2) **Sequence of testing 30 MHz to 1 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) **Sequence of testing 1 GHz to 18 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) **Sequence of testing above 18 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Premeasurement:

--- The antenna is moved spherical over the EUT in different polarizations of the antenna.

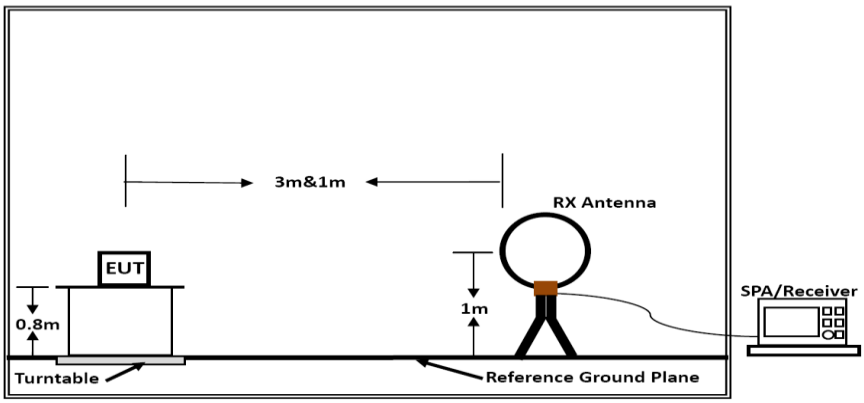
Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

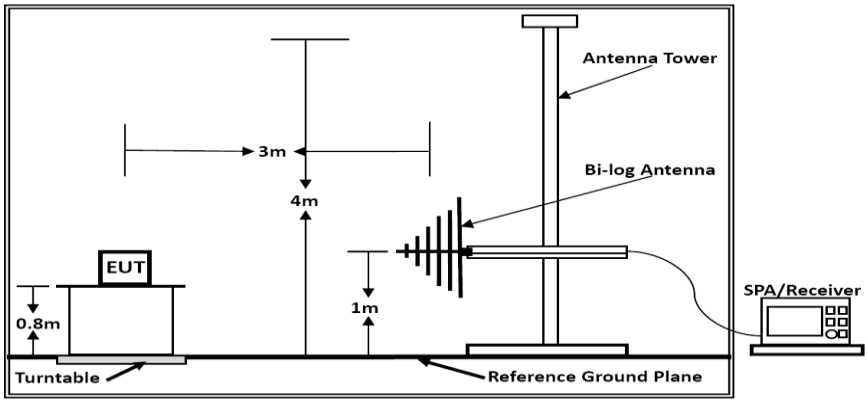
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

5.5.4. Test Setup Layout

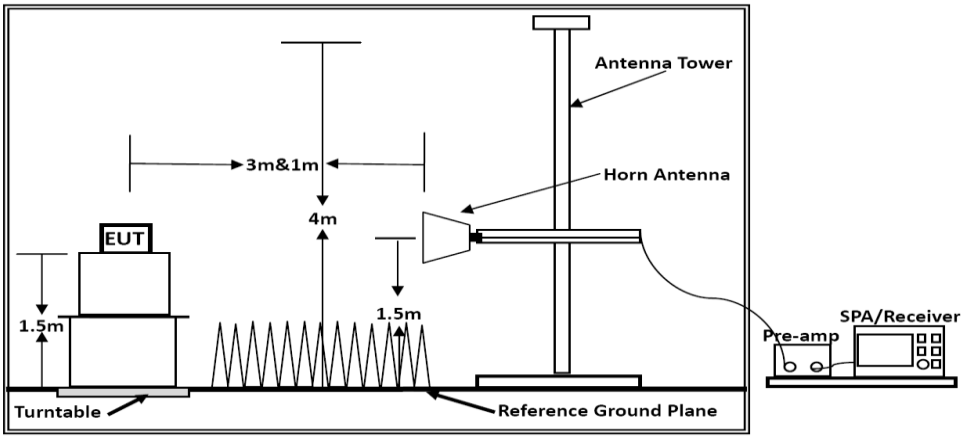
For radiated emissions below 30MHz



Below 30MHz



Below 1GHz



Above 1GHz

Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distanc [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.5.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.5.6. Results of Radiated Emissions (9 KHz~30MHz)

Temperature	24.5℃	Humidity	56.2%
Test Engineer	Gary Qian	Configurations	IEEE 802.11a/n/ac

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

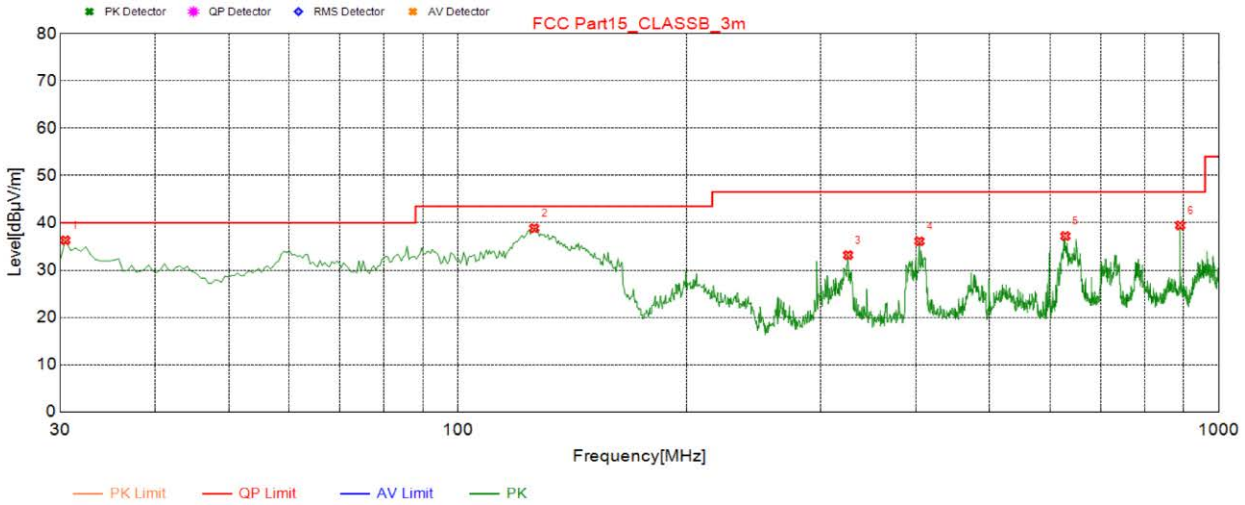
5.5.7. Results of Radiated Emissions (30MHz~1GHz)

Temperature	24.5℃	Humidity	56.2%
Test Engineer	Gary Qian	Configurations	IEEE 802.11n HT20-5180MHz @Chain 0&Chain 1

Test result for IEEE 802.11n HT20-5180MHz @Chain 0&Chain 1 (Worst case)

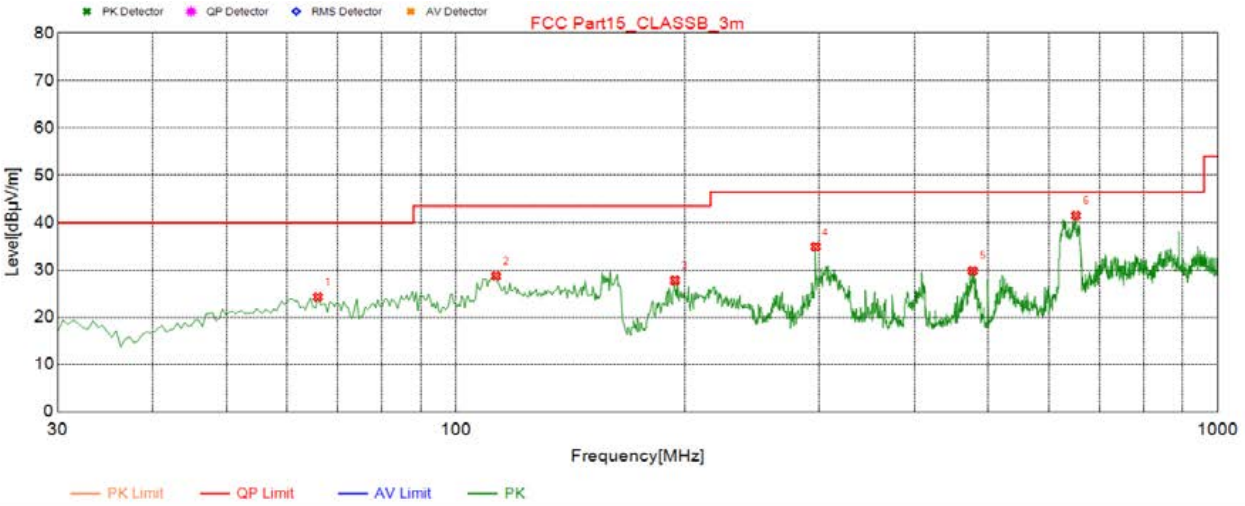
With Adapter(model: SA12V-050200U)

Vertical:



Suspected List								
NO.	Freq. [MHz]	Result Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle[°]	Polarity
1	30.485	36.31	-16.21	40.00	3.69	100	188	Vertical
2	126.030	38.85	-18.50	43.50	4.65	100	288	Vertical
3	325.850	33.16	-12.10	46.50	13.34	100	344	Vertical
4	404.420	36.09	-9.95	46.50	10.41	100	347	Vertical
5	628.975	37.19	-5.23	46.50	9.31	100	310	Vertical
6	890.390	39.44	-1.21	46.50	7.06	100	214	Vertical

Horizontal:



Suspected List								
NO.	Freq. [MHz]	Result Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle[°]	Polarity
1	65.890	24.26	-17.16	40.00	15.74	100	55	Horizontal
2	112.935	28.68	-16.49	43.50	14.82	100	321	Horizontal
3	193.930	27.79	-16.06	43.50	15.71	100	66	Horizontal
4	296.750	34.82	-12.88	46.50	11.68	100	273	Horizontal
5	477.170	29.79	-8.52	46.50	16.71	100	26	Horizontal
6	651.770	41.47	-4.95	46.50	5.03	100	316	Horizontal

Note:

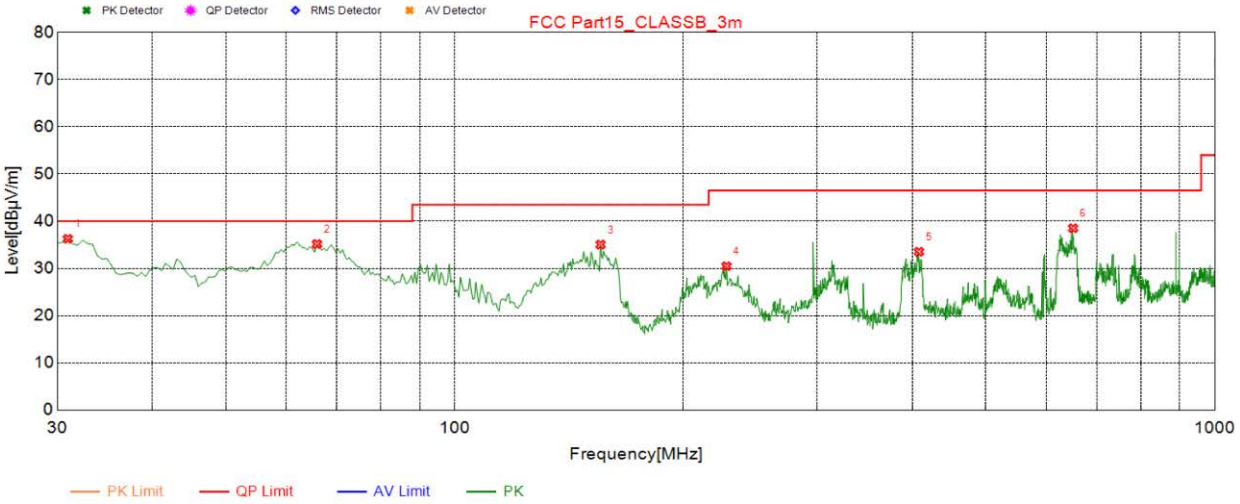
Pre-scan all modes and recorded the worst case results in this report (IEEE 802.11n HT20-5180MHz @Chain 0&Chain 1).

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

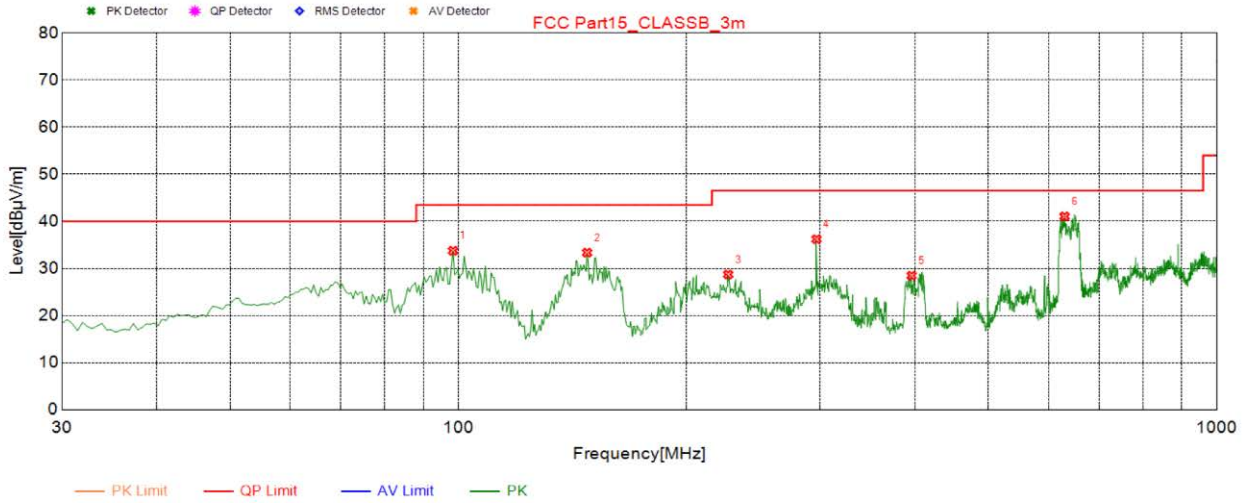
With Adapter(model: A912-050200W-US1)

Vertical:



Suspected List								
NO.	Freq. [MHz]	Result Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle[°]	Polarity
1	30.970	36.25	-16.19	40.00	3.75	100	73	Vertical
2	65.890	35.15	-17.16	40.00	4.85	100	343	Vertical
3	155.615	35.04	-18.86	43.50	8.46	100	19	Vertical
4	227.880	30.44	-14.57	46.50	16.06	100	337	Vertical
5	408.300	33.53	-9.88	46.50	12.97	100	278	Vertical
6	651.285	38.52	-4.95	46.50	7.98	100	27	Vertical

Horizontal:



Suspected List								
NO.	Freq. [MHz]	Result Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle[°]	Polarity
1	98.385	33.75	-16.26	43.50	9.75	300	235	Horizontal
2	147.855	33.35	-19.18	43.50	10.15	100	254	Horizontal
3	226.910	28.72	-14.60	46.50	17.78	100	271	Horizontal
4	296.750	36.22	-12.88	46.50	10.28	100	331	Horizontal
5	396.175	28.48	-10.14	46.50	18.02	100	358	Horizontal
6	630.430	41.05	-5.22	46.50	5.45	100	342	Horizontal

Note:

Pre-scan all modes and recorded the worst case results in this report (IEEE 802.11n HT20-5180MHz @Chain 0&Chain 1).

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

5.5.8. Results for Radiated Emissions (Above 1GHz)

Remark: Measured all modes and recorded worst case;

IEEE 802.11a/ Antenna Chain 1

Channel 36/5180 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.54	52.63	33.06	35.04	3.94	54.59	68.20	-13.61	Peak	Horizontal
15.54	42.02	33.06	35.04	3.94	43.98	54.00	-10.02	Average	Horizontal
15.54	54.89	33.06	35.04	3.94	56.85	68.20	-11.35	Peak	Vertical
15.54	44.92	33.06	35.04	3.94	46.88	54.00	-7.12	Average	Vertical

Channel 40 / 5200 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.60	55.29	33.16	35.15	3.96	57.26	68.20	-10.94	Peak	Horizontal
15.60	44.33	33.16	35.15	3.96	46.30	54.00	-7.70	Average	Horizontal
15.60	56.10	33.16	35.15	3.96	58.07	68.20	-10.13	Peak	Vertical
15.60	43.54	33.16	35.15	3.96	45.51	54.00	-8.49	Average	Vertical

Channel 48 / 5240 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.72	55.37	33.26	35.14	3.98	57.47	68.20	-10.73	Peak	Horizontal
15.72	44.10	33.26	35.14	3.98	46.20	54.00	-7.80	Average	Horizontal
15.72	51.71	33.26	35.14	3.98	53.81	68.20	-14.39	Peak	Vertical
15.72	44.05	33.26	35.14	3.98	46.15	54.00	-7.85	Average	Vertical

IEEE 802.11n-HT20/Combined Antenna Chain 1 and Antenna Chain 2

Channel 36 / 5180 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.54	53.45	33.06	35.04	3.94	55.41	68.20	-12.79	Peak	Horizontal
15.54	41.49	33.06	35.04	3.94	43.45	54.00	-10.55	Average	Horizontal
15.54	53.56	33.06	35.04	3.94	55.52	68.20	-12.68	Peak	Vertical
15.54	42.08	33.06	35.04	3.94	44.04	54.00	-9.96	Average	Vertical

Channel 40 / 5200 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.60	55.43	33.16	35.15	3.96	57.40	68.20	-10.80	Peak	Horizontal
15.60	44.72	33.16	35.15	3.96	46.69	54.00	-7.31	Average	Horizontal
15.60	53.61	33.16	35.15	3.96	55.58	68.20	-12.62	Peak	Vertical
15.60	40.68	33.16	35.15	3.96	42.65	54.00	-11.35	Average	Vertical

Channel 48 / 5240 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.72	55.21	33.26	35.14	3.98	57.31	68.20	-10.89	Peak	Horizontal
15.72	42.29	33.26	35.14	3.98	44.39	54.00	-9.61	Average	Horizontal
15.72	55.77	33.26	35.14	3.98	57.87	68.20	-10.33	Peak	Vertical
15.72	42.85	33.26	35.14	3.98	44.95	54.00	-9.05	Average	Vertical

IEEE 802.11ac VHT20/ Combined Antenna Chain 1 and Antenna Chain 2

Channel 36 / 5180 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.54	56.22	33.06	35.04	3.94	58.18	68.20	-10.02	Peak	Horizontal
15.54	41.89	33.06	35.04	3.94	43.85	54.00	-10.15	Average	Horizontal
15.54	51.73	33.06	35.04	3.94	53.69	68.20	-14.51	Peak	Vertical
15.54	44.74	33.06	35.04	3.94	46.70	54.00	-7.30	Average	Vertical

Channel 40 / 5200 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.60	53.28	33.16	35.15	3.96	55.25	68.20	-12.95	Peak	Horizontal
15.60	41.10	33.16	35.15	3.96	43.07	54.00	-10.93	Average	Horizontal
15.60	53.88	33.16	35.15	3.96	55.85	68.20	-12.35	Peak	Vertical
15.60	40.76	33.16	35.15	3.96	42.73	54.00	-11.27	Average	Vertical

Channel 48 / 5240 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.72	51.86	33.26	35.14	3.98	53.96	68.20	-14.24	Peak	Horizontal
15.72	40.09	33.26	35.14	3.98	42.19	54.00	-11.81	Average	Horizontal
15.72	55.51	33.26	35.14	3.98	57.61	68.20	-10.59	Peak	Vertical
15.72	44.02	33.26	35.14	3.98	46.12	54.00	-7.88	Average	Vertical

IEEE 802.11n HT40 / Antenna Chain 1 and Antenna Chain 2

Channel 38 / 5190 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.57	55.75	33.06	35.04	3.94	57.71	68.20	-10.49	Peak	Horizontal
15.57	43.55	33.06	35.04	3.94	45.51	54.00	-8.49	Average	Horizontal
15.57	54.89	33.06	35.04	3.94	56.85	68.20	-11.35	Peak	Vertical
15.57	40.39	33.06	35.04	3.94	42.35	54.00	-11.65	Average	Vertical

Channel 46 / 5230 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.69	55.07	33.16	35.15	3.96	57.04	68.20	-11.16	Peak	Horizontal
15.69	40.21	33.16	35.15	3.96	42.18	54.00	-11.82	Average	Horizontal
15.69	54.03	33.16	35.15	3.96	56.00	68.20	-12.20	Peak	Vertical
15.69	44.12	33.16	35.15	3.96	46.09	54.00	-7.91	Average	Vertical

IEEE 802.11ac VHT40 / Antenna Chain 1 and Antenna Chain 2

Channel 38 / 5190 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.57	55.36	33.06	35.04	3.94	57.32	68.20	-10.88	Peak	Horizontal
15.57	43.64	33.06	35.04	3.94	45.60	54.00	-8.40	Average	Horizontal
15.57	53.68	33.06	35.04	3.94	55.64	68.20	-12.56	Peak	Vertical
15.57	43.28	33.06	35.04	3.94	45.24	54.00	-8.76	Average	Vertical

Channel 46 / 5230 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.69	53.22	33.16	35.15	3.96	55.19	68.20	-13.01	Peak	Horizontal
15.69	41.74	33.16	35.15	3.96	43.71	54.00	-10.29	Average	Horizontal
15.69	53.77	33.16	35.15	3.96	55.74	68.20	-12.46	Peak	Vertical
15.69	41.00	33.16	35.15	3.96	42.97	54.00	-11.03	Average	Vertical

IEEE 802.11ac VHT80 / Antenna Chain 1 and Antenna Chain 2

Channel 42 / 5210 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
15.63	55.09	33.06	35.04	3.94	57.05	68.20	-11.15	Peak	Horizontal
15.63	44.46	33.06	35.04	3.94	46.42	54.00	-7.58	Average	Horizontal
15.63	53.01	33.06	35.04	3.94	54.97	68.20	-13.23	Peak	Vertical
15.63	41.66	33.06	35.04	3.94	43.62	54.00	-10.38	Average	Vertical

Notes:

1. *Measuring frequencies from 9 KHz ~40 GHz, No emission found between lowest internal used/generated frequencies to 30MHz.*
2. *Radiated emissions measured in frequency range from 9 KHz ~40GHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11a VHT20, IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;*

5.6. Power line conducted emissions

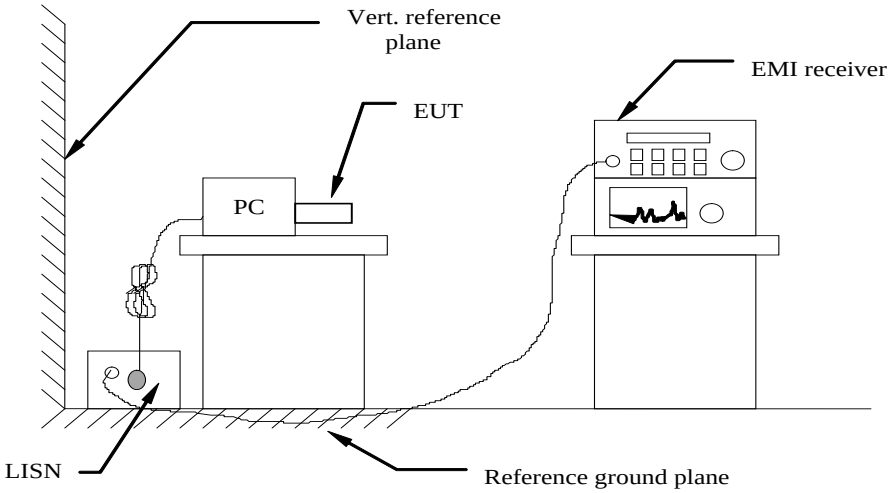
5.6.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which 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 or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreasing linearly with the logarithm of the frequency

5.6.2 Block Diagram of Test Setup



5.6.3 Test Results

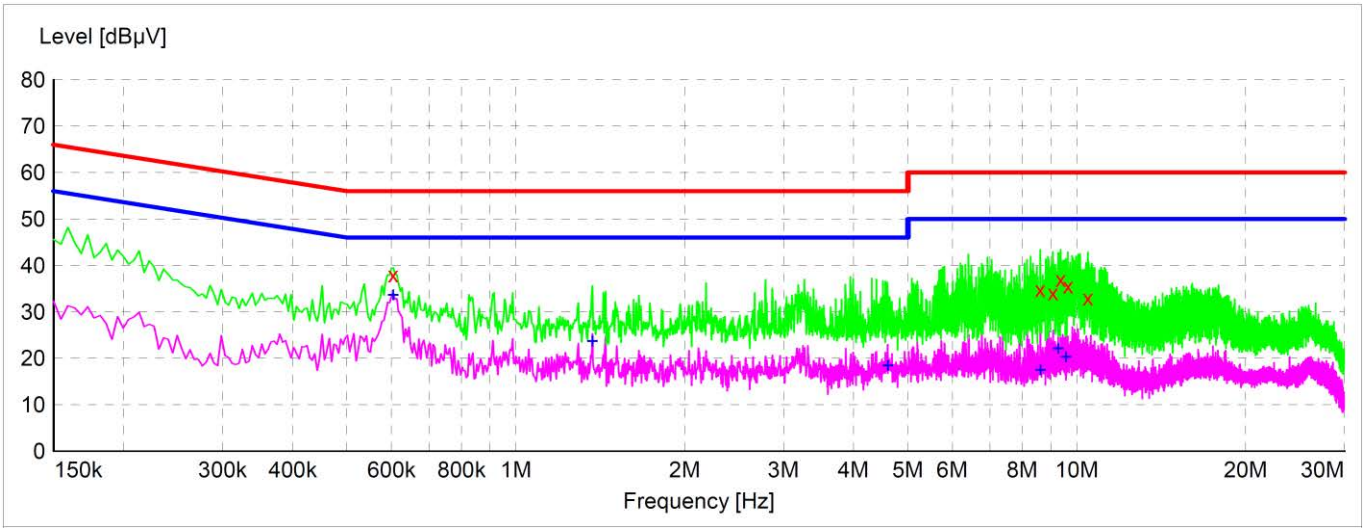
PASS.

The test data please refer to following page.

The worst result for IEEE 802.11n HT20-5180MHz @Chain 0&Chain 1

With Adapter(model: SA12V-050200U)

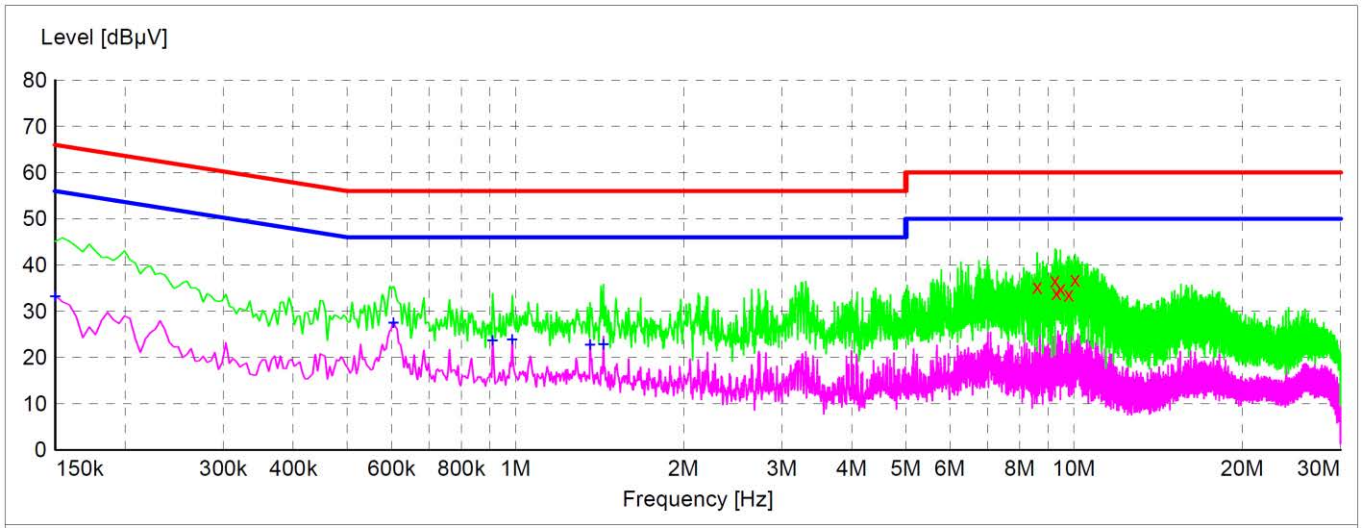
Line



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.604500	38.00	9.9	56	18.0	QP	L1	GND
8.610000	34.80	9.8	60	25.2	QP	L1	GND
9.064500	34.10	9.8	60	25.9	QP	L1	GND
9.357000	37.00	9.8	60	23.0	QP	L1	GND
9.640500	35.60	9.8	60	24.4	QP	L1	GND
10.464000	33.00	9.8	60	27.0	QP	L1	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.604500	33.60	9.9	46	12.4	AV	L1	GND
1.369500	23.70	9.7	46	22.3	AV	L1	GND
4.600500	18.40	9.8	46	27.6	AV	L1	GND
8.614500	17.50	9.8	50	32.5	AV	L1	GND
9.271500	22.10	9.8	50	27.9	AV	L1	GND
9.564000	20.30	9.8	50	29.7	AV	L1	GND

Neutral



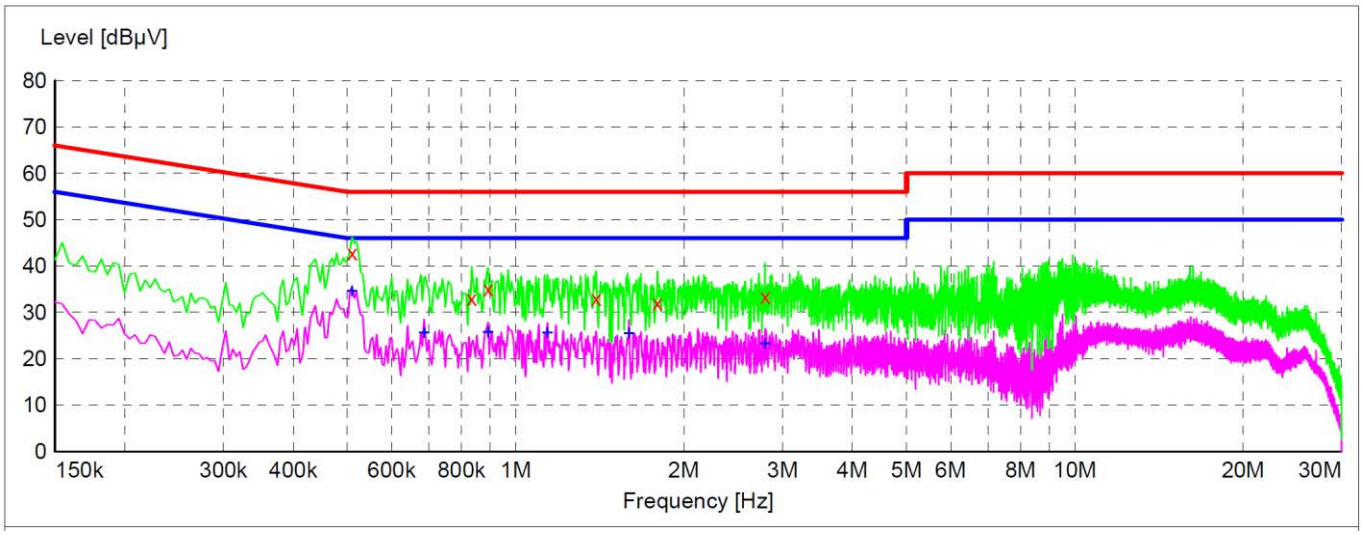
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
8.592000	35.40	9.8	60	24.6	QP	N	GND
9.253500	36.70	9.8	60	23.3	QP	N	GND
9.298500	34.00	9.8	60	26.0	QP	N	GND
9.460500	34.90	9.8	60	25.1	QP	N	GND
9.793500	33.70	9.8	60	26.3	QP	N	GND
10.041000	36.90	9.8	60	23.1	QP	N	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	33.20	9.8	56	22.8	AV	N	GND
0.604500	27.50	9.9	46	18.5	AV	N	GND
0.910500	23.70	9.8	46	22.3	AV	N	GND
0.987000	23.80	9.8	46	22.2	AV	N	GND
1.360500	22.70	9.7	46	23.3	AV	N	GND
1.437000	22.80	9.7	46	23.2	AV	N	GND

******Note: Pre-scan all modes and recorded the worst case results in this report (IEEE 802.11a,5240MHz) @ Chain 0 for 120V/60Hz.***

With Adapter(model: A912-050200W-US1)

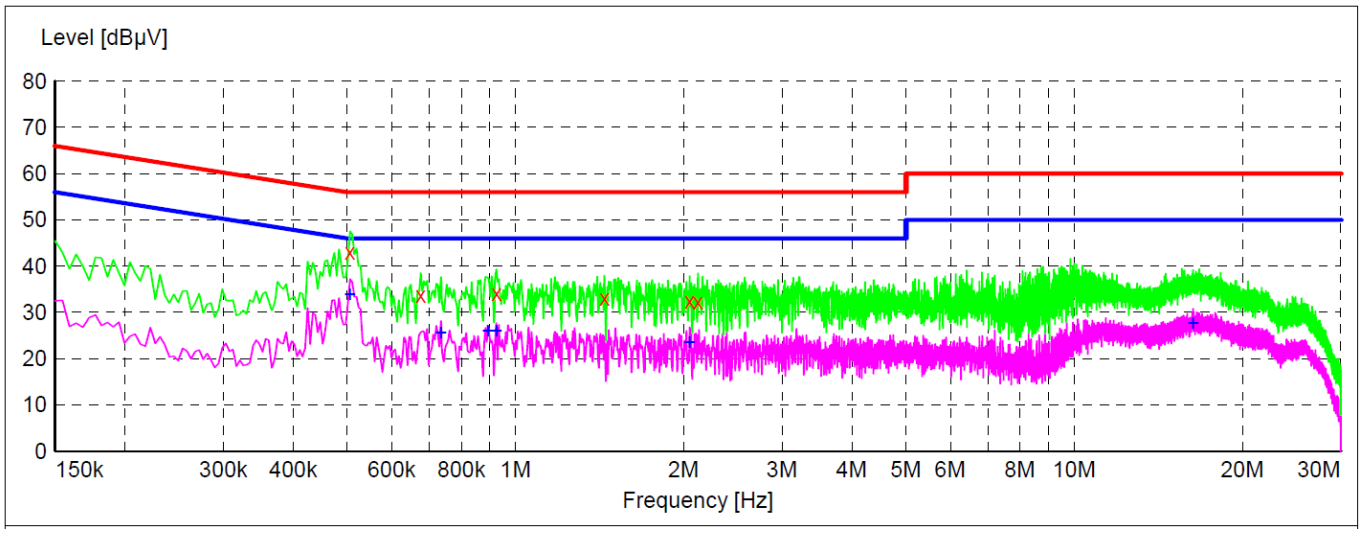
Line



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.510000	42.80	9.9	56	13.2	QP	L1	GND
0.834000	33.00	9.8	56	23.0	QP	L1	GND
0.892500	35.10	9.8	56	20.9	QP	L1	GND
1.392000	33.00	9.7	56	23.0	QP	L1	GND
1.792500	32.00	9.7	56	24.0	QP	L1	GND
2.791500	33.40	9.7	56	22.6	QP	L1	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.510000	34.50	9.9	46	11.5	AV	L1	GND
0.685500	25.50	9.9	46	20.5	AV	L1	GND
0.892500	25.60	9.8	46	20.4	AV	L1	GND
1.140000	25.50	9.8	46	20.5	AV	L1	GND
1.594500	25.40	9.7	46	20.6	AV	L1	GND
2.791500	23.20	9.7	46	22.8	AV	L1	GND

Neutral



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.505500	43.00	9.9	56	13.0	QP	N	GND
0.676500	33.60	9.9	56	22.4	QP	N	GND
0.924000	34.10	9.8	56	21.9	QP	N	GND
1.441500	33.00	9.7	56	23.0	QP	N	GND
2.049000	32.40	9.7	56	23.6	QP	N	GND
2.121000	32.30	9.7	56	23.7	QP	N	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.505500	34.00	9.9	46	12.0	AV	N	GND
0.735000	25.70	9.9	46	20.3	AV	N	GND
0.892500	25.90	9.8	46	20.1	AV	N	GND
0.924000	26.10	9.8	46	19.9	AV	N	GND
2.049000	23.60	9.7	46	22.4	AV	N	GND
16.314000	27.80	10.0	50	22.2	AV	N	GND

******Note: Pre-scan all modes and recorded the worst case results in this report (IEEE 802.11a,5240MHz) @ Chain 0 for 120V/60Hz.***

5.7 Undesirable Emissions Measurement

5.7.1 LIMIT

According to ξ15.407 (b) Undesirable emission limits. Except as shown in paragraph (b) (7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(a) 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.

(b) 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.

(c) 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.

(d) 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.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

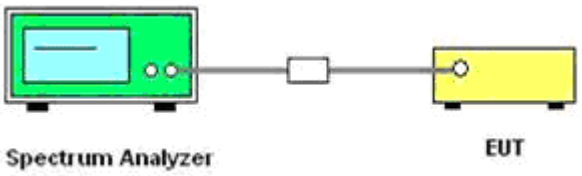
(e) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(f) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(g) The provisions of §15.205 apply to intentional radiators operating under this section.

(h) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

5.7.2 TEST CONFIGURATION



5.7.3 TEST PROCEDURE

According to KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section G: Unwanted Emission Measurement

1. Unwanted Emissions in the Restricted Bands

a) For all measurements, follow the requirements in section II.G.3. “General Requirements for Unwanted Emissions Measurements.”

b) At frequencies below 1000 MHz, use the procedure described in section II.G.4. “Procedure for Unwanted Emissions Measurements below 1000 MHz.”

c) At frequencies above 1000 MHz, measurements performed using the peak and average measurement procedures described in sections II.G.5. and II.G.6, respectively, must satisfy the respective peak and average limits. If all peak measurements satisfy the average limit, then average measurements are not required.

d) For conducted measurements above 1000 MHz, EIRP shall be computed as specified in section II.G.3.b) and then field strength shall be computed as follows (see KDB Publication 412172):

i) E[dBμV/m] = EIRP[dBm] - 20 log (d[meters]) + 104.77, where E = field strength and d = distance at which field strength limit is specified in the rules;

ii) E[dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters

e) For conducted measurements below 1000 MHz, the field strength shall be computed as specified in d), above, and then an additional 4.7 dB shall be added as an upper bound on the field strength that would be observed on a test range with a ground plane for frequencies between 30 MHz and 1000 MHz, or an additional 6 dB shall be added for frequencies below 30 MHz.

2. Unwanted Emissions that fall Outside of the Restricted Bands

a) For all measurements, follow the requirements in section II.G.3. “General Requirements for Unwanted Emissions Measurements.”

b) At frequencies below 1000 MHz, use the procedure described in section II.G.4. “Procedure for Unwanted Emissions Measurements below 1000 MHz.”

c) At frequencies above 1000 MHz, use the procedure for maximum emissions described in section II.G.5., “Procedure for Unwanted Maximum Unwanted Emissions Measurements Above 1000 MHz.”

d) Section 15.407(b) (1-3) specifies the unwanted emissions limit for the U-NII-1 and 2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz. However, an out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz dBm/MHz peak emission limit.

i) Section 15.407(b) (4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b) (4) (i). An alternative to the band emissions mask is specified in Section 15.407(b) (4) (ii). The alternative limits are based on the highest antenna gain specified in the filing. There are also marketing and importation restrictions for the alternative limit.

e) If radiated measurements are performed, field strength is then converted to EIRP as follows:

i) EIRP = ((E×d) ^2) / 30

Where:

- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotopically radiated power in watts;

ii) Working in dB units, the above equation is equivalent to:

EIRP [dBm] = E [dBμV/m] + 20 log (d [meters]) - 104.77

iii) Or, if d is 3 meters:

EIRP [dBm] = E [dBμV/m] - 95.23

3) Radiated versus Conducted Measurements.

The unwanted emission limits in both the restricted and non-restricted bands are based on radiated measurements; however, as an alternative, antenna-port conducted measurements in conjunction with cabinet emissions tests will be permitted to demonstrate compliance provided that the following steps are performed:

(i) Cabinet emissions measurements. A radiated test shall be performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna may be replaced by a termination matching the nominal impedance of the antenna.

(ii) Impedance matching. Conducted tests shall be performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT.

(iii) EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater.[3] However, for devices that operate in multiple bands using the same transmit antenna, the highest gain of the antenna within the operating band nearest to the out-of-band frequency being measured may be used in lieu of the overall highest gain when measuring emissions at frequencies within 20% of the absolute frequency at the nearest edge of that band, but in no case shall a value less than 2 dBi be selected.

(iv) EIRP adjustments for multiple outputs. For devices with multiple outputs occupying the same or overlapping frequency ranges in the same band (e.g., MIMO or beamforming devices), compute the total EIRP as follows:

- Compute EIRP for each output, as described in (iii), above.
- Follow the procedures specified in KDB Publication 662911 for summing emissions across the outputs or adjusting emission levels measured on individual outputs by 10 log (N_{ANT}), where N_{ANT} is the number of outputs.
- Add the array gain term specified in KDB Publication 662911 for out-of-band and spurious signals.

(v) Direction of maximum emission.

For all radiated emissions tests, measurements shall correspond to the direction of maximum emission level for each measured emission (see ANSI C63.10 for guidance).

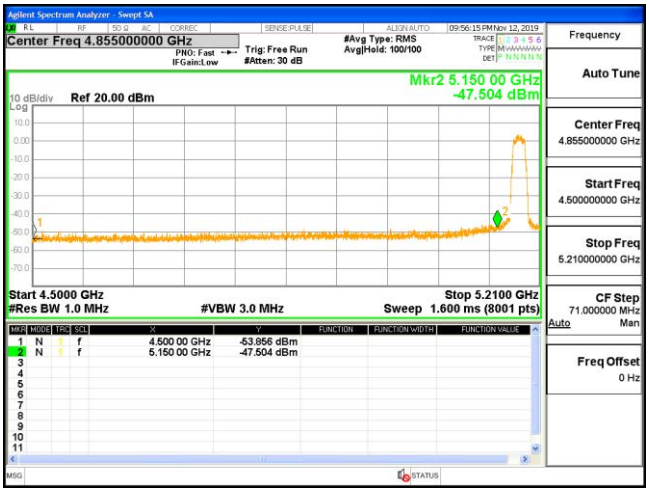
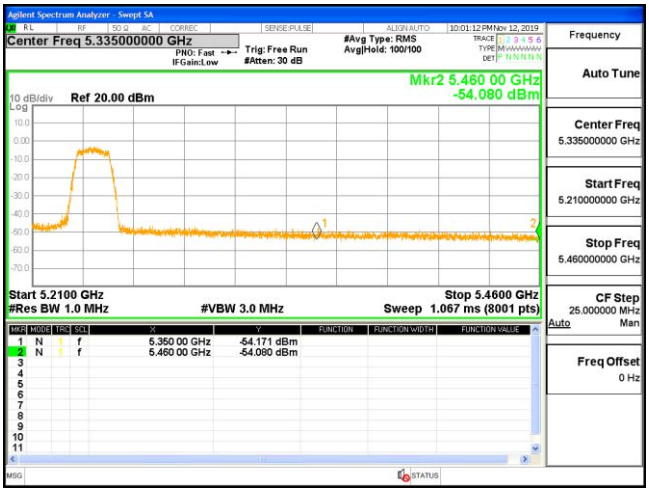
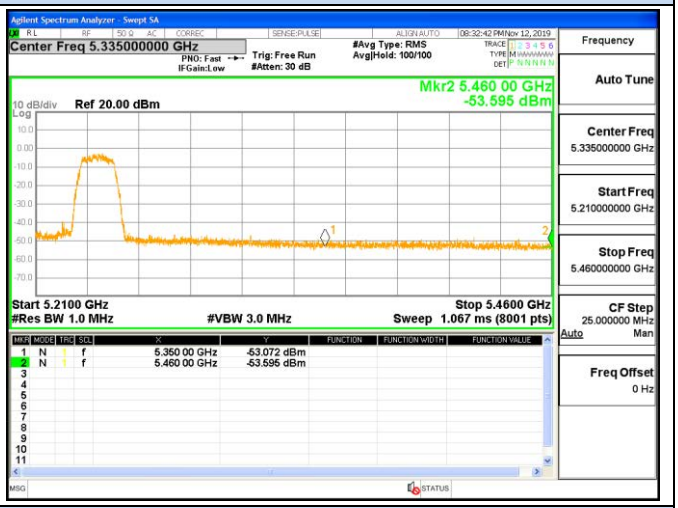
5.7.4 TEST RESULT

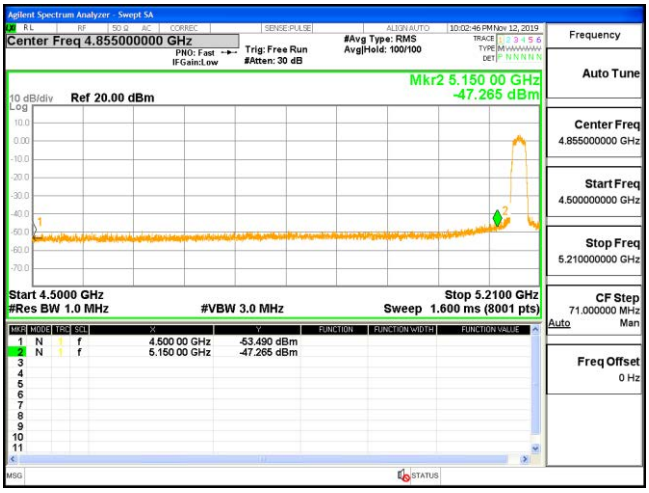
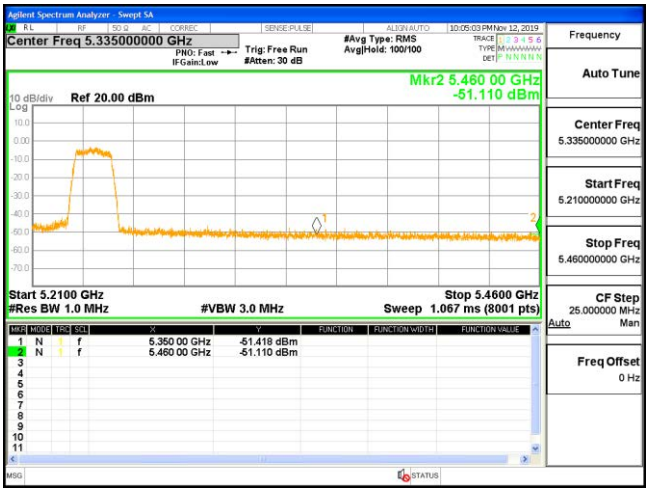
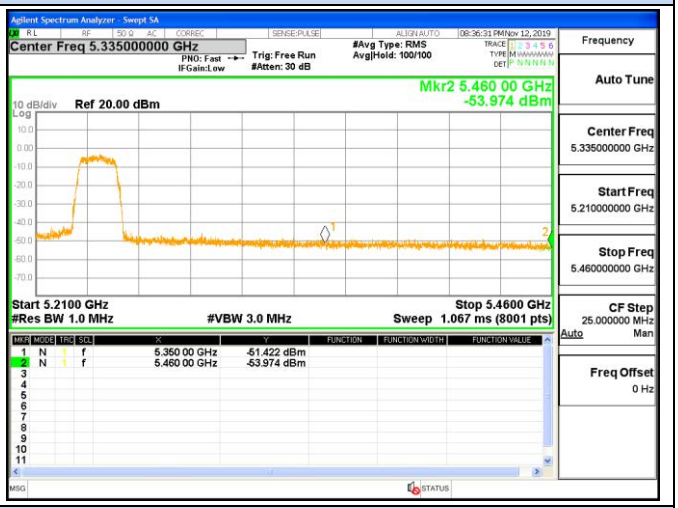
Type	Frequency (MHz)	Nominal Bandwidth (MHz)	Frequency (MHz)	Bandedge Peak (dBm) Ant1	Bandedge Peak (dBm) Ant2	Sum Value (dBm)	Directional Gain (dBi)	Ground Reflection Factor (dB)	Max Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)	Over limit (dB)	Verdict
802.11a	5180	20	-53.86	-54.77	-52.33	/	6.39	0.00	49.26	Peak	68.20	-18.94	Pass
802.11a	5180	20	-47.5	-49.42	-36.74	/	6.39	0.00	64.85	Peak	68.20	-3.35	Pass
802.11a	5240	20	-54.17	-53.07	-49.16	/	6.39	0.00	52.43	Peak	68.20	-15.77	Pass
802.11a	5240	20	-54.08	-53.6	-49.58	/	6.39	0.00	52.01	Peak	68.20	-16.19	Pass
802.11n	5180	20	-53.49	-54.68	-51.78	-49.98	7.82	0.00	53.04	Peak	68.20	-15.16	Pass
802.11n	5180	20	-47.26	-46.4	-44.08	-42.08	7.82	0.00	60.94	Peak	68.20	-7.26	Pass
802.11n	5240	20	-51.42	-51.42	-49.76	-47.50	7.82	0.00	55.52	Peak	68.20	-12.68	Pass
802.11n	5240	20	-51.11	-53.97	-51.07	-49.27	7.82	0.00	53.75	Peak	68.20	-14.45	Pass
802.11ac	5180	20	-53.02	-53.91	-50.37	-48.78	7.82	0.00	54.24	Peak	68.20	-13.96	Pass
802.11ac	5180	20	-49.07	-48.67	-40.68	-40.04	7.82	0.00	62.98	Peak	68.20	-5.22	Pass
802.11ac	5240	20	-51.5	-53.03	-49.67	-48.02	7.82	0.00	55.00	Peak	68.20	-13.20	Pass
802.11ac	5240	20	-53.84	-54.96	-49.72	-48.58	7.82	0.00	54.44	Peak	68.20	-13.76	Pass
802.11n	5190	40	-54.24	-54.24	-50.60	-49.04	7.82	0.00	53.98	Peak	68.20	-14.22	Pass
802.11n	5190	40	-46.8	-48.01	-38.07	-37.65	7.82	0.00	65.37	Peak	68.20	-2.83	Pass
802.11n	5230	40	-52.52	-51.63	-49.35	-47.33	7.82	0.00	55.69	Peak	68.20	-12.51	Pass
802.11n	5230	40	-51.82	-51.98	-51.18	-48.55	7.82	0.00	54.47	Peak	68.20	-13.73	Pass
802.11ac	5190	40	-53.93	-53.42	-51.83	-49.54	7.82	0.00	53.48	Peak	68.20	-14.72	Pass
802.11ac	5190	40	-47.44	-47.66	-38.00	-37.55	7.82	0.00	65.47	Peak	68.20	-2.73	Pass
802.11ac	5230	40	-52.21	-51.7	-50.37	-47.97	7.82	0.00	55.05	Peak	68.20	-13.15	Pass
802.11ac	5230	40	-51.54	-53.57	-50.20	-48.56	7.82	0.00	54.46	Peak	68.20	-13.74	Pass
802.11ac	5210	80	-54.47	-53.41	-53.02	-50.20	7.82	0.00	52.82	Peak	68.20	-15.38	Pass
802.11ac	5210	80	-44.97	-46.69	-41.90	-40.66	7.82	0.00	62.36	Peak	68.20	-5.84	Pass
802.11ac	5210	80	-50.23	-50.99	-50.48	-47.72	7.82	0.00	55.30	Peak	68.20	-12.90	Pass
802.11ac	5210	80	-53.25	-51.87	-49.26	-47.36	7.82	0.00	55.66	Peak	68.20	-12.54	Pass

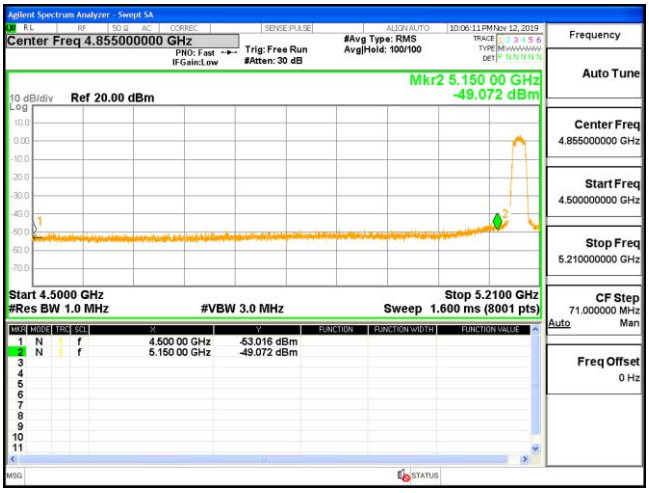
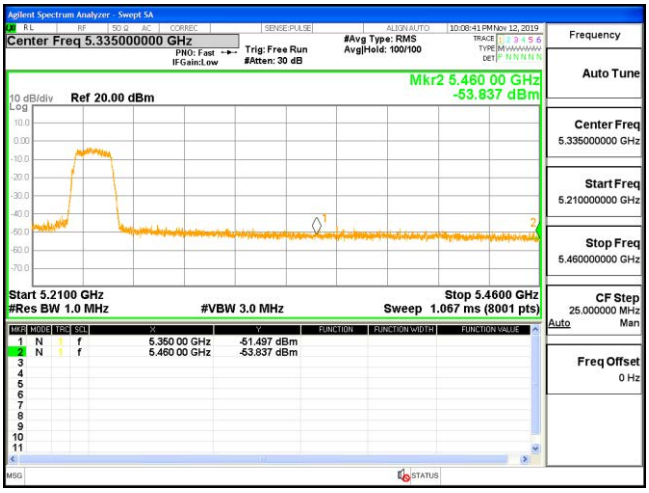
Type	Frequency (MHz)	Nominal Bandwidth (MHz)	Frequency (MHz)	Bandedge Average (dBm) Ant0	Bandedge Average (dBm) Ant1	Sum Value (dBm)	Directional Gain (dBi)	Ground Reflection Factor (dB)	Max Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)	Over limit (dB)	Verdict
802.11a	5180	20	4500	-60.62	-60.61	/	6.39	0.00	40.98	Avg	54.00	-13.02	Pass
802.11a	5180	20	5150	-53.23	-53.19	/	6.39	0.00	48.40	Avg	54.00	-5.60	Pass
802.11a	5240	20	5350	-57.81	-57.77	/	6.39	0.00	43.82	Avg	54.00	-10.18	Pass
802.11a	5240	20	5460	-59.54	-59.55	/	6.39	0.00	42.05	Avg	54.00	-11.95	Pass
802.11n	5180	20	4500	-60.57	-60.59	-57.57	7.82	0.00	45.45	Avg	54.00	-8.55	Pass
802.11n	5180	20	5150	-53.07	-53.33	-50.19	7.82	0.00	52.83	Avg	54.00	-1.17	Pass
802.11n	5240	20	5350	-57.88	-57.86	-54.86	7.82	0.00	48.16	Avg	54.00	-5.84	Pass
802.11n	5240	20	5460	-59.56	-59.58	-56.56	7.82	0.00	46.46	Avg	54.00	-7.54	Pass
802.11ac	5180	20	4500	-60.58	-60.6	-57.58	7.82	0.00	45.44	Avg	54.00	-8.56	Pass
802.11ac	5180	20	5150	-53.08	-52.95	-50.00	7.82	0.00	53.02	Avg	54.00	-0.98	Pass
802.11ac	5240	20	5350	-57.9	-57.91	-54.89	7.82	0.00	48.13	Avg	54.00	-5.87	Pass
802.11ac	5240	20	5460	-59.55	-59.57	-56.55	7.82	0.00	46.47	Avg	54.00	-7.53	Pass
802.11n	5190	40	4500	-60.56	-60.58	-57.56	7.82	0.00	45.46	Avg	54.00	-8.54	Pass
802.11n	5190	40	5150	-53.03	-53.06	-50.03	7.82	0.00	52.99	Avg	54.00	-1.01	Pass
802.11n	5230	40	5350	-57.55	-57.58	-54.55	7.82	0.00	48.47	Avg	54.00	-5.53	Pass
802.11n	5230	40	5460	-59.7	-59.72	-56.70	7.82	0.00	46.32	Avg	54.00	-7.68	Pass
802.11ac	5190	40	4500	-60.58	-60.63	-57.59	7.82	0.00	45.43	Avg	54.00	-8.57	Pass
802.11ac	5190	40	5150	-52.81	-52.5	-49.64	7.82	0.00	53.38	Avg	54.00	-0.62	Pass
802.11ac	5230	40	5350	-57.56	-57.6	-54.57	7.82	0.00	48.45	Avg	54.00	-5.55	Pass
802.11ac	5230	40	5460	-59.65	-59.71	-56.67	7.82	0.00	46.35	Avg	54.00	-7.65	Pass
802.11ac	5210	80	4500	-60.6	-60.61	-57.59	7.82	0.00	45.43	Avg	54.00	-8.57	Pass
802.11ac	5210	80	5150	-53.18	-53.74	-50.44	7.82	0.00	52.58	Avg	54.00	-1.42	Pass
802.11ac	5210	80	5350	-56.48	-56.49	-53.47	7.82	0.00	49.55	Avg	54.00	-4.45	Pass
802.11ac	5210	80	5460	-59.33	-59.31	-56.31	7.82	0.00	46.71	Avg	54.00	-7.29	Pass

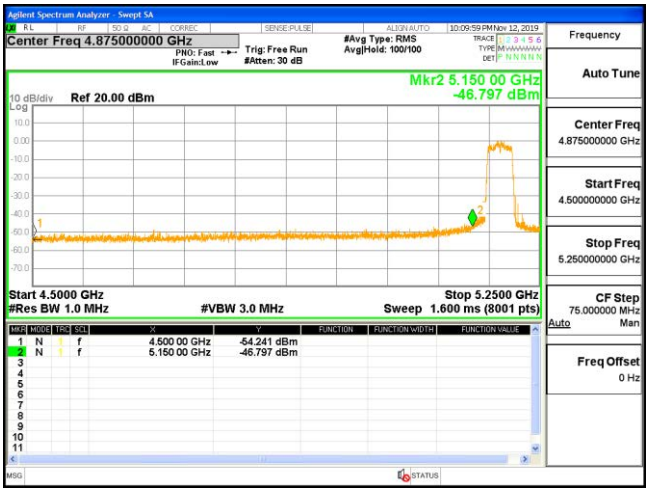
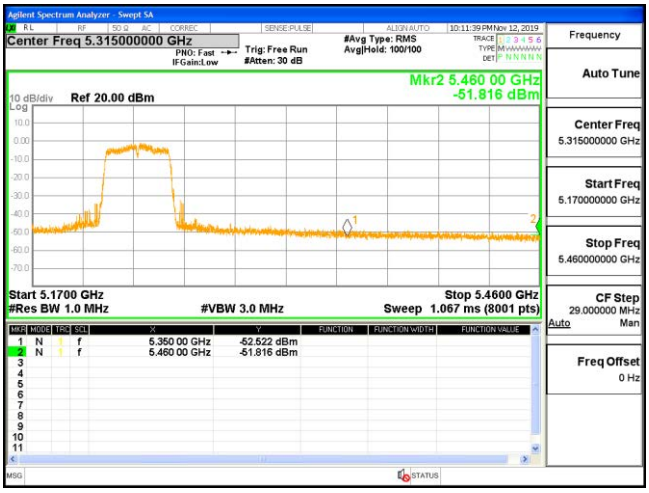
Remark:

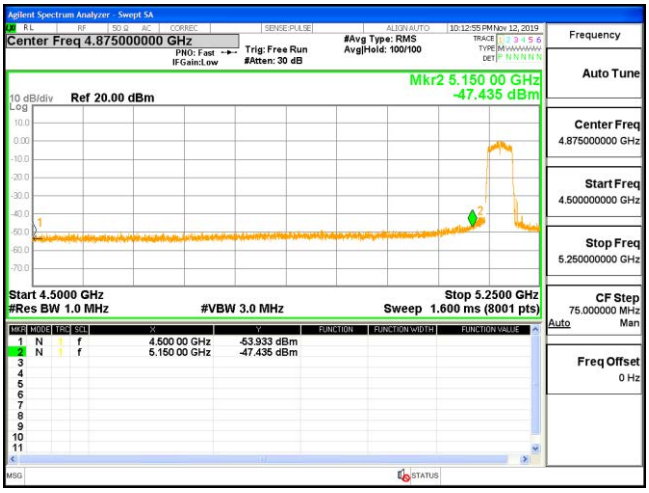
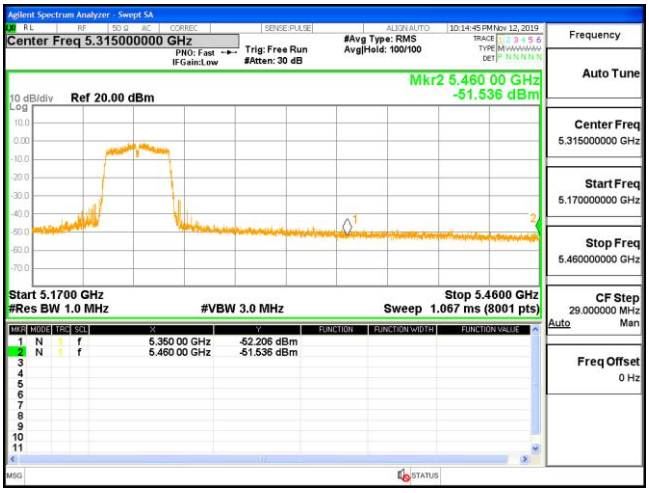
1. *Measured Undesirable emission at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11a VHT20, IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;*
4. *For MIMO with CCD technology device, The Directional Gain= Gain of individual transmit antennas (dBi) + Array gain;*
   Array gain = 10 log (N_{ant}), where N_{ant} is the number of transmit antennas.
5. *Covert Radiated E Level At 3m = Conducted average power + Directional Gain + 104.77-20*log(3);*
6. *Please refer to following test plots;*

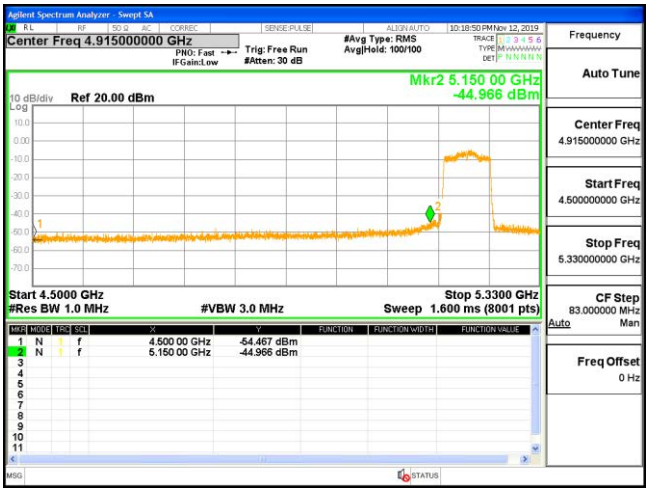
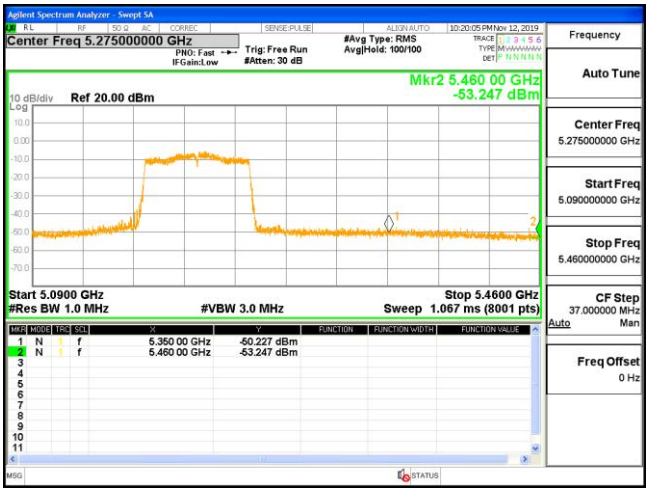
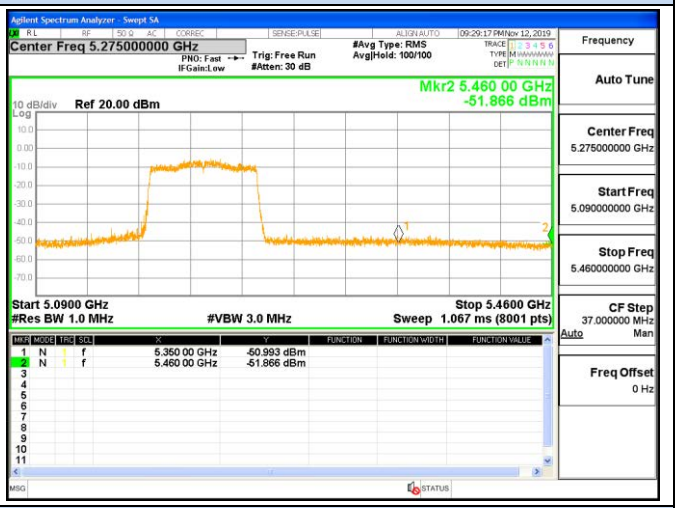
Undesirable emission-Peak	
IEEE 802.11a	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 36 / 5180 MHz – Peak	*Channel 36 / 5180 MHz – Peak*
	
Channel 48 / 5240 MHz – Peak	*Channel 48 / 5240 MHz – Peak*

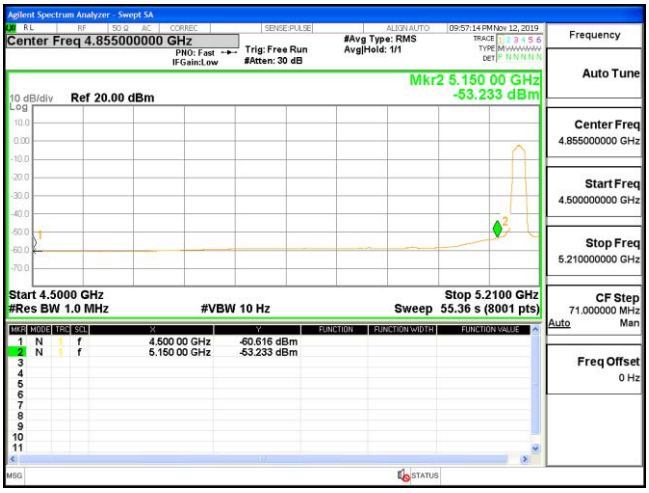
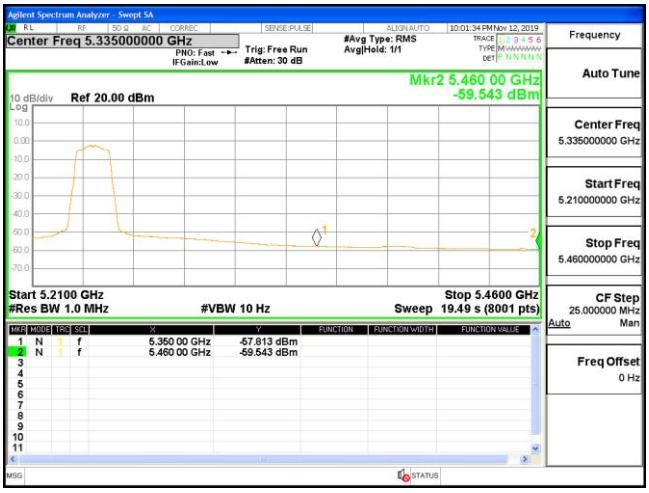
Undesirable emission-Peak	
IEEE 802.11n HT20	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 36 / 5180 MHz – Peak	*Channel 36 / 5180 MHz – Peak*
	
Channel 48 / 5240 MHz – Peak	*Channel 48 / 5240 MHz – Peak*

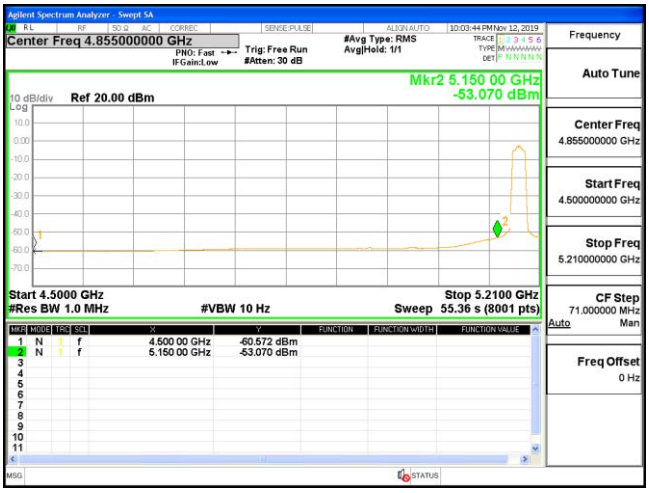
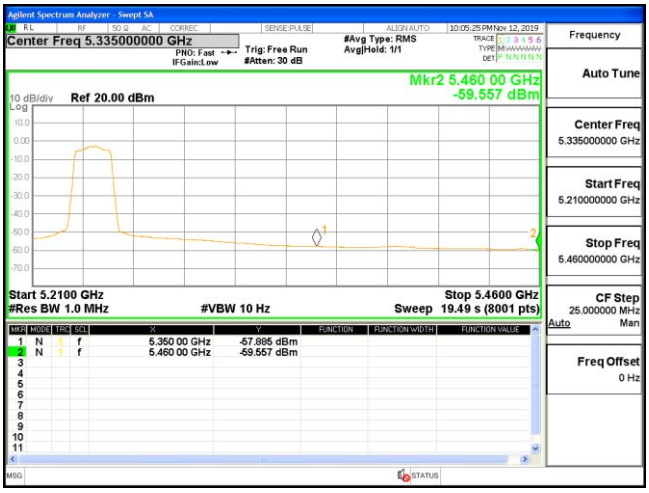
Undesirable emission-Peak	
IEEE 802.11 ac VHT20	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 36 / 5180 MHz – Peak	*Channel 36 / 5180 MHz – Peak*
	
Channel 48 / 5240 MHz – Peak	*Channel 48 / 5240 MHz – Peak*

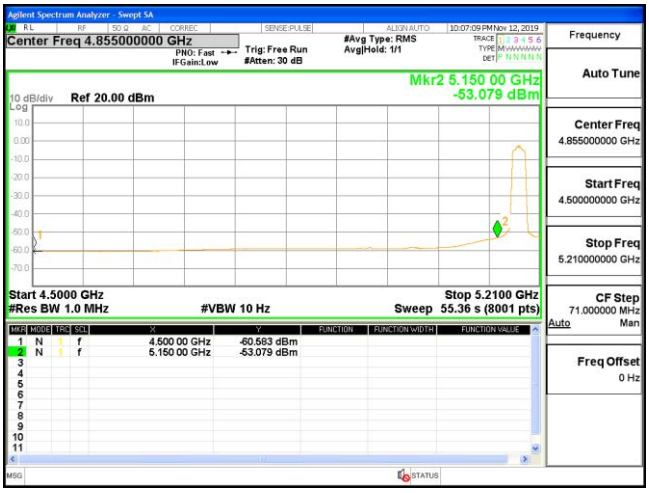
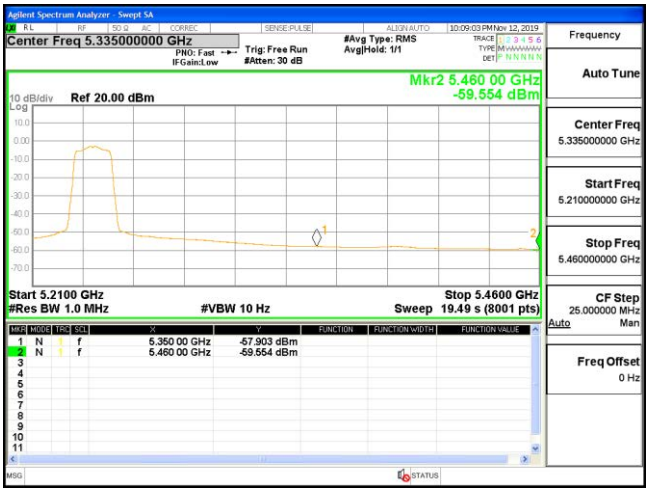
Undesirable emission-Peak	
IEEE 802.11n HT40	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 38 / 5190 MHz – Peak	*Channel 38 / 5190 MHz – Peak*
	
Channel 46 / 5230 MHz – Peak	*Channel 46 / 5230 MHz – Peak*

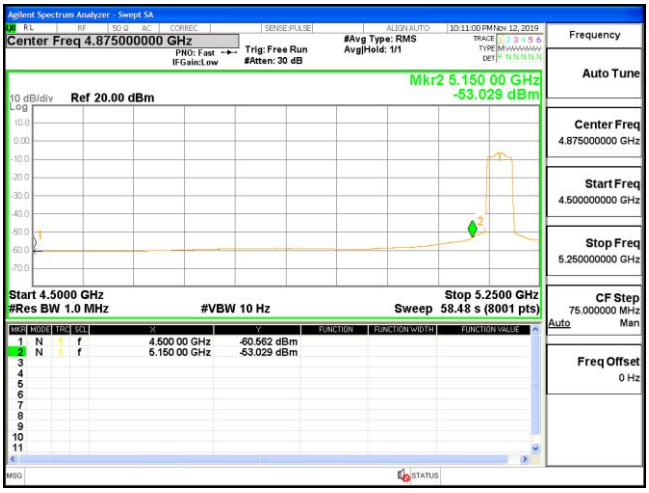
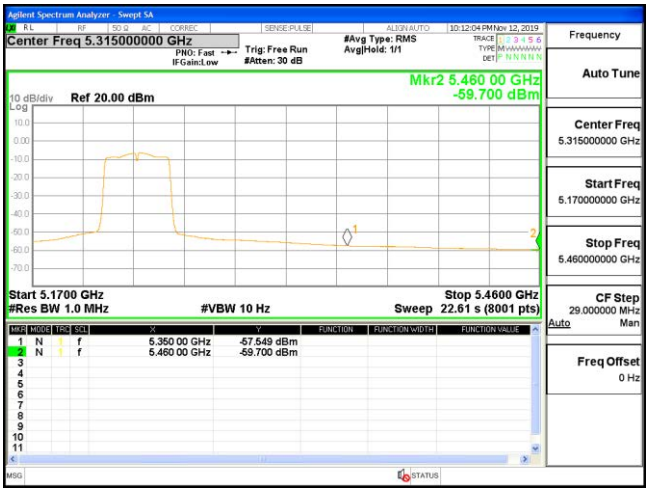
Undesirable emission-Peak	
IEEE 802.11ac VHT40	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 38 / 5190 MHz – Peak	*Channel 38 / 5190 MHz – Peak*
	
Channel 46 / 5230 MHz – Peak	*Channel 46 / 5230 MHz – Peak*

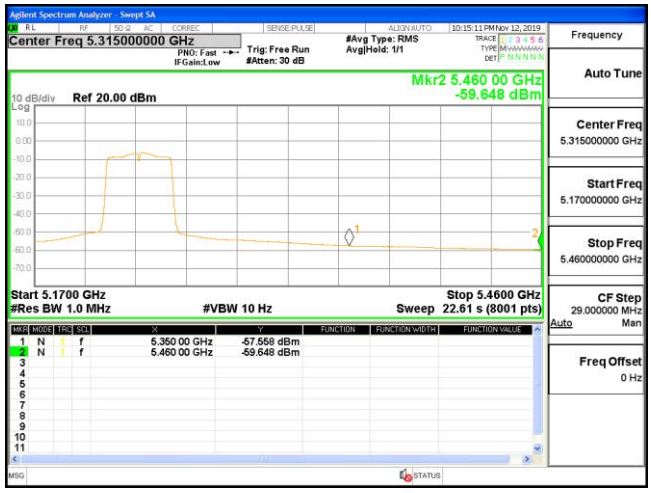
Undesirable emission-Peak	
IEEE 802.11ac VHT80	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 42 / 5210 MHz – Peak	*Channel 42 / 5210 MHz – Peak*
	
Channel 42 / 5210 MHz – Peak	*Channel 42 / 5210 MHz – Peak*

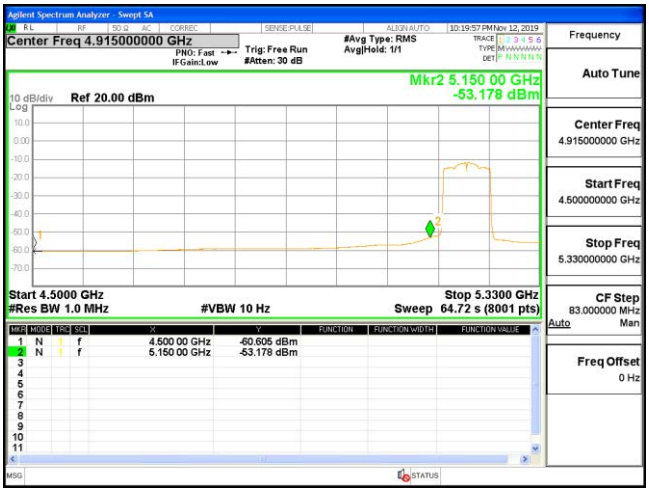
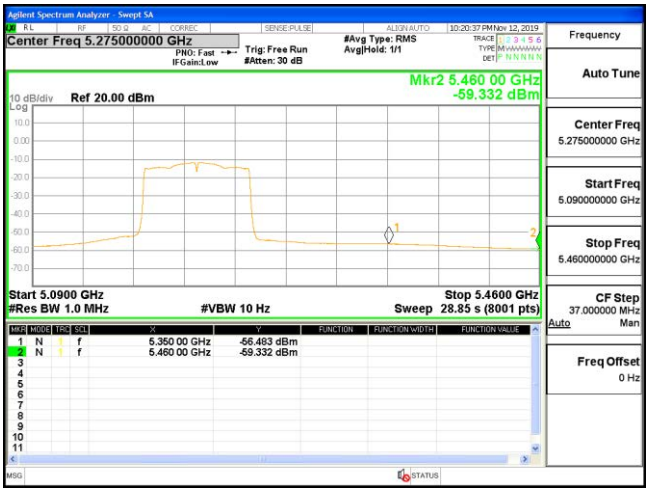
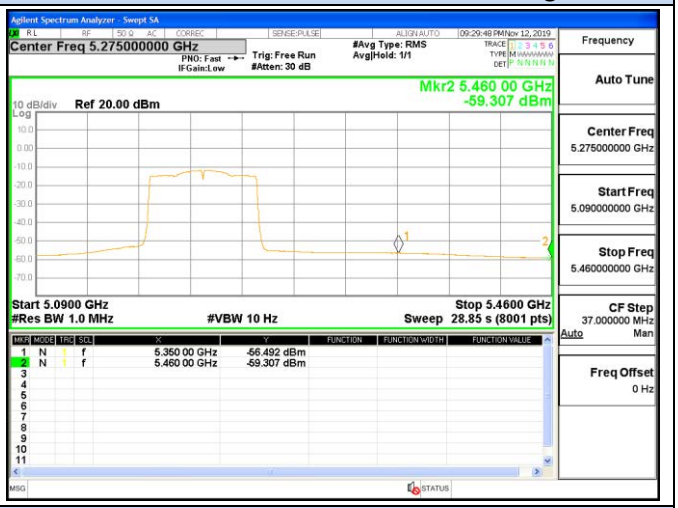
Undesirable emission-Average	
IEEE 802.11a	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 36 / 5180 MHz – Average	*Channel 36 / 5180 MHz – Average*
	
Channel 48 / 5240 MHz – Average	*Channel 48 / 5240 MHz – Average*

Undesirable emission-Average	
IEEE 802.11n HT20	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 36 / 5180 MHz – Average	*Channel 36 / 5180 MHz – Average*
	
Channel 48 / 5240 MHz – Average	*Channel 48 / 5240 MHz – Average*

Undesirable emission-Average	
IEEE 802.11ac VHT20	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 36 / 5180 MHz – Average	*Channel 36 / 5180 MHz – Average*
	
Channel 48 / 5240 MHz – Average	*Channel 48 / 5240 MHz – Average*

Undesirable emission-Average	
IEEE 802.11n HT40	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 38 / 5190 MHz – Average	*Channel 38 / 5190 MHz – Average*
	
Channel 46 / 5230 MHz – Average	*Channel 46 / 5230 MHz – Average*

Undesirable emission-Average	
IEEE 802.11ac VHT40	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 38 / 5190 MHz – Average	*Channel 38 / 5190 MHz – Average*
	
Channel 46 / 5230 MHz – Average	*Channel 46 / 5230 MHz – Average*

Undesirable emission-Average	
IEEE 802.11ac VHT80	
Antenna Chain 1	*Antenna Chain 2*
	
Channel 42 / 5210 MHz – Average	*Channel 42 / 5210 MHz – Average*
	
Channel 42 / 5210 MHz – Average	*Channel 42 / 5210 MHz – Average*

5.8. Antenna Requirements

5.8.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, 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
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.

5.8.2. Antenna Connector Construction

The directional gains of antenna used for transmitting refer to section 1.1 of this report, and the antenna is an internal antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

5.8.3. Results: Compliance.

5.9. Frequency Stability

5.9.1 Standard Applicable

According to FCC §15.407(g) “Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual.”

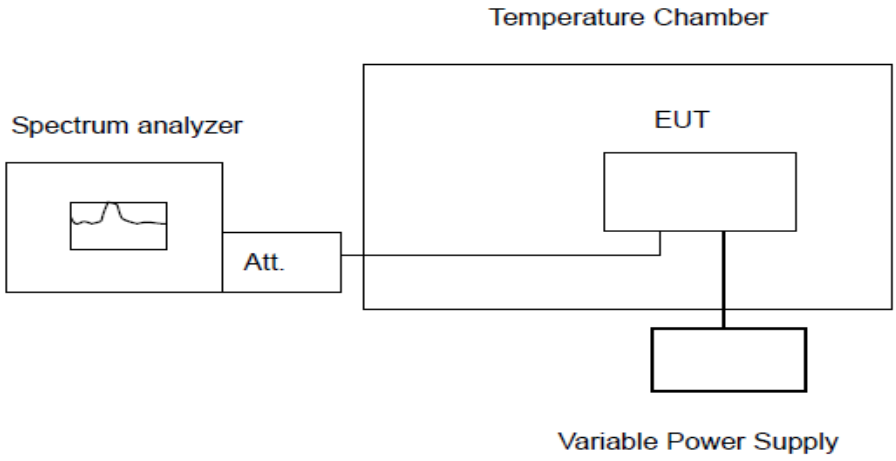
According to FCC §2.1055(a) “The frequency stability shall be measured with variation of ambient temperature as follows:”

(1) From −30° to + 50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

(2) From −20° to + 50° centigrade for equipment to be licensed for use in the Maritime Services under part 80 of this chapter, except for Class A, B, and S Emergency Position Indicating Radiobeacons (EPIRBS), and equipment to be licensed for use above 952 MHz at operational fixed stations in all services, stations in the Local Television Transmission Service and Point-to-Point Microwave Radio Service under part 21 of this chapter, equipment licensed for use aboard aircraft in the Aviation Services under part 87 of this chapter, and equipment authorized for use in the Family Radio Service under part 95 of this chapter.

(3) From 0° to + 50° centigrade for equipment to be licensed for use in the Radio Broadcast Services under part 73 of this chapter.

5.9.2 Test Configuration



5.9.3 Test Procedure

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum anzlyer via feed through attenators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low engouh to obtain the desired frequency resoluation and measure EUT 20 degree operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30 degree. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure wuth 10 degree increased per stage until the highest temperature of +50 degree reached.

5.9.4 Test Results

PASS

Remark:

1. *Measured all conditions and recorded worst case.*

IEEE 802.11a Mode / 5180 – 5240 MHz / 5180 MHz

Enviroment Temperature (Dregree)	Voltage (VAC)	Measured Frequency (MHz)	Limit Range (MHz)	Test Results
20	132	5179.957231	5150 – 5250	PASS
20	108	5180.008603	5150 – 5250	PASS
50	120	5179.927764	5150 – 5250	PASS
40	120	5180.041238	5150 – 5250	PASS
30	120	5180.064206	5150 – 5250	PASS
20	120	5179.992237	5150 – 5250	PASS
10	120	5179.946765	5150 – 5250	PASS
0	120	5179.980508	5150 – 5250	PASS
-10	120	5179.974646	5150 – 5250	PASS
-20	120	5180.062139	5150 – 5250	PASS
-30	120	5180.034441	5150 – 5250	PASS

IEEE 802.11a Mode / 5180 – 5240 MHz / 5240 MHz

Enviroment Temperature (Dregree)	Voltage (VAC)	Measured Frequency (MHz)	Limit Range (MHz)	Test Results
20	132	5240.015376	5150 – 5250	PASS
20	108	5240.086324	5150 – 5250	PASS
50	120	5240.068293	5150 – 5250	PASS
40	120	5240.090614	5150 – 5250	PASS
30	120	5239.998329	5150 – 5250	PASS
20	120	5239.920932	5150 – 5250	PASS
10	120	5239.901444	5150 – 5250	PASS
0	120	5240.029541	5150 – 5250	PASS
-10	120	5239.945896	5150 – 5250	PASS
-20	120	5240.007147	5150 – 5250	PASS
-30	120	5240.027561	5150 – 5250	PASS

6. LIST OF MEASURING EQUIPMENTS

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Dec. 27, 2018	1 Year
2.	Receiver	R&S	ESCI 7	HKE-010	Dec. 27, 2018	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 27, 2018	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Dec. 27, 2018	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2018	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Dec. 27, 2018	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESCI 7	HKE-010	Dec. 27, 2018	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Dec. 27, 2018	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Dec. 27, 2018	1 Year
10.	Horn Antenna	Schewarzbeck	9120D	HKE-013	Dec. 27, 2018	1 Year
11.	Broadband Horn Antenna	Schewarzbeck	BBHA 9170	HKE-017	Dec. 27, 2018	1 Year
12.	Pre-amplifier	EMCI	EMC051845 SE	HKE-015	Dec. 27, 2018	1 Year
13.	Pre-amplifier	Agilent	83051A	HKE-016	Dec. 27, 2018	1 Year
14.	EMI Test Software EZ-EMC	Tonscend	JS1120-B	HKE-083	Dec. 27, 2018	N/A
15.	Power Sensor	Agilent	E9300A	HKE-086	Dec. 27, 2018	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Dec. 27, 2018	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Dec. 27, 2018	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 27, 2018	3 Year
19.	Horn Antenna	ETS	3117	HKE-040	Dec. 27, 2018	1 Year
20.	RF Cable(below 1GHz)	HUBER+SUHNER	RG214	HKE-055	Dec. 27, 2018	1 Year
21.	RF Cable(above 1GHz)	HUBER+SUHNER	RG214	HKE-056	Dec. 27, 2018	1 Year

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