

Report No.: CQASZ20230400480E-01

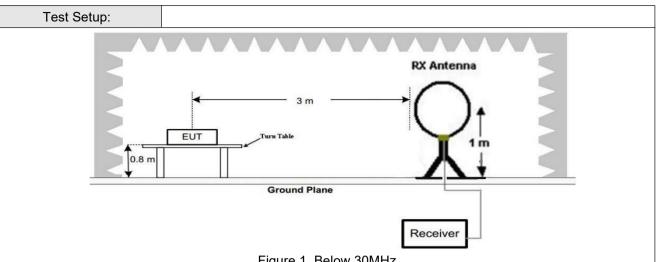


Figure 1. Below 30MHz

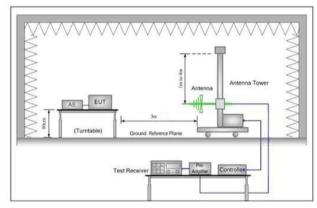


Figure 2. 30MHz to 1GHz

Figure 3. Above 1 GHz

#### Test Procedure:

- 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
  - 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

Note: For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- The EUT was set 3 meters away from the interference-receiving antenna. which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.



	d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.			
	e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.			
	f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.			
	g. Test the EUT in the lowest channel, the middle channel, the Highest channel.			
	h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case .			
	i. Repeat above procedures until all frequencies measured was complete.			
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.			
Final Test Mode:	Only the worst case is recorded in the report.			
Test Results:	Pass			

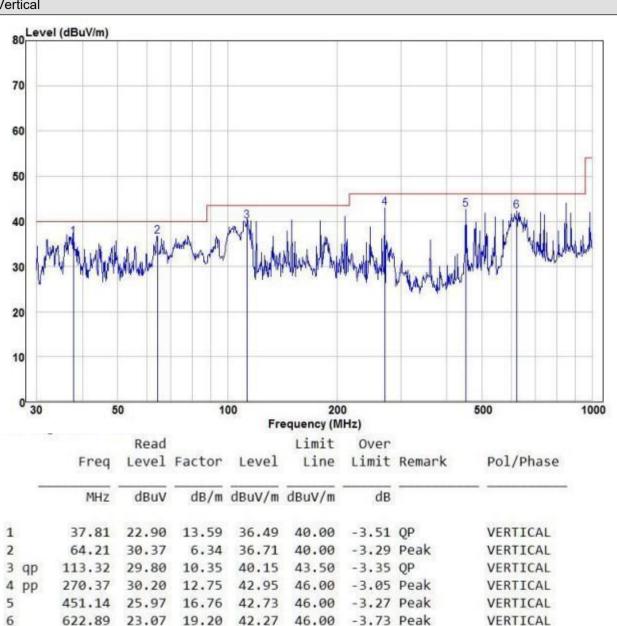


### 5.8.1 Radiated emission below 1GHz

#### 30MHz~1GHz

1#

### Vertical



#### Remark:

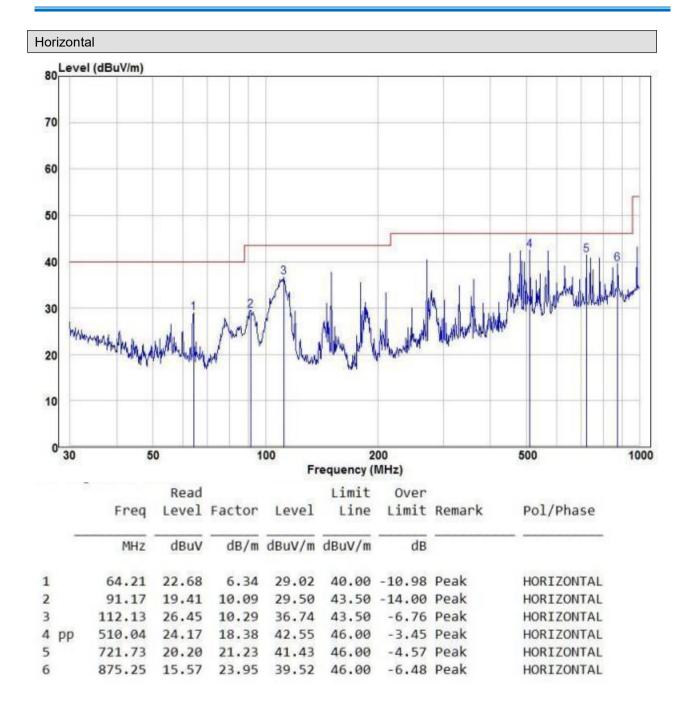
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,







#### Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

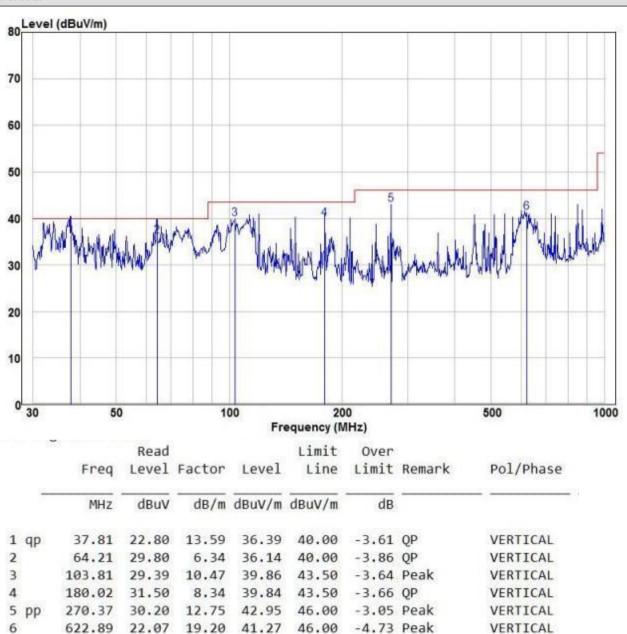
Level = Read Level + Factor,



Report No.: CQASZ20230400480E-01

2#

### Vertical



## Remark:

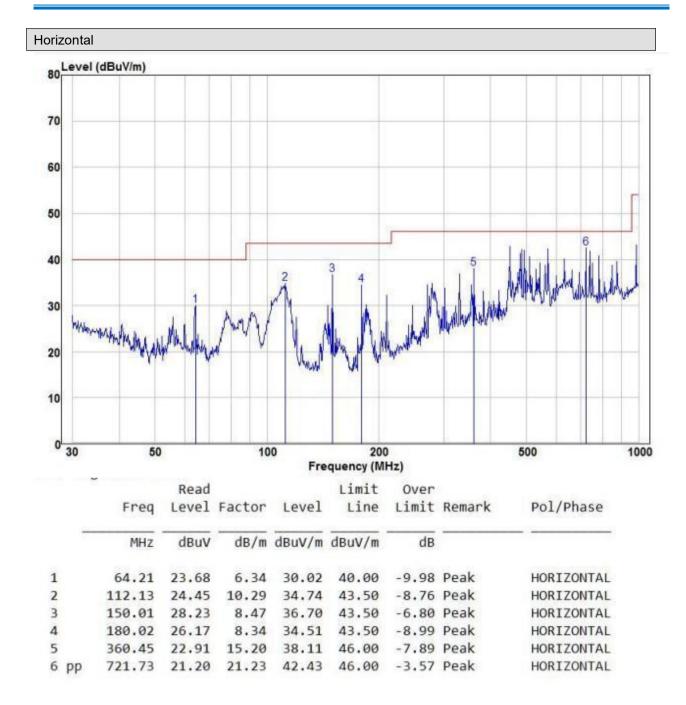
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,







#### Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,



## 5.8.2 Transmitter emission above 1GHz

Test mode:		802.11b(1	Mbps)	Test chann	el:	Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
4824.000	52.59	-4.26	48.33	74	-25.67	peak	Н
4824.000	36.73	-4.26	32.47	54	-21.53	AVG	Н
7236.000	52.06	1.18	53.24	74	-20.76	peak	Н
7236.000	38.37	1.18	39.55	54	-14.45	AVG	Н
4824.000	56.13	-4.26	51.87	74	-22.13	peak	V
4824.000	38.89	-4.26	34.63	54	-19.37	AVG	V
7236.000	51.47	1.18	52.65	74	-21.35	peak	V
7236.000	35.01	1.18	36.19	54	-17.81	AVG	V

Test mode:		802.11b(1	Mbps)	Test chann	el:	Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Datastan	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type	H/V
4874.000	51.28	-4.12	47.16	74	-26.84	peak	Н
4874.000	37.13	-4.12	33.01	54	-20.99	AVG	Н
7311.000	48.96	1.46	50.42	74	-23.58	peak	Н
7311.000	35.73	1.46	37.19	54	-16.81	AVG	Н
4874.000	53.07	-4.12	48.95	74	-25.05	peak	V
4874.000	37.26	-4.12	33.14	54	-20.86	AVG	V
7311.000	50.13	1.46	51.59	74	-22.41	peak	V
7311.000	36.28	1.46	37.74	54	-16.26	AVG	V



Report No.: CQASZ20230400480E-01

Test mode:		802.11b(1	Mbps)	Test chann	el:	Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
4924.000	53.03	-4.03	49.00	74	-25.00	peak	Н
4924.000	38.04	-4.03	34.01	54	-19.99	AVG	Н
7386.000	50.32	1.66	51.98	74	-22.02	peak	Н
7386.000	37.24	1.66	38.90	54	-15.10	AVG	Н
4924.000	53.67	-4.03	49.64	74	-24.36	peak	V
4924.000	37.37	-4.03	33.34	54	-20.66	AVG	V
7386.000	49.33	1.66	50.99	74	-23.01	peak	V
7386.000	36.12	1.66	37.78	54	-16.22	AVG	V

#### Remark:

- 1) The 1Mbps of rate of 802.11b is the worst case.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
  - Final Test Level =Receiver Reading + Antenna Factor + Cable Factor Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



Test mode:		802.11g(6	Mbps)	Test chann	el:	Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
4824.000	53.56	-4.26	49.30	74	-24.70	peak	Н
4824.000	36.70	-4.26	32.44	54	-21.56	AVG	н
7236.000	50.91	1.18	52.09	74	-21.91	peak	Н
7236.000	38.19	1.18	39.37	54	-14.63	AVG	Н
4824.000	54.53	-4.26	50.27	74	-23.73	peak	V
4824.000	39.15	-4.26	34.89	54	-19.11	AVG	V
7236.000	50.45	1.18	51.63	74	-22.37	peak	V
7236.000	35.26	1.18	36.44	54	-17.56	AVG	V

Test mode:		802.11g(6	Mbps)	Test chann	el:	Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
4874.000	52.45	-4.12	48.33	74	-25.67	peak	Н
4874.000	36.42	-4.12	32.30	54	-21.70	AVG	Н
7311.000	49.29	1.46	50.75	74	-23.25	peak	Н
7311.000	35.03	1.46	36.49	54	-17.51	AVG	Н
4874.000	53.07	-4.12	48.95	74	-25.05	peak	V
4874.000	35.99	-4.12	31.87	54	-22.13	AVG	V
7311.000	49.57	1.46	51.03	74	-22.97	peak	V
7311.000	36.88	1.46	38.34	54	-15.66	AVG	V



Report No.: CQASZ20230400480E-01

Test mode:		802.11g(6	Mbps)	Test chann	el:	Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
4924.000	52.90	-4.03	48.87	74	-25.13	peak	Н
4924.000	37.29	-4.03	33.26	54	-20.74	AVG	Н
7386.000	50.37	1.66	52.03	74	-21.97	peak	Н
7386.000	36.70	1.66	38.36	54	-15.64	AVG	Н
4924.000	53.41	-4.03	49.38	74	-24.62	peak	V
4924.000	37.77	-4.03	33.74	54	-20.26	AVG	V
7386.000	50.13	1.66	51.79	74	-22.21	peak	V
7386.000	36.31	1.66	37.97	54	-16.03	AVG	V

#### Remark:

- 1) The 6Mbps of rate of 802.11g is the worst case.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
  - Final Test Level =Receiver Reading + Antenna Factor + Cable Factor Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



Test mode:		802.11n20	(mcs0)	Test chann	el:	Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
4824.000	52.99	-4.26	48.73	74	-25.27	peak	Н
4824.000	36.91	-4.26	32.65	54	-21.35	AVG	Н
7236.000	50.60	1.18	51.78	74	-22.22	peak	Н
7236.000	37.33	1.18	38.51	54	-15.49	AVG	Н
4824.000	55.08	-4.26	50.82	74	-23.18	peak	V
4824.000	38.06	-4.26	33.80	54	-20.20	AVG	V
7236.000	50.24	1.18	51.42	74	-22.58	peak	V
7236.000	35.15	1.18	36.33	54	-17.67	AVG	V

Test mode:		802.11n20	(mcs0)	Test chann	el:	Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
4874.000	52.29	-4.12	48.17	74	-25.83	peak	Н
4874.000	36.70	-4.12	32.58	54	-21.42	AVG	н
7311.000	49.64	1.46	51.10	74	-22.90	peak	Н
7311.000	36.19	1.46	37.65	54	-16.35	AVG	Н
4874.000	52.35	-4.12	48.23	74	-25.77	peak	V
4874.000	37.56	-4.12	33.44	54	-20.56	AVG	V
7311.000	49.81	1.46	51.27	74	-22.73	peak	V
7311.000	35.76	1.46	37.22	54	-16.78	AVG	V



Report No.: CQASZ20230400480E-01

Test mode:		802.11n20	(mcs0)	Test chann	el:	Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
4924.000	52.51	-4.03	48.48	74	-25.52	peak	Н
4924.000	38.42	-4.03	34.39	54	-19.61	AVG	Н
7386.000	50.00	1.66	51.66	74	-22.34	peak	Н
7386.000	36.52	1.66	38.18	54	-15.82	AVG	Н
4924.000	54.51	-4.03	50.48	74	-23.52	peak	V
4924.000	38.11	-4.03	34.08	54	-19.92	AVG	V
7386.000	51.07	1.66	52.73	74	-21.27	peak	V
7386.000	37.65	1.66	39.31	54	-14.69	AVG	V

#### Remark:

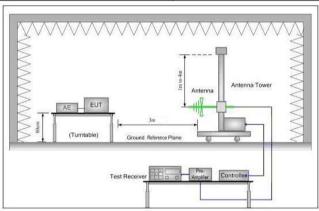
- 1) The MCS0 of rate of 802.11n20 is the worst case.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
  - Final Test Level =Receiver Reading + Antenna Factor + Cable Factor Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



Report No.: CQASZ20230400480E-01

## 5.9 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205						
Test Method:	ANSI C63.10 2013						
Test Site:	Measurement Distance: 3m	(Semi-Anechoic Chambe	r)				
Limit:	Frequency	Limit (dBuV/m @3m)	Remark				
	30MHz-88MHz	40.0	Quasi-peak Value				
	88MHz-216MHz 43.5 Quasi-peak Value						
	216MHz-960MHz	46.0	Quasi-peak Value				
	960MHz-1GHz	54.0	Quasi-peak Value				
	Above 1GHz	54.0 Average Value					
	74.0 Peak Value						
Test Setup:							



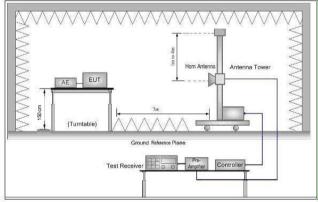


Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz

#### Test Procedure:

a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. Note: For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and



Test Results:	Only the worst case is recorded in the report.  Pass
Final Test Mode:	Pretest the EUT at Transmitting mode, found the Transmitting mode which it is worse case.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates.  Transmitting mode.
	<ul> <li>then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel</li> <li>g. Test the EUT in the lowest channel, the middle channel, the Highest channel.</li> <li>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.</li> <li>i. Repeat above procedures until all frequencies measured was complete.</li> </ul>



Report No.: CQASZ20230400480E-01

## Test data:

103t data.								
Worse case mode:		802.11b(1N	Иbps)	Test channel:		Lowest		
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	H/V	
2390.000	59.01	-9.2	49.81	74	-24.19	peak	Н	
2390.000	44.72	-9.2	35.52	54	-18.48	AVG	Н	
2400.000	59.37	-9.39	49.98	74	-24.02	peak	Н	
2400.000	46.54	-9.39	37.15	54	-16.85	AVG	Н	
2390.000	58.83	-9.2	49.63	74	-24.37	peak	V	
2390.000	44.55	-9.2	35.35	54	-18.65	AVG	V	
2400.000	59.51	-9.39	50.12	74	-23.88	peak	V	
2400.000	46.86	-9.39	37.47	54	-16.53	AVG	V	

Worse case mode:		802.11b(1N	Mbps)	Test channel:		Highest	
	Meter		Emission				Ant. Pol.
Frequency	Reading	Factor	Level	Limits	Over	Detector	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	H/V
2483.500	57.78	-9.29	48.49	74	-25.51	peak	Н
2483.500	44.27	-9.29	34.98	54	-19.02	AVG	Н
2483.500	58.22	-9.29	48.93	74	-25.07	peak	V
2483.500	46.34	-9.29	37.05	54	-16.95	AVG	V



Worse case mode:		802.11g(6N	Mbps)	Test channel:		Lowest	
	Meter		Emission				Ant. Pol.
Frequency	Reading	Factor	Level	Limits	Over	Detector	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	H/V
2390.000	58.89	-9.2	49.69	74	-24.31	peak	Н
2390.000	44.60	-9.2	35.40	54	-18.60	AVG	Н
2400.000	59.55	-9.39	50.16	74	-23.84	peak	Н
2400.000	46.07	-9.39	36.68	54	-17.32	AVG	Н
2390.000	59.01	-9.2	49.81	74	-24.19	peak	V
2390.000	44.20	-9.2	35.00	54	-19.00	AVG	V
2400.000	60.02	-9.39	50.63	74	-23.37	peak	V
2400.000	46.44	-9.39	37.05	54	-16.95	AVG	V

Worse case mode:		802.11g(6N	Mbps)	Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
2483.500	58.16	-9.29	48.87	74	-25.13	peak	Н
2483.500	43.53	-9.29	34.24	54	-19.76	AVG	Н
2483.500	57.71	-9.29	48.42	74	-25.58	peak	V
2483.500	45.50	-9.29	36.21	54	-17.79	AVG	V



Report No.: CQASZ20230400480E-01

Worse case mode:		802.11n(HT	20)(6.5Mbps)	Test channel:		Lowest	
	Meter		Emission				Ant. Pol.
Frequency	Reading	Factor	Level	Limits	Over	Detector	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	H/V
2390.000	58.69	-9.2	49.49	74	-24.51	peak	Н
2390.000	44.49	-9.2	35.29	54	-18.71	AVG	Н
2400.000	59.26	-9.39	49.87	74	-24.13	peak	Н
2400.000	46.29	-9.39	36.90	54	-17.10	AVG	Н
2390.000	58.75	-9.2	49.55	74	-24.45	peak	V
2390.000	44.64	-9.2	35.44	54	-18.56	AVG	V
2400.000	59.44	-9.39	50.05	74	-23.95	peak	V
2400.000	46.80	-9.39	37.41	54	-16.59	AVG	V

Worse case mode:		802.11n(HT	20)(6.5Mbps)	Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
2483.500	57.71	-9.29	48.42	74	-25.58	peak	Н
2483.500	44.06	-9.29	34.77	54	-19.23	AVG	Н
2483.500	58.22	-9.29	48.93	74	-25.07	peak	V
2483.500	45.75	-9.29	36.46	54	-17.54	AVG	V

## Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

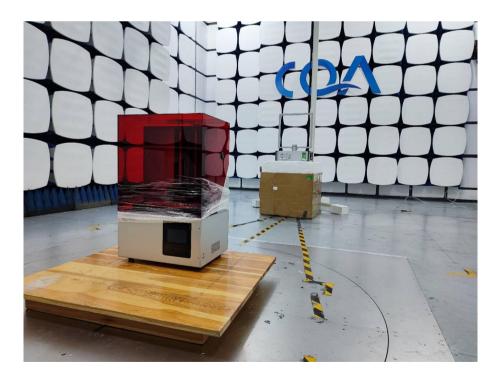
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

# 6 Photographs - EUT Test Setup

# 6.1 Radiated Spurious Emission



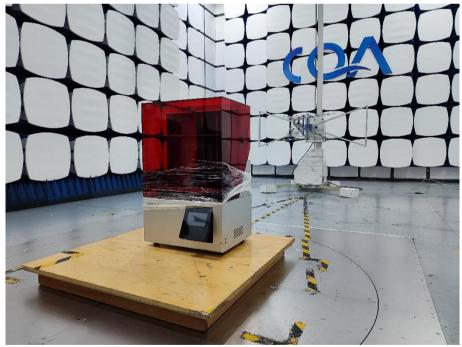






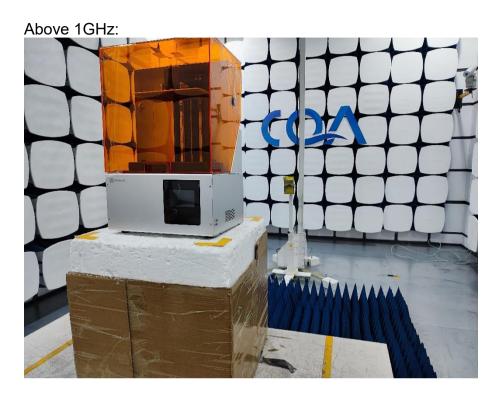


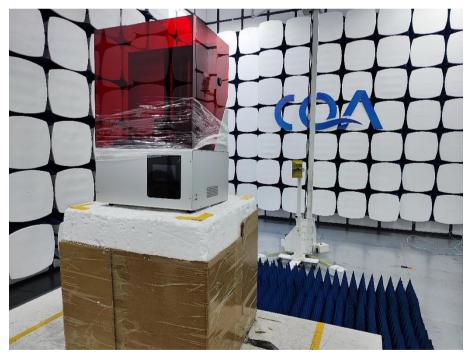








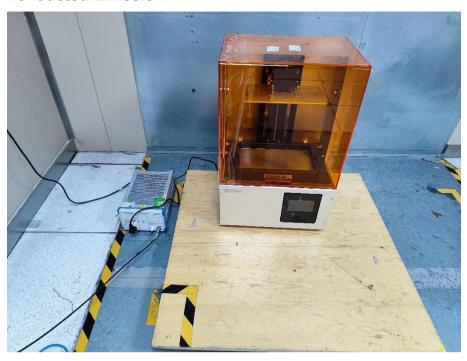


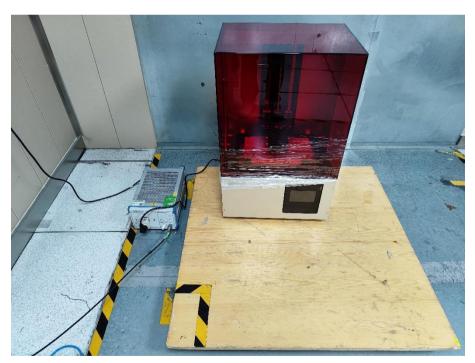




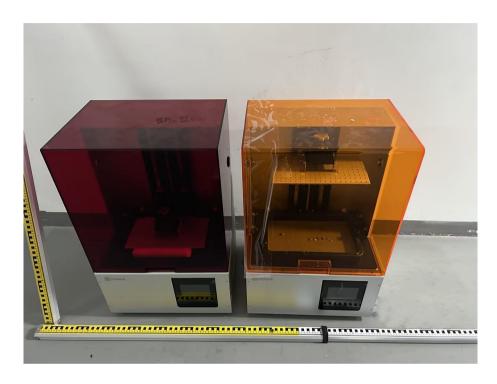


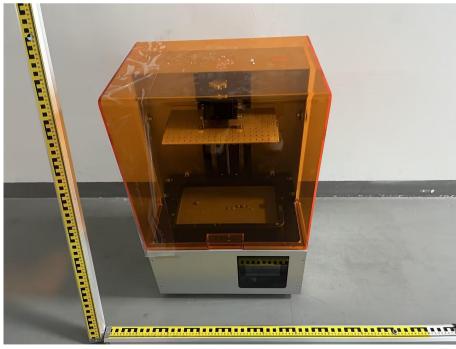
# 6.2 Conducted Emission





# 7 Photographs - EUT Constructional Details









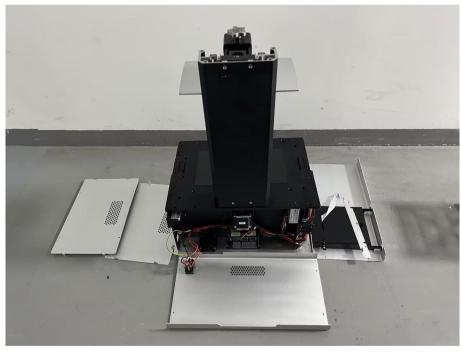




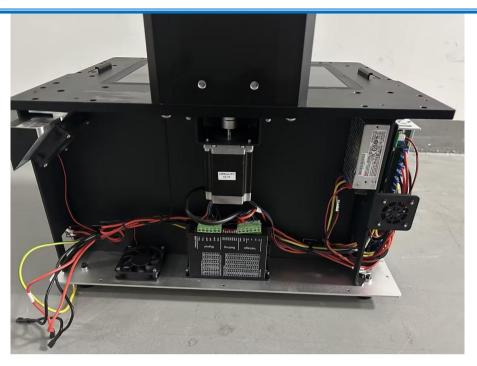


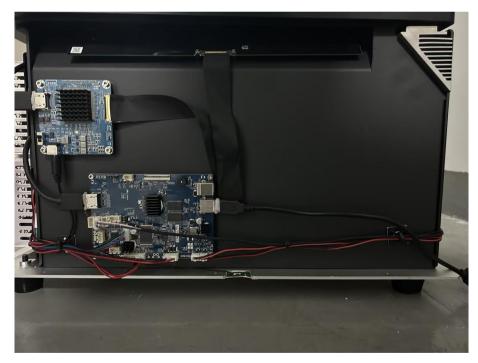




























\*\*\* END OF REPORT \*\*\*