# Appendix Test Data for BT(BDR/EDR) (Conducted Measurement)

**Product Name: CUBE STUDIO**

**Trade Mark: singing machine**

**Test Model: SML678BK**

**FCC ID: 2AAXO-SML678**

# Environmental Conditions

| | |
|---|---|
| Temperature: | 23.5℃ |
| Relative Humidity: | 58% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Allen Lai |
| Supervised by: | Max Zhang |
| NOTE | N/A |

## Appendix A: 20dB Emission Bandwidth

### Test Result

| Test Mode | Antenna | Frequency [MHz] | 20db EBW [MHz] | FL [MHz] | FH [MHz] | Limit [MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 0.954 | 2401.496 | 2402.450 | --- | --- |
| DH5 | Ant1 | 2441 | 0.903 | 2440.526 | 2441.429 | --- | --- |
| DH5 | Ant1 | 2480 | 0.978 | 2479.496 | 2480.474 | --- | --- |
| 2DH5 | Ant1 | 2402 | 1.296 | 2401.355 | 2402.651 | --- | --- |
| 2DH5 | Ant1 | 2441 | 1.308 | 2440.340 | 2441.648 | --- | --- |
| 2DH5 | Ant1 | 2480 | 1.314 | 2479.334 | 2480.648 | --- | --- |

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

## Test Graphs


DH5-Ant1-2402


DH5-Ant1-2441


DH5-Ant1-2480


2DH5-Ant1-2402


2DH5-Ant1-2441


2DH5-Ant1-2480

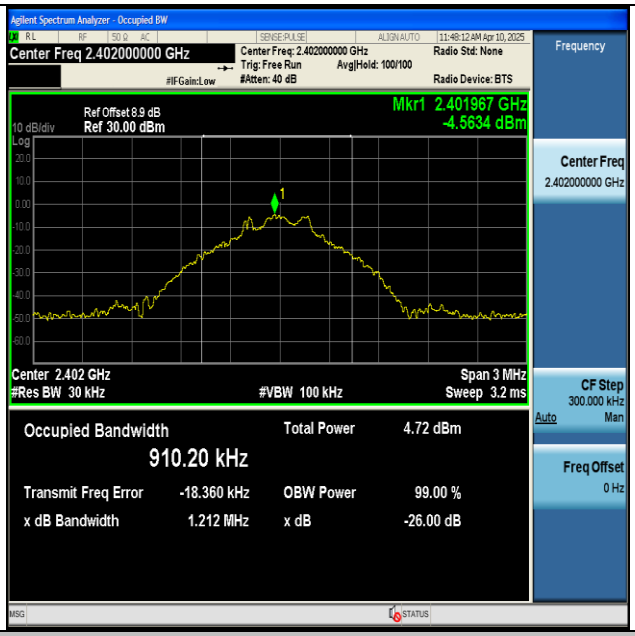
# Appendix B: Occupied Channel Bandwidth

## Test Result

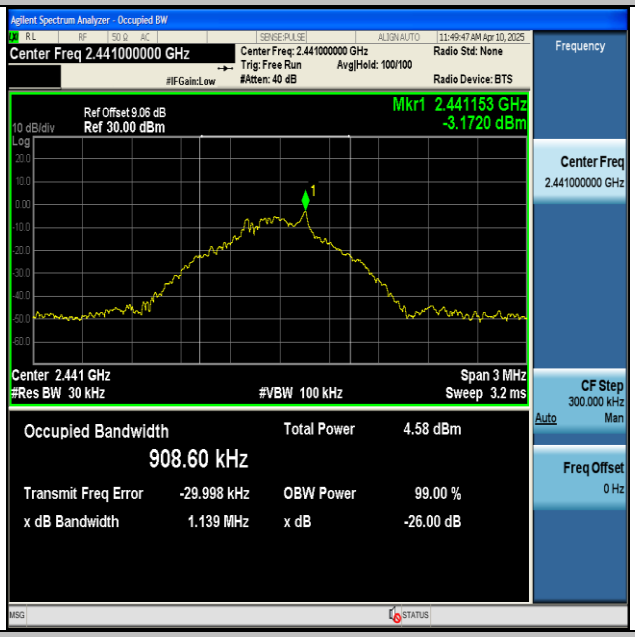
| Test Mode | Antenna | Frequency [MHz] | OCB [MHz] | FL [MHz] | FH [MHz] | Limit [MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 0.91020 | 2401.5265 | 2402.4367 | --- | --- |
| DH5 | Ant1 | 2441 | 0.90860 | 2440.5157 | 2441.4243 | --- | --- |
| DH5 | Ant1 | 2480 | 0.92774 | 2479.5140 | 2480.4417 | --- | --- |
| 2DH5 | Ant1 | 2402 | 1.2060 | 2401.3948 | 2402.6008 | --- | --- |
| 2DH5 | Ant1 | 2441 | 1.1809 | 2440.4039 | 2441.5848 | --- | --- |
| 2DH5 | Ant1 | 2480 | 1.2030 | 2479.3904 | 2480.5934 | --- | --- |

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

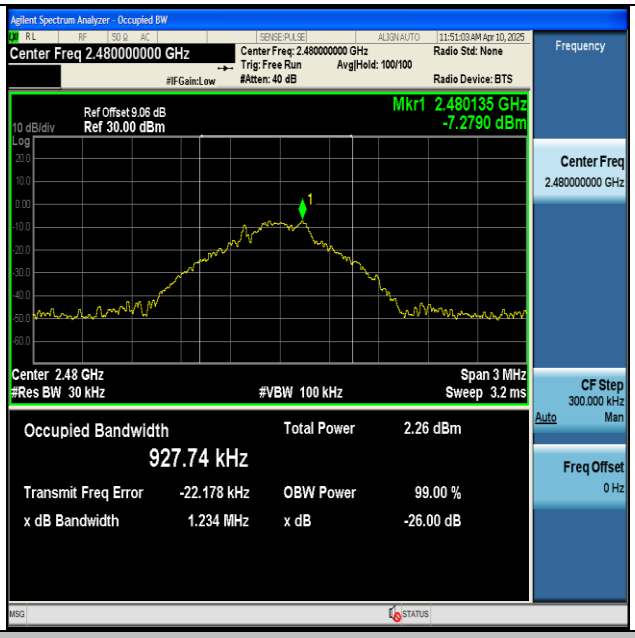
## Test Graphs



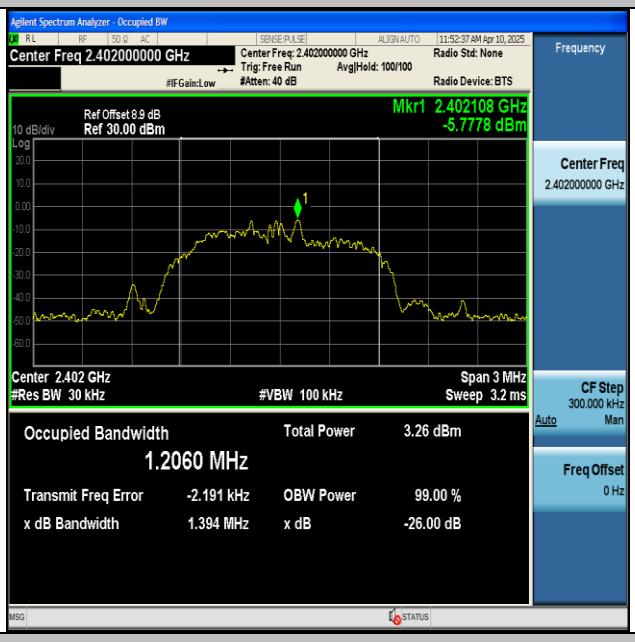

DH5-Ant1-2402




DH5-Ant1-2441

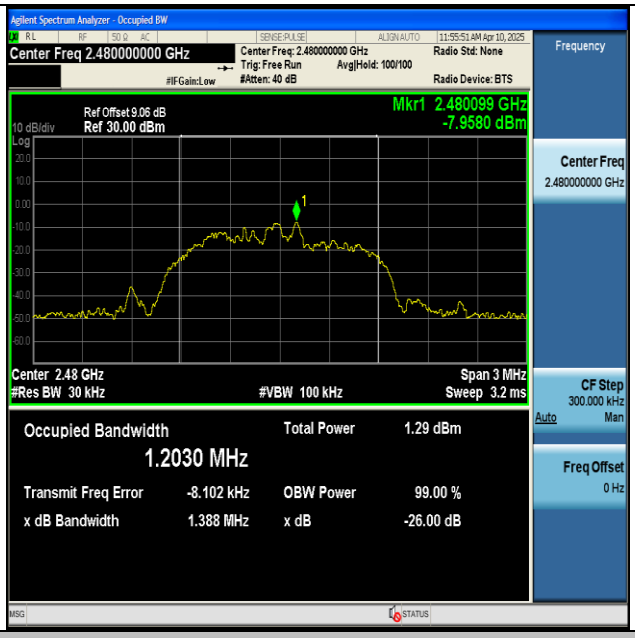



DH5-Ant1-2480




2DH5-Ant1-2402


2DH5-Ant1-2441




2DH5-Ant1-2480

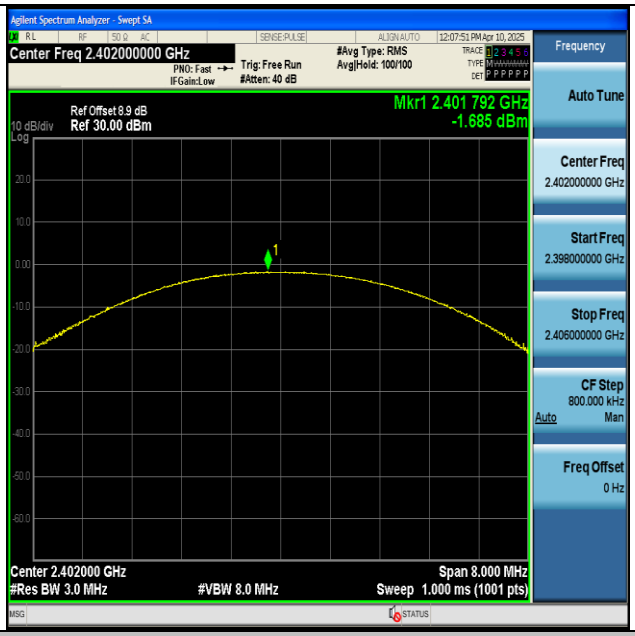
# Appendix C: Maximum peak conducted output power

## Test Result

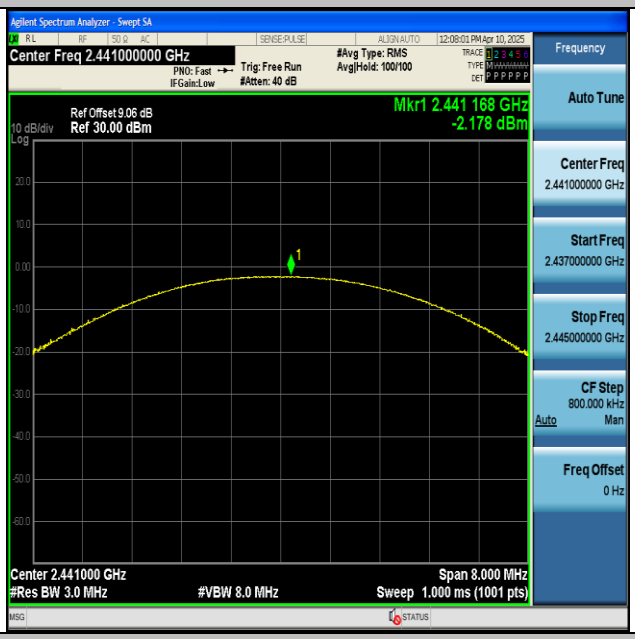
| Test Mode | Antenna | Frequency [MHz] | Conducted Peak Power [dBm] | Conducted Limit [dBm] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | -1.69 | ≤30 | PASS |
| DH5 | Ant1 | 2441 | -2.18 | ≤30 | PASS |
| DH5 | Ant1 | 2480 | -3.86 | ≤30 | PASS |
| 2DH5 | Ant1 | 2402 | -1.82 | ≤20.97 | PASS |
| 2DH5 | Ant1 | 2441 | -2.18 | ≤20.97 | PASS |
| 2DH5 | Ant1 | 2480 | -3.96 | ≤20.97 | PASS |

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

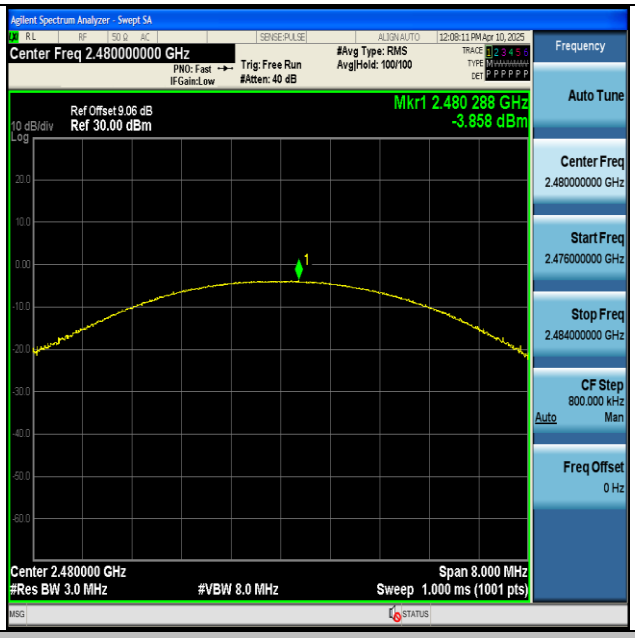
## Test Graphs



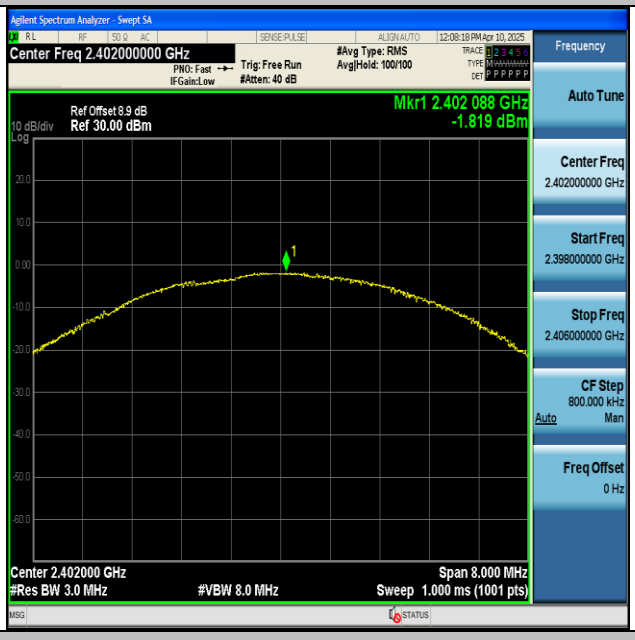

DH5-Ant1-2402-PASS



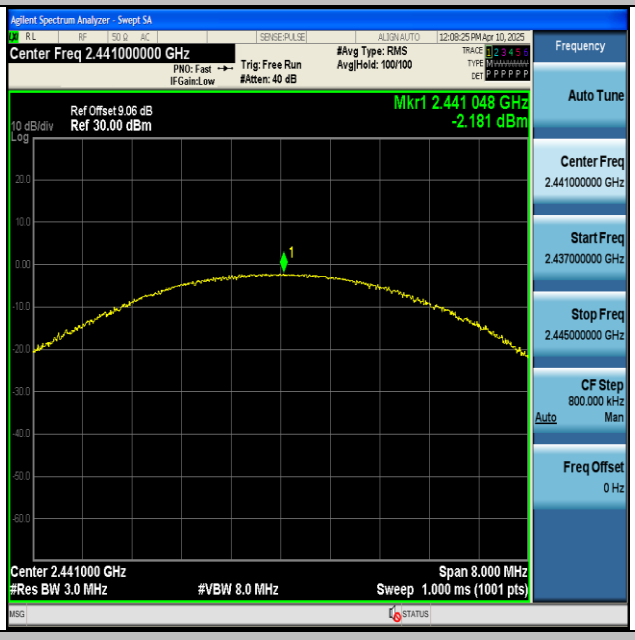

DH5-Ant1-2441-PASS



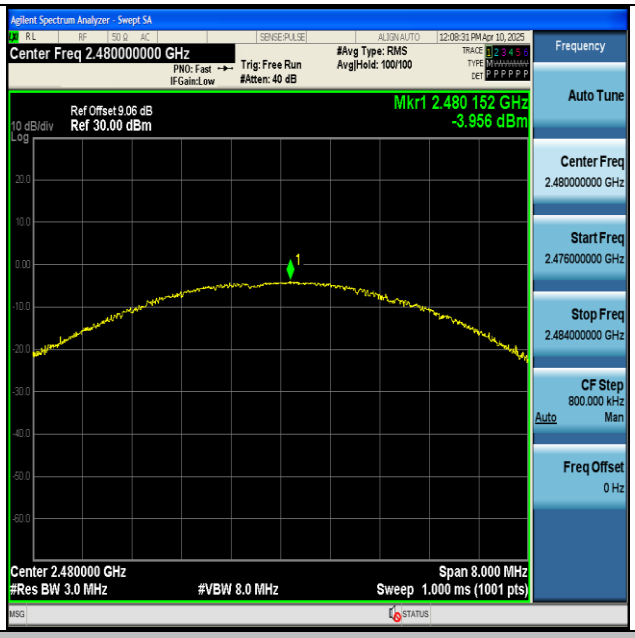

DH5-Ant1-2480-PASS




2DH5-Ant1-2402-PASS




2DH5-Ant1-2441-PASS




2DH5-Ant1-2480-PASS

# Appendix D: Carrier frequency separation

## Test Result

| Test Mode | Antenna | Frequency [MHz] | Result [MHz] | Limit [MHz] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 0.998 | ≥0.978 | PASS |
| 2DH5 | Ant1 | Hop | 1 | ≥0.876 | PASS |

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

## Test Graphs


DH5-Ant1-Hop-PASS


2DH5-Ant1-Hop-PASS

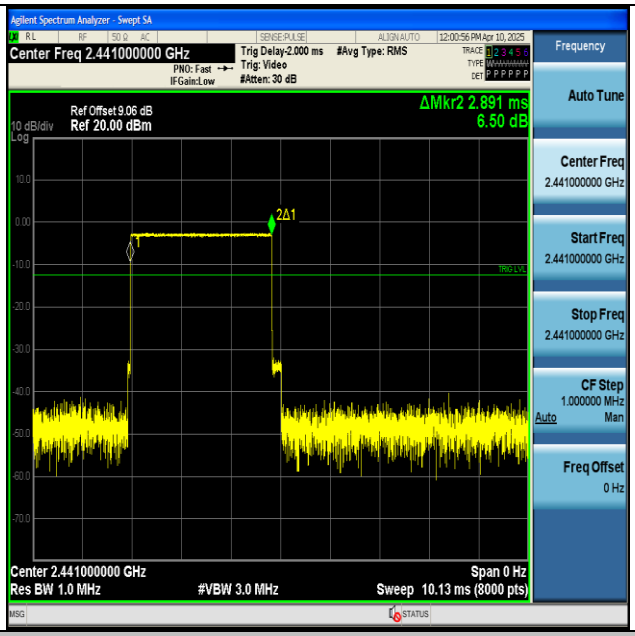
# Appendix E: Time of occupancy

## Test Result

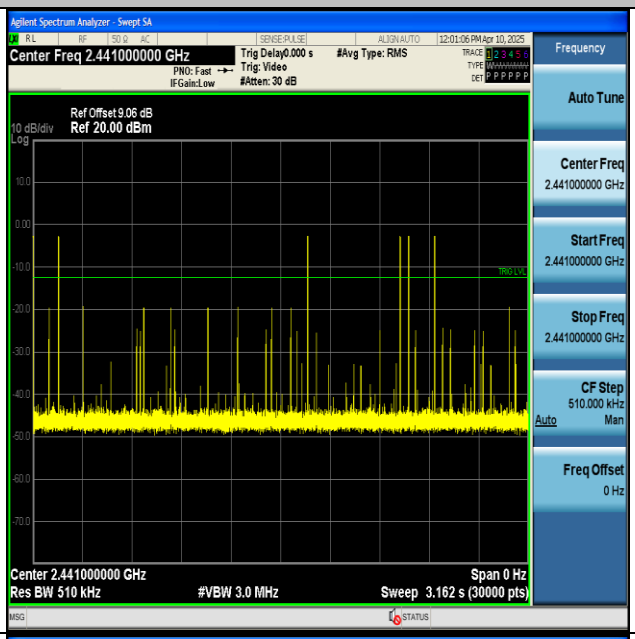
| Test Mode | Antenna | Frequency [MHz] | Burst Width [ms] | TotalHops [Num] | Result [s] | Limit [s] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 2.891 | 60 | 0.173 | ≤0.4 | PASS |
| 2DH5 | Ant1 | Hop | 2.887 | 80 | 0.231 | ≤0.4 | PASS |

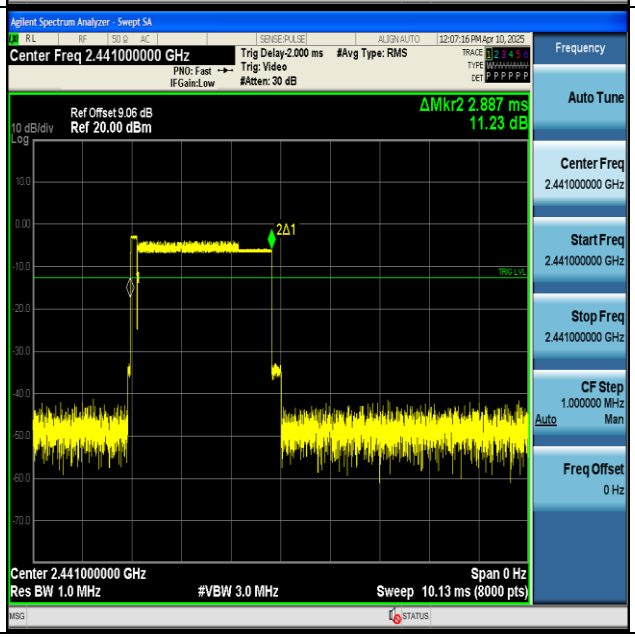
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

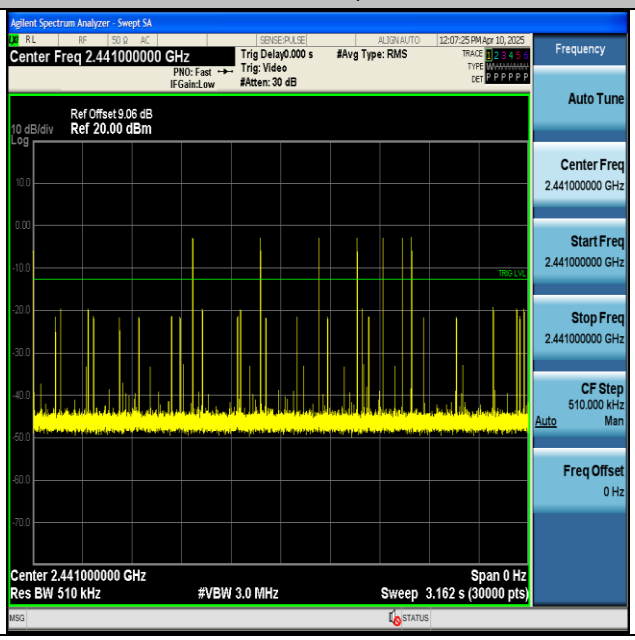
## Test Graphs




DH5-Ant1-Hop-PASS



| 2DH5-Ant1-Hop-PASS |
| --- |
|  |

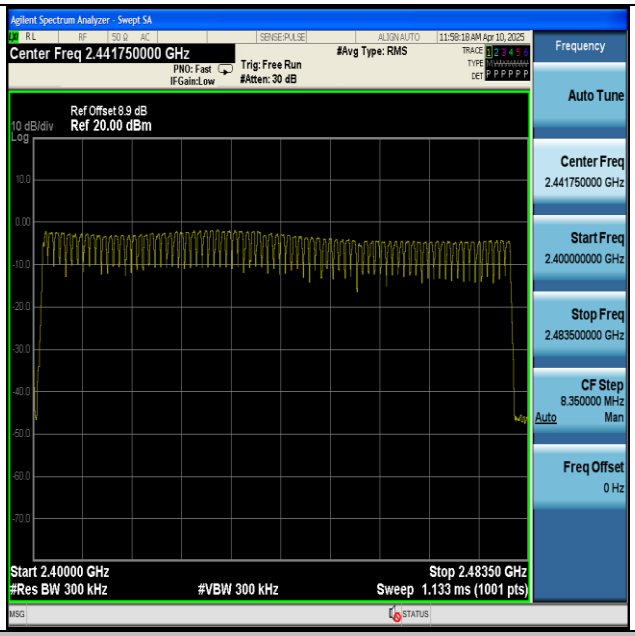
# Appendix F: Number of hopping channels

## Test Result

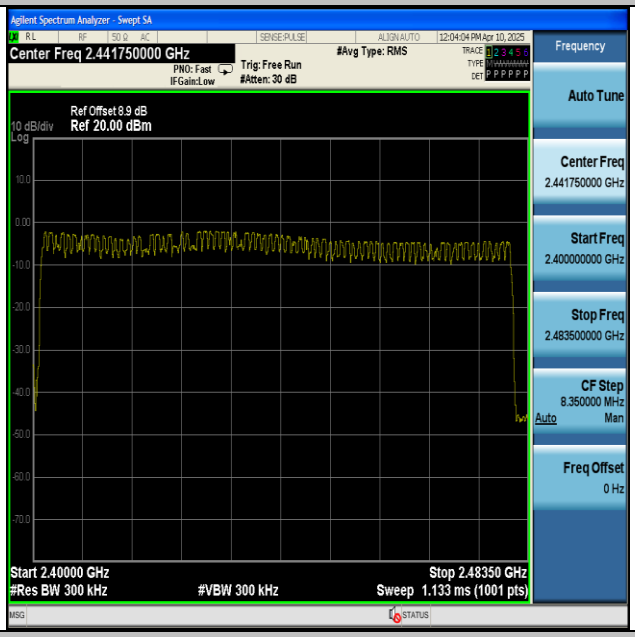
| Test Mode | Antenna | Frequency [MHz] | Result [Num] | Limit [Num] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 79 | ≥15 | PASS |
| 2DH5 | Ant1 | Hop | 79 | ≥15 | PASS |

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

## Test Graphs




DH5-Ant1-Hop-PASS




2DH5-Ant1-Hop-PASS

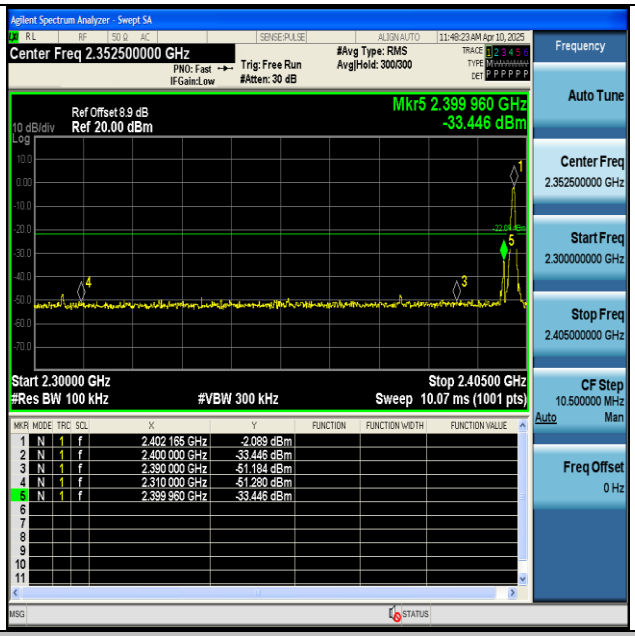
# Appendix G: Band edge measurements

## Test Result

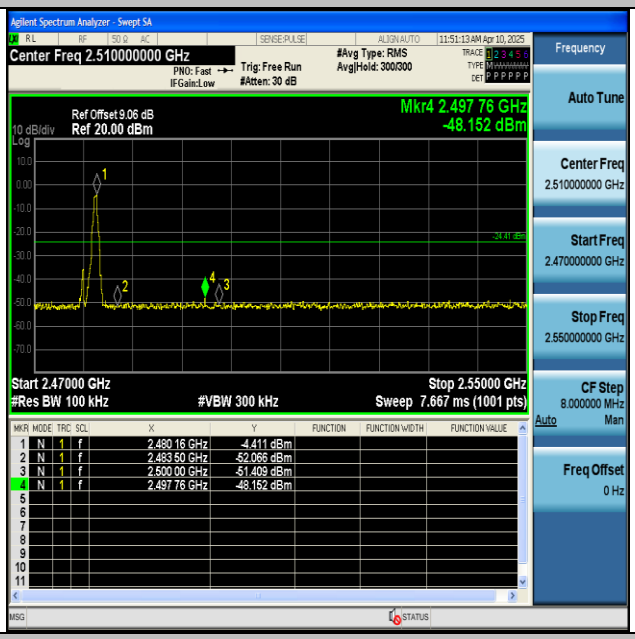
| Test Mode | Antenna | Ch.Name | Frequency [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | Low | 2402 | -2.09 | -33.45 | ≤-22.09 | PASS |
| DH5 | Ant1 | High | 2480 | -4.41 | -48.15 | ≤-24.41 | PASS |
| DH5 | Ant1 | Low | Hop_2402 | -2.90 | -47.59 | ≤-22.9 | PASS |
| DH5 | Ant1 | High | Hop_2480 | -4.47 | -47.8 | ≤-24.47 | PASS |
| 2DH5 | Ant1 | Low | 2402 | -2.64 | -33.42 | ≤-22.64 | PASS |
| 2DH5 | Ant1 | High | 2480 | -4.63 | -48.43 | ≤-24.63 | PASS |
| 2DH5 | Ant1 | Low | Hop_2402 | -6.10 | -34.48 | ≤-26.1 | PASS |
| 2DH5 | Ant1 | High | Hop_2480 | -5.84 | -48.27 | ≤-25.84 | PASS |

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

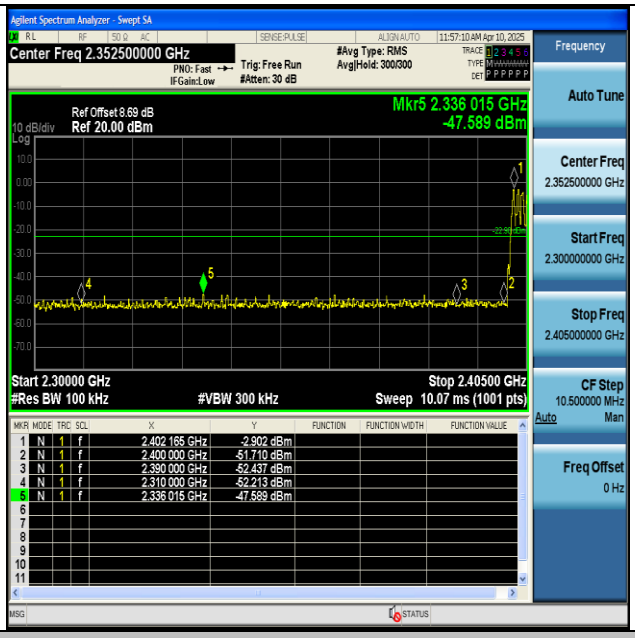
## Test Graphs



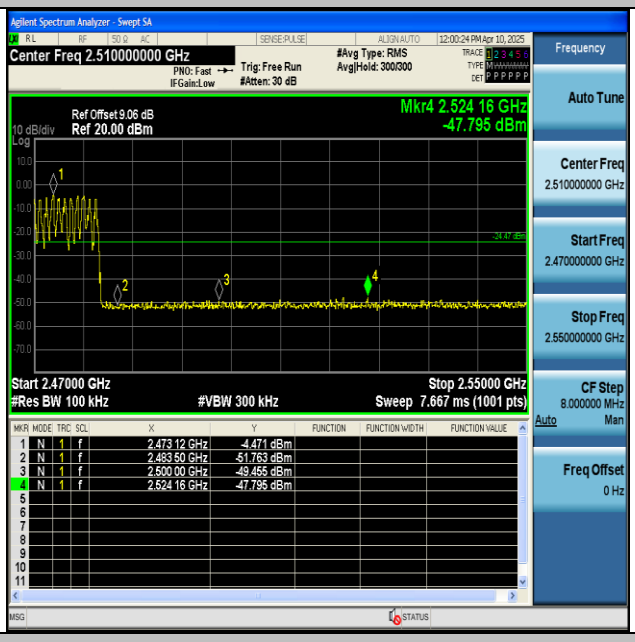

DH5-Ant1-2402-PASS



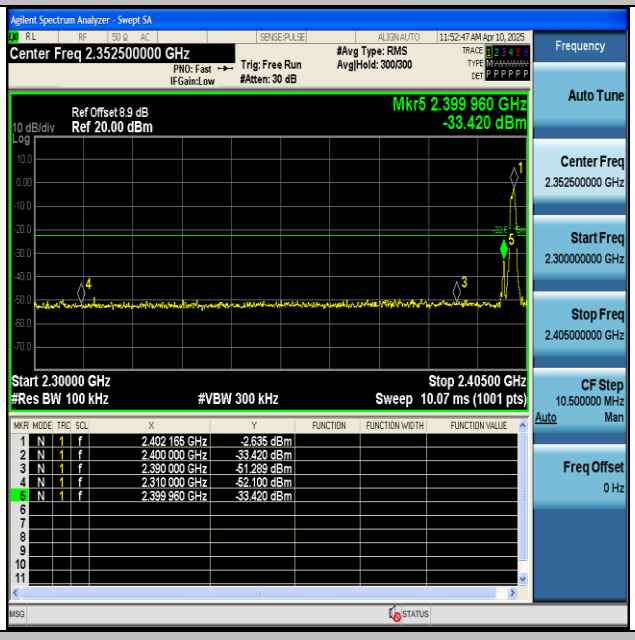

DH5-Ant1-2480-PASS



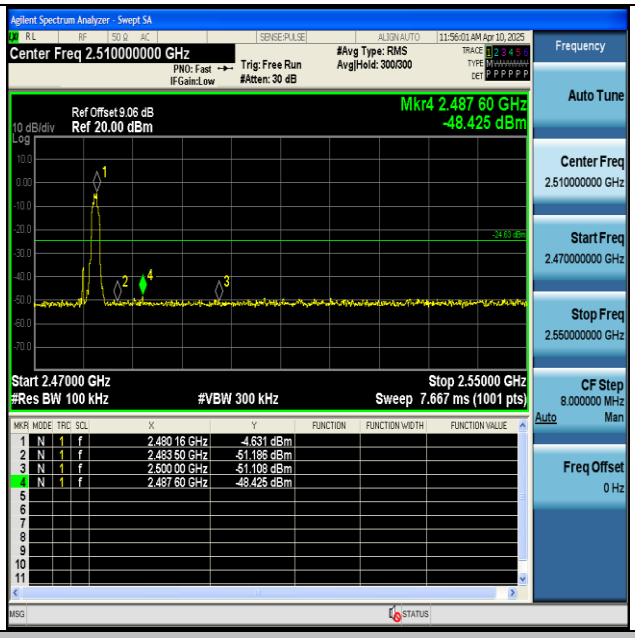

DH5-Ant1-Hop_2402-PASS



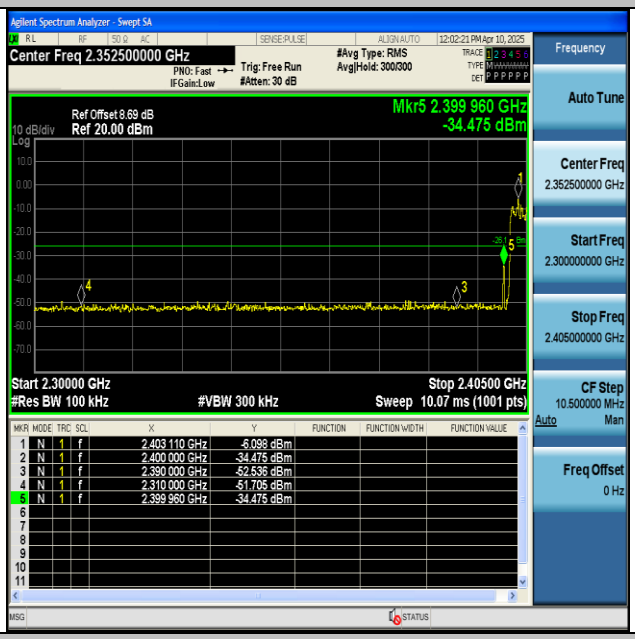

DH5-Ant1-Hop_2480-PASS



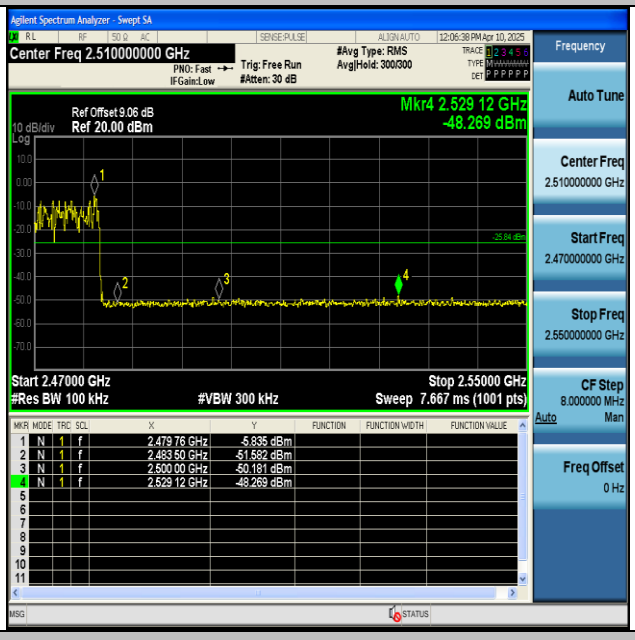

2DH5-Ant1-2402-PASS




2DH5-Ant1-2480-PASS




2DH5-Ant1-Hop_2402-PASS




2DH5-Ant1-Hop_2480-PASS

# Appendix H: Conducted Spurious Emission

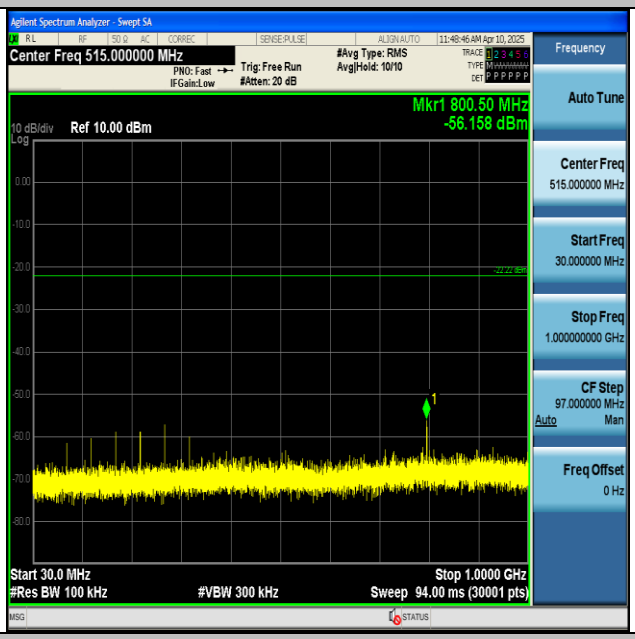
## Test Result

| Test Mode | Antenna | Frequency [MHz] | Freq. Range [MHz] | Ref. Level [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 0~Reference | -2.22 | -2.22 | --- | PASS |
| DH5 | Ant1 | 2402 | 30~1000 | -2.22 | -56.16 | ≤-22.22 | PASS |
| DH5 | Ant1 | 2402 | 1000~26500 | -2.22 | -45.87 | ≤-22.22 | PASS |
| DH5 | Ant1 | 2441 | 0~Reference | -2.86 | -2.86 | --- | PASS |
| DH5 | Ant1 | 2441 | 30~1000 | -2.86 | -56.98 | ≤-22.86 | PASS |
| DH5 | Ant1 | 2441 | 1000~26500 | -2.86 | -45.21 | ≤-22.86 | PASS |
| DH5 | Ant1 | 2480 | 0~Reference | -5.52 | -5.52 | --- | PASS |
| DH5 | Ant1 | 2480 | 30~1000 | -5.52 | -57.16 | ≤-25.52 | PASS |
| DH5 | Ant1 | 2480 | 1000~26500 | -5.52 | -44.97 | ≤-25.52 | PASS |
| 2DH5 | Ant1 | 2402 | 0~Reference | -5.71 | -5.71 | --- | PASS |
| 2DH5 | Ant1 | 2402 | 30~1000 | -5.71 | -56.91 | ≤-25.71 | PASS |
| 2DH5 | Ant1 | 2402 | 1000~26500 | -5.71 | -44.81 | ≤-25.71 | PASS |
| 2DH5 | Ant1 | 2441 | 0~Reference | -3.35 | -3.35 | --- | PASS |
| 2DH5 | Ant1 | 2441 | 30~1000 | -3.35 | -57.47 | ≤-23.35 | PASS |
| 2DH5 | Ant1 | 2441 | 1000~26500 | -3.35 | -45.26 | ≤-23.35 | PASS |
| 2DH5 | Ant1 | 2480 | 0~Reference | -6.28 | -6.28 | --- | PASS |
| 2DH5 | Ant1 | 2480 | 30~1000 | -6.28 | -56.57 | ≤-26.28 | PASS |
| 2DH5 | Ant1 | 2480 | 1000~26500 | -6.28 | -45.41 | ≤-26.28 | PASS |

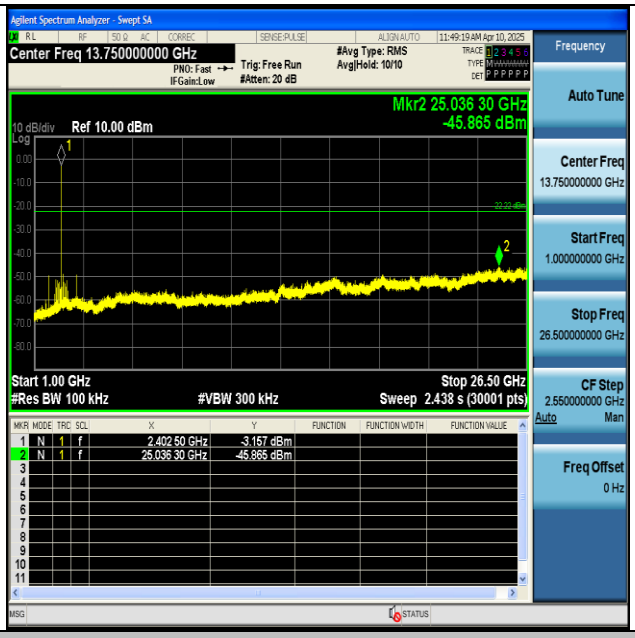
Note: offset(dB) in Reference test plots = cable loss(dB) + attenuator factor(dB); For spurious emissions plots from 30MHz to 26.5GHz, the cable loss and attenuator factors have been set in the 'Input Correction' of the Spectrum Analyzer during the test.

## Test Graphs


DH5-Ant1-2402-0~Reference-PASS

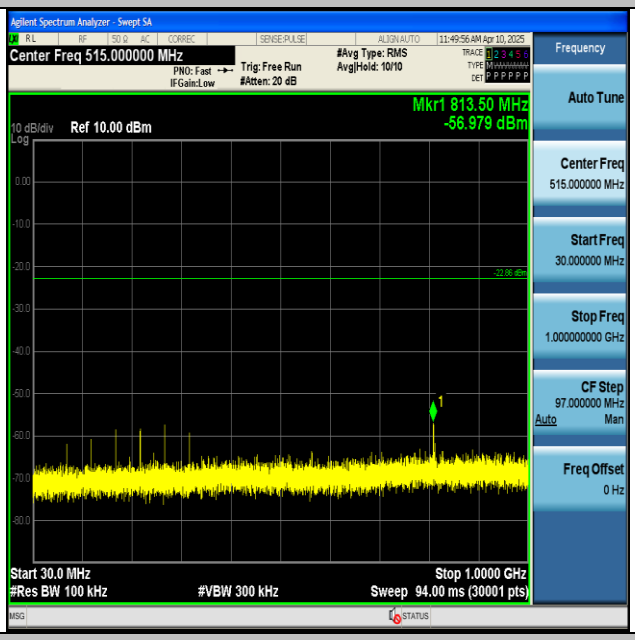



DH5-Ant1-2402-30~1000-PASS

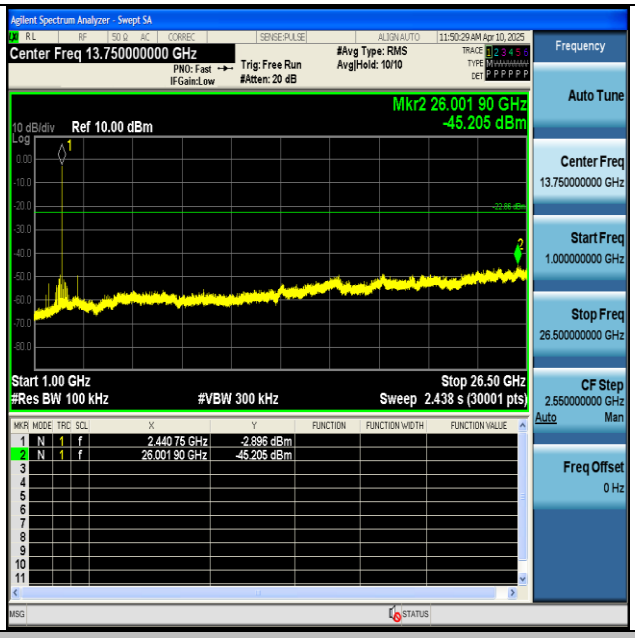



DH5-Ant1-2402-1000~26500-PASS

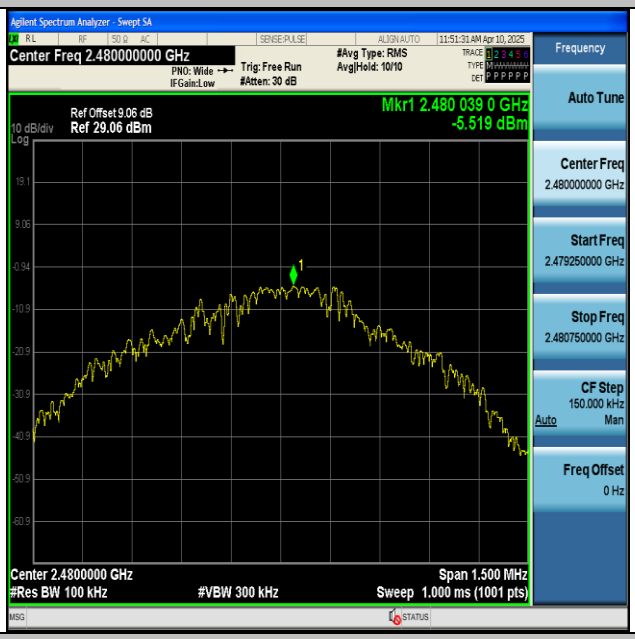

DH5-Ant1-2441-0~Reference-PASS



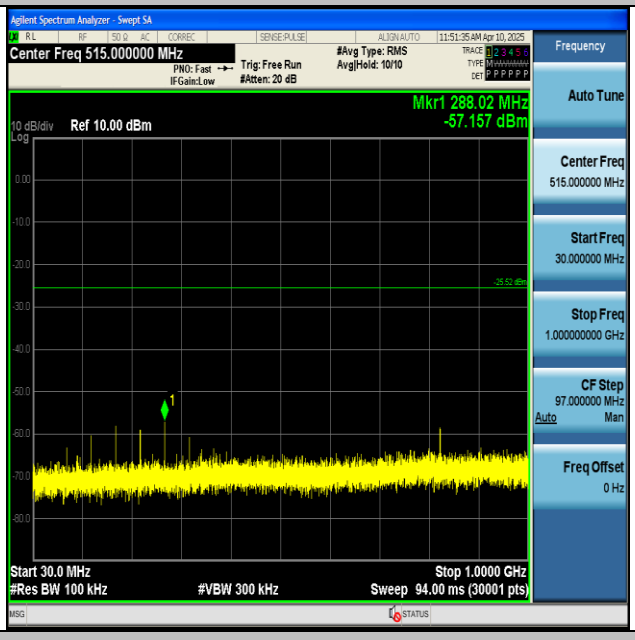

DH5-Ant1-2441-30~1000-PASS



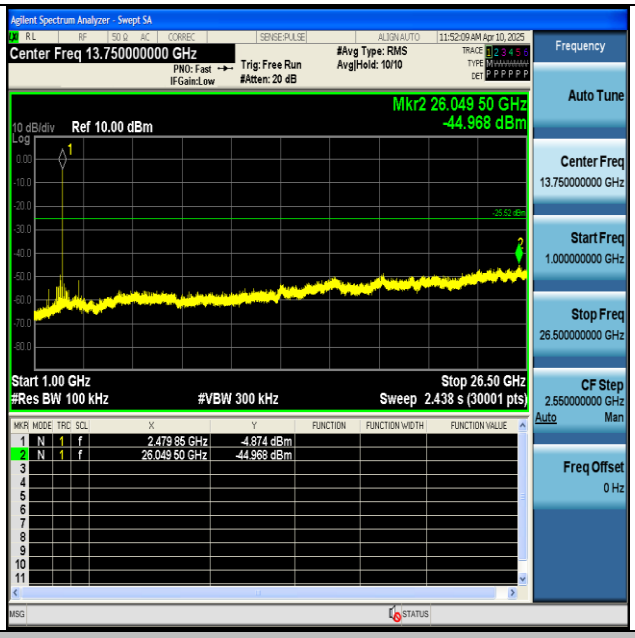

DH5-Ant1-2441-1000~26500-PASS



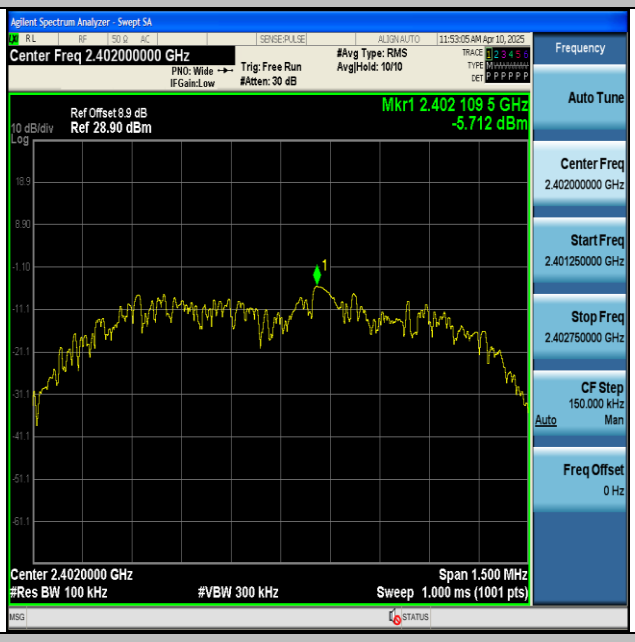

DH5-Ant1-2480-0~Reference-PASS



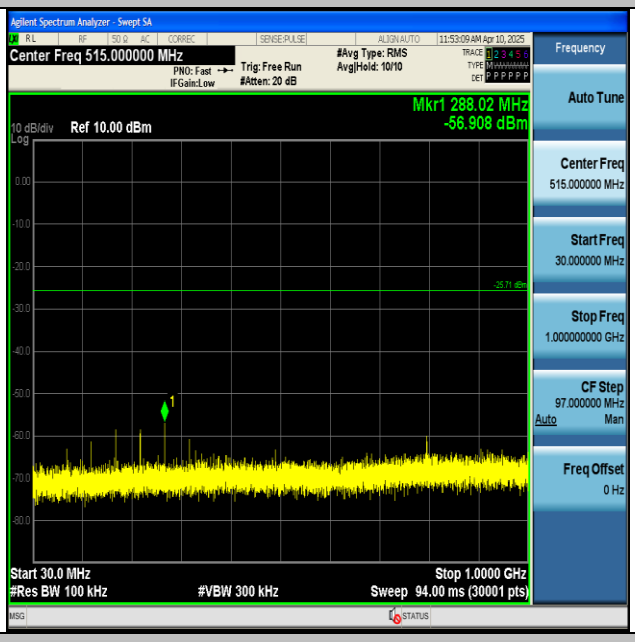

DH5-Ant1-2480-30~1000-PASS



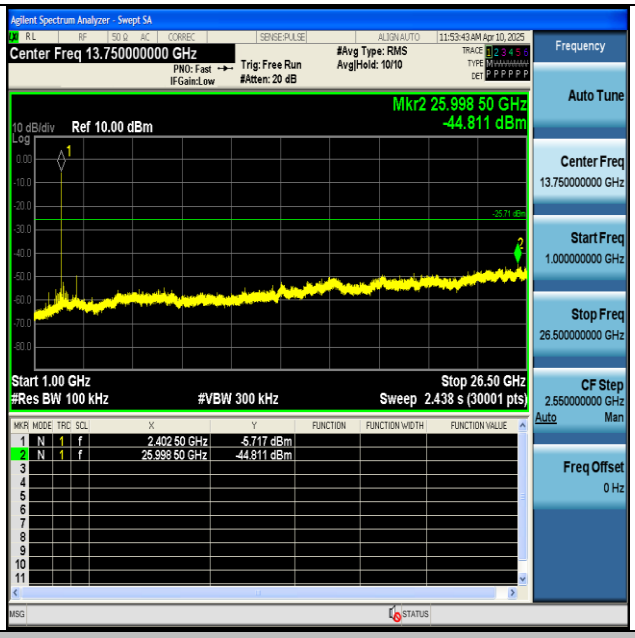

DH5-Ant1-2480-1000~26500-PASS




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

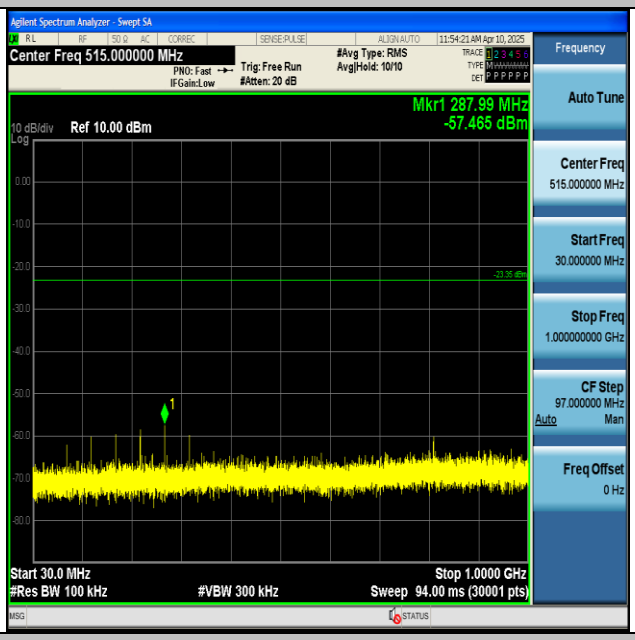



2DH5-Ant1-2402-30~1000-PASS

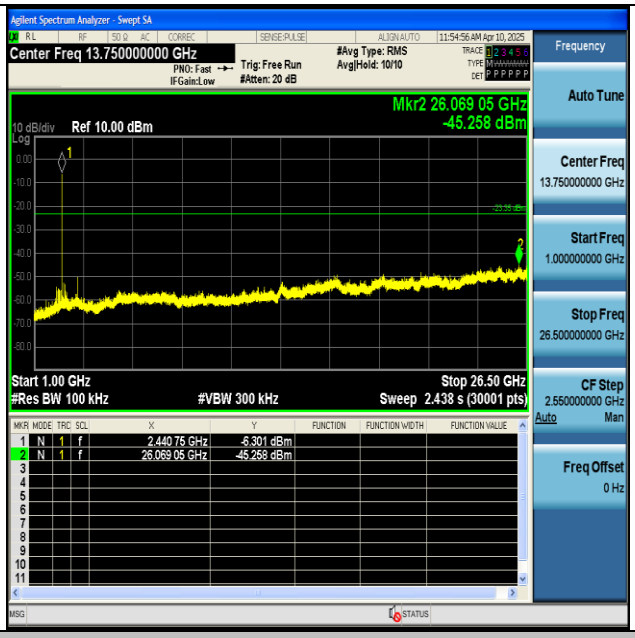



2DH5-Ant1-2402-1000~26500-PASS


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

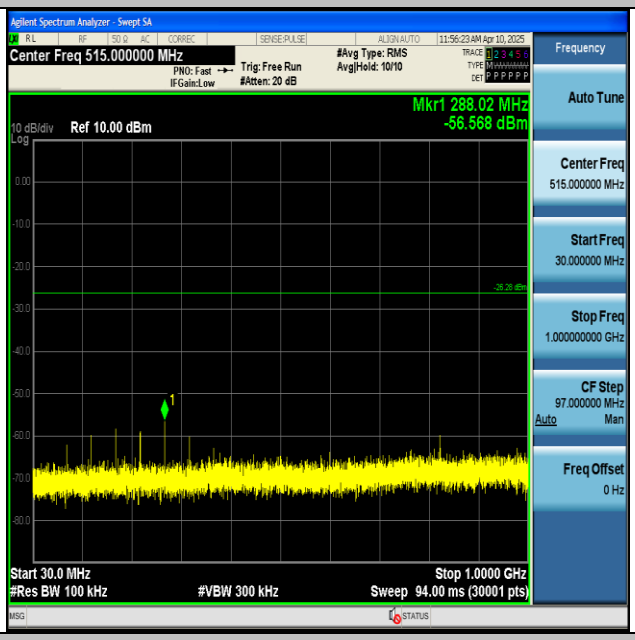



2DH5-Ant1-2441-30~1000-PASS

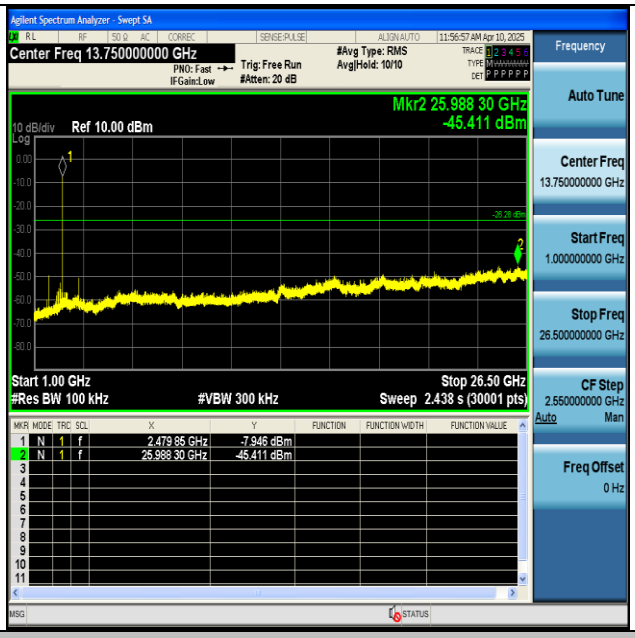



2DH5-Ant1-2441-1000~26500-PASS


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




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




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

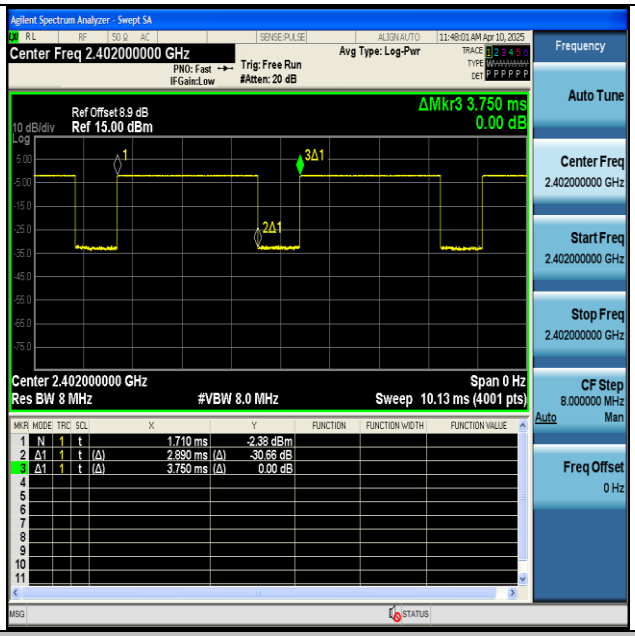
# Appendix I: Duty Cycle

## Test Result

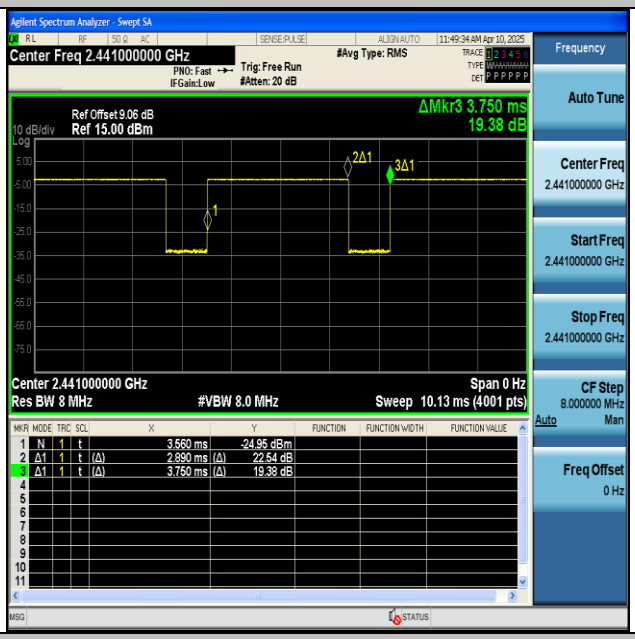
| Test Mode | Antenna | Frequency [MHz] | ON Time [ms] | Period [ms] | Duty Cycle [%] | Duty Cycle Factor [dB] |
|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 2.89 | 3.75 | 77.07 | 1.13 |
| DH5 | Ant1 | 2441 | 2.89 | 3.75 | 77.07 | 1.13 |
| DH5 | Ant1 | 2480 | 2.89 | 3.75 | 77.07 | 1.13 |
| 2DH5 | Ant1 | 2402 | 2.88 | 3.75 | 76.80 | 1.15 |
| 2DH5 | Ant1 | 2441 | 2.89 | 3.76 | 76.86 | 1.14 |
| 2DH5 | Ant1 | 2480 | 2.88 | 3.75 | 76.80 | 1.15 |

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

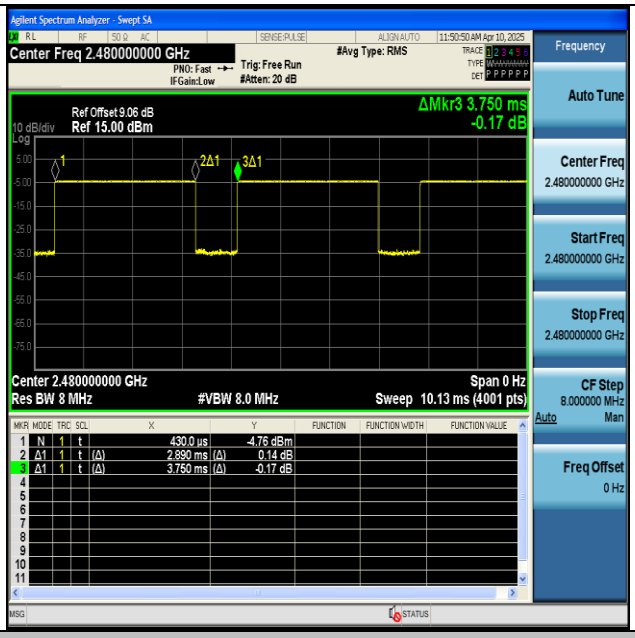
## Test Graphs



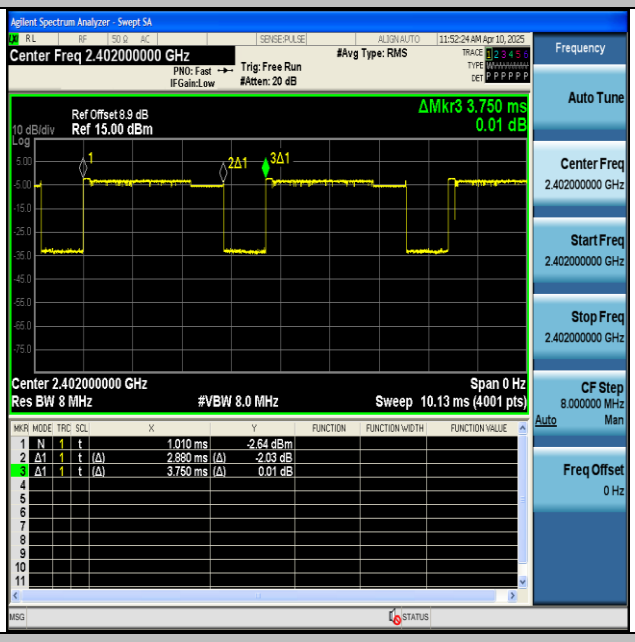

NTNV-DH5-Ant1-2402



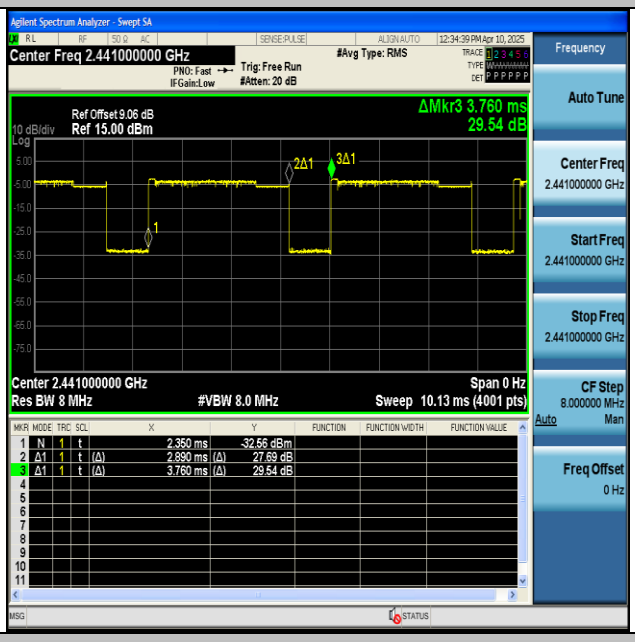

NTNV-DH5-Ant1-2441



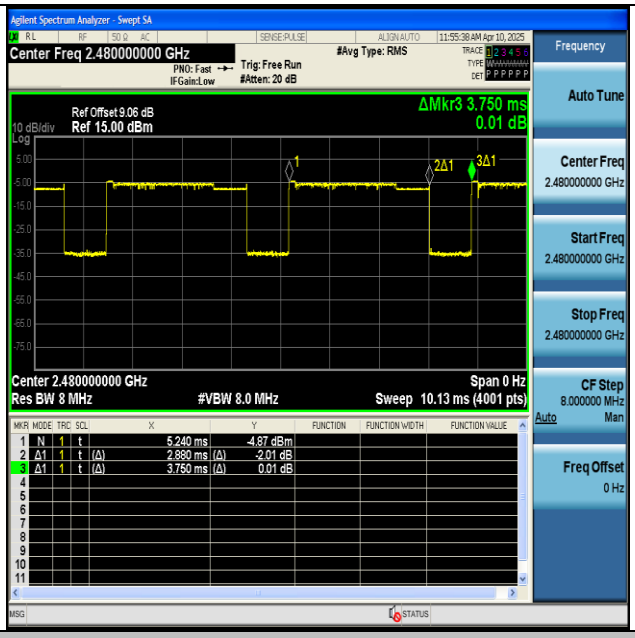

NTNV-DH5-Ant1-2480




NTNV-2DH5-Ant1-2402




NTNV-2DH5-Ant1-2441




NTNV-2DH5-Ant1-2480