TESTING LABORATORY
CERTIFICATE#4323.01

FCC PART 15.407

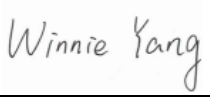
TEST REPORT

For

Xiamen Huoshiquan Import & Export CO., LTD

Room 703, No. 813-2 Xiahe Road, Siming District, XIAMEN, China

FCC ID: 2AJ55HOLYSTONEMD

Report Type: Original Report	**Product Type:** quadcopter	
Test Engineer:	Winnie Yang	
Report Number:	RXM190723054-00C	
Report Date:	2019-09-12	
Reviewed By:	Oscar Ye RF Leader	
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road,Kunshan,Jiangsu province,China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn	

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Xiamen Huoshiquan Import & Export CO., LTD
Tested Model	HS720
Series Model	HS700,HS700D,HS700G,HS110G,HS200G,HS110D,HS200D,HS110,HS200, HS120D,HS130,HS130D,HS100,HS100G,HS100pro,DE25,DE22,HS270, HS110C,HS200C,HS120C,HS130C,HS100C,DE25S,DE22S,HS270D,HS100D, HS161,HS160,F181C,F181W,F181G,HS160pro,HS161D,HS161G,HS160D, HS160G,HS190,HS190W,HS150,HS150D,HS165,HS220,HS165D,HS220D, HS720,HS510,HS550,HS720D,HS720G,HS510D,HS550D,HS550G,HS350, HS230,HS370,HS370S,HS310,HS230D,HS370D,HS310D,HS170,HS210, HS171G,HS170G,HS170D,HS210D,HS410,HS440,HS450,HS470,DE21, DE24,DE27,HS320,HS330,HS500,HS600,HS800,HS900,HS240,HS300, HS400,HS710,HS730,HS740,HS760,HS770
Model Difference	Model Names and color of appearance
Product Type	quadcopter
Dimension	336mm (L)*370mm (W)*56mm(H)
Power Supply	DC7.4V from battery

**All measurement and test data in this report was gathered from production sample serial number: 20190723052. (Assigned by the BACL. The EUT supplied by the applicant was received on 2019-07-23)*

Objective

This type approval report is prepared on behalf of *Xiamen Huoshiquan Import & Export CO., LTD* in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, section 15.203, 15.205, 15.209 and 15.407 rules.

Related Submittal(s)/Grant(s)

FCC Part 15.249 DXX submissions with FCC ID: 2AJ55HOLYSTONEMD.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Kunshan).

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19 dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01), the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

Test channel list is as below,

802.11a/802.11n20 mode Channel 36 was tested.

Channel	Frequency (MHz)
36	5180

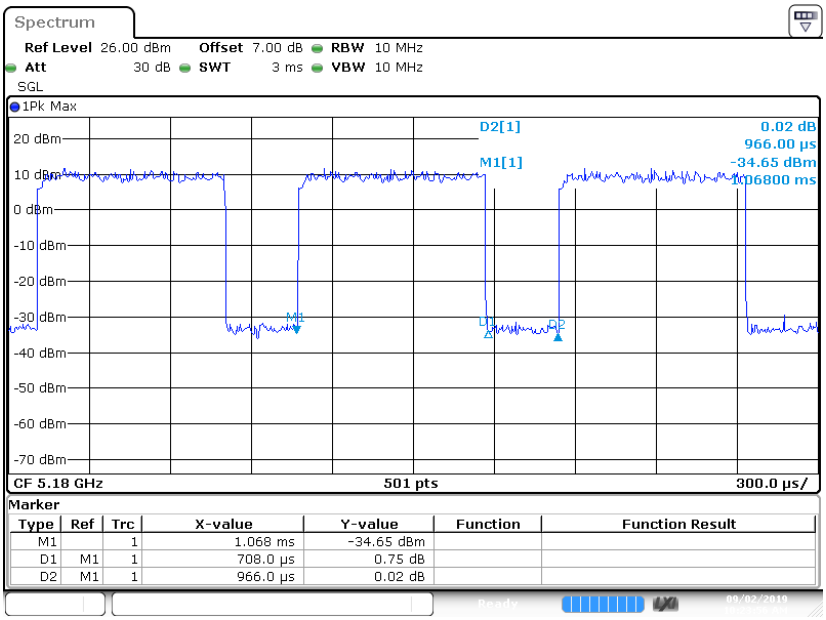
EUT Exercise Software

RF test tool: runtop_certification_client

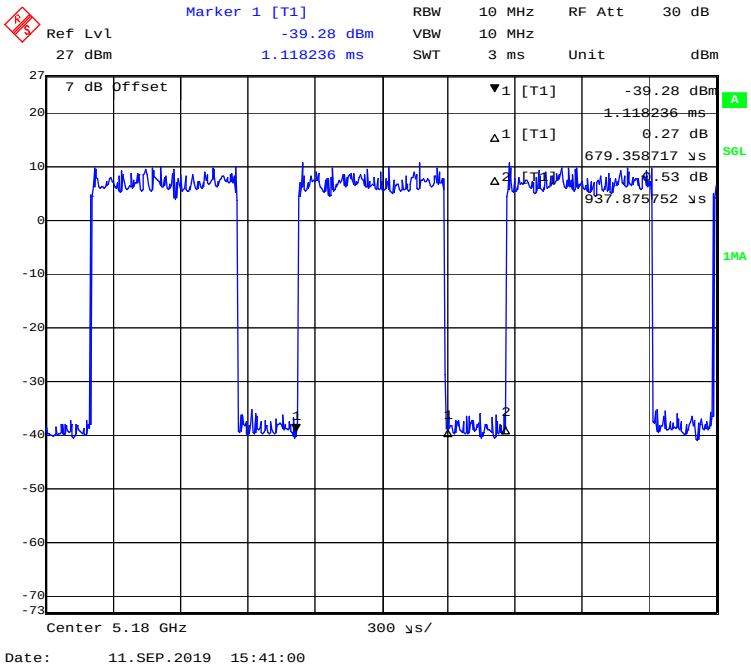
Mode	Data rate	Channel	Power level
802.11a	6 Mbps	5180	15.85
802.11n-HT20	MCS0	5180	14.45

Duty Cycle

802.11a mode



802.11n-HT20 mode



Mode	Frequency (MHz)	Duty Cycle (%)	T (ms)	1/T (kHz)	10log(1/x)
802.11a	5180	73.29	0.708	1.41	1.35
802.11n-HT20		72.39	0.679	1.47	1.40

Note: "x" means duty cycle.

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

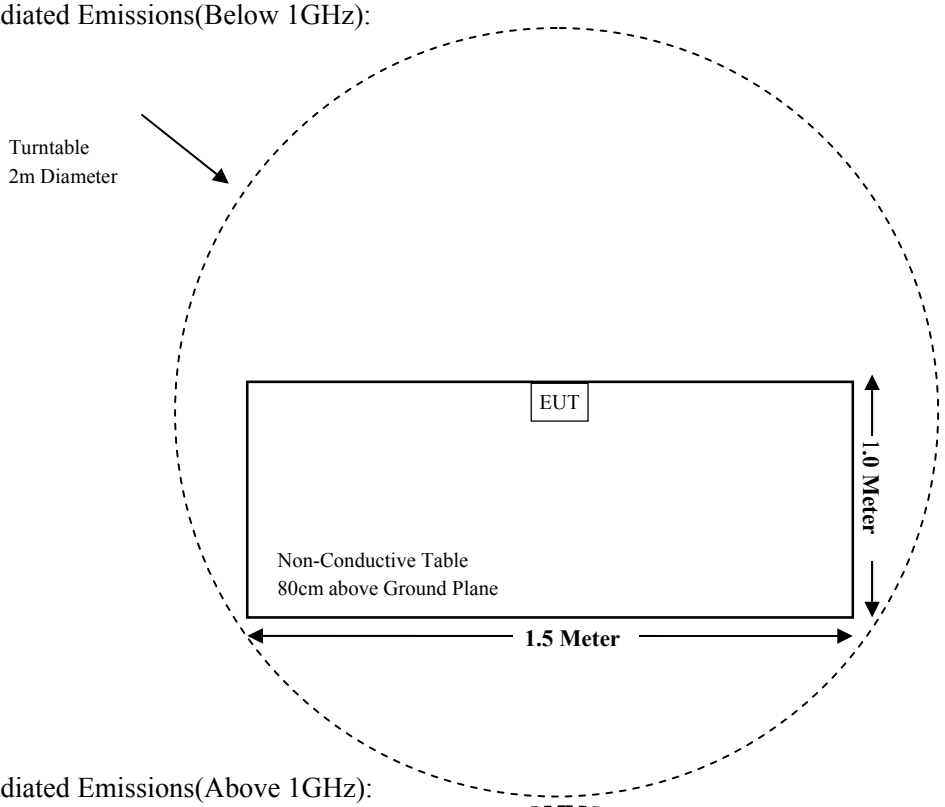
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

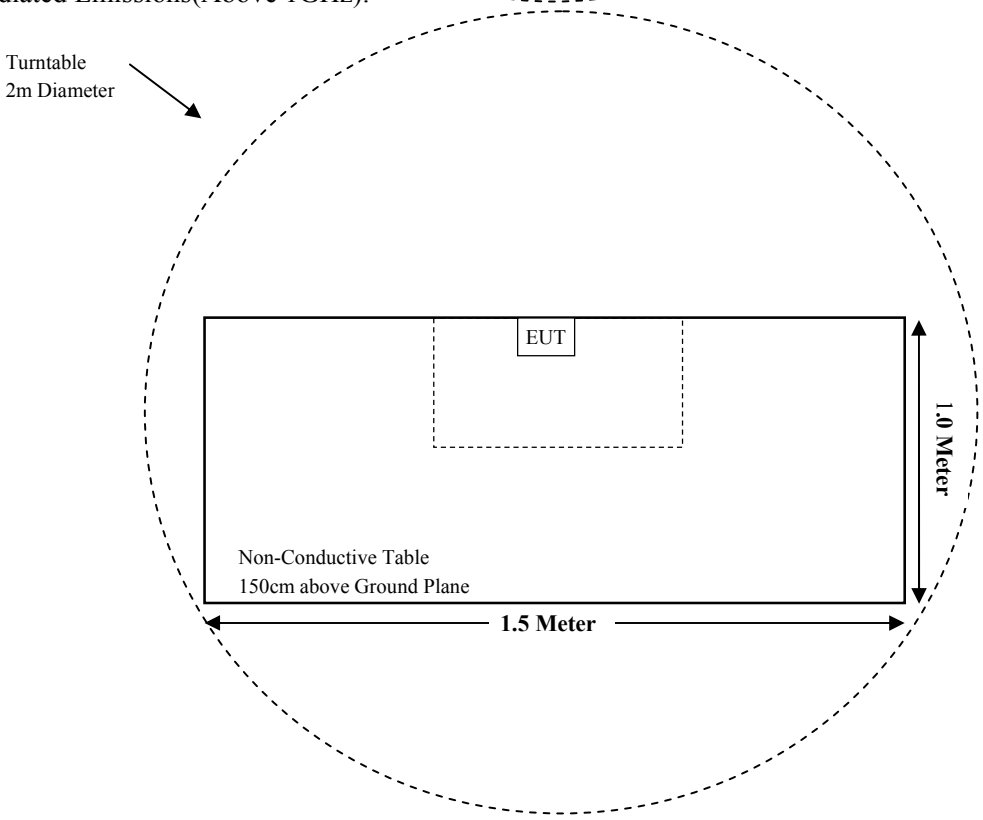
Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup

For Radiated Emissions(Below 1GHz):



For Radiated Emissions(Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1310& §2.1091	MAXIMUM PERMISSIBLE EXPOSURE (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
FCC §15.207 & §15.407(b) (6)	AC Power Line Conducted Emissions	Not Applicable (See Note 1)
§15.205 & §15.209 & §15.407(b) (1) ,(6) ,(7)	Undesirable Emission & Restricted Bands	Compliant
§15.407(a)(1) (5)	Emission Bandwidth	Compliant
§15.407 (a)(1)	Conducted Transmitter Output Power	Compliant
§15.407 (a)(1)	Power Spectral Density	Compliant

Note 1: The equipment was power supply by battery.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test（Chamber 1#）					
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-102454-Qd	2019-06-25	2020-06-24
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2016-12-26	2019-12-25
Sonoma Instrunent	Pre-amplifier	310N	171205	2019-08-14	2020-08-13
Audix	Test Software	e3	V9	--	--
MICRO-COAX	Coaxial Cable	Cable-8	008	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2019-08-15	2020-08-14
Radiated Emission Test（Chamber 2#）					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2019-08-27	2020-08-26
ETS-LINDGREN	Horn Antenna	3115	6229	2016-12-12	2019-12-11
ETS-LINDGREN	Horn Antenna	3116	00084159	2016-12-12	2019-12-11
A.H.Systems, inc	Amplifier	2641-1	491	2019-02-20	2020-02-19
SELECTOR	Amplifier	EM18G40G	060726	2019-03-22	2020-03-21
MICRO-TRONICS	Band Reject Filter	BRC50703	G094	2019-08-05	2020-08-04
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2019-08-15	2020-08-14
RF Conducted Test					
Rohde & Schwarz	FSV40 Signal Analyzer	FSV40	101116	2019-07-23	2020-07-22
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2018-09-21	2019-09-20
Agilent	Power Meter	N1912A	MY5000492	2018-11-18	2019-11-17
Agilent	Power Sensor	N1921A	MY54210024	2018-11-18	2019-11-17
Narda	Attenuator	10dB	010	2019-08-15	2020-08-14
BACL	Temperature & Humidity Chamber	BTH-150	30023	2018-12-20	2019-12-19
EAST	Regulated DC Power Supply	MCH-303D-II	14070562	2018-10-10	2019-10-09
Huoshiquan	RF Cable	Huoshiquan C01	C01	Each Time	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

§1.1310& §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247(i) and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/		f/1500	30
1500-100,000	/		1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

Mode	Frequency (MHz)	Antenna Gain		Tune-up Conducted Power		EvaluationDistance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)	MPE Ratio
		(dBi)	(numeric)	(dBm)	(mW)				
802.11a	5180	2.00	1.58	13.50	22.39	20	0.0070	1.0	0.0070
802.11n20	5180	2.00	1.58	14.00	25.12	20	0.0079	1.0	0.0079
SRD	2417	2.00	1.58	-1.00	0.79	20	0.0002	1.0	0.0002

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

The worst condition is 802.11n20 & SRD, as below:

$$\sum_i \frac{S_i}{S_{Limit,i}} = 0.0079+0.0002=0.0081 < 1.0$$

Note:

(1) The Tune-up output power was declared by the Manufacturer.

Conclusion: The device meets MPE at distance 20cm.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.407, if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has two monopole antennas for 5G Wi-Fi which was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

ANT	Antenna Type	Max. Antenna Gain
Antenna 1	monopole	2 dBi
Antenna 2	monopole	2 dBi

Result: Compliant.

§15.205 & §15.209 & §15.407(B) (1),(6),(7) – UNDESIRABLE EMISSION & RESTRICTED BANDS

Applicable Standard

FCC §15.407 (b) (1), (6), (7); §15.209; §15.205;

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27dBm/MHz

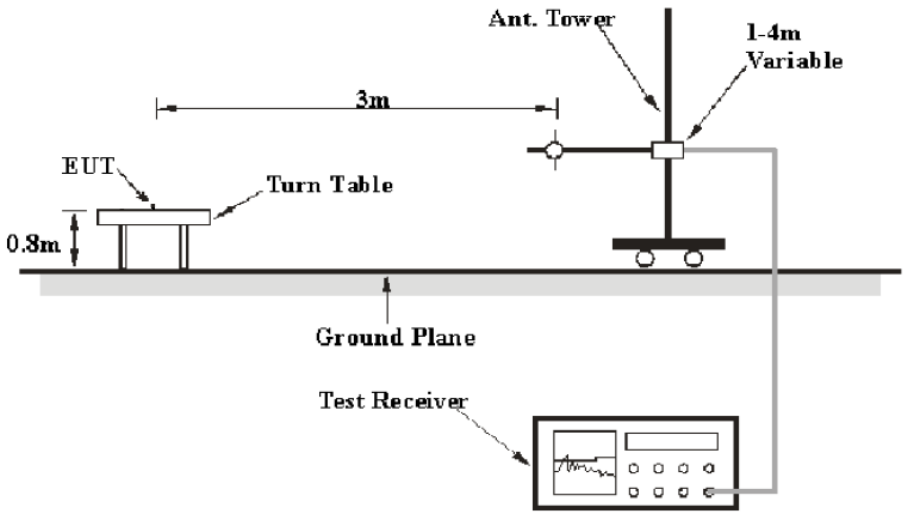
For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

As per FCC §15.35(d):Unless otherwise specified, on any frenquency or frequencies above 1000MHz,the radiated emission limits are based on the use of measurement instrunmentation employing an average detector function. Unless otherwise specified, measurements above 1000MHz shall be performed using a minimum resolution bandwidth of 1MHz.

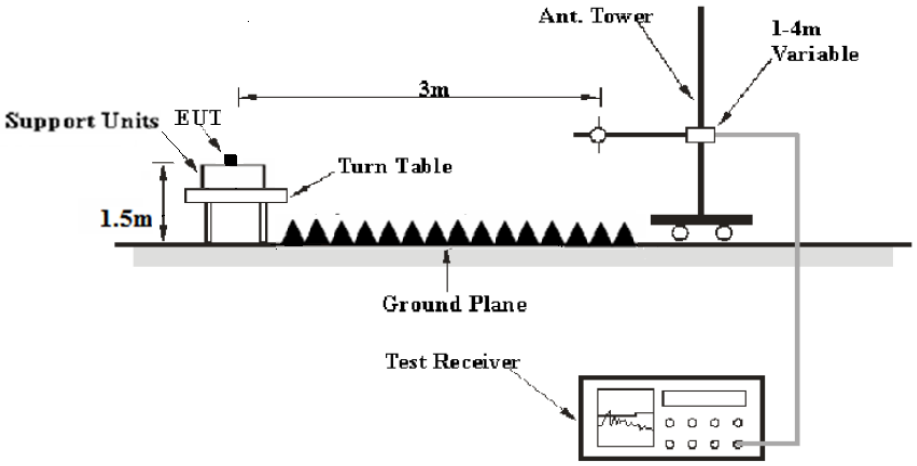
According to 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as: E [dBμV/m] = EIRP [dBm] + 95.2, for d = 3 meters.

EUT Setup

Below 1 GHz:



1 GHz-40GHz:



The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC 15.209 and FCC 15.407 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver Setup was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1GHz	1MHz	3 MHz	/	PK
	1MHz	3 MHz	/	Ave.

Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

Factor & Over Limit Calculation (For Below 1GHz)

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

The "**Over Limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of 7 dB means the emission is 7 dB above the limit. The equation for over limit calculation is as follows:

Over Limit (dB) = Read level (dBμV) + Factor (dB) - Limit (dBμV)

Corrected Amplitude & Margin Calculation (For Above 1GHz)

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit –Extrapolation result

Test Data

Environmental Conditions

Temperature:	24.8 ℃~22.3 ℃
Relative Humidity:	50 %~51 %
ATM Pressure:	101.3 kPa~102.1 kPa

The testing was performed by Winnie Yang from 2019-09-06 to 2019-09-12.

Test Mode: Transmitting

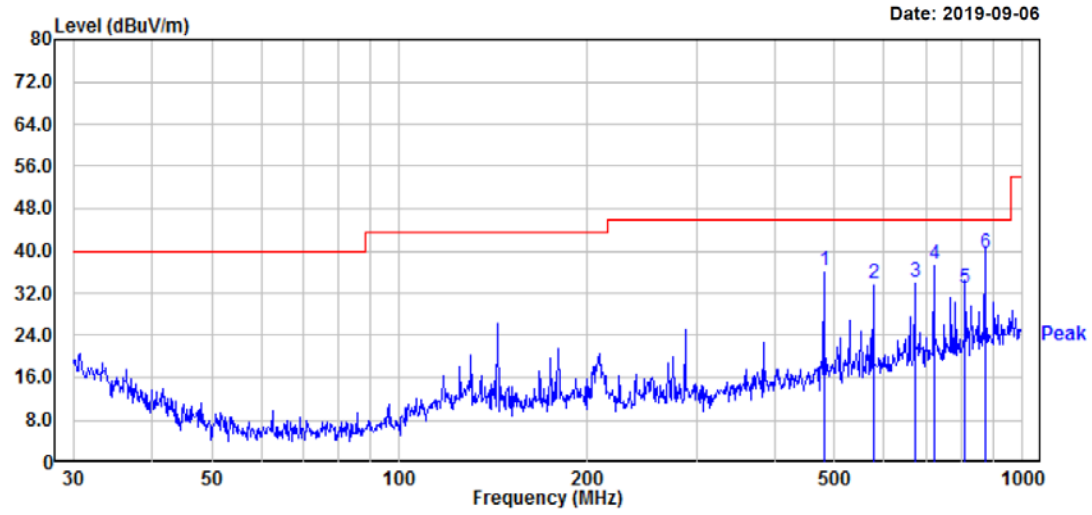
Spurious Emission Test

30MHz-1GHz

802.11a Mode

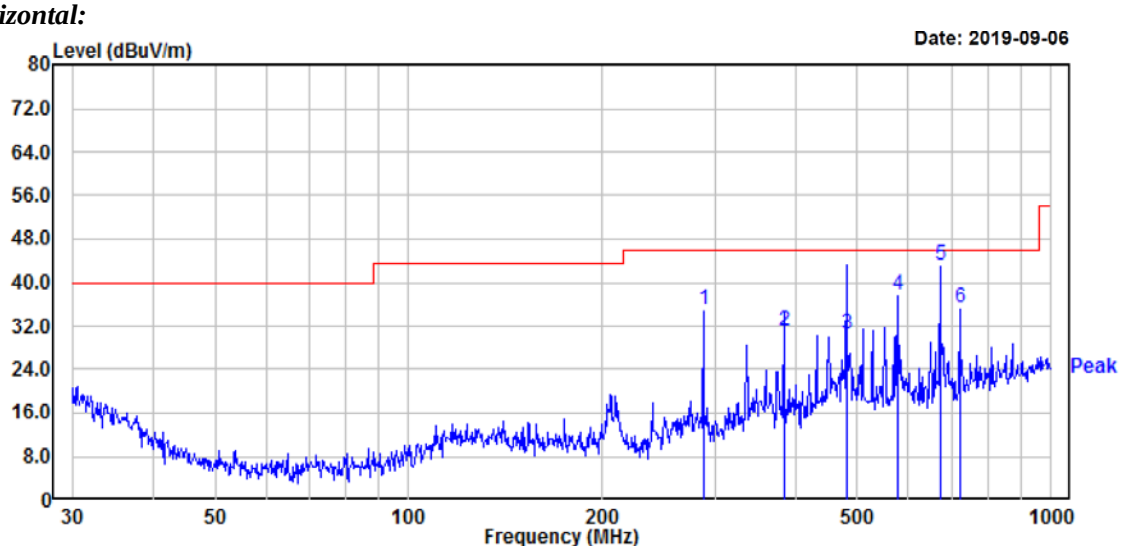
*(Pre-scan in the X, Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded.)*

Vertical:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	480.53	42.30	-5.93	36.37	46.00	-9.63	200	357	QP
2	576.64	38.31	-4.36	33.95	46.00	-12.05	200	357	QP
3	672.85	36.60	-2.62	33.98	46.00	-12.02	100	359	QP
4	721.73	39.20	-1.77	37.43	46.00	-8.57	100	359	QP
5	810.27	33.50	-0.61	32.89	46.00	-13.11	100	359	QP
6	872.18	39.00	0.46	39.46	46.00	-6.54	100	359	QP

Horizontal:



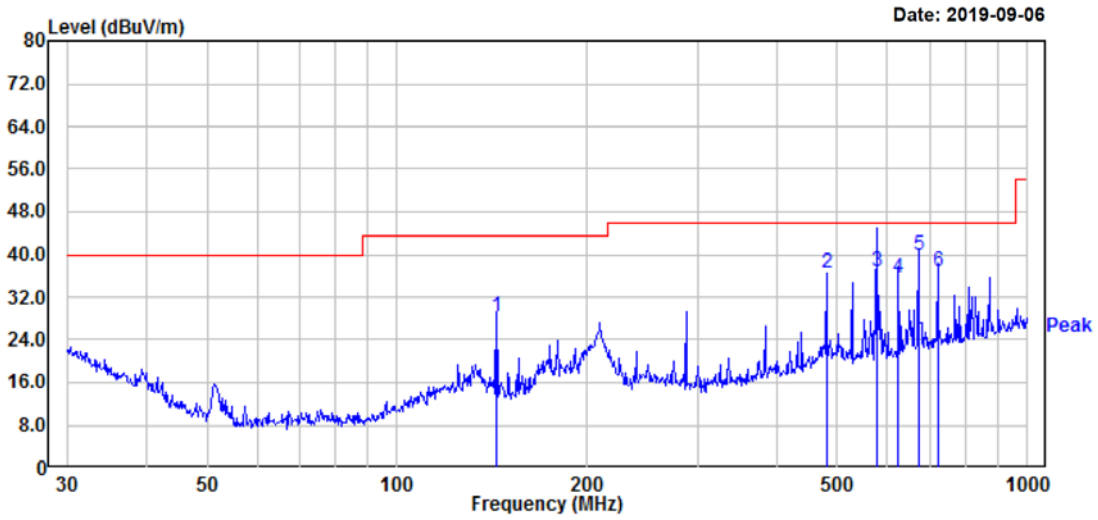
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	287.99	45.51	-10.45	35.06	46.00	-10.94	200	360	QP
2	383.93	39.10	-8.07	31.03	46.00	-14.97	100	359	QP
3	480.53	36.50	-5.93	30.57	46.00	-15.43	100	359	QP
4	576.64	42.01	-4.36	37.65	46.00	-8.35	100	359	QP
5	672.85	45.80	-2.62	43.18	46.00	-2.82	200	360	QP
6	721.73	37.00	-1.77	35.23	46.00	-10.77	200	360	QP

30MHz-1GHz

802.11n-HT20 Mode

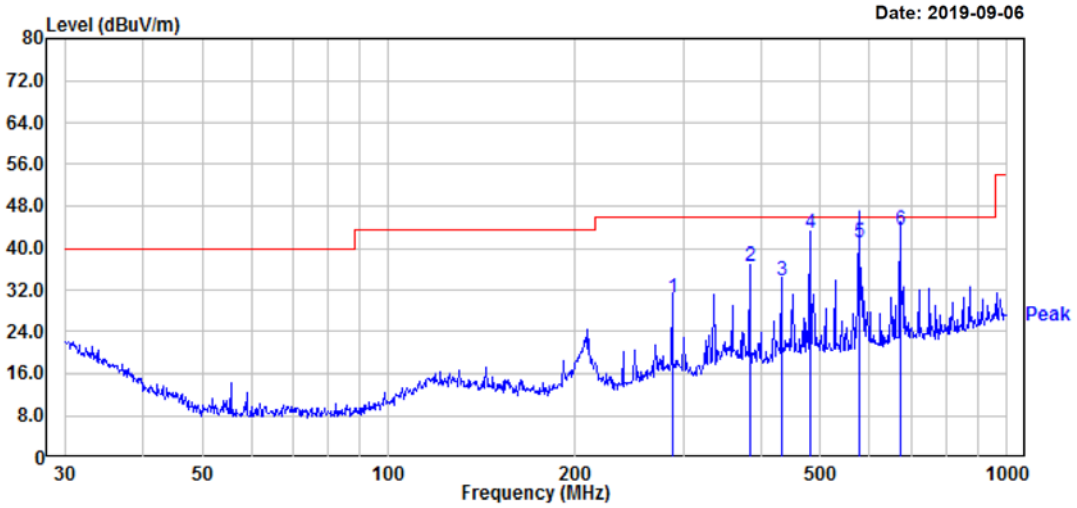
*(Pre-scan in the X, Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded.)*

Vertical:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	143.83	40.11	-11.82	28.29	43.50	-15.21	100	155	QP
2	480.53	42.40	-5.93	36.47	46.00	-9.53	200	2	QP
3	576.64	41.11	-4.36	36.75	46.00	-9.25	100	2	QP
4	625.08	39.09	-3.52	35.57	46.00	-10.43	200	2	QP
5	672.85	42.40	-2.62	39.78	46.00	-6.22	200	2	QP
6	721.73	38.60	-1.77	36.83	46.00	-9.17	100	33	QP

Horizontal:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	287.99	41.01	-10.45	30.56	46.00	-15.44	200	285	QP
2	383.93	44.70	-8.07	36.63	46.00	-9.37	100	216	QP
3	432.55	40.69	-6.96	33.73	46.00	-12.27	100	198	QP
4	480.53	48.70	-5.93	42.77	46.00	-3.23	100	322	QP
5	576.64	45.51	-4.36	41.15	46.00	-4.85	100	335	QP
6	672.85	46.20	-2.62	43.58	46.00	-2.42	200	279	QP

Note:

1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
2) Over Limit (dB) = Read level (dBμV) + Factor (dB) - Limit (dBμV)

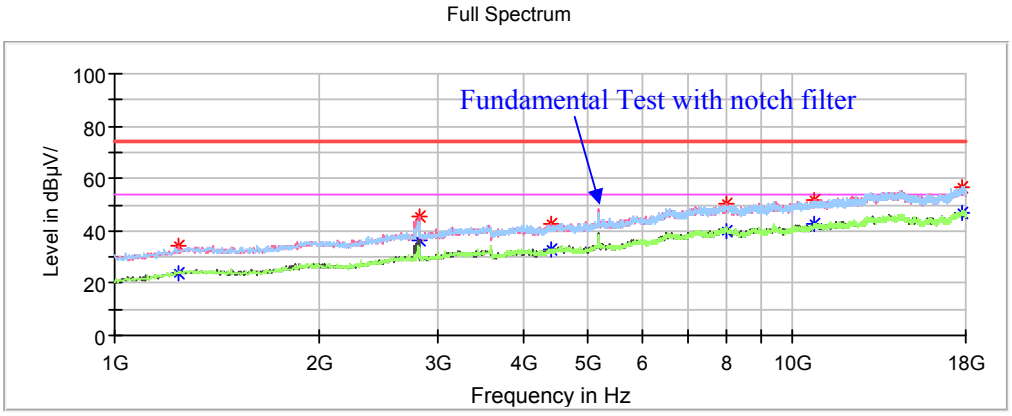
1GHz-18GHz:

802.11a Mode:

*(Pre-scan in the X, Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded.)*

Note:
1. This test was performed with the 5150-5250MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
   Corrected Amplitude = Corrected Factor + Reading
   Margin = Limit - Corrected. Amplitude

Low Channel: 5180MHz



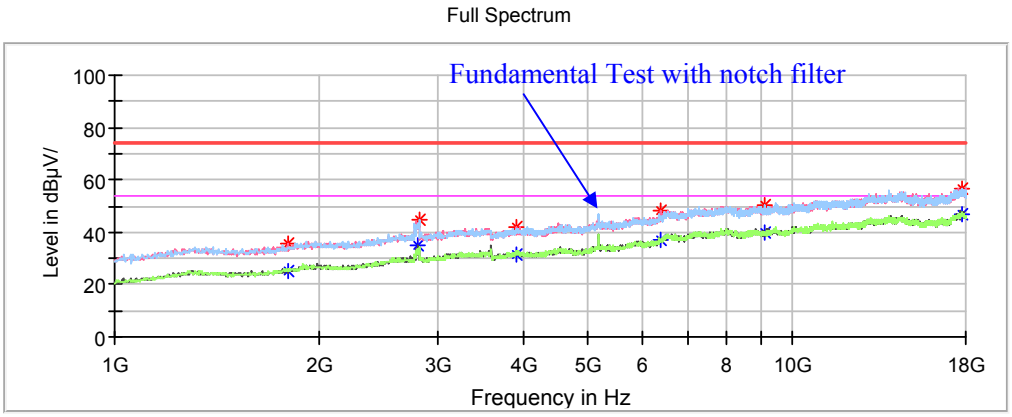
Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1244.80	34.42	---	150.0	V	358.0	-11.3	68.20	33.78
2812.20	---	36.11	200.0	H	228.0	-5.3	54.00	17.89
2812.20	45.62	---	200.0	H	228.0	-5.3	74.00	28.38
4396.60	---	33.11	250.0	V	219.0	-1.2	54.00	20.89
4396.60	42.67	---	250.0	V	219.0	-1.2	74.00	31.33
8004.00	50.59	---	150.0	V	185.0	7.1	68.20	17.61
10730.80	---	42.32	250.0	V	30.0	9.3	54.00	11.68
10730.80	51.95	---	250.0	V	30.0	9.3	74.00	22.05
17802.80	---	47.01	150.0	H	138.0	13.8	54.00	6.99
17802.80	56.74	---	150.0	H	138.0	13.8	74.00	17.26

802.11n-HT20 Mode:

*(Pre-scan in the X, Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded.)*

Note:
1. This test was performed with the 5150-5250MHz band reject filter.
2. Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
   Corrected Amplitude = Corrected Factor + Reading
   Margin = Limit - Corrected. Amplitude

Low Channel: 5180MHz

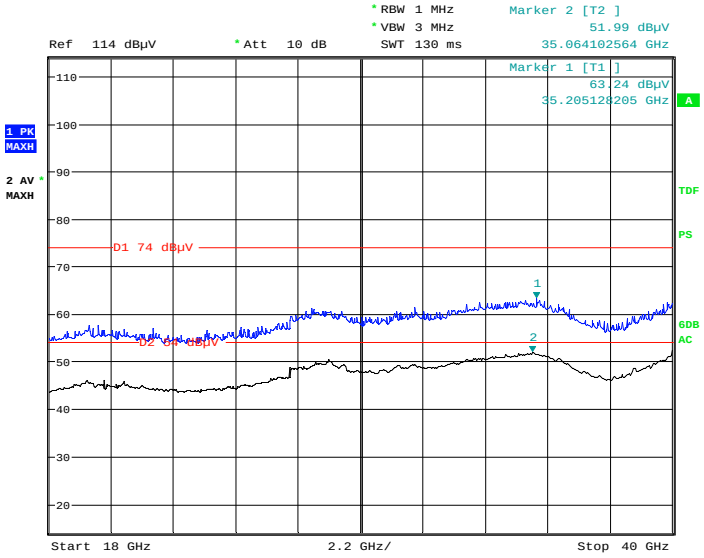


Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
	MaxPeak (dBµV /m)	Average (dBµV /m)	Height (cm)	Polar (H/V)				
1799.00	35.91	---	200.0	V	271.0	-8.9	68.20	32.29
2805.40	---	35.00	250.0	H	325.0	-5.4	54.00	19.00
2805.40	44.94	---	250.0	H	325.0	-5.3	74.00	29.06
3920.60	---	31.64	150.0	V	253.0	-2.1	54.00	22.36
3920.60	41.83	---	150.0	V	253.0	-2.1	74.00	32.17
6378.80	47.97	---	100.0	V	271.0	3.9	68.20	20.23
9119.20	---	39.54	100.0	H	347.0	7.7	54.00	14.46
9119.20	50.63	---	100.0	H	347.0	7.7	74.00	23.37
17755.20	---	46.86	150.0	V	51.0	13.9	54.00	7.14
17755.20	56.40	---	150.0	V	51.0	13.9	74.00	17.60

18GHz-40GHz

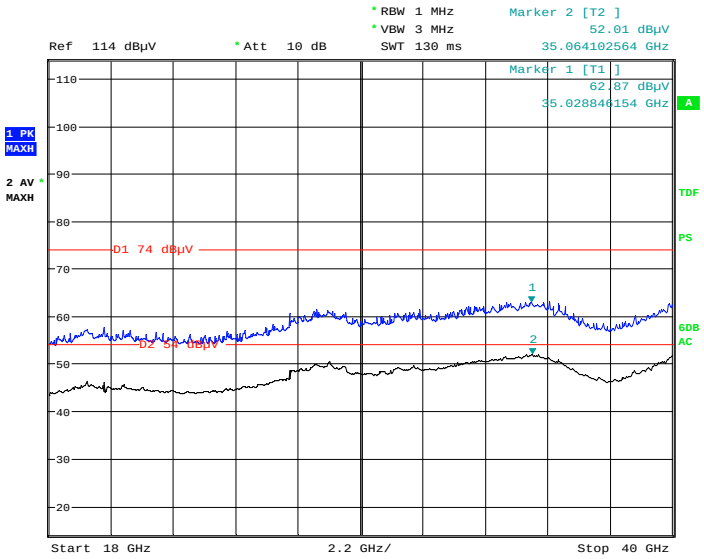
Pre-scan with 802.11a and 802.11n-HT20 modes of operation in the X,Y and Z axes of orientation, the worst case ***802.11n-HT20 mode in Z-axis of orientation*** *was recorded*

Horizontal



Date: 12.SEP.2019 15:04:03

Vertical



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Fundamental Test & Restricted Bands Emissions Test

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss
Corrected Amplitude = Corrected Factor + Reading
Margin = Limit - Corrected. Amplitude

802.11a Mode: *(Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-axis of orientation was recorded)*

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
5180MHz								
5150.00	---	43.63	150	H	17	10.2	54.00	10.37
5150.00	52.14	---	150	H	17	10.2	74.00	21.86
5150.00	---	44.33	200	V	242	10.2	54.00	9.67
5150.00	52.25	---	200	V	242	10.2	74.00	21.75
5350.00	---	44.37	100	H	155	10.9	54.00	9.63
5350.00	53.24	---	100	H	155	10.9	74.00	20.76
5350.00	53.19	---	100	V	308	10.9	74.00	20.81
5350.00	---	44.51	100	V	308	10.9	54.00	9.49

802.11n-HT20 Mode: *(Pre-scan in the X, Y and Z axes of orientation, the worst case in Z-axis of orientation was recorded)*

Frequency (MHz)	Corrected Amplitude		Rx Antenna		Turntable Degree	Correct Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
	MaxPeak (dBμV /m)	Average (dBμV /m)	Height (cm)	Polar (H/V)				
5180MHz								
5150.00	---	44.01	150	H	17	10.2	54.00	9.99
5150.00	52.66	---	150	H	17	10.2	74.00	21.34
5150.00	---	43.56	200	V	242	10.2	54.00	10.44
5150.00	52.17	---	200	V	242	10.2	74.00	21.83
5350.00	---	44.29	100	H	155	10.9	54.00	9.71
5350.00	53.87	---	100	H	155	10.9	74.00	20.13
5350.00	53.66	---	100	V	308	10.9	74.00	20.34
5350.00	---	45.01	100	V	308	10.9	54.00	8.99

FCC §15.407(a)–EMISSION BANDWIDTH

Applicable Standard

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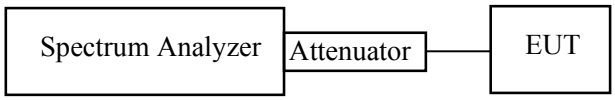
The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.15-5.25 GHz are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

Test Procedure

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > 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%.



Test Data

Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	51 %
ATM Pressure:	101.1 kPa

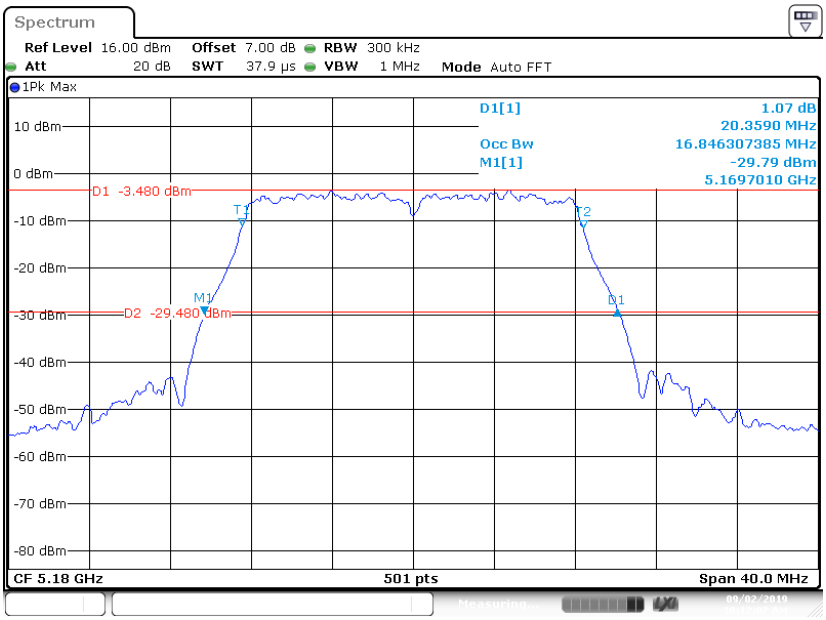
The testing was performed by Winnie Yang on 2019-09-02.

Test Result: Pass.

Test mode	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
802.11a	5180	20.359	16.846
802.11n-HT20	5180	21.158	17.884

26 Bandwidth & 99% Occupied Bandwidth

802.11a mode, 5180MHz



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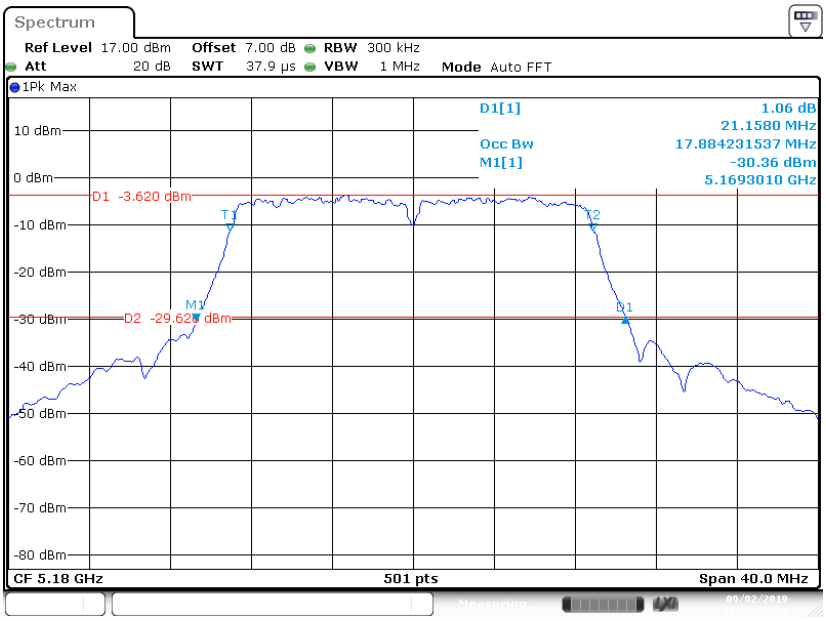
802.11n-HT20 mode, 5180MHz



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FCC §15.407(a) (1) – CONDUCTED TRANSMITTER OUTPUT POWER

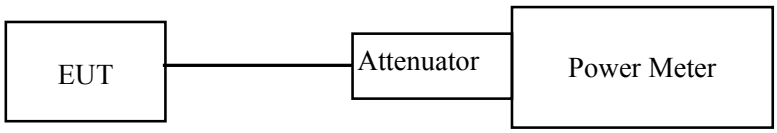
Applicable Standard

According to §15.407(a)(1)

(ii) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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 6 dBi.

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	25.2 °C
Relative Humidity:	50 %
ATM Pressure:	101.2 kPa

The testing was performed by Winnie Yang on 2019-09-02.

Test Mode: Transmitting

Test mode	Channel	Frequency (MHz)	Average Conducted Output Power	Limit (dBm)	Result
802.11a	36	5180	13.06	30	PASS
802.11n-HT20	36	5180	13.77	30	PASS

FCC §15.407(a) (1) - POWER SPECTRAL DENSITY

Applicable Standard

According to §15.407(a)(1)

(ii) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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 6 dBi.

Test Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedyres New Rules v02r01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section F: Maximum power spectral density (PPSD)

Test Data

Environmental Conditions

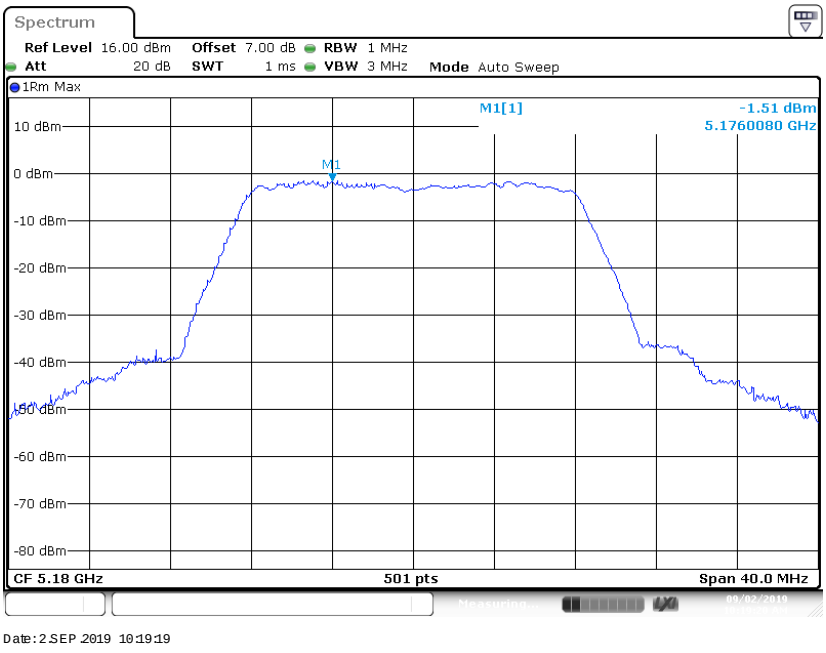
Temperature:	24.5 °C
Relative Humidity:	50 %
ATM Pressure:	101.2 kPa

The testing was performed by Winnie Yang on 2019-09-02.

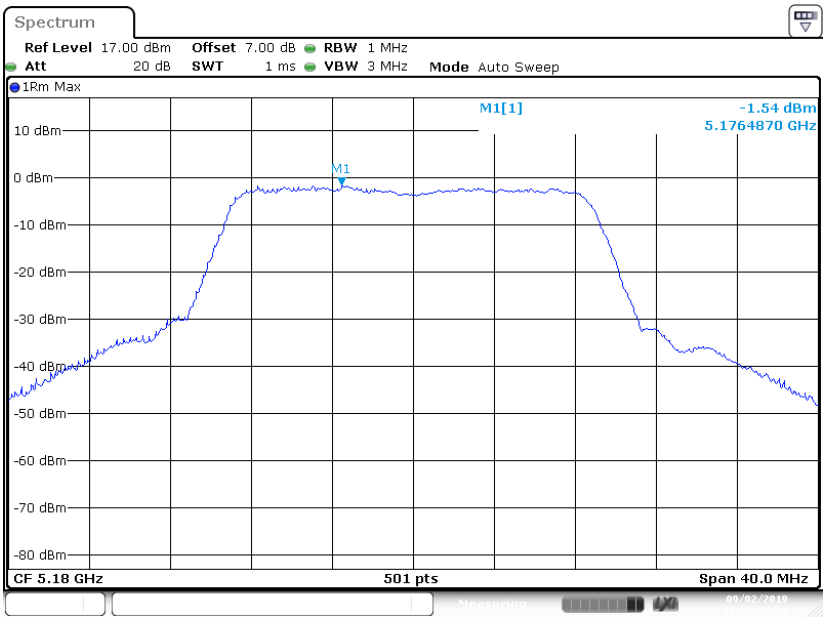
Test Mode: Transmitting

Mode	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	5180	-1.51	17	PASS
802.11n20	5180	-1.54	17	PASS

802.11a mode, Power spectral density-5180MHz



802.11n-HT20 mode, Power spectral density-5180MHz



******* END OF REPORT *******