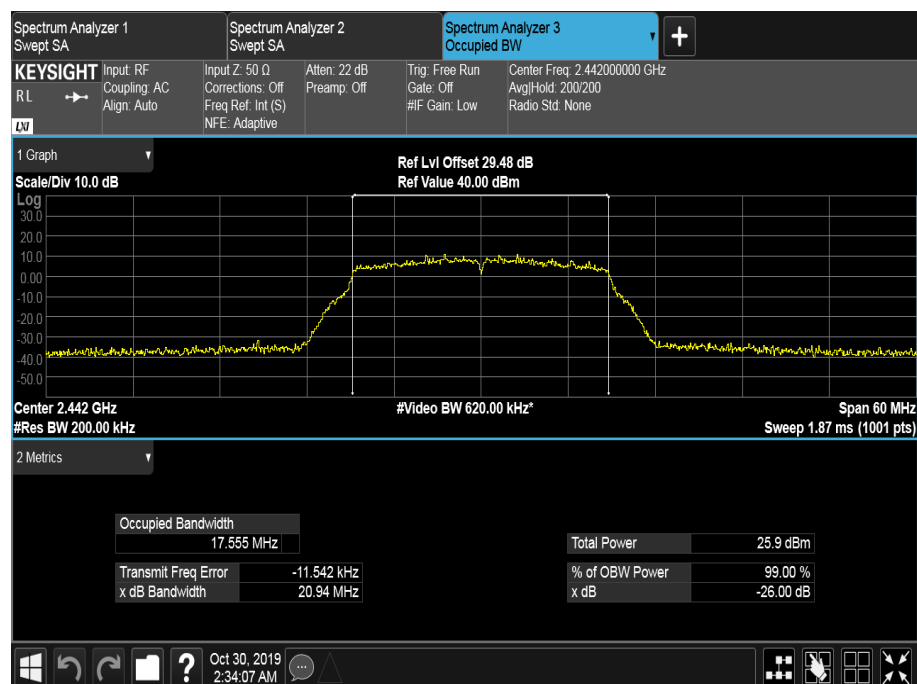


Figure 76 - 2442 MHz - 99% Occupied Bandwidth

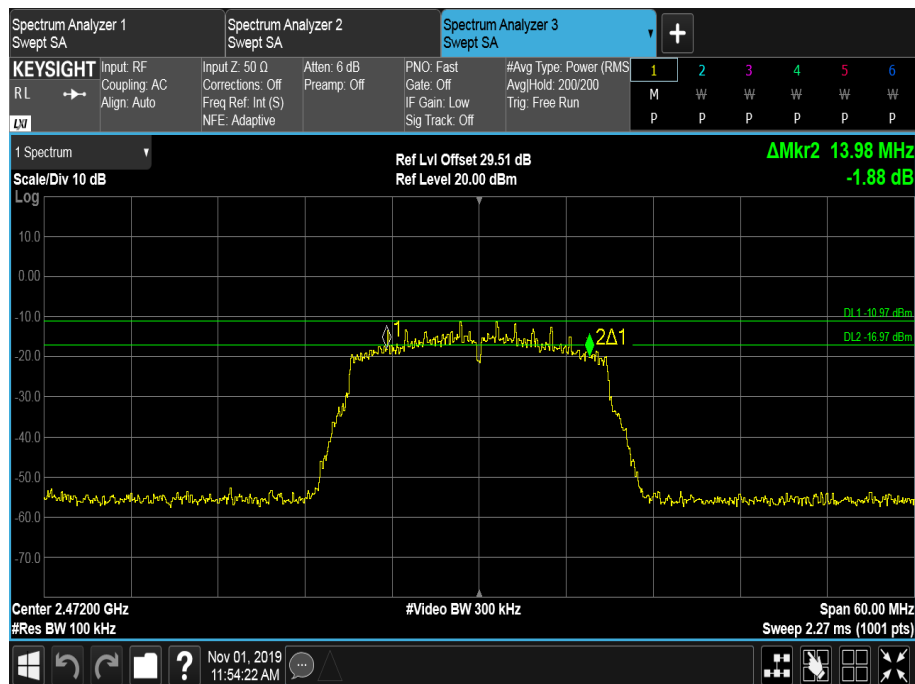


Figure 77 - 2472 MHz - 6 dB DTS Bandwidth

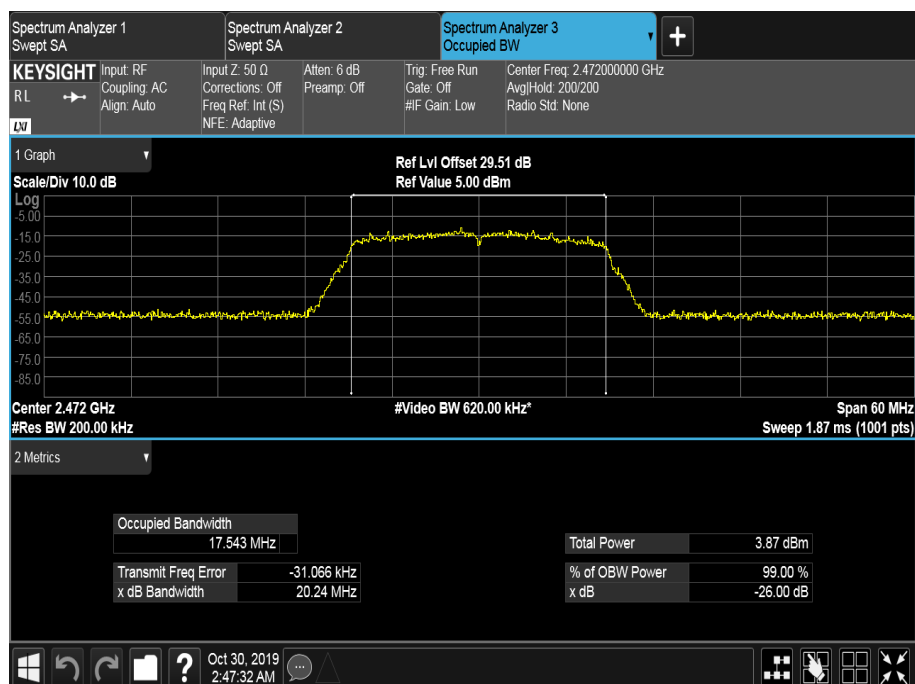


Figure 78 - 2472 MHz - 99% Occupied Bandwidth



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	15.12	14.58	13.98
99% Bandwidth (MHz)	17.540	17.589	17.532

Table 55 - 802.11n / HT20 MCS16 / MIMO SDM / Cores 0+1+2

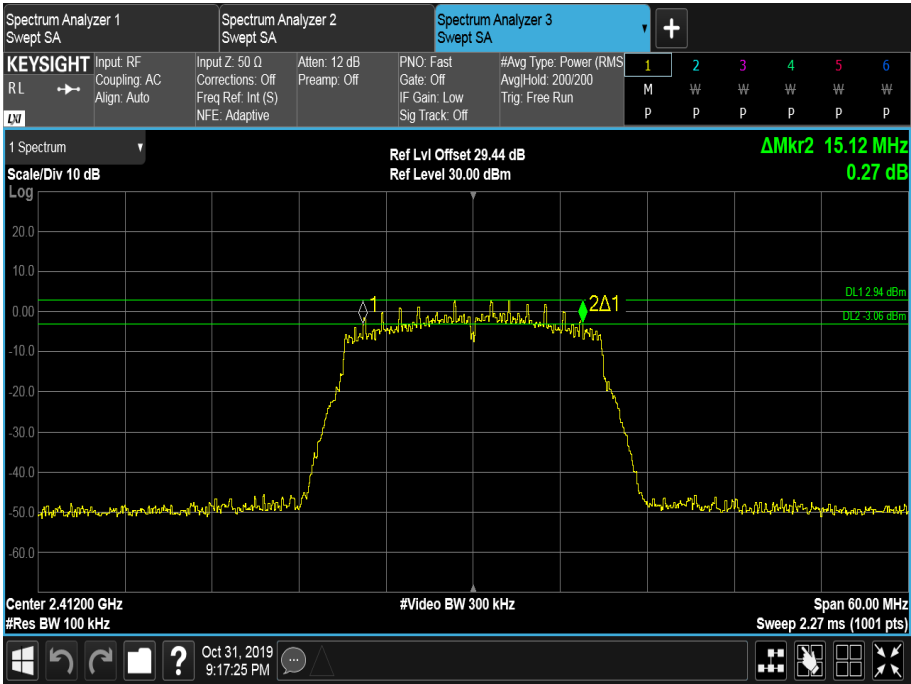


Figure 79 - 2412 MHz - 6 dB DTS Bandwidth

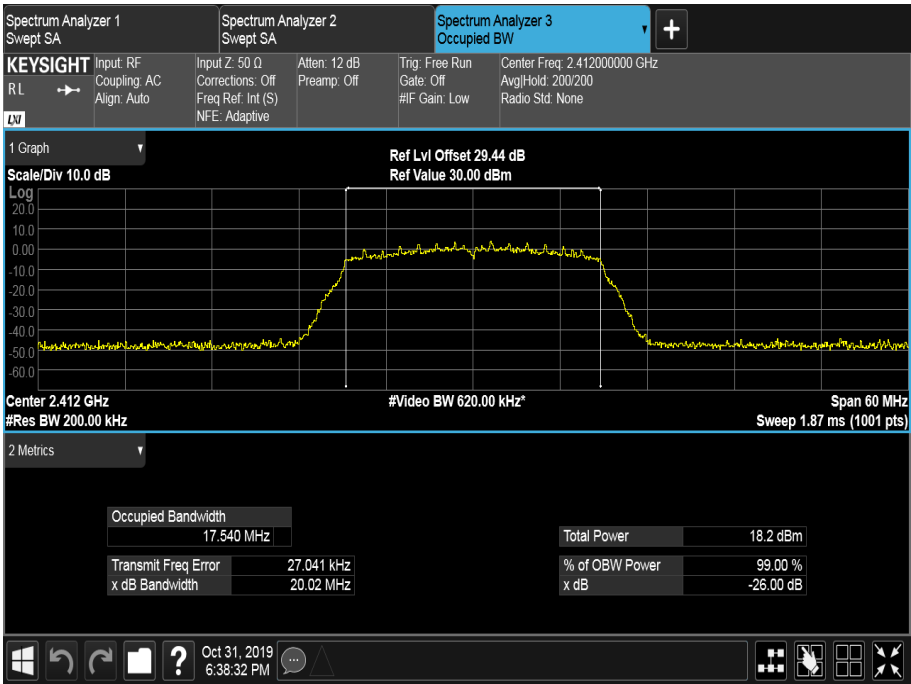


Figure 80 - 2412 MHz - 99% Occupied Bandwidth

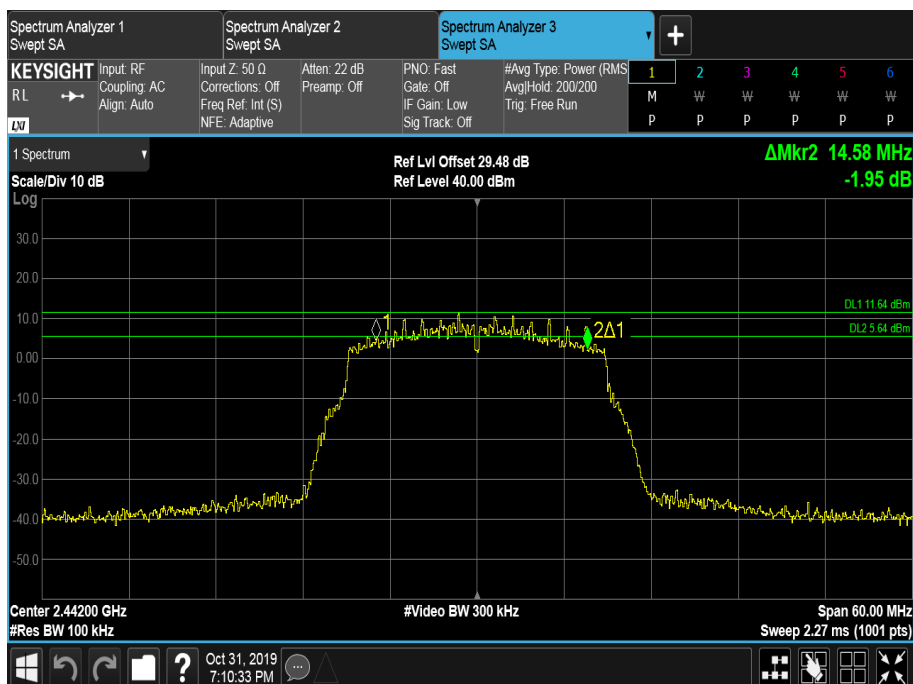


Figure 81 - 2442 MHz - 6 dB DTS Bandwidth

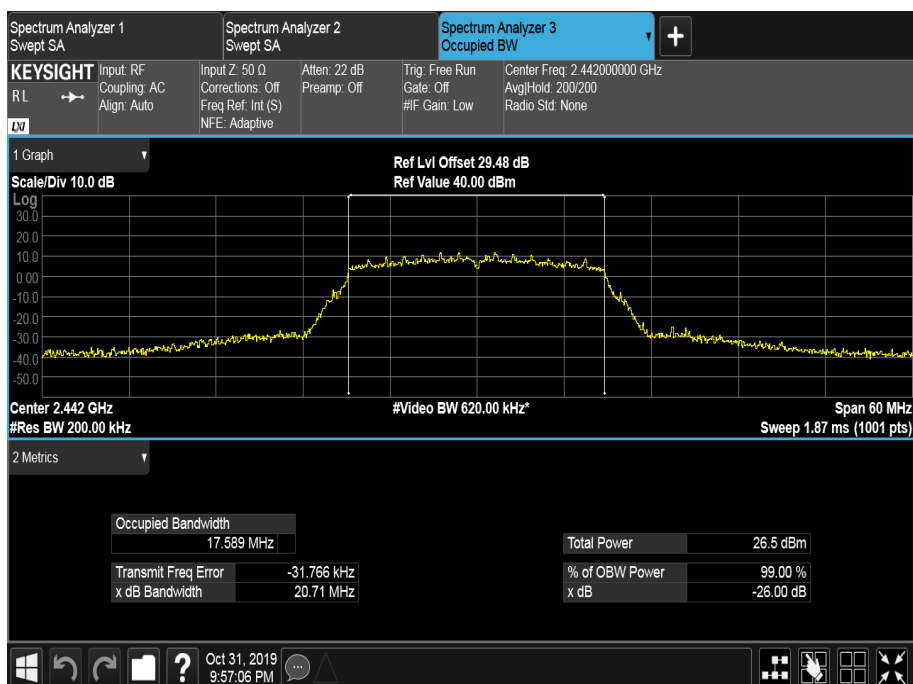


Figure 82 - 2442 MHz - 99% Occupied Bandwidth

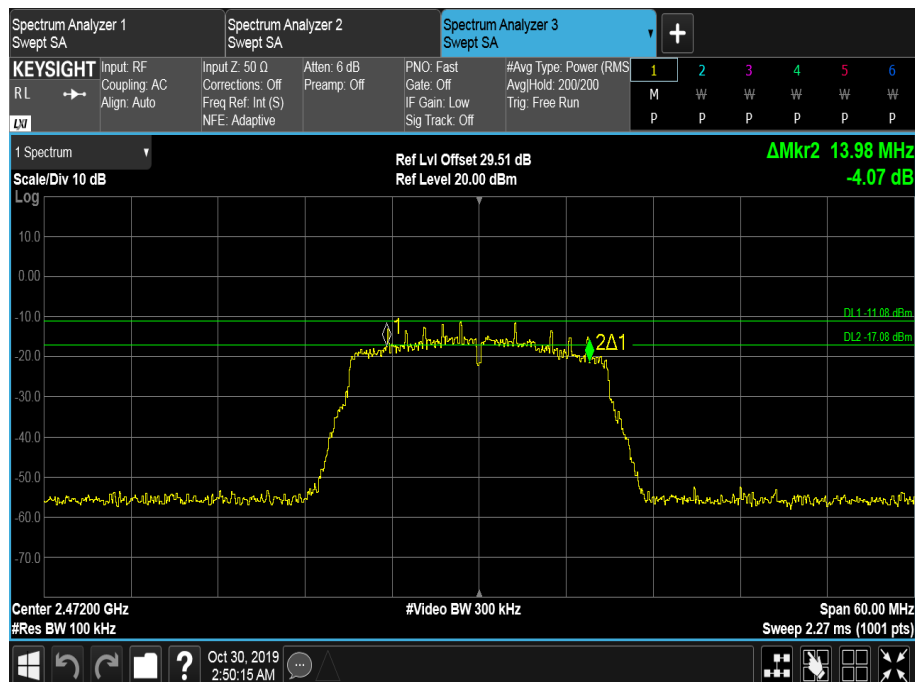


Figure 83 - 2472 MHz - 6 dB DTS Bandwidth

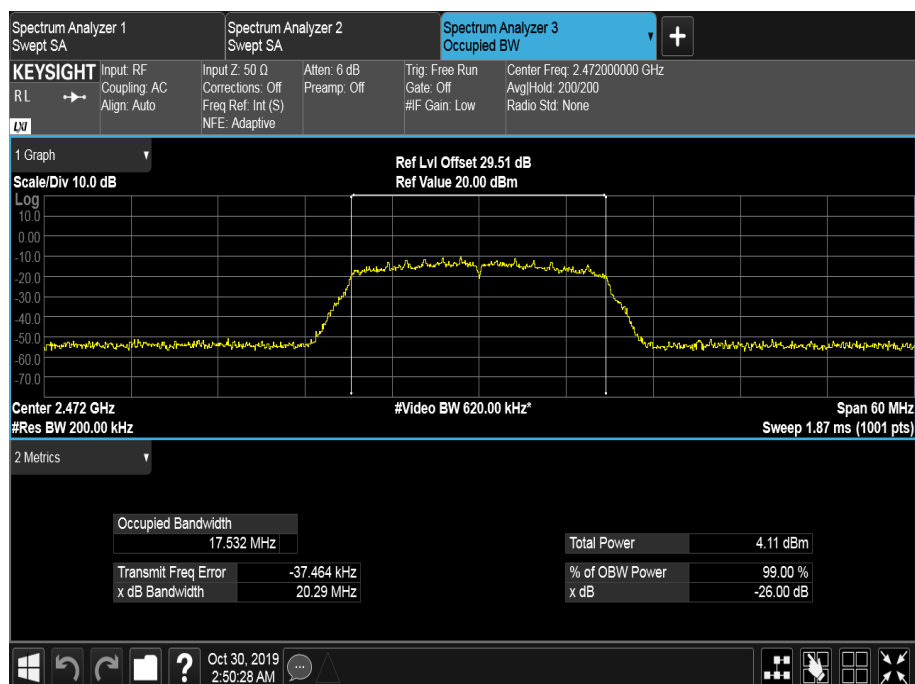


Figure 84 - 2472 MHz - 99% Occupied Bandwidth



Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	13.50	14.94	13.92
99% Bandwidth (MHz)	17.574	17.595	17.542

Table 56 - 802.11n / HT20 MCS0 / MIMO TxBF / Cores 0+1+2

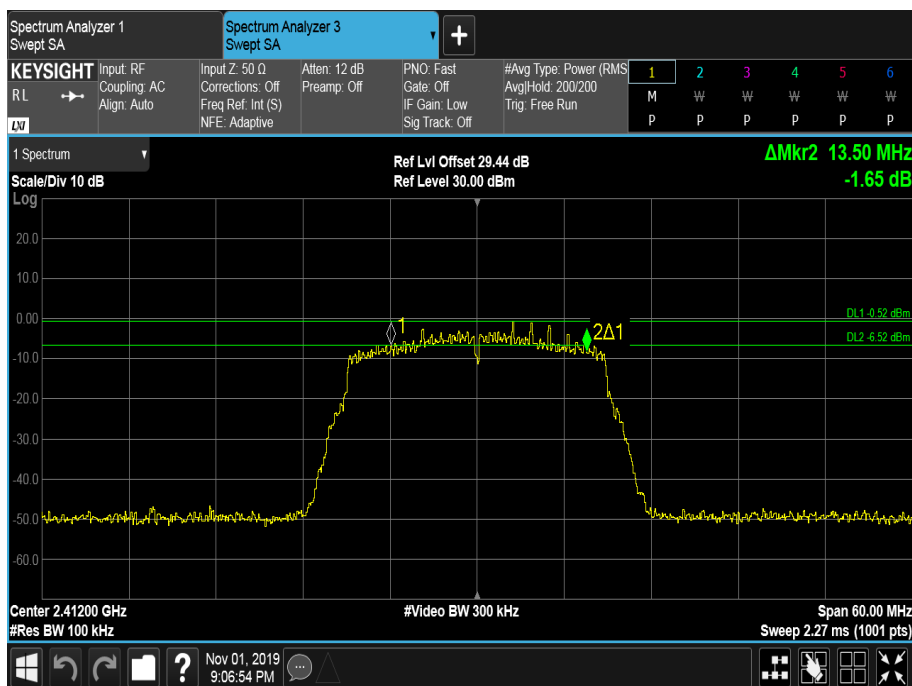


Figure 85 - 2412 MHz - 6 dB DTS Bandwidth

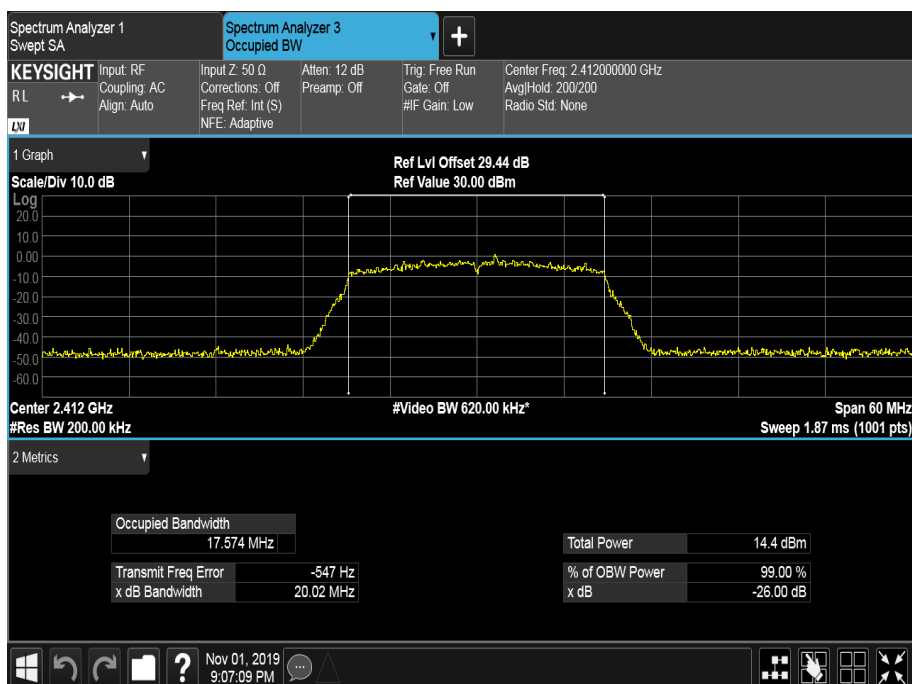


Figure 86 - 2412 MHz - 99% Occupied Bandwidth

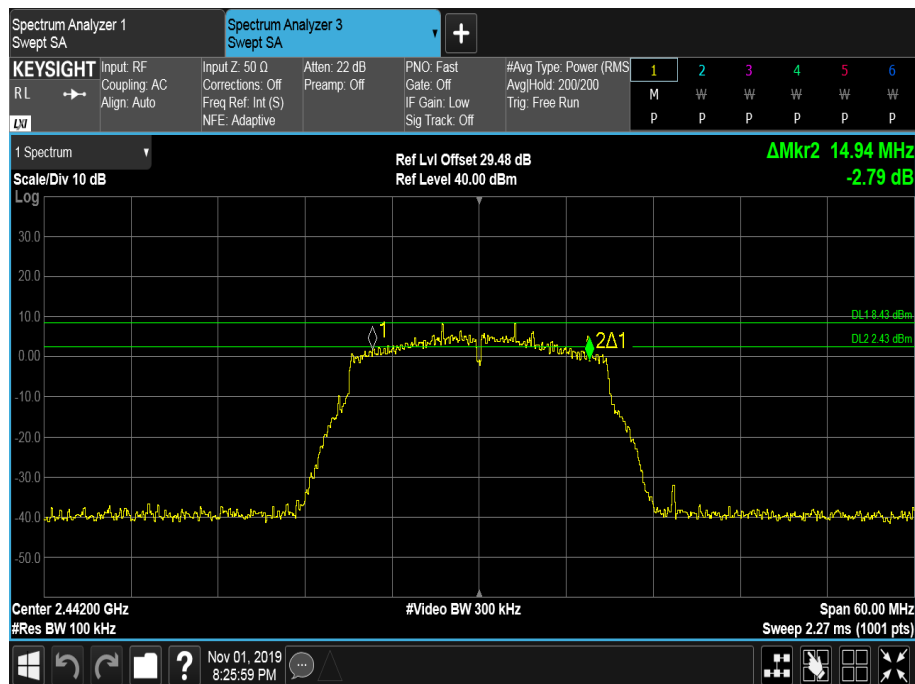


Figure 87 - 2442 MHz - 6 dB DTS Bandwidth

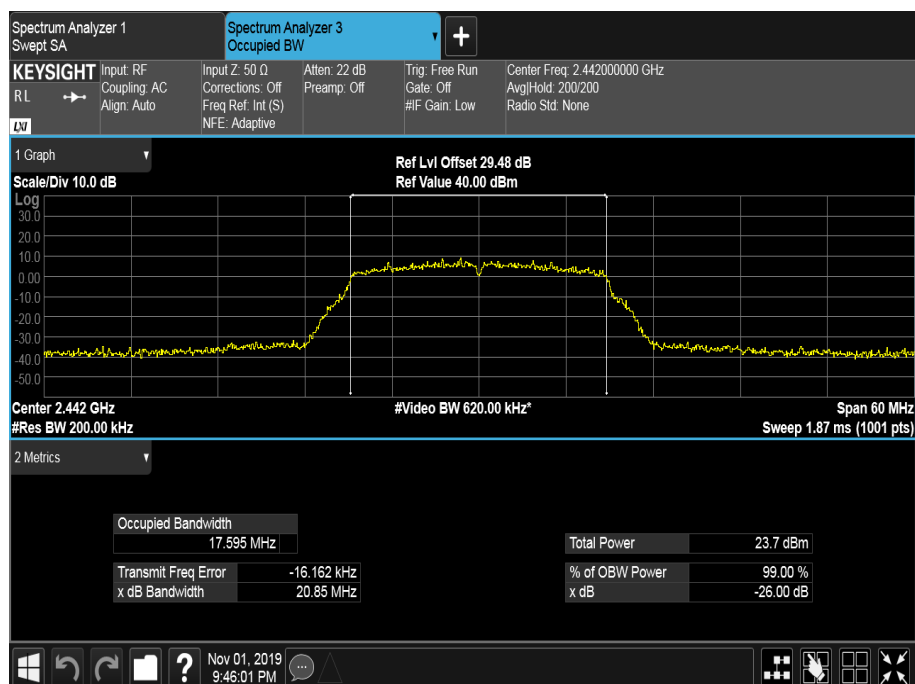


Figure 88 - 2442 MHz - 99% Occupied Bandwidth

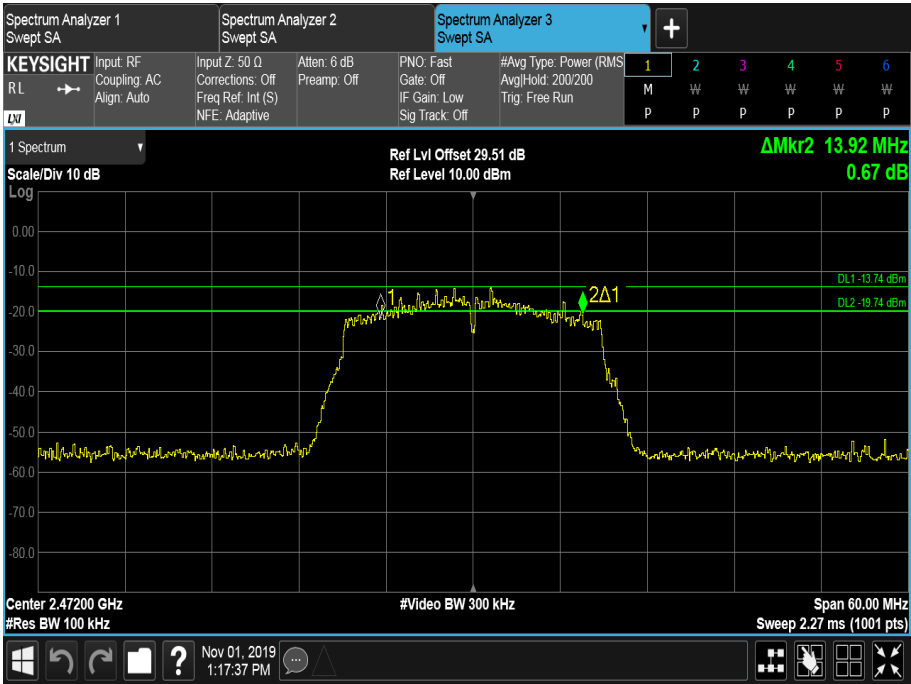


Figure 89 - 2472 MHz - 6 dB DTS Bandwidth

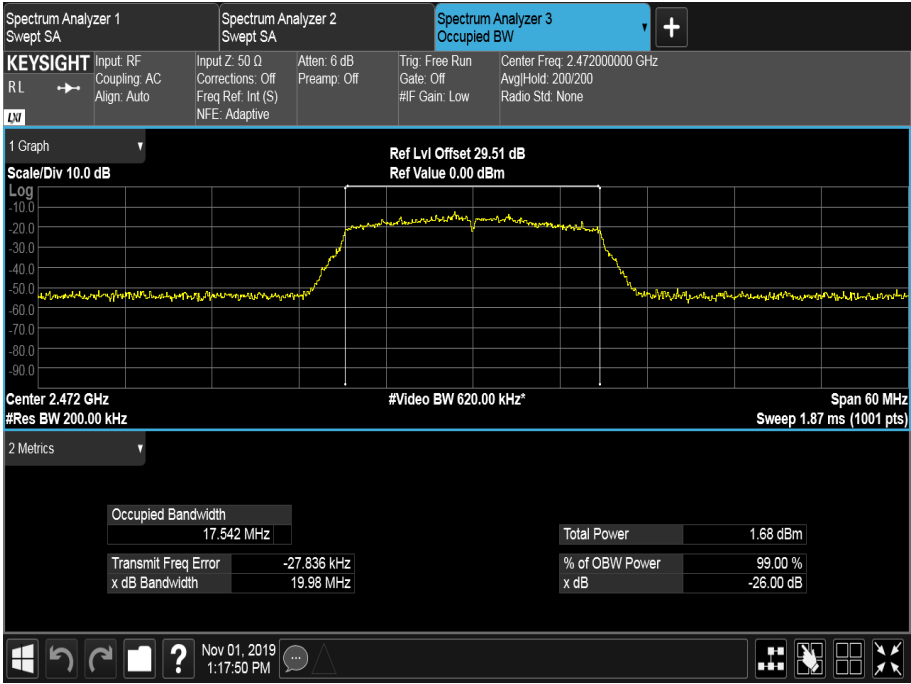


Figure 90 - 2472 MHz - 99% Occupied Bandwidth

Channel	Bottom	Middle	Top
Frequency (MHz)	2412	2442	2472
6 dB Bandwidth (MHz)	17.70	17.70	17.64
99% Bandwidth (MHz)	17.794	17.836	17.789

Table 57 - 802.11n / HT20 MCS0 / Aux Core

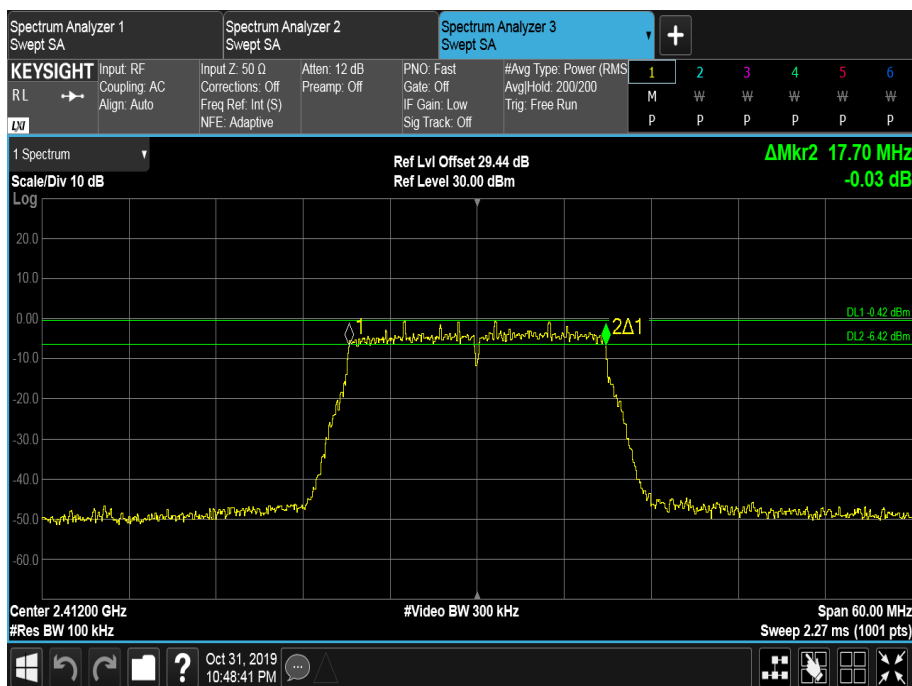


Figure 91 - 2412 MHz - 6 dB DTS Bandwidth

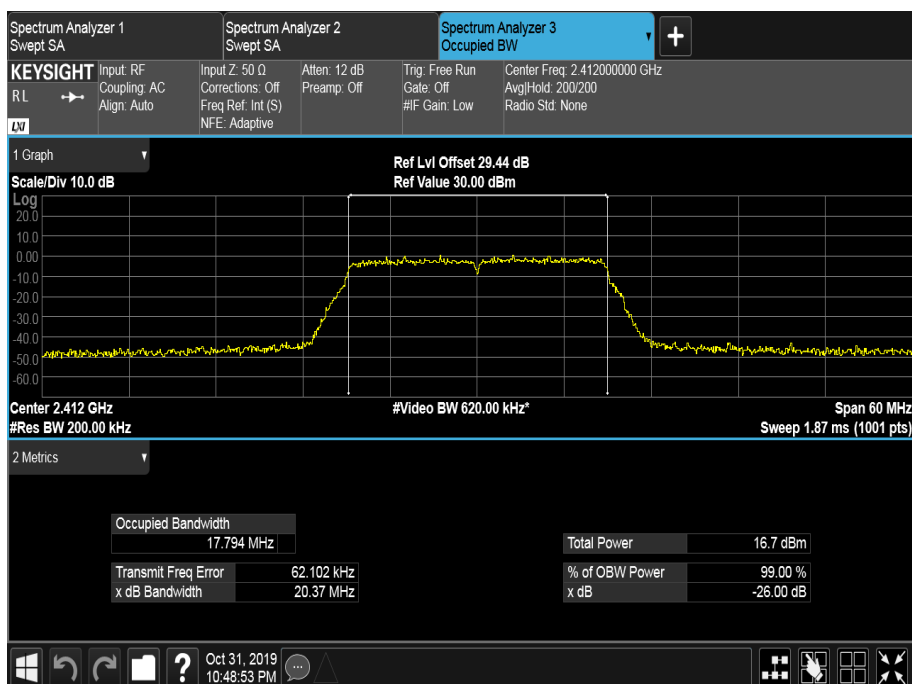


Figure 92 - 2412 MHz - 99% Occupied Bandwidth