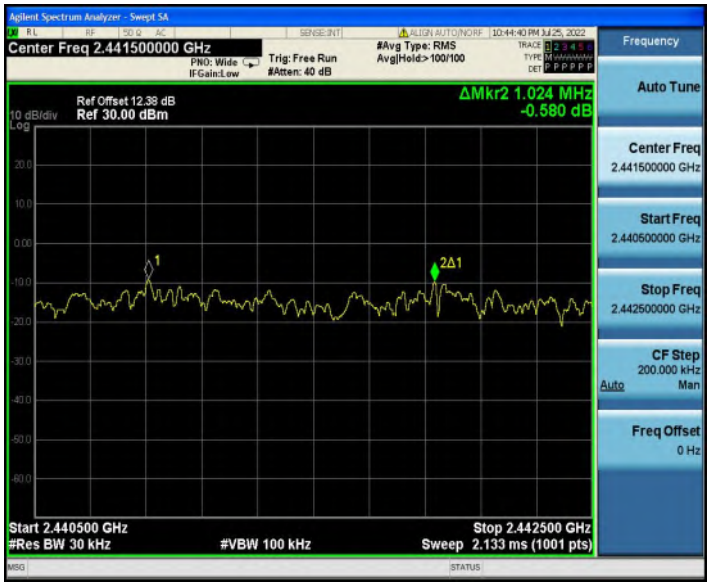
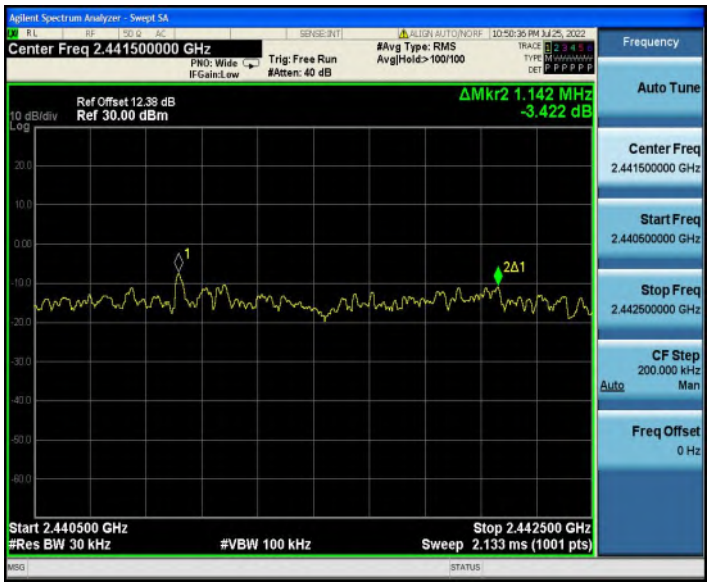
TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.822	≥0.640	PASS
2DH5	Ant1	Hop	1.024	≥0.890	PASS
3DH5	Ant1	Hop	1.142	≥0.886	PASS

DH5_Ant1_Hop

2DH5_Ant1_Hop



3DH5_Ant1_Hop

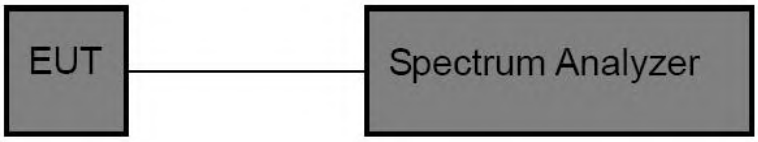


11 Number of Hopping Channel Test

11.1 Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	>15 channels

11.2 Test Setup



11.3 Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer setting:

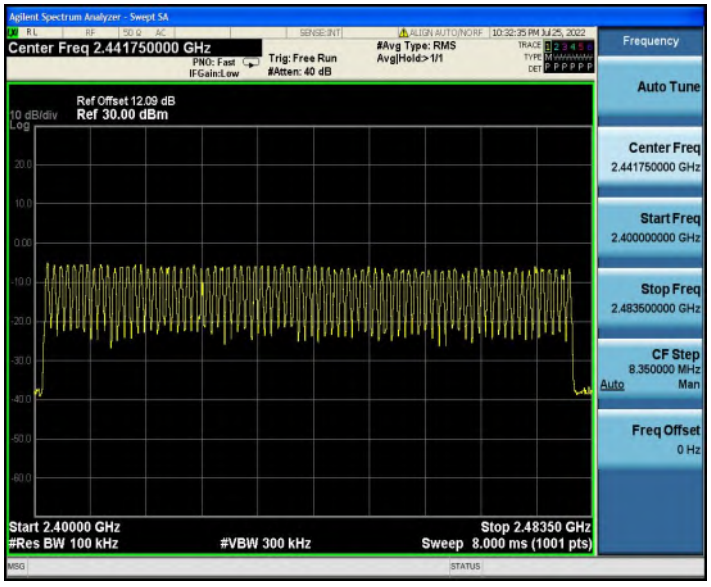
1. Span= the frequency band of operation
2. Set the RBW = 100kHz.
3. Set the VBW = 300kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

11.4 Test Data

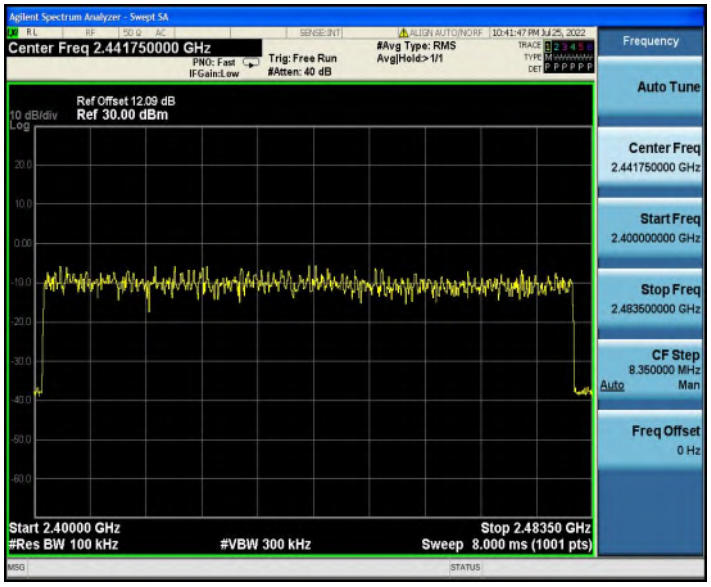
Test Item	:	Number of Hopping Frequency	Test Mode	:	CH Low ~ CH High
Test Voltage	:	AC 120V	Temperature	:	24.5℃
Test Result	:	PASS	Humidity	:	55%RH

TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

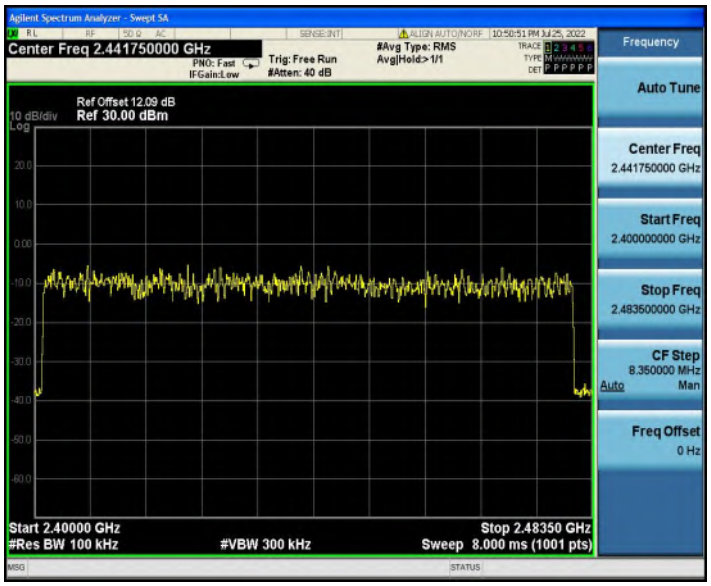
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop

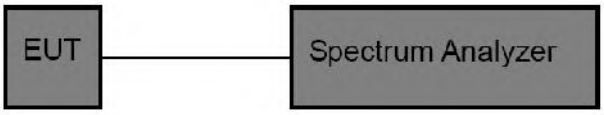


12 Dwell Time Test

12.1 Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	0.4 sec

12.2 Test Setup



12.3 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span= zero span, centered on a hopping channel
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Sweep time = as necessary to capture the entire dwell time per hopping channel.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

12.4 Test Data

Test Item	:	Time of Occupancy	Test Mode	:	CH Low ~ CH High
Test Voltage	:	AC 120V	Temperature	:	24.5℃
Test Result	:	PASS	Humidity	:	55%RH

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.40	320	0.126	≤0.4	PASS
DH3	Ant1	Hop	1.65	160	0.264	≤0.4	PASS
DH5	Ant1	Hop	2.90	106.67	0.309	≤0.4	PASS
2DH1	Ant1	Hop	0.40	320	0.129	≤0.4	PASS
2DH3	Ant1	Hop	1.66	160	0.265	≤0.4	PASS
2DH5	Ant1	Hop	2.90	106.67	0.31	≤0.4	PASS
3DH1	Ant1	Hop	0.41	320	0.13	≤0.4	PASS
3DH3	Ant1	Hop	1.66	160	0.265	≤0.4	PASS
3DH5	Ant1	Hop	2.91	106.67	0.31	≤0.4	PASS

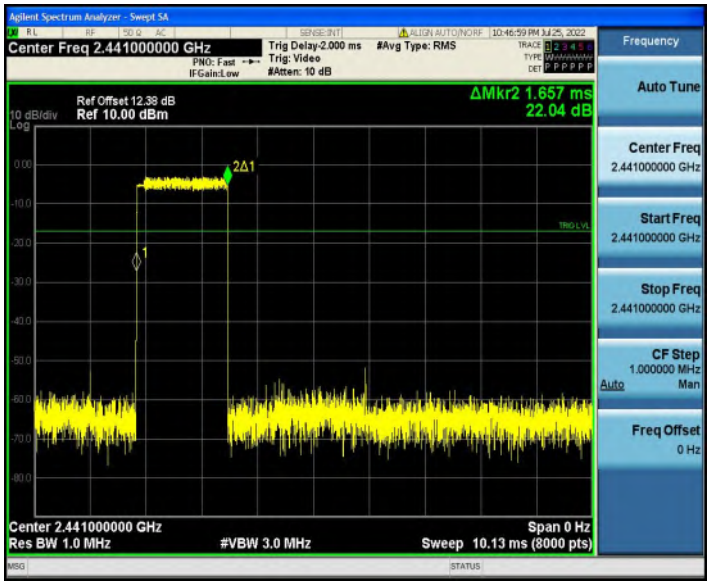
DH1_Ant1_Hop

DH3_Ant1_Hop

DH5_Ant1_Hop

2DH1_Ant1_Hop

2DH3_Ant1_Hop

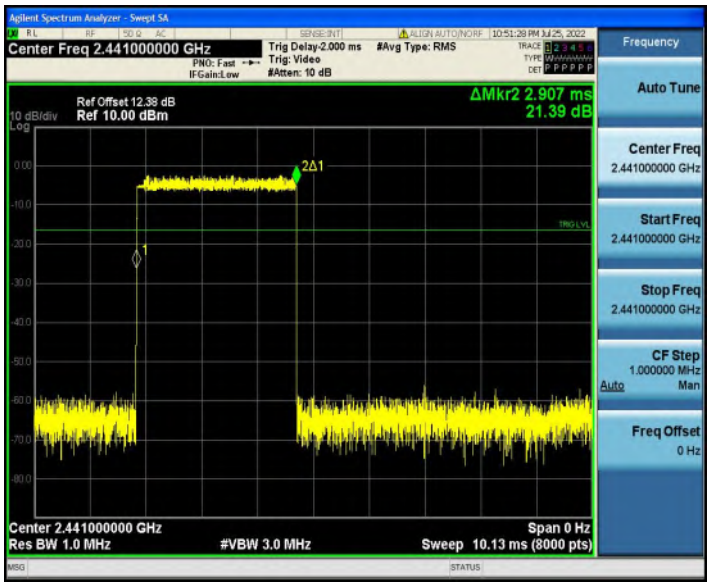


2DH5_Ant1_Hop

3DH1_Ant1_Hop

3DH3_Ant1_Hop

3DH5_Ant1_Hop

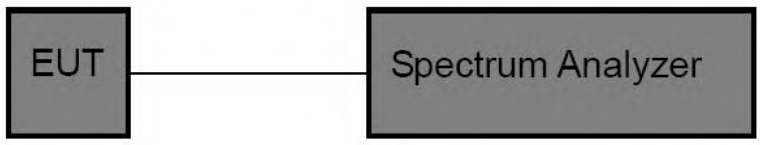


13 100kHz Bandwidth of Frequency Band Edge Requirement

13.1 Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (d)
Test Limit	in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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).

13.2 Test Setup



13.3 Test Procedure

The EUT must have its hopping/Non-hopping function enabled. Using the following spectrum analyzer setting:

1. Set the RBW = 100kHz.

2. Set the VBW = 300kHz.

3. Sweep time = auto couple.

4. Detector function = peak.

5. Trace mode = max hold.

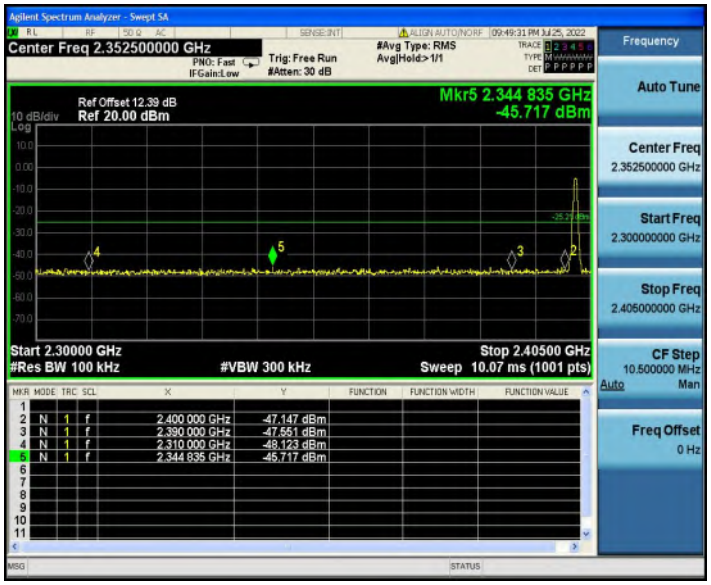
6. Allow trace to fully stabilize.

13.4 Test Data

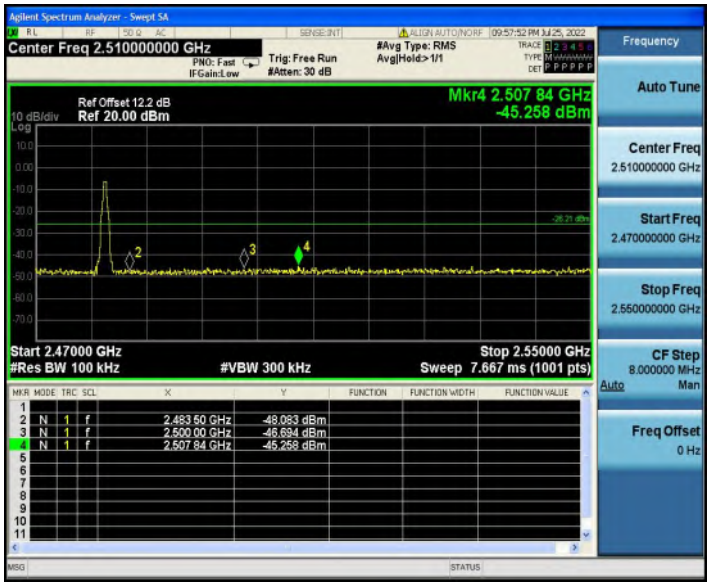
Test Item	:	Band edge	Test Mode	:	CH Low ~ CH High
Test Voltage	:	AC 120V	Temperature	:	24.5℃
Test Result	:	PASS	Humidity	:	55%RH

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-5.21	-45.72	≤-25.21	PASS
		High	2480	-6.21	-45.26	≤-26.21	PASS
		Low	Hop_2402	-5.17	-46.48	≤-25.17	PASS
		High	Hop_2480	-5.95	-44.95	≤-25.95	PASS
2DH5	Ant1	Low	2402	-5.02	-45.53	≤-25.02	PASS
		High	2480	-6.45	-45.14	≤-26.45	PASS
		Low	Hop_2402	-7.54	-45.77	≤-27.54	PASS
		High	Hop_2480	-6.72	-45.01	≤-26.72	PASS
3DH5	Ant1	Low	2402	-4.76	-45.8	≤-24.76	PASS
		High	2480	-6.34	-44.91	≤-26.34	PASS
		Low	Hop_2402	-7.13	-46.37	≤-27.13	PASS
		High	Hop_2480	-7.44	-44.63	≤-27.44	PASS

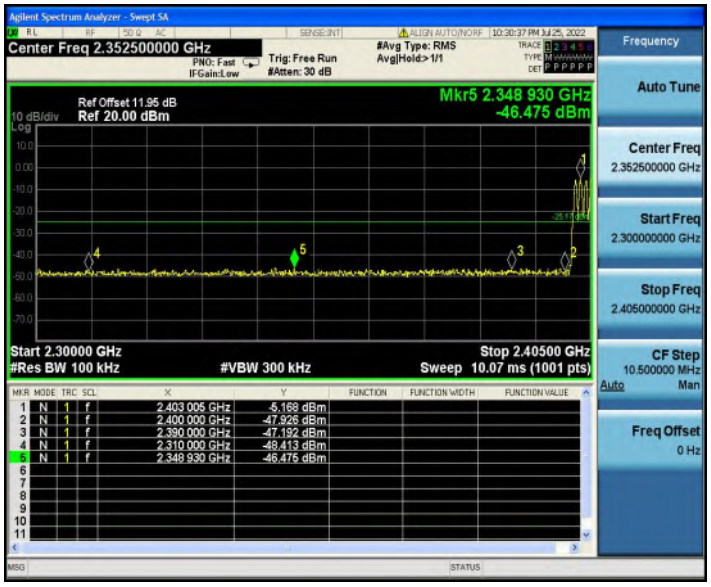
DH5_Ant1_Low_2402



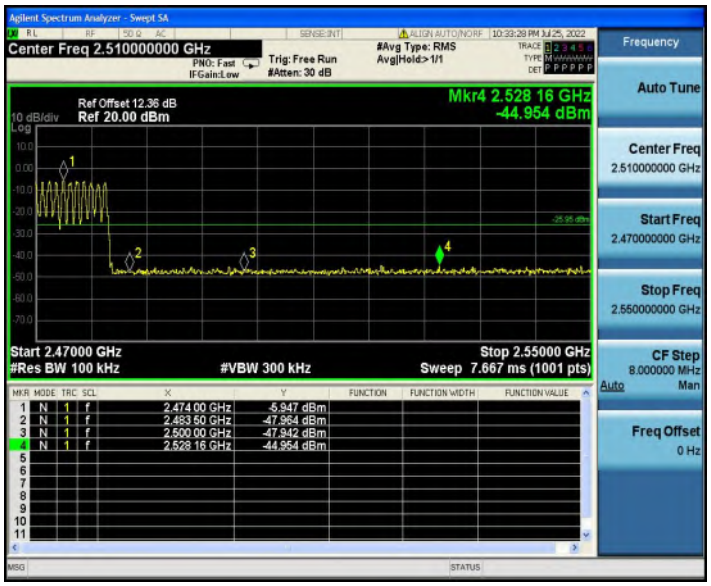
DH5_Ant1_High_2480



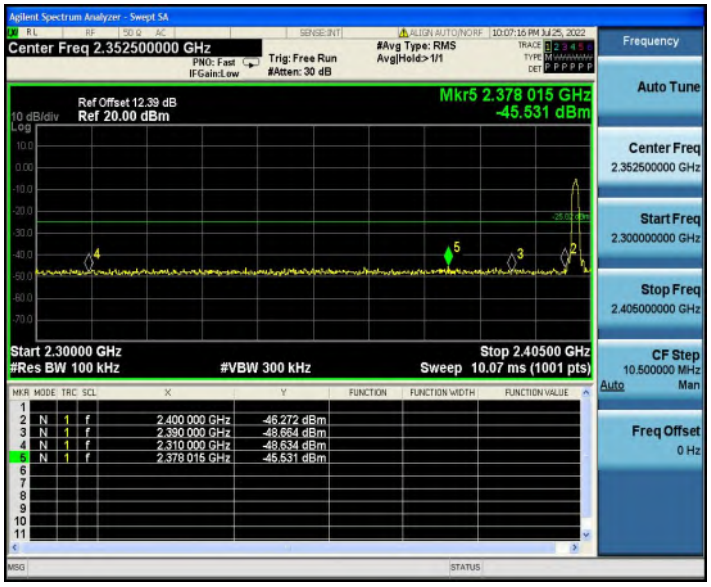
DH5_Ant1_Low_Hop_2402



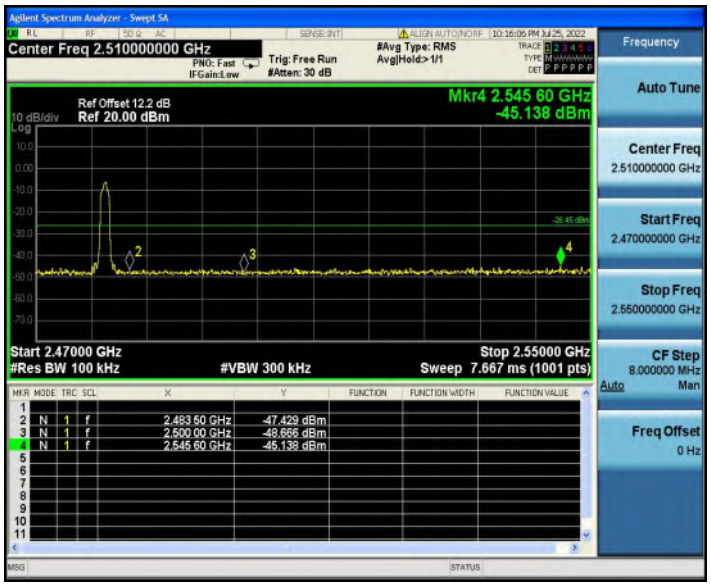
DH5_Ant1_High_Hop_2480



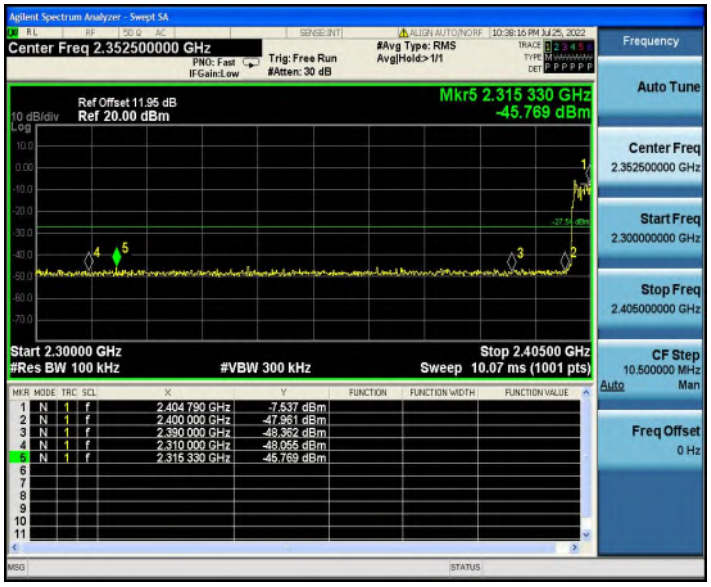
2DH5_Ant1_Low_2402



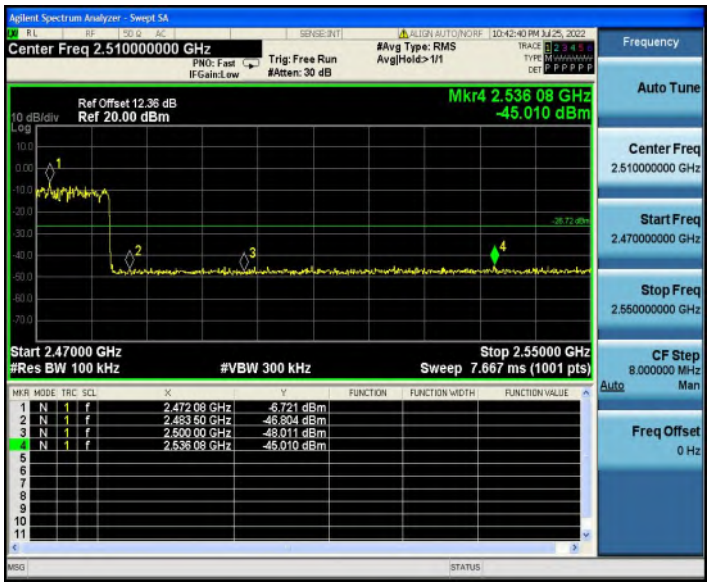
2DH5_Ant1_High_2480



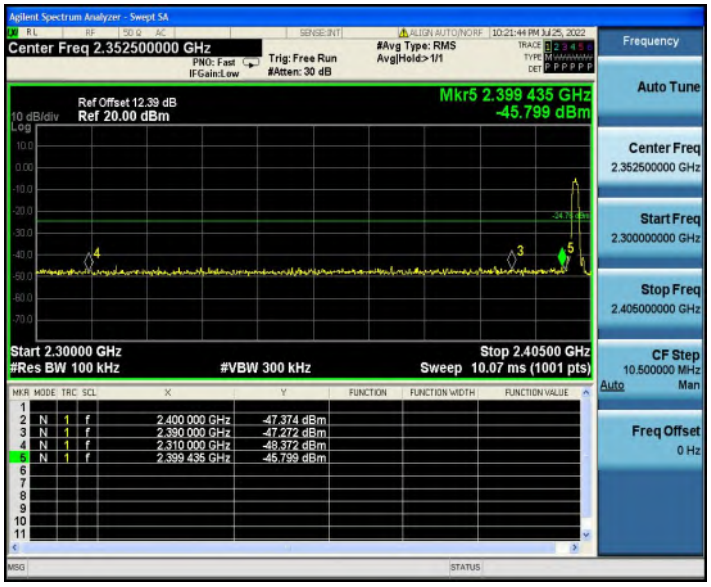
2DH5_Ant1_Low_Hop_2402



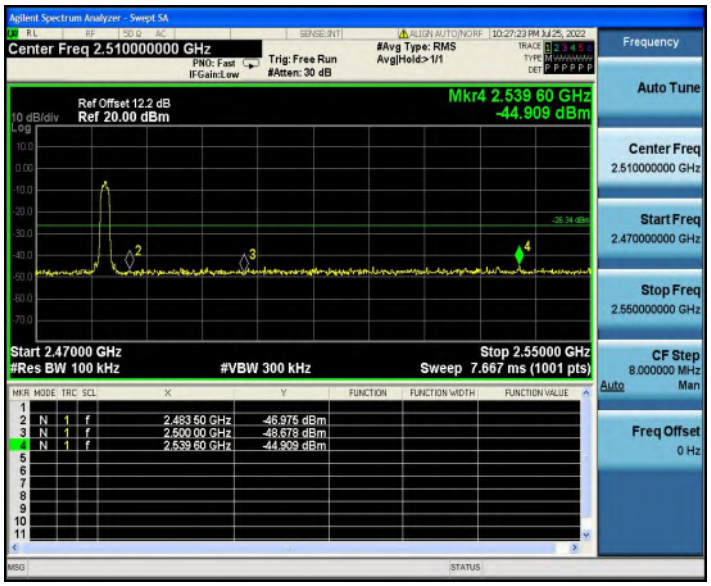
2DH5_Ant1_High_Hop_2480



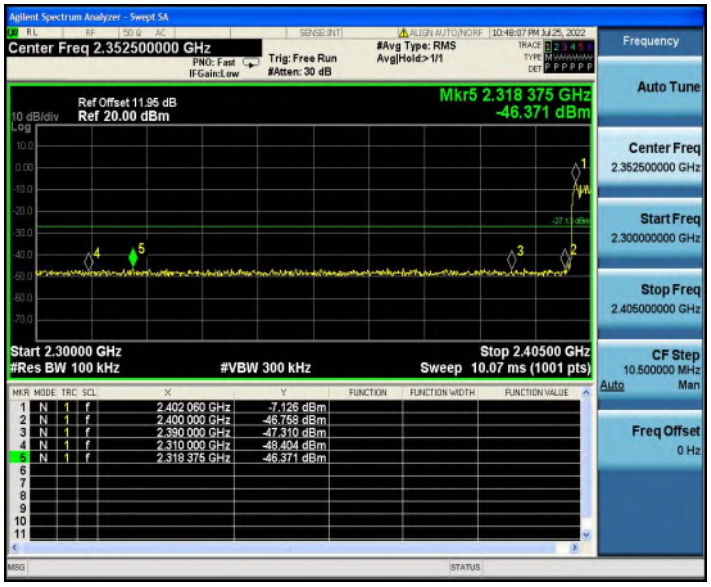
3DH5_Ant1_Low_2402



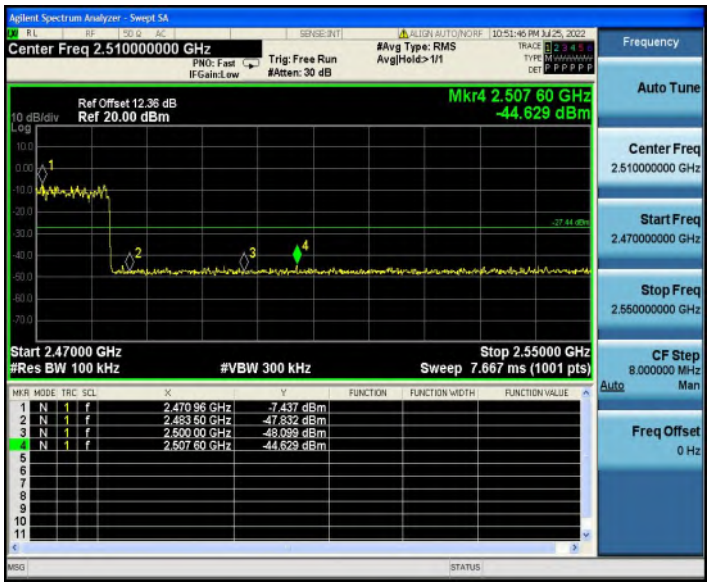
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



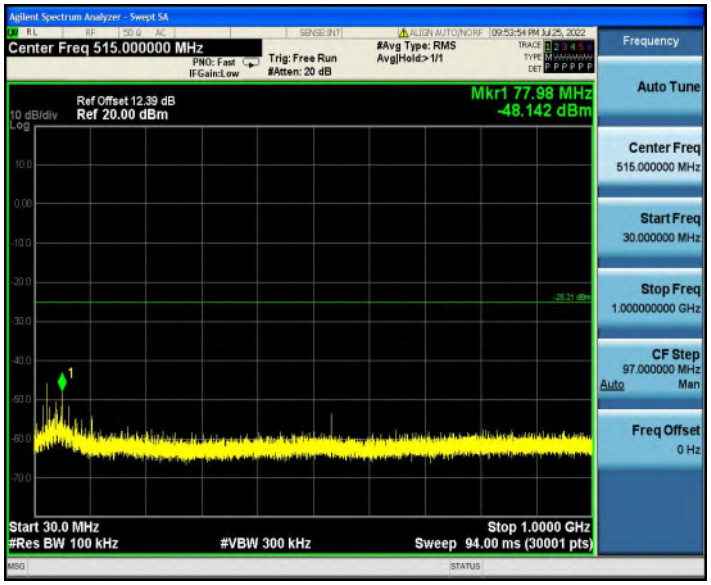
Conducted Emission Method

Test Result

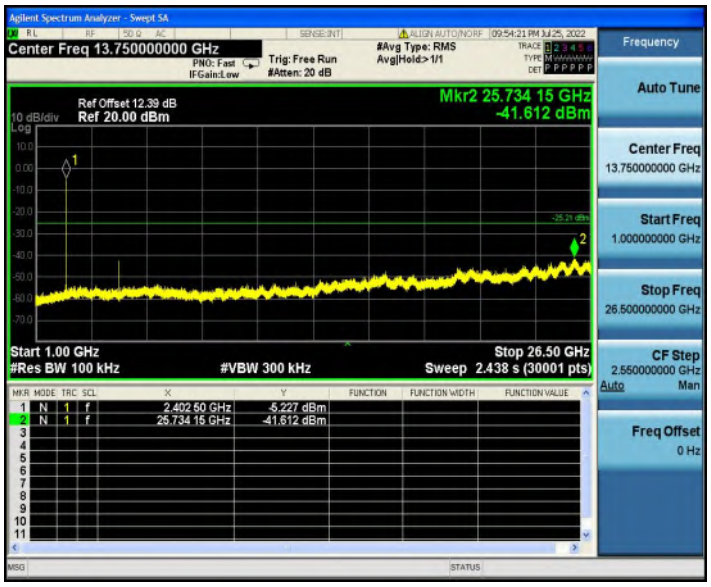
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	30~1000	-5.21	-48.14	≤-25.21	PASS
			1000~26500	-5.21	-41.61	≤-25.21	PASS
		2441	30~1000	-5.36	-47.03	≤-25.36	PASS
			1000~26500	-5.36	-41.41	≤-25.36	PASS
		2480	30~1000	-6.21	-46.31	≤-26.21	PASS
			1000~26500	-6.21	-42.01	≤-26.21	PASS
2DH5	Ant1	2402	30~1000	-5.02	-47.24	≤-25.02	PASS
			1000~26500	-5.02	-41.89	≤-25.02	PASS
		2441	30~1000	-5.47	-39.84	≤-25.47	PASS
			1000~26500	-5.47	-40.22	≤-25.47	PASS
		2480	30~1000	-6.45	-46.58	≤-26.45	PASS
			1000~26500	-6.45	-40.98	≤-26.45	PASS
3DH5	Ant1	2402	30~1000	-4.76	-45.6	≤-24.76	PASS
			1000~26500	-4.76	-41.49	≤-24.76	PASS
		2441	30~1000	-5.24	-45.21	≤-25.24	PASS
			1000~26500	-5.24	-41.39	≤-25.24	PASS
		2480	30~1000	-6.34	-36.17	≤-26.34	PASS
			1000~26500	-6.34	-41.83	≤-26.34	PASS

Test Graphs

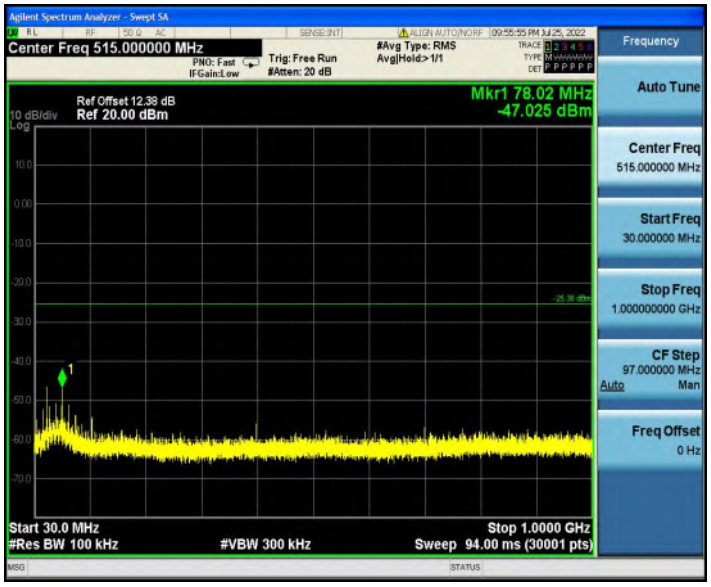
DH5_Ant1_2402_30~1000



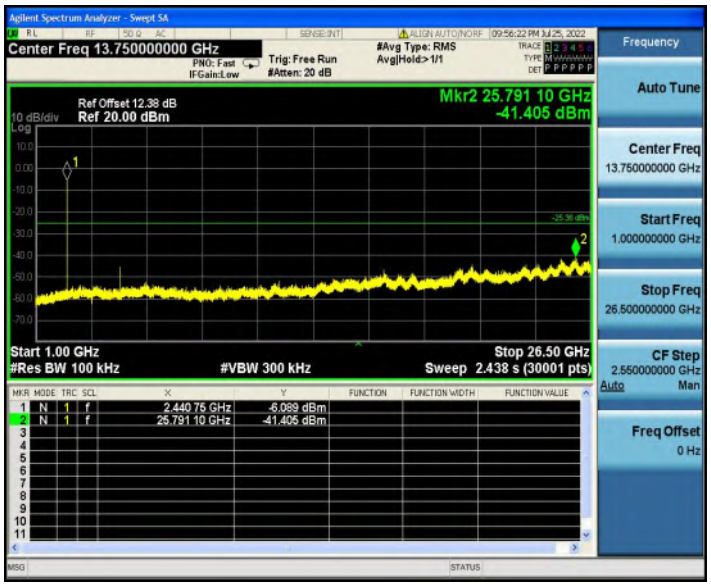
DH5_Ant1_2402_1000~26500



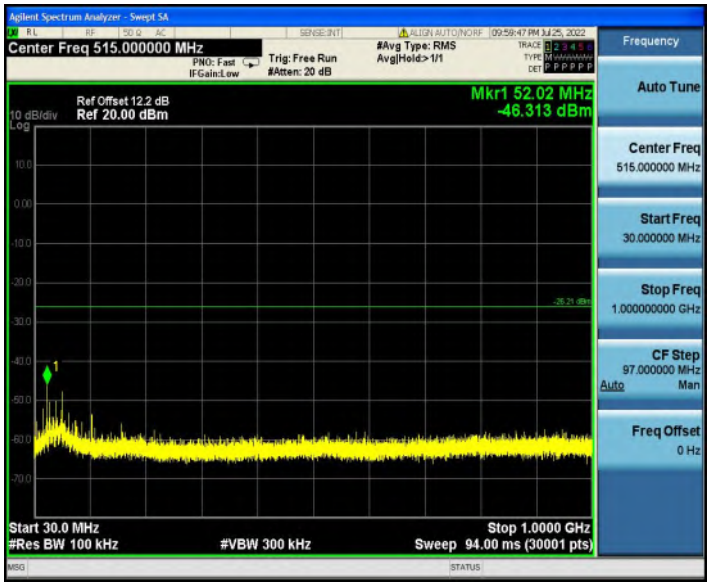
DH5_Ant1_2441_30~1000



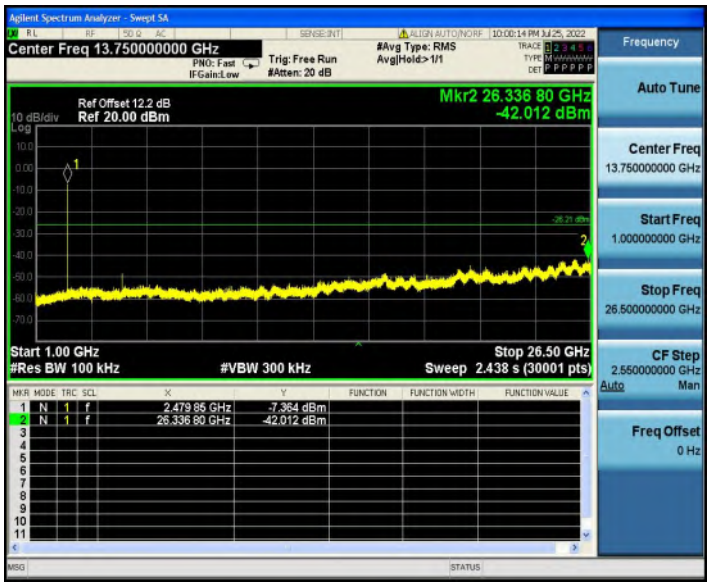
DH5_Ant1_2441_1000~26500



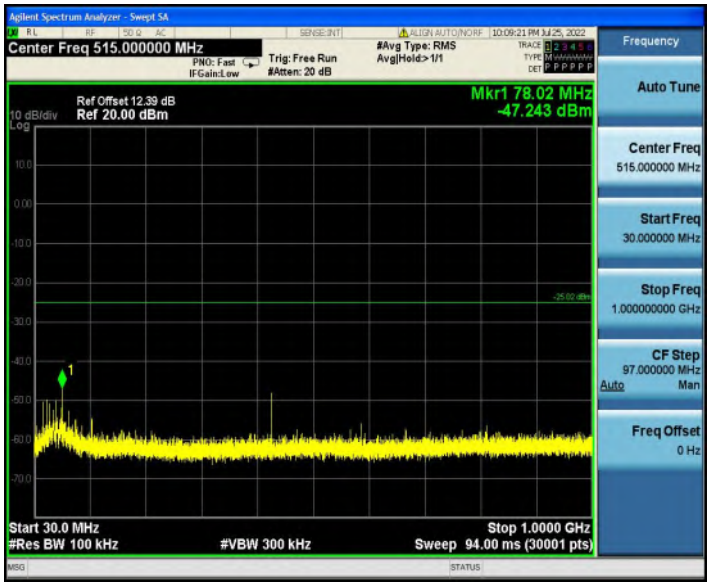
DH5_Ant1_2480_30~1000



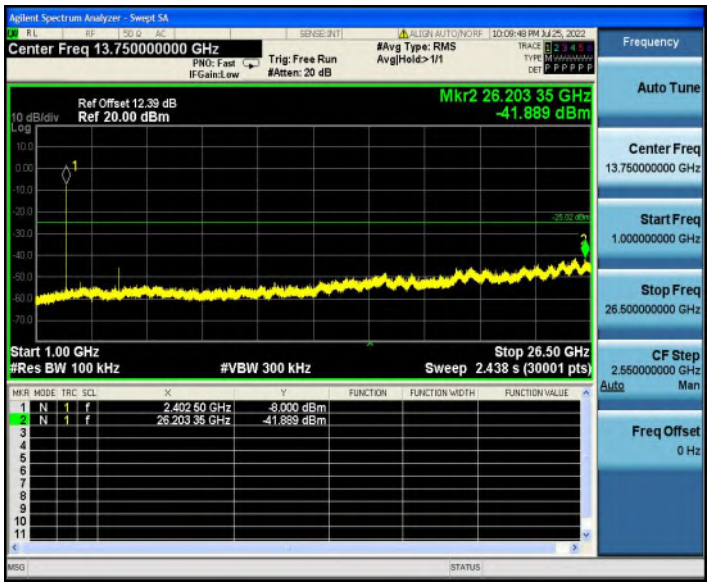
DH5_Ant1_2480_1000~26500



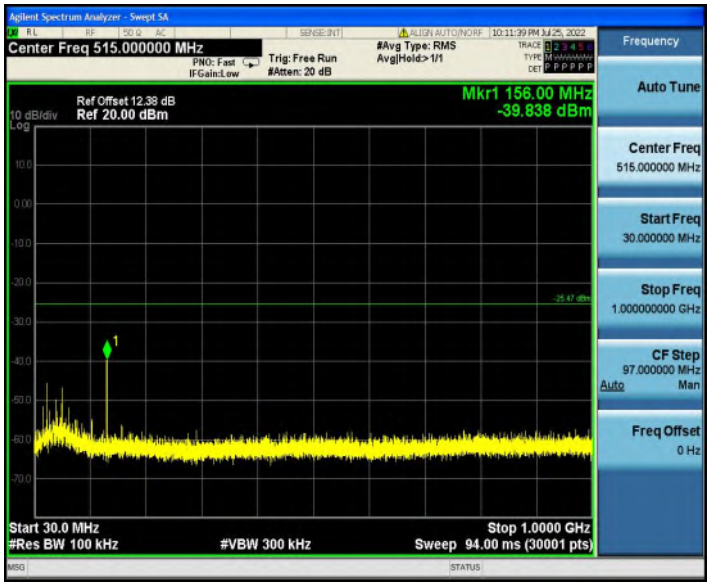
2DH5_Ant1_2402_30~1000



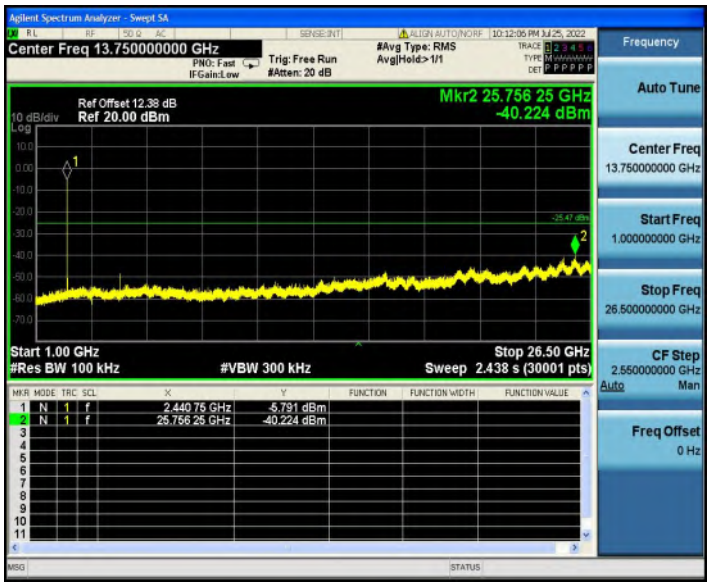
2DH5_Ant1_2402_1000~26500



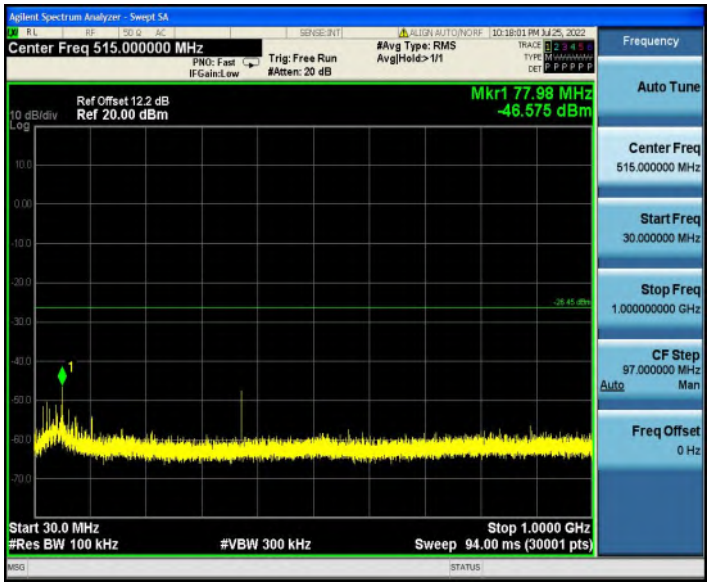
2DH5_Ant1_2441_30~1000



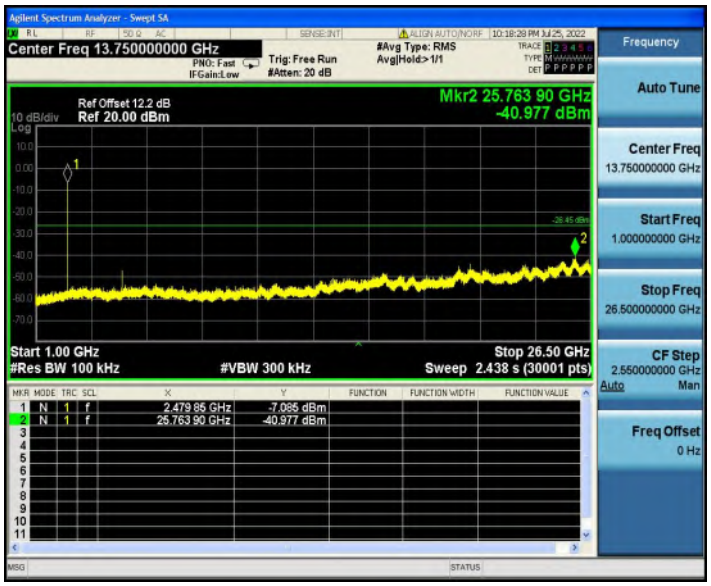
2DH5_Ant1_2441_1000~26500



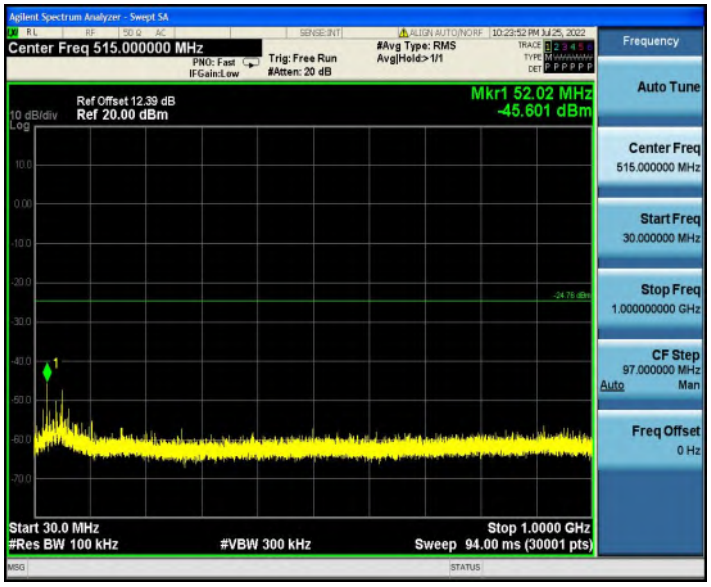
2DH5_Ant1_2480_30~1000



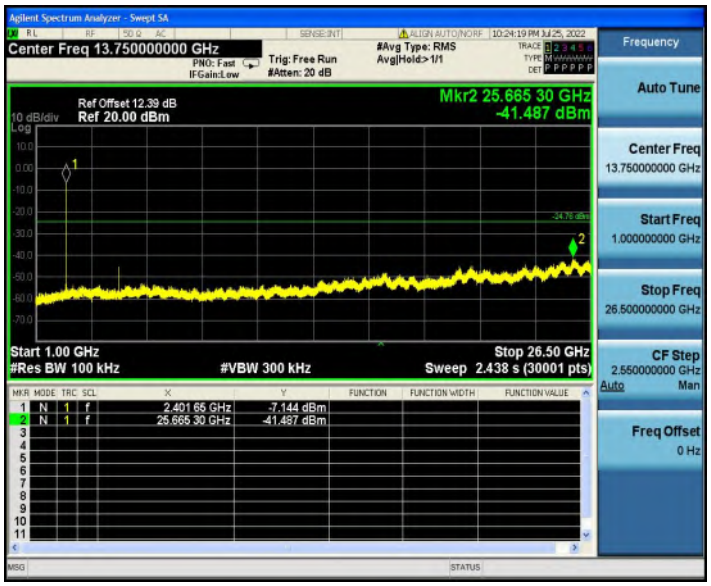
2DH5_Ant1_2480_1000~26500



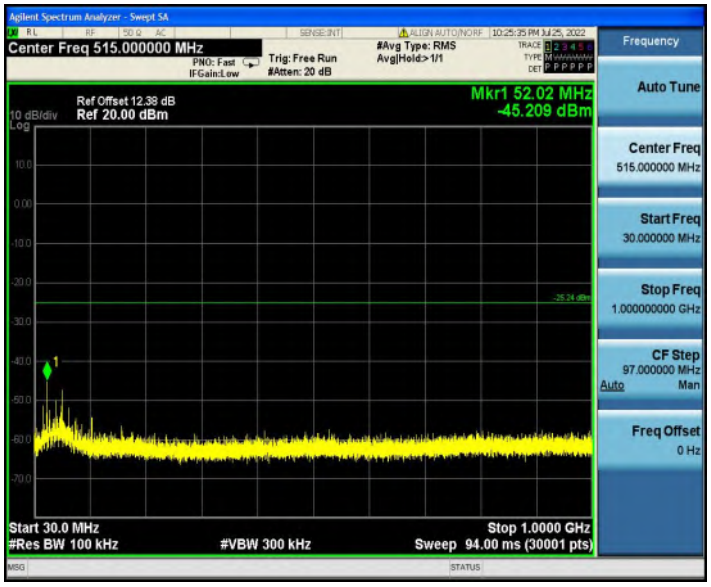
3DH5_Ant1_2402_30~1000



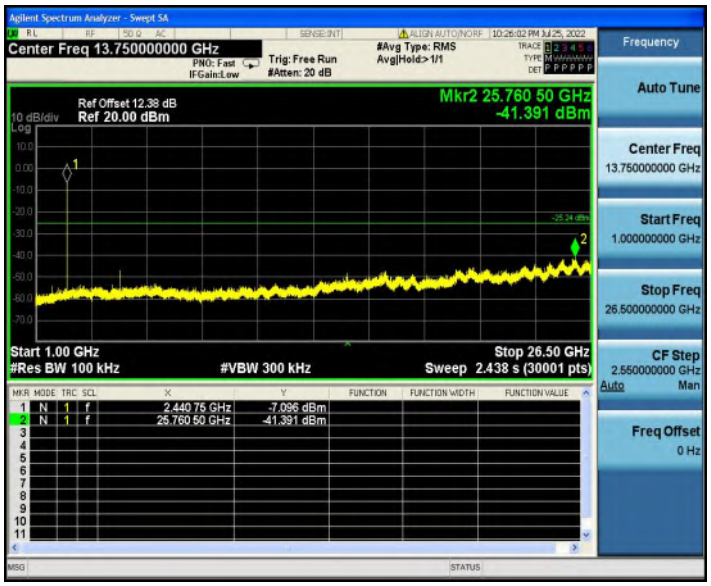
3DH5_Ant1_2402_1000~26500



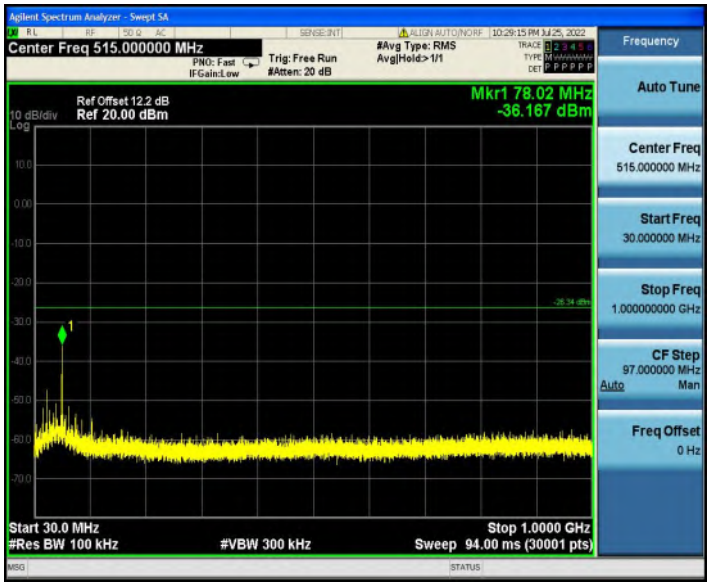
3DH5_Ant1_2441_30~1000



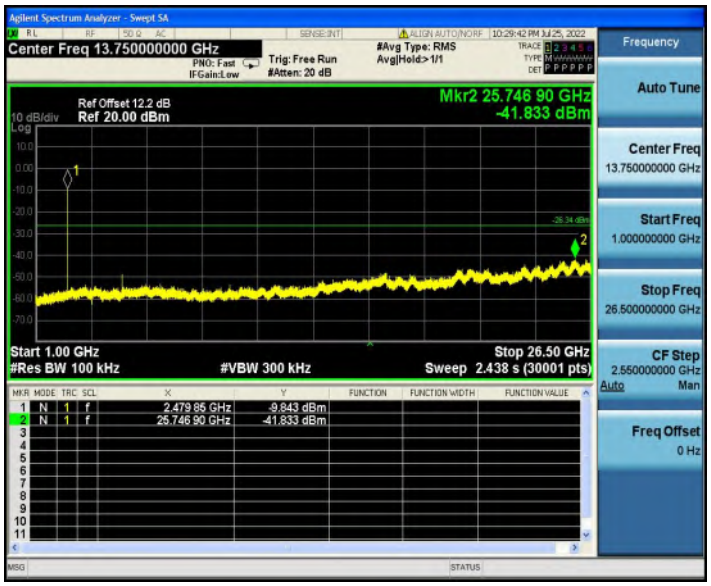
3DH5_Ant1_2441_1000~26500



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



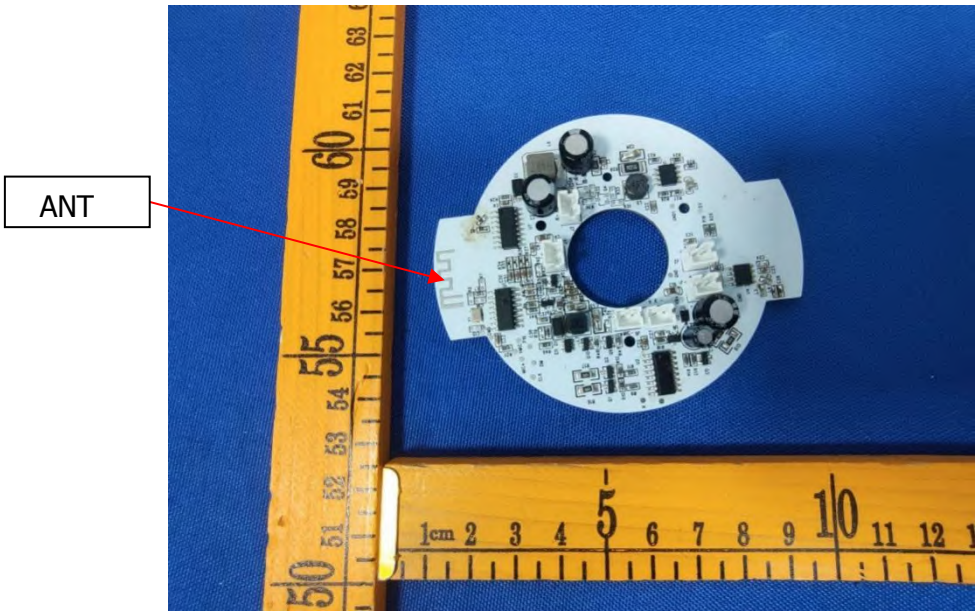
14 Antenna Requirement

14.1 Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	1) 15.203 requirement: 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 2) 15.247(c) (1)(i) requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

14.2 Antenna Connected Construction

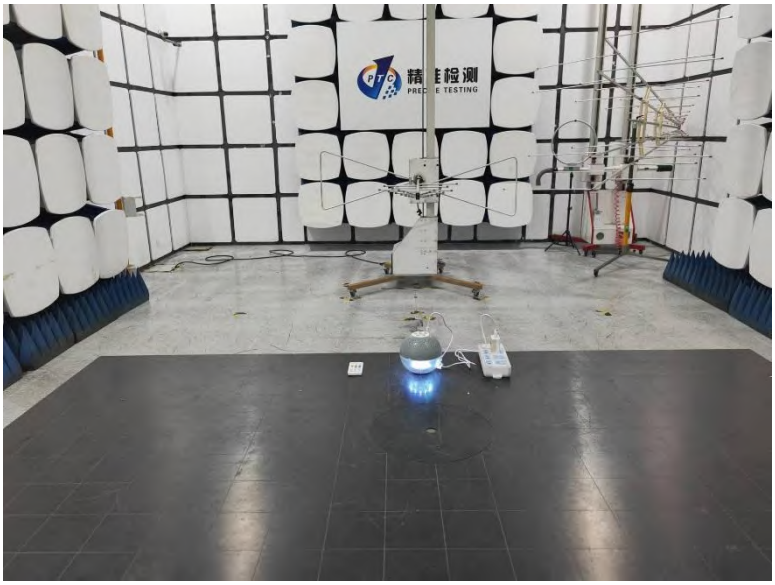
The antenna is PCB Antenna which permanently attached, and the best case gain of the antenna is 2.51dBi. It complies with the standard requirement.



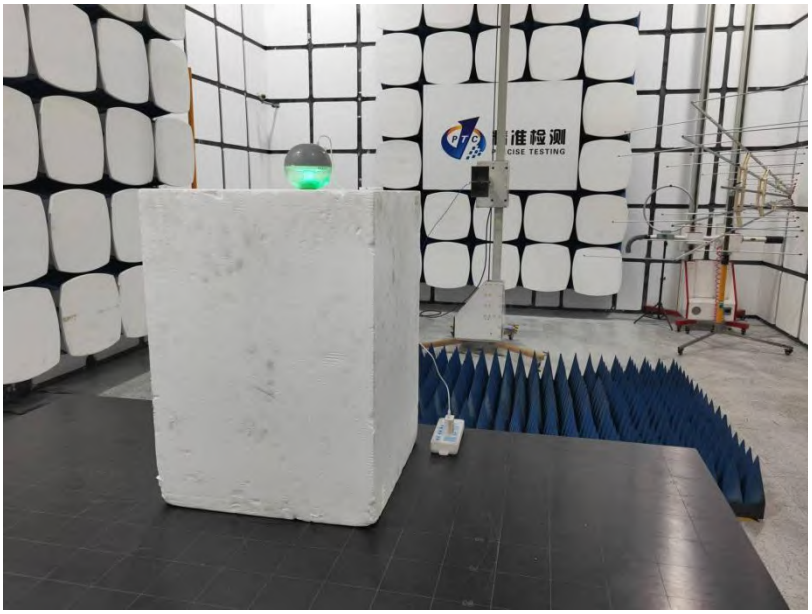
15 APPENDIX I -- TEST SETUP PHOTOGRAPH

Conducted Emissions

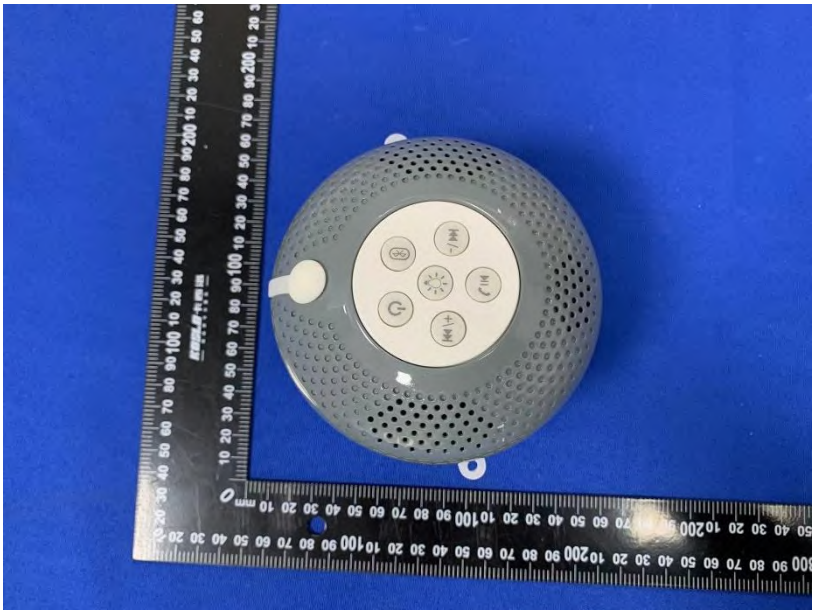
Radiated Emissions
From 30M-1GHz

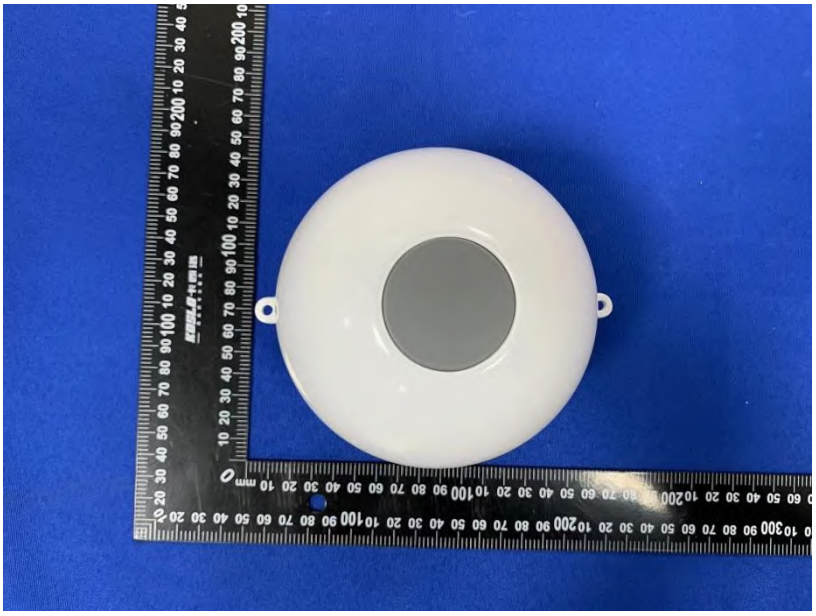


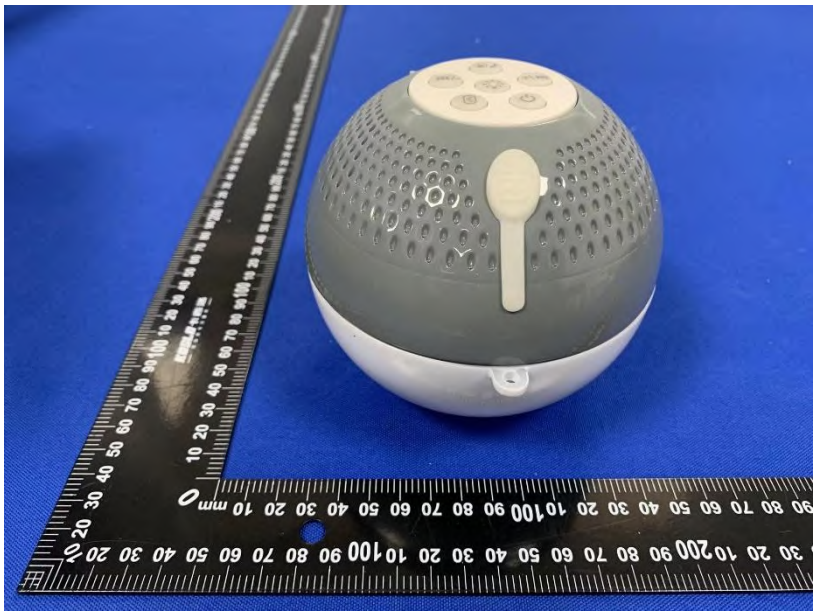
Above 1GHz

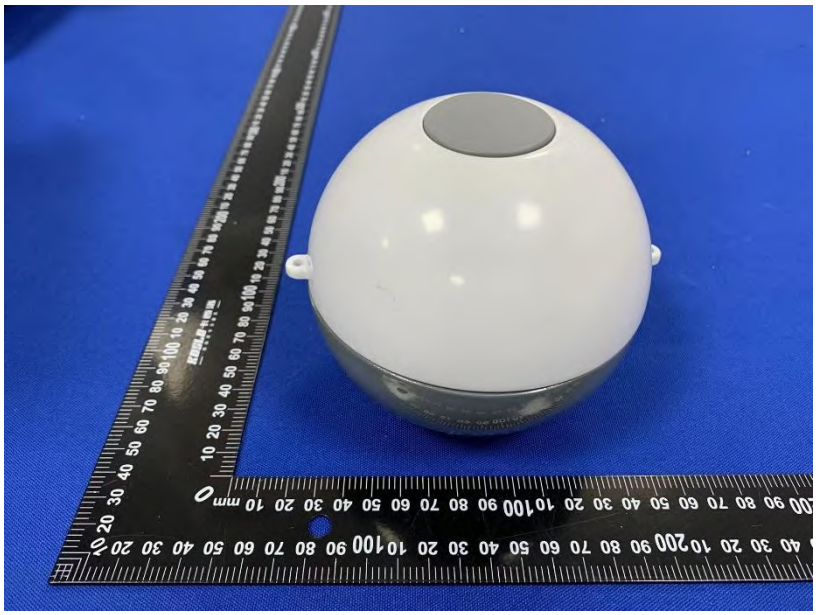


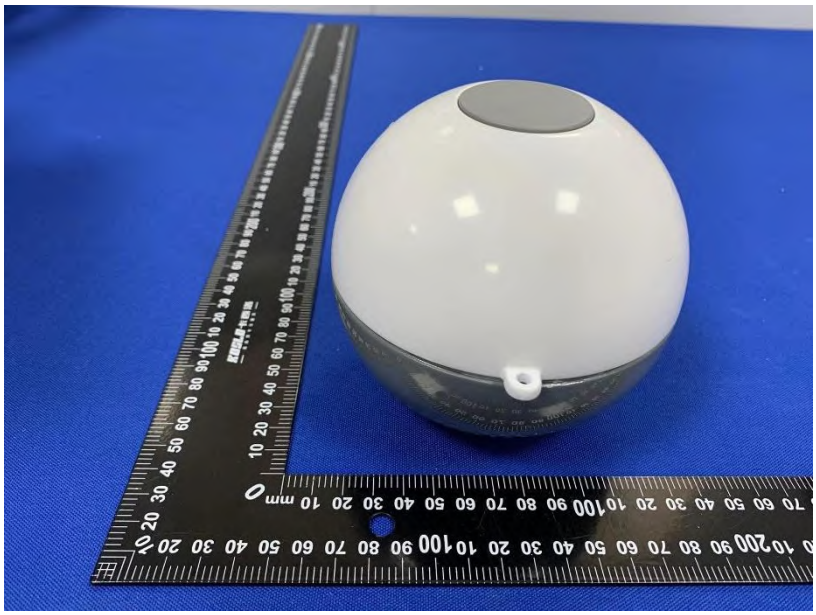
16 APPENDIX II -- EUT PHOTOGRAPH

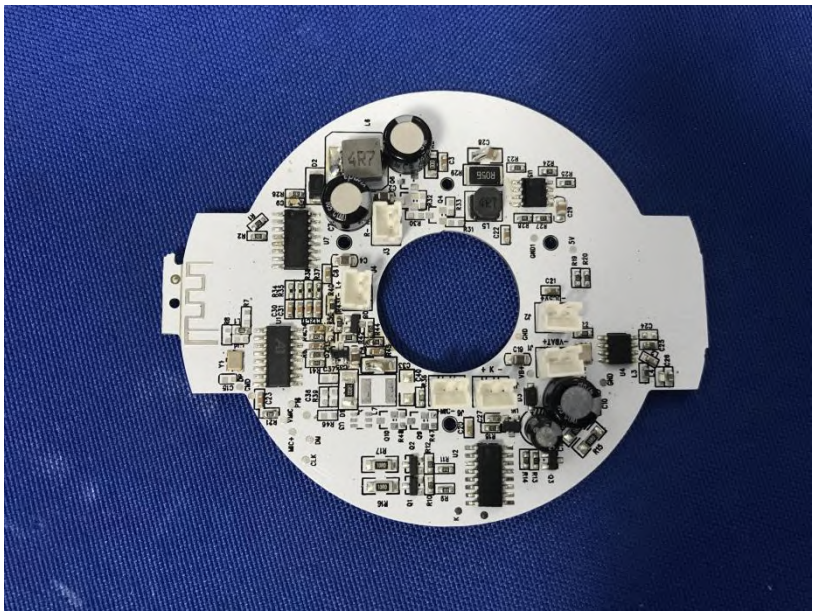


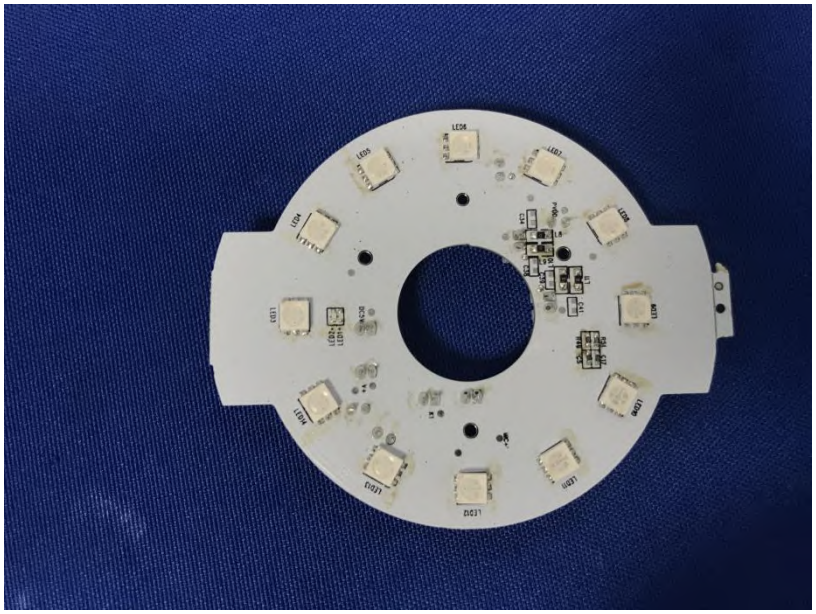


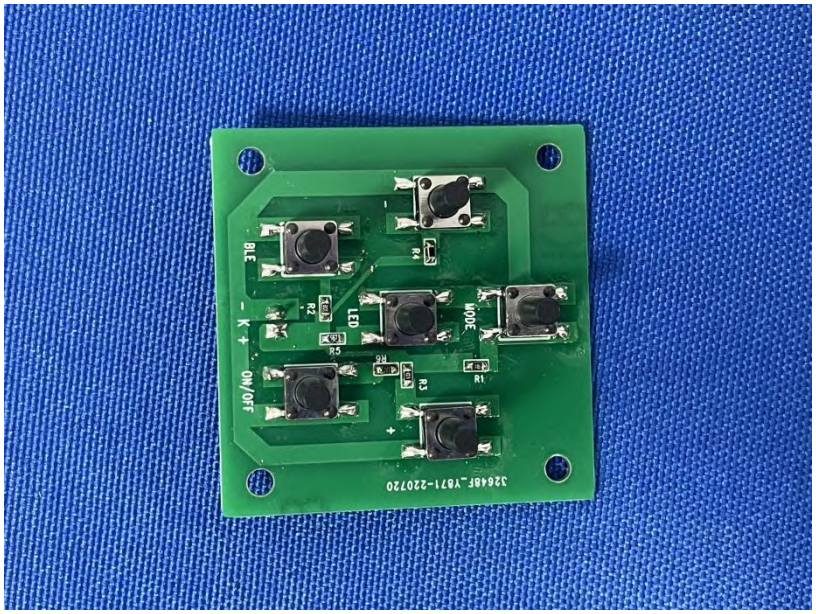


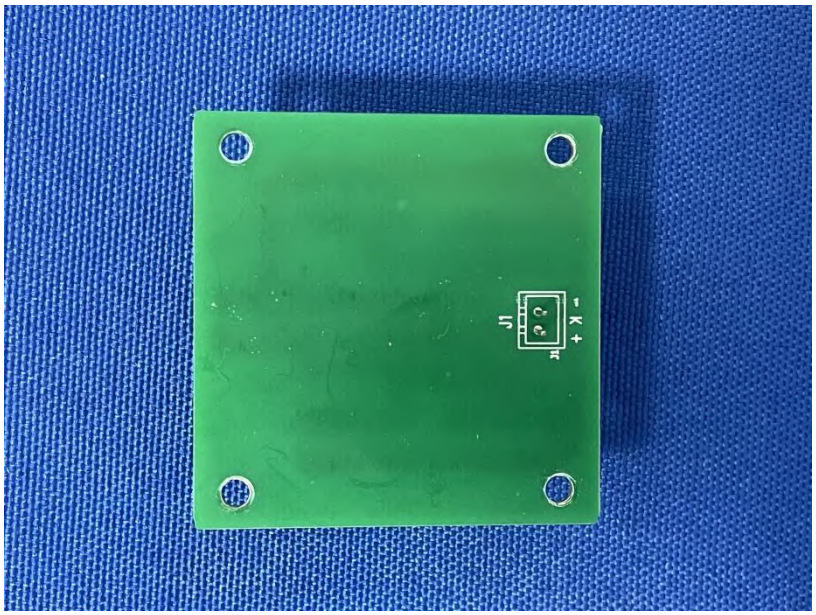


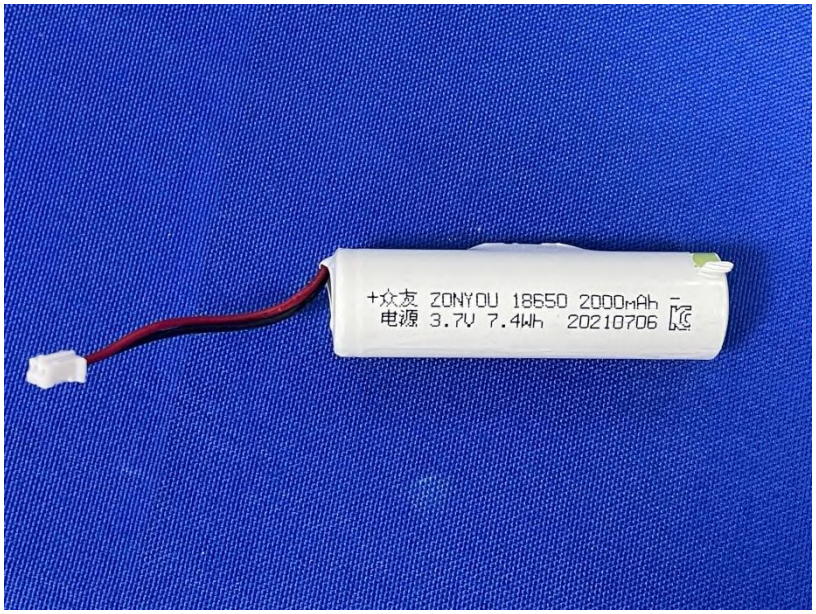


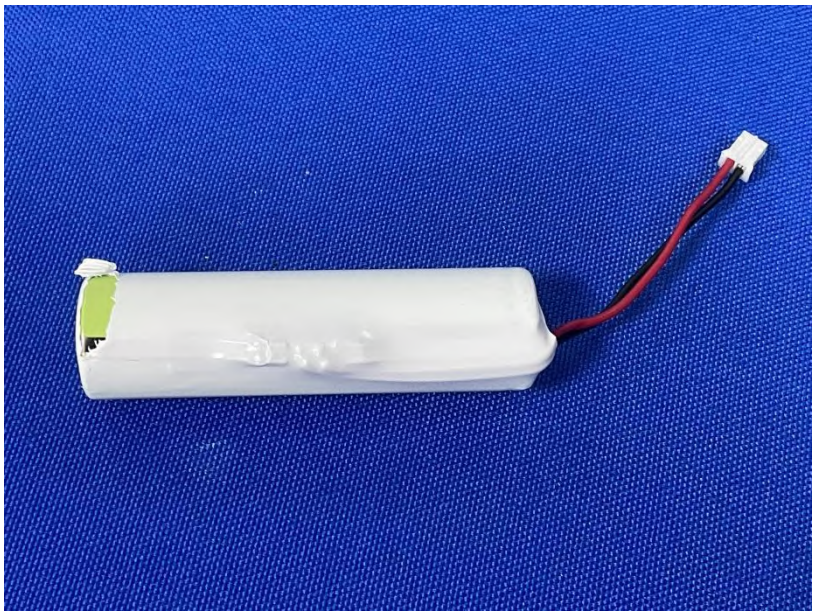





BLE
- K +
ON/OFF
LED
MODE
R1
R2
R3
R4
R5
326ABF_V871-220720


J1
- K +





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