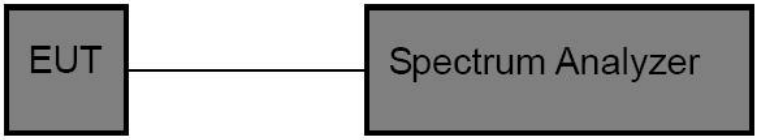
# 13 100kHz Bandwidth of Frequency Band Edge Requirement

## 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.

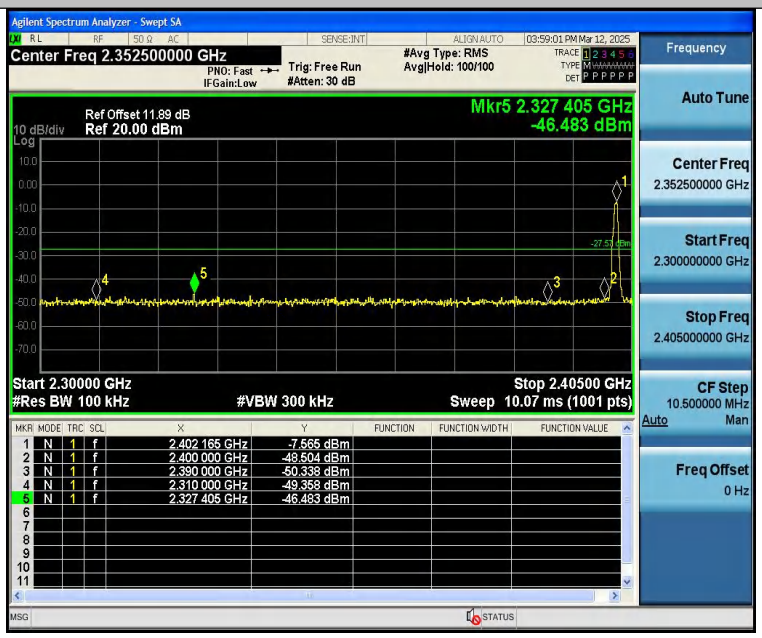
## 13.4 Test Data

| | | | | | |
|---|---|---|---|---|---|
| Test Item | : | Band edge | Test Mode | : | CH Low ~ CH High |
| Test Voltage | : | 3.3V | Temperature | : | 24.5℃ |
| Test Result | : | PASS | Humidity | : | 55%RH |

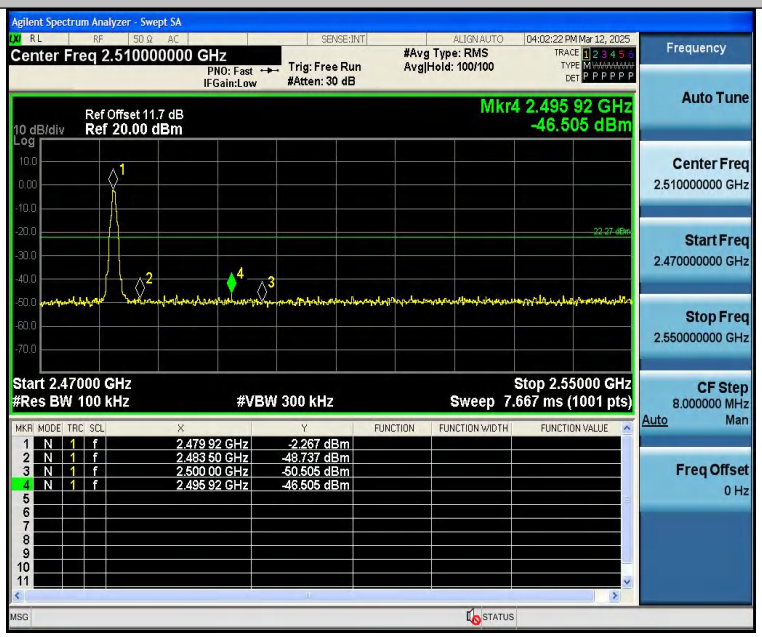
| TestMode | Antenna | ChName | Frequency[MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | Low | 2402 | -7.57 | -46.48 | ≤-27.57 | PASS |
| DH5 | Ant1 | High | 2480 | -2.27 | -46.51 | ≤-22.27 | PASS |
| DH5 | Ant1 | Low | Hop_2402 | -7.49 | -47.02 | ≤-27.49 | PASS |
| DH5 | Ant1 | High | Hop_2480 | 1.28 | -45.07 | ≤-18.72 | PASS |
| 2DH5 | Ant1 | Low | 2402 | -7.96 | -46.78 | ≤-27.96 | PASS |
| 2DH5 | Ant1 | High | 2480 | -2.46 | -47.04 | ≤-22.46 | PASS |
| 2DH5 | Ant1 | Low | Hop_2402 | -3.18 | -46.01 | ≤-23.18 | PASS |
| 2DH5 | Ant1 | High | Hop_2480 | 0.21 | -45.77 | ≤-19.79 | PASS |
| 3DH5 | Ant1 | Low | 2402 | -8.60 | -46.56 | ≤-28.6 | PASS |
| 3DH5 | Ant1 | High | 2480 | -2.04 | -46.26 | ≤-22.04 | PASS |
| 3DH5 | Ant1 | Low | Hop_2402 | -6.38 | -46.49 | ≤-26.38 | PASS |
| 3DH5 | Ant1 | High | Hop_2480 | 1.46 | -45.57 | ≤-18.54 | PASS |

## Test Graphs:

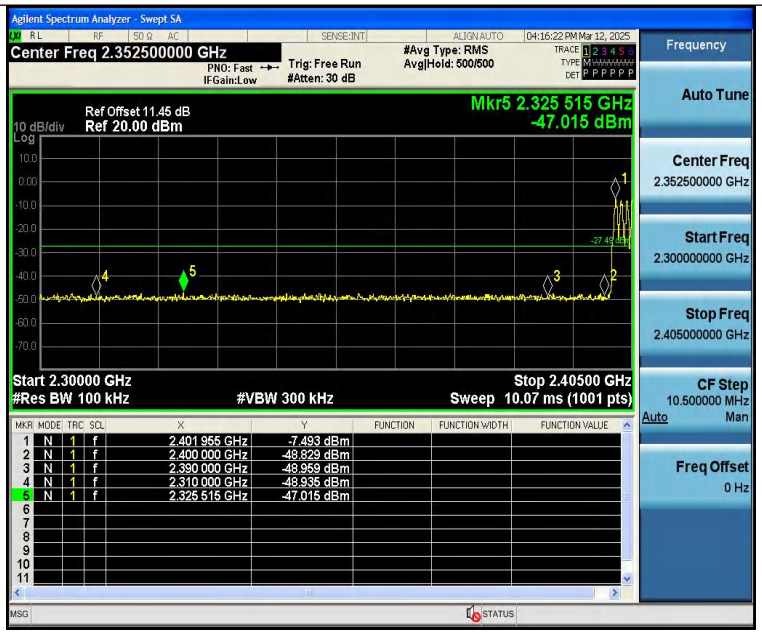
DH5-Ant1-2402-PASS



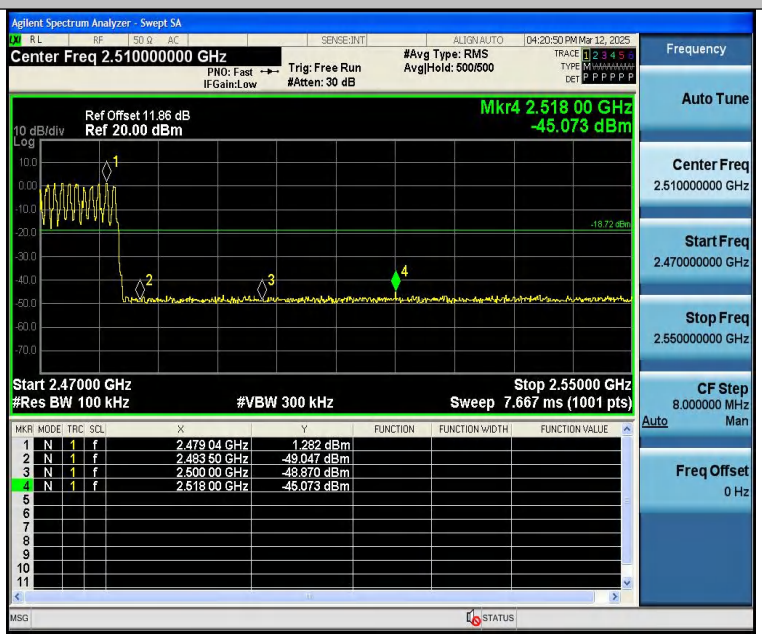

DH5-Ant1-2480-PASS



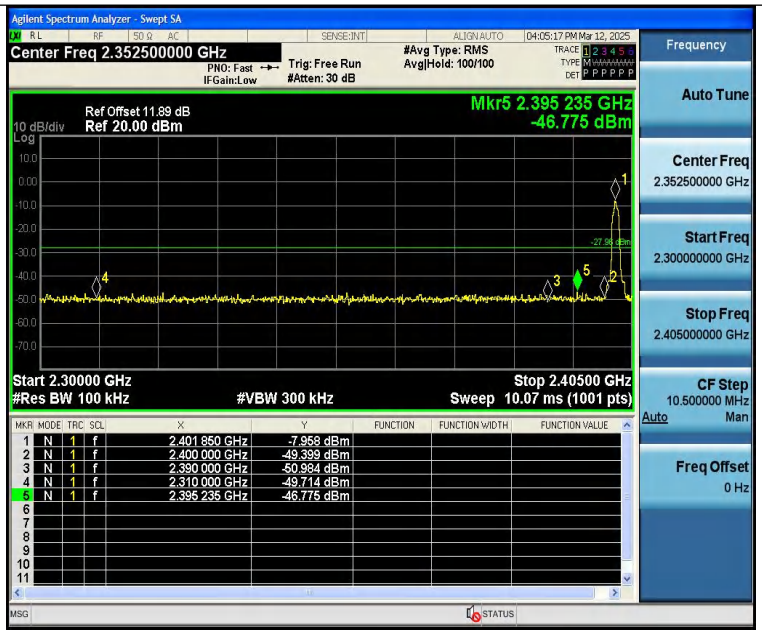

DH5-Ant1-Hop_2402-PASS



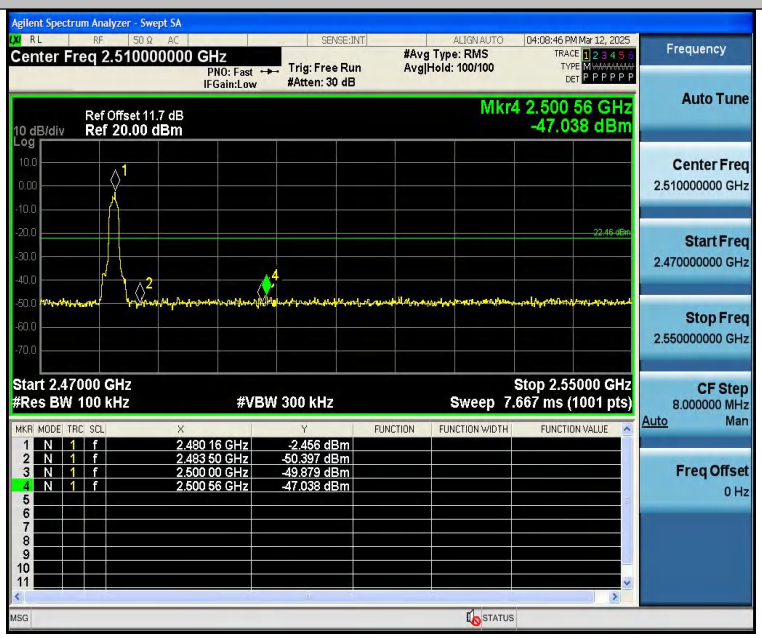

DH5-Ant1-Hop_2480-PASS



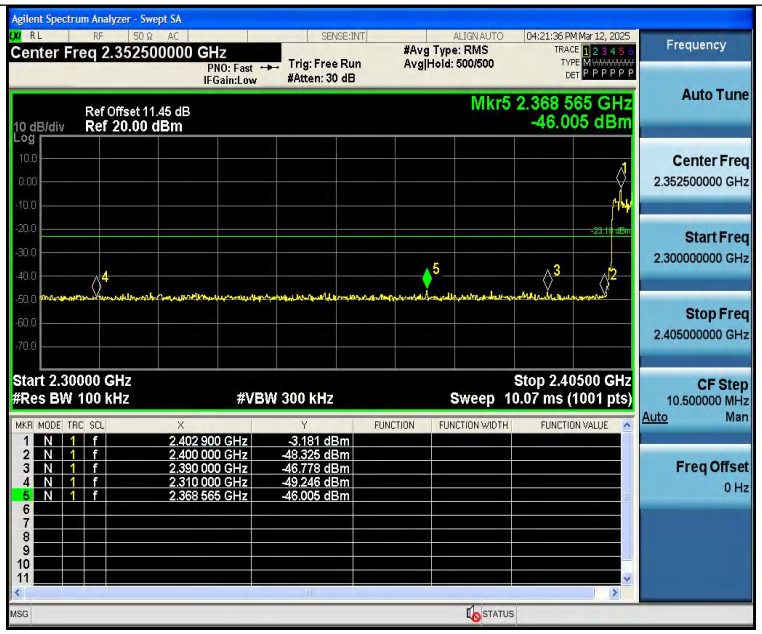

2DH5-Ant1-2402-PASS



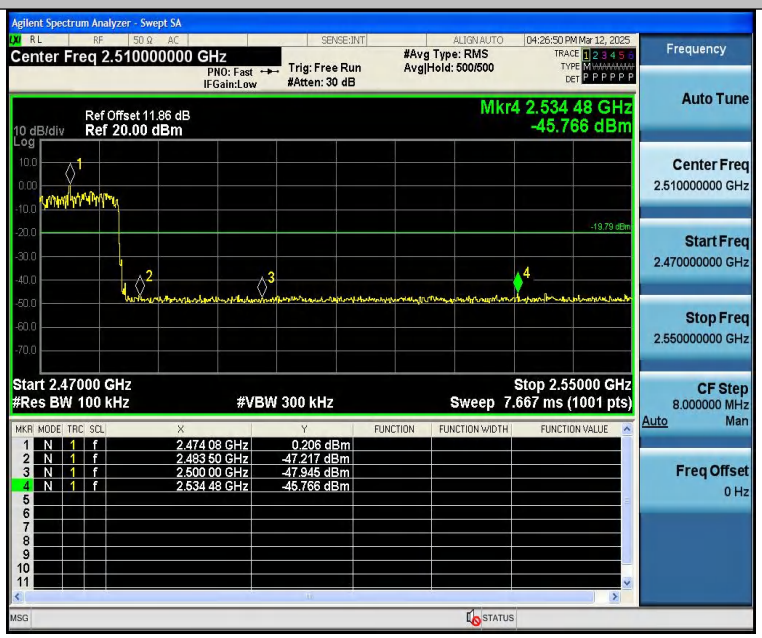

2DH5-Ant1-2480-PASS



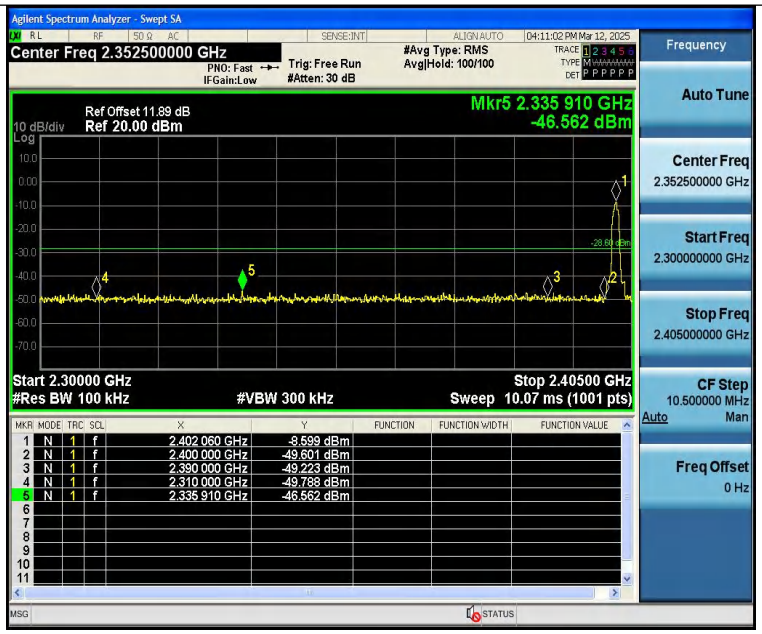

2DH5-Ant1-Hop_2402-PASS



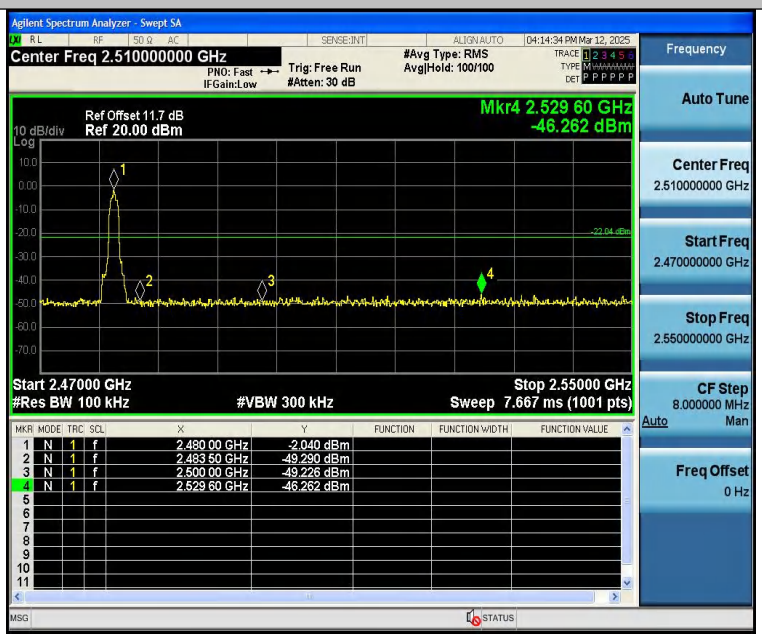

2DH5-Ant1-Hop_2480-PASS



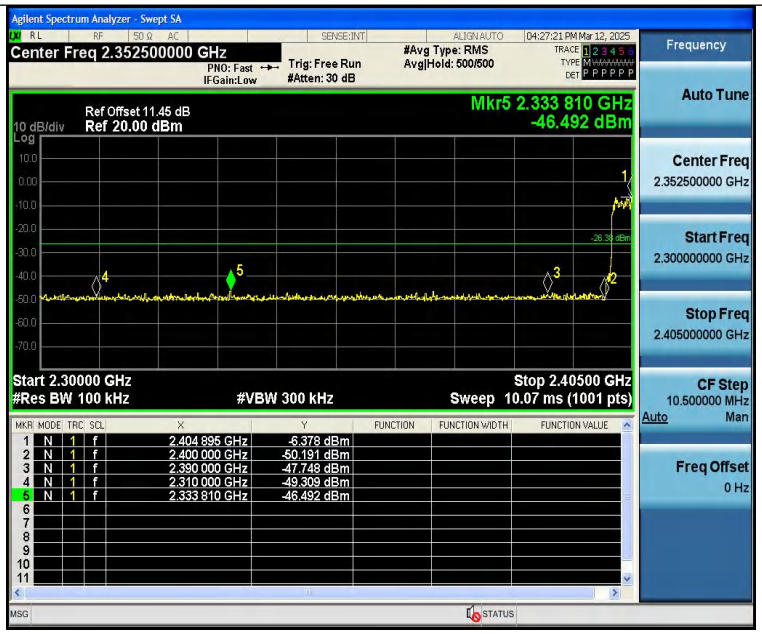

3DH5-Ant1-2402-PASS



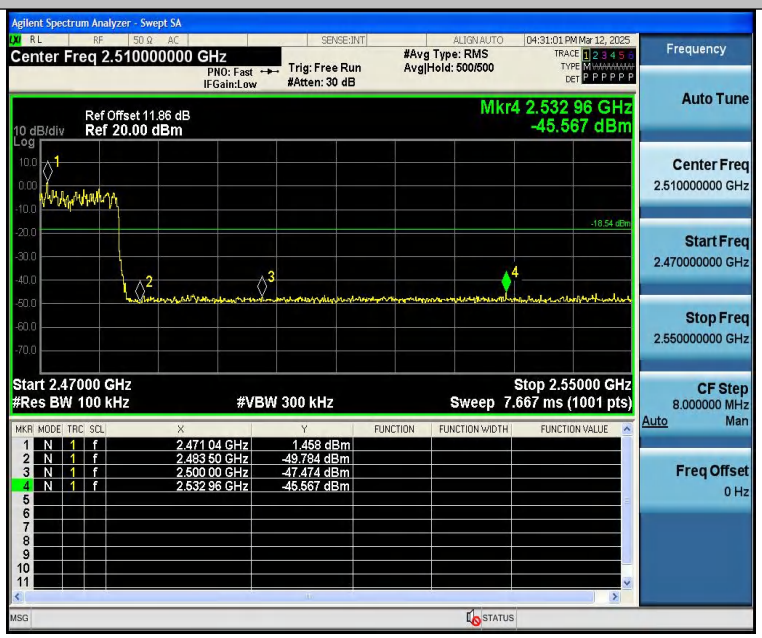

3DH5-Ant1-2480-PASS




3DH5-Ant1-Hop_2402-PASS




3DH5-Ant1-Hop_2480-PASS



Conducted Emission Method

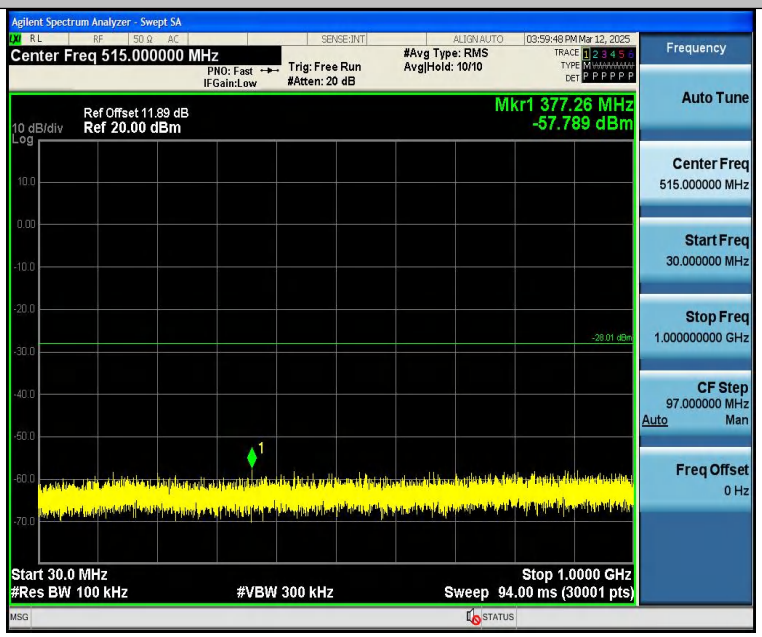
Test Result

| TestMode | Antenna | Frequency[MHz] | FreqRange [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 0~Reference | -8.01 | -8.01 | --- | PASS |
| DH5 | Ant1 | 2402 | 30~1000 | -8.01 | -57.79 | ≤-28.01 | PASS |
| DH5 | Ant1 | 2402 | 1000~26500 | -8.01 | -41.55 | ≤-28.01 | PASS |
| DH5 | Ant1 | 2441 | 0~Reference | -4.81 | -4.81 | --- | PASS |
| DH5 | Ant1 | 2441 | 30~1000 | -4.81 | -57.31 | ≤-24.81 | PASS |
| DH5 | Ant1 | 2441 | 1000~26500 | -4.81 | -40.09 | ≤-24.81 | PASS |
| DH5 | Ant1 | 2480 | 0~Reference | -2.54 | -2.54 | --- | PASS |
| DH5 | Ant1 | 2480 | 30~1000 | -2.54 | -58.17 | ≤-22.54 | PASS |
| DH5 | Ant1 | 2480 | 1000~26500 | -2.54 | -35.77 | ≤-22.54 | PASS |
| 2DH5 | Ant1 | 2402 | 0~Reference | -7.69 | -7.69 | --- | PASS |
| 2DH5 | Ant1 | 2402 | 30~1000 | -7.69 | -58.02 | ≤-27.69 | PASS |
| 2DH5 | Ant1 | 2402 | 1000~26500 | -7.69 | -41.77 | ≤-27.69 | PASS |
| 2DH5 | Ant1 | 2441 | 0~Reference | -6.97 | -6.97 | --- | PASS |
| 2DH5 | Ant1 | 2441 | 30~1000 | -6.97 | -57.65 | ≤-26.97 | PASS |
| 2DH5 | Ant1 | 2441 | 1000~26500 | -6.97 | -39.99 | ≤-26.97 | PASS |
| 2DH5 | Ant1 | 2480 | 0~Reference | -3.37 | -3.37 | --- | PASS |
| 2DH5 | Ant1 | 2480 | 30~1000 | -3.37 | -56.25 | ≤-23.37 | PASS |
| 2DH5 | Ant1 | 2480 | 1000~26500 | -3.37 | -34.67 | ≤-23.37 | PASS |
| 3DH5 | Ant1 | 2402 | 0~Reference | -7.27 | -7.27 | --- | PASS |
| 3DH5 | Ant1 | 2402 | 30~1000 | -7.27 | -57.62 | ≤-27.27 | PASS |
| 3DH5 | Ant1 | 2402 | 1000~26500 | -7.27 | -41.07 | ≤-27.27 | PASS |
| 3DH5 | Ant1 | 2441 | 0~Reference | -3.66 | -3.66 | --- | PASS |
| 3DH5 | Ant1 | 2441 | 30~1000 | -3.66 | -56.91 | ≤-23.66 | PASS |
| 3DH5 | Ant1 | 2441 | 1000~26500 | -3.66 | -39.51 | ≤-23.66 | PASS |
| 3DH5 | Ant1 | 2480 | 0~Reference | -1.60 | -1.60 | --- | PASS |
| 3DH5 | Ant1 | 2480 | 30~1000 | -1.60 | -57.08 | ≤-21.6 | PASS |
| 3DH5 | Ant1 | 2480 | 1000~26500 | -1.60 | -34.19 | ≤-21.6 | PASS |

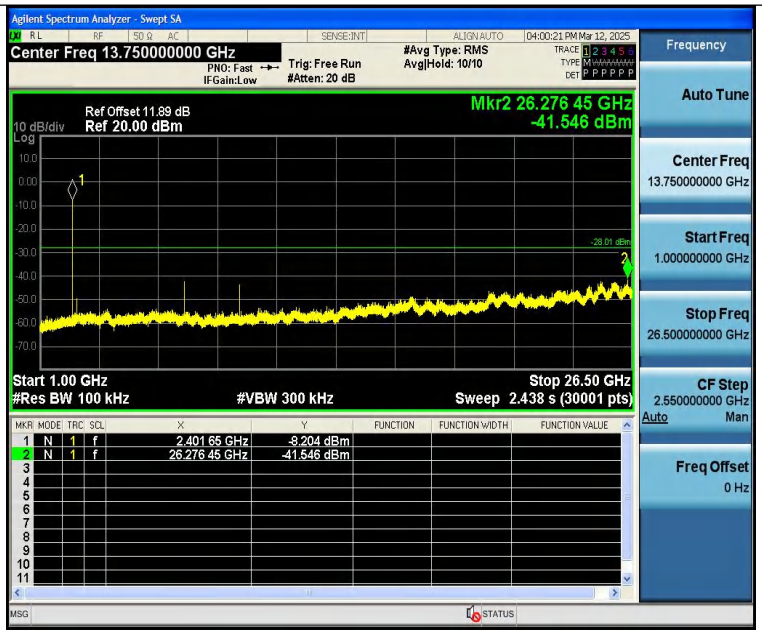
Test Graphs:

DH5-Ant1-2402-0~Reference-PASS

DH5-Ant1-2402-30~1000-PASS

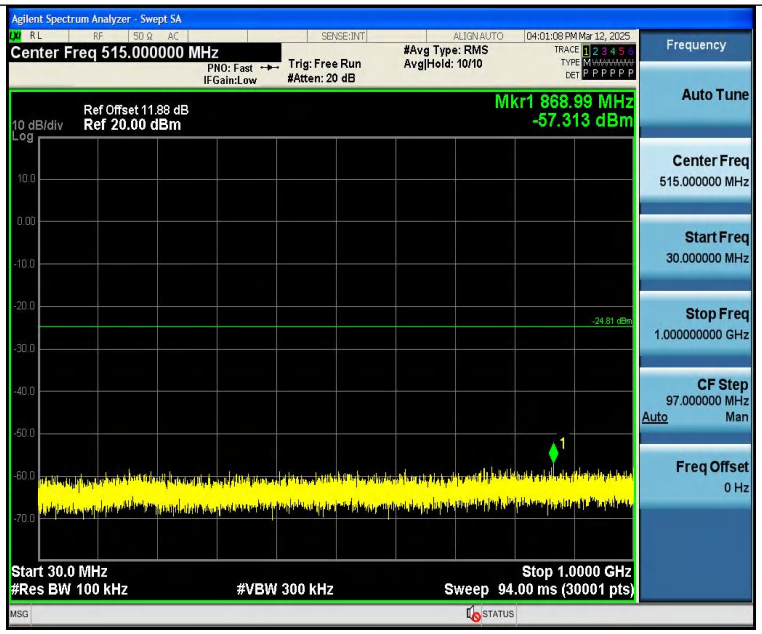



DH5-Ant1-2402-1000~26500-PASS

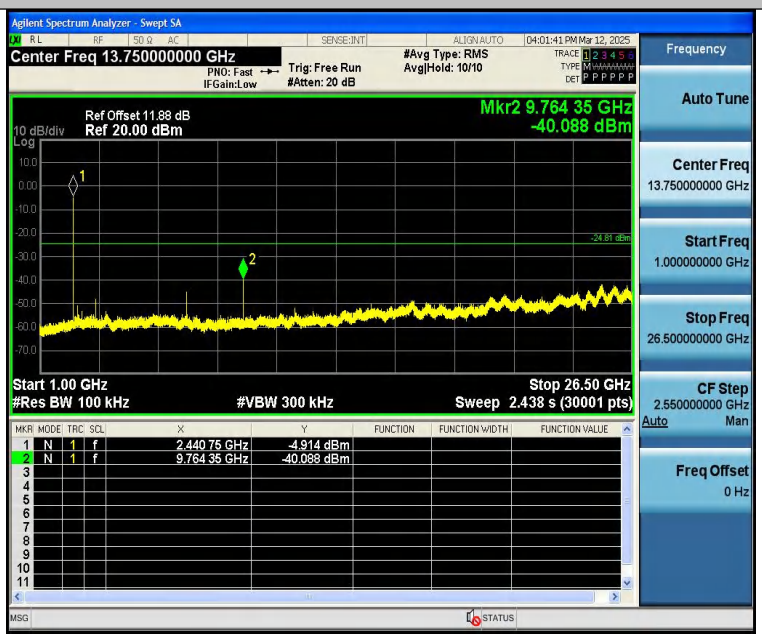



DH5-Ant1-2441-0~Reference-PASS

DH5-Ant1-2441-30~1000-PASS

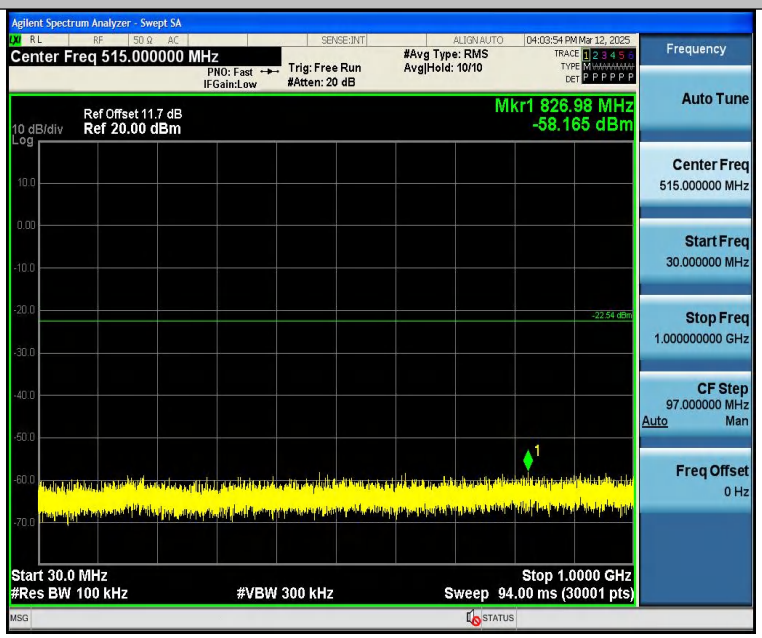



DH5-Ant1-2441-1000~26500-PASS

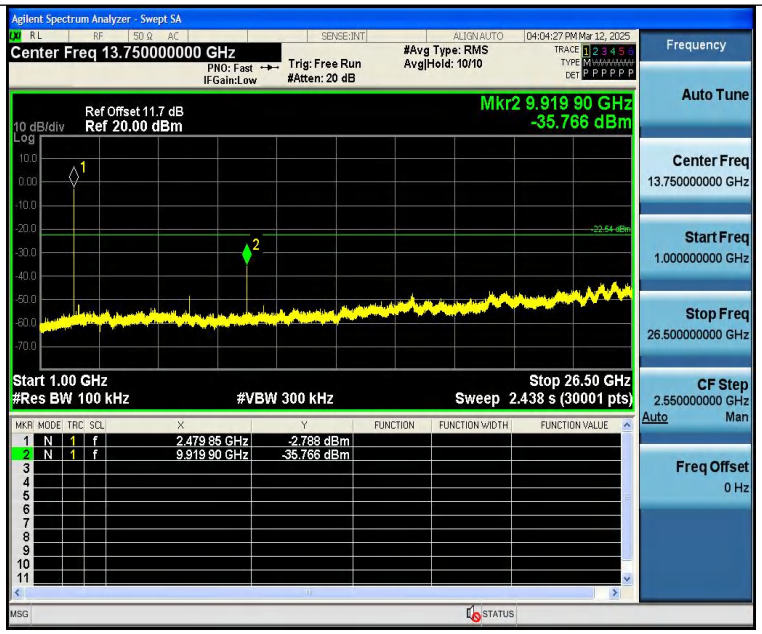



DH5-Ant1-2480-0~Reference-PASS

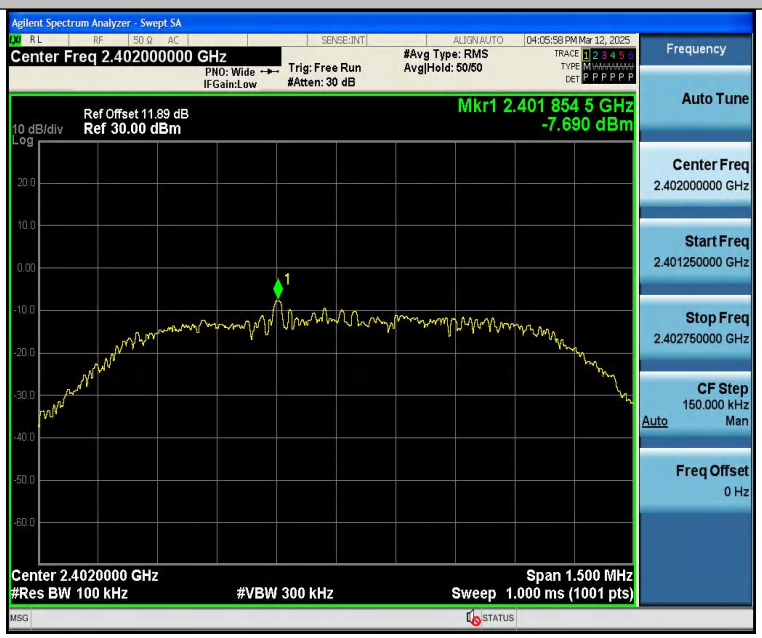
DH5-Ant1-2480-30~1000-PASS



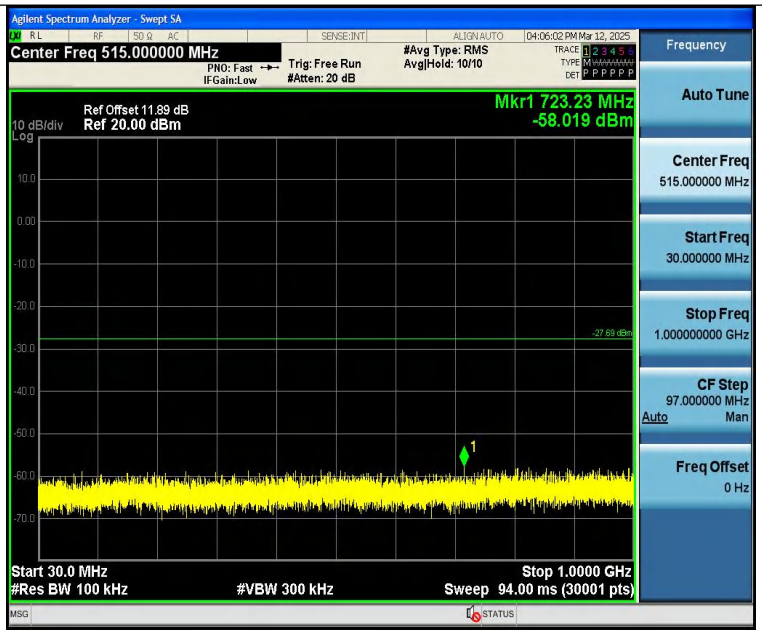

DH5-Ant1-2480-1000~26500-PASS



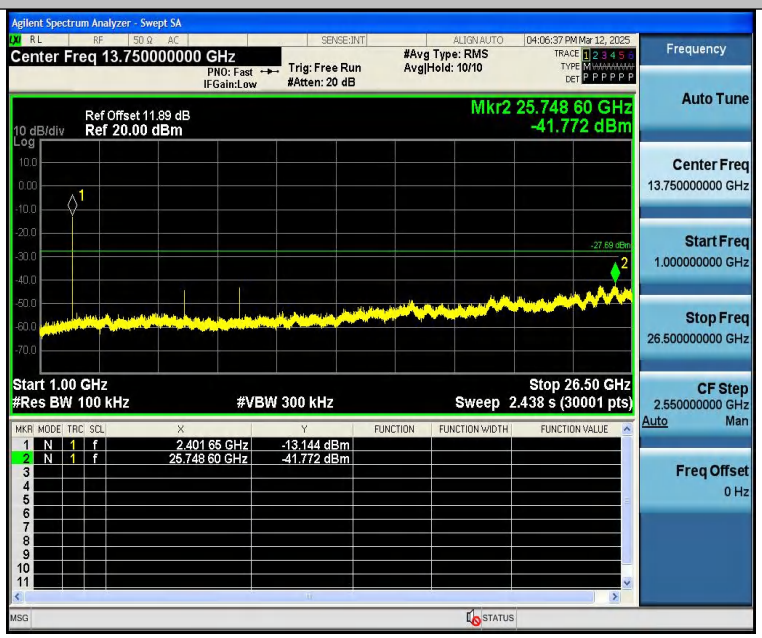

2DH5-Ant1-2402-0~Reference-PASS



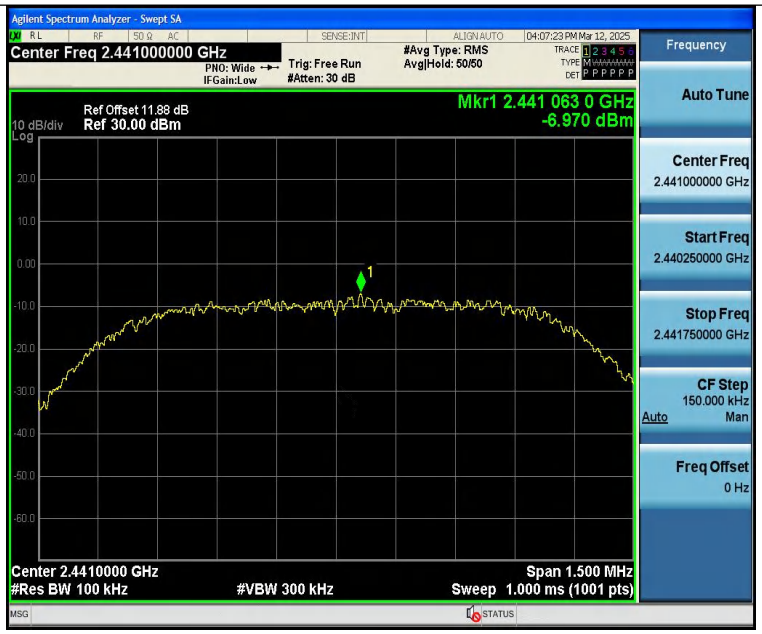

2DH5-Ant1-2402-30~1000-PASS



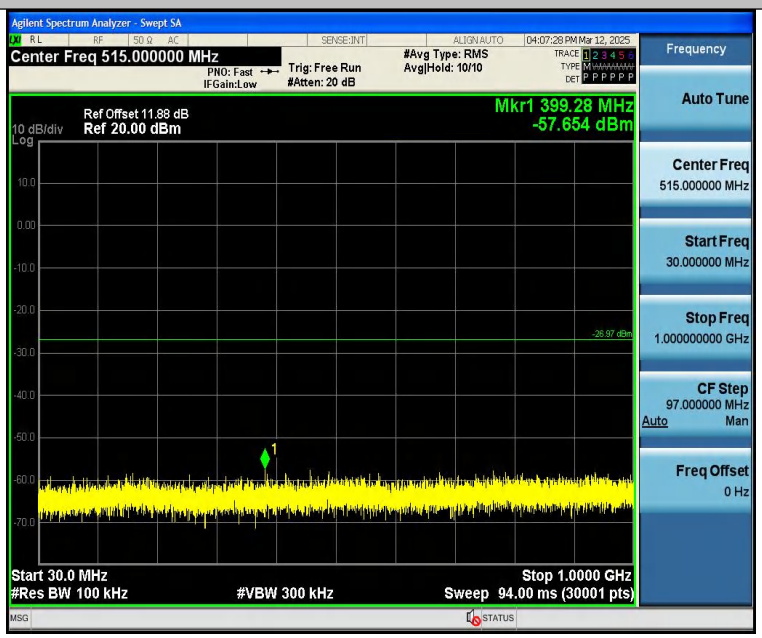

2DH5-Ant1-2402-1000~26500-PASS



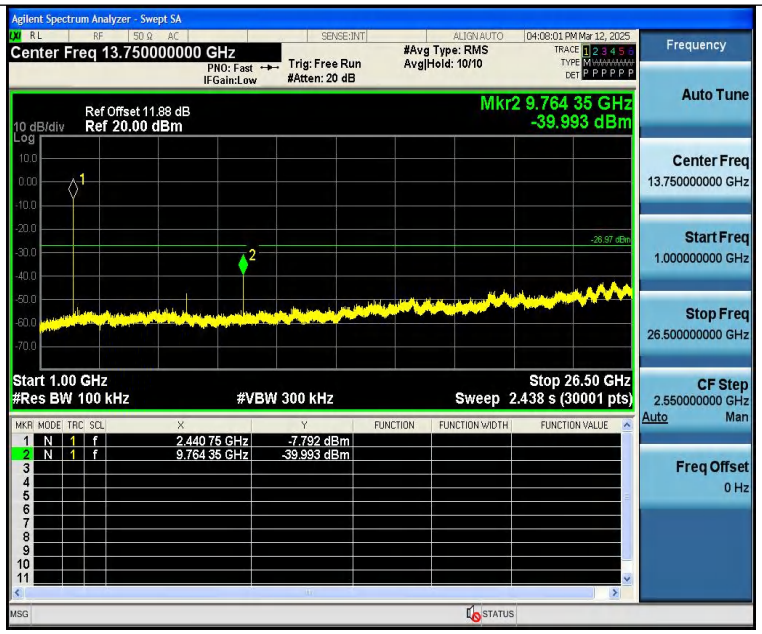

2DH5-Ant1-2441-0~Reference-PASS




2DH5-Ant1-2441-30~1000-PASS

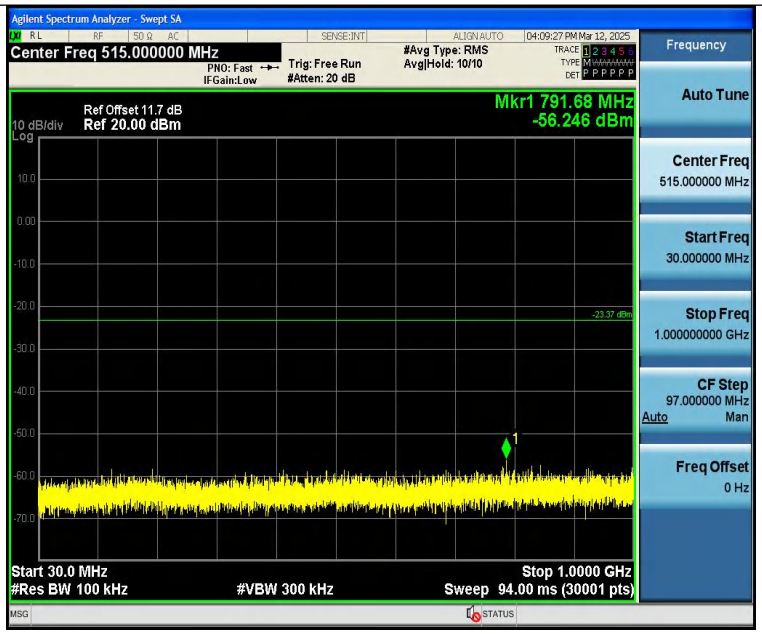



2DH5-Ant1-2441-1000~26500-PASS

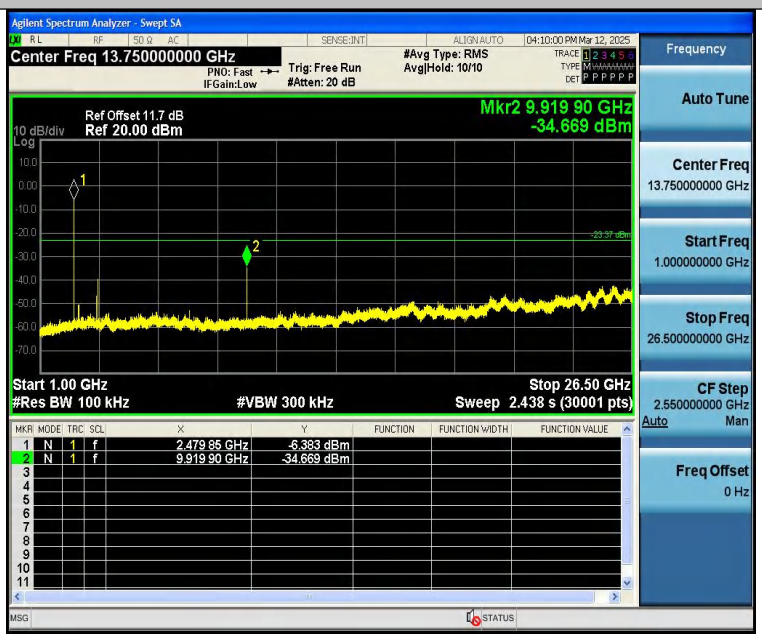



2DH5-Ant1-2480-0~Reference-PASS

2DH5-Ant1-2480-30~1000-PASS

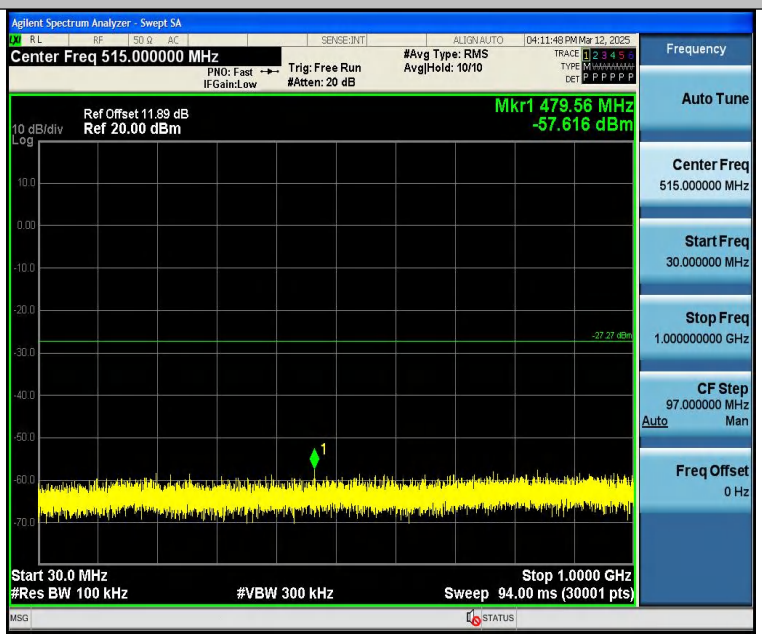



2DH5-Ant1-2480-1000~26500-PASS

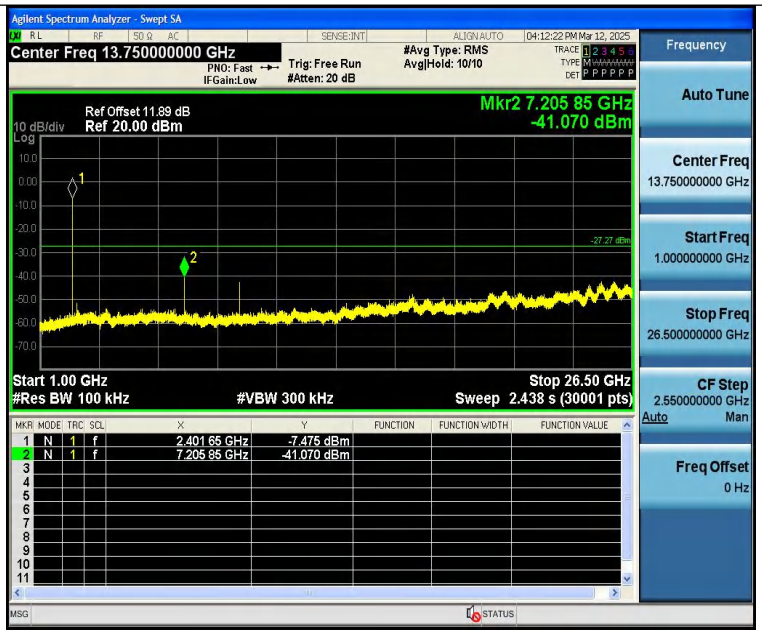



3DH5-Ant1-2402-0~Reference-PASS

3DH5-Ant1-2402-30~1000-PASS

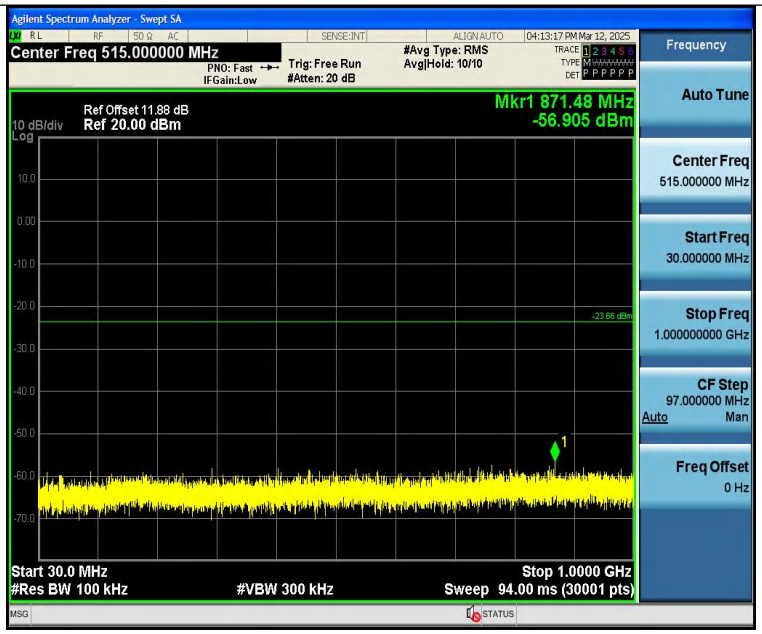



3DH5-Ant1-2402-1000~26500-PASS

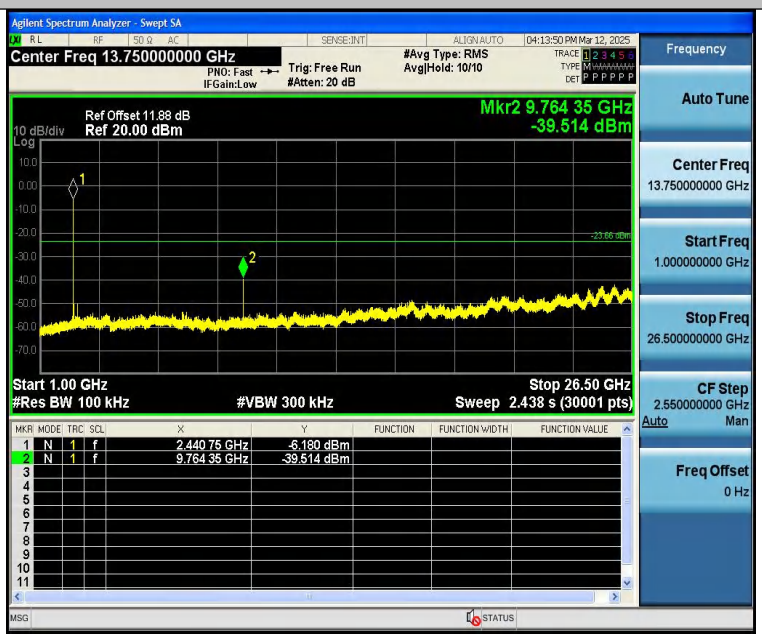



3DH5-Ant1-2441-0~Reference-PASS

3DH5-Ant1-2441-30~1000-PASS

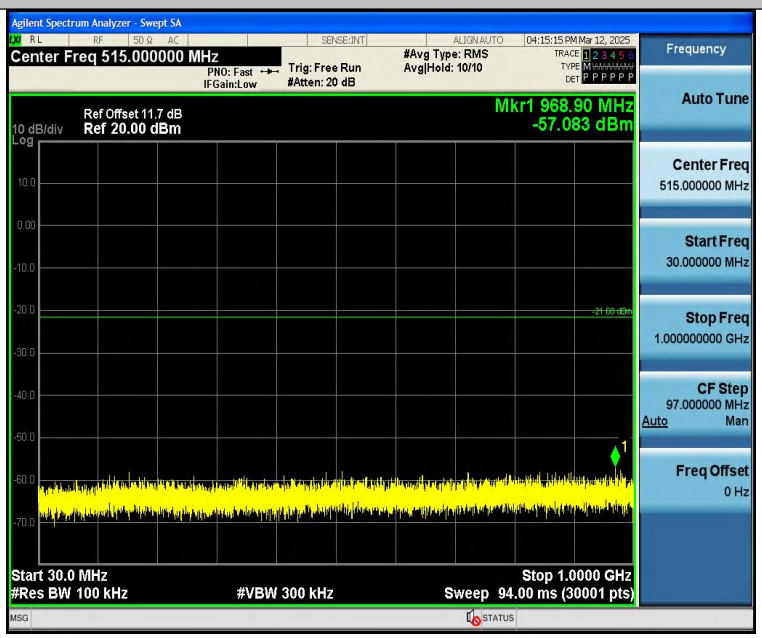



3DH5-Ant1-2441-1000~26500-PASS

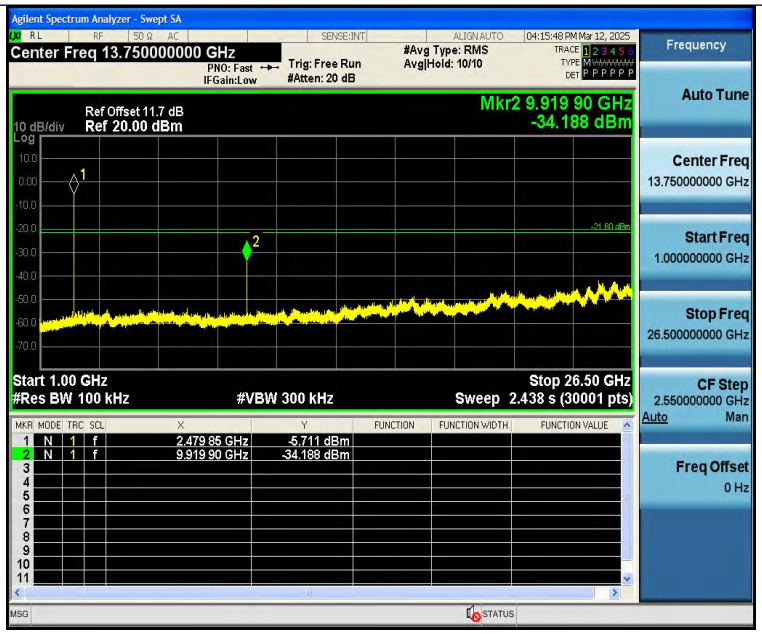



3DH5-Ant1-2480-0~Reference-PASS

3DH5-Ant1-2480-30~1000-PASS




3DH5-Ant1-2480-1000~26500-PASS


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
04:15:48 PM Mar 12, 2025
Ref Offset 11.7 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr2 9.919 90 GHz
-34.188 dBm
-21.60 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.438 s (30001 pts)
1 N 1 f 2.479 85 GHz -5.711 dBm
2 N 1 f 9.919 90 GHz -34.188 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz

# 14 Antenna Requirement

## 14.1 Test Standard and Requirement

| | |
|---|---|
| Test Standard | FCC Part15 Section 15.203 /247(c) |
| Requirement | 1) 15.203 requirement:<br><br>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.<br><br>2) 15.247(c) (1)(i) requirement:<br><br>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. |

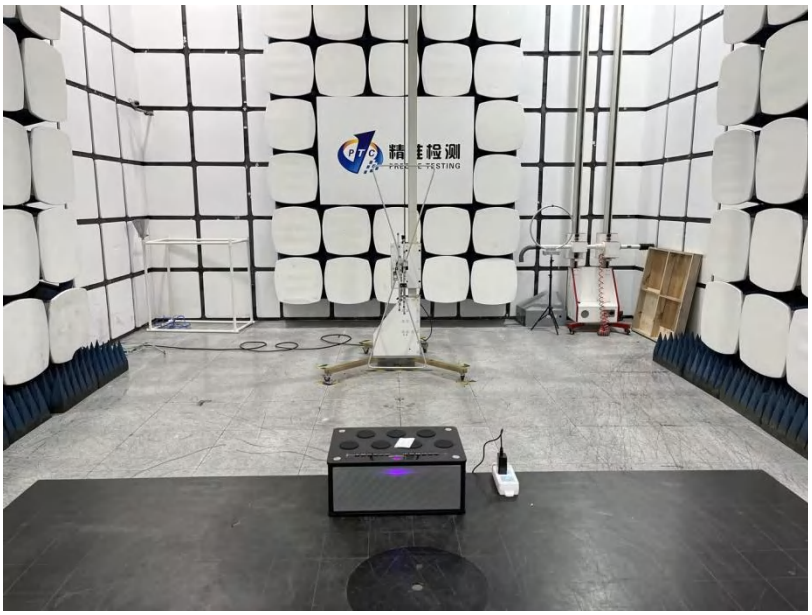
## 14.2 Antenna Connected Construction

The antenna is PCB Antenna which permanently attached, and the best case gain of the antenna is -0.68 dBi. It complies with the standard requirement.

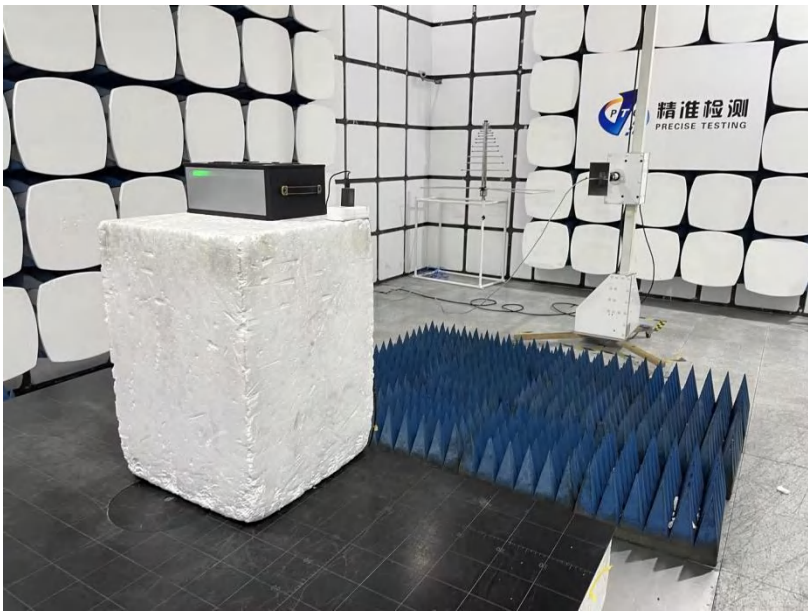
# 15 APPENDIX I -- TEST SETUP PHOTOGRAPH

Conducted Emissions

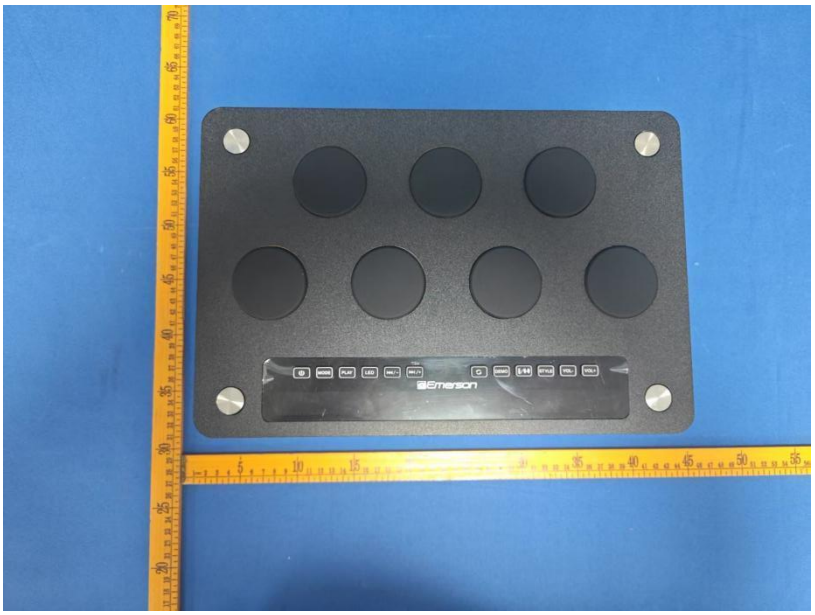
Radiated Emissions
From 30M-1GHz

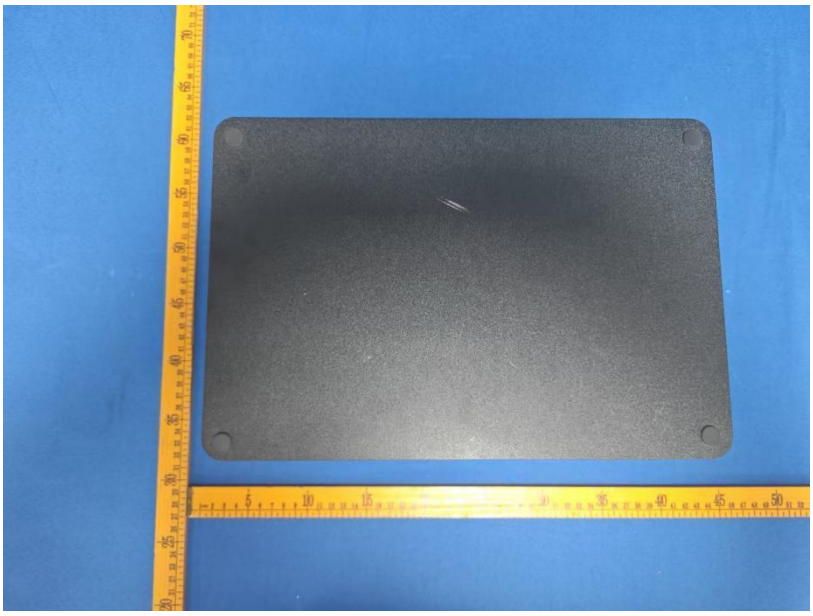


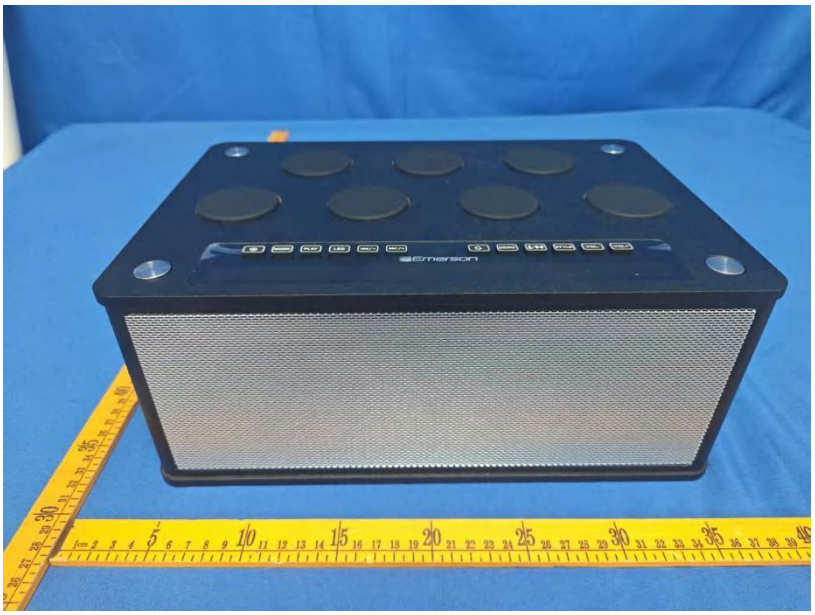
Above 1GHz

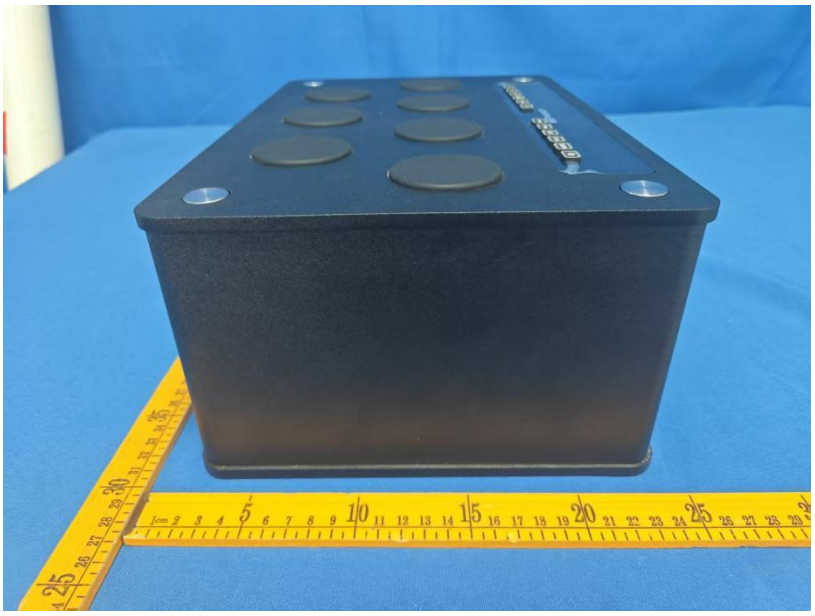


# 16 APPENDIX II -- EUT PHOTOGRAPH

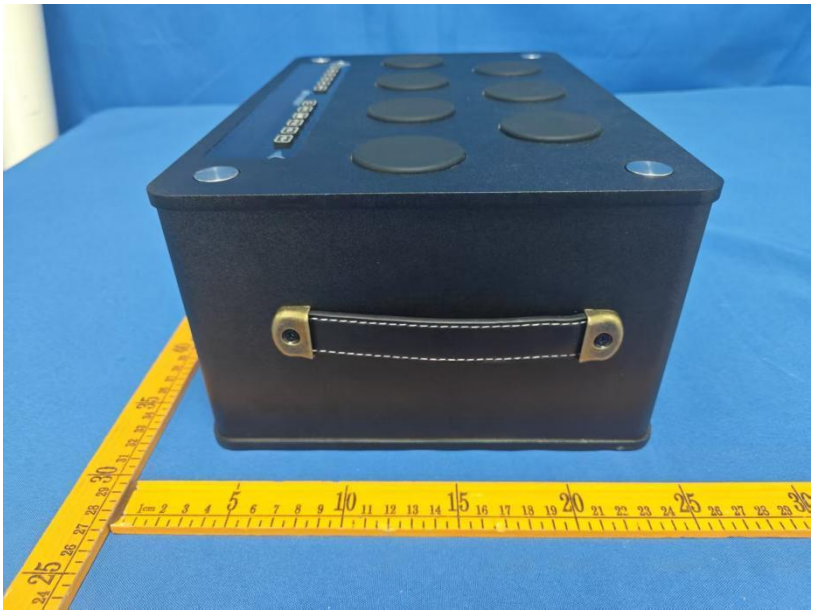


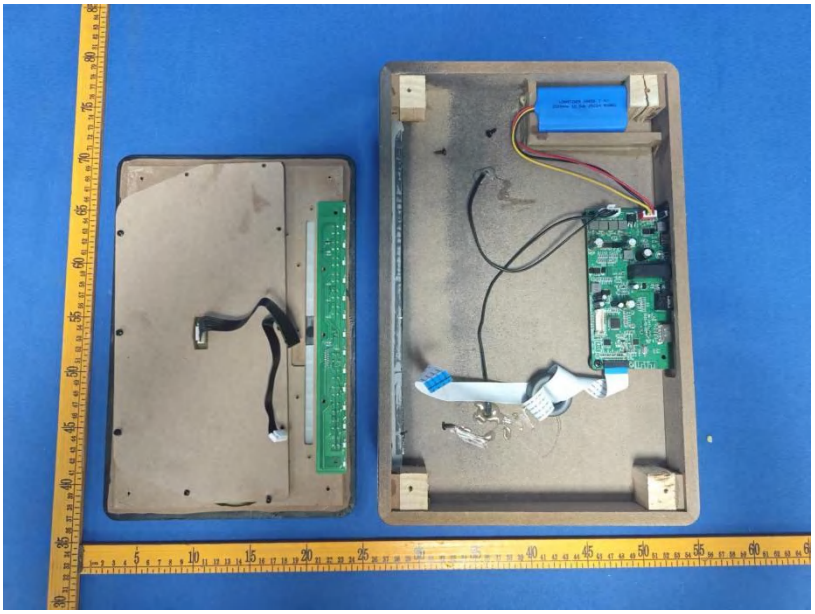


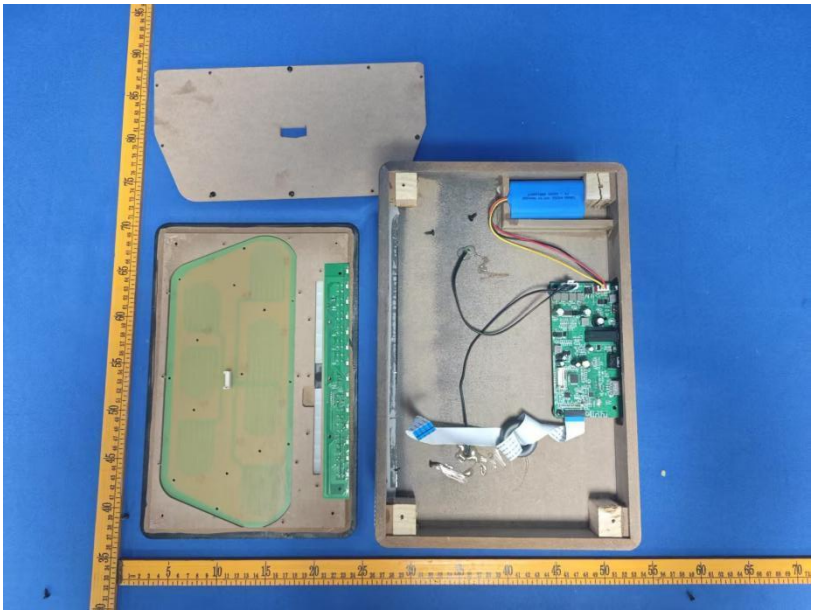

Emerson

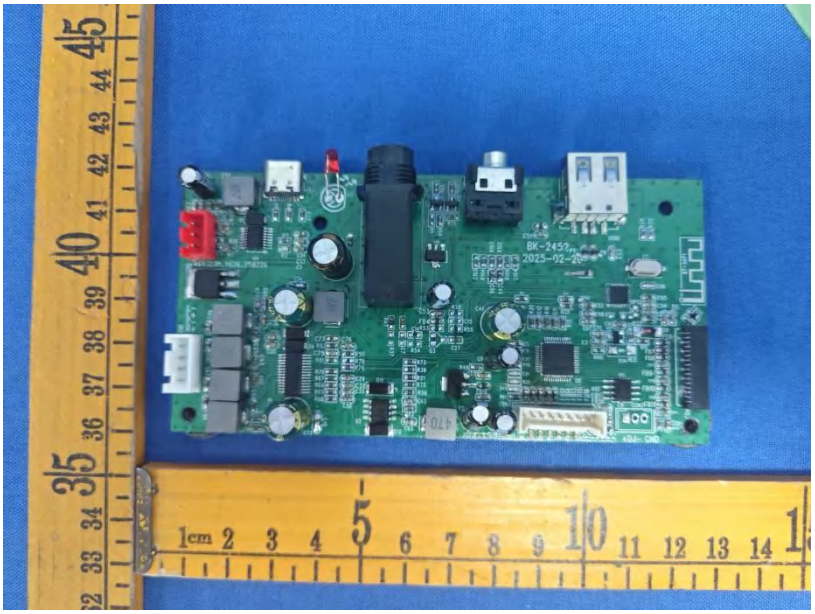


USB
AUX IN
MIC IN
CHARGE
5V⎓2A





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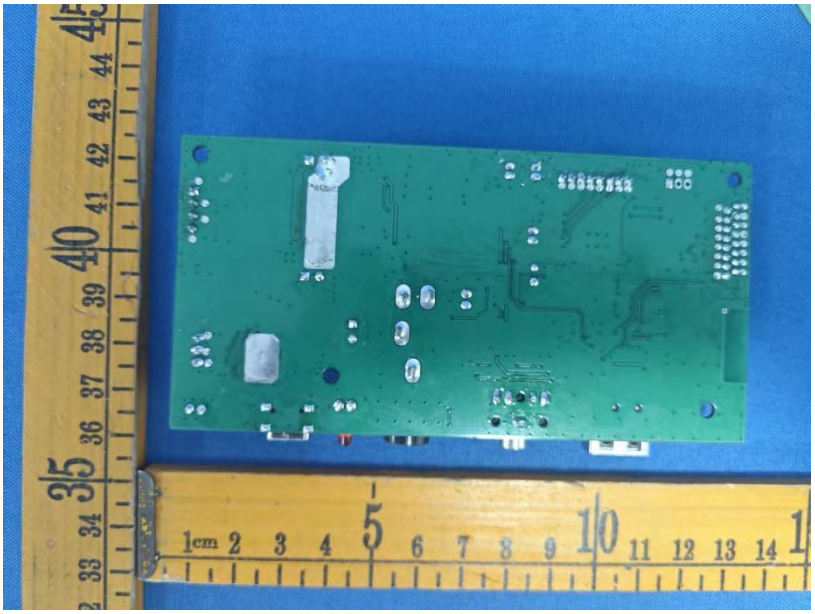
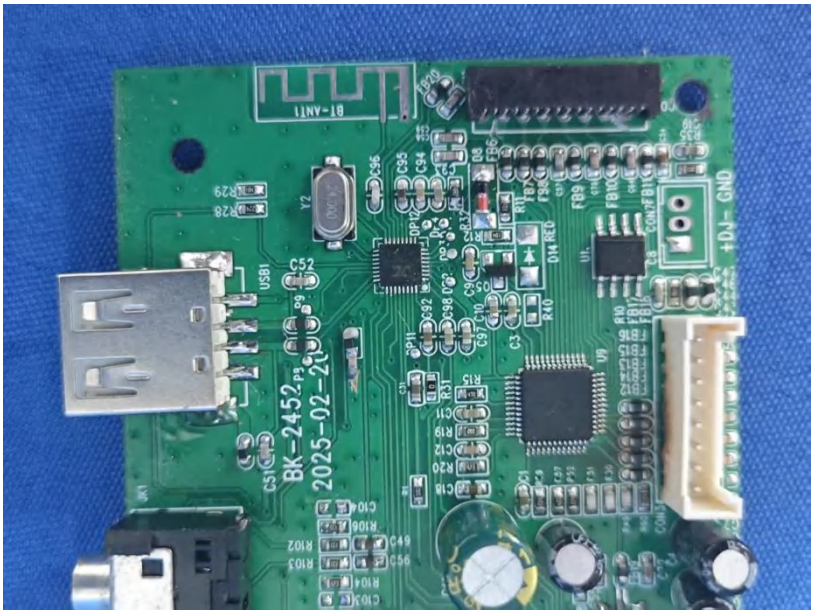
2025-02-20

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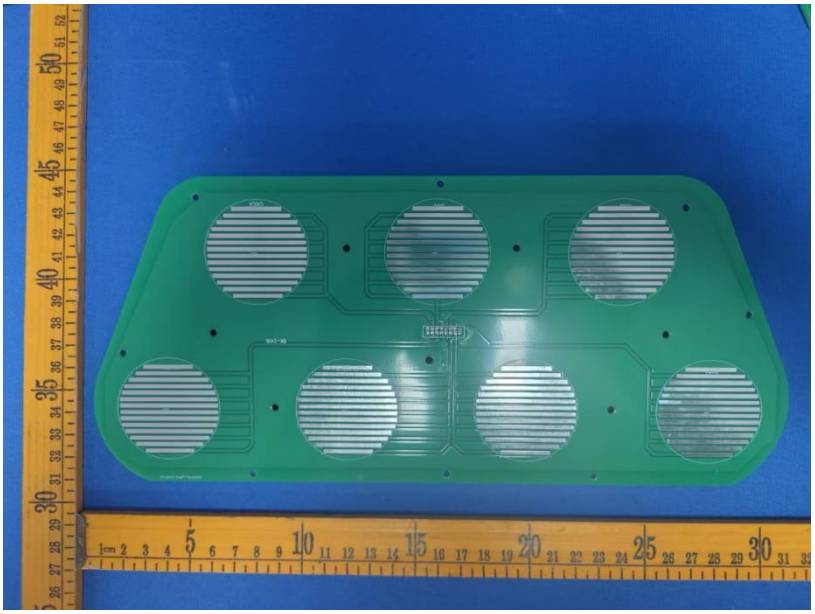
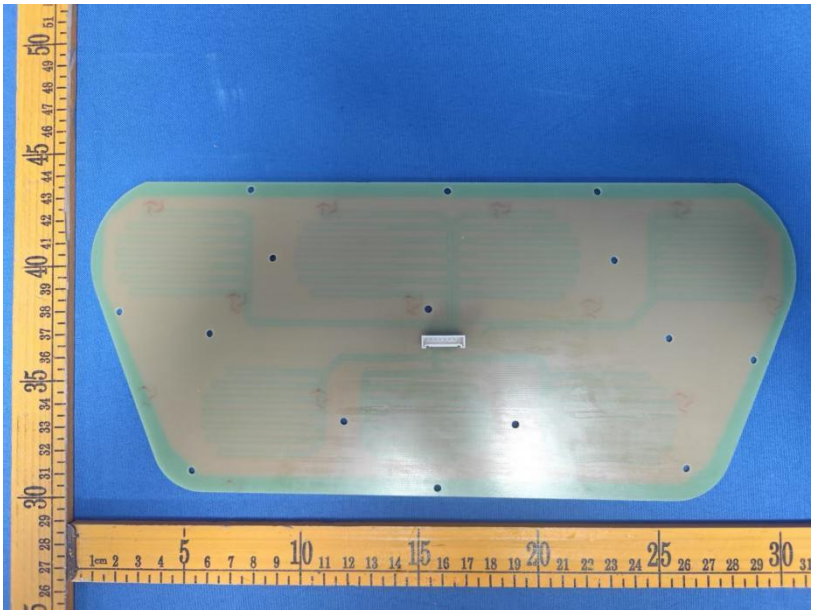
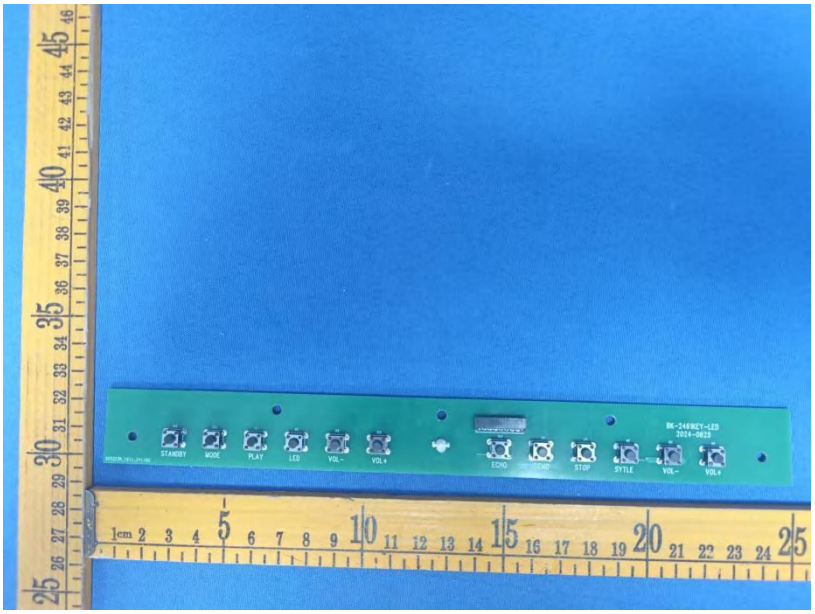
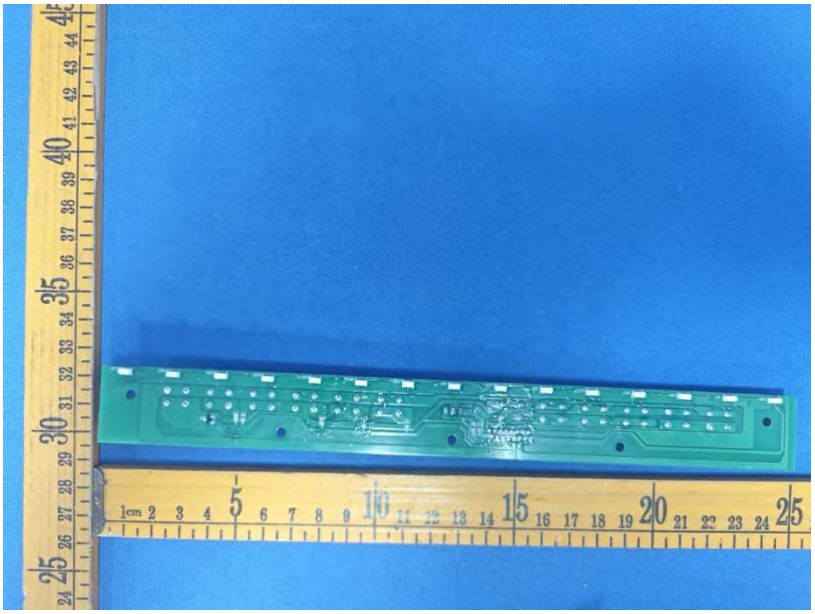
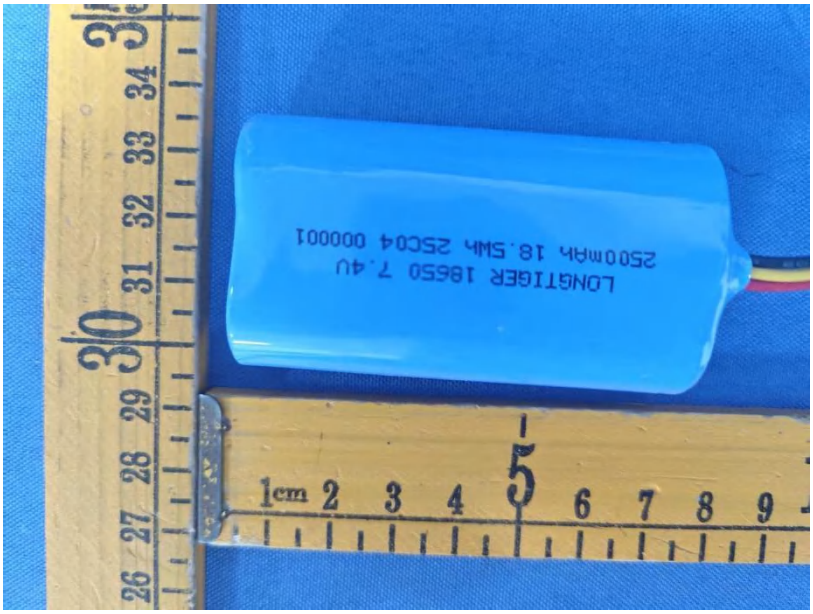
2025-02-20
+DJ- GND

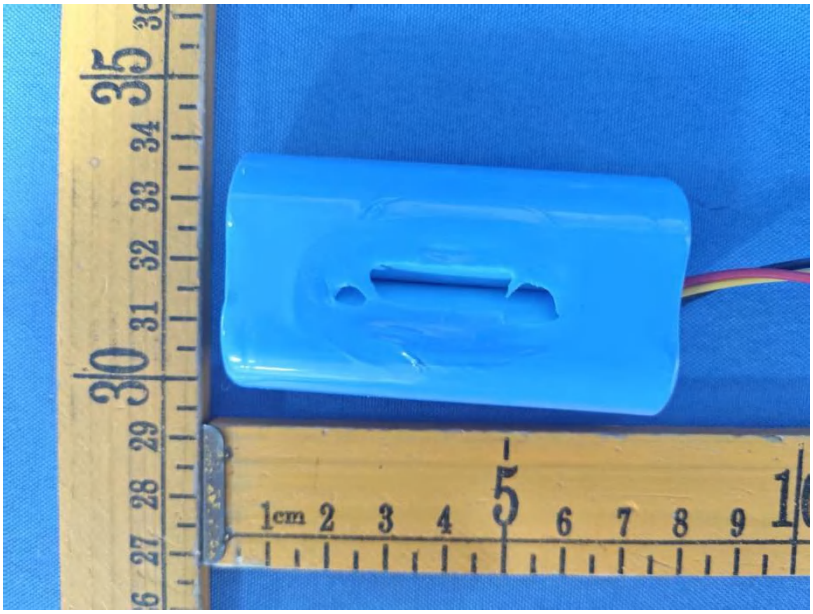


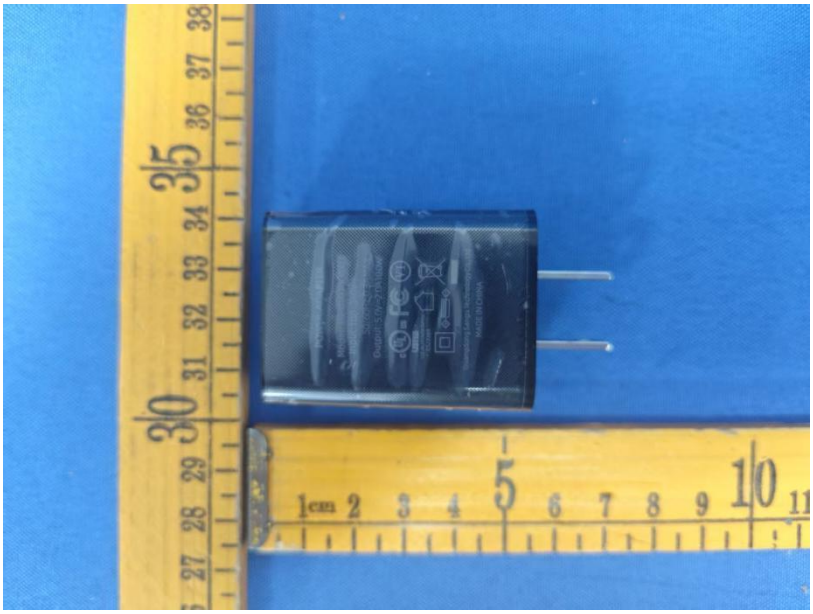


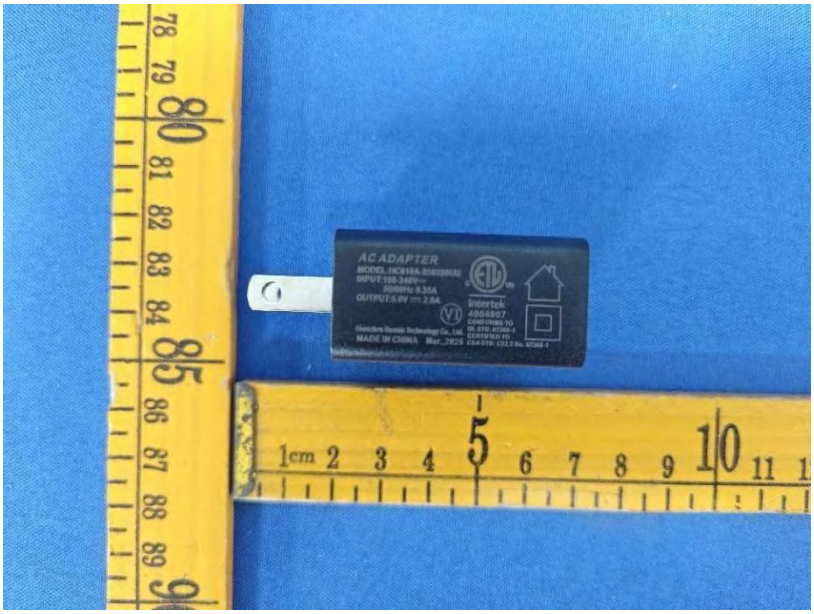

STANDBY
MODE
PLAY
LED
VOL-
VOL+
ECHO
STOP
STYLE
VOL-
VOL+




LONGTIGER 18650 7.4V
2500mAh 18.5Wh 25C04 000001






AC ADAPTER
MADE IN CHINA

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