6. 26DB&99% BANDWIDTH TEST

6.1 APPLIED PROCEDURES / LIMIT

The 26 dB bandwidth is used to determine the conducted power limits.

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

6.1.1 TEST PROCEDURE

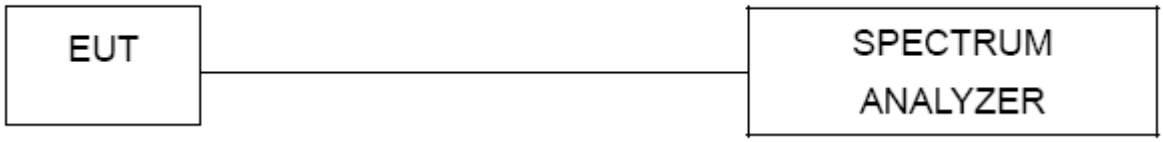
26dB Bandwidth	
Spectrum Parameters	Setting
RBW	approximately 1% of the emission bandwidth
VBW	>RBW
Span	30MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

99% Occupied Bandwidth	
Spectrum Parameters	Setting
RBW	1% to 5% of the OBW
VBW	Approximately three times the RBW
Span	between 1.5 times and 5.0 times the OBW
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP

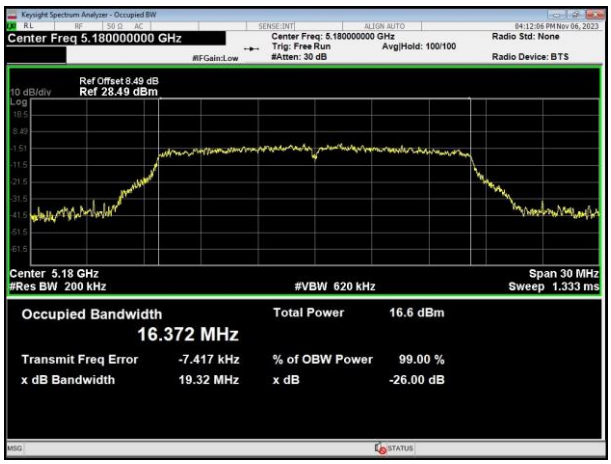
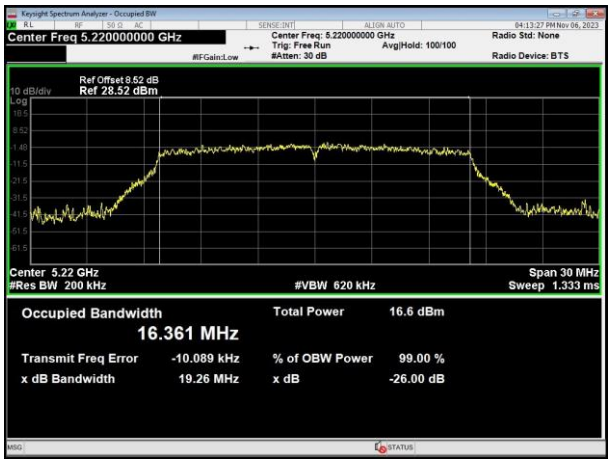
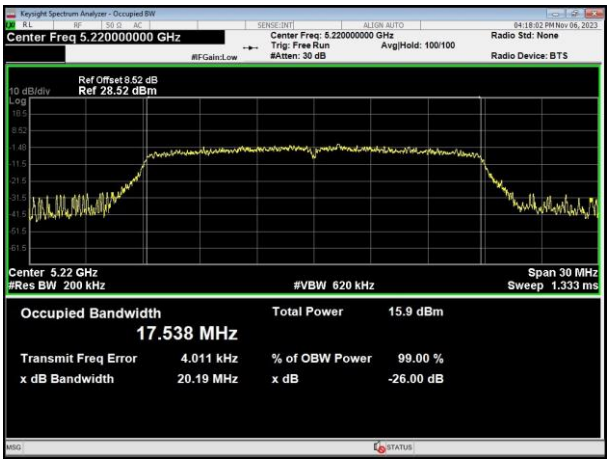
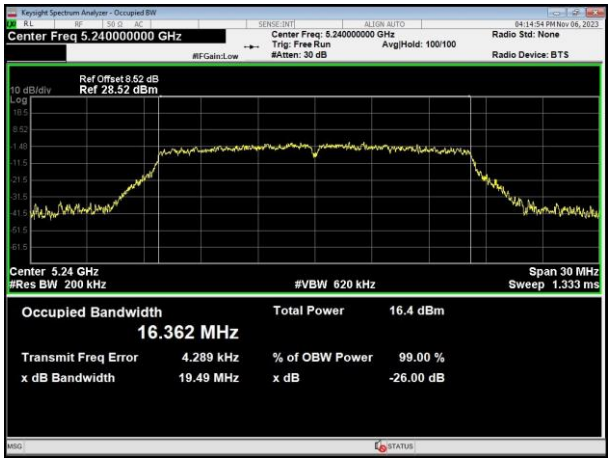


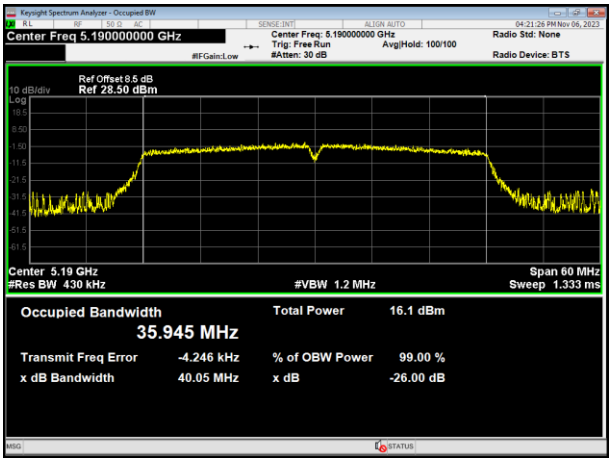
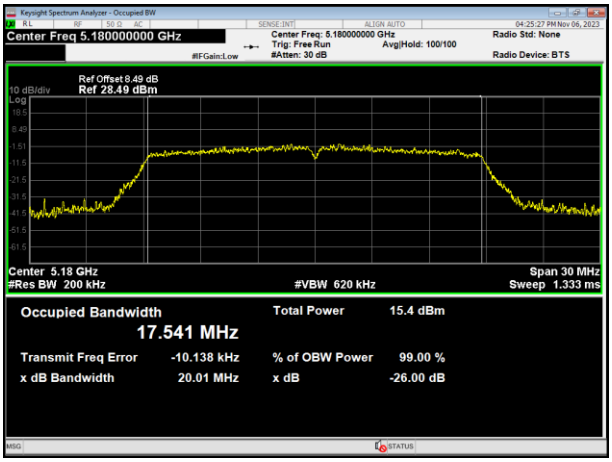
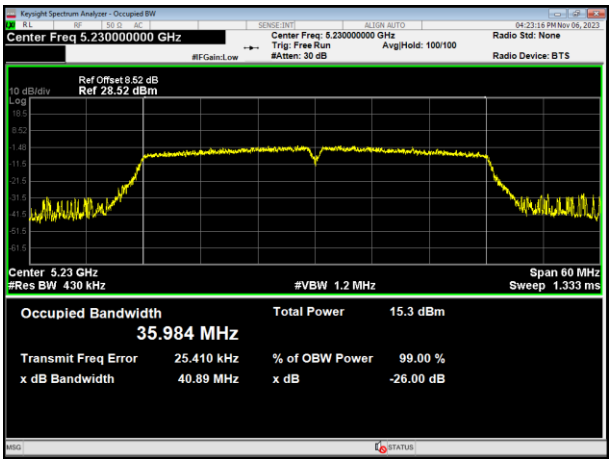
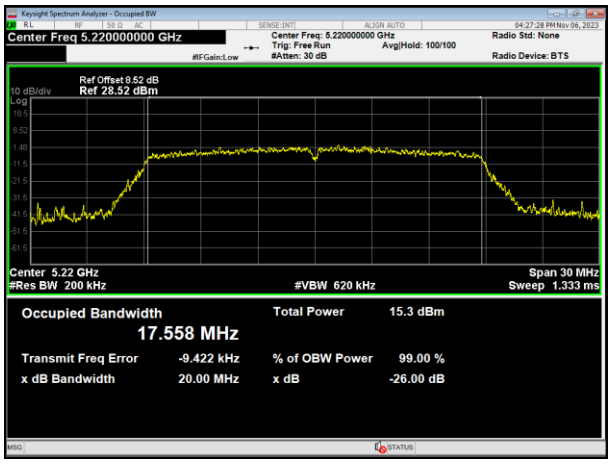
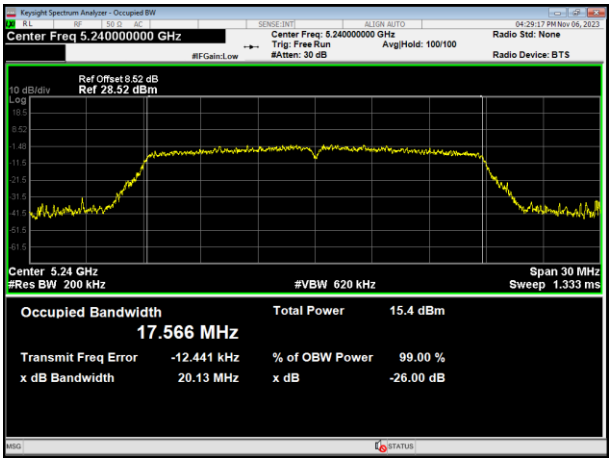
6.1.4 EUT OPERATION CONDITIONS

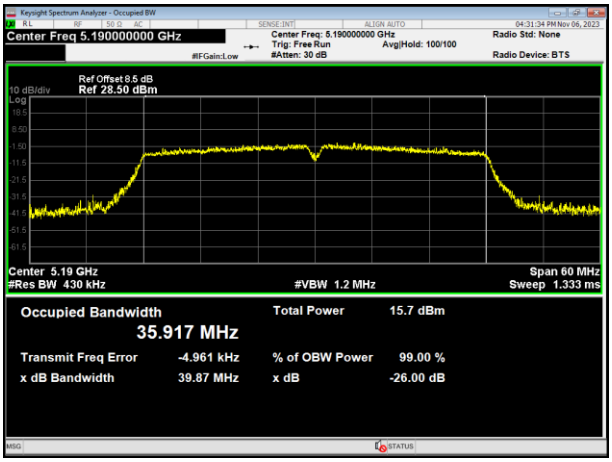
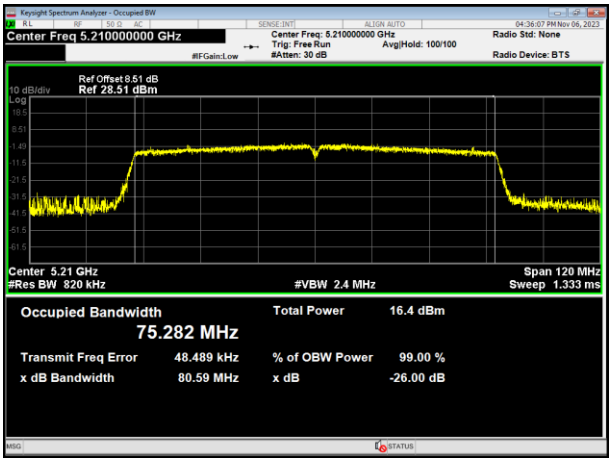
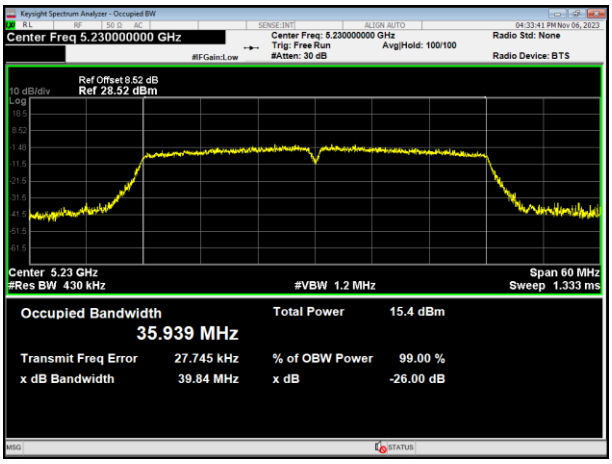
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

		Test Channel	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Band 1	802.11a	Low	19.32	16.372	Pass
		Middle	19.26	16.361	Pass
		High	19.49	16.362	Pass
	802.11n HT20	Low	19.84	17.566	Pass
		Middle	20.19	17.538	Pass
		High	20.13	17.551	Pass
	802.11n HT40	Low	40.05	35.945	Pass
		High	40.89	35.984	Pass
	802.11ac HT20	Low	20.01	17.541	Pass
		Middle	20.00	17.558	Pass
		High	20.13	17.566	Pass
	802.11ac HT40	Low	39.87	35.917	Pass
		High	39.84	35.939	Pass
	802.11ac HT80	/	80.59	75.282	Pass

802.11a	802.11n HT20
	
5180MHz	5180MHz
	
5200MHz	5200MHz
	
5240MHz	5240MHz

802.11n HT40	802.11ac HT20
	
5190MHz	5180MHz
	
5230MHz	5200MHz
	
	5240MHz

802.11ac HT40	802.11ac HT80
	
5190MHz	5210MHz
	
5230MHz	

7. DUTY CYCLE TEST SIGNAL

7.1 APPLIED PROCEDURES / LIMIT

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

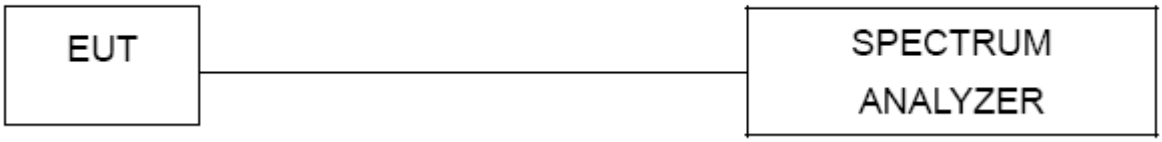
7.1.1 TEST PROCEDURE

1. Set RBW = 1 MHz.
2. Set the video bandwidth (VBW) ≥RBW.
3. Detector = Peak.
4. Sweep = auto couple.
5. Allow the trace to stabilize.
6. Span=0

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP

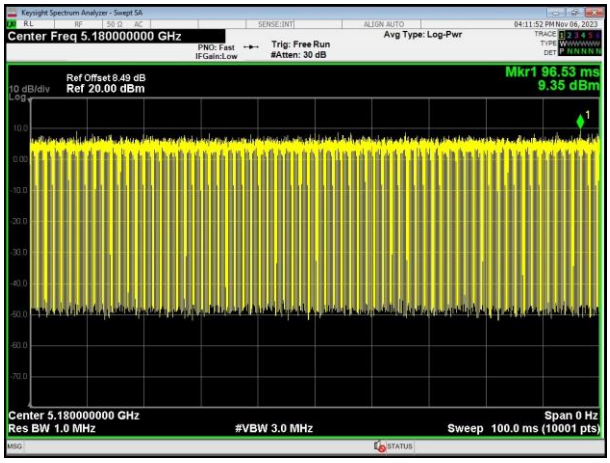
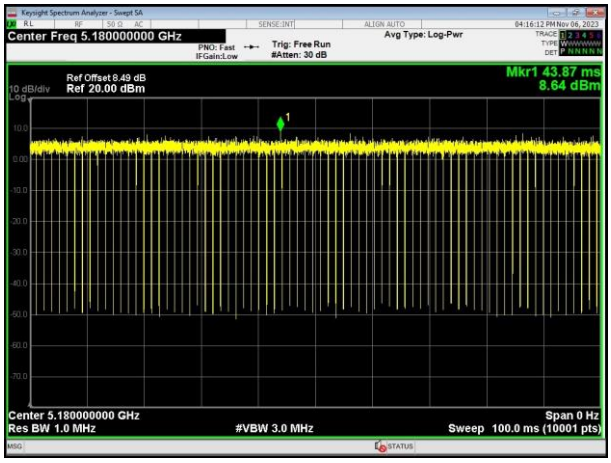
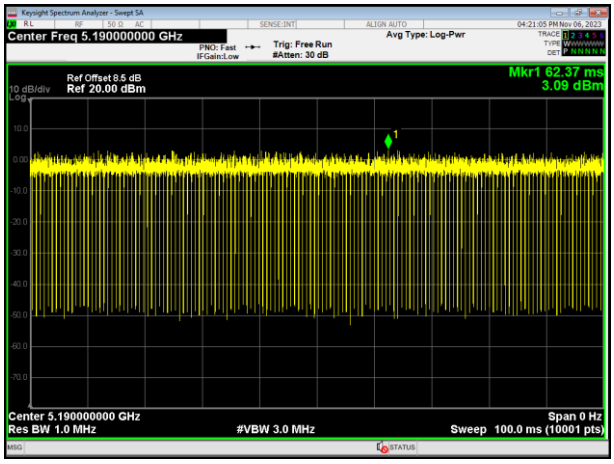
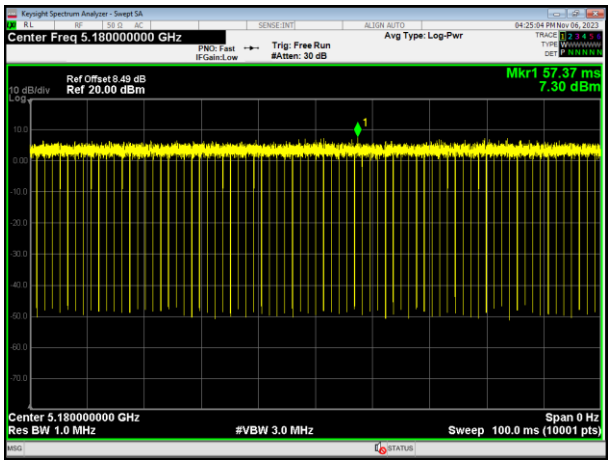
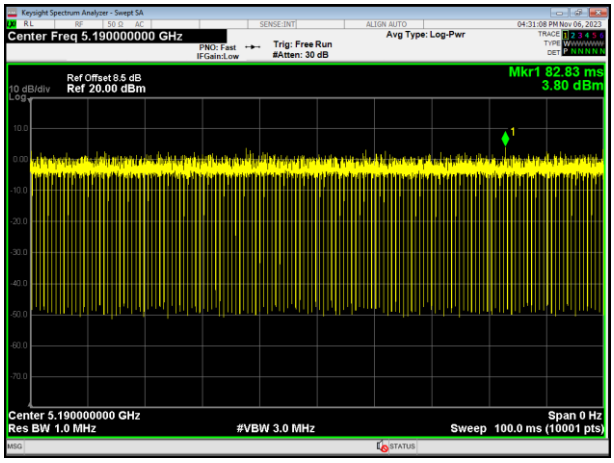
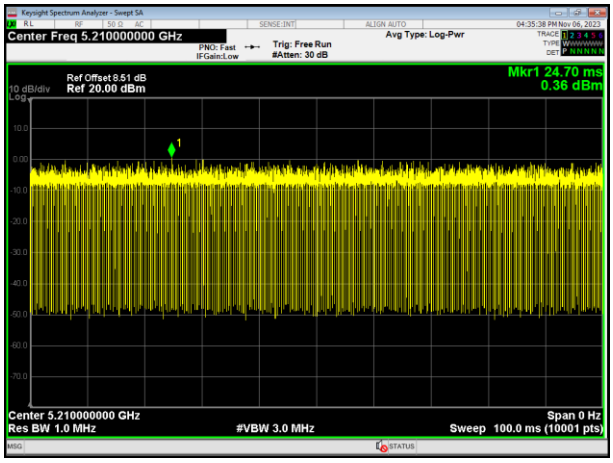


7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1.5 TEST RESULTS

Operation Mode		Duty Cycle(%)	Duty Fator (dB) 10 * log (1/ Duty cycle)
Band 1	802.11a	85.35	0.69
	802.11n(HT20)	97.61	0.11
	802.11n(HT40)	95.36	0.21
	802.11ac(HT20)	97.63	0.1
	802.11ac(HT40)	95.36	0.21
	802.11ac(HT80)	91.22	0.4

802.11a	802.11n HT20
	
802.11n HT40	**802.11ac HT20**
	
802.11ac HT40	**802.11ac HT80**
	

8. FREQUENCY STABILITY

8.1 APPLIED PROCEDURES / LIMIT

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's manual.

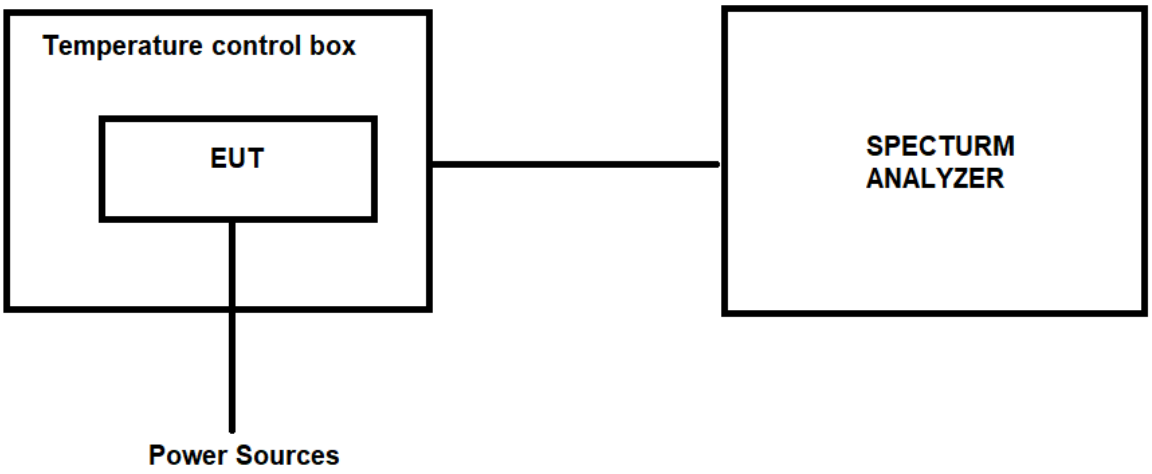
8.1.1 TEST PROCEDURE

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
2. Set EUT as normal operation.
3. Turn the EUT on and couple its output to spectrum.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
6. Repeat step with the temperature chamber set to the lowest temperature.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

8.1.5 TEST RESULTS

Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)			Δ Frequency (PPM)		
			802.11a	802.11n HT20	802.11ac HT20	802.11a	802.11n HT20	802.11ac HT20
4.07V	-20℃	5180	5180.0338	5180.0341	5180.0341	6.5251	6.5830	6.5830
		5220	5220.0363	5220.0336	5220.0333	6.9540	6.4368	6.3793
		5240	5240.0214	5240.0244	5240.0252	4.0840	4.6565	4.8092
3.33V		5180	5180.0236	5180.0247	5180.0214	4.5560	4.7683	4.1313
		5220	5220.0314	5220.0343	5220.0369	6.0153	6.5709	7.0690
		5240	5240.0296	5240.0264	5240.0234	5.6489	5.0382	4.4656
3.7V	25℃	5180	5180.0541	5180.0549	5180.0546	10.4440	10.5985	10.5405
		5220	5220.0263	5220.0234	5220.0228	5.0383	4.4828	4.3678
		5240	5240.0314	5240.0369	5240.0324	5.9924	7.0420	6.1832
4.07V	50℃	5180	5180.0369	5180.0355	5180.0329	7.1236	6.8533	6.3514
		5220	5220.0241	5220.0236	5220.0224	4.6169	4.5211	4.2912
		5240	5240.0369	5240.0385	5240.0319	7.0420	7.3473	6.0878
3.33V	50℃	5180	5180.0352	5180.0341	5180.0352	6.7954	6.5830	6.7954
		5220	5220.0224	5220.0263	5220.0246	4.2912	5.0383	4.7126
		5240	5240.0339	5240.0325	5240.0364	6.4695	6.2023	6.9466

Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)		Δ Frequency (PPM)	
			802.11n HT40	802.11ac HT40	802.11n HT40	802.11ac HT40
4.07V	-20℃	5190	5190.0241	5190.0214	4.6435	4.1233
		5230	5230.0363	5230.0369	6.9407	7.0554
3.33V		5190	5190.0251	5190.0284	4.8362	5.4721
		5230	5230.0385	5230.0361	7.3614	6.9025
3.7V	25℃	5190	5190.0256	5190.0269	4.9326	5.1830
		5230	5230.0637	5230.0552	12.1797	10.5545
4.07V	50℃	5190	5190.0613	5190.0641	11.8112	12.3507
		5230	5230.0584	5230.0559	11.1663	10.6883
3.33V	50℃	5190	5190.0569	5190.0541	10.9634	10.4239
		5230	5230.0345	5230.0368	6.5966	7.0363

Test Voltage	Test Temp.	Measured Frequency (MHz)	Spectrum Frequency (MHz)	Δ Frequency (PPM)
			802.11ac HT80	802.11ac HT80
4.07V	-20℃	5210	5210.0125	2.3992
3.33V		5210	5210.0224	4.2994
3.7V	25℃	5210	5210.0469	9.0019
4.07V	50℃	5210	5210.0355	6.8138
3.33V	50℃	5210	5210.0324	6.2188

9. TRANSMISSION IN THE ABSENCE OF DATA

9.1 STANDARD REQUIREMENT

According to §15.407(c)
The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

9.2 TEST RESULT

No non-compliance noted:
Refer to the theory of operation.

10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

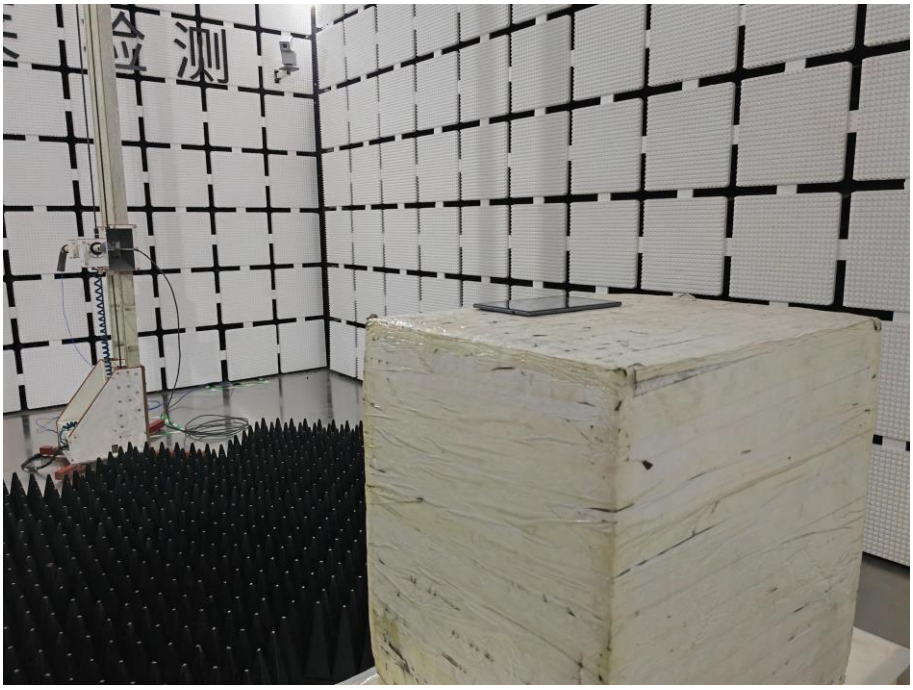
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

10.2 EUT ANTENNA

The EUT antenna is Internal antenna, It comply with the standard requirement.

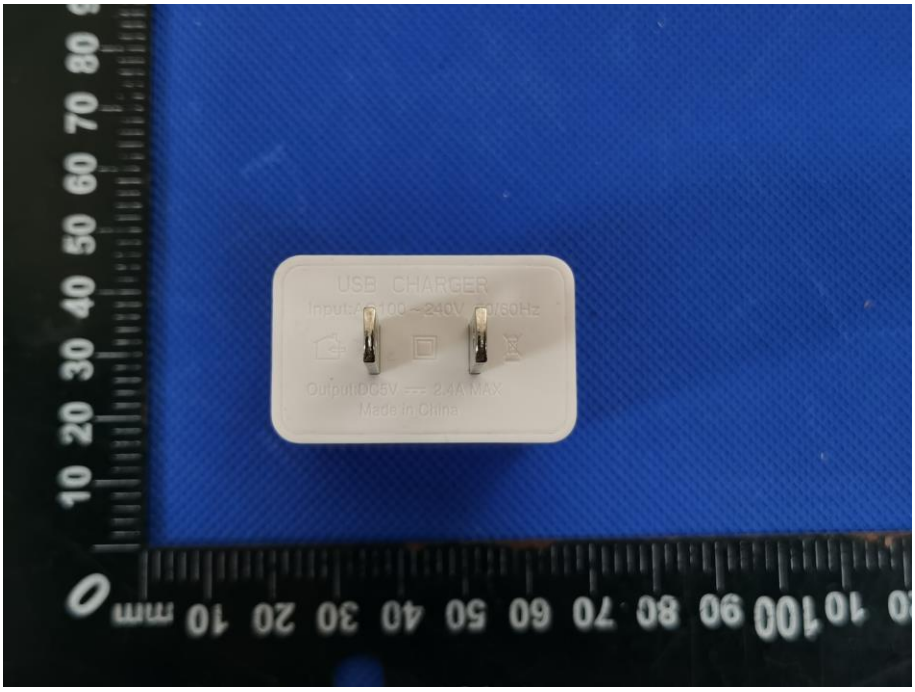
11. TEST SEUUP PHOTO

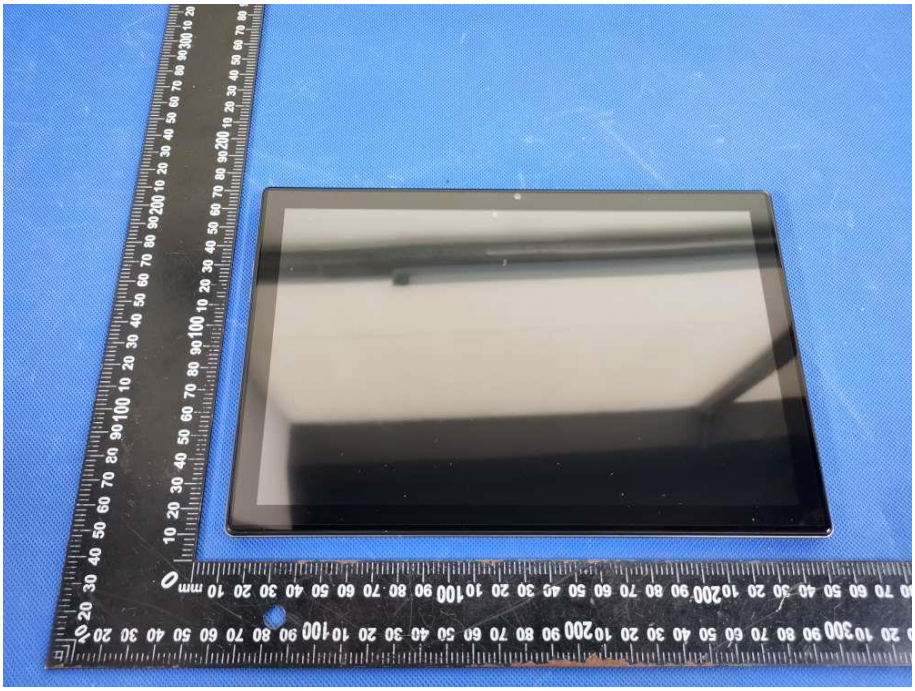
Radiated Measurement Photos

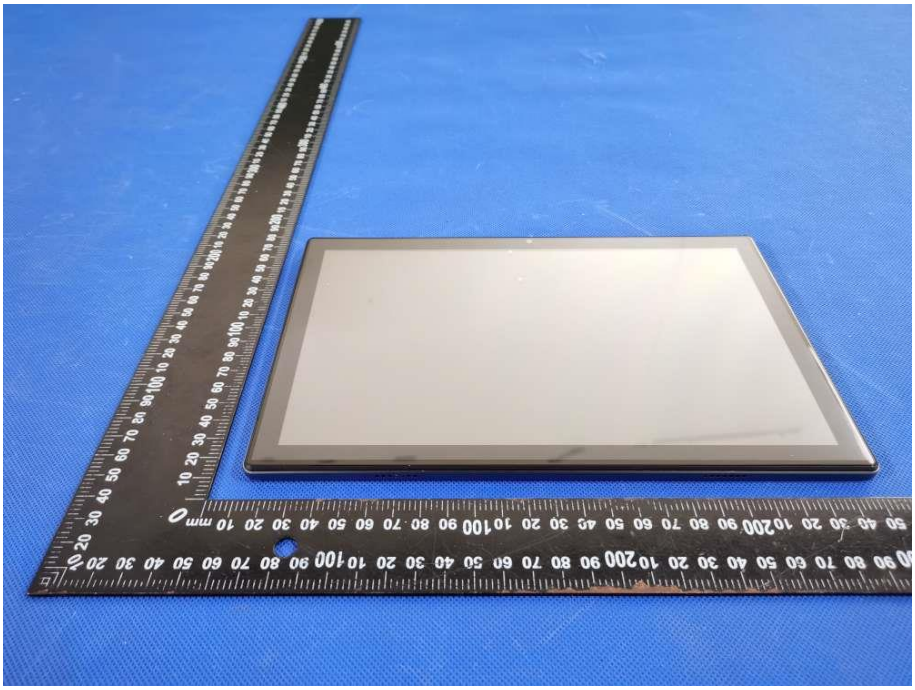


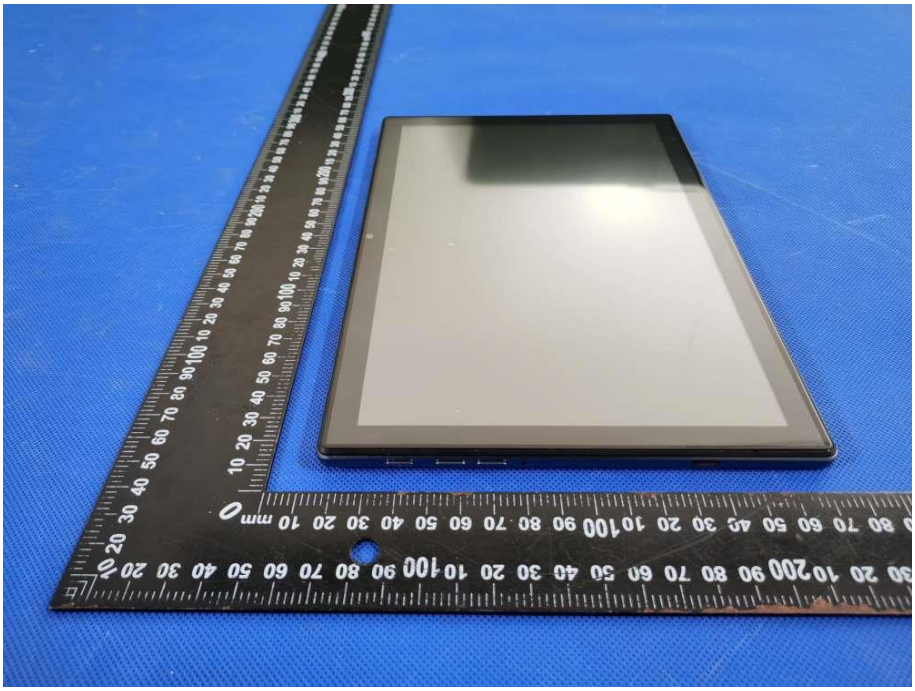
Conducted Measurement Photos

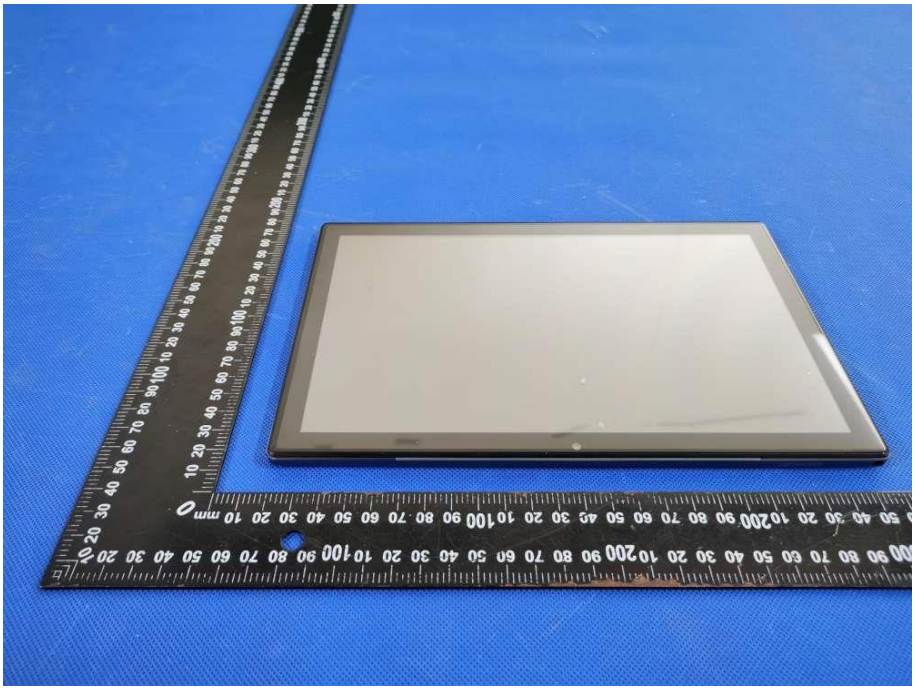
12. EUT PHOTO

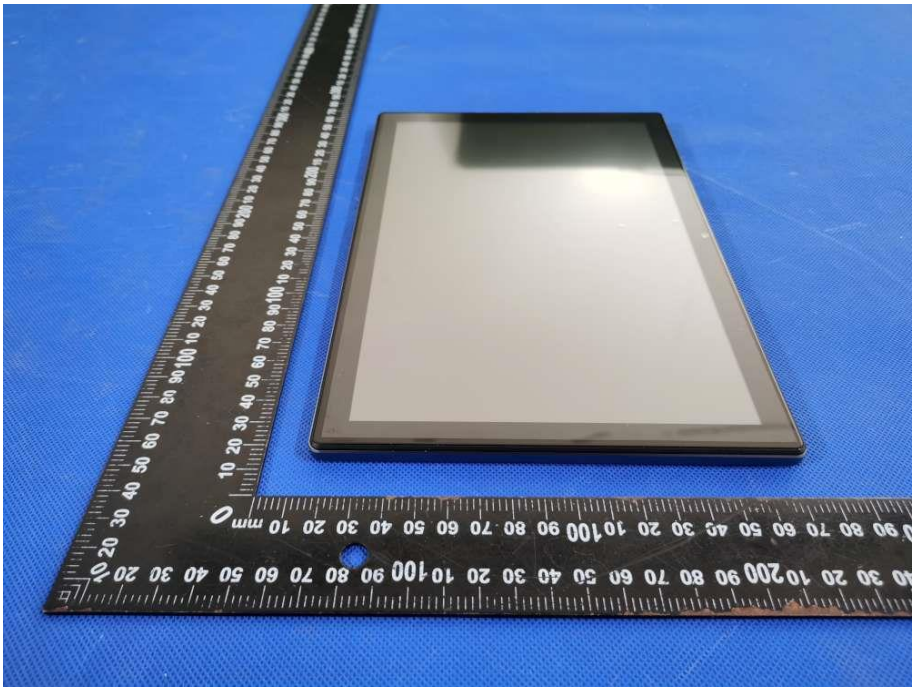


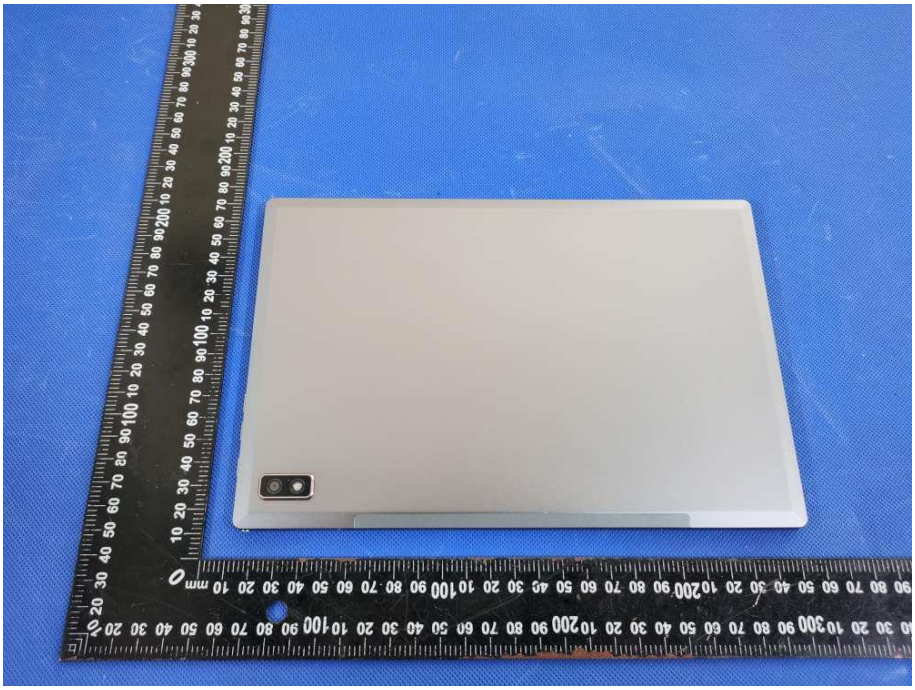


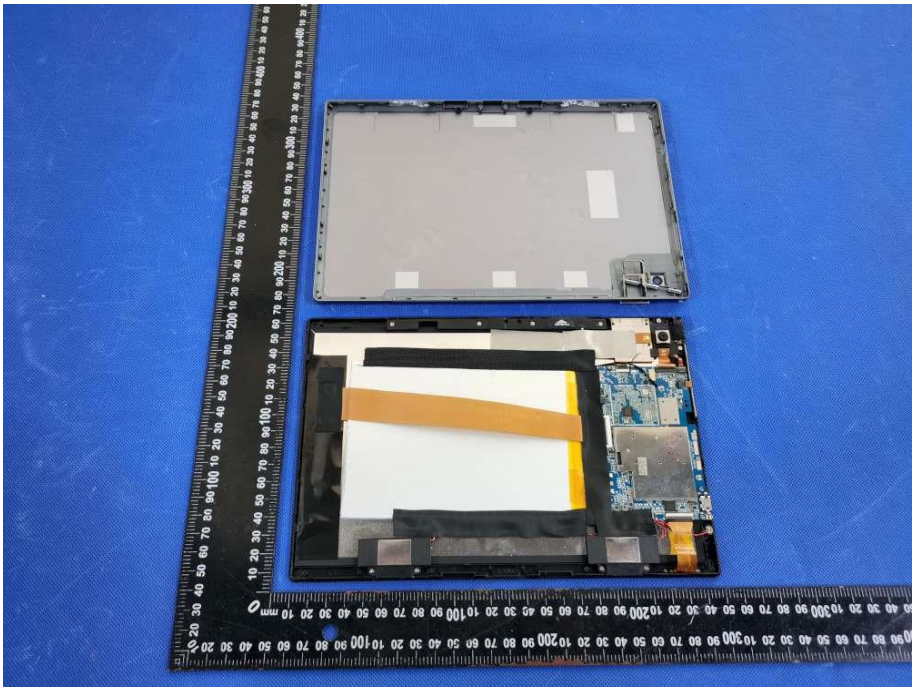


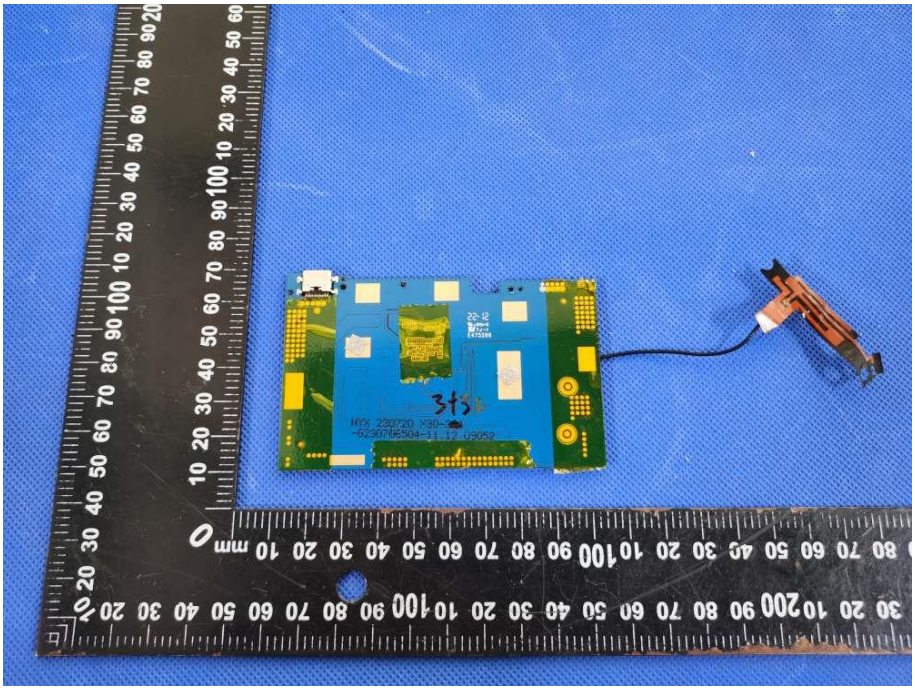


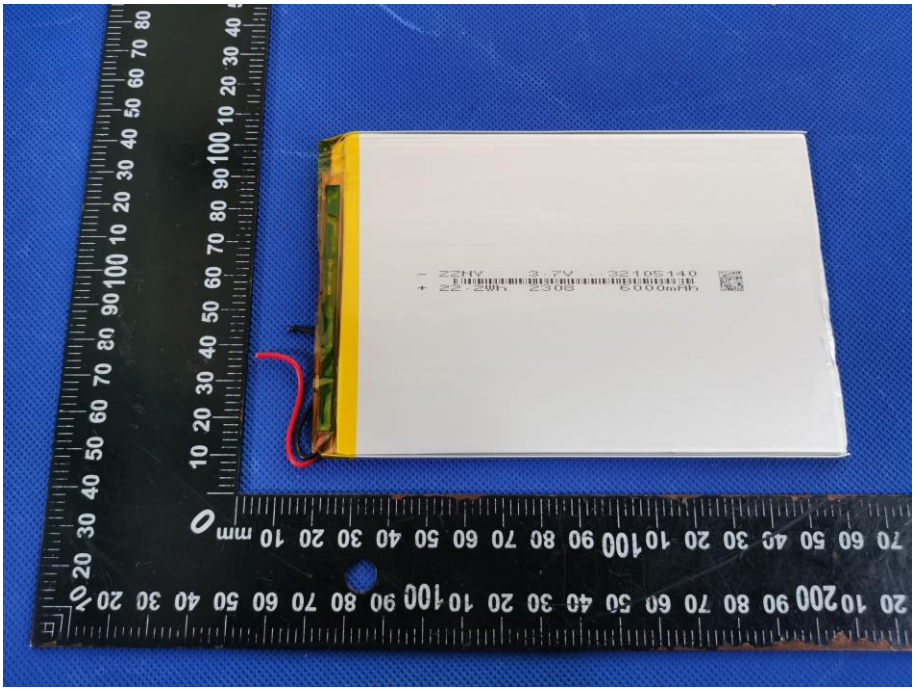


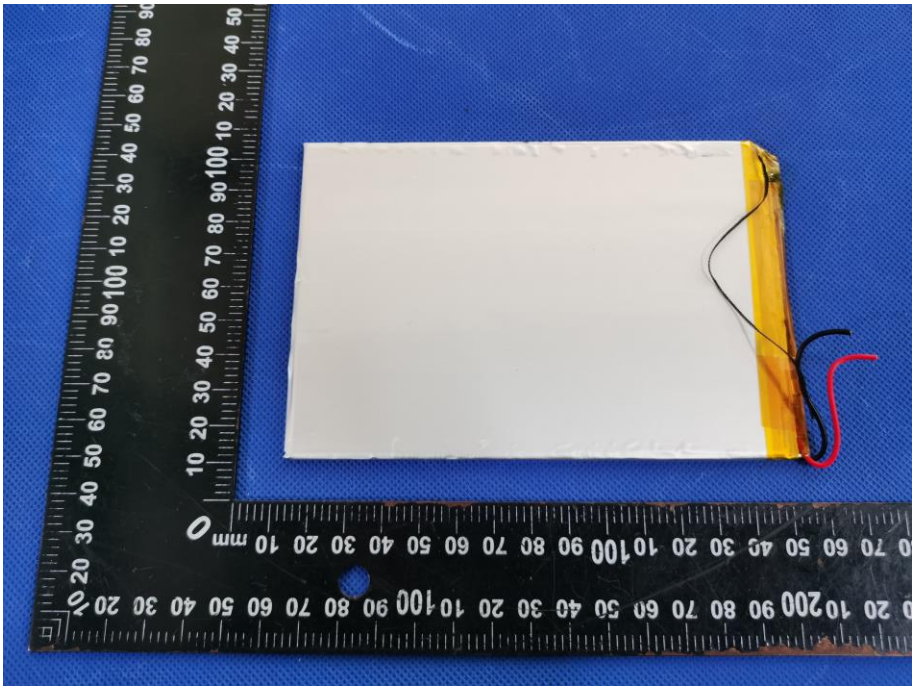


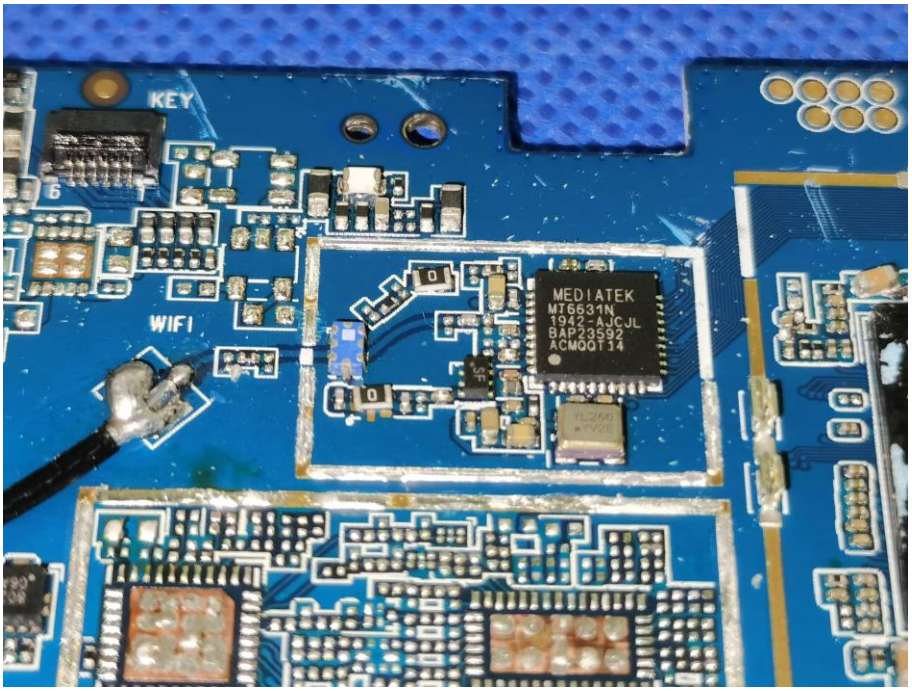







- ZZNY 3.7V 33105140
+ 22.2Wh 2305 5000mAh





※※※※※ **END OF REPORT** ※※※※※