FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

For

Outdoor Wireless LAN Access Point

MODEL NUMBER: AP8030DN

FCC ID: QISAP8030DN

REPORT NUMBER: 4788310840.1-4

ISSUE DATE: August 22, 2018

Prepared for

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Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	07/23/2018	Initial Issue	
R2	08/22/2018	Upgrade data from sections 6.3	Miller. Ma

Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	6/26db Bandwidth	FCC 15.407 (a)&(e) RSS-247 Clause 6.2	PASS
2	99% Bandwidth	RSS-Gen Clause 6.6	PASS
3	Maximum Conducted Output Power	FCC 15.407 (a) RSS-247 Clause 6.2	PASS
4	Power Spectral Density	FCC 15.407 (a) RSS-247 Clause 6.2	PASS
5	Antenna Conducted Spurious Emission	FCC 15.407 (b) RSS-247 Clause 6.2	PASS
6	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
7	Conducted Emission Test For AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	PASS
8	Antenna Requirement	FCC 15.203 RSS-GEN Clause 8.3	PASS
9	Frequency Stability	FCC 15.407 (g)	PASS

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	HUAWEI TECHNOLOGIES CO., LTD.
Address:	Administration Building, Huawei Technologies Co., Ltd. Bantian, Longgang District, Shenzhen, P.R. China, 518129

Manufacturer Information

Company Name:	HUAWEI TECHNOLOGIES CO., LTD.
Address:	Administration Building, Huawei Technologies Co., Ltd. Bantian, Longgang District, Shenzhen, P.R. China, 518129

EUT Description

EUT Name:	Outdoor Wireless LAN Access Point
Model:	AP8030DN
Brand Name:	HUAWEI
Sample Status:	Normal
Sample ID:	1358586
Sample Received Date:	January 04, 2018
Date of Tested:	January 04, 2018~ July 22, 2018

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

Tested By:

Miller Ma
Engineer Project Associate

Checked By:

Shawn Wen
Operations Leader

Approved By:

Stephen Guo

Operations Manager

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 789033 D02 v02r01, KDB 662911 D01 v02r01, RSS-GEN Issue 4, RSS-247 Issue 2 and KDB414788 D01 Radiated Test Site v01.

3. FACILITIES AND ACCREDITATIO

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 Industry Canada. 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: 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

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	2.90dB
Uncertainty for Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	2.2dB
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.52dB
Uncertainty for Radiation Emission test (1GHz to 40GHz)(include Fundamental emission)	5.04dB(1-6GHz)
	5.30dB (6GHz-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.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Equipment	Outdoor Wireless LAN Access Point		
EUT Description	The EUT is an Access Point for outdoor use.		
Model Name	AP8030DN		
Power Supply	Power Adapter	Input	AC 100~240V, 50~60Hz, 1.0A
		Output	DC 48V, 0.65A
Hardware Version	VER.C		
Software Version	V200		

5.2. CHANNEL LIST

20 MHz Bandwidth Channel frequencies		
Band	Channel	Frequency (MHz)
UNII-2	52	5260
	56	5280
	60	5300
	64	5320
UNII-2C	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	120	5600
	124	5620
	128	5640
	132	5660
	136	5680
	140	5700
	144	5720

40 MHz Bandwidth Channel frequencies		
Band	Channel	Frequency (MHz)
UNII-2A	54	5270
	62	5310
UNII-2C	102	5510
	110	5550
	118	5590
	126	5630
	134	5670
	142	5710

80 MHz Bandwidth Channel frequencies		
Band	Channel	Frequency (MHz)
UNII-2A	58	5290
UNII-2C	106	5530
	122	5610
	138	5690

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
A	5250-5350	Omni-Directional	11.5
	5470-5725	Omni-Directional	11.5

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
B	5250-5350	Omni-Directional	11.5
	5470-5725	Omni-Directional	11.5

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
C	5250-5350	Omni-Directional	11.5
	5470-5725	Omni-Directional	11.5

Test Mode	Transmit and Receive Mode	Description
802.11a	3TX, 3RX	Antenna A, Antenna B and Antenna C can be used as transmitting/receiving antenna.
802.11n HT20	3TX, 3RX	Antenna A, Antenna B and Antenna C can be can be used as transmitting/receiving antenna.
802.11n HT40	3TX, 3RX	Antenna A, Antenna B and Antenna C can be can be used as transmitting/receiving antenna.
802.11ac HT20	3TX, 3RX	Antenna A, Antenna B and Antenna C can be can be used as transmitting/receiving antenna.
802.11ac HT40	3TX, 3RX	Antenna A, Antenna B and Antenna C can be can be used as transmitting/receiving antenna.
802.11ac HT80	3TX, 3RX	Antenna A, Antenna B and Antenna C can be can be used as transmitting/receiving antenna.

Remarks: EUT support for diversity and MIMO Transmission, all modes and antennas are pre-scanned, antenna C is worst for 1TX mode worst case, antenna B&C is worst case for 2TX mode, A&B&C is worst case for 3TX mode.

5.4. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	23 ~ 28°C
Voltage :	VL	N/A
	VN	AC 120V/60Hz
	VH	N/A

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage
VH= Upper Extreme Test Voltage
TN= Normal Temperature

5.5. WORST-CASE CONFIGURATIONS

IEE Std. 802.11	Modulation Technology	Modulation Type	Data Rate (Mbps)	Worst Case (Mbps)
a	OFDM	BPSK,QPSK,16QAM, 64QAM	54/48/36/24/18/12/9/6	6

802.11n HT20/HT40							
Antenna	MCS	Modulation	HT20 Data Rate(Mbps)		HT40 Data Rate(Mbps)		Worst Case (Mbps)
			GI=800ns	GI=400ns	GI=800ns	GI=400ns	
2x2	8	BPSK	13	14.4	27	30	MCS8
	9	QPSK	26	28.9	54	60	MCS8
	10	QPSK	39	43.3	81	90	MCS8
	11	16-QAM	52	57.8	108	120	MCS8
	12	16-QAM	78	86.7	162	180	MCS8
	13	64-QAM	104	115.6	216	240	MCS8
	14	64-QAM	117	130	243	270	MCS8
	15	64-QAM	130	144.4	270	300	MCS8

802.11ac HT20/HT40/HT80									
Antenna	MCS	Modulation	HT20 Data Rate (Mbps)		HT40 Data Rate (Mbps)		HT80 Data Rate (Mbps)		Worst Case (Mbps)
			GI=800ns	GI=400ns	GI=800ns	GI=400ns	GI=800ns	GI=400ns	
2x2	0	BPSK	13	14.4	27	30	58.5	65	MCS0
	1	QPSK	26	28.9	54	60	117	130	MCS0
	2	QPSK	39	43.3	81	90	175.5	195	MCS0
	3	16-QAM	52	57.8	108	120	234	260	MCS0
	4	16-QAM	78	86.7	162	180	351	390	MCS0
	5	64-QAM	104	115.6	216	240	468	520	MCS0
	6	64-QAM	117	130.3	243	270	526.5	585	MCS0
	7	64-QAM	130	144.4	270	300	585	650	MCS0
	8	256-QAM	156	173.3	324	360	702	780	MCS0
	9	256-QAM	N/A	N/A	360	400	780	866.7	MCS0

802.11n HT20/HT40							
Antenna	MCS	Modulation	HT20 Data Rate(Mbps)		HT40 Data Rate(Mbps)		Worst Case (Mbps)
			GI=800ns	GI=400ns	GI=800ns	GI=400ns	
3x3	16	BPSK	19.5	21.7	40.5	45	MCS16
	17	QPSK	39.0	43.3	81.0	90	MCS16
	18	QPSK	58.5	65.0	121.5	135	MCS16
	19	16-QAM	78.0	86.7	162.0	180	MCS16
	20	16-QAM	117.0	130.0	243.0	270	MCS16
	21	64-QAM	156.0	173.3	324.0	360	MCS16
	22	64-QAM	175.5	195.0	364.5	405	MCS16
	23	64-QAM	195.0	216.7	405.0	450	MCS16

802.11ac HT20/HT40/HT80									
Antenna	MCS	Modulation	HT20 Data Rate (Mbps)		HT40 Data Rate (Mbps)		HT80 Data Rate (Mbps)		Worst Case (Mbps)
			GI=800ns	GI=400ns	GI=800ns	GI=400ns	GI=800ns	GI=400ns	
3x3	0	BPSK	19.5	21.6	40.5	45	87.8	97.5	MCS0
	1	QPSK	39	43.2	81	90	175.5	195	MCS0
	2	QPSK	58.5	65	121.5	135	263.3	292.5	MCS0
	3	16-QAM	78	86.7	162	180	351	390	MCS0
	4	16-QAM	117	130	243	270	526.5	585	MCS0
	5	64-QAM	156	173	324	360	702	780	MCS0
	6	64-QAM	175.5	195	364.5	405	789.9	877.5	MCS0
	7	64-QAM	195	216.6	405	450	877.5	975	MCS0
	8	256-QAM	234	260	486	540	1053	1170	MCS0
	9	256-QAM	260	288.9	540	600	1170	1300	MCS0

Remarks: EUT support for diversity and MIMO Transmission, all modes and antennas are pre-scanned, antenna C is worst for 1TX mode worst case, antenna B&C is worst case for 2TX mode, A&B&C is worst case for 3TX mode.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	Laptop	ThinkPad	T460S	SL10K24796 JS
2	RJ45 to Serial Cable	N/A	N/A	N/A
3	Serial to USB Cable	N/A	N/A	N/A

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	GE0/PoE	RJ45	Unshielded	0.5	N/A
2	GE1	RJ45	Unshielded	0.5	N/A
3	SPF	Fiber Optic	Unshielded	N/A	N/A
4	Console	RJ45	Unshielded	0.5	N/A

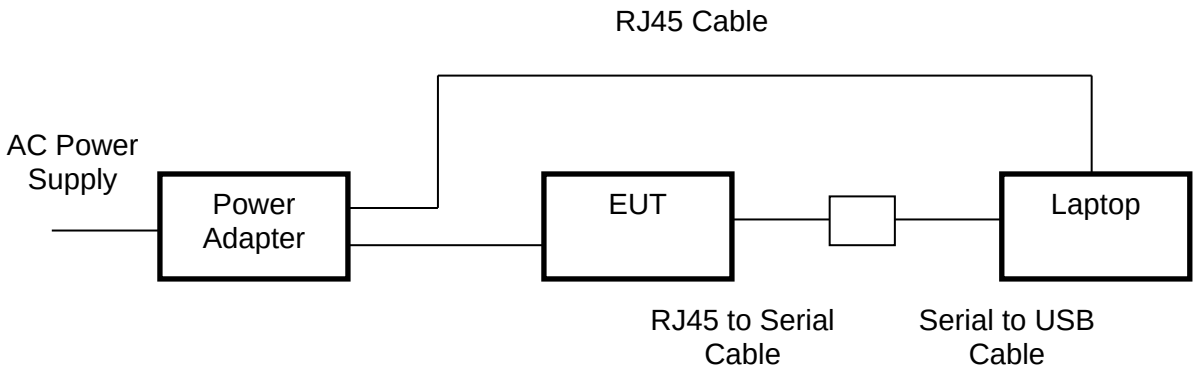
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	Power Adapter	HUAWEI	POE35-54A	Input: AC 100~240, 50/60Hz, 1.0 A Output: DC 48V, 0.65A

TEST SETUP

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

SETUP DIAGRAM FOR TESTS



5.7. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	101961	Dec.12,2017	Dec.11,2018
☑	Two-Line V-Network	R&S	ENV216	101983	Dec.12,2017	Dec.11,2018
Software						
Used	Description		Manufacturer	Name	Version	
☑	Test Software for Conducted disturbance		UL	Antenna port	Ver. 7.2	
Radiated Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.12,2017	Dec.11,2018
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jan.09, 2016	Jan.09, 2019
☑	Preamplifier	HP	8447D	2944A09099	Dec.12,2017	Dec.11,2018
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.12,2017	Dec.11,2018
☑	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2019
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Jan.06, 2016	Jan.06, 2019
☑	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.12,2017	Dec.11,2018
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.12,2017	Dec.11,2018
☑	Loop antenna	Schwarzbeck	1519B	00008	Mar. 26, 2016	Mar. 26, 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.12,2017	Dec.11,2018
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.12,2017	Dec.11,2018
☑	Power Sensor	Keysight	N9323A	MY55440013	Dec.12,2017	Dec.11,2018
☑	Power Sensor	Keysight	U2021XA	MY57030004	Dec.12,2017	Dec.11,2018

6. ANTENNA PORT TEST RESULTS

6.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

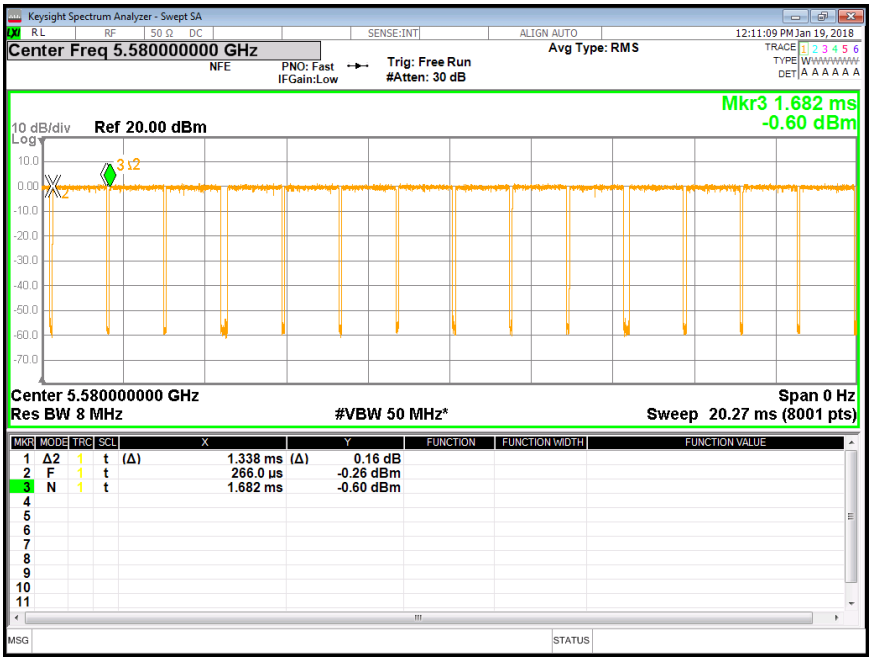
RESULTS

ANTENNA A

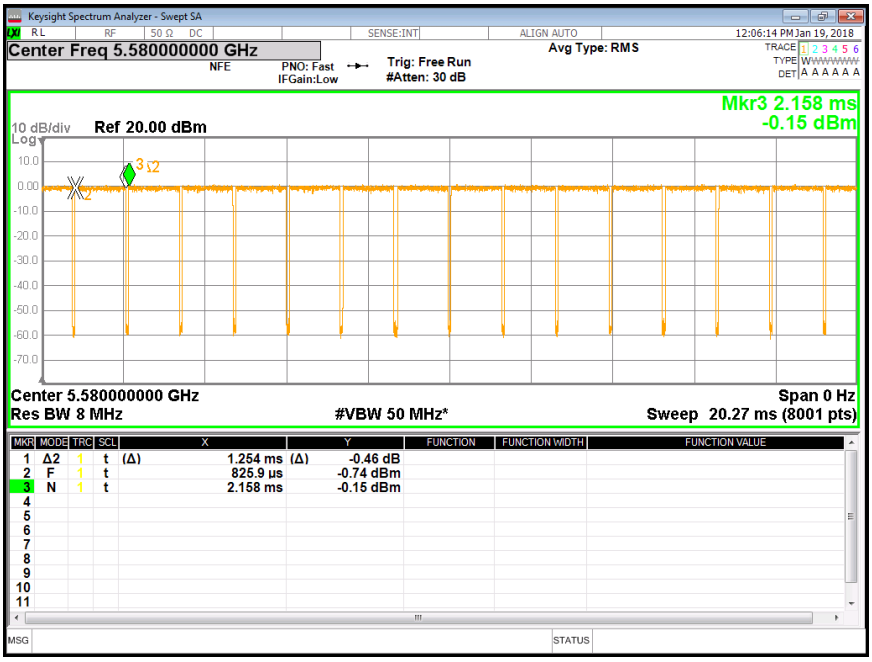
Mode	ON Time (ms)	Period (ms)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (KHz)
11a	1.338	1.416	0.944915254	94	0.25	0.75
11n HT20	1.254	1.3321	0.941370768	94	0.26	0.80
11n HT40	0.6232	0.6966	0.894631065	89	0.48	1.60
11ac HT20	1.262	1.34	0.941791045	94	0.26	0.79
11ac HT40	0.6283	0.7018	0.895269307	90	0.48	1.59
11ac HT80	0.3116	0.5016	0.621212121	62	2.07	3.21

Note: Duty Cycle Correction Factor=10log(1/x).
Where: x is Duty Cycle(Linear)
Antenna A , Antenna B and Antenna C has the same duty cycle, only ANT A data show here.

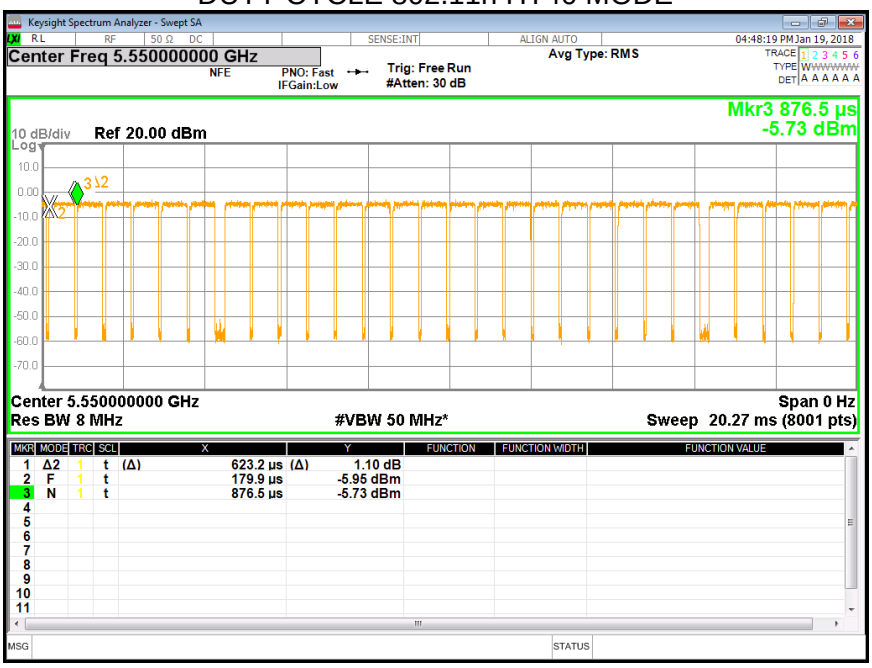
DUTY CYCLE 802.11a MODE



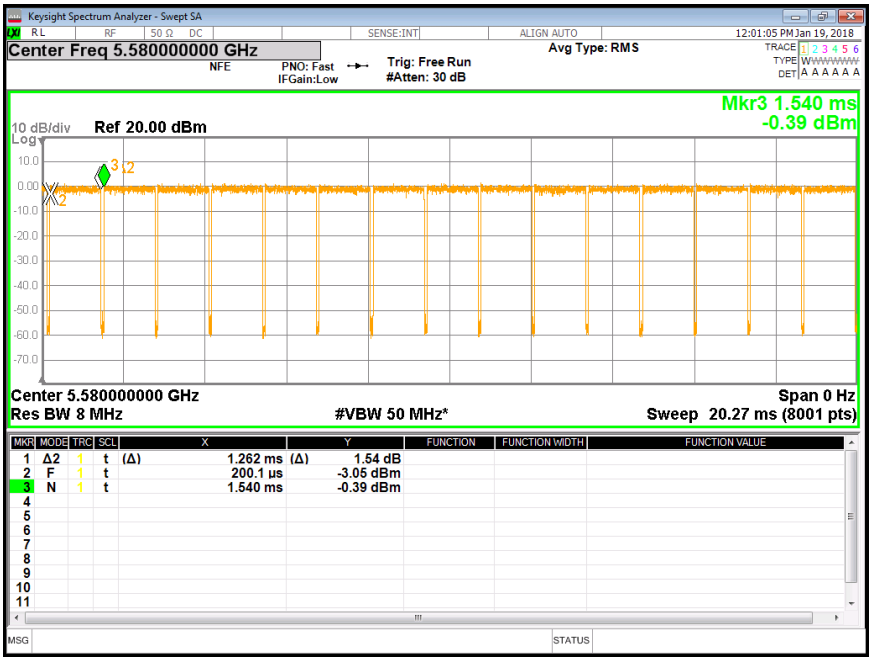
DUTY CYCLE 802.11n HT20 MODE



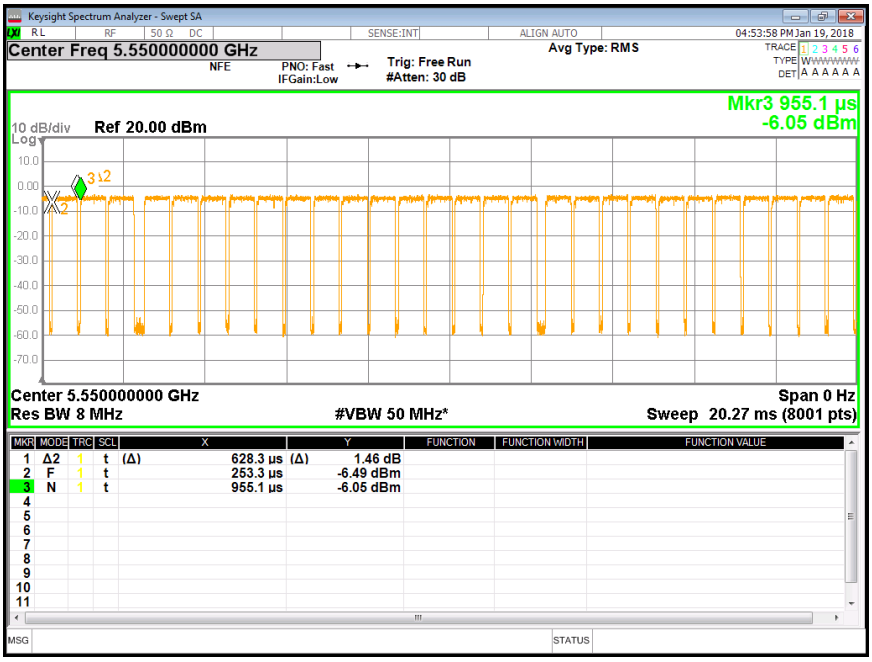
DUTY CYCLE 802.11n HT40 MODE



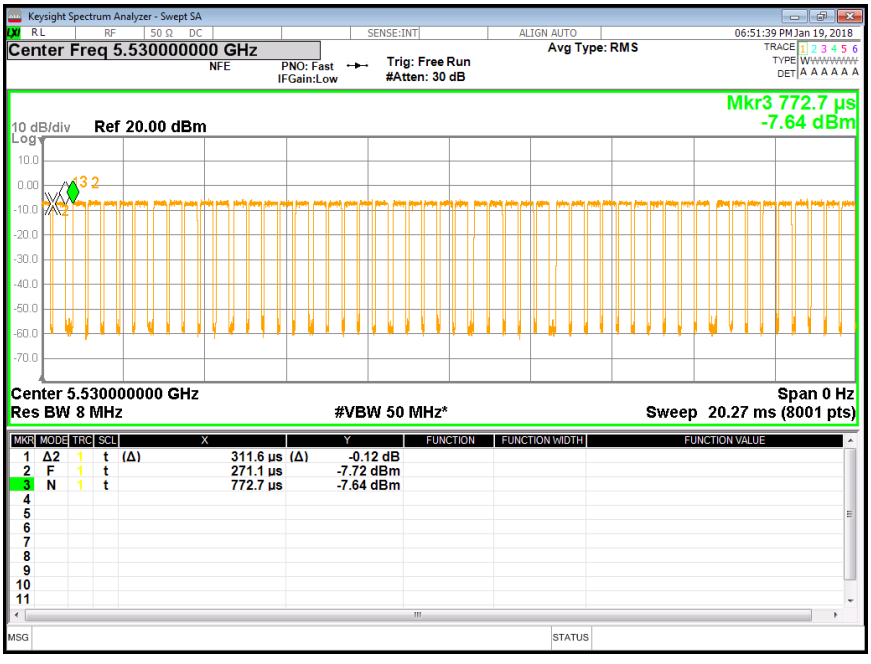
DUTY CYCLE 802.11ac HT20 MODE



DUTY CYCLE 802.11ac HT40 MODE



DUTY CYCLE 802.11ac HT80 MODE



6.2. 6/26/99% dB BANDWIDTH

LIMITS

FCC Part15, Subpart E/ 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

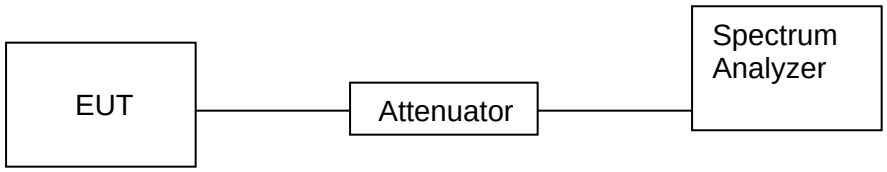
TEST PROCEDUREC

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 99 % Occupied Bandwidth: approximately 1%~5% of the emission bandwidth.
VBW	For 6dB Bandwidth : VBW=300kHz For 26dB Bandwidth : >3RBW For 99 % Occupied Bandwidth : >3RBW
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 6/26/99% dB relative to the maximum level measured in the fundamental emission.

TEST SETUP

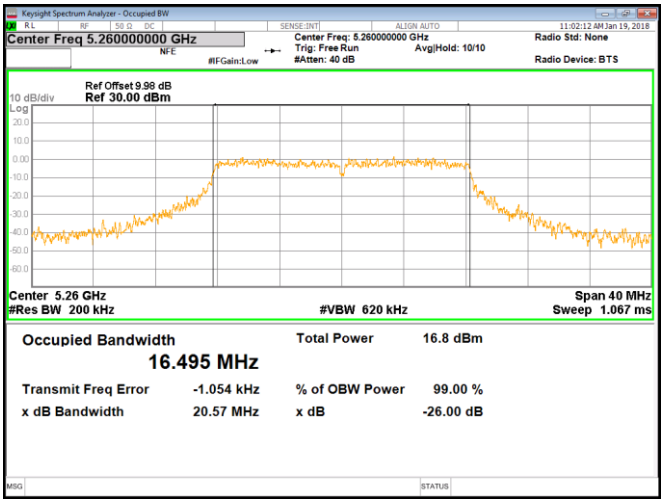


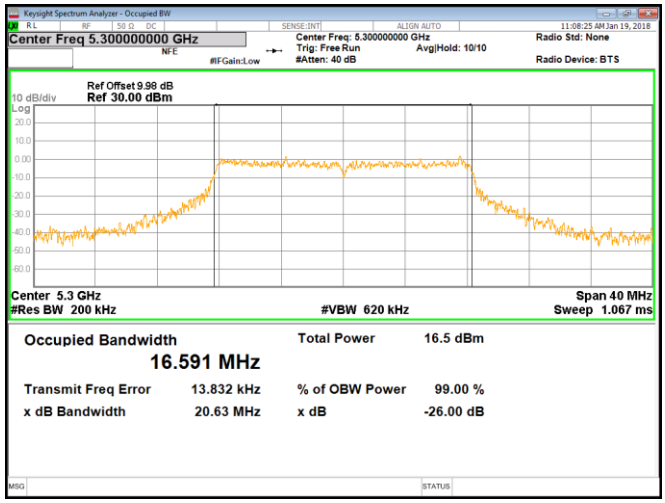
RESULTS

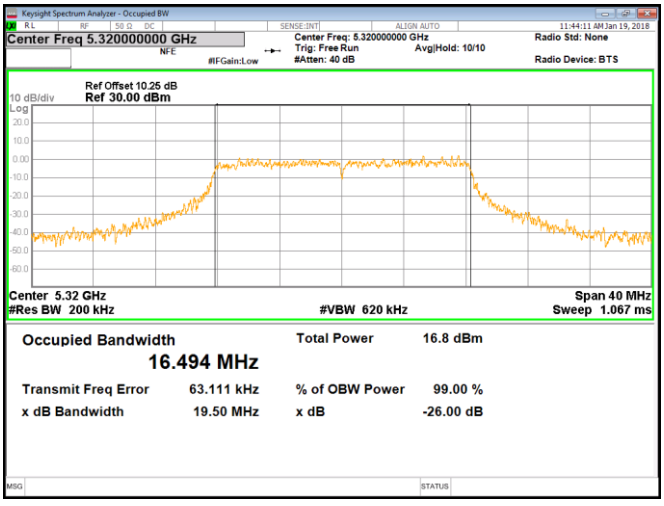
6.2.1. 802.11a 3TX MODE

6.2.1.1. UNII-2A BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5260	20.57	16.495
Mid	5300	20.63	16.591
High	5320	19.50	16.494







6.2.1.2. UNII-2C BAND

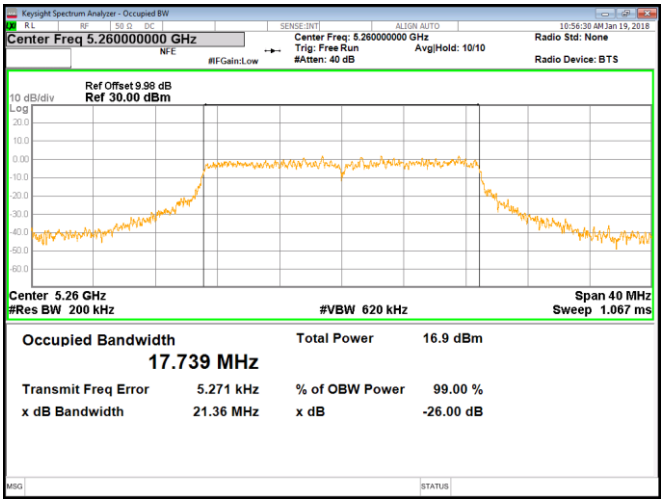
Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5500	20.34	16.504
Mid	5580	20.47	16.515
High	5700	20.46	16.513
CH144	5720	20.69	16.617

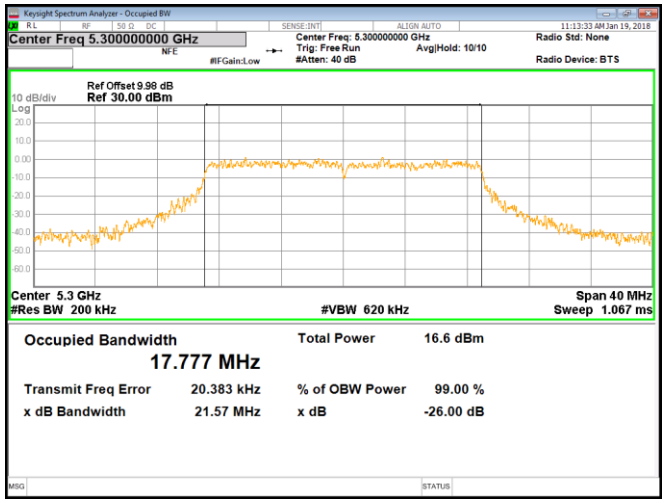
Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.

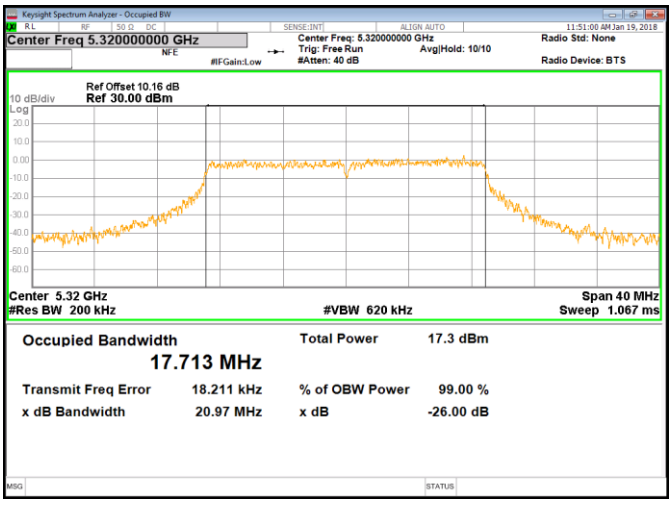
6.2.2. 802.11n HT20 3TX MODE

6.2.2.1. UNII-2A BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5260	21.36	17.739
Mid	5300	21.57	17.777
High	5320	20.97	17.713







6.2.2.2. UNII-2C BAND

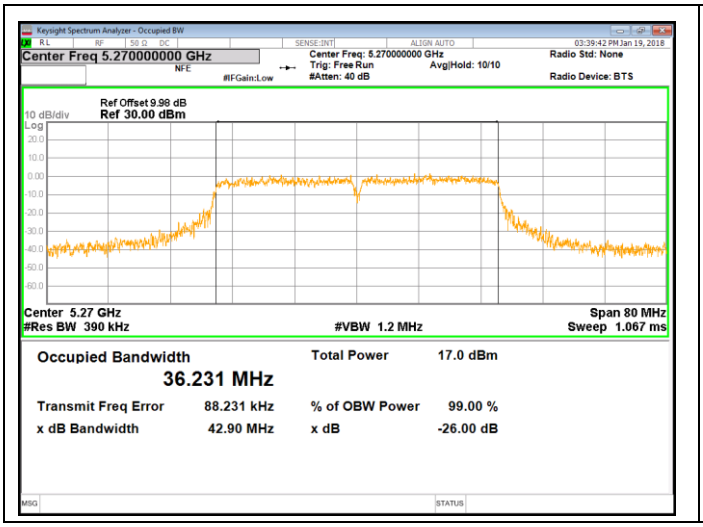
Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5500	20.99	17.669
Mid	5580	21.73	17.658
High	5700	20.69	17.721
CH144	5720	22.05	17.774

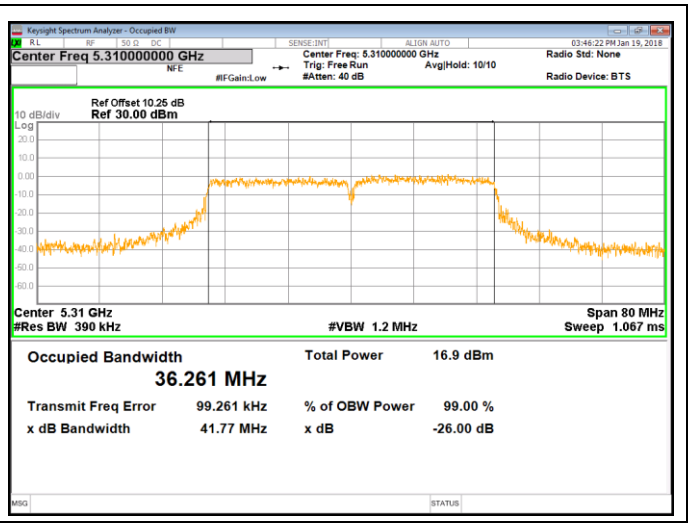
Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.

6.2.3. 802.11n HT40 3TX MODE

6.2.3.1. UNII-2A BAND

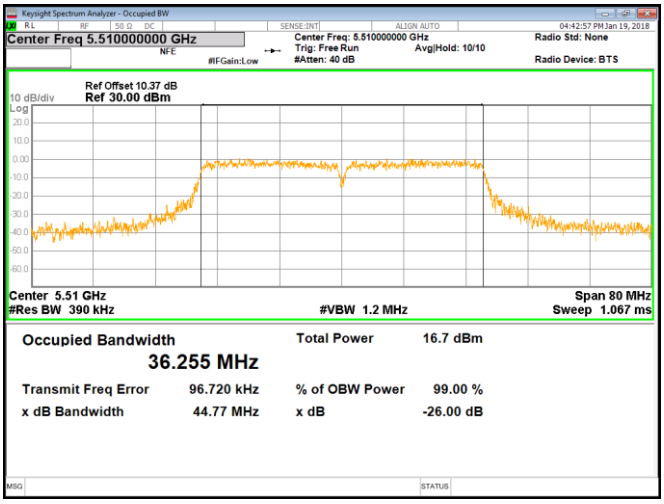
Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5270	42.90	36.231
High	5310	41.77	36.261



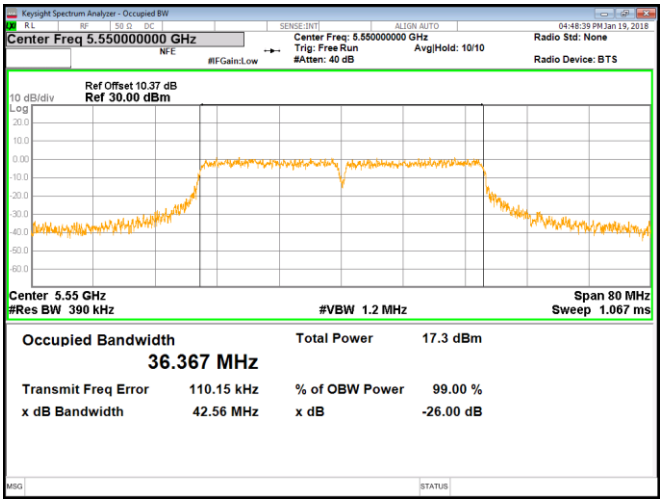


6.2.3.2. UNII-2C BAND

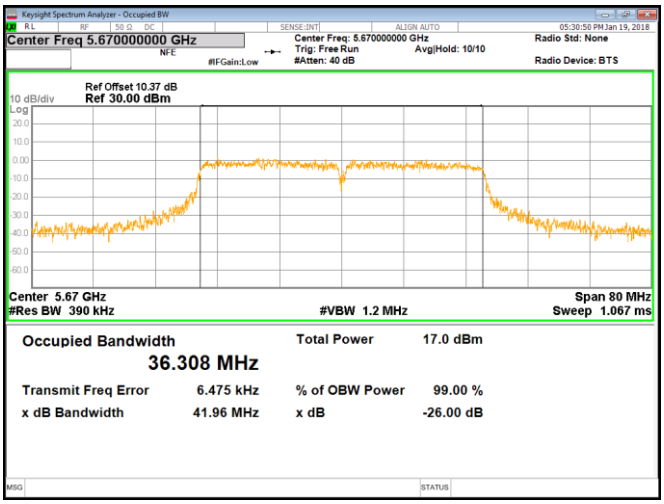
Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5510	44.77	36.255
Mid	5550	42.56	36.367
High	5670	41.96	36.308
CH142	5710	41.94	36.289



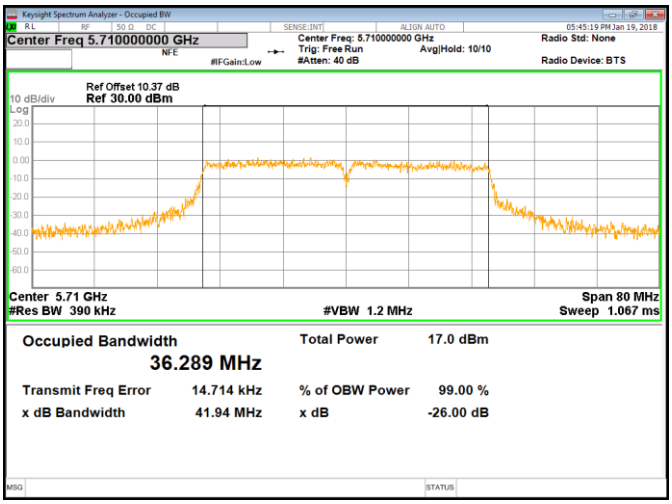
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



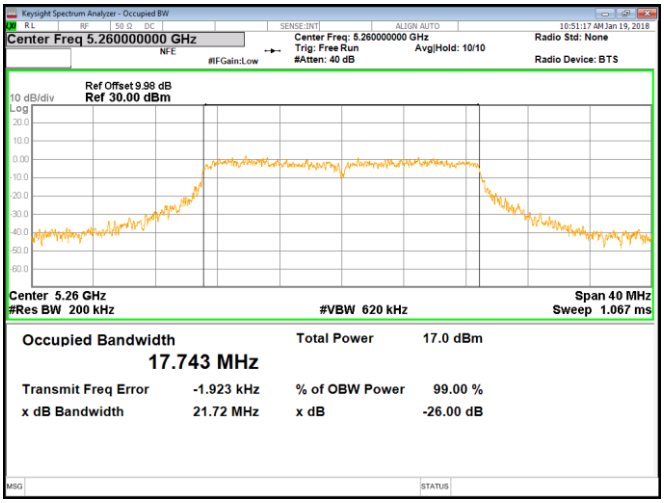
CH 142

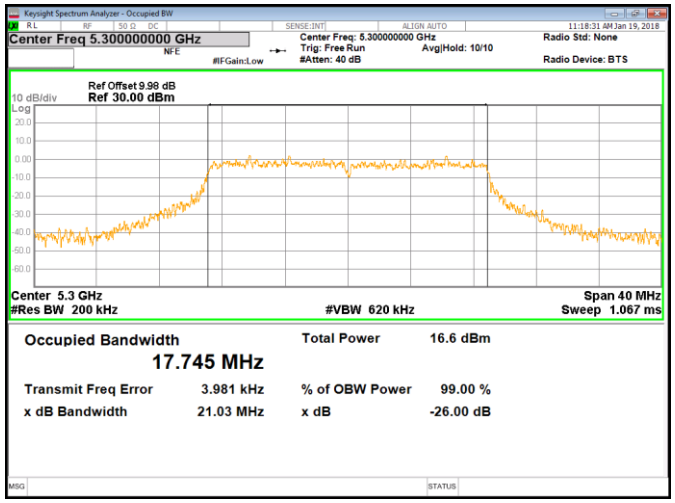
Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.

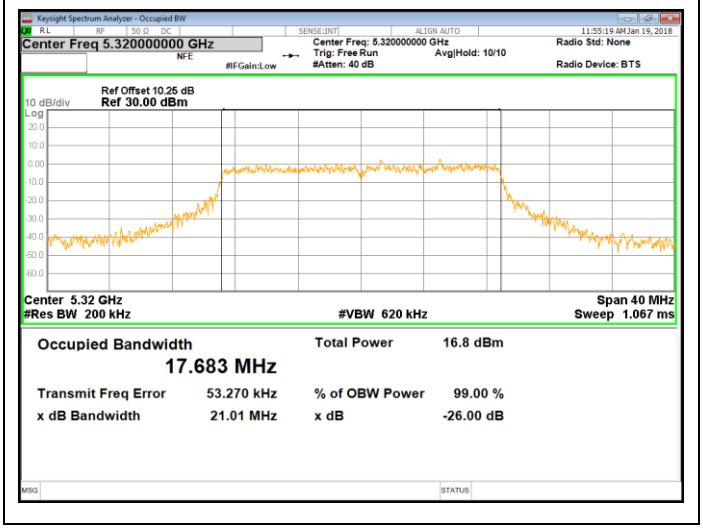
6.2.4. 802.11ac HT20 3TX MODE

6.2.4.1. NII-2A BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5260	21.72	17.743
Mid	5300	21.03	17.745
High	5320	21.01	17.683

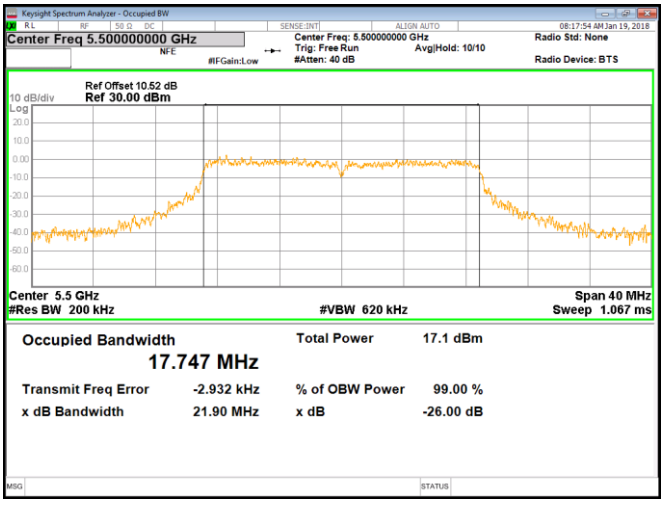


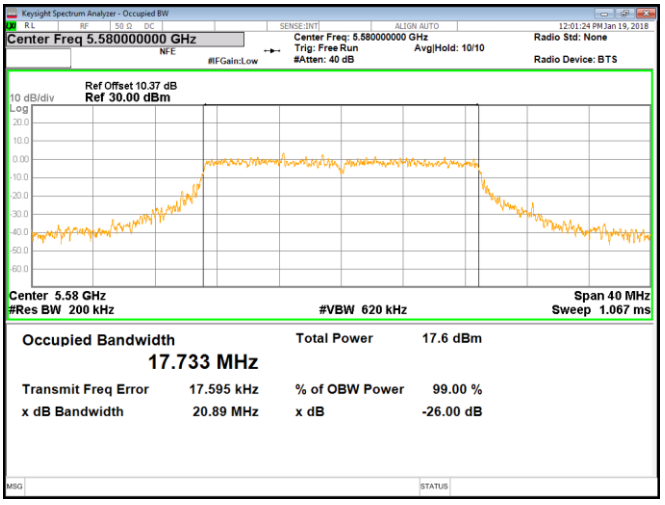


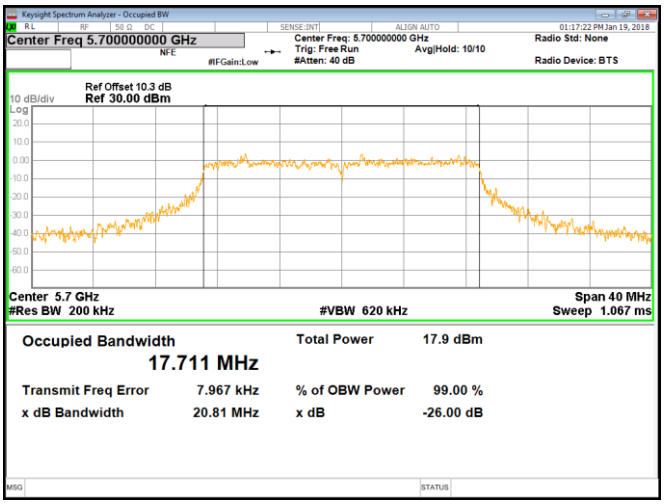


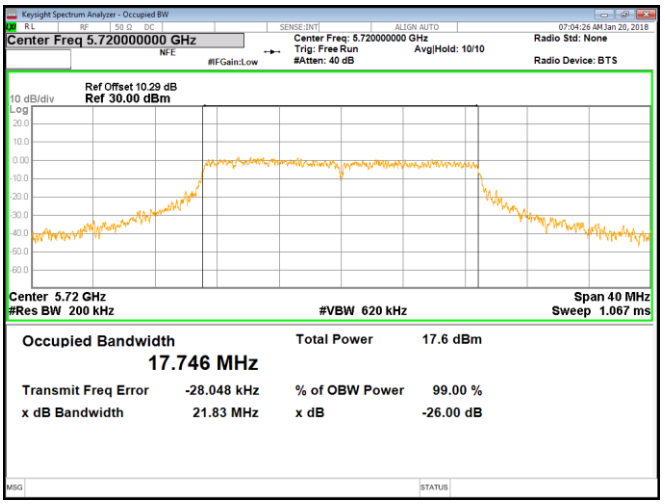
6.2.4.2. UNII-2C BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5500	21.90	17.747
Mid	5580	20.89	17.733
High	5700	20.81	17.711
CH144	5720	21.83	17.746







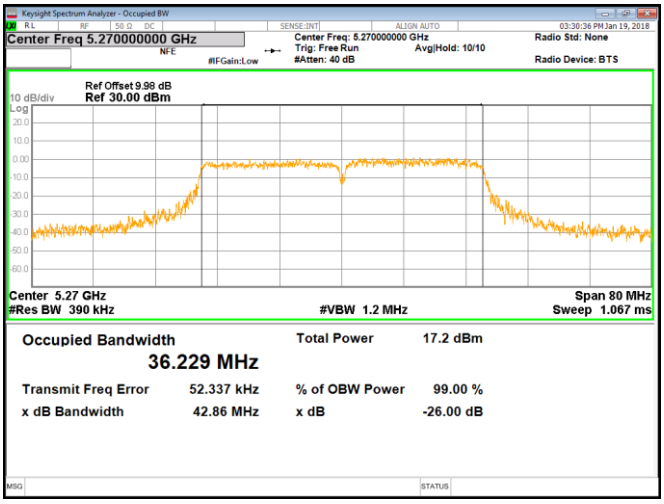


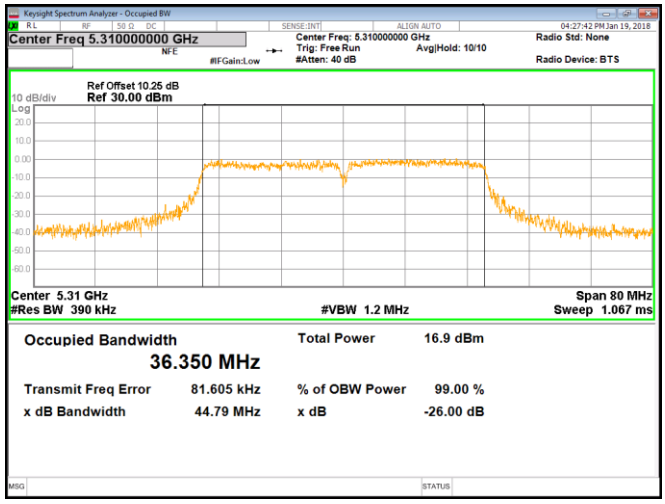
Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.

6.2.5. 802.11ac HT40 3TX MODE

6.2.5.1. UNII-2A BAND

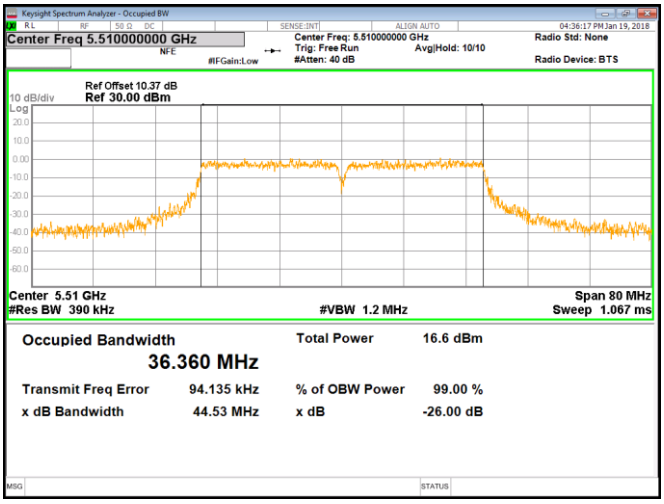
Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5270	42.86	36.229
High	5310	44.79	36.350

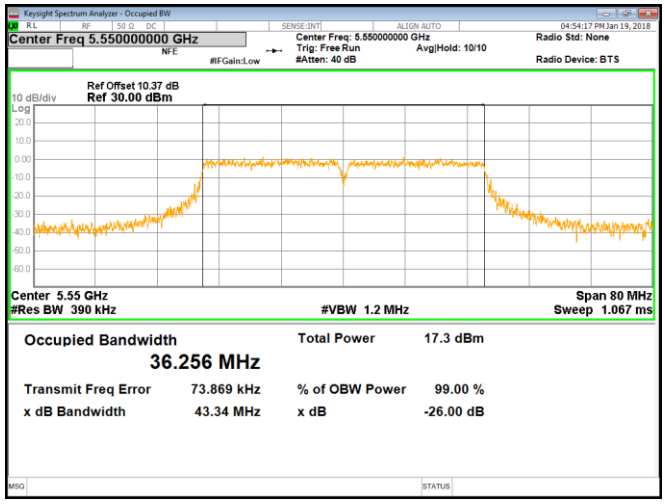


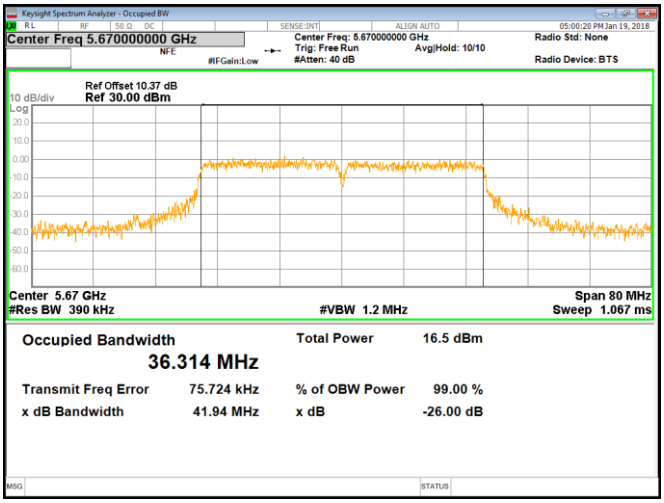


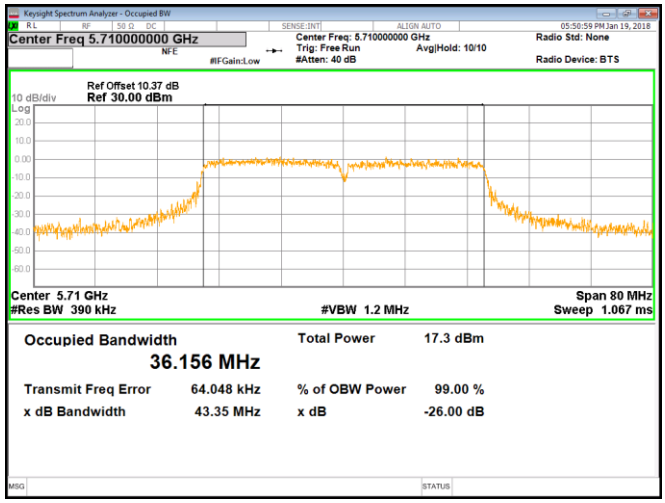
6.2.5.2. UNII-2C BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5510	44.53	36.360
Mid	5550	43.34	36.256
High	5670	41.94	36.314
CH142	5710	43.35	36.156







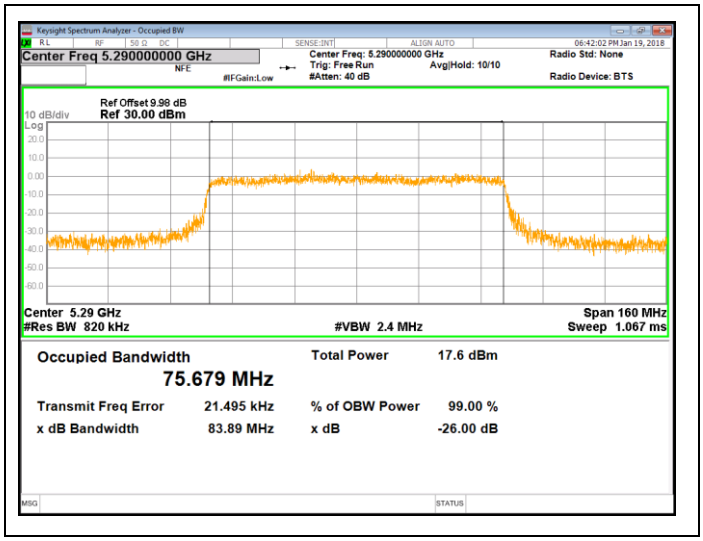


Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.

6.2.6. 802.11ac HT80 3TX MODE

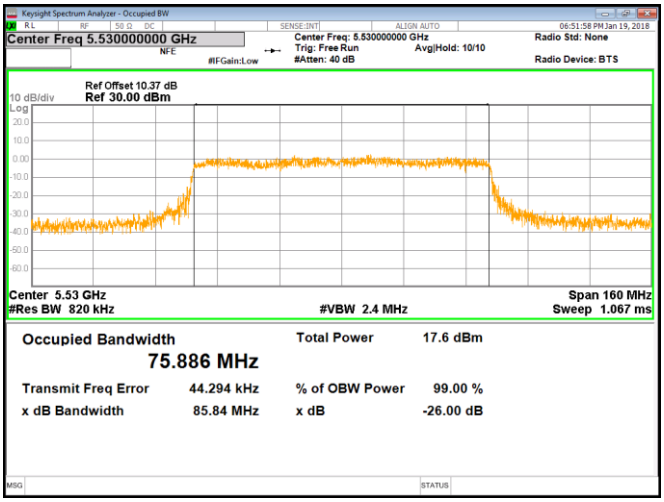
6.2.6.1. UNII-2A BAND

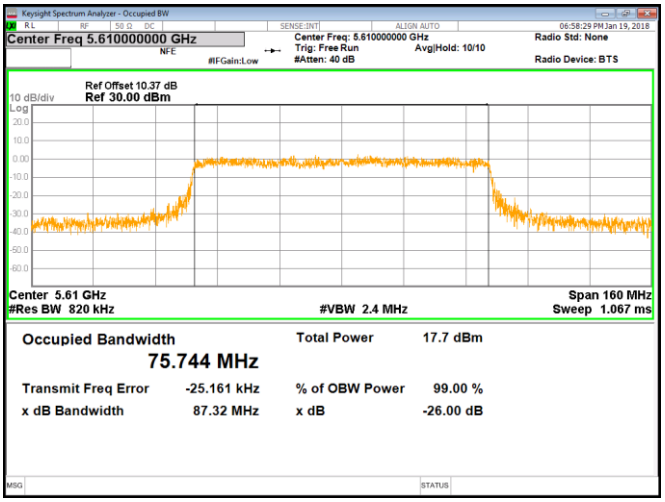
Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5290	83.89	75.679

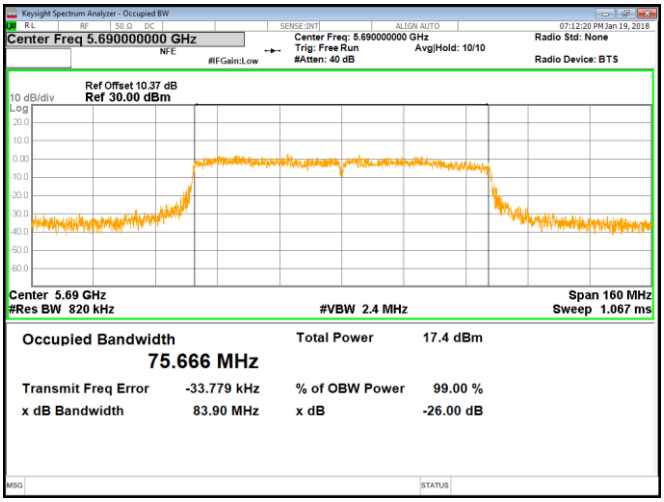


6.2.6.2. UNII-2C BAND

Channel	Frequency (MHz)	26 dB BW (MHz)	99% BW (MHz)
Low	5530	85.84	75.886
High	5610	87.32	75.744
CH138	5690	83.90	75.666







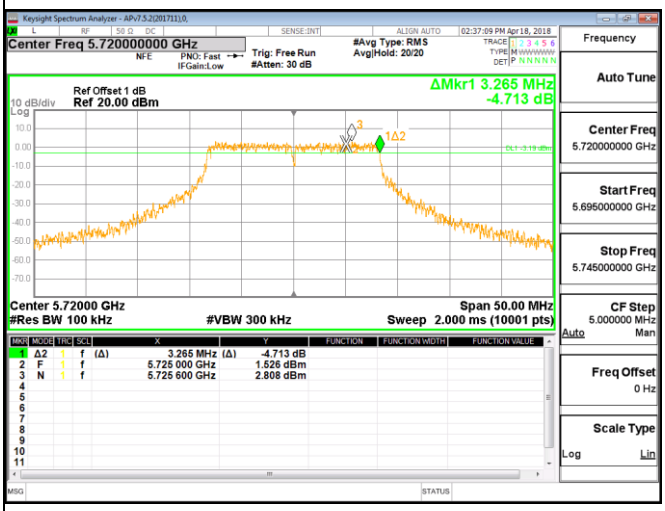
Note: All the modes and antenna ports had been tested, only the worst data recorded in the report.

6.2.7. 6 dB/26dB BANDWIDTH of STRADDLE CHANNEL

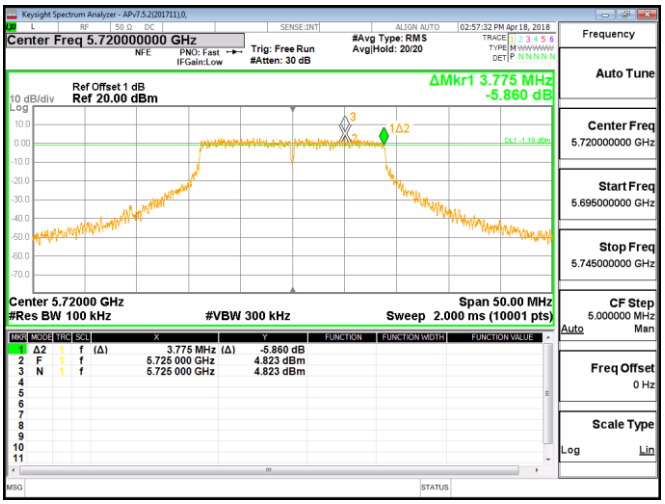
Mode	FREQUENCY	Channel	6 dB BW (MHz))	6 dB BW (KHz))	LIMIT (KHz)	RESULT
802.11a	5720	144	3.265	3265	500	PASS
802.11n_HT20	5720	144	3.775	3775	500	PASS
802.11ac_HT20	5720	144	3.860	3860	500	PASS
802.11n_HT40	5710	142	3.13	3130	500	PASS
802.11ac_HT40	5710	142	3.20	3200	500	PASS
802.11ac_HT80	5690	138	3.22	3220	500	PASS

Mode	FREQUENCY	Channel	Min 26 dB BW (MHz))	RESULT
802.11a	5720	144	16.787	PASS
Note: All the modes and antenna ports had been tested, 802.11a is the worst data recorded in the report.				

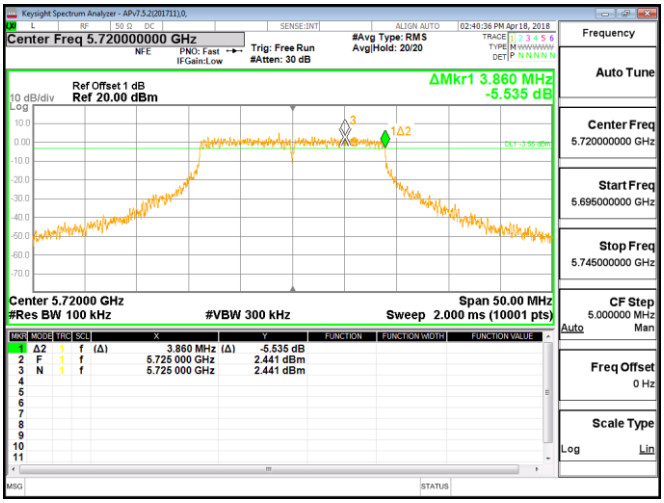
802.11a



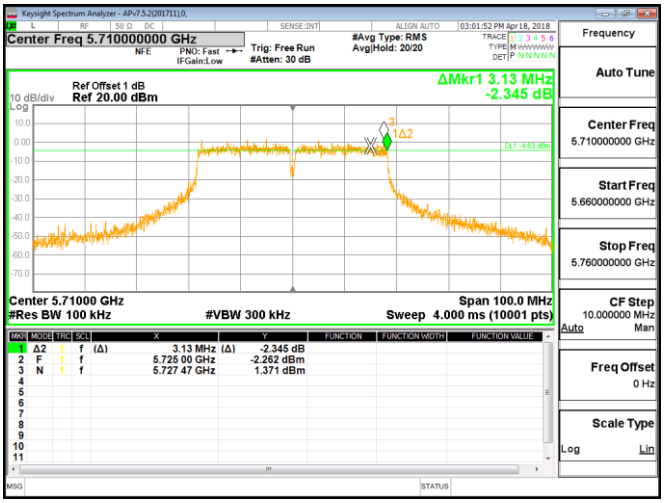
802.11n_HT20



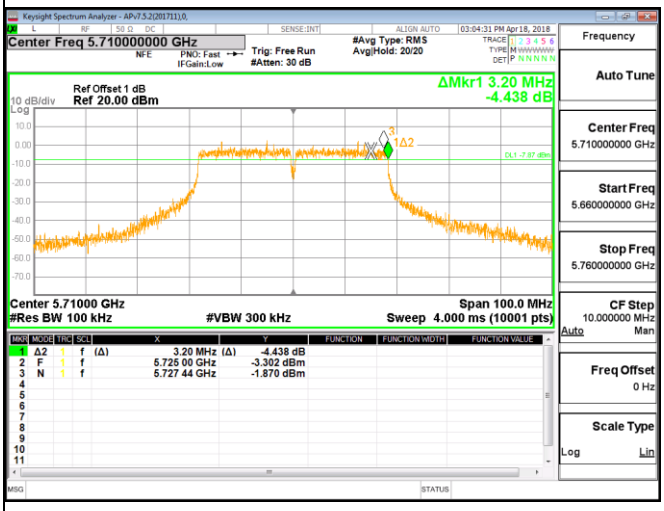
802.11ac_HT20



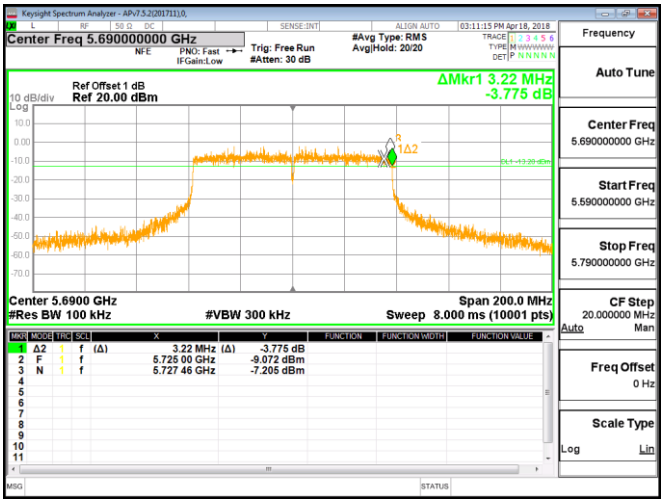
802.11n_HT40



802.11ac_HT40

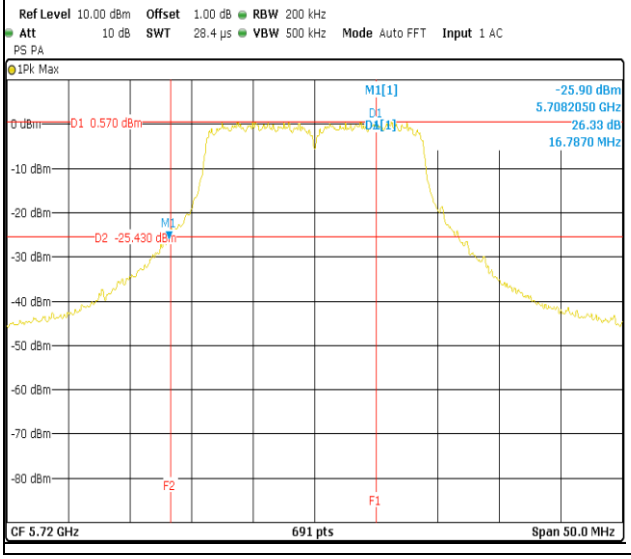


802.11ac_HT80



802.11a_HT20

26 dB BW



6.3. MAXIMUM CONDUCTED OUTPUT POWER

LIMITS

FCC Part15, Subpart E/ RSS-247		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	For FCC client devices :250mW (24dBm)	5150-5250
	For RSS:e.i.r.p. power: not exceed 200 mW(23dBm) or 10 + 10 log10 B	
	The lesser of 250 mW (24dBm) or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.	5250-5350
	The lesser of 250 mW (24dBm) or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.	For FCC:5470-5725 For IC:5470-5600 5650-5725
	1 Watt (30dBm)	5725-5850

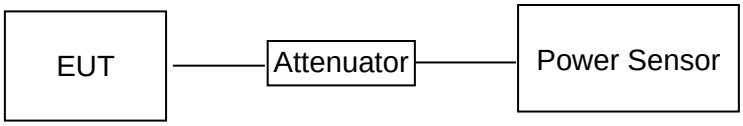
Note: 1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. Directional gain = G_{ANT} + 10 log(N_{ANT}) dBi, where NANT is the number of outputs, G_{ANT} 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 peak 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.

TEST SETUP



REULTS

6.3.1.1. 1TX Mode

Mode	Channel	Antenna	Setting Value	CONDUCTED POWER	Limit
a	5260	C	15.5	15.76	18.5
	5300	C	15.5	15.64	18.5
	5320	C	15.5	15.66	18.5
	5500	C	16	15.72	18.5
	5580	C	16	15.52	18.5
	5700	C	15.5	15.10	18.5
	5720	C	16	15.17	17.75
n20	5260	C	16	16.19	18.5
	5300	C	16	15.91	18.5
	5320	C	16	16.08	18.5
	5500	C	16.5	16.16	18.5
	5580	C	16.5	15.97	18.5
	5700	C	14.50	14.19	18.5
	5720	C	16.5	15.54	17.75
ac20	5260	C	16	16.14	18.5
	5300	C	16	16.03	18.5
	5320	C	16	16.15	18.5
	5500	C	14.5	14.04	18.5
	5580	C	16.5	15.95	18.5
	5700	C	16.5	16.1	18.5
	5720	C	16.5	15.64	17.75
n40	5270	C	18	18.03	18.5
	5310	C	18	18.15	18.5
	5510	C	14	14.01	18.5
	5550	C	18	17.53	18.5
	5670	C	18	17.52	18.5
	5710	C	18	17.56	18.5
ac40	5270	C	18	18.02	18.5
	5310	C	18	18.08	18.5
	5510	C	15.5	13.55	18.5
	5550	C	18	17.47	18.5

	5670	C	18	17.57	18.5
	5710	C	18	17.54	18.5
ac80	5290	C	15	13.45	18.5
	5530	C	10	8.74	18.5
	5610	C	17	16.12	18.5
	5690	C	17	16.18	18.5

Note: 1. All the antennas ports had been tested, but only the worst data recorded in the report.
2. The setting value means the power setting level in the software and these values will use for all the tests in the report.

6.3.1.2. 2TX Mode

Mode	Channel	Antenna	Setting Value	CONDUCTED POWER		Limit
				Single	Total	
a	5260	B	10	9.72	12.85	15.5
		C		9.96		15.5
	5300	B	10	9.63	12.82	15.5
		C		9.98		15.5
	5320	B	10	9.97	13.01	15.5
		C		10.03		15.5
	5500	B	10	9.02	12.29	15.5
		C		9.52		15.5
	5580	B	10	9.21	12.24	15.5
		C		9.24		15.5
	5700	B	10	10.5	13.11	15.5
		C		9.65		15.5
	5720	B	10	10.58	13.18	14.75
		C		9.71		14.75

n20	5260	B	10	9.96	12.9	15.5
		C		9.82		15.5
	5300	B	10	9.67	12.87	15.5
		C		10.04		15.5
	5320	B	10	9.76	12.87	15.5
		C		9.96		15.5
	5500	B	10.5	9.28	12.63	15.5
		C		9.94		15.5
	5580	B	10.5	9.85	12.9	15.5
		C		9.93		15.5
	5700	B	10	10.5	13.04	15.5
		C		9.5		15.5
	5720	B	10	10.68	13.19	14.75
		C		9.62		14.75

ac20	5260	B	10	9.98	13.04	15.5
		C		10.07		15.5
	5300	B	10	9.62	12.82	15.5
		C		10		15.5
	5320	B	10	9.8	12.81	15.5
		C		9.8		15.5
	5500	B	10.5	9.4	12.71	15.5
		C		9.98		15.5
	5580	B	10.5	9.71	12.77	15.5
		C		9.8		15.5
	5700	B	10	10.44	13.07	15.5
		C		9.64		15.5
	5720	B	10	10.61	13.13	14.75
		C		9.56		14.75
n40	5270	B	12.5	12.17	15.36	15.5
		C		12.52		15.5
	5310	B	12.5	12.05	15.39	15.5
		C		12.69		15.5
	5510	B	12.5	10.78	14.3	15.5
		C		11.74		15.5
	5550	B	12.5	11.15	14.47	15.5
		C		11.74		15.5
	5670	B	12.5	12.45	15.37	15.5
		C		12.27		15.5
	5710	B	12.5	12.58	15.35	15.5
		C		12.09		15.5
ac40	5270	B	12.5	12.02	15.23	15.5
		C		12.41		15.5
	5310	B	12.5	11.96	15.35	15.5
		C		12.69		15.5
	5510	B	12.5	10.68	14.22	15.5
		C		11.69		15.5
	5550	B	12.5	11.21	14.47	15.5
		C		11.69		15.5
	5670	B	12.5	12.29	15.31	15.5

		C		12.31		15.5
	5710	B	12.5	12.68	15.44	15.5
		C		12.16		15.5

ac80	5290	B	12	10.93	14.26	15.5
		C		11.54		15.5
	5530	B	7.5	5.77	9.98	15.5
		C		5.22		15.5
	5610	B	12.5	11.36	14.53	15.5
		C		11.68		15.5
	5690	B	12.5	12.04	15	15.5
		C		11.94		15.5

Note: 1. All the antennas ports had been tested, but only the worst data recorded in the report.
2. The setting value means the power setting level in the software and these values will use for all the tests in the report.

6.3.1.3. 3TX Mode

Mode	Channel	Antenna	Setting Value	CONDUCTED POWER		Limit
				Single	Total	
a	5260	A	8	5.65	11.07	13.5
		B		6.59		13.5
		C		6.59		13.5
	5300	A	8	5.46	10.94	13.5
		B		6.45		13.5
		C		6.51		13.5
	5320	A	8	5.25	10.73	13.5
		B		6.02		13.5
		C		6.51		13.5
	5500	A	8	5.4	10.52	13.5
		B		5.68		13.5
		C		6.13		13.5
	5580	A	8	5.64	10.68	13.5
		B		5.94		13.5
		C		6.14		13.5
	5700	A	7.5	5.33	10.85	13.5
		B		6.77		13.5
		C		6.01		13.5
	5720	A	7.5	5.76	11.13	12.75
		B		6.94		12.75
		C		6.31		12.75

n20	5260	A	8	5.67	11.09	13.5
		B		6.51		13.5
		C		6.71		13.5
	5300	A	8	5.47	10.9	13.5
		B		6.36		13.5
		C		6.5		13.5
	5320	A	8	5.38	10.85	13.5
		B		6.22		13.5
		C		6.56		13.5
	5500	A	8	5.43	10.45	13.5
		B		5.54		13.5
		C		6.05		13.5
	5580	A	7	6.18	11.17	13.5
		B		6.34		13.5
		C		6.67		13.5
	5700	A	8	5.68	11.26	13.5
		B		7.19		13.5
		C		6.47		13.5

	5720	A	7.5	5.61	10.91	12.75
		B		6.69		12.75
		C		6.05		12.75

ac20	5260	A	8	5.69	11.02	13.5
		B		6.42		13.5
		C		6.59		13.5
	5300	A	8	5.45	10.85	13.5
		B		6.23		13.5
		C		6.49		13.5
	5320	A	8	5.38	10.77	13.5
		B		6.03		13.5
		C		6.52		13.5
	5500	A	8	5.5	10.61	13.5
		B		5.53		13.5
		C		6.41		13.5
	5580	A	7	6.55	11.23	13.5
		B		6.29		13.5
		C		6.53		13.5
	5700	A	8	5.97	11.4	13.5
		B		7.35		13.5
		C		6.45		13.5
	5720	A	7.5	5.43	10.9	12.75
		B		6.77		12.75
		C		6.08		12.75

n40	5270	A	8.5	7.63	12.88	13.5
		B		8.3		13.5
		C		8.37		13.5
	5310	A	8.5	7.42	12.69	13.5
		B		7.98		13.5
		C		8.3		13.5
	5510	A	8.5	7.2	12.05	13.5
		B		6.97		13.5
		C		7.63		13.5
	5550	A	8.5	7.87	12.37	13.5
		B		7.3		13.5

		C		7.62		13.5
	5670	A	8.5	8.08	12.98	13.5
		B		8.36		13.5
		C		8.19		13.5
	5710	A	8.5	7.82	12.93	13.5
		B		8.72		13.5
		C		7.89		13.5

ac40	5270	A	8.5	7.75	12.82	13.5
		B		8.06		13.5
		C		8.32		13.5
	5310	A	8.5	7.54	12.78	13.5
		B		8.15		13.5
		C		8.31		13.5
	5510	A	8.5	7.3	12.21	13.5
		B		7.34		13.5
		C		7.68		13.5
	5550	A	8.5	7.84	12.68	13.5
		B		7.42		13.5
		C		8.41		13.5
	5670	A	8.5	7.93	12.96	13.5
		B		8.37		13.5
		C		8.26		13.5
	5710	A	8.5	7.9	13.02	13.5
		B		8.77		13.5
		C		8.01		13.5

ac80	5290	A	8	6.70	12.84	13.5
		B		7.13		13.5
		C		7.36		13.5
	5530	A	5.5	4.55	8.68	13.5
		B		3.83		13.5
		C		3.26		13.5
	5610	A	8.5	7.77	12.31	13.5
		B		7.37		13.5
		C		7.46		13.5
	5690	A	8.5	7.7	12.71	13.5
		B		8.26		13.5
		C		7.85		13.5

Note: 1. All the antennas ports had been tested, but only the worst data recorded in the report.
2. The setting value means the power setting level in the software and these values will use for all the tests in the report.