4.7 Radiated Spurious Emission Measurement

Test Specification

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10: 2020
Frequency Range:	9 kHz to 25 GHz
Measurement Distance:	3 m
Antenna Polarization:	Horizontal & Vertical
Operation Mode:	Transmitting mode with modulation

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	Peak	1MHz	10Hz	Average Value

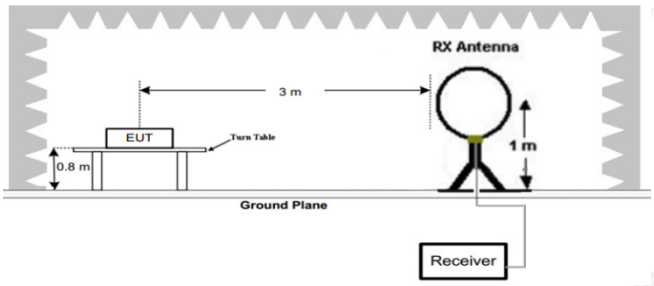
Limit:

Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F(KHz)	300
0.490-1.705	24000/F(KHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)	Detector
Above 1GHz	500	3	Average
	5000	3	Peak

Test Setup:

For radiated emissions below 30MHz



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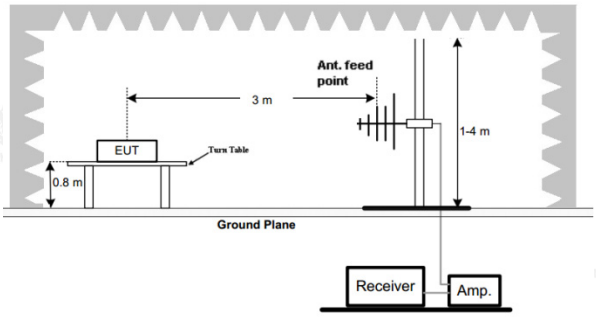
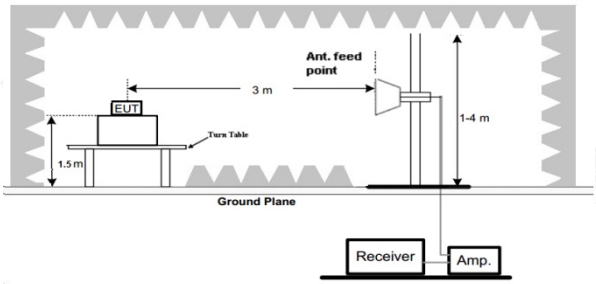
	30MHz to 1GHz  Above 1GHz 
Test Procedure:	1. For the radiated emission test below 1GHz: The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level. 2. For the radiated emission test above 1GHz: Place the measurement antenna on a turntable with 1.5 meter above ground, which is 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.

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	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. 3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 4. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 5. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=120 kHz for f < 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for f 1 GHz for peak measurement. 6.For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent.VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Test Results:	PASS

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Test Instruments

Radiated Emission Test Site (966)					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 19, 2025	Feb. 18, 2026
Spectrum analyzer	Agilent	N9020A	HKE-117	Feb. 19, 2025	Feb. 18, 2026
Spectrum analyzer	R&S	FSV3044	HKE-126	Feb. 19, 2025	Feb. 18, 2026
Preamplifier	EMCI	EMC051845S	HKE-006	Feb. 19, 2025	Feb. 18, 2026
Preamplifier	Schwarzbeck	BBV 9743	HKE-016	Feb. 19, 2025	Feb. 18, 2026
Preamplifier	A.H. Systems	SAS-574	HKE-182	Feb. 19, 2025	Feb. 18, 2026
6dB Attenuator	Pasternack	6db	HKE-184	Feb. 19, 2025	Feb. 18, 2026
EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	Feb. 19, 2025	Feb. 18, 2026
Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	Feb. 21, 2024	Feb. 20, 2026
Loop Antenna	COM-POWER	AL-130R	HKE-014	Feb. 21, 2024	Feb. 20, 2026
Horn Antenna	Schewarzbeck	9120D	HKE-013	Feb. 21, 2024	Feb. 20, 2026
EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	/	/
RSE Test Software	Tonscend	JS36-RSE 5.0.0	HKE-184	/	/

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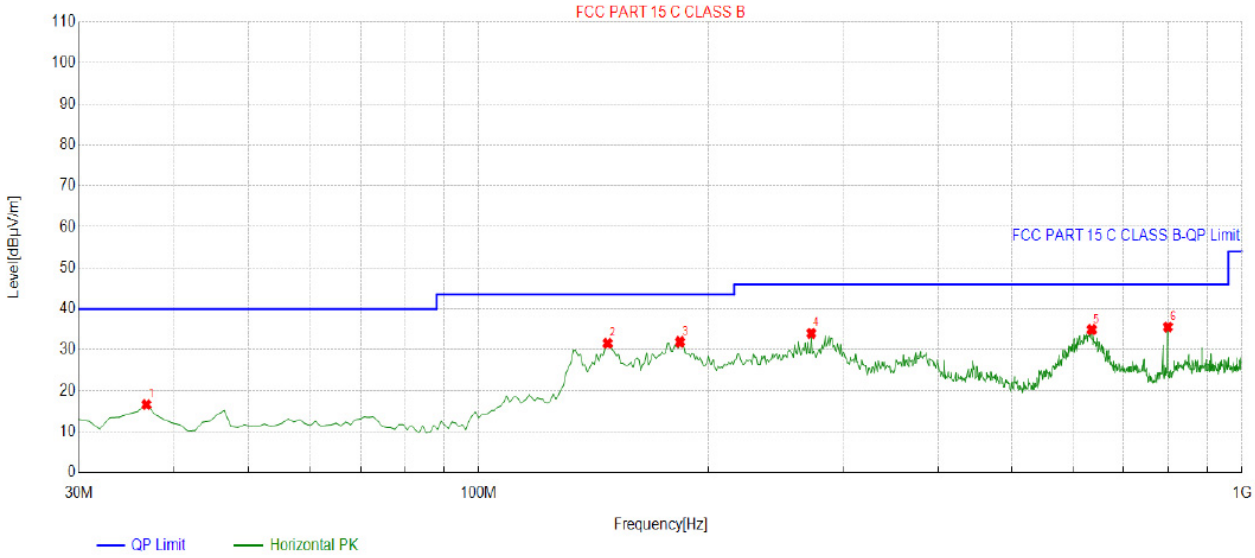
Test Data

All the test modes completed for test. Only the worst result was reported as below:

Below 1GHz Test Results:
Antenna polarity: Horizontal



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.7968	-14.57	31.21	16.64	40.00	23.36	100	359	Horizontal
2	147.4875	-18.23	49.83	31.60	43.50	11.90	100	101	Horizontal
3	183.4134	-15.63	47.57	31.94	43.50	11.56	100	87	Horizontal
4	272.7427	-12.61	46.61	34.00	46.00	12.00	100	308	Horizontal
5	635.8859	-5.10	40.02	34.92	46.00	11.08	100	43	Horizontal
6	799.9800	-3.01	38.56	35.55	46.00	10.45	100	144	Horizontal

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

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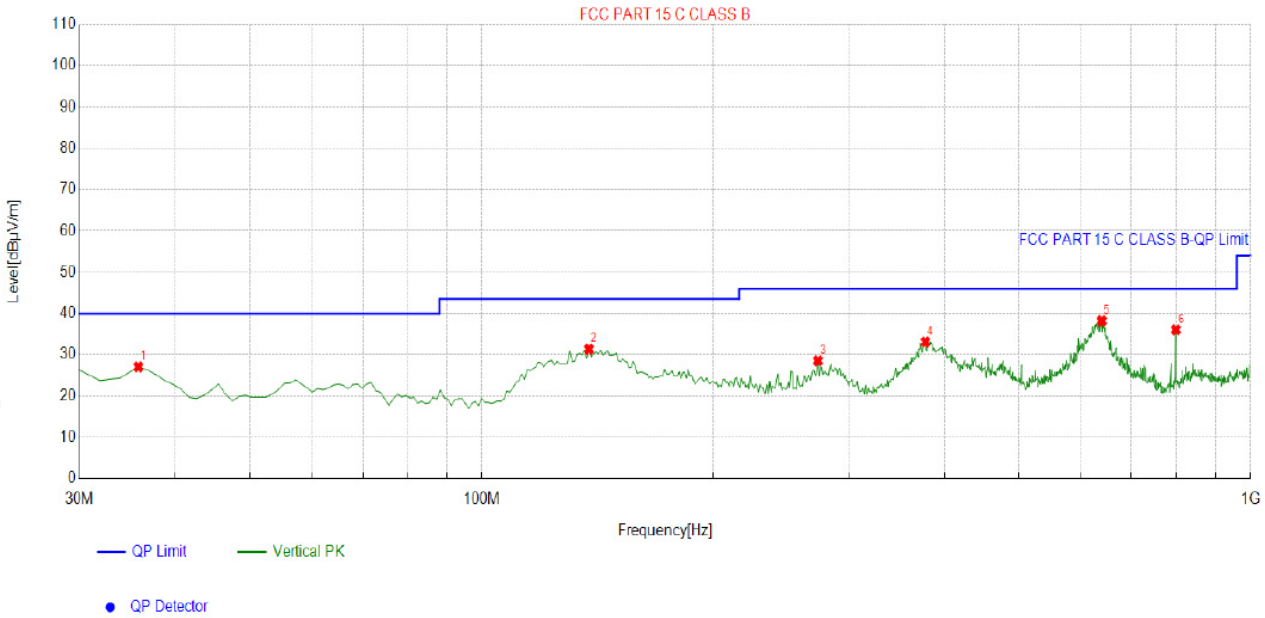
Antenna polarity: Vertical



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.8258	-14.54	41.61	27.07	40.00	12.93	100	296	Vertical
2	137.7778	-17.87	49.22	31.35	43.50	12.15	100	358	Vertical
3	273.7137	-12.65	41.21	28.56	46.00	17.44	100	192	Vertical
4	377.6076	-9.58	42.68	33.10	46.00	12.90	100	52	Vertical
5	640.7407	-5.20	43.41	38.21	46.00	7.79	100	238	Vertical
6	799.9800	-3.01	39.06	36.05	46.00	9.95	100	152	Vertical

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

Harmonics and Spurious Emissions

Frequency Range (9kHz-30MHz)

Frequency (MHz)	Level@3m (dBµV/m)	Limit@3m (dBµV/m)
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Note: *1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor.*

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.

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Above 1GHz

Radiated Emission Test

Operation Mode: 802.11b Mode with 2.4G TX CH Low

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	52.74	-3.64	49.1	74	24.9	peak
4824	41.27	-3.64	37.63	54	16.37	AVG
7236	52.27	-0.95	51.32	74	22.68	peak
7236	40.17	-0.95	39.22	54	14.78	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824	52.71	-3.64	49.07	74	24.93	peak
4824	43.15	-3.64	39.51	54	14.49	AVG
7236	51.77	-0.95	50.82	74	23.18	peak
7236	41.52	-0.95	40.57	54	13.43	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11b Mode with 2.4G TX CH Mid

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874	51.75	-3.51	48.24	74	25.76	peak
4874	41.73	-3.51	38.22	54	15.78	AVG
7311	51.67	-0.82	50.85	74	23.15	peak
7311	40.37	-0.82	39.55	54	14.45	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874	50.27	-3.51	46.76	74	27.24	peak
4874	42.87	-3.51	39.36	54	14.64	AVG
7311	51.38	-0.82	50.56	74	23.44	peak
7311	40.83	-0.82	40.01	54	13.99	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11b Mode with 2.4G TX CH High

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924	52.98	-3.43	49.55	74	24.45	peak
4924	40.38	-3.43	36.95	54	17.05	AVG
7386	52.78	-0.75	52.03	74	21.97	peak
7386	41.98	-0.75	41.23	54	12.77	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924	53.76	-3.43	50.33	74	23.67	peak
4924	41.22	-3.43	37.79	54	16.21	AVG
7386	51.34	-0.75	50.59	74	23.41	peak
7386	41.87	-0.75	41.12	54	12.88	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11g Mode with 2.4G TX CH Low

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824	51.35	-3.64	47.71	74	26.29	peak
4824	42.37	-3.64	38.73	54	15.27	AVG
7236	51.67	-0.95	50.72	74	23.28	peak
7236	39.03	-0.95	38.08	54	15.92	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824	52.64	-3.64	49	74	25	peak
4824	42.13	-3.64	38.49	54	15.51	AVG
7236	51.03	-0.95	50.08	74	23.92	peak
7236	39.27	-0.95	38.32	54	15.68	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11g Mode with 2.4G TX CH Mid

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874	52.87	-3.51	49.36	74	24.64	peak
4874	43.15	-3.51	39.64	54	14.36	AVG
7311	52.67	-0.82	51.85	74	22.15	peak
7311	40.31	-0.82	39.49	54	14.51	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874	51.76	-3.51	48.25	74	25.75	peak
4874	42.33	-3.51	38.82	54	15.18	AVG
7311	50.57	-0.82	49.75	74	24.25	peak
7311	40.98	-0.82	40.16	54	13.84	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11g Mode with 2.4G TX CH High

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	52.01	-3.43	48.58	74	25.42	peak
4924	42.54	-3.43	39.11	54	14.89	AVG
7386	51.87	-0.75	51.12	74	22.88	peak
7386	40.52	-0.75	39.77	54	14.23	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4924	52.28	-3.43	48.85	74	25.15	peak
4924	42.18	-3.43	38.75	54	15.25	AVG
7386	51.21	-0.75	50.46	74	23.54	peak
7386	42.57	-0.75	41.82	54	12.18	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.

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Operation Mode: 802.11n20 Mode with 2.4G TX CH Low

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824	52.87	-3.64	49.23	74	24.77	peak
4824	40.37	-3.64	36.73	54	17.27	AVG
7236	51.48	-0.95	50.53	74	23.47	peak
7236	42.18	-0.95	41.23	54	12.77	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824	52.48	-3.64	48.84	74	25.16	peak
4824	43.15	-3.64	39.51	54	14.49	AVG
7236	52.64	-0.95	51.69	74	22.31	peak
7236	40.58	-0.95	39.63	54	14.37	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11n20 Mode with 2.4G TX CH Mid

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	51.25	-3.51	47.74	74	26.26	peak
4874	42.72	-3.51	39.21	54	14.79	AVG
7311	51.37	-0.82	50.55	74	23.45	peak
7311	40.58	-0.82	39.76	54	14.24	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4874	51.47	-3.51	47.96	74	26.04	peak
4874	41.54	-3.51	38.03	54	15.97	AVG
7311	52.44	-0.82	51.62	74	22.38	peak
7311	41.28	-0.82	40.46	54	13.54	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.

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Operation Mode: 802.11n20 Mode with 2.4G TX CH High

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924	50.47	-3.43	47.04	74	26.96	peak
4924	40.52	-3.43	37.09	54	16.91	AVG
7386	50.12	-0.75	49.37	74	24.63	peak
7386	39.14	-0.75	38.39	54	15.61	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924	53.14	-3.43	49.71	74	24.29	peak
4924	41.78	-3.43	38.35	54	15.65	AVG
7386	51.25	-0.75	50.5	74	23.5	peak
7386	41.24	-0.75	40.49	54	13.51	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11n40 Mode with 2.4G TX CH Low

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4844	51.27	-3.63	47.64	74	26.36	peak
4844	42.19	-3.63	38.56	54	15.44	AVG
7266	51.23	-0.94	50.29	74	23.71	peak
7266	39.14	-0.94	38.2	54	15.8	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4844	52.44	-3.63	48.81	74	25.19	peak
4844	41.52	-3.63	37.89	54	16.11	AVG
7266	51.76	-0.94	50.82	74	23.18	peak
7266	40.96	-0.94	40.02	54	13.98	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11n40 Mode with 2.4G TX CH Mid

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874	51.73	-3.51	48.22	74	25.78	peak
4874	41.65	-3.51	38.14	54	15.86	AVG
7311	52.37	-0.82	51.55	74	22.45	peak
7311	41.12	-0.82	40.3	54	13.7	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874	51.21	-3.51	47.7	74	26.3	peak
4874	41.52	-3.51	38.01	54	15.99	AVG
7311	51.39	-0.82	50.57	74	23.43	peak
7311	39.46	-0.82	38.64	54	15.36	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11n40 Mode with 2.4G TX CH High

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4904	51.24	-3.43	47.81	74	26.19	peak
4904	41.75	-3.43	38.32	54	15.68	AVG
7356	52.47	-0.75	51.72	74	22.28	peak
7356	42.57	-0.75	41.82	54	12.18	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4904	51.72	-3.43	48.29	74	25.71	peak
4904	42.15	-3.43	38.72	54	15.28	AVG
7356	50.62	-0.75	49.87	74	24.13	peak
7356	41.76	-0.75	41.01	54	12.99	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Test Result of Radiated Spurious at Band edges

All modes have been tested. Only the worst result was reported as below:

Operation Mode: 802.11b Mode with 2.4G TX CH Low

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310.00	52.67	-5.81	46.86	74	27.14	peak
2310.00	42.75	-5.81	36.94	54	17.06	AVG
2390.00	52.76	-5.84	46.92	74	27.08	peak
2390.00	43.54	-5.84	37.7	54	16.3	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310.00	51.72	-5.81	45.91	74	28.09	peak
2310.00	42.35	-5.81	36.54	54	17.46	AVG
2390.00	51.34	-5.84	45.5	74	28.5	peak
2390.00	40.53	-5.84	34.69	54	19.31	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11b Mode with 2.4G TX CH High

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	52.66	-5.81	46.85	74	27.15	peak
2483.50	40.27	-5.81	34.46	54	19.54	AVG
2500.00	50.47	-6.06	44.41	74	29.59	peak
2500.00	43.85	-6.06	37.79	54	16.21	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	51.98	-5.81	46.17	74	27.83	peak
2483.50	42.17	-5.81	36.36	54	17.64	AVG
2500.00	52.41	-6.06	46.35	74	27.65	peak
2500.00	41.75	-6.06	35.69	54	18.31	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

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Operation Mode: 802.11g Mode with 2.4G TX CH Low

Horizontal:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310.00	51.27	-5.81	45.46	74	28.54	peak
2310.00	41.39	-5.81	35.58	54	18.42	AVG
2390.00	51.57	-5.84	45.73	74	28.27	peak
2390.00	41.03	-5.84	35.19	54	18.81	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency (MHz)	Reading Result (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310.00	52.8	-5.81	46.99	74	27.01	peak
2310.00	42.51	-5.81	36.7	54	17.3	AVG
2390.00	52.21	-5.84	46.37	74	27.63	peak
2390.00	42.33	-5.84	36.49	54	17.51	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11g Mode with 2.4G TX CH High

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	53.94	-5.65	48.29	74	25.71	peak
2483.50	42.58	-5.65	36.93	54	17.07	AVG
2500.00	52.61	-5.65	46.96	74	27.04	peak
2500.00	40.76	-5.65	35.11	54	18.89	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	53.86	-5.65	48.21	74	25.79	peak
2483.50	41.17	-5.65	35.52	54	18.48	AVG
2500.00	51.39	-5.65	45.74	74	28.26	peak
2500.00	41.41	-5.65	35.76	54	18.24	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

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Operation Mode: 802.11n20 Mode with 2.4G TX CH Low

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310.00	51.27	-5.81	45.46	74	28.54	peak
2310.00	40.87	-5.81	35.06	54	18.94	AVG
2390.00	51.37	-5.84	45.53	74	28.47	peak
2390.00	40.38	-5.84	34.54	54	19.46	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310.00	51.75	-5.81	45.94	74	28.06	peak
2310.00	41.57	-5.81	35.76	54	18.24	AVG
2390.00	51.69	-5.84	45.85	74	28.15	peak
2390.00	41.13	-5.84	35.29	54	18.71	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11n20 Mode with 2.4G TX CH High

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	51.42	-5.65	45.77	74	28.23	peak
2483.50	41.71	-5.65	36.06	54	17.94	AVG
2500.00	51.58	-5.65	45.93	74	28.07	peak
2500.00	41.25	-5.65	35.6	54	18.4	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	51.27	-5.65	45.62	74	28.38	peak
2483.50	43.85	-5.65	38.2	54	15.8	AVG
2500.00	52.71	-5.65	47.06	74	26.94	peak
2500.00	41.32	-5.65	35.67	54	18.33	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

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Operation Mode: 802.11n40 Mode with 2.4G TX CH Low

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310.00	56.43	-5.81	50.62	74	23.38	peak
2310.00	/	-5.81	/	54	/	AVG
2390.00	53.57	-5.84	47.73	74	26.27	peak
2390.00	/	-5.84	/	54	/	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310.00	52.28	-5.81	46.47	74	27.53	peak
2310.00	/	-5.81	/	54	/	AVG
2390.00	54.27	-5.84	48.43	74	25.57	peak
2390.00	/	-5.84	/	54	/	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

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Operation Mode: 802.11n40 Mode with 2.4G TX CH High

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	54.24	-5.65	48.59	74	25.41	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	54.68	-5.65	49.03	74	24.97	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	51.73	-5.65	46.08	74	27.92	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	51.07	-5.65	45.42	74	28.58	peak
2500.00	/	-5.65	/	54	/	AVG
Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Limit - Level.						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

Remark:
1. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.
2. In restricted bands of operation, the spurious emissions below the permissible value more than 20dB.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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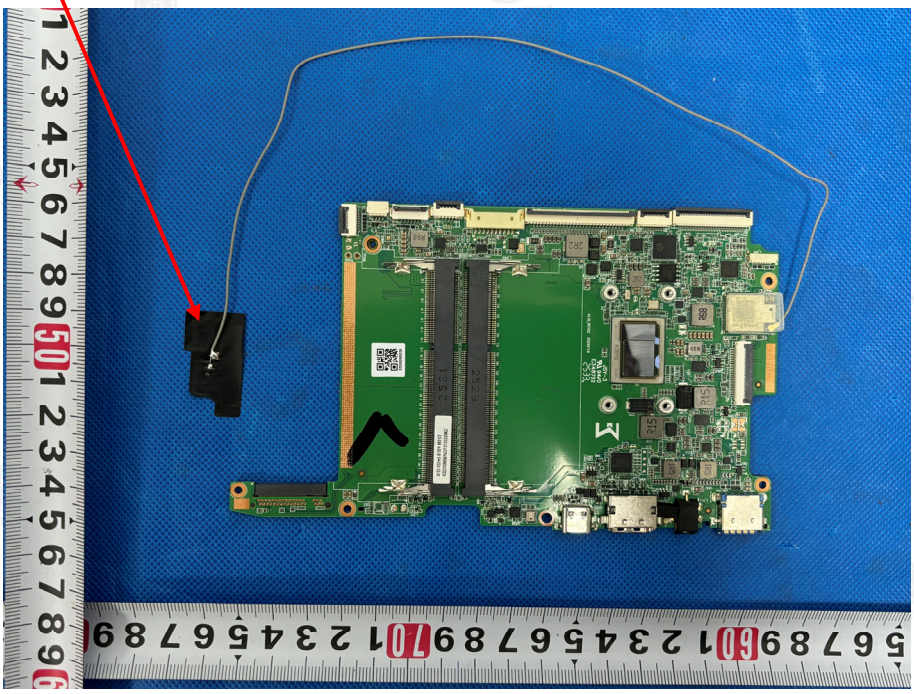
4.8 Antenna Requirement

Standard Applicable
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247, if transmitting antennas of directional gain greater than6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to statement below for compliance.
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction
The antenna used in this product is a FPC antenna, need professional installation, not easy to remove. It conforms to the standard requirements. The directional gains of antenna used for transmitting is 1.68dBi.

WIFI ANTENNA



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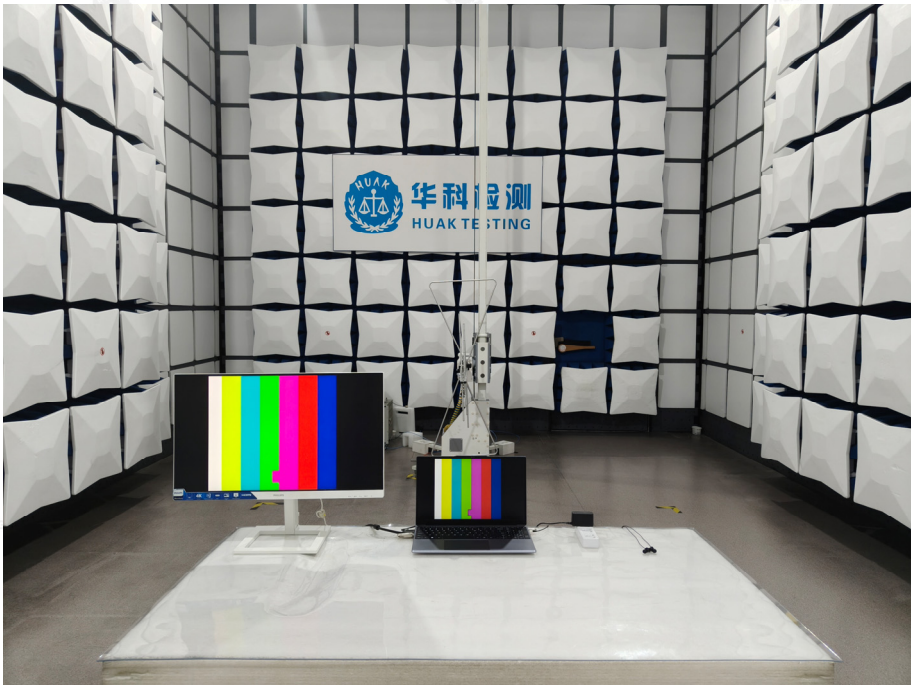
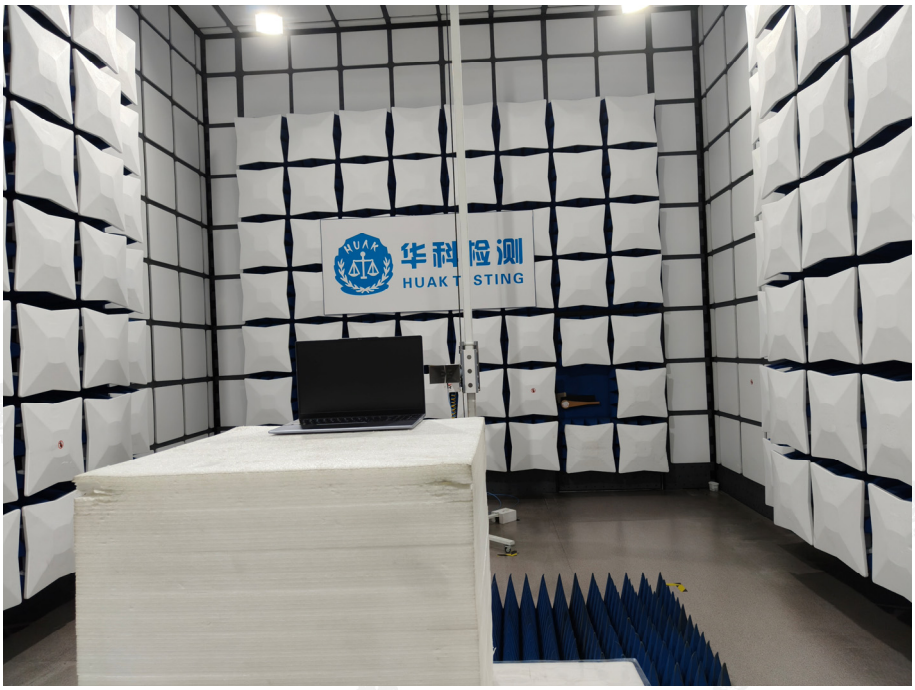
5. Test Setup Photos of the EUT

Radiated Emission





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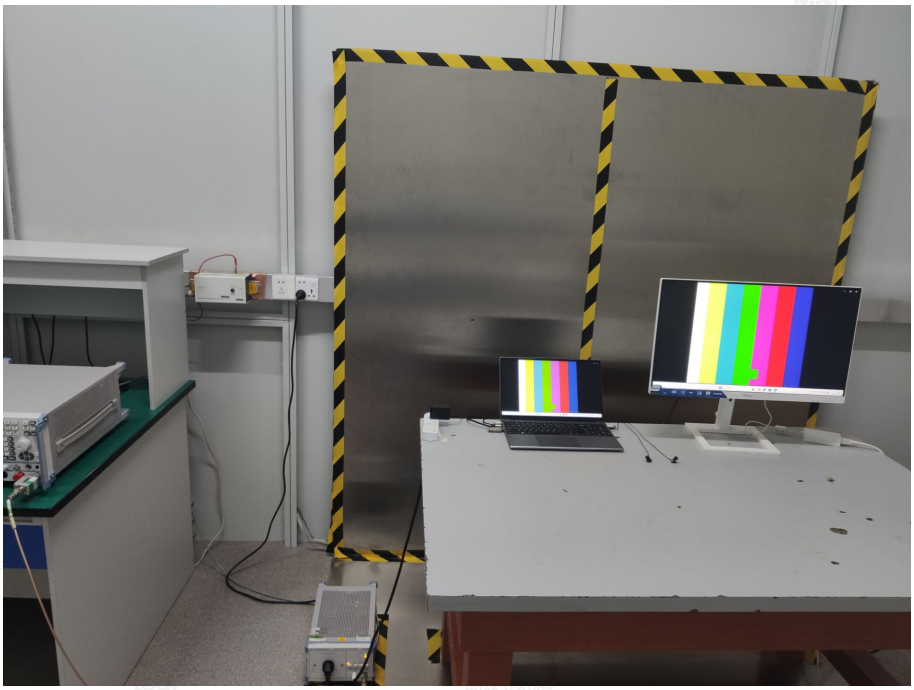
AC Conducted Emission



RF Conducted Emission

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6. Photos of the EUT

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos.

---------End of test report---------

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