

TEST REPORT



CTK Co., Ltd.

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Report No.:
CTK-2019-04999
Page (1) / (173) Pages

1. Client

- Name : Samsung Electronics Co Ltd
- Address : 19 Chapin Rd, Building D. Pine Brook, New Jersey, United States
- Date of Receipt : 2019-11-19

2. Manufacturer

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea

3. Use of Report : For FCC Certification

4. Test Sample / Model: Wi-Fi/BT Transceiver / WCT730M, WCT733M, WCT734M

5. Date of Test : 2019-11-20 to 2019-12-18

6. Test Standard(method) used : FCC 47 CFR part 15 subpart C 15.407

7. Testing Environment: Temp.: (24 ± 1) °C, Humidity: (49 ± 3) % R.H

8. Test Results : Compliance

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full.

Affirmation	Tested by	Technical Manager
	Bongjun, Jang: (Signature)	Won-Jae, Hwang: (Signature)

2019-12-19

Republic of KOREA **CTK Co., Ltd.**



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REPORT REVISION HISTORY

Date	Revision	Page No
2019-12-19	Issued (CTK-2019-04999)	all

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1. General Product Description

1.1 Client Information

Company	Samsung Electronics Co., Ltd.
Contact Point	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea
Contact Person	Name : Minhyung Cho E-mail : mh719.cho@samsung.com Tel : +82-277-2688 Fax : -

1.2 Product Information

FCC ID	A3LWCT730M
IC	649E-WCT730M
Product Description	Wi-Fi/BT Transceiver
Model name	WCT730M
Variant Model name	WCT733M, WCT734M
Operating Frequency	UNII 1 : 5 180 MHz – 5 240 MHz (20 MHz_BW) 5 190 MHz – 5 230 MHz (40 MHz_BW) 5 210 MHz (80 MHz_BW) UNII 2A : 5 260 MHz – 5 320 MHz (20 MHz_BW) 5 270 MHz – 5 310 MHz (40 MHz_BW) 5 290 MHz (80 MHz_BW) UNII 2C : 5 500 MHz – 5 720 MHz (20 MHz_BW) 5 510 MHz – 5 710 MHz (40 MHz_BW) 5 530 MHz – 5 690 MHz (80 MHz_BW) UNII 3 : 5 745 MHz – 5 825 MHz (20 MHz_BW) 5 755 MHz – 5 795 MHz (40 MHz_BW) 5 775 MHz (80 MHz)
RF Output Power	802.11a : 18.07 dBm (64.12 mW) 802.11n_HT20 : 17.03 dBm (50.47 mW) 802.11n_HT40 : 16.99 dBm (50.00 mW) 802.11ac_VHT20 : 16.68 dBm (46.56 mW) 802.11ac_VHT40 : 16.66 dBm (46.34 mW) 802.11ac_VHT80 : 14.39 dBm (27.48 mW)
Antenna Specification	Antenna type : Chip Antenna Peak Gain (5 GHz) : 3.69 dBi (ANT-L), 1.21 dBi (ANT-R)
Type of Modulation	OFDM
Data Rate	802.11a : 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6 Mbps 802.11n : up to 300 Mbps 802.11ac : up to 867 Mbps
Power Source	DC 5 V
Hardware Rev	WCT730M, WCT733M : V2.1 WCT734M : V1.0
Software Rev	FC4

1.3 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Note Computer	HP	15-bs563TU	CND7253R6N
AC/DC Adapter	HP	HSTNN-CA40	-

1.4 Model Differences

Model Name	Type	Description
WCT730M	-	Basic model name, MIC parts mounted, acceleration sensor parts mounted
WCT733M	Type1	MIC parts not mounted, Acceleration sensor parts mounted
WCT733M	Type2	MIC parts not mounted, Acceleration sensor parts not mounted
WCT734M	Type1	MIC parts not mounted, Acceleration sensor parts mounted, IR sensor changed.
WCT734M	Type2	MIC parts not mounted, Acceleration sensor parts not mounted, IR sensor changed.

2. Facility and Accreditations

2.1 Test Facility

The measurement facility is located at (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea.

2.2 Laboratory Accreditations and Listings

Country	Agency	Registration Number
USA	FCC	805871
CANADA	ISED	8737A-2
KOREA	NRRA	KR0025

2.3 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

3. Test Specifications

3.1 Standards

FCC Part Section(s)	Requirement(s)	Limit	Status (Note 1)	Test Condition
15.407(e)	6 dB Bandwidth	> 500 kHz	C	Conducted
15.407(a)	26 dB Bandwidth and 99% Bandwidth	NA	C	
15.407(a)(1)	Conducted Output Power	< 250 mW (5 150 – 5 250 MHz) < 250 mW (5 250 – 5 350 MHz, 5 470 – 5 725 MHz) < 1 W (5 725 – 5 850 MHz)	C	
15.407(a)(1)	Power Spectral Density	< 11 dBm/MHz (5 150 – 5 250 MHz) < 11 dBm/MHz (5 250 – 5 350 MHz, 5 470 – 5 725 MHz) < 30 dBm/500 KHz (5 725 – 5 850 MHz)	C	
15.407(g)	Frequency Stability	NA	C	
15.407 (b)	Undesirable emission	< -27 dBm/MHz EIRP (5 150 – 5 250 MHz, 5250 – 5350 MHz, 5470 – 5725 MHz) < -17 dBm/MHz EIRP (5715 – 5725 MHz, 5 850 – 5 860 MHz) < -27 dBm/MHz EIRP outside (5 715 – 5 850 MHz)	C	Radiated
15.205, 15.407 (b)(5),(6)	Radiated Spurious Emission	15.209(a)	C	
15.207	AC Conducted Emissions	15.207(a)	C	Line Conducted
<u>Note 1:</u> C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable				
<u>Note 2:</u> The data in this test report are traceable to the national or international standards.				
<u>Note 3:</u> The sample was tested according to the following specification: FCC Part 15.247, ANSI C63.10-2013				
<u>Note 4:</u> The tests were performed according to the method of measurements prescribed in KDB No.789033.				

3.2 Mode of operation during the test

The EUT is operated in a manner representative of the typical of the equipments.
During at testing, system components were manipulated within the confines of typical usage to maximize each emission.

For WLAN function, the engineering test program was provided and enabled to make EUT continuous transmit.

All modulation modes were tests. The results are only attached worst cases.

Test Frequency

- 802.11a, 802.11n_HT20, 802.11ac_VHT20

	Lowest channel	Middle channel	Highest channel
UNII 1	5 180 MHz	5 200 MHz	5 240 MHz
UNII 2A	5 260 MHz	5 300 MHz	5 320 MHz
UNII 2C	5 500 MHz	5 600 MHz	5 720 MHz
UNII 3	5 745 MHz	5 785 MHz	5 825 MHz

- 802.11n_HT40, 802.11ac_VHT40

	Lowest channel	Middle channel	Highest channel
UNII 1	5 190 MHz	-	5 230 MHz
UNII 2A	5 270 MHz	-	5 310 MHz
UNII 2C	5 510 MHz	5 590 MHz	5 710 MHz
UNII 3	5 755 MHz	-	5 795 MHz

- 802.11ac_VHT80

	Lowest channel	Middle channel	Highest channel
UNII 1	5 210 MHz	-	-
UNII 2A	5 290 MHz	-	-
UNII 2C	5 530 MHz	-	5 690 MHz
UNII 3	5 775 MHz	-	-

Test mode

Test mode	Modulation	Data rate	Duty Cycle	Duty Cycle Factor
802.11a	DSSS	1 Mbps	97.2 %	0.12 dB
802.11n_HT20	OFDM	MCS 0	97.0 %	0.13 dB
802.11n_HT40	OFDM	MCS 0	93.7 %	0.28 dB
802.11ac_VHT20	OFDM	MNSS 0	94.0 %	0.27 dB
802.11ac_VHT40	OFDM	MNSS 0	89.1 %	0.50 dB
802.11ac_VHT80	OFDM	MNSS 0	84.6 %	0.73 dB

3.3 Device Modifications

The following modifications were necessary for compliance:

Not applicable

3.4 Maximum Measurement Uncertainty

The value of the measurement uncertainty for the measurement of each parameter.
Coverage factor $k = 2$, Confidence levels of 95 %

Description	Uncertainty
Conducted RF Output Power	± 1.5 dB
Power Spectral Density	± 1.5 dB
Occupied Bandwidth	± 0.1 MHz
Unwanted Emission(conducted)	± 3.0 dB
Radiated Emissions ($f \leq 1$ GHz)	± 4.0 dB
Radiated Emissions ($f > 1$ GHz)	± 5.0 dB

3.5 Test Software

Conducted Test	Ics Pro Ver. 6.0.3
Radiated Test	TOYO EMI software EP5RE Ver. 6.0.1.0
Line Conducted Test	ESCI7, ESCI3 : EMC32 Ver. 8.50.0 ESR7 : EMC32 Ver. 8.53.0

4. Technical Characteristic Test

4.1 6dB Bandwidth

Test Procedures

KDB 789033 – Section C.2
ANSI C63.10-2013 - Section 6.9.2

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Settings :

Center frequency = the highest, middle and the lowest channels

- | | |
|--|----------------------------|
| a) RBW = 100 kHz | b) VBW $\geq 3 \times$ RBW |
| c) Detector = peak | d) Trace mode = Max hold |
| e) Sweep = auto couple | |
| f) Allow trace to fully stabilize | |
| g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. | |

Minimum Standard:

6 dB Bandwidth > 500 kHz

Test Data:

ANT-L

	6 dB Bandwidth (MHz)		
Mode	802.11a	802.11n_HT20	802.11ac_VHT20
Frequency			
5 745 MHz	15.33	15.12	15.68
5 785 MHz	15.04	16.02	15.71
5 825 MHz	15.34	15.40	15.70
Measurement uncertainty	± 0.1 MHz		

	6 dB Bandwidth (MHz)	
Mode	802.11n_HT40	802.11ac_VHT40
Frequency		
5 755 MHz	35.15	35.35
5 795 MHz	35.17	35.13
Measurement uncertainty	± 0.1 MHz	

	6 dB Bandwidth (MHz)
Mode	802.11ac_VHT80
Frequency	
5 775 MHz	76.36
Measurement uncertainty	± 0.1 MHz

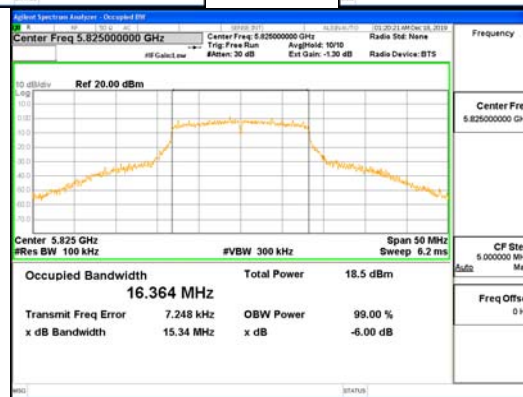
ANT-R

	6 dB Bandwidth (MHz)		
Mode	802.11a	802.11n_HT20	802.11ac_VHT20
Frequency			
5 745 MHz	16.31	15.92	15.13
5 785 MHz	15.41	16.51	15.10
5 825 MHz	15.04	16.54	16.34
Measurement uncertainty	± 0.1 MHz		

	6 dB Bandwidth (MHz)	
Mode	802.11n_HT40	802.11ac_VHT40
Frequency		
5 755 MHz	35.96	35.16
5 795 MHz	36.29	35.15
Measurement uncertainty	± 0.1 MHz	

	6 dB Bandwidth (MHz)
Mode	802.11ac_VHT80
Frequency	
5 775 MHz	76.40
Measurement uncertainty	± 0.1 MHz

See next pages for actual measured spectrum plots.



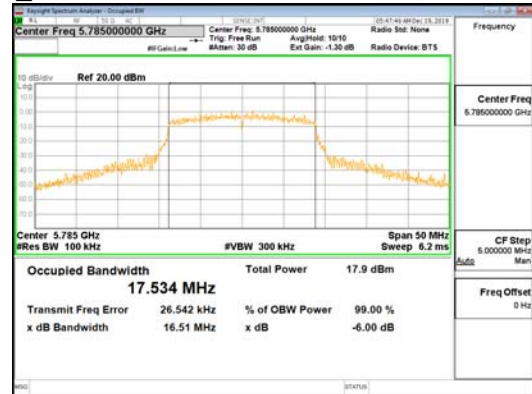
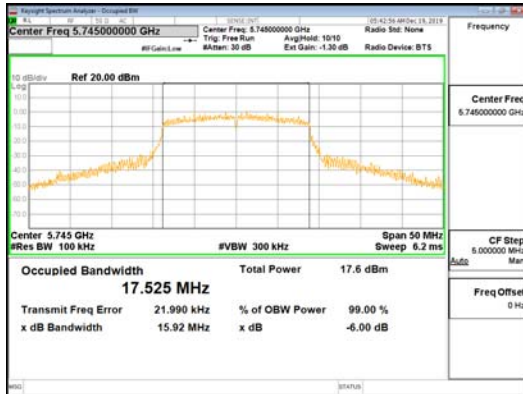
ANT-L_802.11a



ANT-R_802.11a



ANT-L_802.11n_HT20



ANT-R_802.11n_HT20



ANT-L_802.11ac_VHT20



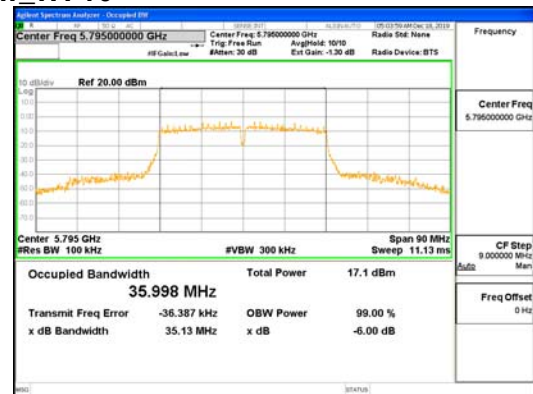
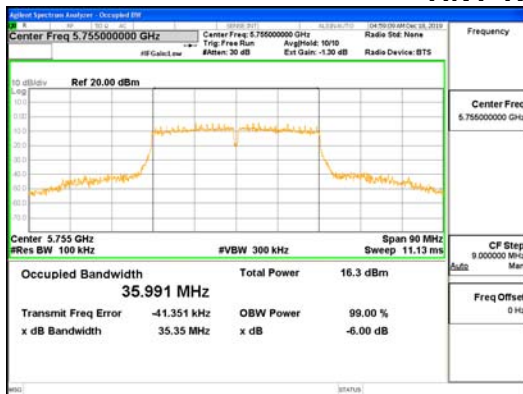
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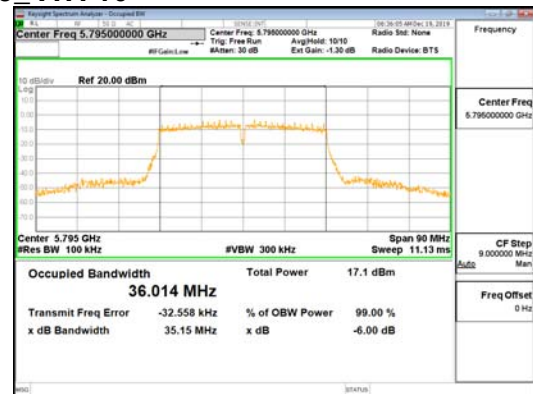
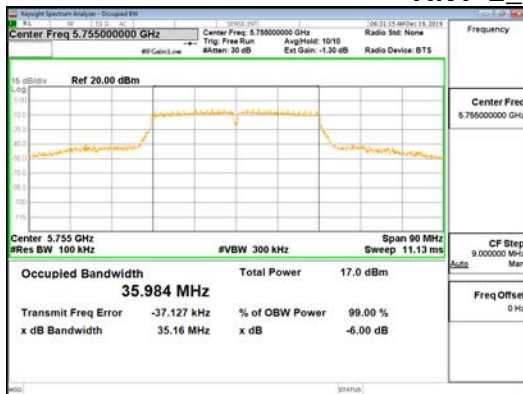
ANT-L_802.11n_HT40



ANT-R_802.11n_HT40



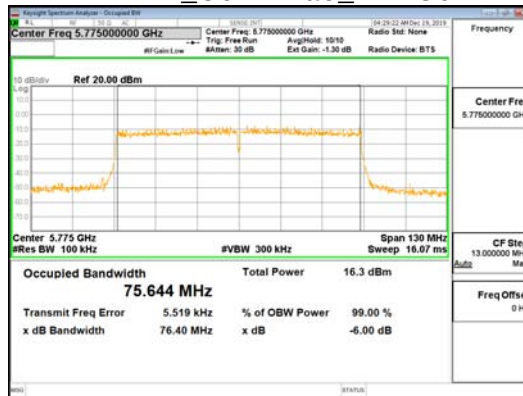
ANT-L_802.11ac_VHT40



ANT-R_802.11ac_VHT40



ANT-L_802.11ac_VHT80



ANT-R_802.11ac_VHT80

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4.2 26 dB Bandwidth and 99 % Bandwidth

Test Procedures

KDB 789033 – Section C.1
ANSI C63.10-2013 - Section 6.9.2

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

Test Procedures

KDB 789033 – Section C.1
ANSI C63.10-2013 - Section 6.9.3

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

Test Settings :

Center frequency = the highest, middle and the lowest channels

- a) RBW = approximately 1 % of the emission bandwidth
- b) VBW $\geq$ RBW
- c) Detector = peak
- d) Trace mode = Max hold
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Minimum Standard:

NA

Test Data:

ANT-L

	26 dB Bandwidth and 99% Bandwidth (MHz)					
Mode	802.11a		802.11n_HT20		802.11ac_VHT20	
Frequency	26 dB	99%	26 dB	99%	26 dB	99%
5 180 MHz	19.54	16.48	20.01	17.56	19.92	17.50
5 200 MHz	19.98	16.53	19.90	17.54	19.73	17.50
5 240 MHz	19.83	16.48	19.97	17.54	19.92	17.51
5 260 MHz	19.57	16.50	20.06	17.55	19.89	17.52
5 300 MHz	19.92	16.52	19.94	17.57	19.87	17.53
5 320 MHz	20.01	16.52	19.96	17.57	19.94	17.53
5 500 MHz	21.31	16.57	20.05	17.60	19.93	17.56
5 600 MHz	20.57	16.58	20.70	17.61	20.05	17.55
5 720 MHz	20.19	16.51	19.96	17.58	20.03	17.53
5 745 MHz	20.72	17.06	22.94	17.99	20.54	17.89
5 785 MHz	20.65	17.10	21.71	17.98	20.62	17.88
5 825 MHz	22.57	17.04	21.09	17.95	20.36	17.87
Measurement uncertainty	± 0.1 MHz					

	26 dB Bandwidth and 99% Bandwidth (MHz)			
Mode	802.11n_HT40		802.11ac_VHT40	
Frequency	26 dB	99 %	26 dB	99 %
5 190 MHz	40.08	36.12	40.45	36.07
5 230 MHz	40.17	36.20	40.67	36.19
5 270 MHz	40.27	36.13	40.63	36.12
5 310 MHz	40.16	36.19	40.63	36.13
5 510 MHz	41.00	36.24	40.55	36.19
5 590 MHz	40.88	36.23	40.78	36.24
5 710 MHz	40.81	36.20	40.58	36.13
5 755 MHz	41.19	36.25	41.15	36.22
5 795 MHz	40.47	36.29	41.07	36.21
Measurement uncertainty	± 0.1 MHz			

	26 dB Bandwidth and 99% Bandwidth (MHz)	
Mode	802.11ac_VHT80	
Frequency	26 dB	99 %
5 210 MHz	80.29	75.89
5 290 MHz	80.68	75.83
5 530 MHz	80.59	75.85
5 690 MHz	84.29	75.92
5 775 MHz	80.10	75.73
Measurement uncertainty	± 0.1 MHz	

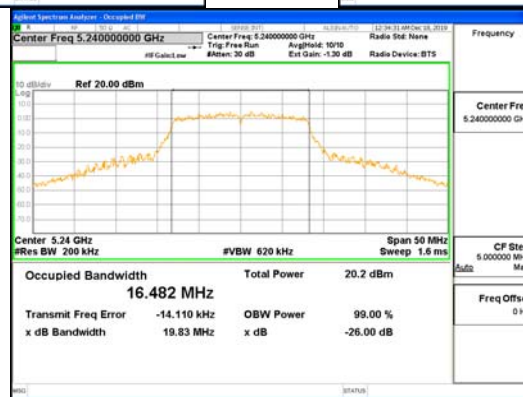
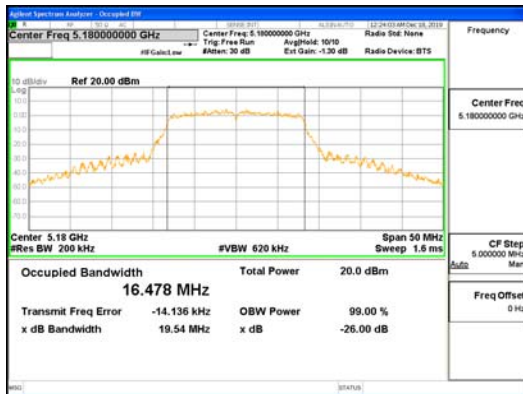
ANT-R

	26 dB Bandwidth and 99% Bandwidth (MHz)					
Mode	802.11a		802.11n_HT20		802.11ac_VHT20	
Frequency	26 dB	99%	26 dB	99%	26 dB	99%
5 180 MHz	19.53	16.36	20.16	17.54	19.88	17.55
5 200 MHz	19.58	16.39	20.53	17.55	19.89	17.57
5 240 MHz	19.74	16.39	20.44	17.54	19.94	17.57
5 260 MHz	19.54	16.38	20.51	17.56	19.91	17.55
5 300 MHz	20.27	16.40	20.67	17.57	20.11	17.58
5 320 MHz	19.98	16.40	20.60	17.57	20.02	17.56
5 500 MHz	20.14	16.40	20.50	17.57	20.00	17.57
5 600 MHz	19.52	16.38	20.42	17.55	19.91	17.56
5 720 MHz	20.09	16.40	20.68	17.58	20.01	17.57
5 745 MHz	21.67	16.76	20.94	17.70	20.29	17.76
5 785 MHz	21.46	16.73	20.93	17.68	20.33	17.75
5 825 MHz	20.49	16.71	20.86	17.67	20.30	17.76
Measurement uncertainty	± 0.1 MHz					

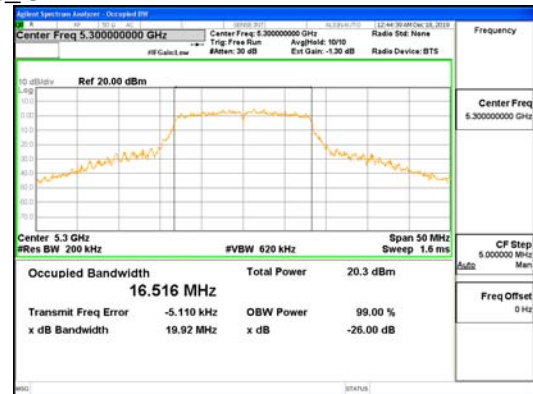
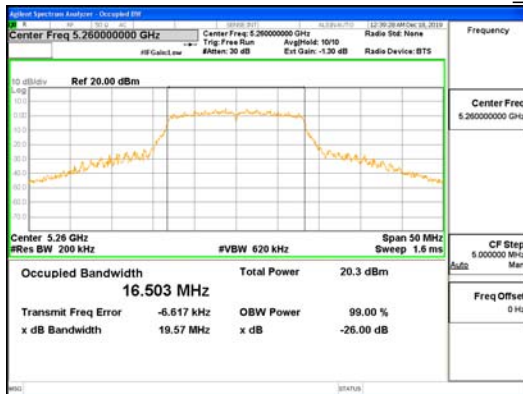
	26 dB Bandwidth and 99% Bandwidth (MHz)			
Mode	802.11n_HT40		802.11ac_VHT40	
Frequency	26 dB	99 %	26 dB	99 %
5 190 MHz	39.87	36.17	39.91	36.04
5 230 MHz	40.11	36.21	39.99	36.05
5 270 MHz	39.93	36.16	40.03	36.06
5 310 MHz	40.05	36.21	40.20	36.11
5 510 MHz	39.89	36.20	40.13	36.10
5 590 MHz	39.61	36.20	39.98	36.12
5 710 MHz	39.81	36.20	39.95	36.10
5 755 MHz	40.05	36.23	40.19	36.11
5 795 MHz	39.98	36.22	40.01	36.12
Measurement uncertainty	± 0.1 MHz			

	26 dB Bandwidth and 99% Bandwidth (MHz)	
Mode	802.11ac_VHT80	
Frequency	26 dB	99 %
5 210 MHz	80.01	75.78
5 290 MHz	80.07	75.77
5 530 MHz	79.72	75.86
5 690 MHz	80.30	75.77
5 775 MHz	79.60	75.68
Measurement uncertainty	± 0.1 MHz	

See next pages for actual measured spectrum plots.



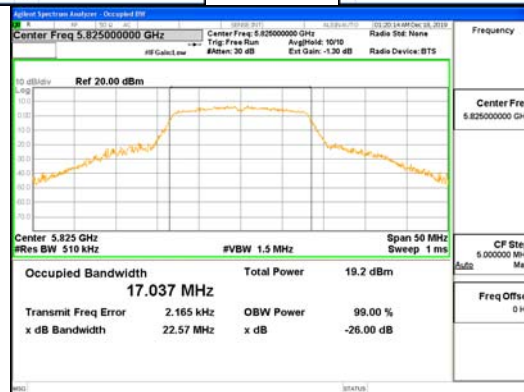
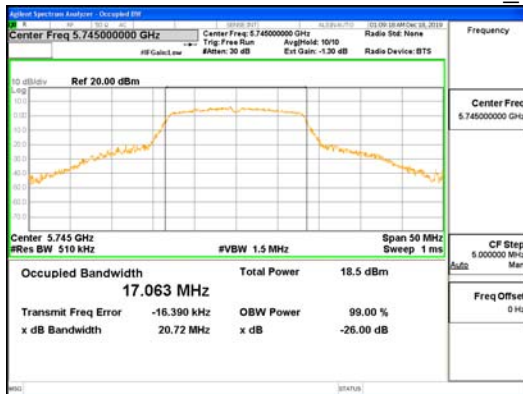
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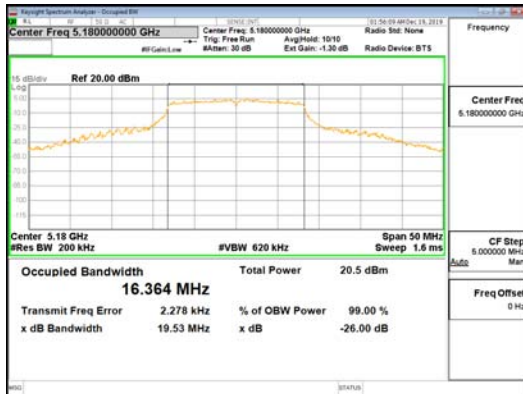
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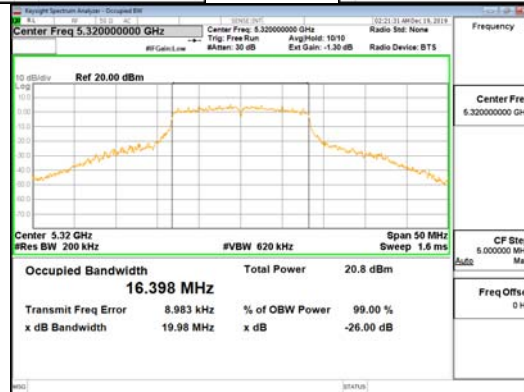
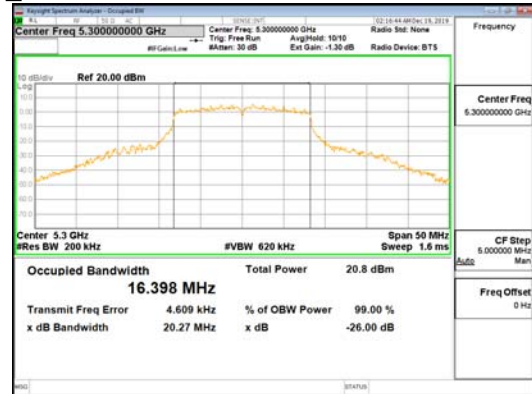
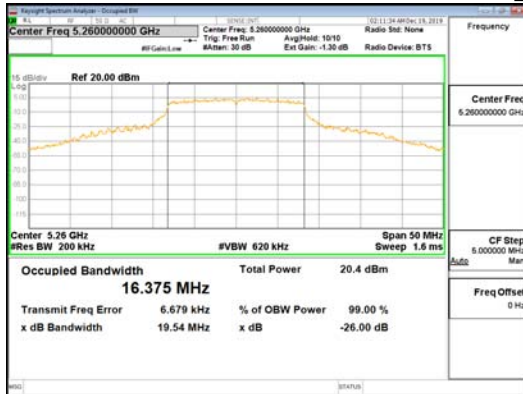
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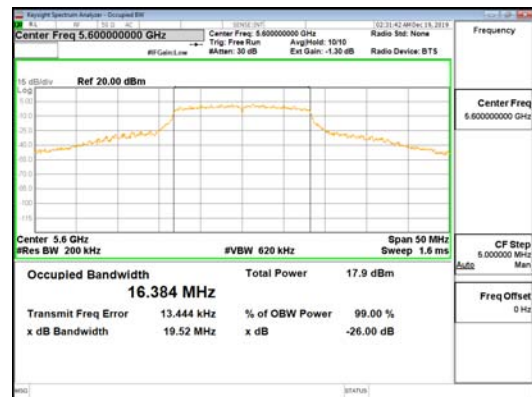
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ANT-R_802.11a_UNII 1



ANT-R_802.11a_UNII 2A



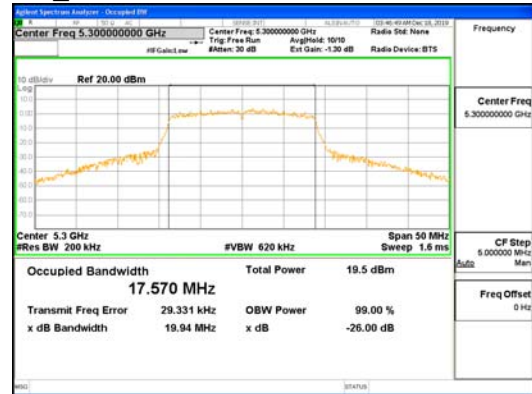
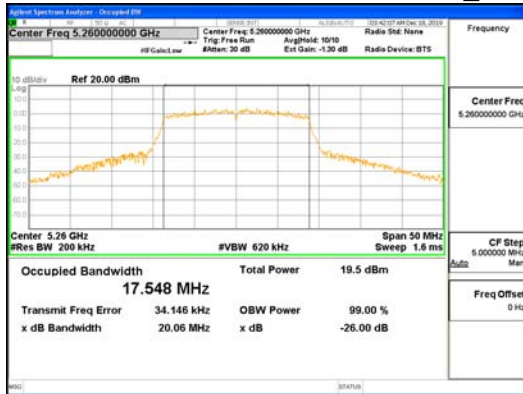
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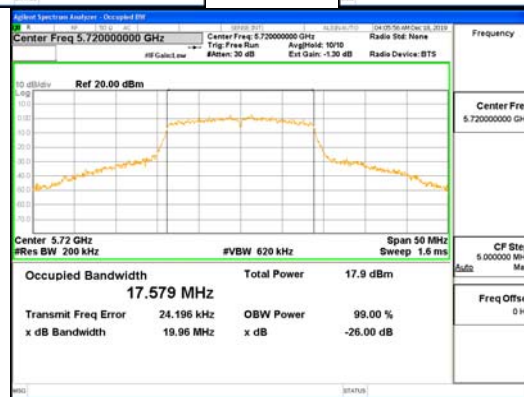
ANT-R_802.11a_UNII 3



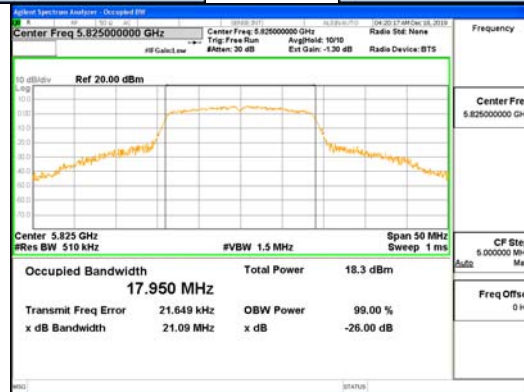
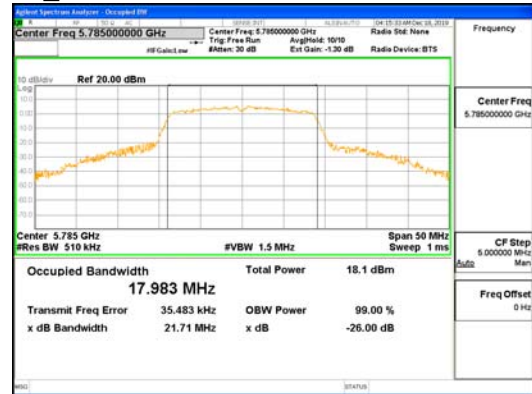
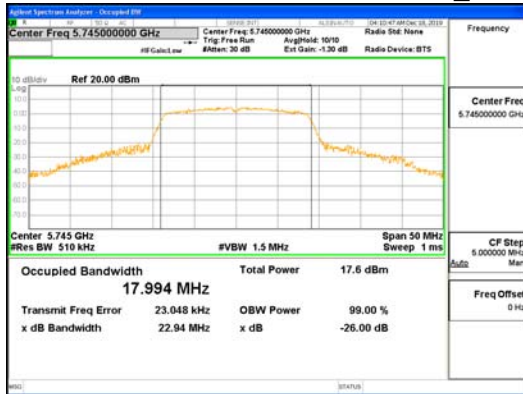
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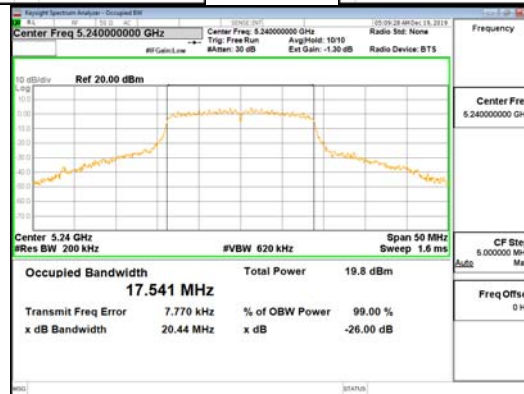
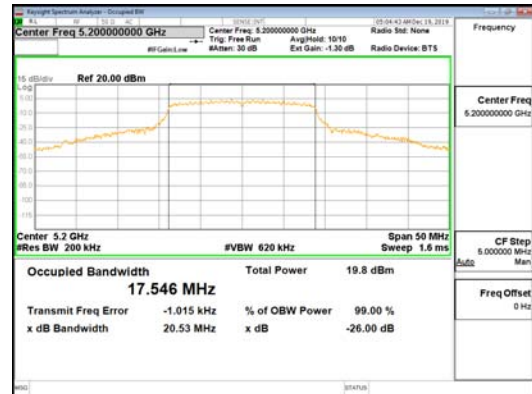
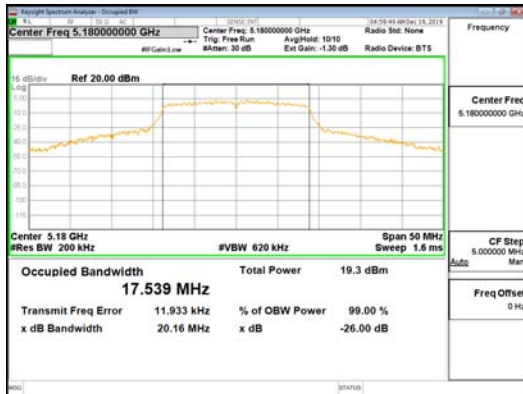
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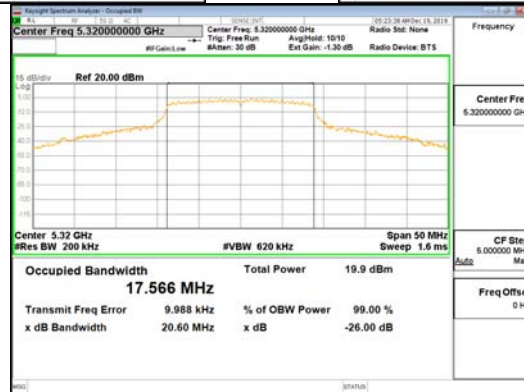
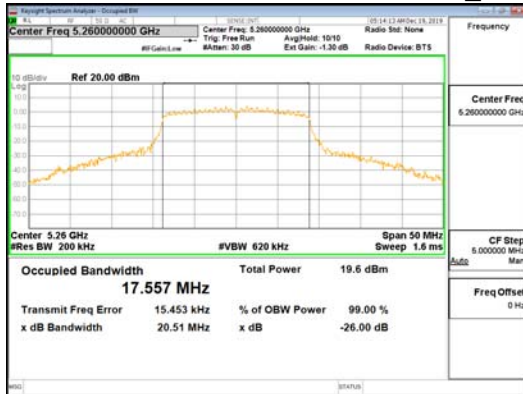
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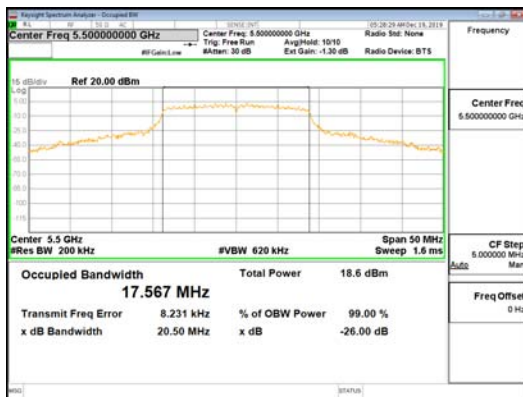
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ANT-R_802.11n_HT20_UNII 1



ANT-R_802.11n_HT20_UNII 2A



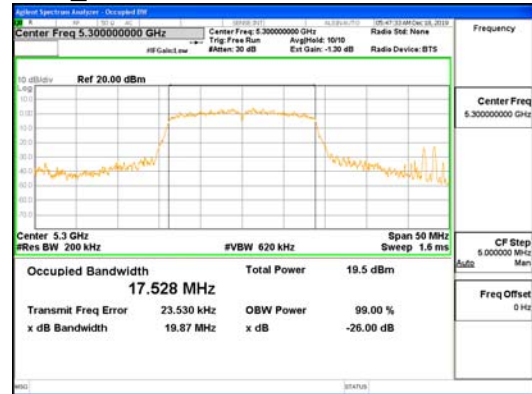
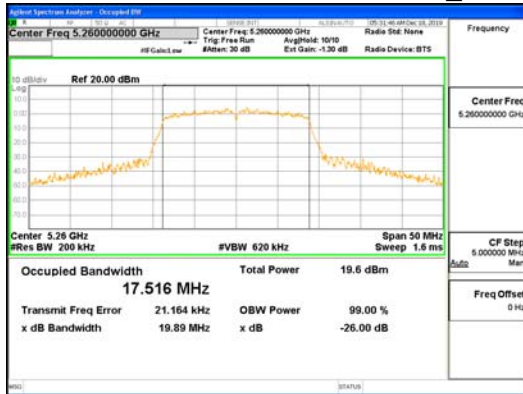
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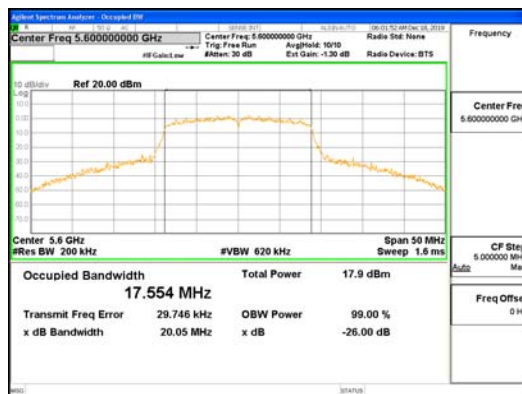
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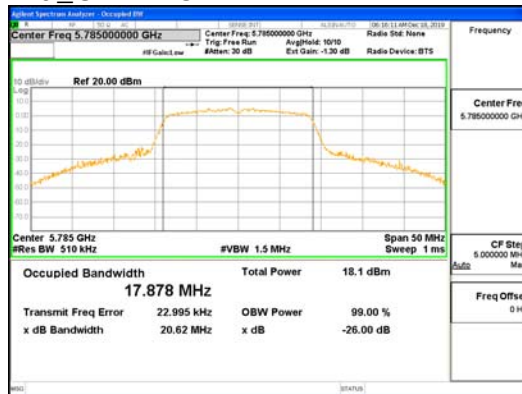
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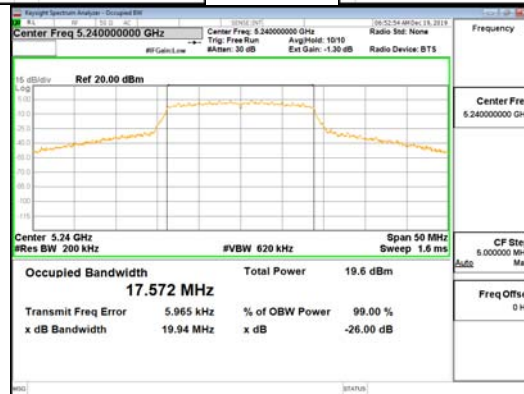
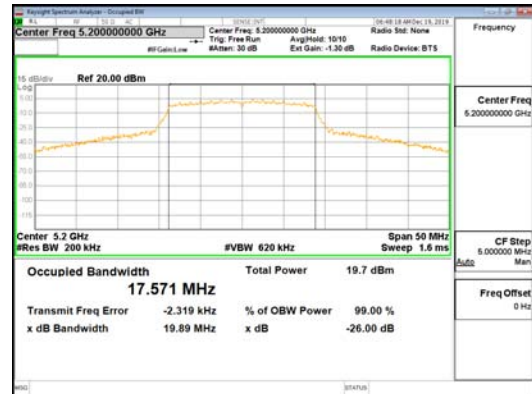
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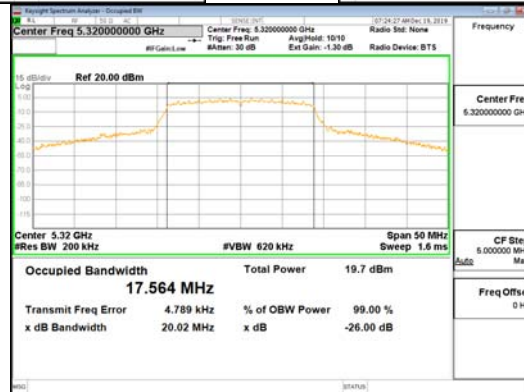
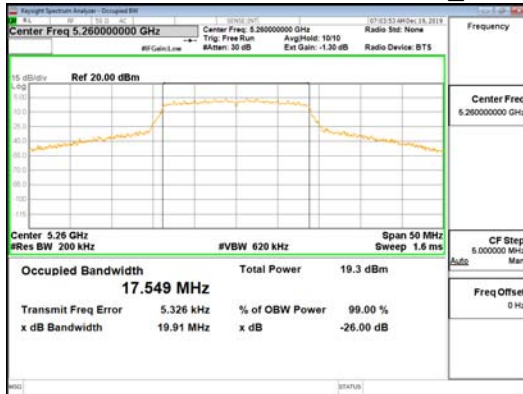
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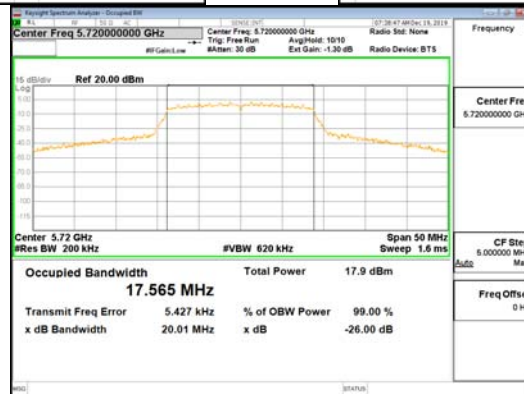
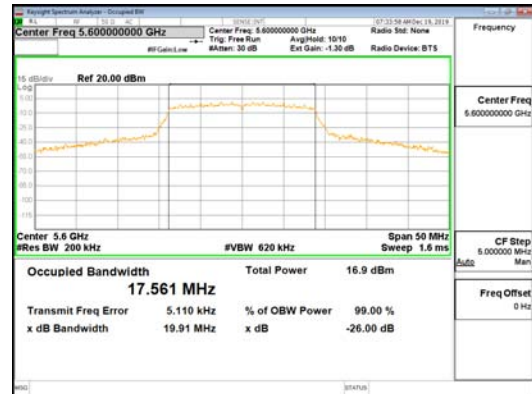
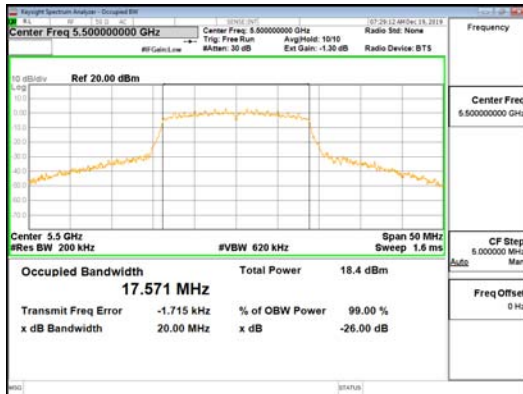
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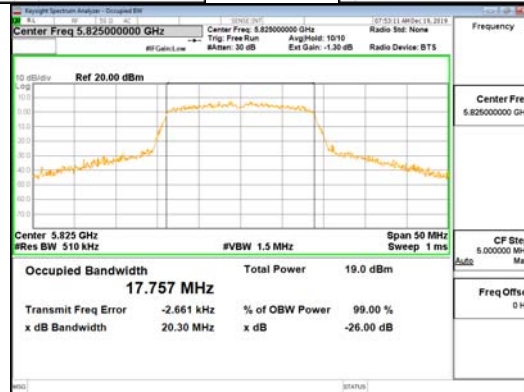
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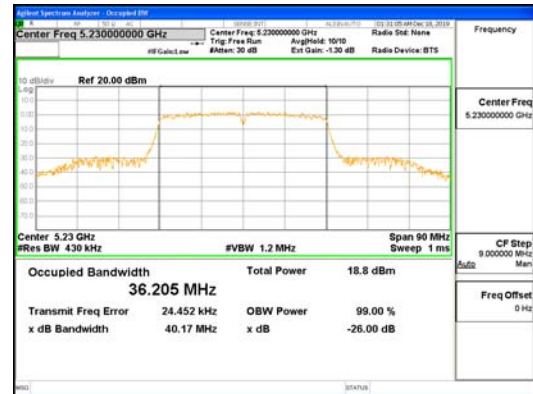
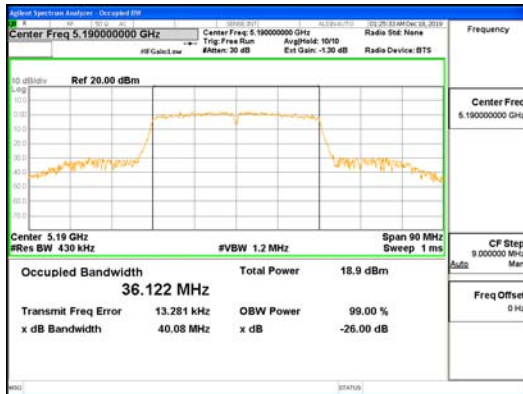
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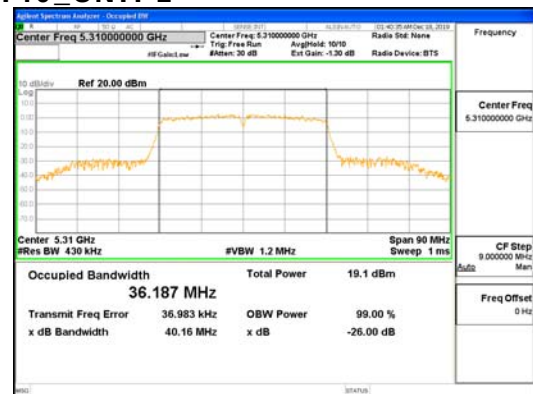
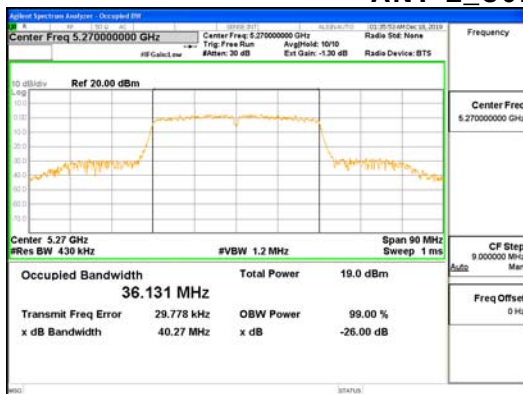
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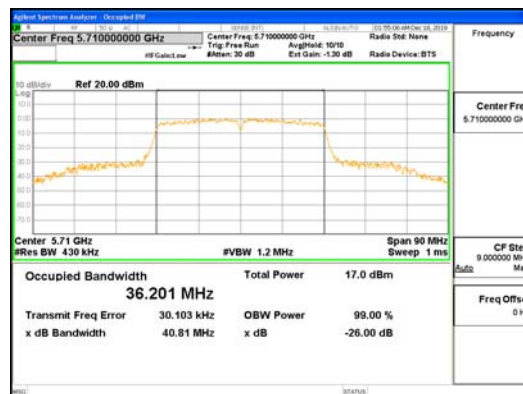
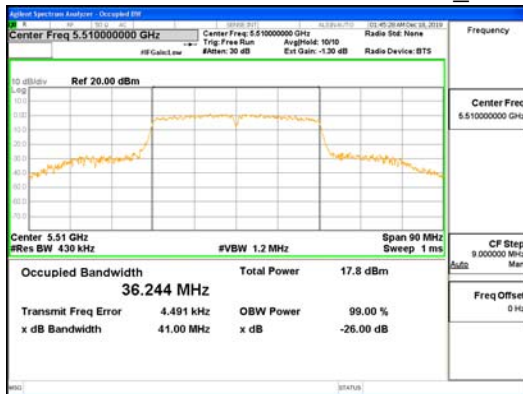
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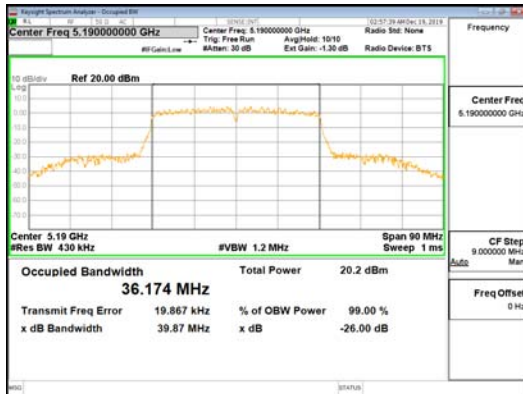
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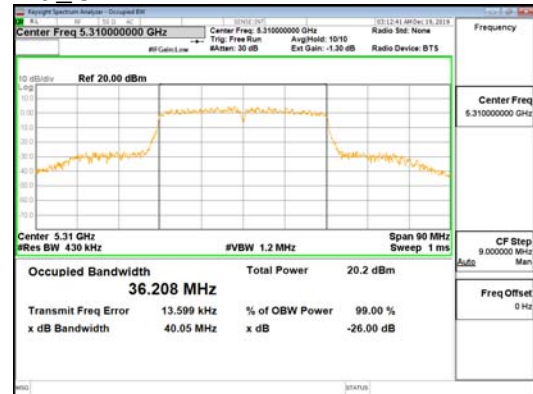
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ANT-L_802.11n_HT40_UNII 3



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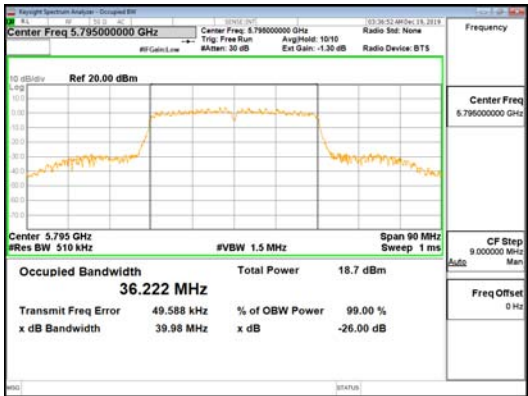


ANT-R_802.11n_HT40_UNII 2C



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Report No.:
CTK-2019-04999
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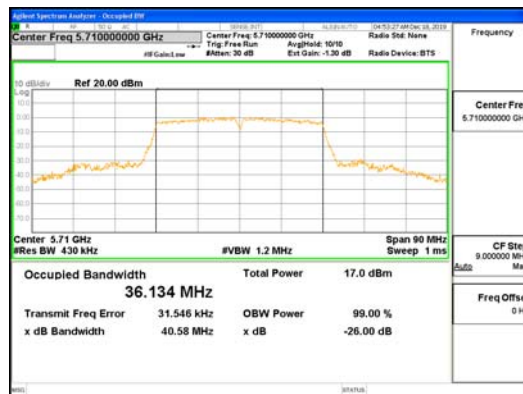
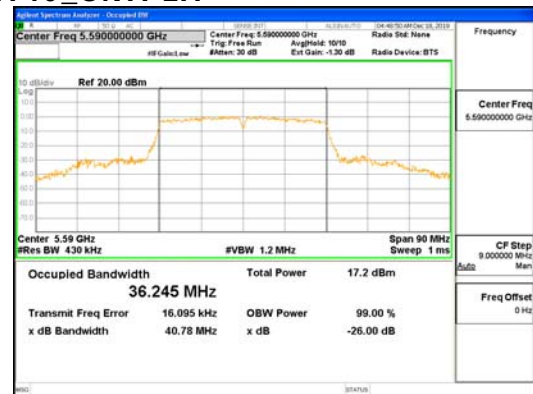
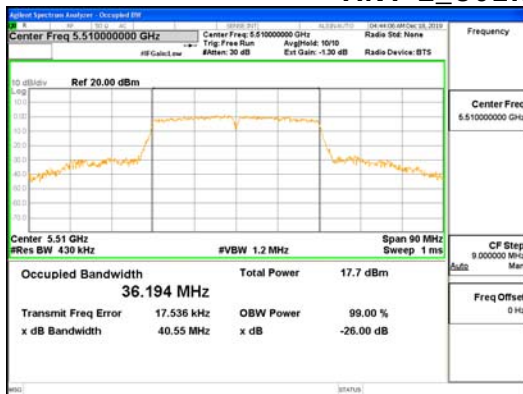
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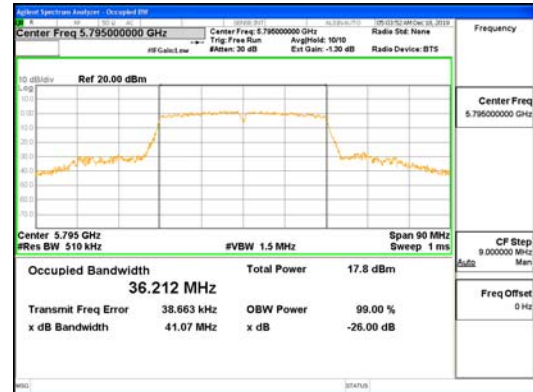
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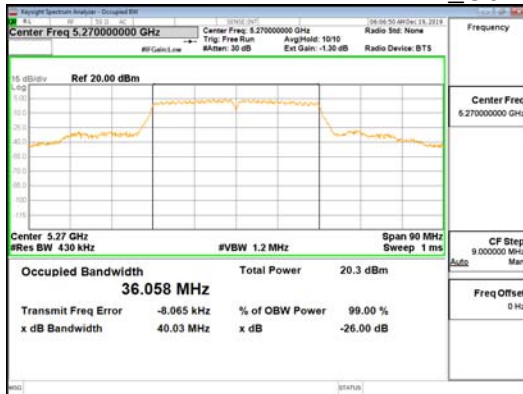
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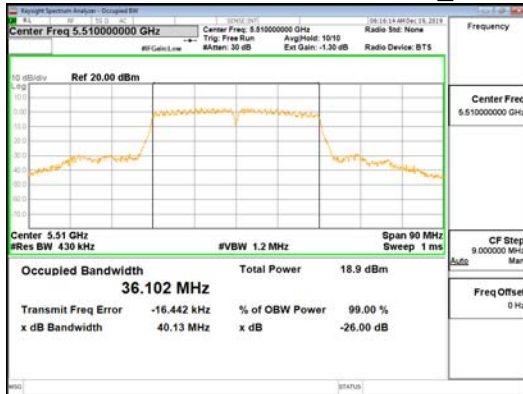
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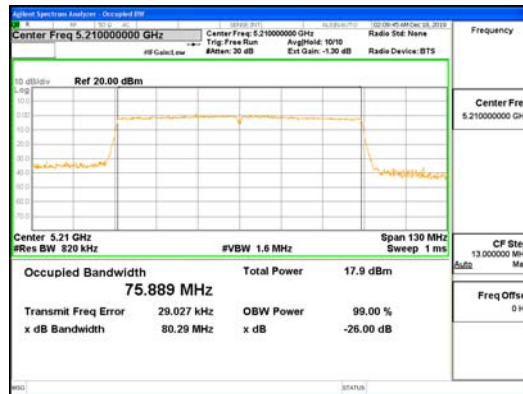


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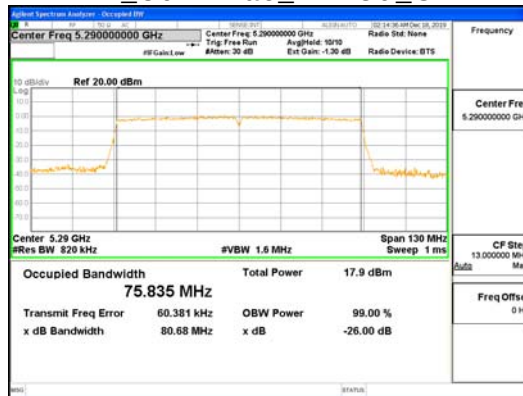




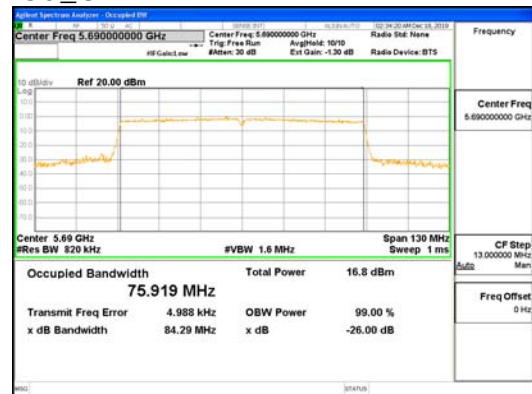
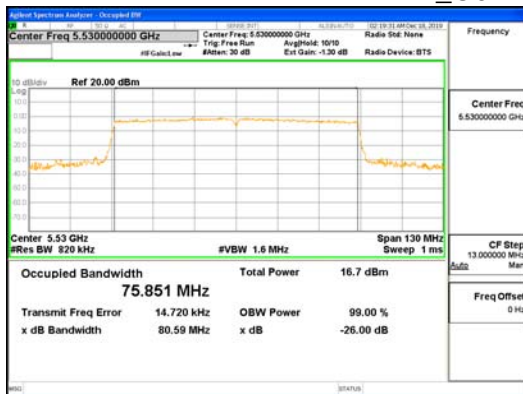
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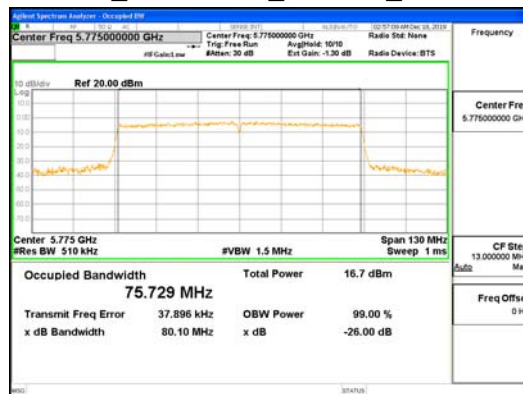
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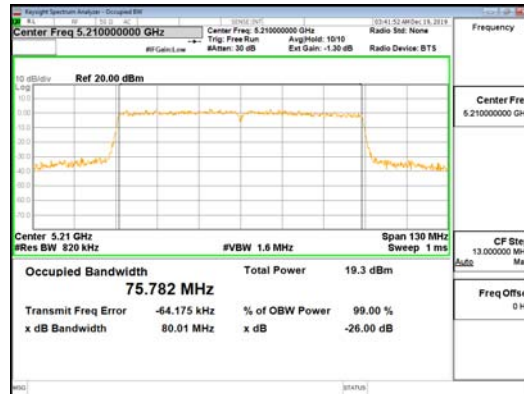
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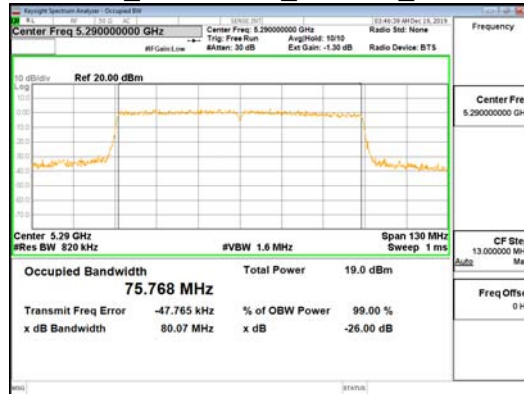
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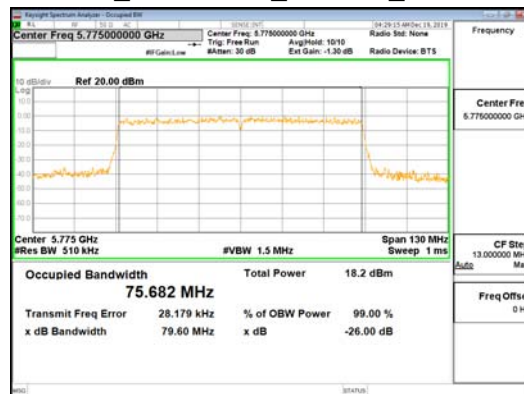
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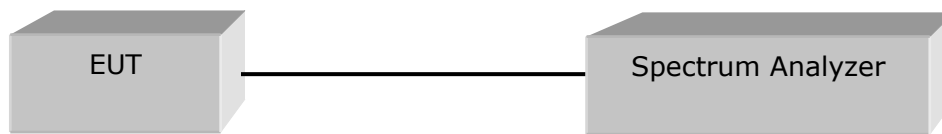
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4.3 OUTPUT POWER

Test Procedures

KDB 789033 – Section E.2.d (Method SA-2, Maximum Conducted Output Power)
KDB 662911 D01, D02 (Multiple Transmitter Output)

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



Test Settings :

Center frequency = the highest, middle and the lowest channels

- a) RBW = 1 MHz
- b) VBW $\geq 3 \times$ RBW
- c) Sweep time = auto
- d) Detector = power averaging (rms)
- e) Trace mode = Average at least 100
- f) Duty cycle factor = $10\log(1/x)$

Test mode	Duty Cycle Factor (dB)
802.11a	0.12
802.11n_HT20	0.13
802.11n_HT40	0.28
802.11ac_VHT20	0.27
802.11ac_VHT40	0.50
802.11ac_VHT80	0.73

Limit

Operating Mode	ANT Configuration	ANT Gain (dBi)	Mode	Band	Limit (dBm)
SISO	ANT-L, ANT-R	3.69, 1.21	802.11a/n/ac	UNII 1	24.00
				UNII 2A	24.00
				UNII 2C	24.00
				UNII 3	30.00
MIMO (2Tx)	ANT-L + ANT-R	5.63	802.11a/n/ac	UNII 1	24.00
				UNII 2A	24.00
				UNII 2C	24.00
				UNII 3	30.00

Test Data

ANT-L

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	14.41	0.12	14.53	24.00	9.47
	5 200	14.63	0.12	14.75	24.00	9.25
	5 240	14.53	0.12	14.65	24.00	9.35
	5 260	14.51	0.12	14.63	24.00	9.37
	5 300	14.71	0.12	14.83	24.00	9.17
	5 320	14.69	0.12	14.81	24.00	9.19
	5 500	13.45	0.12	13.57	24.00	10.43
	5 600	12.77	0.12	12.89	24.00	11.11
	5 720	12.89	0.12	13.01	24.00	10.99
	5 745	12.95	0.12	13.07	30.00	16.93
	5 785	13.41	0.12	13.53	30.00	16.47
	5 825	13.64	0.12	13.76	30.00	16.24
802.11n _HT20	5 180	13.08	0.13	13.21	24.00	10.79
	5 200	13.61	0.13	13.74	24.00	10.26
	5 240	13.29	0.13	13.42	24.00	10.58
	5 260	13.47	0.13	13.60	24.00	10.40
	5 300	13.63	0.13	13.76	24.00	10.24
	5 320	13.67	0.13	13.80	24.00	10.20
	5 500	12.25	0.13	12.38	24.00	11.62
	5 600	11.71	0.13	11.84	24.00	12.16
	5 720	11.84	0.13	11.97	24.00	12.03
	5 745	11.95	0.13	12.08	30.00	17.92
	5 785	12.25	0.13	12.38	30.00	17.62
	5 825	12.47	0.13	12.60	30.00	17.40
802.11ac _VHT20	5 180	13.34	0.27	13.61	24.00	10.39
	5 200	13.52	0.27	13.79	24.00	10.21
	5 240	13.40	0.27	13.67	24.00	10.33
	5 260	13.43	0.27	13.70	24.00	10.30
	5 300	13.52	0.27	13.79	24.00	10.21
	5 320	13.59	0.27	13.86	24.00	10.14
	5 500	12.19	0.27	12.46	24.00	11.54
	5 600	11.66	0.27	11.93	24.00	12.07
	5 720	11.67	0.27	11.94	24.00	12.06

	5 745	11.76	0.27	12.03	30.00	17.97
	5 785	12.24	0.27	12.51	30.00	17.49
	5 825	12.41	0.27	12.68	30.00	17.32
802.11n _HT40	5 190	13.01	0.28	13.29	24.00	10.71
	5 230	12.88	0.28	13.16	24.00	10.84
	5 270	13.03	0.28	13.31	24.00	10.69
	5 310	13.17	0.28	13.45	24.00	10.55
	5 510	11.84	0.28	12.12	24.00	11.88
	5 590	11.36	0.28	11.64	24.00	12.36
	5 710	11.21	0.28	11.49	24.00	12.51
	5 755	11.40	0.28	11.68	30.00	18.32
	5 795	11.91	0.28	12.19	30.00	17.81
802.11ac _VHT40	5 190	12.76	0.50	13.26	24.00	10.74
	5 230	12.68	0.50	13.18	24.00	10.82
	5 270	12.79	0.50	13.29	24.00	10.71
	5 310	12.98	0.50	13.48	24.00	10.52
	5 510	11.55	0.50	12.05	24.00	11.95
	5 590	11.16	0.50	11.66	24.00	12.34
	5 710	11.07	0.50	11.57	24.00	12.43
	5 755	11.02	0.50	11.52	30.00	18.48
	5 795	11.83	0.50	12.33	30.00	17.67
802.11ac _VHT80	5 210	10.21	0.73	10.94	24.00	13.06
	5 290	10.51	0.73	11.24	24.00	12.76
	5 530	9.23	0.73	9.96	24.00	14.04
	5 690	9.28	0.73	10.01	24.00	13.99
	5 775	8.75	0.73	9.48	30.00	20.52
Measurement uncertainty		± 1.5 dB				

ANT-R

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	14.91	0.12	15.03	24.00	8.97
	5 200	15.08	0.12	15.20	24.00	8.80
	5 240	15.11	0.12	15.23	24.00	8.77
	5 260	14.65	0.12	14.77	24.00	9.23
	5 300	15.15	0.12	15.27	24.00	8.73
	5 320	14.98	0.12	15.10	24.00	8.90
	5 500	13.56	0.12	13.68	24.00	10.32
	5 600	12.18	0.12	12.30	24.00	11.70
	5 720	13.20	0.12	13.32	24.00	10.68
	5 745	13.15	0.12	13.27	30.00	16.73
	5 785	13.46	0.12	13.58	30.00	16.42
	5 825	13.31	0.12	13.43	30.00	16.57
802.11n _HT20	5 180	13.55	0.13	13.68	24.00	10.32
	5 200	14.04	0.13	14.17	24.00	9.83
	5 240	14.01	0.13	14.14	24.00	9.86
	5 260	13.74	0.13	13.87	24.00	10.13
	5 300	14.00	0.13	14.13	24.00	9.87
	5 320	14.09	0.13	14.22	24.00	9.78
	5 500	12.76	0.13	12.89	24.00	11.11
	5 600	11.25	0.13	11.38	24.00	12.62
	5 720	12.21	0.13	12.34	24.00	11.66
	5 745	12.20	0.13	12.33	30.00	17.67
	5 785	12.55	0.13	12.68	30.00	17.32
	5 825	12.25	0.13	12.38	30.00	17.62
802.11ac _VHT20	5 180	13.55	0.27	13.82	24.00	10.18
	5 200	13.87	0.27	14.14	24.00	9.86
	5 240	13.75	0.27	14.02	24.00	9.98
	5 260	13.57	0.27	13.84	24.00	10.16
	5 300	13.71	0.27	13.98	24.00	10.02
	5 320	13.82	0.27	14.09	24.00	9.91
	5 500	12.54	0.27	12.81	24.00	11.19
	5 600	11.02	0.27	11.29	24.00	12.71
	5 720	11.90	0.27	12.17	24.00	11.83

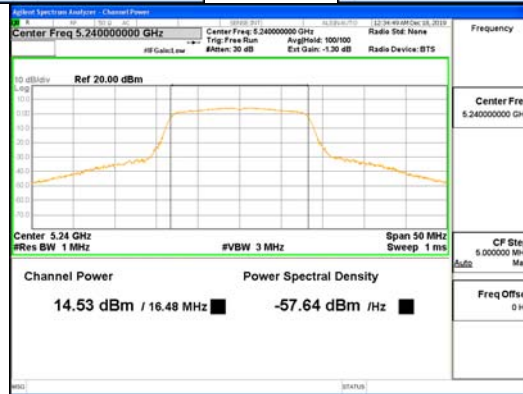
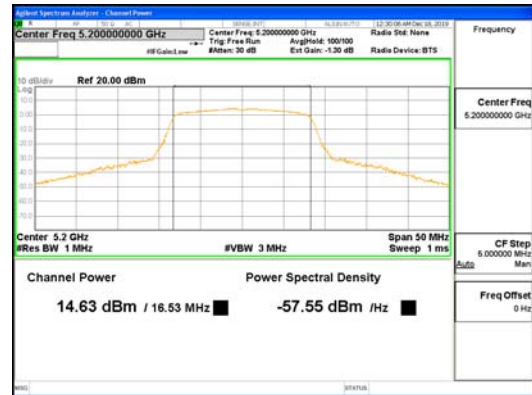
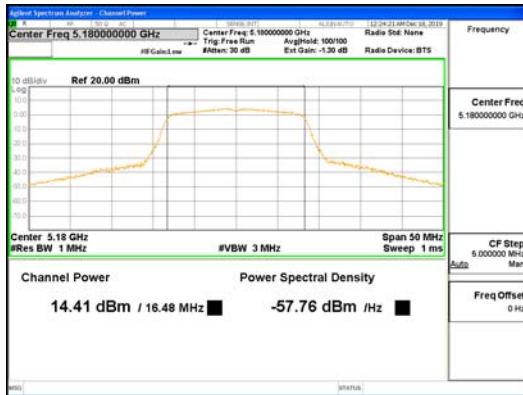
	5 745	12.17	0.27	12.44	30.00	17.56
	5 785	12.37	0.27	12.64	30.00	17.36
	5 825	12.39	0.27	12.66	30.00	17.34
802.11n _HT40	5 190	13.47	0.28	13.75	24.00	10.25
	5 230	13.57	0.28	13.85	24.00	10.15
	5 270	13.34	0.28	13.62	24.00	10.38
	5 310	13.59	0.28	13.87	24.00	10.13
	5 510	12.00	0.28	12.28	24.00	11.72
	5 590	10.87	0.28	11.15	24.00	12.85
	5 710	11.98	0.28	12.26	24.00	11.74
	5 755	11.91	0.28	12.19	30.00	17.81
	5 795	11.92	0.28	12.20	30.00	17.80
802.11ac _VHT40	5 190	13.26	0.50	13.76	24.00	10.24
	5 230	13.43	0.50	13.93	24.00	10.07
	5 270	13.15	0.50	13.65	24.00	10.35
	5 310	13.32	0.50	13.82	24.00	10.18
	5 510	11.72	0.50	12.22	24.00	11.78
	5 590	10.55	0.50	11.05	24.00	12.95
	5 710	11.72	0.50	12.22	24.00	11.78
	5 755	11.62	0.50	12.12	30.00	17.88
	5 795	11.71	0.50	12.21	30.00	17.79
802.11ac _VHT80	5 210	11.04	0.73	11.77	24.00	12.23
	5 290	10.70	0.73	11.43	24.00	12.57
	5 530	9.08	0.73	9.81	24.00	14.19
	5 690	8.19	0.73	8.92	24.00	15.08
	5 775	9.64	0.73	10.37	30.00	19.63
Measurement uncertainty		± 1.5 dB				

ANT-L + ANT-R

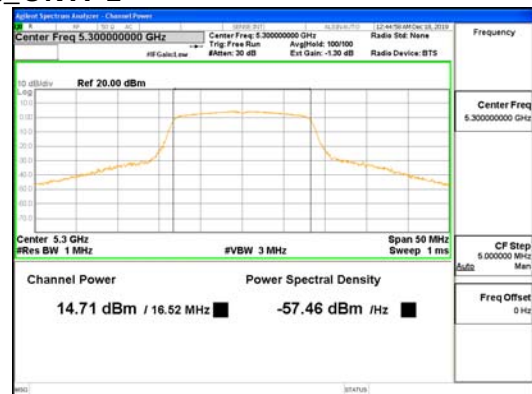
Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	5 180	17.68	0.12	17.80	24.00	6.20
	5 200	17.87	0.12	17.99	24.00	6.01
	5 240	17.84	0.12	17.96	24.00	6.04
	5 260	17.59	0.12	17.71	24.00	6.29
	5 300	17.95	0.12	18.07	24.00	5.93
	5 320	17.85	0.12	17.97	24.00	6.03
	5 500	16.52	0.12	16.64	24.00	7.36
	5 600	15.50	0.12	15.62	24.00	8.38
	5 720	16.06	0.12	16.18	24.00	7.82
	5 745	16.06	0.12	16.18	30.00	13.82
	5 785	16.45	0.12	16.57	30.00	13.43
	5 825	16.49	0.12	16.61	30.00	13.39
802.11n _HT20	5 180	16.33	0.13	16.46	24.00	7.54
	5 200	16.84	0.13	16.97	24.00	7.03
	5 240	16.68	0.13	16.81	24.00	7.19
	5 260	16.62	0.13	16.75	24.00	7.25
	5 300	16.83	0.13	16.96	24.00	7.04
	5 320	16.90	0.13	17.03	24.00	6.97
	5 500	15.52	0.13	15.65	24.00	8.35
	5 600	14.50	0.13	14.63	24.00	9.37
	5 720	15.04	0.13	15.17	24.00	8.83
	5 745	15.09	0.13	15.22	30.00	14.78
	5 785	15.41	0.13	15.54	30.00	14.46
	5 825	15.37	0.13	15.50	30.00	14.50
802.11ac _VHT20	5 180	16.46	0.27	16.73	24.00	7.27
	5 200	16.71	0.27	16.98	24.00	7.02
	5 240	16.59	0.27	16.86	24.00	7.14
	5 260	16.51	0.27	16.78	24.00	7.22
	5 300	16.63	0.27	16.90	24.00	7.10
	5 320	16.72	0.27	16.99	24.00	7.01
	5 500	15.38	0.27	15.65	24.00	8.35
	5 600	14.36	0.27	14.63	24.00	9.37
	5 720	14.80	0.27	15.07	24.00	8.93

	5 745	14.98	0.27	15.25	30.00	14.75
	5 785	15.32	0.27	15.59	30.00	14.41
	5 825	15.41	0.27	15.68	30.00	14.32
802.11n _HT40	5 190	16.26	0.28	16.54	24.00	7.46
	5 230	16.25	0.28	16.53	24.00	7.47
	5 270	16.20	0.28	16.48	24.00	7.52
	5 310	16.40	0.28	16.68	24.00	7.32
	5 510	14.93	0.28	15.21	24.00	8.79
	5 590	14.13	0.28	14.41	24.00	9.59
	5 710	14.62	0.28	14.90	24.00	9.10
	5 755	14.67	0.28	14.95	30.00	15.05
	5 795	14.93	0.28	15.21	30.00	14.79
802.11ac _VHT40	5 190	16.03	0.50	16.53	24.00	7.47
	5 230	16.08	0.50	16.58	24.00	7.42
	5 270	15.98	0.50	16.48	24.00	7.52
	5 310	16.16	0.50	16.66	24.00	7.34
	5 510	14.65	0.50	15.15	24.00	8.85
	5 590	13.88	0.50	14.38	24.00	9.62
	5 710	14.42	0.50	14.92	24.00	9.08
	5 755	14.34	0.50	14.84	30.00	15.16
	5 795	14.78	0.50	15.28	30.00	14.72
802.11ac _VHT80	5 210	13.66	0.73	14.39	24.00	9.61
	5 290	13.62	0.73	14.35	24.00	9.65
	5 530	12.17	0.73	12.90	24.00	11.10
	5 690	11.78	0.73	12.51	24.00	11.49
	5 775	12.23	0.73	12.96	30.00	17.04
Measurement uncertainty		± 1.5 dB				

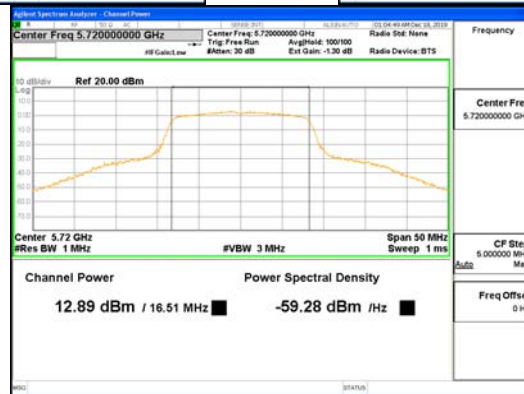
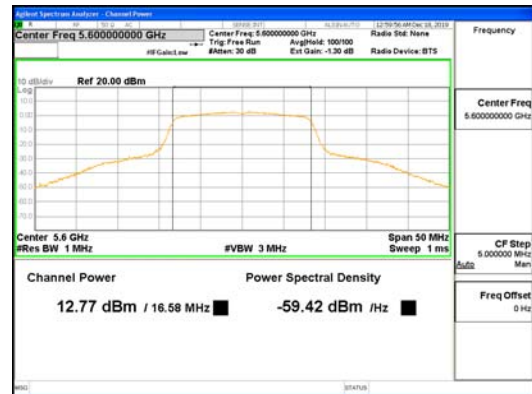
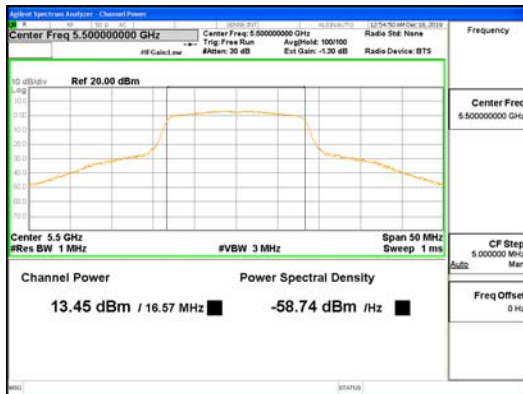
See next pages for actual measured spectrum plots.



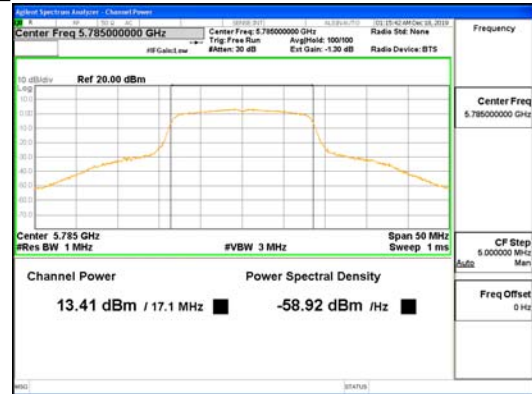
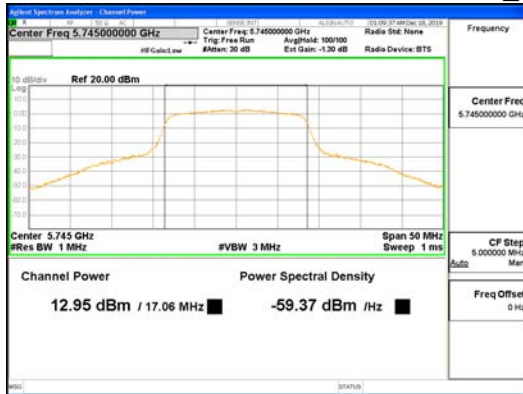
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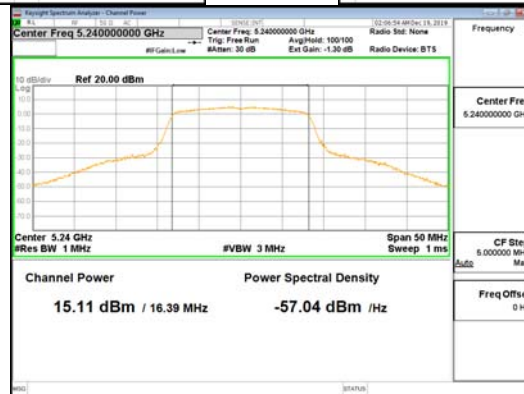
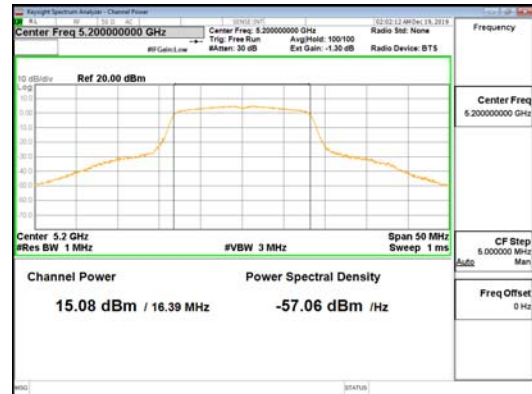
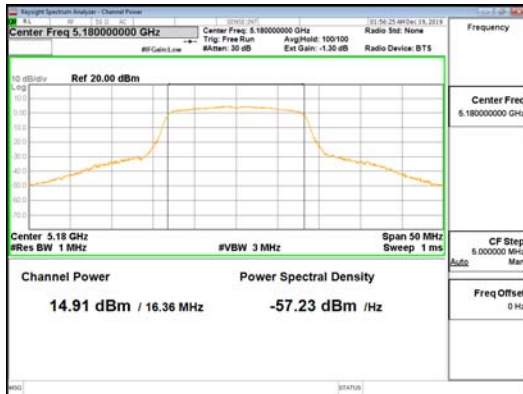
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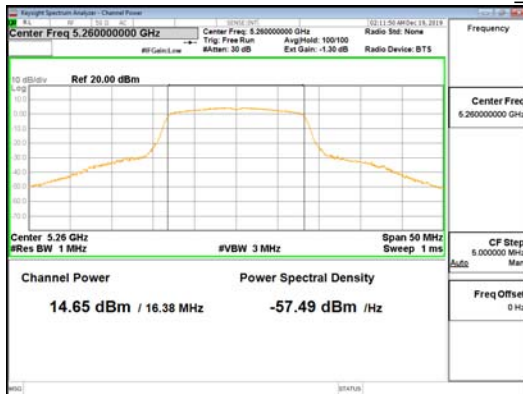
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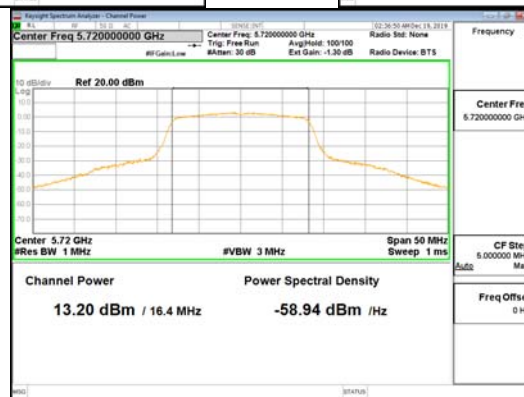
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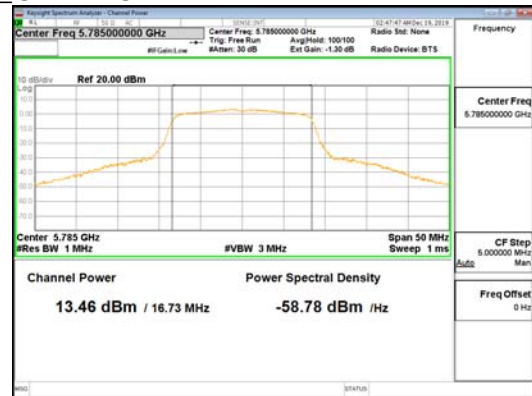
ANT-R_802.11a_UNII 1



ANT-R_802.11a_UNII 2A



ANT-R_802.11a_UNII 2C



ANT-R_802.11a_UNII 3