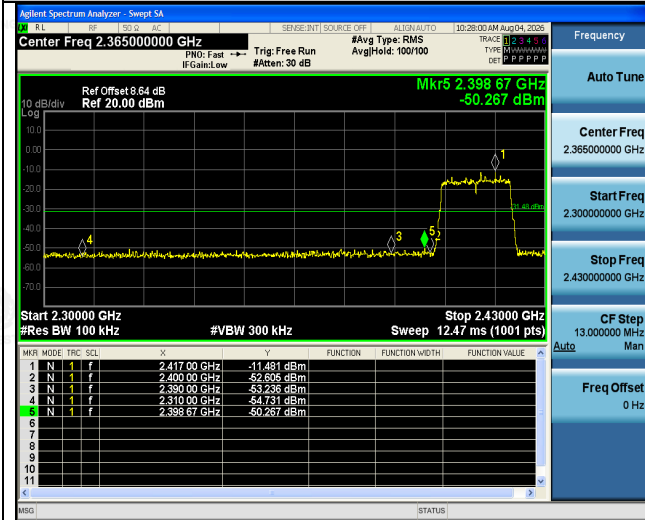




802.11n (HT20) Modulation

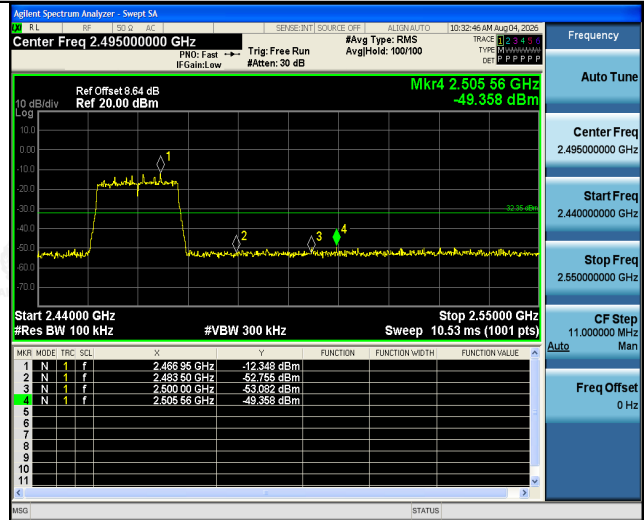
Lowest Channel

Band Edge

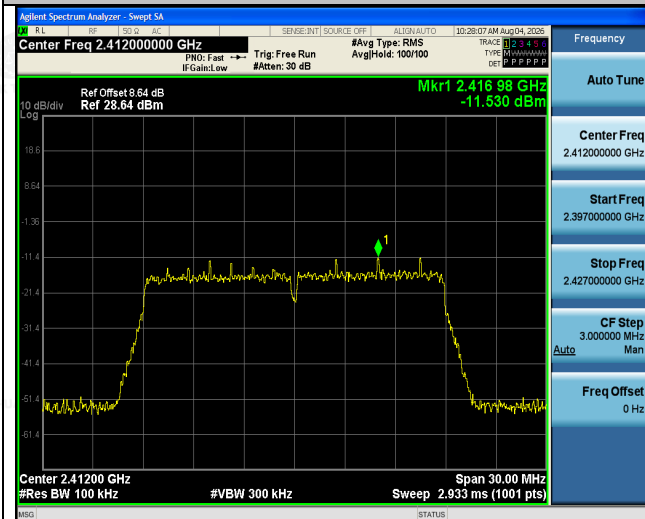


Highest Channel

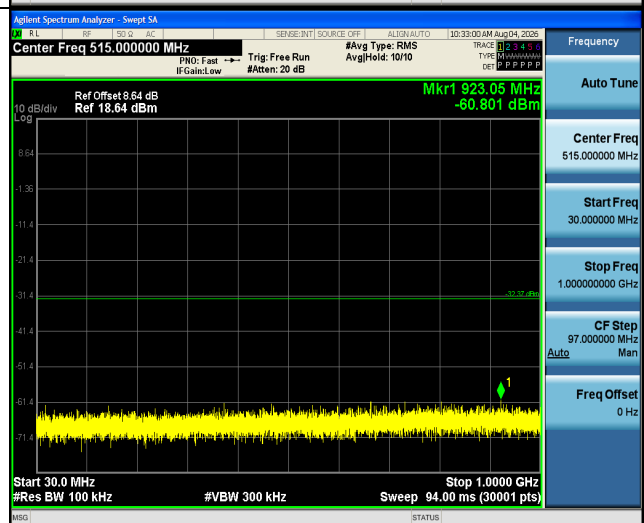
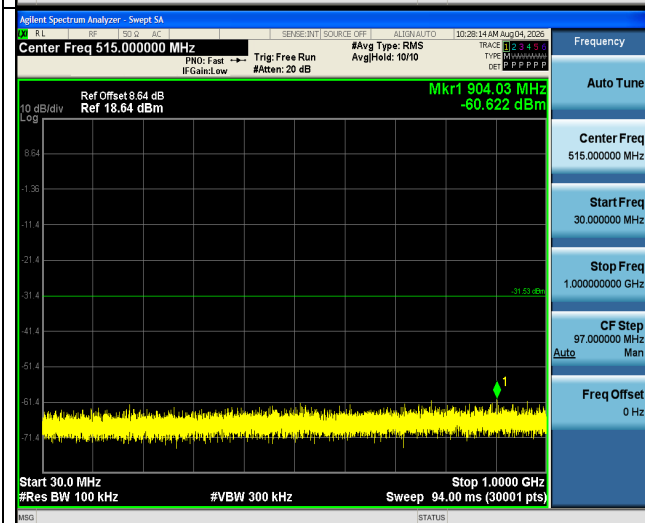
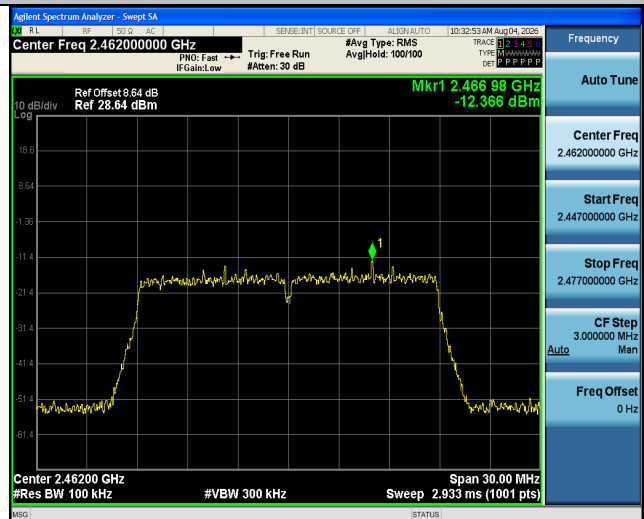
Band Edge



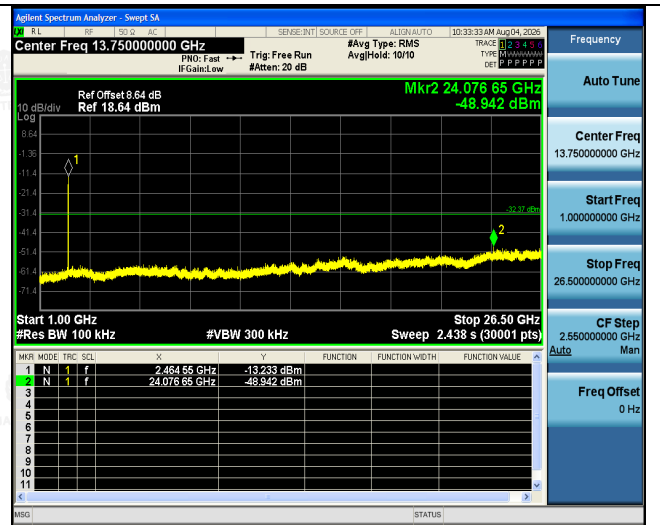
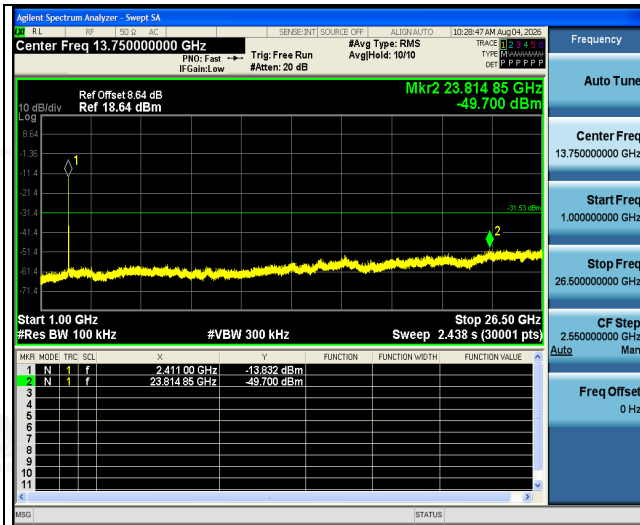
Spurious Emission



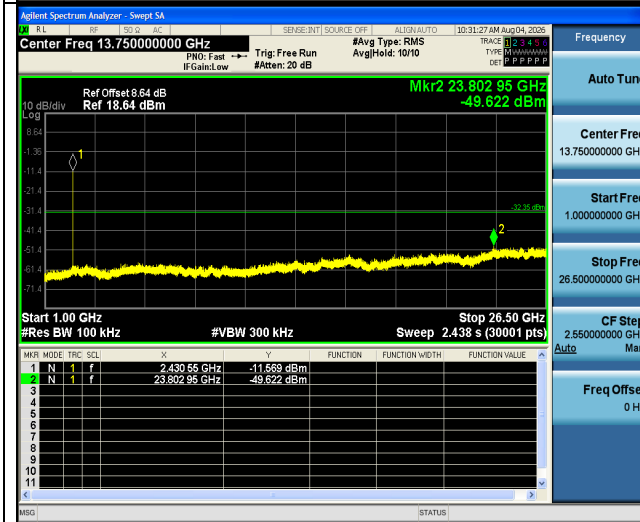
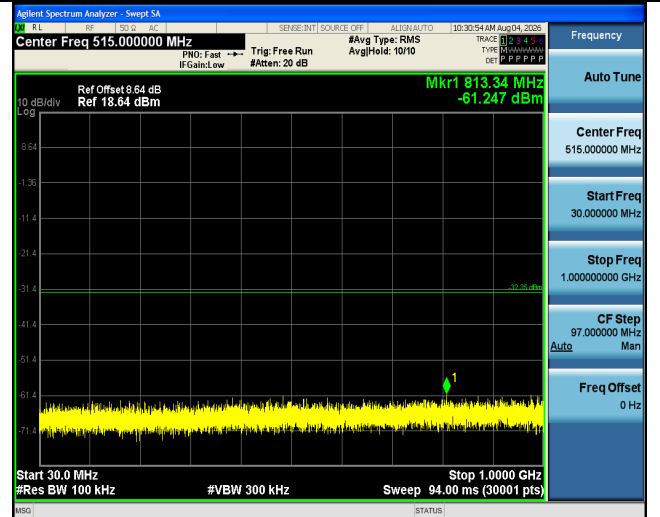
Spurious Emission



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.



Middle Channel Spurious Emission



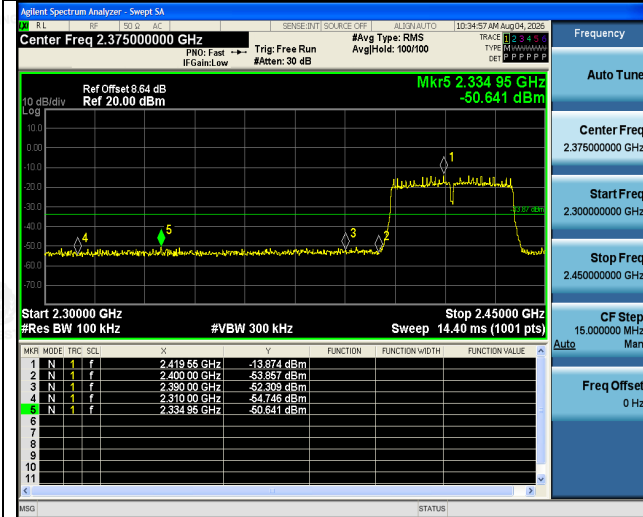
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 15 days only. The document is issued by Shenzhen HUAKE Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.



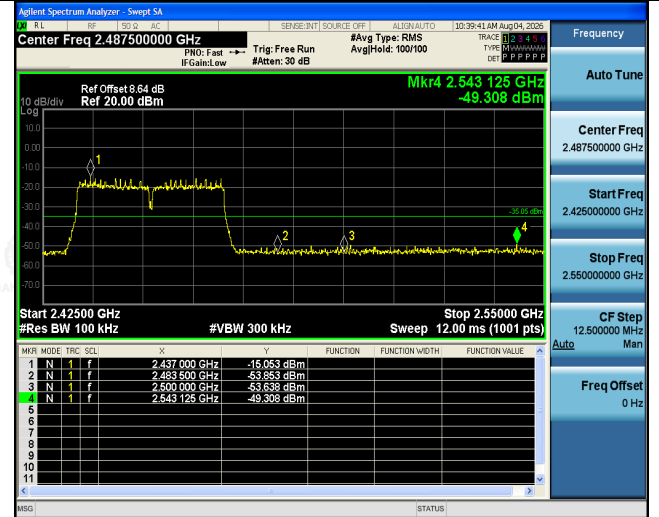
HUAKE TESTING

802.11n (HT40) Modulation

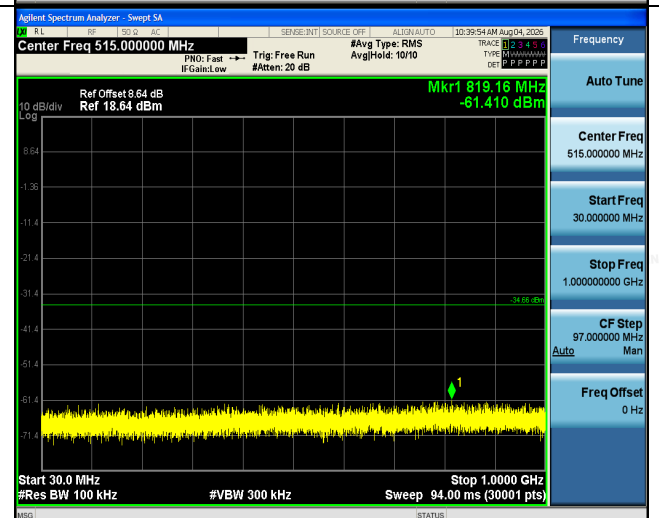
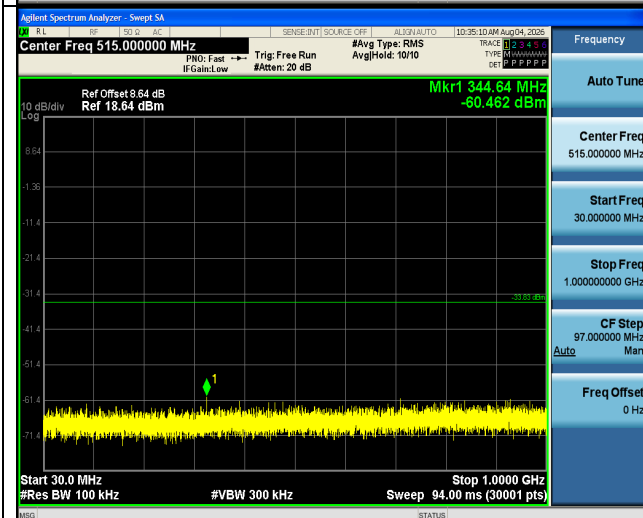
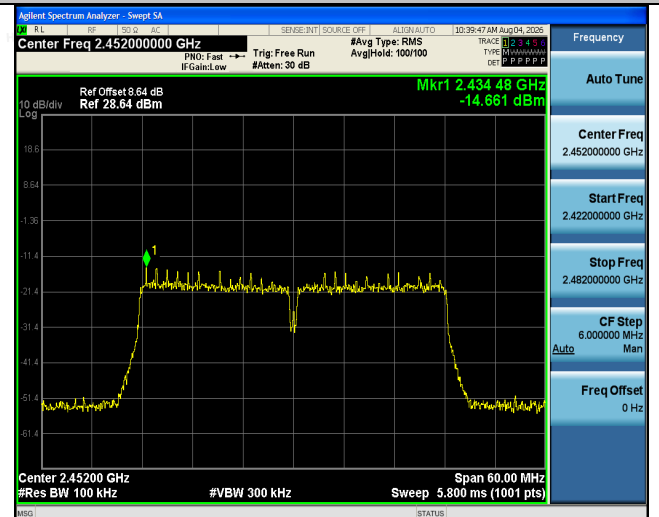
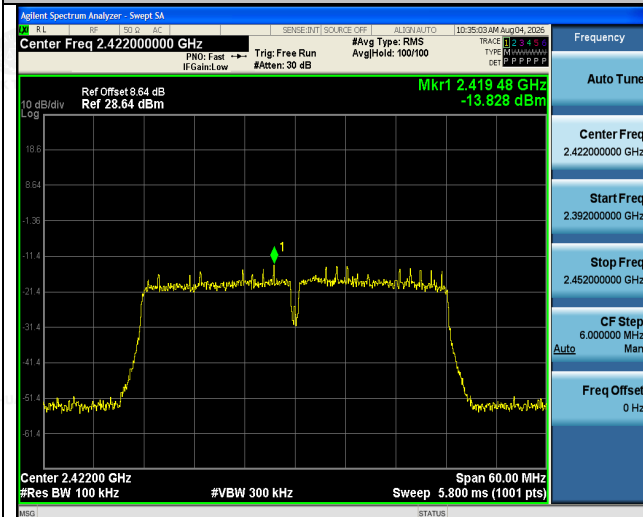
Lowest Channel Band Edge



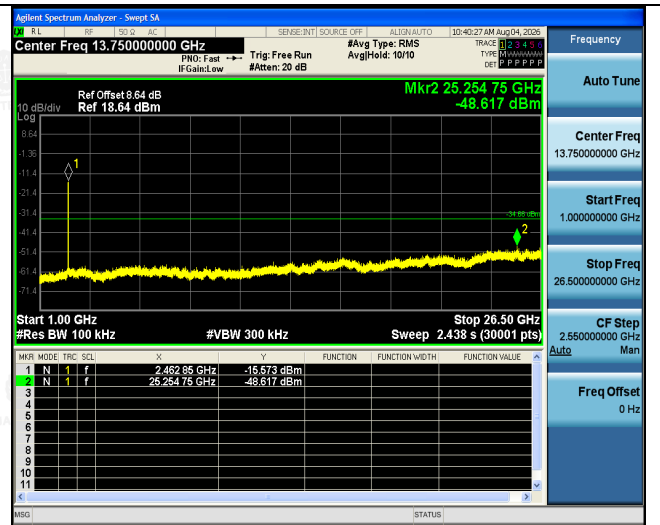
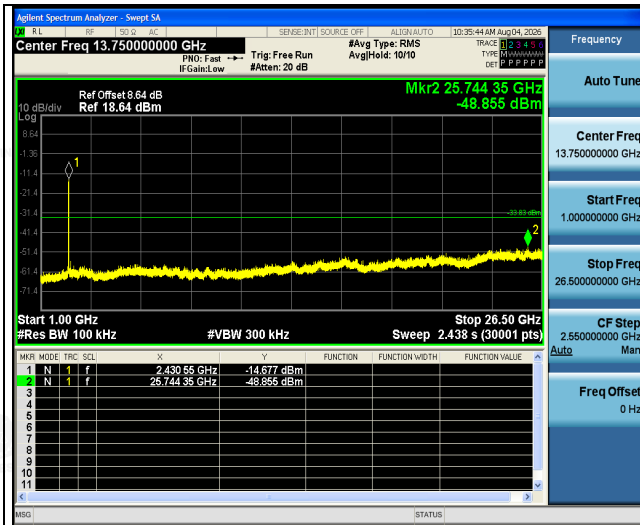
Highest Channel Band Edge



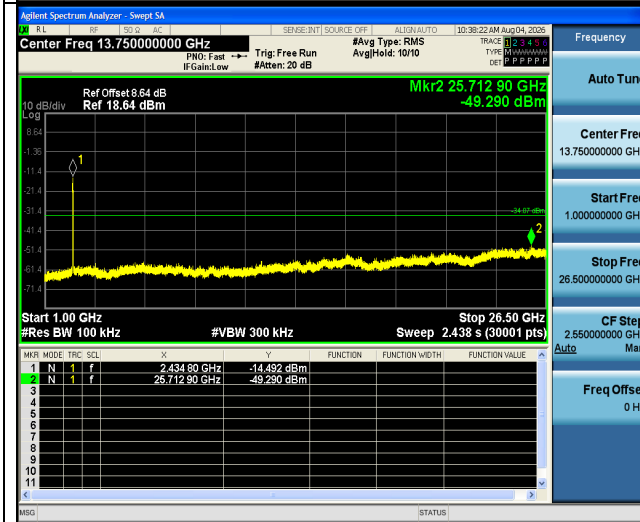
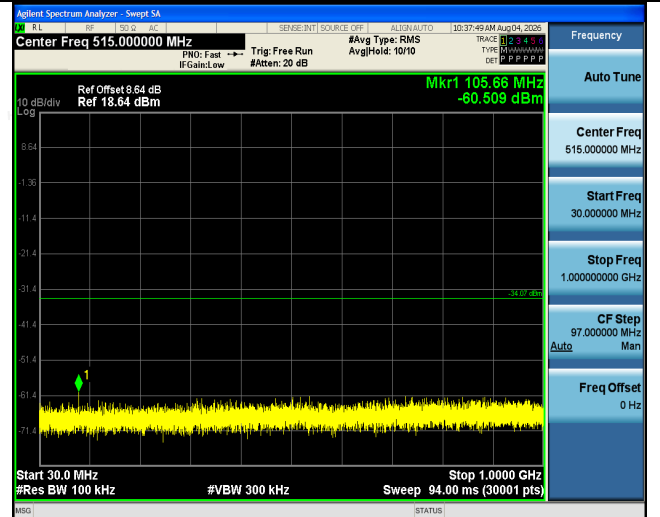
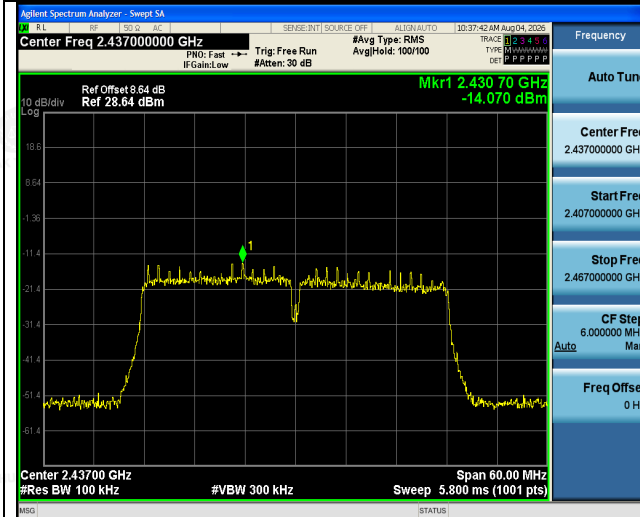
Spurious Emission



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.

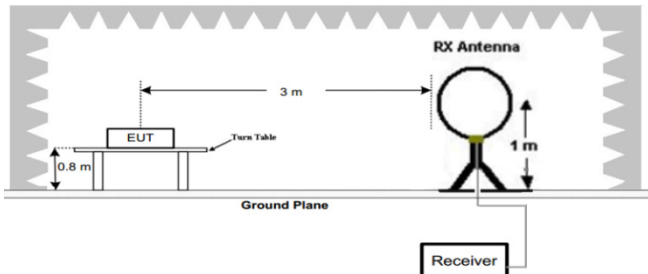


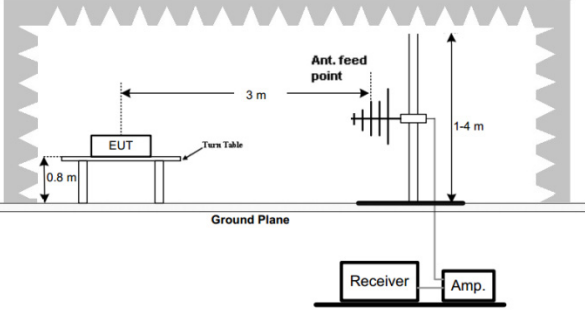
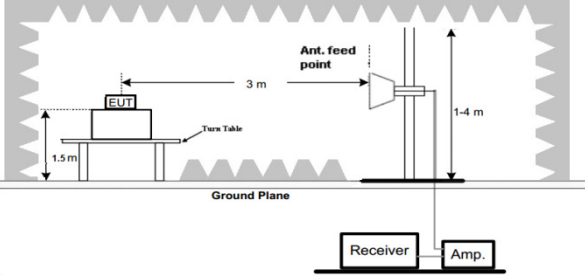
Middle Channel Spurious Emission



5.6 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.



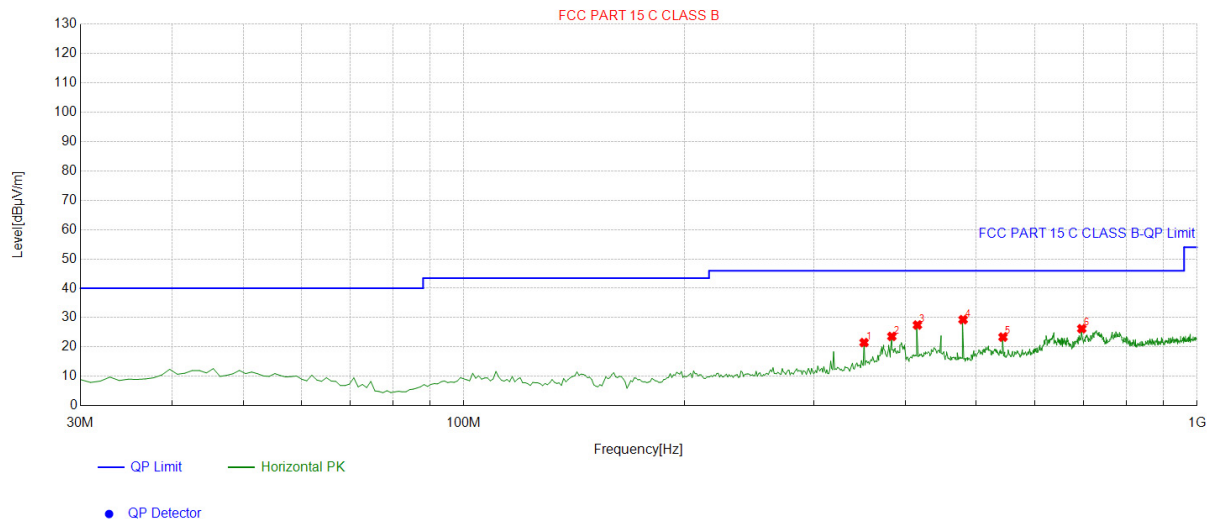
	The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. 3. Corrected Reading: Antenna Factor + Cable Loss + Read 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 Data

Below 1GHz Test Results

All modes have been tested, only the worst mode of 802.11b Low channel TX is reflected.

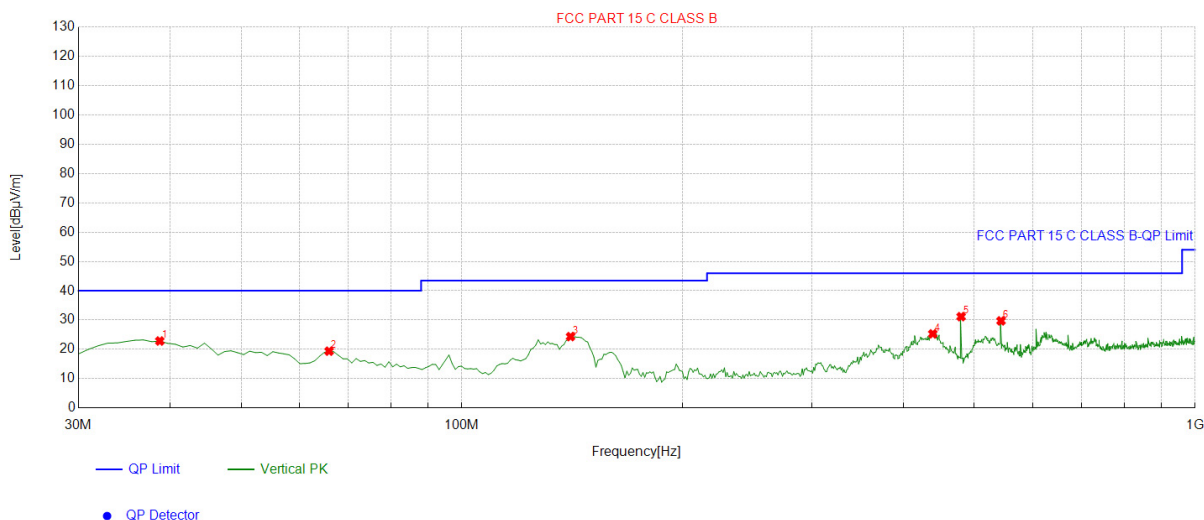
Antenna polarity: Horizontal



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	351.391	-10.54	32.07	21.53	46.00	24.47	100	138	Horizontal
2	383.433	-10.18	33.80	23.62	46.00	22.38	100	282	Horizontal
3	415.475	-9.28	36.78	27.50	46.00	18.50	100	293	Horizontal
4	479.560	-8.19	37.53	29.34	46.00	16.66	100	289	Horizontal
5	543.644	-6.84	30.23	23.39	46.00	22.61	100	351	Horizontal
6	696.086	-4.27	30.52	26.25	46.00	19.75	100	289	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	38.739	-13.91	36.77	22.86	40.00	17.14	100	211	Vertical
2	65.926	-15.37	34.77	19.40	40.00	20.60	100	280	Vertical
3	140.691	-18.30	42.66	24.36	43.50	19.14	100	211	Vertical
4	438.779	-8.92	34.22	25.30	46.00	20.70	100	265	Vertical
5	479.560	-8.19	39.36	31.17	46.00	14.83	100	77	Vertical
6	543.644	-6.84	36.57	29.73	46.00	16.27	100	200	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)
--	--	--
--	--	--
--	--	--
--	--	--

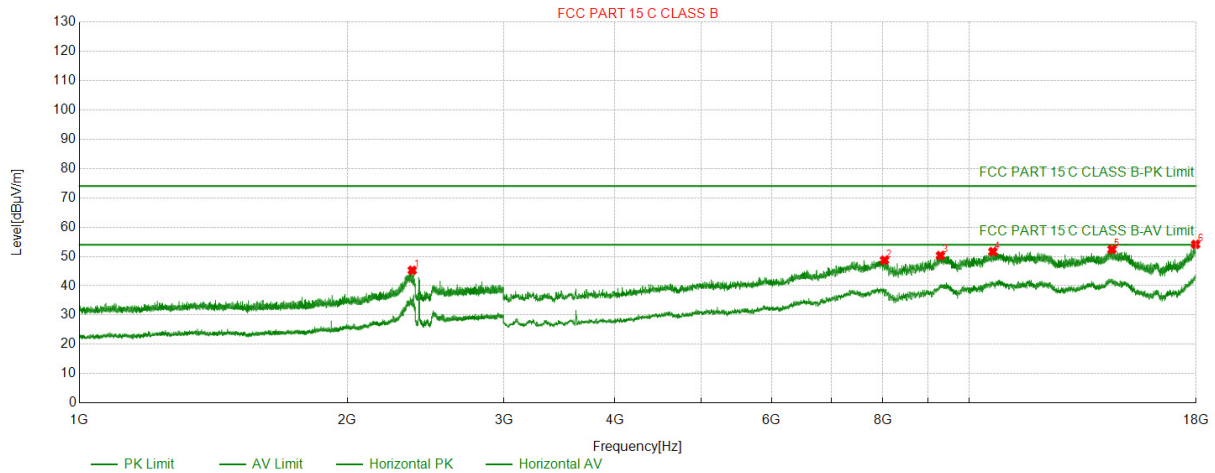
Note: 1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor.

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 modes have been tested, only the worst mode of 802.11b Low channel TX is reflected.
For 1GHz to 18GHz

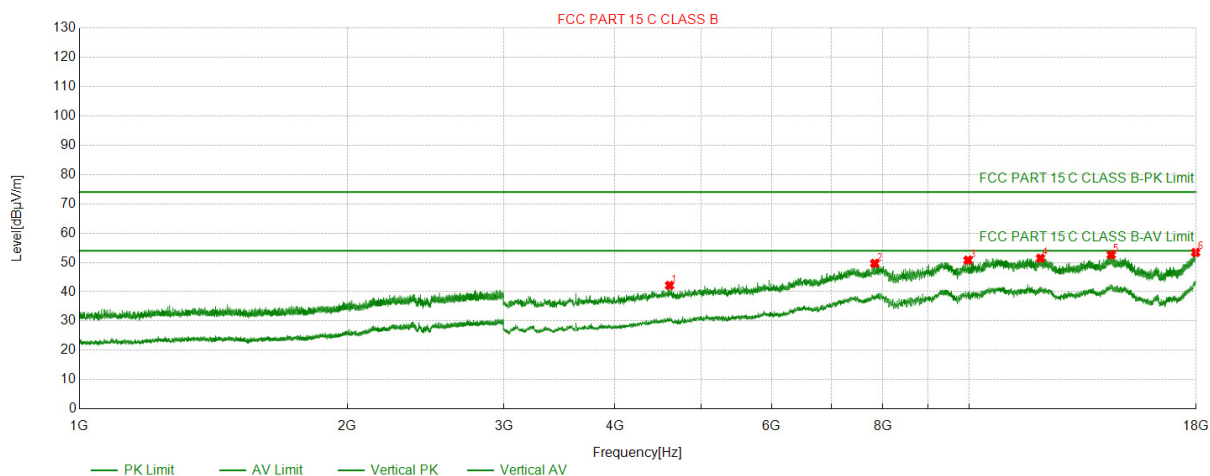
Antenna polarity: Horizontal



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	2366.737	59.78	45.28	-14.50	74.00	28.72	150	360	Horizontal
2	8036.004	50.92	48.73	-2.19	74.00	25.27	150	344	Horizontal
3	9287.129	51.24	50.31	-0.93	74.00	23.69	150	267	Horizontal
4	10637.264	50.87	51.64	0.77	74.00	22.36	150	296	Horizontal
5	14479.148	48.74	52.40	3.66	74.00	21.60	150	225	Horizontal
6	17975.998	47.03	54.13	7.10	74.00	19.87	150	196	Horizontal

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

Antenna polarity: Vertical

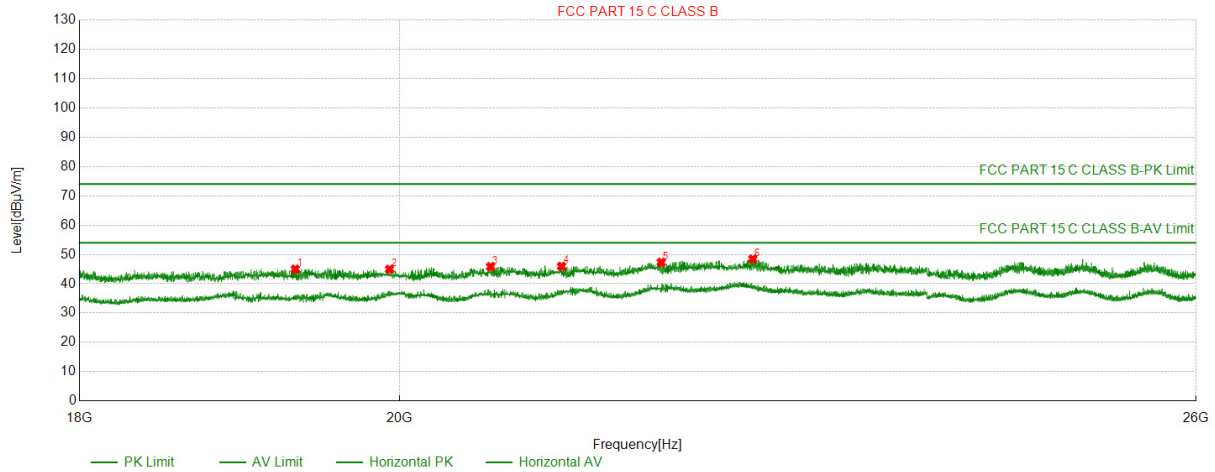


Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	PK Level [dBμV/m]	Factor [dB]	PK Limit [dBμV/m]	PK Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4606.661	53.67	42.17	-11.50	74.00	31.83	150	60	Vertical
2	7833.483	52.41	49.66	-2.75	74.00	24.34	150	236	Vertical
3	9972.697	50.42	50.75	0.33	74.00	23.25	150	0	Vertical
4	12033.903	48.43	51.44	3.01	74.00	22.56	150	358	Vertical
5	14450.645	48.99	52.60	3.61	74.00	21.40	150	331	Vertical
6	17975.998	46.31	53.41	7.10	74.00	20.59	150	349	Vertical

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

For 18GHz to 26GHz

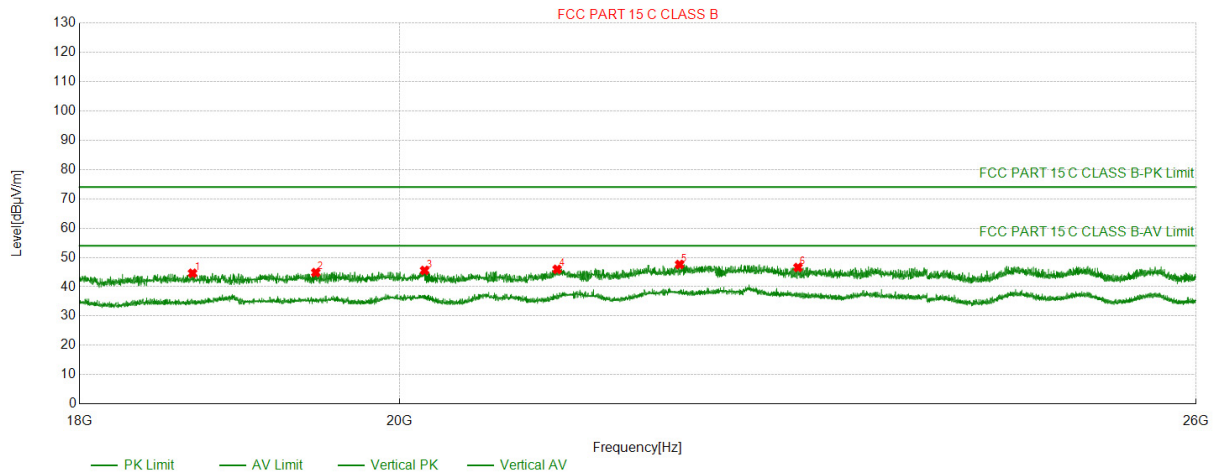
Antenna polarity: Horizontal



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	19325.733	38.97	44.99	6.02	74.00	29.01	150	60	Horizontal
2	19935.394	38.75	44.93	6.18	74.00	29.07	150	130	Horizontal
3	20609.861	39.96	45.83	5.87	74.00	28.17	150	110	Horizontal
4	21097.110	40.63	45.95	5.32	74.00	28.05	150	280	Horizontal
5	21801.180	41.74	47.30	5.56	74.00	26.70	150	70	Horizontal
6	22468.447	42.78	48.43	5.65	74.00	25.57	150	110	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	18683.268	39.15	44.61	5.46	74.00	29.39	150	40	Vertical
2	19456.946	38.78	44.85	6.07	74.00	29.15	150	60	Vertical
3	20166.617	39.47	45.57	6.10	74.00	28.43	150	250	Vertical
4	21066.707	40.62	45.95	5.33	74.00	28.05	150	0	Vertical
5	21933.193	41.92	47.60	5.68	74.00	26.40	150	220	Vertical
6	22805.281	41.05	46.59	5.54	74.00	27.41	150	220	Vertical

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

5.7 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.

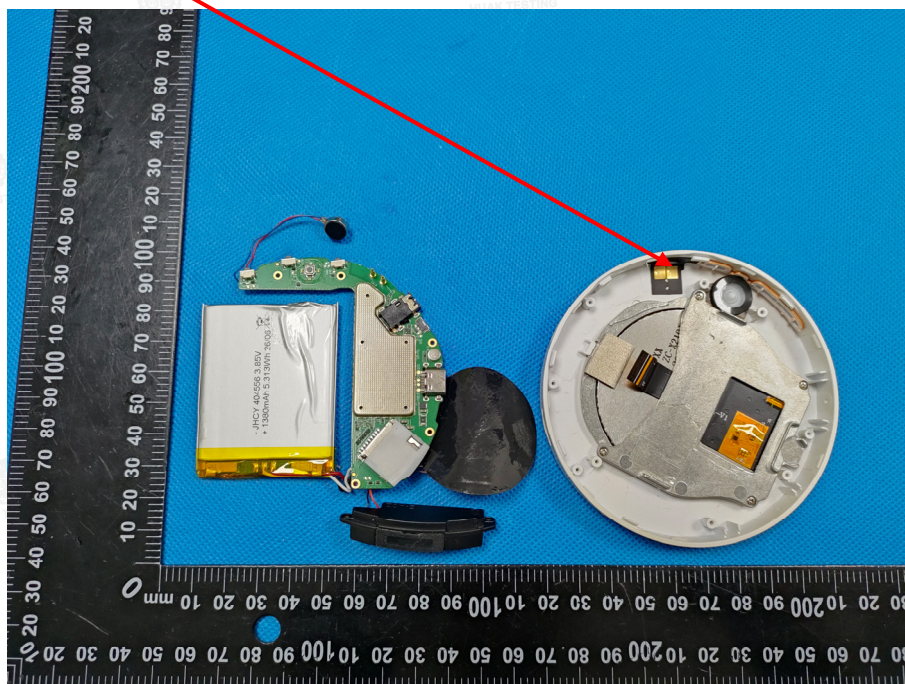
Refer to statement below for compliance.

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

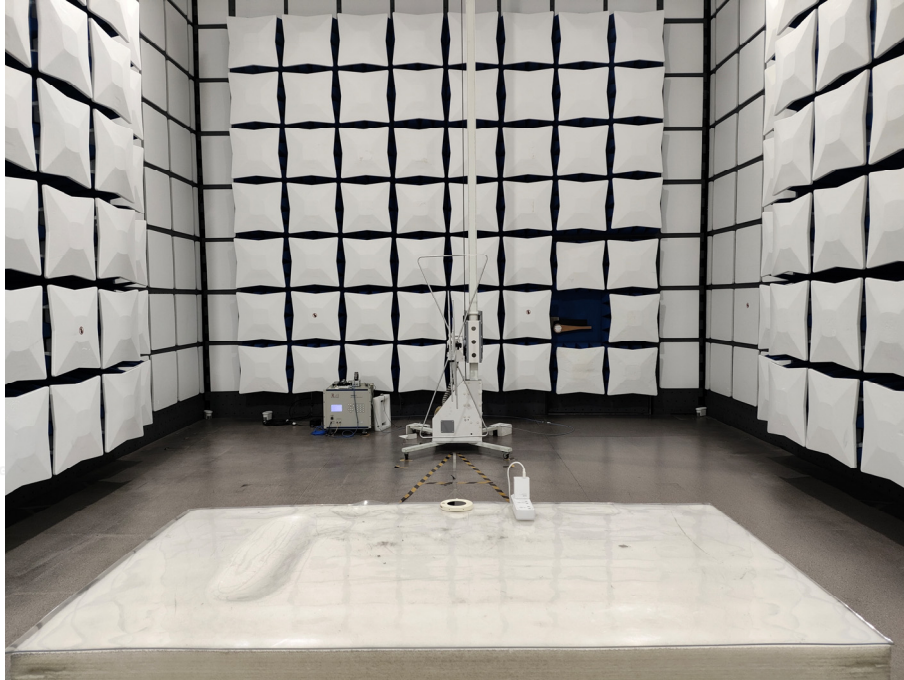
The antenna used in this product is a FPC Antenna, not easy to remove. It conforms to the standard requirements. The gain of antenna used for transmitting is 1.22dBi.

WIFI Antenna



6. Test Setup Photos of the EUT

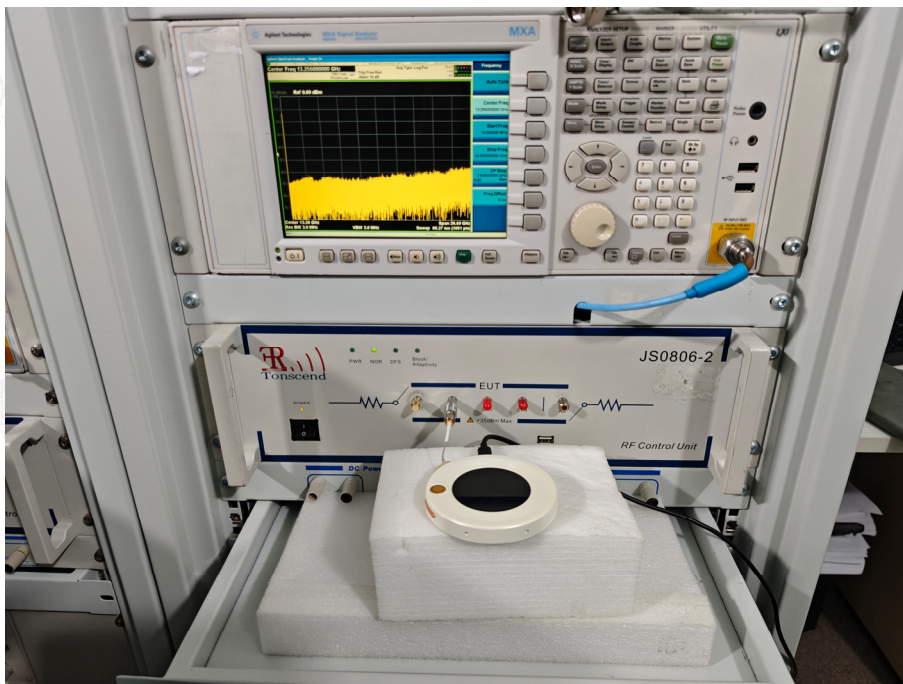
Radiated Emission



AC Conducted Emission



RF Conducted Emission





HUAKE TESTING

7. Photos of the EUT

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

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

