

## **FCC Appendix RF Test Data**

**FCC ID** : 2BM59-T40

**Company** : Haoyin (Guangzhou) Digital Technology Co., Ltd.

**EUT** : T40 thermal printer

**Model Number** : T40

**Report No.** : CTA25062505702

**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      | 0.948            | 2401.544 | 2402.492 | ---        | ---     |
|          |         | 2441      | 0.948            | 2440.550 | 2441.498 | ---        | ---     |
|          |         | 2480      | 0.942            | 2479.550 | 2480.492 | ---        | ---     |
| 2DH5     | Ant1    | 2402      | 1.311            | 2401.355 | 2402.666 | ---        | ---     |
|          |         | 2441      | 1.278            | 2440.379 | 2441.657 | ---        | ---     |
|          |         | 2480      | 1.278            | 2479.382 | 2480.660 | ---        | ---     |

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.40200000 GHz

Ref Offset 1.1 dB  
Ref 11.10 dBm

Trig: Free Run  
#Atten: 20 dB

#Avg Type: RMS  
Avg/Hold: 100/100

Span 3.000 MHz  
#Res BW 30 kHz  
#VBW 100 kHz  
Sweep (#Swp) 3.200 ms (1001 pts)

ΔMkr3 948 kHz  
0.524 dB

| MNR | MODE | TRC | SCL   | X            | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|-----|-------|--------------|-------------|----------|----------------|----------------|
| 1   | N    | 1   | f     | 2.401544 GHz | -22.500 dBm |          |                |                |
| 2   | N    | 1   | f     | 2.402000 GHz | -2.500 dBm  |          |                |                |
| 3   | Δ    | 1   | f (Δ) | 948 kHz (Δ)  | 0.524 dB    |          |                |                |

Frequency

Auto Tune

Center Freq  
2.402000000 GHz

Start Freq  
2.400500000 GHz

Stop Freq  
2.403500000 GHz

CF Step  
300.000 kHz  
Man

Freq Offset  
0 Hz

DH5\_Ant1\_2402

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.441000000 GHz

Ref Offset 1.1 dB  
Ref 11.10 dBm

Trig: Free Run  
#Atten: 20 dB

#Avg Type: RMS  
Avg/Hold: 100/100

Span 3.000 MHz  
#Res BW 30 kHz  
#VBW 100 kHz  
Sweep (#Swp) 3.200 ms (1001 pts)

ΔMkr3 948 kHz  
-0.222 dB

| MNR | MODE | TRC | SCL   | X            | Y           | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|-----|-------|--------------|-------------|----------|----------------|----------------|
| 1   | N    | 1   | f     | 2.440550 GHz | -21.291 dBm |          |                |                |
| 2   | N    | 1   | f     | 2.441000 GHz | -2.224 dBm  |          |                |                |
| 3   | Δ    | 1   | f (Δ) | 948 kHz (Δ)  | -0.222 dB   |          |                |                |

Frequency

Auto Tune

Center Freq  
2.441000000 GHz

Start Freq  
2.439500000 GHz

Stop Freq  
2.442500000 GHz

CF Step  
300.000 kHz  
Man

Freq Offset  
0 Hz

DH5\_Ant1\_2441



2DH5\_Ant1\_2402



2DH5\_Ant1\_2441



# 2DH5\_Ant1\_2480

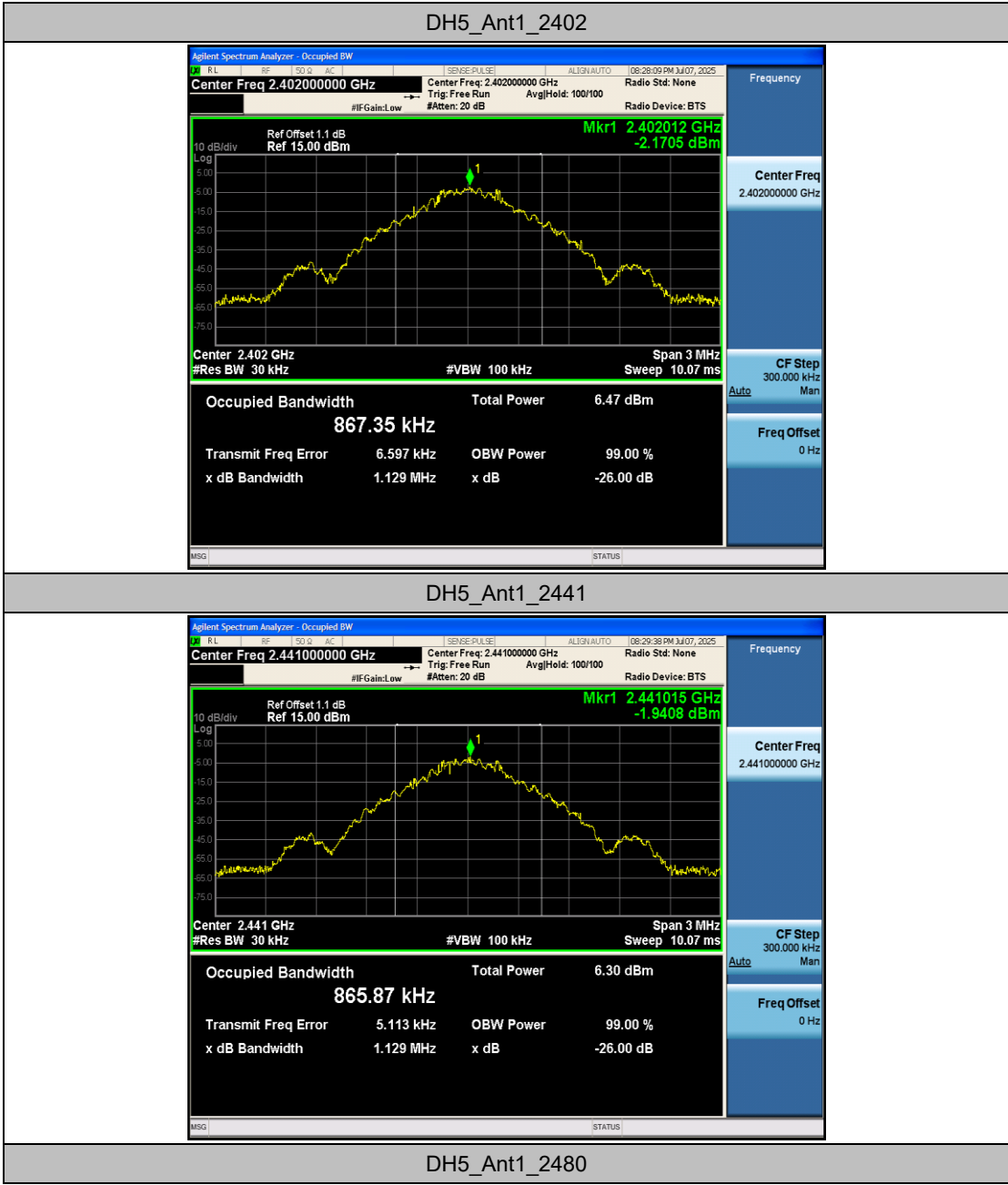


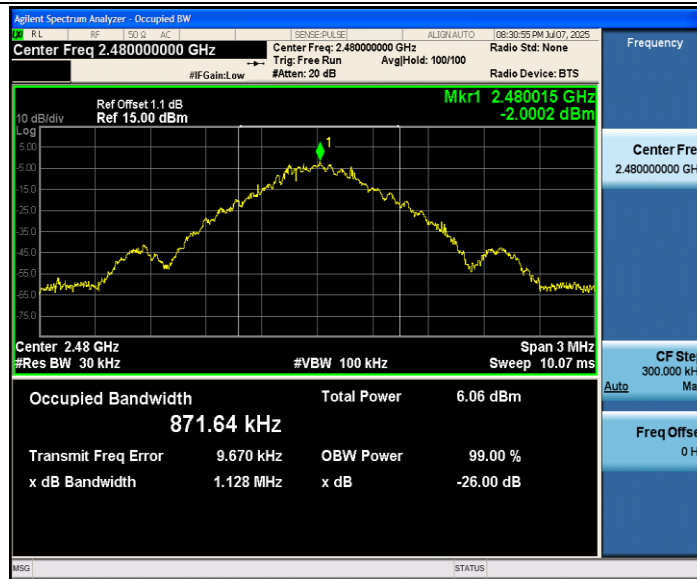
## Appendix B: Occupied Channel Bandwidth

### Test Result

| TestMode | Antenna | Freq(MHz) | OCB [MHz] | FL[MHz]   | FH[MHz]   | Limit[MHz] | Verdict |
|----------|---------|-----------|-----------|-----------|-----------|------------|---------|
| DH5      | Ant1    | 2402      | 0.86735   | 2401.5729 | 2402.4403 | ---        | ---     |
|          |         | 2441      | 0.86587   | 2440.5722 | 2441.4380 | ---        | ---     |
|          |         | 2480      | 0.87164   | 2479.5739 | 2480.4455 | ---        | ---     |
| 2DH5     | Ant1    | 2402      | 1.1887    | 2401.4147 | 2402.6034 | ---        | ---     |
|          |         | 2441      | 1.1841    | 2440.4173 | 2441.6014 | ---        | ---     |
|          |         | 2480      | 1.1904    | 2479.4145 | 2480.6049 | ---        | ---     |

Test Graphs

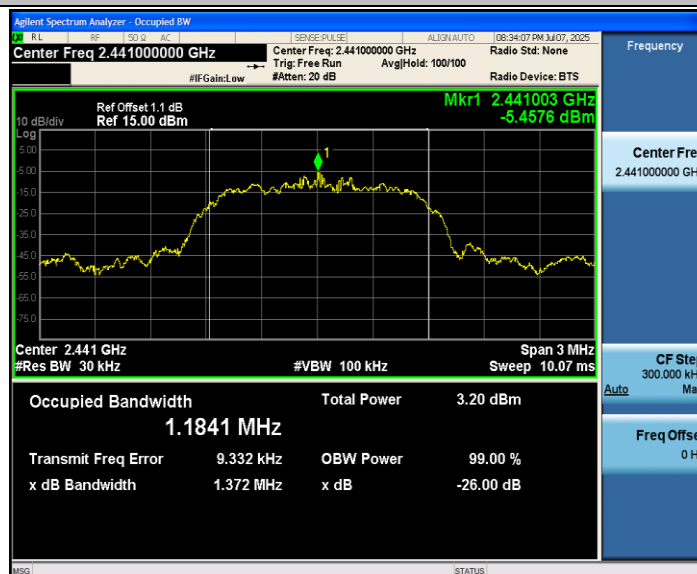




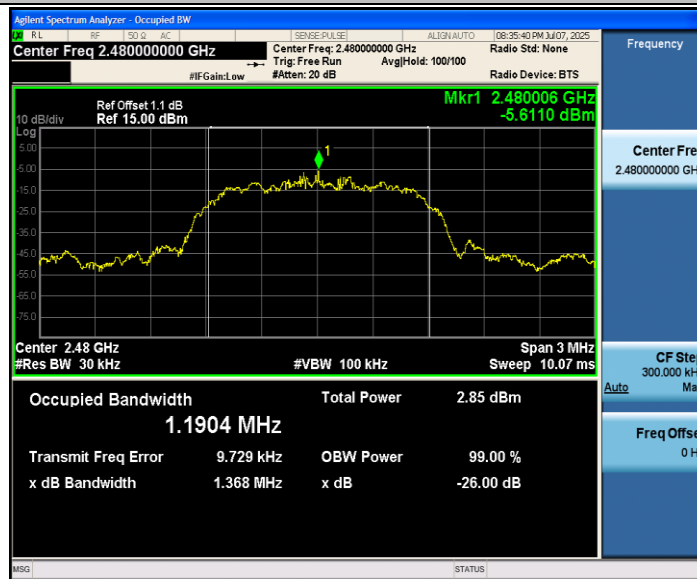
2DH5\_Ant1\_2402



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      | 0.55                      | ≤20.97               | PASS    |
|           |         | 2441      | 0.29                      | ≤20.97               | PASS    |
|           |         | 2480      | 0.22                      | ≤20.97               | PASS    |
| 2DH5      | Ant1    | 2402      | -0.23                     | ≤20.97               | PASS    |
|           |         | 2441      | -0.50                     | ≤20.97               | PASS    |
|           |         | 2480      | -0.64                     | ≤20.97               | PASS    |

## Appendix D: Carrier frequency separation

### Test Result

| TestMode | Antenna | Freq(MHz) | Result[MHz] | Limit[MHz]   | Verdict |
|----------|---------|-----------|-------------|--------------|---------|
| DH5      | Ant1    | Hop       | 1.024       | $\geq 0.948$ | PASS    |
| 2DH5     | Ant1    | Hop       | 0.88        | $\geq 0.874$ | PASS    |

Test Graphs

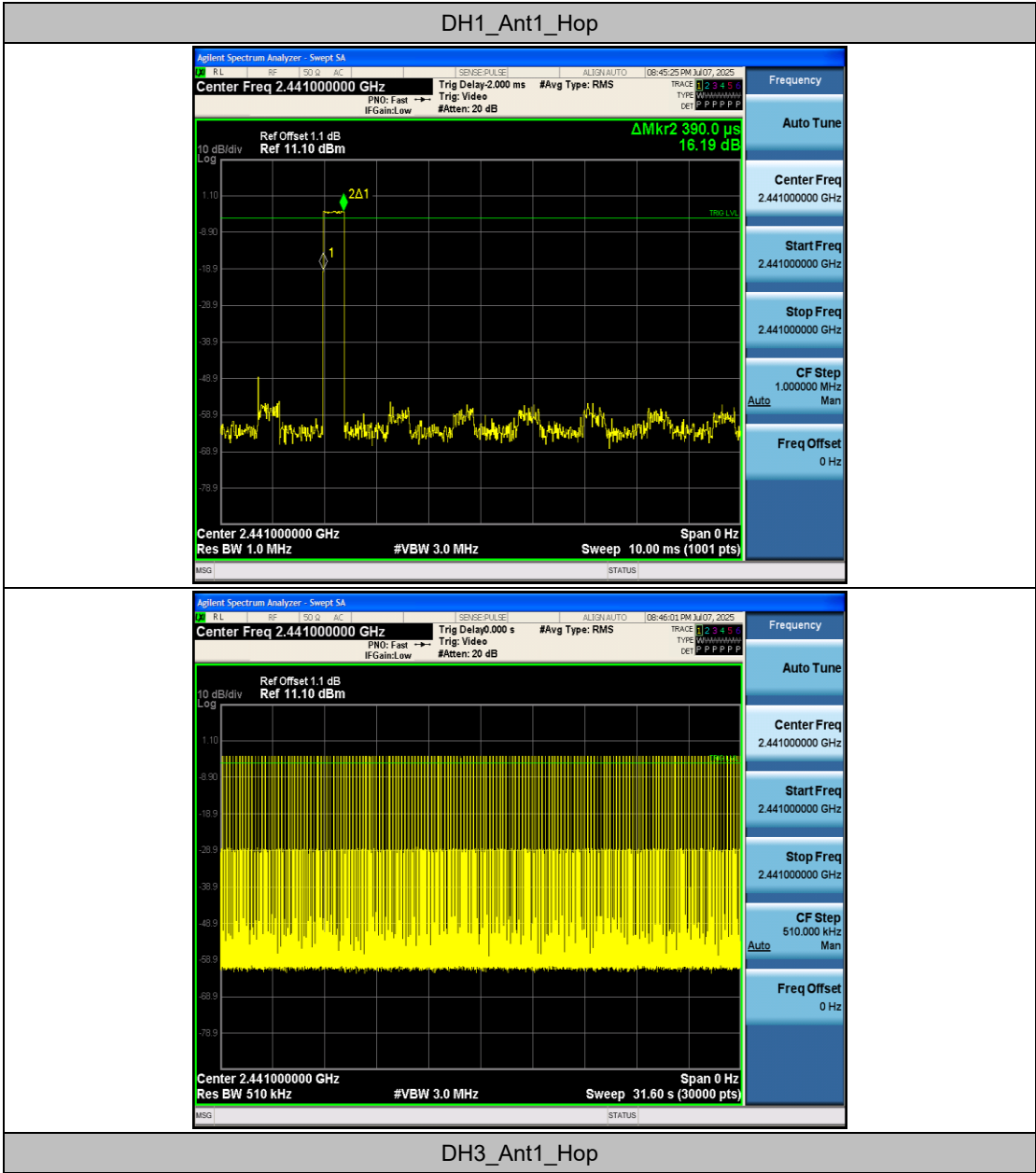


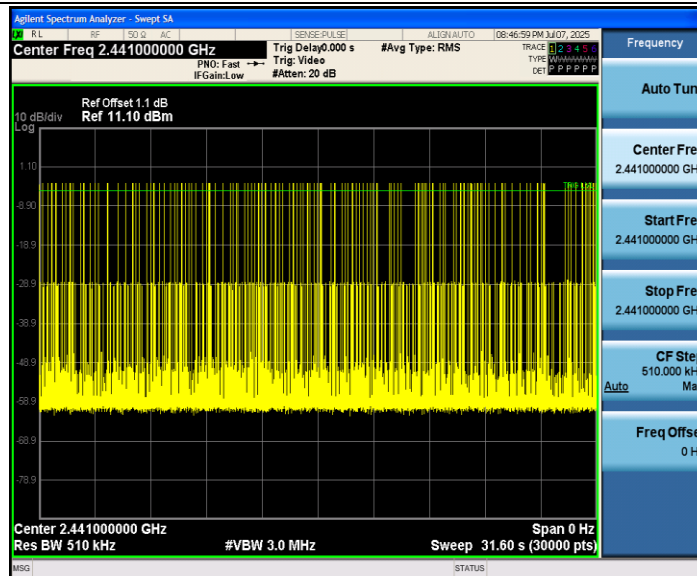
## Appendix E: Time of occupancy

### 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       | 1.640              | 158                | 0.259     | ≤0.4     | PASS    |
| DH5      | Ant1    | Hop       | 2.890              | 104                | 0.301     | ≤0.4     | PASS    |
| 2DH1     | Ant1    | Hop       | 0.400              | 318                | 0.127     | ≤0.4     | PASS    |
| 2DH3     | Ant1    | Hop       | 1.650              | 161                | 0.266     | ≤0.4     | PASS    |
| 2DH5     | Ant1    | Hop       | 2.900              | 108                | 0.313     | ≤0.4     | PASS    |

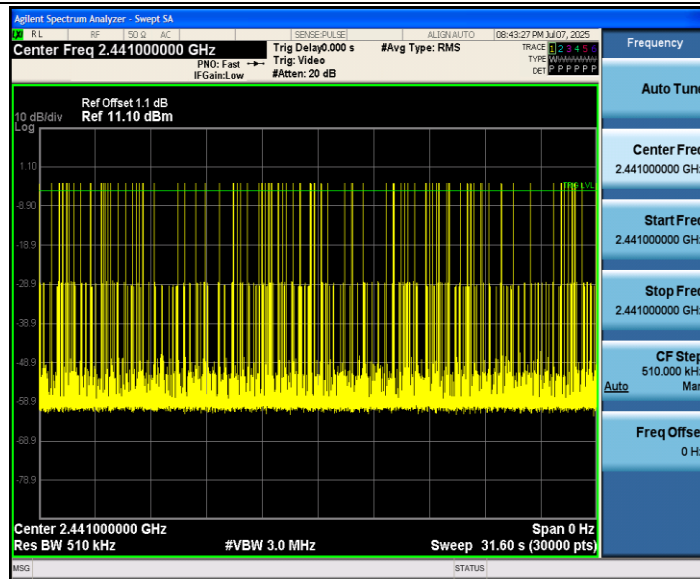
Test Graphs



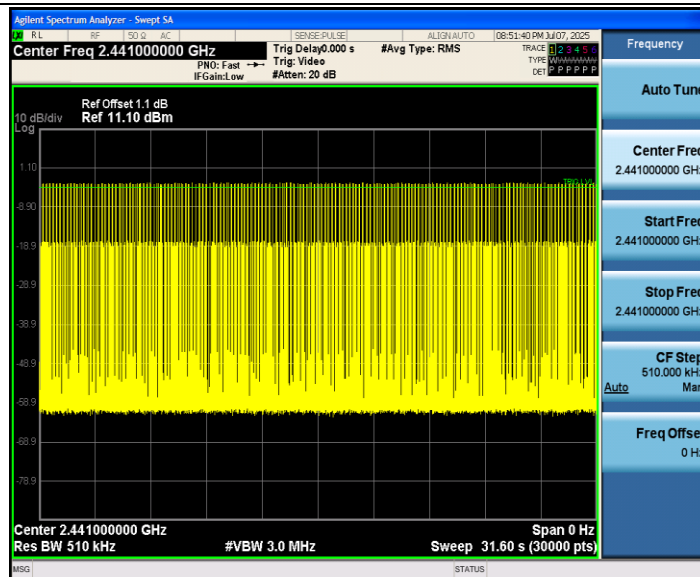
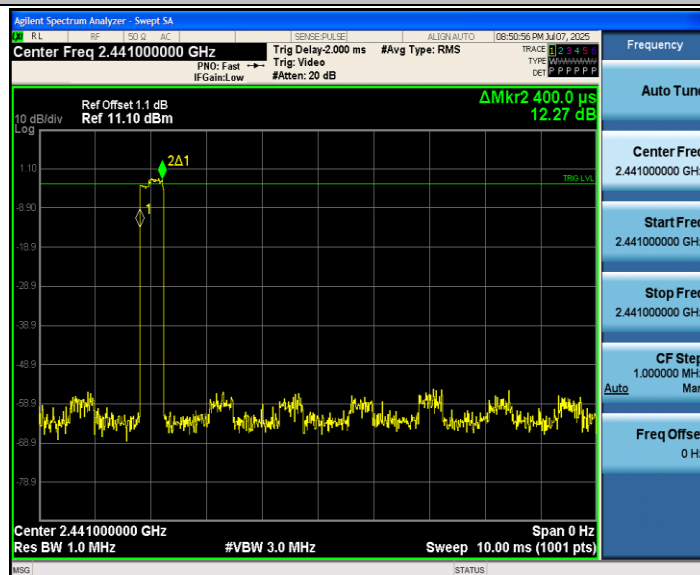


DH5\_Ant1\_Hop

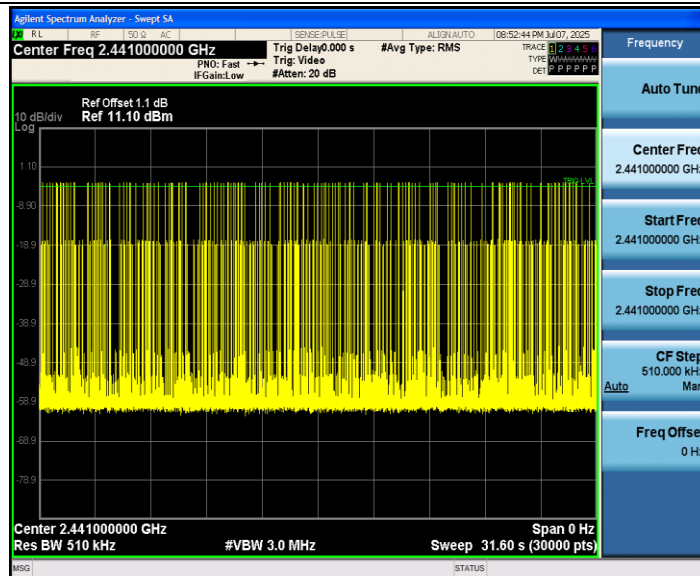
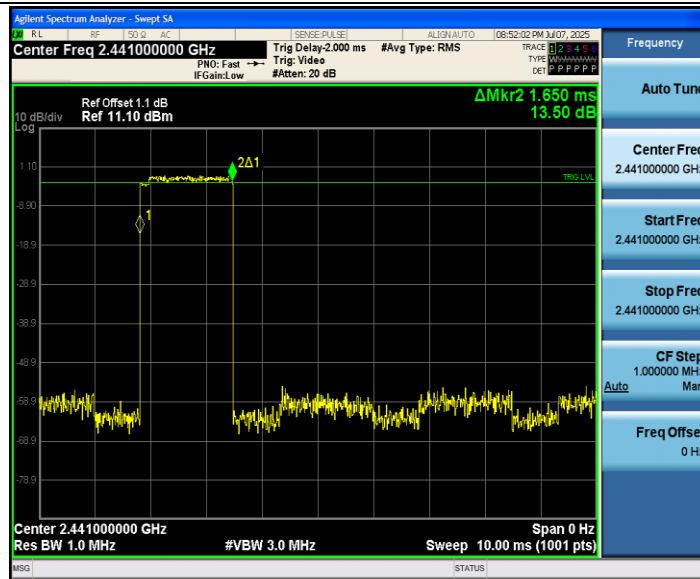




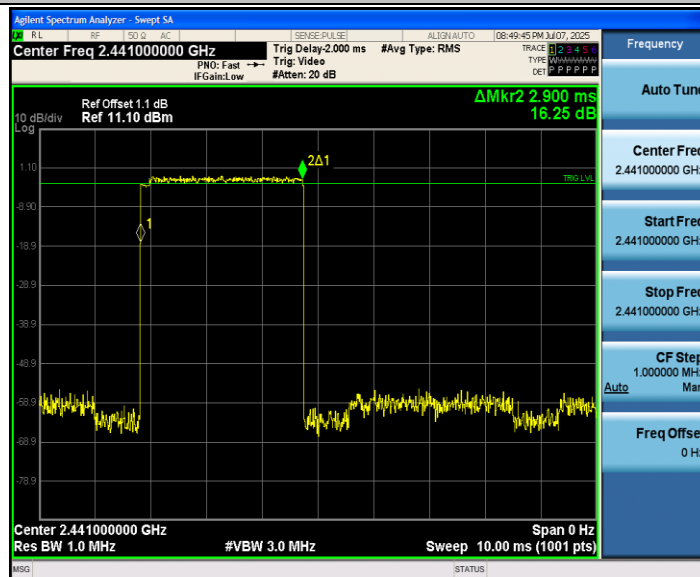
2DH1\_Ant1\_Hop

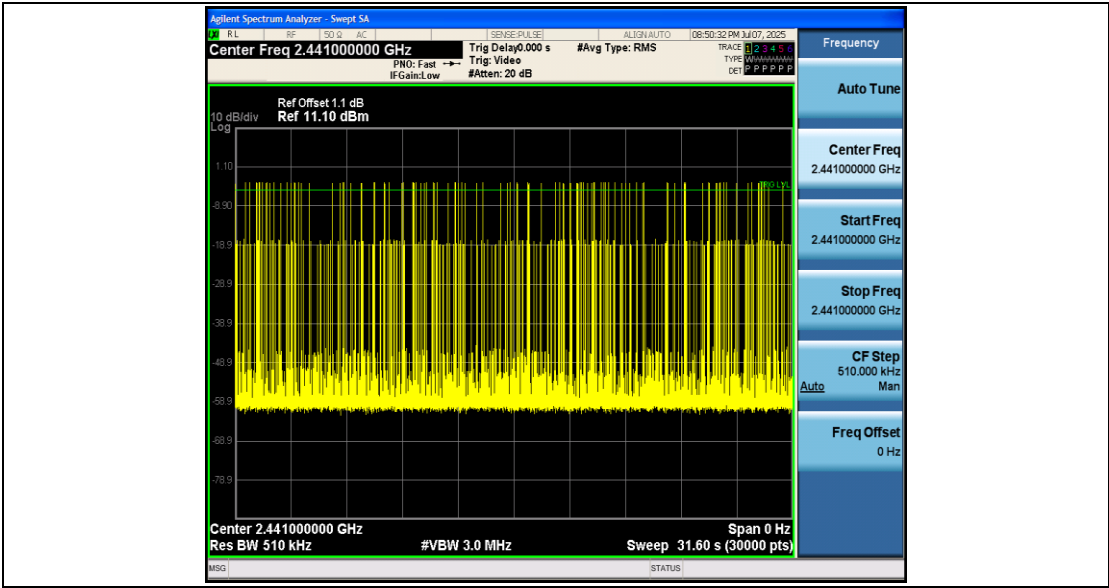


2DH3\_Ant1\_Hop



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

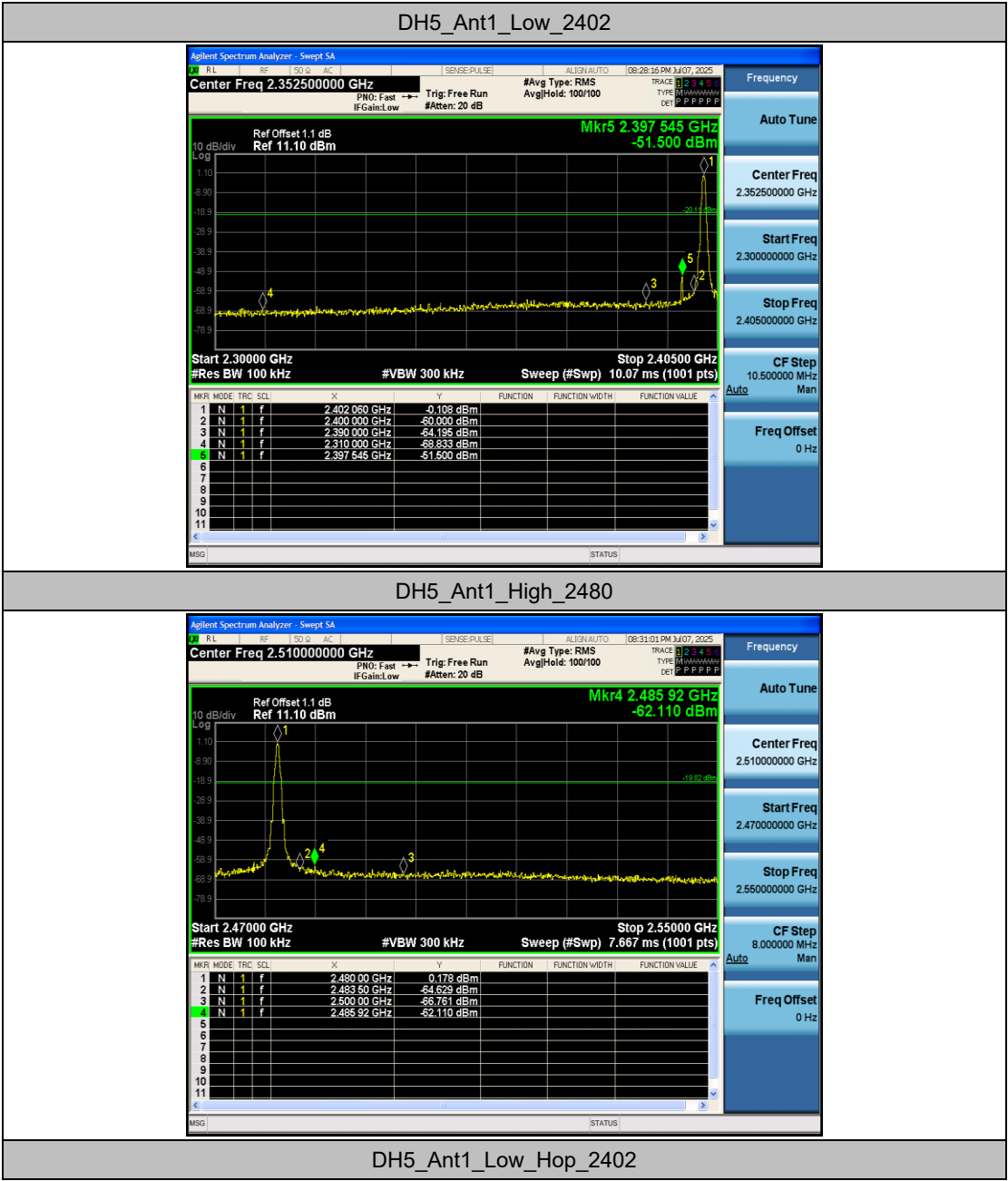


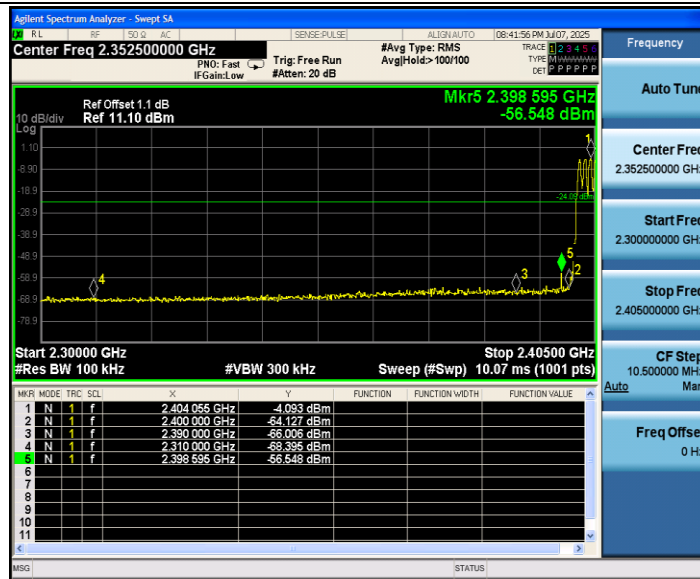
## Appendix G: Band edge measurements

### Test Result

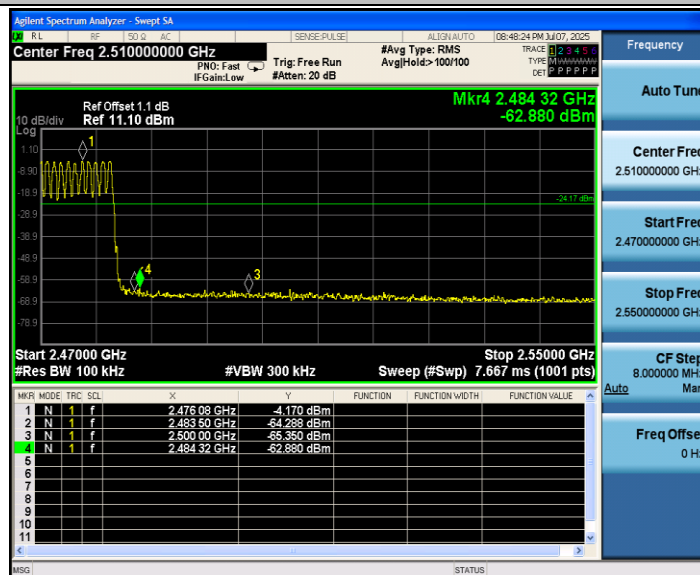
| TestMode | Antenna | ChName | Freq(MHz) | RefLevel<br>[dBm] | Result<br>[dBm] | Limit<br>[dBm] | Verdict |
|----------|---------|--------|-----------|-------------------|-----------------|----------------|---------|
| DH5      | Ant1    | Low    | 2402      | -0.11             | -51.5           | ≤-20.11        | PASS    |
|          |         | High   | 2480      | 0.18              | -62.11          | ≤-19.82        | PASS    |
|          |         | Low    | Hop_2402  | -4.09             | -56.55          | ≤-24.09        | PASS    |
|          |         | High   | Hop_2480  | -4.17             | -62.88          | ≤-24.17        | PASS    |
| 2DH5     | Ant1    | Low    | 2402      | -5.48             | -60.24          | ≤-25.48        | PASS    |
|          |         | High   | 2480      | -3.38             | -58.29          | ≤-23.38        | PASS    |
|          |         | Low    | Hop_2402  | -5.22             | -58.26          | ≤-25.22        | PASS    |
|          |         | High   | Hop_2480  | -3.31             | -63.61          | ≤-23.31        | PASS    |

Test Graphs

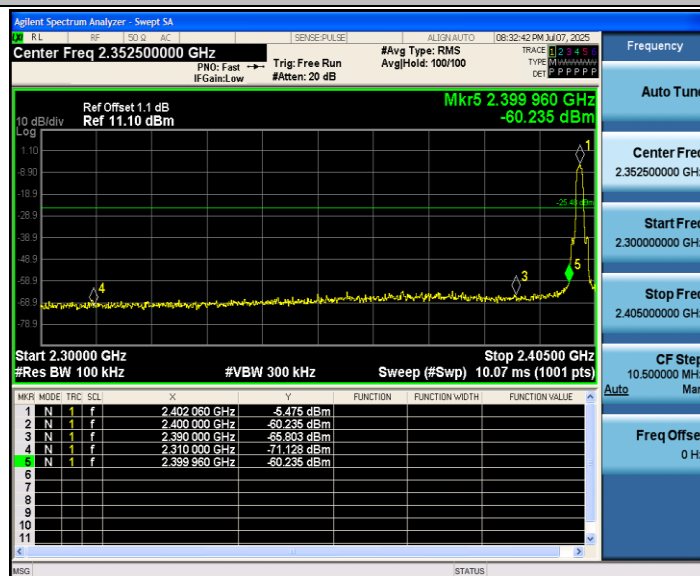




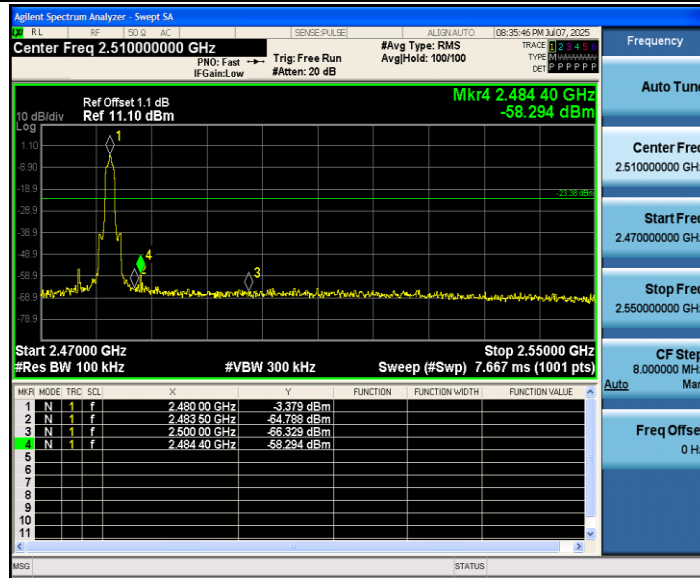
DH5\_Ant1\_High\_Hop\_2480



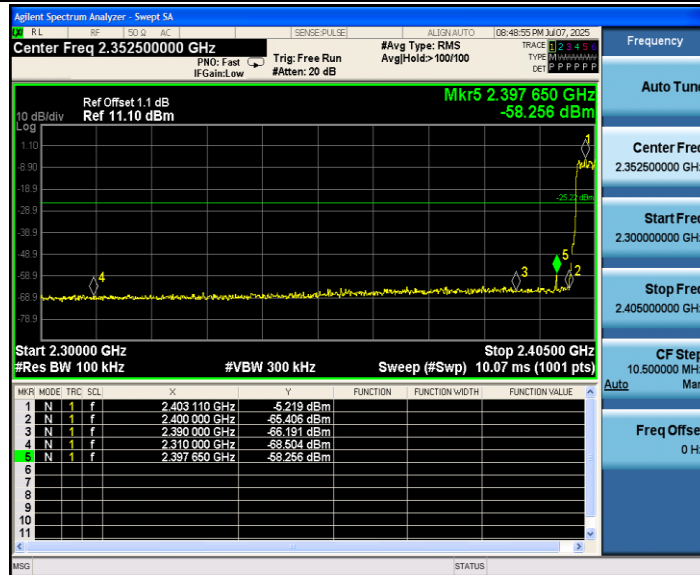
2DH5\_Ant1\_Low\_2402



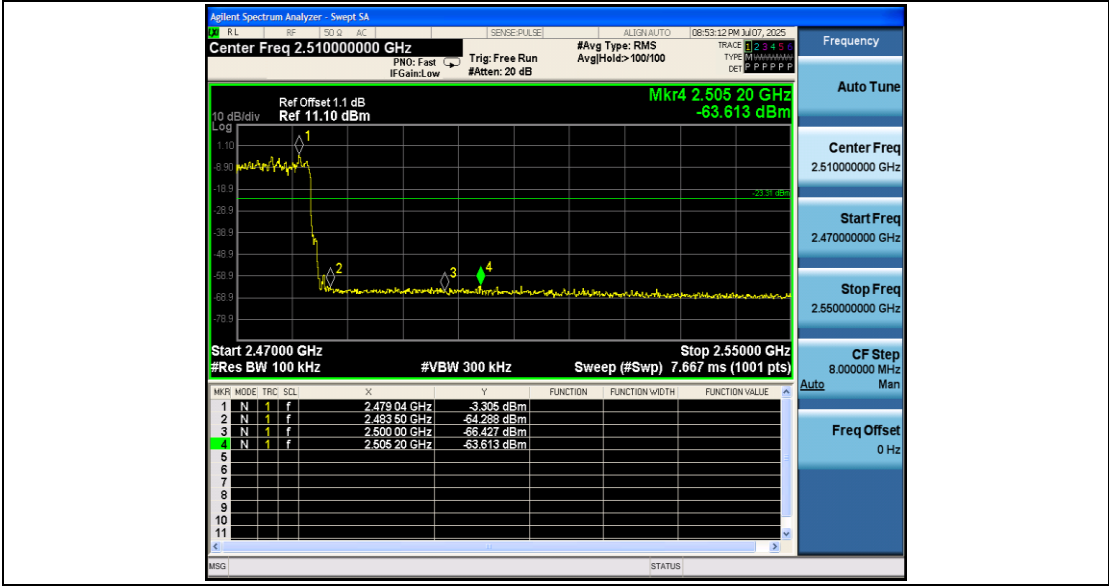
## 2DH5\_Ant1\_High\_2480



## 2DH5\_Ant1\_Low\_Hop\_2402



## 2DH5\_Ant1\_High\_Hop\_2480

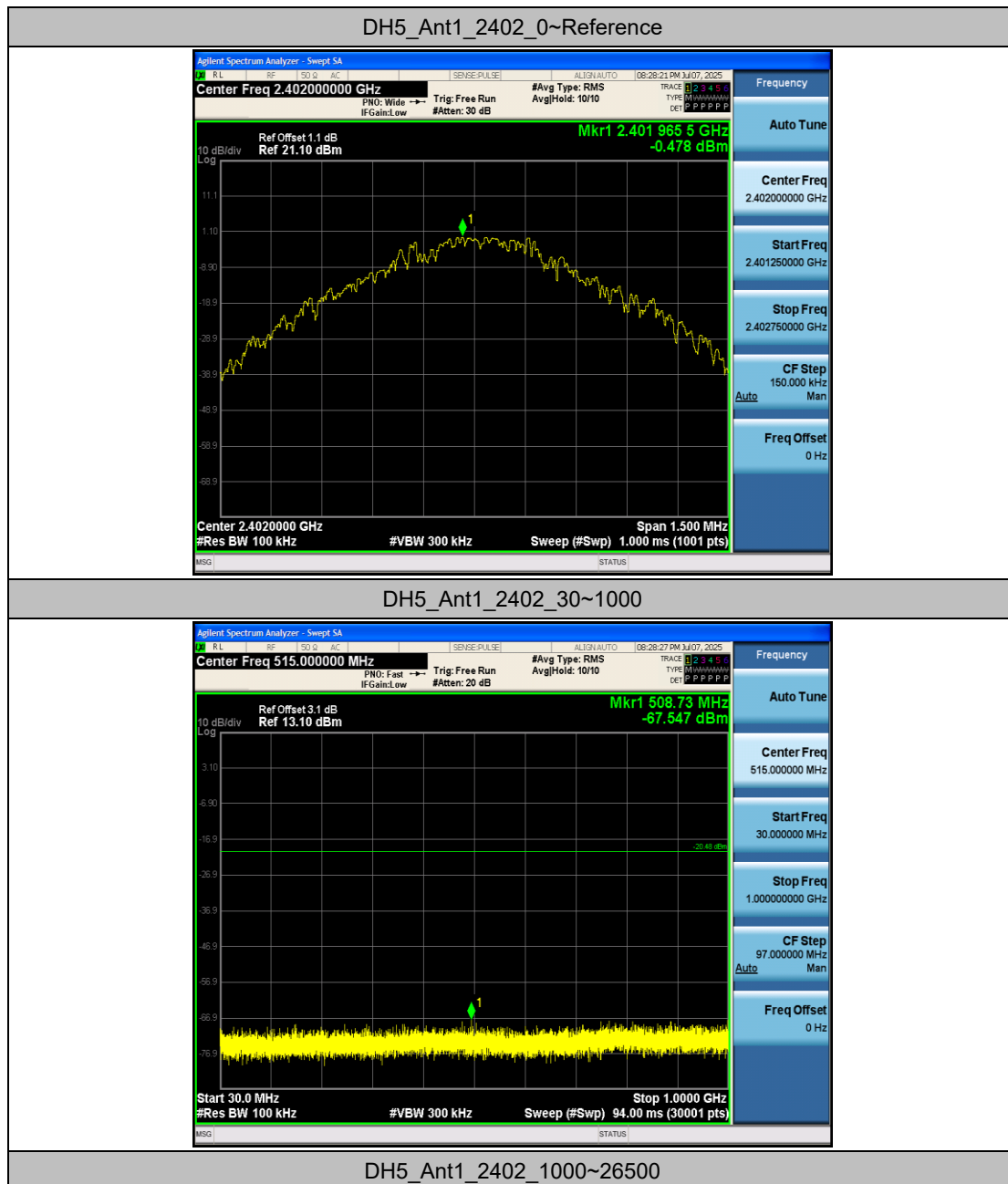


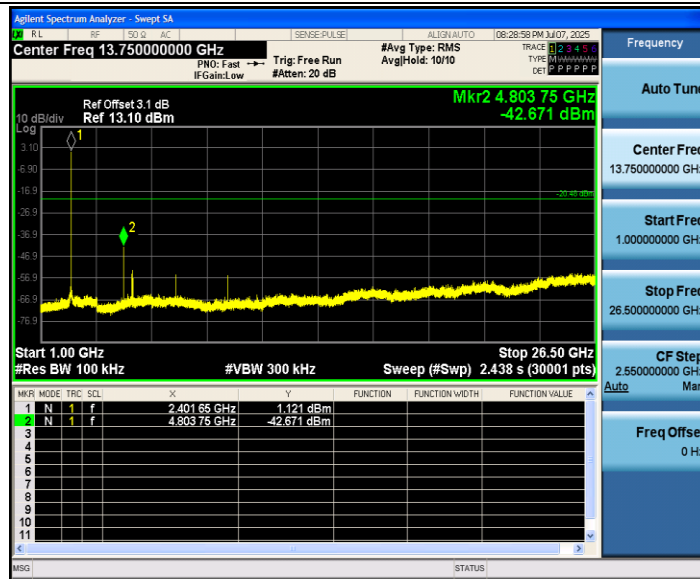
## Appendix H: Conducted Spurious Emission

### Test Result

| TestMode | Antenna | Freq(MHz) | FreqRange<br>[MHz] | RefLevel<br>[dBm] | Result<br>[dBm] | Limit<br>[dBm] | Verdict |
|----------|---------|-----------|--------------------|-------------------|-----------------|----------------|---------|
| DH5      | Ant1    | 2402      | Reference          | -0.48             | -0.48           | ---            | PASS    |
|          |         |           | 30~1000            | -0.48             | -67.55          | ≤-20.48        | PASS    |
|          |         |           | 1000~26500         | -0.48             | -42.67          | ≤-20.48        | PASS    |
|          |         | 2441      | Reference          | -0.69             | -0.69           | ---            | PASS    |
|          |         |           | 30~1000            | -0.69             | -67.4           | ≤-20.69        | PASS    |
|          |         |           | 1000~26500         | -0.69             | -40.94          | ≤-20.69        | PASS    |
|          |         | 2480      | Reference          | 0.09              | 0.09            | ---            | PASS    |
|          |         |           | 30~1000            | 0.09              | -67.14          | ≤-19.91        | PASS    |
|          |         |           | 1000~26500         | 0.09              | -44.11          | ≤-19.91        | PASS    |
| 2DH5     | Ant1    | 2402      | Reference          | -5.01             | -5.01           | ---            | PASS    |
|          |         |           | 30~1000            | -5.01             | -67.37          | ≤-25.01        | PASS    |
|          |         |           | 1000~26500         | -5.01             | -48.66          | ≤-25.01        | PASS    |
|          |         | 2441      | Reference          | -6.72             | -6.72           | ---            | PASS    |
|          |         |           | 30~1000            | -6.72             | -66.65          | ≤-26.72        | PASS    |
|          |         |           | 1000~26500         | -6.72             | -49.64          | ≤-26.72        | PASS    |
|          |         | 2480      | Reference          | -5.43             | -5.43           | ---            | PASS    |
|          |         |           | 30~1000            | -5.43             | -68.03          | ≤-25.43        | PASS    |
|          |         |           | 1000~26500         | -5.43             | -49.88          | ≤-25.43        | PASS    |

## Test Graphs

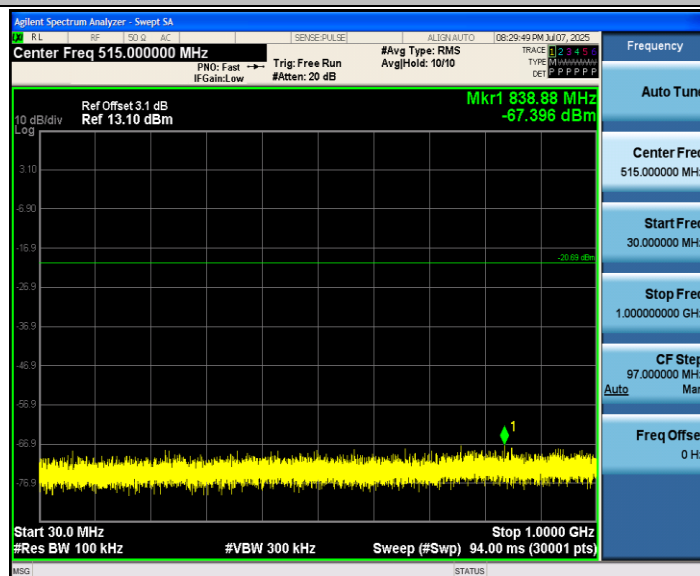




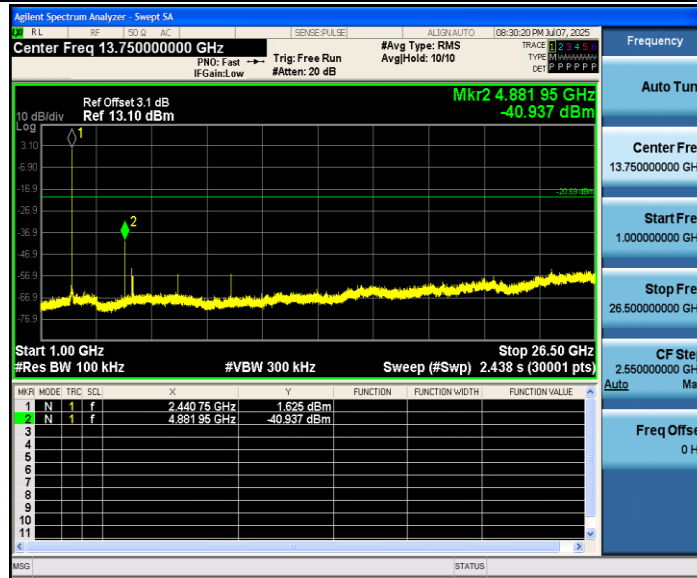
DH5\_Ant1\_2441\_0~Reference



DH5\_Ant1\_2441\_30~1000



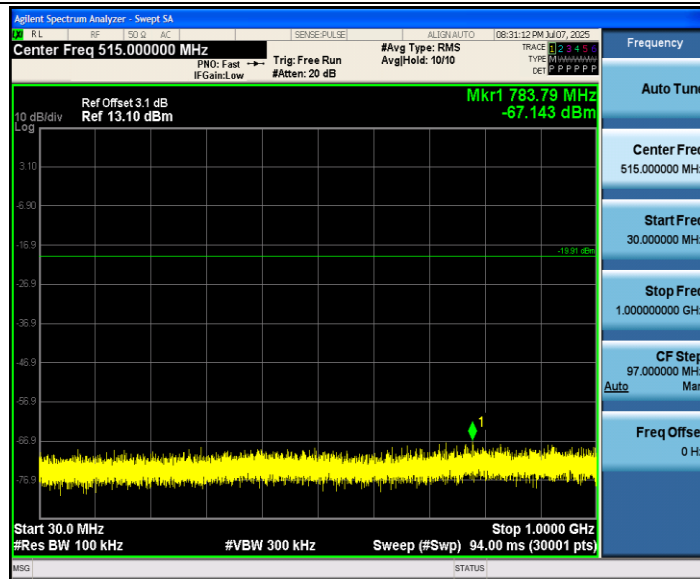
# DH5\_Ant1\_2441\_1000~26500



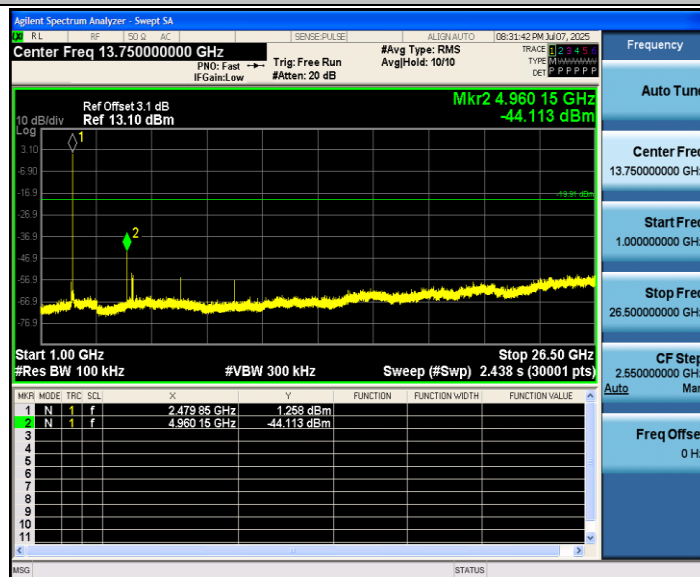
# DH5\_Ant1\_2480\_0~Reference



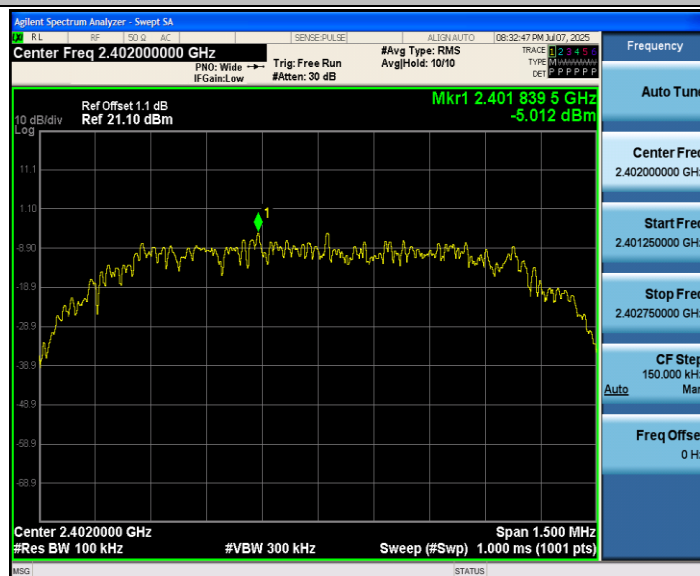
# DH5\_Ant1\_2480\_30~1000



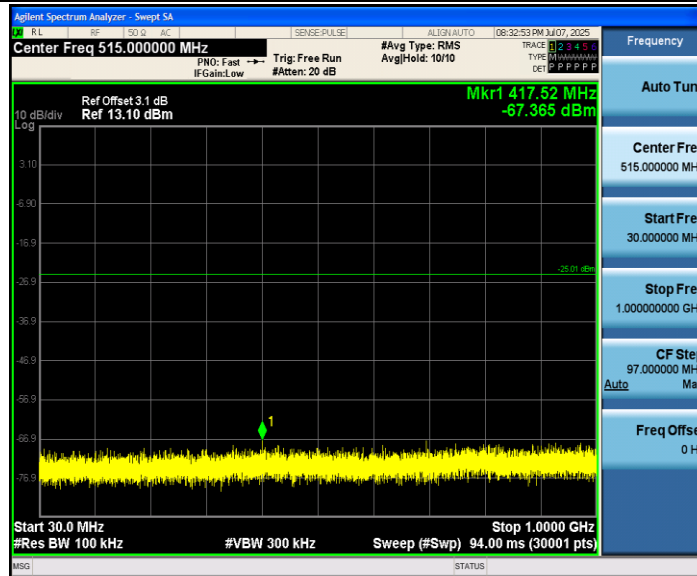
DH5\_Ant1\_2480\_1000~26500



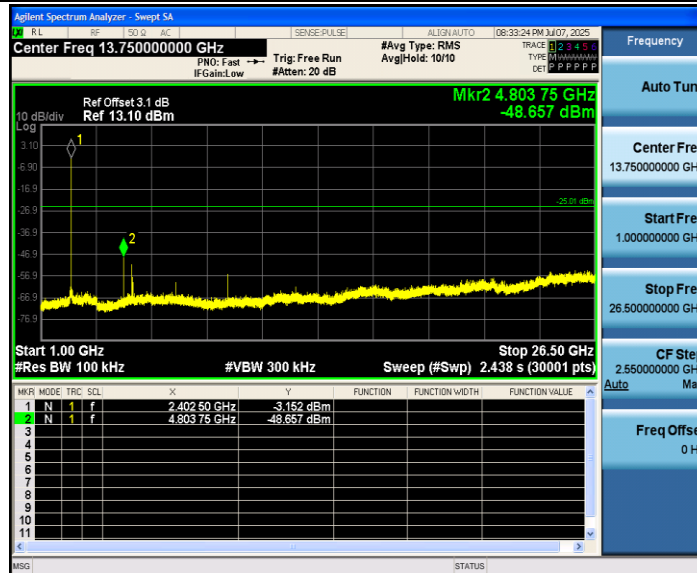
2DH5\_Ant1\_2402\_0~Reference



# 2DH5\_Ant1\_2402\_30~1000



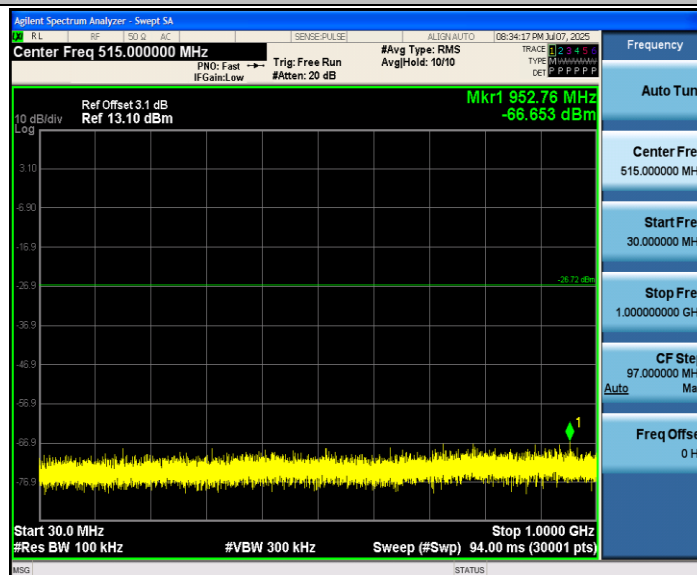
# 2DH5\_Ant1\_2402\_1000~26500



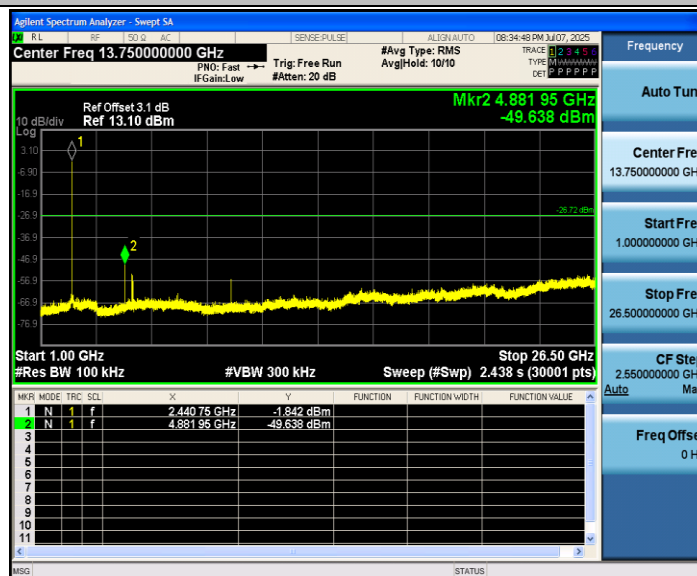
# 2DH5\_Ant1\_2441\_0~Reference



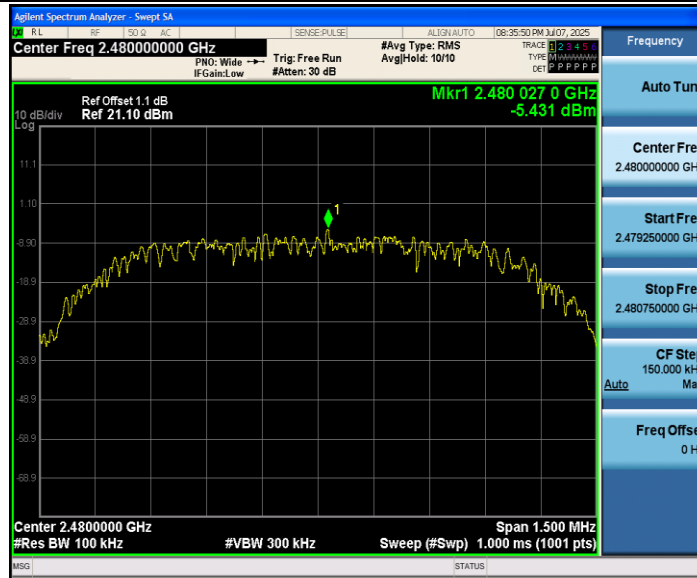
2DH5\_Ant1\_2441\_30~1000



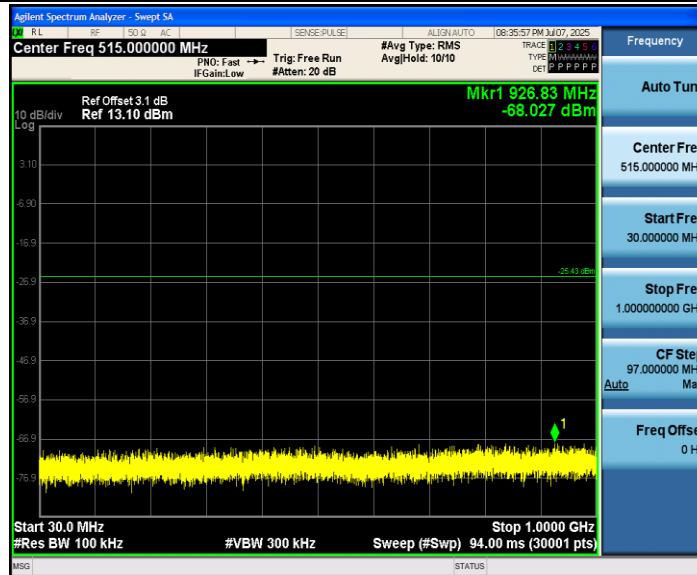
2DH5\_Ant1\_2441\_1000~26500



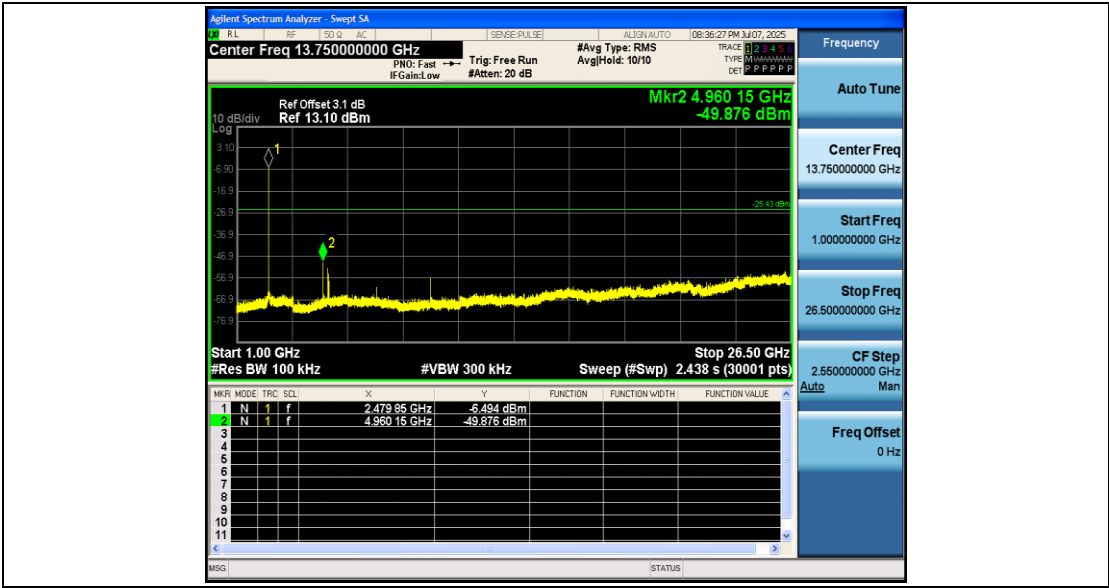
# 2DH5\_Ant1\_2480\_0~Reference



# 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      | 2.92            | 3.75           | 77.87     | 1.09    | ---   | ---     |
|          |         | 2441      | 2.92            | 3.75           | 77.87     | 1.09    | ---   | ---     |
|          |         | 2480      | 2.92            | 3.75           | 77.87     | 1.09    | ---   | ---     |
| 2DH5     | Ant1    | 2402      | 2.92            | 3.75           | 77.87     | 1.09    | ---   | ---     |
|          |         | 2441      | 2.91            | 3.75           | 77.60     | 1.10    | ---   | ---     |
|          |         | 2480      | 2.92            | 3.75           | 77.87     | 1.09    | ---   | ---     |

**DH5\_Ant1\_2402**

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.402000000 GHz

Ref Offset 1.1 dB  
Ref 20.00 dBm

Trig Delay: 200.0  $\mu$ s  
Trig: Video  
#Avg Type: RMS  
#Atten: 30 dB

$\Delta$ Mkr3 3.750 ms  
0.43 dB

Center 2.402000000 GHz  
Res BW 8 MHz  
#VBW 8.0 MHz  
Sweep 5.000 ms (1001 pts)

| MKR | MODE       | TRIG | SCL | X             | Y            | FUNCTION  | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------------|------|-----|---------------|--------------|-----------|----------------|----------------|
| 1   | N          | 1    | t   | 180.0 $\mu$ s | -23.21 dBm   |           |                |                |
| 2   | $\Delta$ 1 | 1    | t   | (A)           | 2.920 ms (A) | -20.89 dB |                |                |
| 3   | $\Delta$ 1 | 1    | t   | (A)           | 3.750 ms (A) | 0.43 dB   |                |                |

**DH5\_Ant1\_2441**

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.441000000 GHz

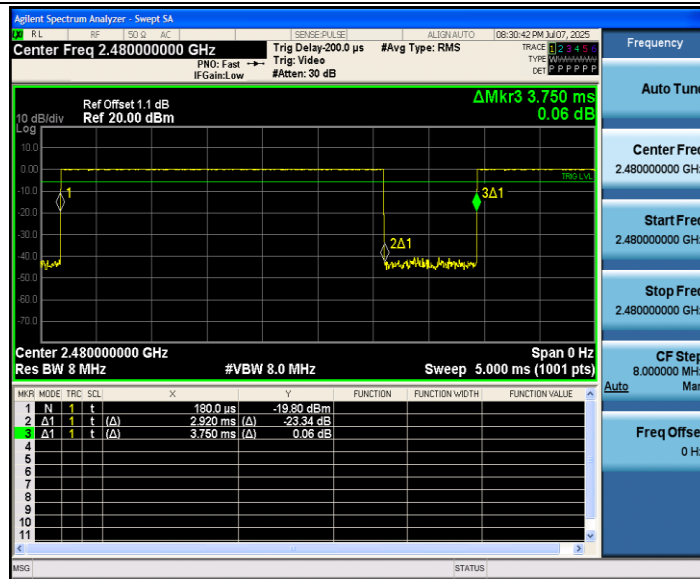
Ref Offset 1.1 dB  
Ref 20.00 dBm

Trig Delay: 200.0  $\mu$ s  
Trig: Video  
#Avg Type: RMS  
#Atten: 30 dB

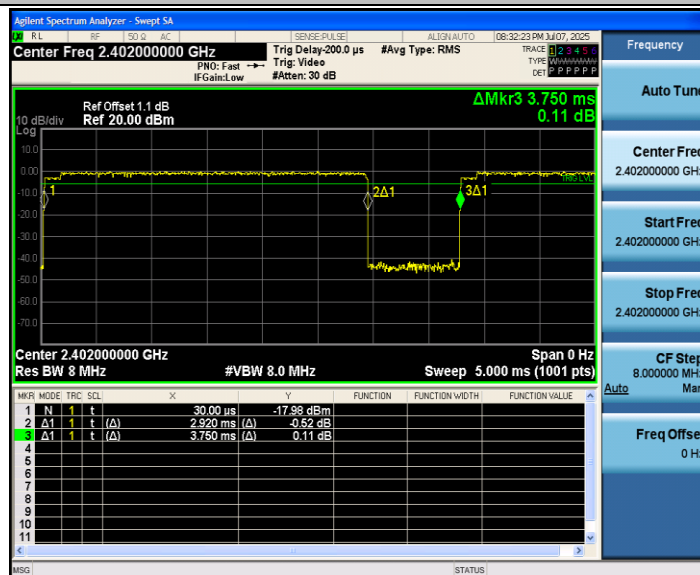
$\Delta$ Mkr3 3.750 ms  
0.13 dB

Center 2.441000000 GHz  
Res BW 8 MHz  
#VBW 8.0 MHz  
Sweep 5.000 ms (1001 pts)

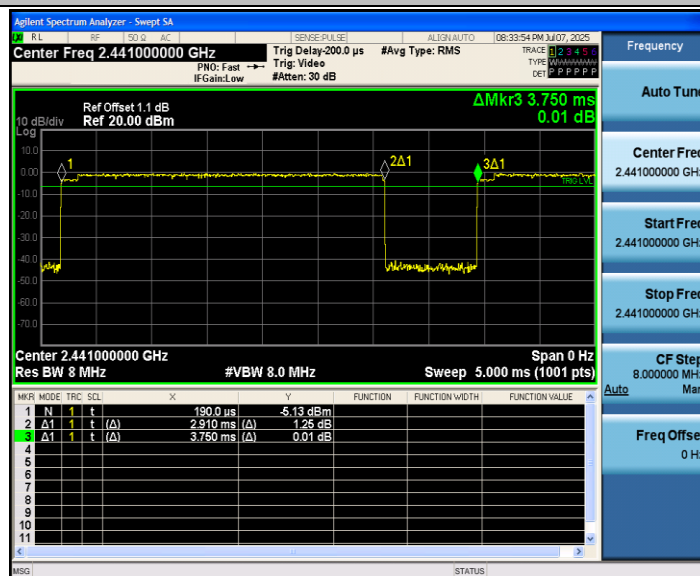
| MKR | MODE       | TRIG | SCL | X             | Y            | FUNCTION  | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------------|------|-----|---------------|--------------|-----------|----------------|----------------|
| 1   | N          | 1    | t   | 180.0 $\mu$ s | -19.92 dBm   |           |                |                |
| 2   | $\Delta$ 1 | 1    | t   | (A)           | 2.920 ms (A) | -25.68 dB |                |                |
| 3   | $\Delta$ 1 | 1    | t   | (A)           | 3.750 ms (A) | 0.13 dB   |                |                |



2DH5\_Ant1\_2402



2DH5\_Ant1\_2441



# 2DH5\_Ant1\_2480

