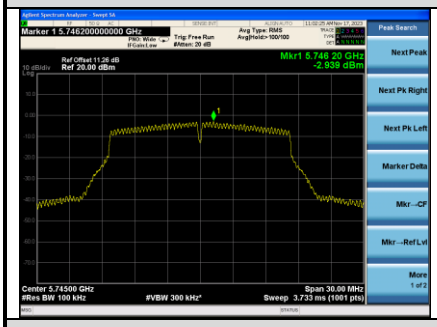
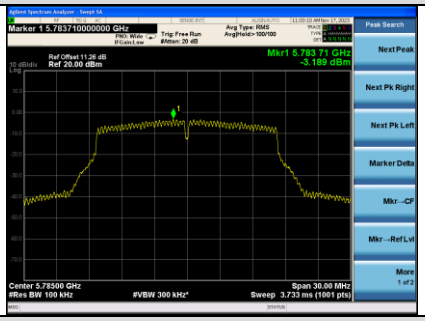
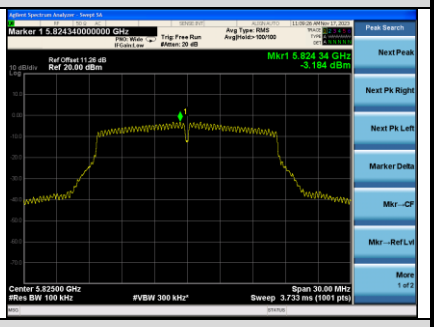
U-NII-3 Band: ANTA

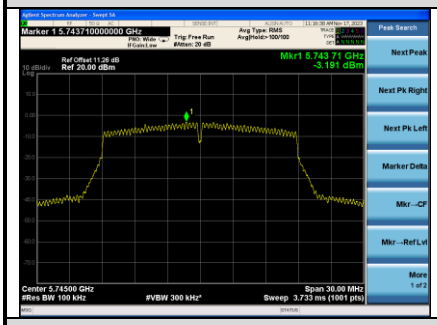
IEEE 802.11a

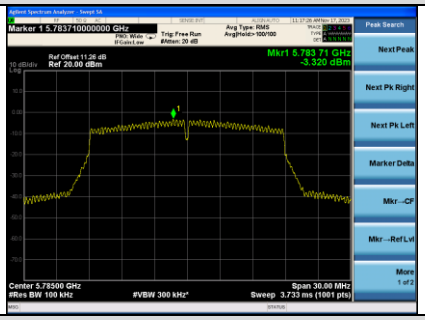


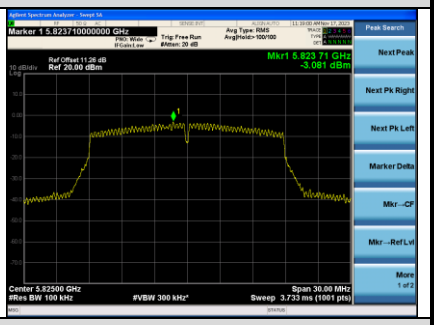




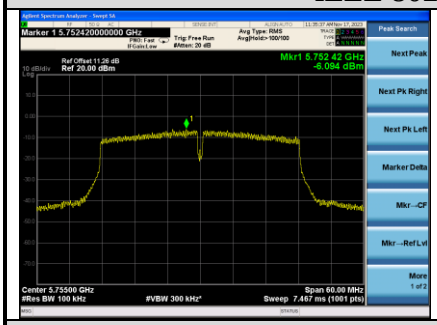
IEEE 802.11n HT20

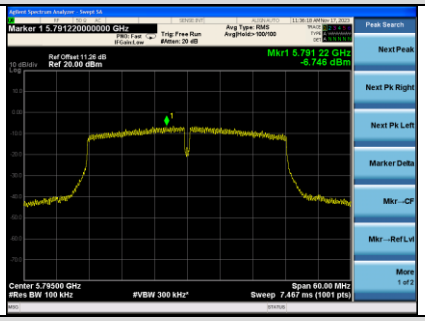




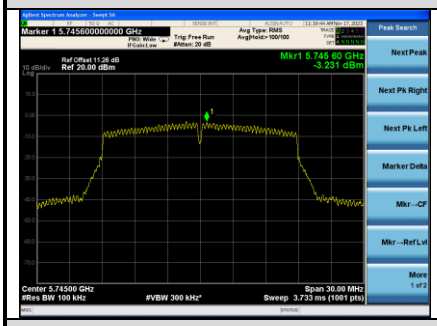


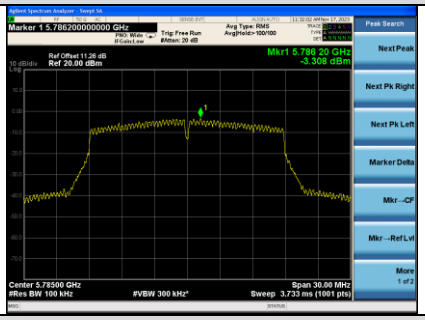
IEEE 802.11n HT40

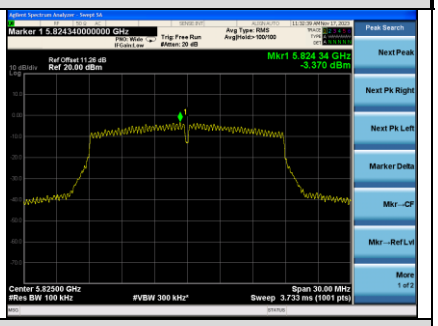




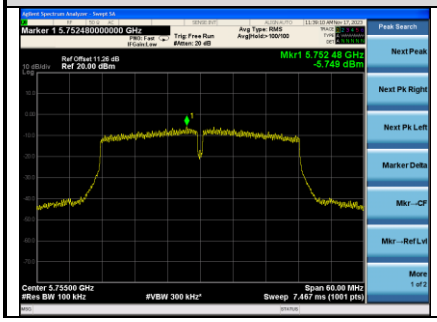
IEEE 802.11ac VHT20

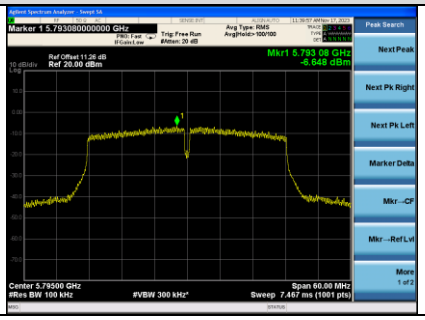






IEEE 802.11ac VHT40

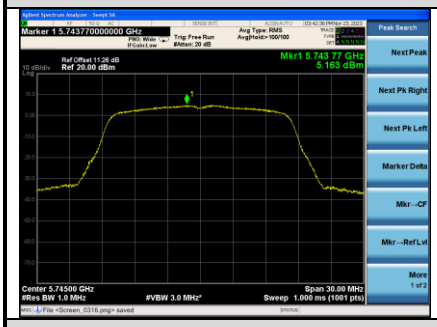


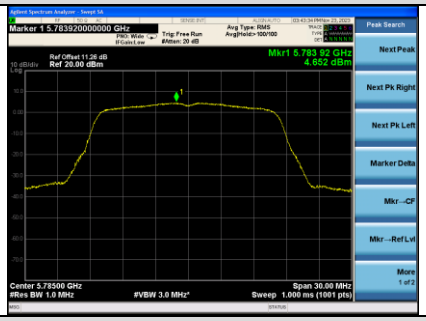


IEEE 802.11ac VHT80

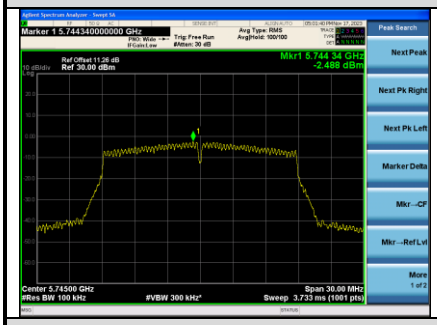
U-NII-3 Band: ANTB

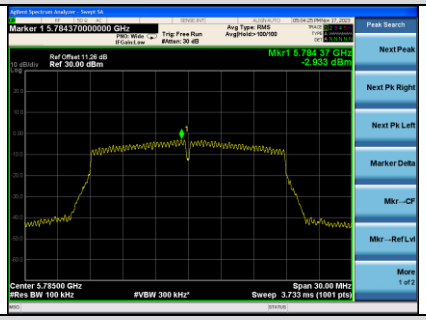
IEEE 802.11a



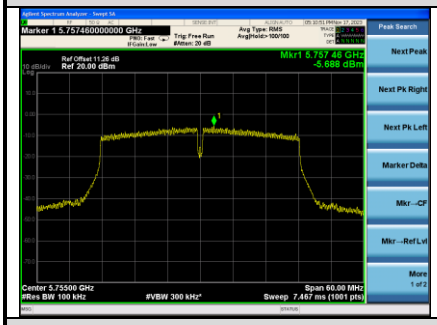


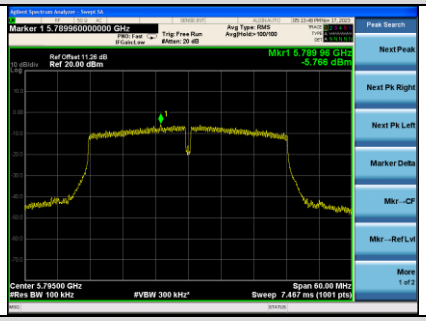
IEEE 802.11n HT20



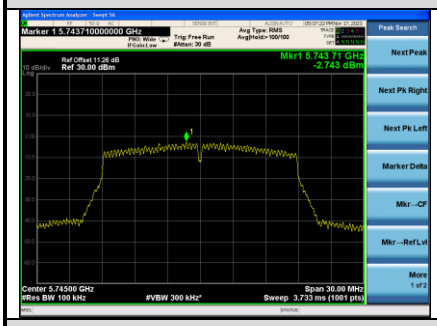


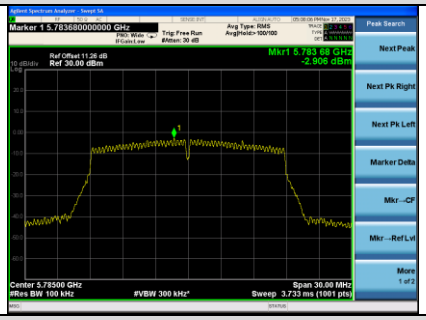
IEEE 802.11n HT40



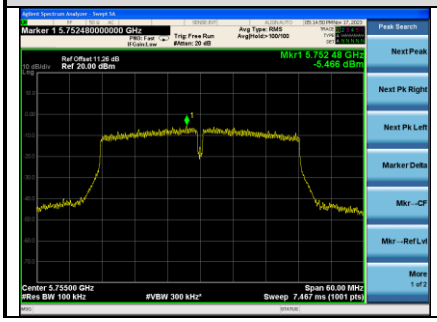


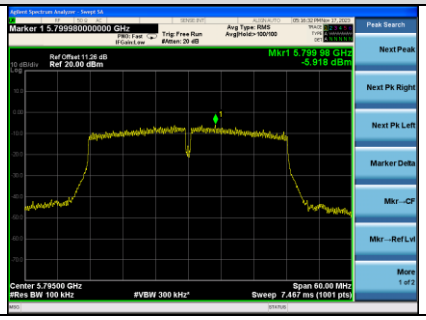
IEEE 802.11ac VHT20





IEEE 802.11ac VHT40





IEEE 802.11ac VHT80

9. FREQUENCY STABILITY MEASUREMENT

9.1.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
4.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.01,23	1 Year
5.	Attenuator	Agilent	8491B	MY39269201	Apr.02,23	1 Year
6.	RF Cable	HUBER+SUHNER	SUCOFLEX-106	505238/6	Apr.02,23	1 Year

9.2.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.

9.3.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 3.1V to 3.5V.
2. Extreme temperature is 0℃~60℃.

9.4.Test Result

EUT: Wi-Fi Module		
M/N: U9W44		
Test date: 2023-11-21	Pressure: 103.1±1.0 kpa	Humidity: 51.5±3.0%
Tested by: lili	Test site: RF site	Temperature:22.5±0.6 ℃

Frequency Stability vs.Voltage:

Test Voltage	Temperature	CH	Reading (MHz)		Target Frequency (MHz)	Result (ppm)	
			ANTA	ANTB		ANTA	ANTB
DC 3.1V	25℃	CH36	5179.9752	5179.9803	5180	-4.79	-3.80
		CH38	5189.9721	5189.9641	5190	-5.38	-6.92
		CH40	5199.9616	5199.9682	5200	-7.38	-6.12
		CH42	5209.9872	5209.9655	5210	-2.46	-6.62
		CH46	5229.9665	5229.9664	5230	-6.41	-6.42
		CH48	5239.9711	5239.9686	5240	-5.52	-5.99
		CH149	5744.9924	5744.9911	5745	-1.32	-1.55
		CH151	5754.9903	5754.9913	5755	-1.69	-1.51
		CH155	5774.9965	5774.9789	5775	-0.61	-3.65
		CH157	5784.9890	5785.0003	5785	-1.90	0.05
		CH159	5794.9936	5794.9875	5795	-1.10	-2.16
		CH165	5824.9881	5824.9962	5825	-2.04	-0.65

Test Voltage	Temperature	CH	Reading (MHz)		Target Frequency (MHz)	Result (ppm)	
			ANTA	ANTB		ANTA	ANTB
DC 3.3V	25℃	CH36	5179.9750	5179.9800	5180	-4.83	-3.86
		CH38	5189.9720	5189.9640	5190	-5.39	-6.94
		CH40	5199.9615	5199.9680	5200	-7.40	-6.15
		CH42	5209.9870	5209.9655	5210	-2.50	-6.62
		CH46	5229.9665	5229.9665	5230	-6.41	-6.41
		CH48	5239.9710	5239.9680	5240	-5.53	-6.11
		CH149	5744.9920	5744.9910	5745	-1.39	-1.57
		CH151	5754.9905	5754.9915	5755	-1.65	-1.48
		CH155	5774.9960	5774.9785	5775	-0.69	-3.72
		CH157	5784.9895	5785.0000	5785	-1.82	0.00
		CH159	5794.9935	5794.9870	5795	-1.12	-2.24
		CH165	5824.9880	5824.9960	5825	-2.06	-0.69

Test Voltage	Temperature	CH	Reading (MHz)		Target Frequency (MHz)	Result (ppm)	
			ANTA	ANTB		ANTA	ANTB
DC 3.5V	25℃	CH36	5179.9756	5179.9809	5180	-4.71	-3.69
		CH38	5189.9723	5189.9642	5190	-5.34	-6.90
		CH40	5199.9614	5199.9685	5200	-7.42	-6.06
		CH42	5209.9878	5209.9650	5210	-2.34	-6.72
		CH46	5229.9660	5229.9665	5230	-6.50	-6.41
		CH48	5239.9715	5239.9687	5240	-5.44	-5.97
		CH149	5744.9923	5744.9916	5745	-1.34	-1.46
		CH151	5754.9909	5754.9915	5755	-1.58	-1.48
		CH155	5774.9962	5774.9787	5775	-0.66	-3.69
		CH157	5784.9891	5785.0010	5785	-1.88	0.17
		CH159	5794.9933	5794.9870	5795	-1.16	-2.24
		CH165	5824.9887	5824.9965	5825	-1.94	-0.60

Frequency Stability vs.Temperature:

Test Voltage	Temperature	CH	Reading (MHz)		Target Frequency (MHz)	Result (ppm)	
			ANTA	ANTB		ANTA	ANTB
DC 3.3V	0℃	CH36	5179.9751	5179.9810	5180	-4.81	-3.67
		CH38	5189.9722	5189.9649	5190	-5.36	-6.76
		CH40	5199.9619	5199.9684	5200	-7.33	-6.08
		CH42	5209.9870	5209.9652	5210	-2.50	-6.68
		CH46	5229.9667	5229.9668	5230	-6.37	-6.35
		CH48	5239.9718	5239.9685	5240	-5.38	-6.01
		CH149	5744.9924	5744.9910	5745	-1.32	-1.57
		CH151	5754.9902	5754.9914	5755	-1.70	-1.49
		CH155	5774.9968	5774.9785	5775	-0.55	-3.72
		CH157	5784.9897	5785.0013	5785	-1.78	0.22
		CH159	5794.9936	5794.9874	5795	-1.10	-2.17
		CH165	5824.9882	5824.9960	5825	-2.03	-0.69

Test Voltage	Temperature	CH	Reading (MHz)		Target Frequency (MHz)	Result (ppm)	
			ANTA	ANTB		ANTA	ANTB
DC 3.3V	10℃	CH36	5179.9779	5179.9824	5180	-4.27	-3.40
		CH38	5189.9782	5189.9659	5190	-4.20	-6.57
		CH40	5199.9691	5199.9675	5200	-5.94	-6.25
		CH42	5209.9868	5209.9648	5210	-2.53	-6.76
		CH46	5229.9648	5229.9672	5230	-6.73	-6.27
		CH48	5239.9784	5239.9699	5240	-4.12	-5.74
		CH149	5744.9977	5744.9919	5745	-0.40	-1.41
		CH151	5754.9917	5754.9922	5755	-1.44	-1.36
		CH155	5774.9975	5774.9785	5775	-0.43	-3.72
		CH157	5784.9885	5785.0019	5785	-1.99	0.33
		CH159	5794.9994	5794.9871	5795	-0.10	-2.23
		CH165	5824.9885	5824.9964	5825	-1.97	-0.62

Test Voltage	Temperature	CH	Reading (MHz)		Target Frequency (MHz)	Result (ppm)	
			ANTA	ANTB		ANTA	ANTB
DC 3.3V	20℃	CH36	5179.9770	5179.9829	5180	-4.44	-3.30
		CH38	5189.9784	5189.9654	5190	-4.16	-6.67
		CH40	5199.9697	5199.9676	5200	-5.83	-6.23
		CH42	5209.9869	5209.9643	5210	-2.51	-6.85
		CH46	5229.9654	5229.9671	5230	-6.62	-6.29
		CH48	5239.9776	5239.9690	5240	-4.27	-5.92
		CH149	5744.9972	5744.9915	5745	-0.49	-1.48
		CH151	5754.9928	5754.9927	5755	-1.25	-1.27
		CH155	5774.9943	5774.9783	5775	-0.99	-3.76
		CH157	5784.9888	5785.0017	5785	-1.94	0.29
		CH159	5794.9981	5794.9878	5795	-0.33	-2.11
		CH165	5824.9879	5824.9964	5825	-2.08	-0.62

Test Voltage	Temperature	CH	Reading (MHz)		Target Frequency (MHz)	Result (ppm)	
			ANTA	ANTB		ANTA	ANTB
DC 3.3V	30℃	CH36	5179.9758	5179.9809	5180	-4.67	-3.69
		CH38	5189.9727	5189.9641	5190	-5.26	-6.92
		CH40	5199.9611	5199.9684	5200	-7.48	-6.08
		CH42	5209.9877	5209.9658	5210	-2.36	-6.56
		CH46	5229.9664	5229.9660	5230	-6.42	-6.50
		CH48	5239.9718	5239.9685	5240	-5.38	-6.01
		CH149	5744.9924	5744.9913	5745	-1.32	-1.51
		CH151	5754.9900	5754.9918	5755	-1.74	-1.42
		CH155	5774.9964	5774.9782	5775	-0.62	-3.77
		CH157	5784.9897	5785.0010	5785	-1.78	0.17
		CH159	5794.9931	5794.9873	5795	-1.19	-2.19
		CH165	5824.9884	5824.9966	5825	-1.99	-0.58

Test Voltage	Temperature	CH	Reading (MHz)		Target Frequency (MHz)	Result (ppm)	
			ANTA	ANTB		ANTA	ANTB
DC 3.3V	40℃	CH36	5179.9759	5179.9805	5180	-4.65	-3.76
		CH38	5189.9721	5189.9643	5190	-5.38	-6.88
		CH40	5199.9619	5199.9687	5200	-7.33	-6.02
		CH42	5209.9875	5209.9655	5210	-2.40	-6.62
		CH46	5229.9660	5229.9664	5230	-6.50	-6.42
		CH48	5239.9713	5239.9686	5240	-5.48	-5.99
		CH149	5744.9926	5744.9917	5745	-1.29	-1.44
		CH151	5754.9911	5754.9913	5755	-1.55	-1.51
		CH155	5774.9968	5774.9786	5775	-0.55	-3.71
		CH157	5784.9894	5785.0011	5785	-1.83	0.19
		CH159	5794.9933	5794.9875	5795	-1.16	-2.16
		CH165	5824.9889	5824.9969	5825	-1.91	-0.53

Test Voltage	Temperature	CH	Reading (MHz)		Target Frequency (MHz)	Result (ppm)	
			ANTA	ANTB		ANTA	ANTB
DC 3.3V	50℃	CH36	5179.9762	5179.9812	5180	-4.59	-3.63
		CH38	5189.9737	5189.9639	5190	-5.07	-6.96
		CH40	5199.9645	5199.9674	5200	-6.83	-6.27
		CH42	5209.9883	5209.9644	5210	-2.25	-6.83
		CH46	5229.9672	5229.9671	5230	-6.27	-6.29
		CH48	5239.9738	5239.9693	5240	-5.00	-5.86
		CH149	5744.9919	5744.9920	5745	-1.41	-1.39
		CH151	5754.9926	5754.9910	5755	-1.29	-1.56
		CH155	5774.9957	5774.9785	5775	-0.74	-3.72
		CH157	5784.9886	5785.0029	5785	-1.97	0.50
		CH159	5794.9922	5794.9874	5795	-1.35	-2.17
		CH165	5824.9871	5824.9963	5825	-2.21	-0.64

Test Voltage	Temperature	CH	Reading (MHz)		Target Frequency (MHz)	Result (ppm)	
			ANTA	ANTB		ANTA	ANTB
DC 3.3V	60℃	CH36	5179.9768	5179.9815	5180	-4.48	-3.57
		CH38	5189.9731	5189.9634	5190	-5.18	-7.05
		CH40	5199.9646	5199.9672	5200	-6.81	-6.31
		CH42	5209.9880	5209.9640	5210	-2.30	-6.91
		CH46	5229.9675	5229.9673	5230	-6.21	-6.25
		CH48	5239.9730	5239.9691	5240	-5.15	-5.90
		CH149	5744.9913	5744.9924	5745	-1.51	-1.32
		CH151	5754.9925	5754.9916	5755	-1.30	-1.46
		CH155	5774.9951	5774.9783	5775	-0.85	-3.76
		CH157	5784.9884	5785.0026	5785	-2.01	0.45
		CH159	5794.9920	5794.9877	5795	-1.38	-2.12
		CH165	5824.9874	5824.9960	5825	-2.16	-0.69

10. ANTENNA REQUIREMENT

10.1. 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.

10.2. Antenna Connected Construction

The antennas used for this product are Embedded Pattern Antennas(Antenna A/B); PCB Antennas (Antenna A/B) 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 are Wi-Fi U-NII-1 Peak Gain: ANTA: 1.91dBi max; ANTB: -2.55dBi max; Wi-Fi U-NII-3 Band Peak Gain: ANTA: 3.12dBi max; ANTB: 0.38dBi max.

11. DEVIATION TO TEST SPECIFICATIONS

[NONE]

THE END