



8 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.

Test Procedure

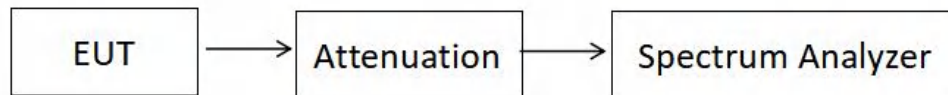
The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., $RBW = 100$ kHz, the automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode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

Test Setup



Test Result

Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.676	2401.644	2402.320	0.5	PASS
BLE_1M	Ant1	2440	0.640	2439.672	2440.312	0.5	PASS
BLE_1M	Ant1	2480	0.724	2479.624	2480.348	0.5	PASS
BLE_2M	Ant1	2402	1.144	2401.412	2402.556	0.5	PASS
BLE_2M	Ant1	2440	1.160	2439.400	2440.560	0.5	PASS
BLE_2M	Ant1	2480	1.092	2479.448	2480.540	0.5	PASS

Test Graphs:





BLE_2M-Ant1-2402-PASS



BLE_2M-Ant1-2440-PASS



BLE_2M-Ant1-2480-PASS





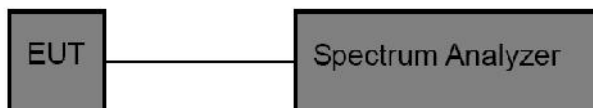
9 Maximum Peak Output Power

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.

9.1 Test Procedure

1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Measure the conducted output power and record the results in the test report.
4. The signal analyzer resolution bandwidth was set to 2 MHz and video bandwidth of 10 MHz, A peak detector was used, sweep time was set to auto and trace mode was Max Hold. The span was set to 10 MHz. A marker was placed at the peak of the signal and the results recorded in the tables below.

9.2 Test Setup



9.3 Test Result

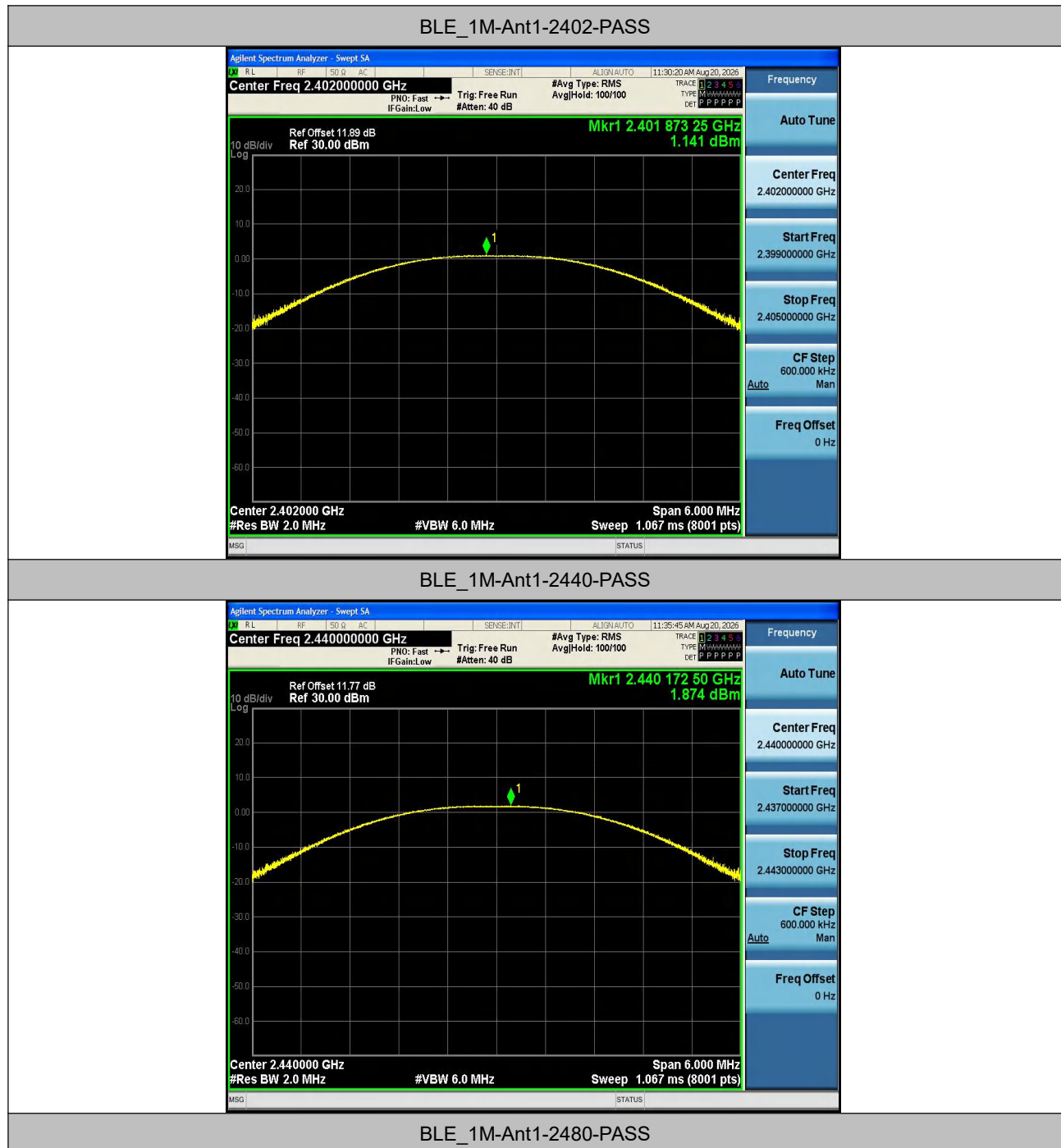
Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
BLE_1M	Ant1	2402	1.14	≤30	PASS
BLE_1M	Ant1	2440	1.87	≤30	PASS
BLE_1M	Ant1	2480	2.12	≤30	PASS
BLE_2M	Ant1	2402	1.09	≤30	PASS
BLE_2M	Ant1	2440	2.06	≤30	PASS
BLE_2M	Ant1	2480	2.19	≤30	PASS



Report No.: PTC26062419301E-FC02

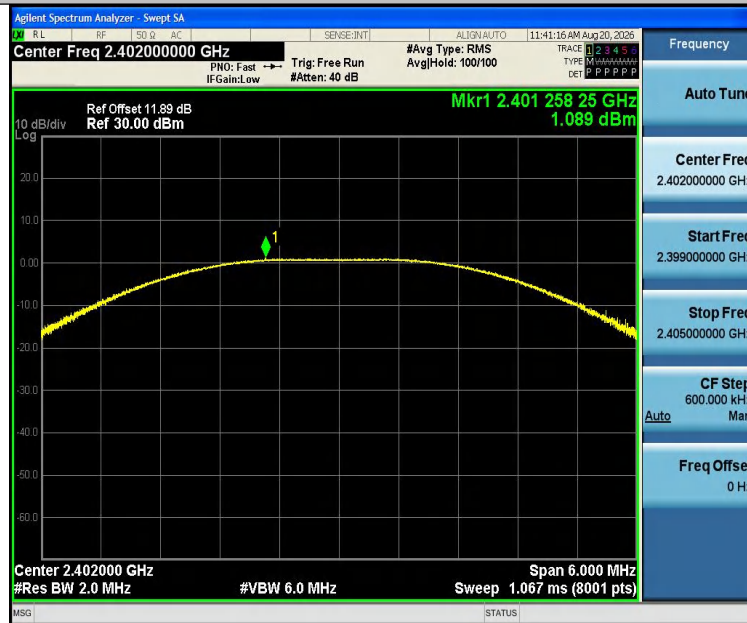


Test Graphs:

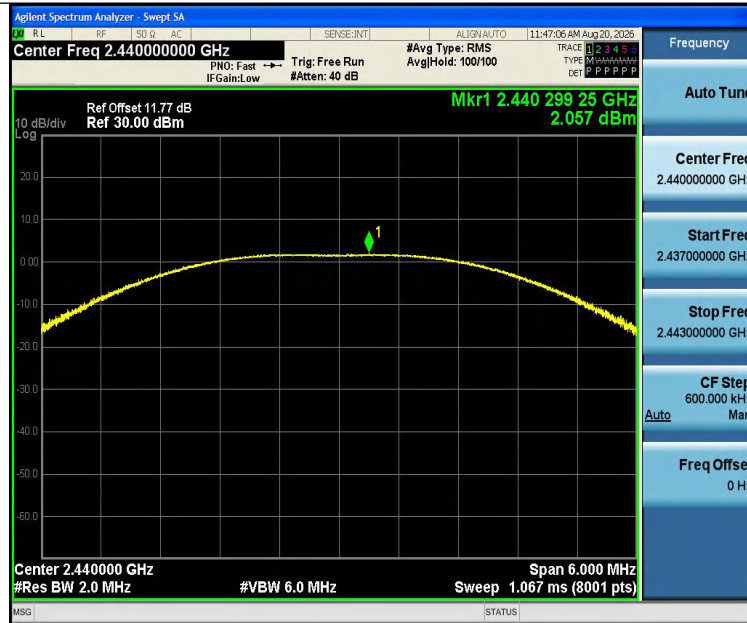




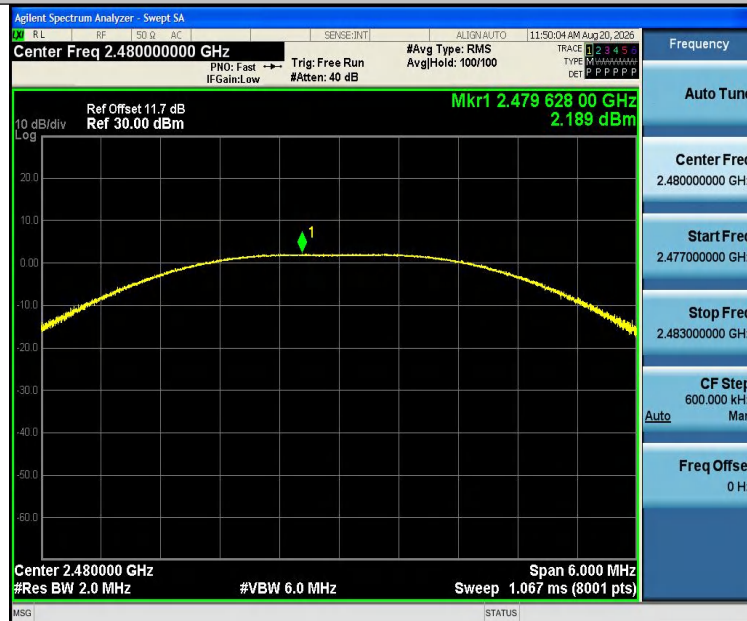
BLE_2M-Ant1-2402-PASS



BLE_2M-Ant1-2440-PASS



BLE_2M-Ant1-2480-PASS





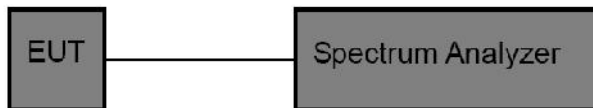
10 Power Spectral density

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10-2020
Test Limit	: Regulation 15.247(f) 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.

10.1 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 = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

10.2 Test Setup

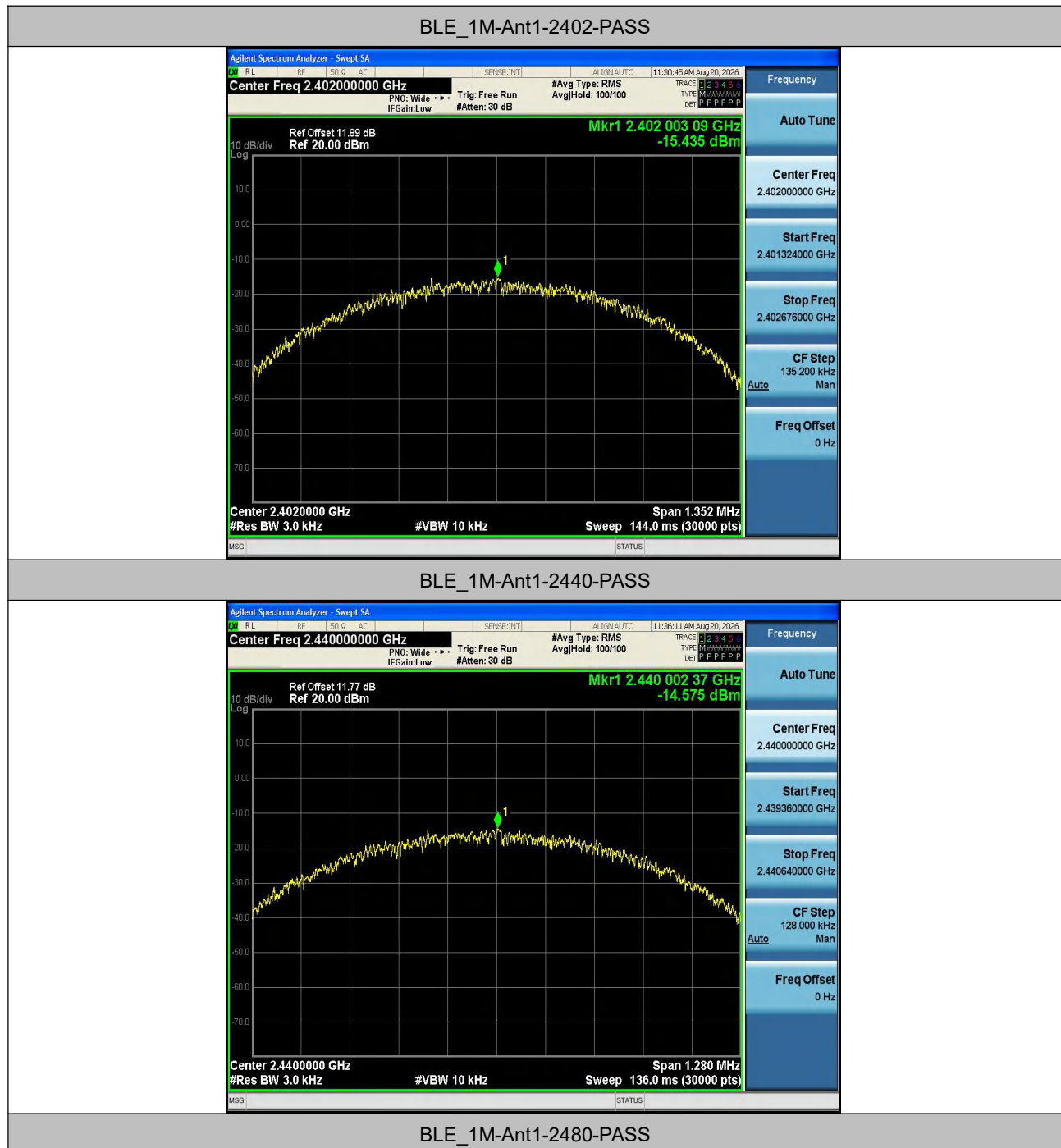


10.3 Test Result

Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-15.44	≤8.00	PASS
BLE_1M	Ant1	2440	-14.58	≤8.00	PASS
BLE_1M	Ant1	2480	-14.11	≤8.00	PASS
BLE_2M	Ant1	2402	-17.94	≤8.00	PASS
BLE_2M	Ant1	2440	-17	≤8.00	PASS
BLE_2M	Ant1	2480	-16.64	≤8.00	PASS



Test Graphs:





BLE_2M-Ant1-2402-PASS



BLE_2M-Ant1-2440-PASS



BLE_2M-Ant1-2480-PASS





11 Antenna Application

11.1 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.

11.2 Result

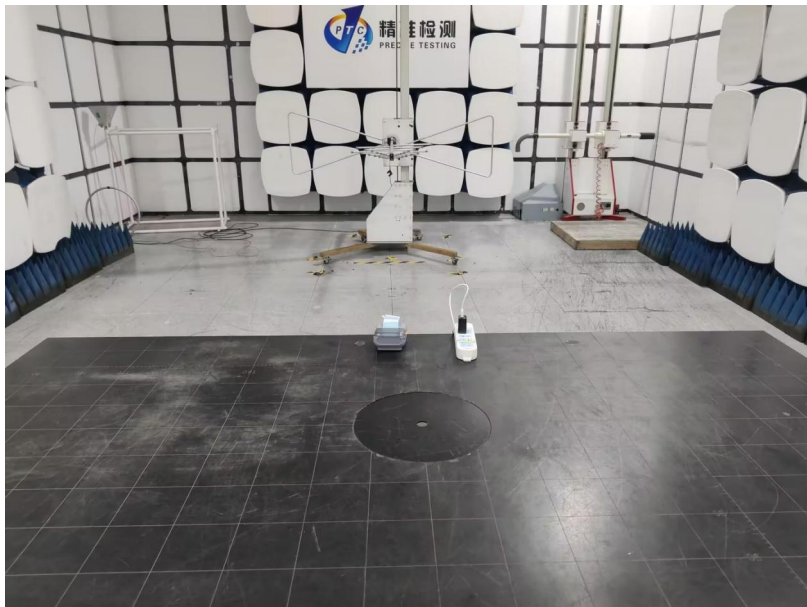
The EUT'S antenna, permanent attached antenna, is internal PCB antenna. The antenna's gain is 4.85 dBi and meets the requirement.

12 Test Setup

Conducted Emissions



Radiated Emissions From 30M-1GHz



Above 1GHz





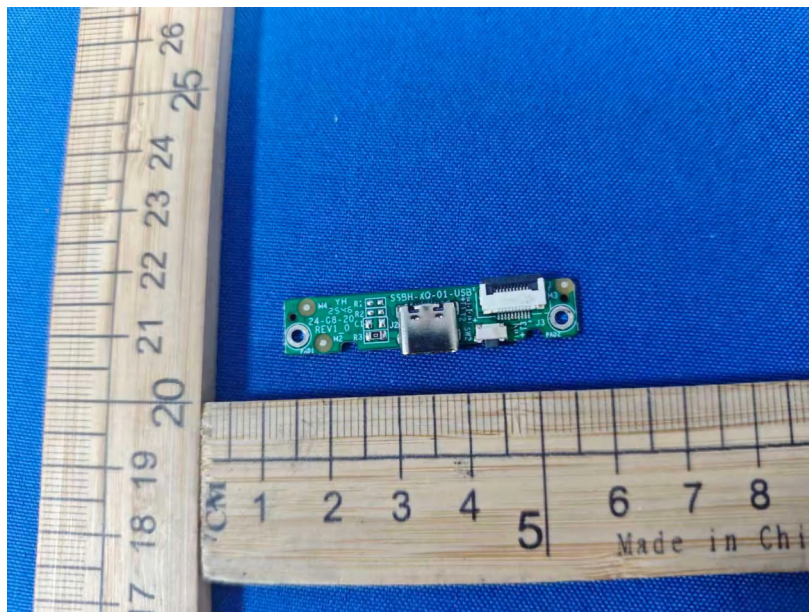
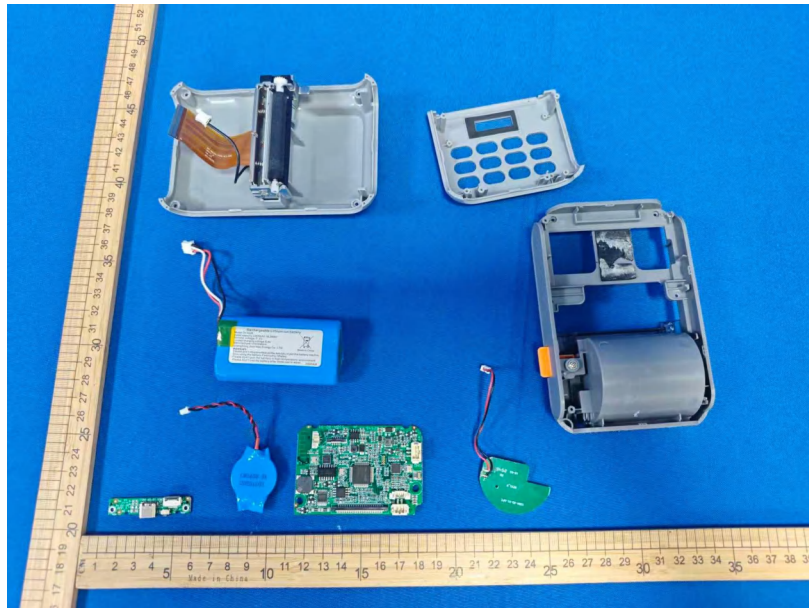
13 EUT Photos

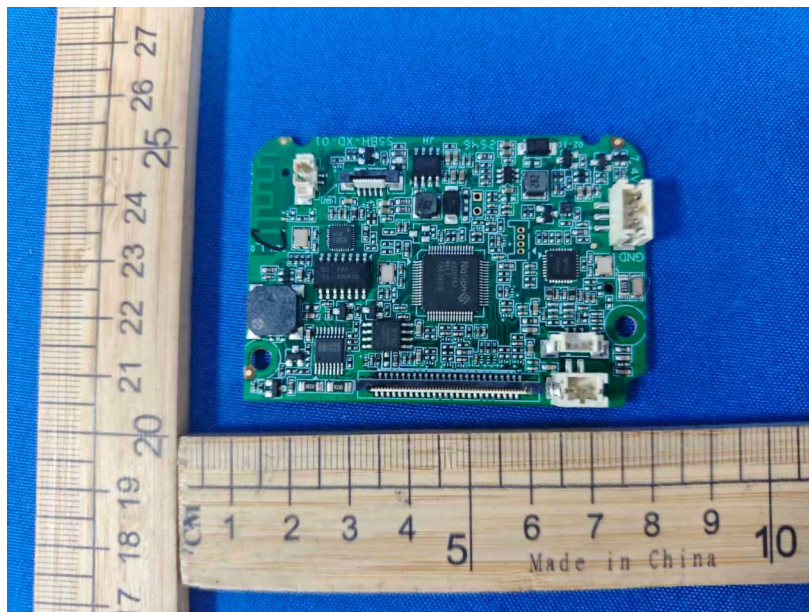
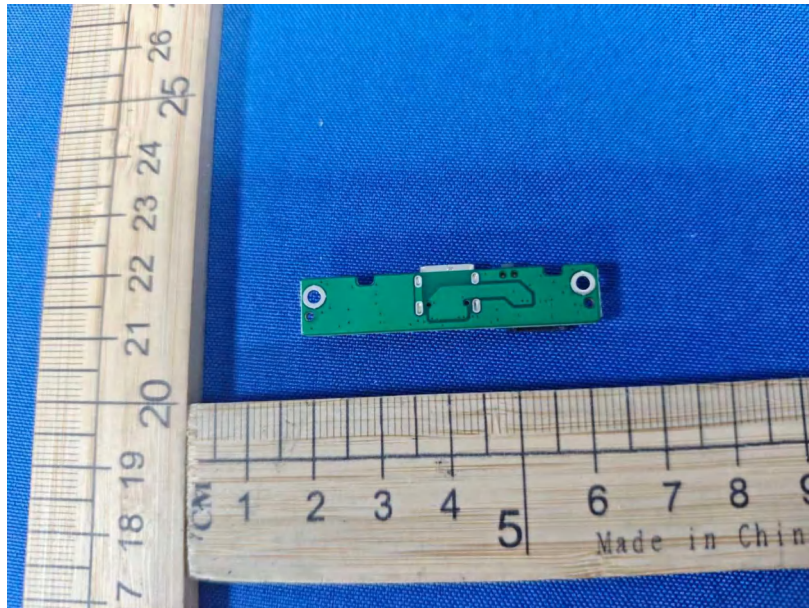


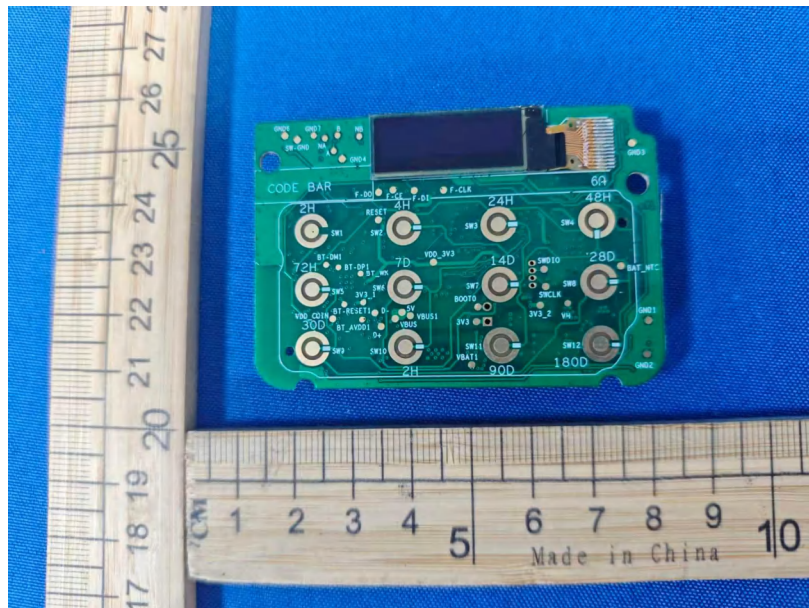


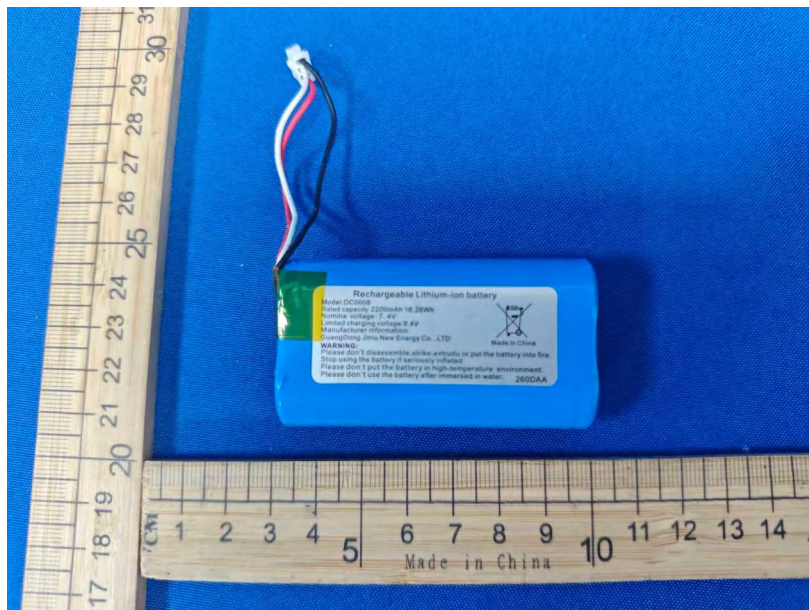
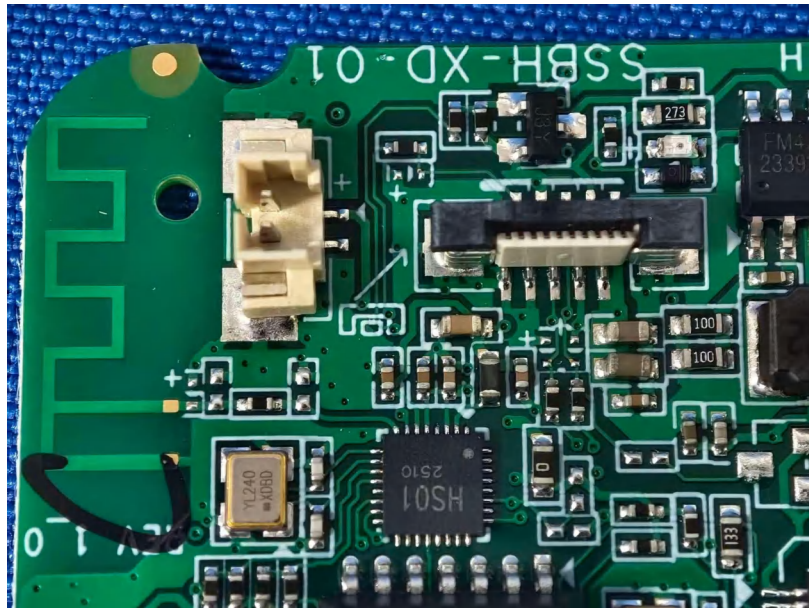






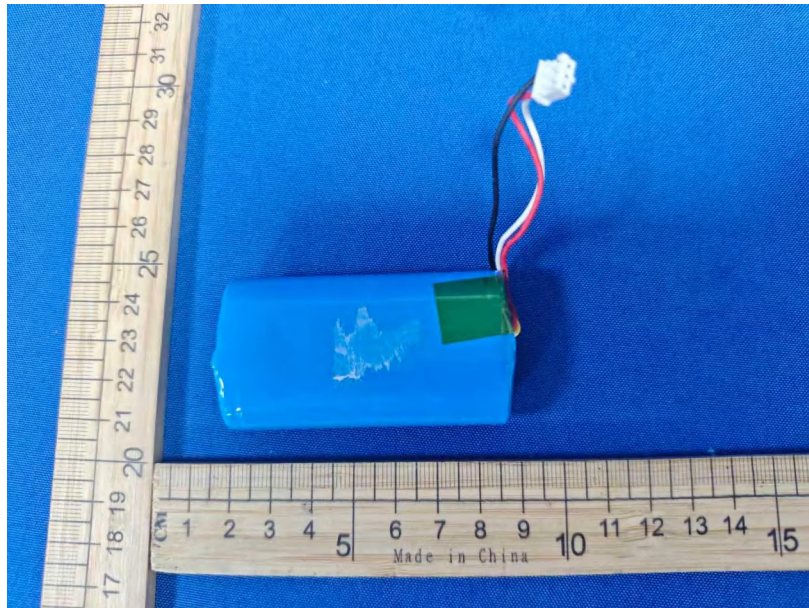








Report No.: PTC26062419301E-FC02



*****THE END REPORT*****