



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

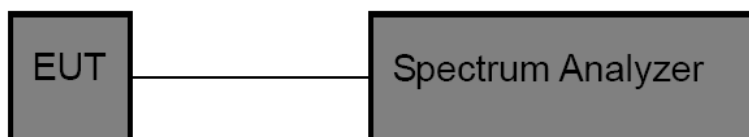
6dB Bandwidth:

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: Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz; Set the VBW $\geq [3 \times \text{RBW}]$; Detector = peak; Trace mode = max-hold; Sweep = No faster than coupled (auto) time.

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 Setup



9.3 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	15.920	2403.880	2419.800	0.5	PASS
11G	Ant1	2437	15.720	2429.040	2444.760	0.5	PASS
11G	Ant1	2462	16.080	2454.040	2470.120	0.5	PASS
11N20SISO	Ant1	2412	15.640	2403.880	2419.520	0.5	PASS
11N20SISO	Ant1	2437	16.520	2428.880	2445.400	0.5	PASS
11N20SISO	Ant1	2462	16.880	2453.480	2470.360	0.5	PASS



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11N40SISO	Ant1	2422	35.280	2404.480	2439.760	0.5	PASS
11N40SISO	Ant1	2437	32.560	2421.960	2454.520	0.5	PASS
11N40SISO	Ant1	2452	35.040	2434.480	2469.520	0.5	PASS

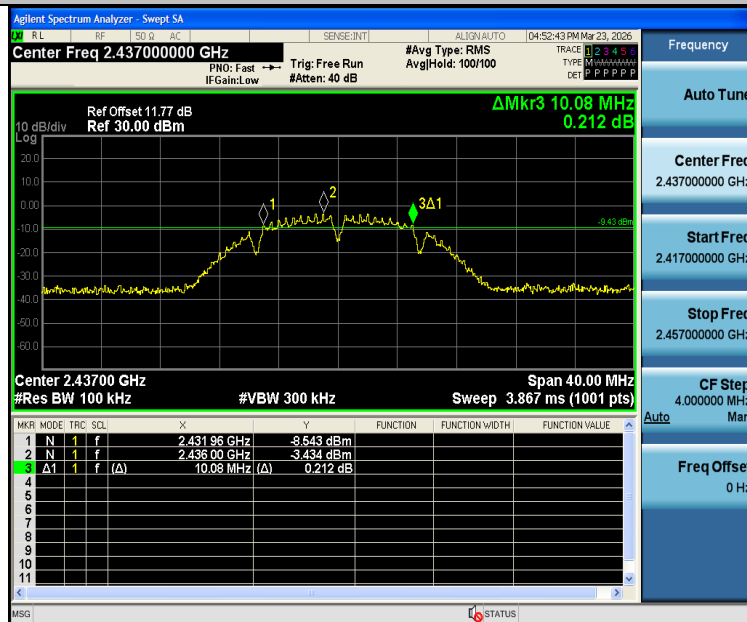


Test Graphs:

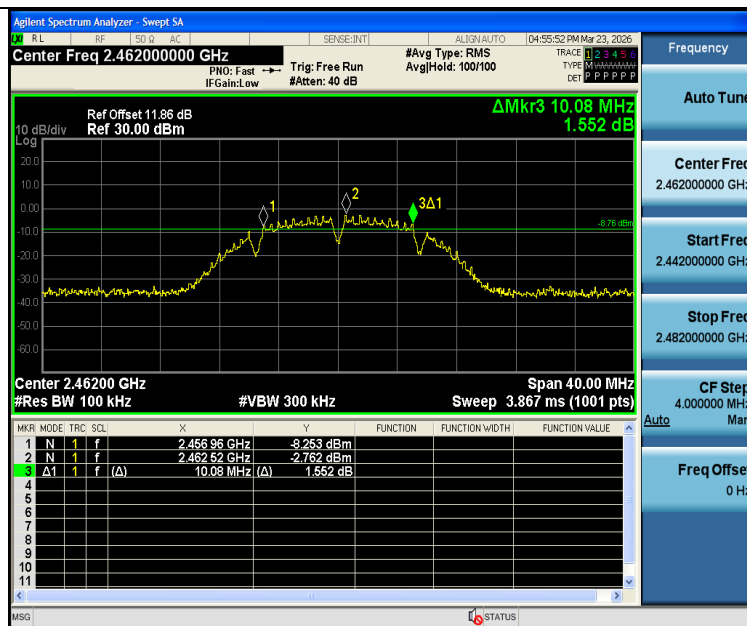
11B-Ant1-2412-PASS



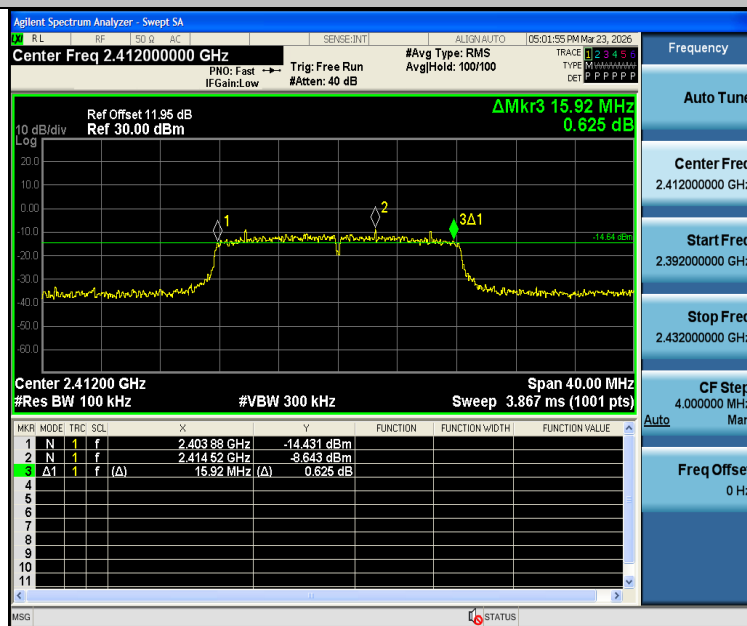
11B-Ant1-2437-PASS



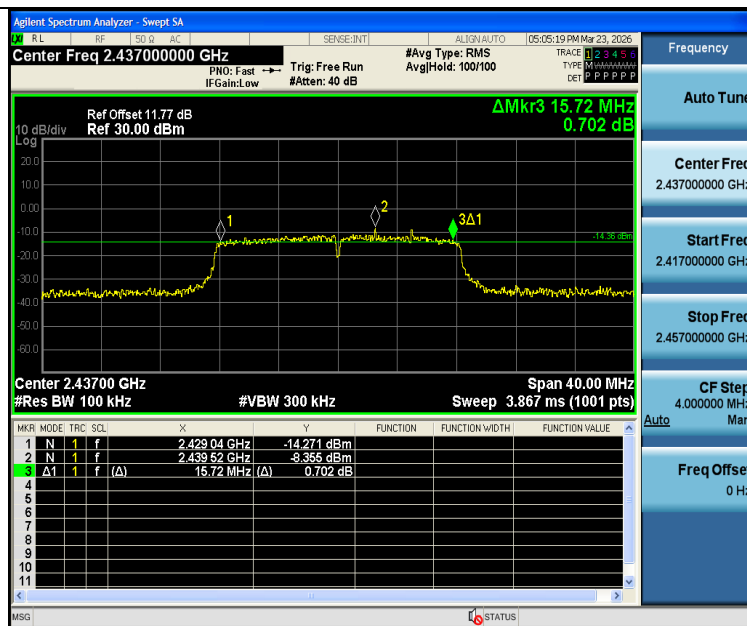
11B-Ant1-2462-PASS



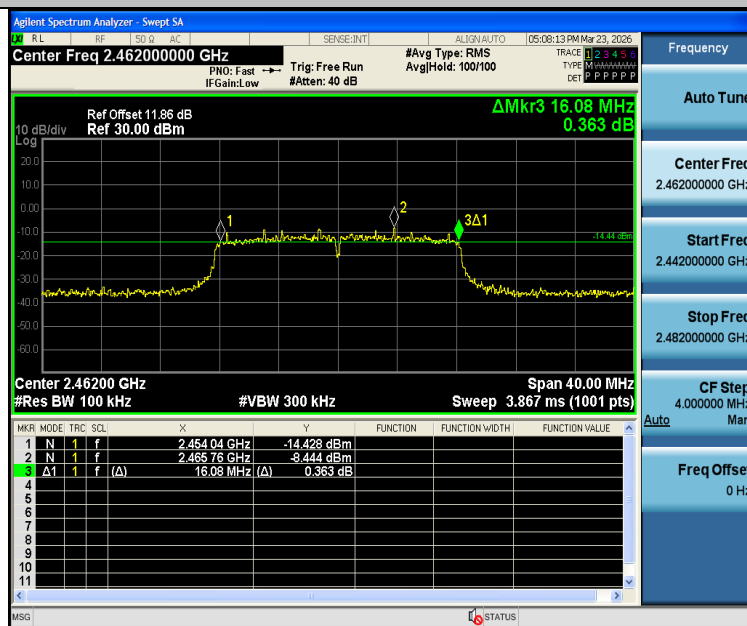
11G-Ant1-2412-PASS



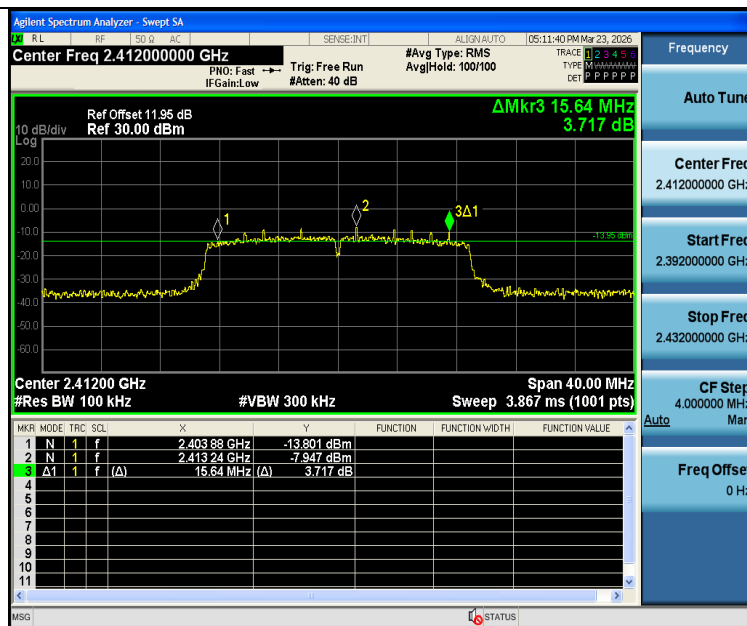
11G-Ant1-2437-PASS



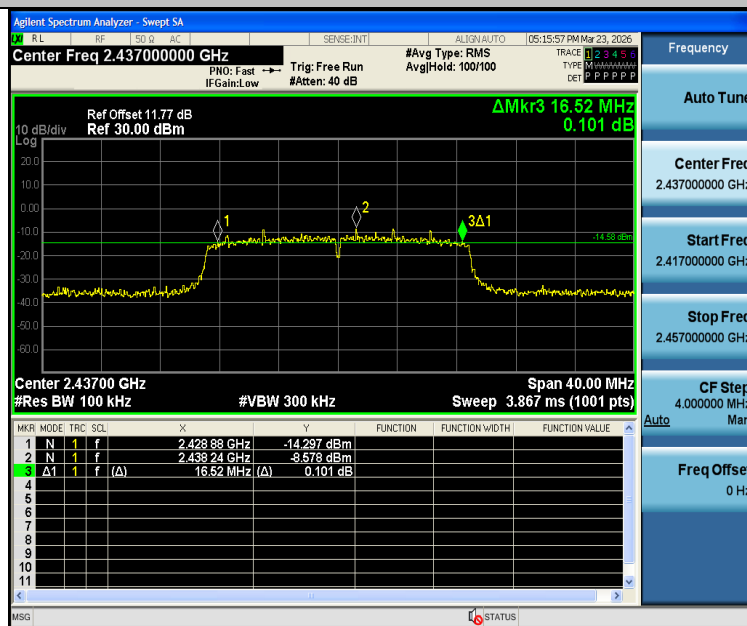
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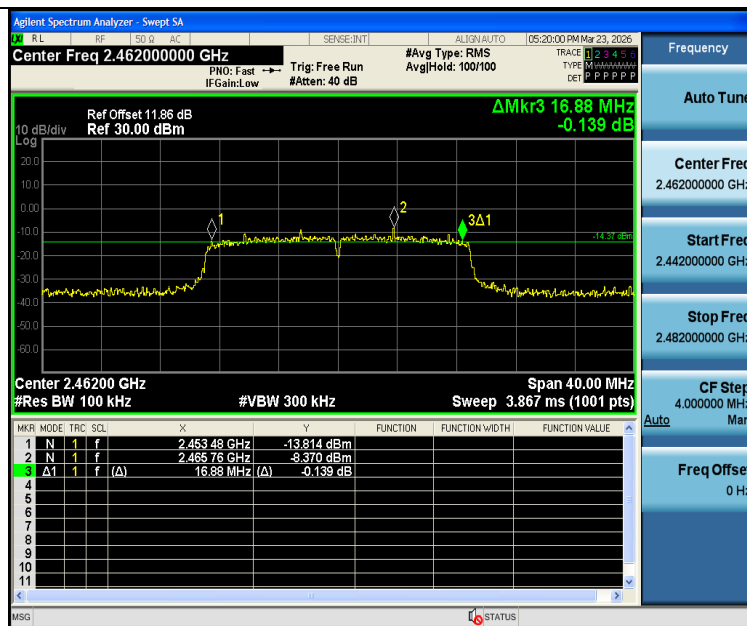
11N20SISO-Ant1-2412-PASS



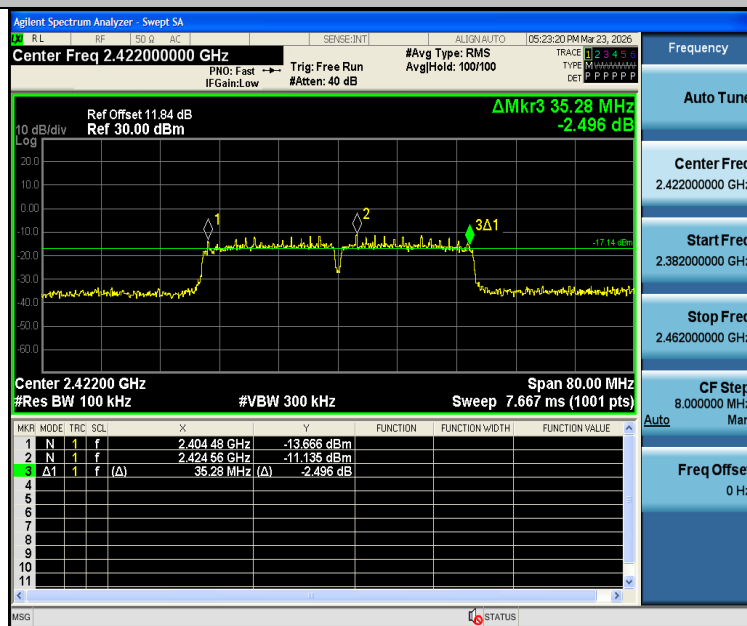
11N20SISO-Ant1-2437-PASS



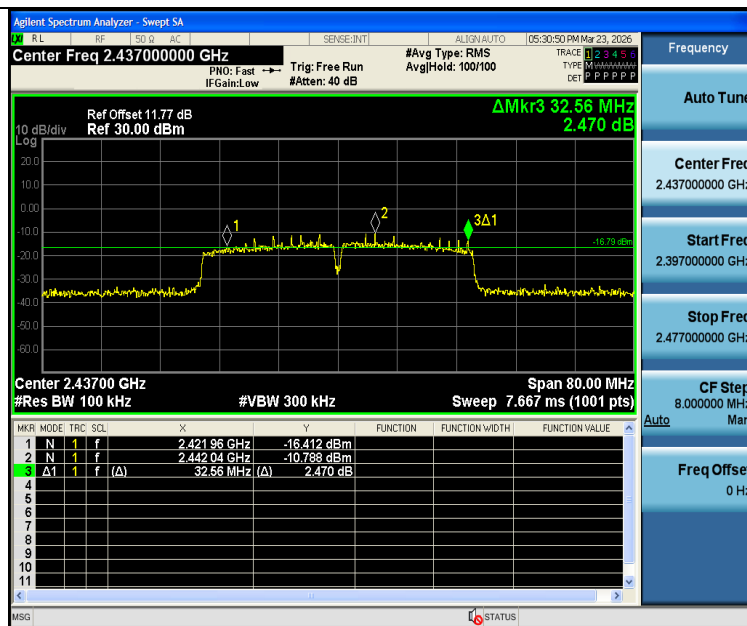
11N20SISO-Ant1-2462-PASS



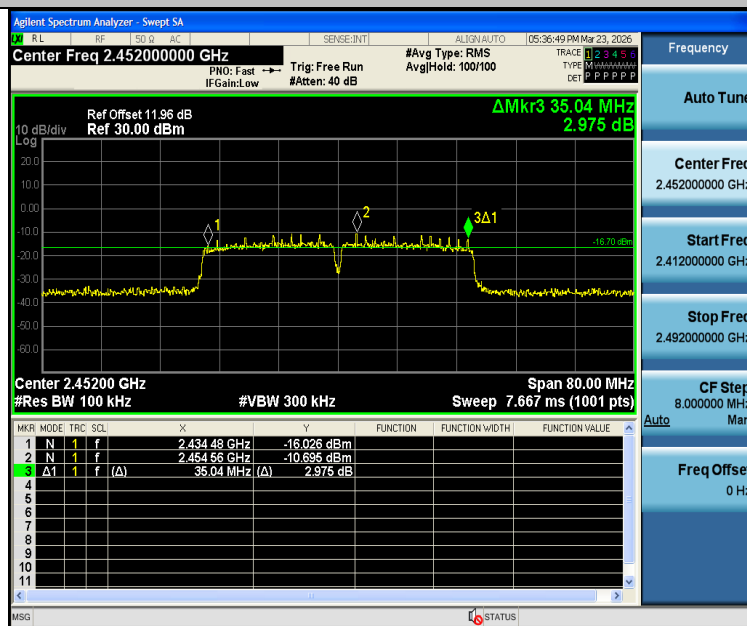
11N40SISO-Ant1-2422-PASS



11N40SISO-Ant1-2437-PASS



11N40SISO-Ant1-2452-PASS





10 Maximum conducted output power

Test Requirement : FCC CFR47 Part 15 Section 15.247

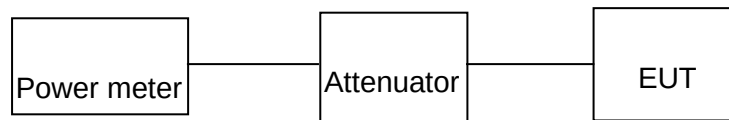
Test Method : ANSI C63.10-2020

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	---	8.11	≤30.00	PASS
11B	Ant1	2437	---	7.77	≤30.00	PASS
11B	Ant1	2462	---	8.32	≤30.00	PASS
11G	Ant1	2412	---	8.75	≤30.00	PASS
11G	Ant1	2437	---	8.65	≤30.00	PASS
11G	Ant1	2462	---	8.88	≤30.00	PASS
11N20SISO	Ant1	2412	---	8.42	≤30.00	PASS
11N20SISO	Ant1	2437	---	8.43	≤30.00	PASS
11N20SISO	Ant1	2462	---	8.71	≤30.00	PASS
11N40SISO	Ant1	2422	---	8.53	≤30.00	PASS
11N40SISO	Ant1	2437	---	8.15	≤30.00	PASS
11N40SISO	Ant1	2452	---	8.97	≤30.00	PASS



11 Power Spectral density

Test Requirement : FCC CFR47 Part 15 Section 15.247

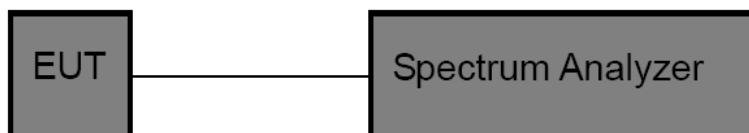
Test Method : ANSI C63.10-2020

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



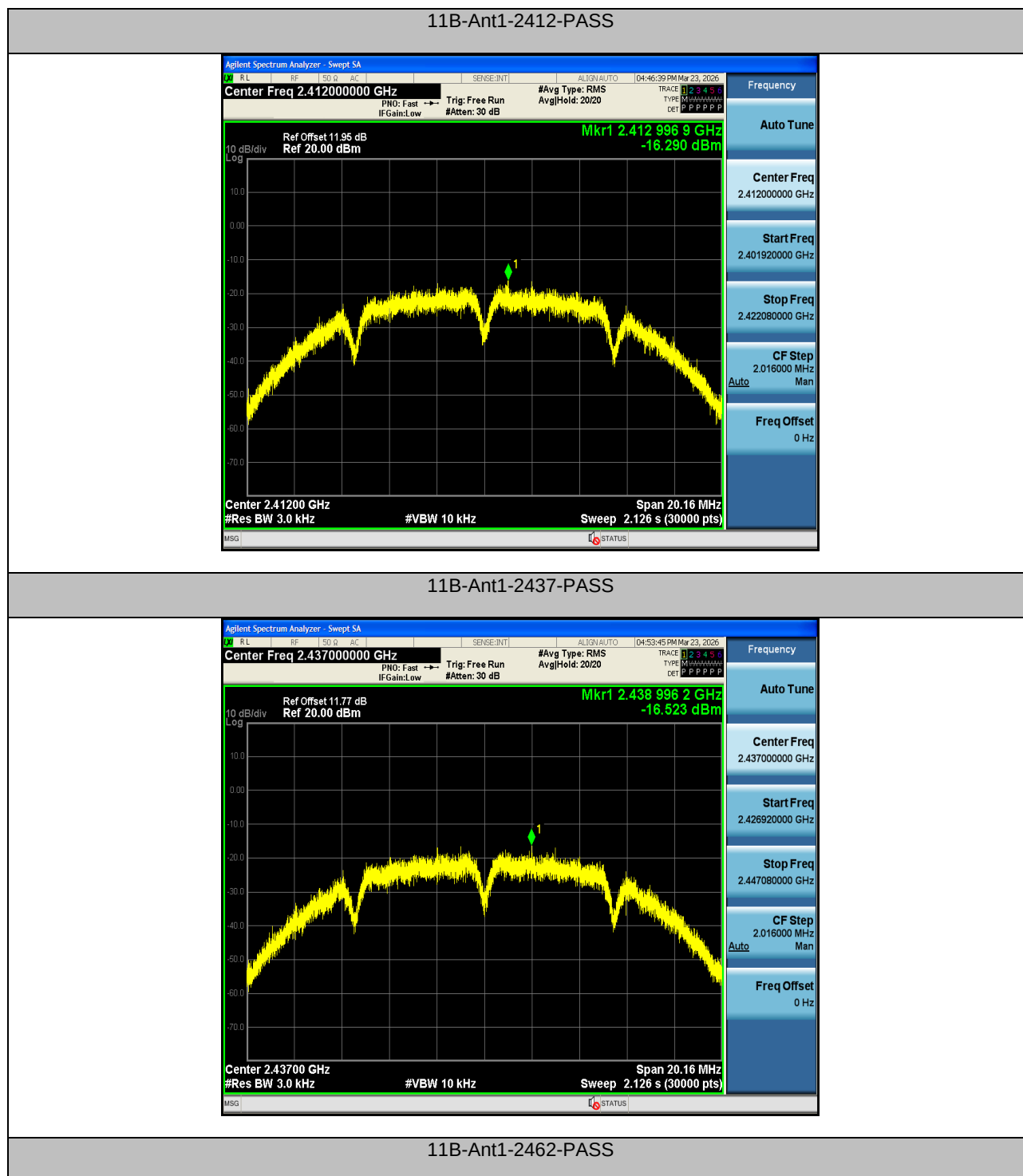
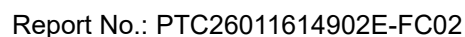
11.3 Test Result

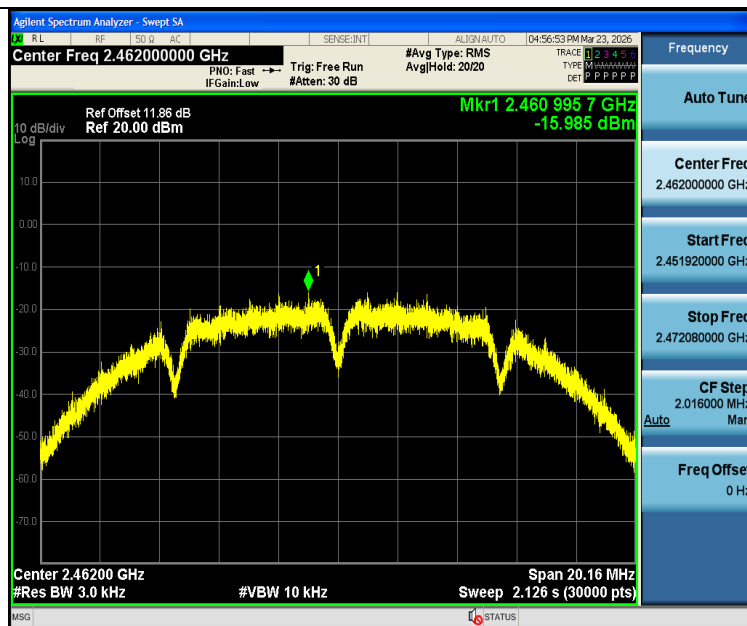
TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-16.29	≤8.00	PASS
11B	Ant1	2437	-16.52	≤8.00	PASS
11B	Ant1	2462	-15.99	≤8.00	PASS
11G	Ant1	2412	-22.59	≤8.00	PASS
11G	Ant1	2437	-22.44	≤8.00	PASS
11G	Ant1	2462	-22.49	≤8.00	PASS
11N20SISO	Ant1	2412	-22.43	≤8.00	PASS
11N20SISO	Ant1	2437	-22.16	≤8.00	PASS



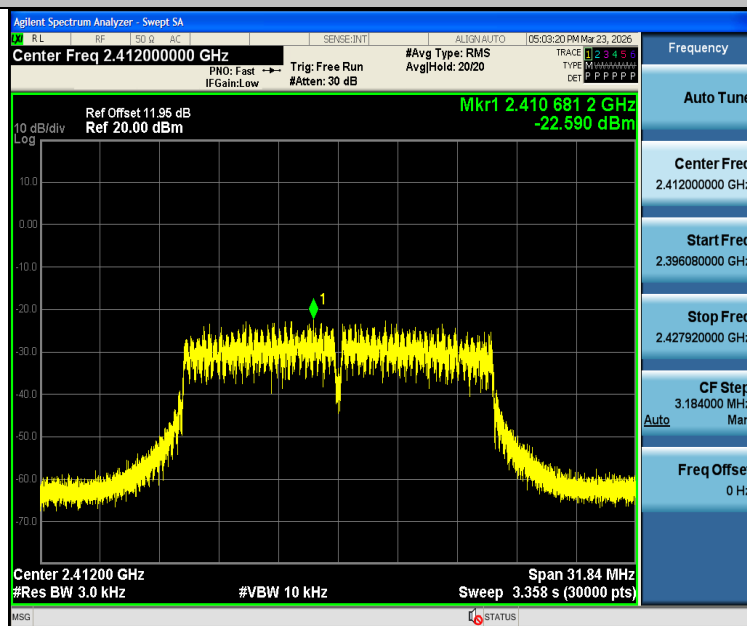
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11N20SISO	Ant1	2462	-22.31	≤ 8.00	PASS
11N40SISO	Ant1	2422	-24.46	≤ 8.00	PASS
11N40SISO	Ant1	2437	-24.98	≤ 8.00	PASS
11N40SISO	Ant1	2452	-24.06	≤ 8.00	PASS

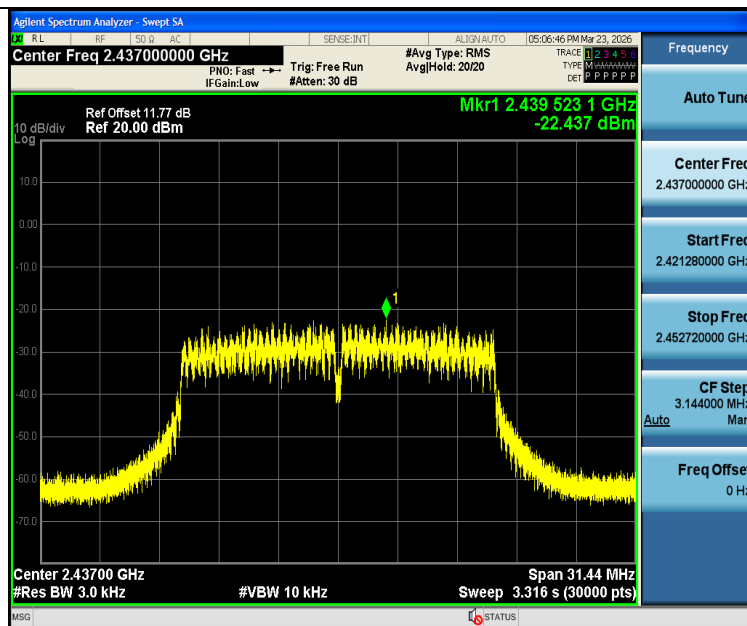




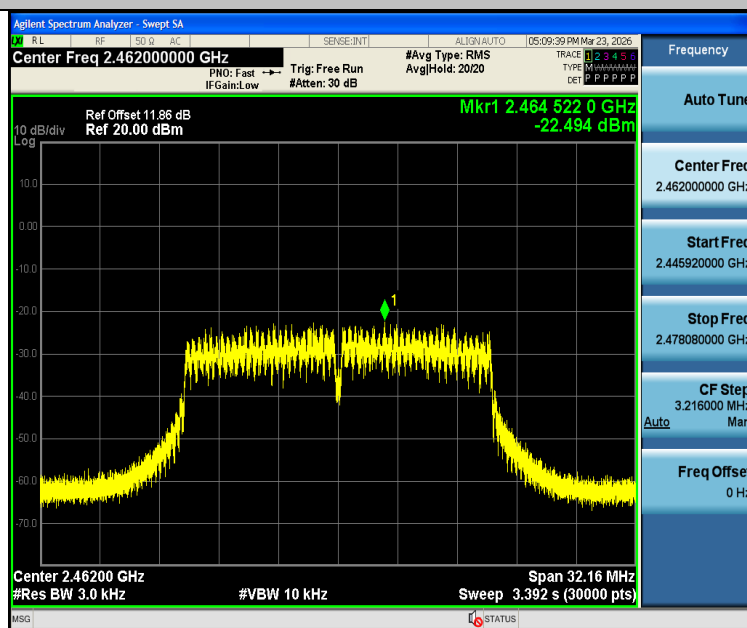
11G-Ant1-2412-PASS



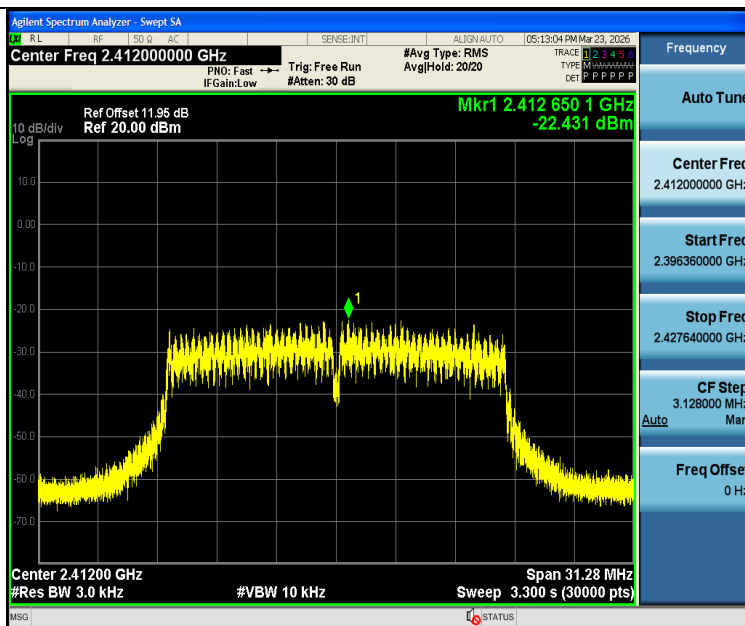
11G-Ant1-2437-PASS



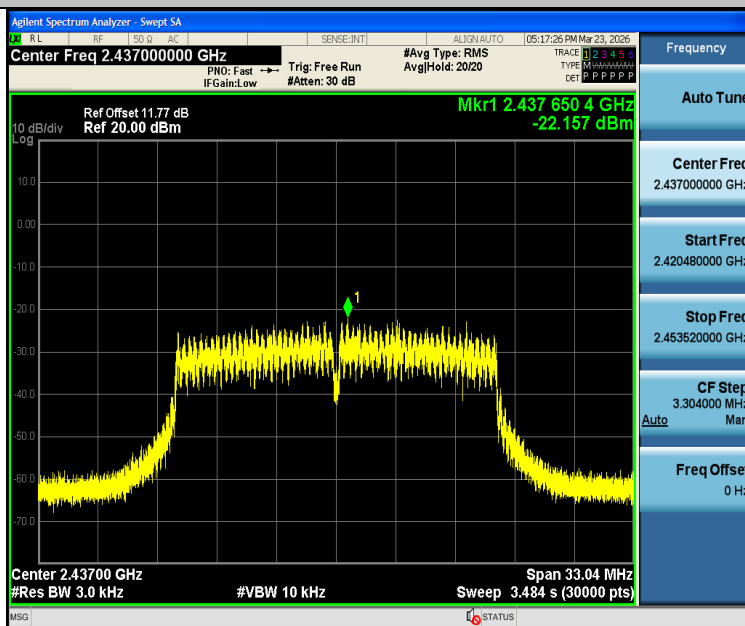
11G-Ant1-2462-PASS



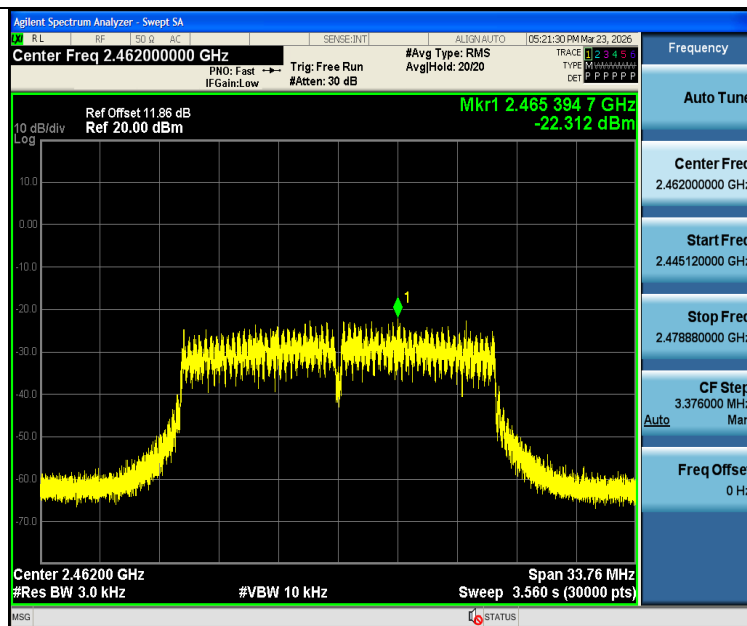
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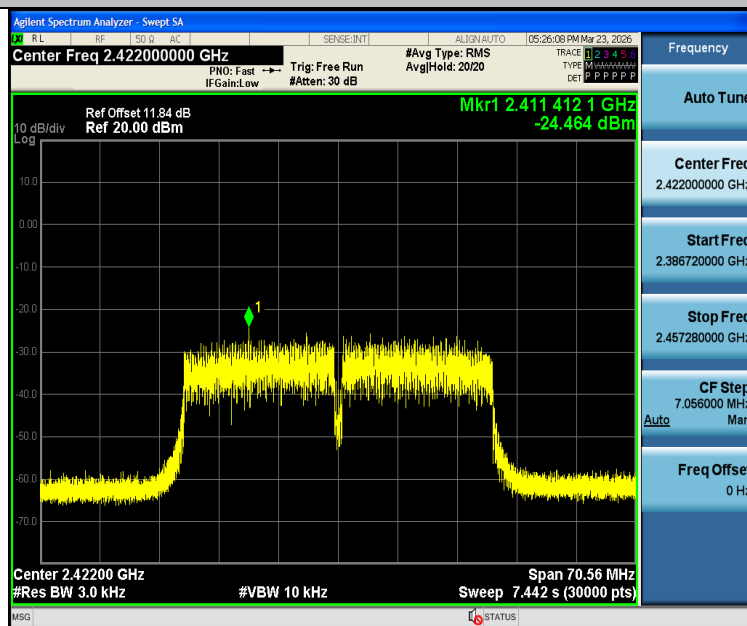
11N20SISO-Ant1-2437-PASS



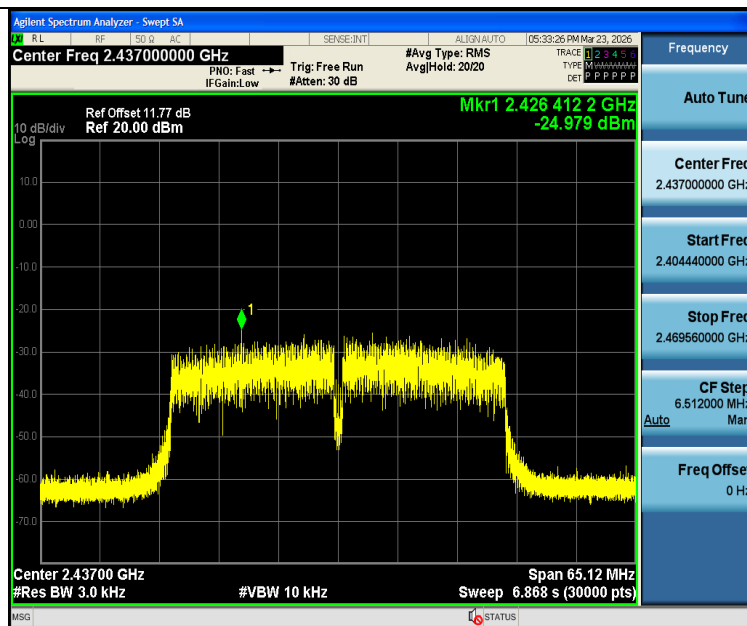
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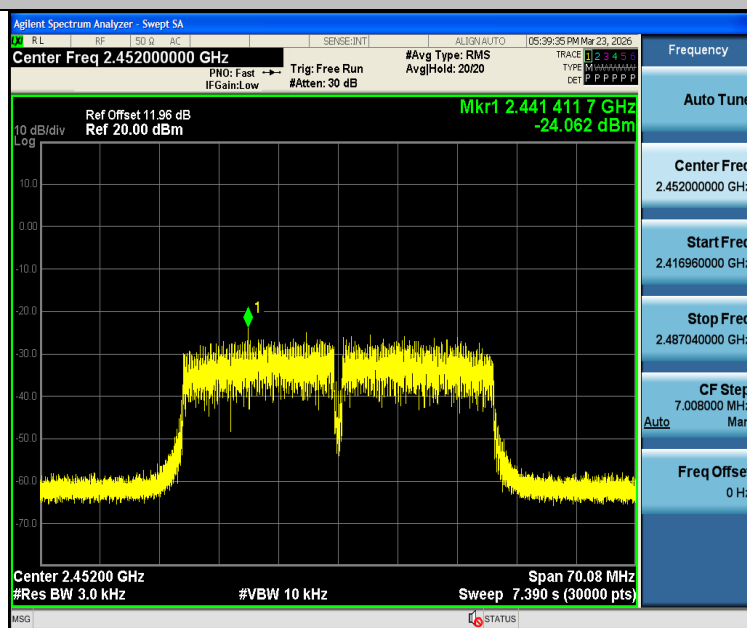
11N40SISO-Ant1-2422-PASS



11N40SISO-Ant1-2437-PASS



11N40SISO-Ant1-2452-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

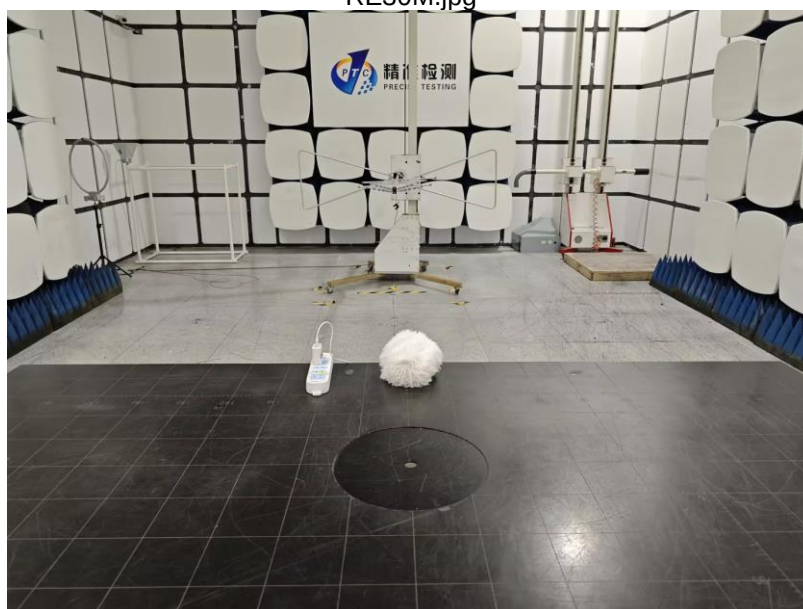
The EUT'S antenna, permanent attached antenna, is PCB Antenna. The antenna's gain is -0.68 dBi and meets the requirement.

13 Test Setup

Conducted Emissions



Radiated Spurious Emissions
From 30MHz-1000MHz
RE30M.jpg





Test frequency from Above 1GHz
RSE1G.jpg



14 EUT PHOTOS







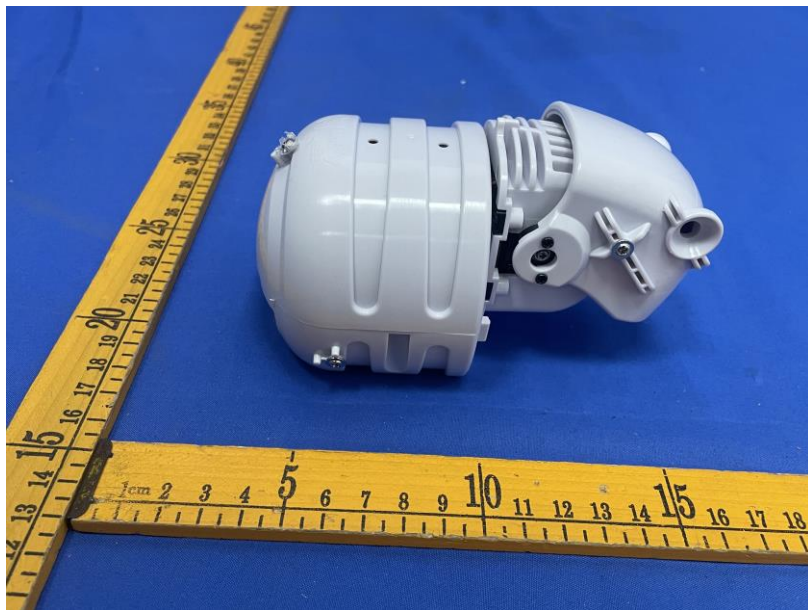
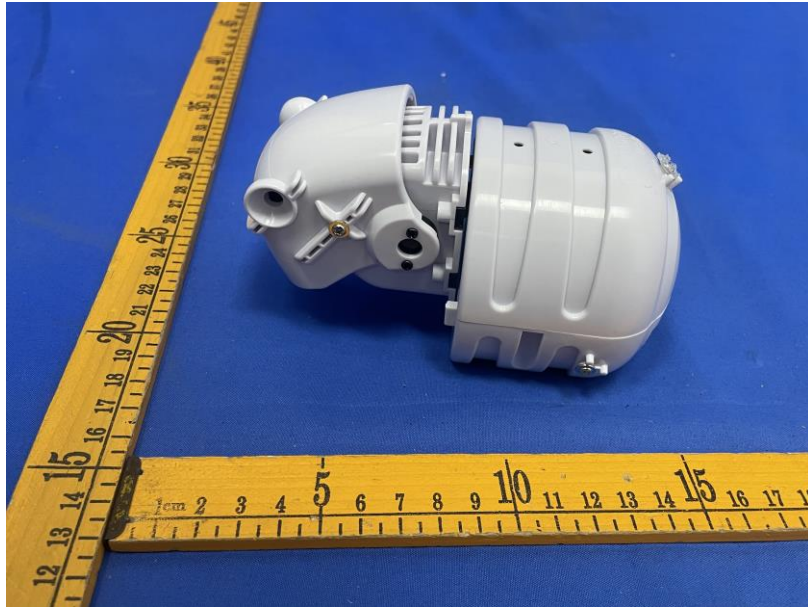


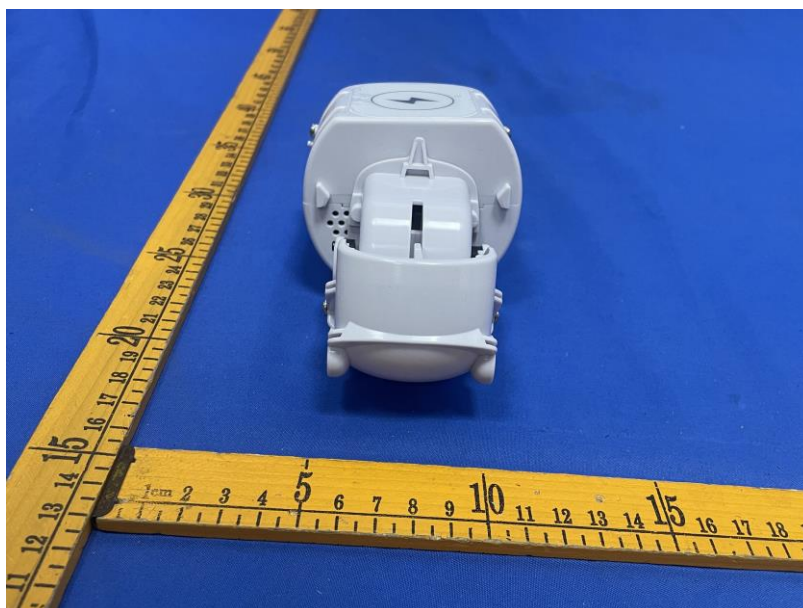


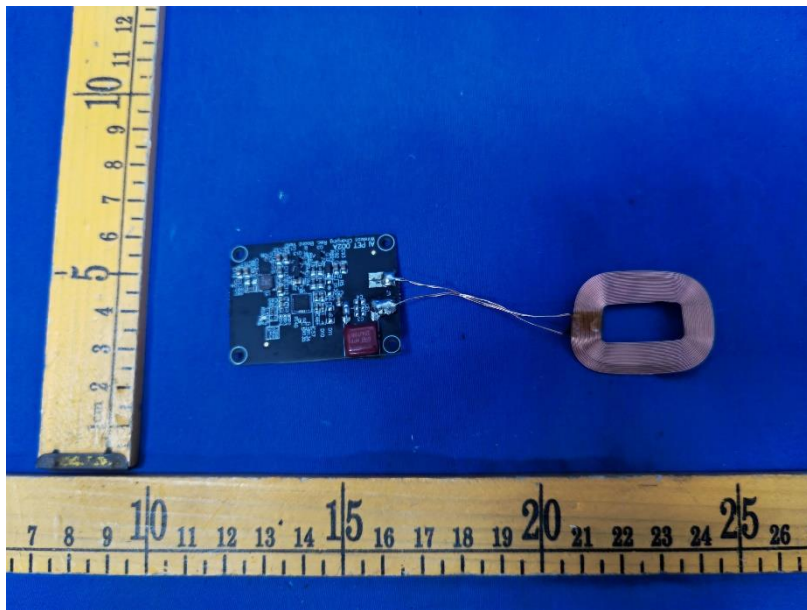
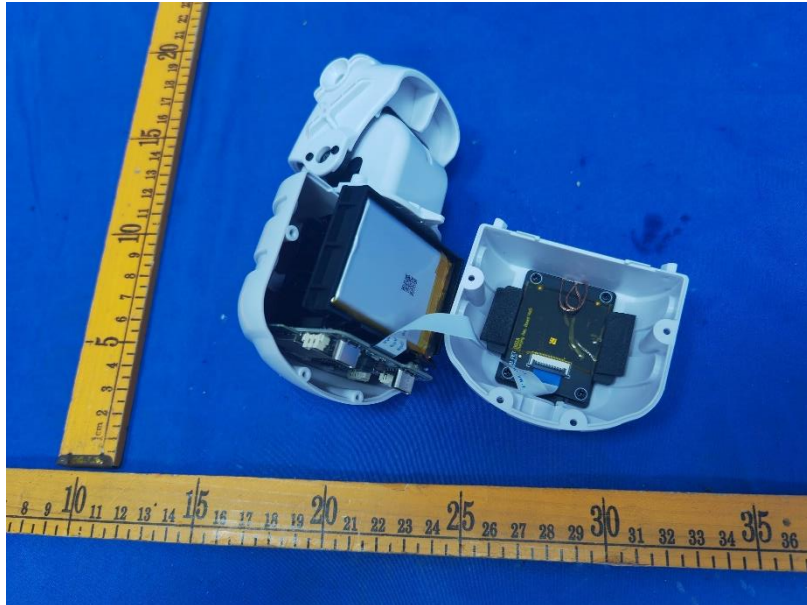


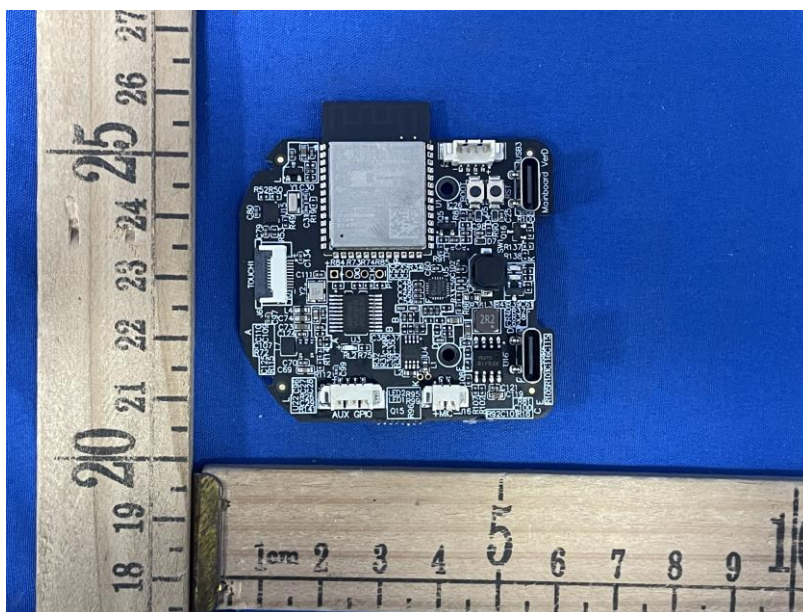
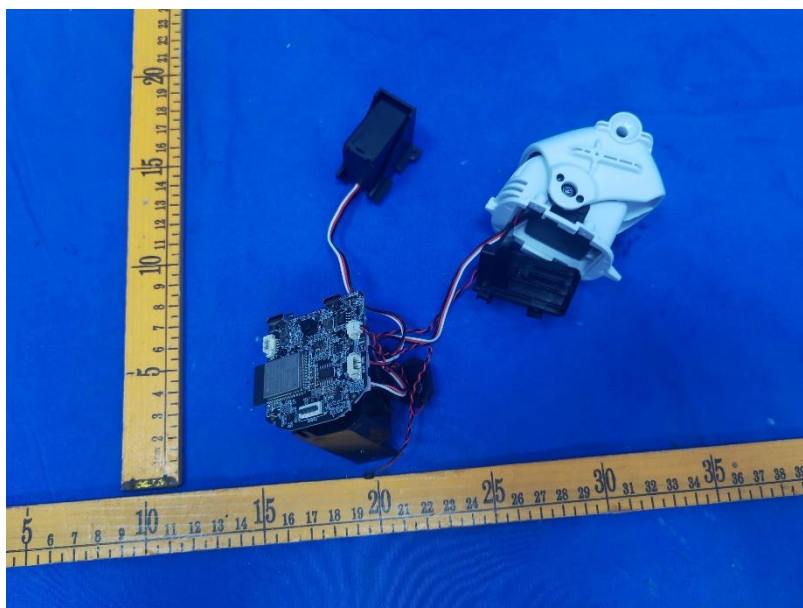


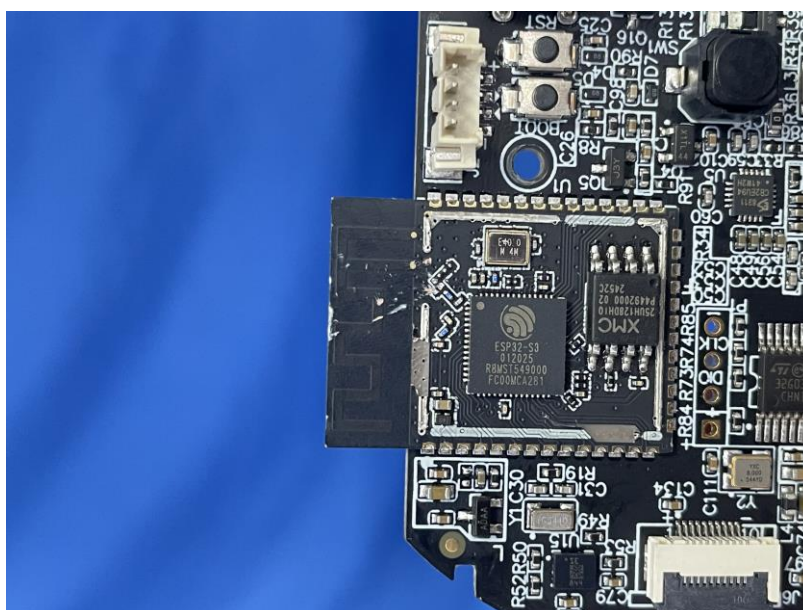
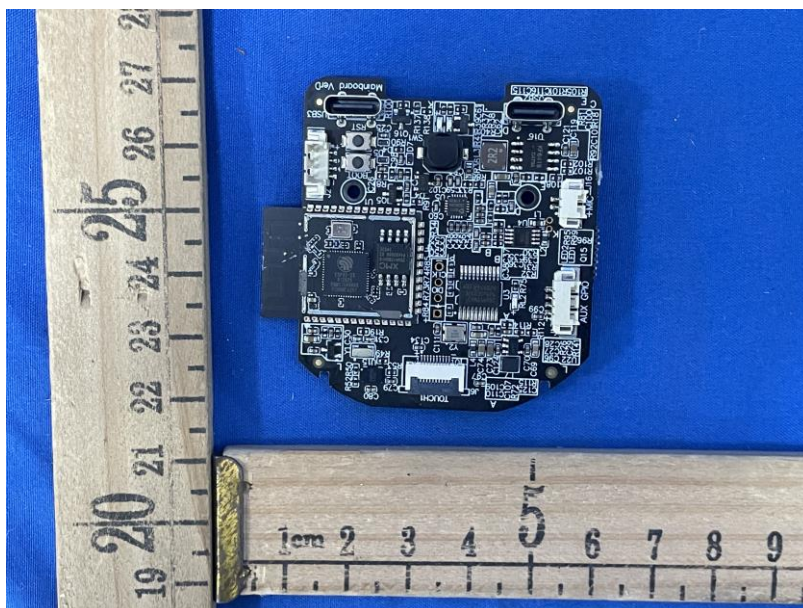


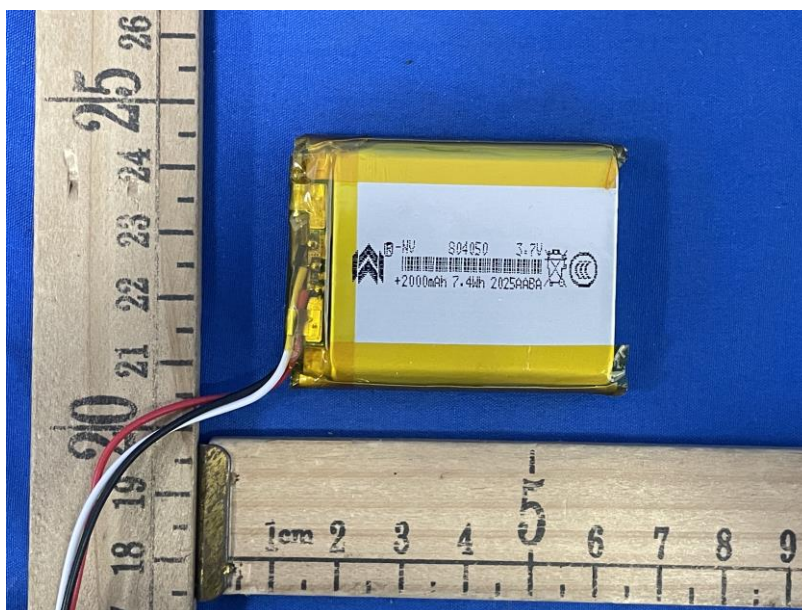
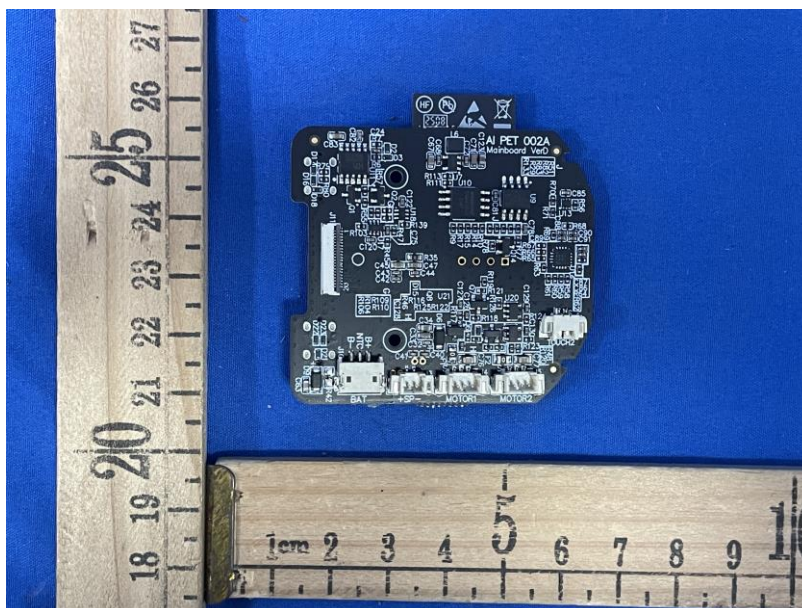


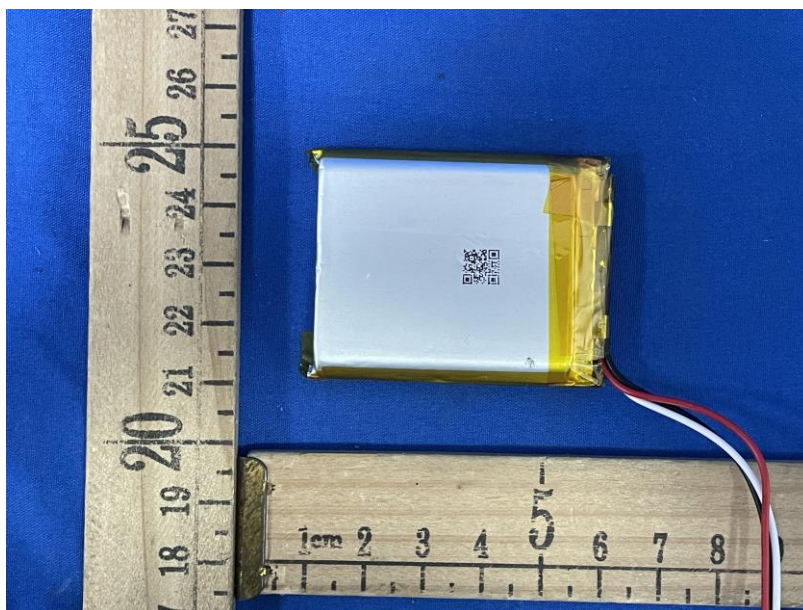












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