



REPORT No.: SZ24070300W04

# TEST REPORT

**APPLICANT** : Linkplay Technology Inc.

**PRODUCT NAME** : WiiM CI MOD A80 Stereo Streaming Amplifier

**MODEL NAME** : AMP011

**BRAND NAME** : WiiM

**FCC ID** : 2BABF-AMP011

**STANDARD(S)** : 47 CFR Part 15 Subpart E

**RECEIPT DATE** : 2024-07-31

**TEST DATE** : 2024-09-05 to 2024-09-12

**ISSUE DATE** : 2024-09-23



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Change History		
Version	Date	Reason for change
1.0	2024-09-23	First edition



# 1. Summary of Test Result

No.	Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	N/A <sup>Note1</sup>	N/A
2	ANSI C63.10	Duty Cycle of the Test Signal	N/A	N/A	N/A <sup>Note1</sup>	N/A
3	15.407(a)	Maximum Conducted Output Power	N/A	N/A	N/A <sup>Note1</sup>	N/A
4	15.407(a)(e)	Emission Bandwidth	N/A	N/A	N/A <sup>Note1</sup>	N/A
5	15.407(a)	Peak Power Spectral Density	N/A	N/A	N/A <sup>Note1</sup>	N/A
6	15.407(g)	Frequency Stability	N/A	N/A	N/A <sup>Note1</sup>	N/A
7	15.407(h)	DFS	N/A	N/A	N/A <sup>Note1</sup>	N/A
8	15.207	Conducted Emission	Aug. 16, 2024	Fan Shengquan	PASS	No deviation
9	15.407(b)	Restricted Frequency Bands	Sep. 04&05, 2024	Gao Jianrou	PASS	No deviation
10	15.407(b)	Radiated Emission	Sep. 04&05, 2024	Gao Jianrou	PASS	No deviation

**Note 1:** The test results of all conducted test items please refer to the module FCC test report (Report No.: SZ24040154W04), which issued on Jul. 26, 2024.

**Note 2:** The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.102013.

**Note 3:** These RF tests were performed according to the method of measurements prescribed in KDB 789033 D02 v02r01.

**Note 4:** These RF tests were performed according to the method of measurements prescribed in KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02.

**Note 5:** Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.



**Note 6:** When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

## 1.1. Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart E Radio Frequency Devices



## 1.2. Test Equipment List

### 1.2.1 Conducted Emission Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2024.01.25	2025.01.24
LISN	8127449	NSLK 8127	Schwarzbeck	2024.02.02	2025.02.01
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2024.05.30	2025.05.29
RF Coaxial Cable (DC-100MHz)	BNC	MRE04	Qualwave	2024.07.02	2025.07.01

### 1.2.2 List of Software Used

Description	Manufacturer	Software Version
Morlab EMCR	Morlab	V1.2
TS+ -[JS32-CE]	Tonscend	V2.5.0.0

**1.2.4 Radiated Test Equipment**

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Signal Analyzer	MY56060145	N9020A	Agilent	2024.05.30	2025.05.29
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2024.06.22	2025.06.21
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2024.06.03	2025.06.02
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2024.06.22	2025.06.21
Test Antenna – Horn	BBHA9170 #773	BBHA9170	Schwarzbeck	2024.06.22	2025.06.21
Preamplifier (10MHz-6GHz)	46732	S10M100L38 02	LUCIX CORP.	2024.05.30	2025.05.29
Preamplifier (2GHz-18GHz)	61171/61172	S020180L32 03	LUCIX CORP.	2024.05.30	2025.05.29
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-40C-S	Decentest	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-K K-0.5	Qualwave	2024.07.03	2025.07.02
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-K KF-2	Qualwave	2024.07.03	2025.07.02
RF Coaxial Cable (DC-18GHz)	22120181	QA500-18-N N-5	Qualwave	2024.07.03	2025.07.02
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.05.10	2025.05.09



### 1.3. Measurement Uncertainty

Test Items	Uncertainty	Remark
Restricted Frequency Bands	±5%	Confidence levels of 95%
Radiated Emission	±2.95dB	Confidence levels of 95%
Conducted Emission	±2.44dB	Confidence levels of 95%

### 1.4. Testing Laboratory

Laboratory Name	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone	+86 755 36698555
Facsimile	+86 755 36698525
FCC Designation Number	CN1192
FCC Test Firm Registration Number	226174



## 2. General Description

### 2.1. Information of Applicant and Manufacturer

<b>Applicant</b>	Linkplay Technology Inc.
<b>Applicant Address</b>	8000 Jarvis Avenue Suite #130, Newark, CA 94560
<b>Manufacturer</b>	Linkplay Technology Inc.
<b>Manufacturer Address</b>	8000 Jarvis Avenue Suite #130, Newark, CA 94560

### 2.2. Information of EUT

<b>Product Name:</b>	WiiM CI MOD A80 Stereo Streaming Amplifier
<b>Sample No.:</b>	1#
<b>Hardware Version:</b>	A98D V02+Main Board V03
<b>Software Version:</b>	Linkplay.5.2.623957
<b>Modulation Technology:</b>	OFDM, OFDMA
<b>Modulation Mode:</b>	802.11a, 802.11n (HT20), 802.11n (HT40) 802.11ac (VHT20), 802.11ac (VHT40), 802.11ac (VHT80) 802.11ax (HEW20), 802.11ax (HEW40), 802.11ax (HEW80)
<b>Operating Frequency Range:</b>	5180MHz-5240MHz; 5260MHz-5320MHz; 5500MHz-5720MHz; 5745MHz-5825MHz
<b>Antenna Type:</b>	PIFA Antenna
<b>Antenna Gain:</b>	ANT1: 2.67dBi; ANT2: 2.67dBi

**Note 1:** The test results of all conducted test items please refer to the module FCC test report (Report No.: SZ24040154W04), which issued on Jul. 26, 2024. We only recorded the radiated test result in this report.

**Note 2:** The EUT has two antennas that cannot transmit simultaneously. Both of the two antennas were evaluated separately, only the worst test result (ANT1) were recorded in the test report.

**Note 3:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



## 2.3. Channel List of EUT

<b>(U-NII-1) 5180MHz-5240MHz</b>				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	<b>36</b>	<b>5180</b>	40	5200
	<b>44</b>	<b>5220</b>	<b>48</b>	<b>5240</b>
40MHz	<b>38</b>	<b>5190</b>	<b>46</b>	<b>5230</b>
80MHz	<b>42</b>	<b>5210</b>		
<b>(U-NII-2A) 5260MHz-5320MHz</b>				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	<b>52</b>	<b>5260</b>	56	5280
	<b>60</b>	<b>5300</b>	<b>64</b>	<b>5320</b>
40MHz	<b>54</b>	<b>5270</b>	<b>62</b>	<b>5310</b>
80MHz	<b>58</b>	<b>5290</b>		
<b>(U-NII-2C) 5500MHz-5720MHz</b>				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	<b>100</b>	<b>5500</b>	105	5520
			108	5540
			116	5580
			124	5620
			132	5660
			140	5700
40MHz	<b>102</b>	<b>5510</b>	110	5550
			118	5590
			134	5670
80MHz	<b>106</b>	<b>5530</b>	<b>122</b>	<b>5610</b>
	<b>138</b>	<b>5690</b>		
<b>(U-NII-3) 5745MHz-5825MHz</b>				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	<b>149</b>	<b>5745</b>	153	5765
	<b>157</b>	<b>5785</b>	161	5805
	<b>165</b>	<b>5825</b>		
40MHz	<b>151</b>	<b>5755</b>	<b>159</b>	<b>5795</b>
80MHz	<b>155</b>	<b>5775</b>		

**Note 1:** The black bold channels were selected for test.



## 2.4. Test Configuration of EUT

### 2.4.1. Modulation Type and Data Rate of EUT

Mode	Bandwidth (MHz)	Modulation Technology	Modulation Type	Data Rate	RU Size
802.11a	20	OFDM	<b>BPSK</b>	<b>6/9/12/18/24/36/48/54Mbps</b>	N/A
			QPSK		
			16QAM		
			64QAM		
802.11n	20/40 (HT20/40)	OFDM	<b>BPSK</b>	<b>MCS0~MCS7</b>	N/A
			QPSK		
			16QAM		
			64QAM		
802.11ac	20/40/80 (VHT20/40/80)	OFDM	<b>BPSK</b>	<b>MCS0~MCS9</b>	N/A
			QPSK		
			16QAM		
			64QAM		
			256QAM		
802.11ax	20/40/80 (HEW20/40/80)	OFDM/ OFDMA	<b>BPSK</b>	<b>MCS0~MCS11</b>	26/52/106/242/484
			QPSK		
			16QAM		
			64QAM		
			256QAM		
			1024QAM		

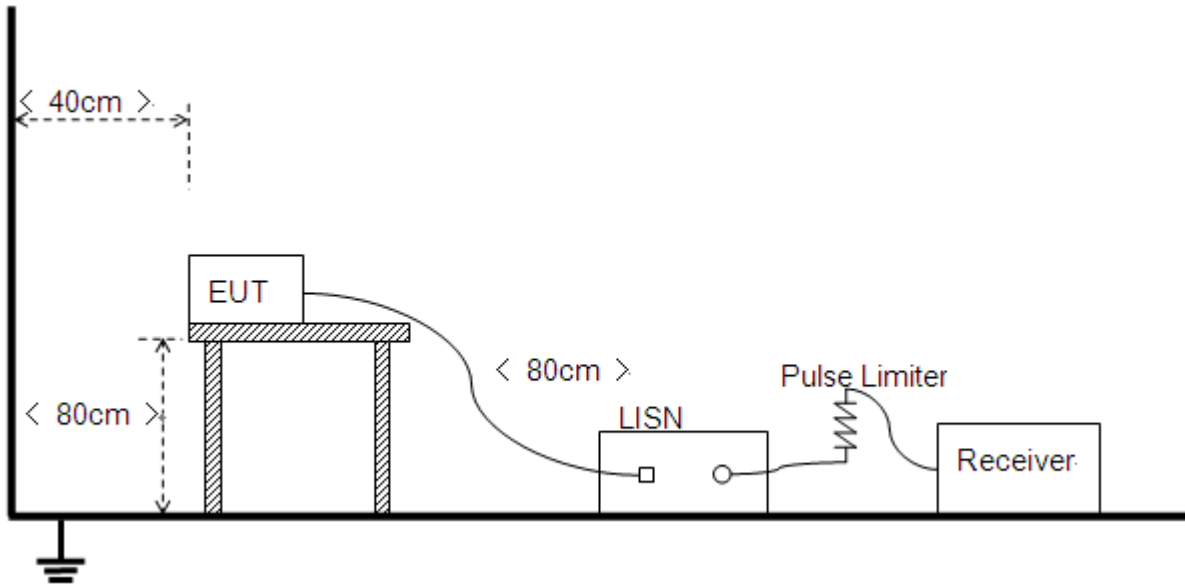
**Note1:** The worst-case mode (bold face) in all data rates has been determined during the pre-scan, only the test data of the worst-case were recorded in this report.

## 2.5. Test Conditions

Temperature (°C)	15–35
Relative Humidity (%)	30–60
Atmospheric Pressure (kPa)	86–106

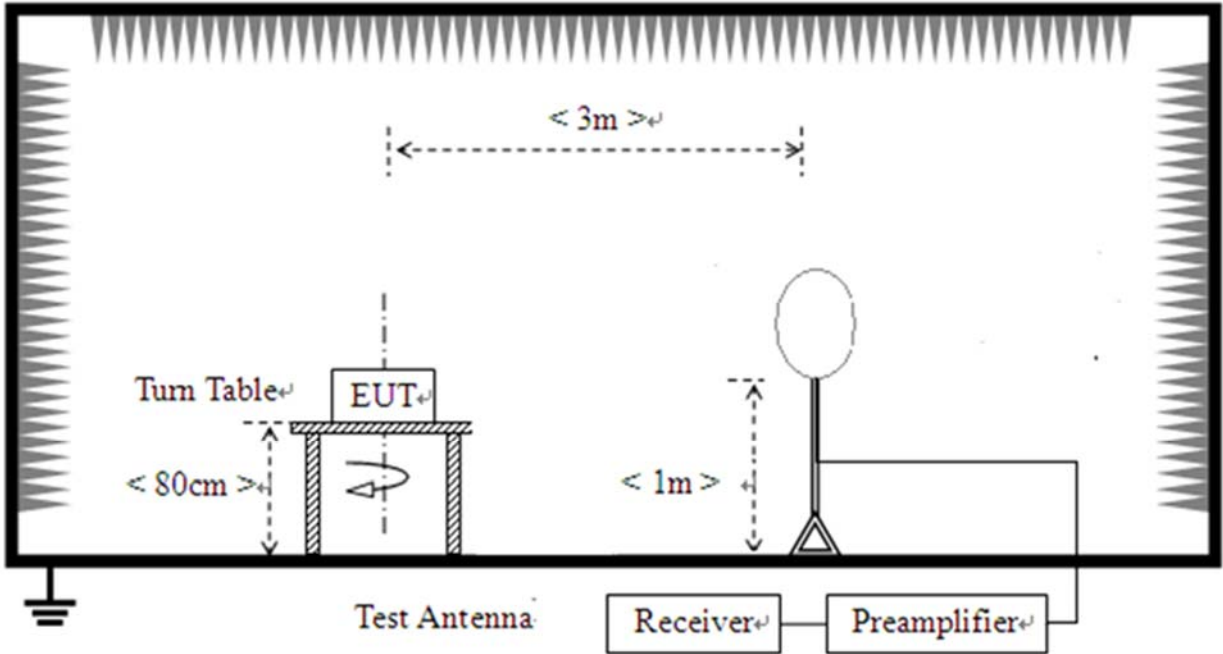
## 2.6. Test Setup Layout Diagram

### 2.6.1. Conducted Emission Measurement

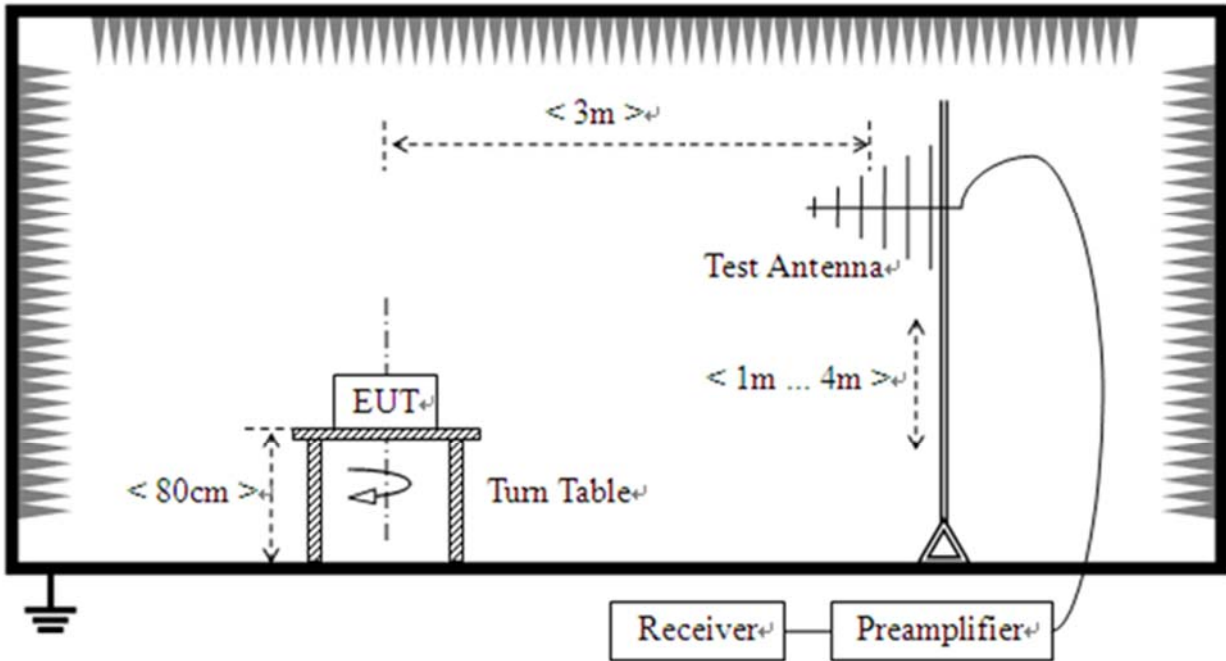


**2.6.2.Radiation Measurement**

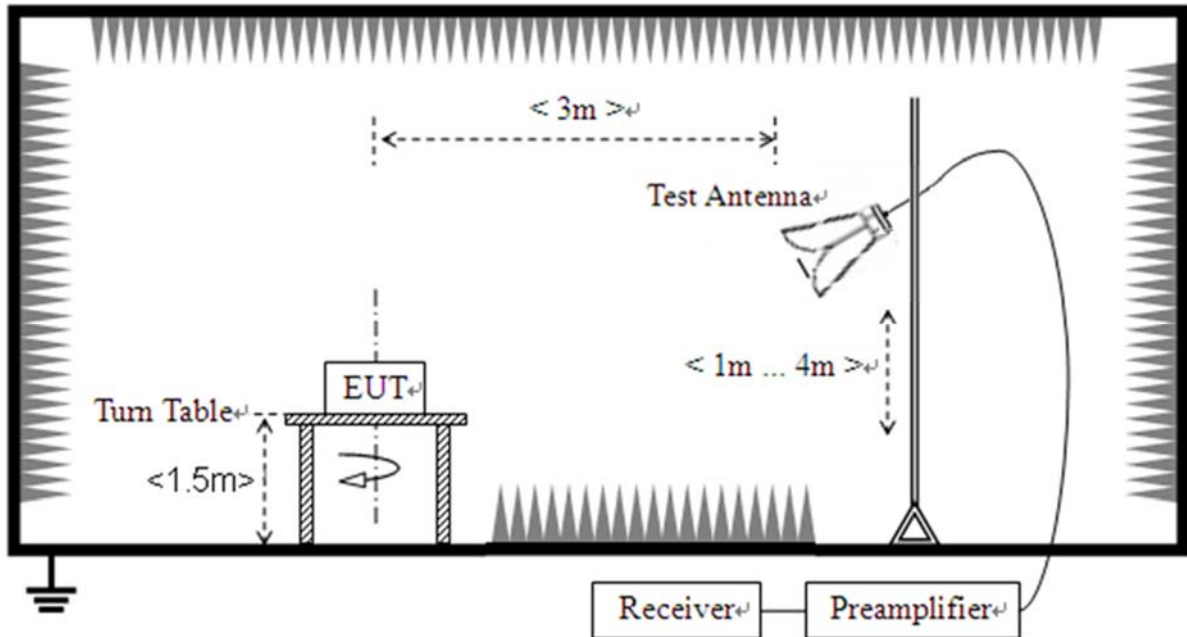
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



## 3. Test Results

### 3.1. Conducted Emission

#### 3.1.1. Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

Frequency Range (MHz)	Conducted Limit (dB $\mu$ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

- (a) The lower limit shall apply at the band edges.
- (b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

#### 3.1.2. Test Procedures

The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.

#### 3.1.3. Test Setup Layout

Refer to chapter 2.6.2 in this report.

#### 3.1.4. Test Result

Refer to Annex A.1 in this report.



## 3.2. Restricted Frequency Bands

### 3.2.1. Requirement

The peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of -27dBm/MHz.
- (2) 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 EIRP of -27dBm/MHz.
- (3) 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 EIRP of -27dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
  - (i) 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 following formula is used to convert the equipment isotropic radiated power(e.i.r.p.) to field strength (dBμV/m);

$$E = 1000000 \times \sqrt{30P} / 3 \mu\text{V/m}$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dBuV/m



Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ( $\mu\text{V}/\text{m}$ )	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table).

### 3.2.2. Test Procedures

The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

KDB 789033 Section H) 3)5)6(d)) was used in order to prove compliance

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

### 3.2.3. Test Setup Layout

Refer to chapter 2.6.3 in this report.

### 3.2.4. Test Result

Refer to Annex A.2 in this report.





### 3.3. Radiated Emission

#### 3.3.1. Requirement

The peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of -27dBm/MHz.
- (2) 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 EIRP of -27dBm/MHz.
- (3) 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 EIRP of -27dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

The following formula is used to convert the equipment isotropic radiated power(e.i.r.p.) to field strength (dBμV/m);

$$E = 1000000 \times \sqrt{30P} / 3 \mu\text{V/m}$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dBuV/m

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3



For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table).

### **3.3.2.Test Procedures**

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz.The antenna to EUT distance is 3meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions. For measurements above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

### **3.3.3.Test Setup Layout**

Refer to chapter 2.6.3 in this report.

### **3.3.4.Test Result**

Refer to Annex A.3 in this report.



## Annex A Test Data and Result

### A.1. Conducted Emission

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Set RBW=9kHz, VBW=30kHz. Refer to recorded points and plots below.

**Note:** Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

#### A. Test Setup:

Test Mode: EUT + PC +PC Adapter + WIFI TX

Test voltage: AC 120V/60Hz

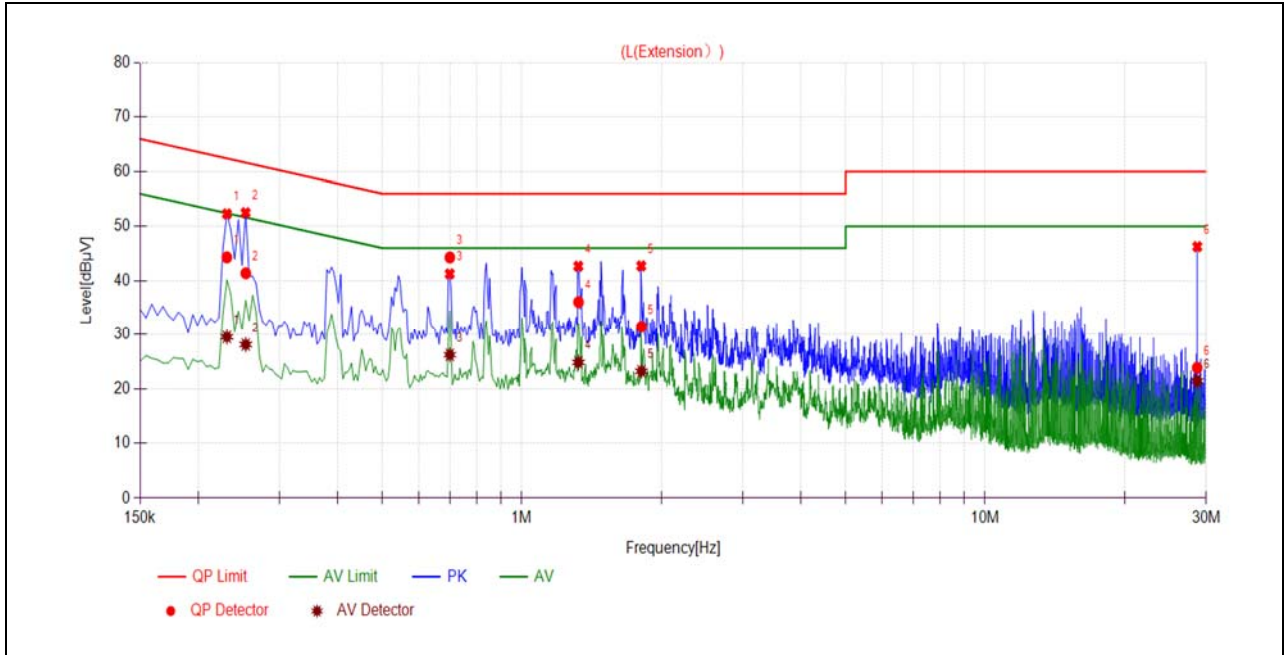
The measurement results are obtained as below:

$E [dB\mu V] = U_R + L_{Cable\ loss} [dB] + A_{Factor}$

$U_R$ : Receiver Reading

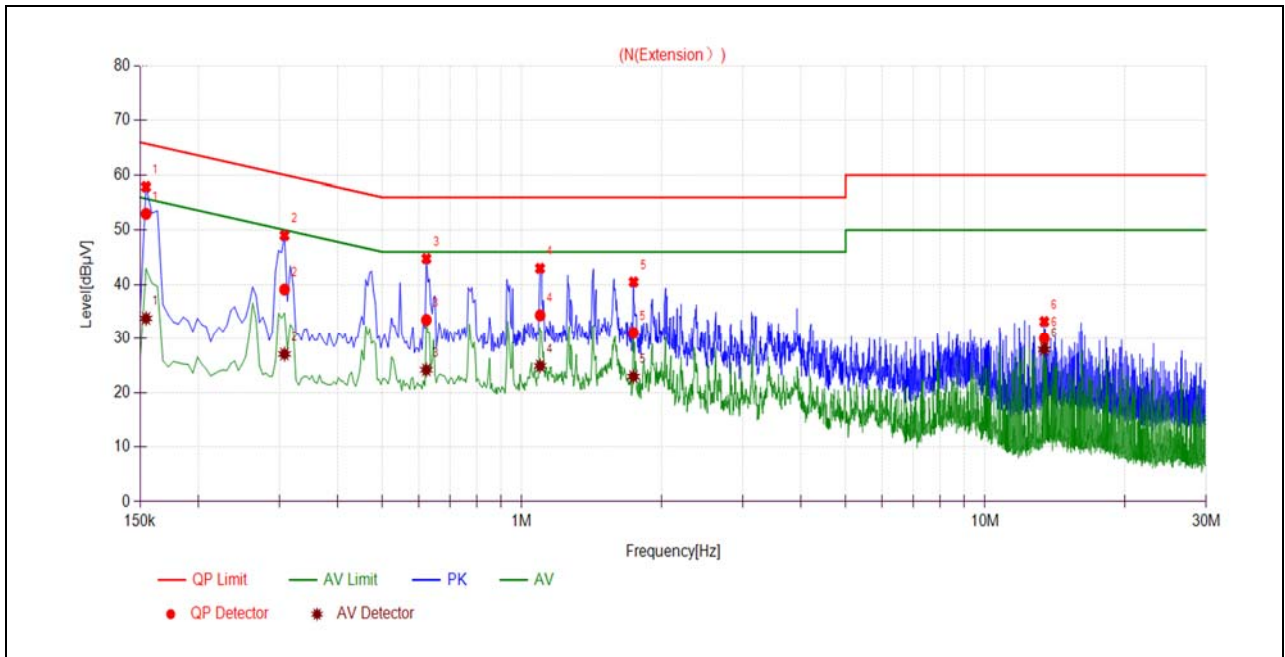
$A_{Factor}$ : Voltage division factor of LISN

**B. Test Plot:**



(L Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.2309	44.30	29.52	62.42	52.42	Line	PASS
2	0.2536	41.38	28.10	61.64	51.64		PASS
3	0.6993	44.29	26.21	56.00	46.00		PASS
4	1.3254	36.06	24.82	56.00	46.00		PASS
5	1.8123	31.45	23.19	56.00	46.00		PASS
6	28.6873	23.83	21.40	60.00	50.00		PASS



(N Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1545	52.99	33.80	65.76	55.76	Neutral	PASS
2	0.3075	39.10	27.07	60.04	50.04		PASS
3	0.6222	33.50	24.16	56.00	46.00		PASS
4	1.0954	34.36	24.90	56.00	46.00		PASS
5	1.7415	31.08	22.92	56.00	46.00		PASS
6	13.4203	29.98	27.96	60.00	50.00		PASS



## A.2. Restricted Frequency Bands

The lowest and highest channels are tested to verify the Restricted Frequency Bands.

The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V/m]} = U_R + A_T + A_{\text{Factor}} \text{ [dB]}; A_T = L_{\text{Cable loss}} \text{ [dB]} - G_{\text{preamp}} \text{ [dB]}$$

$A_T$ : Total correction Factor except Antenna

$U_R$ : Receiver Reading

$G_{\text{preamp}}$ : Preamplifier Gain

$A_{\text{Factor}}$ : Antenna Factor at 3m

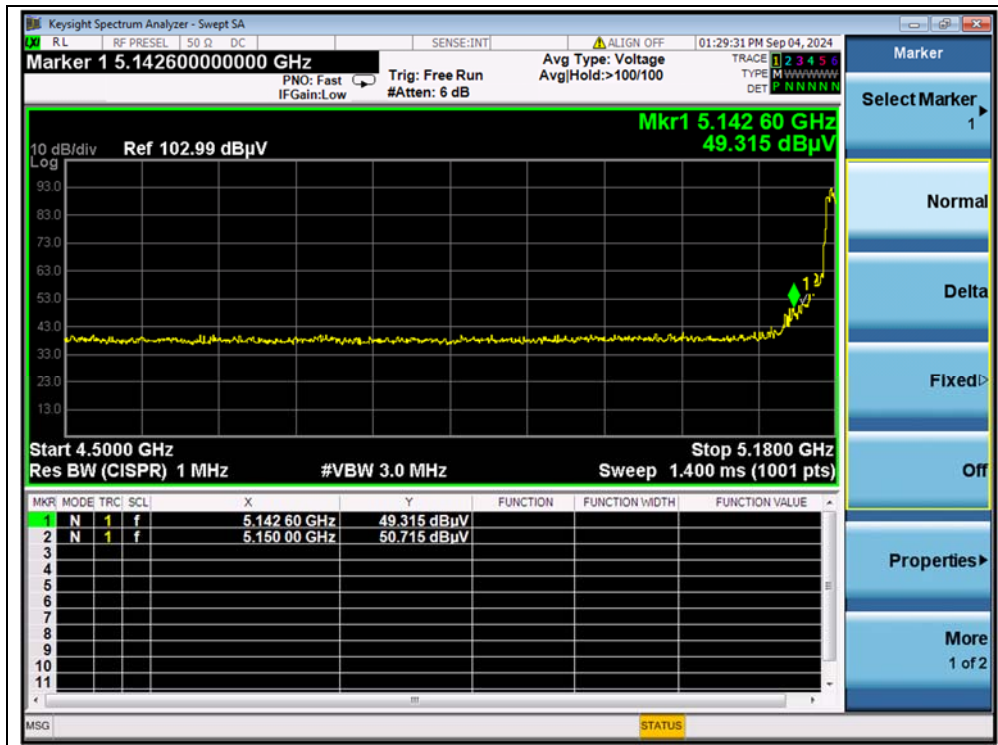
**Note 1:** Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (Horizontal) was recorded in this test report.

**Note 2:** Restricted Frequency Bands were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

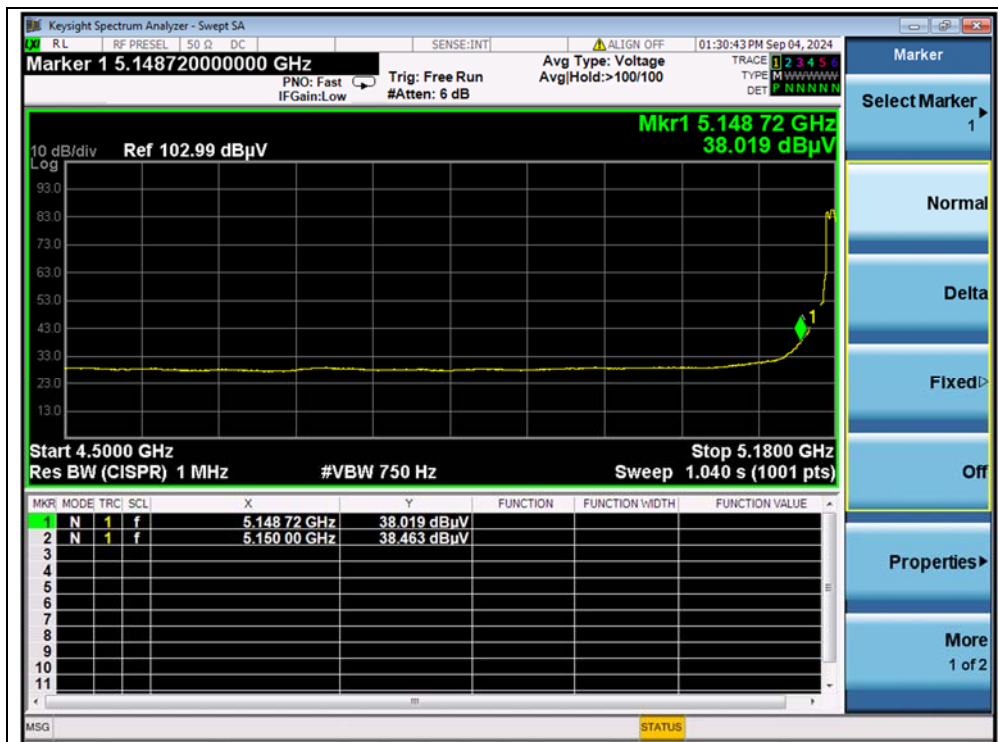
**Note 3:** All test modes and bandwidth were considered and evaluated respectively by performing full test, only the worst data were recorded for each bandwidth.

### 802.11a Mode

Channel	Frequency (MHz)	Detector	Receiver Reading	$A_T$ (dB)	$A_{\text{Factor}}$ (dB@3m)	Max. Emission E (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Verdict
		PK/ AV	$U_R$ (dB $\mu$ V)					
36	5150.00	PK	50.72	-21.29	32.20	61.63	74	PASS
36	5150.00	AV	38.46	-21.29	32.20	49.37	54	PASS
64	5355.20	PK	45.38	-20.66	32.20	56.92	74	PASS
64	5350.00	AV	36.57	-20.66	32.20	48.11	54	PASS
100	5465.12	PK	47.18	-20.24	32.20	59.14	68.23	PASS
100	5460.00	AV	31.11	-20.24	32.20	43.07	54	PASS
144	5725.00	PK	48.99	-20.24	32.20	60.95	68.23	PASS
149	5725.00	PK	53.40	-21.11	32.20	64.49	122.23	PASS
165	5850.00	PK	49.23	-21.11	32.20	60.32	122.23	PASS

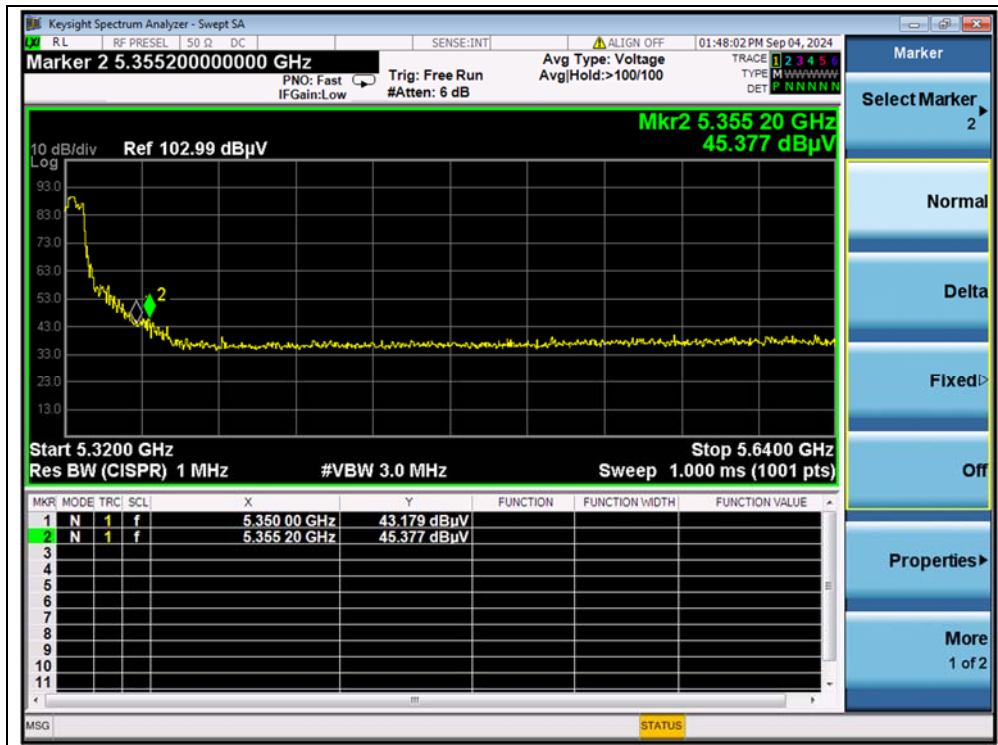


(PEAK, Channel 36, 802.11a)

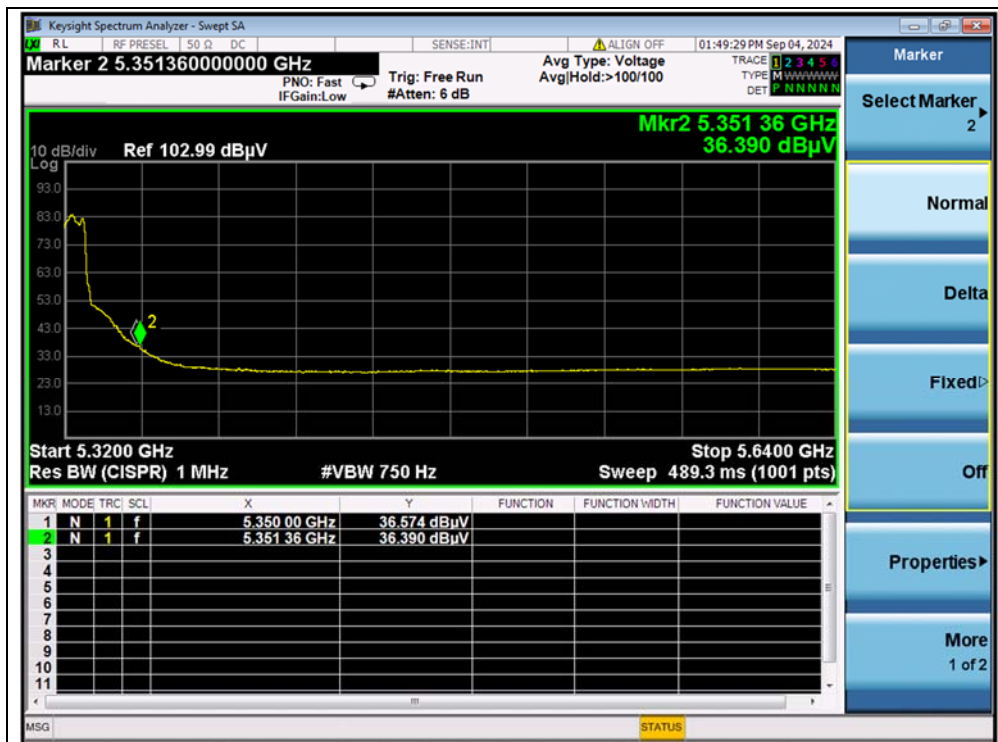


(AVERAGE, Channel 36, 802.11a)



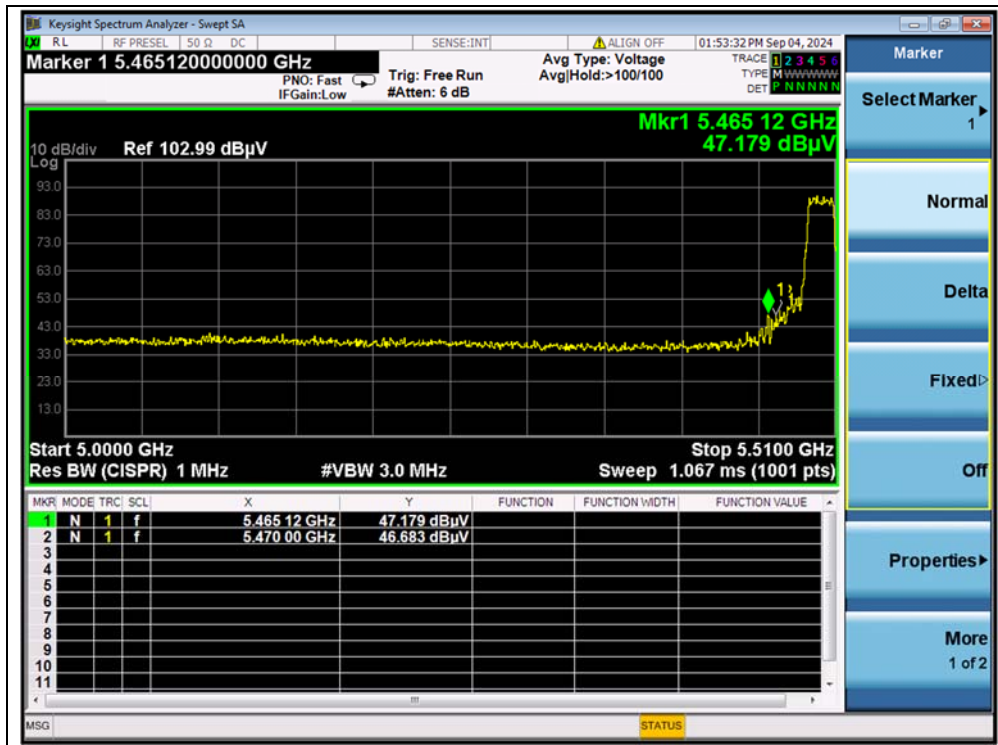


(PEAK, Channel 64, 802.11a)

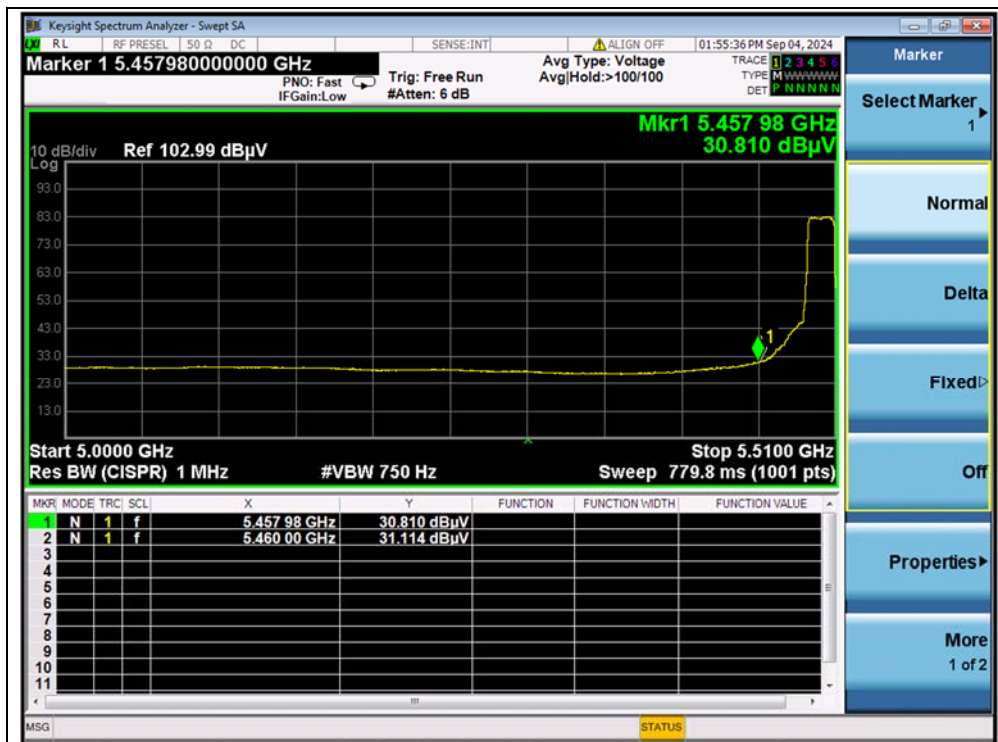


(AVERAGE, Channel 64, 802.11a)

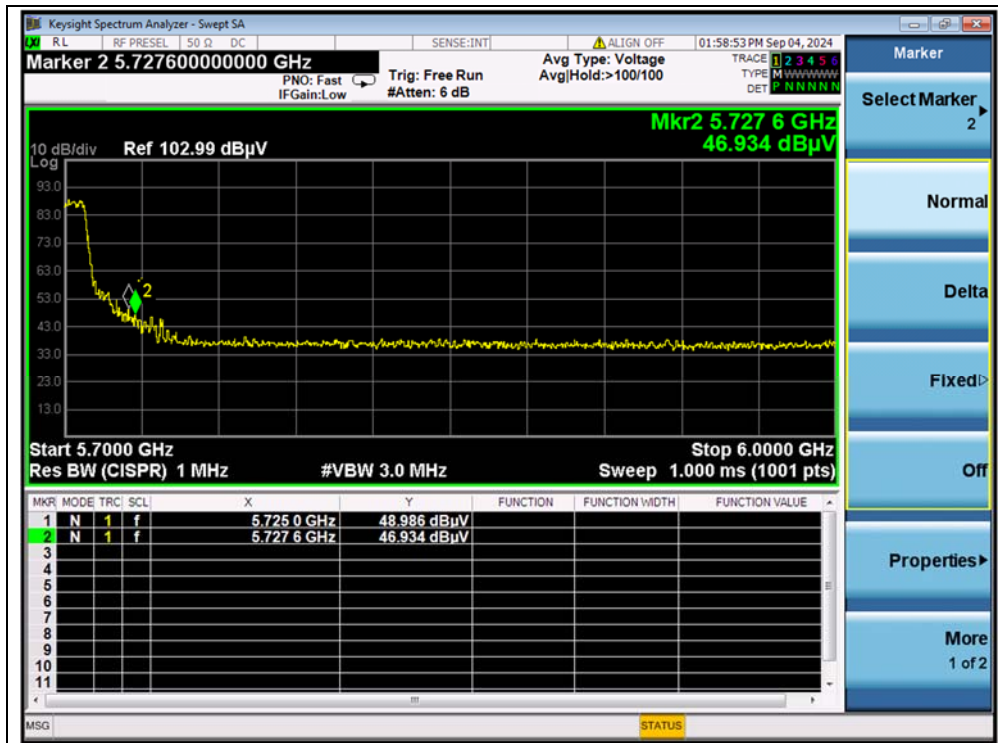




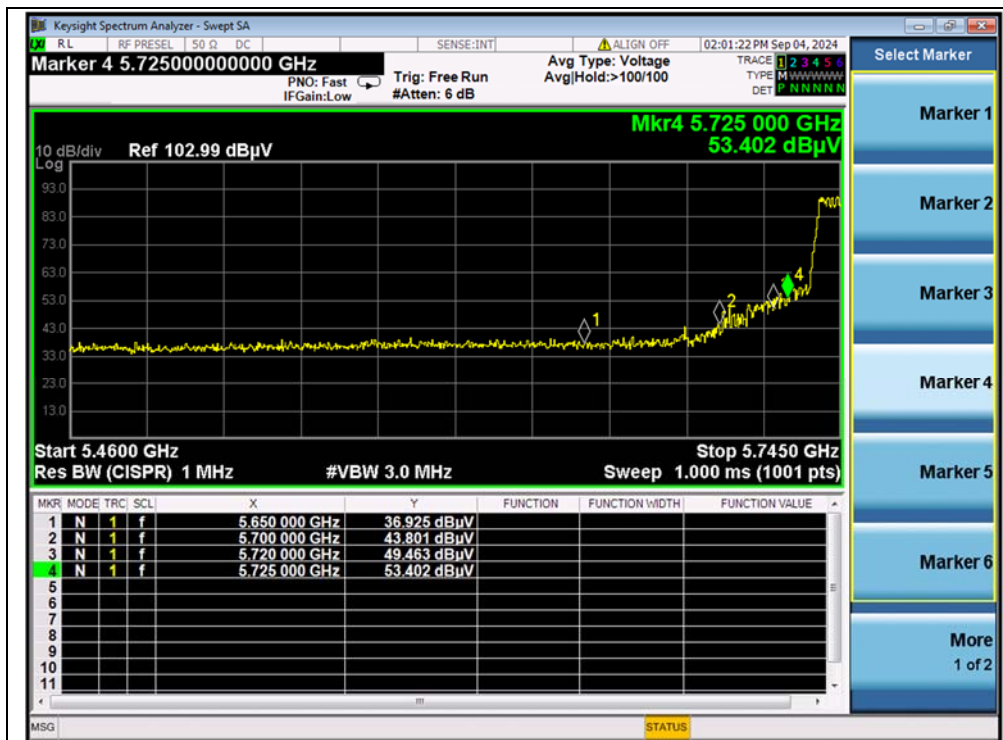
(PEAK, Channel 100, 802.11a)



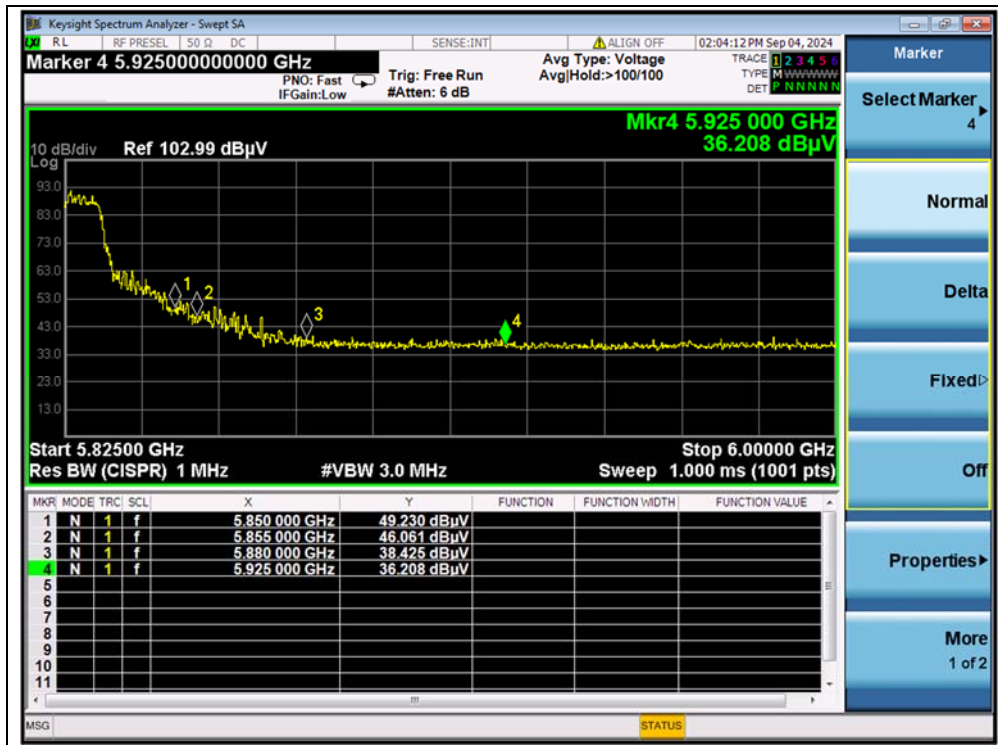
(AVERAGE, Channel 100, 802.11a)



(PEAK, Channel 144, 802.11a)



(PEAK, Channel 149, 802.11a)

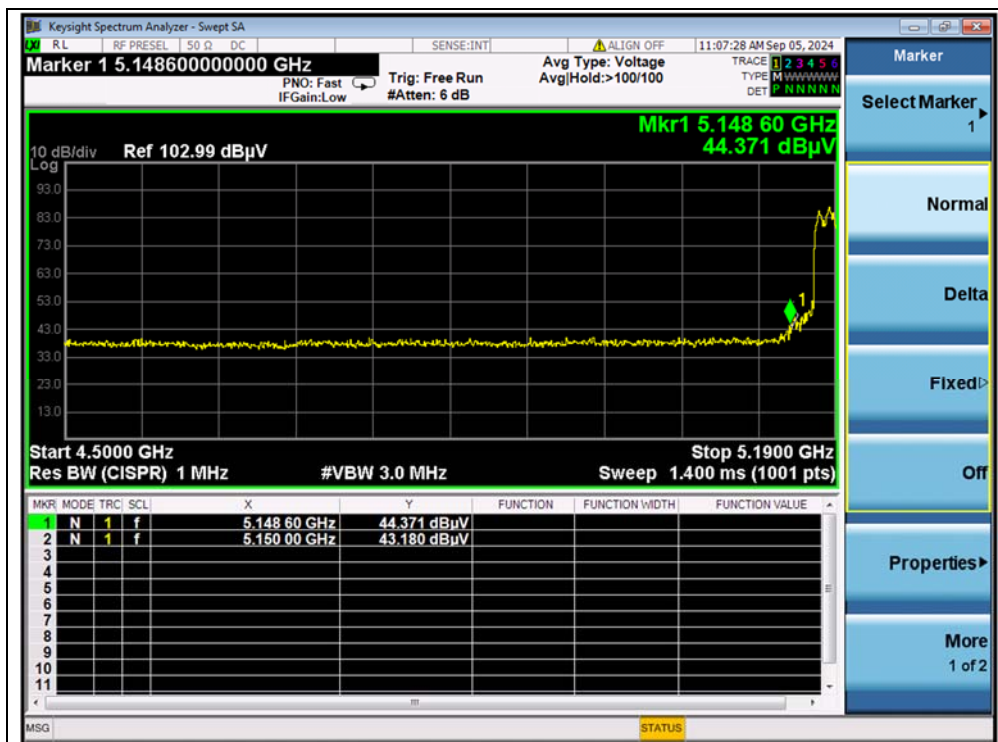


(PEAK, Channel 165, 802.11a)

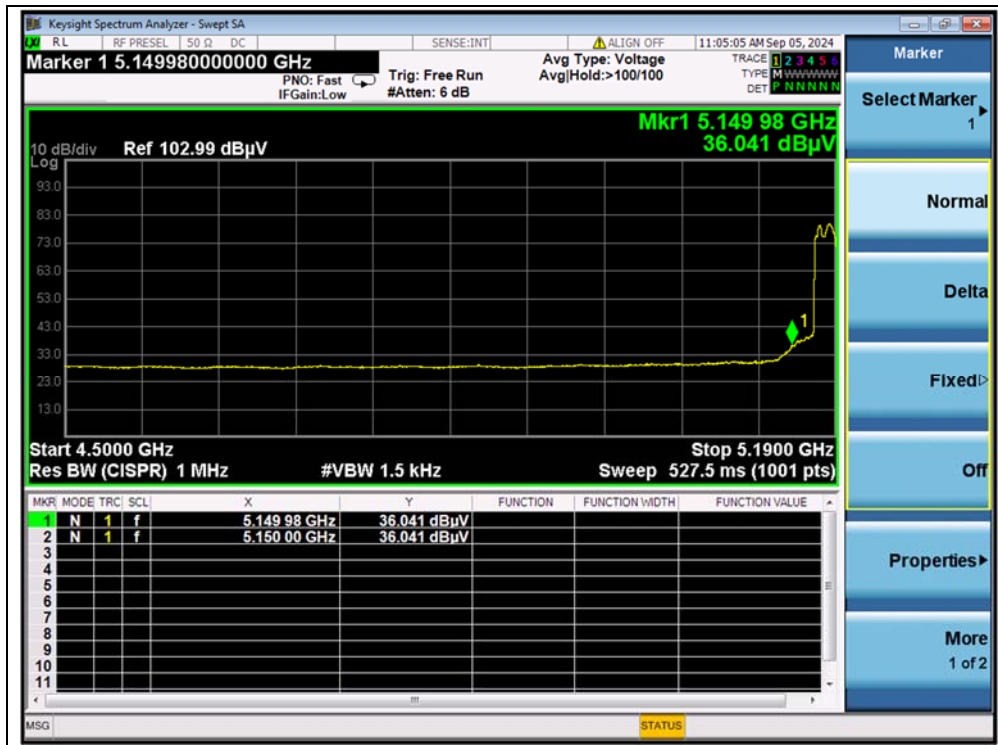


802.11n (HT40) Mode

Channel	Frequency (MHz)	Detector	Receiver Reading	$A_T$	$A_{Factor}$	Max. Emission	Limit (dB $\mu$ V/m)	Verdict
		PK/ AV	$U_R$ (dB $\mu$ V)	(dB)	(dB@3m)	E (dB $\mu$ V/m)		
38	5148.60	PK	44.37	-21.29	32.20	55.28	74	PASS
38	5149.98	AV	36.04	-21.29	32.20	46.95	54	PASS
62	5354.10	PK	45.09	-20.66	32.20	56.63	74	PASS
62	5351.10	AV	39.14	-20.66	32.20	50.68	54	PASS
102	5463.59	PK	49.89	-20.24	32.20	61.85	68.23	PASS
102	5460.00	AV	37.34	-20.24	32.20	49.30	54	PASS
142	5730.39	PK	43.77	-20.24	32.20	55.73	68.23	PASS
151	5725.00	PK	56.39	-21.11	32.20	67.48	122.23	PASS
159	5850.00	PK	47.61	-21.11	32.20	58.70	122.23	PASS



(PEAK, Channel 38, 802.11n (HT40))

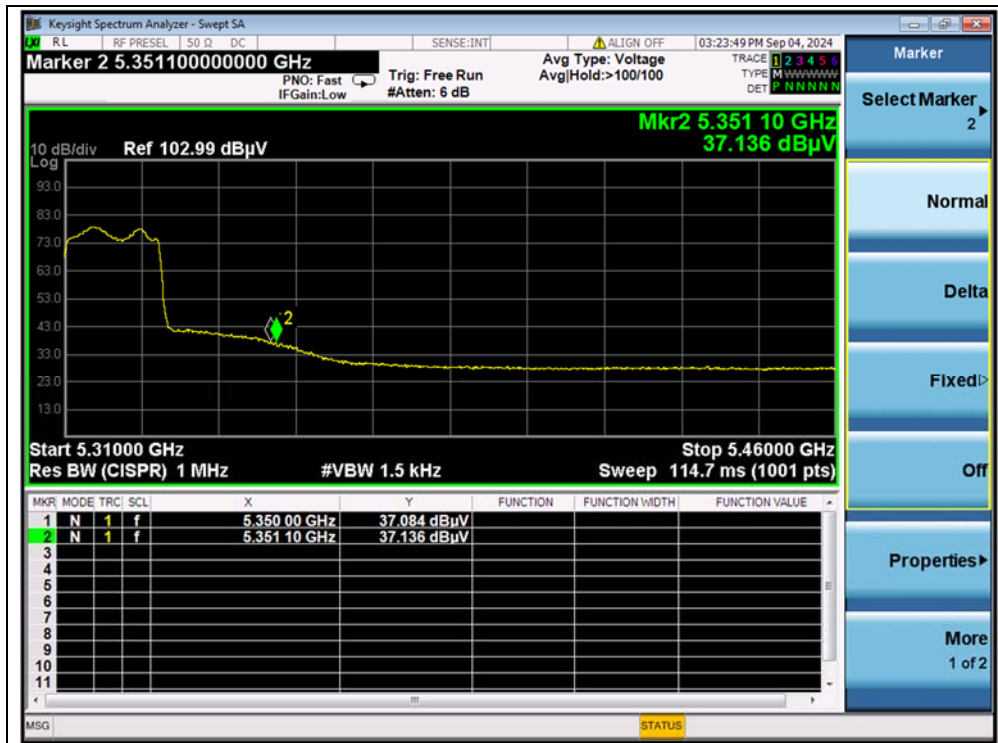


(AVERAGE, Channel 38, 802.11n (HT40))

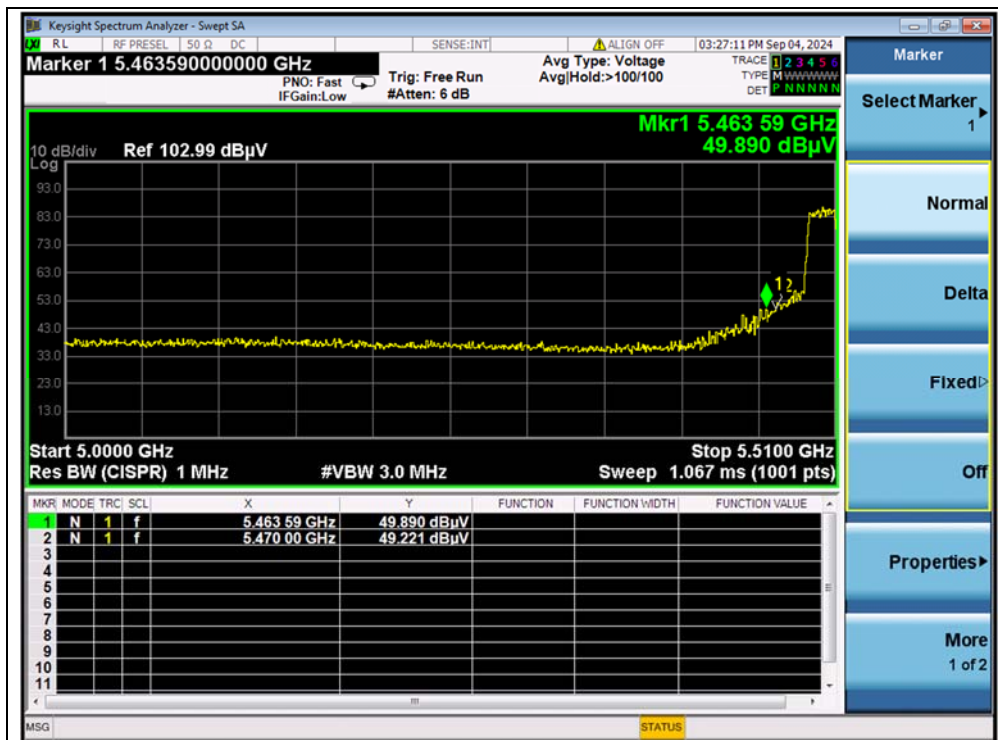


(PEAK, Channel 62, 802.11n (HT40))

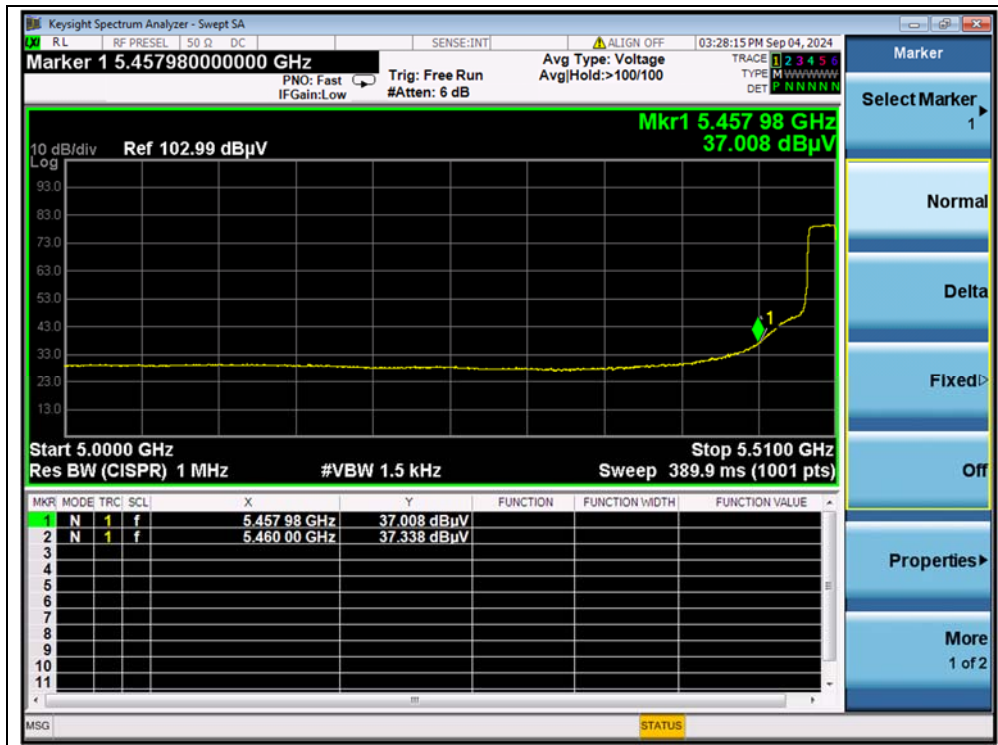




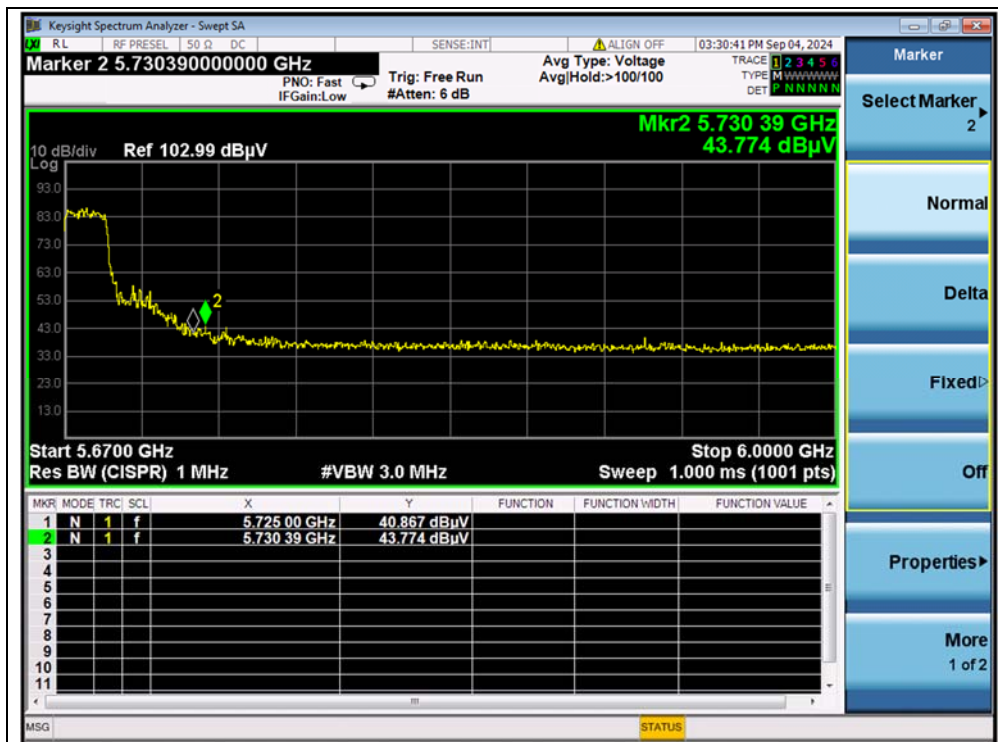
(AVERAGE, Channel 62, 802.11n (HT40))



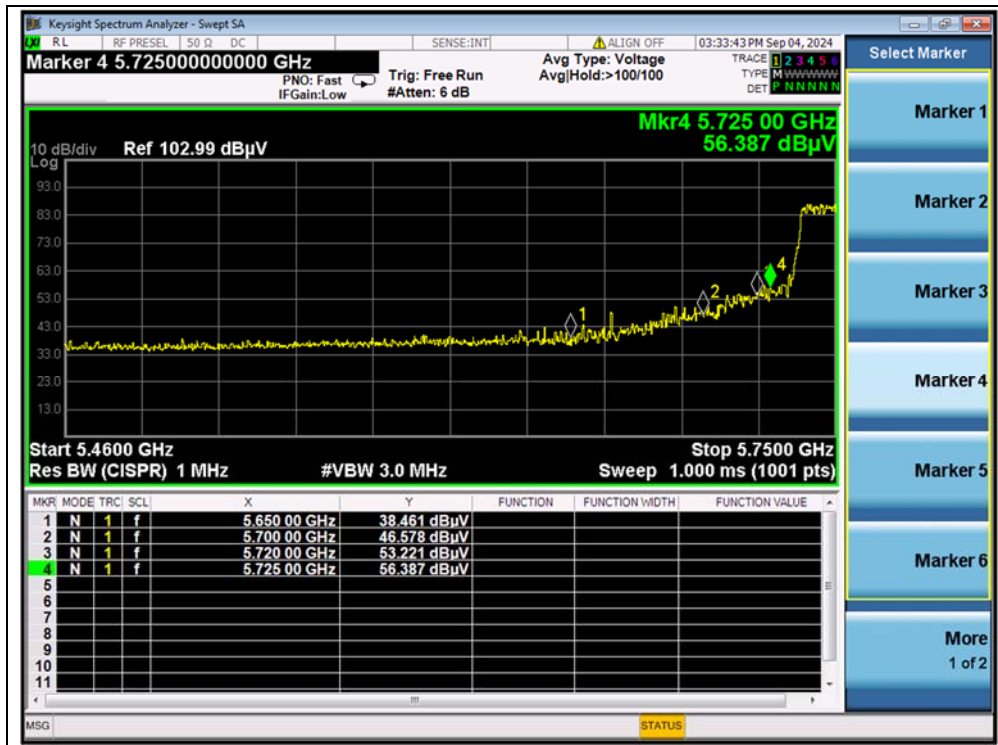
(PEAK, Channel 102, 802.11n (HT40))



(AVERAGE, Channel 102, 802.11n (HT40))



(PEAK, Channel 142, 802.11n (HT40))



(PEAK, Channel 151, 802.11n (HT40))



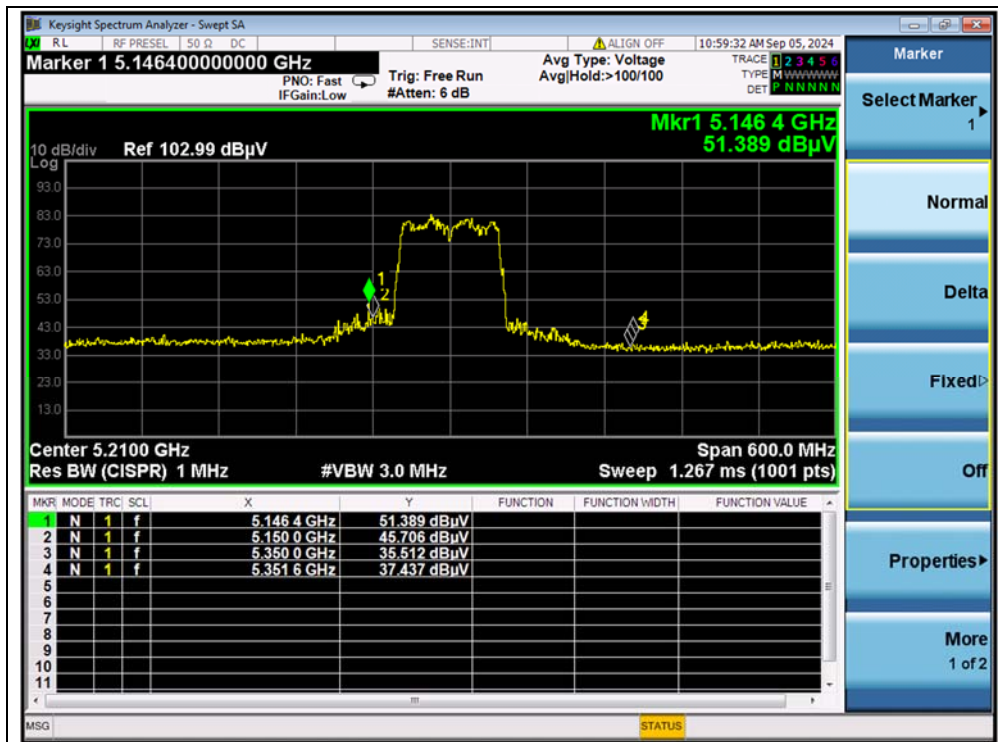
(PEAK, Channel 159, 802.11n (HT40))



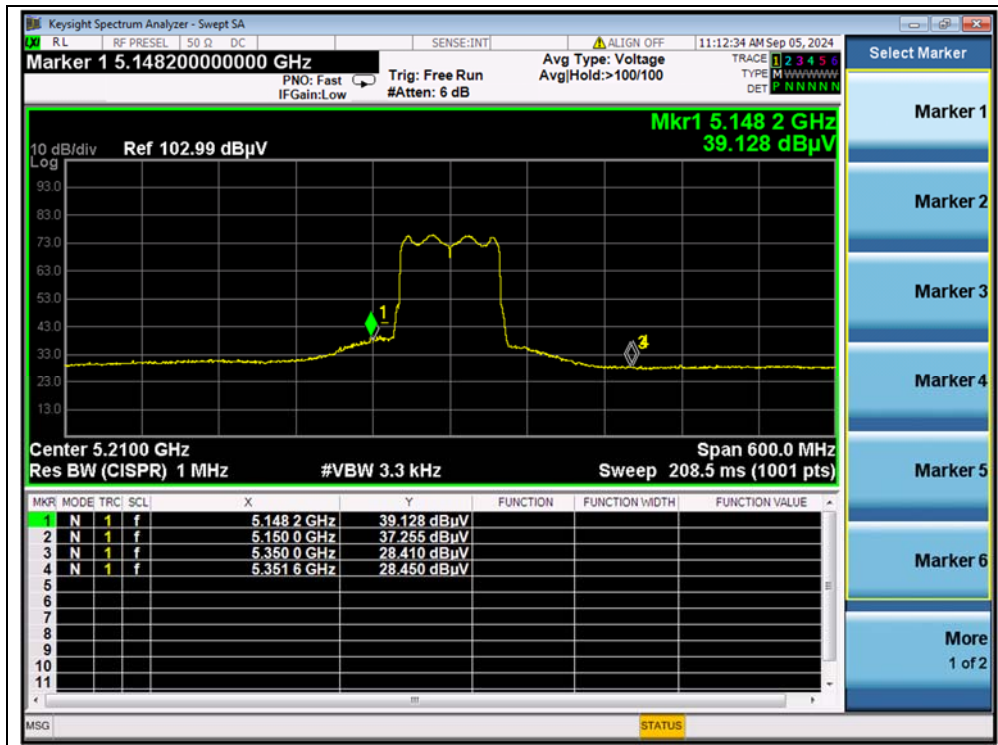


802.11ac (VHT80) Mode

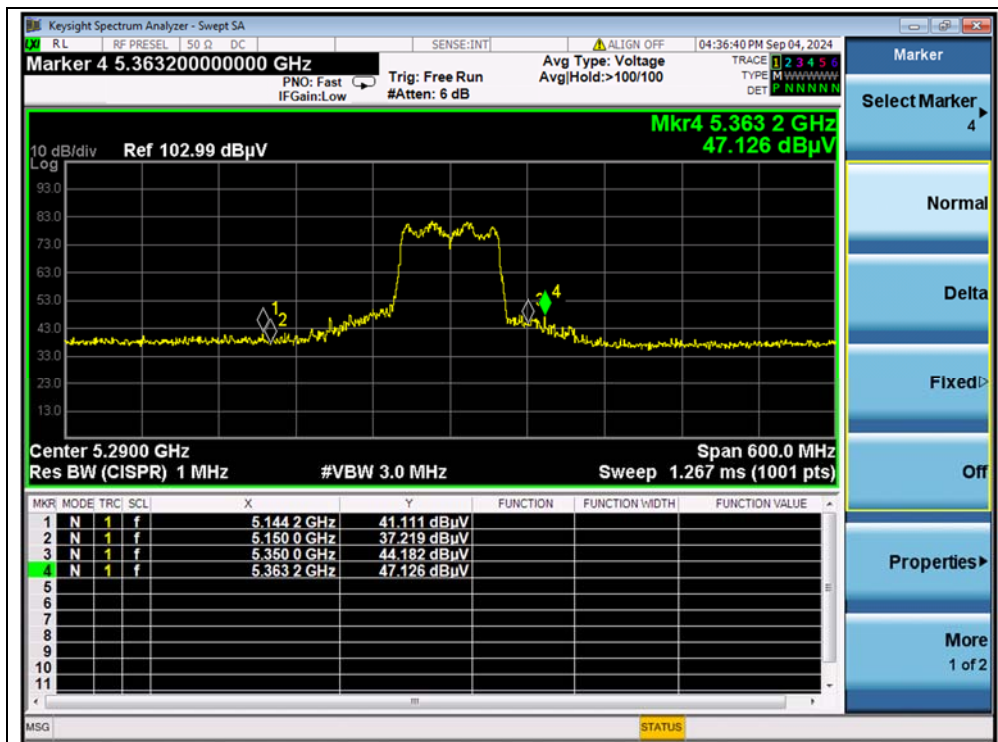
Channel	Frequency (MHz)	Detector	Receiver Reading U <sub>R</sub> (dBμV)	A <sub>T</sub> (dB)	A <sub>Factor</sub> (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
42	5146.40	PK	51.39	-21.29	32.20	62.30	74	PASS
42	5148.20	AV	39.13	-21.29	32.20	50.04	54	PASS
58	5363.20	PK	47.13	-20.66	32.20	58.67	74	PASS
58	5353.00	AV	36.78	-20.66	32.20	48.32	54	PASS
106	5461.10	PK	41.73	-20.24	32.20	53.69	68.23	PASS
106	5460.00	AV	33.62	-20.24	32.20	45.58	54	PASS
138	5725.00	PK	29.67	-20.24	32.20	41.63	68.23	PASS
155	5720.00	PK	48.63	-21.11	32.20	59.72	110.83	PASS
155	5850.00	PK	41.19	-21.11	32.20	52.28	122.23	PASS



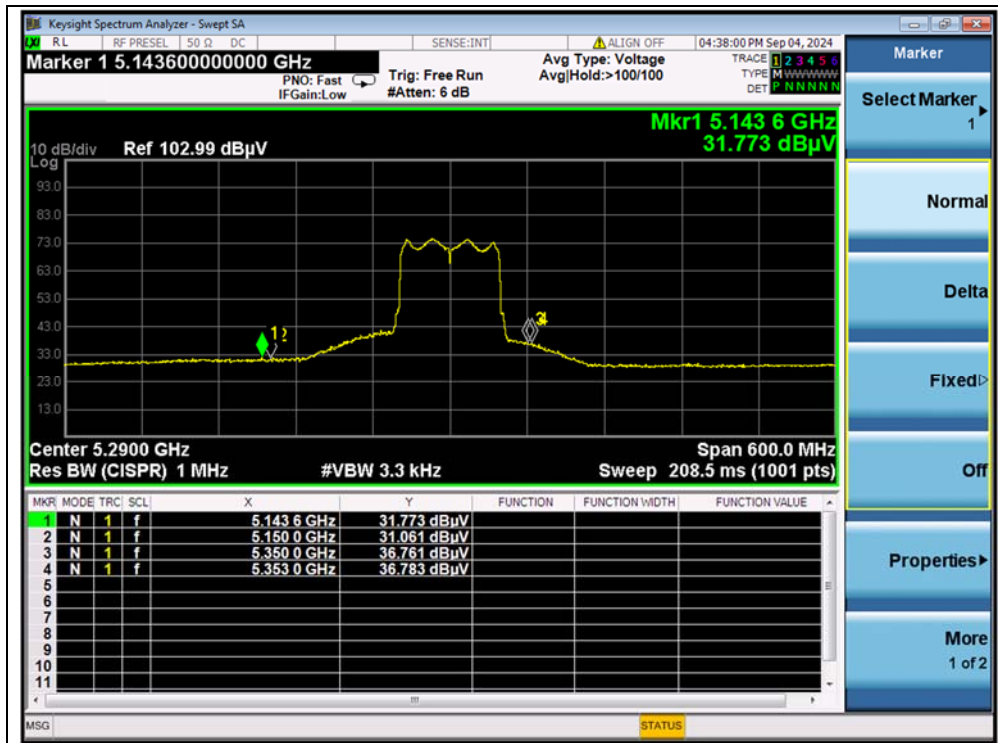
(PEAK, Channel 42, 802.11ac (VHT80))



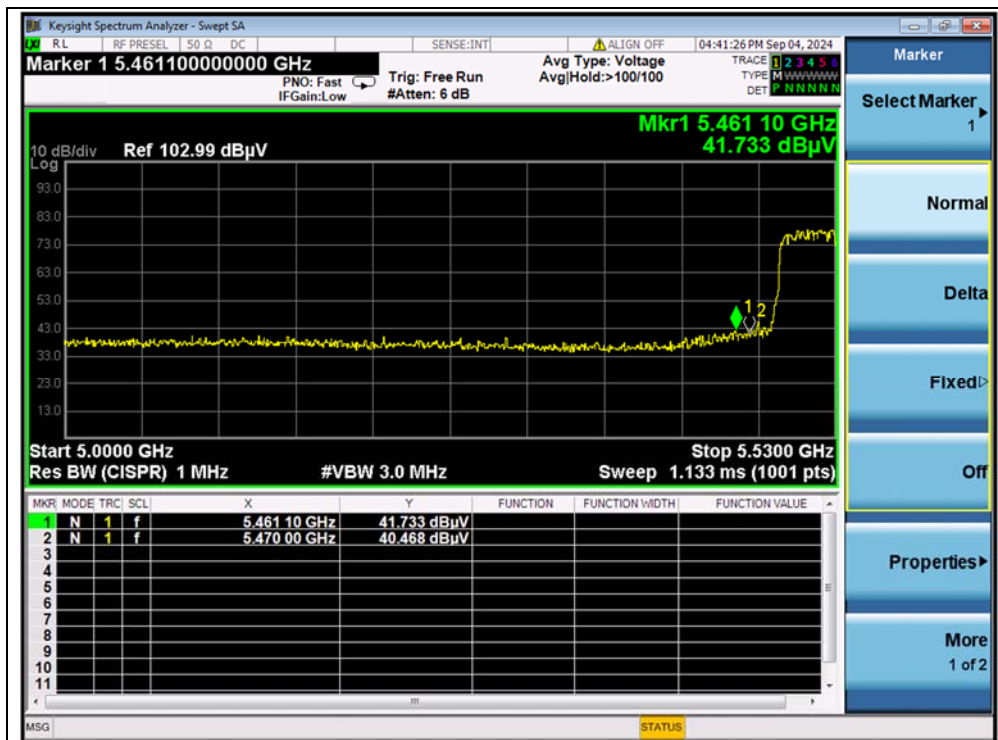
(AVERAGE, Channel 42, 802.11ac (VHT80))



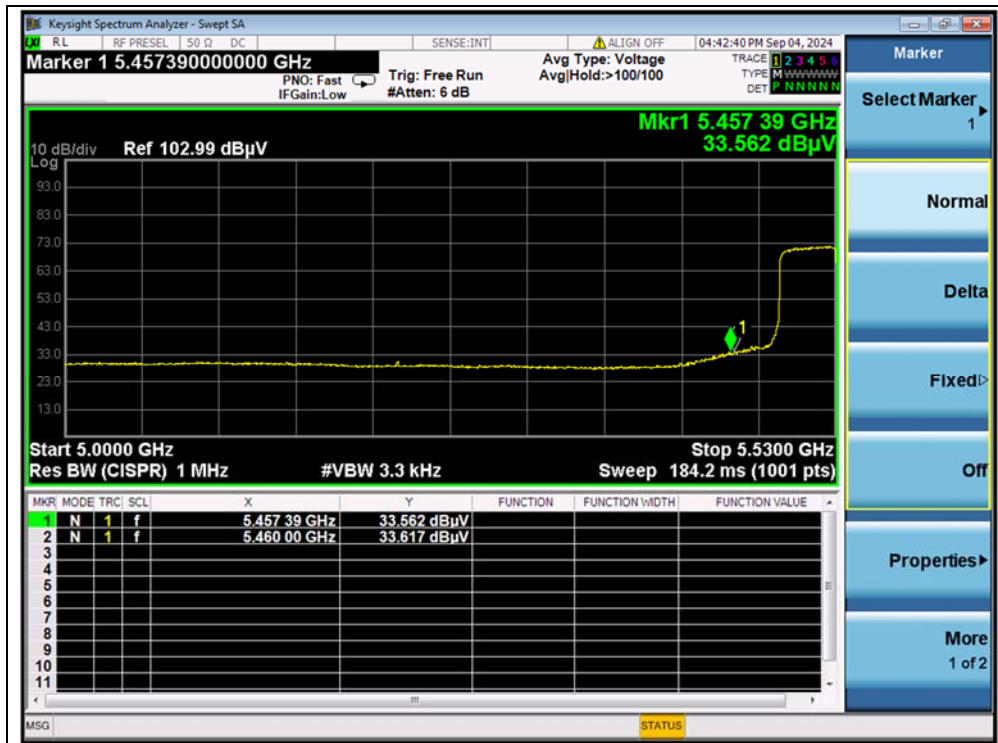
(PEAK, Channel 58, 802.11ac (VHT80))



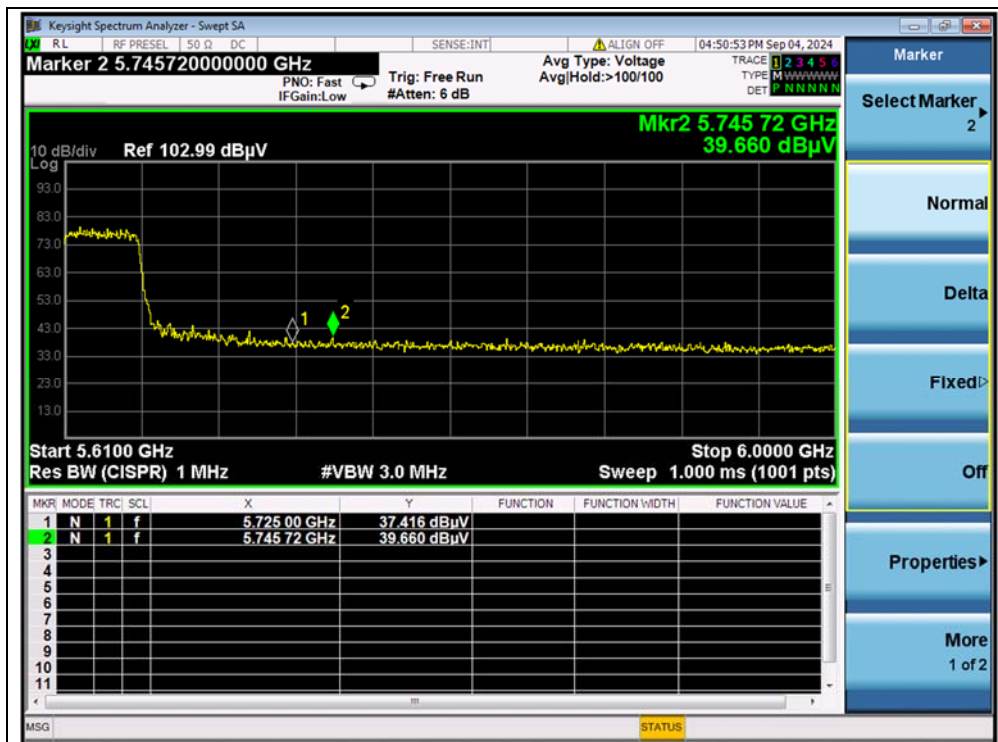
(AVERAGE, Channel 58, 802.11ac (VHT80))



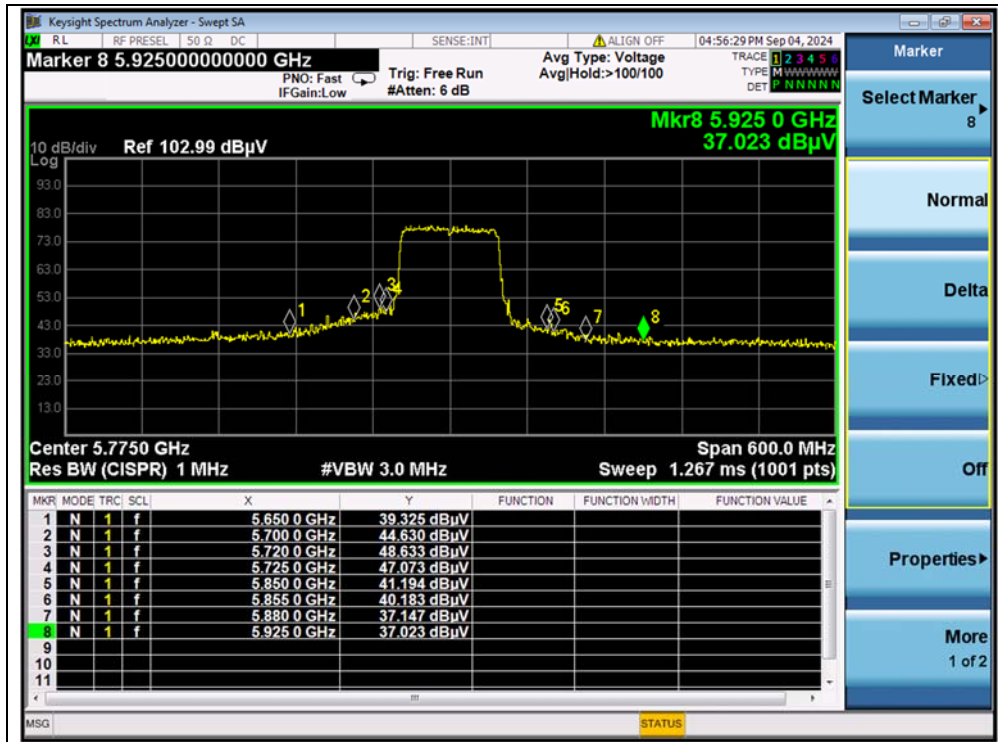
(PEAK, Channel 106, 802.11ac (VHT80))



(AVERAGE, Channel 106, 802.11ac (VHT80))



(PEAK, Channel 138, 802.11ac (VHT80))



(PEAK, Channel 155, 802.11ac (VHT80))



### A.3. Radiated Emission

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak (or average) limit, it is unnecessary to perform an quasi-peak measurement (or average).

The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V/m]} = U_R + A_T + A_{\text{Factor}} \text{ [dB]}; A_T = L_{\text{Cable loss}} \text{ [dB]} - G_{\text{preamp}} \text{ [dB]}$$

$A_T$ : Total correction Factor except Antenna

$U_R$ : Receiver Reading

$G_{\text{preamp}}$ : Preamplifier Gain

$A_{\text{Factor}}$ : Antenna Factor at 3m

During the test, the total correction Factor  $A_T$  and  $A_{\text{Factor}}$  were built in test software.

**Note1:** All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis (Y axis) test condition was recorded in this test report.

**Note2:** For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

**Note3:** For the frequency, which started from 18GHz to 40GHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

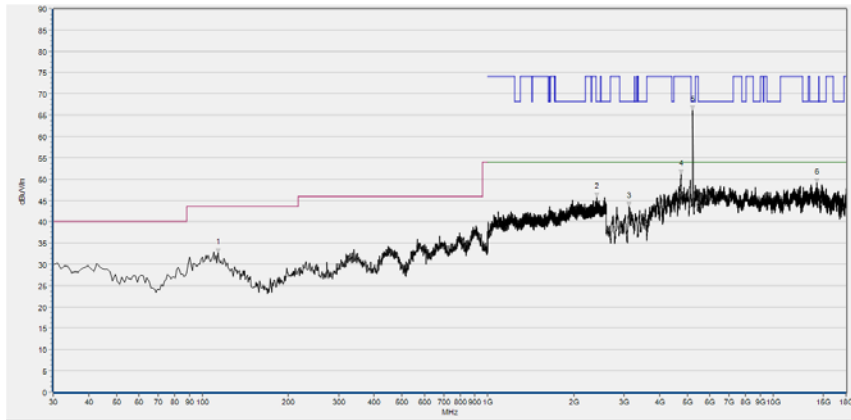
**Note 4:** All test modes, bandwidth and channel were considered and evaluated respectively by performing full test, only the worst data were recorded.





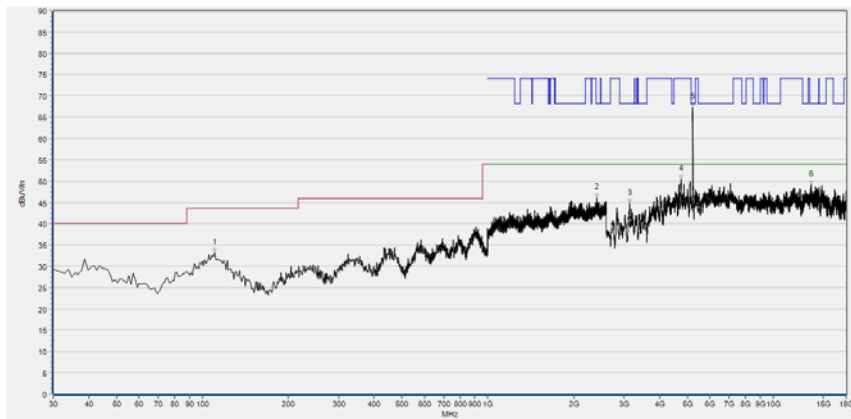
**802.11a Mode**

**Plot for Channel 44**



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
113.420	32.68	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2412.800	45.80	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
3129.760	43.65	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
4749.840	51.13	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5214.920	66.22	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
14230.080	49.05	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

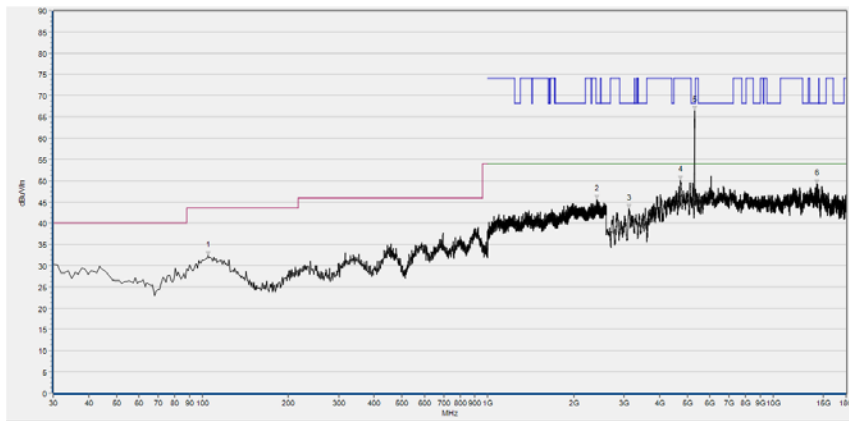
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
110.510	33.26	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2408.533	46.10	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
3135.920	44.68	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4752.920	50.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5224.160	67.44	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
13561.720	49.17	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

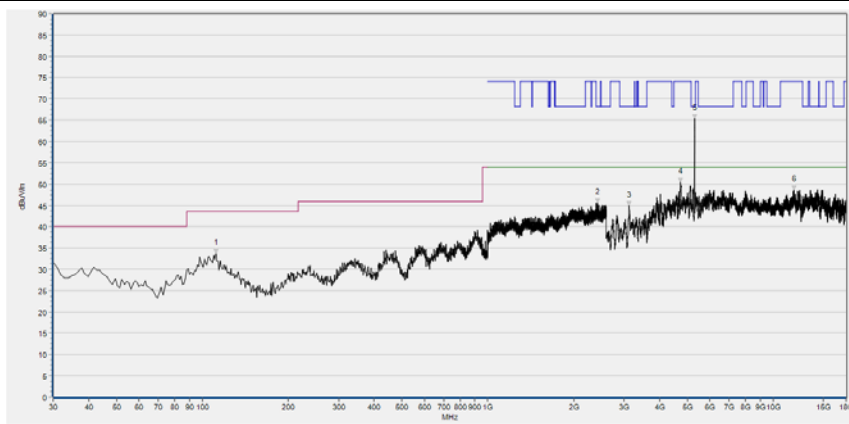
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 60



Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
104.690	32.38	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2403.733	45.52	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
3117.440	43.35	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
4737.520	50.19	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5304.240	66.53	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
14190.040	49.28	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

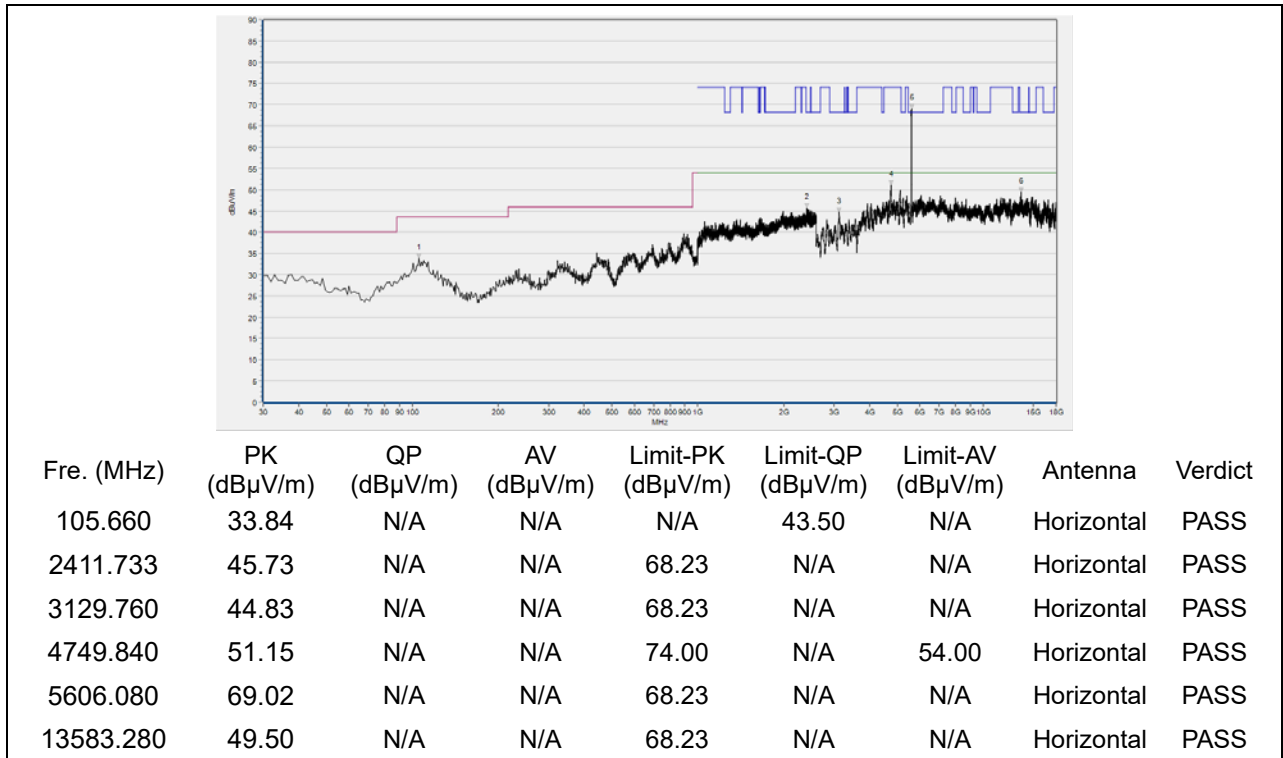


Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
111.480	33.63	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2429.333	45.56	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
3129.760	44.90	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
4740.600	50.40	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5304.240	65.29	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
11793.800	48.62	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

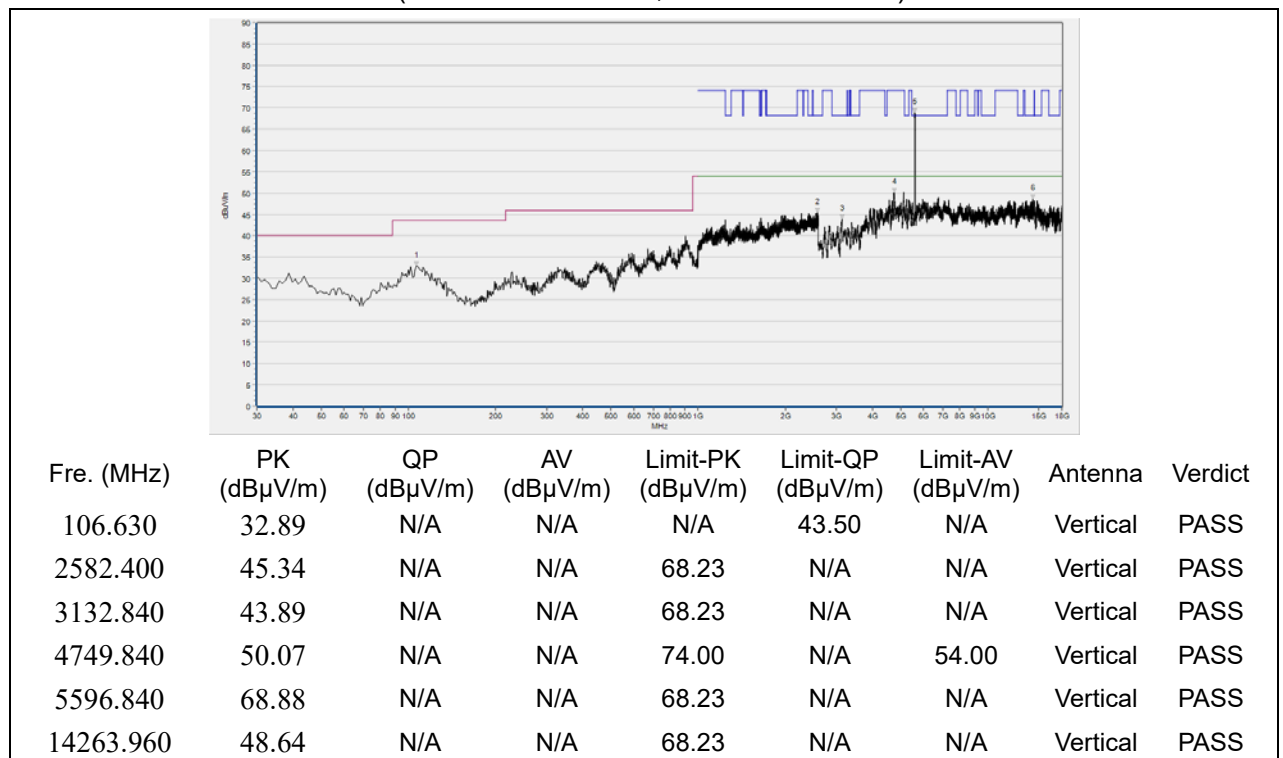
(Antenna Vertical, 30MHz to 18GHz)



Plot for Channel 120

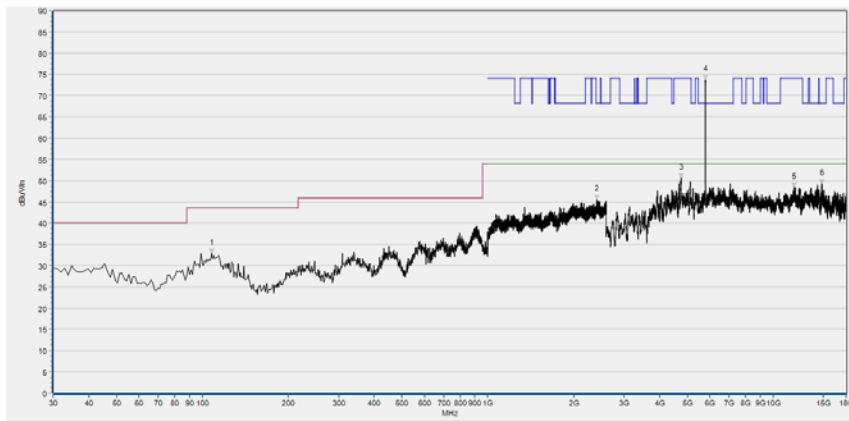


(Antenna Horizontal, 30MHz to 18GHz)



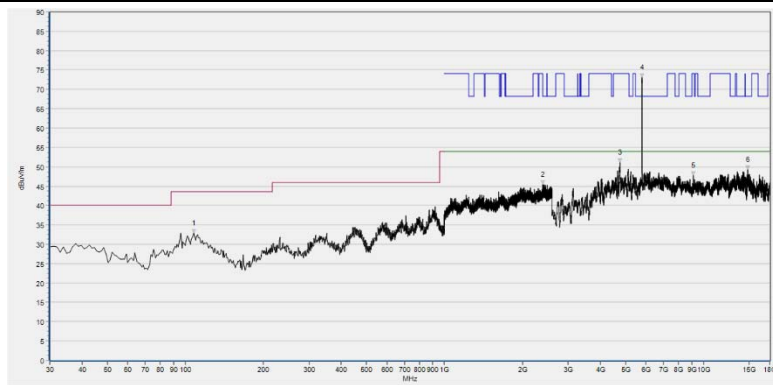
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 157



Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
107.600	32.88	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2412.267	45.53	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
4749.840	50.70	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5778.560	73.68	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
11796.880	48.39	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14793.720	49.19	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
107.600	32.85	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2398.933	45.45	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
4749.840	51.17	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5790.880	73.15	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
9135.760	47.75	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14790.640	49.23	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

————— END OF REPORT —————