

## **FCC Appendix RF Test Data**

**FCC ID** : 2BPVC-V49

**Company:** : Shenzhen Haling Technology Co., LTD

**EUT** : Bluetooth headphones

**Model Number** : V49

**Report No.** : CTA25052100801

**Reviewed By** : Eric Wang

## Appendix A: 20dB Emission Bandwidth

### Test Result

| TestMode | Antenna | Freq(MHz) | 20dB<br>EBW[MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|-----------|------------------|----------|----------|------------|---------|
| DH5      | Ant1    | 2402      | 0.954            | 2401.547 | 2402.501 | ---        | ---     |
|          |         | 2441      | 0.957            | 2440.544 | 2441.501 | ---        | ---     |
|          |         | 2480      | 0.936            | 2479.550 | 2480.486 | ---        | ---     |
| 2DH5     | Ant1    | 2402      | 1.335            | 2401.340 | 2402.675 | ---        | ---     |
|          |         | 2441      | 1.284            | 2440.379 | 2441.663 | ---        | ---     |
|          |         | 2480      | 1.317            | 2479.349 | 2480.666 | ---        | ---     |

## Test Graphs

DH5\_Ant1\_2402



DH5\_Ant1\_2441



DH5\_Ant1\_2480



2DH5\_Ant1\_2402



2DH5\_Ant1\_2441



# 2DH5\_Ant1\_2480

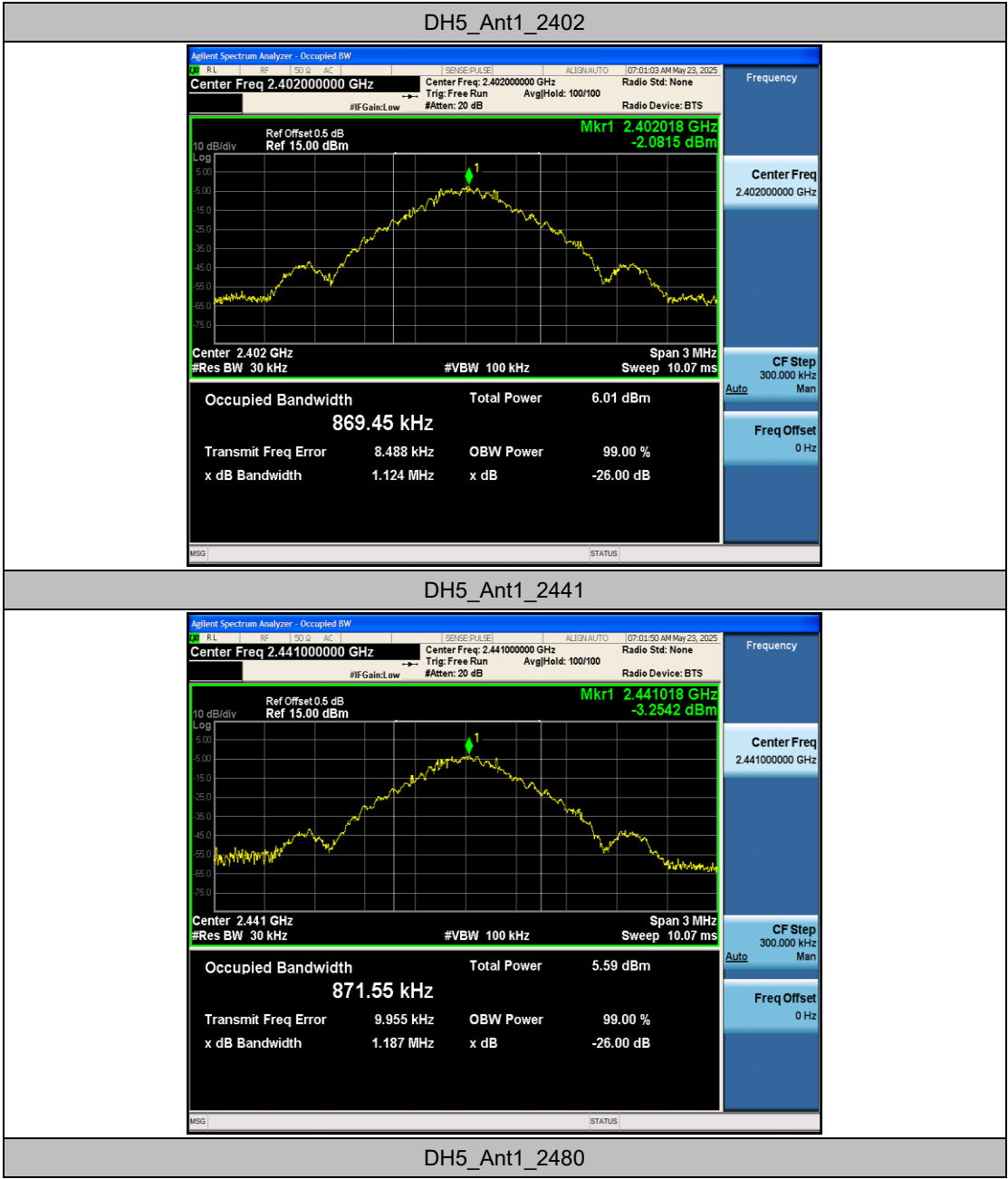


## Appendix B: Occupied Channel Bandwidth

### Test Result

| TestMode | Antenna | Freq(MHz) | OCB [MHz] | FL[MHz]   | FH[MHz]   | Limit[MHz] | Verdict |
|----------|---------|-----------|-----------|-----------|-----------|------------|---------|
| DH5      | Ant1    | 2402      | 0.86945   | 2401.5738 | 2402.4432 | ---        | ---     |
|          |         | 2441      | 0.87155   | 2440.5742 | 2441.4457 | ---        | ---     |
|          |         | 2480      | 0.86951   | 2479.5732 | 2480.4427 | ---        | ---     |
| 2DH5     | Ant1    | 2402      | 1.1874    | 2401.4156 | 2402.6030 | ---        | ---     |
|          |         | 2441      | 1.1884    | 2440.4168 | 2441.6052 | ---        | ---     |
|          |         | 2480      | 1.1914    | 2479.4154 | 2480.6068 | ---        | ---     |

Test Graphs

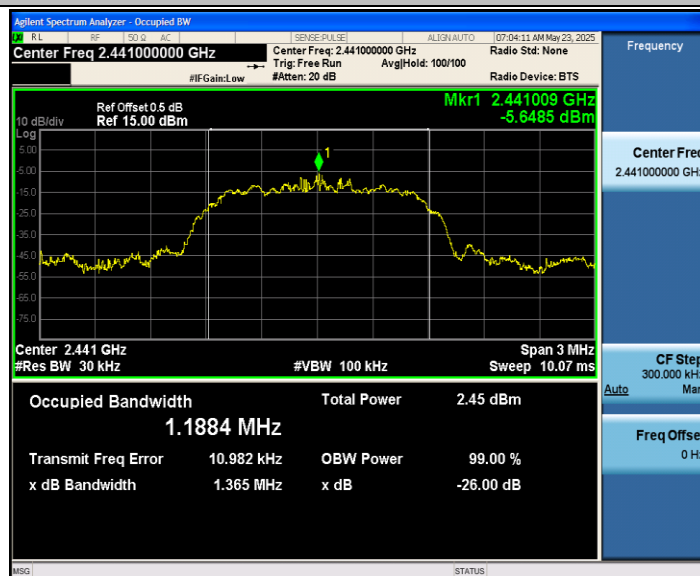




2DH5\_Ant1\_2402



2DH5\_Ant1\_2441





# 2DH5\_Ant1\_2480



## Appendix C: Maximum conducted output power

### Test Result Peak

| Test Mode | Antenna | Freq(MHz) | Conducted Peak Power[dBm] | Conducted Limit[dBm] | Verdict |
|-----------|---------|-----------|---------------------------|----------------------|---------|
| DH5       | Ant1    | 2402      | 0.11                      | ≤20.97               | PASS    |
|           |         | 2441      | -0.12                     | ≤20.97               | PASS    |
|           |         | 2480      | -0.32                     | ≤20.97               | PASS    |
| 2DH5      | Ant1    | 2402      | -0.76                     | ≤20.97               | PASS    |
|           |         | 2441      | -0.95                     | ≤20.97               | PASS    |
|           |         | 2480      | -1.08                     | ≤20.97               | PASS    |

## Appendix D: Carrier frequency separation

### Test Result

| TestMode | Antenna | Freq(MHz) | Result[MHz] | Limit[MHz]   | Verdict |
|----------|---------|-----------|-------------|--------------|---------|
| DH5      | Ant1    | Hop       | 1.156       | $\geq 0.957$ | PASS    |
| 2DH5     | Ant1    | Hop       | 1.184       | $\geq 0.890$ | PASS    |

## Test Graphs

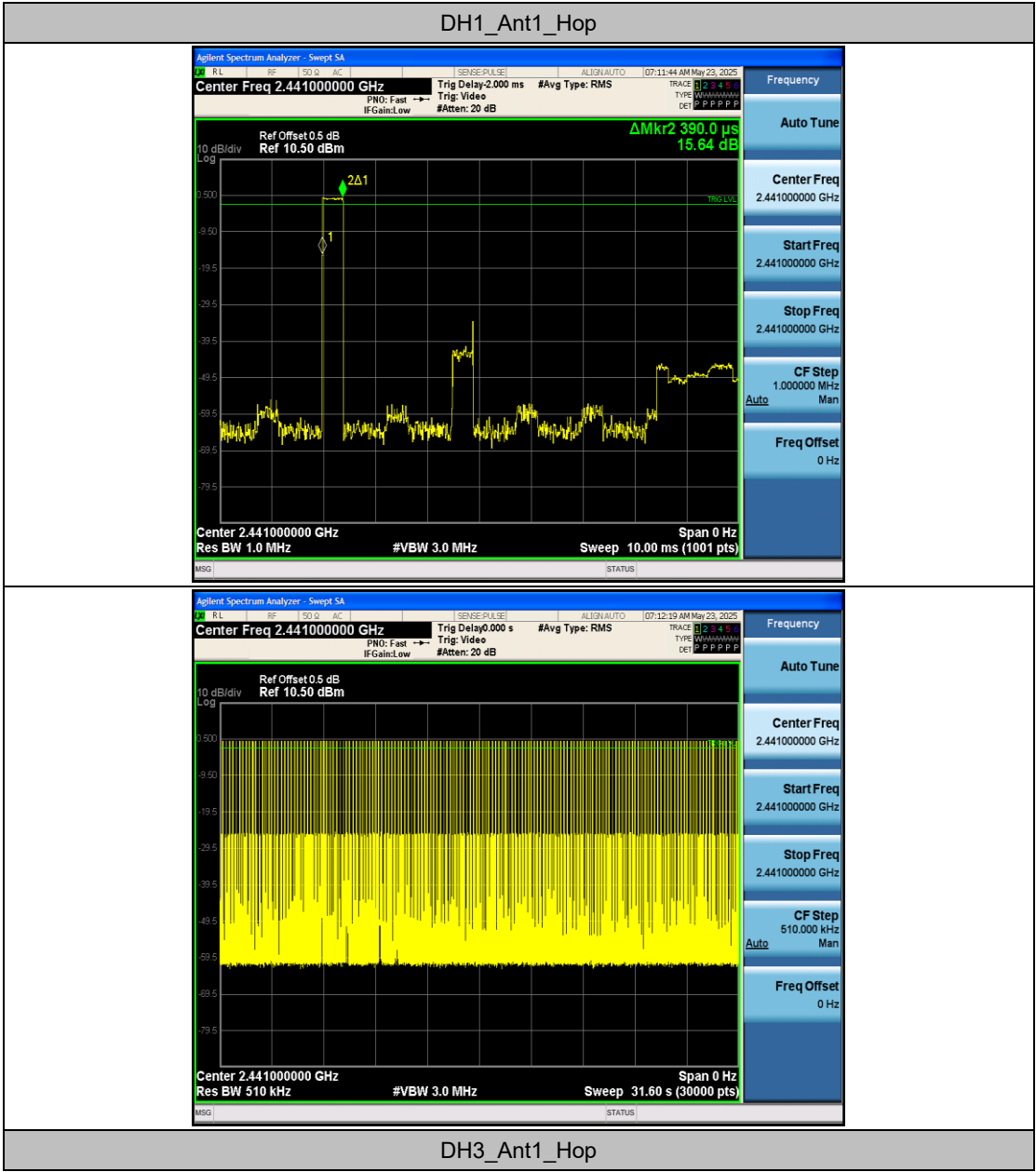


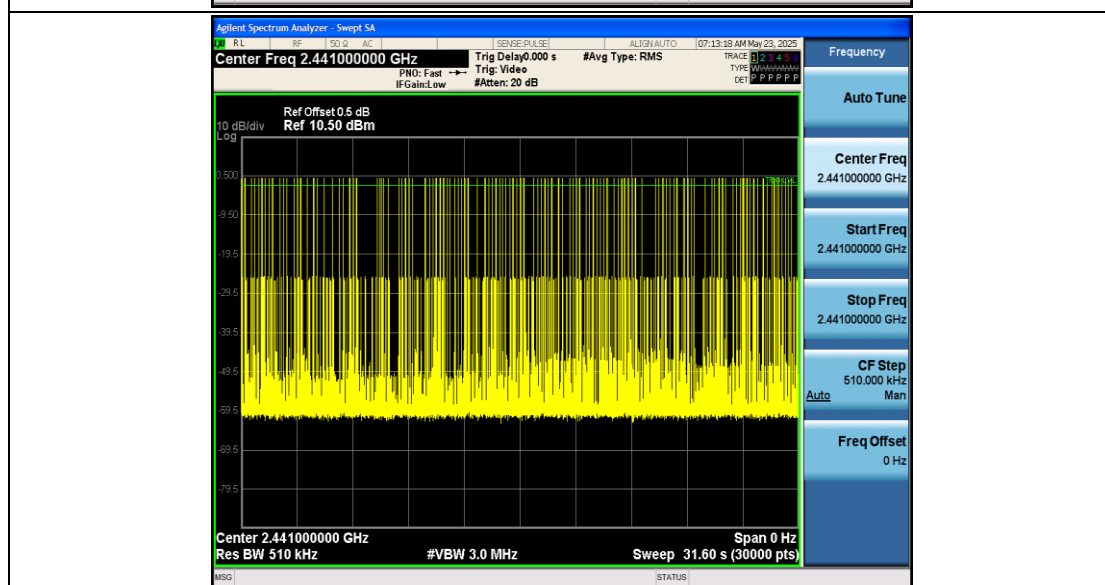
## Appendix E: Time of occupancy

### Test Result

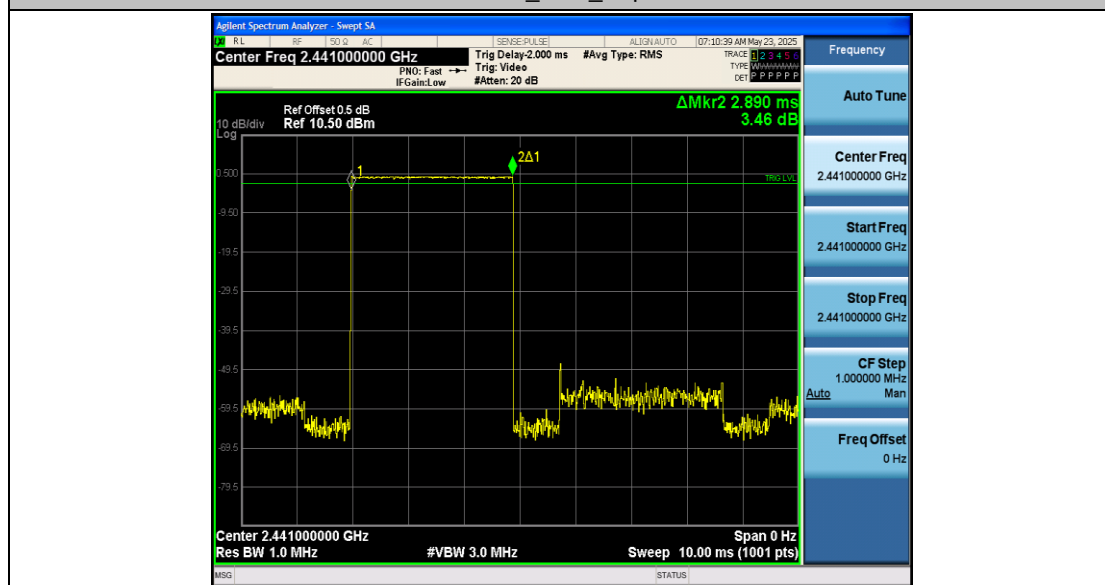
| TestMode | Antenna | Freq(MHz) | BurstWidth<br>[ms] | TotalHops<br>[Num] | Result[s] | Limit[s] | Verdict |
|----------|---------|-----------|--------------------|--------------------|-----------|----------|---------|
| DH1      | Ant1    | Hop       | 0.390              | 319                | 0.124     | ≤0.4     | PASS    |
| DH3      | Ant1    | Hop       | 1.650              | 158                | 0.261     | ≤0.4     | PASS    |
| DH5      | Ant1    | Hop       | 2.890              | 105                | 0.303     | ≤0.4     | PASS    |
| 2DH1     | Ant1    | Hop       | 0.400              | 319                | 0.128     | ≤0.4     | PASS    |
| 2DH3     | Ant1    | Hop       | 1.650              | 160                | 0.264     | ≤0.4     | PASS    |
| 2DH5     | Ant1    | Hop       | 2.890              | 105                | 0.303     | ≤0.4     | PASS    |

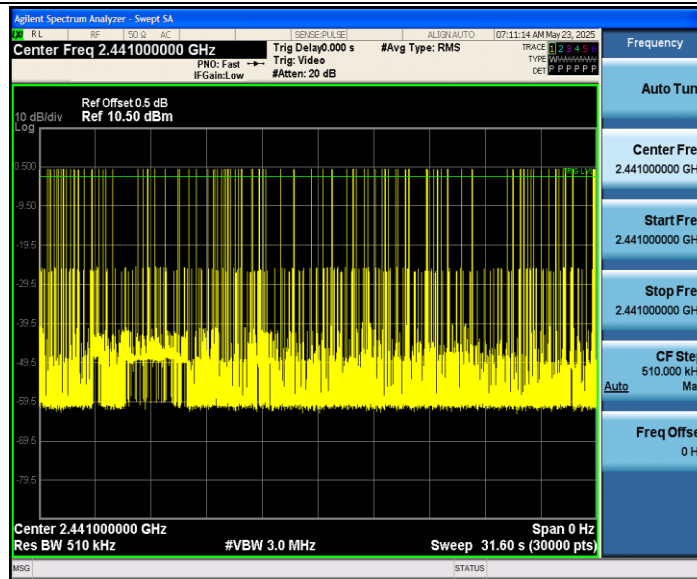
Test Graphs



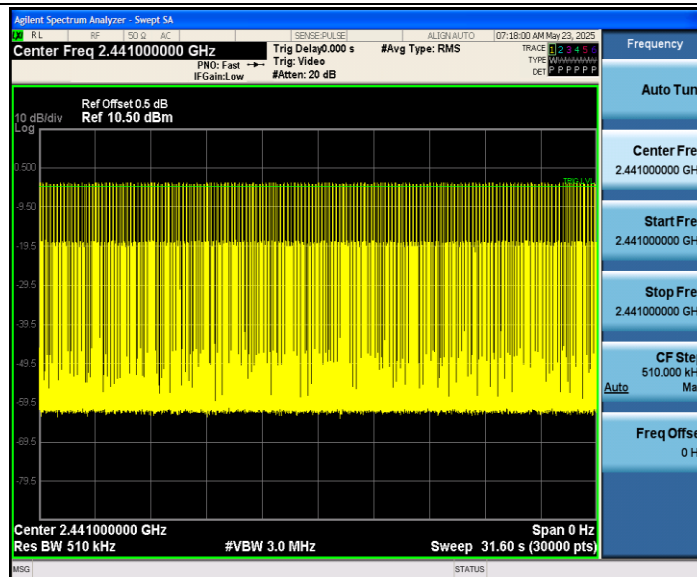
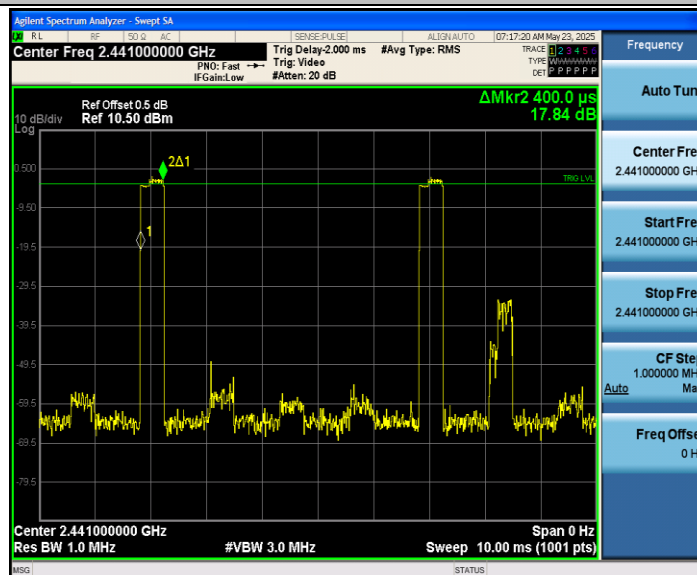


DH5\_Ant1\_Hop



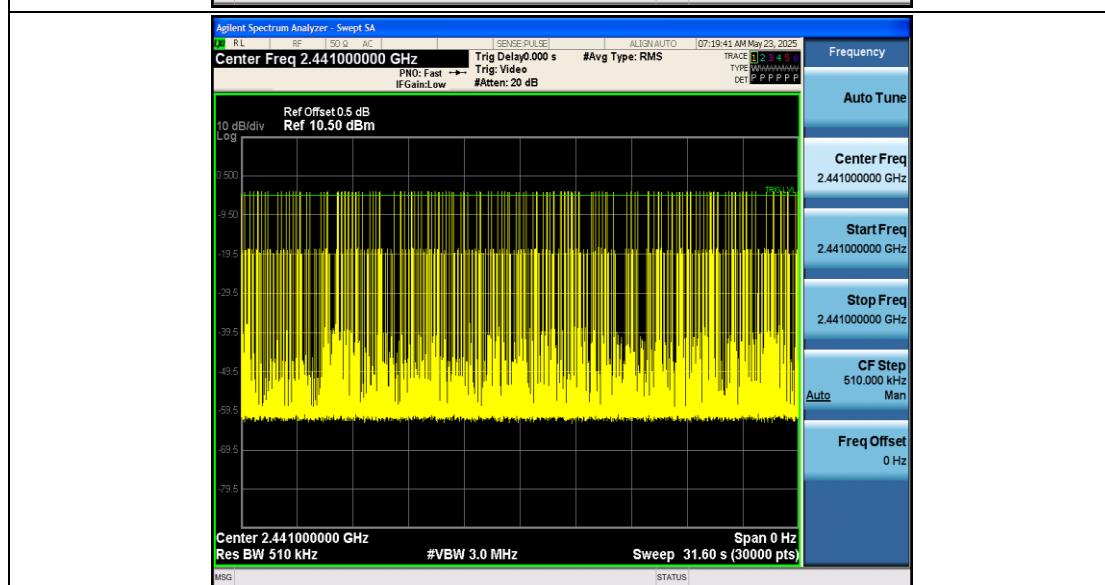


2DH1\_Ant1\_Hop

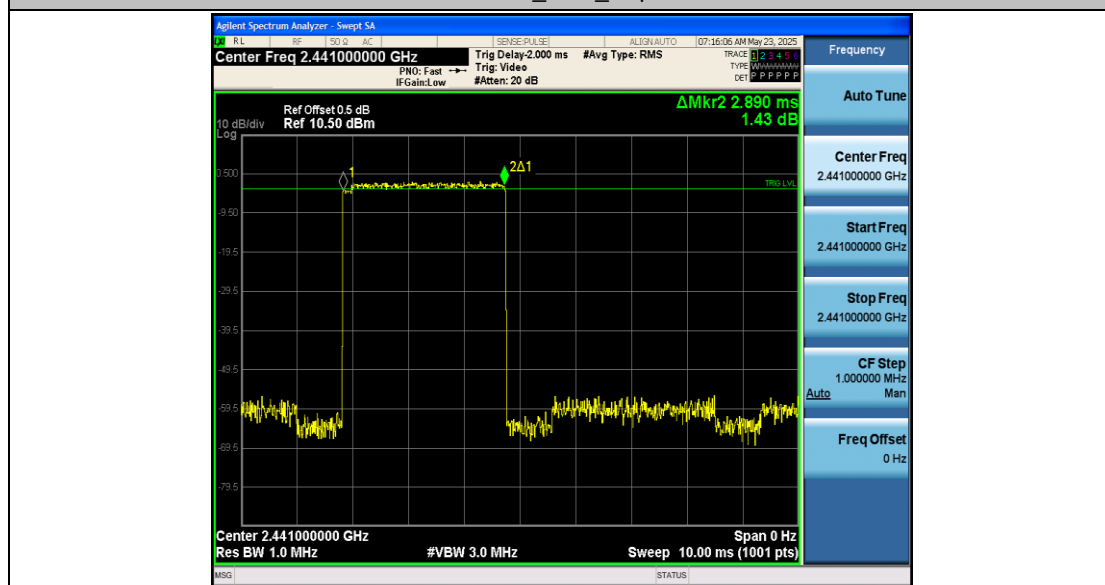


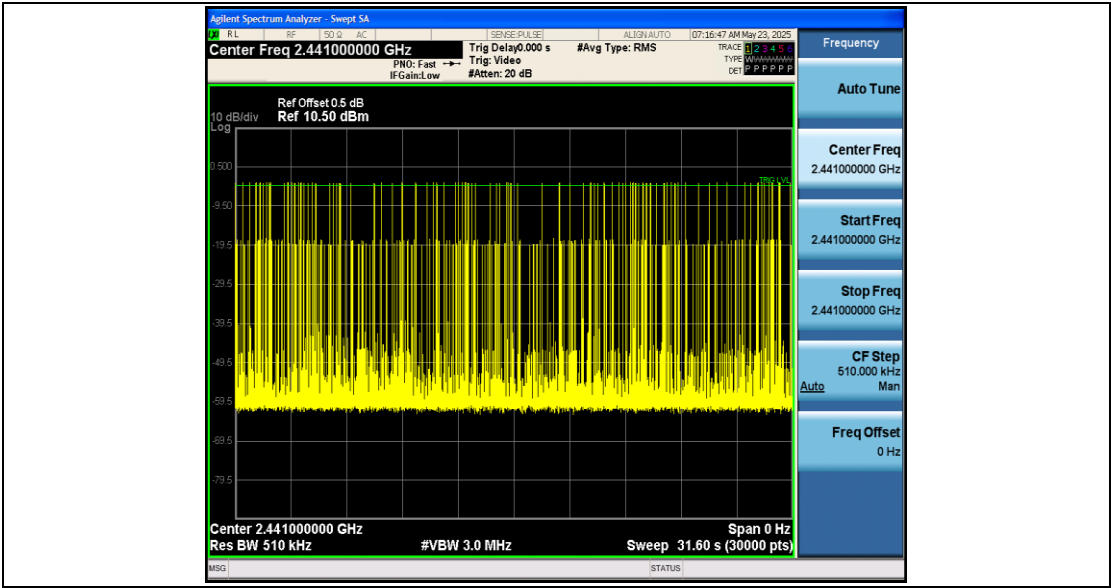
2DH3\_Ant1\_Hop





2DH5\_Ant1\_Hop





## Appendix F: Number of hopping channels

### Test Result

| TestMode | Antenna | Freq(MHz) | Result[Num] | Limit[Num] | Verdict |
|----------|---------|-----------|-------------|------------|---------|
| DH5      | Ant1    | Hop       | 79          | ≥15        | PASS    |
| 2DH5     | Ant1    | Hop       | 79          | ≥15        | PASS    |

Test Graphs

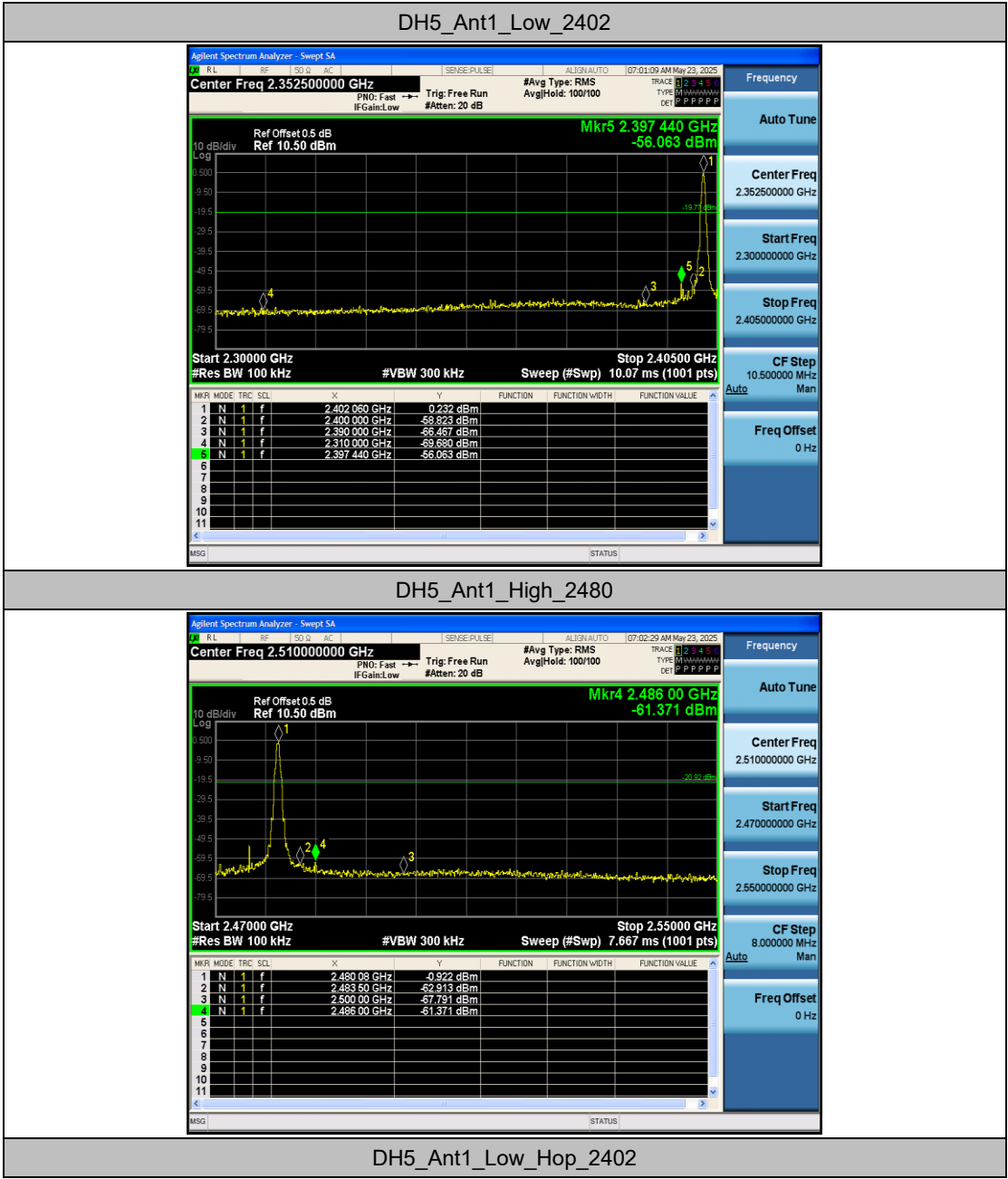


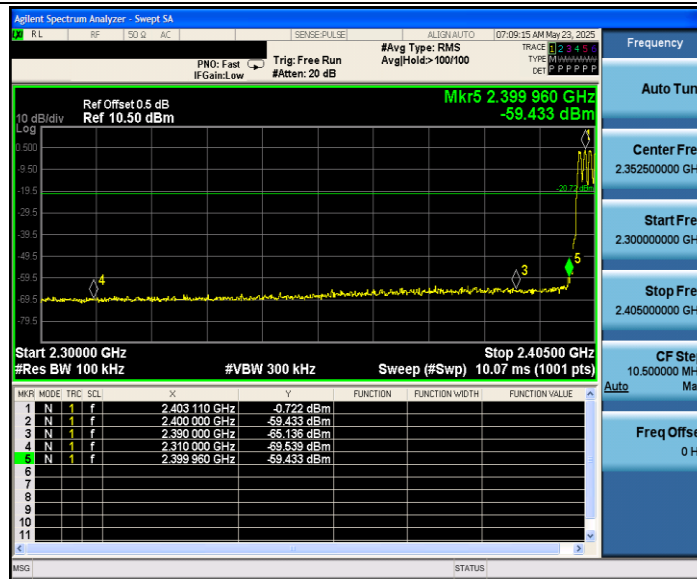
## Appendix G: Band edge measurements

### Test Result

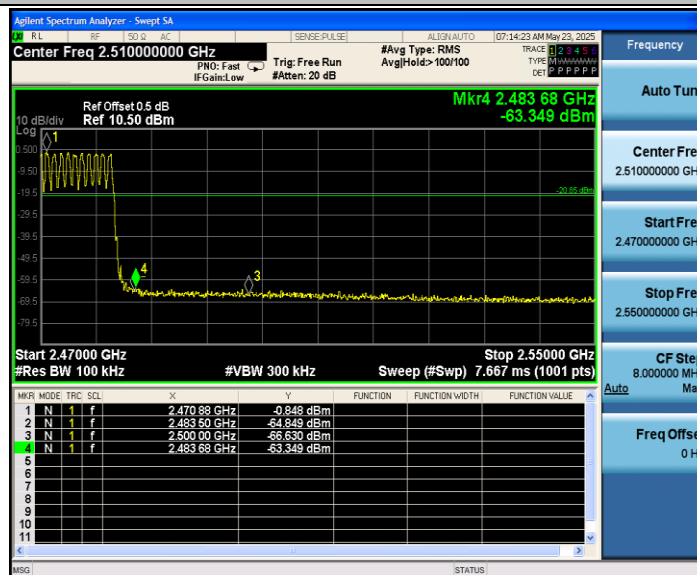
| TestMode | Antenna | ChName | Freq(MHz) | RefLevel<br>[dBm] | Result<br>[dBm] | Limit<br>[dBm] | Verdict |
|----------|---------|--------|-----------|-------------------|-----------------|----------------|---------|
| DH5      | Ant1    | Low    | 2402      | 0.23              | -56.06          | ≤-19.77        | PASS    |
|          |         | High   | 2480      | -0.92             | -61.37          | ≤-20.92        | PASS    |
|          |         | Low    | Hop_2402  | -0.72             | -59.43          | ≤-20.72        | PASS    |
|          |         | High   | Hop_2480  | -0.85             | -63.35          | ≤-20.85        | PASS    |
| 2DH5     | Ant1    | Low    | 2402      | -4.57             | -61.73          | ≤-24.57        | PASS    |
|          |         | High   | 2480      | -4.95             | -56             | ≤-24.95        | PASS    |
|          |         | Low    | Hop_2402  | -5.39             | -63.11          | ≤-25.39        | PASS    |
|          |         | High   | Hop_2480  | -3.95             | -64.03          | ≤-23.95        | PASS    |

# Test Graphs

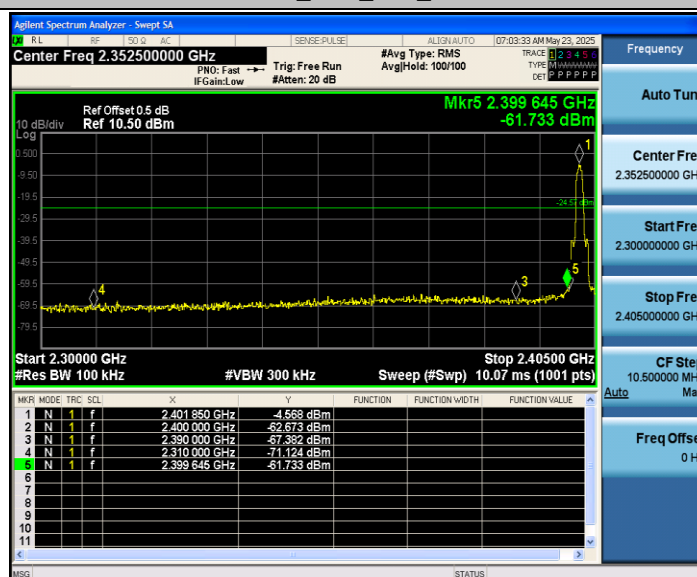




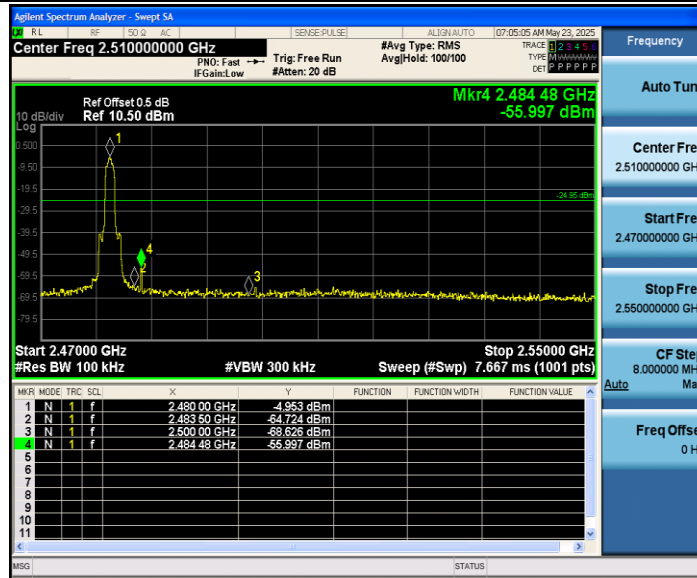
DH5\_Ant1\_High\_Hop\_2480



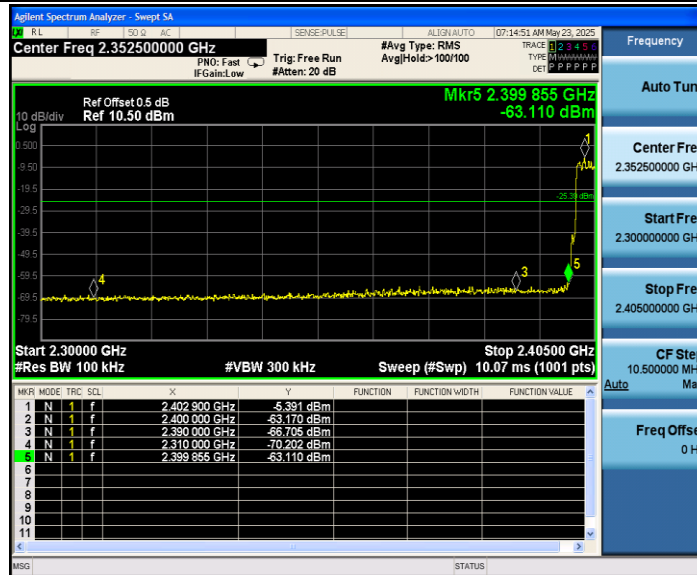
2DH5\_Ant1\_Low\_2402



# 2DH5\_Ant1\_High\_2480

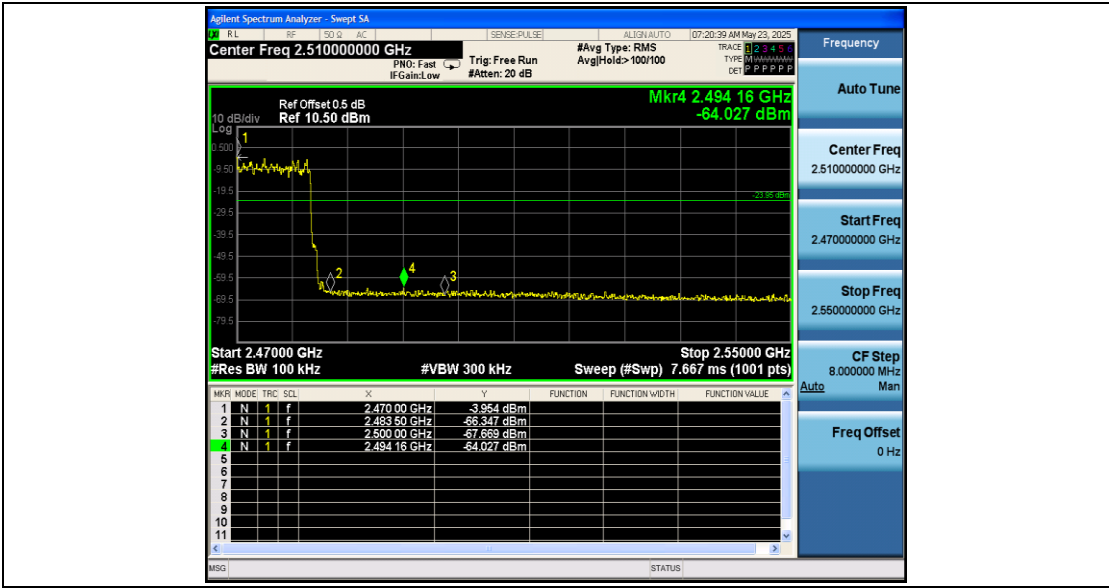


# 2DH5\_Ant1\_Low\_Hop\_2402



# 2DH5\_Ant1\_High\_Hop\_2480



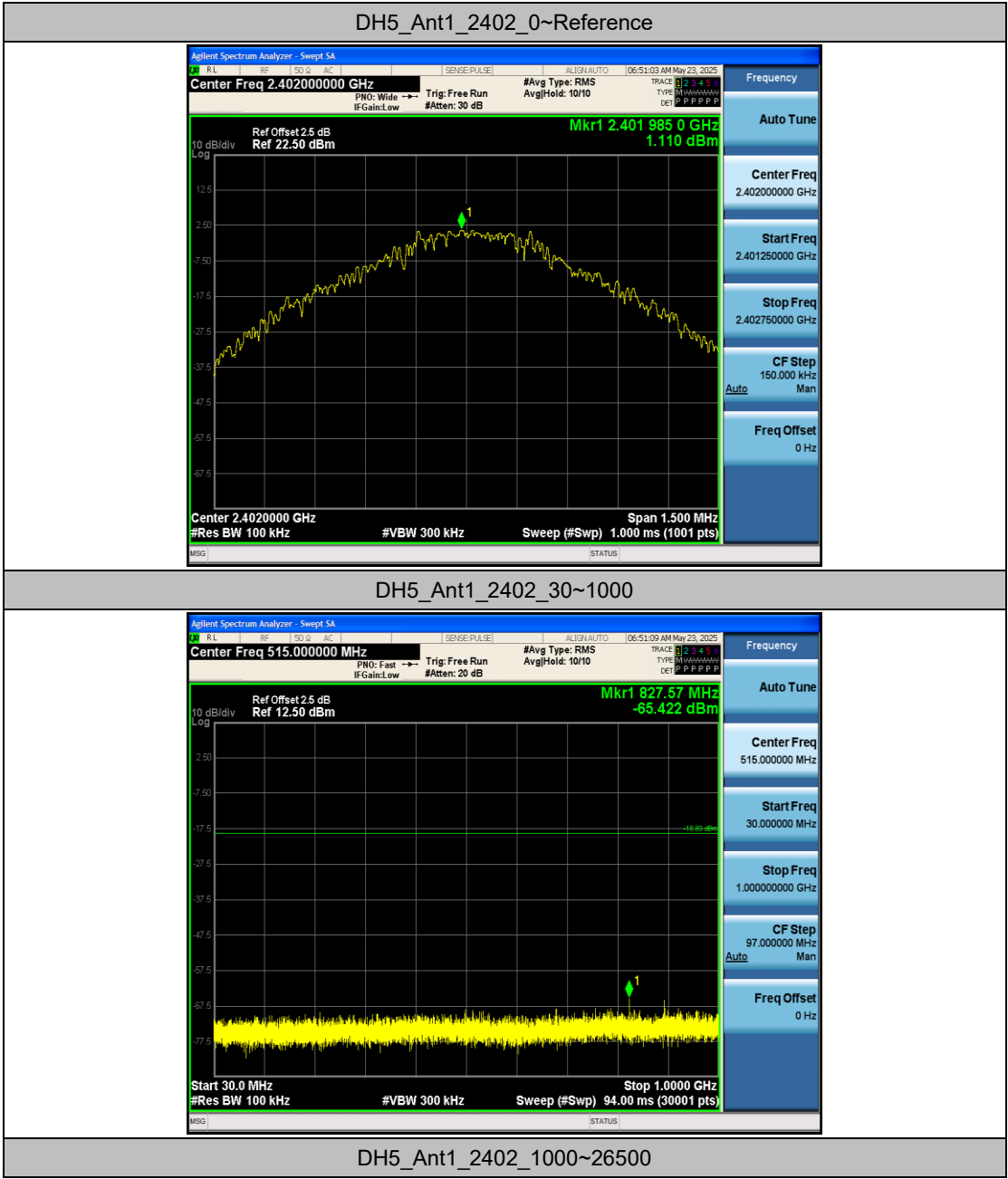


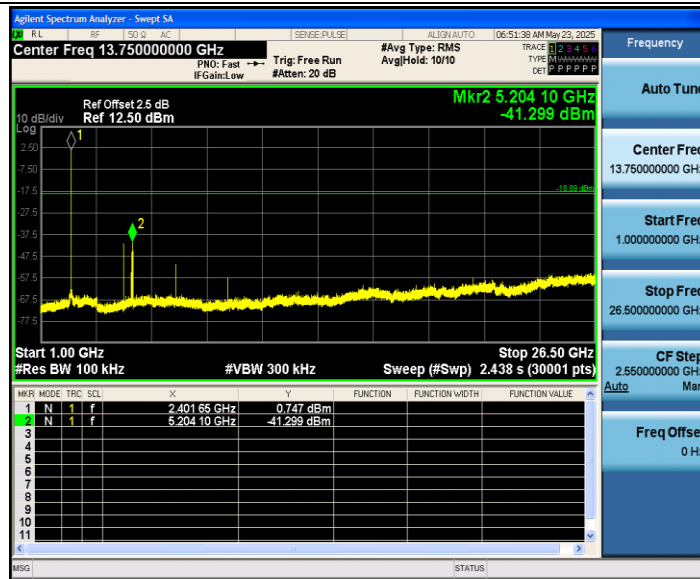
## Appendix H: Conducted Spurious Emission

### Test Result

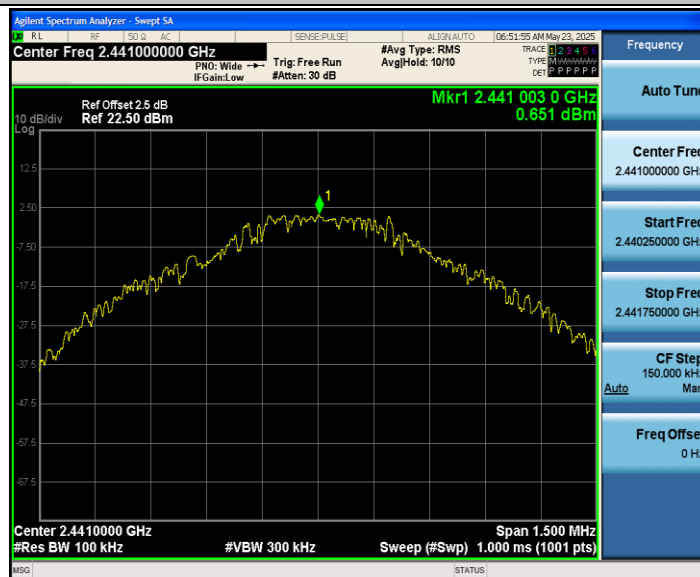
| TestMode | Antenna | Freq(MHz) | FreqRange [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|----------|---------|-----------|-----------------|----------------|--------------|-------------|---------|
| DH5      | Ant1    | 2402      | Reference       | 1.11           | 1.11         | ---         | PASS    |
|          |         |           | 30~1000         | 1.11           | -65.42       | ≤-18.89     | PASS    |
|          |         |           | 1000~26500      | 1.11           | -41.3        | ≤-18.89     | PASS    |
|          |         | 2441      | Reference       | 0.65           | 0.65         | ---         | PASS    |
|          |         |           | 30~1000         | 0.65           | -68.11       | ≤-19.35     | PASS    |
|          |         |           | 1000~26500      | 0.65           | -40.95       | ≤-19.35     | PASS    |
|          |         | 2480      | Reference       | 0.47           | 0.47         | ---         | PASS    |
|          |         |           | 30~1000         | 0.47           | -67.62       | ≤-19.53     | PASS    |
|          |         |           | 1000~26500      | 0.47           | -41.74       | ≤-19.53     | PASS    |
| 2DH5     | Ant1    | 2402      | Reference       | -2.99          | -2.99        | ---         | PASS    |
|          |         |           | 30~1000         | -2.99          | -67.31       | ≤-22.99     | PASS    |
|          |         |           | 1000~26500      | -2.99          | -40.15       | ≤-22.99     | PASS    |
|          |         | 2441      | Reference       | -4.65          | -4.65        | ---         | PASS    |
|          |         |           | 30~1000         | -4.65          | -68.2        | ≤-24.65     | PASS    |
|          |         |           | 1000~26500      | -4.65          | -39.33       | ≤-24.65     | PASS    |
|          |         | 2480      | Reference       | -4.40          | -4.40        | ---         | PASS    |
|          |         |           | 30~1000         | -4.40          | -67.37       | ≤-24.4      | PASS    |
|          |         |           | 1000~26500      | -4.40          | -40.88       | ≤-24.4      | PASS    |

Test Graphs

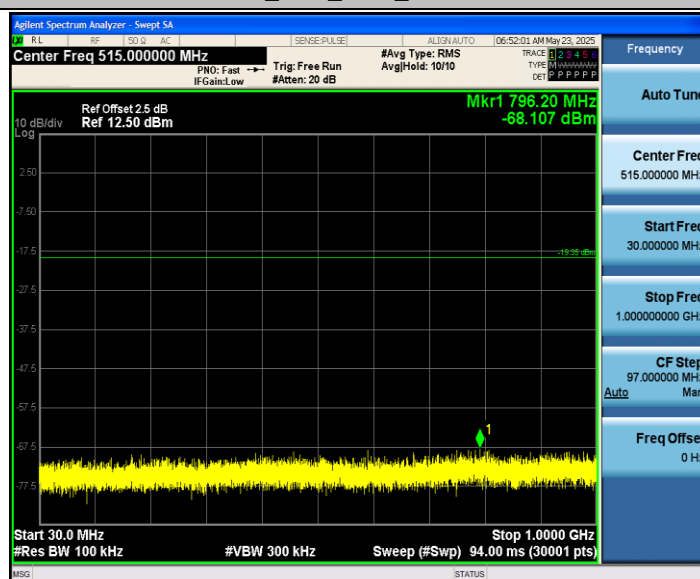




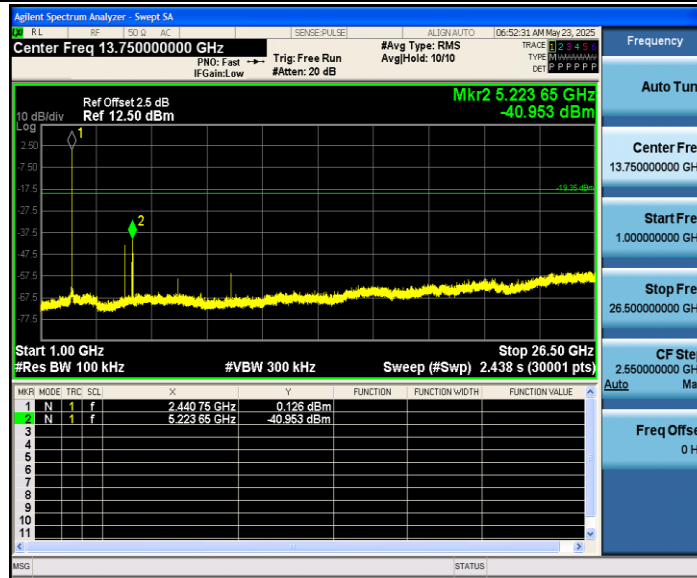
DH5\_Ant1\_2441\_0~Reference



DH5\_Ant1\_2441\_30~1000



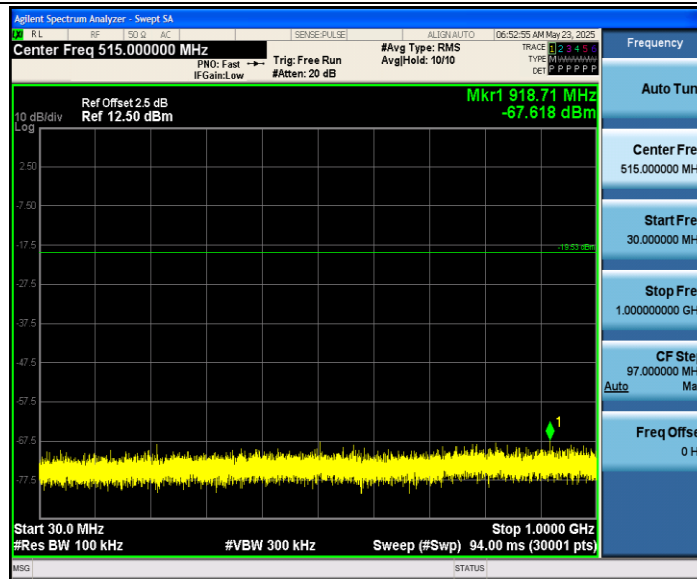
# DH5\_Ant1\_2441\_1000~26500



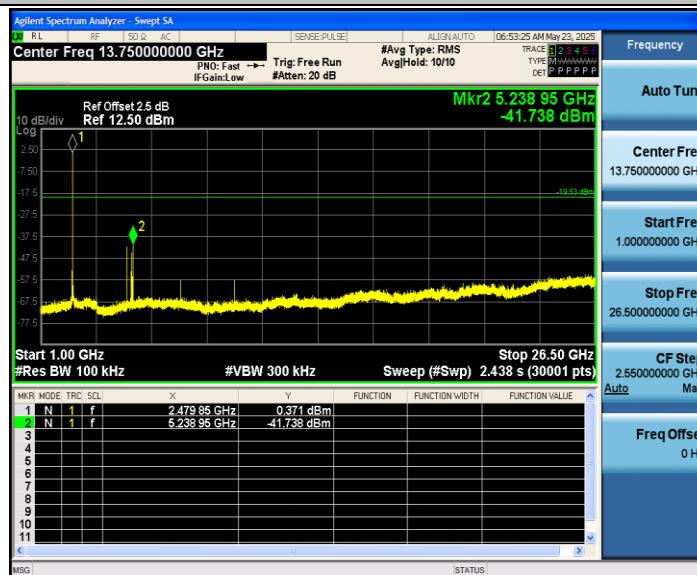
# DH5\_Ant1\_2480\_0~Reference



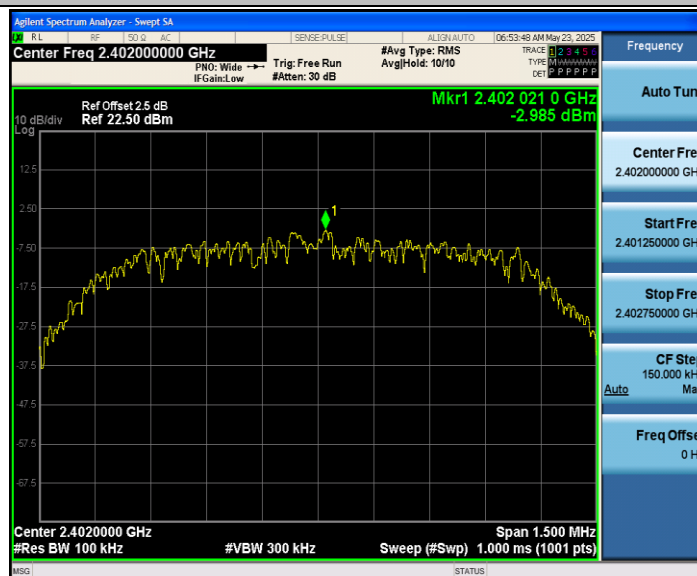
# DH5\_Ant1\_2480\_30~1000



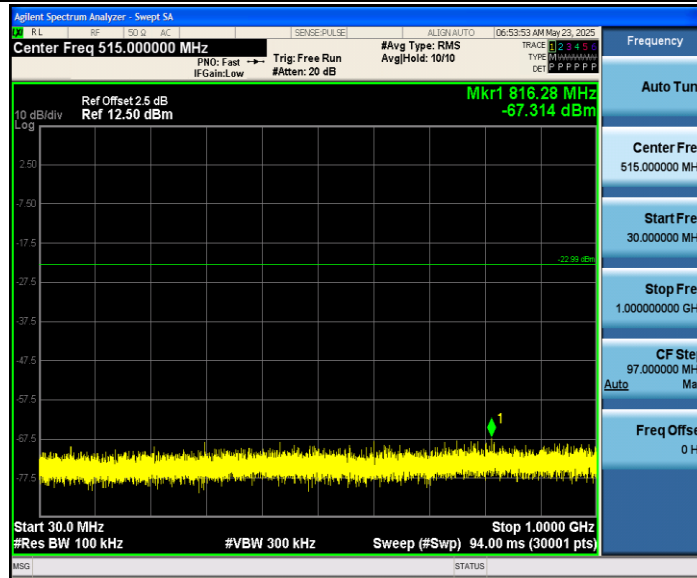
DH5\_Ant1\_2480\_1000~26500



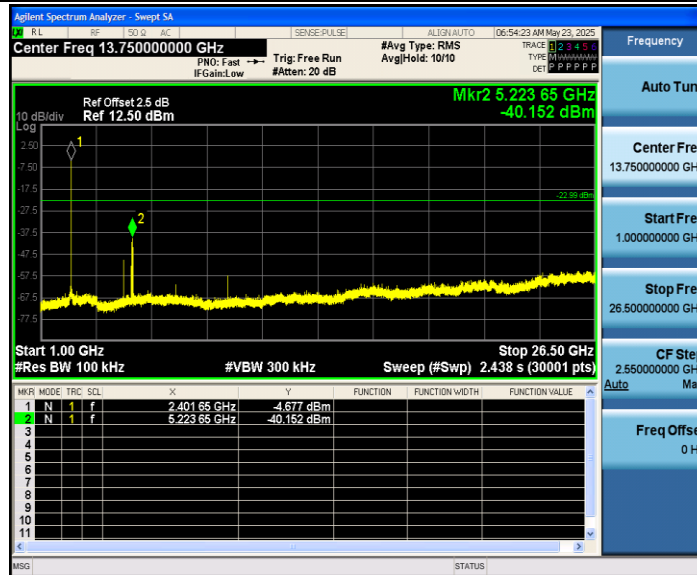
2DH5\_Ant1\_2402\_0~Reference



# 2DH5\_Ant1\_2402\_30~1000



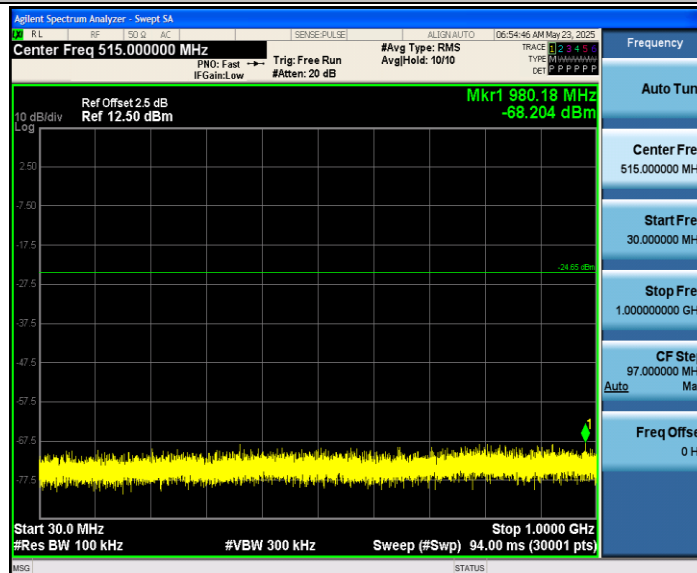
# 2DH5\_Ant1\_2402\_1000~26500



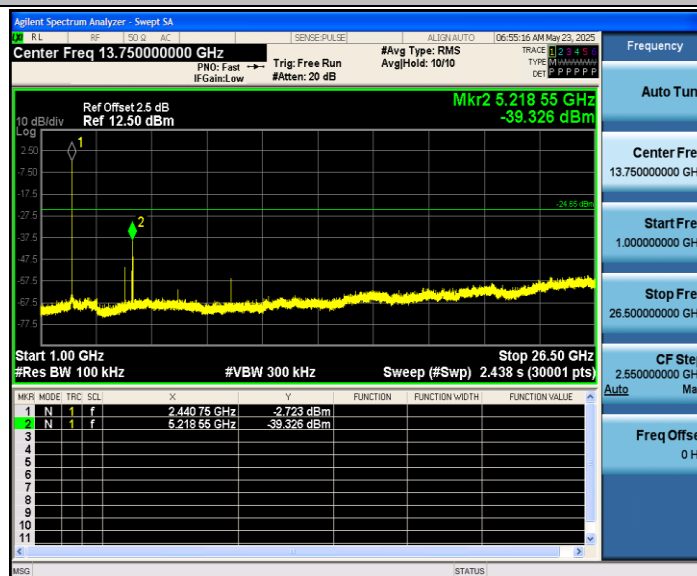
# 2DH5\_Ant1\_2441\_0~Reference



2DH5\_Ant1\_2441\_30~1000

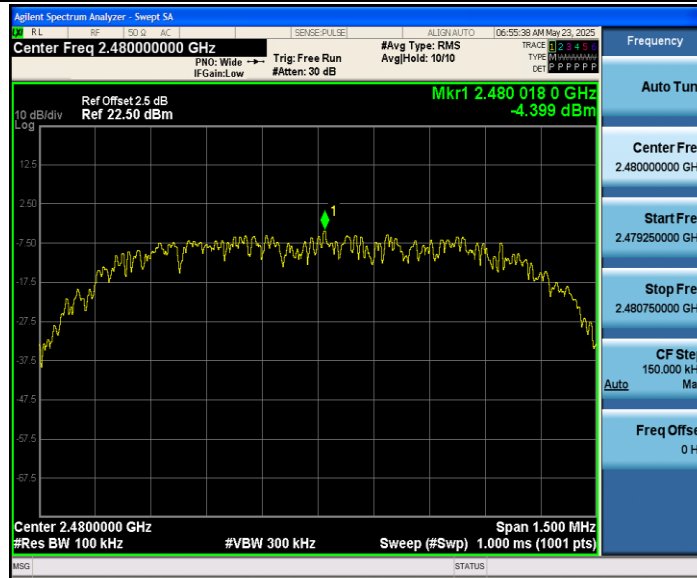


2DH5\_Ant1\_2441\_1000~26500

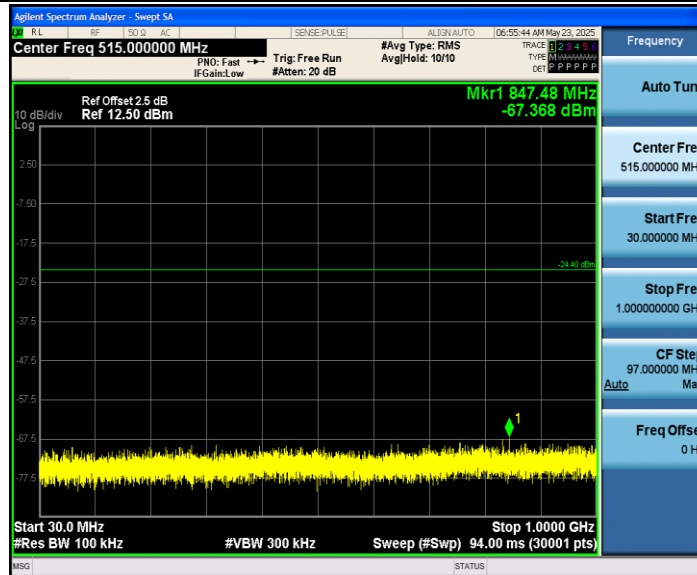




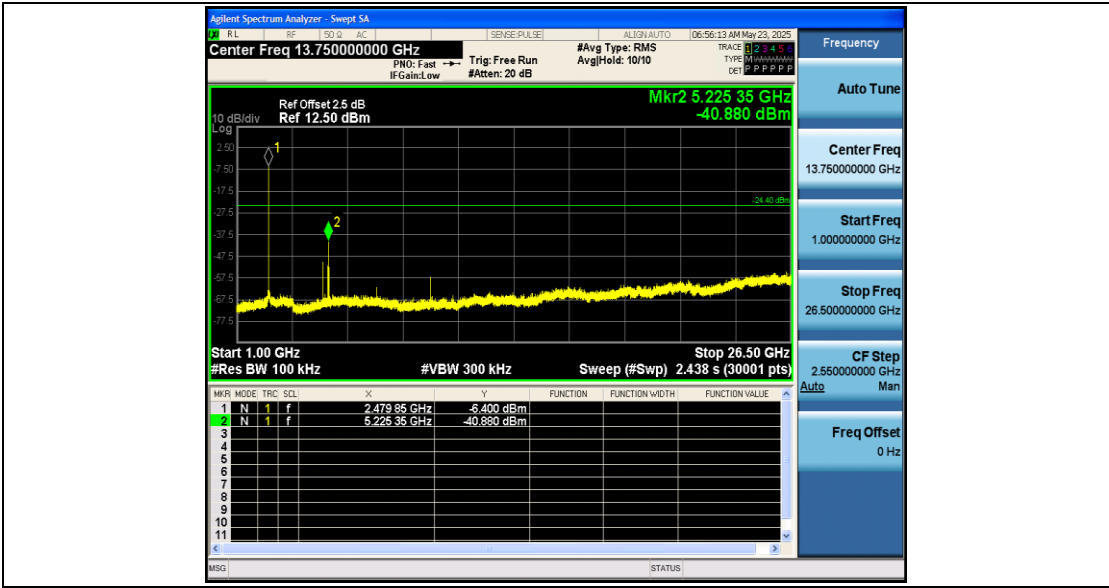
# 2DH5\_Ant1\_2480\_0~Reference



# 2DH5\_Ant1\_2480\_30~1000



# 2DH5\_Ant1\_2480\_1000~26500



## Appendix I: Duty Cycle

### Test Result

| TestMode | Antenna | Freq(MHz) | ON Time<br>[ms] | Period<br>[ms] | DC<br>[%] | xFactor | Limit | Verdict |
|----------|---------|-----------|-----------------|----------------|-----------|---------|-------|---------|
| DH5      | Ant1    | 2402      | 2.91            | 3.75           | 77.60     | 1.10    | ---   | ---     |
|          |         | 2441      | 2.92            | 3.75           | 77.87     | 1.09    | ---   | ---     |
|          |         | 2480      | 2.91            | 3.75           | 77.60     | 1.10    | ---   | ---     |
| 2DH5     | Ant1    | 2402      | 2.92            | 3.75           | 77.87     | 1.09    | ---   | ---     |
|          |         | 2441      | 2.92            | 3.75           | 77.87     | 1.09    | ---   | ---     |
|          |         | 2480      | 2.92            | 3.75           | 77.87     | 1.09    | ---   | ---     |

**DH5\_Ant1\_2402**

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.402000000 GHz

Ref Offset 0.5 dB

Ref 20.00 dBm

Trig Delay 200.0  $\mu$ s

Trig: Video

#Aven: 30 dB

Span 0 Hz

CF Step 8.000000 MHz

Freq Offset 0 Hz

Auto Tune

Center Freq 2.402000000 GHz

Start Freq 2.402000000 GHz

Stop Freq 2.402000000 GHz

Res BW 8 MHz

#VBW 8.0 MHz

Sweep 5.000 ms (1001 pts)

| MNR | MODE | TRIG | SCL | X             | Y            | FUNCTION  | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|------|-----|---------------|--------------|-----------|----------------|----------------|
| 1   | N    | 1    | t   | 190.0 $\mu$ s | -4.17 dBm    |           |                |                |
| 2   | A1   | 1    | t   | (A)           | 2.910 ms (A) | -29.85 dB |                |                |
| 3   | A1   | 1    | t   | (A)           | 3.750 ms (A) | 0.02 dB   |                |                |

**DH5\_Ant1\_2441**

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.441000000 GHz

Ref Offset 0.5 dB

Ref 20.00 dBm

Trig Delay 200.0  $\mu$ s

Trig: Video

#Aven: 30 dB

Span 0 Hz

CF Step 8.000000 MHz

Freq Offset 0 Hz

Auto Tune

Center Freq 2.441000000 GHz

Start Freq 2.441000000 GHz

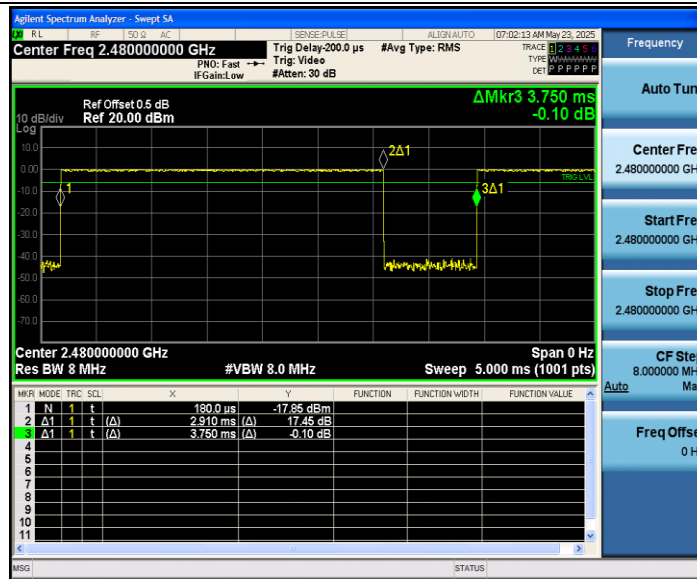
Stop Freq 2.441000000 GHz

Res BW 8 MHz

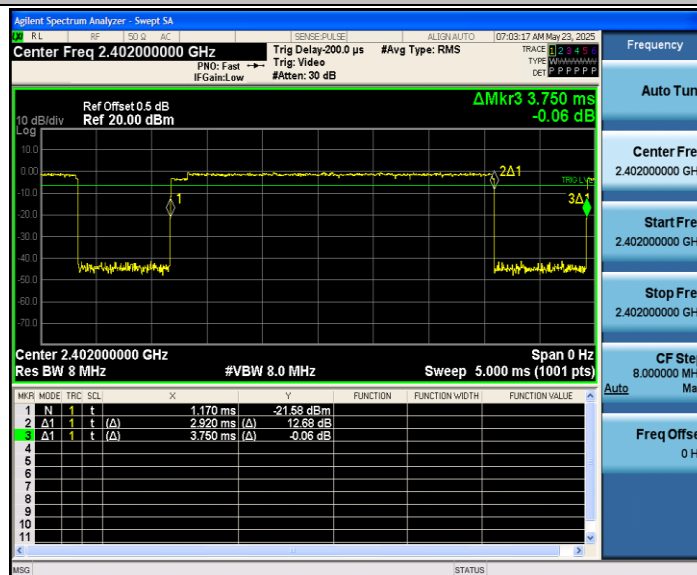
#VBW 8.0 MHz

Sweep 5.000 ms (1001 pts)

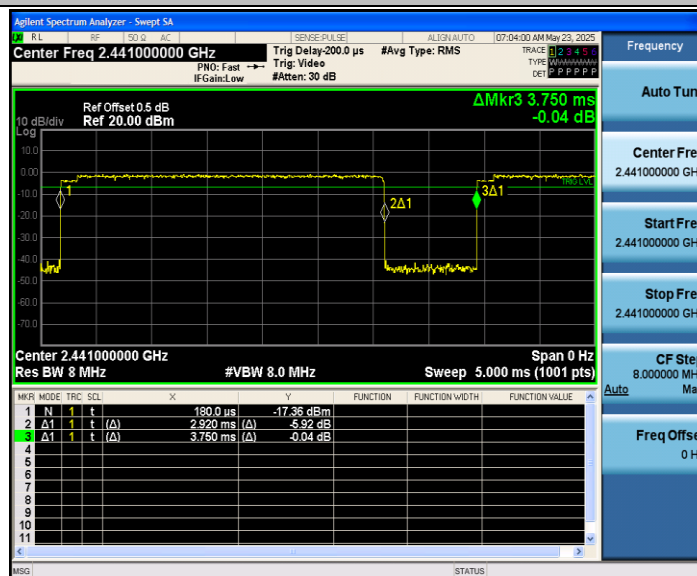
| MNR | MODE | TRIG | SCL | X             | Y            | FUNCTION  | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|------|-----|---------------|--------------|-----------|----------------|----------------|
| 1   | N    | 1    | t   | 180.0 $\mu$ s | -20.50 dBm   |           |                |                |
| 2   | A1   | 1    | t   | (A)           | 2.920 ms (A) | -25.16 dB |                |                |
| 3   | A1   | 1    | t   | (A)           | 3.750 ms (A) | 0.70 dB   |                |                |



2DH5\_Ant1\_2402



2DH5\_Ant1\_2441



# 2DH5\_Ant1\_2480

