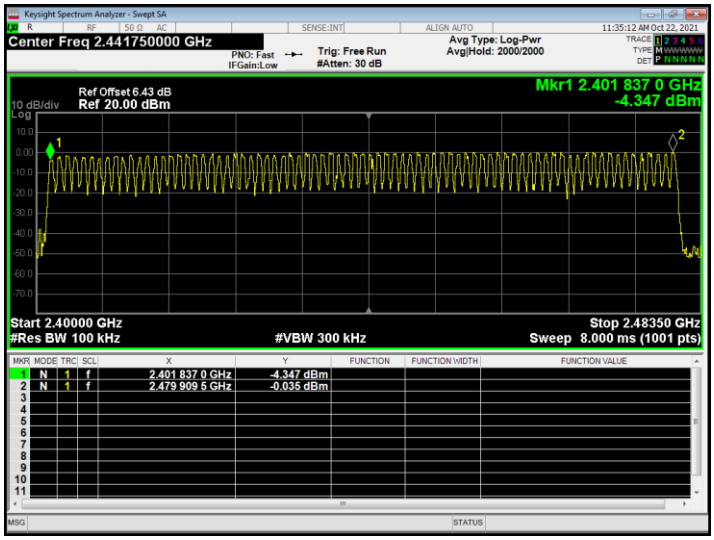
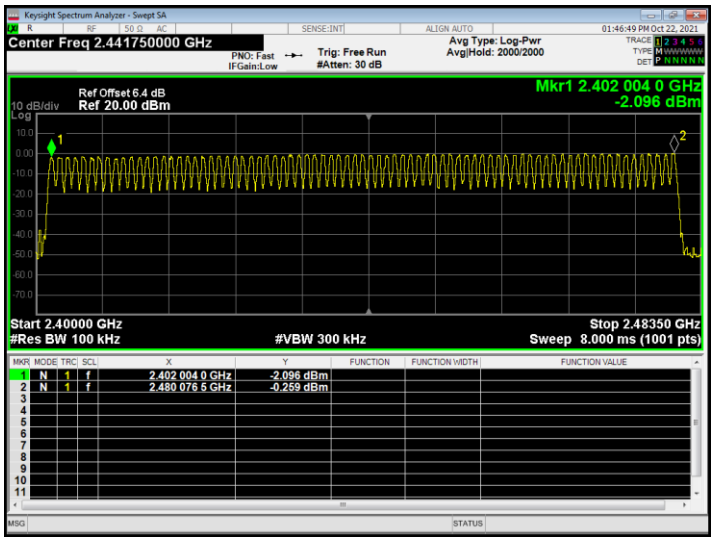
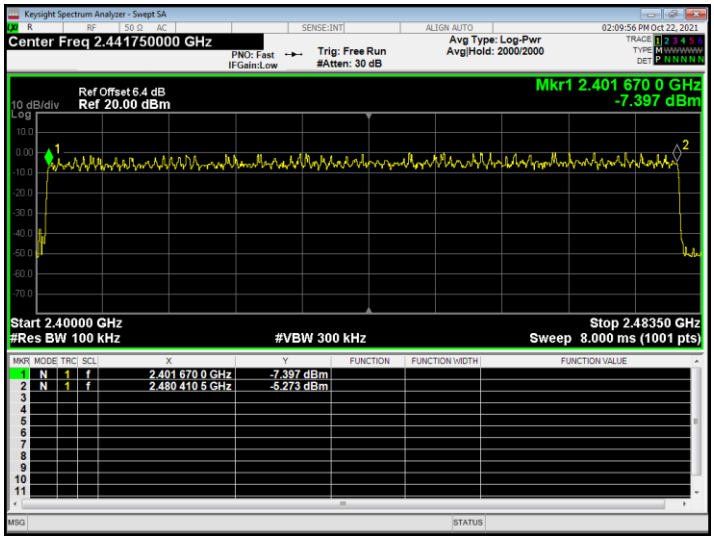
GFSK



π/4 DQPSK



8DPSK



6. BANDWIDTH TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C	
Section	Test Item
15.247(a)(2)	Bandwidth

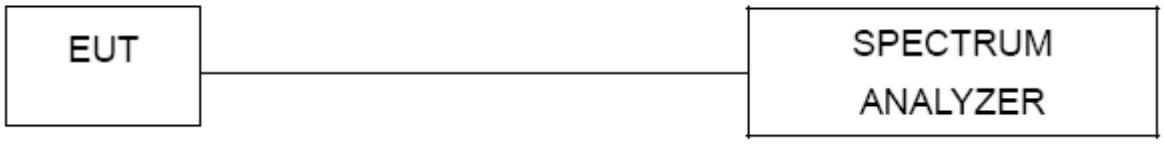
6.1.1 TEST PROCEDURE

1. Set RBW = 30 kHz.
2. Set the video bandwidth (VBW) ≥RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP

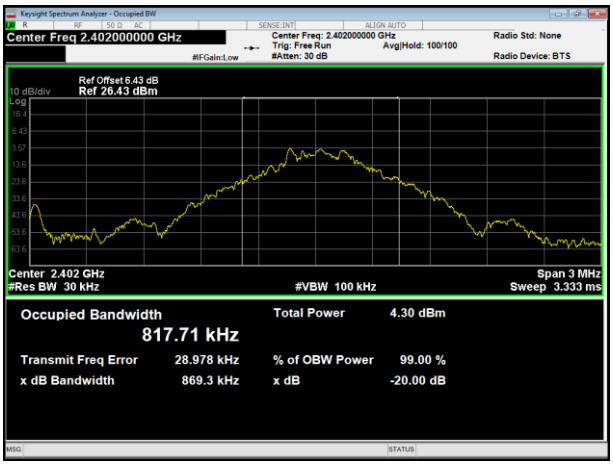
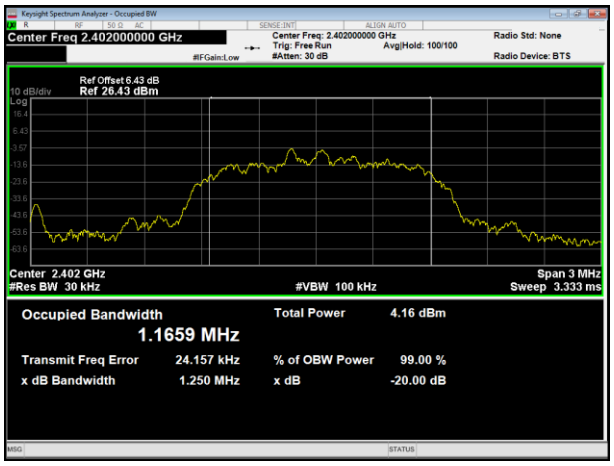
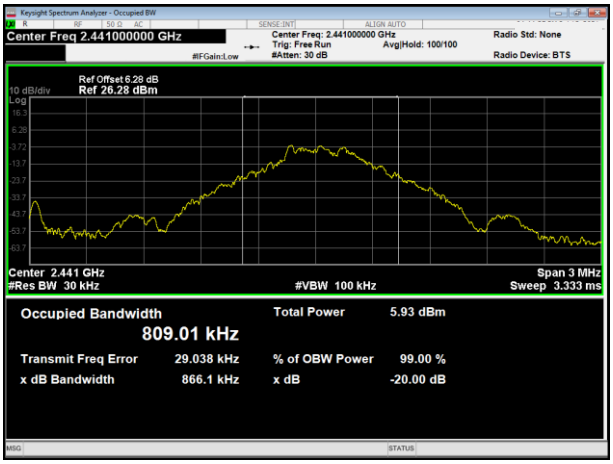
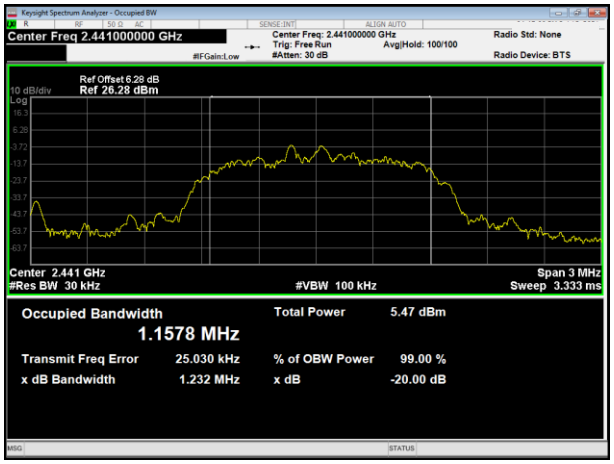
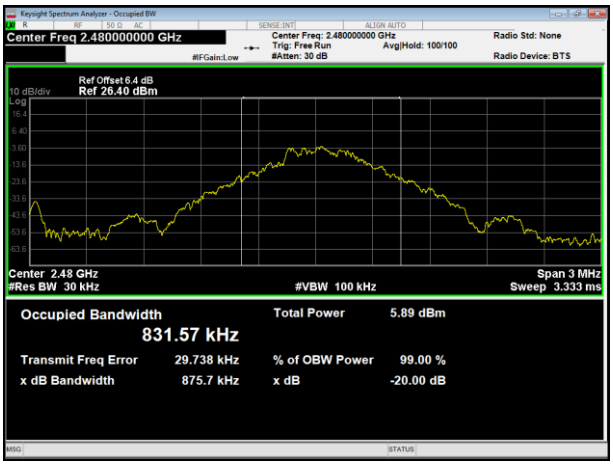
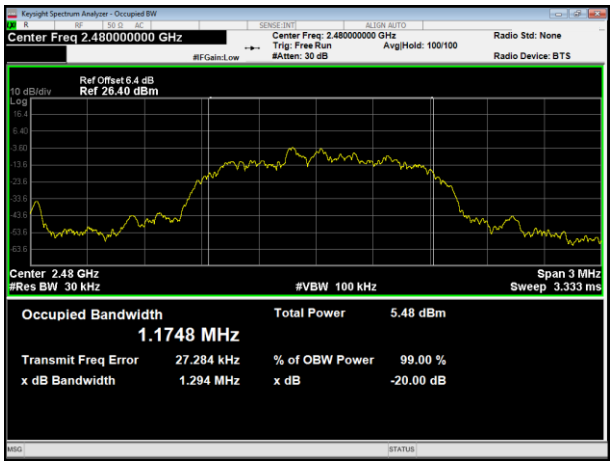


6.1.4 EUT OPERATION CONDITIONS

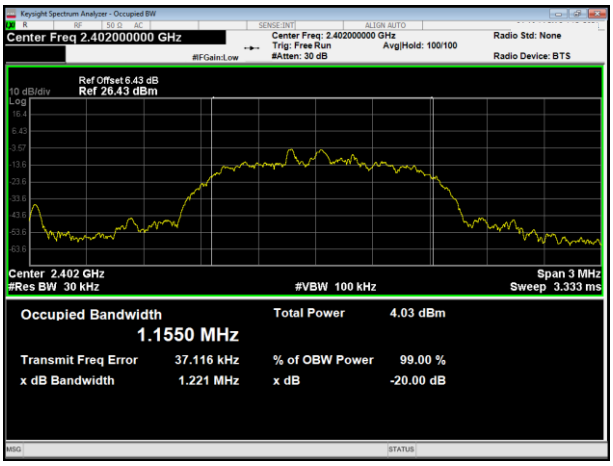
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

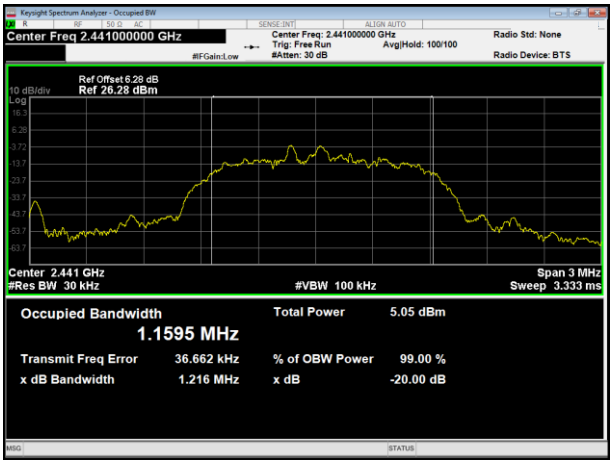
	Frequency (MHz)	20dB Bandwidth (MHz)	Result
GFSK	2402	0.869	Pass
	2441	0.866	Pass
	2480	0.876	Pass
π/4 DQPSK	2402	1.250	Pass
	2441	1.232	Pass
	2480	1.294	Pass
8DPSK	2402	1.221	Pass
	2441	1.216	Pass
	2480	1.244	Pass

GFSK	π/4 DQPSK
	
2402MHz	2402MHz
	
2441MHz	2441MHz
	
2480MHz	2480MHz

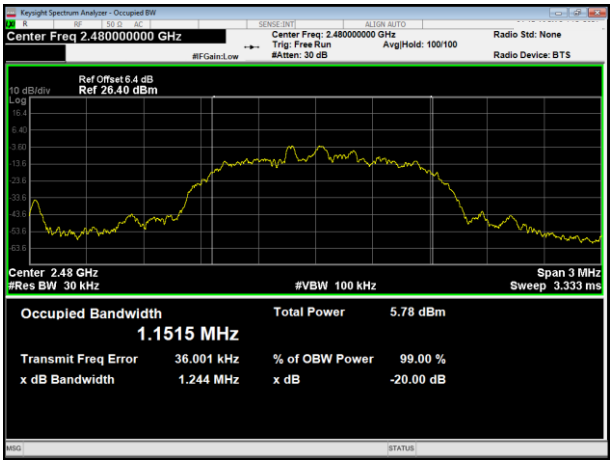
8DPSK



2402MHz



2441MHz



2480MHz

7. HOPPING CHANNEL SEPARATION MEASUREMENT

7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (Channel Separation)
VB	100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

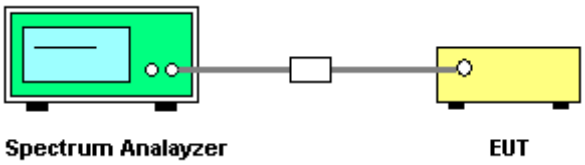
7.1.1 TEST PROCEDURE

a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

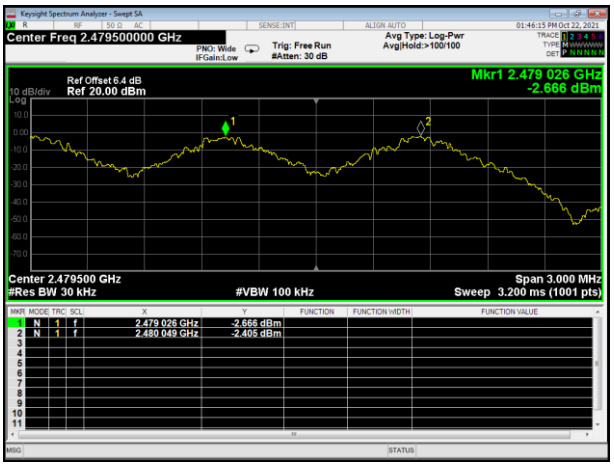
The EUT was programmed to be in continuously transmitting mode.

7.1.5 TEST RESULTS

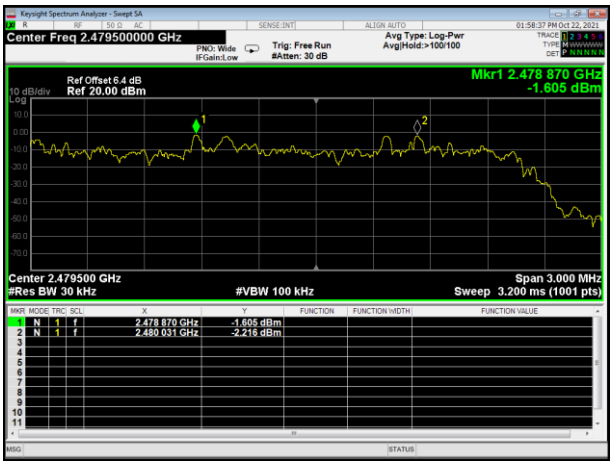
Temperature:	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V

Test Mode	Ch. Separation (MHz)	Limit (MHz)	Result
GFSK	1.023	0.584	Complies
π/4 DQPSK	1.161	0.863	Complies
8DPSK	1.005	0.829	Complies

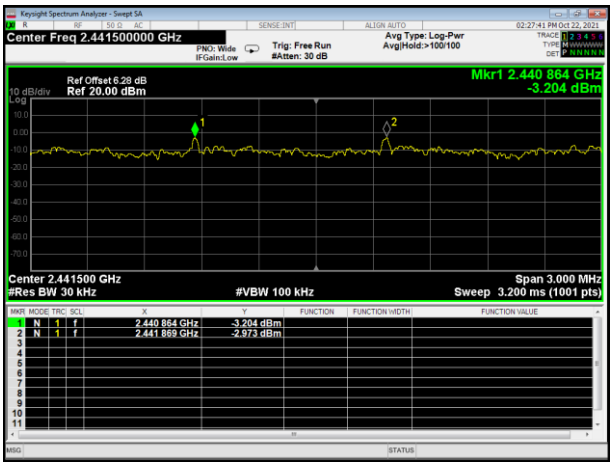
GFSK



π/4DPSK



8DPSK



8. DWELL TIME OF OCCUPANCY

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

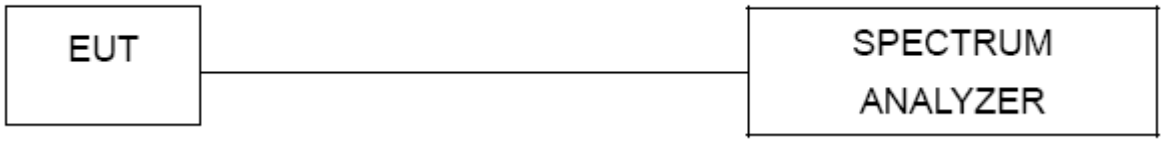
8.1.1 TEST PROCEDURE

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
h. Measure the maximum time duration of one single pulse.
i. A Period Time = (channel number)*0.4
DH1 Time Slot: Reading * (1600/2)*31.6/(channel number)
DH3 Time Slot: Reading * (1600/4)*31.6/(channel number)
DH5 Time Slot: Reading * (1600/6)*31.6/(channel number)

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 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

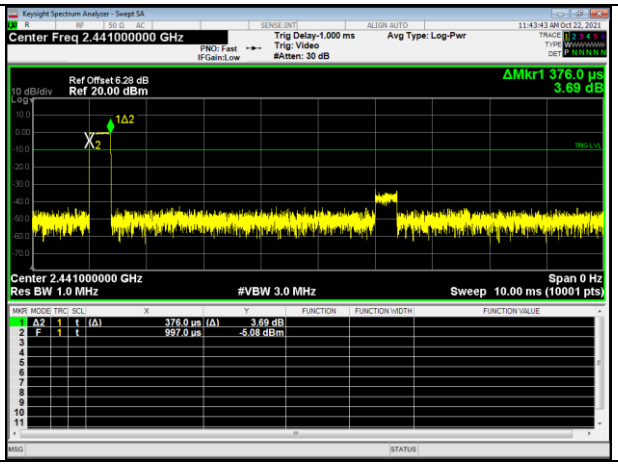
8.1.5 TEST RESULTS

Test Mode :	CH39-DH5, 2DH5, 3DH5

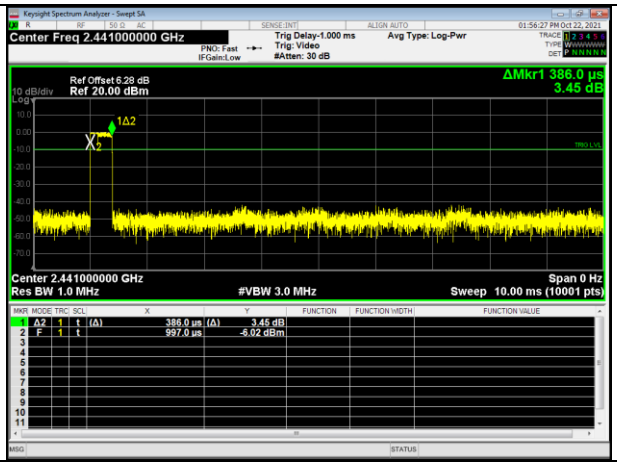
Frequency	Packet	Pulse time (ms)	Dwell time(ms)	Limit(ms)	Result
2441MHz	DH1	0.376	120.32	400	Pass
	DH3	1.632	261.12	400	Pass
	DH5	2.881	307.307	400	Pass
2441MHz	2-DH1	0.386	123.52	400	Pass
	2-DH3	1.639	262.24	400	Pass
	2-DH5	2.886	307.84	400	Pass
2441MHz	3-DH1	0.387	123.84	400	Pass
	3-DH3	1.637	261.92	400	Pass
	3-DH5	2.888	308.053	400	Pass

Dwell time=Pulse time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second for DH1, 2-DH1, 3-DH1
Dwell time=Pulse time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second for DH3, 2-DH3, 3-DH3
Dwell time=Pulse time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second for DH5, 2-DH5, 3-DH5

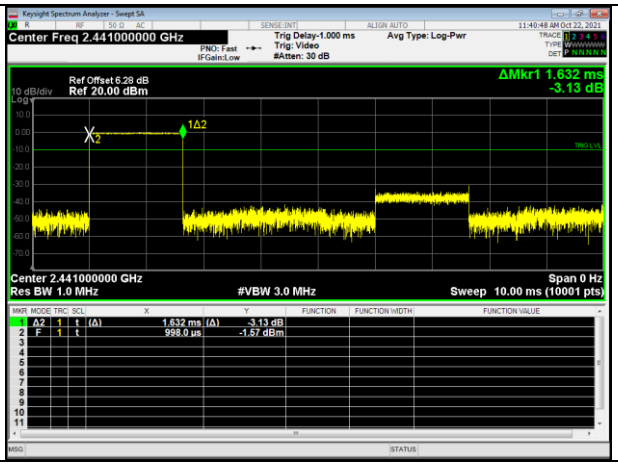
Test channel: 2441MHz



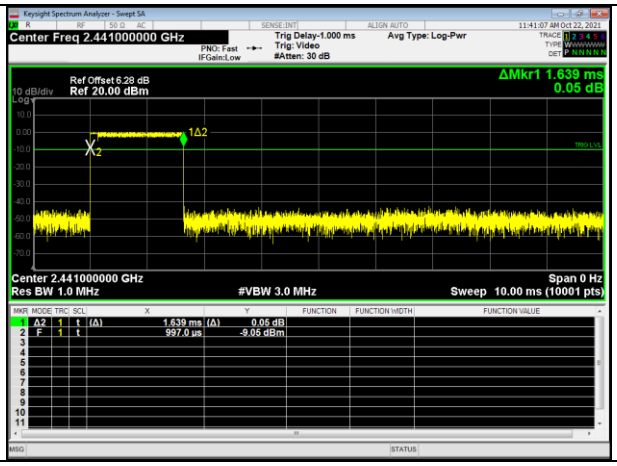
DH1



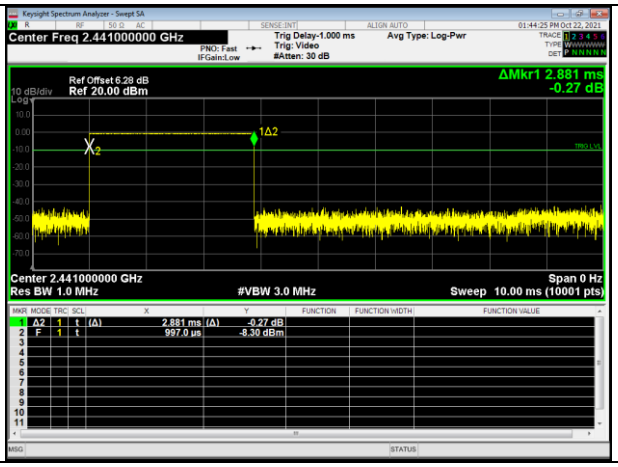
2-DH1



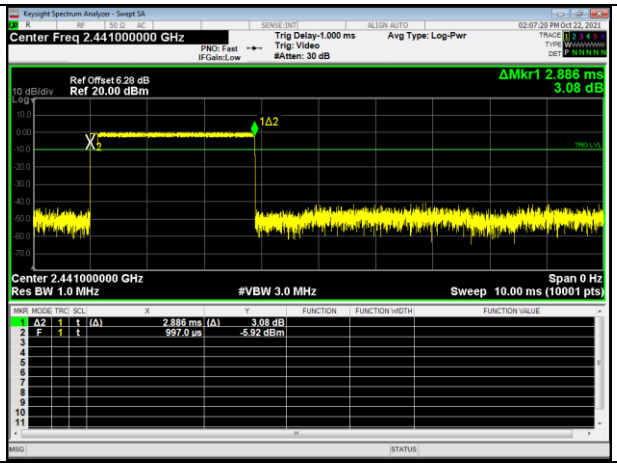
DH3



2-DH3

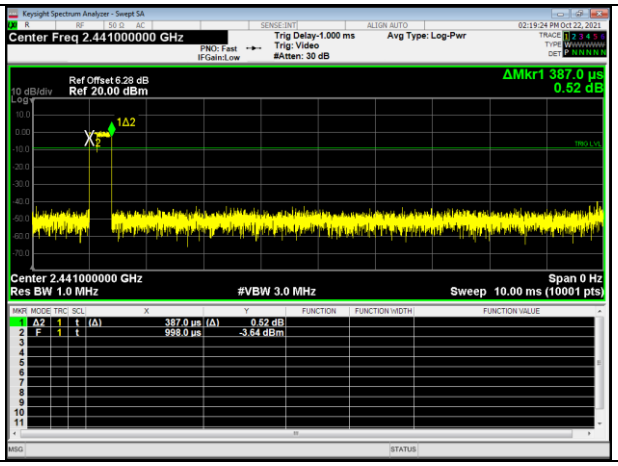


DH5

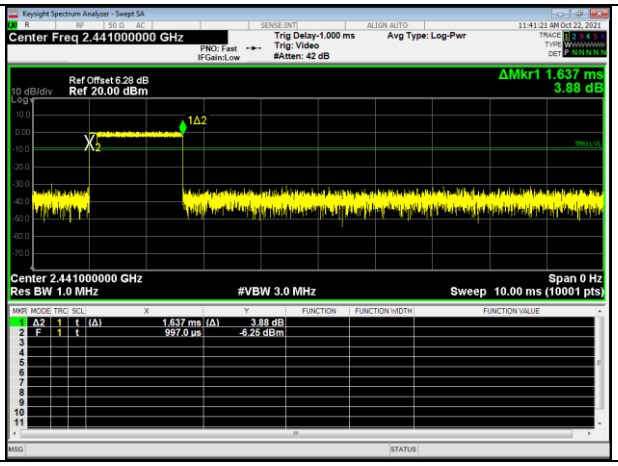


2-DH5

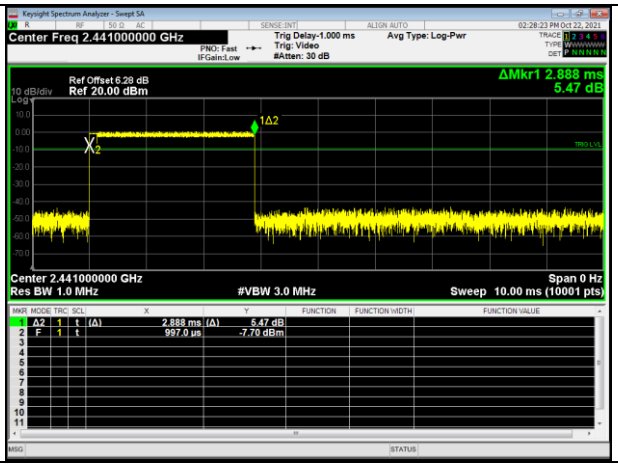
Test channel: 2441MHz



3-DH1



3-DH3



3-DH5

9. ANTENNA REQUIREMENT

9.1 STANDARD REQUIREMENT

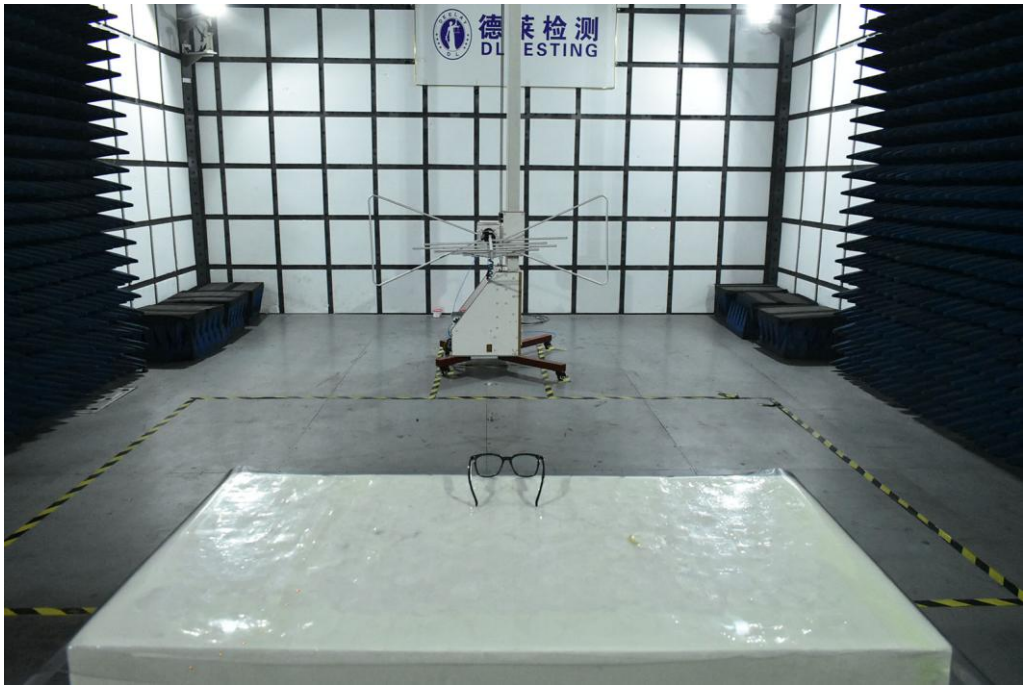
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

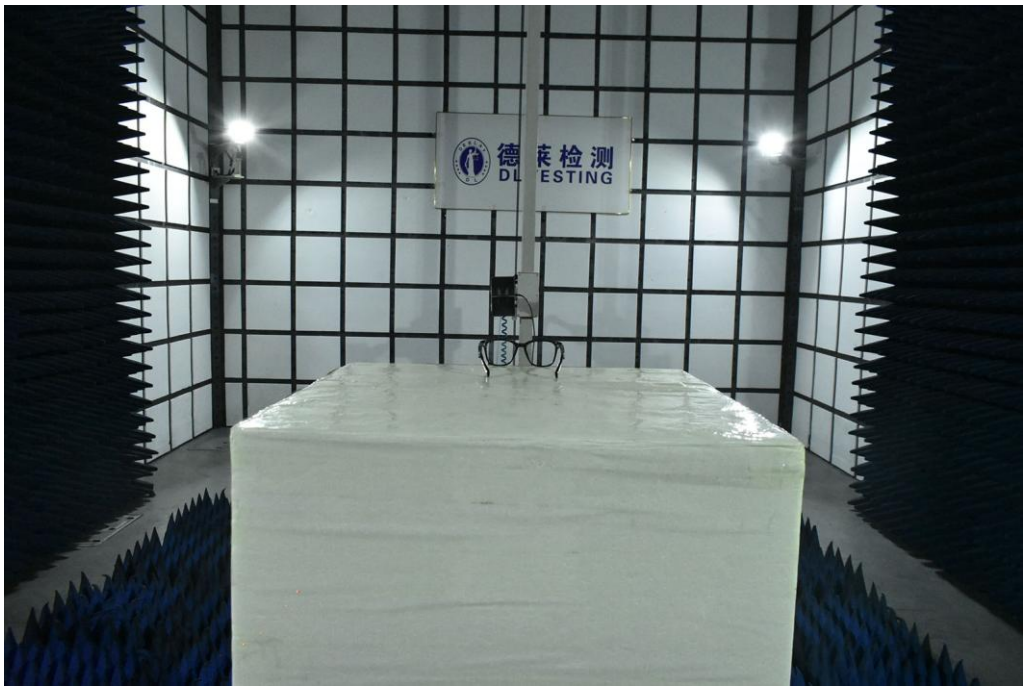
9.2 EUT ANTENNA

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

10. TEST SETUP PHOTO

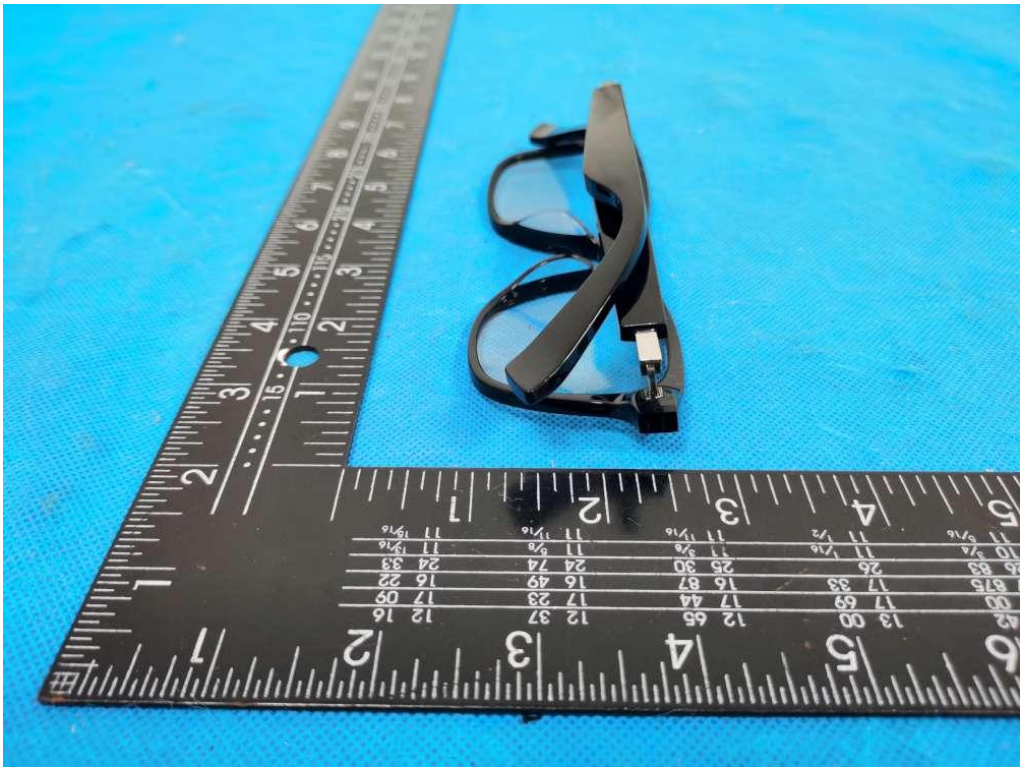
Radiated Measurement Photos

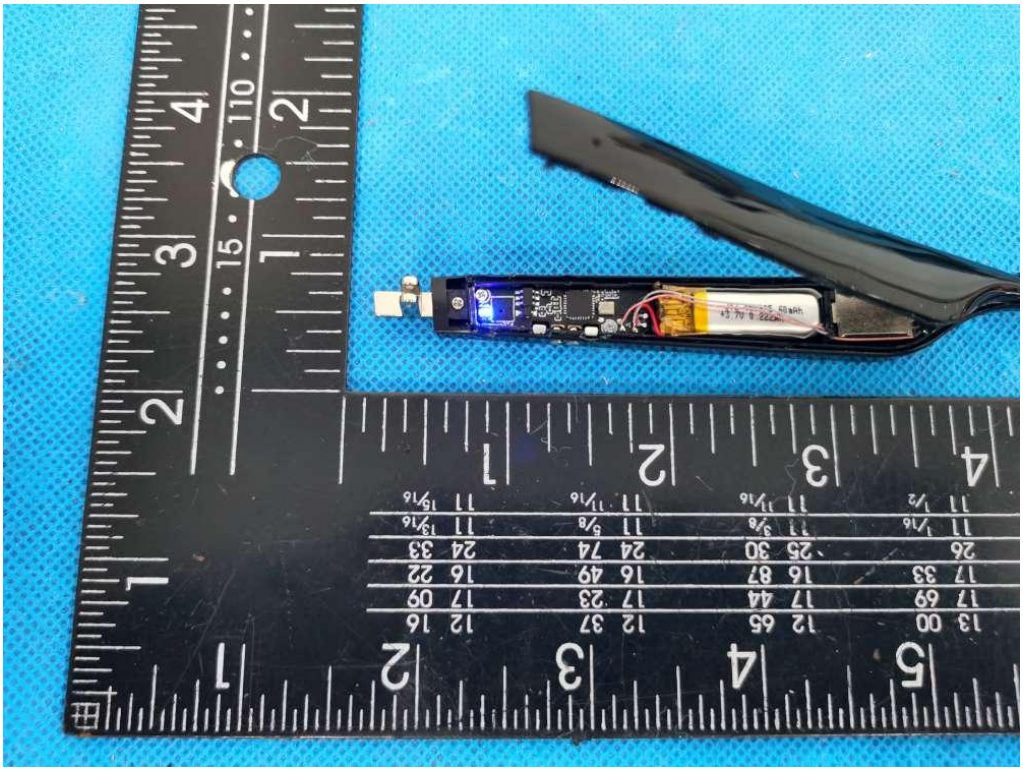


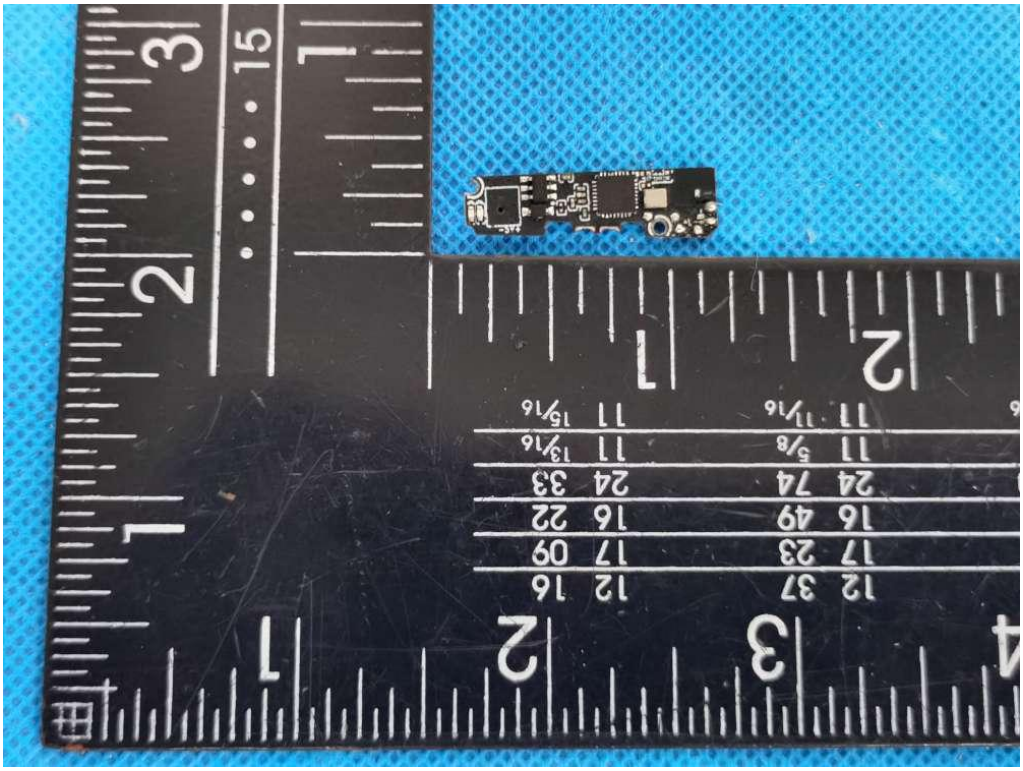


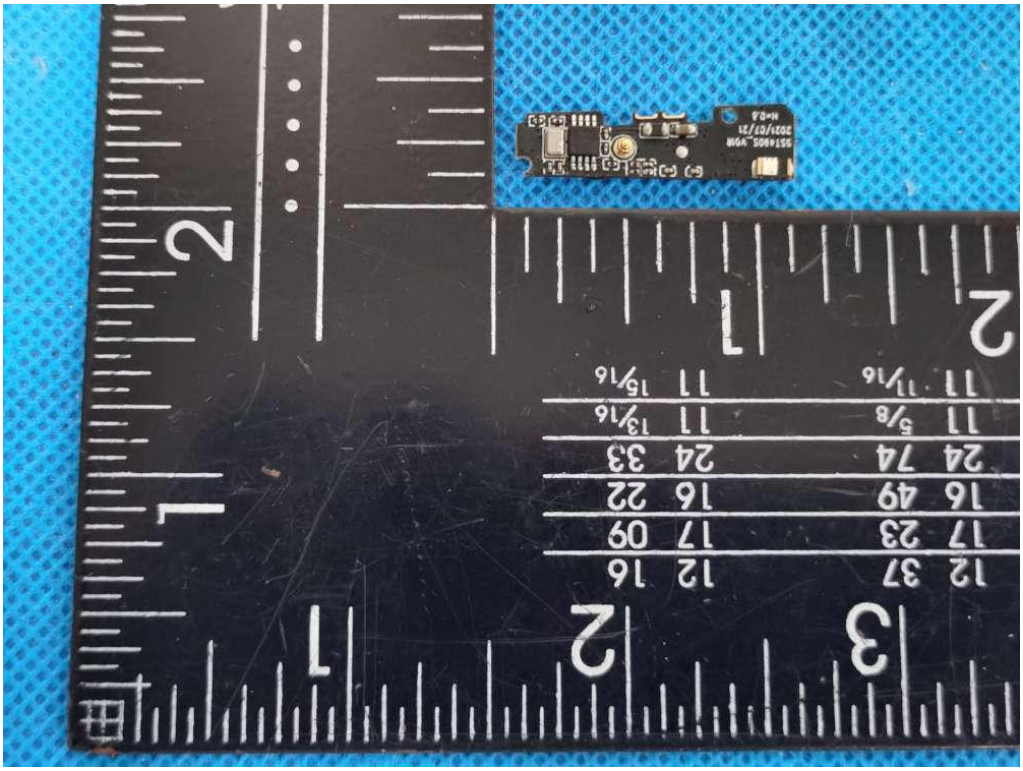
Conducted Measurement Photos

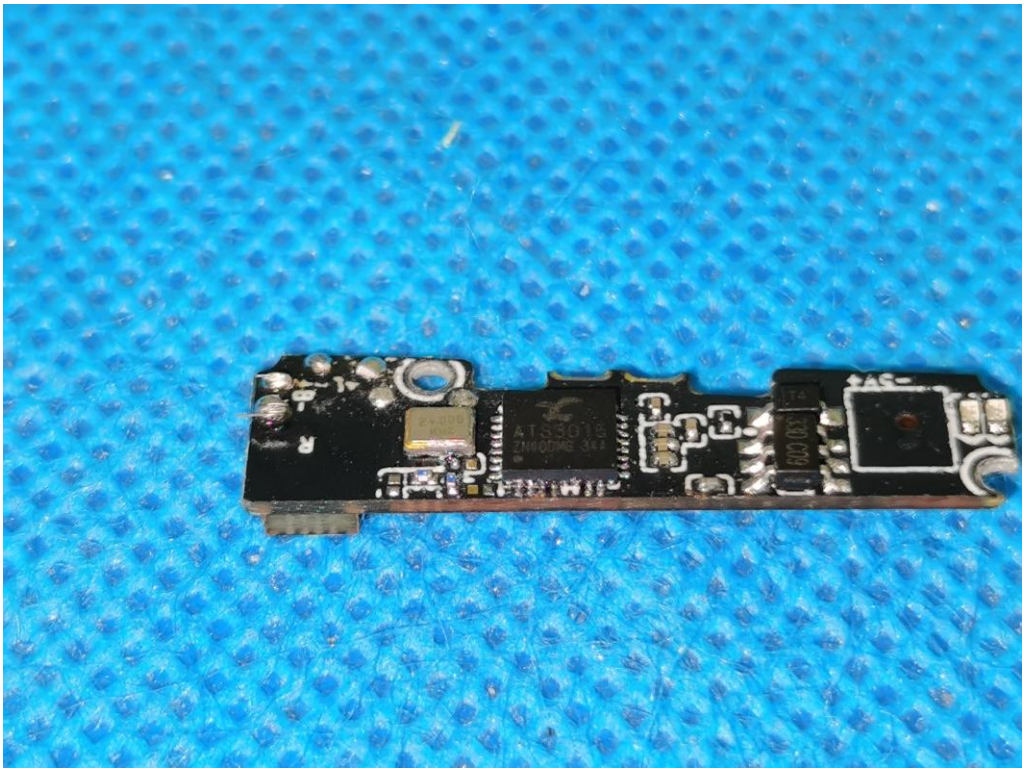
11. EUT PHOTO

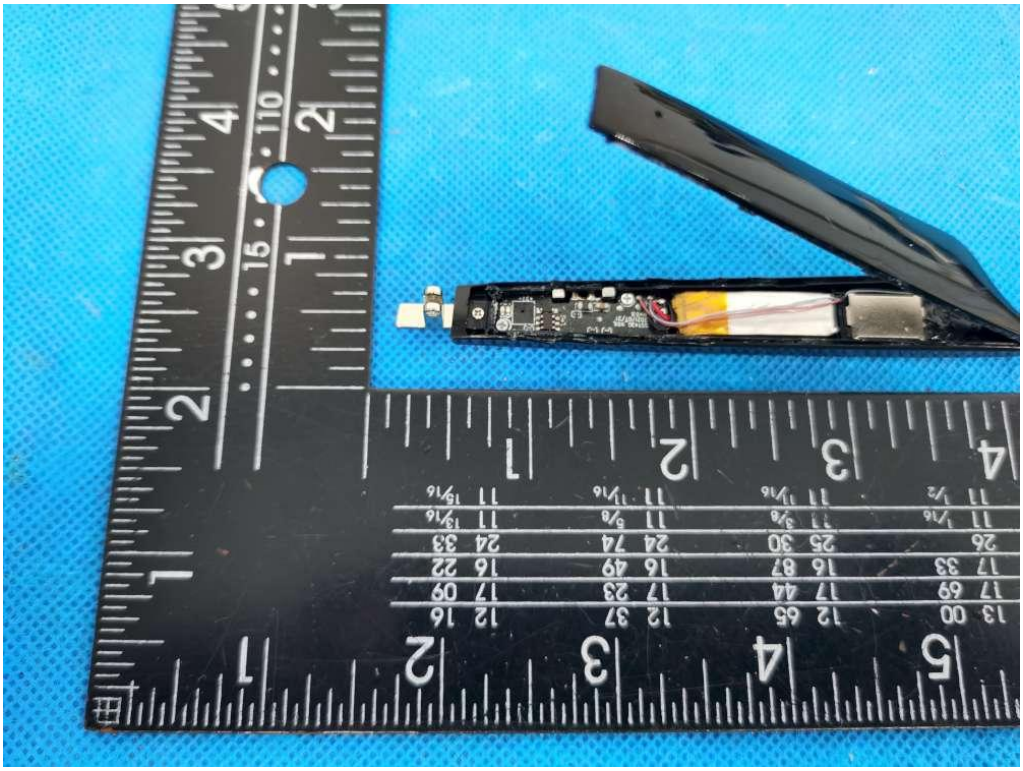


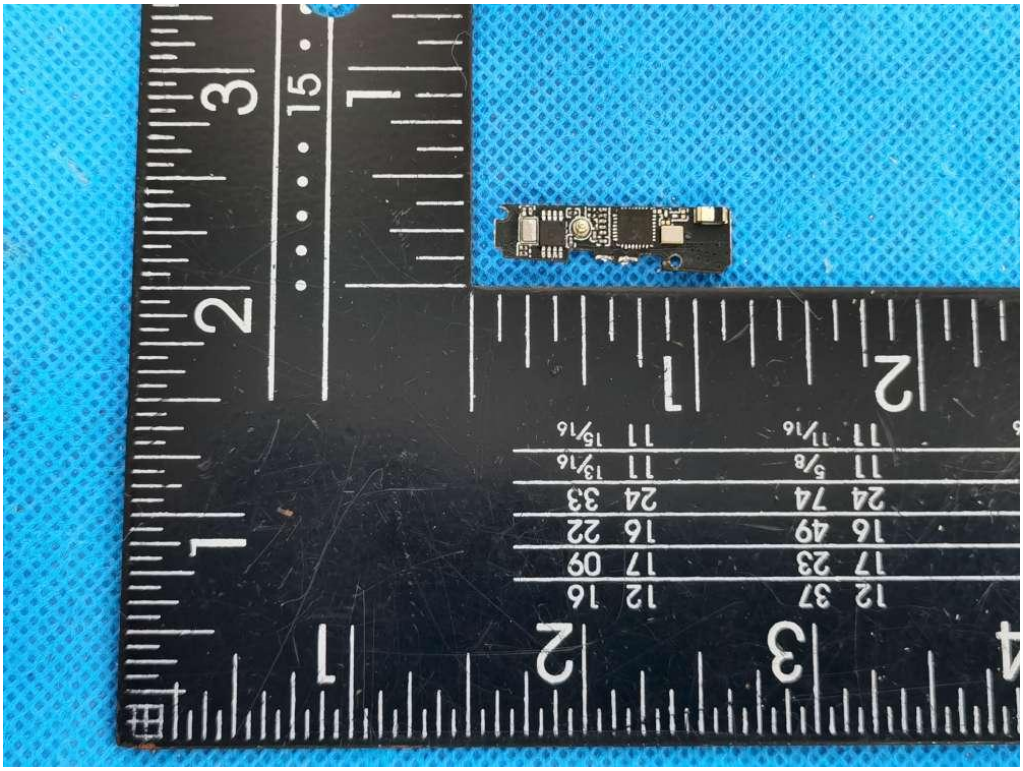


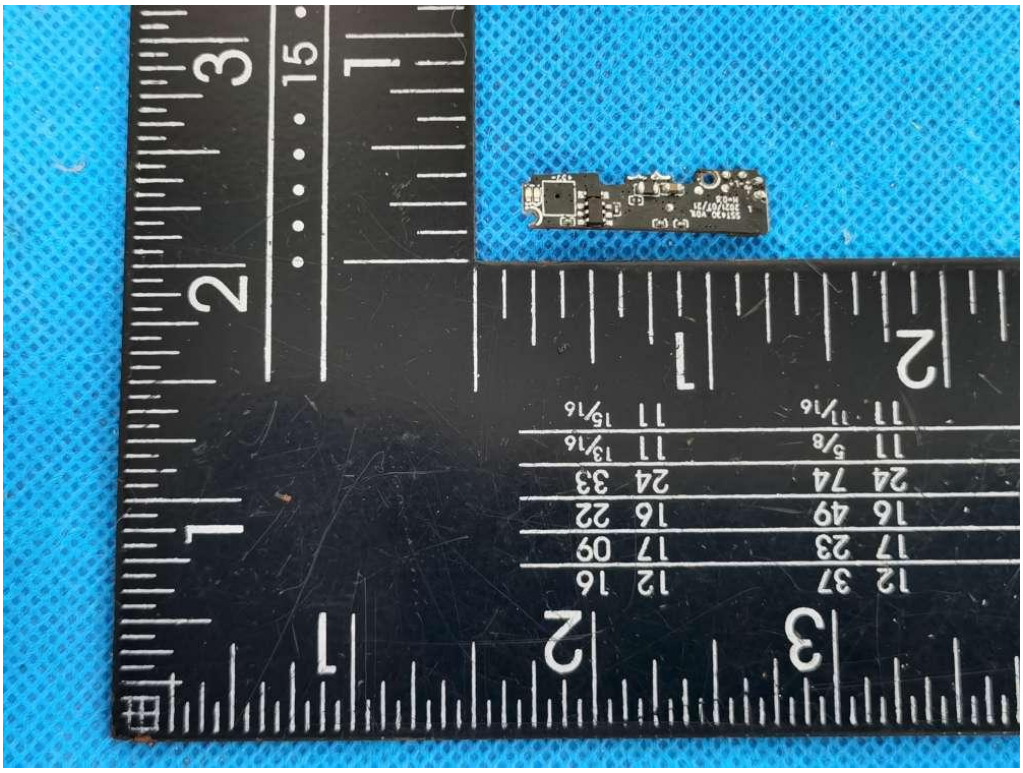


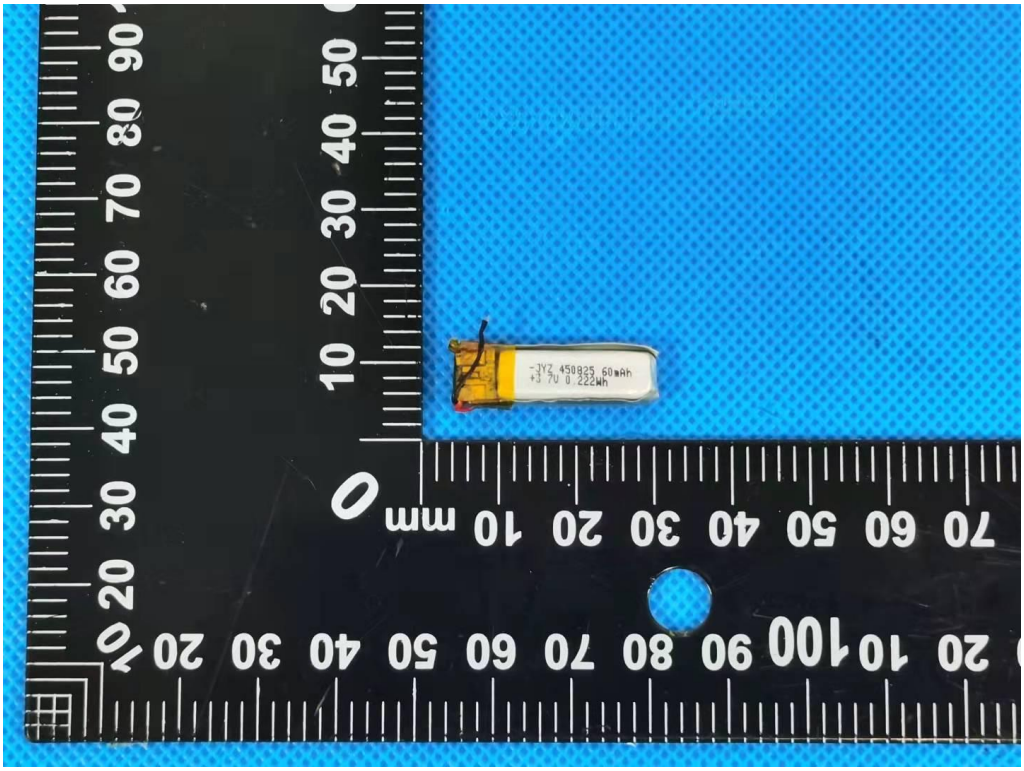


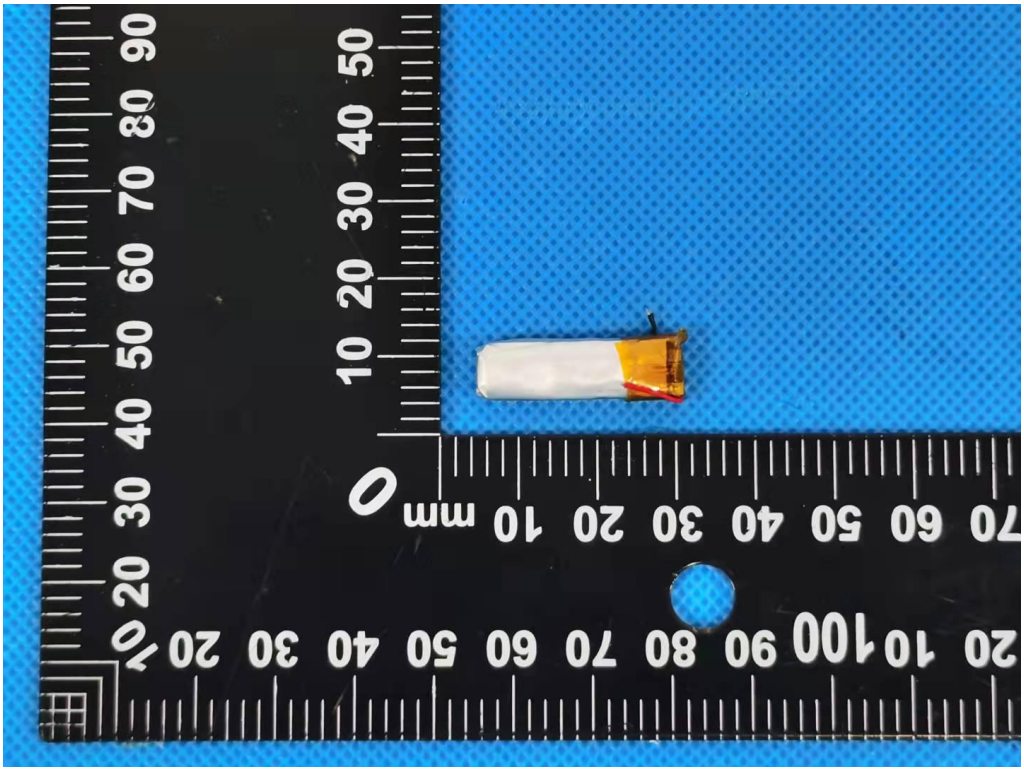












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