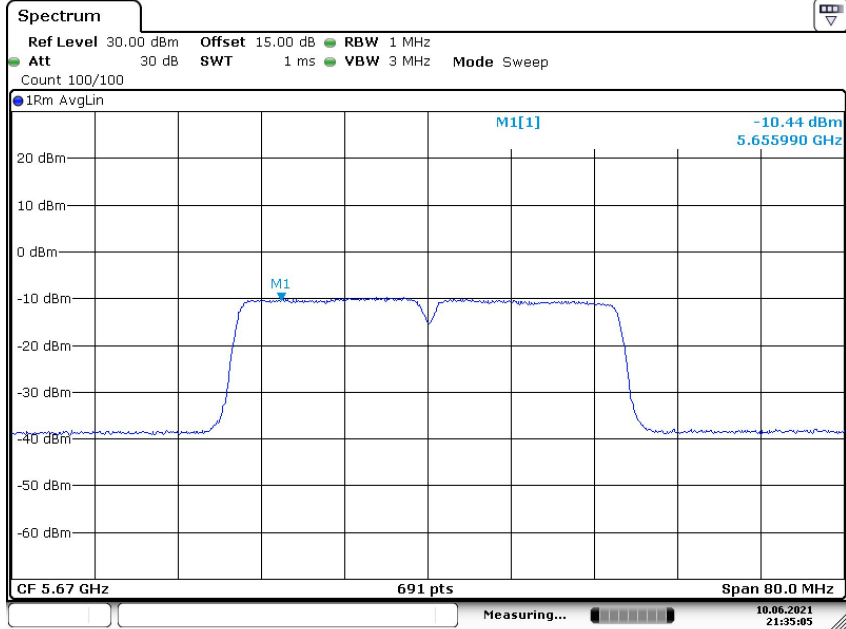
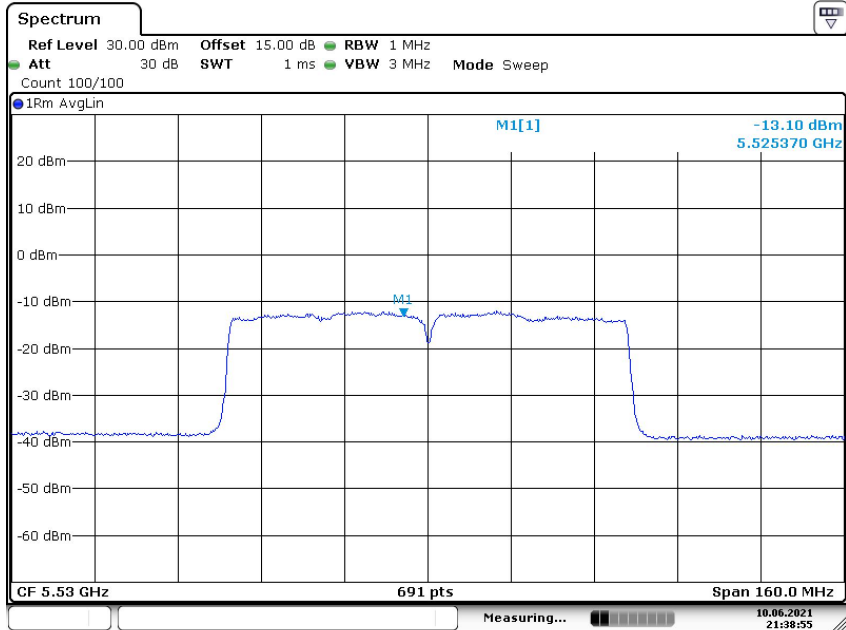


**Power Spectral Density** **U-NII – 2C**  
**Test Model** 802.11ac(HT40) **Frequency(MHz)** 5670



Date: 10 JUN 2021 21:35:05

**Power Spectral Density** **U-NII – 2C**  
**Test Model** 802.11ac 80 **Frequency(MHz)** 5530

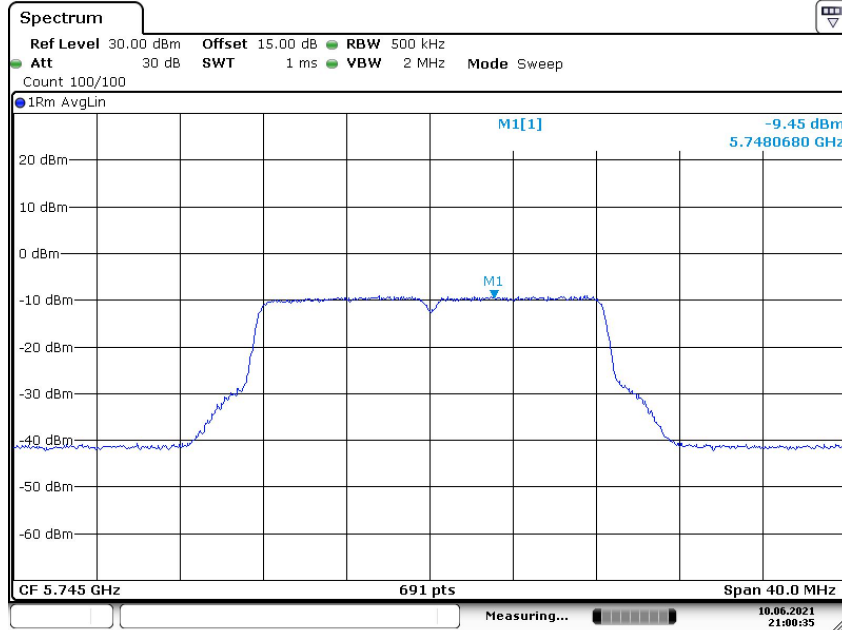


Date: 10 JUN 2021 21:38:55

5725-5850MHz

Operating mode	Test Channel	Power Spectral Density dBm/500kHz	Limit ( dBm/500kHz)
802.11a	5745	-9.45	30
	5785	-9.40	30
	5825	-10.45	30
802.11n-HT20	5745	-10.11	30
	5785	-9.46	30
	5825	-11.06	30
802.11ac(HT20)	5745	-9.84	30
	5785	-9.86	30
	5825	-10.87	30
802.11n-HT40	5755	-12.34	30
	5795	-13.06	30
802.11ac(HT40)	5755	-13.20	30
	5795	-12.91	30
802.11ac(HT80)	5775	-16.96	30

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11a **Frequency(MHz)** 5745



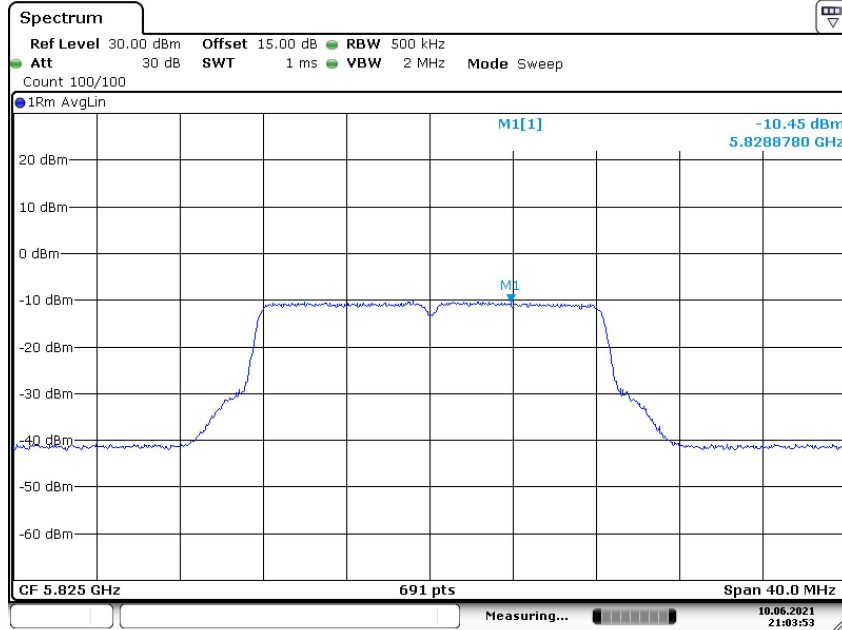
Date: 10 JUN 2021 21:00:34

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11a **Frequency(MHz)** 5785



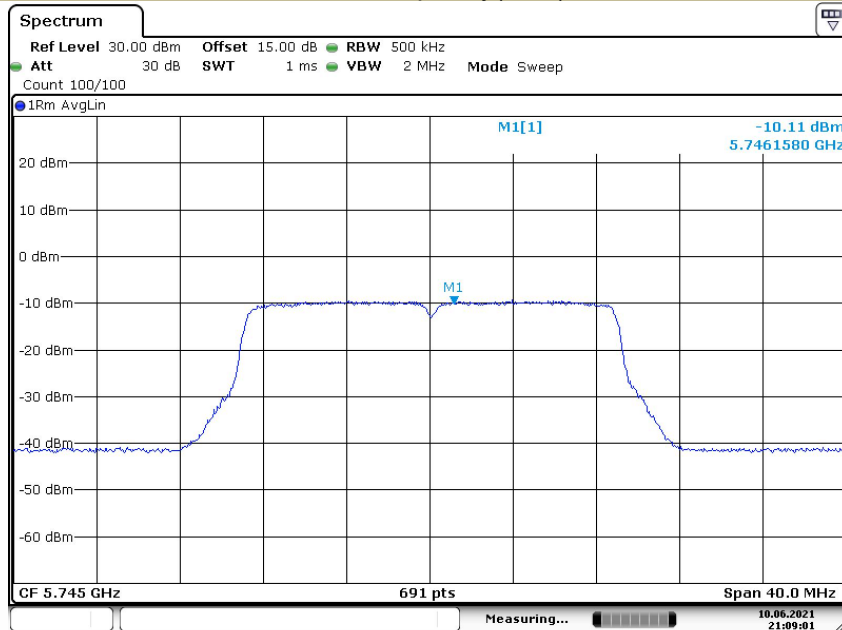
Date: 10 JUN 2021 21:00:57

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11a **Frequency(MHz)** 5825



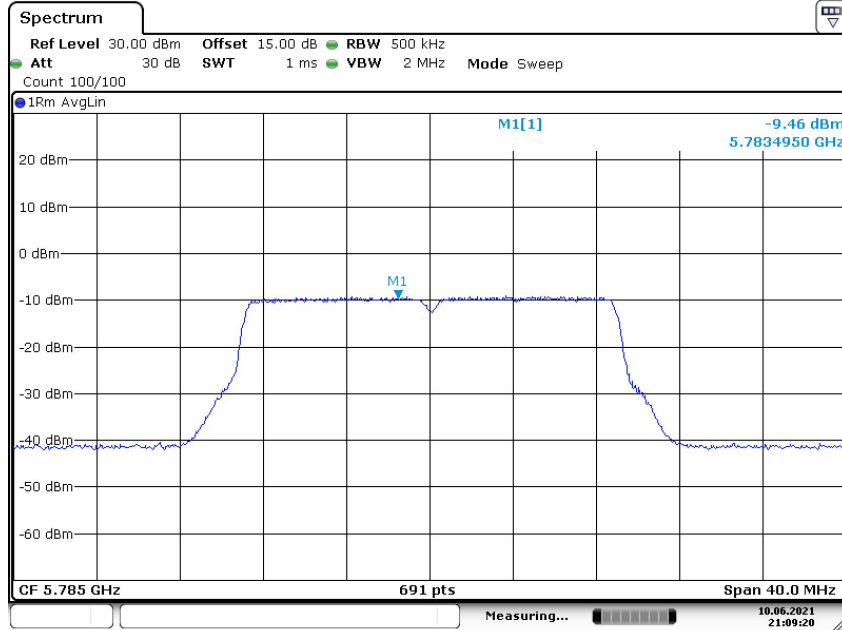
Date: 10 JUN 2021 21:03:53

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11n-HT20 **Frequency(MHz)** 5745



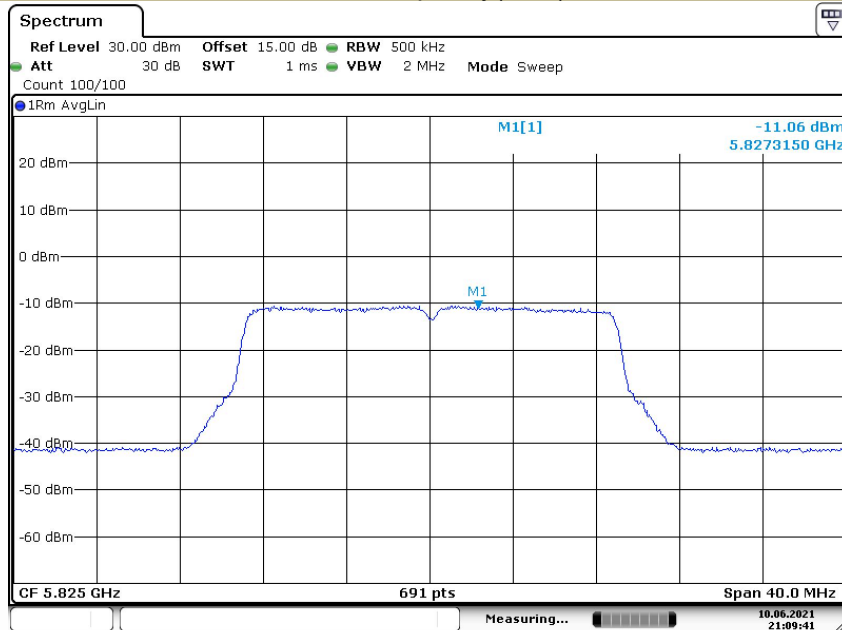
Date: 10 JUN 2021 21:09:00

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11n-HT20 **Frequency(MHz)** 5785



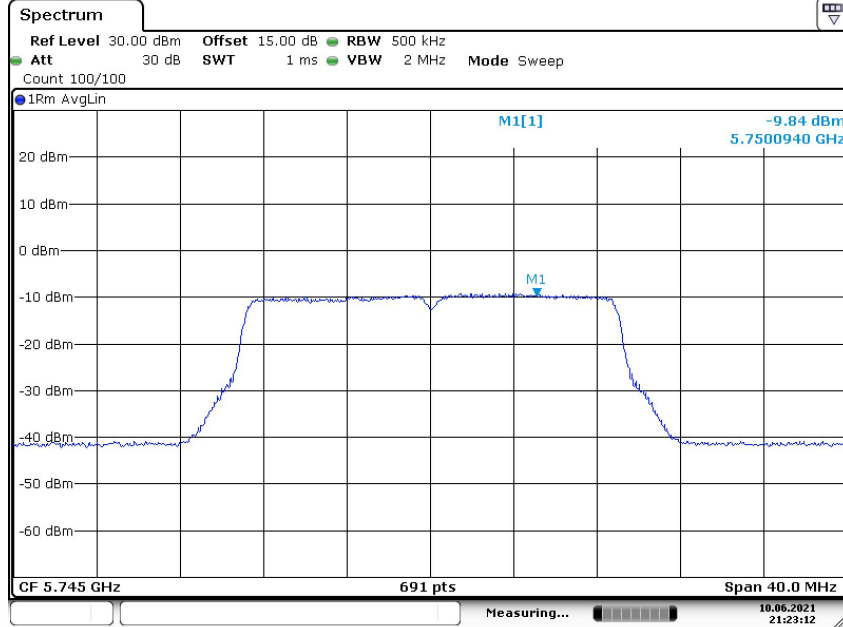
Date: 10 JUN 2021 21:09:20

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11n-HT20 **Frequency(MHz)** 5825



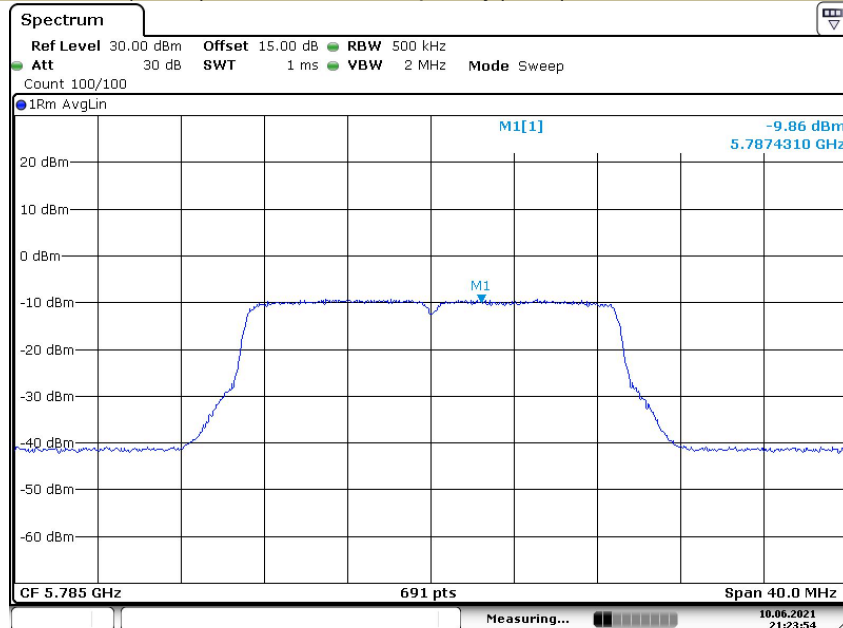
Date: 10 JUN 2021 21:09:41

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11ac(HT20) **Frequency(MHz)** 5745



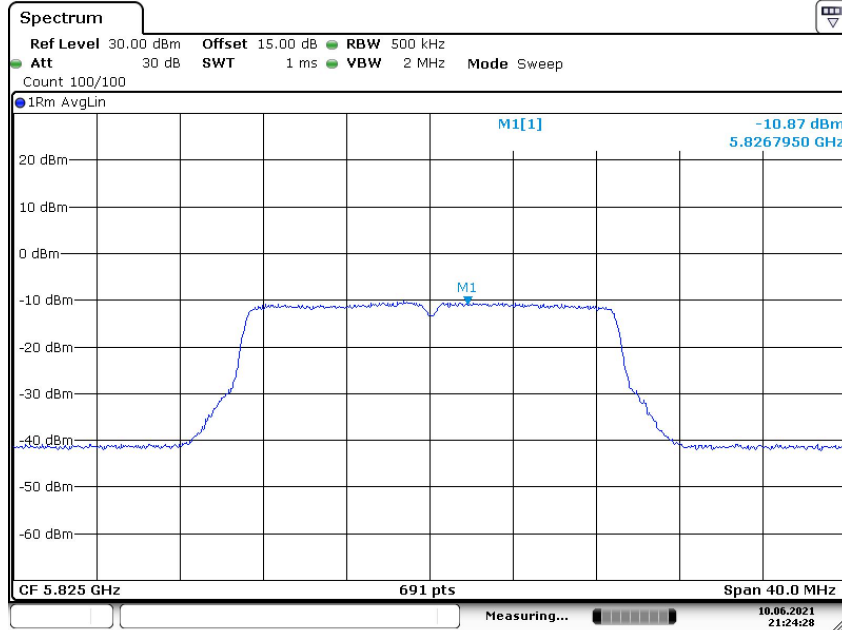
Date: 10.JUN.2021 21:23:13

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11ac(HT20) **Frequency(MHz)** 5785



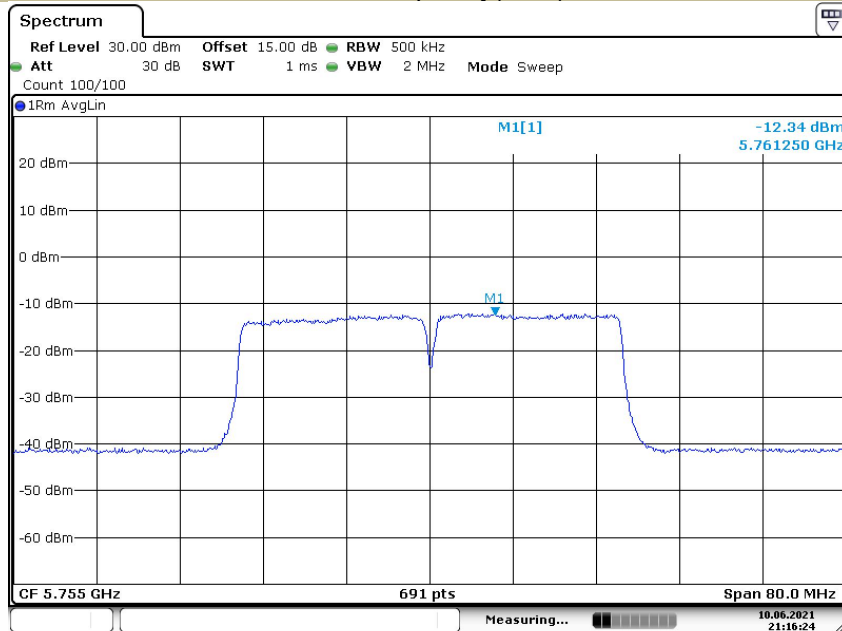
Date: 10.JUN.2021 21:23:54

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11ac(HT20) **Frequency(MHz)** 5825



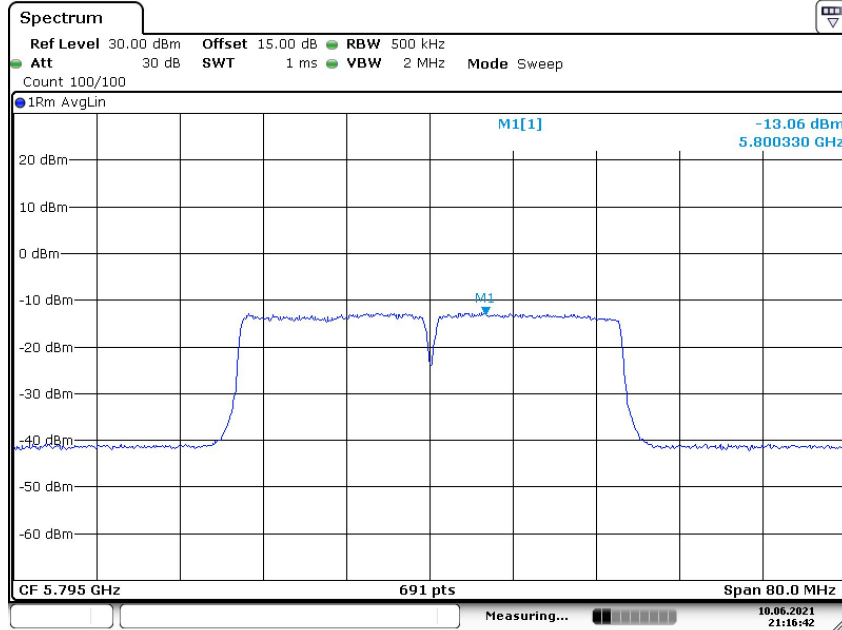
Date: 10.JUN.2021 21:24:28

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11n-HT40 **Frequency(MHz)** 5755



Date: 10.JUN.2021 21:16:24

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11n-HT40 **Frequency(MHz)** 5795



Date: 10.JUN.2021 21:16:42

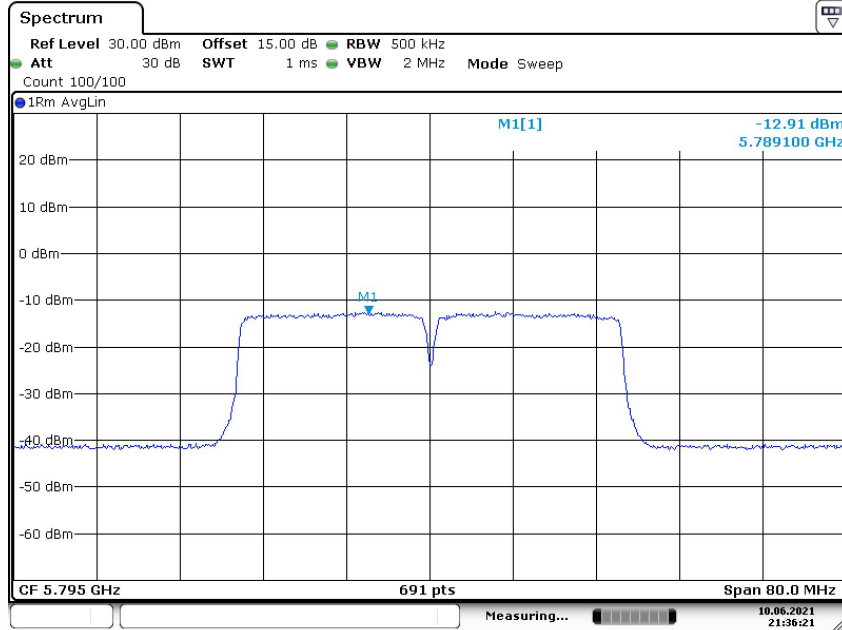
**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11ac(HT40) **Frequency(MHz)** 5755



Date: 10.JUN.2021 21:35:54

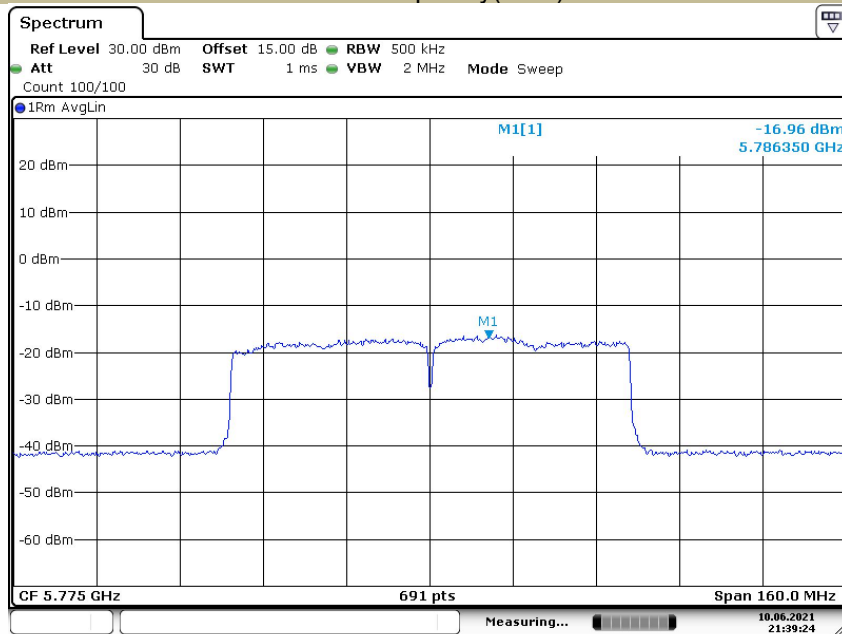


**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11ac(HT40) **Frequency(MHz)** 5795



Date: 10 JUN 2021 21:36:21

**Power Spectral Density** **U-NII - 3**  
**Test Model** 802.11ac 80 **Frequency(MHz)** 5775



Date: 10 JUN 2021 21:39:24

## 8.4 FREQUENCY STABILITY

### 8.4.1 Applicable Standard

According to FCC Part 15.407(g)  
ANSI C63.10 Section 6.8

### 8.4.2 Conformance 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 users manual.

### 8.4.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

### 8.4.4 Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = 10 kHz.

Set Span= Entire absence of modulation emissions band

Set the video bandwidth (VBW) =30 kHz. width

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

Allow the trace to stabilize.

The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

Beginning at each temperature level specified in user manual , the frequency shall be measured within one minute after application of primary power to the transmitter and at intervals of no more than one minute thereafter until ten minutes have elapsed or until sufficient measurements are obtained to indicate clearly that the frequency has stabilized within the applicable tolerance, whichever time period is greater. During each test, the ambient temperature shall not be allowed to rise more than 10° centigrade above the respective beginning ambient temperature level

Measure and record the results in the test report.

### 8.4.5 Test Results

802.11a		5180		
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5180	0	Pass
	-10	5180.0137	13.7	Pass
	0	5179.9852	-14.8	Pass
	10	5180.0067	6.7	Pass
	20	5179.9842	-15.8	Pass
	30	5180.0207	20.7	Pass
	40	5180.0198	19.8	Pass
	50	5179.9849	-15.1	Pass
85% Vnom	25	5180.0098	9.8	Pass
115% Vnom	25	5179.9915	-8.5	Pass

5200				
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5199.9948	-5.2	Pass
	-10	5200.0202	20.2	Pass
	0	5199.9916	-8.4	Pass
	10	5200.0006	0.6	Pass
	20	5200.0017	1.7	Pass
	30	5200.0136	13.6	Pass
	40	5200.0089	8.9	Pass
	50	5200.015	15.0	Pass
85% Vnom	25	5199.9899	-10.1	Pass
115% Vnom	25	5199.9824	-17.6	Pass

5240				
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5239.9911	-8.9	Pass
	-10	5239.985	-15.0	Pass
	0	5239.9828	-17.2	Pass
	10	5240.0098	9.8	Pass
	20	5240.0094	9.4	Pass
	30	5239.9859	-14.1	Pass
	40	5240.0064	6.4	Pass
	50	5240.004	4.0	Pass
85% Vnom	25	5240.0135	13.5	Pass
115% Vnom	25	5239.9902	-9.8	Pass

## 5190

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5190.006	6.0	Pass
	-10	5189.9869	-13.1	Pass
	0	5190.0008	0.8	Pass
	10	5190.0047	4.7	Pass
	20	5189.9842	-15.8	Pass
	30	5189.9887	-11.3	Pass
	40	5189.9883	-11.7	Pass
	50	5190.0011	1.1	Pass
85% Vnom	25	5189.9887	-11.3	Pass
115% Vnom	25	5190.0078	7.8	Pass

## 5230

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5230.0066	-20	Pass
	-10	5230.023	-10	Pass
	0	5230.0088	0	Pass
	10	5230.0218	10	Pass
	20	5229.9949	20	Pass
	30	5230.0143	30	Pass
	40	5230.0202	40	Pass
	50	5229.998	50	Pass
85% Vnom	25	5230.0145	25	Pass
115% Vnom	25	5229.9828	25	Pass

## 5210

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5209.9847	-15.3	Pass
	-10	5209.9903	-9.7	Pass
	0	5209.9932	-6.8	Pass
	10	5209.9835	-16.5	Pass
	20	5210.0029	2.9	Pass
	30	5209.9844	-15.6	Pass
	40	5209.9991	-0.9	Pass
	50	5209.9976	-2.4	Pass
85% Vnom	25	5210.0055	5.5	Pass
115% Vnom	25	5209.9937	-6.3	Pass

802.11a		5260		
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5259.9951	-4.9	Pass
	-10	5259.9951	-4.9	Pass
	0	5260.0224	22.4	Pass
	10	5259.9897	-10.3	Pass
	20	5259.9865	-13.5	Pass
	30	5260.0127	12.7	Pass
	40	5259.9976	-2.4	Pass
	50	5260.0026	2.6	Pass
85% Vnom	25	5259.9964	-3.6	Pass
115% Vnom	25	5259.9872	-12.8	Pass

		5280		
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5280.008	8.0	Pass
	-10	5279.9888	-11.2	Pass
	0	5279.9887	-11.3	Pass
	10	5279.9898	-10.2	Pass
	20	5279.9939	-6.1	Pass
	30	5280.0207	20.7	Pass
	40	5279.9889	-11.1	Pass
	50	5279.9934	-6.6	Pass
85% Vnom	25	5279.9973	-2.7	Pass
115% Vnom	25	5280.009	9.0	Pass

		5320		
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5319.9985	-1.5	Pass
	-10	5319.9848	-15.2	Pass
	0	5319.9976	-2.4	Pass
	10	5320.0095	9.5	Pass
	20	5319.9896	-10.4	Pass
	30	5320.0149	14.9	Pass
	40	5319.9837	-16.3	Pass
	50	5320.0046	4.6	Pass
85% Vnom	25	5319.9824	-17.6	Pass
115% Vnom	25	5320.0206	20.6	Pass

## 5270

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5269.9973	-2.7	Pass
	-10	5269.994	-6.0	Pass
	0	5270.0101	10.1	Pass
	10	5270.0133	13.3	Pass
	20	5269.9945	-5.5	Pass
	30	5269.9988	-1.2	Pass
	40	5269.9863	-13.7	Pass
	50	5270.0068	6.8	Pass
85% Vnom	25	5269.9876	-12.4	Pass
115% Vnom	25	5269.9815	-18.5	Pass

## 5310

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5309.9882	-11.8	Pass
	-10	5309.9938	-6.2	Pass
	0	5310.0024	2.4	Pass
	10	5309.9937	-6.3	Pass
	20	5310.0137	13.7	Pass
	30	5310.0135	13.5	Pass
	40	5309.9909	-9.1	Pass
	50	5309.9961	-3.9	Pass
85% Vnom	25	5310.0118	11.8	Pass
115% Vnom	25	5310.012	12.0	Pass

## 5290

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5290.0028	2.8	Pass
	-10	5290.0222	22.2	Pass
	0	5290.0218	21.8	Pass
	10	5289.9893	-10.7	Pass
	20	5290.0039	3.9	Pass
	30	5289.9946	-5.4	Pass
	40	5290.004	4.0	Pass
	50	5290.0127	12.7	Pass
85% Vnom	25	5289.9958	-4.2	Pass
115% Vnom	25	5290.0205	20.5	Pass

802.11a		5500		
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5500.0087	8.7	Pass
	-10	5500.0053	5.3	Pass
	0	5499.9884	-11.6	Pass
	10	5499.9998	-0.2	Pass
	20	5499.9994	-0.6	Pass
	30	5499.9928	-7.2	Pass
	40	5499.9912	-8.8	Pass
	50	5500.0143	14.3	Pass
85% Vnom	25	5500.0004	0.4	Pass
115% Vnom	25	5500.0213	21.3	Pass

		5580		
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5579.9924	-7.6	Pass
	-10	5579.9823	-17.7	Pass
	0	5579.993	-7.0	Pass
	10	5580.0084	8.4	Pass
	20	5580.0024	2.4	Pass
	30	5580.0024	2.4	Pass
	40	5579.9834	-16.6	Pass
	50	5580.0165	16.5	Pass
85% Vnom	25	5580.022	22.0	Pass
115% Vnom	25	5579.9981	-1.9	Pass

		5700		
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5699.9977	-2.3	Pass
	-10	5700.0215	21.5	Pass
	0	5699.9848	-15.2	Pass
	10	5700.0149	14.9	Pass
	20	5699.9825	-17.5	Pass
	30	5699.9961	-3.9	Pass
	40	5700.0228	22.8	Pass
	50	5700.0047	4.7	Pass
85% Vnom	25	5700.0176	17.6	Pass
115% Vnom	25	5699.9918	-8.2	Pass

## 5510

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5510.0136	13.6	Pass
	-10	5510.0033	3.3	Pass
	0	5509.9943	-5.7	Pass
	10	5510.0109	10.9	Pass
	20	5510.0203	20.3	Pass
	30	5509.9928	-7.2	Pass
	40	5510.0063	6.3	Pass
	50	5509.9924	-7.6	Pass
85% Vnom	25	5509.9893	-10.7	Pass
115% Vnom	25	5509.9867	-13.3	Pass

## 5670

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5670.0167	16.7	Pass
	-10	5669.9978	-2.2	Pass
	0	5669.9976	-2.4	Pass
	10	5670.0104	10.4	Pass
	20	5670.0045	4.5	Pass
	30	5669.9883	-11.7	Pass
	40	5669.991	-9.0	Pass
	50	5670.0022	2.2	Pass
85% Vnom	25	5670.0054	5.4	Pass
115% Vnom	25	5669.9956	-4.4	Pass

## 5530

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5529.9945	-5.5	Pass
	-10	5530.0151	15.1	Pass
	0	5530.0116	11.6	Pass
	10	5529.9952	-4.8	Pass
	20	5529.9907	-9.3	Pass
	30	5529.9914	-8.6	Pass
	40	5530.0011	1.1	Pass
	50	5529.9996	-0.4	Pass
85% Vnom	25	5530.008	8.0	Pass
115% Vnom	25	5530.0061	6.1	Pass



802.11a

5745

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5745.021	21.0	Pass
	-10	5744.9913	-8.7	Pass
	0	5745.0031	3.1	Pass
	10	5745.0039	3.9	Pass
	20	5745.0156	15.6	Pass
	30	5744.9925	-7.5	Pass
	40	5744.9815	-18.5	Pass
	50	5744.9979	-2.1	Pass
85% Vnom	25	5744.9993	-0.7	Pass
115% Vnom	25	5744.9929	-7.1	Pass

5785

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5785.0144	14.4	Pass
	-10	5784.9987	-1.3	Pass
	0	5784.9952	-4.8	Pass
	10	5784.9928	-7.2	Pass
	20	5785.0038	3.8	Pass
	30	5785.0099	9.9	Pass
	40	5785.0054	5.4	Pass
	50	5785.017	17.0	Pass
85% Vnom	25	5784.9845	-15.5	Pass
115% Vnom	25	5785.0054	5.4	Pass

5825

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5824.999	-1.0	Pass
	-10	5824.9883	-11.7	Pass
	0	5825.0058	5.8	Pass
	10	5825.0076	7.6	Pass
	20	5824.9885	-11.5	Pass
	30	5825.0123	12.3	Pass
	40	5825.0215	21.5	Pass
	50	5825.0012	1.2	Pass
85% Vnom	25	5825.0114	11.4	Pass
115% Vnom	25	5825.0078	7.8	Pass

## 5755

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5754.9829	-17.1	Pass
	-10	5755.0156	15.6	Pass
	0	5755.011	11.0	Pass
	10	5755.0151	15.1	Pass
	20	5755.0026	2.6	Pass
	30	5754.9991	-0.9	Pass
	40	5755.0011	1.1	Pass
	50	5755.0168	16.8	Pass
85% Vnom	25	5754.9855	-14.5	Pass
115% Vnom	25	5755.0162	16.2	Pass

## 5795

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5794.9979	-2.1	Pass
	-10	5795.0058	5.8	Pass
	0	5795.0171	17.1	Pass
	10	5794.9936	-6.4	Pass
	20	5794.9917	-8.3	Pass
	30	5795.0181	18.1	Pass
	40	5794.9963	-3.7	Pass
	50	5795.0168	16.8	Pass
85% Vnom	25	5794.9871	-12.9	Pass
115% Vnom	25	5794.9935	-6.5	Pass

## 5775

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5775.0115	11.5	Pass
	-10	5774.9894	-10.6	Pass
	0	5775.0093	9.3	Pass
	10	5774.9982	-1.8	Pass
	20	5775.0197	19.7	Pass
	30	5775.0049	4.9	Pass
	40	5774.9891	-10.9	Pass
	50	5774.989	-11.0	Pass
85% Vnom	25	5775.0001	0.1	Pass
115% Vnom	25	5775.0085	8.5	Pass

## 8.5 UNDESIRABLE RADIATED SPURIOUS EMISSION

### 8.5.1 Applicable Standard

According to FCC Part 15.407 (b)  
According to 789033 D02 Section II(G)

### 8.5.2 Conformance Limit

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 e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/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.

The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209 The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Restricted Frequency(MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The provisions of §15.205 apply to intentional radiators operating under this section,15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

Remark: 1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of  $\xi$  15.205, and the emissions located in restricted bands also comply with 15.209 limit.

### 8.5.3 Test Configuration

Test according to clause 6.2 radio frequency test setup

### 8.5.4 Test Procedure

#### ■ Unwanted Emissions Measurements below 1000 MHz

Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

The EUT was placed on a turn table which is 0.8m above ground plane.

And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Repeat above procedures until all frequency measured was complete.

We use software control the EUT, Let EUT hopping on and transmit with highest power, All the modes have been tested and the worst result was reported.

Use the following spectrum analyzer settings:

Set RBW=120kHz for  $f < 1$  GHz(30MHz to 1GHz), 200Hz for  $f < 150$ KHz(9KHz to 150KHz), 9KHz for  $< 30$ MHz

(150KHz to 30KHz).

Set the VBW > RBW.

Detector = Peak.

Trace mode = max hold.

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Repeat above procedures until all frequency measured was complete.

#### ■ Unwanted Maximum peak Emissions Measurements above 1000 MHz

Maximum emission levels are measured by setting the analyzer as follows:

RBW = 1 MHz.

VBW  $\geq$  3 MHz.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately  $1/x$ , where  $x$  is the duty cycle. For example, at 50 percent duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

#### ■ Unwanted Average Emissions Measurements above 1000 MHz

Method VB (Averaging using reduced video bandwidth): Alternative method.

RBW = 1 MHz.

Video bandwidth. • If the EUT is configured to transmit with duty cycle  $\geq$  98 percent, set VBW  $\leq$  RBW/100 (i.e., 10 kHz) but not less than 10 Hz.

• If the EUT duty cycle is  $<$  98 percent, set VBW  $\geq$   $1/T$ , where  $T$  is defined in section II.B.1.a).

Video bandwidth mode or display mode • The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).

• As an alternative, the analyzer may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some analyzers require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle. For example, use at least 200 traces if the duty cycle is 25 percent. (If a specific emission is demonstrated to be continuous—i.e., 100 percent duty cycle—rather than turning on and off with the transmit cycle, at least 50 traces shall be averaged.)

■ Band edge measurements.

Unwanted band-edge emissions may be measured using either of the special band-edge measurement techniques (the marker-delta or integration methods) described below. Note that the marker-delta method is primarily a radiated measurement technique that requires the 99% occupied bandwidth edge to be within 2 MHz of the authorized band edge, whereas the integration method can be used in either a radiated or conducted measurement without any special requirement with regards to the displacement of the unwanted emission(s) relative to the authorized bandwidth.

Marker-Delta Method.

The marker-delta method, as described in ANSI C63.10, can be used to perform measurements of the radiated unwanted emissions level of emissions provided that the 99% occupied bandwidth of the fundamental is within 2 MHz of the authorized band-edge.

8.5.5 Test Results

Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

■ Spurious Emission below 30MHz(9KHz to 30MHz)

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor =  $40\log(\text{Specific distance}/ \text{test distance})$ ( dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor

- For Undesirable radiated Spurious Emission in U-NII – 1  
All the modes 802.11a/n/ac has been tested and the worst result antenna 1 802.11ac recorded as below:

:  Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

Test mode: 802.11ac Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11062.3	V	57.58	-37.65	-27	-10.65
14056.85	V	58.4	-36.83	-27	-9.83
17877.6	V	65.48	-29.75	-27	-2.75
11083.55	H	56.07	-39.16	-27	-12.16
14003.3	H	57.82	-37.41	-27	-10.41
17973.65	H	65.75	-29.48	-27	-2.48

Test mode: 802.11ac Frequency(MHz): 5200

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11053.8	V	55.48	-39.75	-27	-12.75
15041.15	V	57.99	-37.24	-27	-10.24
17997.45	V	66.79	-28.44	-27	-1.44
11051.25	H	56.25	-38.98	-27	-11.98
13935.3	H	58.56	-36.67	-27	-9.67
17977.05	H	66.31	-28.92	-27	-1.92

Test mode: 802.11ac Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11131.15	V	56.43	-38.8	-27	-11.8
13954	V	57.67	-37.56	-27	-10.56
17993.2	V	66.28	-28.95	-27	-1.95
11875.75	H	56.27	-38.96	-27	-11.96
14162.25	H	57.62	-37.61	-27	-10.61
17858.05	H	64.31	-30.92	-27	-3.92

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3)EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters



Test mode: 802.11ac

Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
11062.3	V	57.58	40.58	74	54	-16.42	-13.42
14056.85	V	58.40	41.40	74	54	-15.60	-12.60
17877.6	V	65.48	47.48	74	54	-8.52	-6.52
11083.55	H	56.07	40.07	74	54	-17.93	-13.93
14003.3	H	57.82	41.82	74	54	-16.18	-12.18
17973.65	H	65.75	48.75	74	54	-8.25	-5.25

Test mode: 802.11ac

Frequency(MHz): 5200

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
11053.8	V	55.48	38.48	74	54	-18.52	-15.52
15041.15	V	57.99	40.99	74	54	-16.01	-13.01
17997.45	V	66.79	48.79	74	54	-7.21	-5.21
11051.25	H	56.25	40.25	74	54	-17.75	-13.75
13935.3	H	58.56	42.56	74	54	-15.44	-11.44
17977.05	H	66.31	50.31	74	54	-7.69	-3.69

Test mode: 802.11ac

Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
11131.15	V	56.43	40.43	74	54	-17.57	-13.57
13954	V	57.67	41.67	74	54	-16.33	-12.33
17993.2	V	66.28	50.28	74	54	-7.72	-3.72
11875.75	H	56.27	40.27	74	54	-17.73	-13.73
14162.25	H	57.62	41.62	74	54	-16.38	-12.38
17858.05	H	64.31	48.31	74	54	-9.69	-5.69

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
  - (2) Emission Level= Reading Level+Correct Factor.
  - (3) Correct Factor= Ant\_F + Cab\_L - Preamp
  - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

● ☒ Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

Test mode: 802.11ac Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5124.65	H	47.69	-47.54	-27	Pass
5146.75	V	59.11	-36.12	-27	Pass

Test mode: 802.11ac Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5351.21	H	47.81	-47.42	-27	Pass
5355.5	V	47.87	-47.36	-27	Pass

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3) EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

Test mode: 802.11ac Frequency(MHz): 5180

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5124.65	H	47.69	74	30.69	54
5146.75	V	59.11	74	41.11	54

Test mode: 802.11ac Frequency(MHz): 5240

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5351.21	H	47.81	74	30.81	54
5355.5	V	47.87	74	30.87	54

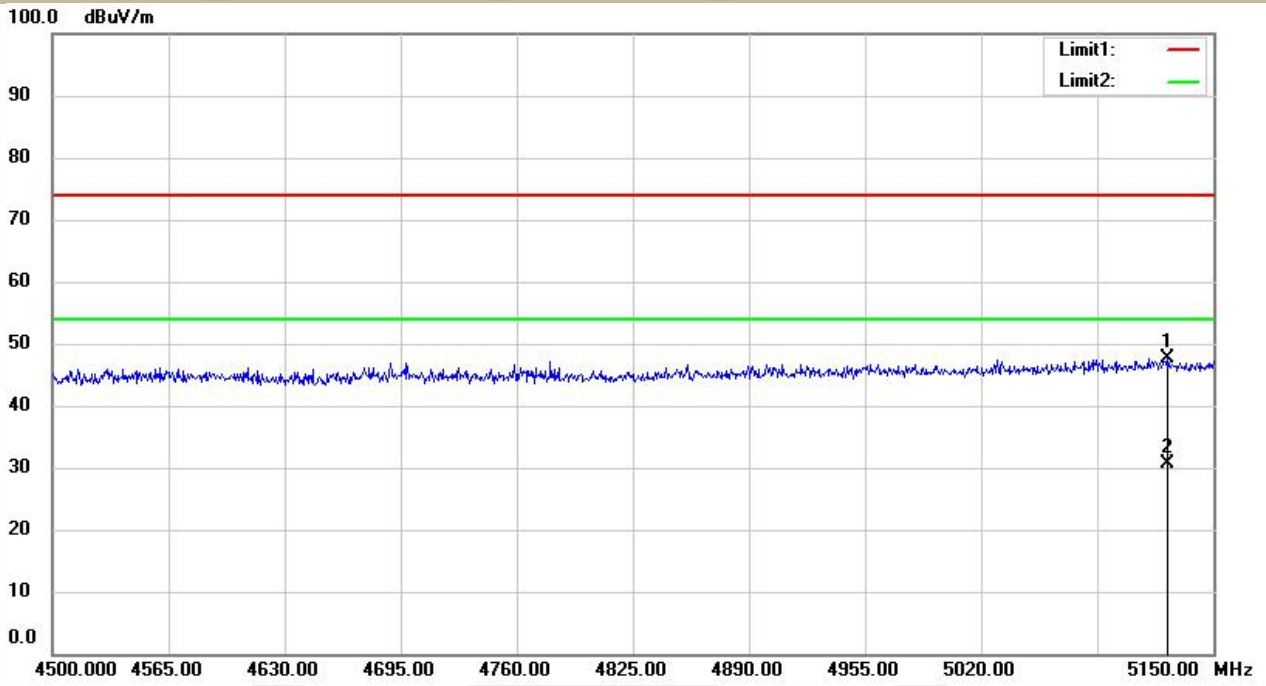
**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



**U-NII - 1**

Test Model    Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

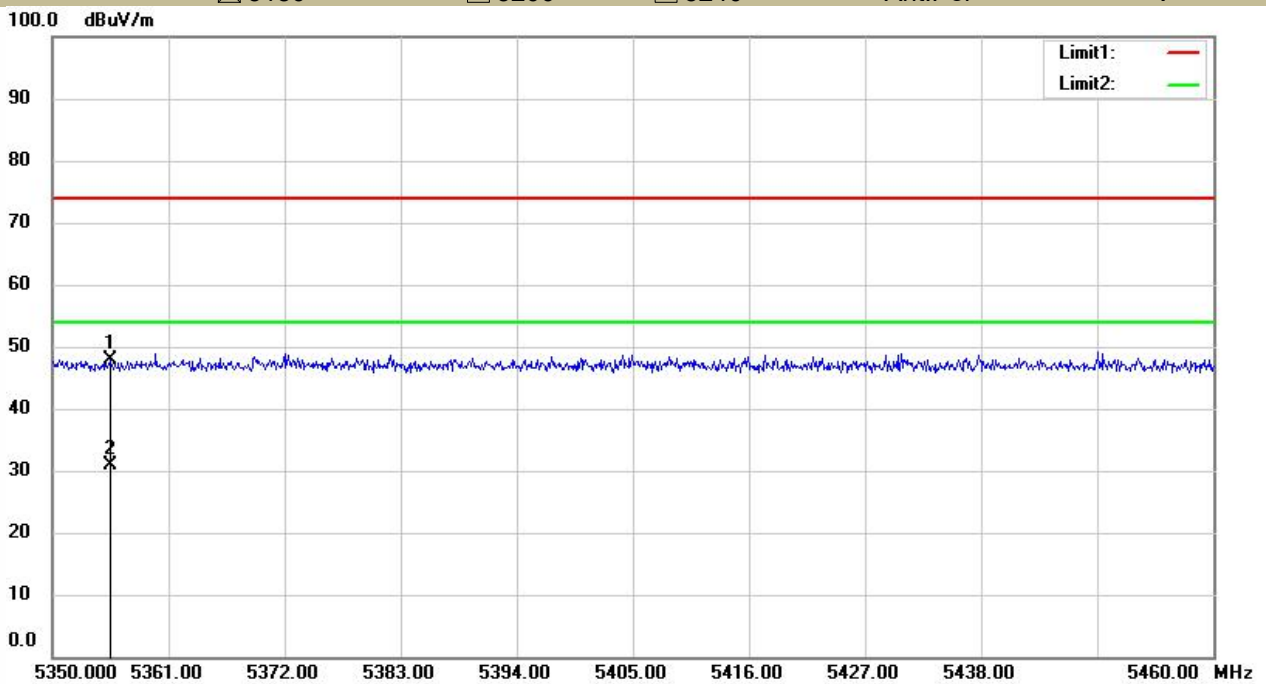
802.11ac                       802.11n(HT20)                       802.11n(HT40)  
 5180                                       5200                                       5240                                      Ant.Pol                                      H



**U-NII - 1**

Test Model    Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

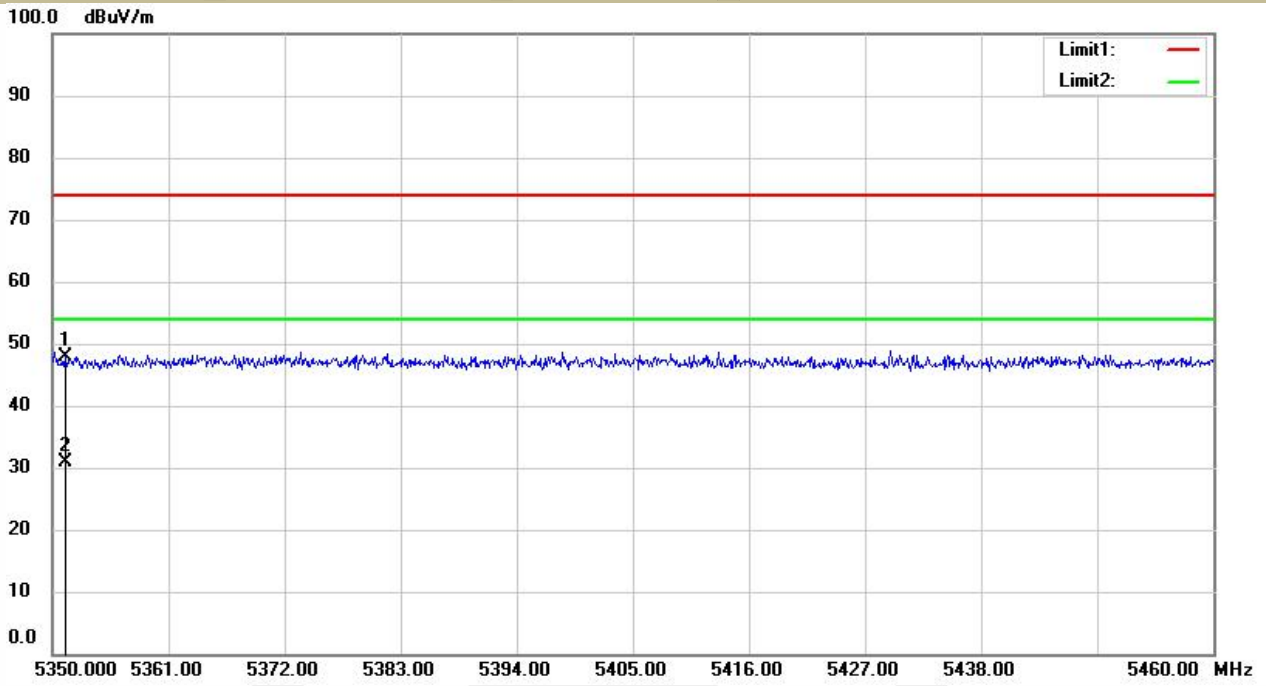
802.11ac                       802.11n(HT20)                       802.11n(HT40)  
 5180                                       5200                                       5240                                      Ant.Pol                                      V



**U-NII - 1**

Test Model Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

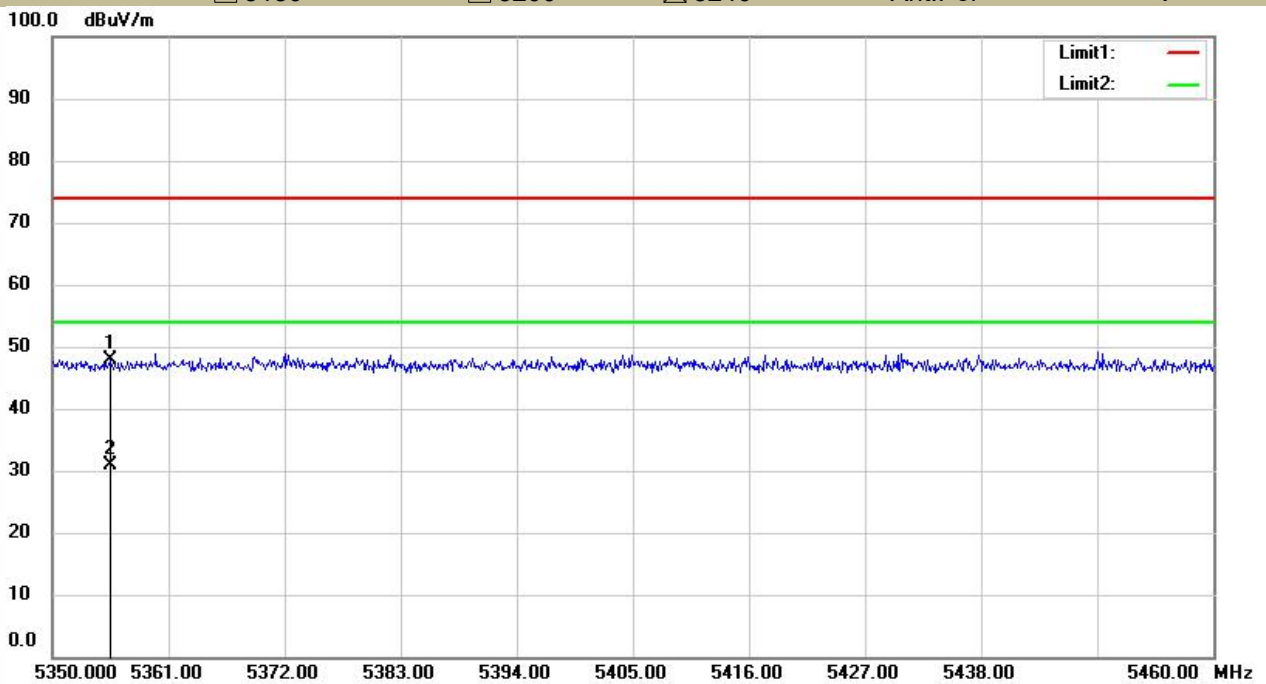
802.11ac       802.11n(HT20)       802.11n(HT40)  
 5180       5200       5240      Ant.Pol      H



**U-NII - 1**

Test Model Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

802.11ac       802.11n(HT20)       802.11n(HT40)  
 5180       5200       5240      Ant.Pol      V



- For Undesirable radiated Spurious Emission in U-NII -2A
- All the modes 802.11a/n/ac has been tested and the worst result antenna 1 802.11ac recorded as below:
- :  Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

Test mode: 802.11ac Frequency(MHz): 5260

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11163.45	V	57.73	-37.5	-27	-10.5
14039.85	V	58.74	-36.49	-27	-9.49
17994.9	V	65.14	-30.09	-27	-3.09
11972.65	H	56.79	-38.44	-27	-11.44
14965.5	H	57.91	-37.32	-27	-10.32
17987.25	H	65.52	-29.71	-27	-2.71

Test mode: 802.11ac Frequency(MHz): 5280

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11018.1	V	56.02	-39.21	-27	-12.21
14960.4	V	57.9	-37.33	-27	-10.33
17986.4	V	66.01	-29.22	-27	-2.22
11059.75	H	57.04	-38.19	-27	-11.19
14980.8	H	58.1	-37.13	-27	-10.13
17998.3	H	64.87	-30.36	-27	-3.36

Test mode: 802.11ac Frequency(MHz): 5320

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11914	V	56.9	-38.33	-27	-11.33
15007.15	V	58.48	-36.75	-27	-9.75
17985.55	V	66.03	-29.2	-27	-2.2
11064	H	57.23	-38	-27	-11
14084.9	H	57.99	-37.24	-27	-10.24
17978.75	H	65.6	-29.63	-27	-2.63

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3)EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

Frequency: 802.11ac

Frequency(MHz): 5260

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		H/V	PK	AV	PK	AV	PK
11163.45	V	57.73	40.73	74	54	-16.27	-13.27
14039.85	V	58.74	41.74	74	54	-15.26	-12.26
17994.9	V	65.14	48.14	74	54	-8.86	-5.86
11972.65	H	56.79	40.79	74	54	-17.21	-13.21
14965.5	H	57.91	41.91	74	54	-16.09	-12.09
17987.25	H	65.52	48.52	74	54	-8.48	-5.48

Frequency: 802.11ac

Frequency(MHz): 5280

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		H/V	PK	AV	PK	AV	PK
11018.1	V	56.02	40.02	74	54	-17.98	-13.98
14960.4	V	57.90	41.90	74	54	-16.10	-12.10
17986.4	V	66.01	50.01	74	54	-7.99	-3.99
11059.75	H	57.04	40.04	74	54	-16.96	-13.96
14980.8	H	58.10	41.10	74	54	-15.90	-12.90
17998.3	H	64.87	48.87	74	54	-9.13	-5.13

Frequency: 802.11ac

Frequency(MHz): 5320

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		H/V	PK	AV	PK	AV	PK
11914	V	56.90	40.90	74	54	-17.10	-13.10
15007.15	V	58.48	41.48	74	54	-15.52	-12.52
17985.55	V	66.03	50.03	74	54	-7.97	-3.97
11064	H	57.23	40.23	74	54	-16.77	-13.77
14084.9	H	57.99	41.99	74	54	-16.01	-12.01
17978.75	H	65.60	48.60	74	54	-8.40	-5.40

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
  - (2) Emission Level= Reading Level+Correct Factor.
  - (3) Correct Factor= Ant\_F + Cab\_L - Preamp
  - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

● ☒ Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

Test mode: 802.11ac Frequency(MHz): 5260

Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5131.8	H	48.31	-46.92	-27	Pass
5109.05	V	47.56	-47.67	-27	Pass

Test mode: 802.11ac Frequency(MHz): 5320

Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5350.77	H	48.19	-47.04	-27	Pass
5350	V	50.66	-44.57	-27	Pass

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3)EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

Test mode: 802.11ac Frequency(MHz): 5260

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5131.8	H	48.31	74	30.31	54
5109.05	V	47.56	74	30.56	54

Test mode: 802.11ac Frequency(MHz): 5320

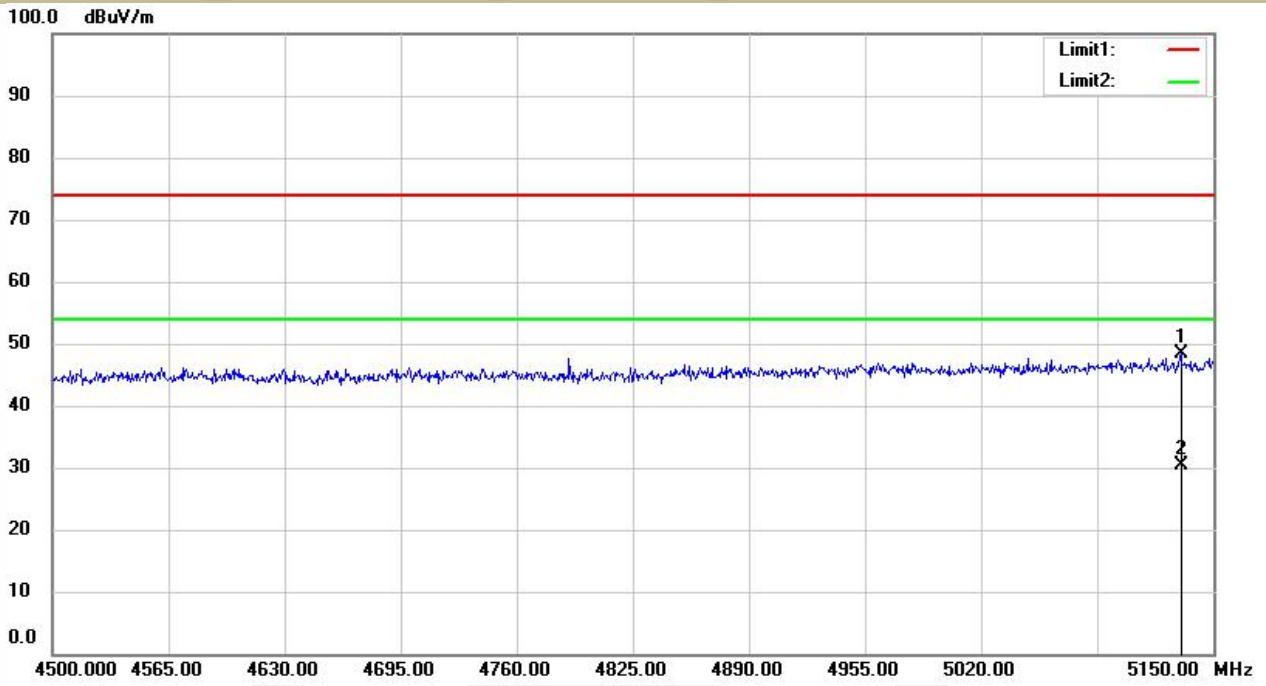
Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5350.77	H	48.19	74	30.19	54
5350	V	50.66	74	32.66	54

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

**U-NII -2A**

Test Model Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

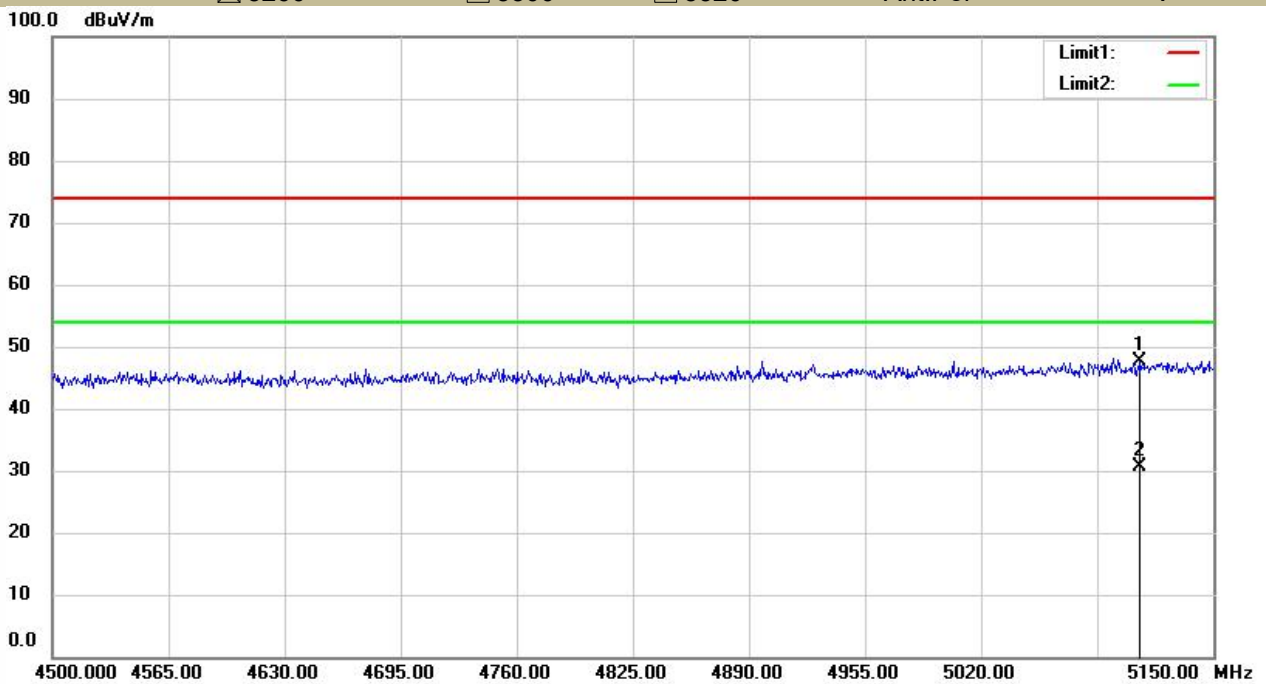
802.11ac       802.11n(HT20)       802.11 ac (VHT20)  
 5260       5300       5320      Ant.Pol      H



**U-NII -2A**

Test Model Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

802.11ac       802.11n(HT20)       802.11 ac (VHT20)  
 5260       5300       5320      Ant.Pol      V

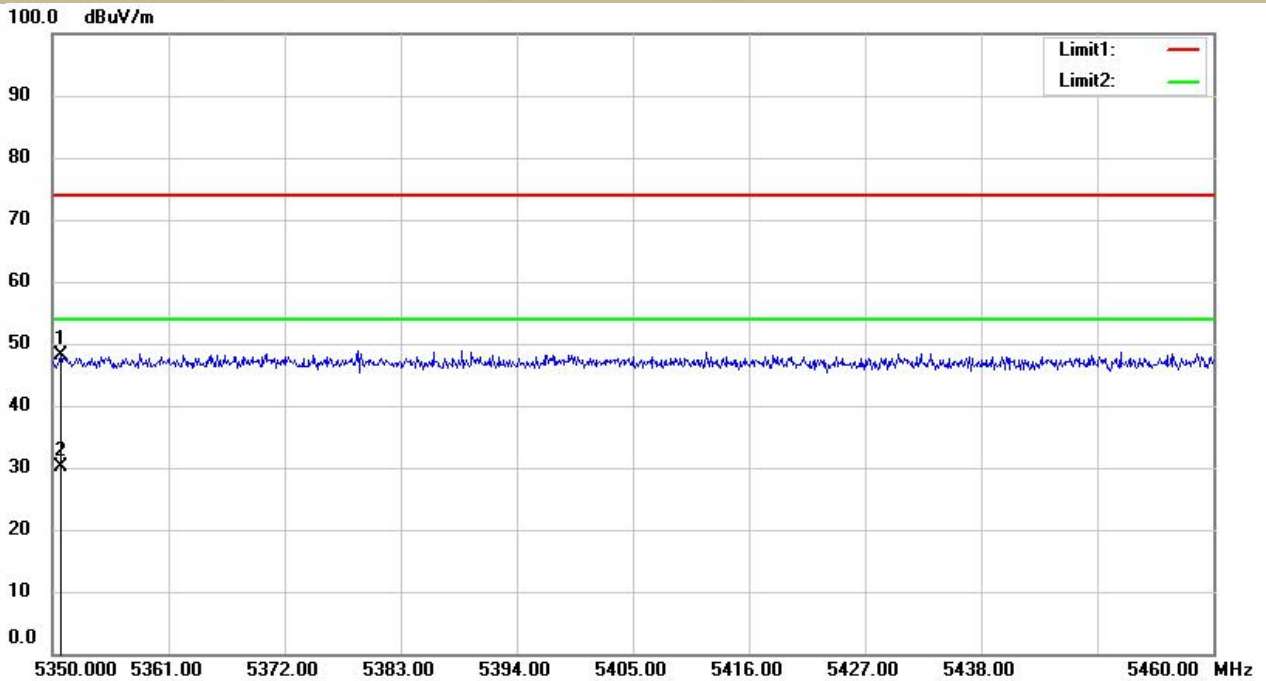


**U-NII -2A**

Test Model Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

802.11ac
 802.11n(HT20)
 802.11 ac (VHT20)

5260
 5300
 5320
Ant.Pol
H

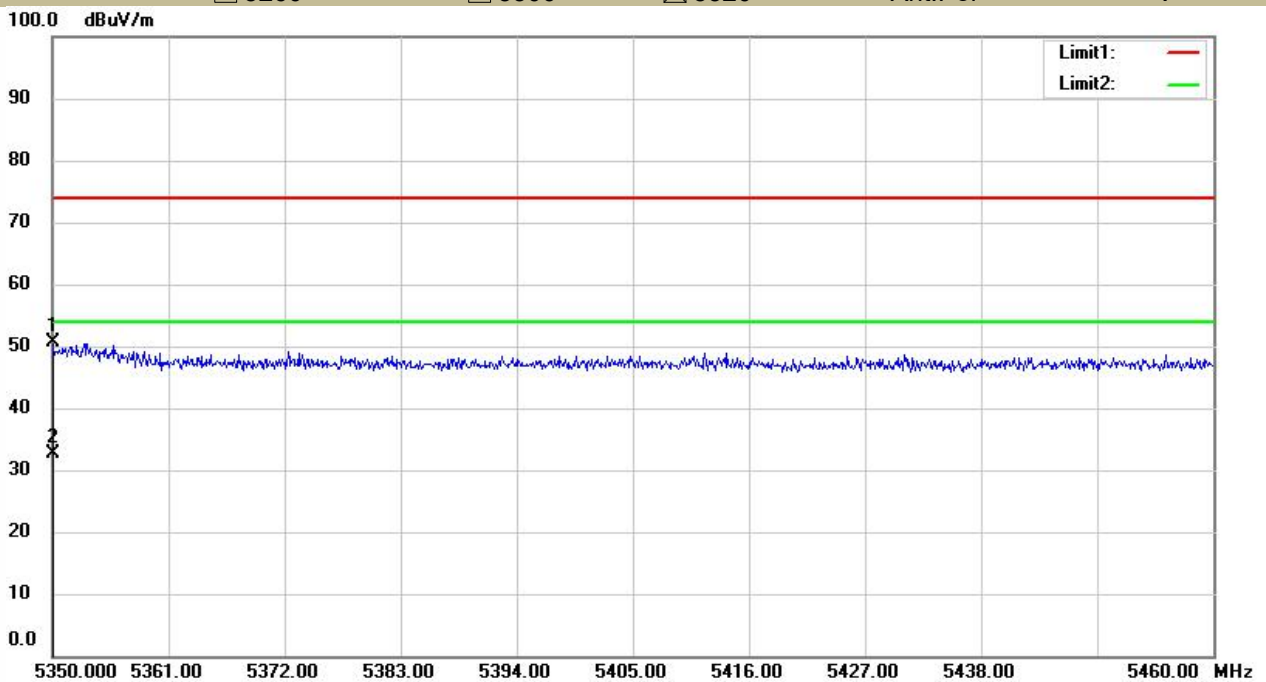


**U-NII -2A**

Test Model Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

802.11ac
 802.11n(HT20)
 802.11 ac (VHT20)

5260
 5300
 5320
Ant.Pol
V





- For Undesirable radiated Spurious Emission in U-NII -2C
- All the modes 802.11a/n/ac has been tested and the worst result antenna 1 802.11ac recorded as below:
- :  Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

Test mode: 802.11ac Frequency(MHz): 5500

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11936.95	V	56.56	-38.67	-27	-11.67
15143.15	V	58.38	-36.85	-27	-9.85
17916.7	V	66.02	-29.21	-27	-2.21
11001.1	H	56.56	-38.67	-27	-11.67
14215.8	H	58.26	-36.97	-27	-9.97
17947.3	H	65.62	-29.61	-27	-2.61

Test mode: 802.11ac Frequency(MHz): 5580

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11100.55	V	56.95	-38.28	-27	-11.28
15144	V	58.1	-37.13	-27	-10.13
17814.7	V	64.32	-30.91	-27	-3.91
11035.95	H	56.39	-38.84	-27	-11.84
14872.85	H	58.79	-36.44	-27	-9.44
17998.3	H	65.61	-29.62	-27	-2.62

Test mode: 802.11ac Frequency(MHz): 5700

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11060.6	V	55.74	-39.49	-27	-12.49
14889	V	57.81	-37.42	-27	-10.42
17998.3	V	64.96	-30.27	-27	-3.27
11048.7	H	56.98	-38.25	-27	-11.25
14978.25	H	58.5	-36.73	-27	-9.73
17993.2	H	65.19	-30.04	-27	-3.04

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3)EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters



Frequency: 802.11ac

Frequency(MHz): 5500

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
11936.95	V	56.56	40.26	74	54	-17.44	-13.74
15143.15	V	58.38	42.38	74	54	-15.62	-11.62
17916.7	V	66.02	50.02	74	54	-7.98	-3.98
11001.1	H	56.56	40.56	74	54	-17.44	-13.44
14215.8	H	58.26	42.26	74	54	-15.74	-11.74
17947.3	H	65.62	48.62	74	54	-8.38	-5.38

Frequency: 802.11ac

Frequency(MHz): 5580

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
11100.55	V	56.95	40.95	74	54	-17.05	-13.05
15144	V	58.10	41.10	74	54	-15.90	-12.90
17814.7	V	64.32	48.32	74	54	-9.68	-5.68
11035.95	H	56.39	40.39	74	54	-17.61	-13.61
14872.85	H	58.79	41.79	74	54	-15.21	-12.21
17998.3	H	65.61	48.61	74	54	-8.39	-5.39

Frequency: 802.11ac

Frequency(MHz): 5700

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
11060.6	V	55.74	39.74	74	54	-18.26	-14.26
14889	V	57.81	41.81	74	54	-16.19	-12.19
17998.3	V	64.96	48.96	74	54	-9.04	-5.04
11048.7	H	56.98	40.98	74	54	-17.02	-13.02
14978.25	H	58.50	41.50	74	54	-15.50	-12.50
17993.2	H	65.19	48.19	74	54	-8.81	-5.81

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
  - (2) Emission Level= Reading Level+Correct Factor.
  - (3) Correct Factor= Ant\_F + Cab\_L - Preamp
  - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

● ☒ Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

Test mode: 802.11ac Frequency(MHz): 5500

Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5468.95	H	48.52	-46.71	-27	Pass
5468.85	V	51.63	-43.6	-27	Pass

Test mode: 802.11ac Frequency(MHz): 5700

Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5725.3	H	48.24	-46.99	-27	Pass
5725.3	V	50.27	-44.96	-27	Pass

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3)EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

Test mode: 802.11ac Frequency(MHz): 5500

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5468.95	H	48.52	74	30.52	54
5468.85	V	51.63	74	35.63	54

Test mode: 802.11ac Frequency(MHz): 5700

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5725.3	H	48.24	74	30.24	54
5725.3	V	50.27	74	32.27	54

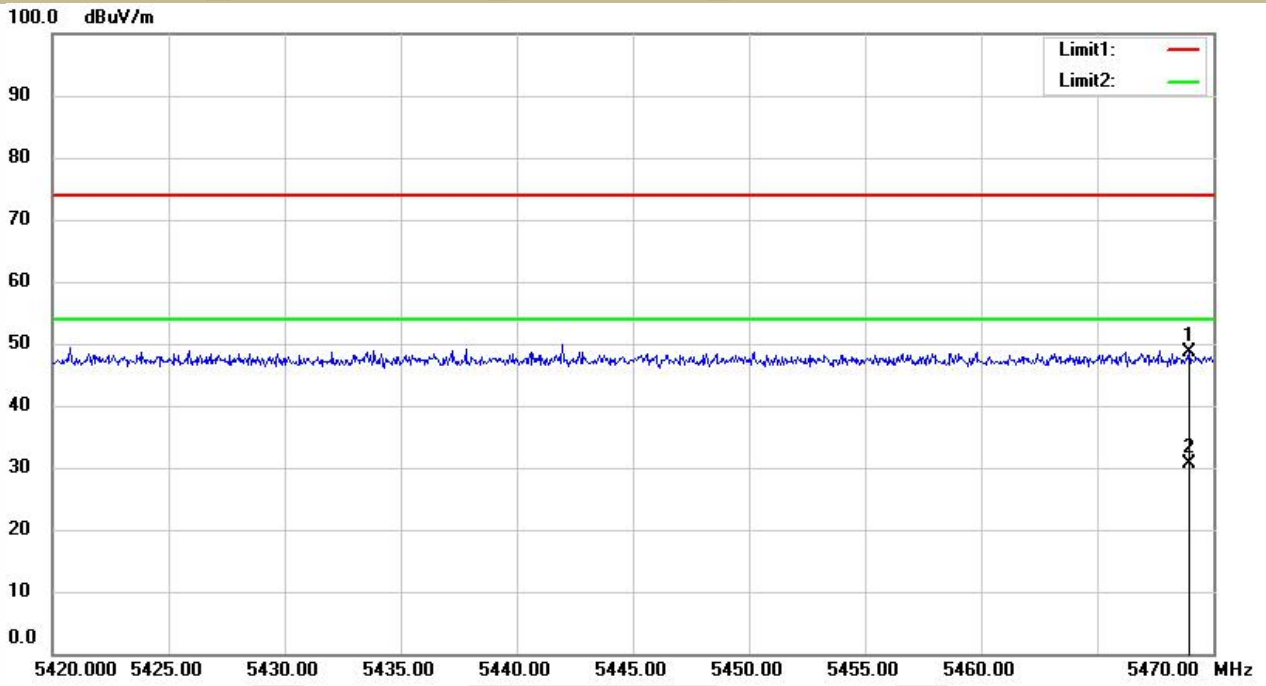
**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

**U-NII -2C**

Test Model    Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

802.11ac                       802.11n(HT20)                       802.11 ac (VHT20)

5500                       5580                       5700                      Ant.Pol                      H

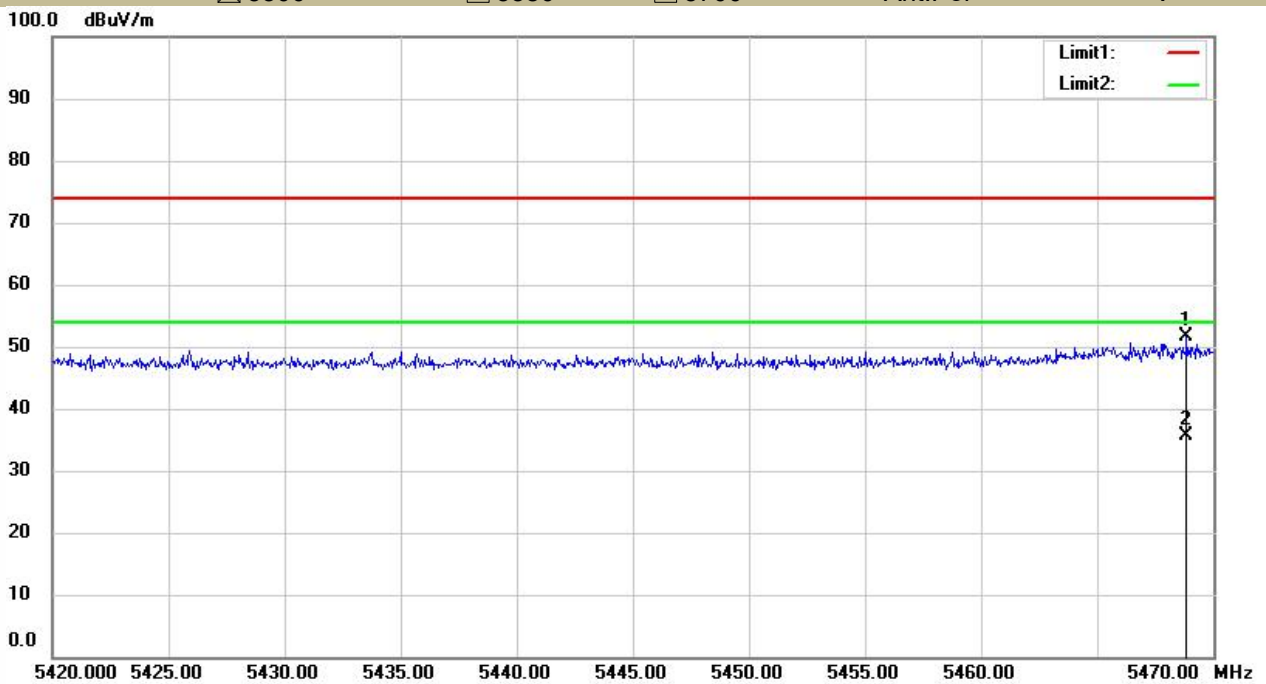


**U-NII -2C**

Test Model    Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

802.11ac                       802.11n(HT20)                       802.11 ac (VHT20)

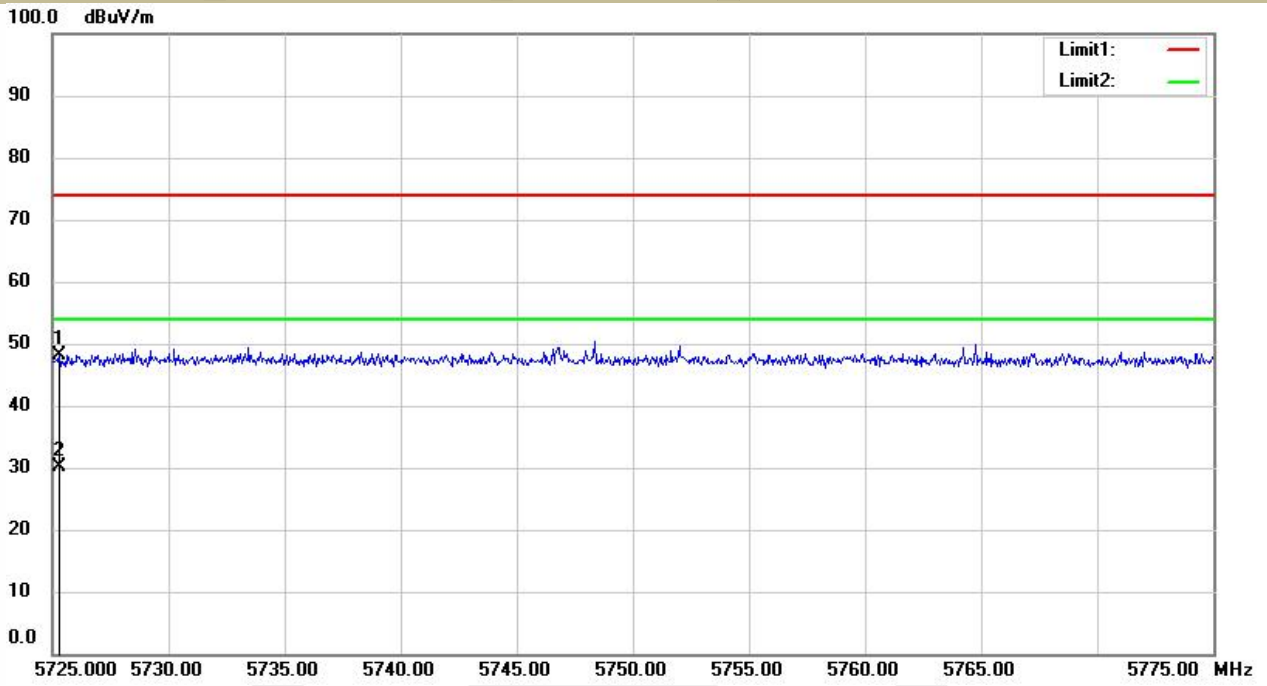
5500                       5580                       5700                      Ant.Pol                      V



**U-NII -2C**

Test Model    Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

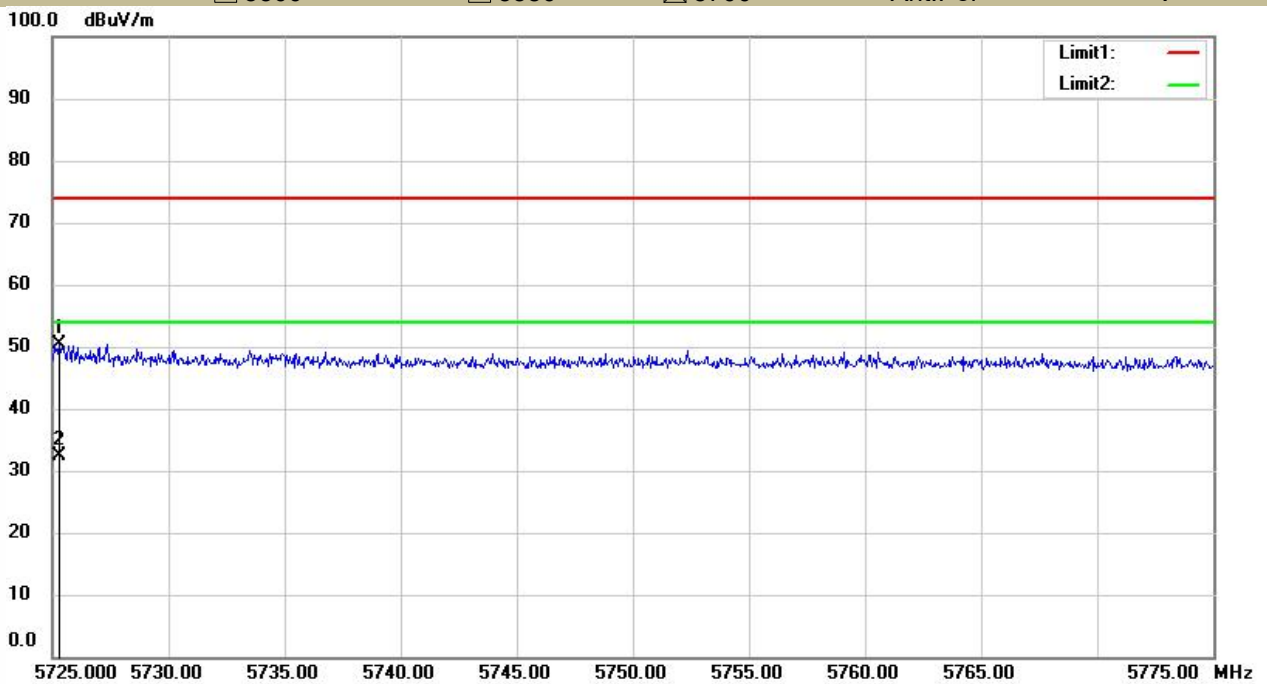
802.11ac                       802.11n(HT20)                       802.11 ac (VHT20)  
 5500                                       5580                                       5700                                      Ant.Pol                                      H



**U-NII -2C**

Test Model    Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

802.11ac                       802.11n(HT20)                       802.11 ac (VHT20)  
 5500                                       5580                                       5700                                      Ant.Pol                                      V



- For Undesirable radiated Spurious Emission in U-NII -3
- All the modes 802.11a/n/ac has been tested and the worst result antenna 1 802.11ac recorded as below:
- Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

Test mode: 802.11ac Frequency(MHz): 5745

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11038.5	V	56.82	-38.41	-27	-11.41
15176.3	V	57.89	-37.34	-27	-10.34
17957.5	V	64.9	-30.33	-27	-3.33
11026.6	H	56.29	-38.94	-27	-11.94
15195.85	H	58.31	-36.92	-27	-9.92
17872.5	H	65.5	-29.73	-27	-2.73

Test mode: 802.11ac Frequency(MHz): 5785

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10999.4	V	56.18	-39.05	-27	-12.05
14838.85	V	58.02	-37.21	-27	-10.21
17905.65	V	65.04	-30.19	-27	-3.19
11018.1	H	55.79	-39.44	-27	-12.44
15076.85	H	59.2	-36.03	-27	-9.03
17968.55	H	65.83	-29.4	-27	-2.4

Test mode: 802.11ac Frequency(MHz): 5825

Freq. (MHz)	Ant.Pol.	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11109.9	V	56.23	-39	-27	-12
14962.1	V	58.34	-36.89	-27	-9.89
18000	V	64.99	-30.24	-27	-3.24
11013.85	H	55.81	-39.42	-27	-12.42
14980.8	H	58.34	-36.89	-27	-9.89
17983	H	66.55	-28.68	-27	-1.68

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3)EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

Frequency: 802.11ac

Frequency(MHz): 5745

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
11038.5	V	56.82	40.82	74	54	-17.18	-13.18
15176.3	V	57.89	41.89	74	54	-16.11	-12.11
17957.5	V	64.90	48.90	74	54	-9.10	-5.10
11026.6	H	56.29	40.29	74	54	-17.71	-13.71
15195.85	H	58.31	42.31	74	54	-15.69	-11.69
17872.5	H	65.50	48.50	74	54	-8.50	-5.50

Frequency: 802.11ac

Frequency(MHz): 5785

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
10999.4	V	56.18	40.18	74	54	-17.82	-13.82
14838.85	V	58.02	42.02	74	54	-15.98	-11.98
17905.65	V	65.04	48.04	74	54	-8.96	-5.96
11018.1	H	55.79	39.79	74	54	-18.21	-14.21
15076.85	H	59.20	42.20	74	54	-14.80	-11.80
17968.55	H	65.83	49.83	74	54	-8.17	-4.17

Frequency: 802.11ac

Frequency(MHz): 5825

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
11109.9	V	56.23	40.23	74	54	-17.77	-13.77
14962.1	V	58.34	42.34	74	54	-15.66	-11.66
18000	V	64.99	48.99	74	54	-9.01	-5.01
11013.85	H	55.81	39.81	74	54	-18.19	-14.19
14980.8	H	58.34	42.34	74	54	-15.66	-11.66
17983	H	66.55	50.55	74	54	-7.45	-3.45

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
  - (2) Emission Level= Reading Level+Correct Factor.
  - (3) Correct Factor= Ant\_F + Cab\_L - Preamp
  - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

●  Undesirable radiated Spurious Emission in band edge

Test mode: 802.11ac Frequency: 5745

Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5724.25	H	53.97	-41.26	27	Pass
5724.25	V	58.96	-36.27	27	Pass

Test mode: 802.11ac Frequency: 5825

Freq. (MHz)	Ant.Pol.	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5855.625	H	48.23	-47	15.42	Pass
5850.75	V	50.38	-44.85	27	Pass

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3)  $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$   
 d is the measurement distance in 3 meters

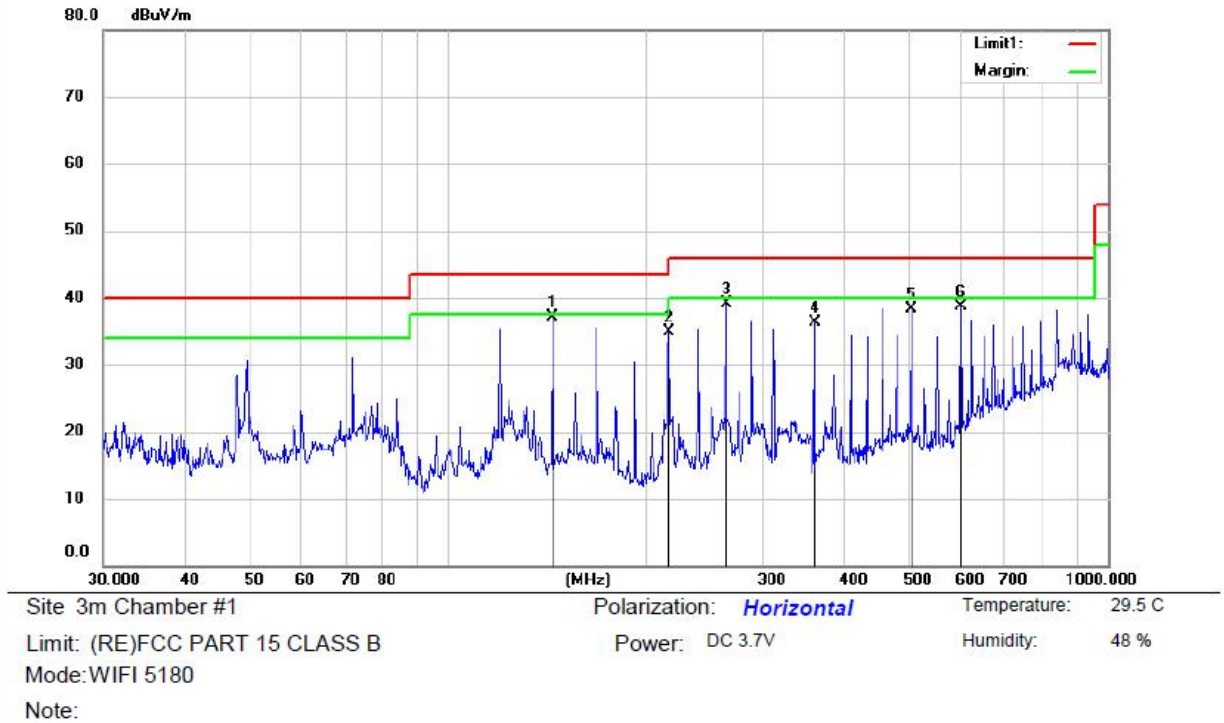




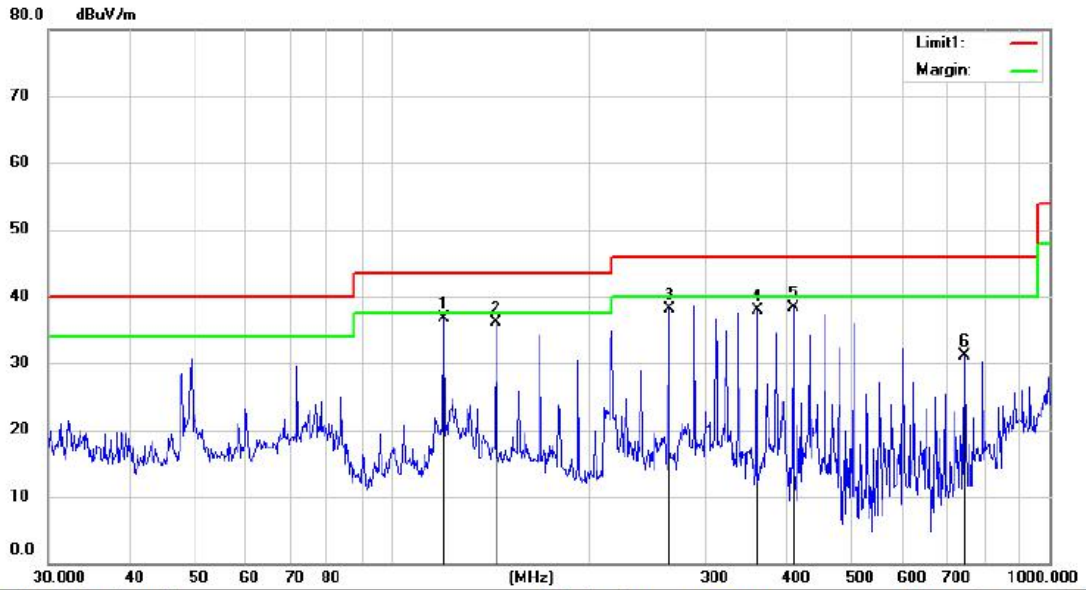




- Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)  
All the modes 802.11a/n/ac has been tested and the worst result 802.11a recorded as below:

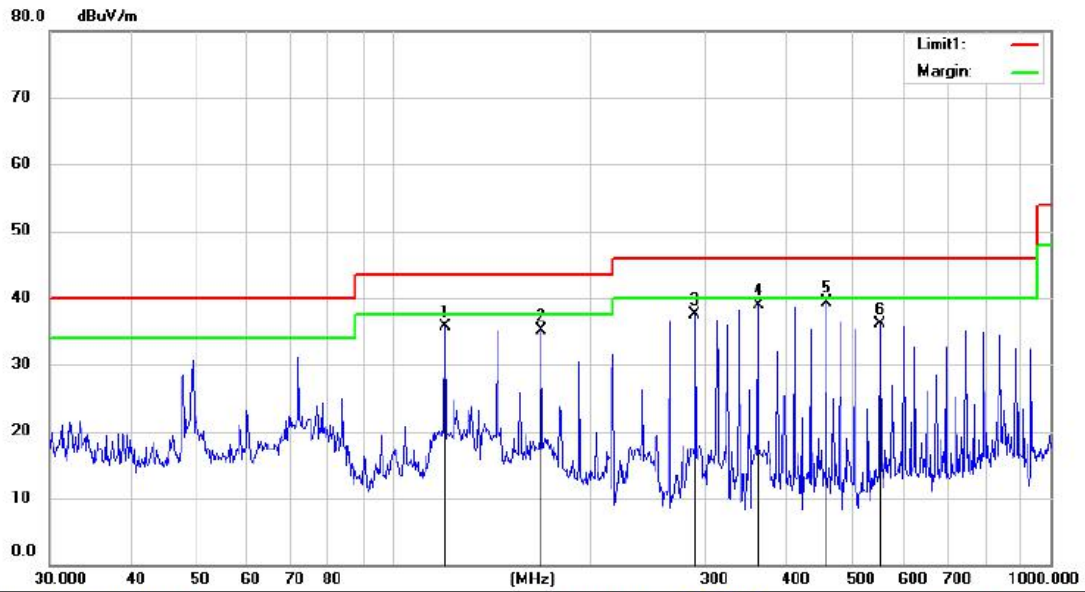


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	144.0188	51.34	-14.25	37.09	43.50	-6.41	QP		
2		216.0240	48.19	-13.27	34.92	46.00	-11.08	QP		
3		264.0504	49.89	-10.82	39.07	46.00	-6.93	QP		
4		359.9741	43.81	-7.44	36.37	46.00	-9.63	QP		
5		504.0430	43.34	-4.99	38.35	46.00	-7.65	QP		
6		600.1100	41.45	-2.84	38.61	46.00	-7.39	QP		



Site: 3m Chamber #1      Polarization: **Vertical**      Temperature: 29.5 C  
 Limit: (RE)FCC PART 15 CLASS B      Power: DC 3.7V      Humidity: 48 %  
 Mode: WIFI 5180  
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	120.0133	51.15	-14.35	36.80	43.50	-6.70	QP		
2		144.0188	50.34	-14.25	36.09	43.50	-7.41	QP		
3		264.0504	48.89	-10.82	38.07	46.00	-7.93	QP		
4		359.9741	45.31	-7.44	37.87	46.00	-8.13	QP		
5		408.0507	44.58	-6.24	38.34	46.00	-7.66	QP		
6		744.2134	31.11	0.02	31.13	46.00	-14.87	QP		



Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 29.5 C

Limit: (RE)FCC PART 15 CLASS B

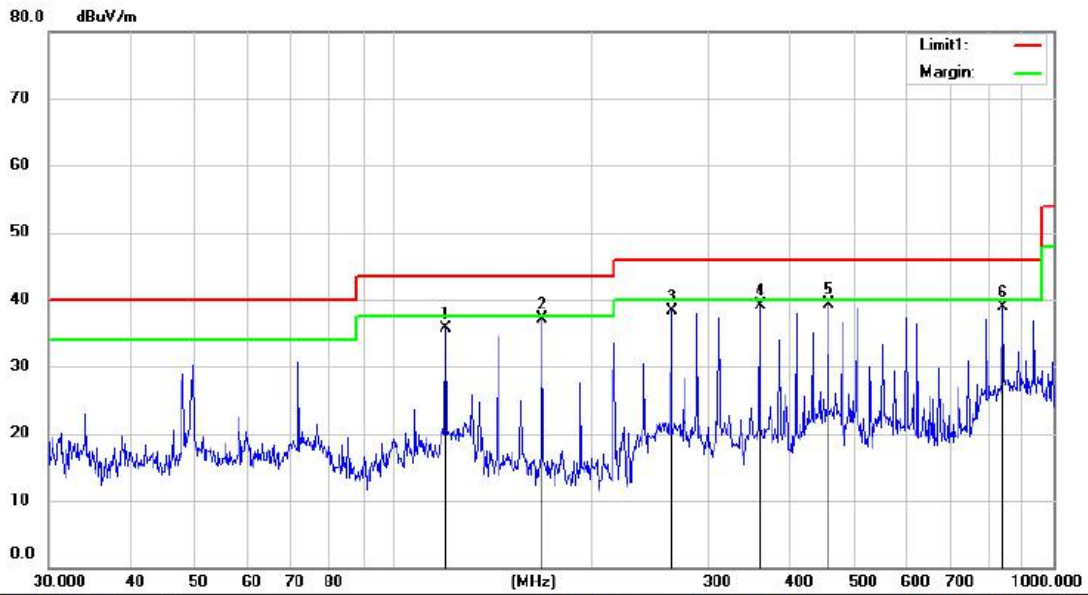
Power: DC 3.7V

Humidity: 48 %

Mode:WIFI 5200

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		120.0133	50.15	-14.35	35.80	43.50	-7.70			QP
2		168.0451	49.16	-14.11	35.05	43.50	-8.45			QP
3		287.9904	47.07	-9.66	37.41	46.00	-8.59			QP
4		359.9741	46.31	-7.44	38.87	46.00	-7.13			QP
5	*	456.1057	45.12	-5.85	39.27	46.00	-6.73			QP
6		552.1568	40.17	-3.98	36.19	46.00	-9.81			QP



Site 3m Chamber #1

Polarization: **Horizontal**

Temperature: 29.5 C

Limit: (RE)FCC PART 15 CLASS B

Power: DC 3.7V

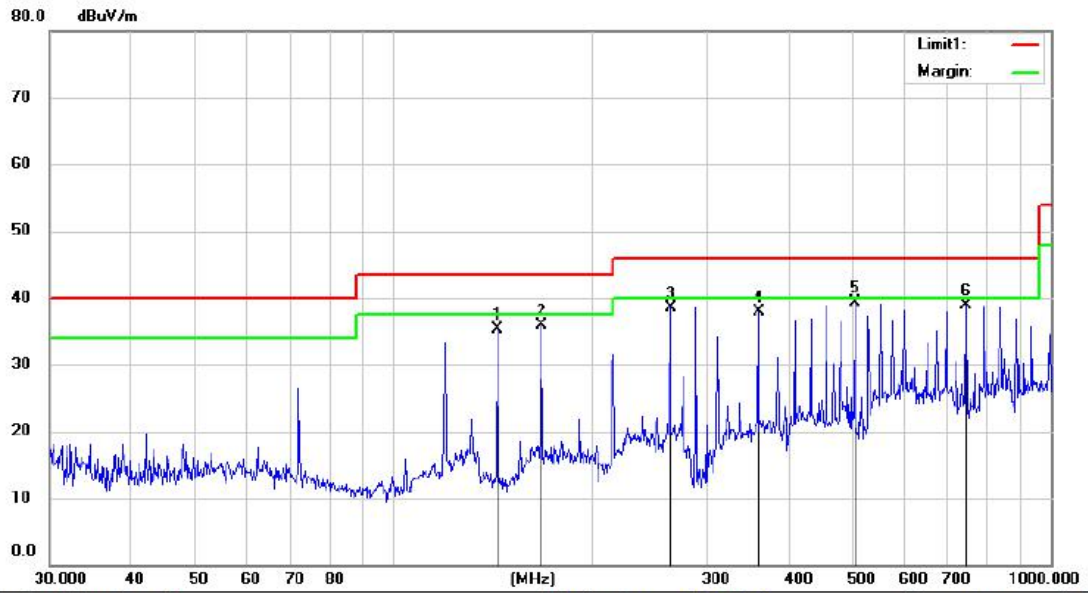
Humidity: 48 %

Mode: WIFI 5200

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree	Comment
1		120.0133	50.00	-14.35	35.65	43.50	-7.85	QP			
2	*	168.0451	51.30	-14.11	37.19	43.50	-6.31	QP			
3		264.0504	49.14	-10.82	38.32	46.00	-7.68	QP			
4		360.1320	46.55	-7.44	39.11	46.00	-6.89	QP			
5		456.1057	45.23	-5.85	39.38	46.00	-6.62	QP			
6		840.2860	36.13	2.86	38.99	46.00	-7.01	QP			





Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 29.5 C

Limit: (RE)FCC PART 15 CLASS B

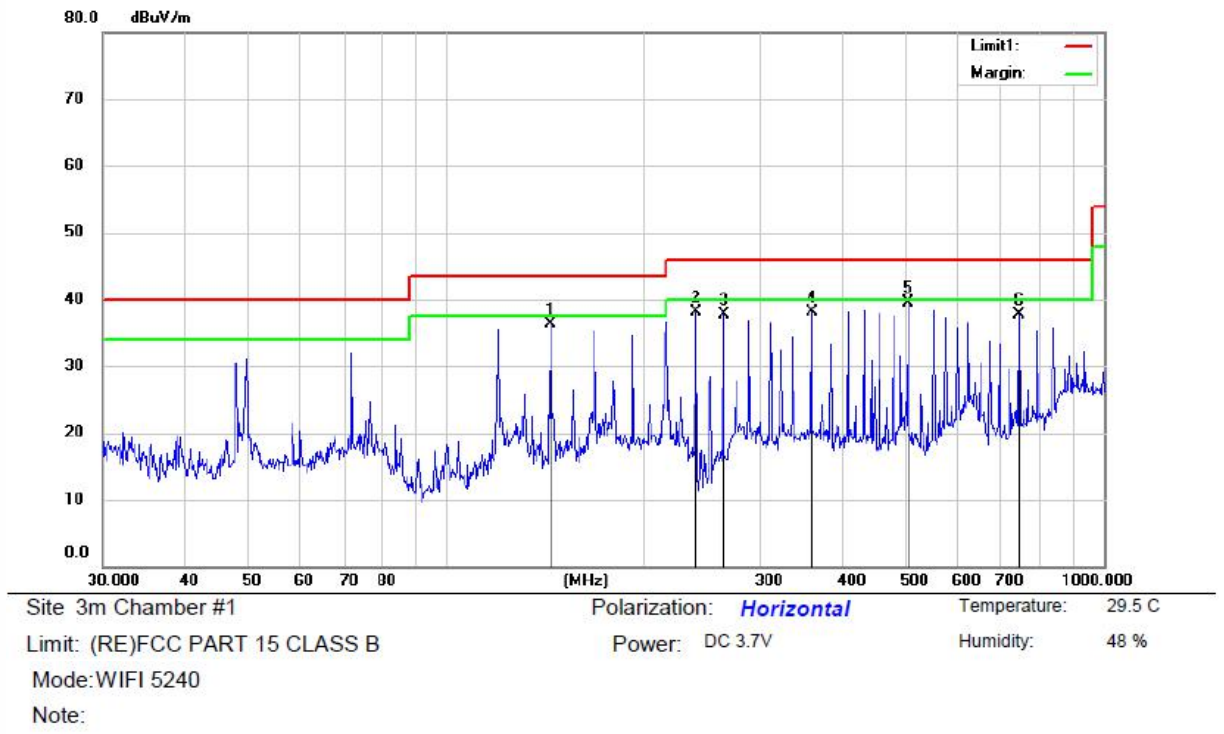
Power: DC 3.7V

Humidity: 48 %

Mode:WIFI 5240

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		144.0188	49.60	-14.25	35.35	43.50	-8.15			QP
2		167.9714	50.11	-14.11	36.00	43.50	-7.50			QP
3		264.0504	49.28	-10.82	38.46	46.00	-7.54			QP
4		359.9741	45.33	-7.44	37.89	46.00	-8.11			QP
5	*	504.0430	44.39	-4.99	39.40	46.00	-6.60			QP
6		744.2134	38.83	0.02	38.85	46.00	-7.15			QP



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		144.0188	50.50	-14.25	36.25	43.50	-7.25			QP
2		239.9873	50.23	-12.16	38.07	46.00	-7.93			QP
3		264.0504	48.54	-10.82	37.72	46.00	-8.28			QP
4		359.9741	45.60	-7.44	38.16	46.00	-7.84			QP
5	*	504.0430	44.44	-4.99	39.45	46.00	-6.55			QP
6		744.2134	37.75	0.02	37.77	46.00	-8.23			QP

## 8.6 POWER LINE CONDUCTED EMISSIONS

### 8.6.1 Applicable Standard

According to FCC Part 15.207(a)

### 8.6.2 Conformance Limit

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies  
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 8.6.3 Test Configuration

Test according to clause 6.3 conducted emission test setup

### 8.6.4 Test Procedure

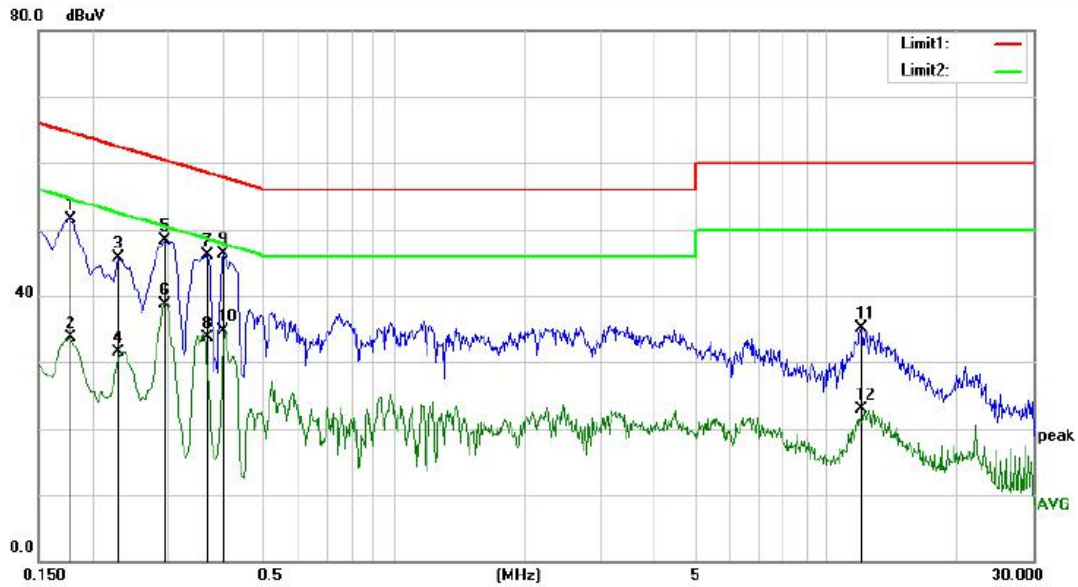
The EUT was placed on a table which is 0.8m above ground plane.  
Maximum procedure was performed on the highest emissions to ensure EUT compliance.  
Repeat above procedures until all frequency measured were complete.

### 8.6.5 Test Results

Pass

The AC120V &240V voltage have been tested, and the worst result recorded was report as below:



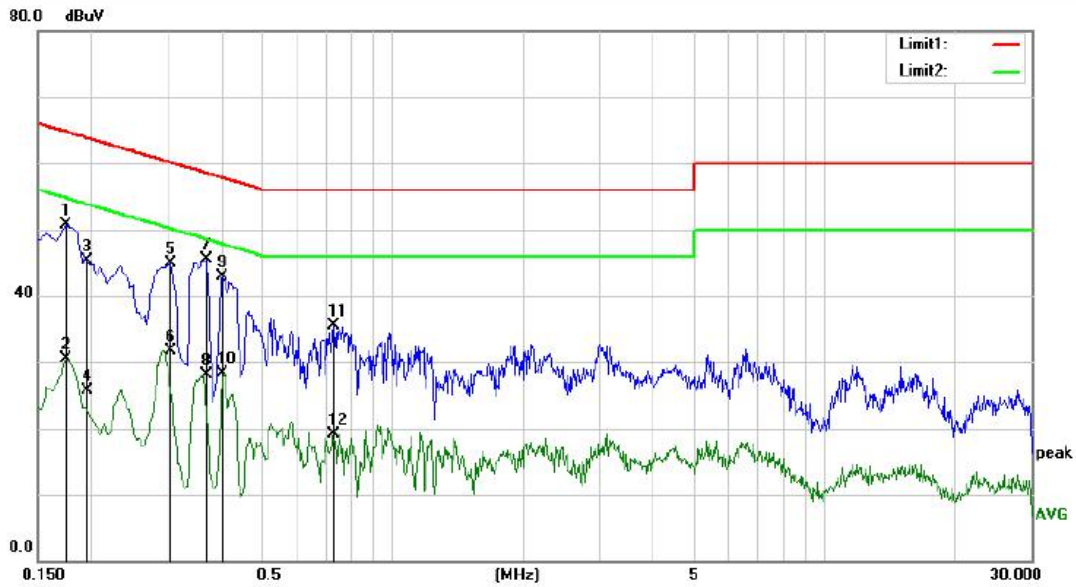


Site: Conduction #1  
 Limit: (CE)FCC PART 15 class B\_QP  
 Mode: TX  
 Note:

Phase: **N**  
 Power: AC 120V/60Hz

Temperature: 24.9  
 Humidity: 54 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1780	42.04	9.49	51.53	64.58	-13.05	QP	
2		0.1780	24.23	9.49	33.72	54.58	-20.86	AVG	
3		0.2300	36.35	9.38	45.73	62.45	-16.72	QP	
4		0.2300	22.19	9.38	31.57	52.45	-20.88	AVG	
5		0.2940	38.91	9.30	48.21	60.41	-12.20	QP	
6		0.2940	29.49	9.30	38.79	50.41	-11.62	AVG	
7		0.3700	36.78	9.32	46.10	58.50	-12.40	QP	
8		0.3700	24.31	9.32	33.63	48.50	-14.87	AVG	
9	*	0.4020	36.94	9.33	46.27	57.81	-11.54	QP	
10		0.4020	25.38	9.33	34.71	47.81	-13.10	AVG	
11		12.0100	24.86	10.15	35.01	60.00	-24.99	QP	
12		12.0100	12.69	10.15	22.84	50.00	-27.16	AVG	



Site: Conduction #1  
 Limit: (CE)FCC PART 15 class B\_QP  
 Mode: TX  
 Note:

Phase: L1  
 Power: AC 120V/60Hz  
 Temperature: 24.9  
 Humidity: 54 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1740	41.11	9.50	50.61	64.77	-14.16	QP	
2		0.1740	21.07	9.50	30.57	54.77	-24.20	AVG	
3		0.1955	35.78	9.43	45.21	63.80	-18.59	QP	
4		0.1955	16.28	9.43	25.71	53.80	-28.09	AVG	
5		0.3060	35.52	9.29	44.81	60.08	-15.27	QP	
6		0.3060	22.37	9.29	31.66	50.08	-18.42	AVG	
7	*	0.3700	36.23	9.32	45.55	58.50	-12.95	QP	
8		0.3700	18.82	9.32	28.14	48.50	-20.36	AVG	
9		0.4020	33.51	9.33	42.84	57.81	-14.97	QP	
10		0.4020	19.06	9.33	28.39	47.81	-19.42	AVG	
11		0.7300	26.21	9.34	35.55	56.00	-20.45	QP	
12		0.7300	9.77	9.34	19.11	46.00	-26.89	AVG	

## 8.7 ANTENNA APPLICATION

### 8.7.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 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 use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

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.

### 8.7.2 Result

PASS.

- The EUT has an Internal Antenna: antenna gains is 3.0 dBi
- Note:
- Antennas use a permanently attached antenna which is not replaceable.
  - Not using a standard antenna jack or electrical connector for antenna replacement
  - The antenna has to be professionally installed (please provide method of installation)

Which in accordance to section 15.203, please refer to the internal photos.

Detail of factor for radiated emission

Frequency(MHz)	Ant_F(dB)	Cab_L(dB)	Preamp(dB)	Correct Factor(dB)
0.009	20.6	0.03	\	20.63
0.15	20.7	0.1	\	20.8
1	20.9	0.15	\	21.05
10	20.1	0.28	\	20.38
30	18.8	0.45	\	19.25
30	11.7	0.62	27.9	-15.58
100	12.5	1.02	27.8	-14.28
300	12.9	1.91	27.5	-12.69
600	19.2	2.92	27	-4.88
800	21.1	3.54	26.6	-1.96
1000	22.3	4.17	26.2	0.27
1000	25.6	1.76	41.4	-14.04
3000	28.9	3.27	43.2	-11.03
5000	31.1	4.2	44.6	-9.3
8000	36.2	5.95	44.7	-2.55
10000	38.4	6.3	43.9	0.8
12000	38.5	7.14	42.3	3.34
15000	40.2	8.15	41.4	6.95
18000	45.4	9.02	41.3	13.12
18000	37.9	1.81	47.9	-8.19
21000	37.9	1.95	48.7	-8.85
25000	39.3	2.01	42.8	-1.49
28000	39.6	2.16	46.0	-4.24
31000	41.2	2.24	44.5	-1.06
34000	41.5	2.29	46.6	-2.81
37000	43.8	2.30	46.4	-0.3
40000	43.2	2.50	42.2	3.5

----- END OF REPORT -----