CFR 47 FCC PART 15 SUBPART E
ISED RSS-247 ISSUE 2

TEST REPORT

For

IEEE 802.11a/b/g/n 2T2R USB Wi-Fi Module

MODEL NUMBER: SKO.W618U.1_638BU

FCC ID: 2AR82-SKOW618U101
IC: 24728- SKOW618U101

REPORT NUMBER: 4789279523.1-2

ISSUE DATE: December 25, 2019

Prepared for

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	12/25/2019	Initial Issue	

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Summary of Test Results			
Clause	Test Items	FCC Rules	Test Results
1	6/26db/99% Bandwidth	FCC 15.407 (a)&(e) RSS-247 Clause 6.2 RSS-Gen Clause 6.7	PASS
2	Maximum Conducted Output Power	FCC 15.407 (a) RSS-247 Clause 6.2	PASS
3	Power Spectral Density	FCC 15.407 (a) RSS-247 Clause 6.2	PASS
4	Antenna Conducted Spurious Emission	FCC 15.407 (b) RSS-247 Clause 6.2	PASS
5	Radiated Bandedge and Spurious Emission	FCC 15.407 (a) FCC 15.209 FCC 15.205 RSS-247 Clause 6.2 RSS-GEN Clause 8.9	PASS
6	Conducted Emission Test For AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	PASS
7	Antenna Requirement	FCC 15.203 RSS-GEN Clause 8.3	PASS
8	Frequency Stability	FCC 15.407 (g)	PASS
9	Dynamic Frequency Selection	FCC 15.407 (h) RSS-247 Clause 6.3	PASS
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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Guangzhou Shikun Electronics Co., Ltd
Address: NO.6 Liankun Road,Huangpu District,Guangzhou,China

Manufacturer Information

Company Name: Guangzhou Shikun Electronics Co., Ltd
Address: NO.6 Liankun Road,Huangpu District,Guangzhou,China

EUT Description

EUT Name: IEEE 802.11a/b/g/n 2T2R USB Wi-Fi Module
Model: SKO.W618U.1_638BU
Sample Status: Normal
Sample Received Date: December 6, 2019
Date of Tested: December 6~December 25, 2019

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 FCC PART 15 SUBPART E	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 5	PASS

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Checked By:

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, CFR 47 FCC Part 2, CFR 47 FCC Part 15, KDB 789033 D02 v02r01, RSS-GEN Issue 5, RSS-247 Issue 2, KDB414788 D01 Radiated Test Site v01r01, KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02 and 905462 D03 Client Without DFS New Rules v01r02.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Delcaration of Conformity (DoC) and Certification rules **IC(Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011

Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz had been correlated to measurements performed on an OFS.

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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 recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

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

Test Item	Uncertainty
Uncertainty for Conduction emission test	3.62dB
Uncertainty for Radiation Emission test(include Fundamental emission) (9kHz-30MHz)	2.2dB
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.00dB
Uncertainty for Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.78dB (1GHz-18Gz)
	5.23dB (18GHz-26Gz)
	5.64dB (26GHz-40Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	IEEE 802.11a/b/g/n 2T2R USB Wi-Fi Module
Model	SKO.W618U.1_638BU
Radio Technology	IEEE802.11a IEEE802.11n HT20/HT40 IEEE802.11ac VHT20/VHT40
Operation frequency	UNII-1/UNII-2A/UNII-2C/UNII-3
Modulation	OFDM(BPSK,QPSK,16QAM,64QAM,256QAM in ac mode only.)
Rated Input	DC 3.3V

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5.2. MAXIMUM POWER

UNII-1 BAND

IEE Std. 802.11	Frequency (MHz)	Max Power (dBm)	Max EIRP (dBm)
a SISO	5150-5250	14.61	16.64
n(HT20) MIMO	5150-5250	15.57	17.60
n(HT40) MIMO	5150-5250	14.60	16.63
ac(HT20) MIMO	5150-5250	15.69	17.72
ac(HT40) MIMO	5150-5250	16.30	18.33

UNII-2A BAND

IEE Std. 802.11	Frequency (MHz)	Max Power (dBm)
a SISO	5250-5350	15.12
n(HT20) MIMO	5250-5350	15.91
n(HT40) MIMO	5250-5350	14.58
ac(HT20) MIMO	5250-5350	15.80
ac(HT40) MIMO	5250-5350	17.11

UNII-2C BAND

IEE Std. 802.11	Frequency (MHz)	Max Power (dBm)
a SISO	5470-5725	15.22
n(HT20) MIMO	5470-5725	15.91
n(HT40) MIMO	5470-5725	14.13
ac(HT20) MIMO	5470-5725	16.38
ac(HT40) MIMO	5470-5725	15.62

UNII-3 BAND

IEE Std. 802.11	Frequency (MHz)	Max Power (dBm)
a SISO	5725-5850	14.13
n(HT20) MIMO	5725-5850	15.77
n(HT40) MIMO	5725-5850	14.40
ac(HT20) MIMO	5725-5850	15.79
ac(HT40) MIMO	5725-5850	16.04

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5.3. CHANNEL LIST

UNII-1 (For Bandwidth=20MHz)		UNII-1 (For Bandwidth=40MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190
40	5200	46	5230
44	5220		
48	5240		

UNII-2A (For Bandwidth=20MHz)		UNII-2A (For Bandwidth=40MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	54	5270
56	5280	62	5310
60	5300		
64	5320		

UNII-2C (For Bandwidth=20MHz)		UNII-2C (For Bandwidth=40MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510
104	5520	110	5550
108	5540	118	5590
112	5560	126	5630
116	5580	134	5670
120	5600	142	5710
124	5620		
128	5640		
132	5660		
136	5680		
140	5700		
144	5720		

UNII-3		UNII-3		UNII-3	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

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5.4. CTHE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter	
Test Software	QATool_Dbg
Frequency Band	Setting
UNII-1	default
UNII-2A	default
UNII-2C	default
UNII-3	default

5.5. THE WORSE CASE CONFIGURATIONS

For SISO modes, there are two transmission antennas. The antenna used in any given time can be either ANTENNA 0 or ANTENNA 1. All antenna ports have the same power; output power measurement for SISO modes on both antennas are reported.
For 2TX MIMO modes, ANTENNA 0 and ANTENNA 1, used at the same time.

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 VHT20 mode: MCS0
802.11ac VHT40 mode: MCS0

802.11ac VHT20 and VHT40 mode are different from 802.11nHT20 and HT40 only in control messages, so for these 4 modes, only 802.11ac VHT20 and 802.11ac VHT40 worst case modes datas are recorded in the report .
802.11a support SISO mode, two antenna have the same power setting, so only the worst data for antenna 0 are recorded in the report.

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5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna No.	Frequency (MHz)	Antenna Type	Max Antenna Gain (dBi)
0	5150-5850	PCB Antenna	2.01
1	5150-5850	PCB Antenna	2.03

Note: Directional gain= $10\log[(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}] = < 6dBi$

N_{ANT}: the number of Antenna

IEE Std. 802.11	Transmit and Receive Mode	Description
802.11a	☒2TX, 2RX	ANT 0, 1 can be used as transmitting/receiving antenna.
802.11n HT20	☒2TX, 2RX	ANT 0, 1 can be used as transmitting/receiving antenna.
802.11n HT40	☒2TX, 2RX	ANT 0, 1 can be used as transmitting/receiving antenna.
802.11ac VHT20	☒2TX, 2RX	ANT 0, 1 can be used as transmitting/receiving antenna.
802.11ac VHT40	☒2TX, 2RX	ANT 0, 1 can be used as transmitting/receiving antenna.
Note: 1. WLAN 2.4G & WLAN 5G can't transmit simultaneously. (declared by client) 2. Only 802.11a does not support MIMO mode.		

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5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	PC	Dell	Vostro 3902	8KNDDB2
2	Debug	N/A	N/A	N/A

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	PCIEX	N/A	N/A	0.1	N/A
2	USB	N/A	N/A	1	N/A

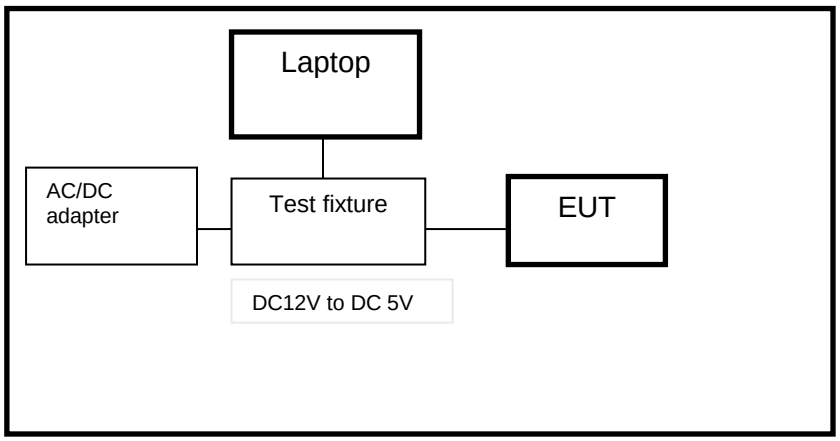
ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
1	Power Adapter	N/A	HW-120150E2W	INPUT:100-240V~50/60Hz, 0.5A OUTPUT:12.0V, 1.5A

TEST SETUP

The EUT can work in engineering mode with a software through a Laptop.

SETUP DIAGRAM FOR TESTS



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6. MEASURING INSTRUMENT AND SOFTWARE USED

For the previous calibration information

Conducted Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	101961	Dec.10,2018	Dec.10,2019
☑	Two-Line V-Network	R&S	ENV216	101983	Dec.10,2018	Dec.10,2019
☑	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.10,2018	Dec.10,2019
Software						
Used	Description			Manufacturer	Name	Version
☑	Test Software for Conducted disturbance			Farad	EZ-EMC	Ver. UL-3A1
Radiated Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.10,2018	Dec.10,2019
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Sep.17, 2018	Sep.17, 2021
☑	Preamplifier	HP	8447D	2944A09099	Dec.10,2018	Dec.10,2019
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.10,2018	Dec.10,2019
☑	Horn Antenna	TDK	HRN-0118	130939	Sep.17, 2018	Sep.17, 2021
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Aug.11, 2018	Aug.11, 2021
☑	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.10,2018	Dec.10,2019
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.10,2018	Dec.10,2019
☑	Preamplifier	TDK	PA-02-3	TRS-308-00002	Dec.10,2018	Dec.10,2019
☑	Loop antenna	Schwarzbeck	1519B	00008	Jan.07, 2019	Jan.07, 2022
☑	Band Reject Filter	Wainwright	WRCJV12-5695-5725-5850-5880-40SS	4	Dec.10,2018	Dec.10,2019
☑	Band Reject Filter	Wainwright	WRCJV20-5120-5150-5350-5380-60SS	2	Dec.10,2018	Dec.10,2019
☑	Band Reject Filter	Wainwright	WRCJV20-5440-5470-	1	Dec.10,2018	Dec.10,2019

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			5725-5755-60SS			
☑	High Pass Filter	Wainwright	WHKX10-5850-6500-1800-40SS	4	Dec.10,2018	Dec.10,2019

Software				
Used	Description	Manufacturer	Name	Version
☑	Test Software for Radiated disturbance	Farad	EZ-EMC	Ver. UL-3A1

Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.10,2018	Dec.10,2019
☑	Power Meter	Keysight	N1911A	MY55416024	Dec.10,2018	Dec.10,2019
☑	Power Sensor	Keysight	U2021XA	MY5100022	Dec.10,2018	Dec.10,2019

Note: This table records the previous calibration information

For the last calibration information

Conducted Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	101961	Dec.05,2019	Dec.05,2020
☑	Two-Line V-Network	R&S	ENV216	101983	Dec.05,2019	Dec.05,2020
☑	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.05,2019	Dec.05,2020

Software				
Used	Description	Manufacturer	Name	Version
☑	Test Software for Conducted disturbance	Farad	EZ-EMC	Ver. UL-3A1

Radiated Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.06,2019	Dec.06,2020
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Sep.17, 2018	Sep.17, 2021
☑	Preamplifier	HP	8447D	2944A09099	Dec.05,2019	Dec.05,2020
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.05,2019	Dec.05,2020
☑	Horn Antenna	TDK	HRN-0118	130939	Sep.17, 2018	Sep.17, 2021
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Aug.11, 2018	Aug.11, 2021

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☑	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.05,2019	Dec.05,2020
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.05,2019	Dec.05,2020
☑	Preamplifier	TDK	PA-02-3	TRS-308-00002	Dec.05,2019	Dec.05,2020
☑	Loop antenna	Schwarzbeck	1519B	00008	Jan.07, 2019	Jan.07, 2022
☑	Band Reject Filter	Wainwright	WRCJV12-5695-5725-5850-5880-40SS	4	Dec.05,2019	Dec.05,2020
☑	Band Reject Filter	Wainwright	WRCJV20-5120-5150-5350-5380-60SS	2	Dec.05,2019	Dec.05,2020
☑	Band Reject Filter	Wainwright	WRCJV20-5440-5470-5725-5755-60SS	1	Dec.05,2019	Dec.05,2020
☑	High Pass Filter	Wainwright	WHKX10-5850-6500-1800-40SS	4	Dec.05,2019	Dec.05,2020

Software				
Used	Description	Manufacturer	Name	Version
☑	Test Software for Radiated disturbance	Farad	EZ-EMC	Ver. UL-3A1

Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.06,2019	Dec.06,2020
☑	Power Meter	Keysight	N1911A	MY55416024	Dec.06,2019	Dec.06,2020
☑	Power Sensor	Keysight	U2021XA	MY5100022	Dec.06,2019	Dec.06,2020

Note: This table records the last calibration information

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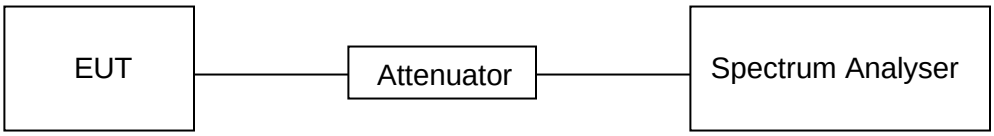
7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only

TEST SETUP



TEST ENVIRONMENT

Temperature	23.5°C	Relative Humidity	59%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.3V

RESULTS

Mode	ON Time (ms)	Period (ms)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
11a	1.400	1.425	0.982	98.2%	0.079	0.71	1
11n HT20	1.300	1.335	0.974	97.4%	0.114	0.77	1
11n HT40	0.650	0.685	0.949	94.9%	0.227	1.54	2
11ac VHT20	0.680	0.716	0.950	95.0%	0.223	1.47	2
11ac VHT40	0.352	0.387	0.910	91.0%	0.410	2.84	3

Note:
Duty Cycle Correction Factor=10log (1/x).
Where: x is Duty Cycle (Linear)
Where: T is On Time
If that calculated VBW is not available on the analyzer then the next higher value should be used.
Antenna 1 and Antenna 1 has the same duty cycle, only ANT 0 data show here.

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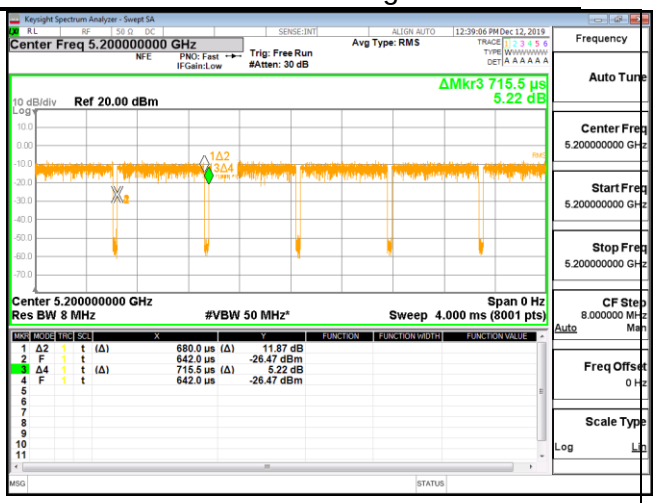
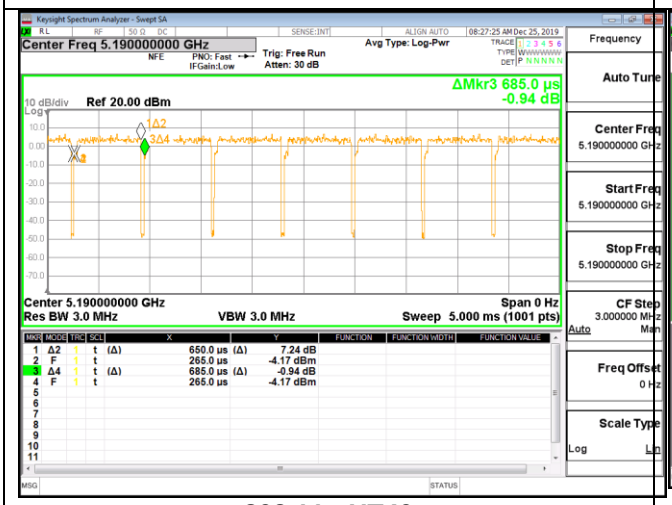
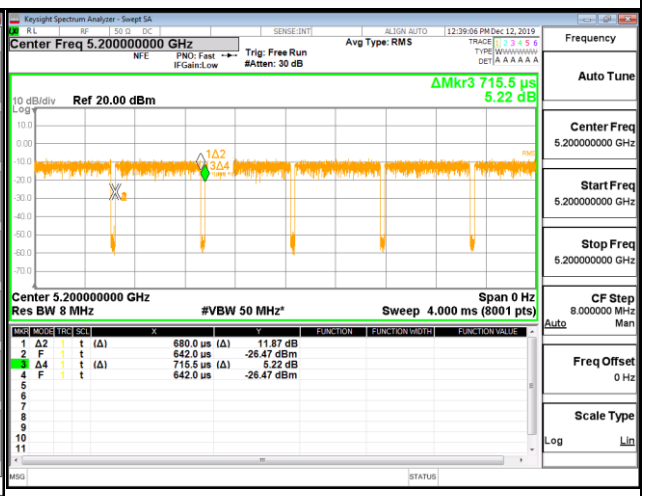
802.11a



802.11n HT20



802.11n HT40



11ac VHT20

11ac VHT40

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7.2. 6/26/99% dB BANDWIDTH

LIMITS

CFR 47 FCC Part15, Subpart E ISED RSS-247		
Test Item	Limit	Frequency Range (MHz)
Bandwidth	26 dB Bandwidth	5150-5250
	26 dB Bandwidth	5250-5350
	26 dB Bandwidth	For FCC:5470-5725 For IC:5470-5600 5650-5725
	Minimum 500kHz 6dB Bandwidth	5725-5850

ISED RSS-247		
RSS-Gen Clause 6.6	99% Bandwidth	For reporting purposes only.

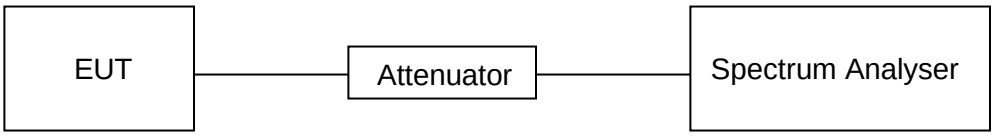
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6dB Bandwidth: RBW=100kHz For 26dB Bandwidth: approximately 1% of the emission bandwidth. For 99dB Bandwidth: approximately 1%~5% of the emission bandwidth.
VBW	For 6dB Bandwidth : ≥3×RBW For 26dB Bandwidth : ≥3×RBW For 99% Occupied Bandwidth: ≥3×RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and 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 6dB/26dB&99% Occupied Bandwidth relative to the maximum level measured in the fundamental emission.

TEST SETUP



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TEST ENVIRONMENT

Temperature	23.5°C	Relative Humidity	59%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.3V

RESULTS

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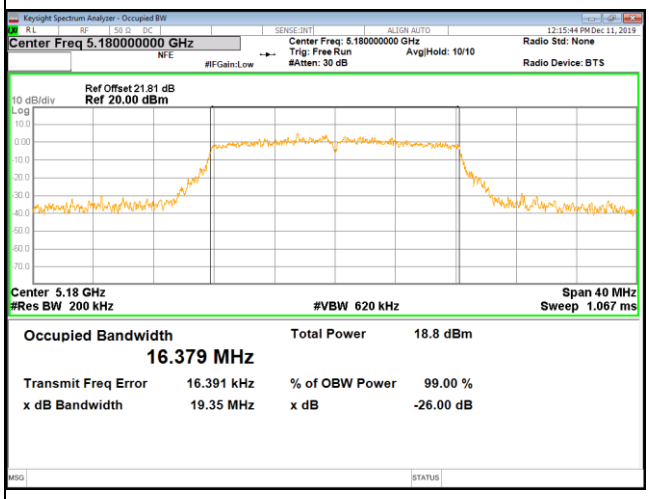
7.2.1. 802.11a SISO MODE

ANT0 WORST CASE

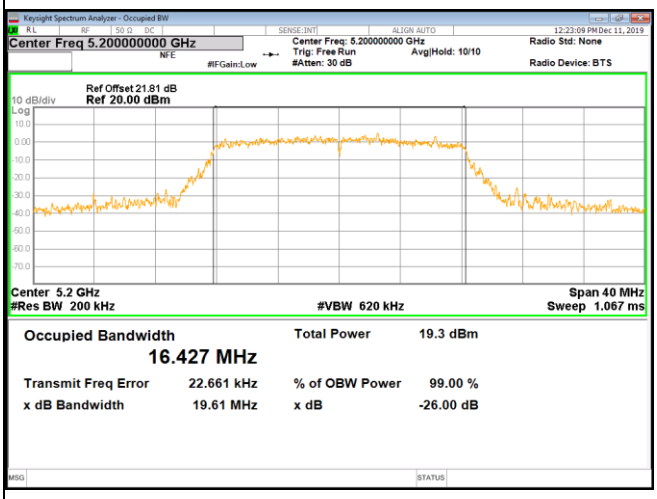
UNII-1 BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5180	19.35	16.379
Mid	5200	19.61	16.427
High	5240	19.40	16.355

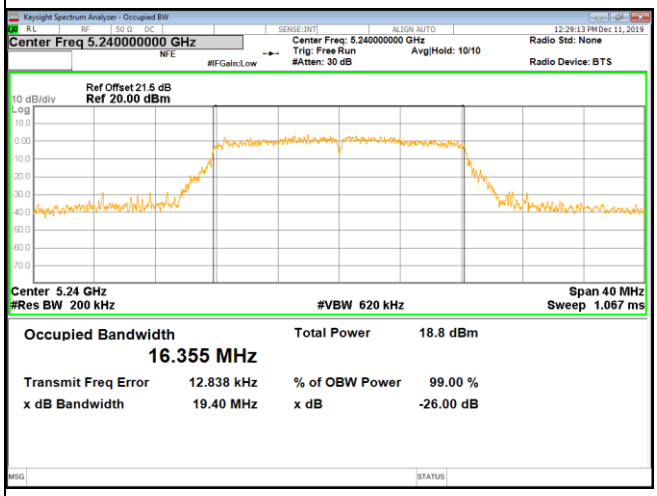
Low CHANNEL



Mid CHANNEL



High CHANNEL



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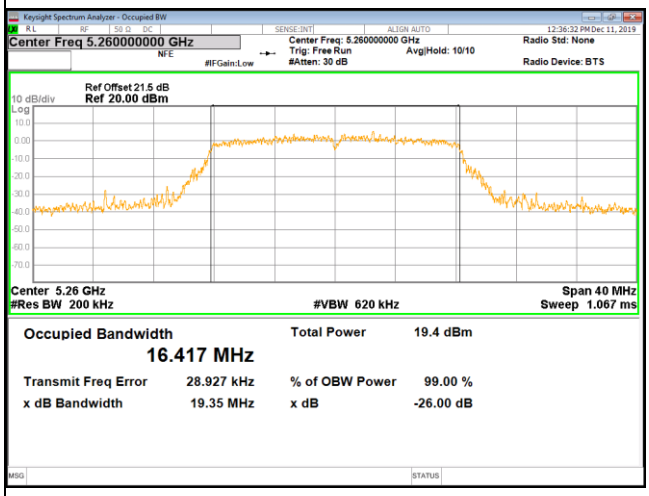
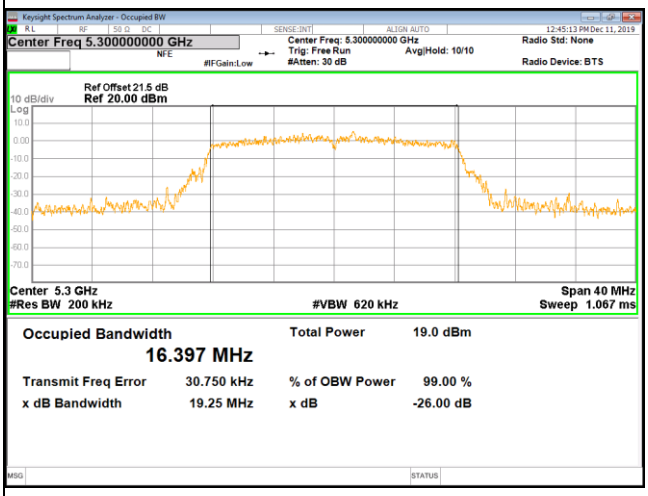
UNII-2A BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5260	19.35	16.417
Mid	5300	19.25	16.397
High	5320	19.43	16.459

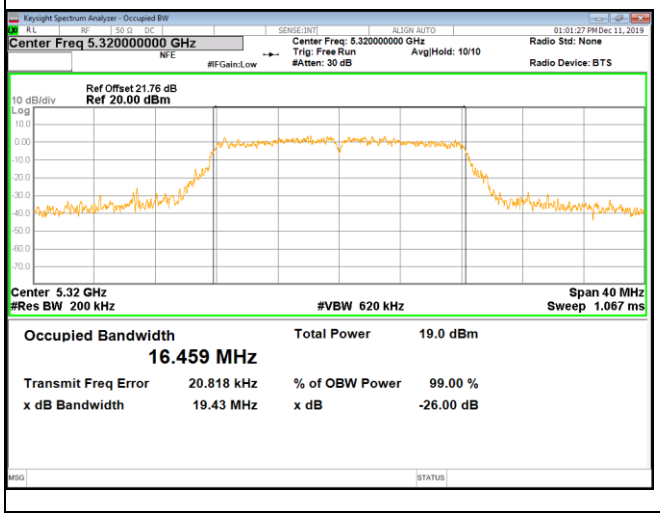
Low CHANNEL



Mid CHANNEL



High CHANNEL



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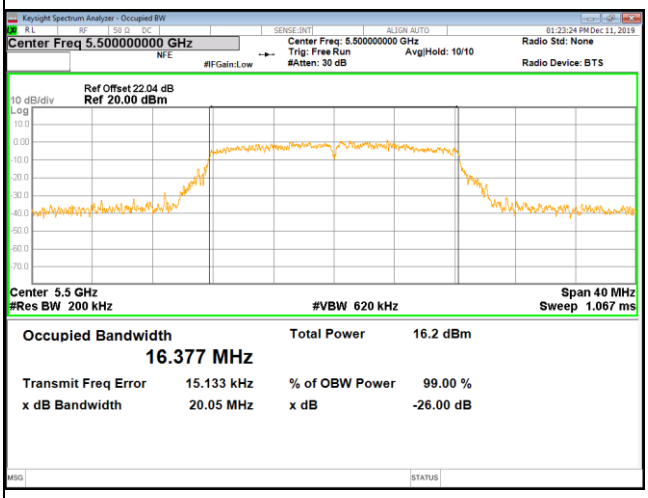
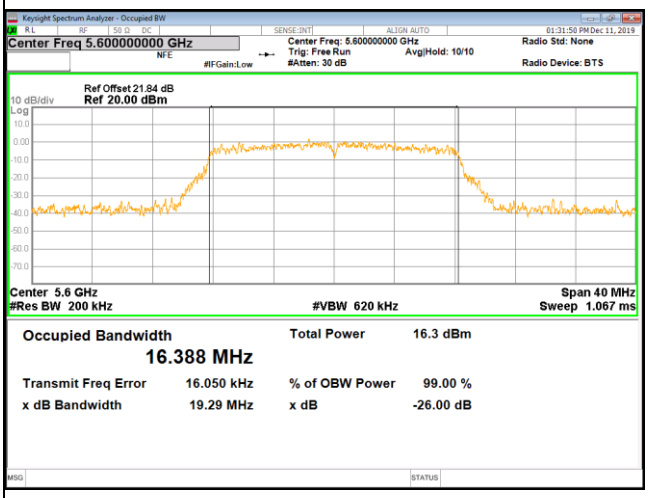
UNII-2C BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5500	20.05	16.377
Mid	5580	19.29	16.388
High	5700	19.21	16.444
CH144	5720	19.46	16.368

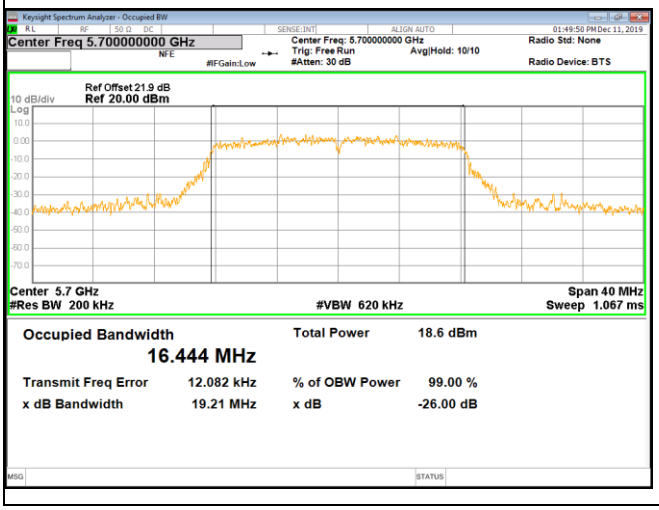
Low CHANNEL



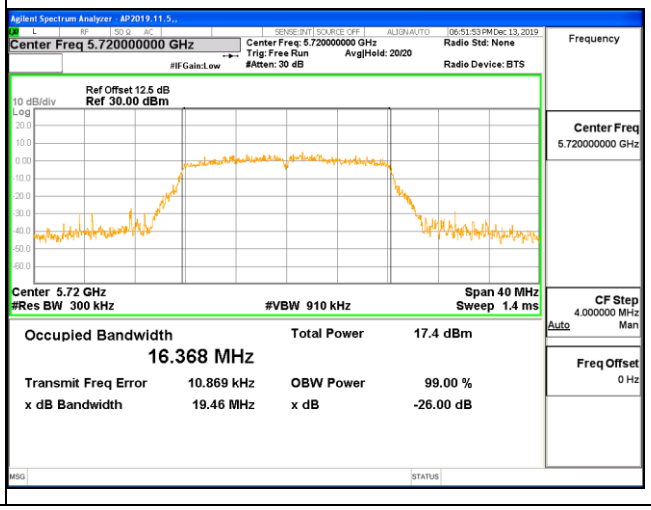
Mid CHANNEL



High CHANNEL



CHANNEL 144



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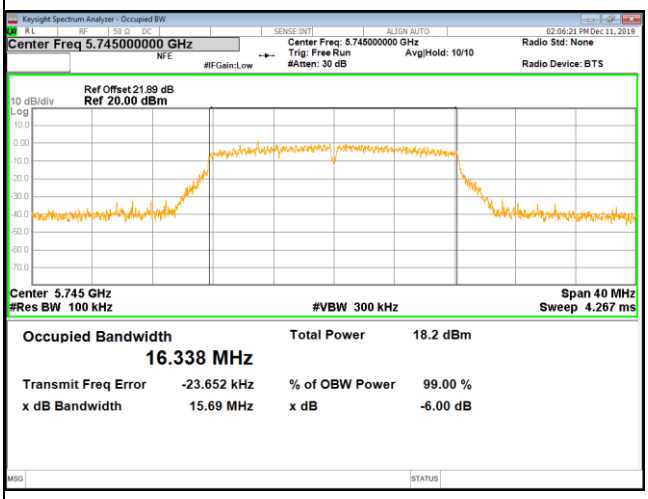
UNII-3 BAND

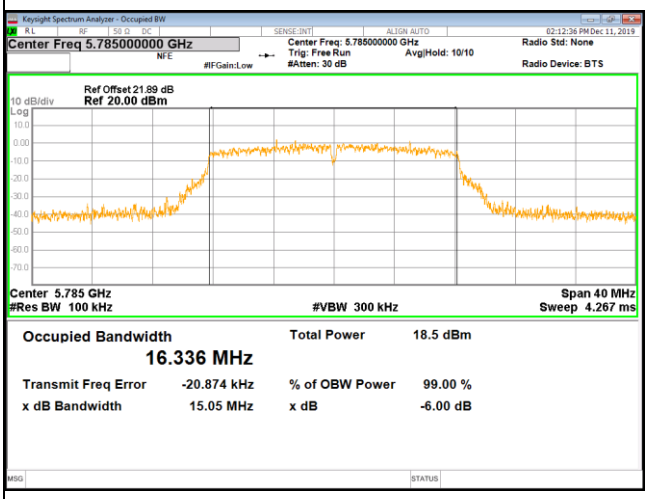
Channel	Frequency (MHz)	6 dB BW (MHz)	99% BW (MHz)	Limit For 6dB BW (kHz)	Result
Low	5745	15.69	16.435	500	PASS
Mid	5785	15.05	16.448	500	PASS
High	5825	11.96	16.405	500	PASS
CH144	5720	15.41	/	500	PASS

6dB BW

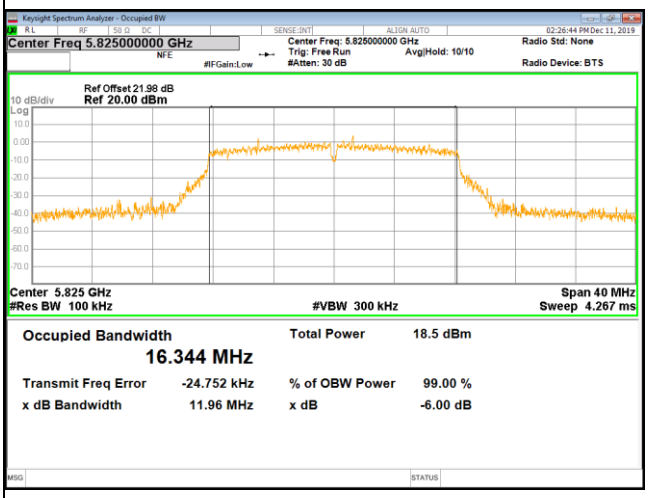
Low CHANNEL



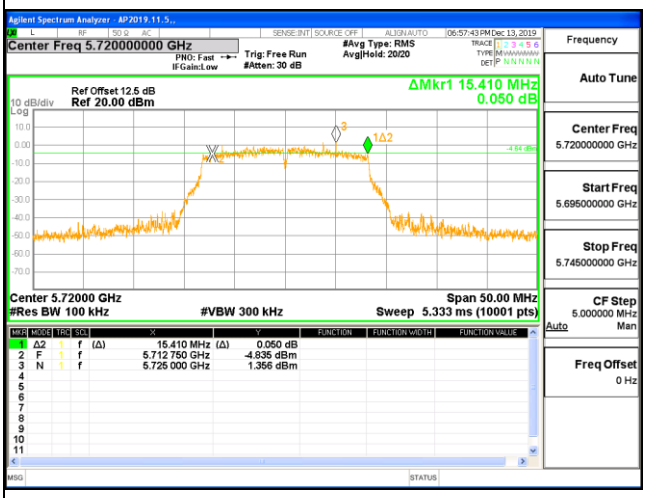
Mid CHANNEL



High CHANNEL



CHANNEL 144



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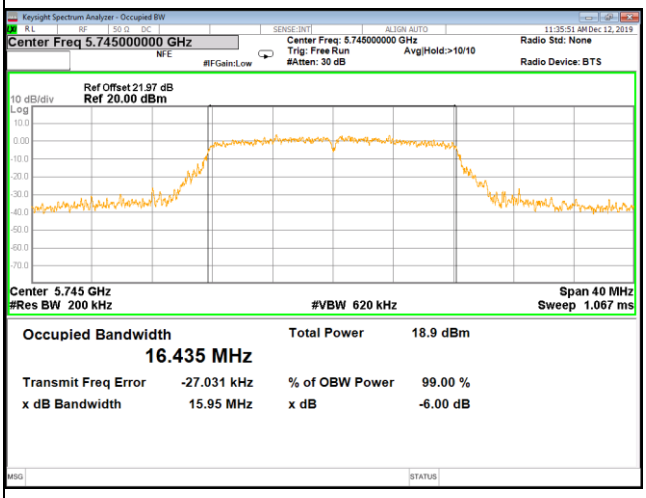
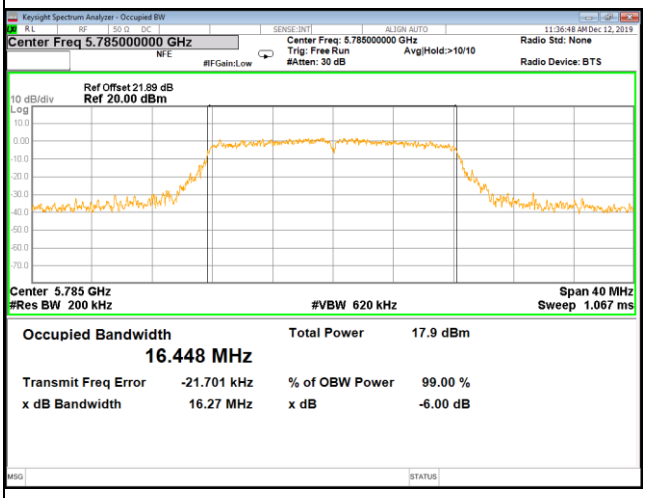
99% BW

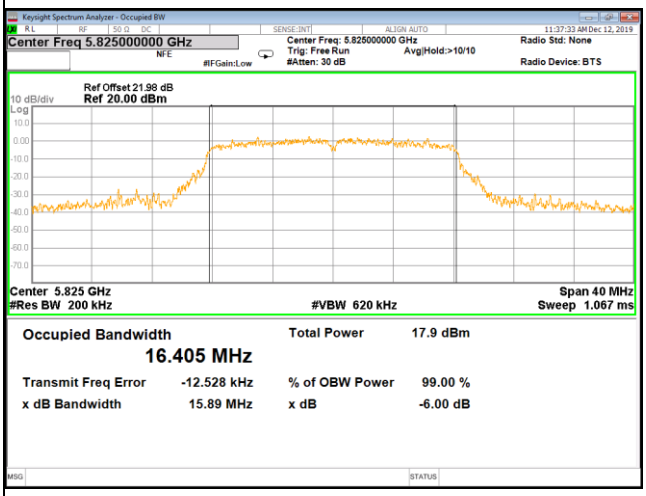
Low CHANNEL



Mid CHANNEL



High CHANNEL



Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.

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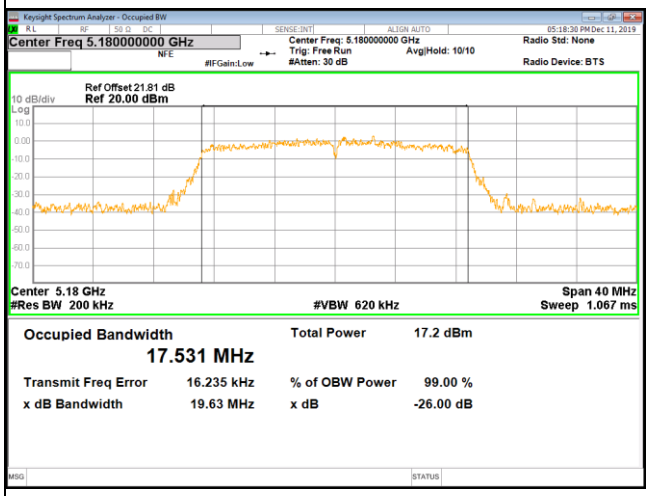
7.2.2. 802.11ac VHT20 MIMO MODE

ANT0 WORST CASE

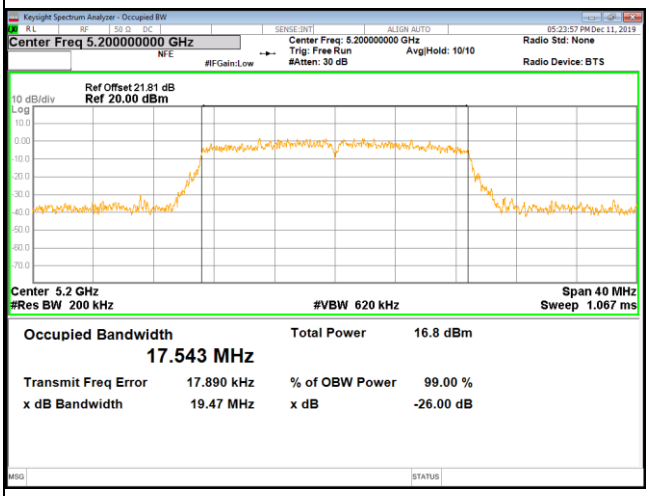
UNII-1 BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5180	19.63	17.531
Mid	5200	19.47	17.543
High	5240	19.46	17.525

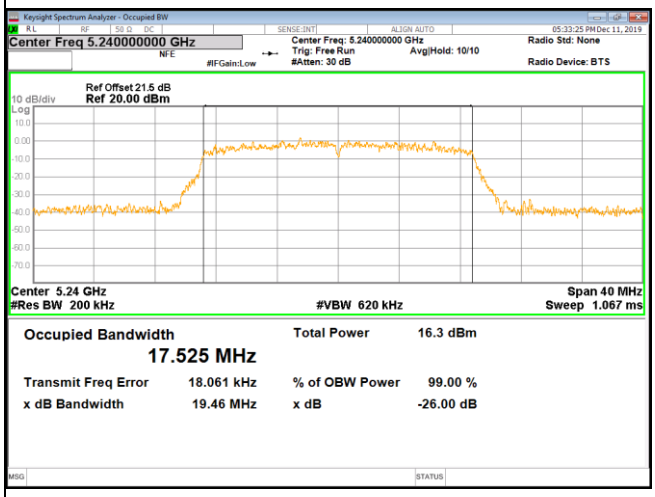
Low CHANNEL



Mid CHANNEL



High CHANNEL



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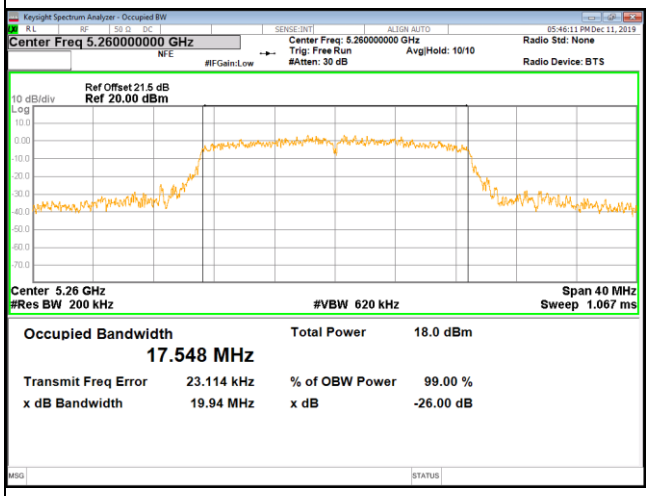
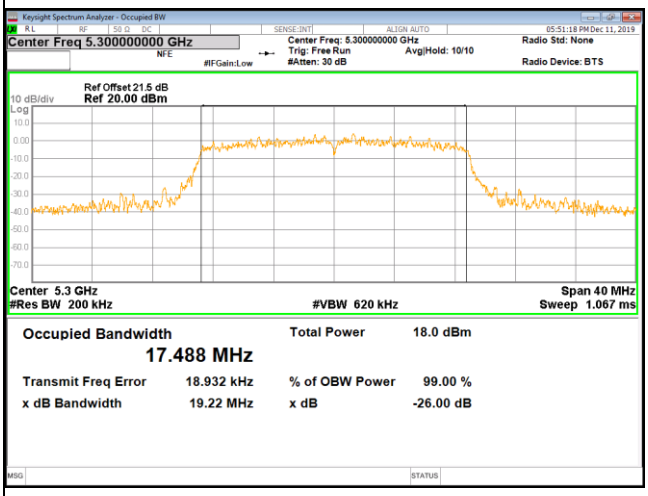
UNII-2A BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5260	19.94	17.548
Mid	5300	19.22	17.488
High	5320	19.71	17.555

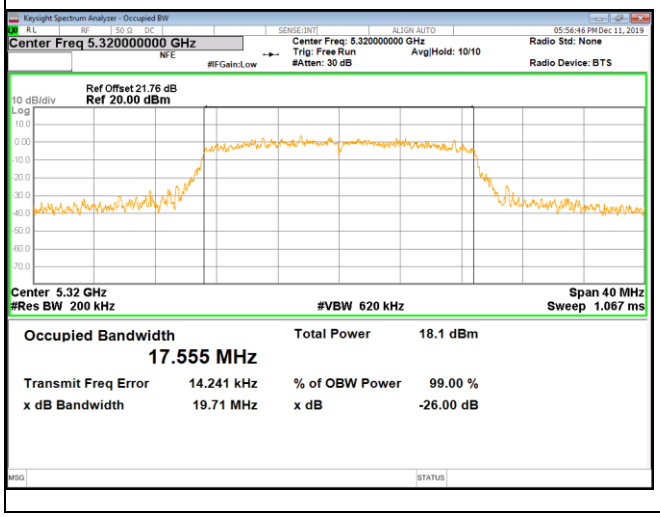
Low CHANNEL



Mid CHANNEL



High CHANNEL



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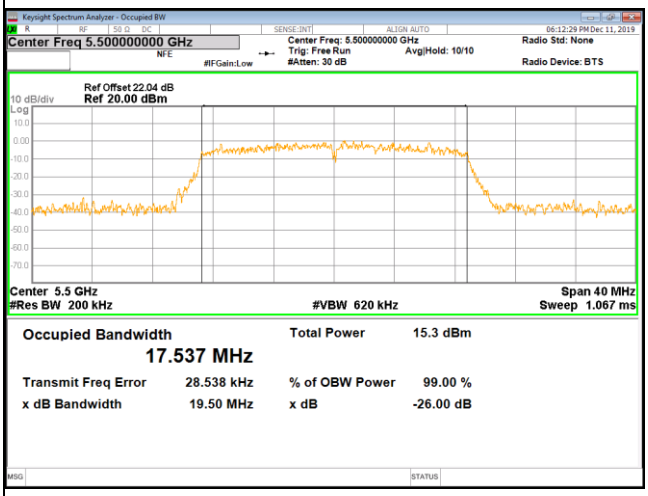
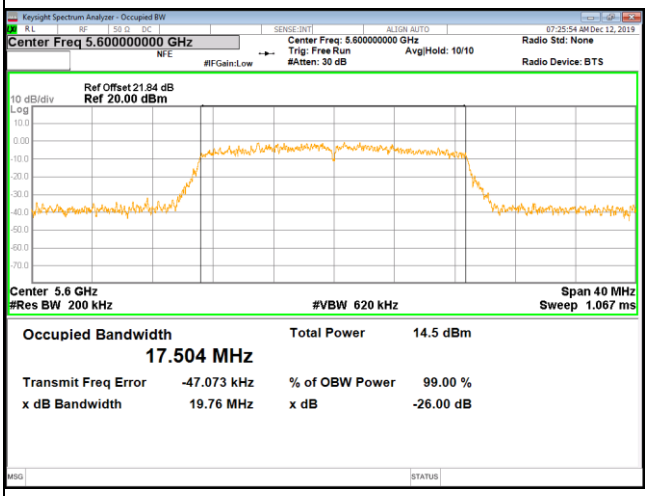
UNII-2C BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5500	19.50	17.537
Mid	5580	19.76	17.504
High	5700	19.56	17.483
CH144	5720	20.07	17.556

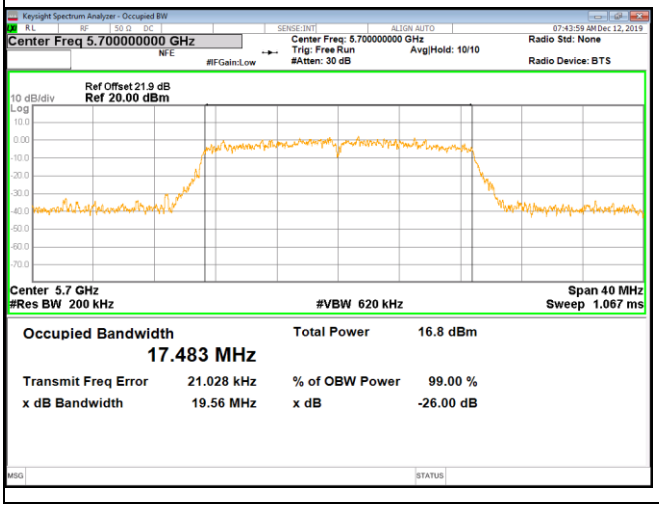
Low CHANNEL



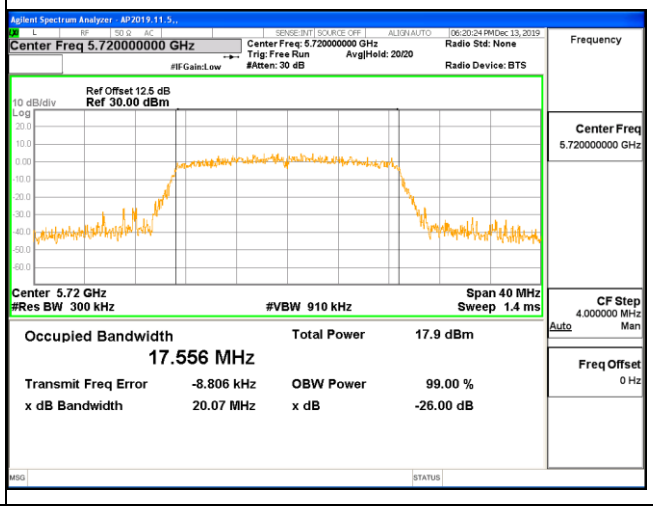
Mid CHANNEL



High CHANNEL



CHANNEL 144



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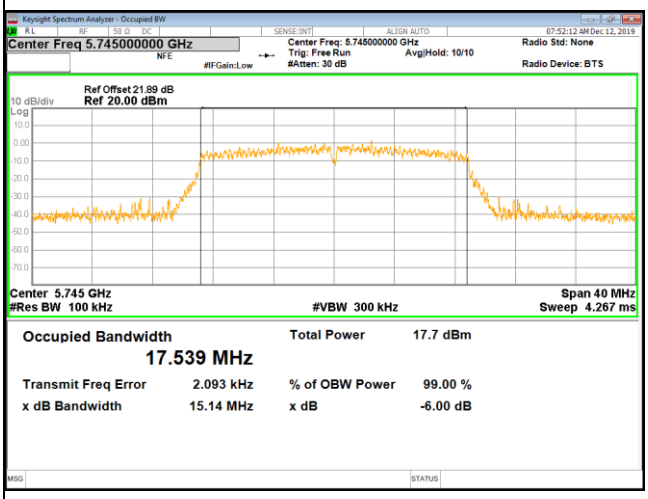
UNII-3 BAND

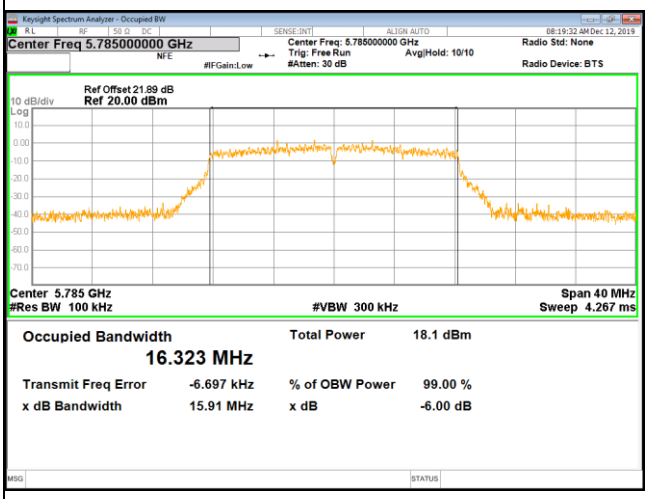
Channel	Frequency (MHz)	6 dB BW (MHz)	99% BW (MHz)	Limit For 6dB BW (kHz)	Result
Low	5745	15.14	17.580	500	PASS
Mid	5785	15.91	17.539	500	PASS
High	5825	15.05	17.562	500	PASS
CH144	5720	17.55	/	500	PASS

6dB BW

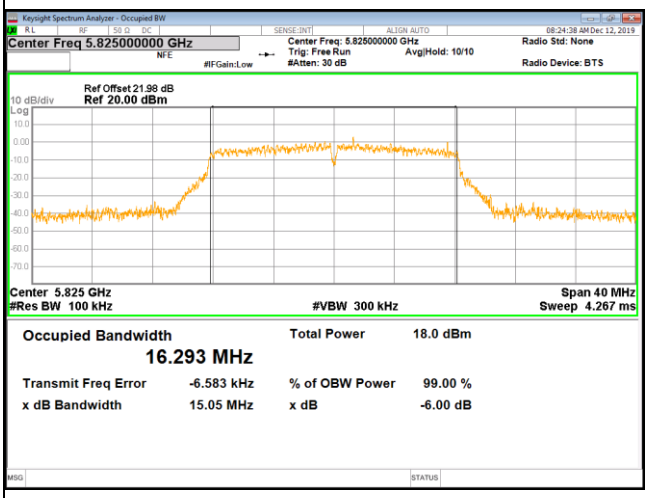
Low CHANNEL



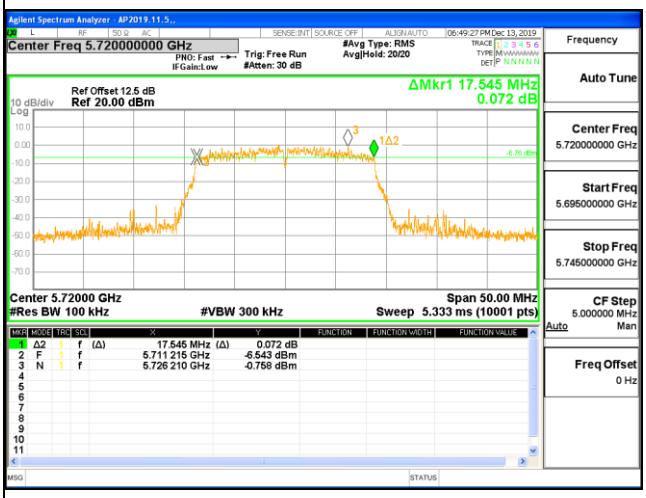
Mid CHANNEL



High CHANNEL



CHANNEL 144



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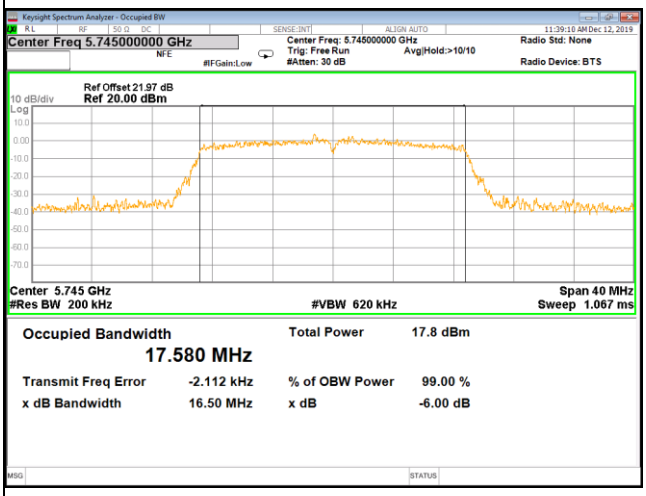
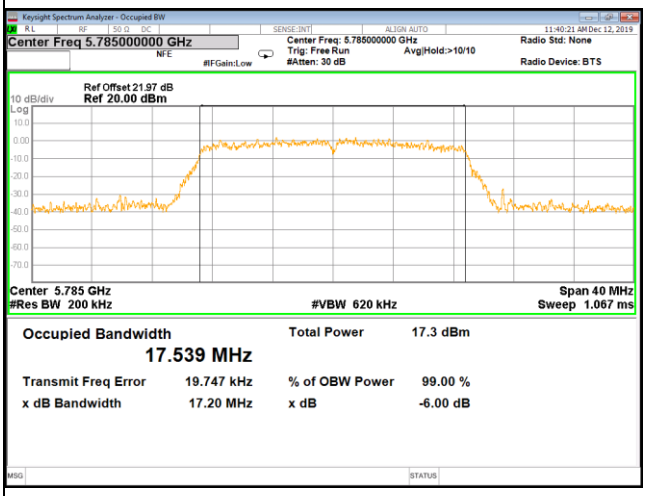
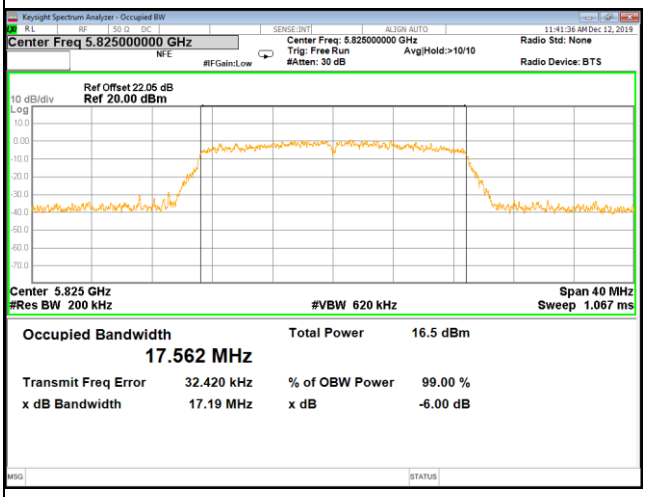
99% BW	
Low CHANNEL	**Mid CHANNEL**
	
High CHANNEL	
	

Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.

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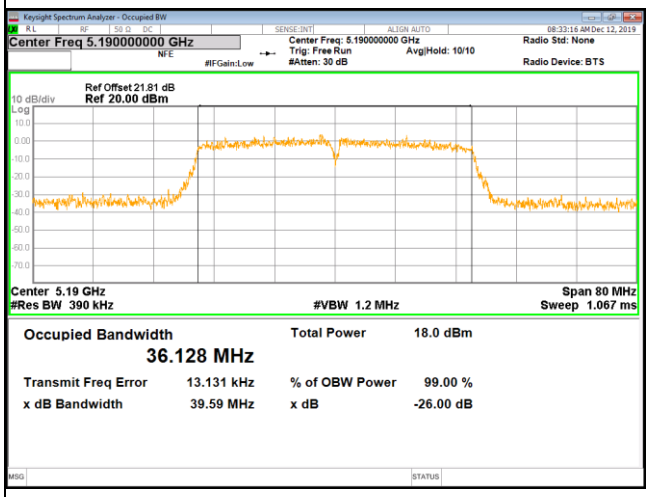
7.2.3. 802.11ac VHT40 MIMO MODE

ANT0 WORST CASE

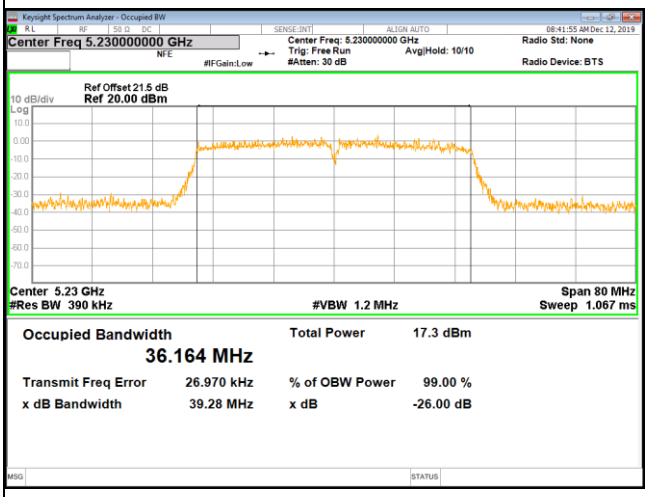
UNII-1 BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5190	39.59	36.128
High	5230	39.28	36.164

Low CHANNEL



High CHANNEL



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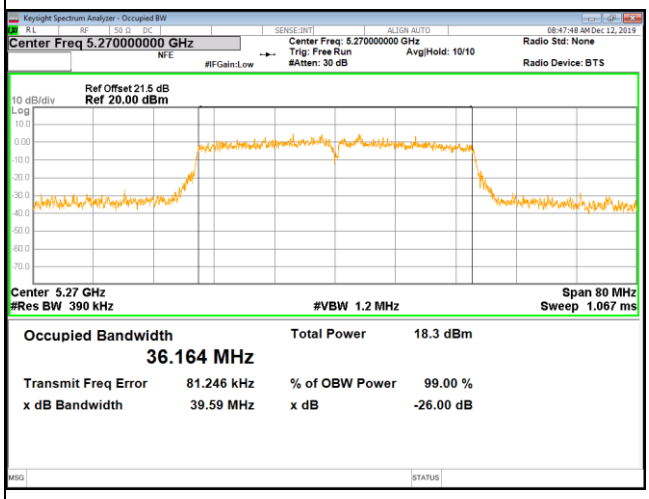
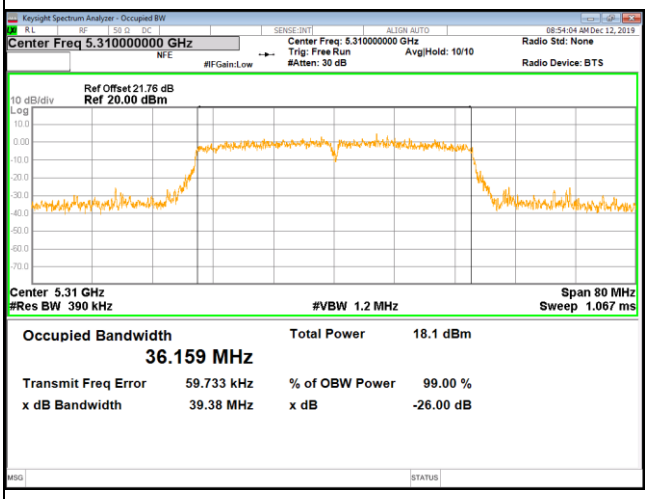
UNII-2A BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5270	39.59	36.164
High	5310	39.38	36.159

Low CHANNEL



High CHANNEL



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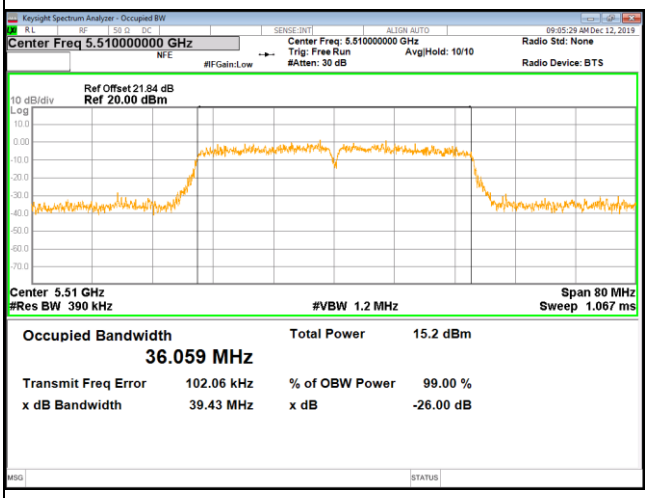
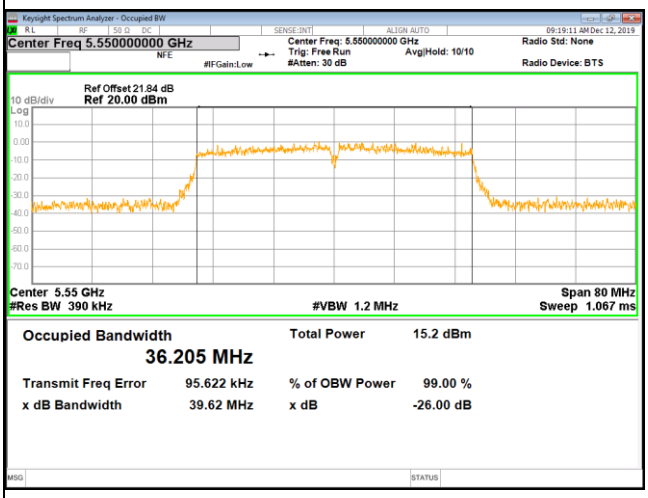
UNII-2C BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5510	39.43	36.059
Mid	5550	39.62	36.205
High	5670	38.91	36.074
CH142	5710	41.10	36.171

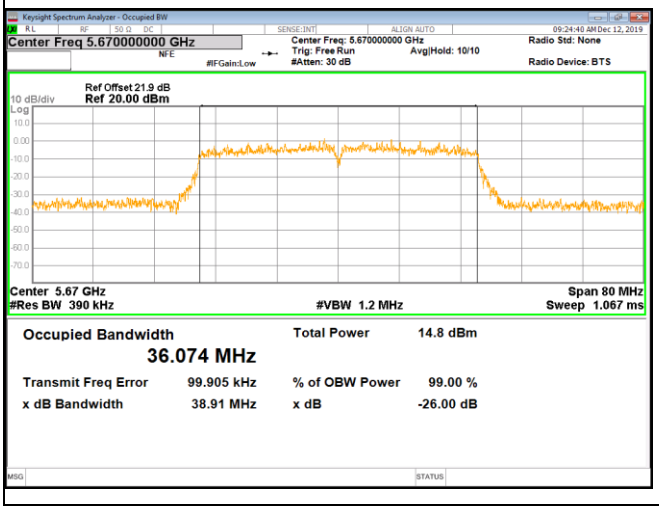
Low CHANNEL



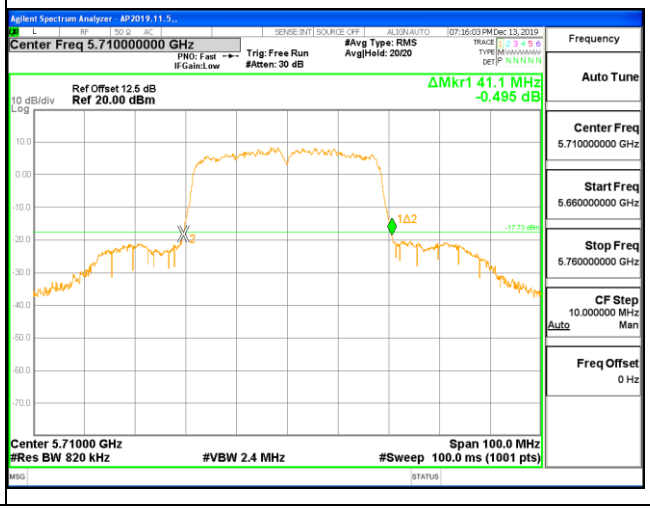
Mid CHANNEL



High CHANNEL



CHANNEL 142 for 26dB BW



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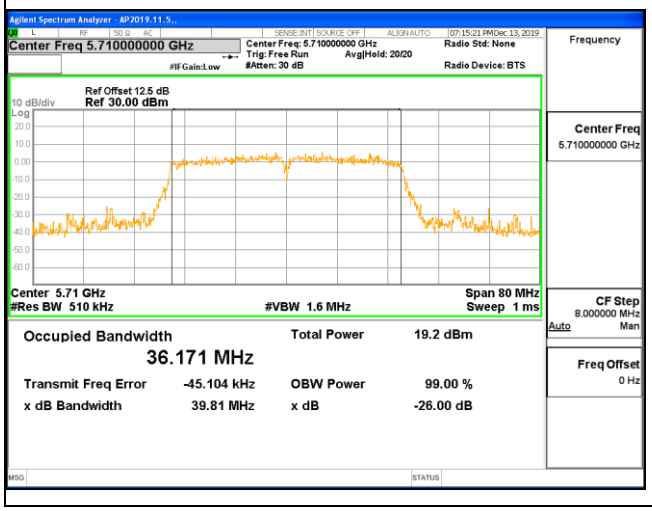
CHANNEL 142 for 99% BW



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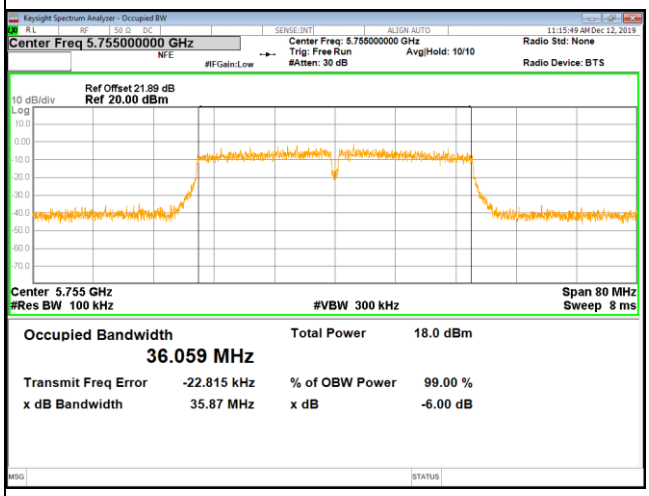
UNII-3 BAND

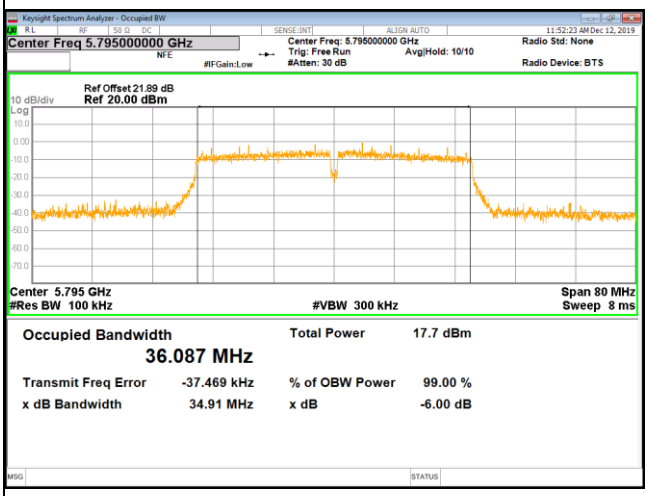
Channel	Frequency (MHz)	6 dB BW (MHz)	99% BW (MHz)	Limit (kHz)	Result
Low	5755	35.87	36.195	500	PASS
High	5795	34.91	36.153	500	PASS
CH142	5710	32.65	/	500	PASS

6dB BW

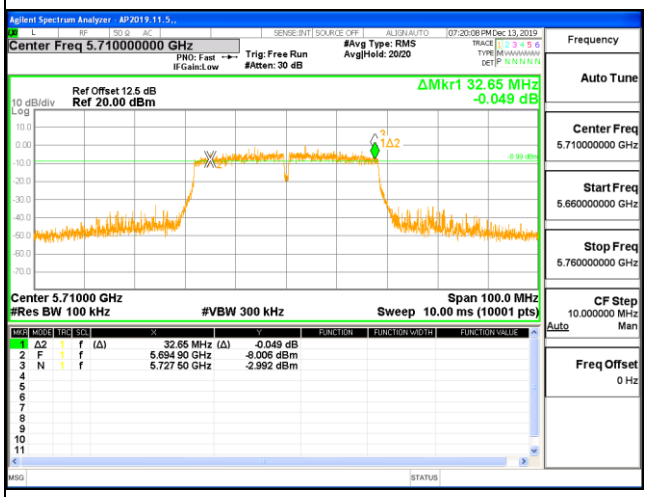
Low CHANNEL



High CHANNEL



CHANNEL 142



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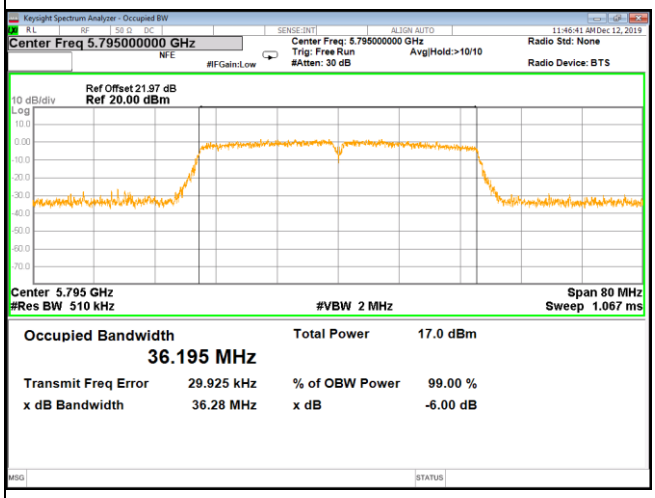
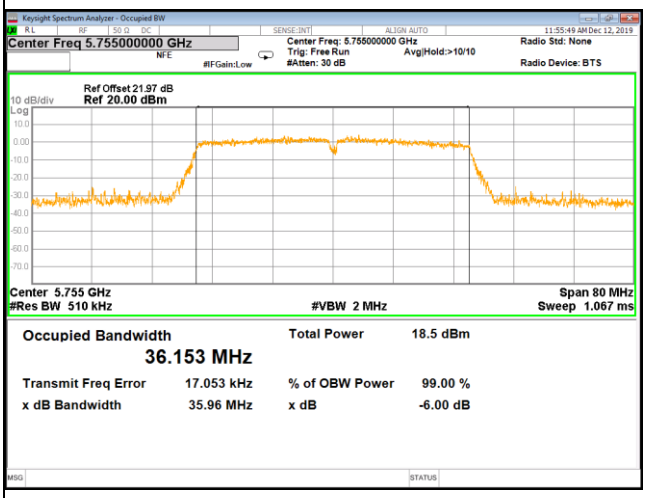
99% BW	
Low CHANNEL	**HIGH CHANNEL**
	

Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.

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7.3. MAXIMUM CONDUCTED OUTPUT POWER

LIMITS

CFR 47 FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	For FCC client devices:250mW (24dBm)	5150-5250
	Not exceed the lesser of 250 mW or 11 dBm + 10 log B whichever is less where B is the 26 dB emission bandwidth in megahertz	5250-5350
	Not exceed the lesser of 250 mW or 11 dBm + 10 log B whichever is less where B is the 26 dB emission bandwidth in megahertz	5470-5725
	1 Watt (30dBm)	5725-5850

ISED RSS-247		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	Maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever is less where B is the 99% emission bandwidth in megahertz	5150-5250
	Not exceed 250 mW or 11 + 10 log10 B, where B is the 99% emission bandwidth in megahertz	5250-5350
	Not exceed 250 mW or 11 + 10 log10 B, where B is the 99% emission bandwidth in megahertz	5470-5600 5650-5725
	1 Watt (30dBm)	5725-5850

Note:
1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.
2. Directional gain = $10\log[(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}]$ <6dBi, where N_{ANT} is the number of outputs, $G_{1/2}$ is the Antenna gain.

TEST PROCEDURE

Refer to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Connect the EUT to the a broadband average RF power meter, the power meter shall have a video bandwidth that is greater than or equal to the bandwidth and shall utilize a fast-responding diode detector.

Straddle channel power is measured using PXA spectrum analyzer.

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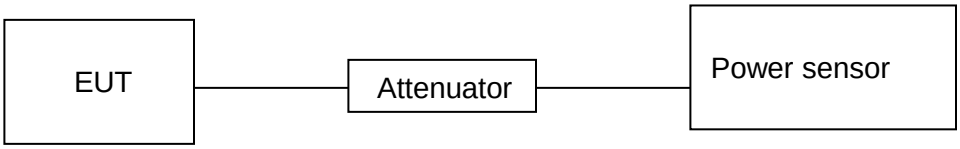
TEST SETUP



TEST ENVIRONMENT

Temperature	23.5°C	Relative Humidity	59%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.3V

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RESULTS

7.3.1. UNII-1 BAND

Modec	Frequency (MHz)	Chain	Conducted AV Power Single（dBm）	Total（dBm）	Limit (dBm)	EIRP (dBm)	ISED EIRP Limit (dBm)
802.11a	5180	ANT0	14.56	/	24.00	16.59	23.00
		ANT1	14.45			16.48	
	5200	ANT0	14.61	/	24.00	16.64	23.00
		ANT1	14.56			16.59	
	5240	ANT0	14.55	/	24.00	16.58	23.00
		ANT1	14.42			16.45	
802.11n (20M)	5180	ANT0	12.61	15.57	24.00	17.60	23.00
		ANT1	12.51				
	5200	ANT0	12.52	15.50	24.00	17.53	23.00
		ANT1	12.46				
	5240	ANT0	12.56	15.53	24.00	17.56	23.00
		ANT1	12.48				
802.11ac (20M)	5180	ANT0	12.68	15.69	24.00	17.72	23.00
		ANT1	12.67				
	5200	ANT0	12.67	15.63	24.00	17.66	23.00
		ANT1	12.56				
	5240	ANT0	12.66	15.67	24.00	17.70	23.00
		ANT1	12.65				
802.11n (40M)	5190	ANT0	11.68	14.60	24.00	16.63	23.00
		ANT1	11.50				
	5230	ANT0	11.30	14.44	24.00	16.47	23.00
		ANT1	11.56				
802.11ac (40M)	5190	ANT0	13.34	16.30	24.00	18.33	23.00
		ANT1	13.24				
	5230	ANT0	13.31	16.27	24.00	18.30	23.00
		ANT1	13.21				

Note: 1.Conducted Power=Meas. Level+ Correction Factor
2. About correction Factor please refer to section 7.1
3.EIRP=conducted Power + Antenna Gain

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7.3.2. UNII-2A BAND

Mode	Frequency (MHz)	Chain	Conducted AV Power Single（dBm）	Total（dBm）	FCC Limit (dBm)	ISED Limit (dBm)
802.11a	5260	ANT0	15.12	/	24.0	24.0
		ANT1	15.07			
	5300	ANT0	14.81	/	24.0	24.0
		ANT1	14.79			
	5320	ANT0	14.61	/	24.0	24.0
		ANT1	14.58			
802.11n (20M)	5260	ANT0	12.91	15.91	24.0	24.0
		ANT1	12.89			
	5300	ANT0	12.57	15.55	24.0	24.0
		ANT1	12.5			
	5320	ANT0	12.82	15.65	24.0	24.0
		ANT1	12.45			
802.11ac (20M)	5260	ANT0	12.84	15.80	24.0	24.0
		ANT1	12.73			
	5300	ANT0	12.58	15.47	24.0	24.0
		ANT1	12.33			
	5320	ANT0	13.03	15.72	24.0	24.0
		ANT1	12.36			
802.11n (40M)	5270	ANT0	11.6	14.58	24.0	24.0
		ANT1	11.53			
	5310	ANT0	11.12	14.12	24.0	24.0
		ANT1	11.09			
802.11ac (40M)	5270	ANT0	14.13	17.11	24.0	24.0
		ANT1	14.06			
	5310	ANT0	14.02	17.02	24.0	24.0
		ANT1	13.99			

C

Note: 1.Conducted Power=Meas. Level+ Correction Factor
2. About correction Factor please refer to section 7.1
3.EIRP=conducted Power + Antenna Gain

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7.3.3. UNII-2C BAND

Mode	Frequency (MHz)	Chain	Conducted AV Power Single（dBm）	Total（dBm）	FCC Limit (dBm)	ISED Limit (dBm)
802.11a	5500	ANT0	14.32	/	24.0	24.0
		ANT1	12.10			
	5600	ANT0	14.95	/	24.0	24.0
		ANT1	12.01			
	5700	ANT0	15.22	/	24.0	24.0
		ANT1	14.30			
802.11n (20M)	5500	ANT0	13.20	15.91	24.0	24.0
		ANT1	12.59			
	5600	ANT0	13.09	15.79	24.0	24.0
		ANT1	12.45			
	5700	ANT0	12.37	15.82	24.0	24.0
		ANT1	13.22			
802.11ac (20M)	5500	ANT0	13.31	15.91	24.0	24.0
		ANT1	12.44			
	5600	ANT0	13.13	16.38	24.0	24.0
		ANT1	13.60			
	5700	ANT0	12.70	16.14	24.0	24.0
		ANT1	13.51			
802.11n (40M)	5510	ANT0	10.04	12.37	24.0	24.0
		ANT1	8.57			
	5550	ANT0	10.52	12.64	24.0	24.0
		ANT1	8.52			
	5670	ANT0	12.37	14.13	24.0	24.0
		ANT1	9.37			
802.11ac (40M)	5510	ANT0	11.49	13.85	24.0	24.0
		ANT1	10.08			
	5550	ANT0	12.15	14.14	24.0	24.0
		ANT1	9.79			
	5670	ANT0	13.91	15.62	24.0	24.0
		ANT1	10.73			

Note: 1.Conducted Power=Meas. Level+ Correction Factor
2. About correction Factor please refer to section 7.1

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7.3.4. STRADDLE CHANNEL

UNII-2C BAND

Mode	Frequency (MHz)	ANT	Maximum AVG Conducted Output Power (dBm)		Min 26dB BW(MHz)	Limit (dBm)
			Single	Total		
a	5720	0	12.88	N/A	15.18	22.8
		1	12.22			
n HT20	5720	0	12.76	15.54	15.30	22.8
		1	12.28			
ac HT20	5720	0	12.20	14.70	15.28	22.8
		1	11.11			
n HT40	5710	0	13.93	16.56	35.80	24
		1	13.13			
ac HT40	5710	0	13.31	15.72	35.80	24
		1	12.01			

Note: 1.Conducted Power=Meas. Level+ Correction Factor
2. About correction Factor please refer to section 7.1

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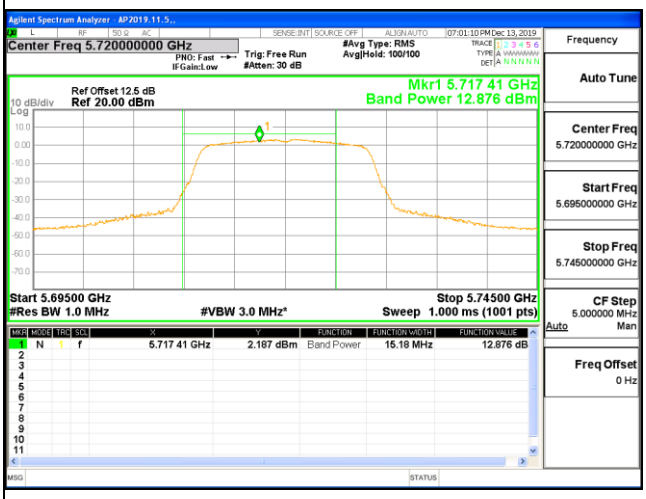
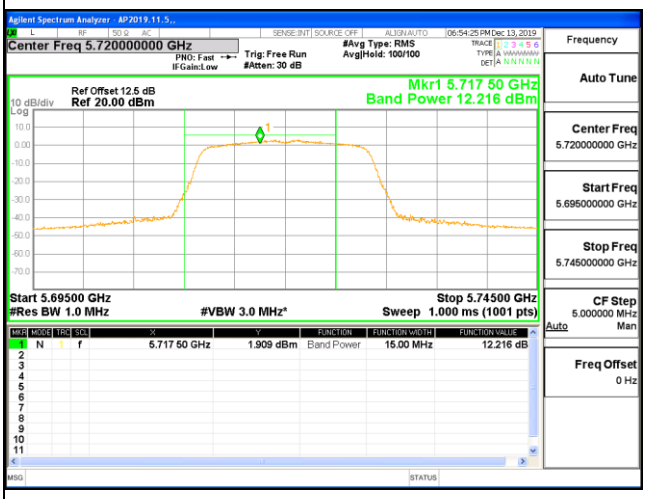
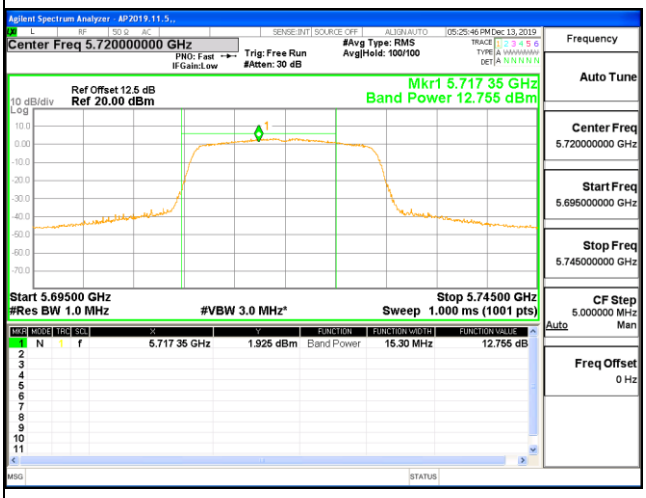
802.11a-Antenna 0



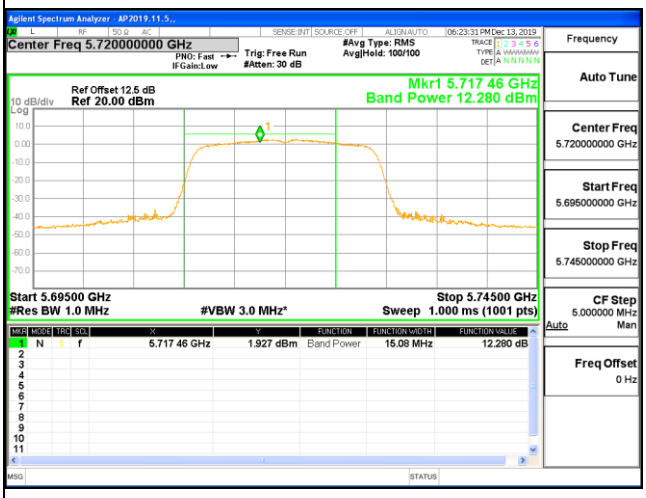
802.11a-Antenna 1



802.11n HT20-Antenna 0

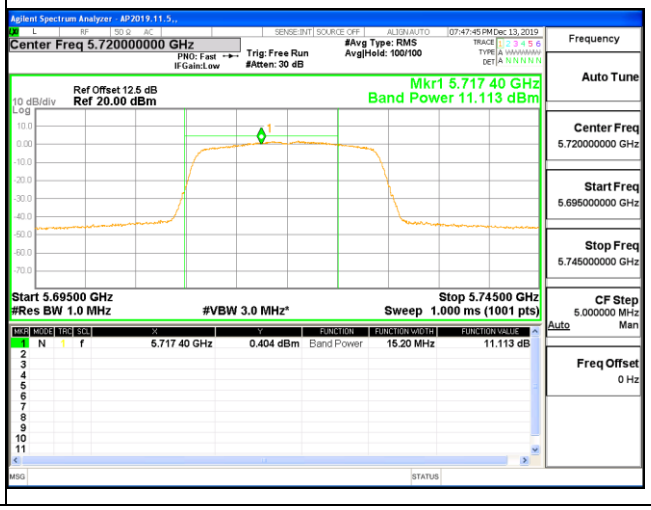


802.11n HT20-Antenna 1



802.11ac HT20-Antenna 0

802.11ac HT20-Antenna 1



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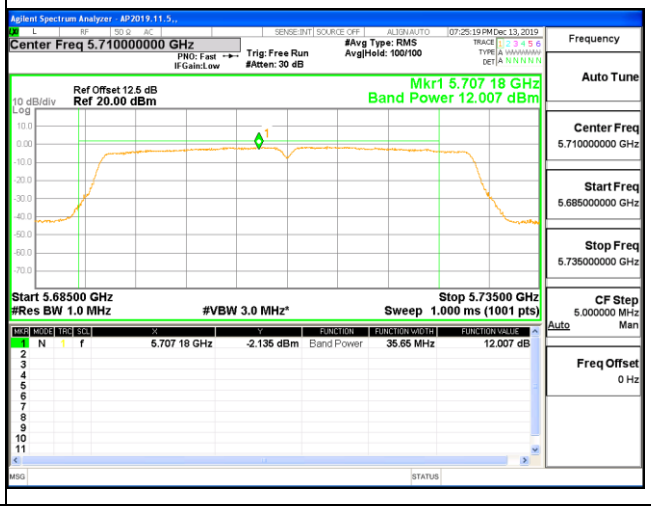
802.11n HT40-Antenna 0

802.11n HT40-Antenna 1

802.11ac HT40-Antenna 0

802.11ac HT40-Antenna 1



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UNII-3 BAND

Mode	Frequency (MHz)	ANT	Maximum AVG Conducted Output Power (dBm)		Min 26dB BW(MHz)	Limit (dBm)
			Single	Total		
a	5720	0	5.06	N/A	5.25	30
		1	4.85			
n HT20	5720	0	5.26	8.13	5.20	30
		1	4.97			
ac HT20	5720	0	4.848	7.56	5.20	30
		1	4.227			
n HT40	5710	0	1.899	4.95	5.80	30
		1	1.982			
ac HT40	5710	0	1.29	4.04	5.85	30
		1	0.743			

Note: 1.Conducted Power=Meas. Level+ Correction Factor
2. About correction Factor please refer to section 7.1

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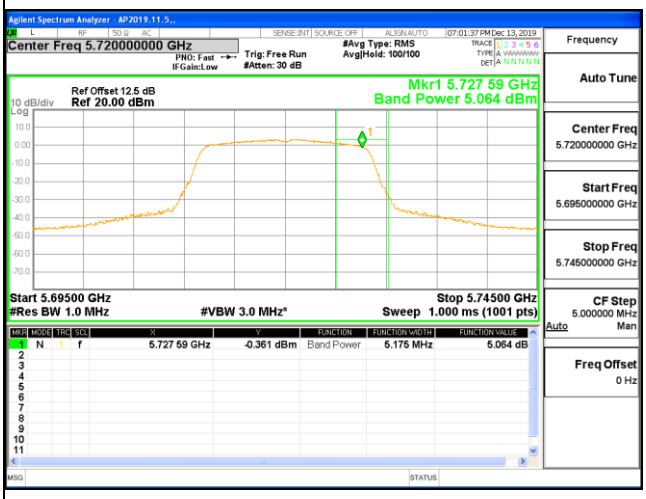
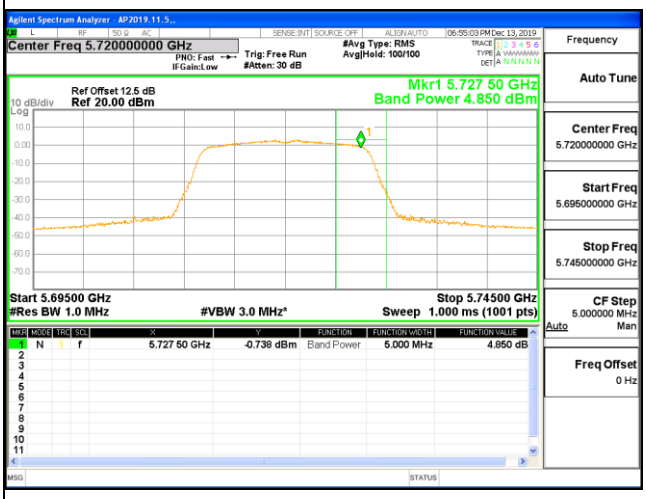
802.11a-Antenna 0

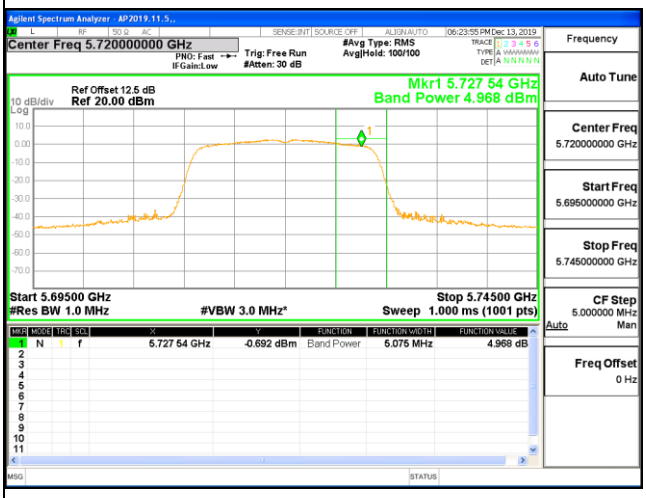


802.11a-Antenna 1

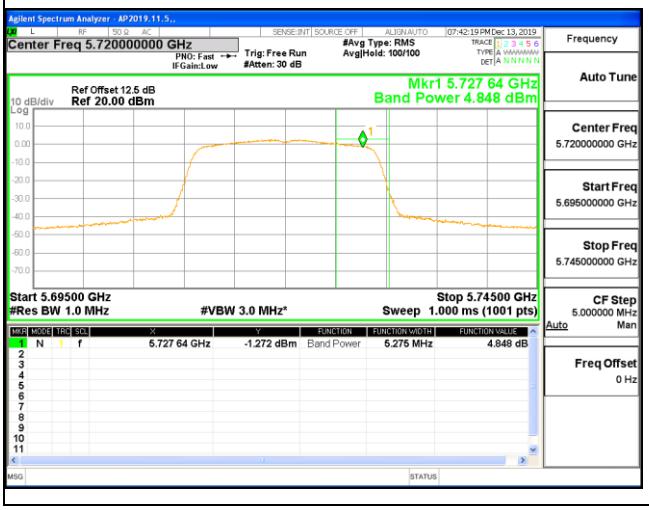


802.11n HT20-Antenna 0

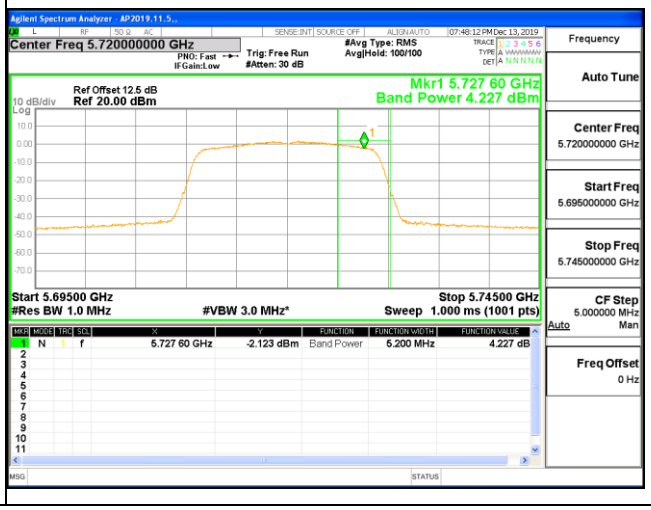
802.11n HT20-Antenna 1



802.11ac HT20-Antenna 0



802.11ac HT20-Antenna 1



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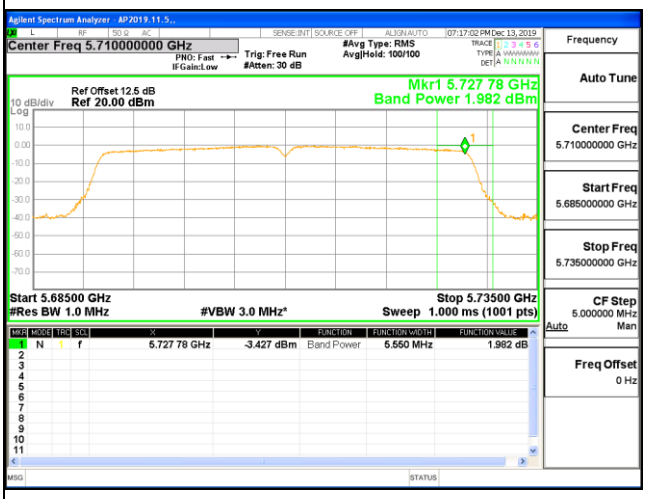
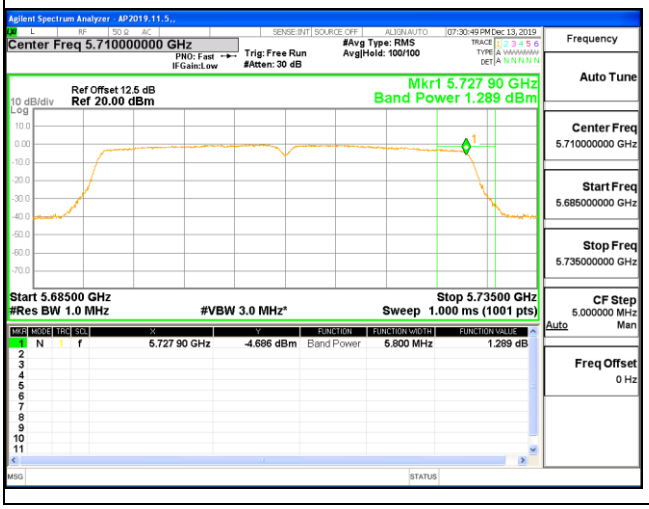
802.11n HT40-Antenna 0

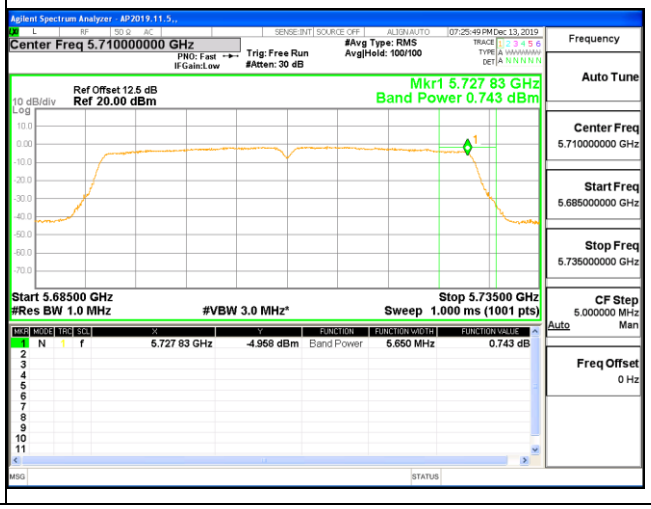
802.11n HT40-Antenna 1



802.11ac HT40-Antenna 0



802.11ac HT40-Antenna 1



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7.3.5. UNII-3 BAND

Mode	Frequency (MHz)	Chain	Conducted AV Power Single（dBm）	Total （dBm）	Limit (dBm)
802.11a	5745	ANT0	14.13	/	30
		ANT1	13.33		
	5785	ANT0	13.57	/	30
		ANT1	13.52		
	5825	ANT0	12.73	/	30
		ANT1	12.92		
802.11n (20M)	5745	ANT0	12.97	15.62	30
		ANT1	12.21		
	5785	ANT0	12.64	15.77	30
		ANT1	12.88		
	5825	ANT0	11.89	15.34	30
		ANT1	12.73		
802.11ac (20M)	5745	ANT0	12.84	15.69	30
		ANT1	12.52		
	5785	ANT0	12.88	15.53	30
		ANT1	12.12		
	5825	ANT0	12.93	15.79	30
		ANT1	12.62		
802.11n (40M)	5755	ANT0	12.00	14.40	30
		ANT1	10.68		
	5795	ANT0	10.73	13.36	30
		ANT1	9.94		
802.11ac (40M)	5755	ANT0	13.28	16.04	30
		ANT1	12.76		
	5795	ANT0	12.01	15.03	30
		ANT1	12.03		

C

Note: 1.Conducted Power=Meas. Level+ Correction Factor
2. About correction Factor please refer to section 7.1

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