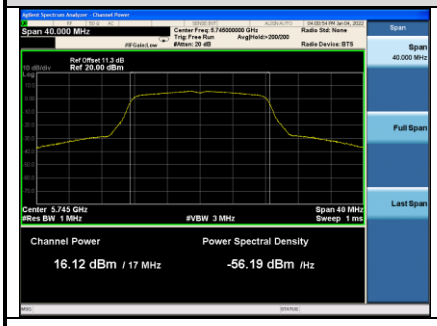
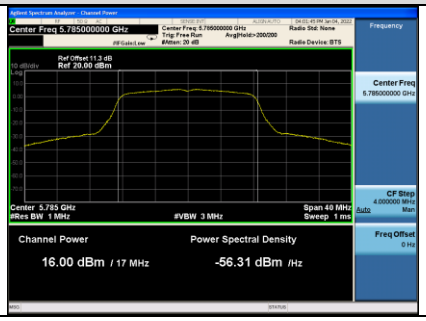
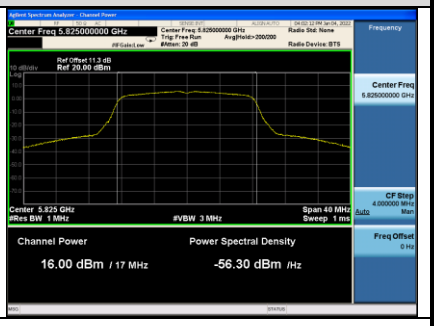
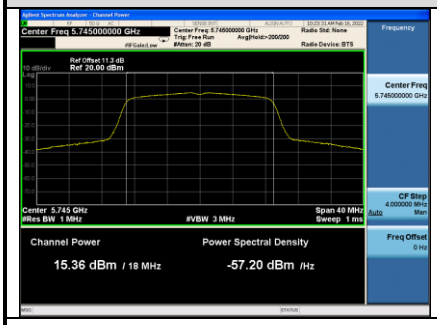
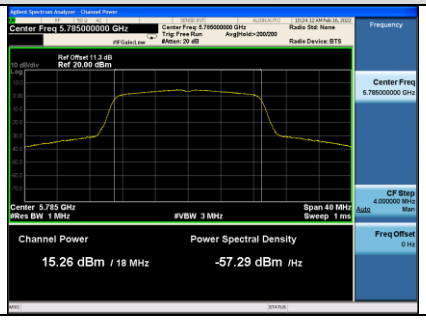
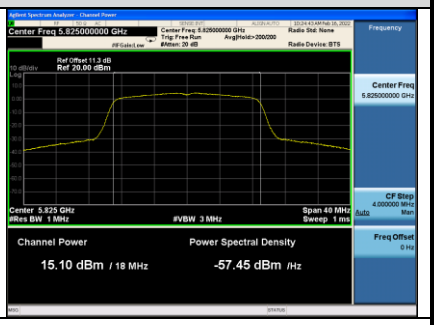
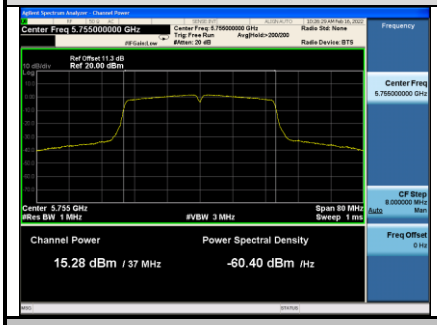
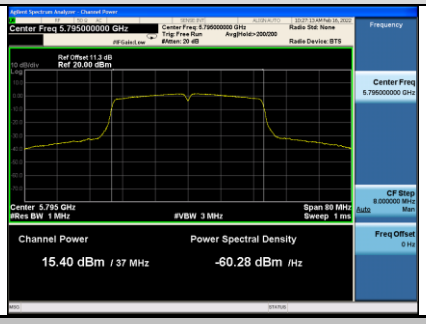
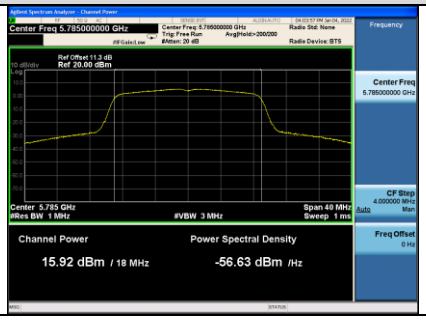
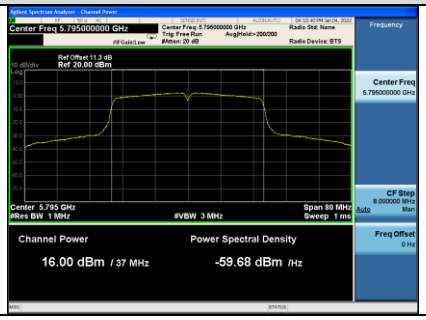
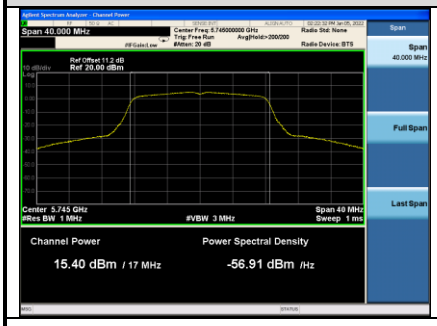
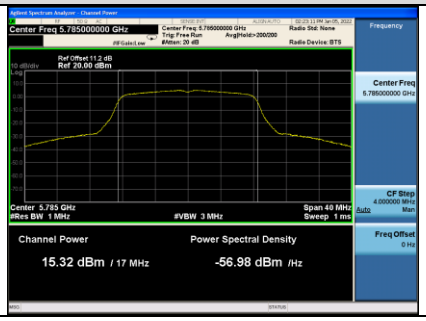
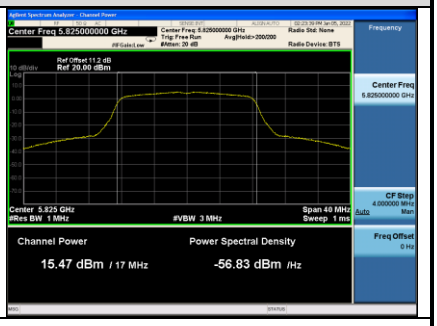
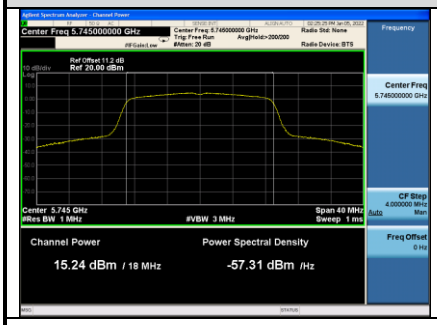
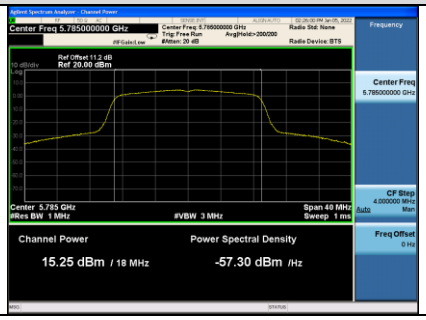
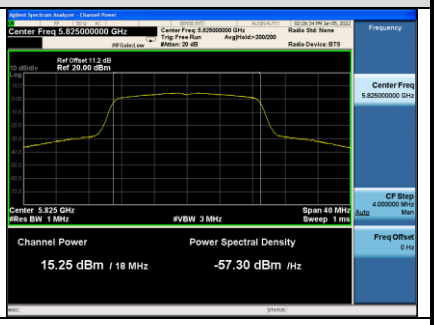
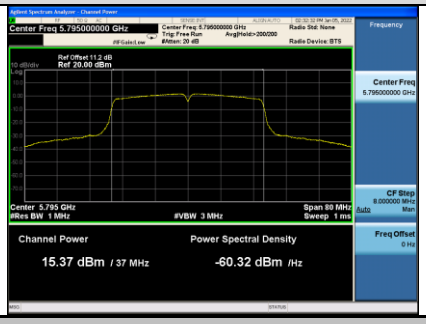
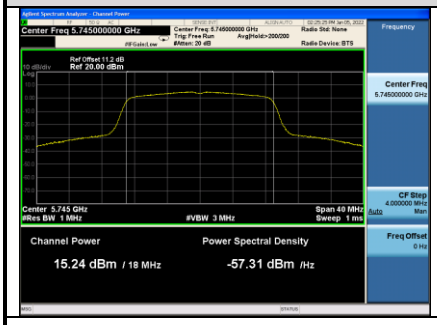
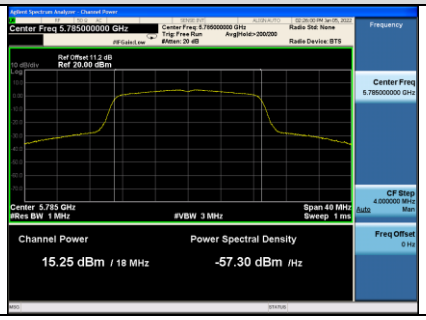
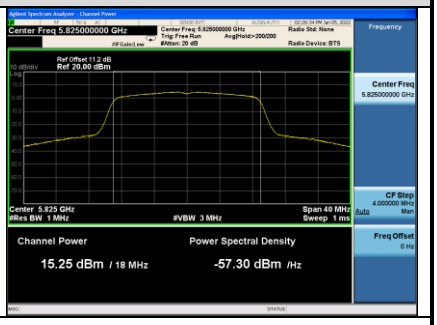
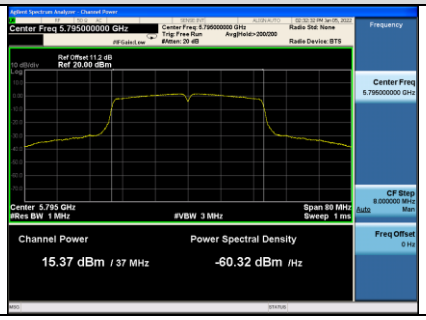
U-NII-3 Band: ANTB		
SISO		
IEEE 802.11a		
		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		---
		---
MIMO		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		---
		---

U-NII-3 Band: ANTA		
SISO		
IEEE 802.11a		
		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		---
		---
MIMO		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		---
		---

8. EQUIVALENT ISOTROPIC RADIATED POWER TEST

8.1. 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.

8.2.Test Results

U-NII-1 Band:

EUT: WiFi module		
M/N: U9W35		
Test date: 2022-01-04~02-16	Pressure: 102.2 ±1.0 kpa	Humidity: 53.5 ±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 25.7 ±0.6 ℃

SISO:

Test Mode	Frequency (MHz)	Output Power (dBm)		EIRP (dBm)		Limit (mW)
		ANTB	ANTA	ANTB	ANTA	
11a	5180	15.48	14.28	10.81	15.70	500
	5200	15.32	14.37	10.65	15.79	
	5240	15.71	14.87	11.04	16.29	
11n HT20	5180	15.35	14.85	10.68	16.27	500
	5200	15.14	14.73	10.47	16.15	
	5240	15.50	15.12	10.83	16.54	
11n HT40	5190	15.32	15.00	10.65	16.42	500
	5230	15.46	15.26	10.79	16.68	
Conclusion：PASS						

MIMO:

Test Mode	Frequency (MHz)	Output Power (dBm)			Directional Gain (dBi)	EIRP (dBm)	Limit (mW)
		ANTB	ANTA	Total			
11n HT20	5180	15.35	13.63	17.58	1.91	19.49	500
	5200	15.14	13.23	17.30	1.91	19.21	
	5240	15.50	13.78	17.73	1.91	19.64	
11n HT40	5190	15.32	13.36	17.46	1.91	19.37	500
	5230	15.46	13.71	17.68	1.91	19.59	
Conclusion：PASS							

Note: Directional Gain= 10 log$[(10^{1.42/20}+10^{-4.67/20})^2/2]$dBi=1.91dBi＜6dBi.

U-NII-2A Band:

EUT: WiFi module		
M/N: U9W35		
Test date: 2022-01-04~02-16	Pressure: 102.2 ±1.0 kpa	Humidity: 53.5 ±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 25.7 ±0.6 ℃

SISO:

Test Mode	Frequency (MHz)	Output Power (dBm)		EIRP (dBm)		Limit (mW)
		ANTB	ANTA	ANTB	ANTA	
11a	5260	15.82	14.93	15.66	10.59	500
	5300	15.85	14.97	15.69	10.63	
	5320	15.96	14.85	15.80	10.51	
11n HT20	5260	15.21	14.77	15.05	10.43	500
	5300	15.24	14.85	15.08	10.51	
	5320	15.33	14.85	15.17	10.51	
11n HT40	5270	15.26	14.87	15.10	10.53	500
	5310	15.26	14.88	15.10	10.54	
Conclusion：PASS						

MIMO:

Test Mode	Frequency (MHz)	Output Power (dBm)			Directional Gain (dBi)	EIRP (dBm)	Limit (mW)
		ANTB	ANTA	Total			
11n HT20	5260	15.55	13.91	17.82	1.01	18.83	500
	5300	15.74	13.83	17.90	1.01	18.91	
	5320	15.85	14.11	18.08	1.01	19.09	
11n HT40	5270	15.61	14.00	17.89	1.01	18.90	500
	5310	15.70	13.91	17.91	1.01	18.92	
Conclusion：PASS							

Note: 1. Directional Gain= 10 log$[(10^{-4.34/20}+10^{-0.16/20})^2/2]$dBi= 1.01dBi < 6dBi.

U-NII-2C Band:

EUT: WiFi module		
M/N: U9W35		
Test date: 2022-01-04~02-16	Pressure: 102.2 ±1.0 kpa	Humidity: 53.5 ±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 25.7 ±0.6 ℃

SISO:

Test Mode	Frequency (MHz)	Output Power (dBm)		EIRP (dBm)		Limit (mW)
		ANTB	ANTA	ANTB	ANTA	
11a	5500	15.96	14.50	16.05	10.47	500
	5580	15.65	14.38	15.74	10.35	
	5700	15.93	14.56	16.02	10.53	
11n HT20	5500	15.35	14.84	15.44	10.81	500
	5580	15.36	14.63	15.45	10.60	
	5700	15.07	14.92	15.16	10.89	
11n HT40	5510	15.12	14.67	15.21	10.64	500
	5550	15.41	14.71	15.50	10.68	
	5670	14.99	14.83	15.08	10.80	
Conclusion：PASS						

MIMO:

Test Mode	Frequency (MHz)	Output Power (dBm)			Directional Gain (dBi)	EIRP (dBm)	Limit (mW)
		ANTB	ANTA	Total			
11n HT20	5500	15.78	14.40	18.15	1.28	19.43	500
	5580	15.44	14.25	17.90	1.28	19.18	
	5700	15.77	14.34	18.12	1.28	19.40	
11n HT40	5510	15.59	14.07	17.91	1.28	19.19	500
	5550	15.75	14.25	18.07	1.28	19.35	
	5670	15.62	14.17	17.97	1.28	19.25	
Conclusion：PASS							

Note: 1. Directional Gain= 10 log$[(10^{-4.03/20}+10^{0.09/20})^2/2]$dBi= 1.28dBi＜6dBi.

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.07,21	1 Year
2.	Attenuator	Agilent	8491B	MY39269201	Oct.09,21	1 Year
3.	RF Cable	HUBER+SUHNER	SUCOFLEX-106	505238/6	Apr.07,21	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 5250-5350 MHz:
The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
Band 5470-5725 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

Use the test method described in ANSI C63.10 clause 12.5:
For the Band 5.15-5.35GHz; 5.47-5.725 GHz:
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 =300kHz
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: WiFi module		
M/N: U9W35		
Test date: 2022-01-04~05	Pressure: 102.2 ±1.0 kpa	Humidity: 53.5 ±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 25.7 ±0.6 ℃

Test Mode	Frequency (MHz)	Power density (dBm/MHz)			Limit (dBm/MHz)
		ANTB	ANTA	Total	
11a	5180	5.012	3.957	N/A	11
	5200	4.936	4.057	N/A	
	5240	5.118	4.471	N/A	
11n HT20	5180	4.762	3.181	7.053	11
	5200	4.138	2.815	6.537	
	5240	5.151	3.133	7.268	
11n HT40	5190	1.341	-0.290	3.612	11
	5230	2.255	0.216	4.364	
Conclusion: PASS					

Note: Directional Gain= 10 log[$(10^{1.42/20}+10^{-4.67/20})^2$/2]dBi= 1.91dBi＜6dBi.

U-NII-2A Band:

EUT: WiFi module		
M/N: U9W35		
Test date: 2022-01-04~05	Pressure: 102.2 ±1.0 kpa	Humidity: 53.5 ±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 25.7 ±0.6 ℃

Test Mode	Frequency (MHz)	Power density (dBm/MHz)			Limit (dBm/MHz)
		ANTB	ANTA	Total	
11a	5260	5.350	4.178	N/A	11
	5300	5.489	4.644	N/A	
	5320	5.620	4.557	N/A	
11n HT20	5260	5.400	3.458	7.547	11
	5300	5.274	3.565	7.513	
	5320	5.223	3.736	7.553	
11n HT40	5270	2.688	0.806	4.858	11
	5310	2.261	0.483	4.473	
Conclusion: PASS					

Note: Directional Gain= 10 log[$(10^{-4.34/20}+10^{-0.16/20})^2/2$]dBi= 1.01dBi＜6dBi.

U-NII-2C Band:

EUT: WiFi module		
M/N: U9W35		
Test date: 2022-01-04~05	Pressure: 102.2 ±1.0 kpa	Humidity: 53.5 ±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 25.7 ±0.6 ℃

Test Mode	Frequency (MHz)	Power density (dBm/MHz)			Limit (dBm/MHz)
		ANTB	ANTA	Total	
11a	5500	5.625	4.206	N/A	11
	5600	5.647	3.991	N/A	
	5700	5.479	4.443	N/A	
11n HT20	5500	5.359	4.163	7.812	11
	5600	5.418	3.553	7.595	
	5700	5.312	4.135	7.774	
11n HT40	5510	2.411	0.734	4.663	11
	5590	2.253	0.764	4.582	
	5670	2.070	0.785	4.485	
Conclusion: PASS					

Note: Directional Gain= 10 log[$(10^{-4.03/20}+10^{0.09/20})^2/2$]dBi= 1.28dBi＜6dBi.

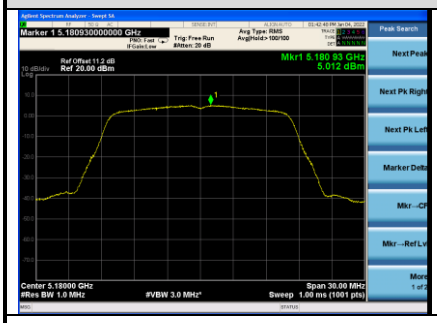
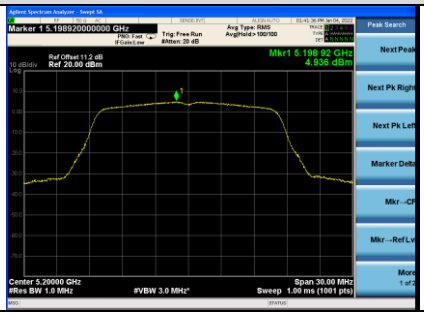
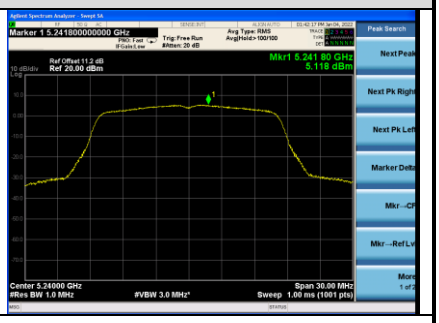
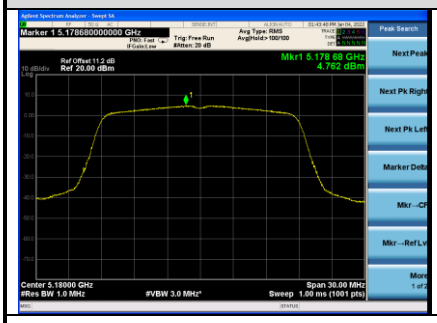
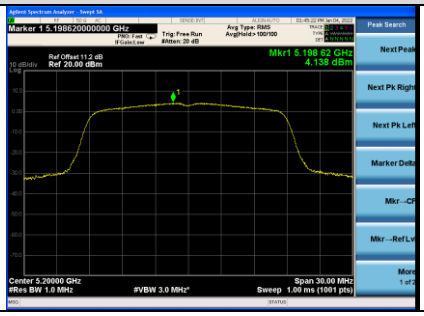
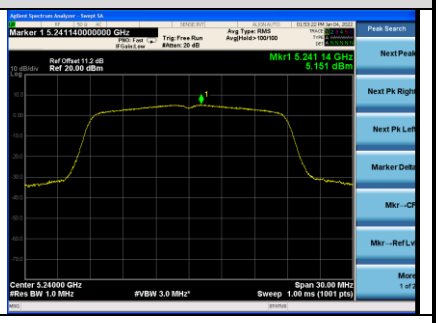
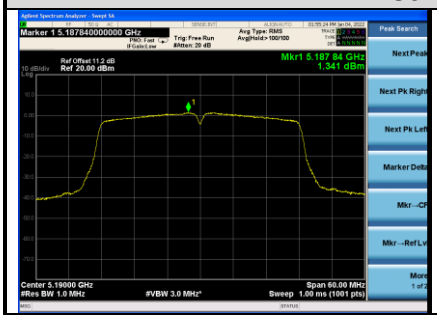
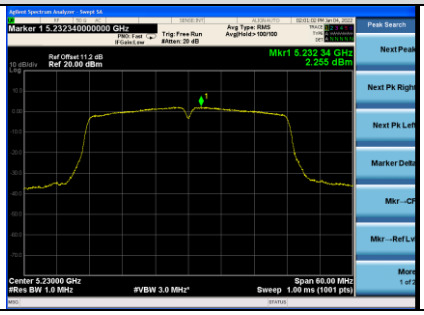
U-NII-3 Band:

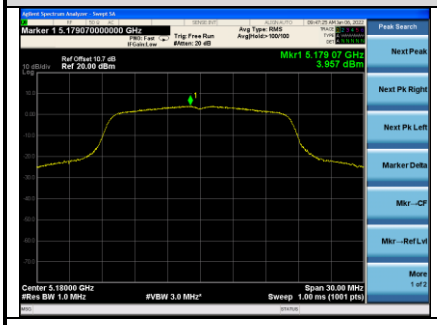
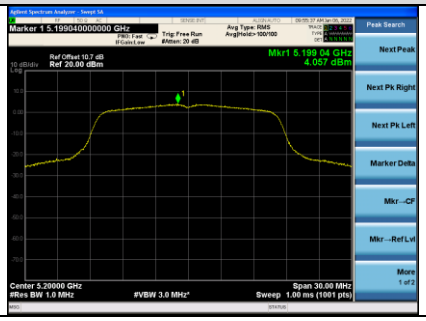
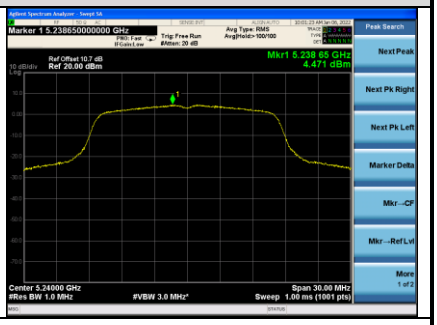
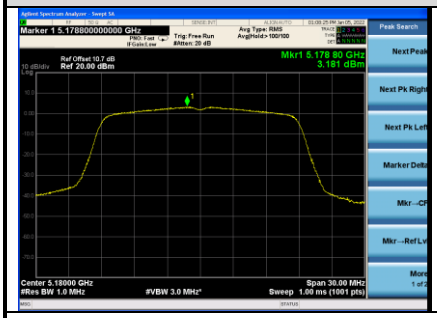
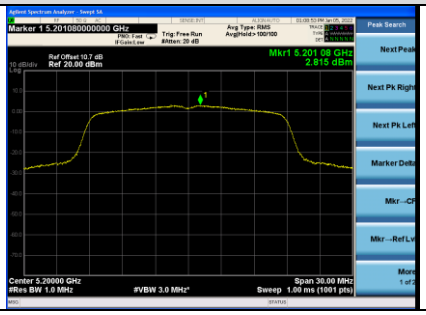
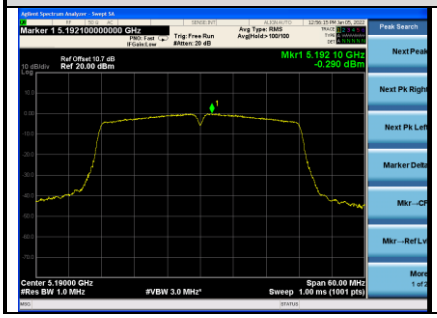
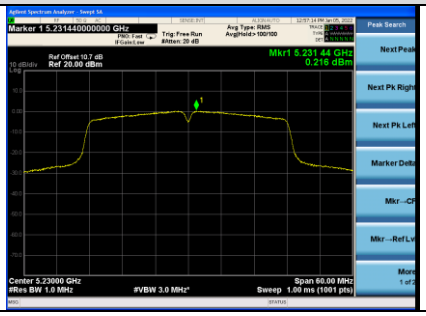
EUT: WiFi module		
M/N: U9W35		
Test date: 2022-01-04~05	Pressure: 102.2±1.0 kpa	Humidity: 53.5±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 25.7±0.6 ℃

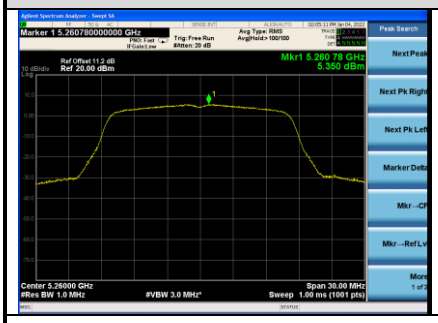
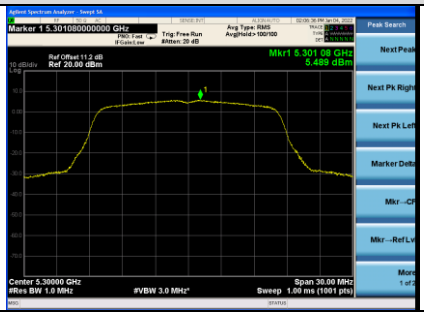
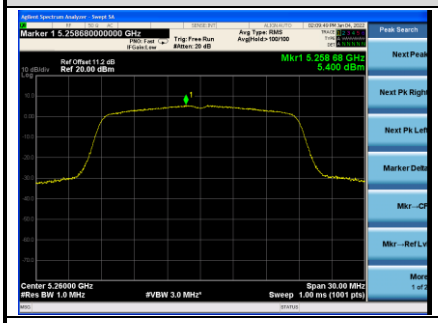
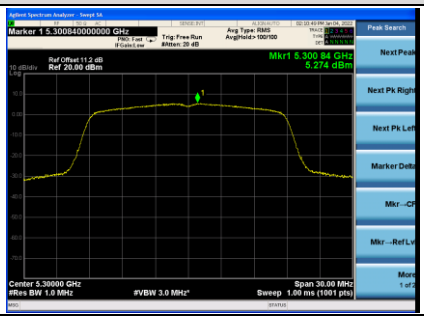
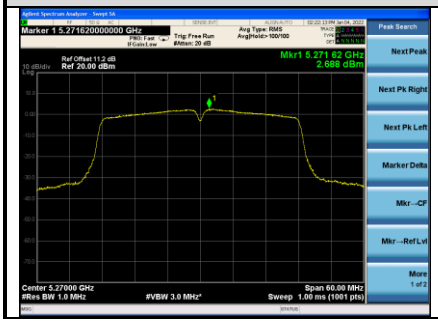
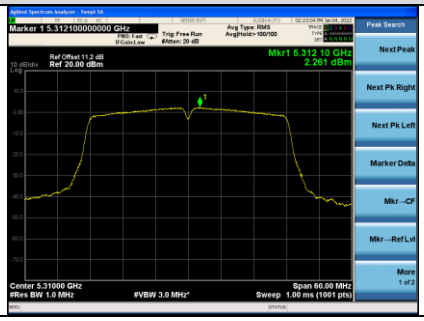
Test Mode	Frequency (MHz)	Power density (dBm/500KHz)			Limit (dBm/500KHz)
		ANTB	ANTA	Total	
11a	5745	4.204	3.205	N/A	30
	5785	3.994	3.337	N/A	
	5825	4.341	3.190	N/A	
11n HT20	5745	3.812	3.067	6.465	30
	5785	4.050	3.014	6.573	
	5825	3.724	2.941	6.360	
11n HT40	5755	0.547	0.207	3.390	30
	5795	0.637	0.281	3.473	
Conclusion: PASS					

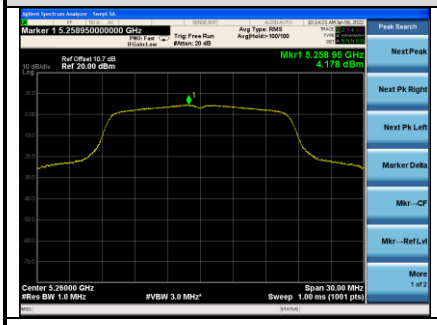
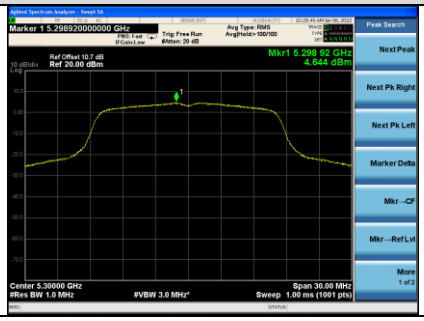
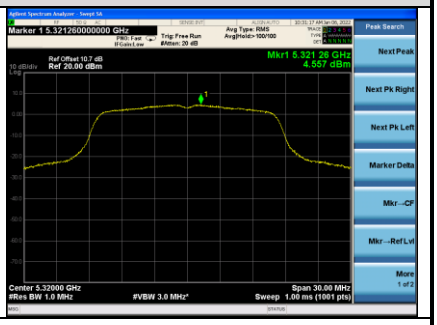
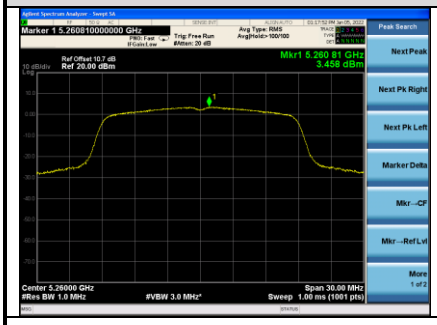
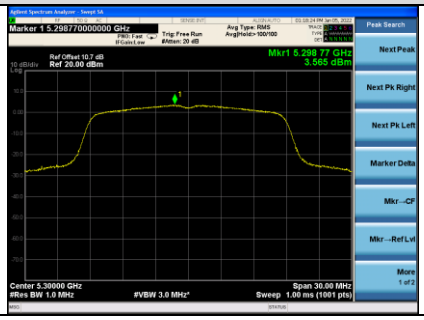
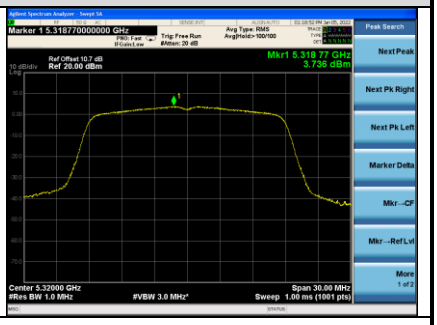
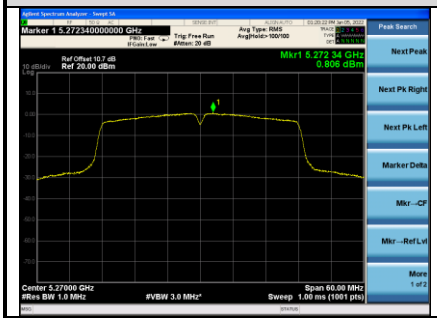
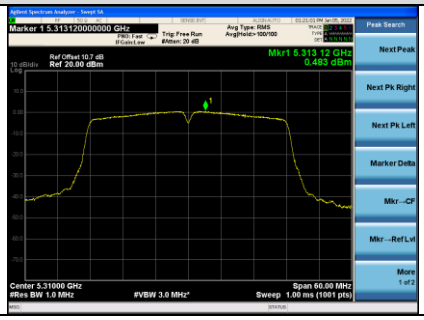
Notes: 1. Directional Gain= 10 log[$(10^{0.98/20}+10^{-4.36/20})^2/2$]dBi=1.72dBi＜6dBi.

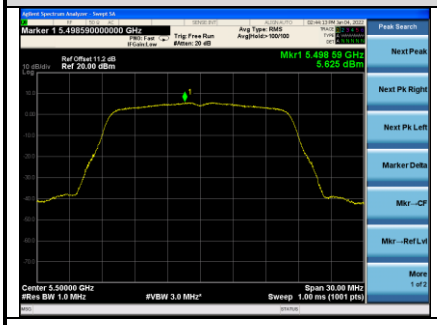
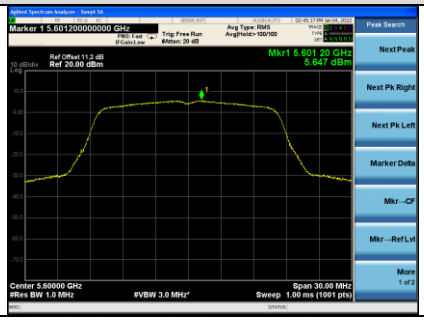
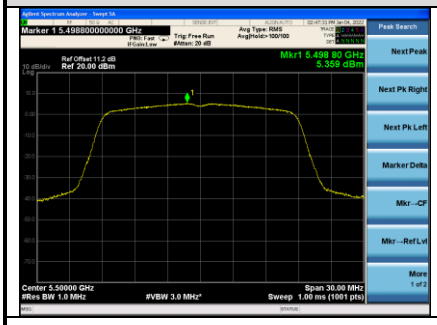
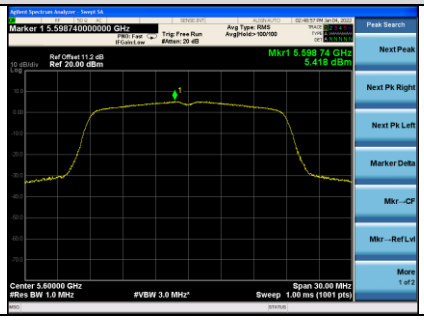
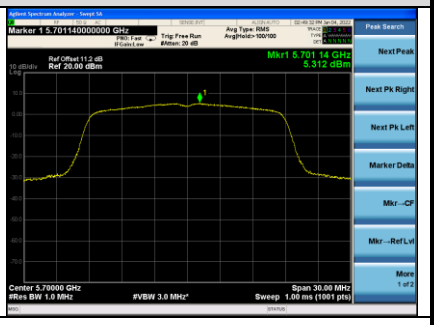
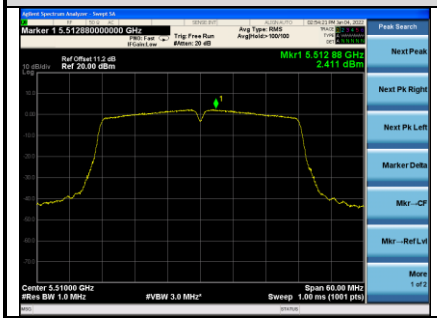
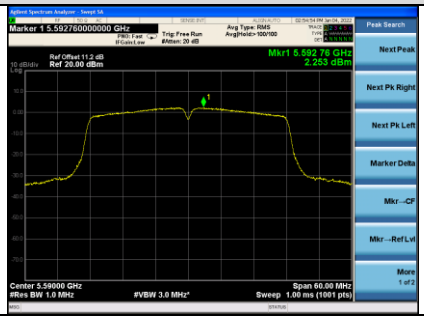
2. The total result = Reading + 10log(500kHz/100kHz)

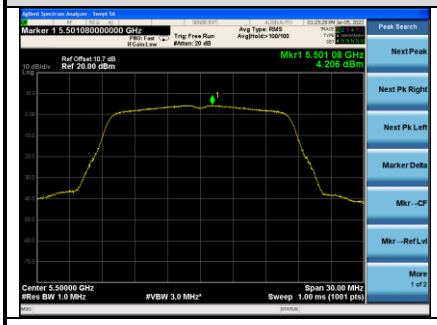
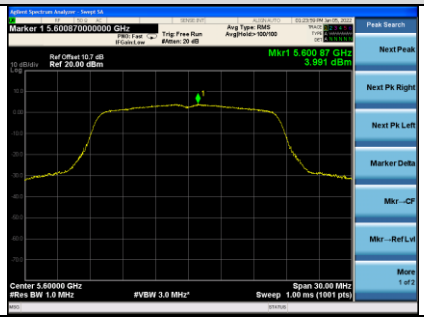
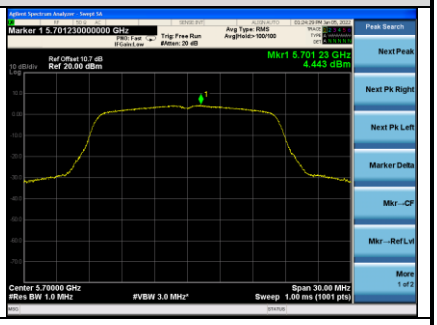
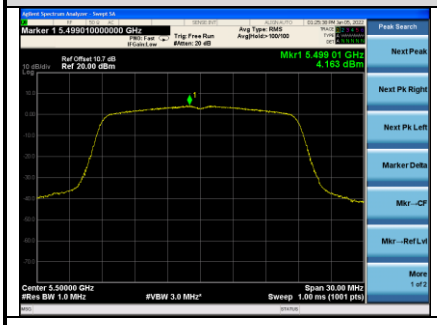
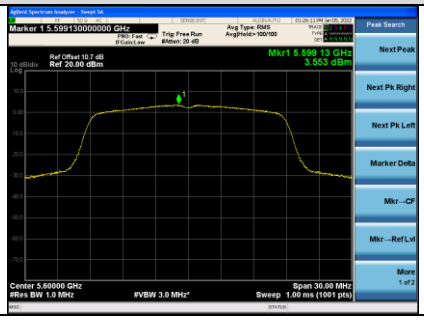
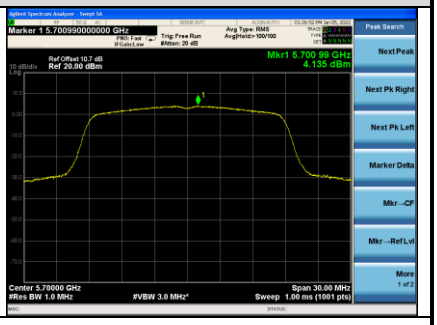
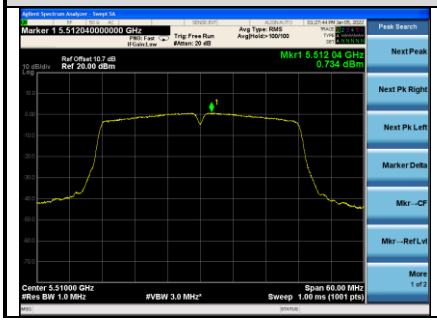
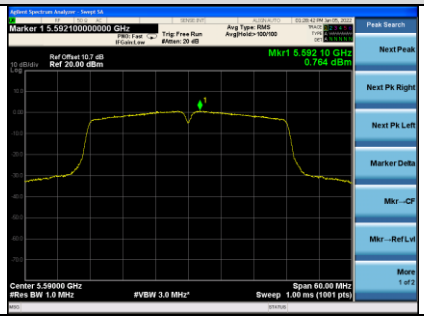
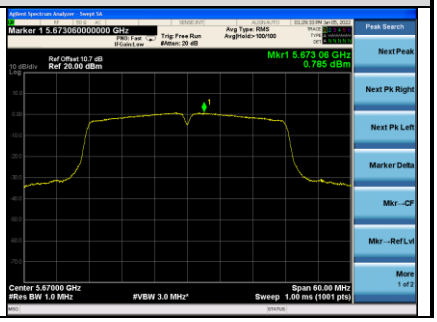
U-NII-1 Band: ANTB		
IEEE 802.11a		
		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		---
		---

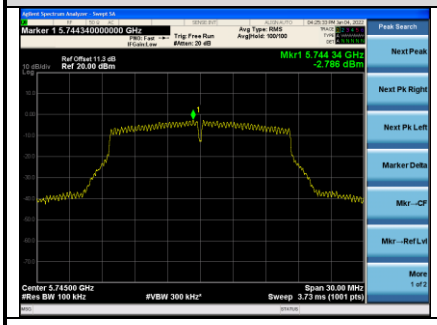
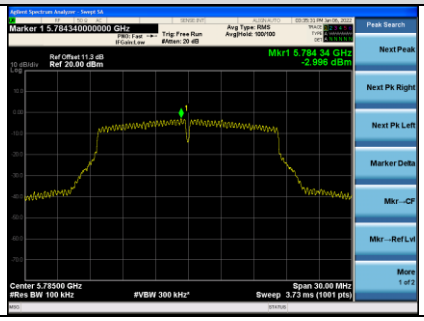
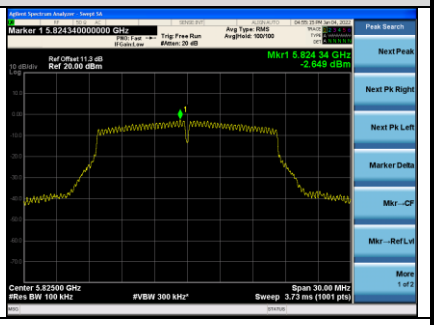
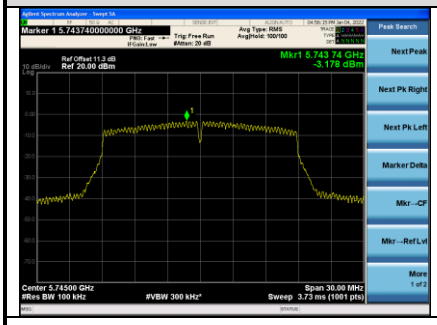
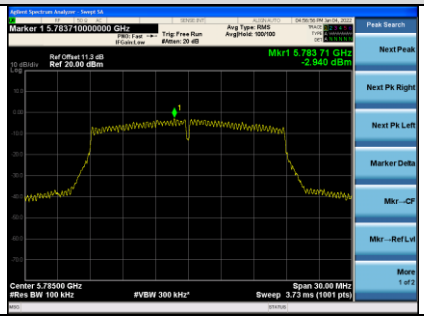
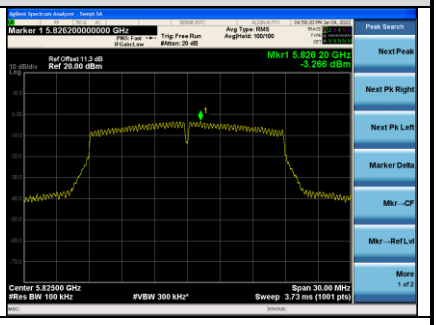
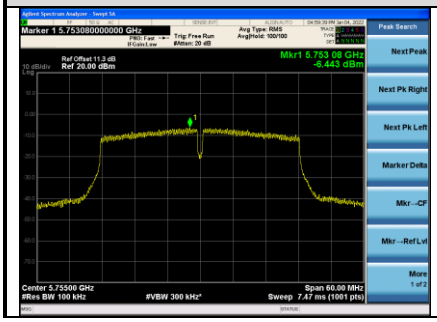
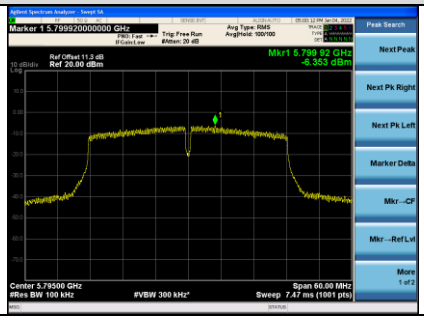
U-NII-1 Band: ANTA		
IEEE 802.11a		
		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		---
		---

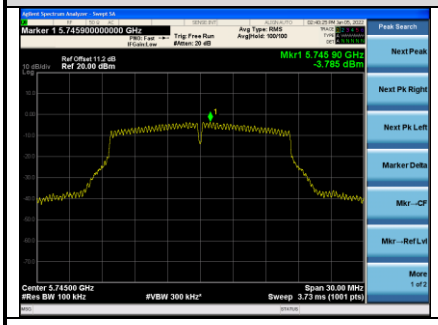
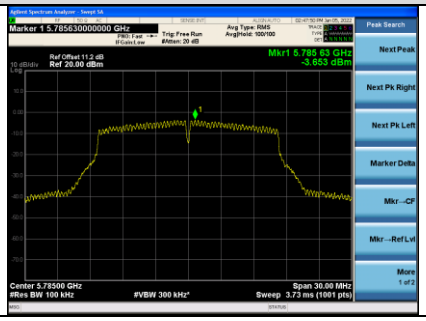
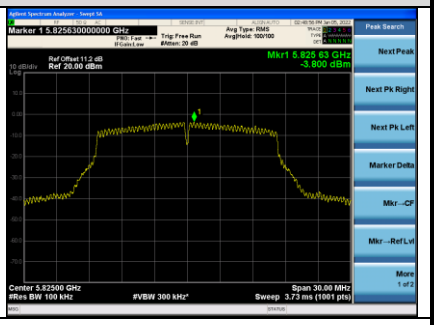
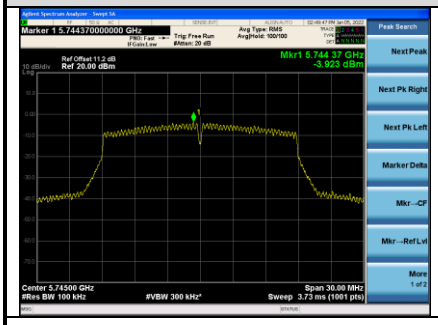
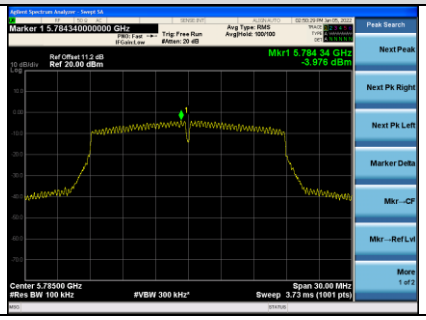
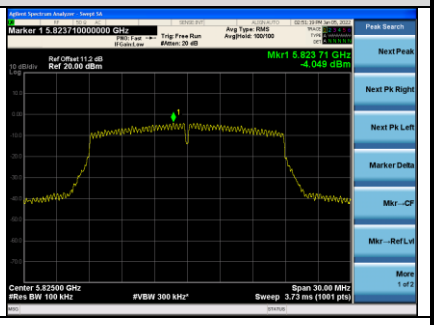
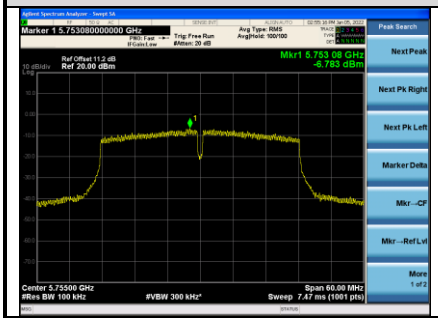
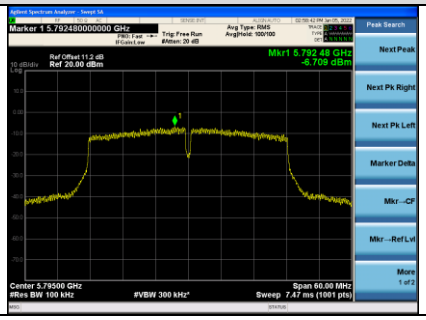
U-NII-2A Band: ANTB		
IEEE 802.11a		
		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		---
		---

U-NII-2A Band: ANTA		
IEEE 802.11a		
		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		---
		---

U-NII-2C Band: ANTB		
IEEE 802.11a		
		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		
		

U-NII-2C Band: ANTA		
IEEE 802.11a		
		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		
		

U-NII-3 Band: ANTB		
IEEE 802.11a		
		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		---
		---

U-NII-3 Band: ANTA		
IEEE 802.11a		
		
IEEE 802.11n HT20		
		
IEEE 802.11n HT40		---
		---

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	Apr.07,21	1 Year
5.	Attenuator	Agilent	8491B	MY39269201	Oct.09,21	1 Year
6.	RF Cable	HUBER+SUHNER	SUCOFLEX-106	505238/6	Apr.07,21	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

Use the test method described in ANSI C63.10 clause 6.8:

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 is 0 ℃~60 ℃.

10.4.Test Result

EUT: WiFi module		
M/N: U9W35		
Test date: 2022-01-04	Pressure: 102.2 ±1.0 kpa	Humidity: 53.5 ±3.0%
Tested by: Lynn	Test site: RF site	Temperature:25.7 ±0.6 ℃

Frequency Stability vs.Voltage:

Test Voltage	Temperature	CH	Reading (MHz)	Target Frequency (MHz)	Result (ppm)
DC 4.25V	25℃	CH36	5179.97	5180	-4.92
		CH40	5199.98	5200	-2.30
		CH48	5239.97	5240	-4.96
		CH52	5259.97	5260	-5.13
		CH60	5299.97	5300	-5.28
		CH64	5319.97	5320	-5.63
		CH100	5499.97	5500	-5.18
		CH120	5599.96	5600	-6.51
		CH140	5699.96	5700	-6.40
		CH149	5744.95	5745	-8.44
		CH157	5784.95	5785	-8.47
		CH165	5824.95	5825	-8.32
DC 5V	25℃	CH36	5179.97	5180	-4.53
		CH40	5199.97	5200	-3.94
		CH48	5239.98	5240	-3.62
		CH52	5259.97	5260	-4.18
		CH60	5299.97	5300	-5.18
		CH64	5319.97	5320	-4.51
		CH100	5499.97	5500	-5
		CH120	5599.96	5600	-5.89
		CH140	5699.96	5700	-6.75
		CH149	5744.96	5745	-6.09
		CH157	5784.95	5785	-7.34
		CH165	5824.96	5825	-6.69

DC 5.75V	25℃	CH36	5179.97	5180	-5.50
		CH40	5199.98	5200	-3.36
		CH48	5239.98	5240	-3.72
		CH52	5259.98	5260	-3.42
		CH60	5299.97	5300	-5.37
		CH64	5319.97	5320	-5.16
		CH100	5499.98	5500	-3.09
		CH120	5599.96	5600	-6.69
		CH140	5699.96	5700	-6.22
		CH149	5744.95	5745	-8.18
		CH157	5784.95	5785	-7.86
		CH165	5824.96	5825	-6.18

Frequency Stability vs. Temperature:

Test Voltage	Temperature	CH	Reading (MHz)	Target Frequency (MHz)	Result (ppm)
DC 5V	0℃	CH36	5179.95	5180	-8.39
		CH40	5199.97	5200	-4.61
		CH48	5239.97	5240	-4.86
		CH52	5259.98	5260	-3.23
		CH60	5299.97	5300	-3.86
		CH64	5319.98	5320	-3.57
		CH100	5499.97	5500	-5
		CH120	5599.96	5600	-6.42
		CH140	5699.96	5700	-6.14
		CH149	5744.96	5745	-6.52
		CH157	5784.97	5785	-5.18
		CH165	5824.97	5825	-4.54
DC 5V	10℃	CH36	5179.98	5180	-3.76
		CH40	5199.98	5200	-2.59
		CH48	5239.97	5240	-5.15
		CH52	5259.97	5260	-5.32
		CH60	5299.97	5300	-4.52
		CH64	5319.97	5320	-4.04
		CH100	5499.97	5500	-5.09
		CH120	5599.96	5600	-5.80
		CH140	5699.97	5700	-4.91
		CH149	5744.97	5745	-4.26
		CH157	5784.95	5785	-7.26
		CH165	5824.95	5825	-7.29
DC 5V	20℃	CH36	5179.96	5180	-6.66
		CH40	5199.98	5200	-2.40
		CH48	5239.97	5240	-4.19
		CH52	5259.97	5260	-5.41
		CH60	5299.98	5300	-2.92
		CH64	5319.99	5320	-1.87
		CH100	5499.97	5500	-5
		CH120	5599.96	5600	-6.96
		CH140	5699.96	5700	-6.57
		CH149	5744.95	5745	-8.18
		CH157	5784.95	5785	-8.55
		CH165	5824.95	5825	-7.55

DC 5V	30℃	CH36	5179.97	5180	-5.30
		CH40	5199.98	5200	-3.26
		CH48	5239.97	5240	-4.86
		CH52	5259.97	5260	-4.46
		CH60	5299.97	5300	-5.47
		CH64	5319.97	5320	-4.41
		CH100	5499.97	5500	-4.90
		CH120	5599.96	5600	-5.89
		CH140	5699.96	5700	-6.75
		CH149	5744.95	5745	-7.39
		CH157	5784.95	5785	-7.95
		CH165	5824.95	5825	-7.21
DC 5V	40℃	CH36	5179.97	5180	-5.59
		CH40	5199.98	5200	-2.40
		CH48	5239.97	5240	-5.15
		CH52	5259.97	5260	-5.22
		CH60	5299.97	5300	-4.15
		CH64	5319.97	5320	-4.60
		CH100	5499.97	5500	-4.18
		CH120	5599.96	5600	-5.62
		CH140	5699.95	5700	-8.15
		CH149	5744.95	5745	-7.39
		CH157	5784.95	5785	-7.86
		CH165	5824.95	5825	-7.55
DC 5V	50℃	CH36	5179.97	5180	-4.72
		CH40	5199.97	5200	-4.32
		CH48	5239.98	5240	-3.72
		CH52	5259.98	5260	-2.85
		CH60	5299.97	5300	-4.43
		CH64	5319.97	5320	-4.79
		CH100	5499.98	5500	-3
		CH120	5599.99	5600	-1.78
		CH140	5699.96	5700	-5.70
		CH149	5744.95	5745	-7.57
		CH157	5784.95	5785	-8.38
		CH165	5824.95	5825	-7.46

DC 5V	60℃	CH36	5179.98	5180	-3.57
		CH40	5199.98	5200	-3.17
		CH48	5239.97	5240	-5.24
		CH52	5259.97	5260	-4.94
		CH60	5299.97	5300	-4.15
		CH64	5319.98	5320	-3.47
		CH100	5499.97	5500	-4.90
		CH120	5599.97	5600	-4.10
		CH140	5699.96	5700	-6.05
		CH149	5744.96	5745	-6.35
		CH157	5784.97	5785	-5.18
		CH165	5824.97	5825	-3.51

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 ANTA: monopole Antenna and ANTB: External Metal 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: ANTA: 1.42dBi; ANTB: -4.67dBi; U-NII-2A Band: ANTA: -4.34dBi; ANTB: -0.16dBi; U-NII-2C Band: ANTA: -4.03dBi; ANTB: 0.09dBi; U-NII-3 Band: ANTA: 0.98dBi; ANTB:-4.36dBi.

12. DEVIATION TO TEST SPECIFICATIONS

[NONE]

THE END