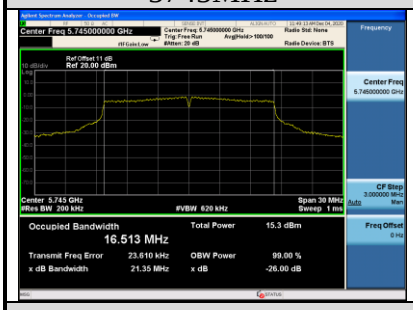
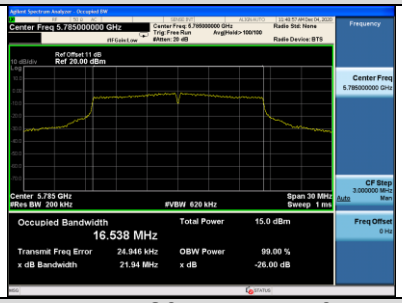
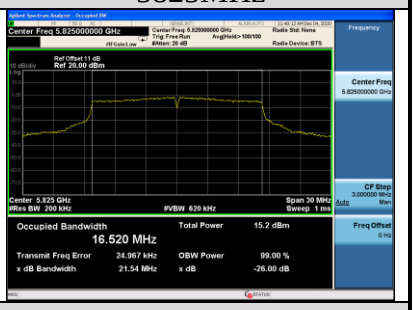
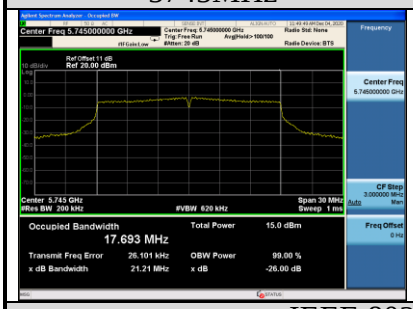
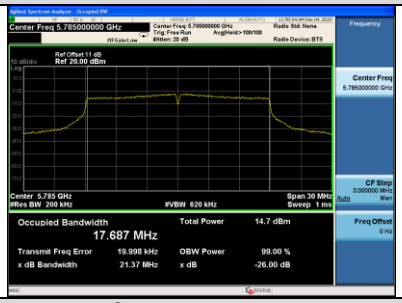
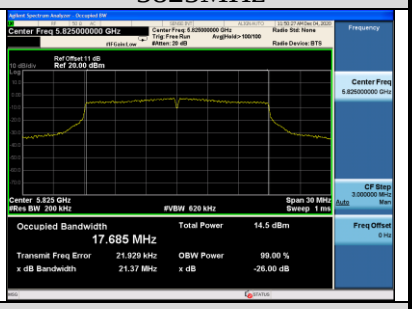
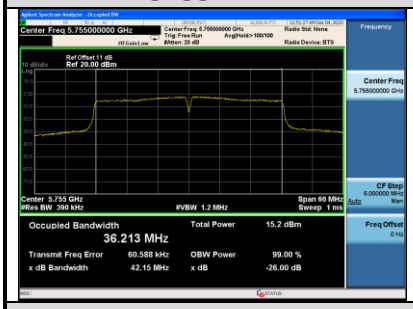
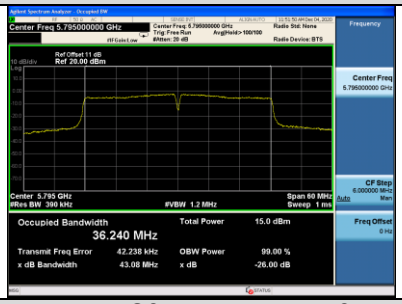
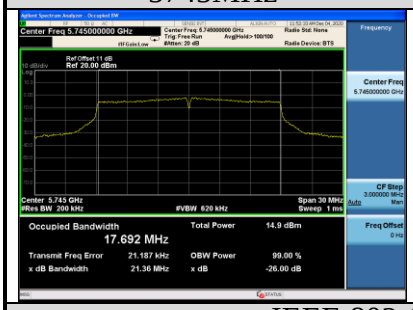
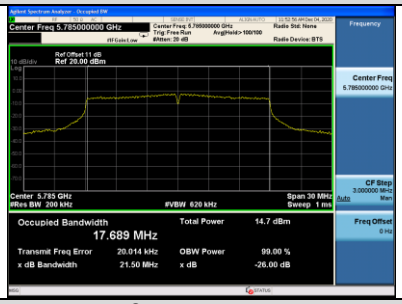
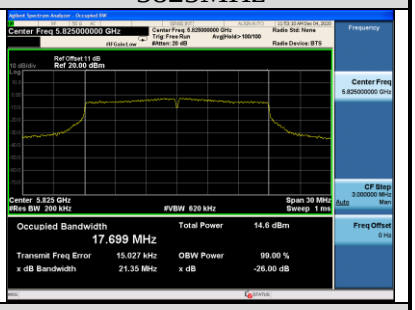
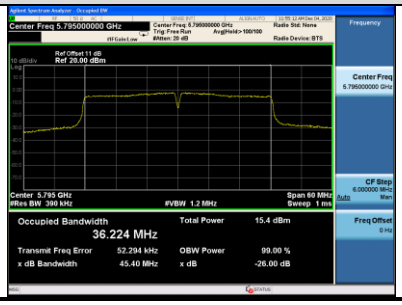
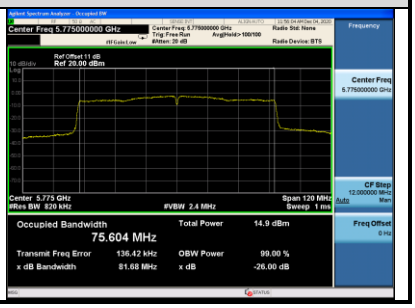
U-NII-3 Band:		
26dB bandwidth & 99% Occupied bandwidth		
IEEE 802.11a		
5745MHz	5785MHz	5825MHz
		
IEEE 802.11n HT20		
5745MHz	5785MHz	5825MHz
		
IEEE 802.11n HT40		---
5755MHz	5795MHz	---
		---
IEEE 802.11ac VHT20		
5745MHz	5785MHz	5825MHz
		
IEEE 802.11ac VHT40		IEEE 802.11ac VHT80
5755MHz	5795MHz	5775MHz
		

7. OUTPUT POWER TEST

7.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.12,20	1 Year
2.	Power meter	HP	436A	2016A07891	Apr 11,20	1 Year
3.	Power Sensor	Agilent	8482B	MY41090514	Apr.11,20	1 Year
4.	Attenuator	Agilent	8491B	MY39269201	Oct.12,20	1 Year
5.	RF Cable	EMCI	EMC102-KM-KM 3500	170702	Apr.12,20	1 Year

7.2. Limit

For the band 5.15–5.25 GHz.

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the max-imum antenna gain does not exceed 6 dBi.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

7.3. Test Procedure

1. Connected the EUT's antenna port to measure device by 20dB attenuator.
   1) Measure the duty cycle, x, of the transmitter output signal as described in II.B.
   2) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
   3) Set RBW = 1 MHz.
   4) Set VBW ≥ 3 MHz.
   5) Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
   6) Sweep time = auto.
   7) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
   8) Do not use sweep triggering. Allow the sweep to "free run."
   9) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
   10) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
   11) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

7.4.Test Results

U-NII-1 Band:

EUT: Room Booking Panel		
M/N: IAD-18010A		
Test date: 2020-12-16	Pressure: 102.1 ±1.0 kpa	Humidity: 51.1 ±3.0%
Tested by: Allen	Test site: RF site	Temperature:22.8 ±0.6 ℃

Test Mode	Frequency (MHz)	Maximum Conducted output power (dBm)	Limit (dBm)
11a	5180	12.51	23.98
	5200	12.30	
	5240	12.60	
11n HT20	5180	12.10	23.98
	5200	11.92	
	5240	12.33	
11n HT40	5190	12.12	23.98
	5230	12.14	
11ac VHT20	5180	11.99	23.98
	5200	11.90	
	5240	12.23	
11ac VHT40	5190	12.05	23.98
	5230	12.14	
11ac VHT80	5210	11.63	23.98
Conclusion: PASS			

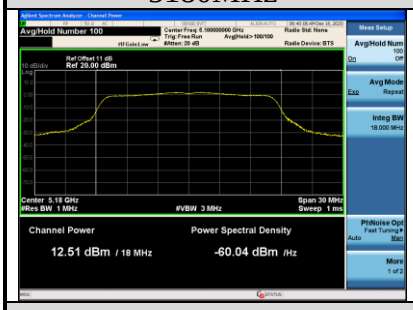
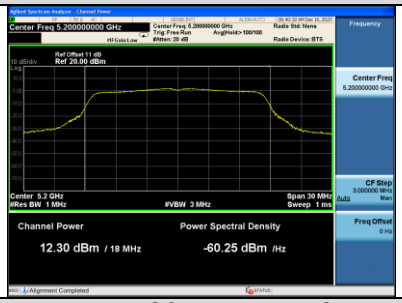
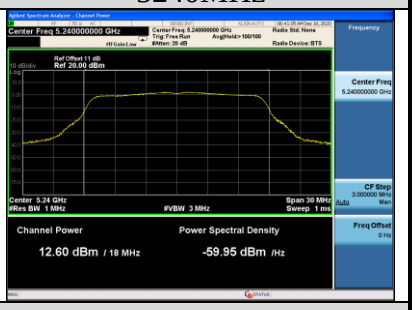
U-NII-3 Band:

EUT: Room Booking Panel		
M/N: IAD-18010A		
Test date: 2020-12-04~16	Pressure: 102.1 ±1.0 kpa	Humidity: 51.1 ±3.0%
Tested by: Allen	Test site: RF site	Temperature:22.8 ±0.6 ℃

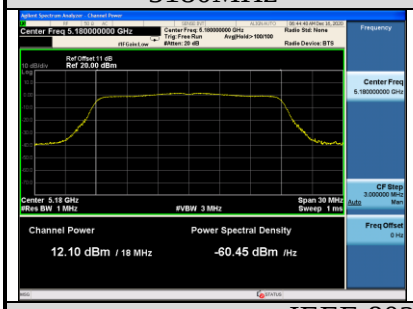
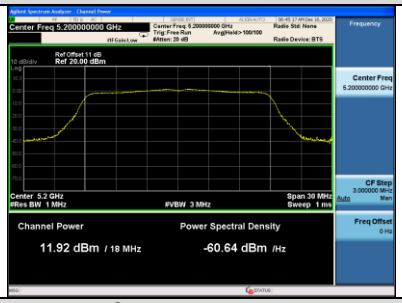
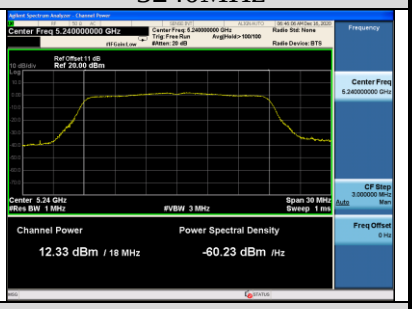
Test Mode	Frequency (MHz)	Maximum Conducted output power (dBm)	Limit (dBm)
11a	5745	15.79	30
	5785	15.67	
	5825	15.53	
11n HT20	5745	15.46	30
	5785	15.32	
	5825	15.13	
11n HT40	5755	16.15	30
	5795	16.02	
11ac VHT20	5745	15.57	30
	5785	15.36	
	5825	15.20	
11ac VHT40	5755	16.07	30
	5795	16.03	
11ac VHT80	5775	15.35	30
Conclusion: PASS			

U-NII-1 Band:

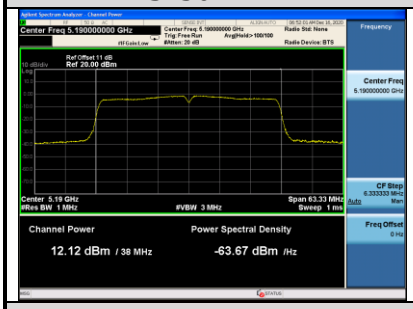
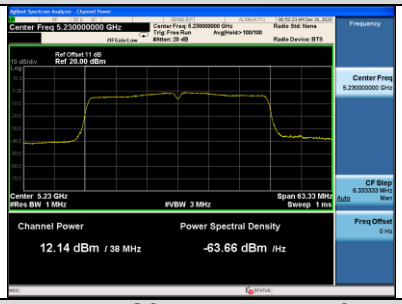
IEEE 802.11a

5180MHz	5200MHz	5240MHz
		
Channel Power 12.51 dBm / 18 MHz; Power Spectral Density -60.04 dBm /Hz	Channel Power 12.30 dBm / 18 MHz; Power Spectral Density -60.25 dBm /Hz	Channel Power 12.60 dBm / 18 MHz; Power Spectral Density -59.95 dBm /Hz

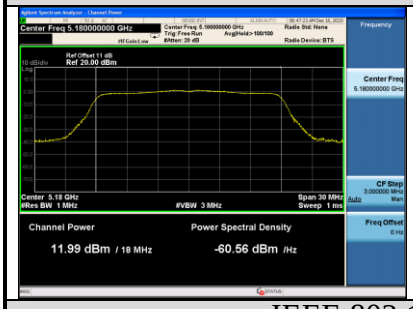
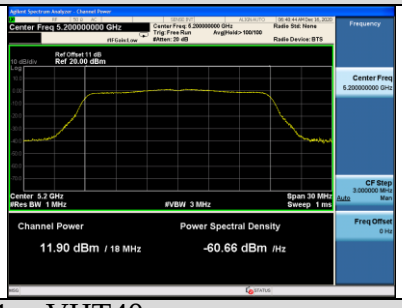
IEEE 802.11n HT20

5180MHz	5200MHz	5240MHz
		
Channel Power 12.10 dBm / 18 MHz; Power Spectral Density -60.45 dBm /Hz	Channel Power 11.92 dBm / 18 MHz; Power Spectral Density -60.64 dBm /Hz	Channel Power 12.33 dBm / 18 MHz; Power Spectral Density -60.23 dBm /Hz

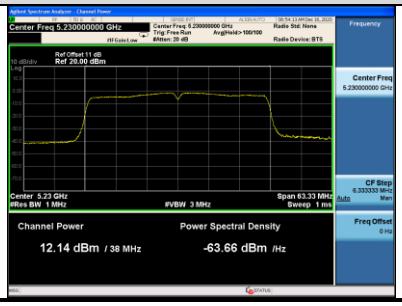
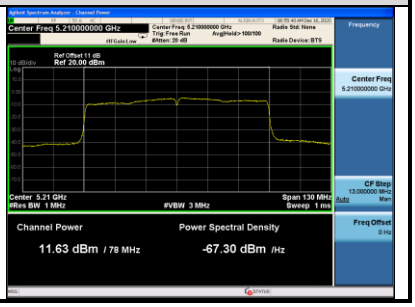
IEEE 802.11n HT40 / ---

5190MHz	5230MHz	---
		---
Channel Power 12.12 dBm / 38 MHz; Power Spectral Density -63.67 dBm /Hz	Channel Power 12.14 dBm / 38 MHz; Power Spectral Density -63.66 dBm /Hz	

IEEE 802.11ac VHT20

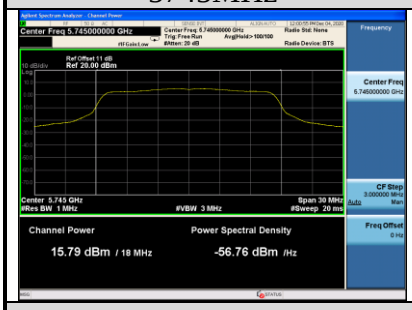
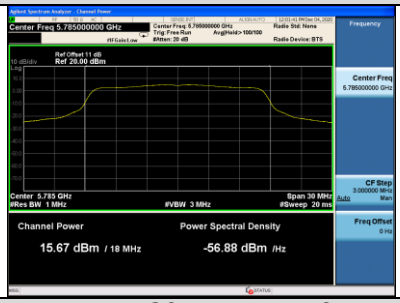
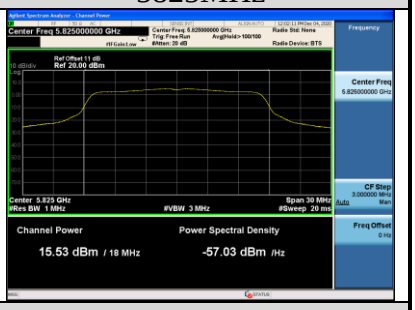
5180MHz	5200MHz	5240MHz
		
Channel Power 11.99 dBm / 18 MHz; Power Spectral Density -60.56 dBm /Hz	Channel Power 11.90 dBm / 18 MHz; Power Spectral Density -60.66 dBm /Hz	Channel Power 12.23 dBm / 18 MHz; Power Spectral Density -60.32 dBm /Hz

IEEE 802.11ac VHT40 / IEEE 802.11ac VHT80

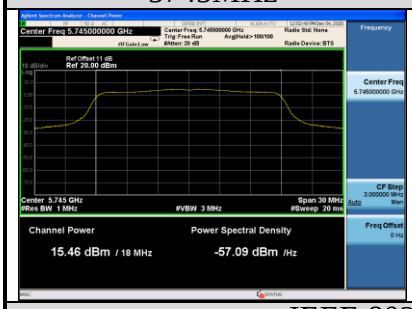
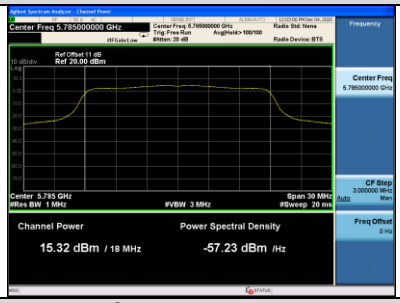
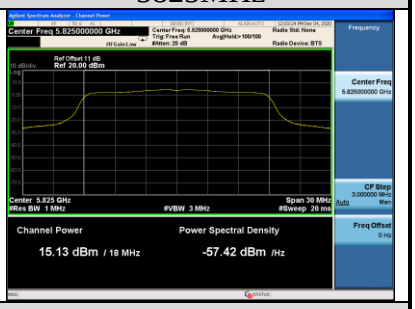
5190MHz	5230MHz	5210MHz
		
Channel Power 12.05 dBm / 38 MHz; Power Spectral Density -63.75 dBm /Hz	Channel Power 12.14 dBm / 38 MHz; Power Spectral Density -63.66 dBm /Hz	Channel Power 11.63 dBm / 78 MHz; Power Spectral Density -67.30 dBm /Hz

U-NII-3 Band:

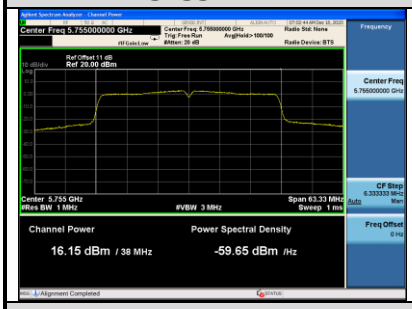
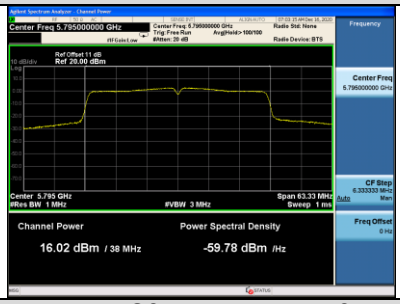
IEEE 802.11a

5745MHz	5785MHz	5825MHz
		

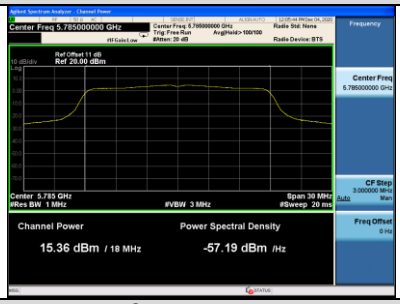
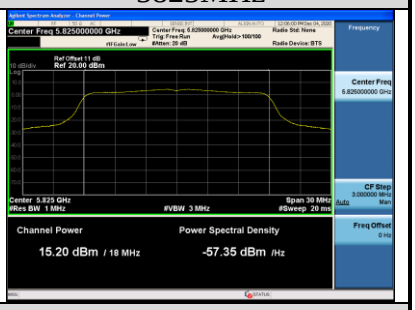
IEEE 802.11n HT20

5745MHz	5785MHz	5825MHz
		

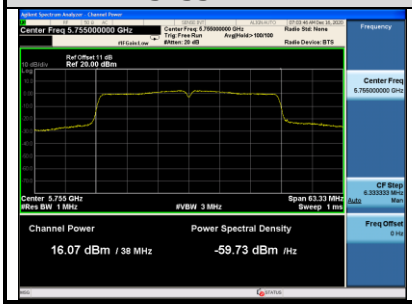
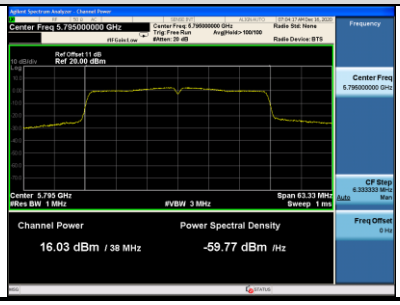
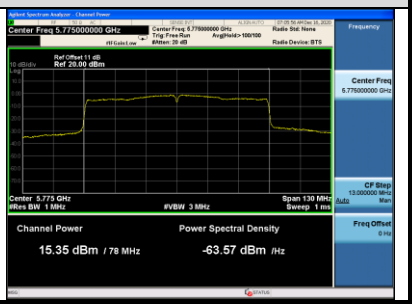
IEEE 802.11n HT40 / ---

5755MHz	5795MHz	---
		---

IEEE 802.11ac VHT20

5745MHz	5785MHz	5825MHz
		

IEEE 802.11ac VHT40 / IEEE 802.11ac VHT80

5755MHz	5795MHz	5775MHz
		

8. EQUIVALENT ISOTROPIC RADIATED POWER TEST

8.1.Limit

Use the test method described in FCC Part 15.407(h) (1):

The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

8.2.Test Procedure

Use the test method described in ANSI C63.10 Annex G :

(1) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator ,set the Spectrum Analyzer as below:

Span: Zero
RBW:100KHz
VBW:100KHz

Read out the duty cycle(X) of the transmitter and record as X

(2) The channel power measure function of spectrum Analyzer was used to measure out average output power of transmitter.

(3)Calculated e.i.r.p according to the formula: Read + Cable loss + Atten loss + Antenna Gain + 10log(1/x)

(4)Repeated test at the lowest, the middle, and the highest frequency of the stated frequency range.

8.3.Test Results

U-NII-1 Band:

EUT: Room Booking Panel		
M/N: IAD-18010A		
Test date: 2020-12-16	Pressure: 102.5±1.0 kpa	Humidity: 53.1±3.0%
Tested by: Allen	Test site: RF site	Temperature:22.6±0.6 ℃

Test Mode	Frequency (MHz)	EIRP (dBm)	Limit (dBm)
11a	5180	16.01	22.17
	5200	15.80	
	5240	16.10	
11n HT20	5180	15.60	22.48
	5200	15.42	
	5240	15.83	
11n HT40	5190	15.62	23.01
	5230	15.64	
11ac VHT20	5180	15.49	22.47
	5200	15.40	
	5240	15.73	
11ac VHT40	5190	15.55	23.01
	5230	15.64	
11ac VHT80	5210	15.13	23.01
Conclusion: PASS			

Note: For 11a Mode
Limit=10dBm + 10 log B=22.17dBm
For 11n HT20 Mode
Limit=10dBm + 10 log B=22.48dBm
For 11ac VHT20 Mode
Limit=10dBm + 10 log B=22.47dBm
where B is the 99% emission bandwidth in megahertz.

For 11n HT40/11ac VHT40/ 11ac VHT80Mode
Limit= 23.01dBm

9. SPECTRAL DENSITY TEST

9.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.12,20	1 Year
2.	Attenuator	Agilent	8491B	MY39269201	Oct.12,20	1 Year
3.	RF Cable	EMCI	EMC102-KM-KM 3500	170702	Apr.12,20	1 Year

9.2.Limit

Band 5150-5250 MHz:
The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
Band 5725-5850 MHz:
The power spectral density shall not exceed 30 dBm in any 500 KHz band.

9.3.Test Procedure

For the Band 5.15-5.25GHz:
The transmitter output was connected to a spectrum analyzer. Power density was measured by spectrum analyzer with 1MHz RBW and 3MHz VBW; Detector: RMS mode.

For the band 5.725-5.85 GHz:
The transmitter output was connected to a spectrum analyzer. Power density was measured by spectrum analyzer with 1MHz RBW and 3MHz VBW,RMS Detector.
So use the test method described in KDB789033 clause E

1) Set the RBW=100kHz and VBW ≥3 RBW
2) Number of points in sweep ≥ 2 Span / RBW.(This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
3) Sweep time = auto
4) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
5) Use the “peak search” function of spectrum analyzer find the max value, then add 10log (500kHz/RBW) to the measured result.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

9.4.Test Results

U-NII-1 Band:

EUT: Room Booking Panel		
M/N: IAD-18010A		
Test date: 2020-12-16	Pressure: 102.5±1.0 kpa	Humidity: 53.1±3.0%
Tested by: Allen	Test site: RF site	Temperature:22.6±0.6 ℃

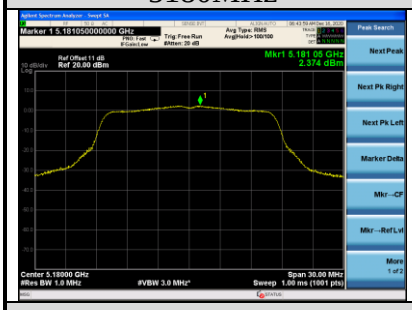
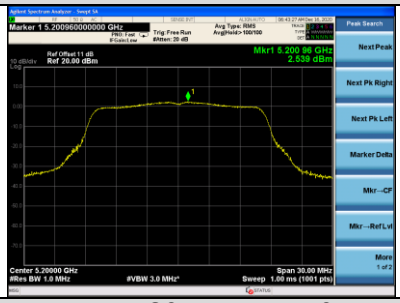
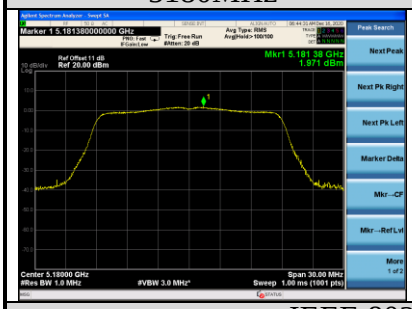
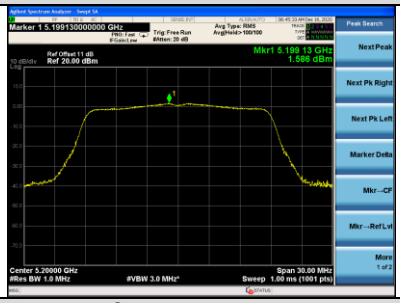
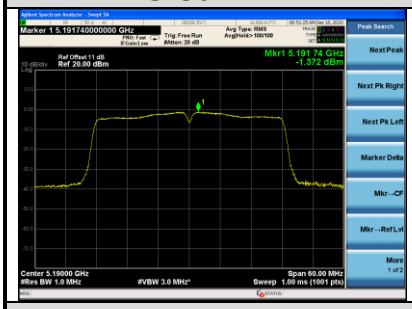
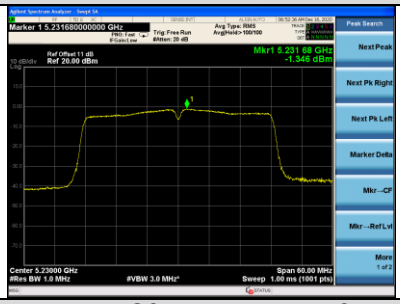
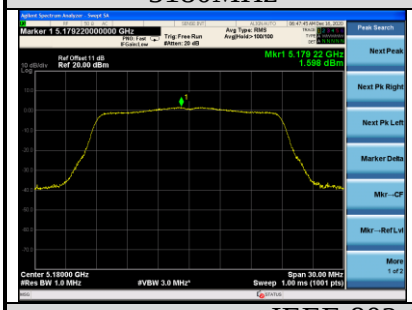
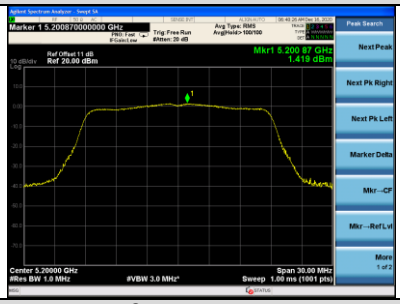
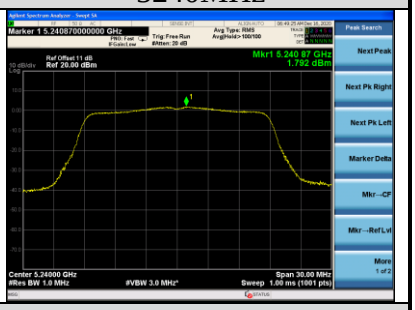
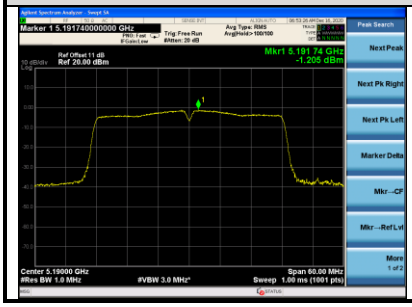
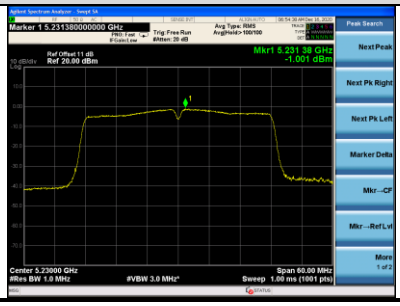
Test Mode	Frequency (MHz)	Power density (dBm/MHz)	Limit (dBm/MHz)
11a	5180	2.374	11
	5200	2.539	
	5240	2.533	
11n HT20	5180	1.971	11
	5200	1.586	
	5240	2.252	
11n HT40	5190	-1.372	11
	5230	-1.346	
11ac VHT20	5180	1.598	11
	5200	1.419	
	5240	1.792	
11ac VHT40	5190	-1.205	11
	5230	-1.001	
11ac VHT80	5210	-4.835	11
Conclusion: PASS			

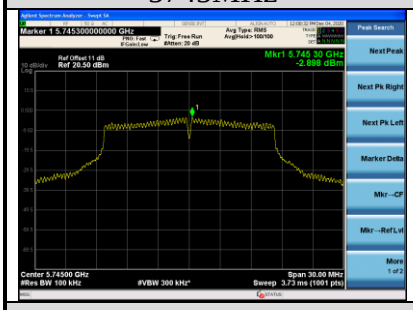
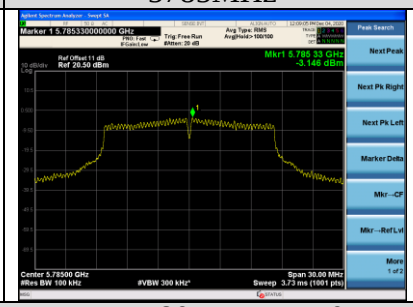
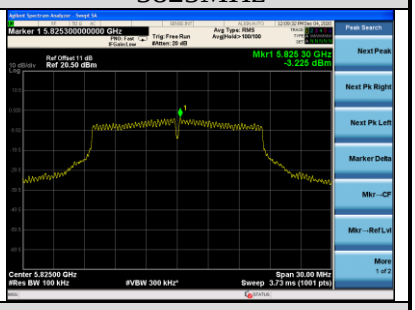
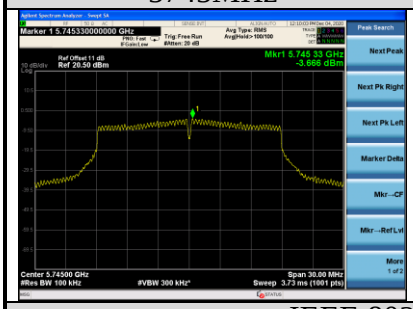
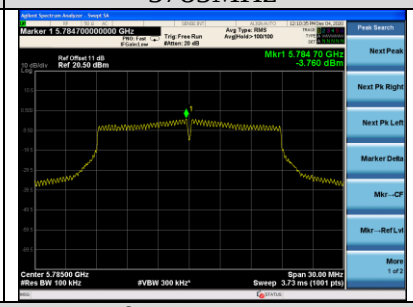
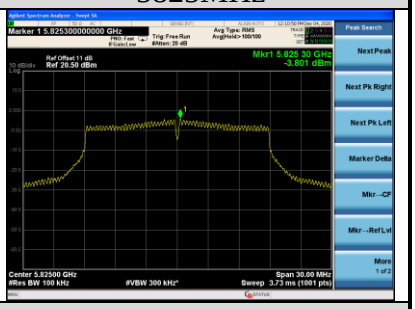
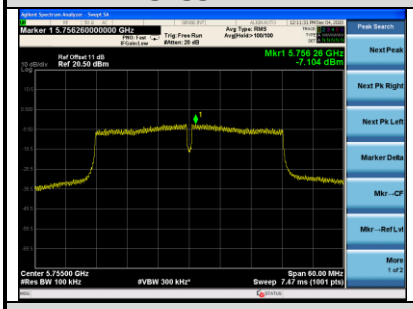
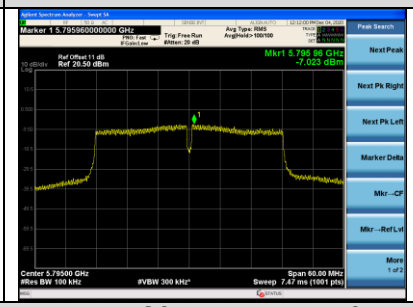
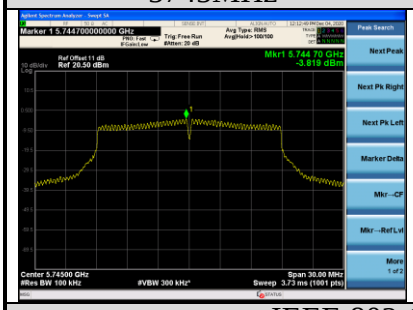
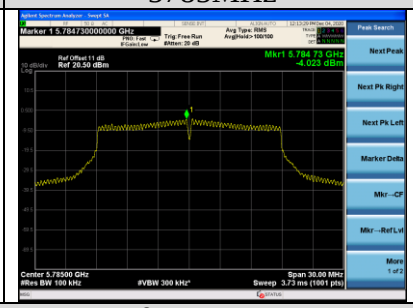
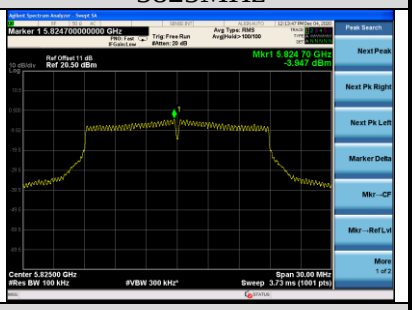
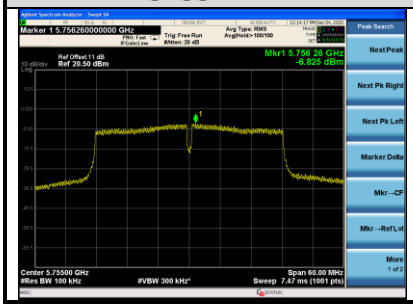
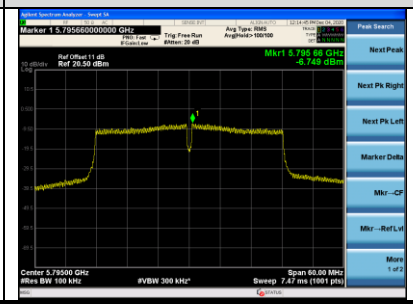
U-NII-3 Band:

EUT: Room Booking Panel		
M/N: IAD-18010A		
Test date: 2020-12-04	Pressure: 102.7±1.0 kpa	Humidity: 54.1±3.0%
Tested by: Allen	Test site: RF site	Temperature:23.4±0.6 ℃

Test Mode	Frequency (MHz)	Power density (dBm/500KHz)	Limit (dBm/500KHz)
11a	5745	4.092	30
	5785	3.844	
	5825	3.765	
11n HT20	5745	3.324	30
	5785	3.230	
	5825	3.189	
11n HT40	5755	-0.114	30
	5795	-0.033	
11ac VHT20	5745	3.171	30
	5785	2.967	
	5825	3.043	
11ac VHT40	5755	0.165	30
	5795	0.241	
11ac VHT80	5775	-2.949	30
Conclusion: PASS			

Note: The total result = Reading + 10 log(500kHz/100kHz)

U-NII-1 Band:		
IEEE 802.11a		
5180MHz	5200MHz	5240MHz
		
IEEE 802.11n HT20		
5180MHz	5200MHz	5240MHz
		
IEEE 802.11n HT40		---
5190MHz	5230MHz	---
		---
IEEE 802.11ac VHT20		
5180MHz	5200MHz	5240MHz
		
IEEE 802.11ac VHT40		IEEE 802.11ac VHT80
5190MHz	5230MHz	5210MHz
		

U-NII-3 Band:		
IEEE 802.11a		
5745MHz	5785MHz	5825MHz
		
IEEE 802.11n HT20		
5745MHz	5785MHz	5825MHz
		
IEEE 802.11n HT40		---
5755MHz	5795MHz	---
		---
IEEE 802.11ac VHT20		
5745MHz	5785MHz	5825MHz
		
IEEE 802.11ac VHT40		IEEE 802.11ac VHT80
5755MHz	5795MHz	5775MHz
		

10.FREQUENCY STABILITY MEASUREMENT

10.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
4.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Jun.30,19	1 Year
5.	Attenuator	Agilent	8491B	MY39269201	Oct.13,19	1 Year
6.	RF Cable	EMCI	EMC102-KM-KM 3500	170702	May.13,19	1 Year

10.2.Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

10.3.Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
   EUT have transmitted absence of modulation signal and fixed channelise. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings. fc is declaring of channel frequency. Then the frequency error formula is $(fc-f)/f \times 10^{-6}$ppm. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
2. Extreme temperature rule is 0 ℃~50 ℃.

10.4.Test Result

EUT: Room Booking Panel		
M/N: IAD-18010A		
Test date: 2020-12-19	Pressure: 102.7±1.0 kpa	Humidity: 52.5±3.0%
Tested by: Allen	Test site: RF site	Temperature:22.7±0.6 ℃

Frequency Stability vs.Voltage:

Test Voltage	Temperature	CH	Max. Reading (MHz)	Target Frequency (MHz)	Result (ppm)
DC 2.81V	20℃	CH36	5180.0150	5180	2.90
		CH38	5190.0130	5190	2.50
		CH40	5200.0145	5200	2.79
		CH42	5210.0125	5210	2.40
		CH46	5230.0125	5230	2.39
		CH48	5240.0145	5240	2.77
		CH149	5745.0155	5745	2.70
		CH151	5755.0135	5755	2.35
		CH155	5775.0130	5775	2.25
		CH157	5785.0150	5785	2.59
		CH159	5795.0130	5795	2.24
		CH165	5825.0145	5825	2.49
DC 3.3V	20℃	CH36	5179.994	5180	-1.16
		CH38	5189.993	5190	-1.35
		CH40	5199.992	5200	-1.54
		CH42	5209.996	5210	-0.77
		CH46	5229.962	5230	-7.27
		CH48	5239.992	5240	-1.53
		CH149	5744.992	5745	-1.39
		CH151	5754.996	5755	-0.70
		CH155	5774.993	5775	-1.21
		CH157	5784.996	5785	-0.69
		CH159	5794.991	5795	-1.55
		CH165	5824.991	5825	-1.55

DC 3.8V	20℃	CH36	5179.996	5180	-0.77
		CH38	5189.995	5190	-0.96
		CH40	5199.996	5200	-0.77
		CH42	5209.993	5210	-1.34
		CH46	5229.965	5230	-6.69
		CH48	5239.994	5240	-1.15
		CH149	5744.993	5745	-1.22
		CH151	5754.992	5755	-1.39
		CH155	5774.993	5775	-1.21
		CH157	5784.992	5785	-1.38
		CH159	5794.996	5795	-0.69
		CH165	5824.993	5825	-1.20

Frequency Stability vs.Temperature:

Test Voltage	Temperature	CH	Max. Reading (MHz)	Target Frequency (MHz)	Result (ppm)
DC 3.3V	0℃	CH36	5179.984	5180	-3.09
		CH38	5189.956	5190	-8.48
		CH40	5199.935	5200	-12.50
		CH42	5209.927	5210	-14.01
		CH46	5229.927	5230	-13.96
		CH48	5239.939	5240	-11.64
		CH149	5744.969	5745	-5.40
		CH151	5754.969	5755	-5.39
		CH155	5774.963	5775	-6.41
		CH157	5784.963	5785	-6.40
		CH159	5794.996	5795	-0.69
		CH165	5824.994	5825	-1.03
DC 3.3V	10℃	CH36	5179.989	5180	-2.12
		CH38	5189.989	5190	-2.12
		CH40	5199.996	5200	-0.77
		CH42	5209.987	5210	-2.50
		CH46	5229.987	5230	-2.49
		CH48	5239.985	5240	-2.86
		CH149	5744.991	5745	-1.57
		CH151	5754.991	5755	-1.56
		CH155	5774.993	5775	-1.21
		CH157	5784.998	5785	-0.35
		CH159	5794.992	5795	-1.38
		CH165	5824.992	5825	-1.37

DC 3.3V	20℃	CH36	5179.993	5180	-1.35
		CH38	5189.992	5190	-1.54
		CH40	5199.992	5200	-1.54
		CH42	5209.993	5210	-1.34
		CH46	5229.961	5230	-7.46
		CH48	5239.998	5240	-0.38
		CH149	5744.995	5745	-0.87
		CH151	5754.996	5755	-0.70
		CH155	5774.991	5775	-1.56
		CH157	5784.996	5785	-0.69
		CH159	5794.994	5795	-1.04
		CH165	5824.994	5825	-1.03
DC 3.3V	30℃	CH36	5179.996	5180	-0.77
		CH38	5189.992	5190	-1.54
		CH40	5199.996	5200	-0.77
		CH42	5209.994	5210	-1.15
		CH46	5229.965	5230	-6.69
		CH48	5239.991	5240	-1.72
		CH149	5744.996	5745	-0.70
		CH151	5754.997	5755	-0.52
		CH155	5774.996	5775	-0.69
		CH157	5784.992	5785	-1.38
		CH159	5794.994	5795	-1.04
		CH165	5824.996	5825	-0.69
DC 3.3V	40℃	CH36	5179.993	5180	-1.35
		CH38	5189.992	5190	-1.54
		CH40	5199.996	5200	-0.77
		CH42	5209.992	5210	-1.54
		CH46	5229.995	5230	-0.96
		CH48	5239.996	5240	-0.76
		CH149	5744.995	5745	-0.87
		CH151	5754.997	5755	-0.52
		CH155	5774.996	5775	-0.69
		CH157	5784.994	5785	-1.04
		CH159	5794.996	5795	-0.69
		CH165	5824.994	5825	-1.03

DC 3.3V	50℃	CH36	5179.997	5180	-0.58
		CH38	5189.996	5190	-0.77
		CH40	5199.994	5200	-1.15
		CH42	5209.992	5210	-1.54
		CH46	5229.995	5230	-0.96
		CH48	5239.992	5240	-1.53
		CH149	5744.999	5745	-0.17
		CH151	5754.993	5755	-1.22
		CH155	5774.994	5775	-1.04
		CH157	5784.992	5785	-1.38
		CH159	5794.993	5795	-1.21
		CH165	5824.994	5825	-1.03
DC 3.3V	60℃	CH36	5179.998	5180	-0.39
		CH38	5189.994	5190	-1.16
		CH40	5199.996	5200	-0.77
		CH42	5209.993	5210	-1.34
		CH46	5229.994	5230	-1.15
		CH48	5239.994	5240	-1.15
		CH149	5744.995	5745	-0.87
		CH151	5754.995	5755	-0.87
		CH155	5774.993	5775	-1.21
		CH157	5784.992	5785	-1.38
		CH159	5794.994	5795	-1.04
		CH165	5824.995	5825	-0.86

11. ANTENNA REQUIREMENT

11.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.407 (a), if 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 6dBi.

11.2. Antenna Connected Construction

The antennas used for this product are FPC antenna that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is **U-NII-1 Band:** 3.5dBi; **U-NII-3 Band:** 5.1dBi.

12. DEVIATION TO TEST SPECIFICATIONS

[NONE]

THE END