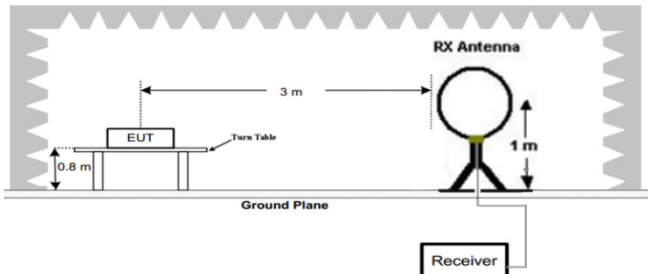
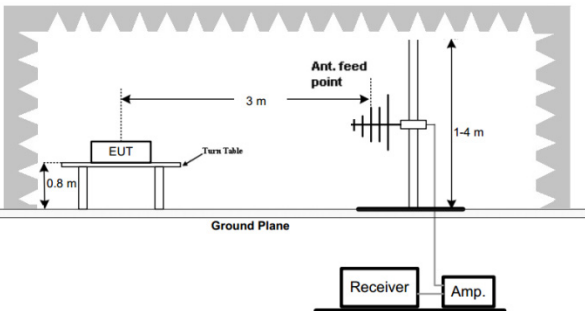
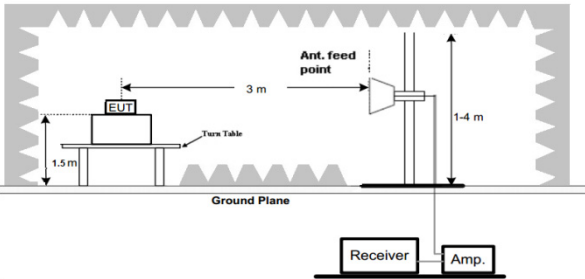


4.6 Radiated Spurious Emission Measurement

Test Specification

Test Requirement:	FCC Part15 C Section 15.209					
Test Method:	ANSI C63.10: 2020					
Frequency Range:	9 kHz to 26 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				
						

	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.



	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 $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement. 6. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW $\geq 1/T$, 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



Test Instruments

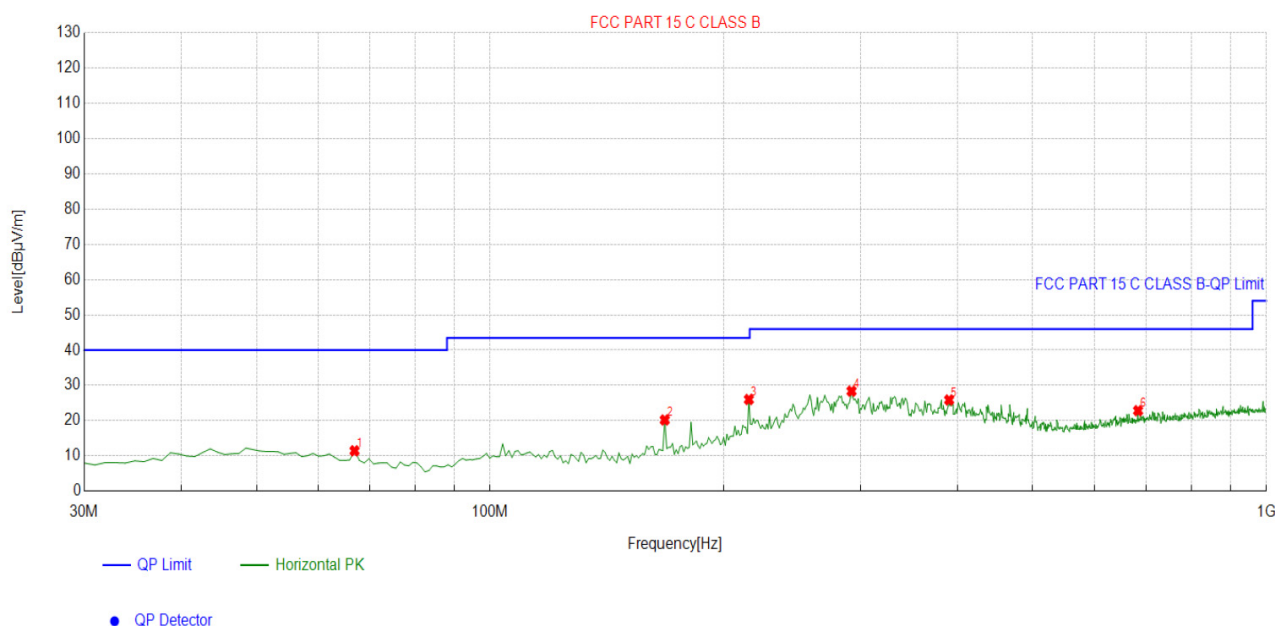
Radiated Emission Test Site (966)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 06, 2026	Feb. 05, 2027
Spectrum analyzer	KEYSIGHT	N9020A	HKE-117	Feb. 06, 2026	Feb. 05, 2027
Spectrum analyzer	R&S	FSV3044	HKE-126	Feb. 06, 2026	Feb. 05, 2027
Preamplifier	Schwarzbeck	EMC051845SE	HKE-006	Feb. 04, 2026	Feb. 03, 2027
Preamplifier	Agilent	83051A	HKE-016	Feb. 04, 2026	Feb. 03, 2027
Preamplifier	QJD	QJD18-40-50	HKE-030	Feb. 05, 2026	Feb. 04, 2027
6dB Attenuator	Pasternack	6dB	HKE-152	Feb. 06, 2026	Feb. 05, 2027
EMI Test Receiver	R&S	ESR-7	HKE-010	Feb. 06, 2026	Feb. 05, 2027
Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	Feb. 06, 2026	Feb. 05, 2028
Loop Antenna	COM-POWER	AL-130R	HKE-014	Feb. 06, 2026	Feb. 05, 2028
Horn Antenna	Schwarzbeck	9120D	HKE-013	Feb. 06, 2026	Feb. 05, 2028
Broadband Horn Antenna	A-INFO	LB-180400-KF	HKE-031	Feb. 06, 2026	Feb. 05, 2028
EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	/	/
RSE Test Software	Tonscend	JS36-RSE 5.0.0	HKE-184	/	/

Test Data

Below 1GHz Test Results

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

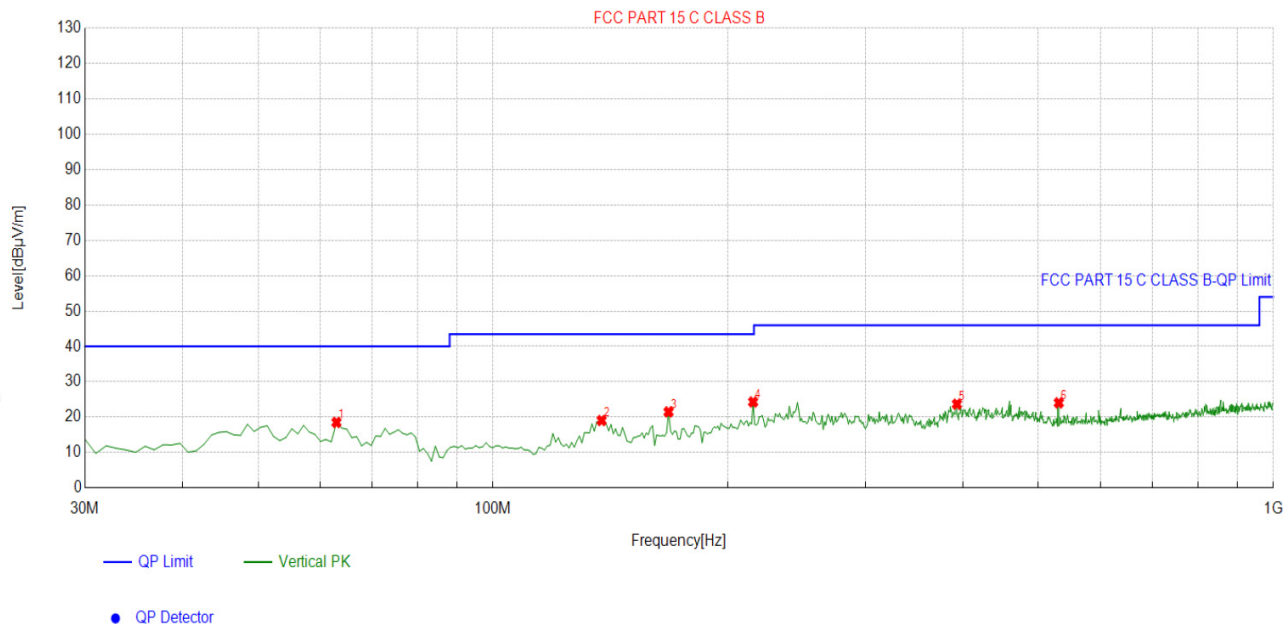
Antenna polarity: Horizontal



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	66.897	-15.75	27.22	11.47	40.00	28.53	100	256	Horizontal
2	167.878	-17.20	37.41	20.21	43.50	23.29	100	156	Horizontal
3	215.455	-14.51	40.53	26.02	43.50	17.48	100	132	Horizontal
4	292.162	-12.24	40.63	28.39	46.00	17.61	100	360	Horizontal
5	390.230	-9.94	35.82	25.88	46.00	20.12	100	328	Horizontal
6	683.463	-4.45	27.30	22.85	46.00	23.15	100	220	Horizontal

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

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	63.013	-14.68	33.21	18.53	40.00	21.47	100	318	Vertical
2	137.778	-18.29	37.38	19.09	43.50	24.41	100	295	Vertical
3	167.878	-17.20	38.70	21.50	43.50	22.00	100	213	Vertical
4	215.455	-14.51	38.82	24.31	43.50	19.19	100	196	Vertical
5	393.143	-9.85	33.56	23.71	46.00	22.29	100	241	Vertical
6	531.021	-7.15	31.21	24.06	46.00	21.94	100	284	Vertical

Remark: Factor = Cable loss + Antenna factor + Attenuator – 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)
--	--	--
--	--	--
--	--	--
--	--	--

Note: 1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor.

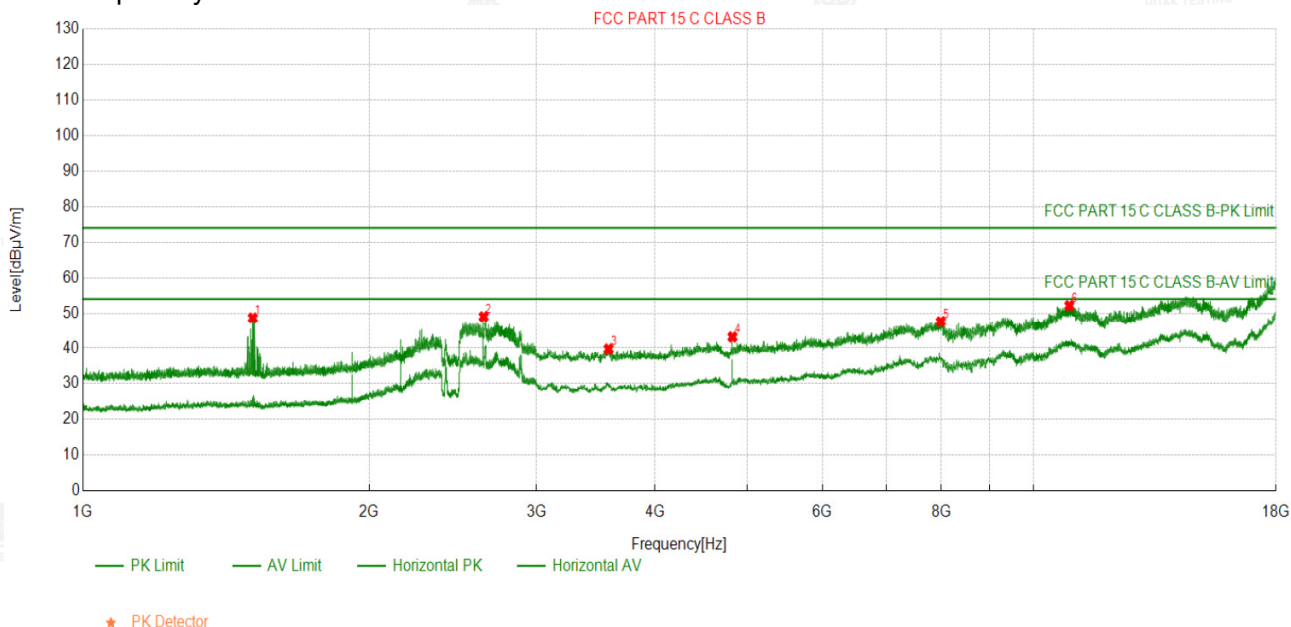
2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.

Above 1GHz Test Results

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

For 1GHz to 18GHz

Antenna polarity: Horizontal

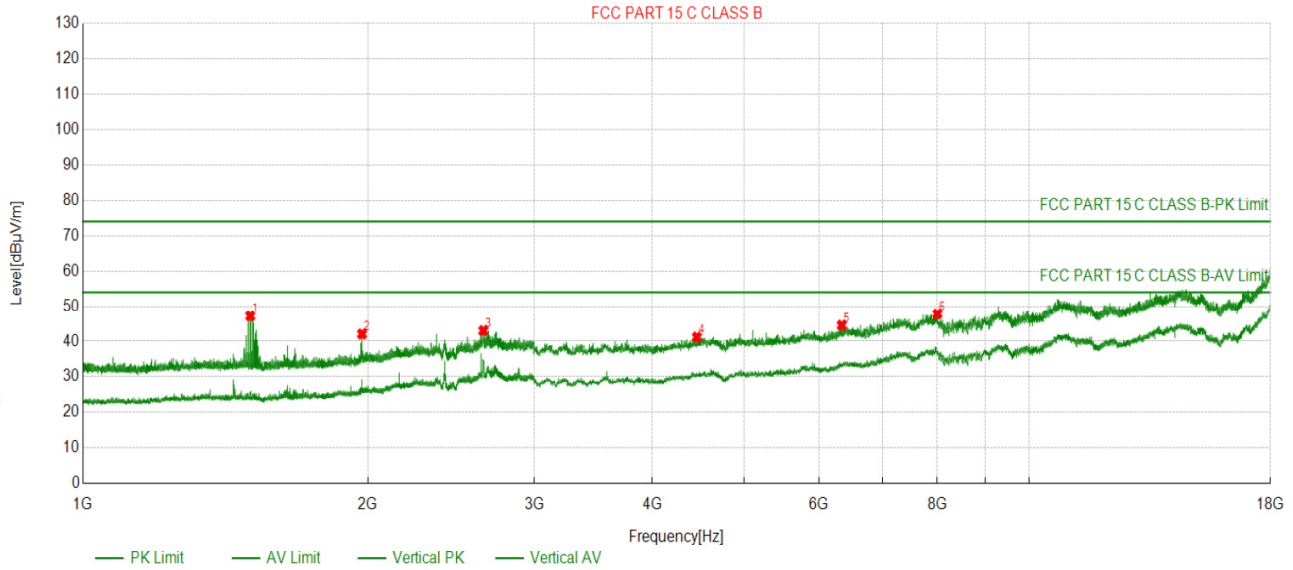


Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	PK Level [dBμV/m]	Factor [dB]	PK Limit [dBμV/m]	PK Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1509.051	67.16	48.61	-18.55	74.00	25.39	150	172	Horizontal
2	2639.964	62.85	48.98	-13.87	74.00	25.02	150	15	Horizontal
3	3573.057	52.47	39.71	-12.76	74.00	34.29	150	174	Horizontal
4	4824.182	53.04	43.12	-9.92	74.00	30.88	150	122	Horizontal
5	7989.499	49.34	47.53	-1.81	74.00	26.47	150	168	Horizontal
6	10910.291	49.33	52.11	2.78	74.00	21.89	150	245	Horizontal

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

Antenna polarity: Vertical



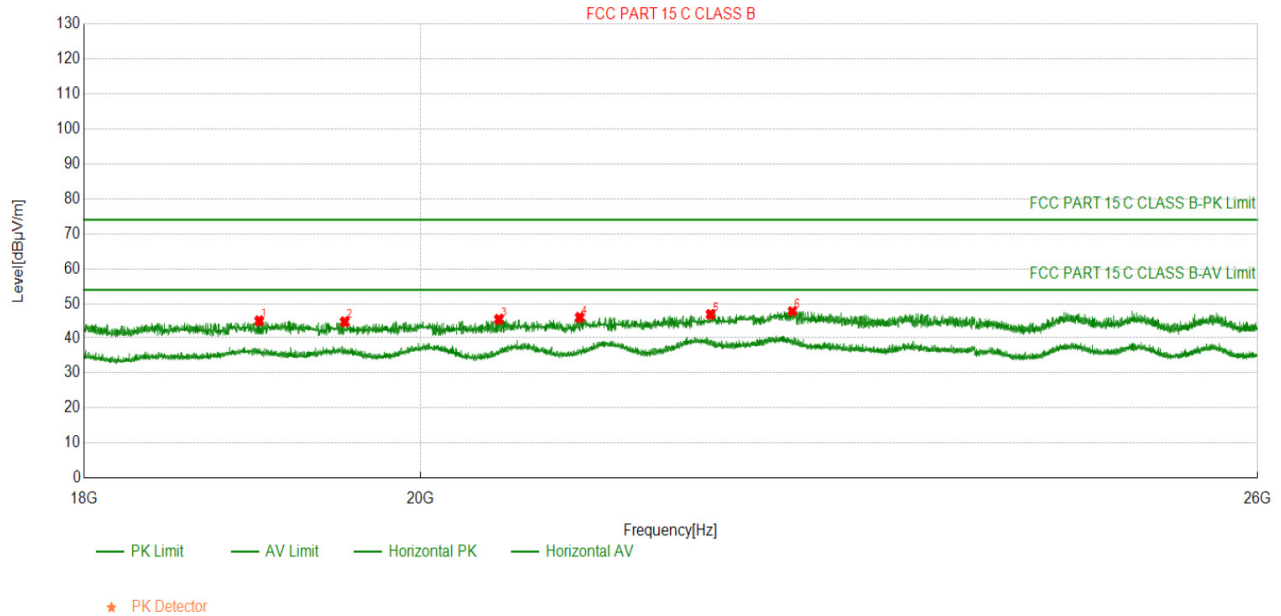
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	PK Level [dBμV/m]	Factor [dB]	PK Limit [dBμV/m]	PK Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1502.850	65.68	47.13	-18.55	74.00	26.87	150	227	Vertical
2	1972.697	58.69	42.03	-16.66	74.00	31.97	150	104	Vertical
3	2650.165	56.79	42.97	-13.82	74.00	31.03	150	86	Vertical
4	4456.646	51.72	41.13	-10.59	74.00	32.87	150	13	Vertical
5	6340.834	51.62	44.49	-7.13	74.00	29.51	150	229	Vertical
6	8003.000	49.45	47.76	-1.69	74.00	26.24	150	258	Vertical

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

For 18GHz to 26GHz

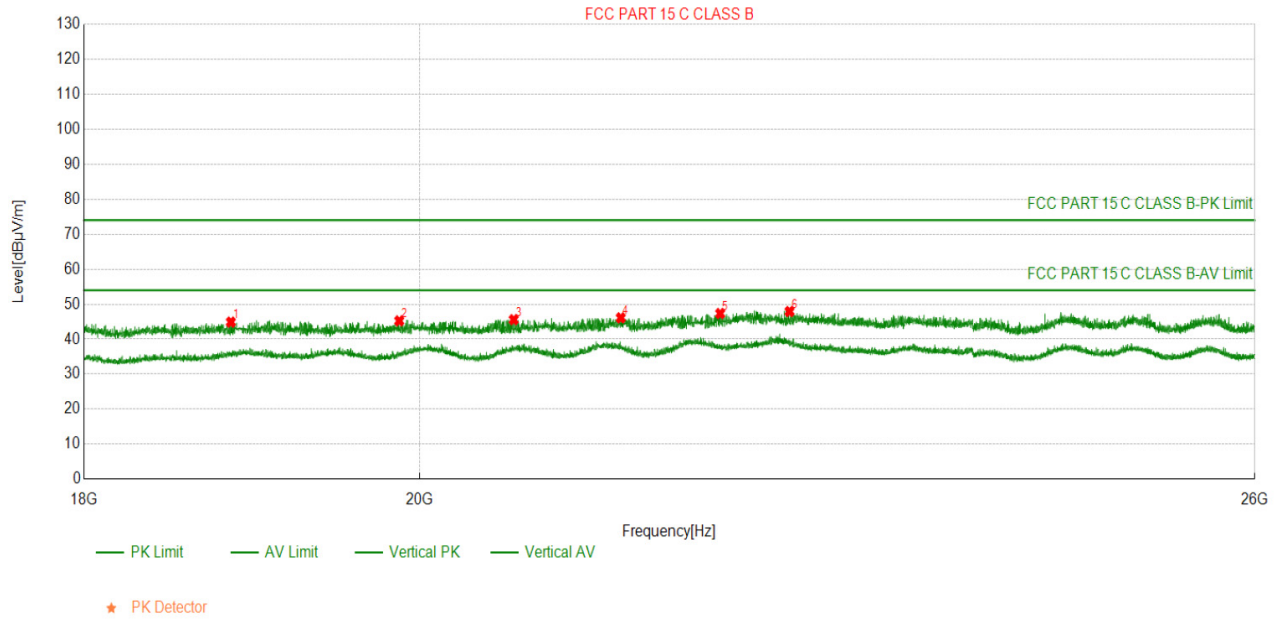
Antenna polarity: Horizontal



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	PK Level [dBμV/m]	Factor [dB]	PK Limit [dBμV/m]	PK Margin [dB]	Height [cm]	Angle [°]	Polarity
1	19016.102	39.14	44.84	5.70	74.00	29.16	150	50	Horizontal
2	19532.153	38.48	44.57	6.09	74.00	29.43	150	150	Horizontal
3	20498.650	39.29	45.27	5.98	74.00	28.73	150	30	Horizontal
4	21025.103	40.47	45.81	5.34	74.00	28.19	150	220	Horizontal
5	21904.390	41.05	46.71	5.66	74.00	27.29	150	340	Horizontal
6	22472.447	42.07	47.72	5.65	74.00	26.28	150	140	Horizontal

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

Antenna polarity: Vertical



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	PK Level [dBμV/m]	Factor [dB]	PK Limit [dBμV/m]	PK Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18850.485	39.33	44.90	5.57	74.00	29.10	150	10	Vertical
2	19873.787	39.10	45.25	6.15	74.00	28.75	150	170	Vertical
3	20601.060	39.72	45.59	5.87	74.00	28.41	150	260	Vertical
4	21305.931	40.83	46.11	5.28	74.00	27.89	150	130	Vertical
5	21981.198	41.61	47.34	5.73	74.00	26.66	150	130	Vertical
6	22465.247	42.27	47.92	5.65	74.00	26.08	150	30	Vertical

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

4.7 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 than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

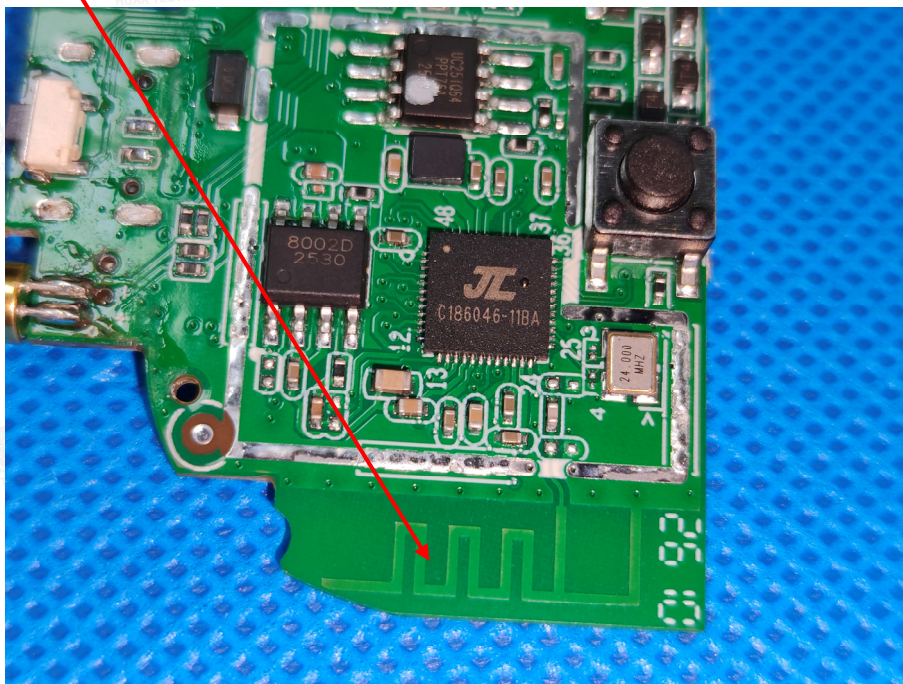
Refer to statement below for compliance.

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 an PCB Antenna, is a permanently attached antenna on the PCB. It conforms to the standard requirements. The directional gains of antenna used for transmitting is -1.80dBi.

WIFI ANTENNA

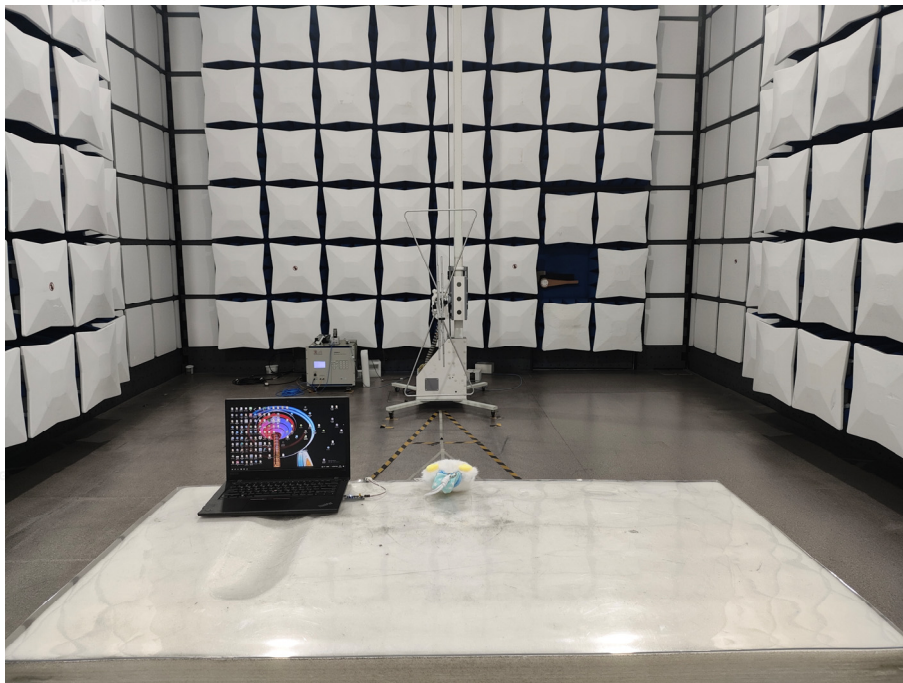




HUAKE TESTING

5. Test Setup Photos of the EUT

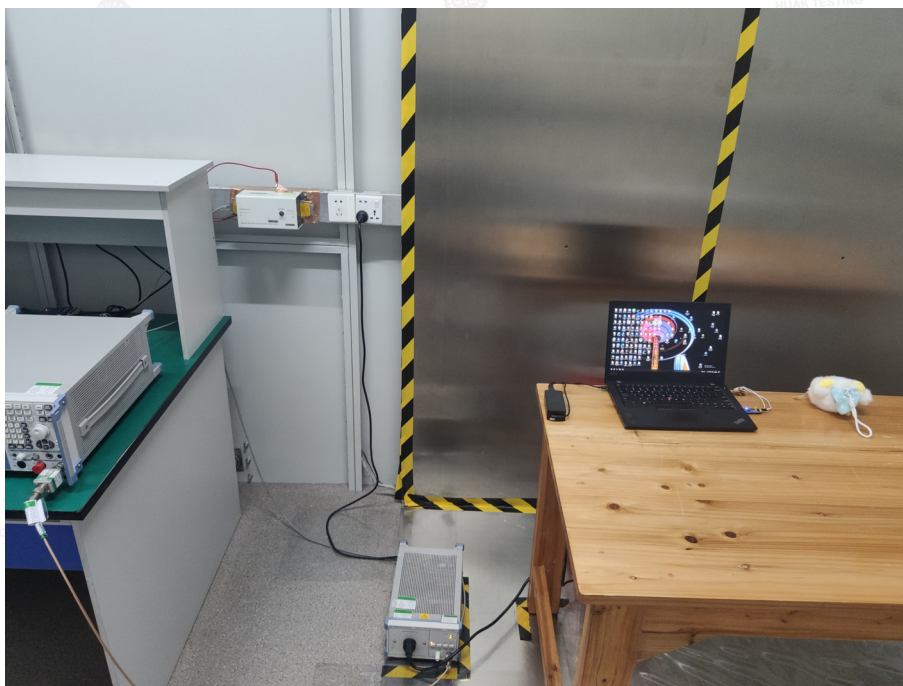
Radiated Emission



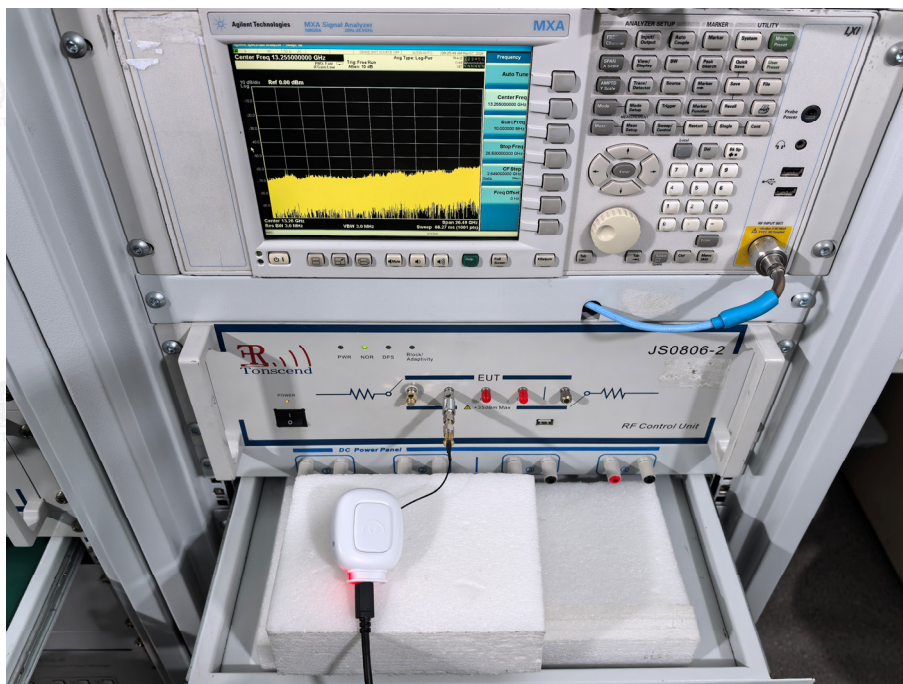
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 15 days only. The document is issued by Shenzhen HUAKE Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

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AC Conducted Emission



RF Conducted Emission





HUAKE TESTING

6. Photos of the EUT

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

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