

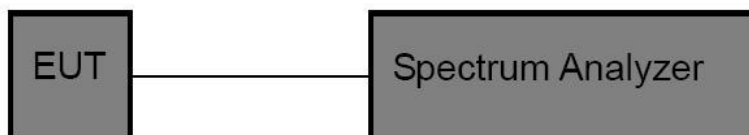
8 Band Edge Measurement

Test Requirement	:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method	:	ANSI C63.10-2020
Test Limit	:	Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

8.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold

8.2 Test Setup

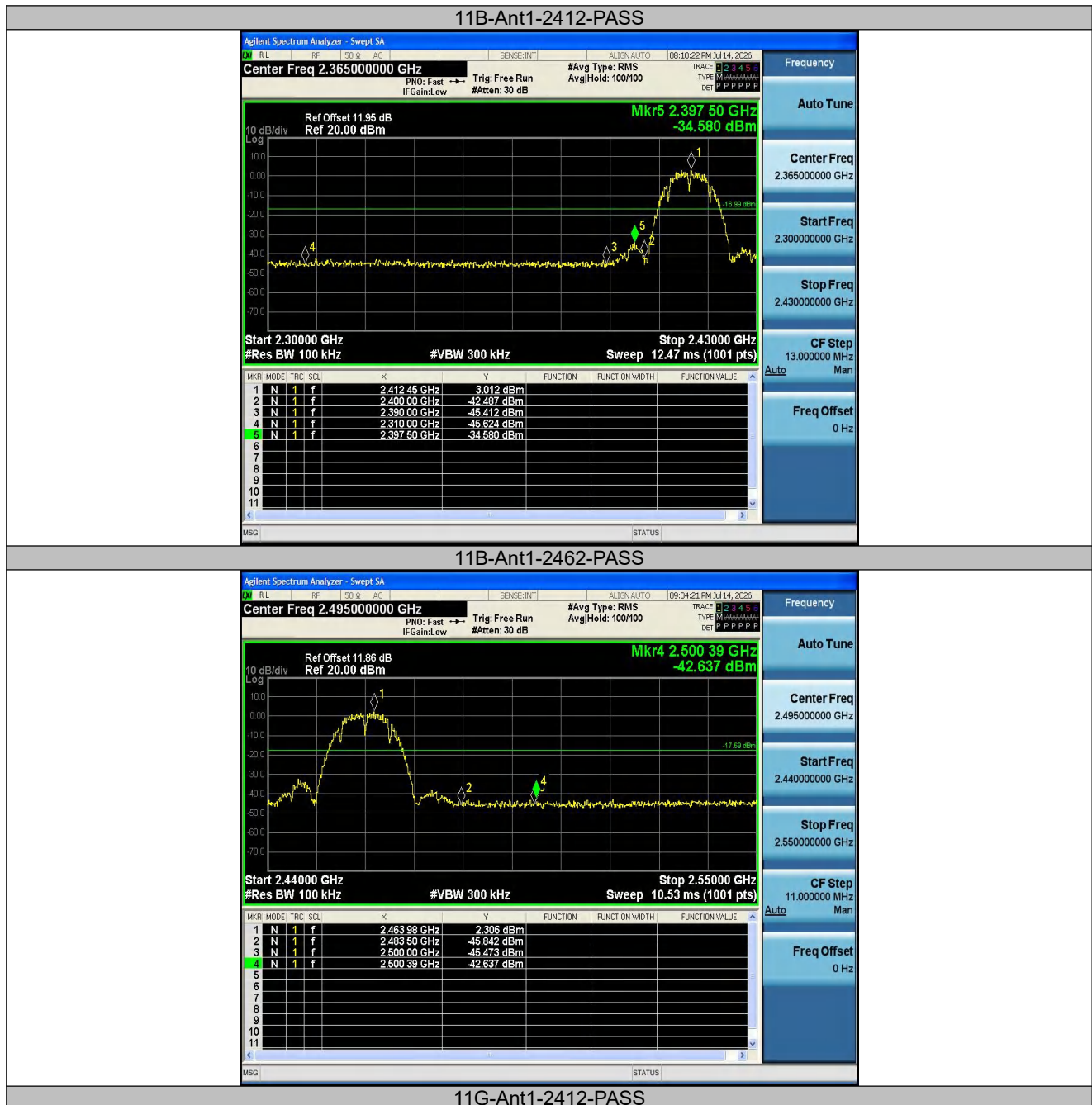


8.3 Test Result

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	3.01	-34.58	≤-16.99	PASS
11B	Ant1	High	2462	2.31	-42.64	≤-17.69	PASS
11G	Ant1	Low	2412	-4.21	-42.44	≤-24.21	PASS
11G	Ant1	High	2462	-4.95	-42.5	≤-24.95	PASS
11N20SISO	Ant1	Low	2412	-4.15	-39.77	≤-24.15	PASS
11N20SISO	Ant1	High	2462	-5.46	-42.52	≤-25.46	PASS

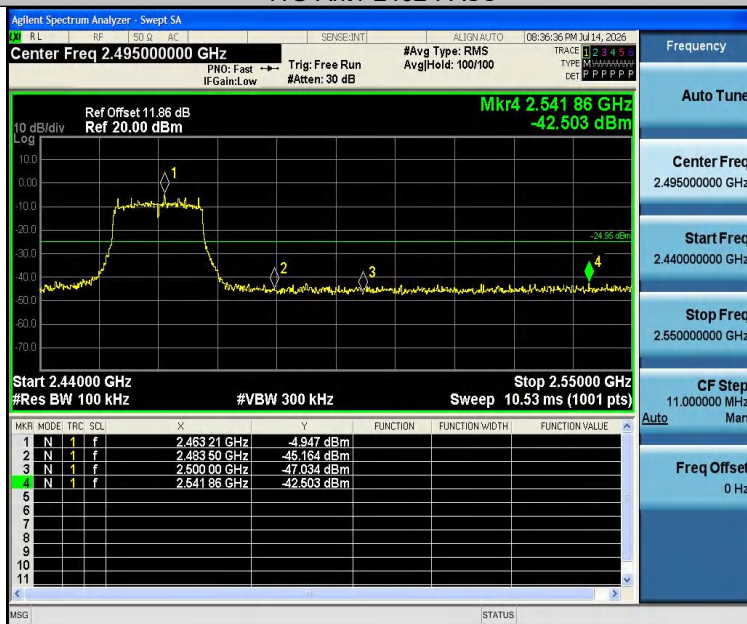


Test Graphs:

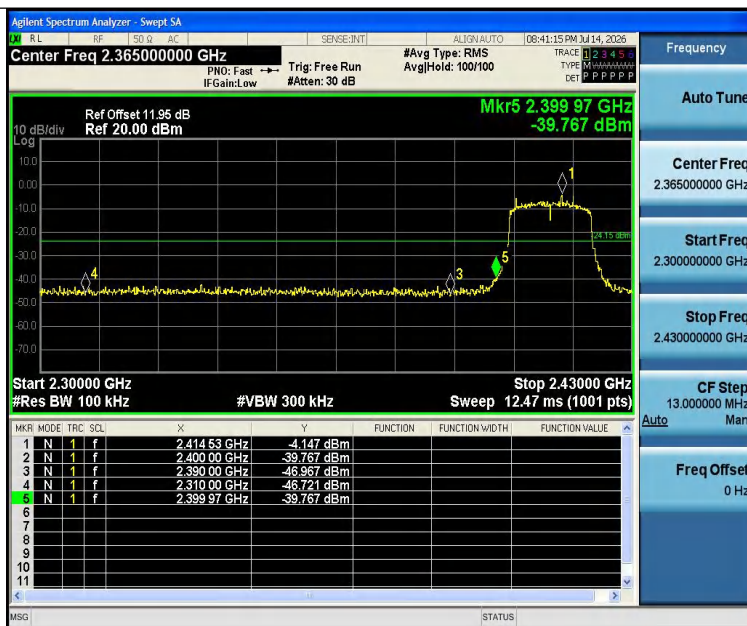




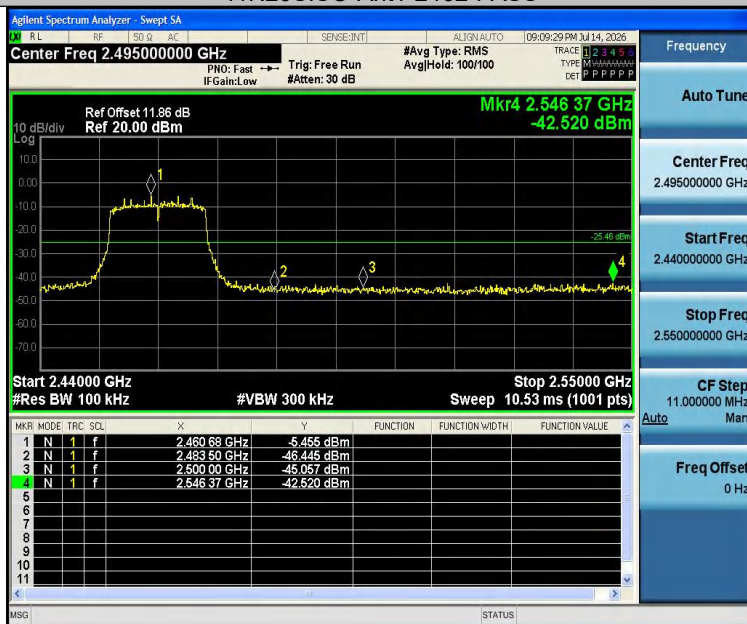
11G-Ant1-2462-PASS



11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2462-PASS





9 6dB Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10-2020

Test Limit : Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

9.1 Test Procedure

6dB Bandwidth:

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, the automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz,

VBW $\geq 3 \times$ RBW, and peak detector with maximum hold) is implemented by the instrumentation function.

When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

11.8.1 Option 1

The steps for the first option are as follows:

Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz. Set the VBW $\geq [3 \times$ RBW]. Detector = peak. Trace mode = max-hold. Sweep = No faster than coupled (auto) time. Allow the trace to stabilize. Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-6 dB down amplitude”. If a marker is below this “-6 dB down amplitude” value, then it shall be as close as possible to this value

Occupied bandwidth:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1% to 5% of the OBW, VBW = approximately three times the RBW.

9.2 Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.080	2406.960	2417.040	0.5	PASS
11B	Ant1	2437	10.080	2431.960	2442.040	0.5	PASS
11B	Ant1	2462	10.080	2456.960	2467.040	0.5	PASS
11G	Ant1	2412	14.400	2404.240	2418.640	0.5	PASS
11G	Ant1	2437	16.320	2428.840	2445.160	0.5	PASS
11G	Ant1	2462	15.640	2454.480	2470.120	0.5	PASS
11N20SISO	Ant1	2412	15.720	2404.200	2419.920	0.5	PASS
11N20SISO	Ant1	2437	16.320	2429.120	2445.440	0.5	PASS
11N20SISO	Ant1	2462	15.800	2454.720	2470.520	0.5	PASS

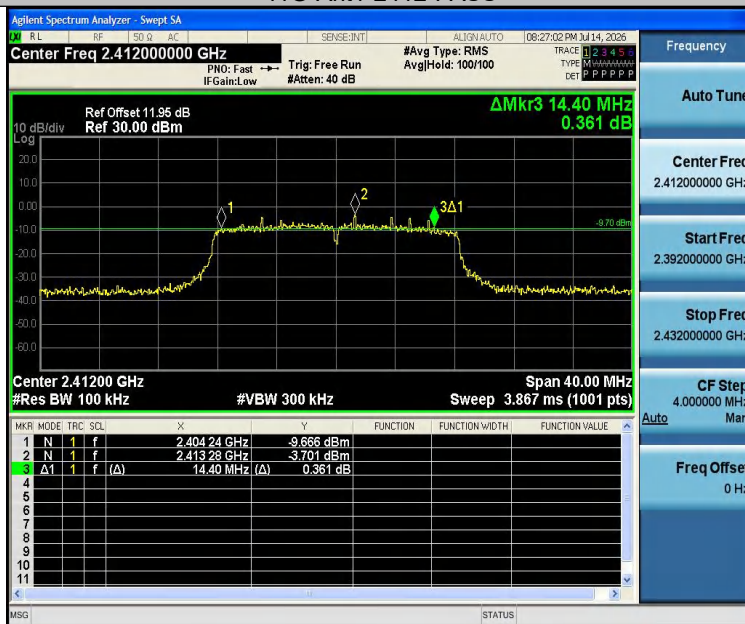


Test Graphs:





11G-Ant1-2412-PASS



11G-Ant1-2437-PASS



11G-Ant1-2462-PASS



11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2437-PASS



11N20SISO-Ant1-2462-PASS





10 Maximum conducted output power

Test Requirement : FCC CFR47 Part 15 Section 15.247

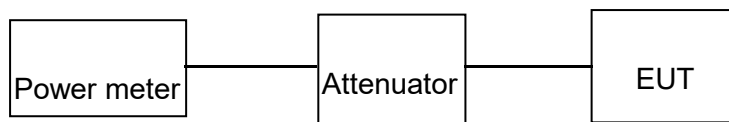
Test Method : ANSI C63.10-2020

Test Limit : Regulation 15.247 (b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.

10.1 Test Procedure

1. According to ANSI C63.10-2020 clause 11.9.1.2 PKPM1 Peak power meter method. The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

10.2 Test Setup



10.3 Test Result

TestMode	Antenna	Frequency[MHz]	Set Power	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	---	14.99	≤30.00	PASS
11B	Ant1	2437	---	14.42	≤30.00	PASS
11B	Ant1	2462	---	14.40	≤30.00	PASS
11G	Ant1	2412	---	13.52	≤30.00	PASS
11G	Ant1	2437	---	13.38	≤30.00	PASS
11G	Ant1	2462	---	12.75	≤30.00	PASS
11N20SISO	Ant1	2412	---	13.59	≤30.00	PASS
11N20SISO	Ant1	2437	---	13.01	≤30.00	PASS
11N20SISO	Ant1	2462	---	12.57	≤30.00	PASS



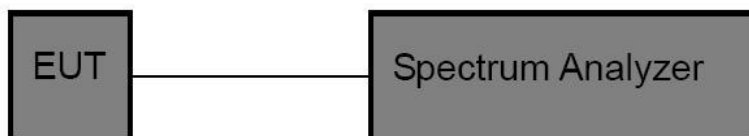
11 Power Spectral density

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10-2020
Test Limit	: Regulation 15.247(e) The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

11.1 Test Procedure

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below:
Center frequency=DTS channel center frequency
Span = 1.5 times the DTS bandwidth
RBW = 3KHz, VBW = 10KHz
Sweep time = auto couple
Detector = peak
Trace mode =max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Use the peak marker function to determine the maximum amplitude level within the RBW.
5. If measured value exceeds limit, reduce RBW(no less than 3KHz) and repeat.

11.2 Test Setup

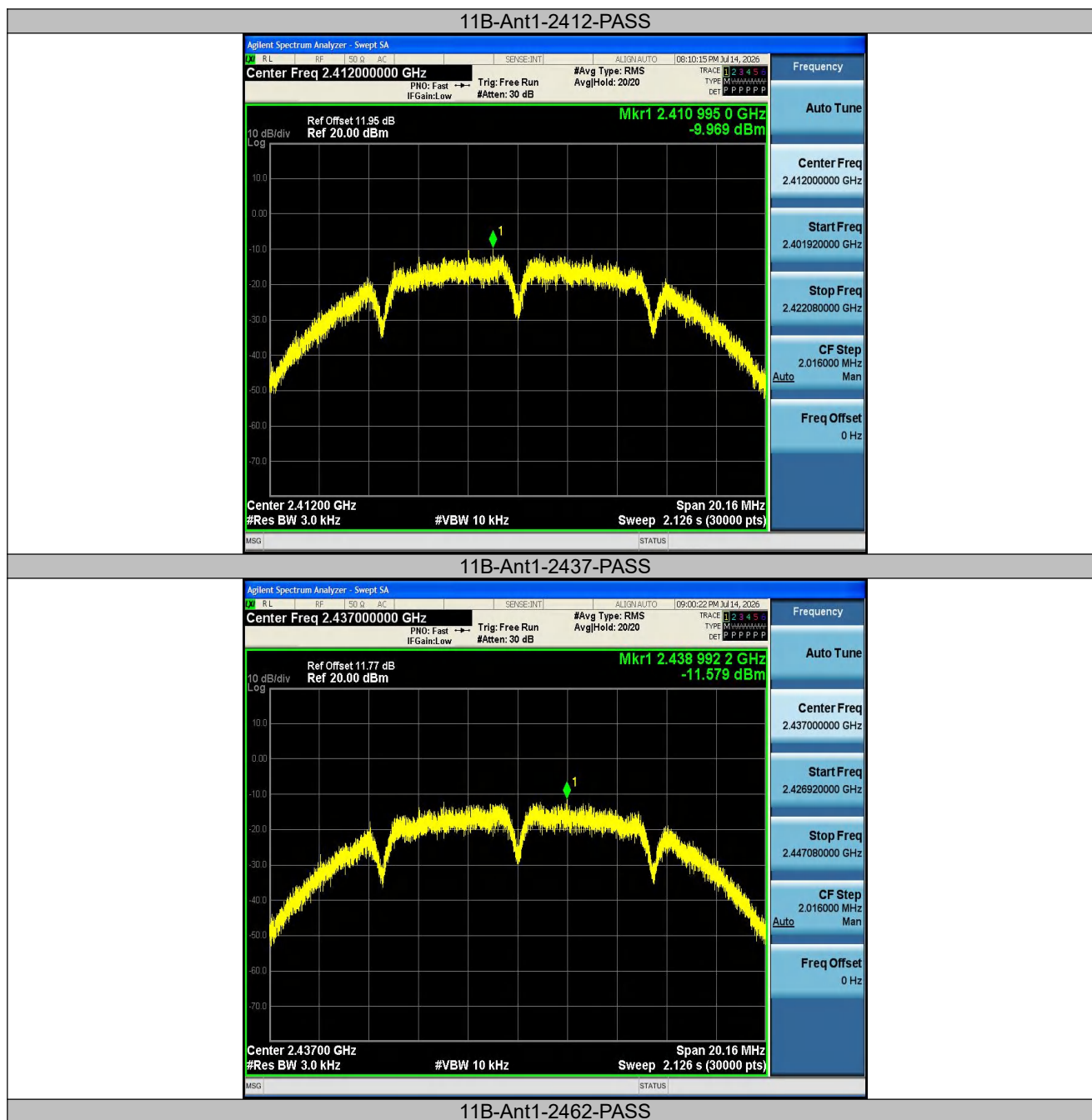


11.3 Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-9.97	≤8.00	PASS
11B	Ant1	2437	-11.58	≤8.00	PASS
11B	Ant1	2462	-10.77	≤8.00	PASS
11G	Ant1	2412	-18.53	≤8.00	PASS
11G	Ant1	2437	-18.76	≤8.00	PASS
11G	Ant1	2462	-19.31	≤8.00	PASS
11N20SISO	Ant1	2412	-18.23	≤8.00	PASS
11N20SISO	Ant1	2437	-18.6	≤8.00	PASS
11N20SISO	Ant1	2462	-19.12	≤8.00	PASS

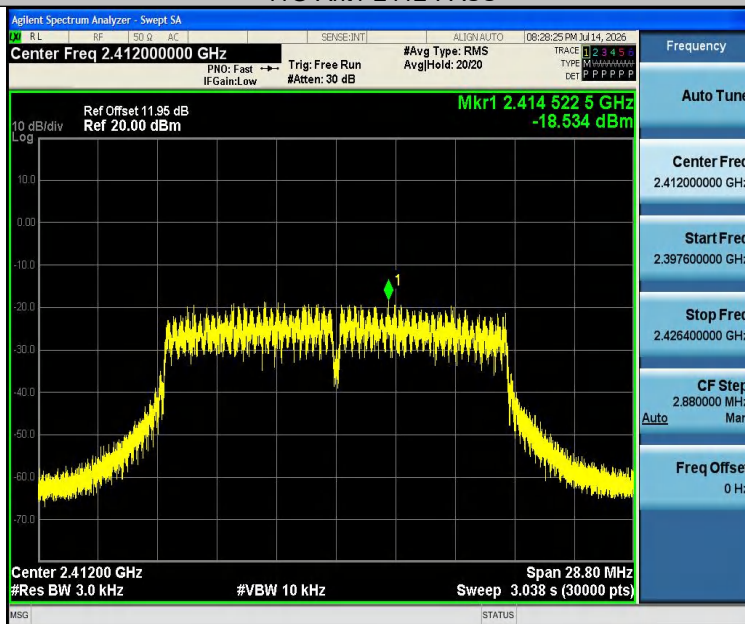


Test Graphs:

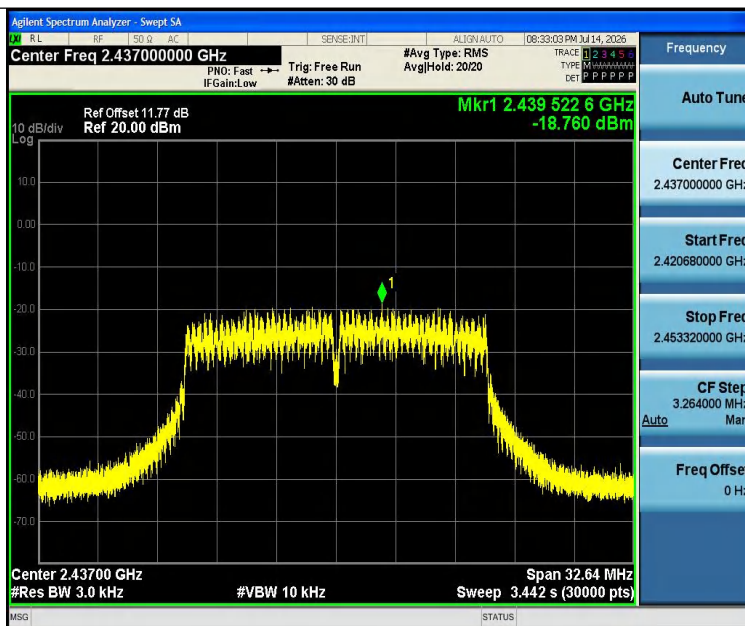




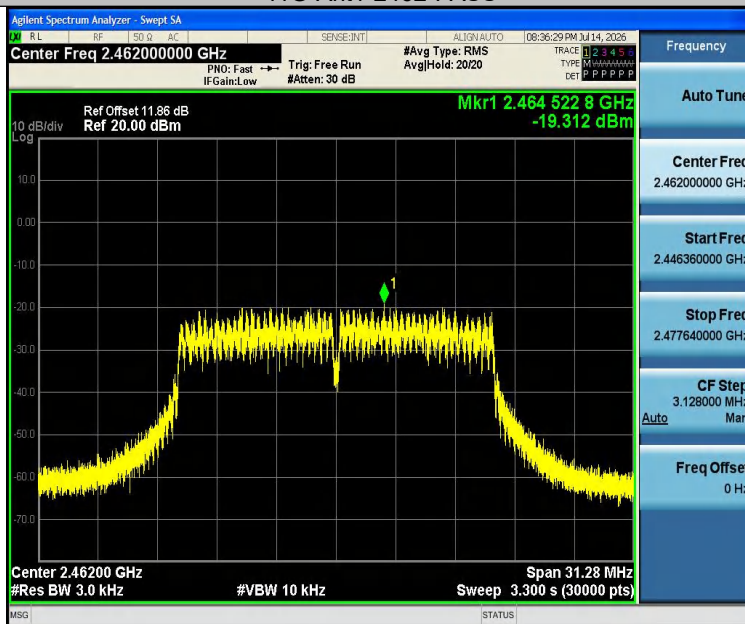
11G-Ant1-2412-PASS



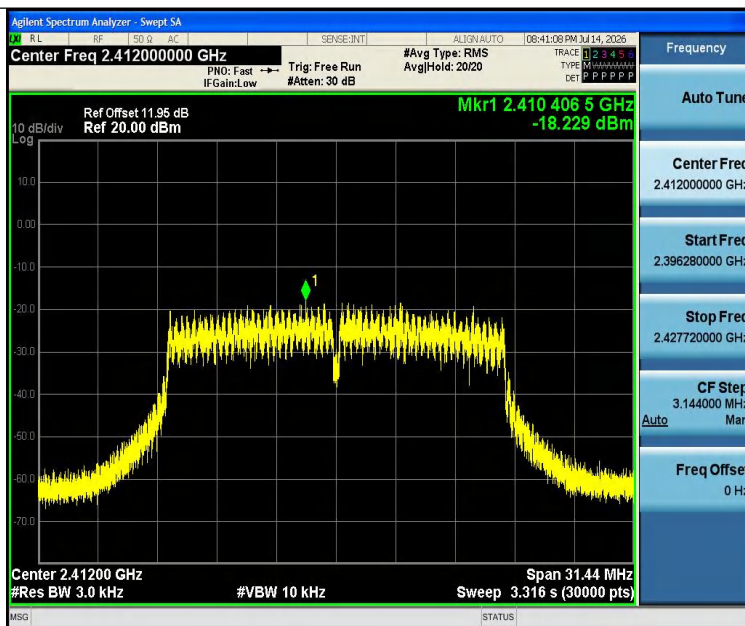
11G-Ant1-2437-PASS



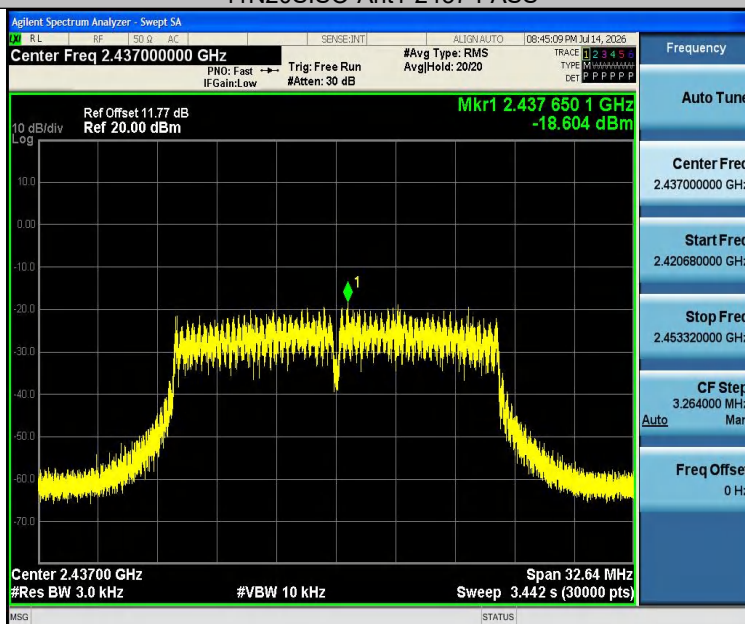
11G-Ant1-2462-PASS



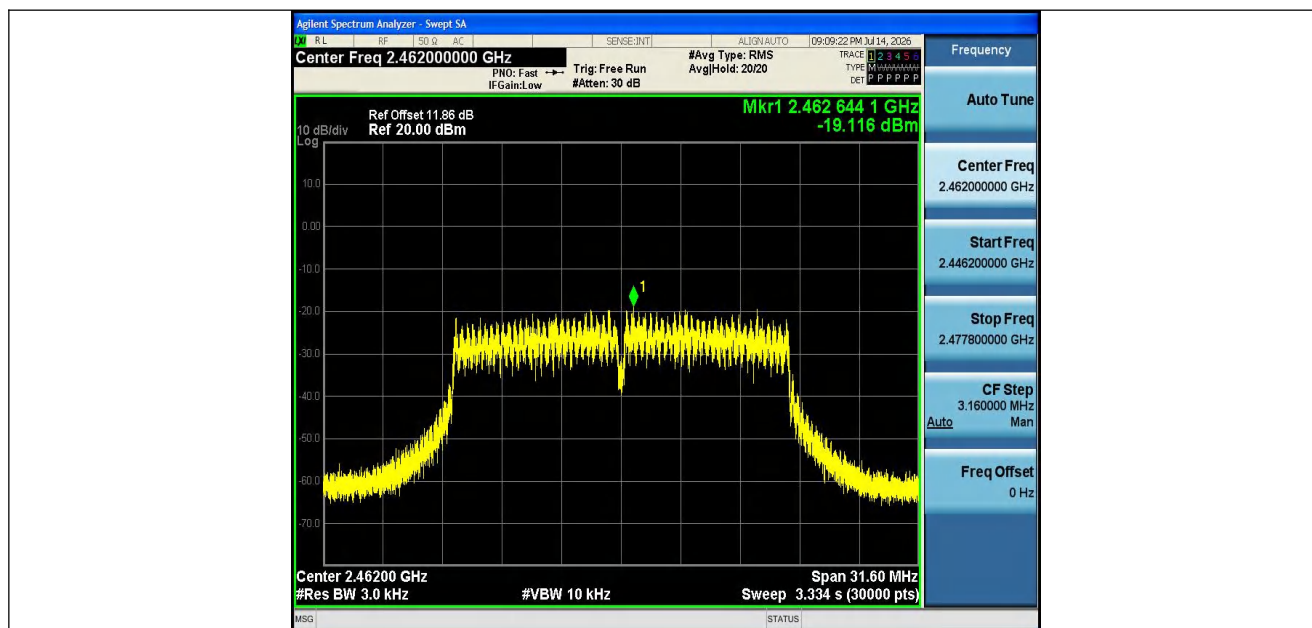
11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2437-PASS



11N20SISO-Ant1-2462-PASS





12 Antenna Application

12.1 Antenna Requirement

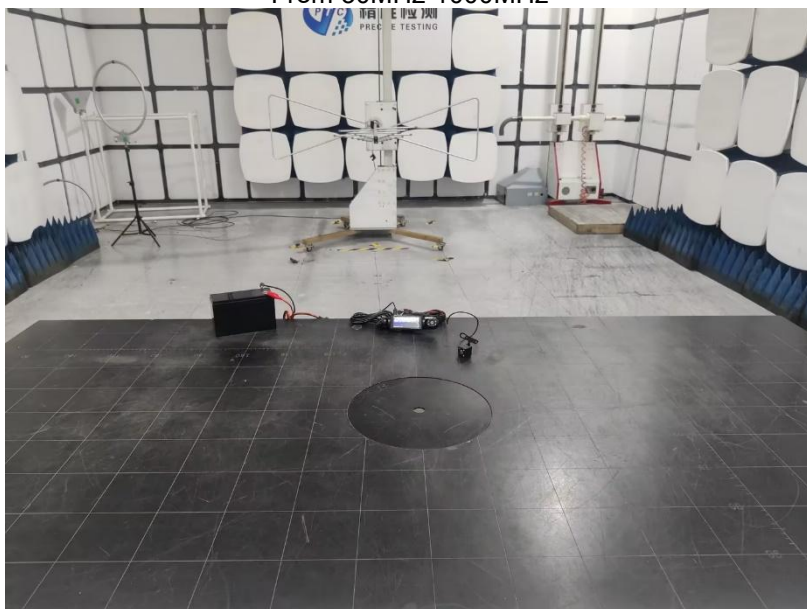
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional 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.

12.2 Result

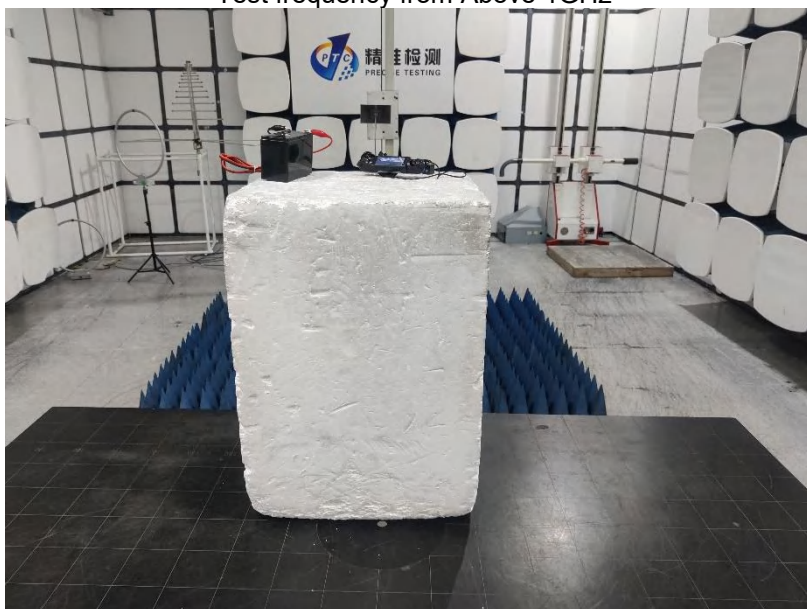
The EUT'S antenna, permanent attached antenna, is PCB Antenna. The antenna's gain is -0.58 dBi and meets the requirement.

13 Test Setup

Radiated Spurious Emissions
From 30MHz-1000MHz



Test frequency from Above 1GHz



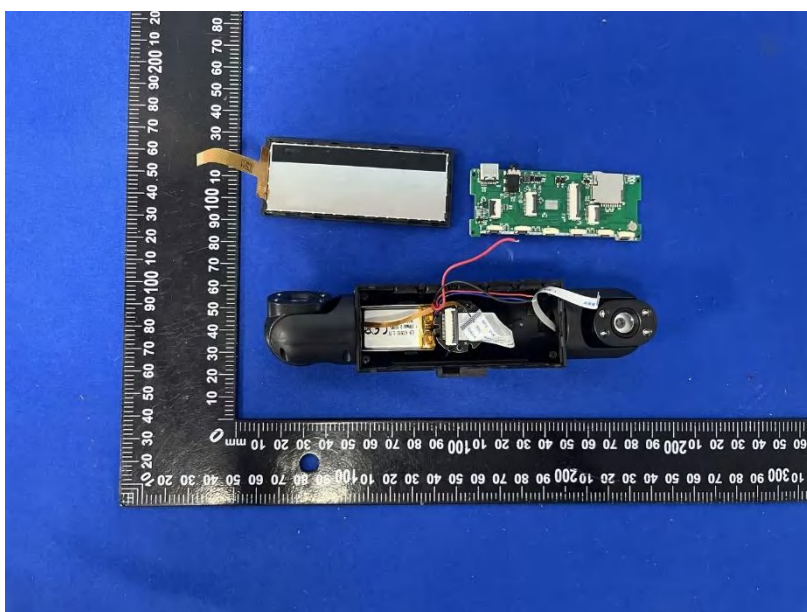
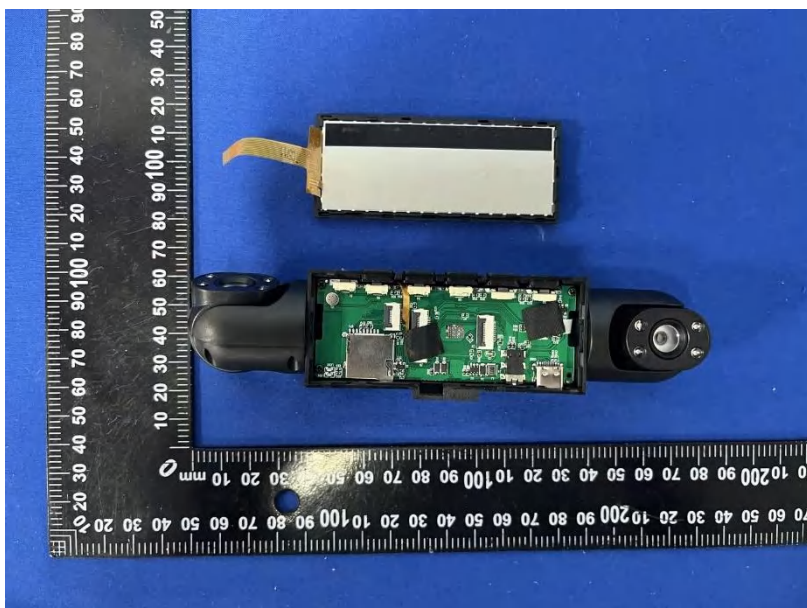
14 EUT PHOTOS

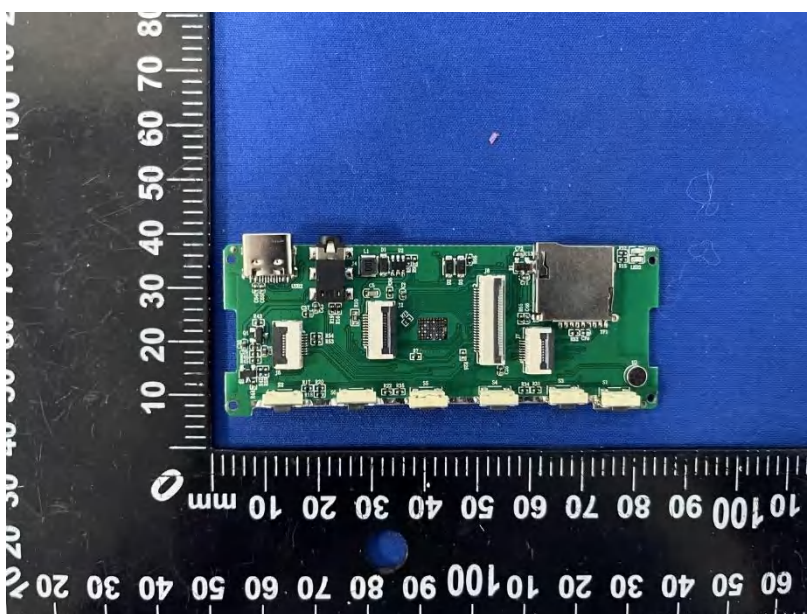
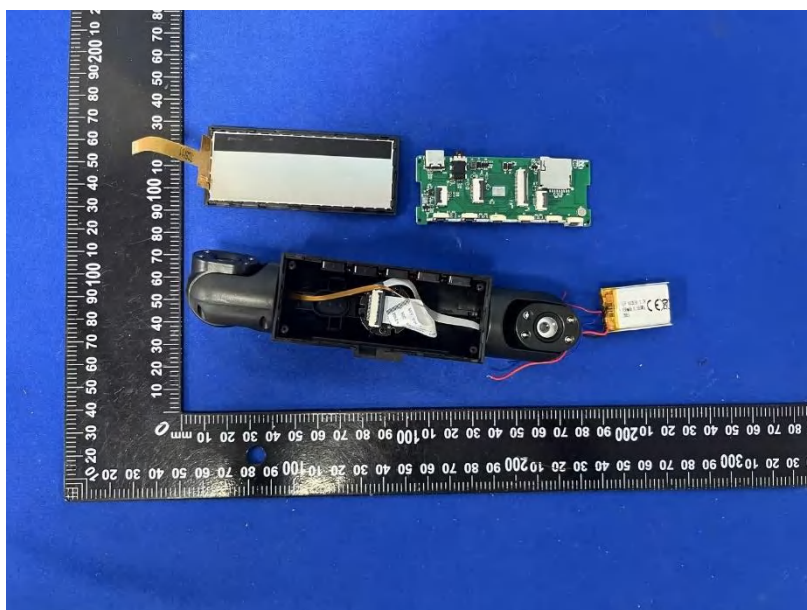


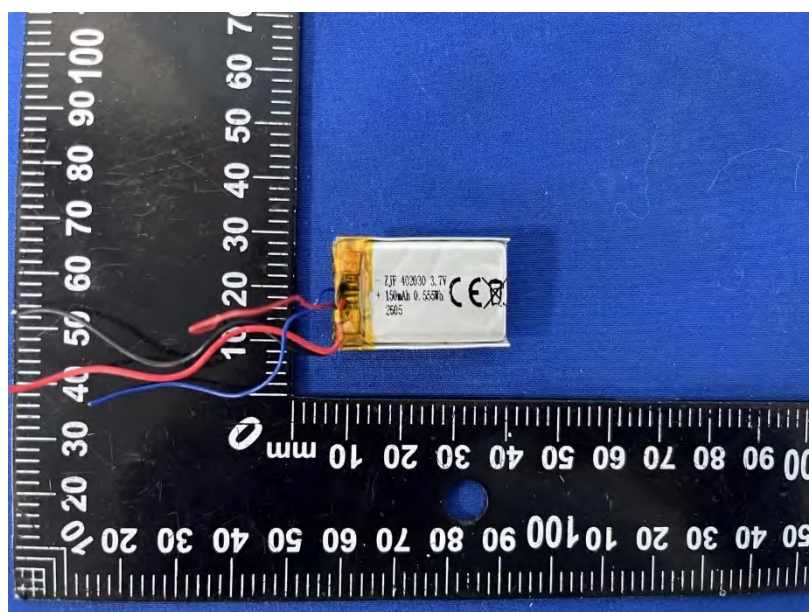
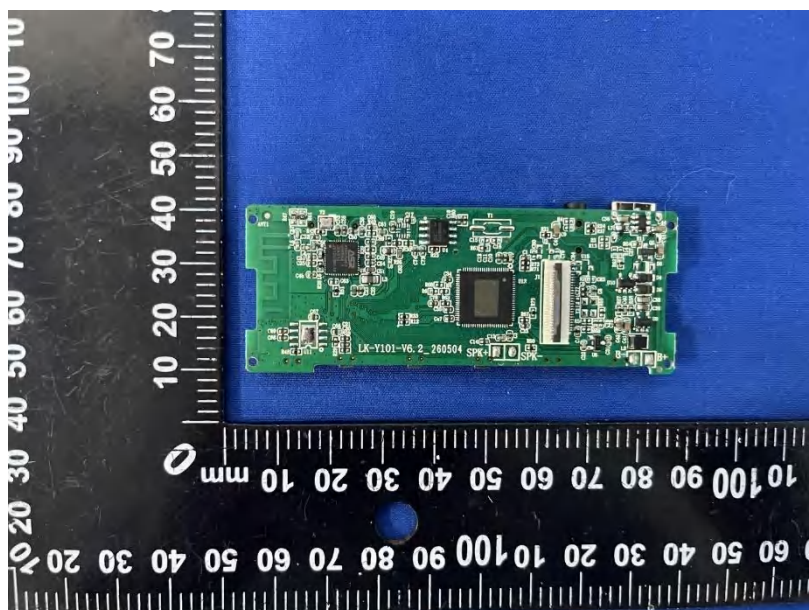












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