CERTIFICATION TEST REPORT

Report Number. : 11836945-E4V2

Applicant	:	Google LLC. 1600 Amphitheatre Parkway Mountain View, CA 94043 U.S.A.
Model	:	H0B
FCC ID	:	A4R-H0B
EUT Description	:	Multimedia Device
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E

Date Of Issue:
October 25, 2017

Prepared by:
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NVLAP LAB CODE 200065-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	10/23/17	Initial Issue	---
V2	10/25/17	Updated Sections 2, 5.5, 8.1	C. Susa

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	Google LLC. 1600 Amphitheatre Parkway Mountain View, CA 94043 U.S.A.
EUT DESCRIPTION:	Multimedia Device
MODEL:	H0B
SERIAL NUMBER:	7904M2Z2N8(radiated), 7904M2Z2N6(radiated), 7904M2Z154(conducted)
DATE TESTED:	September 11th, 2017 - October 10th, 2017

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

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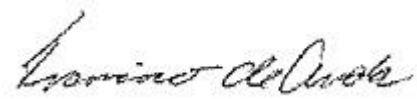

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 14-30, FCC KDB 662911 D01 v02r01, FCC KDB 905462 D02 v02/D03 v01r02/D06 v02, FCC KDB 789033 D02 v01r04, FCC KDB 644545 D03 v01, ANSI C63.10-2013, FCC 06-96, FCC KDB 905462 D02 and D03, RSS-GEN Issue 4, and RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☒ Chamber A	☒ Chamber D
☐ Chamber B	☒ Chamber E
☐ Chamber C	☒ Chamber F
	☐ Chamber G
	☐ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through C are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under Industry Canada company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/2000650.htm.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.84 dB
Conducted Distrubance, 0.15 to 30 MHz	3.65 dB
Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Radiated Disturbance,1000 to 18000 MHz	4.32 dB
Radiated Disturbance,18000 to 26000 MHz	4.45 dB
Radiated Disturbance,26000 to 40000 MHz	5.24 dB

Uncertainty figures are valid to a confidence level of 95%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a multimedia device

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5.2 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx			
5180 - 5240	802.11a	21.50	141.25
5180 - 5240	802.11n HT20	21.54	142.56
5190 - 5230	802.11n HT40	21.75	149.62
5210	802.11ac VHT80	15.60	36.31
2Tx			
5180 - 5240	802.11n HT20	19.28	84.72
5190 - 5230	802.11n HT40	21.51	141.58
5210	802.11ac VHT80	15.62	36.48

5.3 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx			
5260 - 5320	802.11a	21.34	136.14
5260 - 5320	802.11n HT20	21.83	152.41
5270 - 5310	802.11n HT40	22.10	162.18
5290	802.11ac VHT80	15.95	39.36
2Tx			
5260 - 5320	802.11n HT20	19.33	85.70
5270 - 5310	802.11n HT40	20.12	102.80
5290	802.11ac VHT80	16.29	42.56

5.6 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx			
5500 - 5700	802.11a	21.16	130.62
5500 - 5700	802.11n HT20	21.64	145.88
5510 - 5670	802.11n HT40	23.17	207.49
5530 - 5610	802.11ac VHT80	21.45	139.64
2Tx			
5500 - 5700	802.11n HT20	19.06	80.54
5510 - 5670	802.11n HT40	22.01	158.85
5530 - 5610	802.11ac VHT80	23.16	207.01

5.8 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx			
5745 - 5825	802.11a	22.85	192.75
5745 - 5825	802.11n HT20	22.94	196.79
5755 - 5795	802.11n HT40	23.50	223.87
5775	802.11ac VHT80	21.71	148.25
2Tx			
5745 - 5825	802.11n HT20	25.83	382.82
5755 - 5795	802.11n HT40	26.30	426.58
5775	802.11ac VHT80	24.58	287.08

STRADDLE CHANNELS

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx (Channels overlapping UNII-2C and UNII-3)			
5720 (Whole Fundamental)	802.11a	21.93	156.10
5720 (Whole Fundamental)	802.11n HT20	22.10	162.04
5710 (Whole Fundamental)	802.11n HT40	23.95	248.23
5690 (Whole Fundamental)	802.11ac VHT80	22.41	174.34
2Tx (Channels overlapping UNII-2C and UNII-3)			
5720 (Whole Fundamental)	802.11n HT20	18.94	78.27
5710 (Whole Fundamental)	802.11n HT40	23.07	202.60
5690 (Whole Fundamental)	802.11ac VHT80	24.13	258.89

Note: Straddle channels full power is calculated.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency Band (GHz)	Antenna Gain (dBi)	
	Chain 0	Chain 1
5.2	4.80	4.90
5.3	5.00	4.90
5.6	5.50	4.20
5.8	5.50	4.20

Note: Chain 0➔Antenna 1 and Chain1➔ Antenna 2

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was v1.29.99992

The test utility software used during testing was QRCT v3.0.264.0.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

The fundamental of the EUT was investigated in two orientations Y and Z, it was determined that Z orientation was worst-case orientation. X orientation was not investigated due to the AC and I/O ports in the back of the EUT. Therefore, all final radiated testing was performed with the EUT in Z orientation.

All measurements were performed with the AC plugged into a power source.

Worst-case data rates as provided by the client were:

802.11a mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0
802.11ac VHT80 mode: MCS0

802.11ac VHT20 and VHT40 mode are different from 802.11nHT20 and HT40 only in control messages and have the same power settings.

For simultaneous transmission of multiple channels from the same antenna in the 2.4GHz and 5GHz bands, tests were conducted for various configurations having the highest power. No noticeable new emission was found.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List			
Description	**Manufacturer**	**Model**	**Serial Number**
AC Adapter	HP	HSTNN-LA40	WDUV0B3U8HK1Y
Laptop	HP	11-d001ax	5CD51643JG
USB Ethernet Adapter	Linksys	USB3GIG	15710S05701719
USB Hub	CGC	27402	NSN

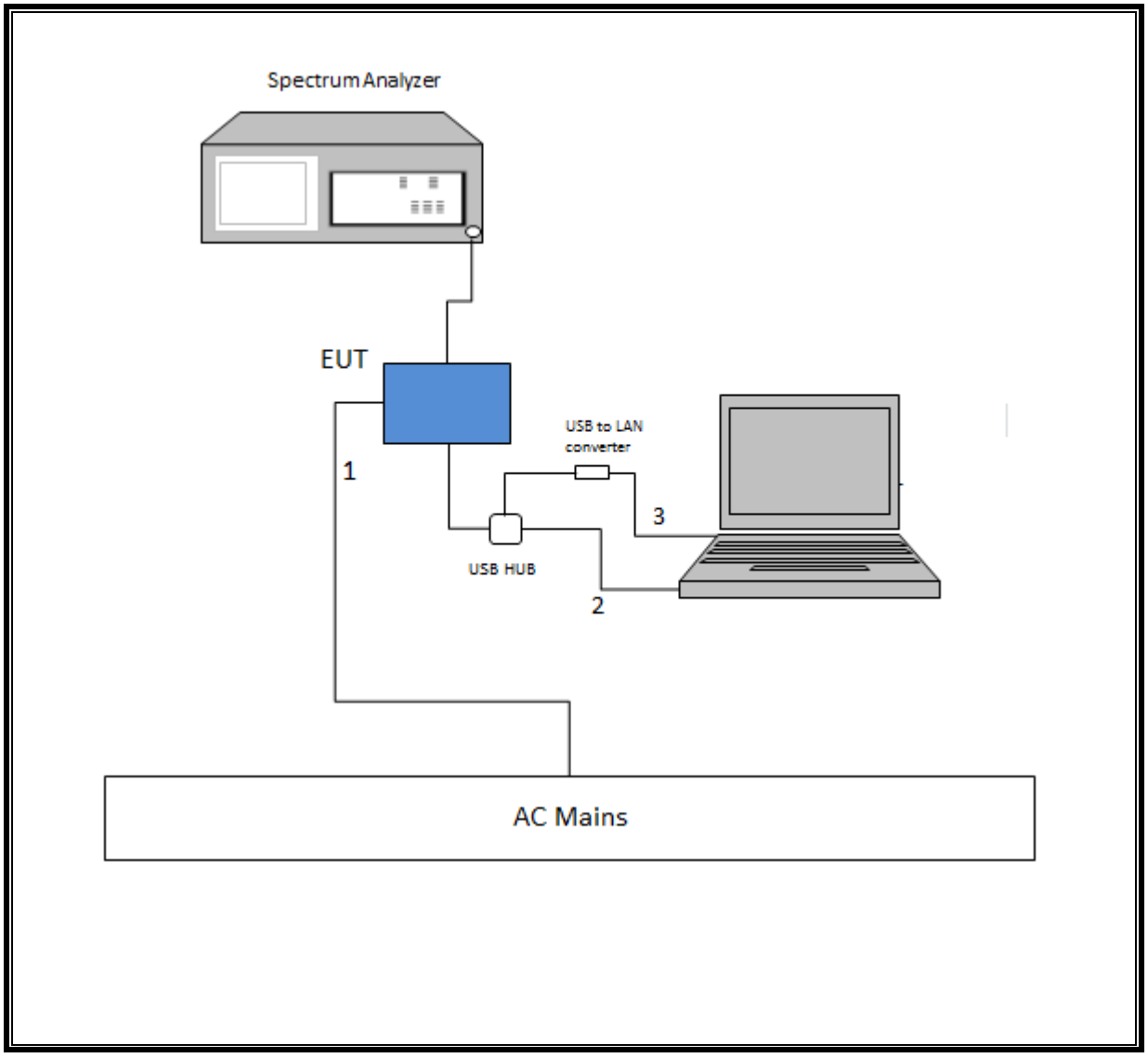
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	2-Prong	unshielded	2	
2	USB	1	USB	unshielded	2.5	USB serial cable
3	Ethernet	1	RJ45	unshielded	1	

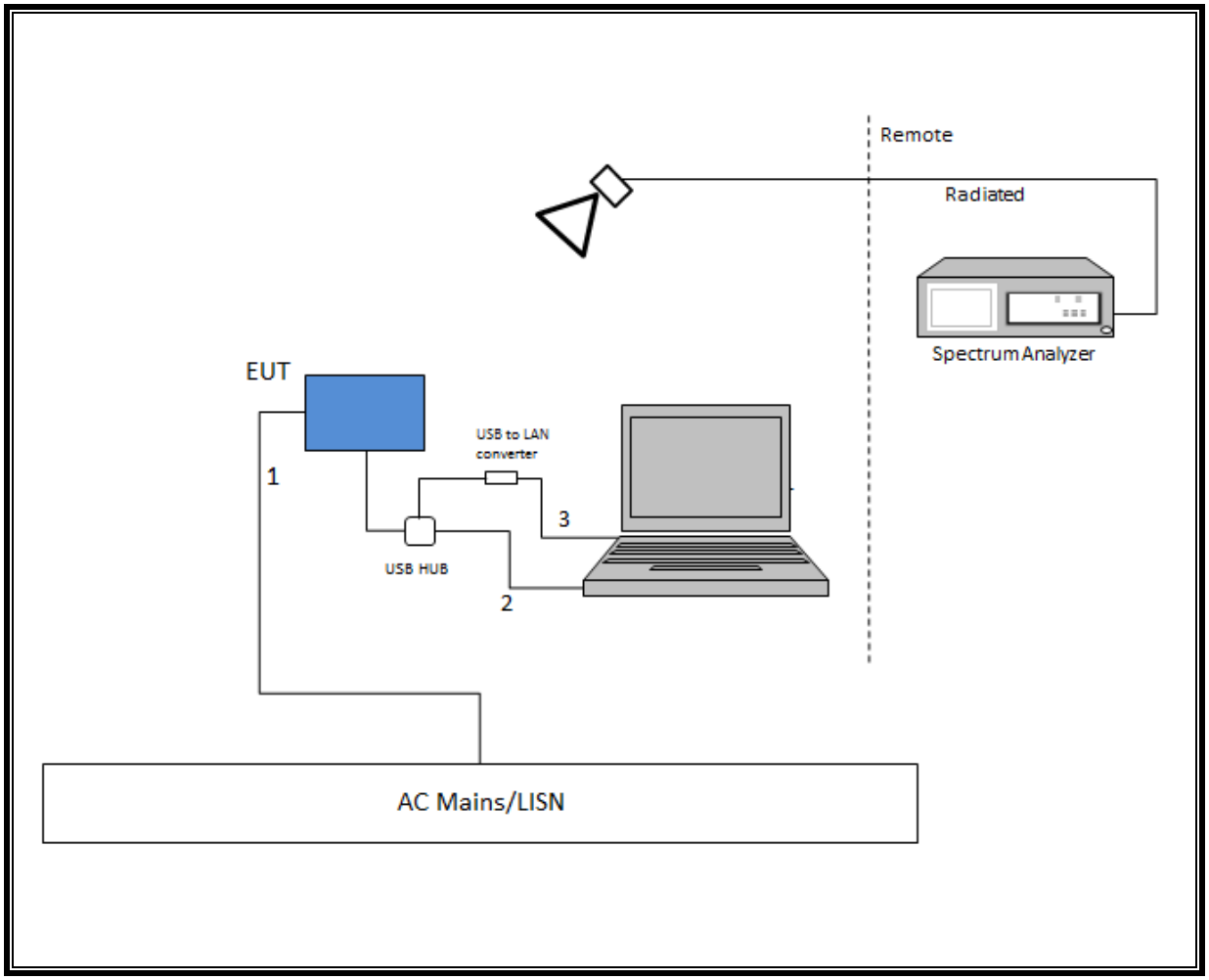
TEST SETUP

The EUT is connected to a test laptop. Test software exercises the radio.

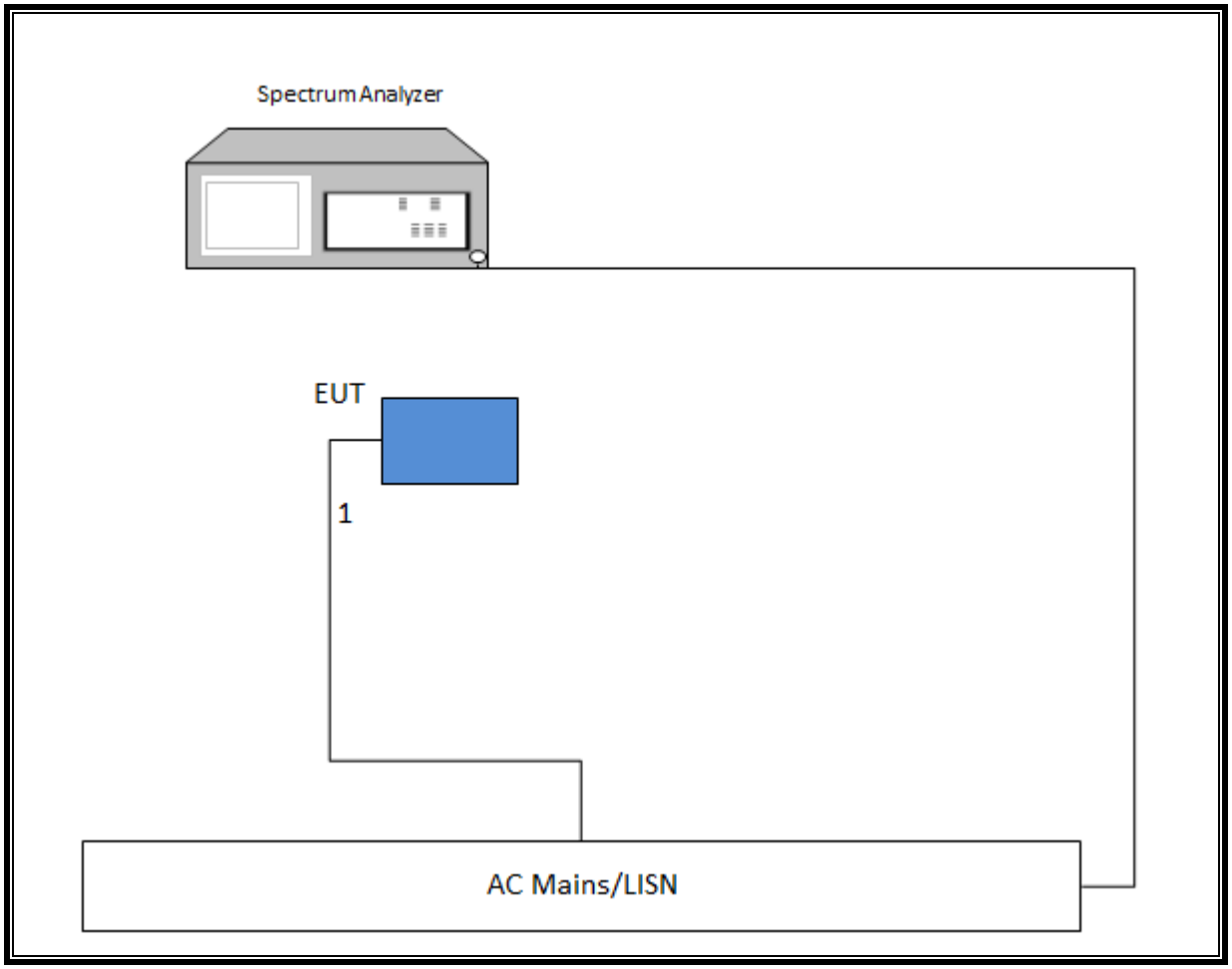
SETUP DIAGRAM FOR CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS



SETUP DIAGRAM FOR LINE CONDUCTED TEST



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T862	06/09/18	06/09/17
RF Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	T1165	06/24/18	06/26/17
RF Amplifier, 1-8GHz	MITEQ	AMF-4D-01000800-30-29P	T1573	06/24/18	06/26/17
Spectrum Analyzer	Keysight	N9030A	T1466	04/11/18	04/11/17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	T481	06/24/18	06/24/17
High Pass Filter 6GHz	Micro-Tronics	HPS17542	T484	06/24/18	06/24/17
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T346	03/28/18	03/28/17
RF Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	T1131	06/29/18	06/29/17
RF Amplifier, 1-8GHz	MITEQ	AMF-4D-01000800-30-29P	T1169	06/29/18	06/29/17
Spectrum Analyzer	Keysight	N9030A	T906	02/14/18	02/14/17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	T420	06/29/18	06/29/17
High Pass Filter 6GHz	Micro-Tronics	HPS17542	T424	06/29/18	06/29/17
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T119	03/28/18	03/28/18
RF Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	T742	01/25/18	01/25/17
Spectrum Analyzer	Keysight	N9030A	T1113	12/20/17	12/20/16
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	T421	01/25/18	01/25/17
High Pass Filter 6GHz	Micro-Tronics	HPS17542	T425	01/25/18	01/25/17
High Pass Filter 3GHz	Micro-Tronics	HPM17543	T427	01/25/18	01/25/17
Filter, BRF, 5150-5350MHz	Micro-Tronics	BRC50703	T1518	12/13/17	12/13/16
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	10/11/17	10/11/16
Rf Preamplifier, 10kHz – 1GHz	Sonoma	310N	T286	06/02/18	06/02/17
Spectrum Analyzer	Keysight	N9030A	T340	12/14/17	12/14/18
Spectrum Analyzer	Keysight	N9030A	T1210	07/17/18	07/17/17
Power Meter	Keysight	N1911A	T229	08/14/18	08/14/17
Power Sensor	Keysight	N1921A	T1225	03/29/18	03/29/17
EMI Receiver	Rohde & Schwarz	ESR	T1436	01/06/18	01/06/17
LISN	Fischer Custom Communications	FCC-LISN-50/250-25-2-01	T1310	06/15/18	06/15/17
Antenna Horn, 18-26GHz	ARA	MWH-1826	T89	01/04/18	01/04/17
Antenna Horn, 26-40GHz	ARA	MWH-2640	T90	08/25/18	08/25/17
RF Preamplifier, 1-26GHz	Agilent	8449B	T404	07/23/18	07/23/17
RF Preamplifier, 26-40GHz	Miteq	TTA2640-35-HG	T1864	09/21/18	09/21/17
Spectrum Analyzer	Keysight	N9030A	T1454	12/15/18	12/15/17

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Ver 9.5, Dec 01, 2016
Conducted Emissions Software	UL	UL EMC	Ver 9.5, May 26, 2015

7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v01r04, Section B

6 dB BW: KDB 789033 D02 v01r04, Section C.2

26 dB Emission BW: KDB 789033 D02 v01r04, Section C.1

99% Occupied BW: KDB 789033 D02 v01r04, Section D.

Conducted Output Power: KDB 789033 D02 v01r04, Section E.3.b (Method PM-G) and KDB 789033 D02 v01r04, Section E.2.b (Method SA-1)

Power Spectral Density: KDB 789033 D02 v01r04, Section F

Unwanted emissions in restricted bands: KDB 789033 D02 v01r04, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v01r04, Sections G.3, G.4, and G.5.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

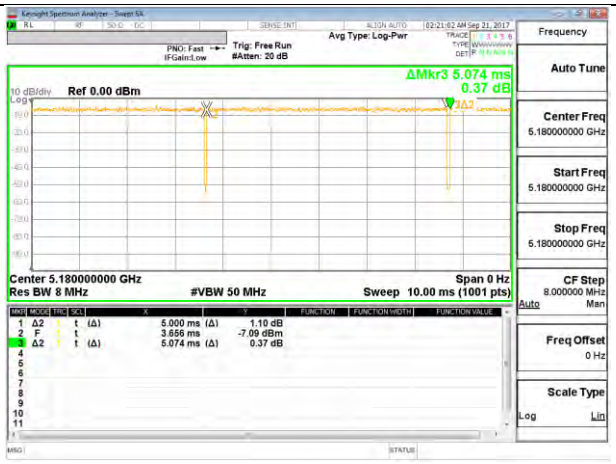
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a Chain 0	2.064	2.124	0.972	97.18%	0.12	0.484
802.11a Chain 1	2.064	2.130	0.969	96.90%	0.14	0.484
802.11n HT20 Chain 0	5.002	5.067	0.987	98.72%	0.00	0.010
802.11n HT20 Chain 1	5.000	5.074	0.985	98.54%	0.00	0.010
802.11n HT20 2Tx CDD	4.987	5.070	0.984	98.36%	0.00	0.010
802.11n HT40 Chain 0	2.388	2.484	0.961	96.14%	0.17	0.419
802.11n HT40 Chain 1	2.420	2.489	0.972	97.23%	0.12	0.413
802.11n HT40 2Tx CDD	2.420	2.499	0.968	96.84%	0.14	0.413
802.11ac VHT80 Chain 0	1.144	1.208	0.947	94.70%	0.24	0.874
802.11ac VHT80 Chain 1	1.131	1.199	0.943	94.33%	0.25	0.884
802.11ac VHT80 2Tx CDD	1.1490	1.2140	0.946	94.65%	0.24	0.870

DUTY CYCLE PLOTS

802.11a C0 MODE

802.11a C1 MODE

802.11n HT20 C0 MODE



802.11n HT20 C1 MODE

802.11n HT20 2Tx CDD MODE

802.11n HT40 C0 MODE

802.11n HT40 C1 MODE

802.11n HT40 2Tx CDD MODE

802.11ac VHT80 C0 MODE

802.11ac VHT80 C1 MODE

802.11ac VHT80 2Tx CDD MODE

8.2. 26 dB BANDWIDTH

LIMITS

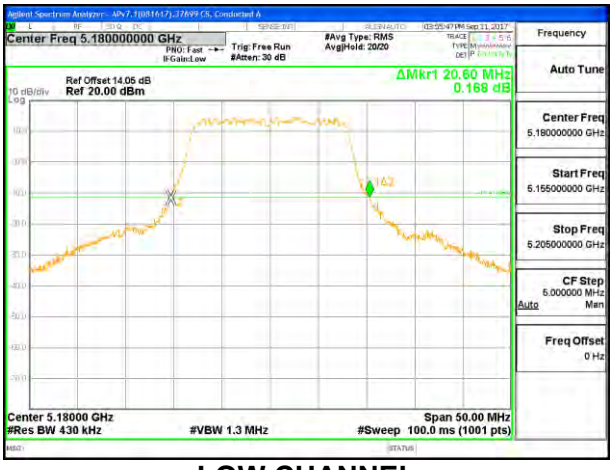
None; for reporting purposes only.

RESULTS

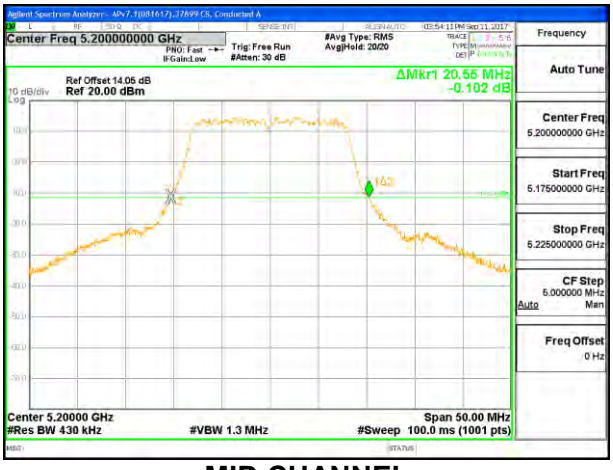
8.2.1. 802.11a MODE IN THE 5.2 GHz BAND

1TX Chain 0

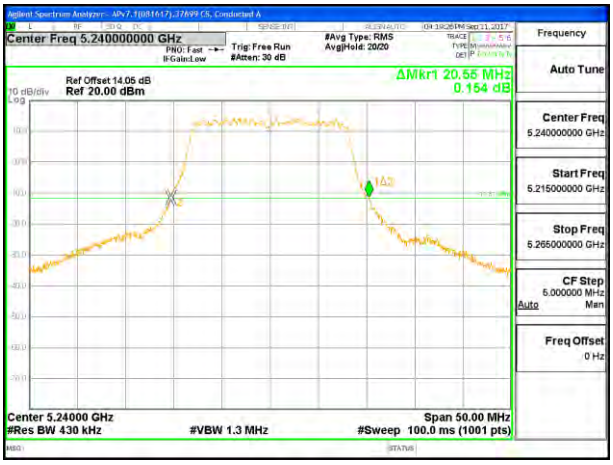
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	20.60
Mid	5200	20.55
High	5240	20.55



LOW CHANNEL



MID CHANNEL

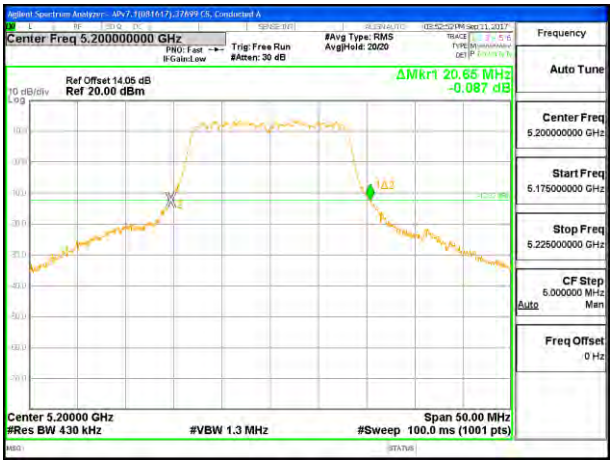


HIGH CHANNEL

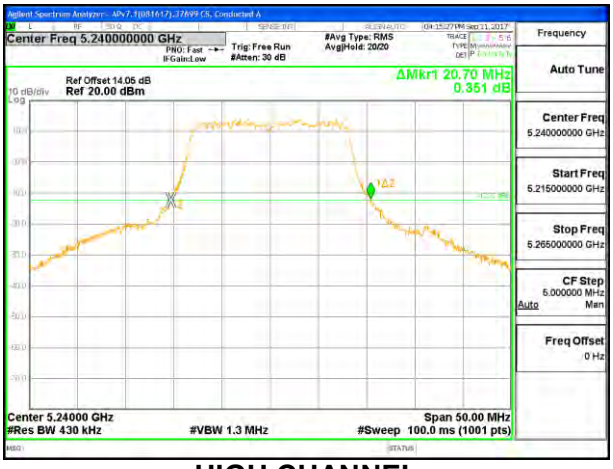
1TX Chain 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	20.40
Mid	5200	20.65
High	5240	20.70

LOW CHANNEL



MID CHANNEL

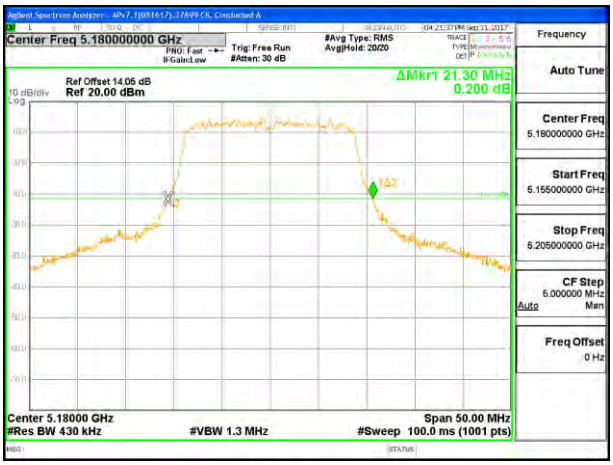


HIGH CHANNEL

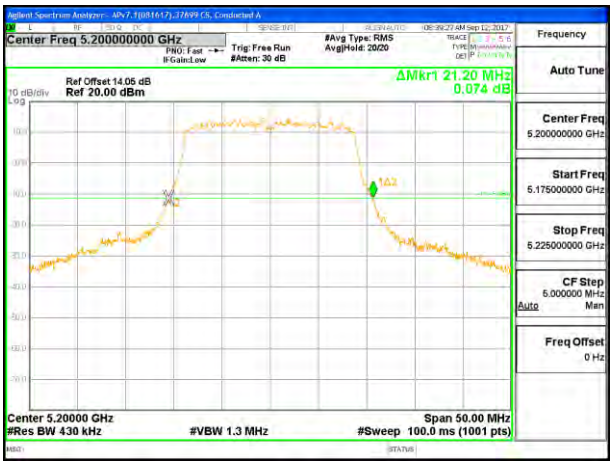
8.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

1TX Chain 0

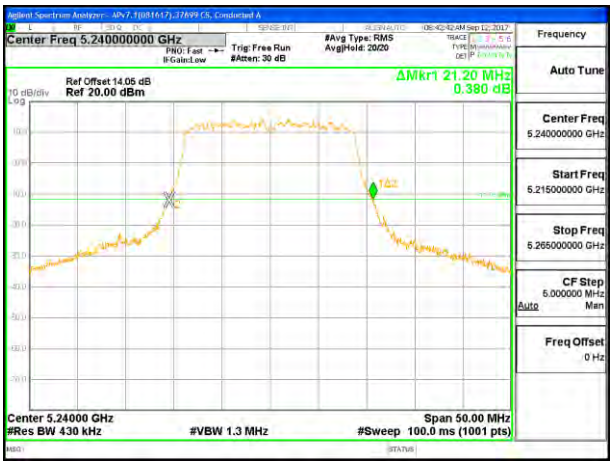
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.30
Mid	5200	21.20
High	5240	21.20



LOW CHANNEL



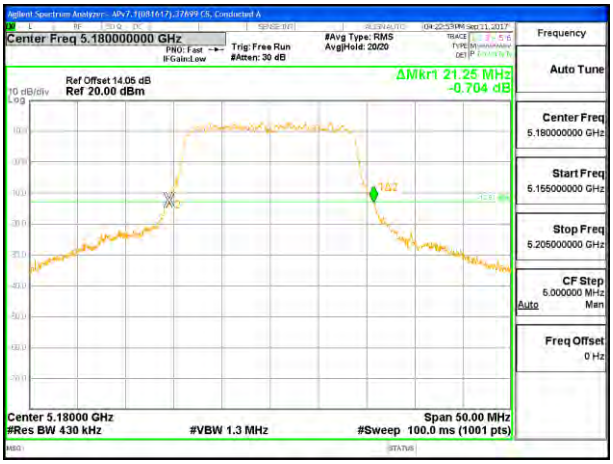
MID CHANNEL



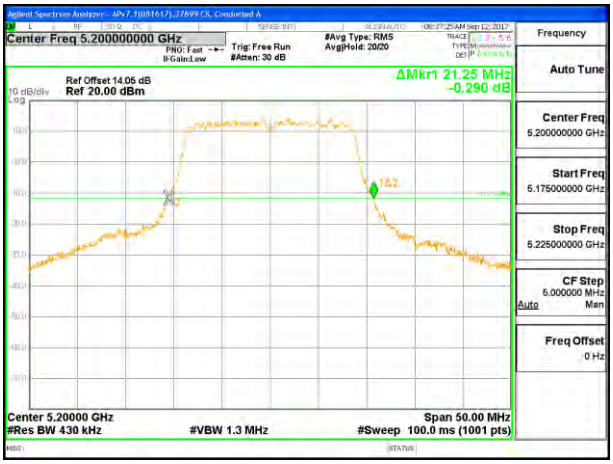
HIGH CHANNEL

1TX Chain 1

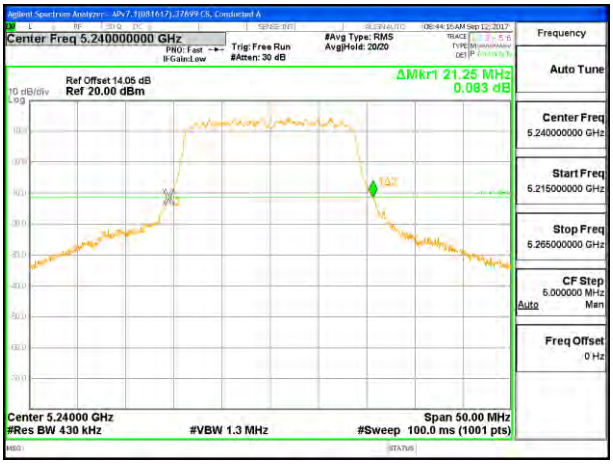
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.25
Mid	5200	21.25
High	5240	21.25



LOW CHANNEL



MID CHANNEL

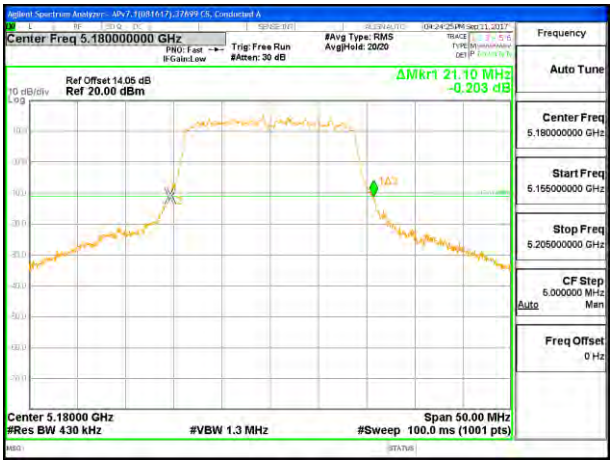


HIGH CHANNEL

2TX Chain 0 + Chain 1 CDD

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5180	21.10	21.05
Mid	5200	21.10	21.05
High	5240	21.00	21.35

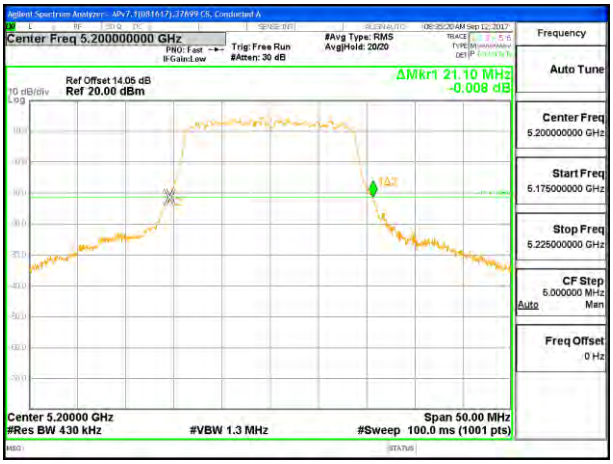
LOW CHANNEL



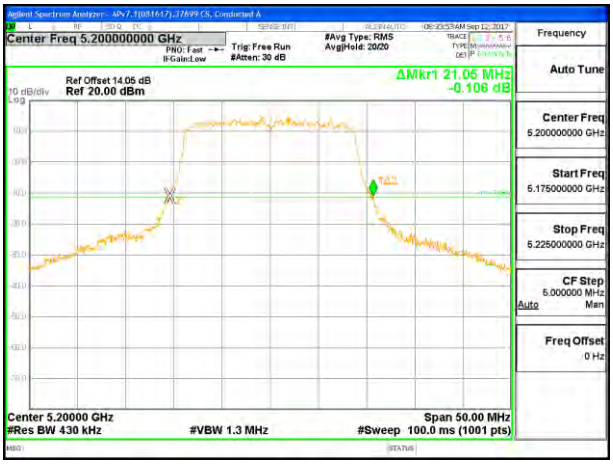
LOW CHANNEL CHAIN 0

LOW CHANNEL CHAIN 1

MID CHANNEL

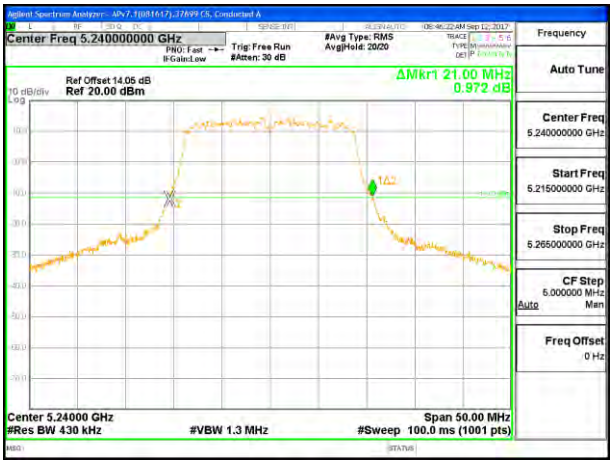


MID CHANNEL CHAIN 0

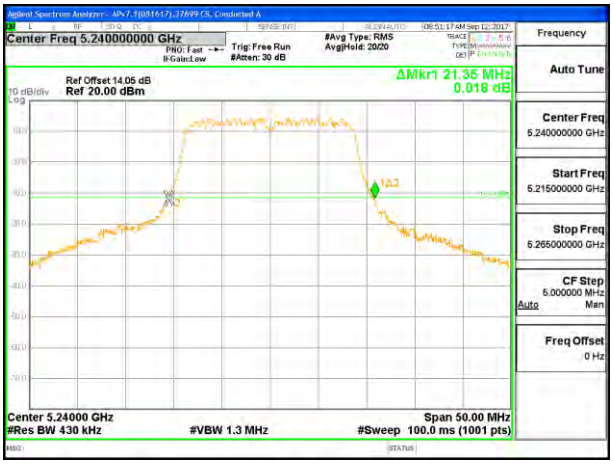


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0

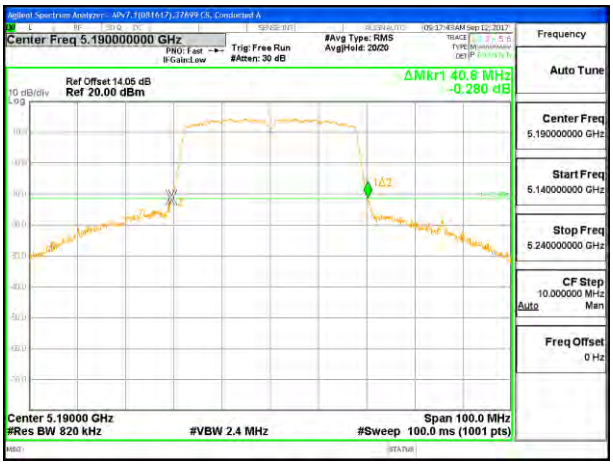


HIGH CHANNEL CHAIN 1

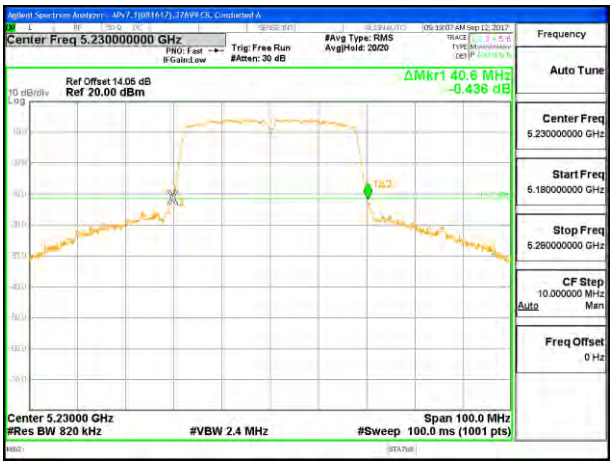
8.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5190	40.80
High	5230	40.60



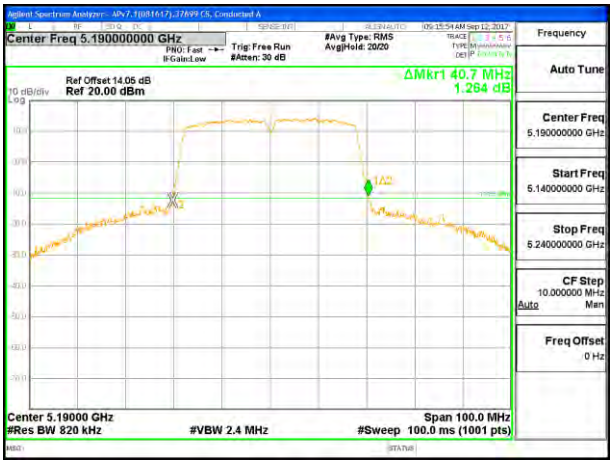
LOW CHANNEL



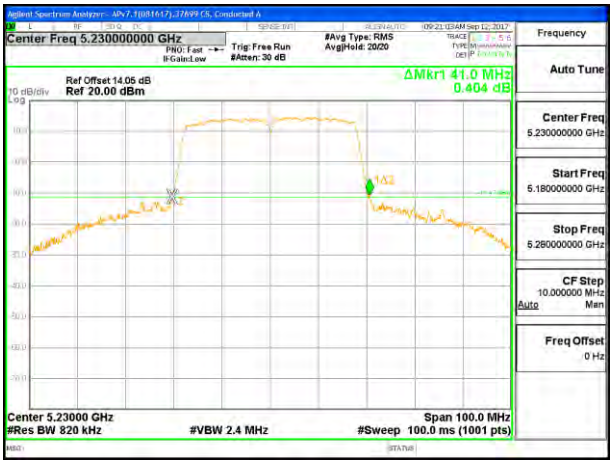
HIGH CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5190	40.70
High	5230	41.00



LOW CHANNEL

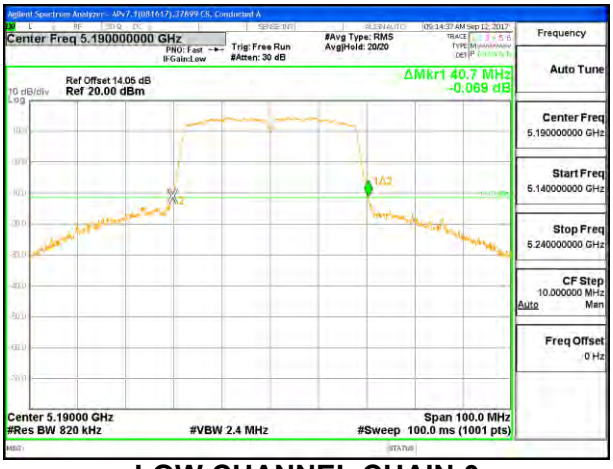


HIGH CHANNEL

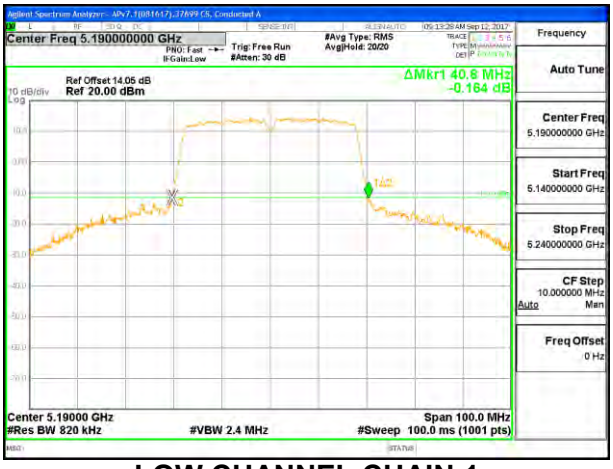
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5190	40.70	40.80
High	5230	40.70	40.90

LOW CHANNEL

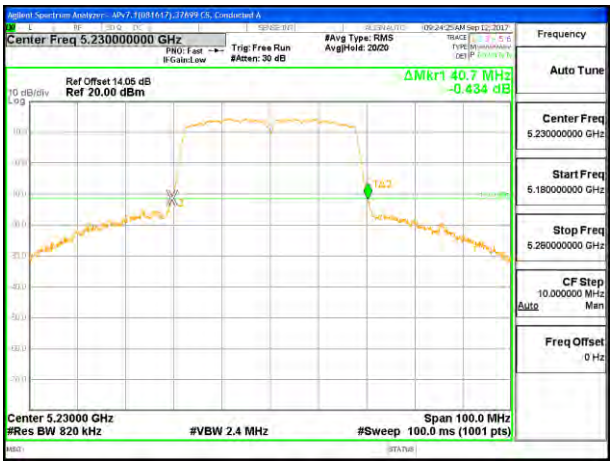


LOW CHANNEL CHAIN 0

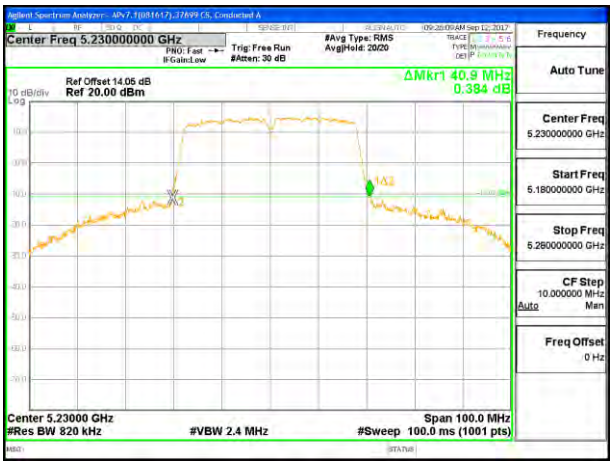


LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0

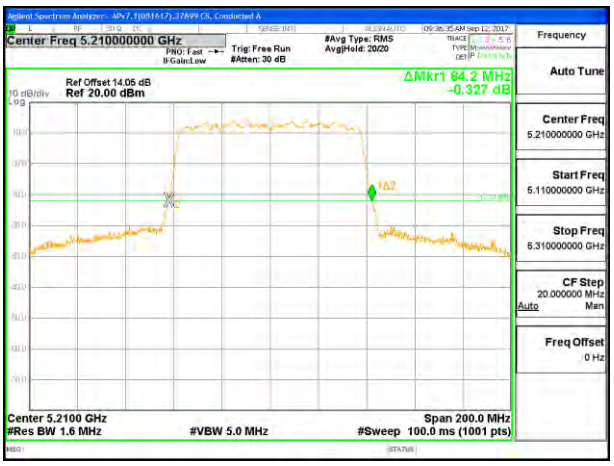


HIGH CHANNEL CHAIN 1

8.2.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

1TX Chain 0

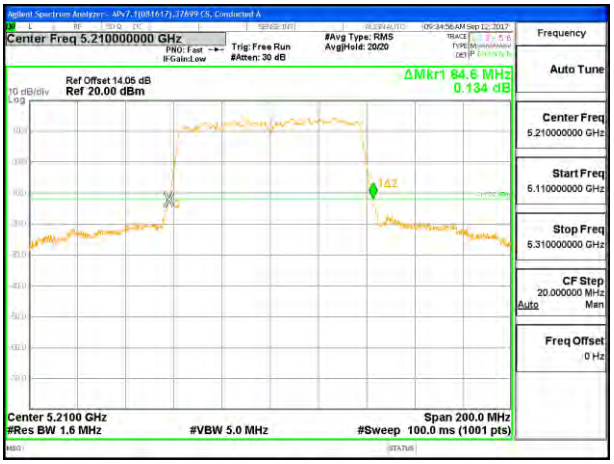
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5210	84.20



MID CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5210	84.60



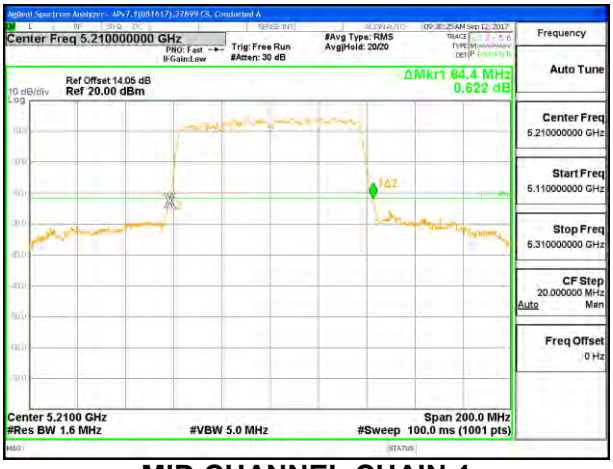
MID CHANNEL

2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	84.40	84.40

MID CHANNEL

MID CHANNEL CHAIN 0



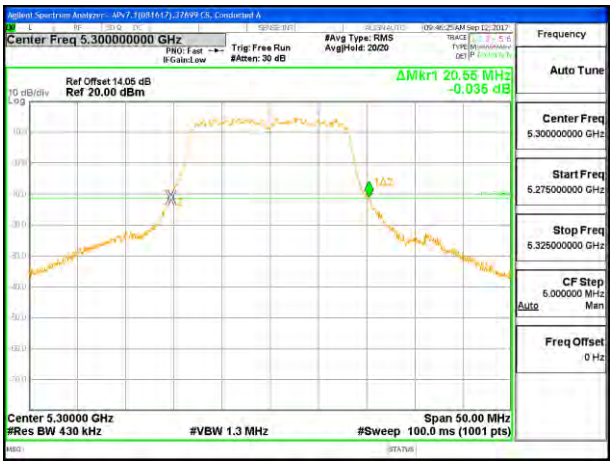
MID CHANNEL CHAIN 1

8.2.5. 802.11a MODE IN THE 5.3 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	20.55
Mid	5300	20.55
High	5320	20.55

LOW CHANNEL

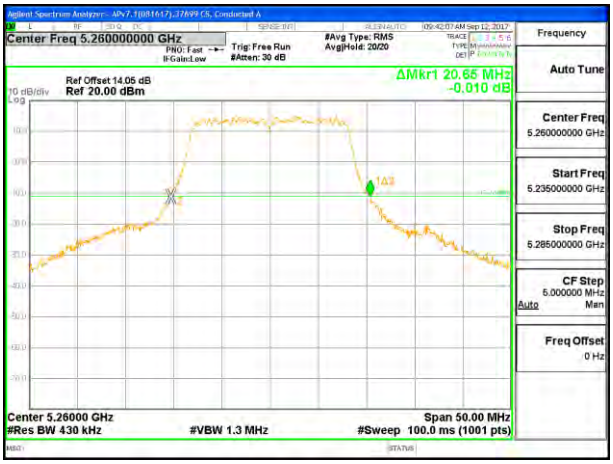


MID CHANNEL

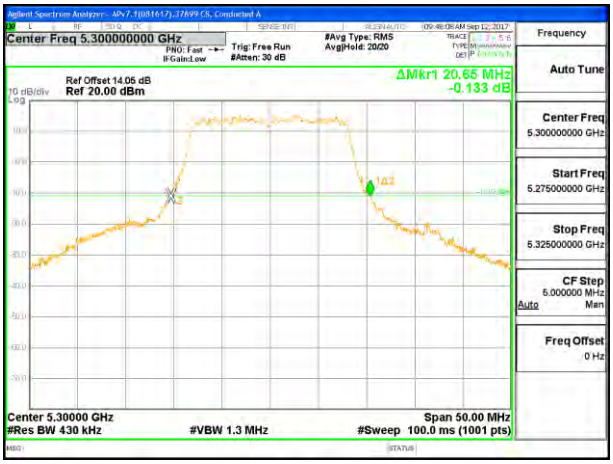
HIGH CHANNEL

1TX Chain 1

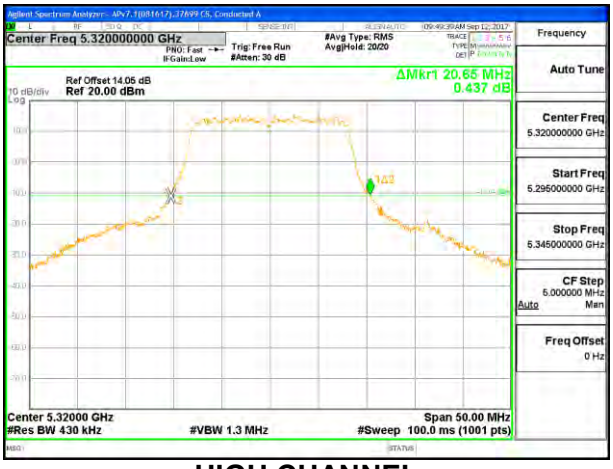
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	20.65
Mid	5300	20.65
High	5320	20.65



LOW CHANNEL



MID CHANNEL

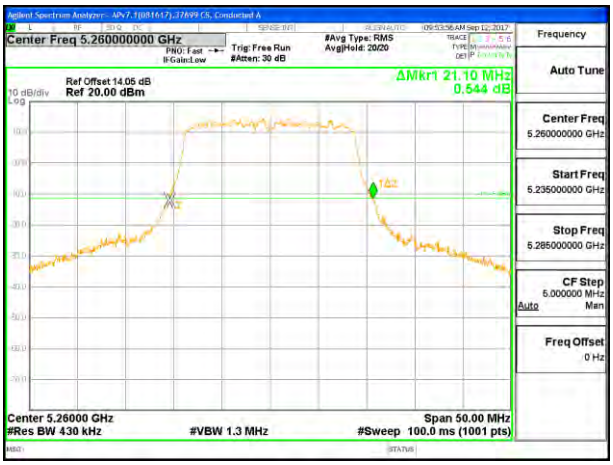


HIGH CHANNEL

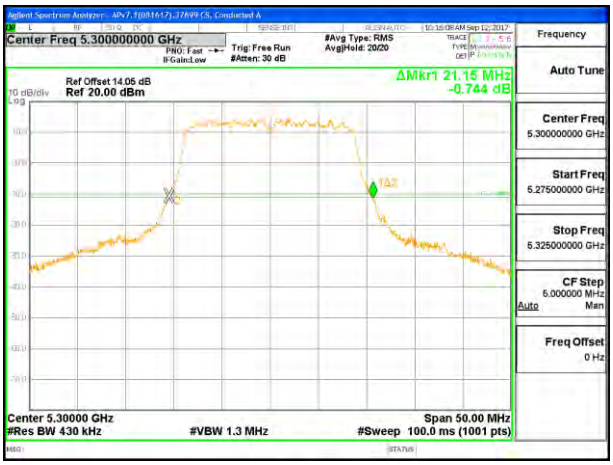
8.2.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

1TX Chain 0

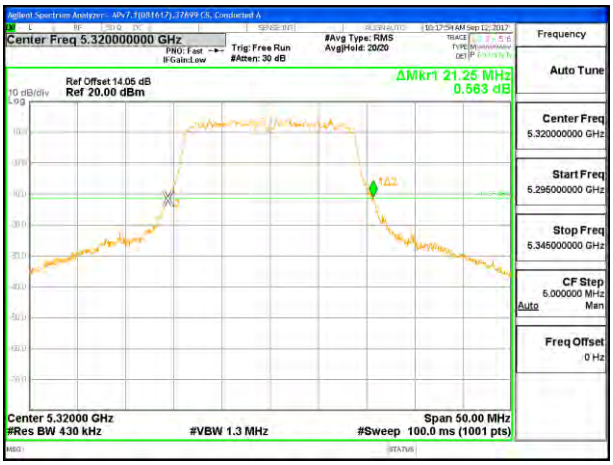
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.10
Mid	5300	21.15
High	5320	21.25



LOW CHANNEL



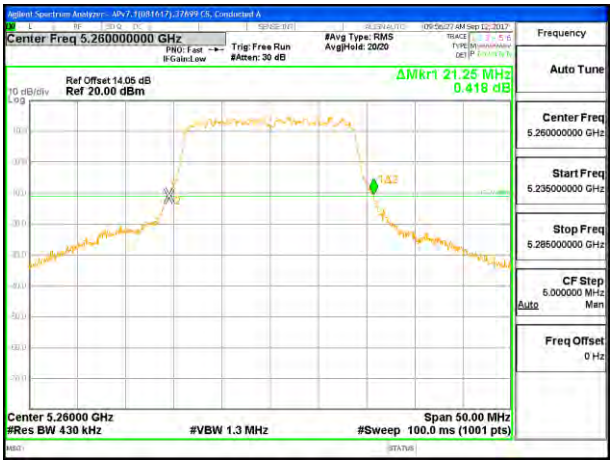
MID CHANNEL



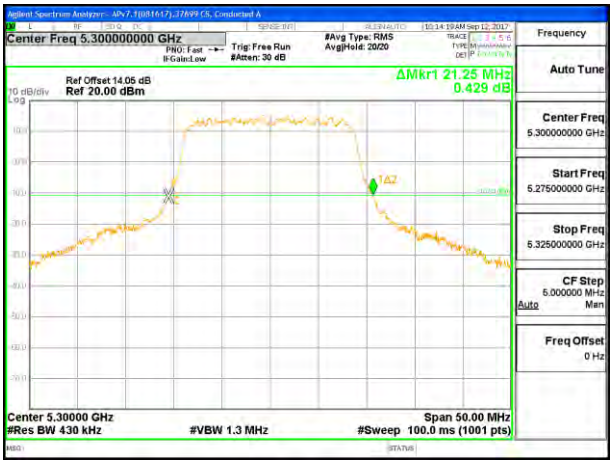
HIGH CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.25
Mid	5300	21.25
High	5320	21.25



LOW CHANNEL



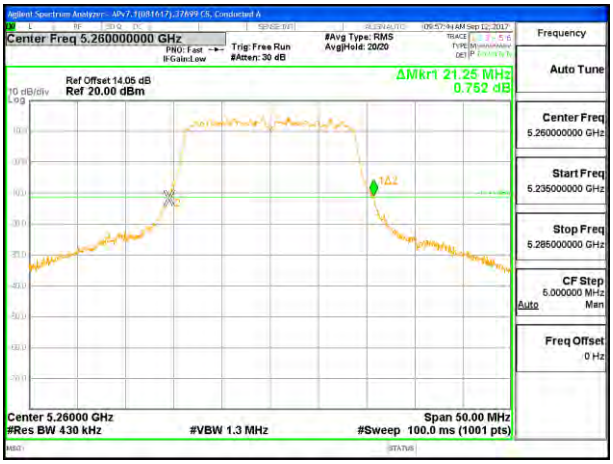
MID CHANNEL

HIGH CHANNEL

2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5260	21.25	21.30
Mid	5300	21.10	21.15
High	5320	21.20	21.30

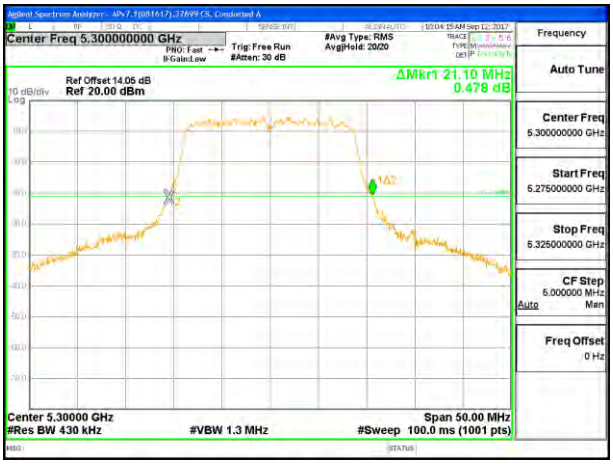
LOW CHANNEL



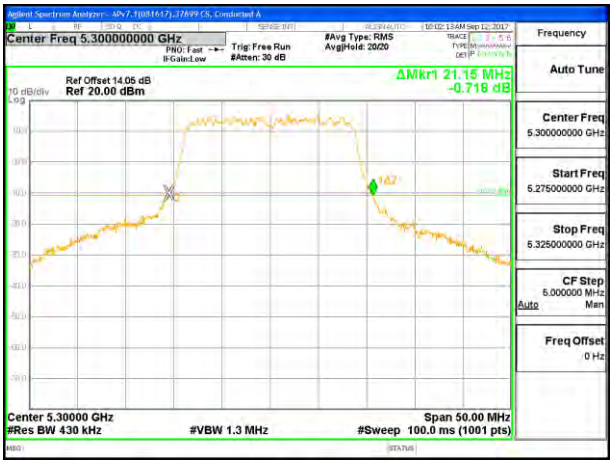
LOW CHANNEL CHAIN 0

LOW CHANNEL CHAIN 1

MID CHANNEL



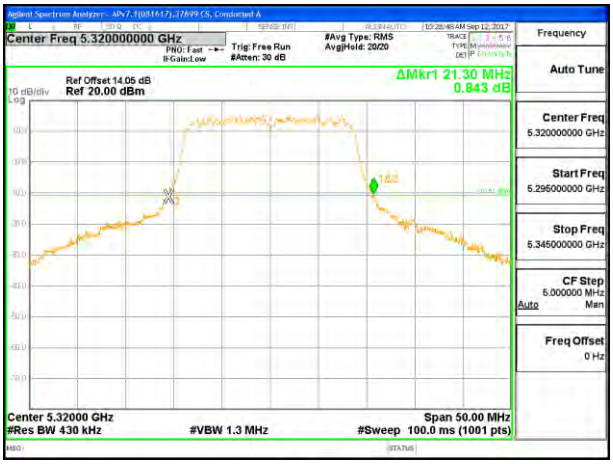
MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

HIGH CHANNEL

HIGH CHANNEL CHAIN 0

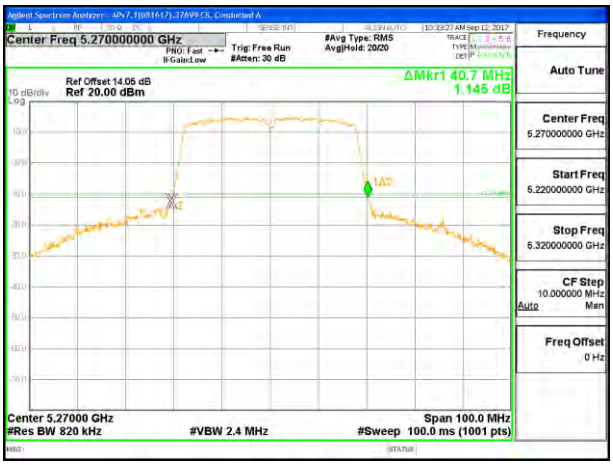


HIGH CHANNEL CHAIN 1

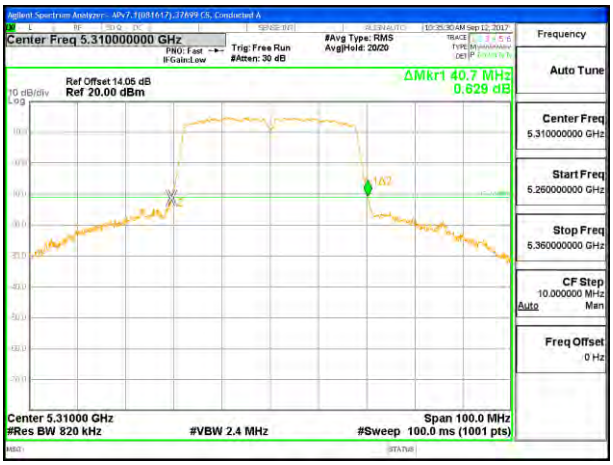
8.2.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5270	40.70
High	5310	40.70



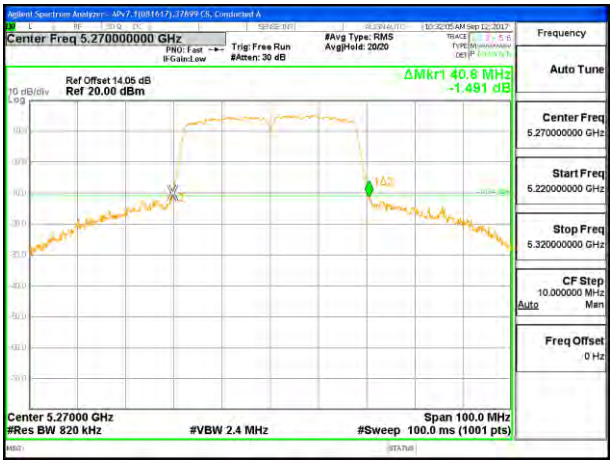
LOW CHANNEL



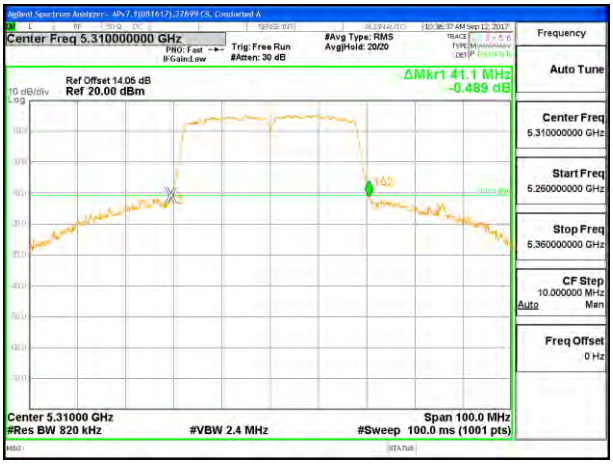
HIGH CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5270	40.80
High	5310	41.10



LOW CHANNEL

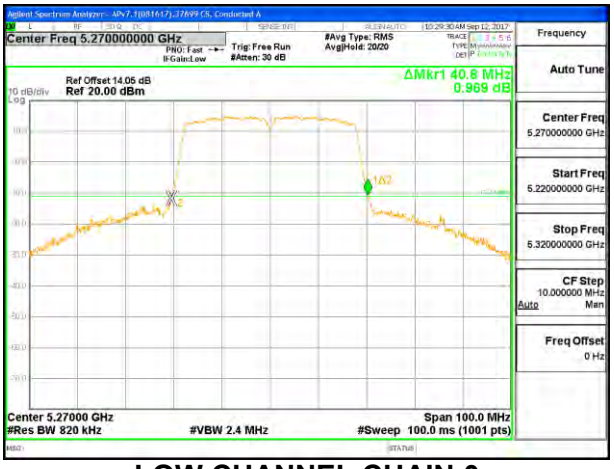


HIGH CHANNEL

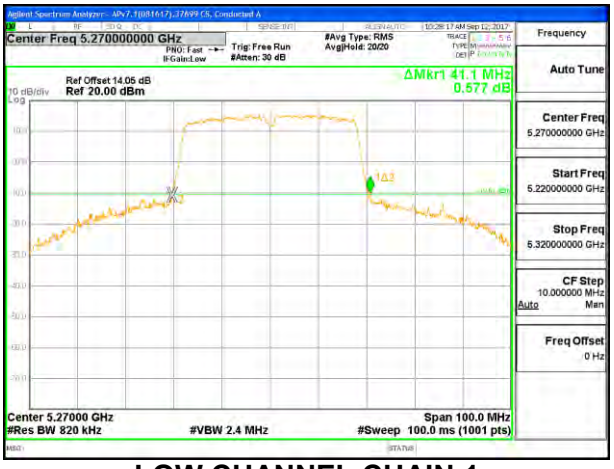
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5270	40.80	41.10
High	5310	40.80	41.30

LOW CHANNEL

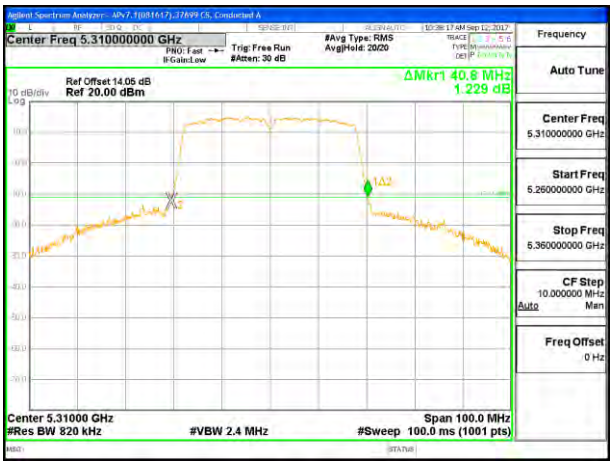


LOW CHANNEL CHAIN 0

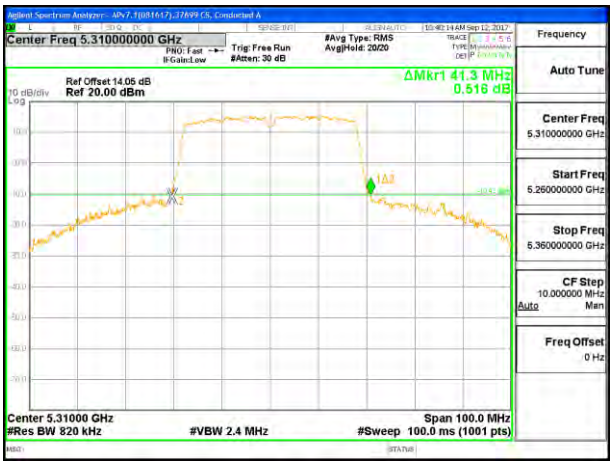


LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0

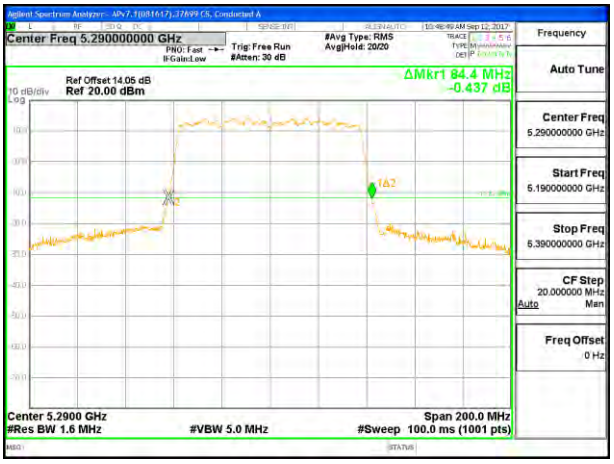


HIGH CHANNEL CHAIN 1

8.2.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

1TX Chain 0

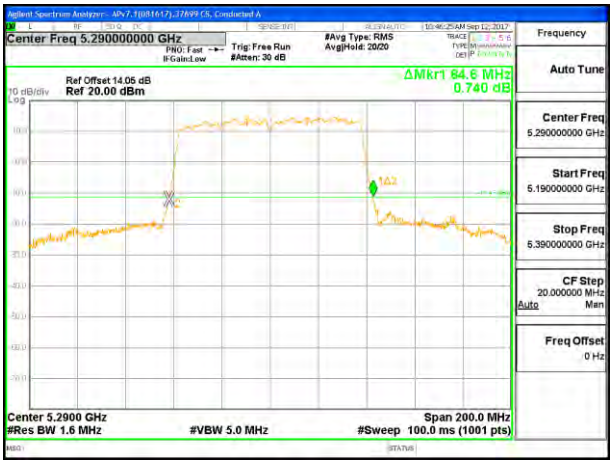
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5290	84.40



MID CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5290	84.60

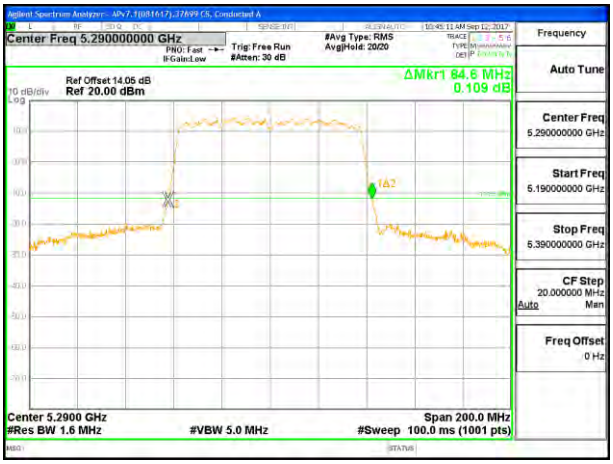


MID CHANNEL

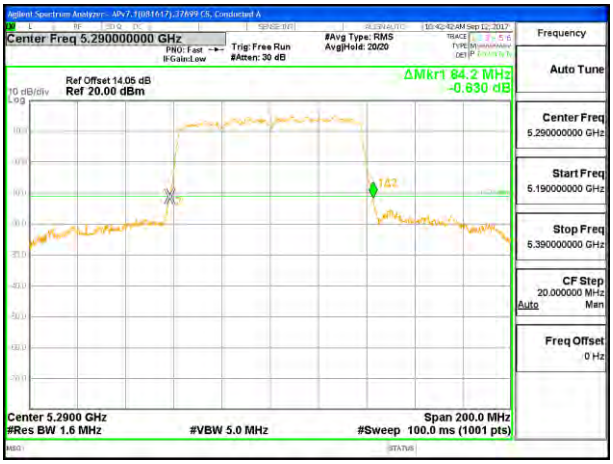
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5290	84.60	84.20

MID CHANNEL



MID CHANNEL CHAIN 0

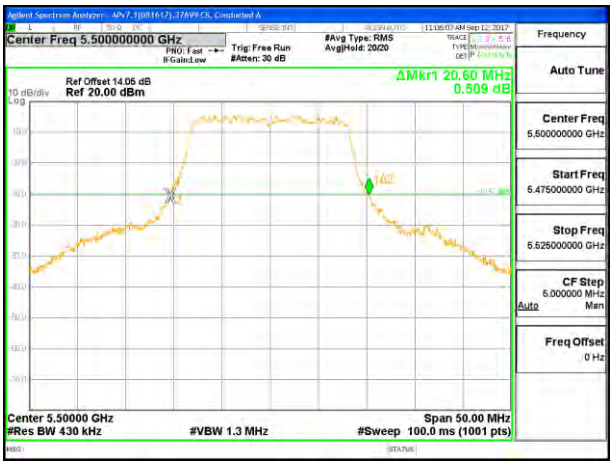


MID CHANNEL CHAIN 1

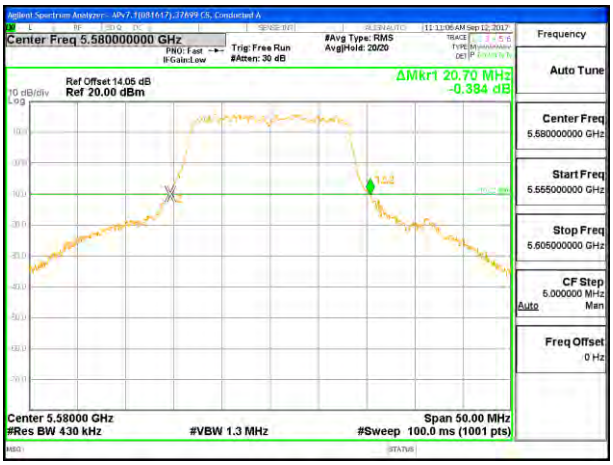
8.2.9. 802.11a MODE IN THE 5.6 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	20.60
Mid	5580	20.70
High	5700	20.65
144	5720	20.60



LOW CHANNEL



MID CHANNEL

HIGH CHANNEL

CHANNEL 144

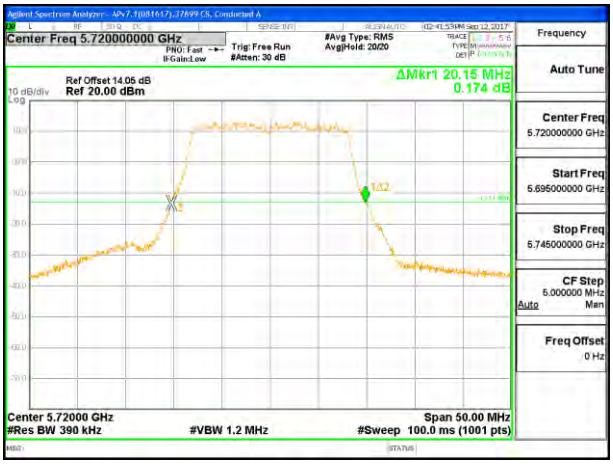
1TX Chain 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	20.70
Mid	5580	20.60
High	5700	20.45
144	5720	20.15

LOW CHANNEL

MID CHANNEL

HIGH CHANNEL

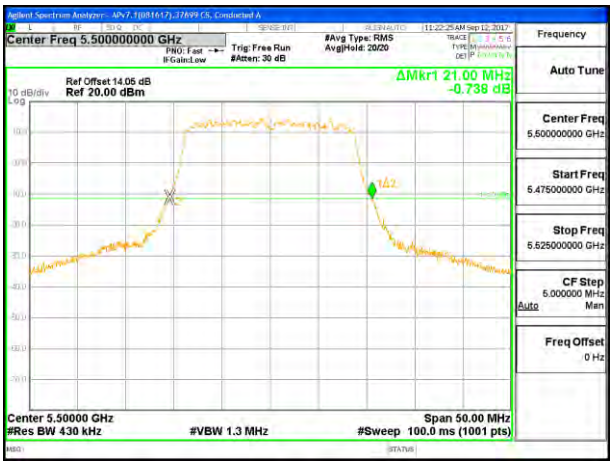


CHANNEL 144

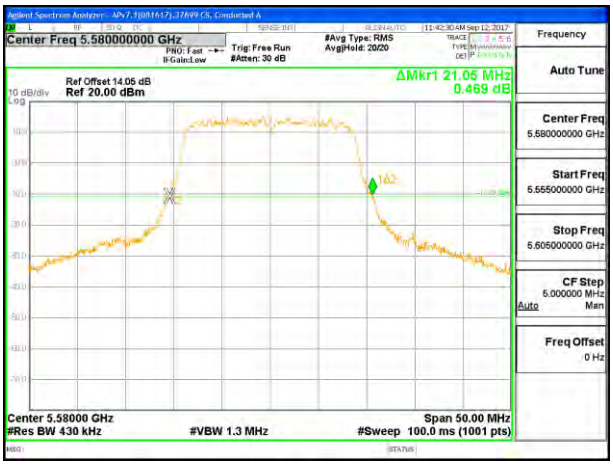
8.2.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.00
Mid	5580	21.05
High	5700	21.55
144	5720	21.30

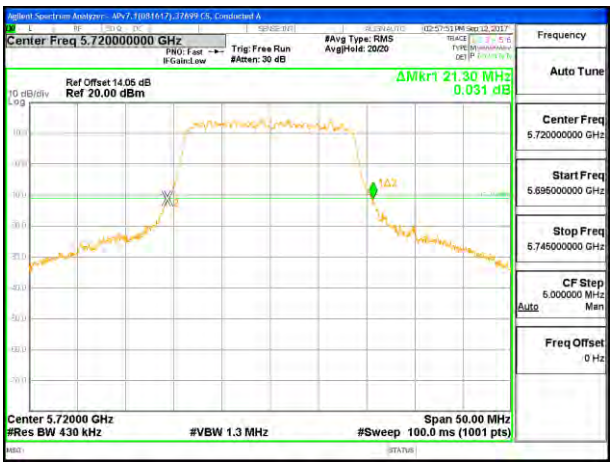


LOW CHANNEL



MID CHANNEL

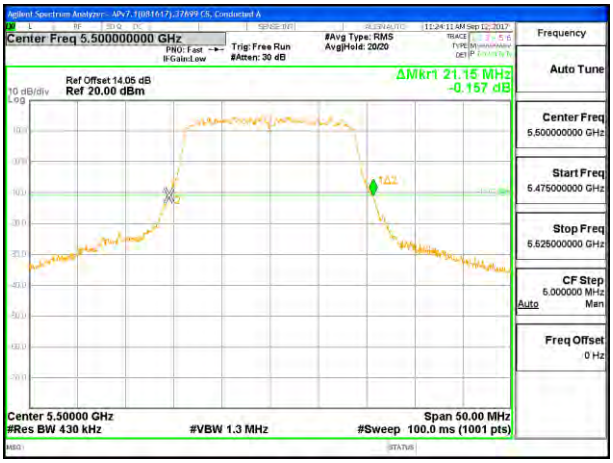
HIGH CHANNEL



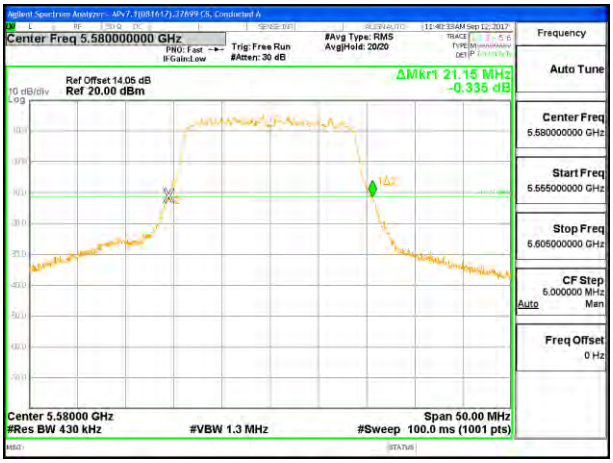
CHANNEL 144

1TX Chain 1

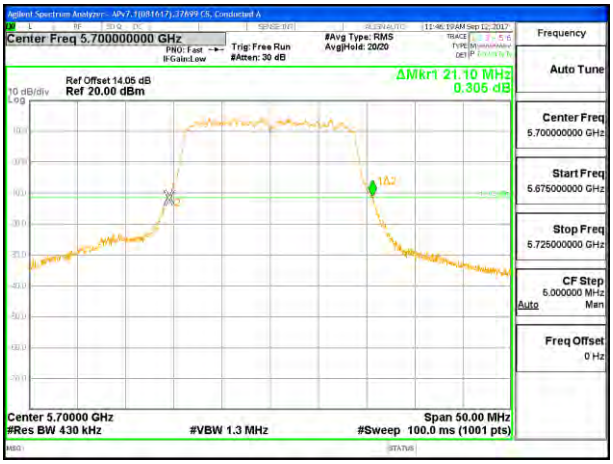
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.15
Mid	5580	21.15
High	5700	21.10
144	5720	20.95



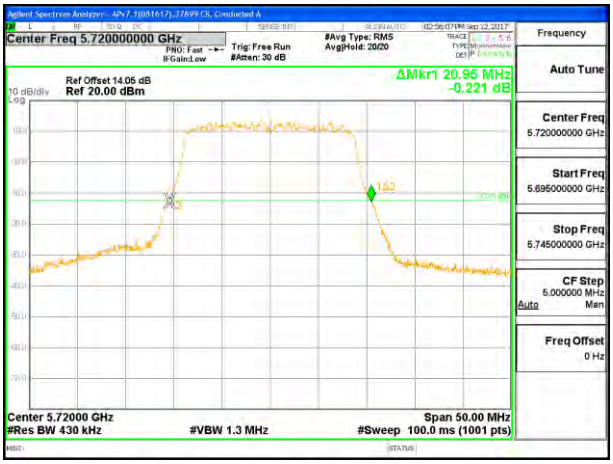
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

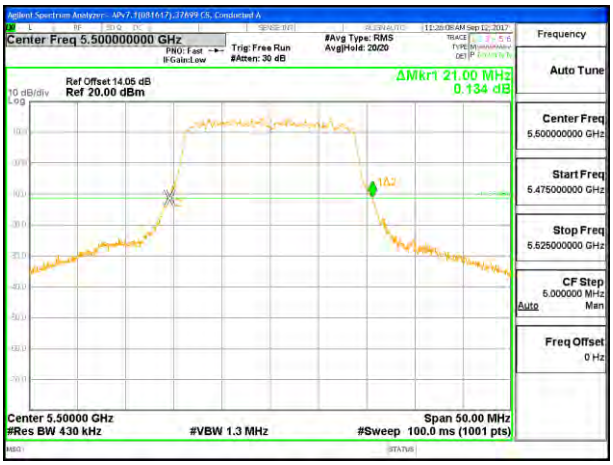


CHANNEL 144

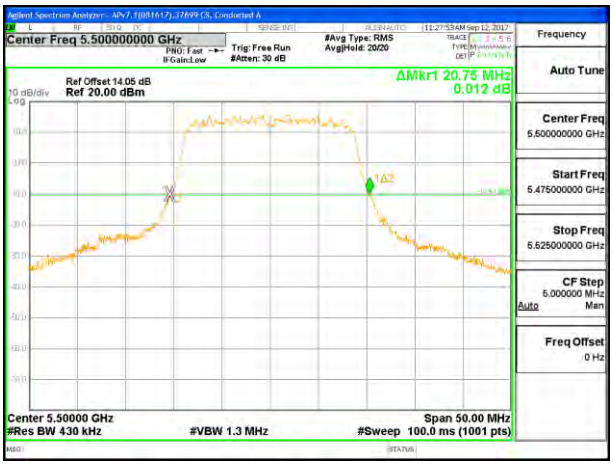
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5500	21.00	20.75
Mid	5580	21.15	20.90
High	5700	21.65	20.75
144	5720	21.35	21.10

LOW CHANNEL

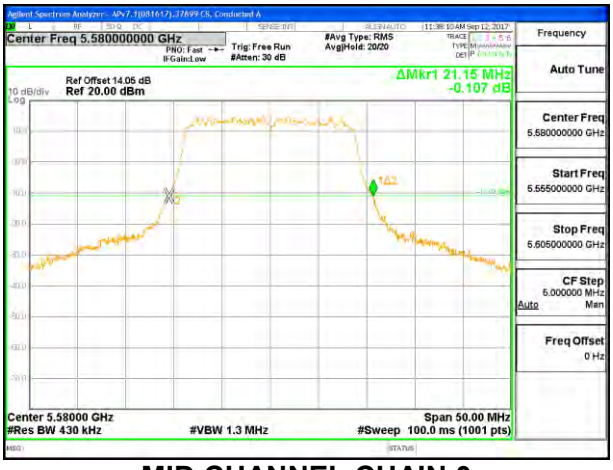


LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

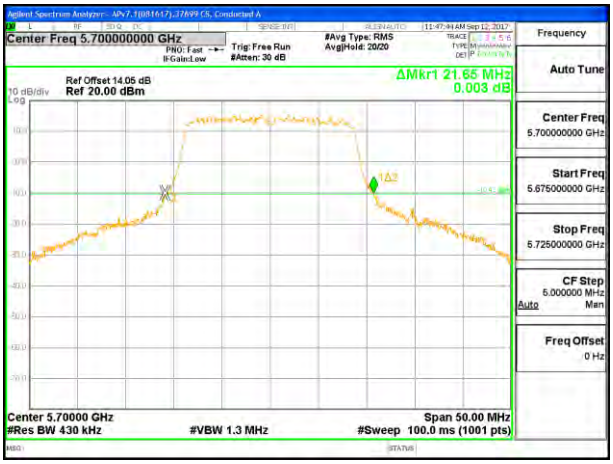
MID CHANNEL



MID CHANNEL CHAIN 0

MID CHANNEL CHAIN 1

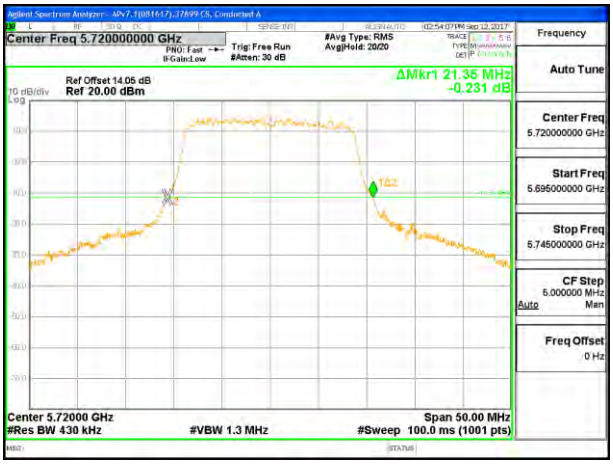
HIGH CHANNEL



HIGH CHANNEL CHAIN 0

HIGH CHANNEL CHAIN 1

CHANNEL 144



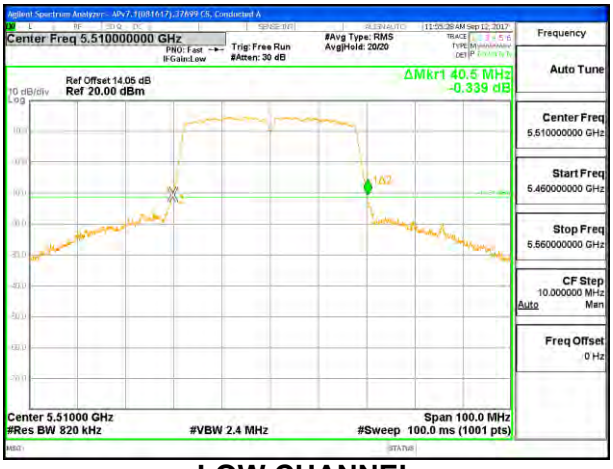
CHANNEL 144 CHAIN 0

CHANNEL 144 CHAIN 1

8.2.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

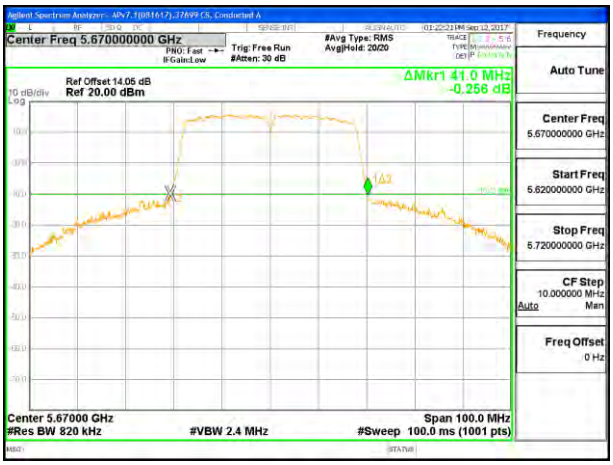
1TX Chain 0

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	40.50
Mid	5550	40.70
High	5670	41.00
142	5710	40.60

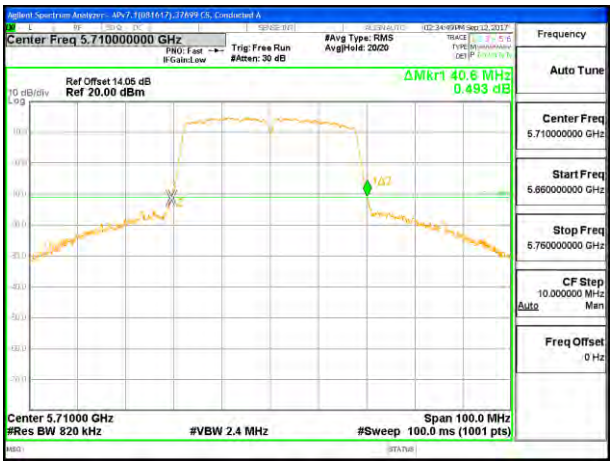


LOW CHANNEL

MID CHANNEL



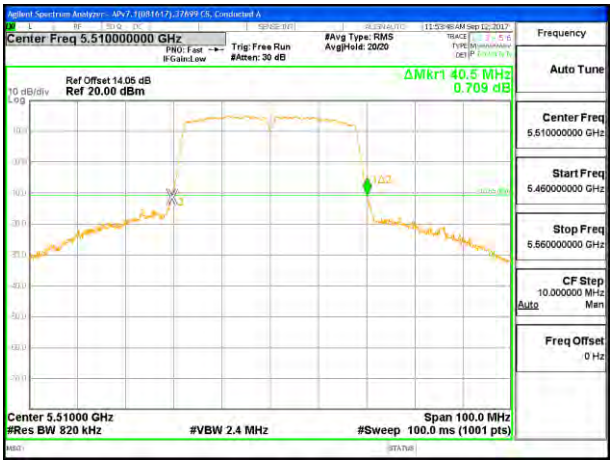
HIGH CHANNEL



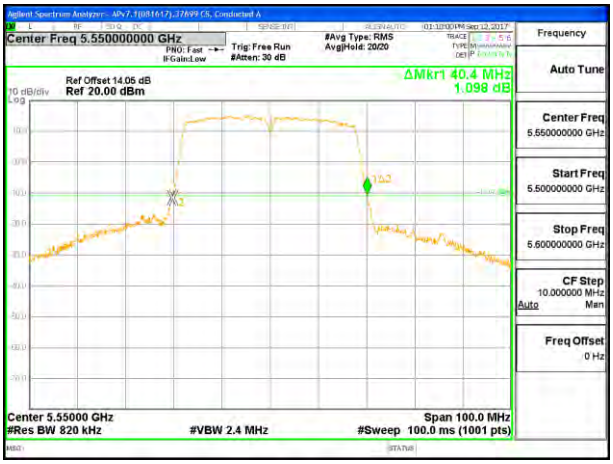
CHANNEL 142

1TX Chain 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	40.50
Mid	5550	40.40
High	5670	40.60
142	5710	40.50



LOW CHANNEL



MID CHANNEL

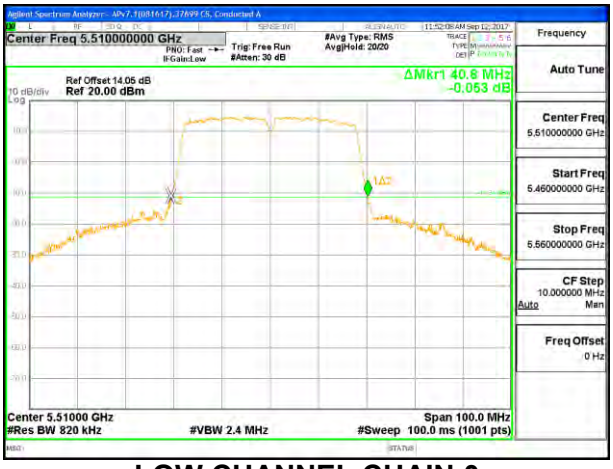
HIGH CHANNEL

CHANNEL 142

2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5510	40.80	40.50
Mid	5550	40.50	40.40
High	5670	41.10	40.70
142	5710	40.80	40.40

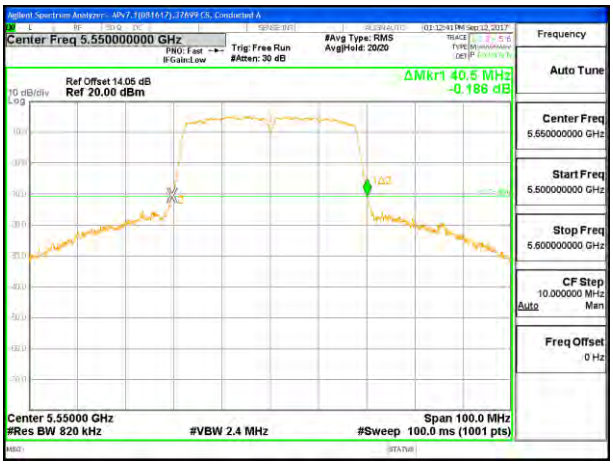
LOW CHANNEL



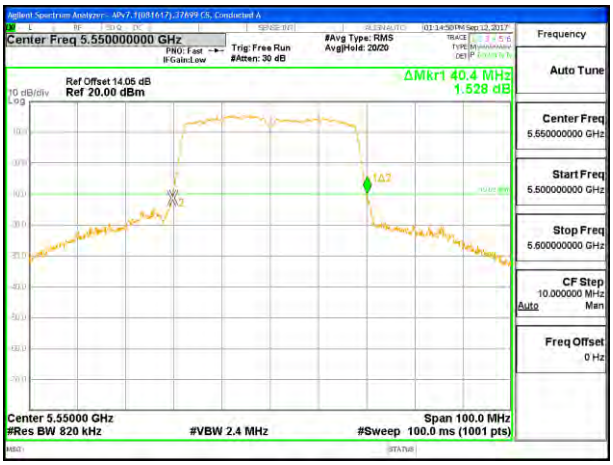
LOW CHANNEL CHAIN 0

LOW CHANNEL CHAIN 1

MID CHANNEL

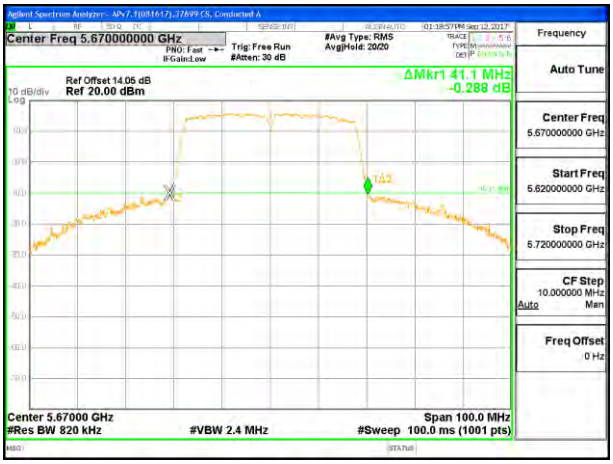


MID CHANNEL CHAIN 0

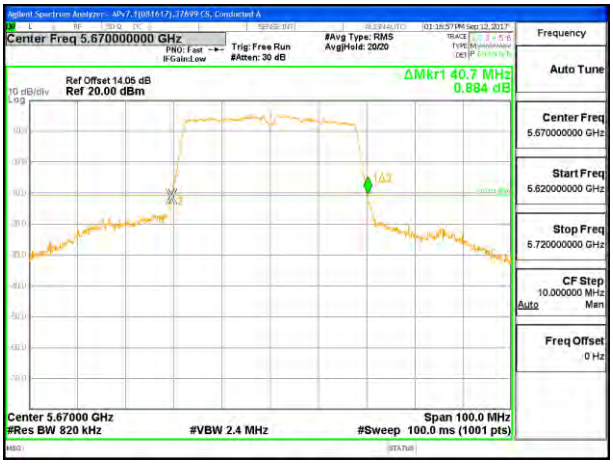


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

CHANNEL 142

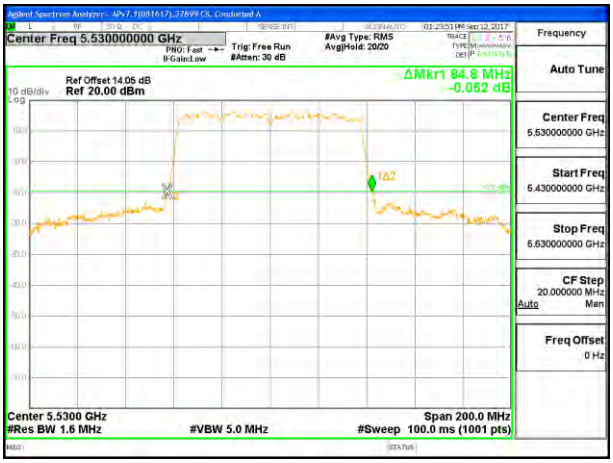
CHANNEL 142 CHAIN 0

CHANNEL 142 CHAIN 1

8.2.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

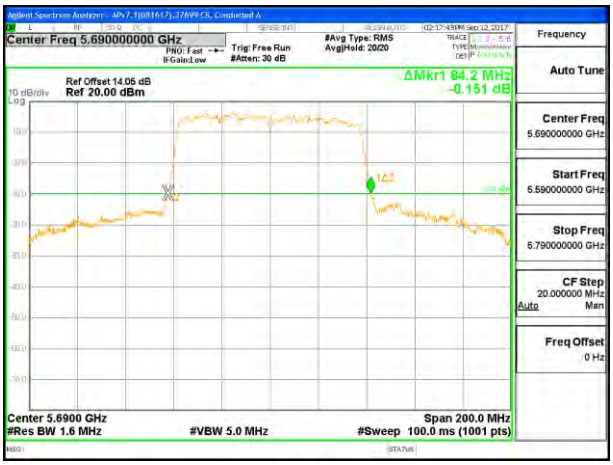
1TX Chain 0

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5530	84.80
High	5610	84.80
138	5690	84.20



LOW CHANNEL

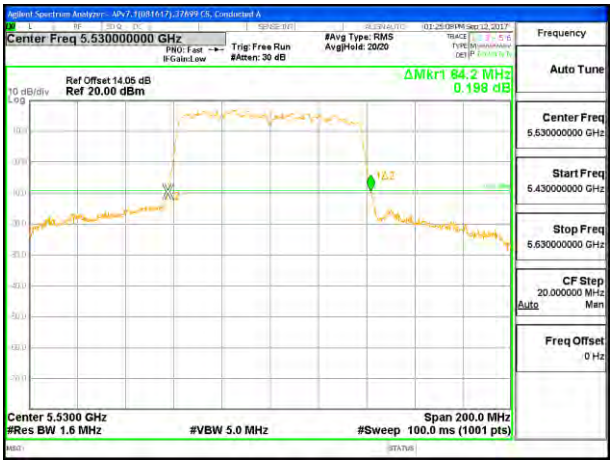
HIGH CHANNEL



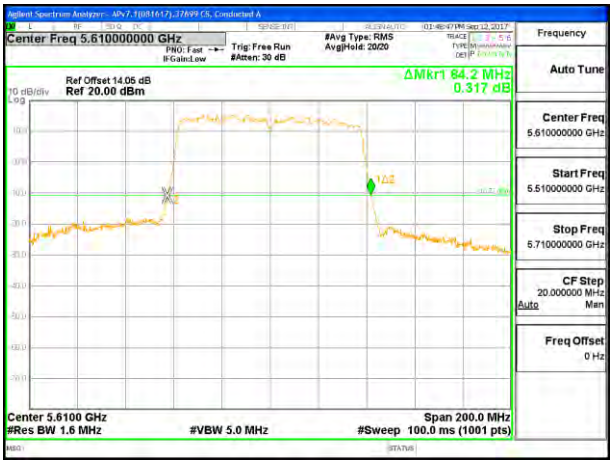
CHANNEL 138

1TX Chain 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5530	84.20
High	5610	84.20
138	5690	84.20



LOW CHANNEL



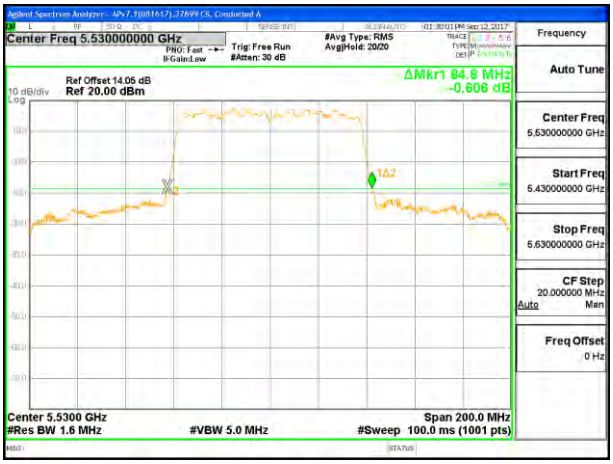
HIGH CHANNEL

CHANNEL 138

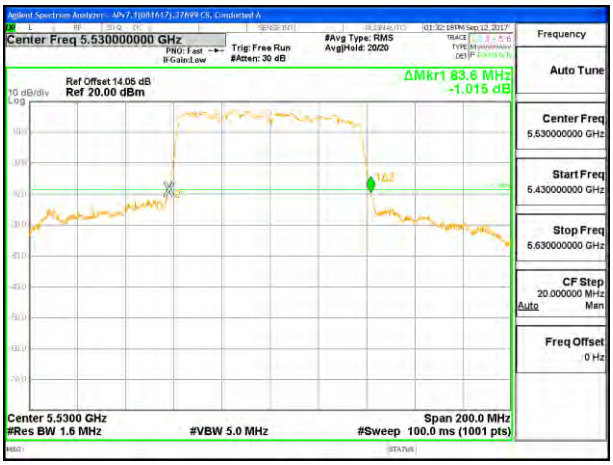
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5530	84.80	83.60
High	5610	84.60	83.60
138	5690	84.40	83.60

LOW CHANNEL

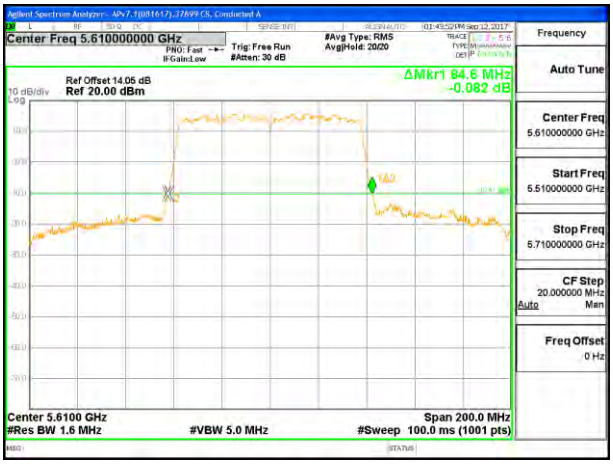


LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

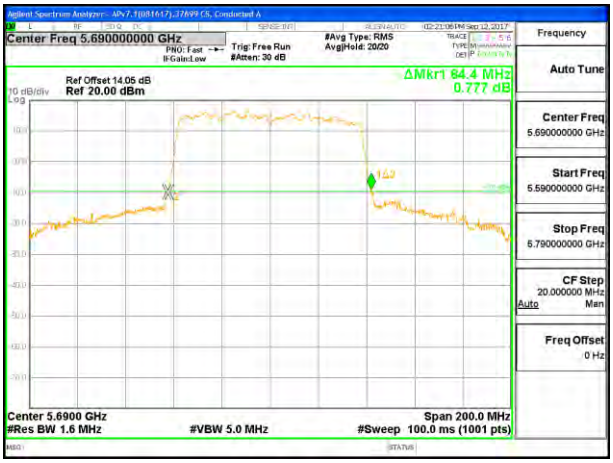
HIGH CHANNEL



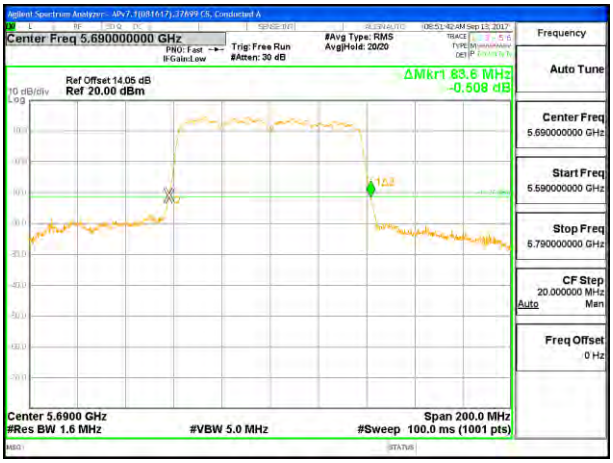
HIGH CHANNEL CHAIN 0

HIGH CHANNEL CHAIN 1

CHANNEL 138



CHANNEL 138 CHAIN 0

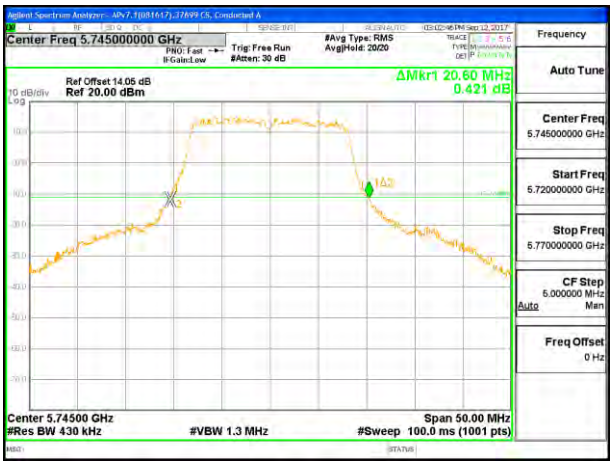


CHANNEL 138 CHAIN 1

8.2.13. 802.11a MODE IN THE 5.8 GHz BAND

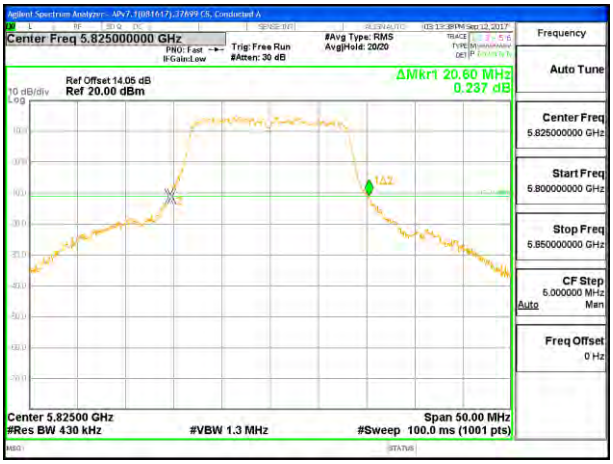
1TX Chain 0

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	20.60
Mid	5785	20.60
High	5825	20.60



LOW CHANNEL

MID CHANNEL



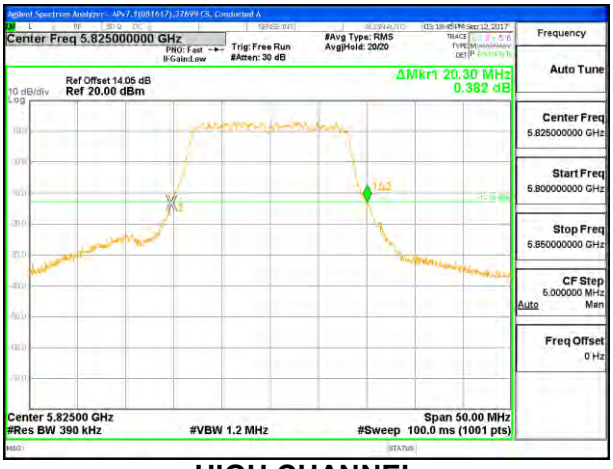
HIGH CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	20.35
Mid	5785	20.40
High	5825	20.30

LOW CHANNEL

MID CHANNEL

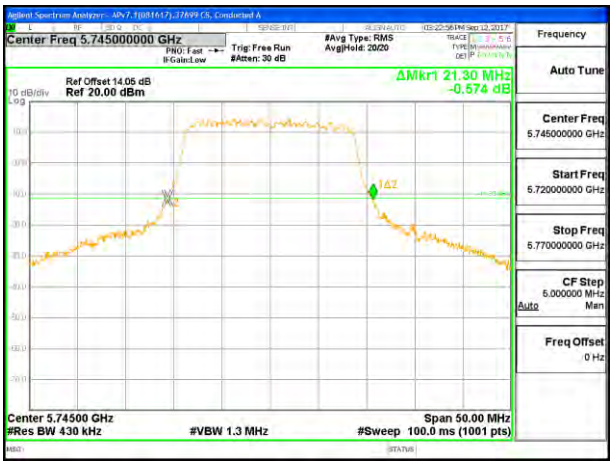


HIGH CHANNEL

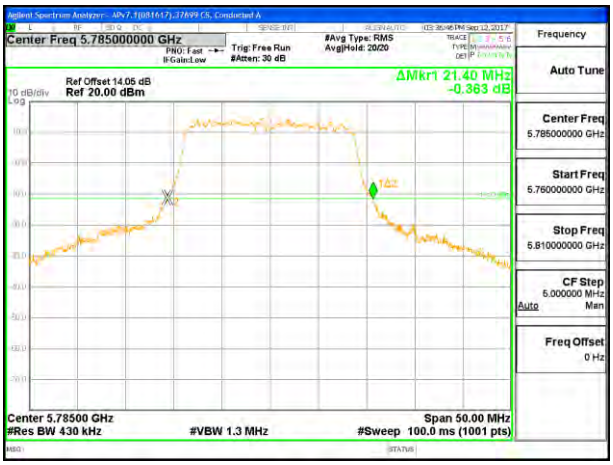
8.2.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

1TX Chain 0

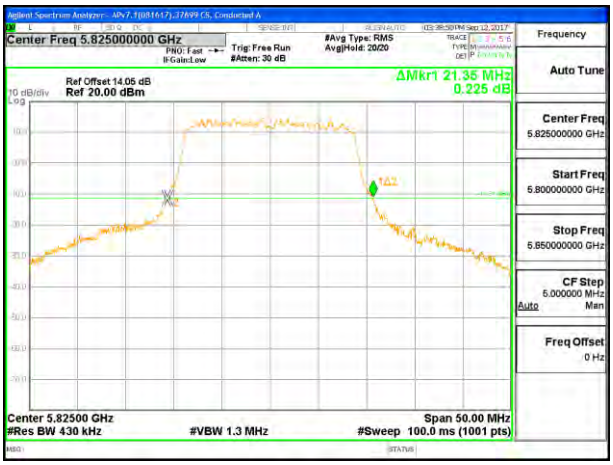
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	21.30
Mid	5785	21.40
High	5825	21.35



LOW CHANNEL



MID CHANNEL

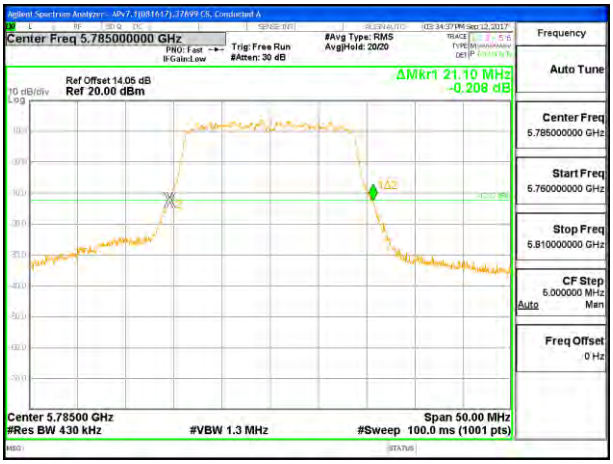


HIGH CHANNEL

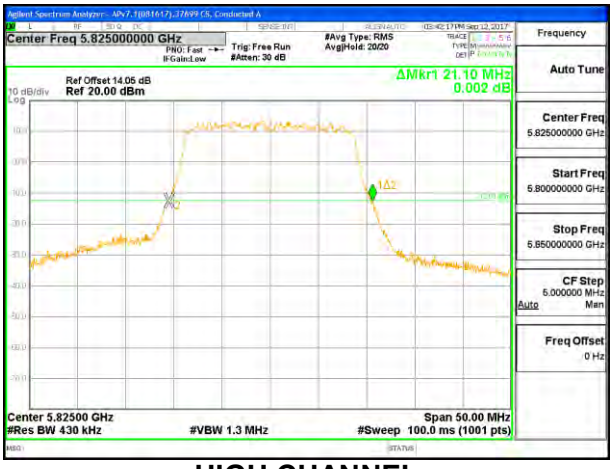
1TX Chain 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	21.00
Mid	5785	21.10
High	5825	21.10

LOW CHANNEL



MID CHANNEL

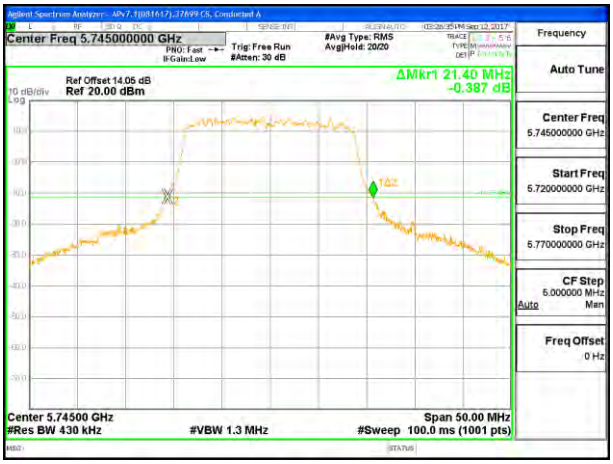


HIGH CHANNEL

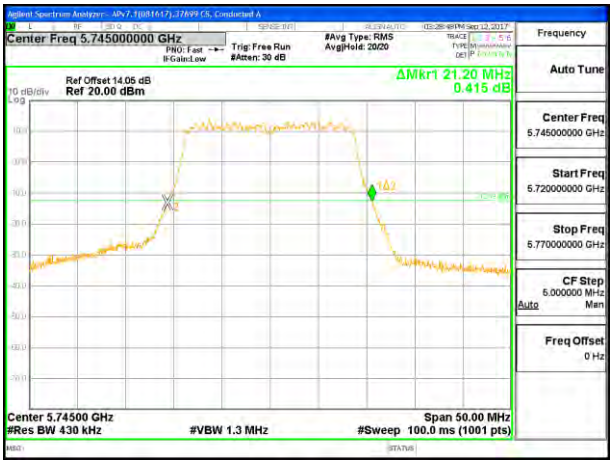
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5745	21.40	21.20
Mid	5785	21.30	20.85
High	5825	21.25	20.80

LOW CHANNEL

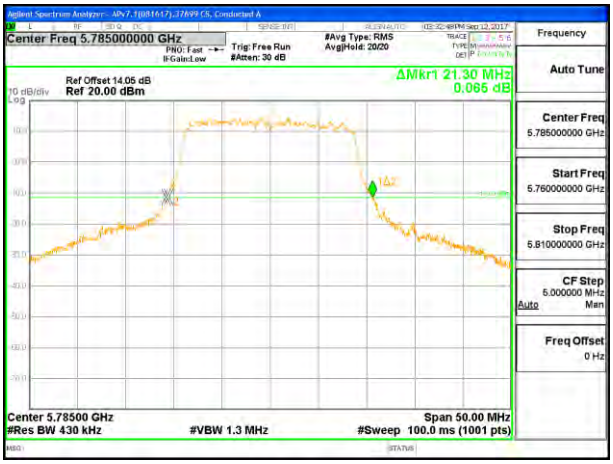


LOW CHANNEL CHAIN 0

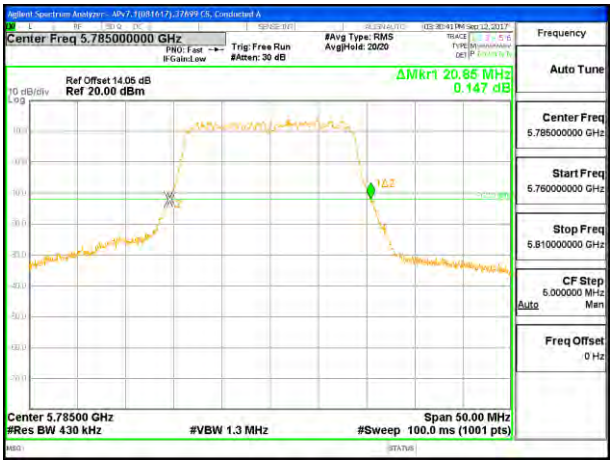


LOW CHANNEL CHAIN 1

MID CHANNEL

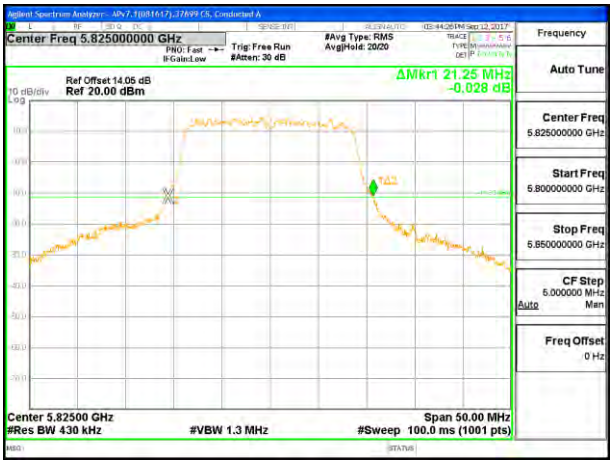


MID CHANNEL CHAIN 0

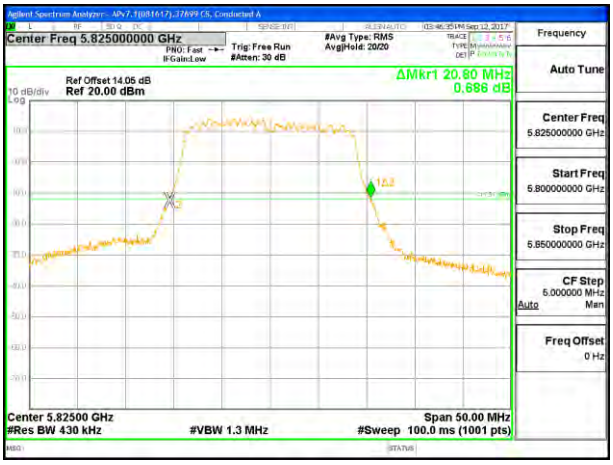


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0

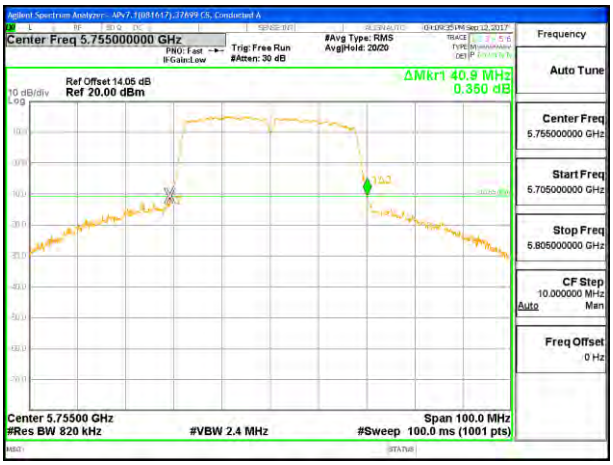


HIGH CHANNEL CHAIN 1

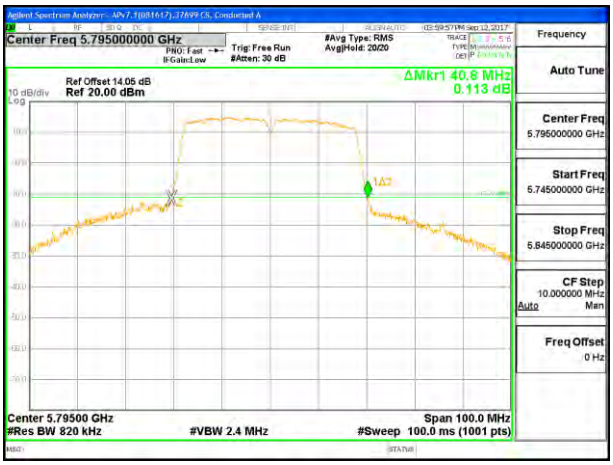
8.2.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5755	40.90
High	5795	40.80



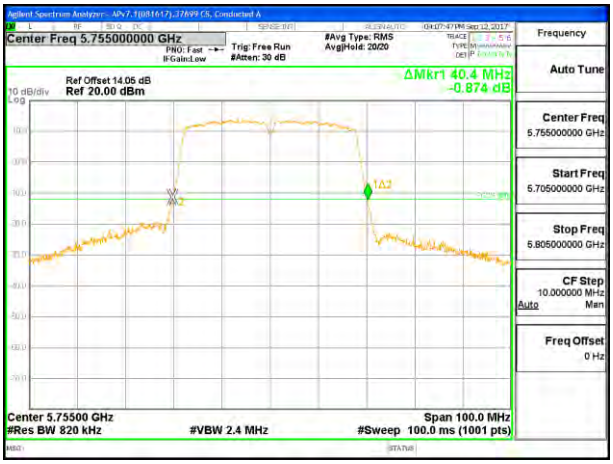
LOW CHANNEL



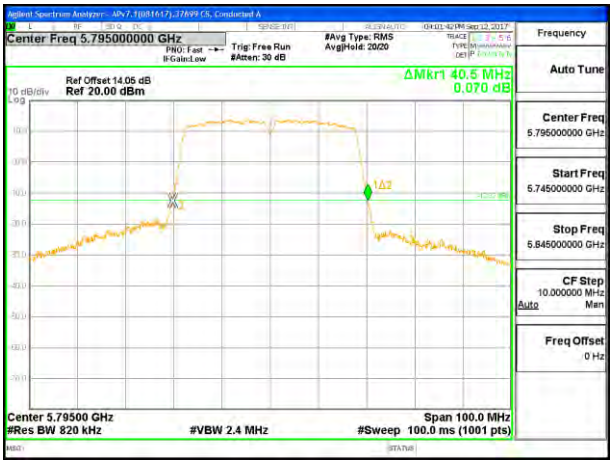
HIGH CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5755	40.40
High	5795	40.50



LOW CHANNEL

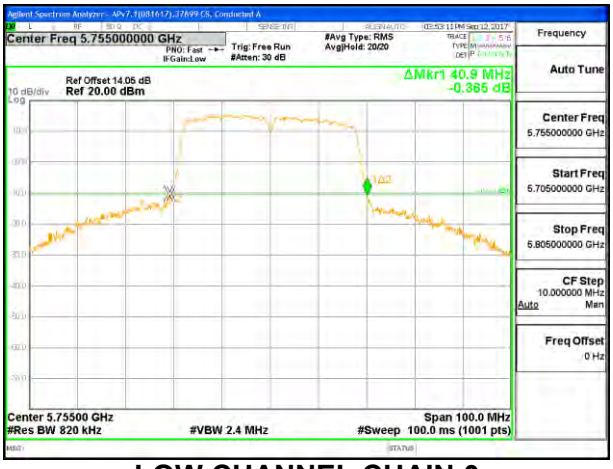


HIGH CHANNEL

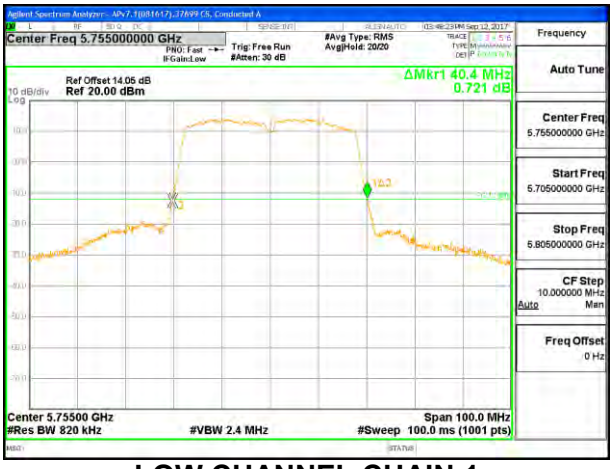
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5755	40.90	40.40
High	5795	41.10	40.30

LOW CHANNEL



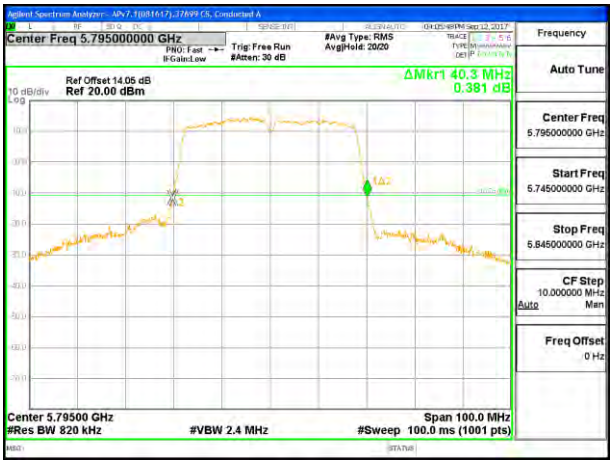
LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

HIGH CHANNEL

HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

8.2.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

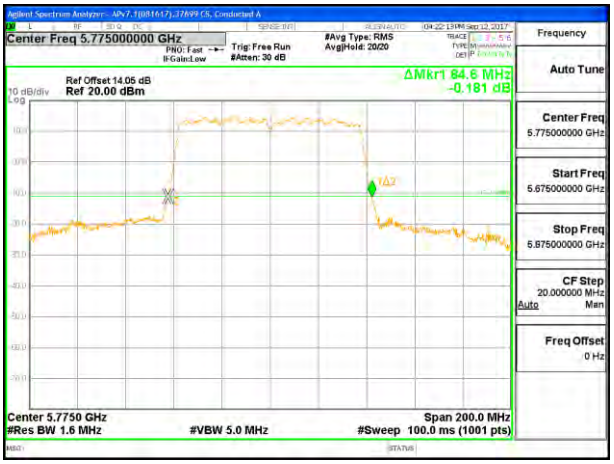
1TX Chain 0

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5775	84.00

MID CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5775	84.60



MID CHANNEL

2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5775	84.20	83.80

MID CHANNEL

MID CHANNEL CHAIN 0

MID CHANNEL CHAIN 1

8.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

8.3.1. 802.11a MODE IN THE 5.2 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.5130
Mid	5200	16.4930
High	5240	16.5450

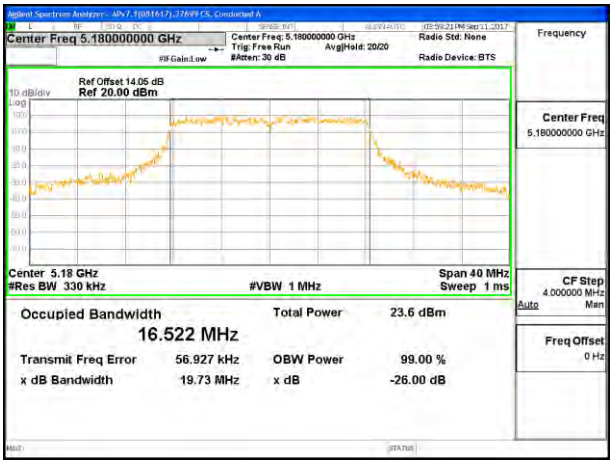
LOW CHANNEL

MID CHANNEL

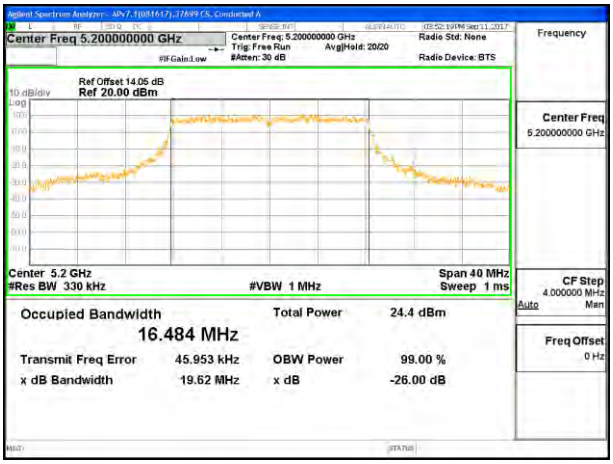
HIGH CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.5220
Mid	5200	16.4840
High	5240	16.5420



LOW CHANNEL



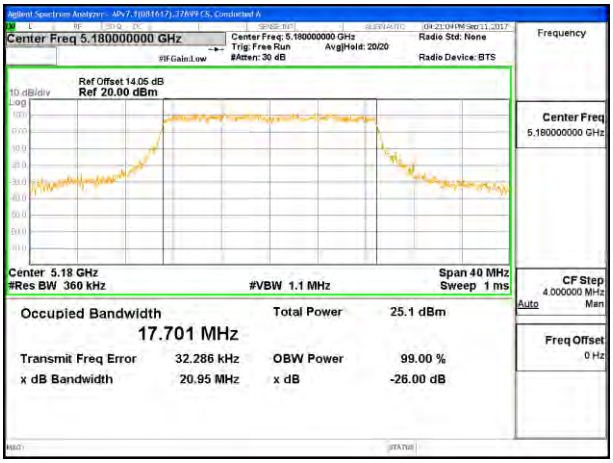
MID CHANNEL

HIGH CHANNEL

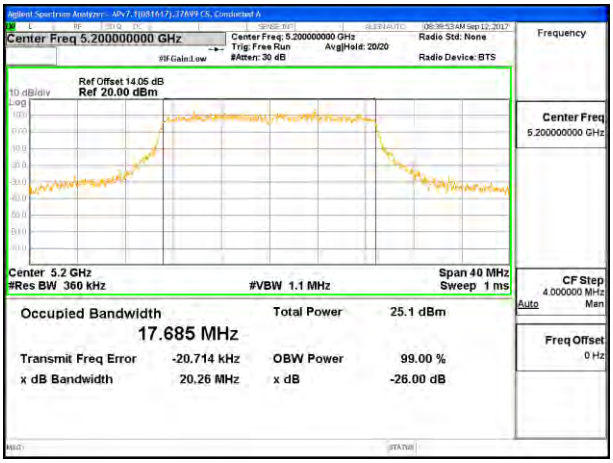
8.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

1TX Chain 0

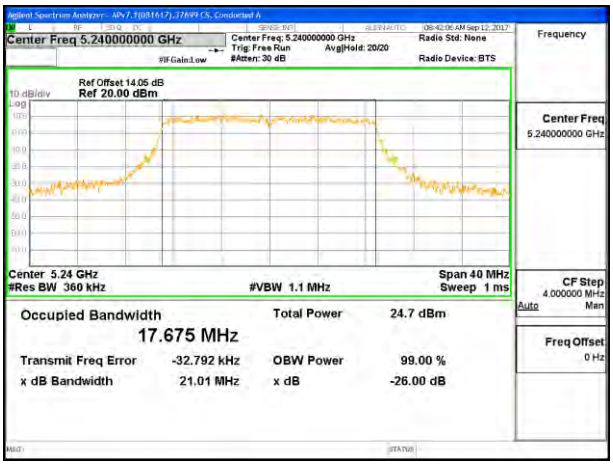
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.7010
Mid	5200	17.6850
High	5240	17.6750



LOW CHANNEL



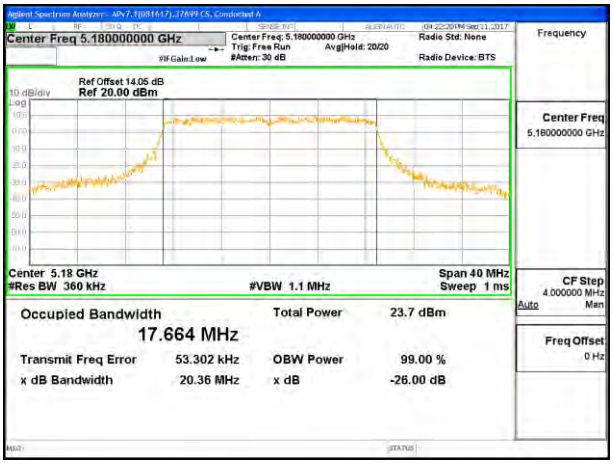
MID CHANNEL



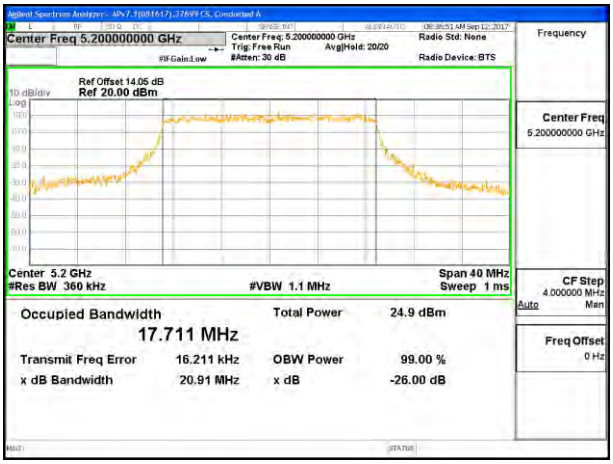
HIGH CHANNEL

1TX Chain 1

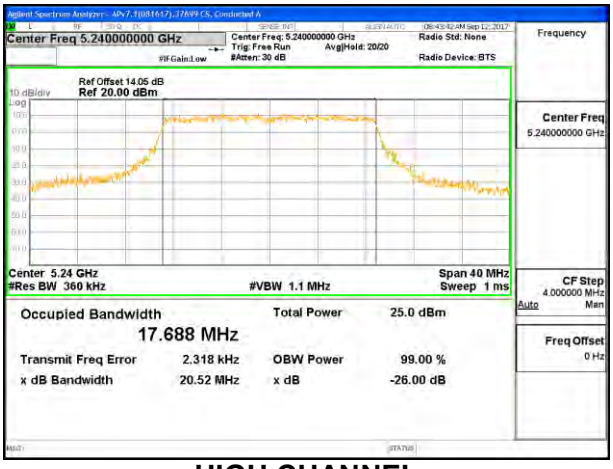
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.6640
Mid	5200	17.7110
High	5240	17.6880



LOW CHANNEL



MID CHANNEL

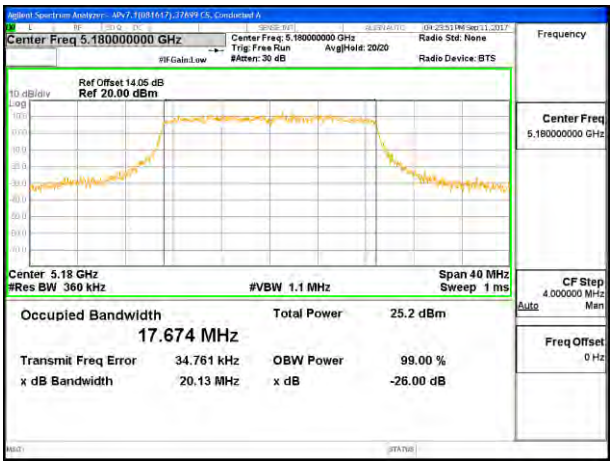


HIGH CHANNEL

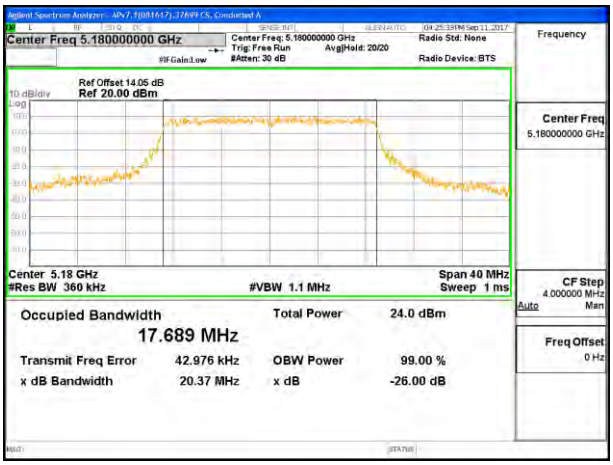
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5180	17.6740	17.6890
Mid	5200	17.7010	17.7090
High	5240	17.6800	17.7530

LOW CHANNEL

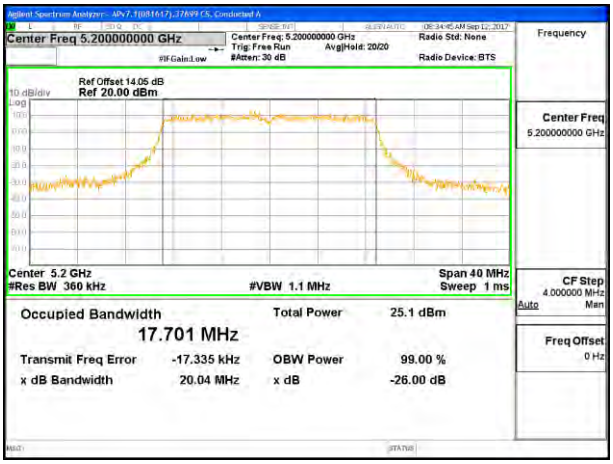


LOW CHANNEL CHAIN 0

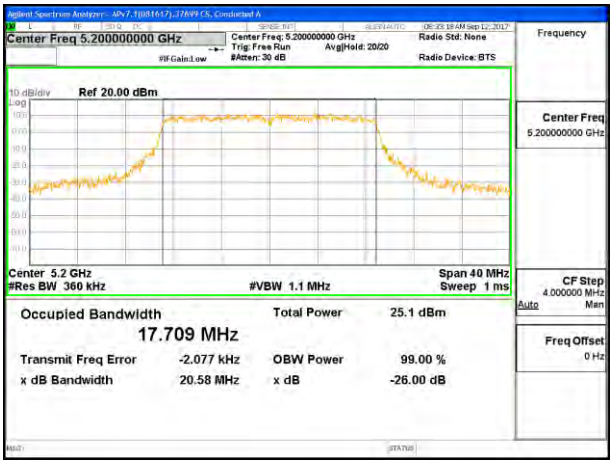


LOW CHANNEL CHAIN 1

MID CHANNEL

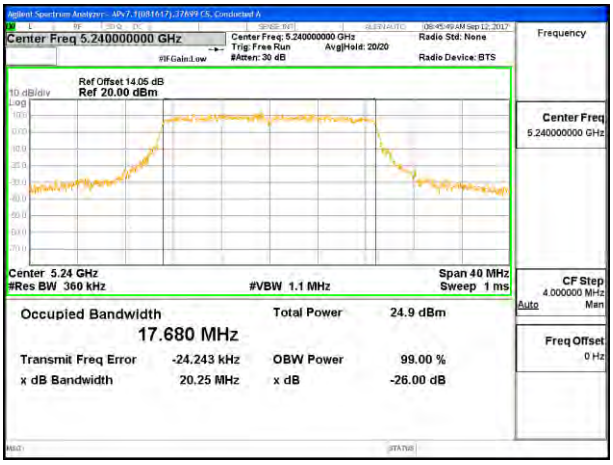


MID CHANNEL CHAIN 0

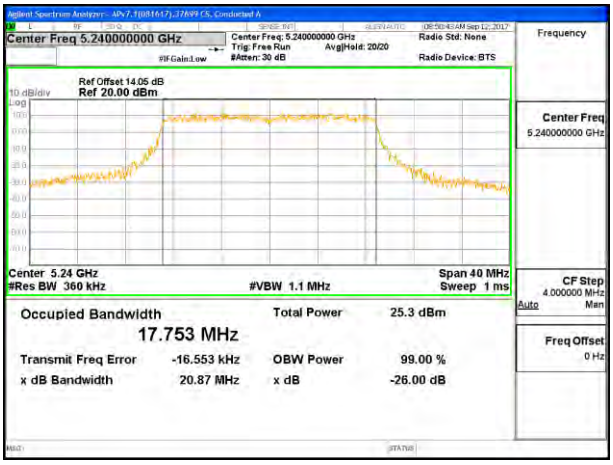


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0

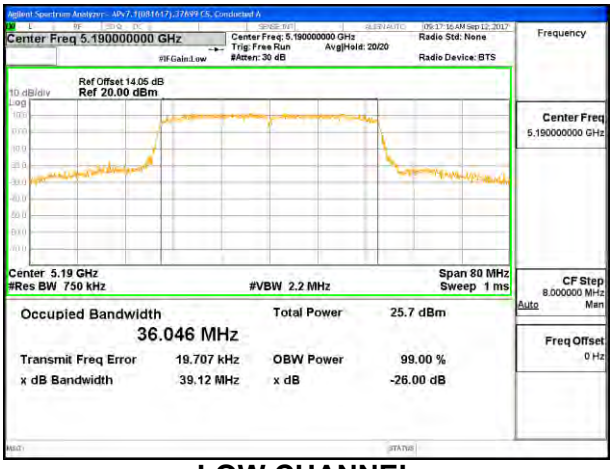


HIGH CHANNEL CHAIN 1

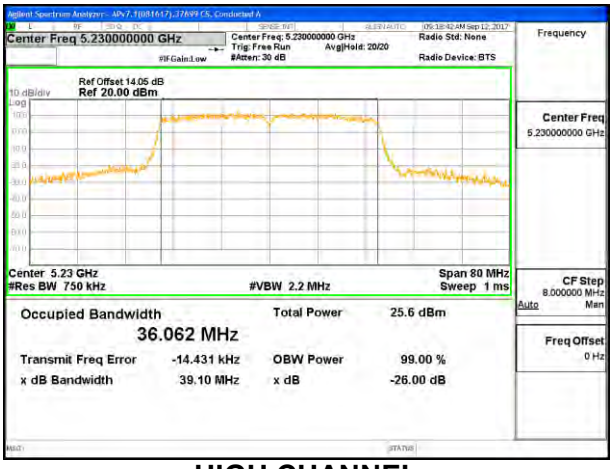
8.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.0460
High	5230	36.0620



LOW CHANNEL



HIGH CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.1140
High	5230	36.1800

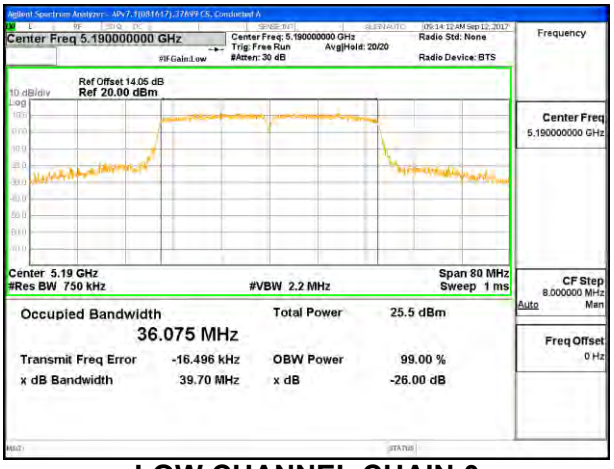
LOW CHANNEL

HIGH CHANNEL

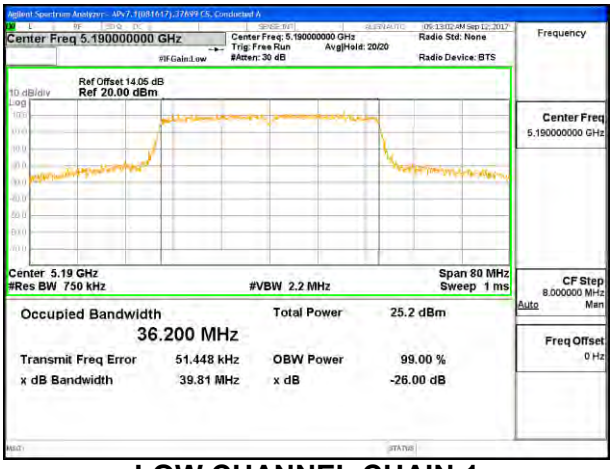
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5190	36.0750	36.2000
High	5230	36.0520	36.1600

LOW CHANNEL

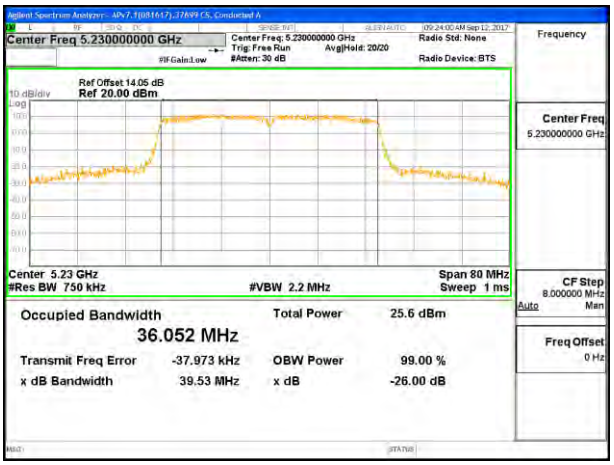


LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0

HIGH CHANNEL CHAIN 1

8.3.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5210	76.1210

MID CHANNEL

1TX Chain 1

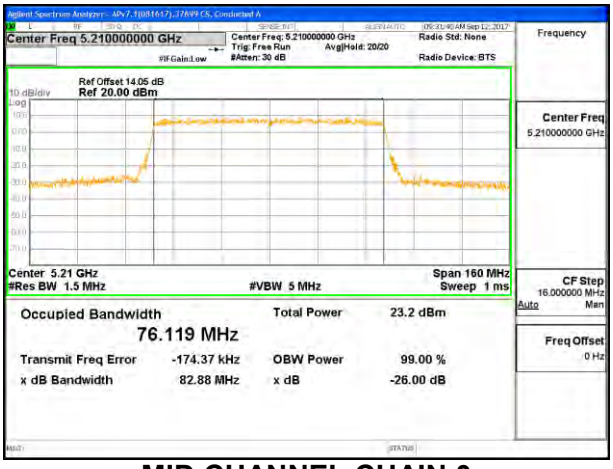
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5210	76.0530

MID CHANNEL

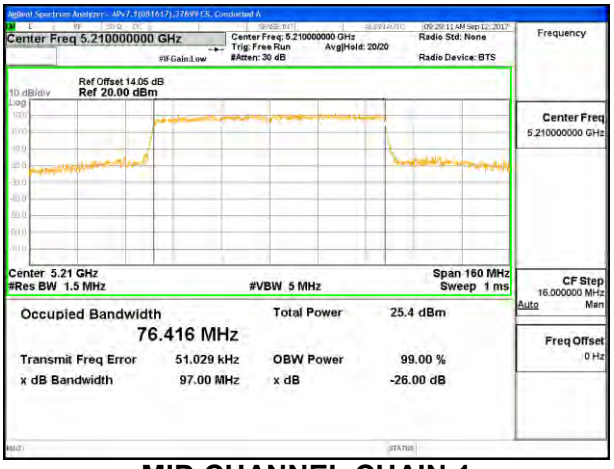
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Mid	5210	76.1190	76.4160

MID CHANNEL



MID CHANNEL CHAIN 0



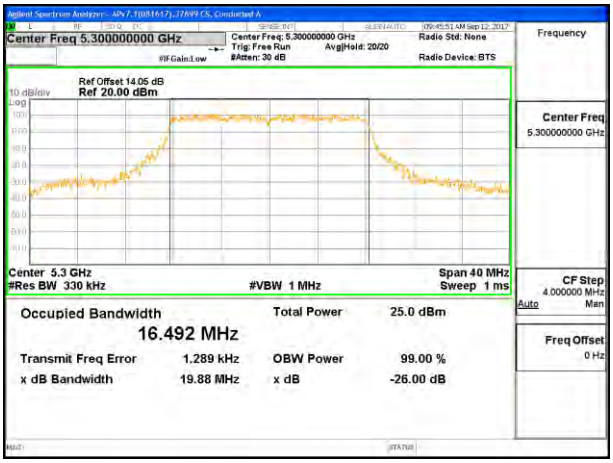
MID CHANNEL CHAIN 1

8.3.5. 802.11a MODE IN THE 5.3 GHz BAND

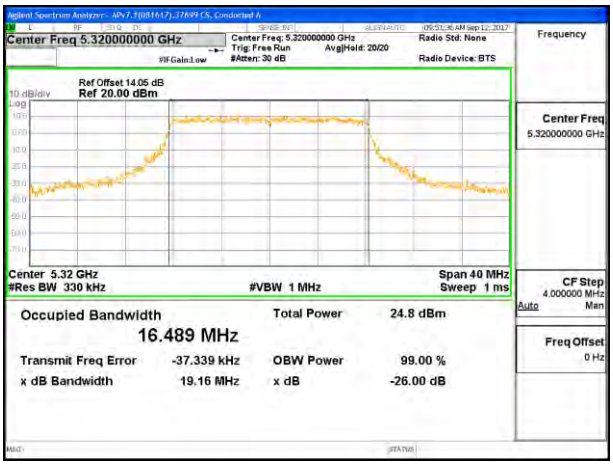
1TX Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.4980
Mid	5300	16.4920
High	5320	16.4890

LOW CHANNEL



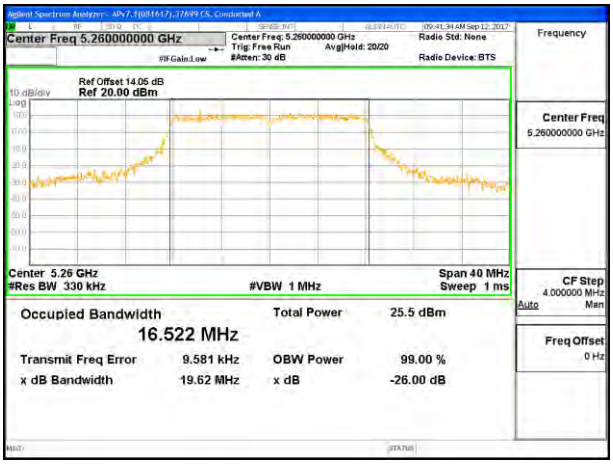
MID CHANNEL



HIGH CHANNEL

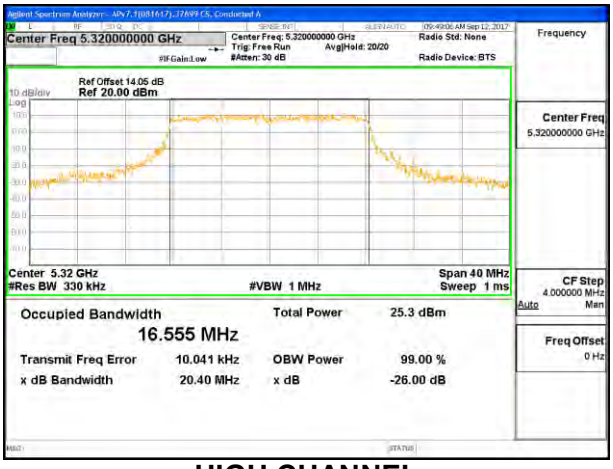
1TX Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.5220
Mid	5300	16.5230
High	5320	16.5550



LOW CHANNEL

MID CHANNEL



HIGH CHANNEL

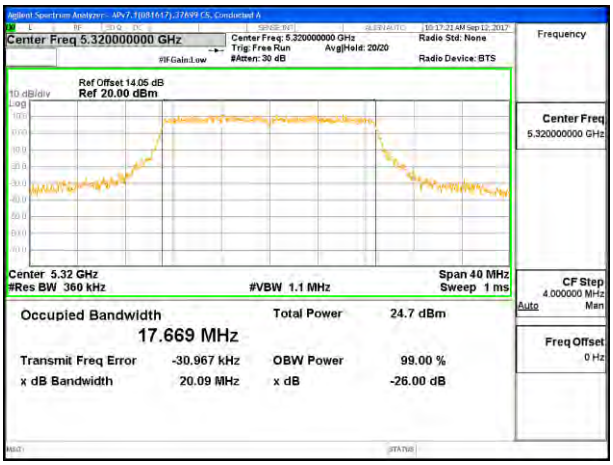
8.3.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.7200
Mid	5300	17.6760
High	5320	17.6690

LOW CHANNEL

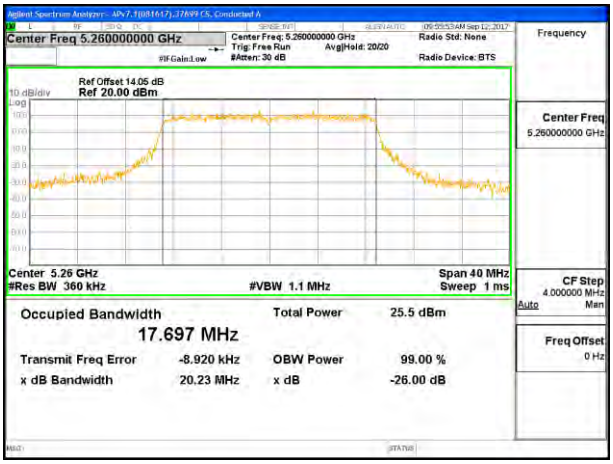
MID CHANNEL



HIGH CHANNEL

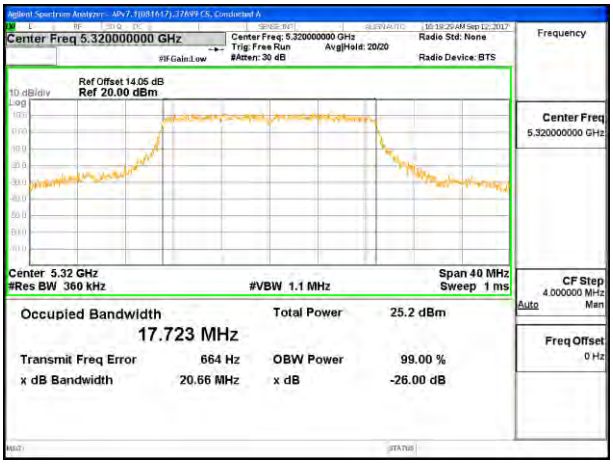
1TX Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.6970
Mid	5300	17.7080
High	5320	17.7230



LOW CHANNEL

MID CHANNEL

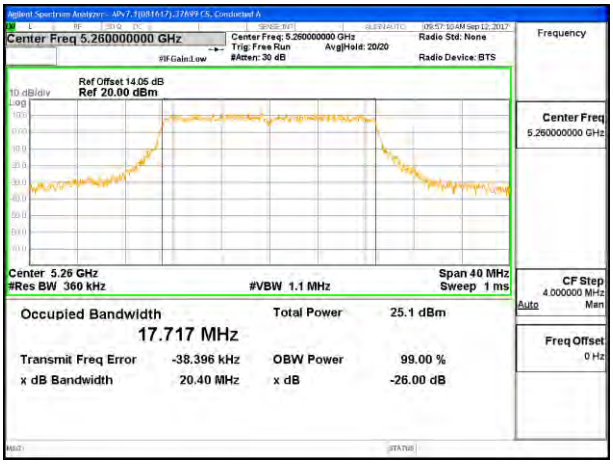


HIGH CHANNEL

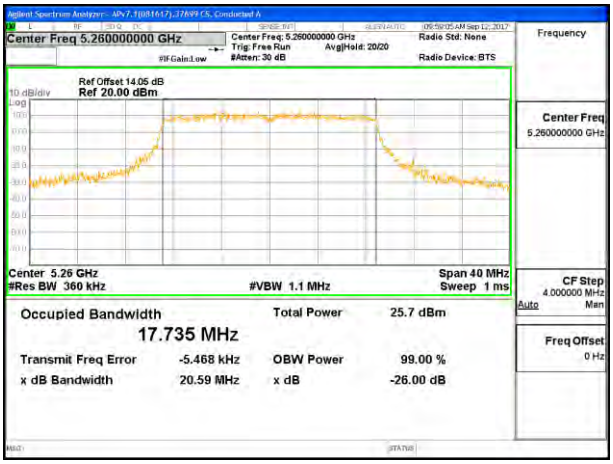
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5260	17.7170	17.7350
Mid	5300	17.7030	17.7420
High	5320	17.7040	17.7210

LOW CHANNEL

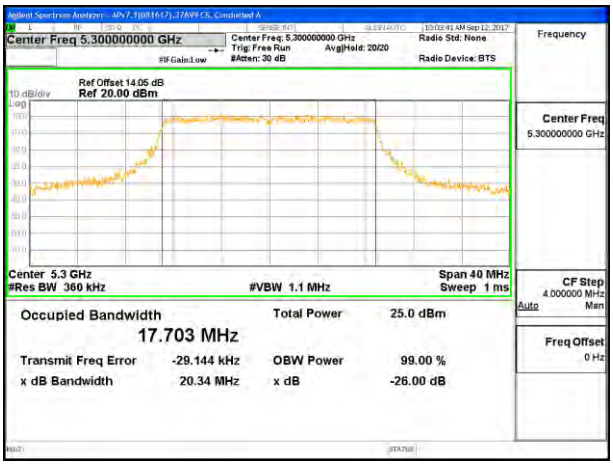


LOW CHANNEL CHAIN 0

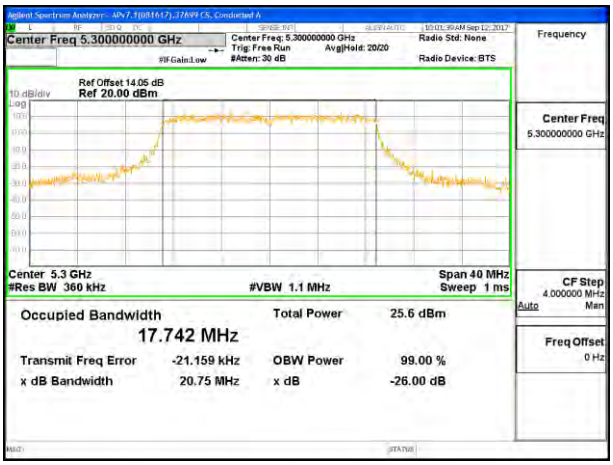


LOW CHANNEL CHAIN 1

MID CHANNEL

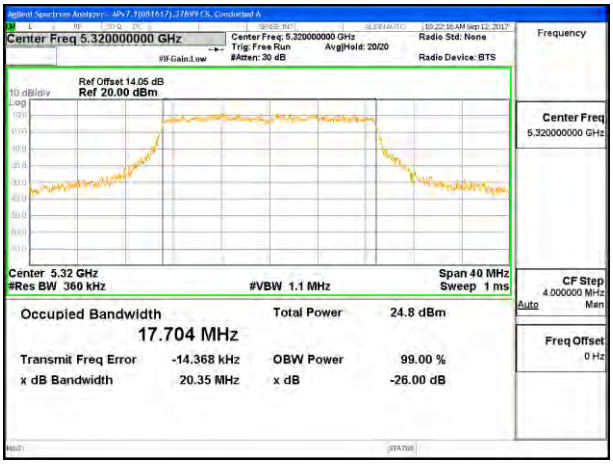


MID CHANNEL CHAIN 0

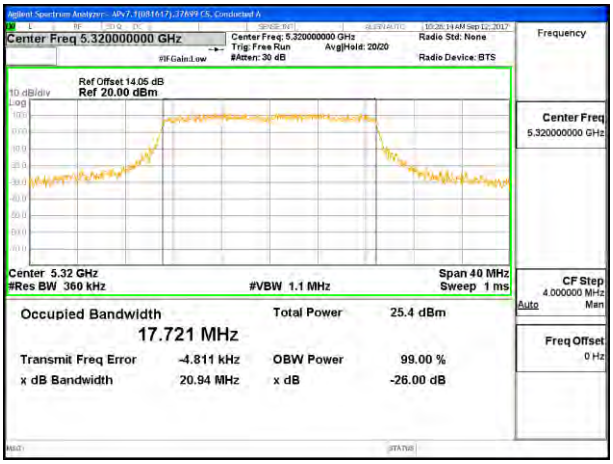


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0

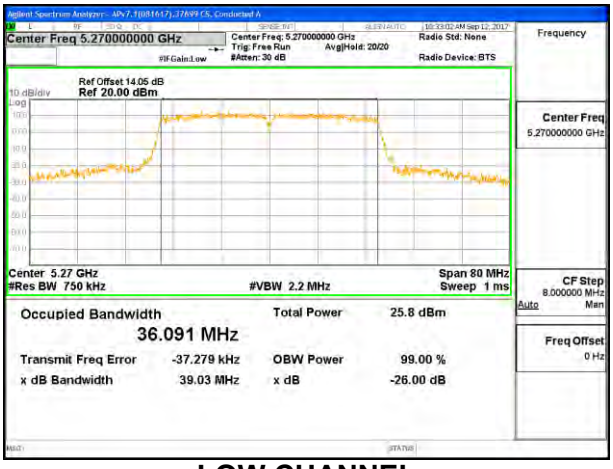


HIGH CHANNEL CHAIN 1

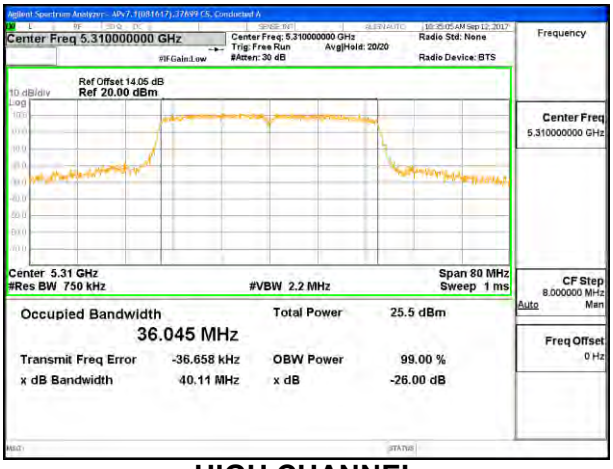
8.3.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.0910
High	5310	36.0450



LOW CHANNEL



HIGH CHANNEL

1TX Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.1260
High	5310	36.1980

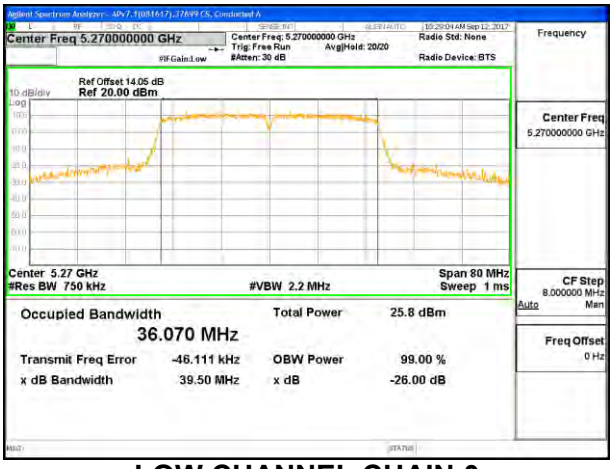
LOW CHANNEL

HIGH CHANNEL

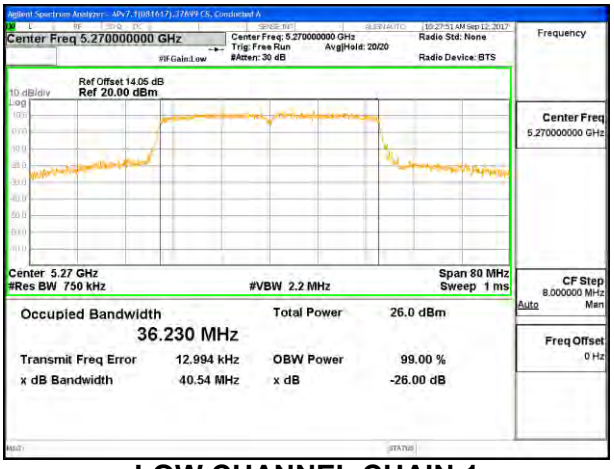
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5270	36.0700	36.2300
High	5310	36.0910	36.2130

LOW CHANNEL

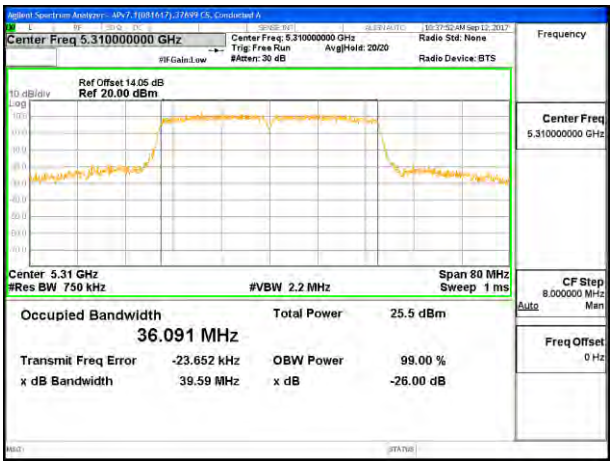


LOW CHANNEL CHAIN 0

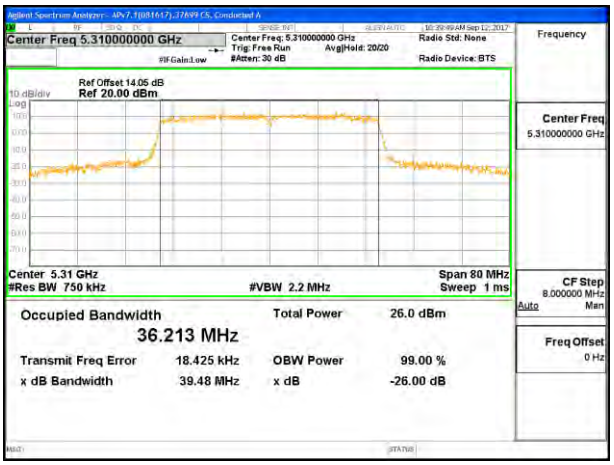


LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0

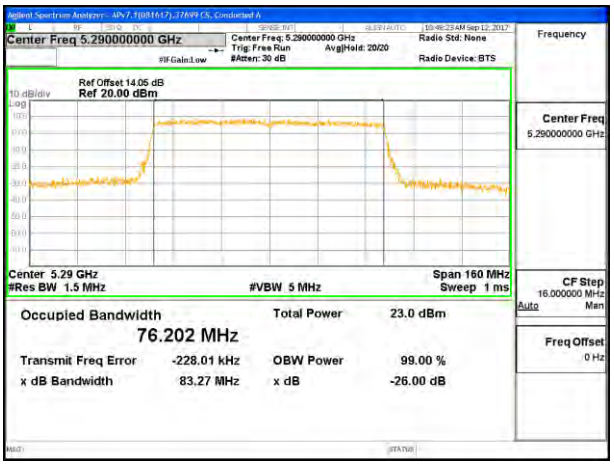


HIGH CHANNEL CHAIN 1

8.3.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

1TX Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5290	76.2020



MID CHANNEL

1TX Chain 1

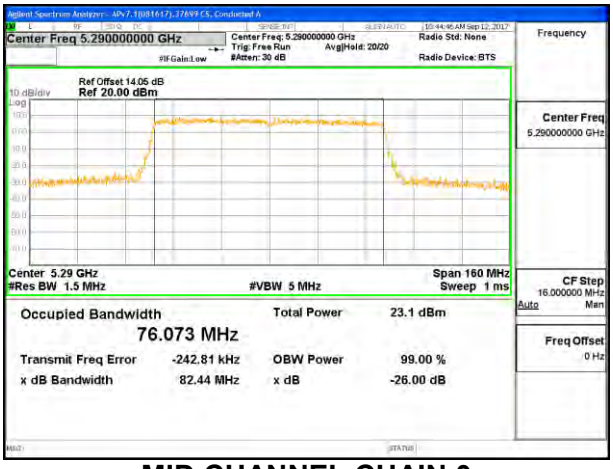
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5290	76.1740

MID CHANNEL

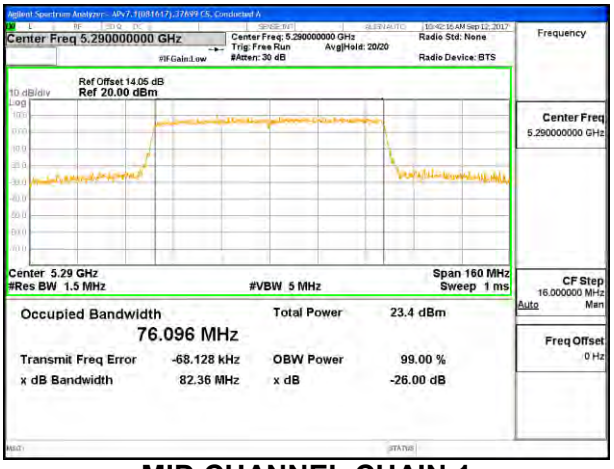
2TX Chain 0 + Chain 1 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Mid	5290	76.0730	76.0960

MID CHANNEL



MID CHANNEL CHAIN 0

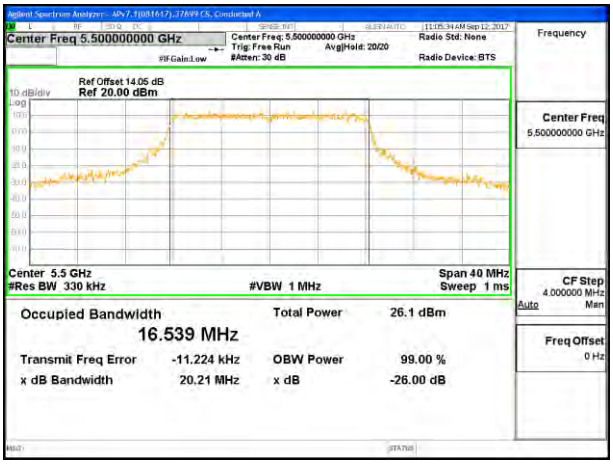


MID CHANNEL CHAIN 1

8.3.9. 802.11a MODE IN THE 5.6 GHz BAND

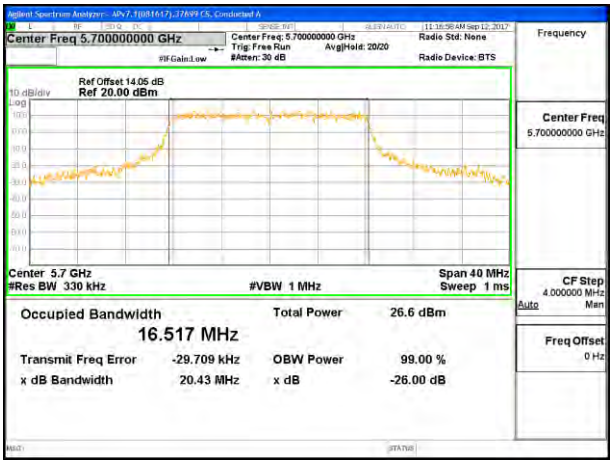
1TX Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.5390
Mid	5580	16.5050
High	5700	16.5170
144	5720	16.5010



LOW CHANNEL

MID CHANNEL



HIGH CHANNEL

CHANNEL 144

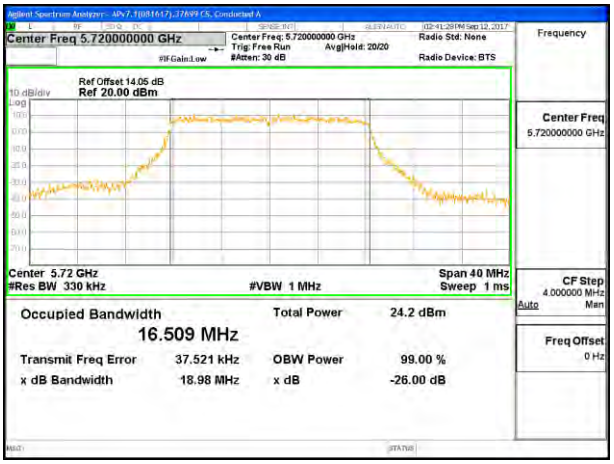
1TX Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.5550
Mid	5580	16.5100
High	5700	16.4900
144	5720	16.5090

LOW CHANNEL

MID CHANNEL

HIGH CHANNEL

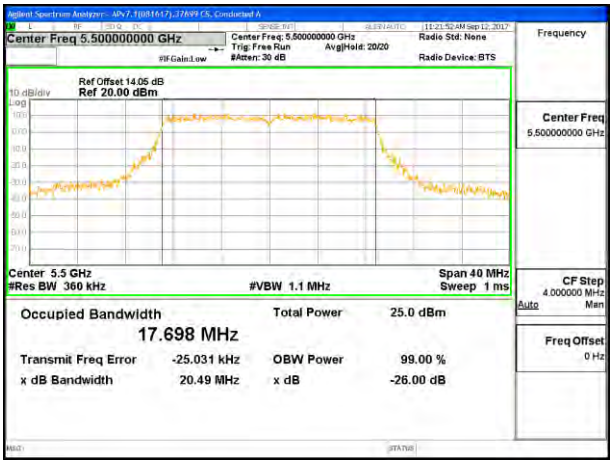


CHANNEL 144

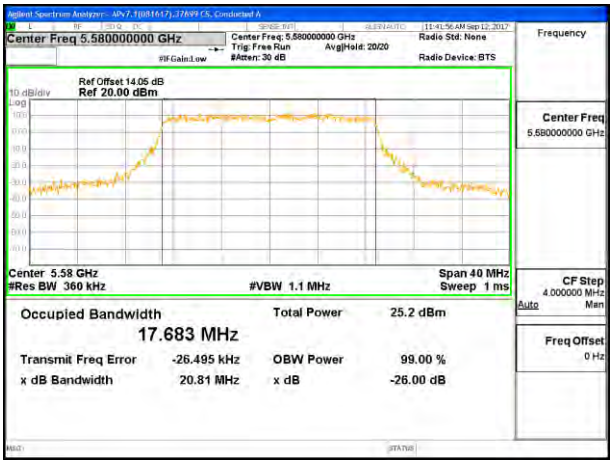
8.3.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

1TX Chain 0

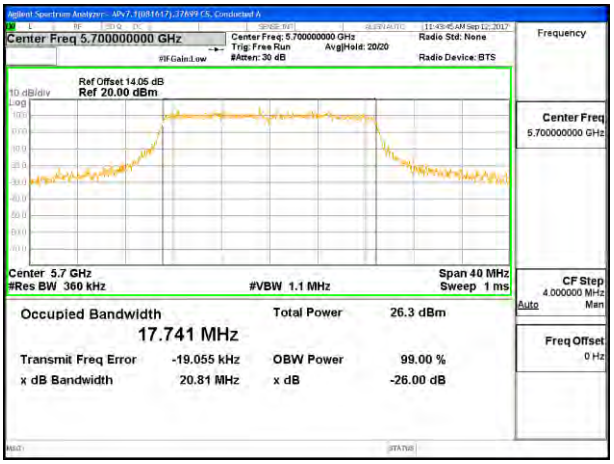
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.6980
Mid	5580	17.6830
High	5700	17.7410
144	5720	17.7290



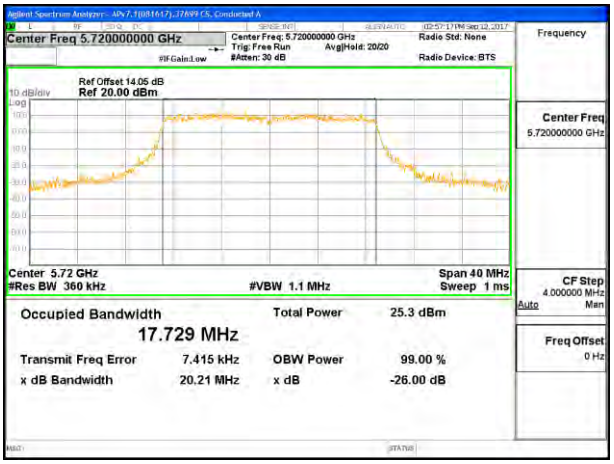
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



CHANNEL 144