



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

Product Name: WIFI TOUCH SCREEN KARAOKE SYSTEM

Trade Mark: SingingMachine

Test Model: System 1

FCC ID: 2AAXO-ISM9080

### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 23.5°C    |
| 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<br>[MHz] | 20db EBW<br>[MHz] | FL<br>[MHz] | FH<br>[MHz] | Limit<br>[MHz] | Verdict |
|-----------|---------|--------------------|-------------------|-------------|-------------|----------------|---------|
| DH5       | Ant1    | 2402               | 0.957             | 2401.487    | 2402.444    | ---            | ---     |
| DH5       | Ant1    | 2441               | 0.945             | 2440.490    | 2441.435    | ---            | ---     |
| DH5       | Ant1    | 2480               | 0.963             | 2479.484    | 2480.447    | ---            | ---     |
| 2DH5      | Ant1    | 2402               | 1.272             | 2401.334    | 2402.606    | ---            | ---     |
| 2DH5      | Ant1    | 2441               | 1.287             | 2440.322    | 2441.609    | ---            | ---     |
| 2DH5      | Ant1    | 2480               | 1.284             | 2479.322    | 2480.606    | ---            | ---     |
| 3DH5      | Ant1    | 2402               | 1.293             | 2401.304    | 2402.597    | ---            | ---     |
| 3DH5      | Ant1    | 2441               | 1.308             | 2440.304    | 2441.612    | ---            | ---     |
| 3DH5      | Ant1    | 2480               | 1.287             | 2479.316    | 2480.603    | ---            | ---     |

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



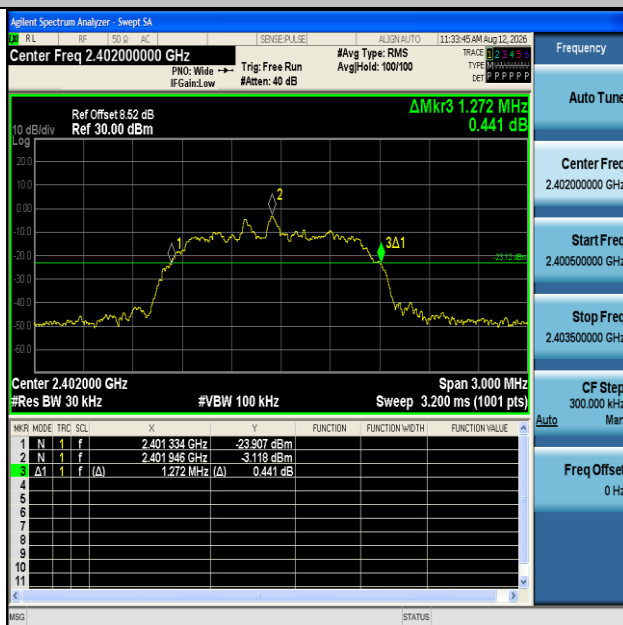


## Test Graphs





DH5-Ant1-2480

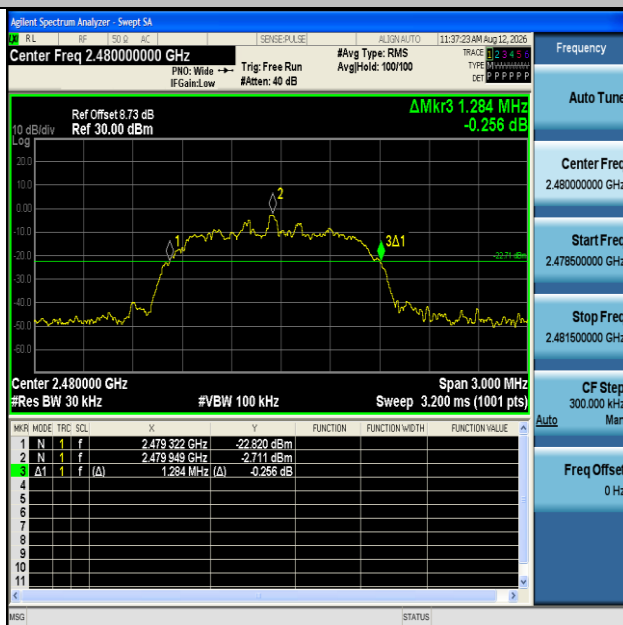


2DH5-Ant1-2402





2DH5-Ant1-2441



2DH5-Ant1-2480





3DH5-Ant1-2402



3DH5-Ant1-2441







## Appendix B: Occupied Channel Bandwidth

### Test Result

| Test Mode | Antenna | Frequency<br>[MHz] | OCB<br>[MHz] | FL<br>[MHz] | FH<br>[MHz] | Limit<br>[MHz] | Verdict |
|-----------|---------|--------------------|--------------|-------------|-------------|----------------|---------|
| DH5       | Ant1    | 2402               | 0.88076      | 2401.5178   | 2402.3986   | ---            | ---     |
| DH5       | Ant1    | 2441               | 0.86565      | 2440.5177   | 2441.3833   | ---            | ---     |
| DH5       | Ant1    | 2480               | 0.85599      | 2479.5223   | 2480.3783   | ---            | ---     |
| 2DH5      | Ant1    | 2402               | 1.1984       | 2401.3561   | 2402.5545   | ---            | ---     |
| 2DH5      | Ant1    | 2441               | 1.1942       | 2440.3576   | 2441.5518   | ---            | ---     |
| 2DH5      | Ant1    | 2480               | 1.1947       | 2479.3574   | 2480.5521   | ---            | ---     |
| 3DH5      | Ant1    | 2402               | 1.1918       | 2401.3565   | 2402.5483   | ---            | ---     |
| 3DH5      | Ant1    | 2441               | 1.1950       | 2440.3555   | 2441.5505   | ---            | ---     |
| 3DH5      | Ant1    | 2480               | 1.2017       | 2479.3479   | 2480.5496   | ---            | ---     |

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



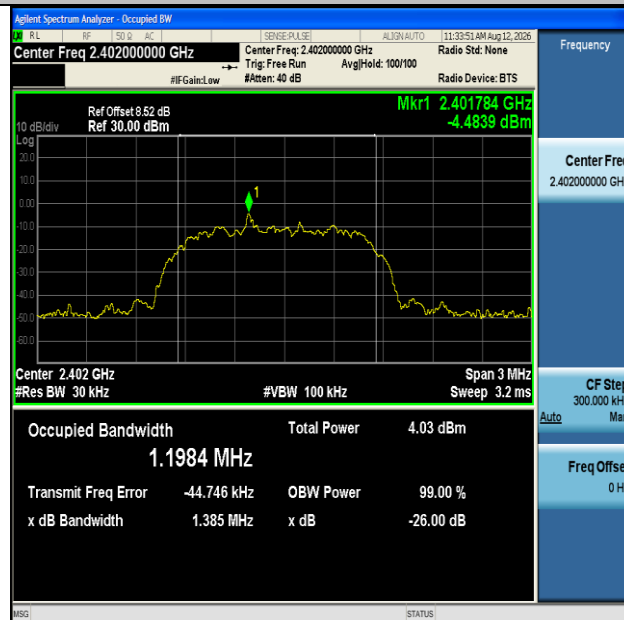


## Test Graphs



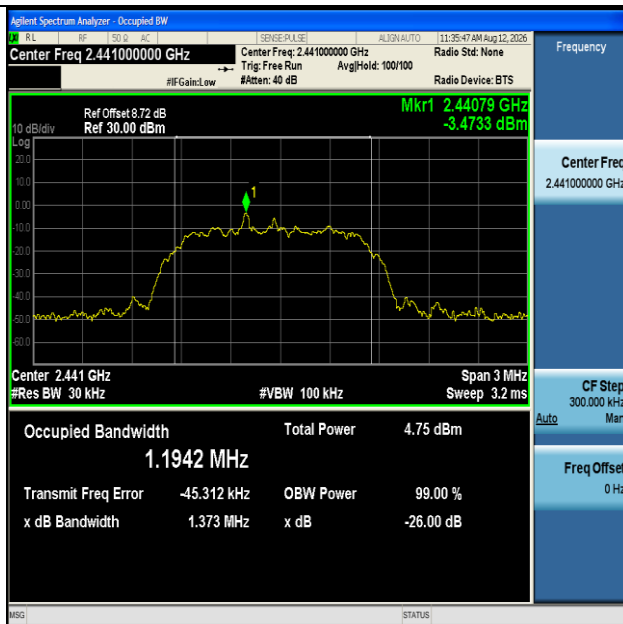


DH5-Ant1-2480

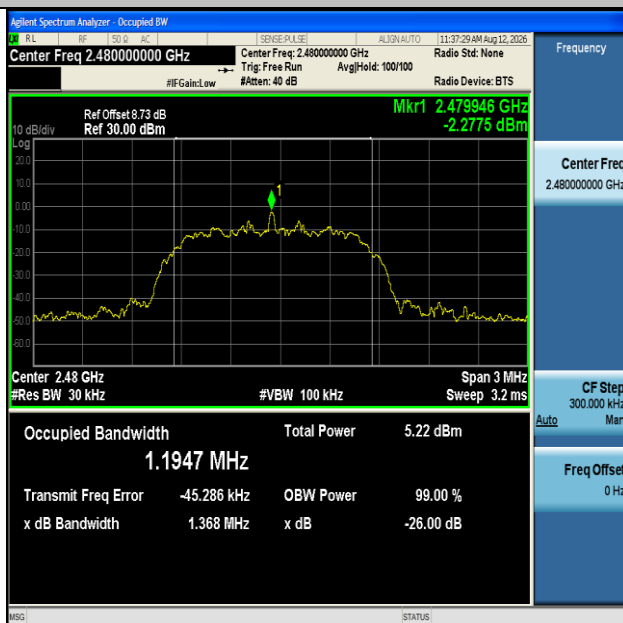


2DH5-Ant1-2402



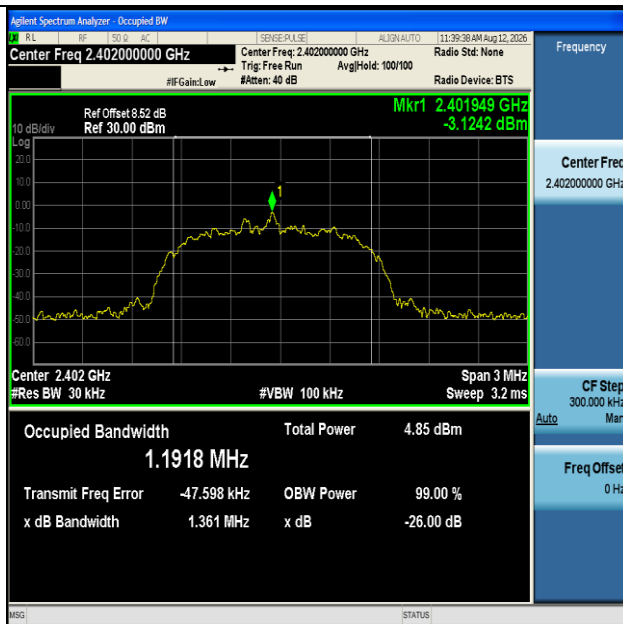


2DH5-Ant1-2441

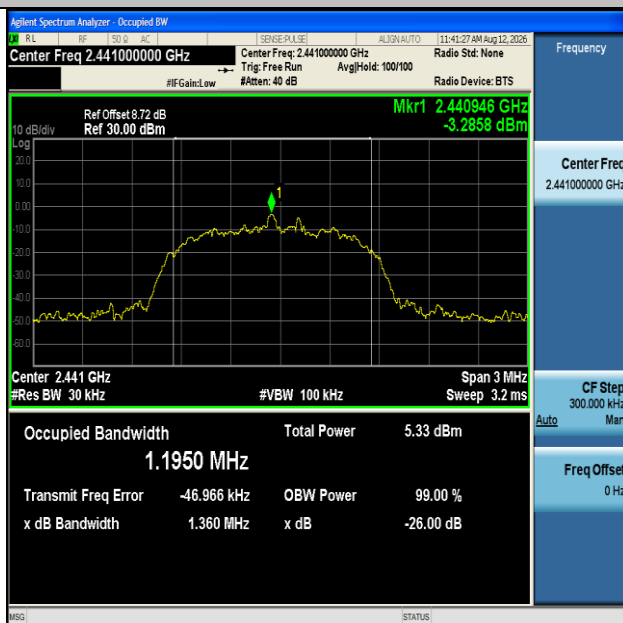


2DH5-Ant1-2480



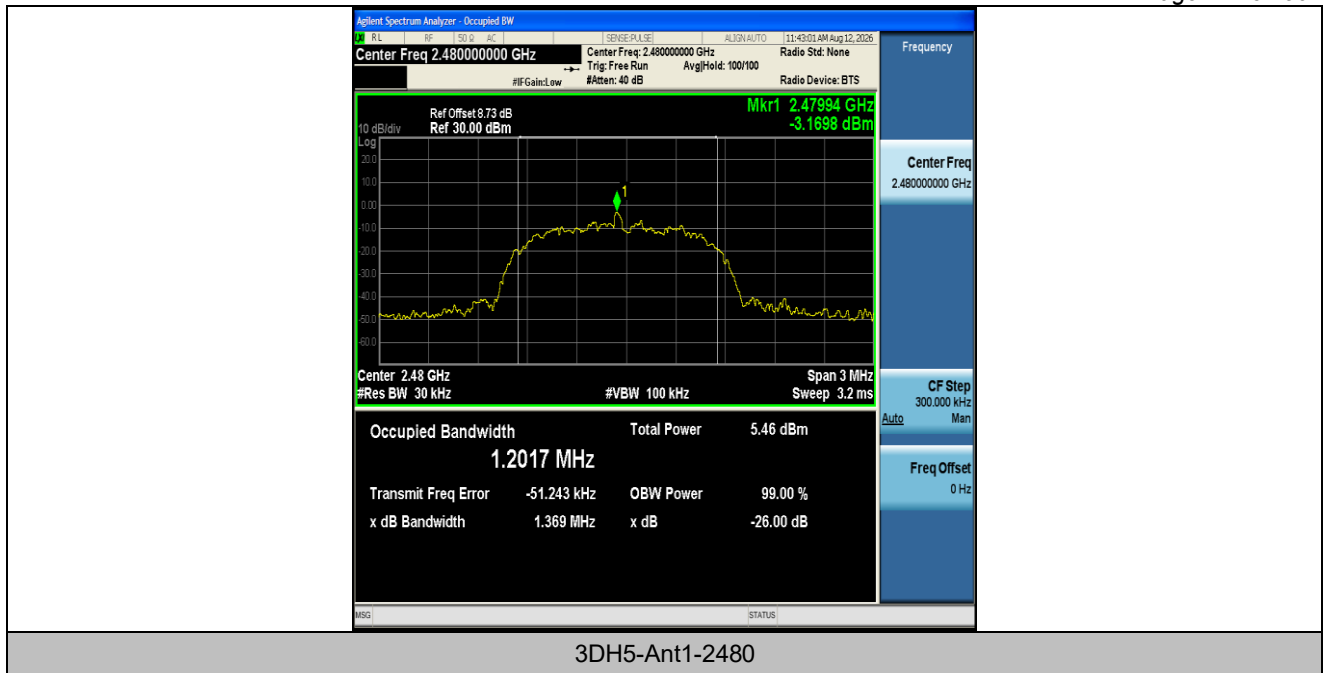


3DH5-Ant1-2402



3DH5-Ant1-2441







## Appendix C: Maximum peak conducted output power

### Test Result

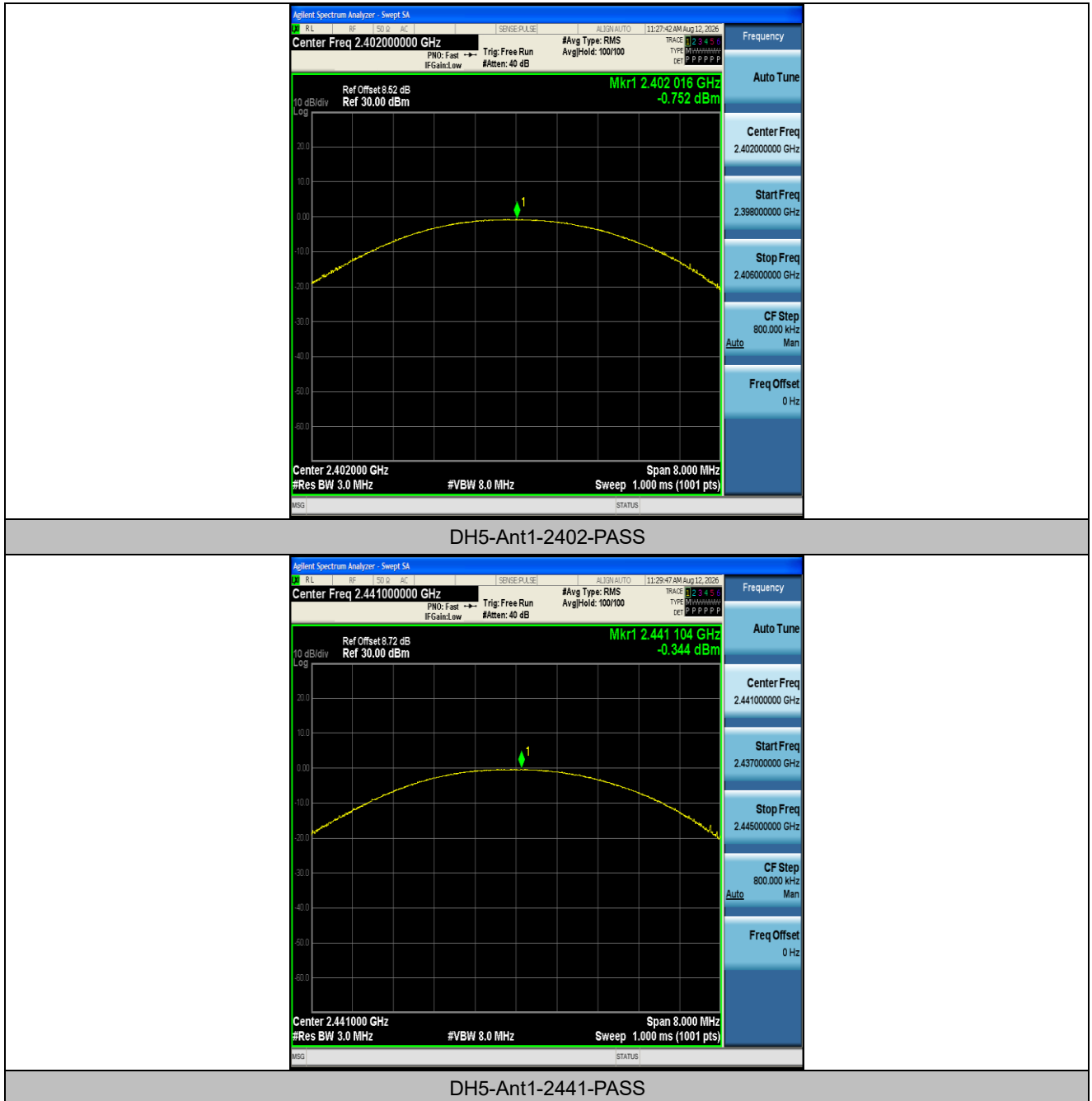
| Test Mode | Antenna | Frequency [MHz] | Conducted Peak Power [dBm] | Conducted Limit [dBm] | Verdict |
|-----------|---------|-----------------|----------------------------|-----------------------|---------|
| DH5       | Ant1    | 2402            | -0.75                      | ≤30                   | PASS    |
| DH5       | Ant1    | 2441            | -0.34                      | ≤30                   | PASS    |
| DH5       | Ant1    | 2480            | 0.14                       | ≤30                   | PASS    |
| 2DH5      | Ant1    | 2402            | 0.08                       | ≤20.97                | PASS    |
| 2DH5      | Ant1    | 2441            | 0.49                       | ≤20.97                | PASS    |
| 2DH5      | Ant1    | 2480            | 0.91                       | ≤20.97                | PASS    |
| 3DH5      | Ant1    | 2402            | 0.37                       | ≤20.97                | PASS    |
| 3DH5      | Ant1    | 2441            | 0.74                       | ≤20.97                | PASS    |
| 3DH5      | Ant1    | 2480            | 1.21                       | ≤20.97                | PASS    |

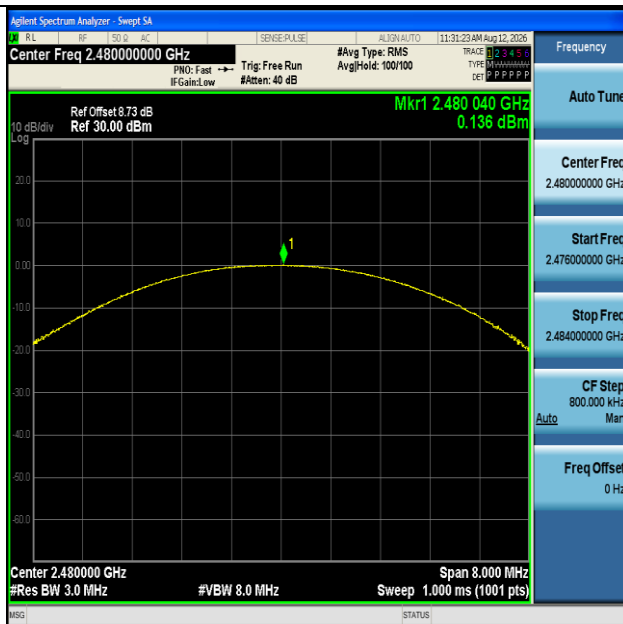
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



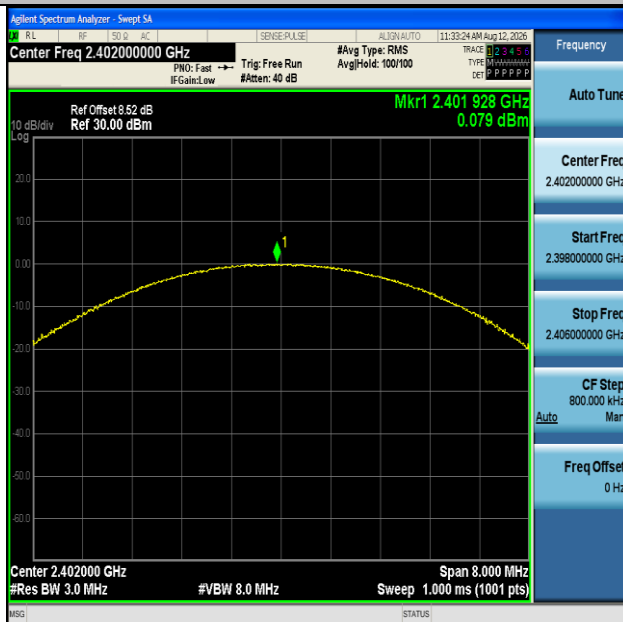


## Test Graphs



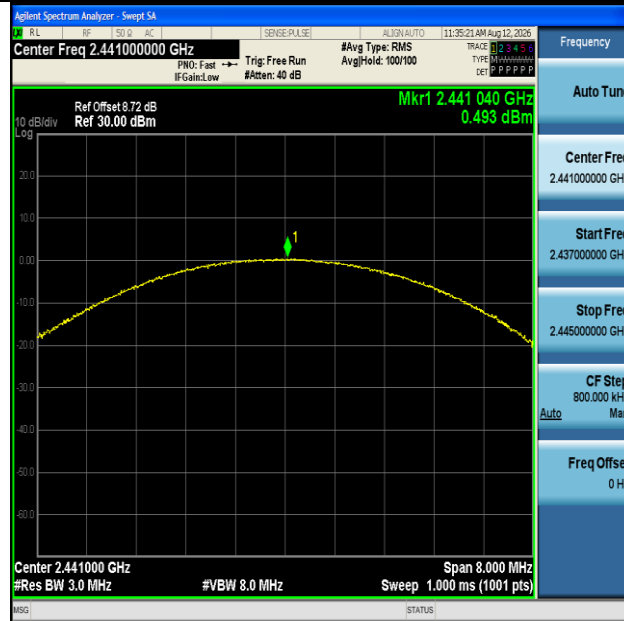


DH5-Ant1-2480-PASS

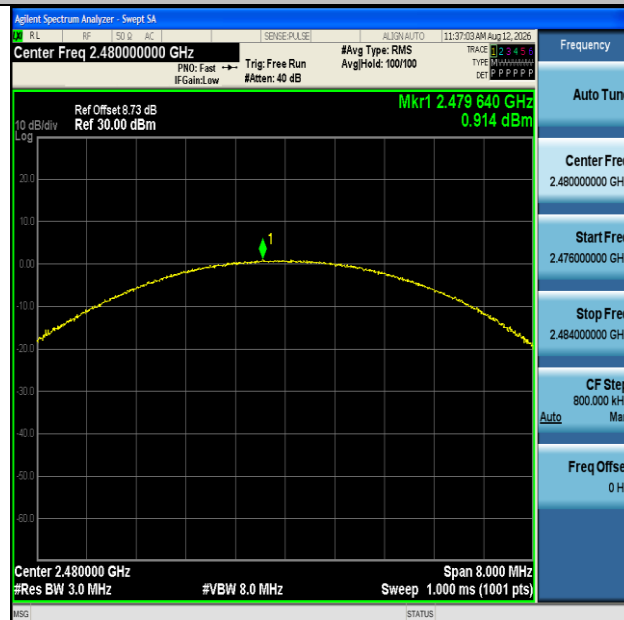


2DH5-Ant1-2402-PASS



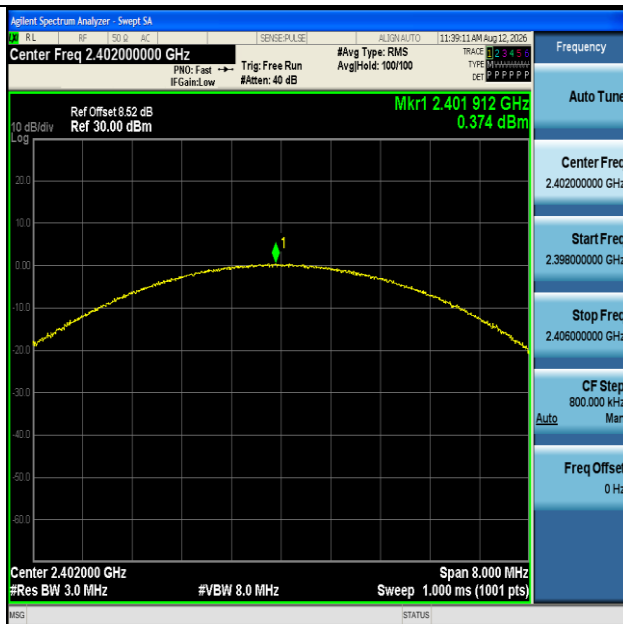


2DH5-Ant1-2441-PASS

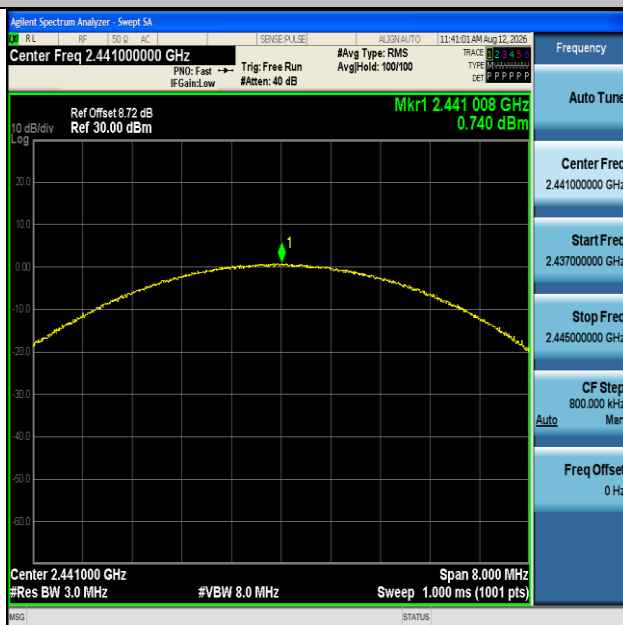


2DH5-Ant1-2480-PASS



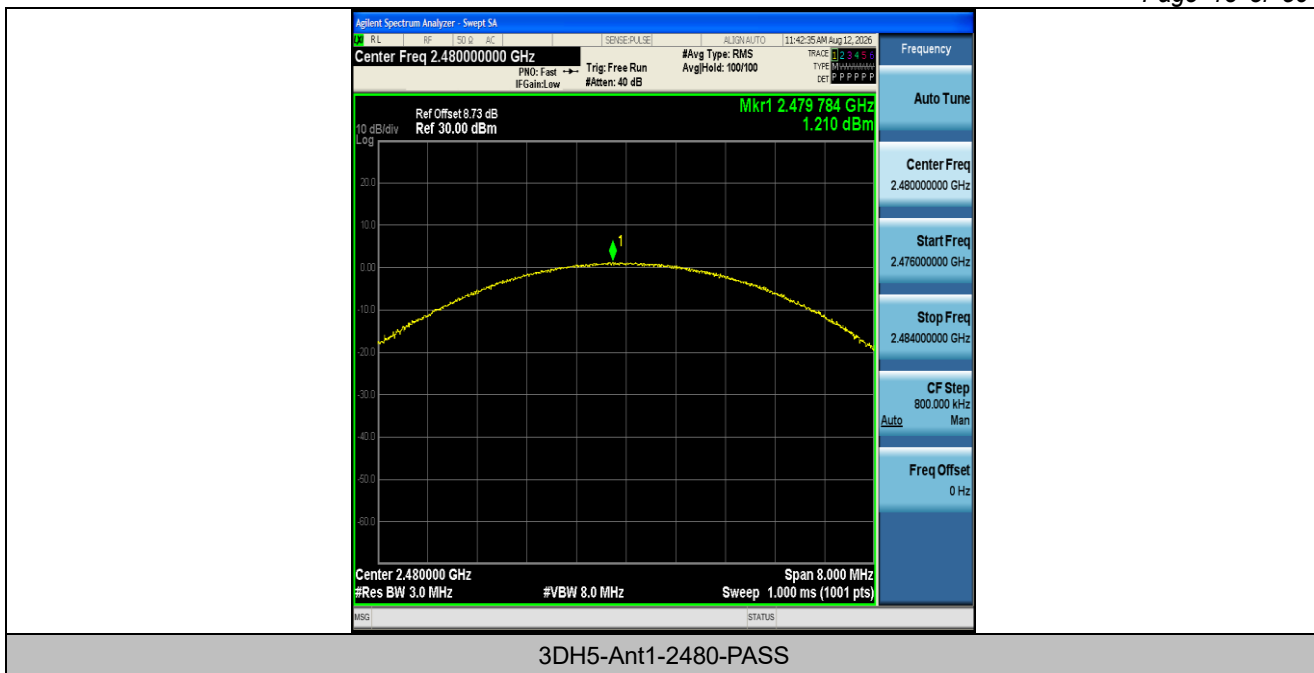


3DH5-Ant1-2402-PASS



3DH5-Ant1-2441-PASS







## Appendix D: Carrier frequency separation

### Test Result

| Test Mode | Antenna | Frequency<br>[MHz] | Result<br>[MHz] | Limit<br>[MHz] | Verdict |
|-----------|---------|--------------------|-----------------|----------------|---------|
| DH5       | Ant1    | Hop                | 0.984           | ≥0.963         | PASS    |
| 2DH5      | Ant1    | Hop                | 0.956           | ≥0.858         | PASS    |
| 3DH5      | Ant1    | Hop                | 1.01            | ≥0.872         | PASS    |

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





## Test Graphs







## Appendix E: Time of occupancy

### Test Result

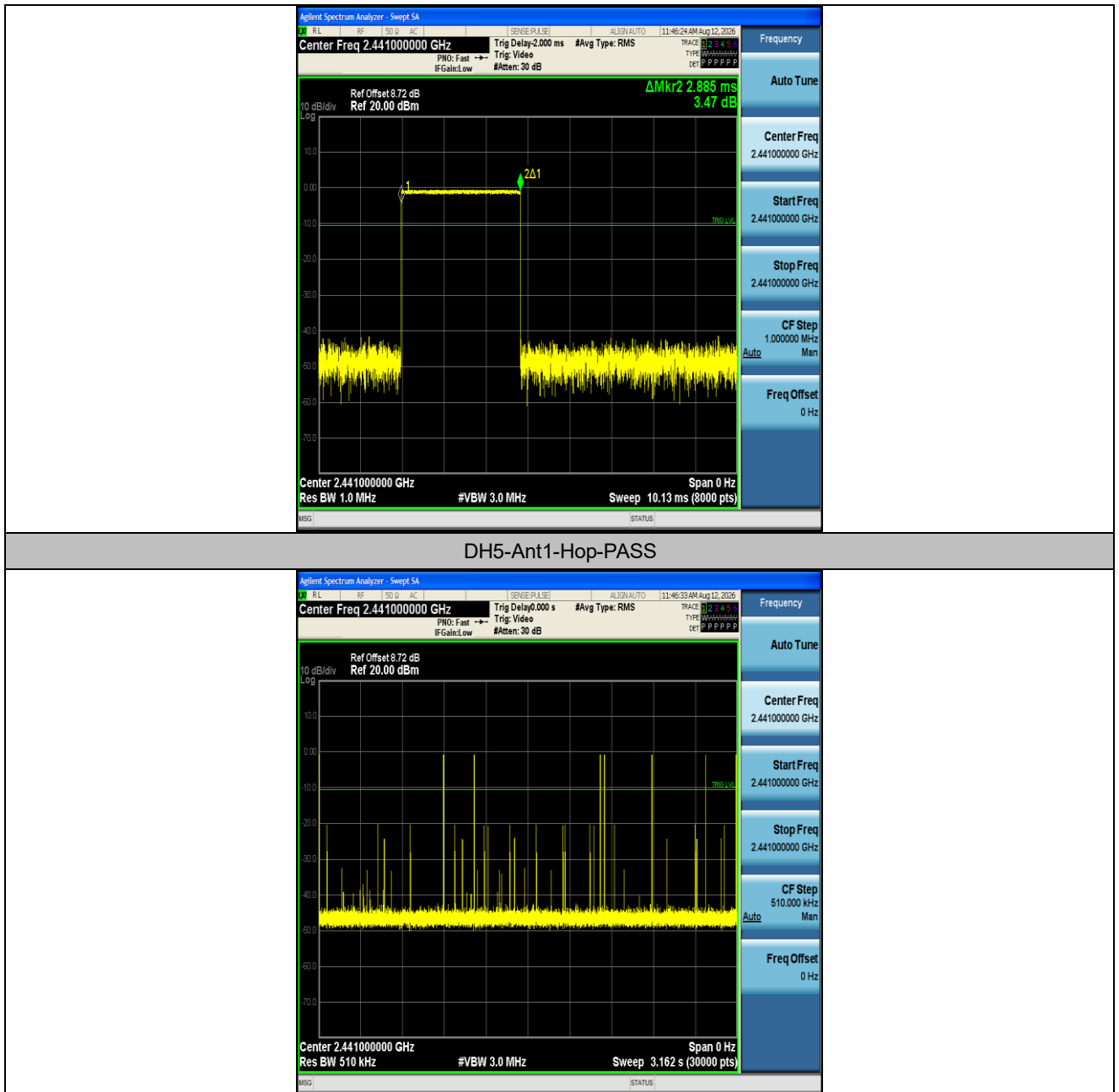
| Test Mode | Antenna | Frequency<br>[MHz] | Burst Width<br>[ms] | TotalHops<br>[Num] | Result<br>[s] | Limit<br>[s] | Verdict |
|-----------|---------|--------------------|---------------------|--------------------|---------------|--------------|---------|
| DH5       | Ant1    | Hop                | 2.885               | 80                 | 0.231         | ≤0.4         | PASS    |
| 2DH5      | Ant1    | Hop                | 2.892               | 130                | 0.376         | ≤0.4         | PASS    |
| 3DH5      | Ant1    | Hop                | 2.893               | 120                | 0.347         | ≤0.4         | PASS    |

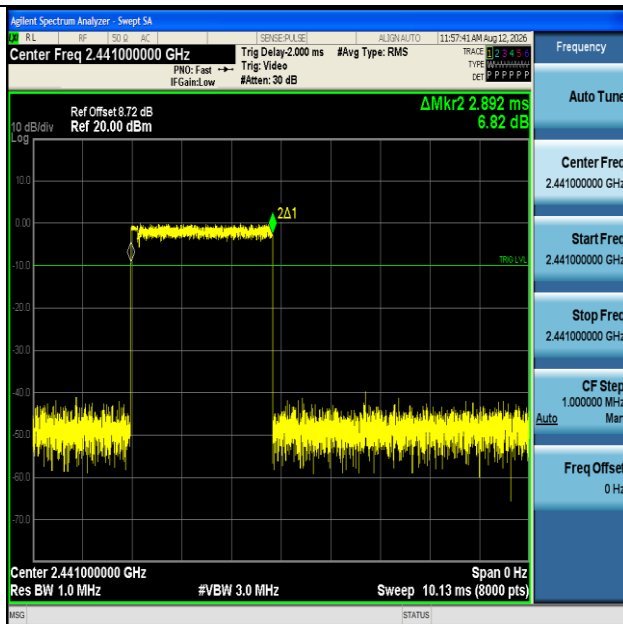
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



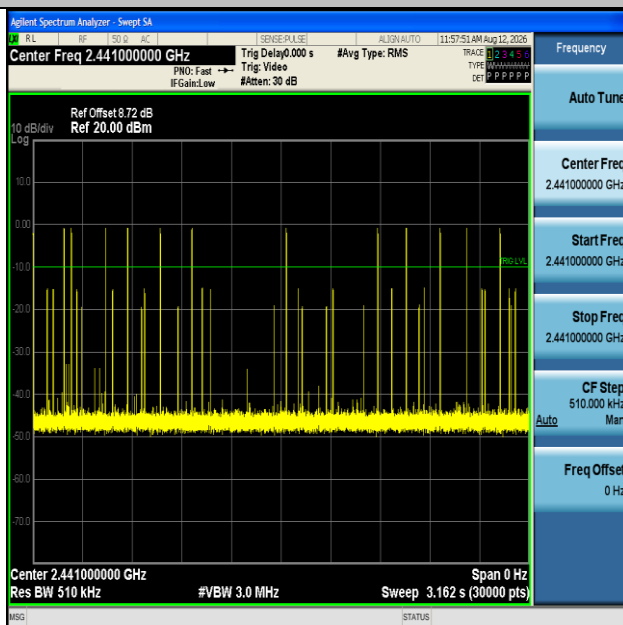


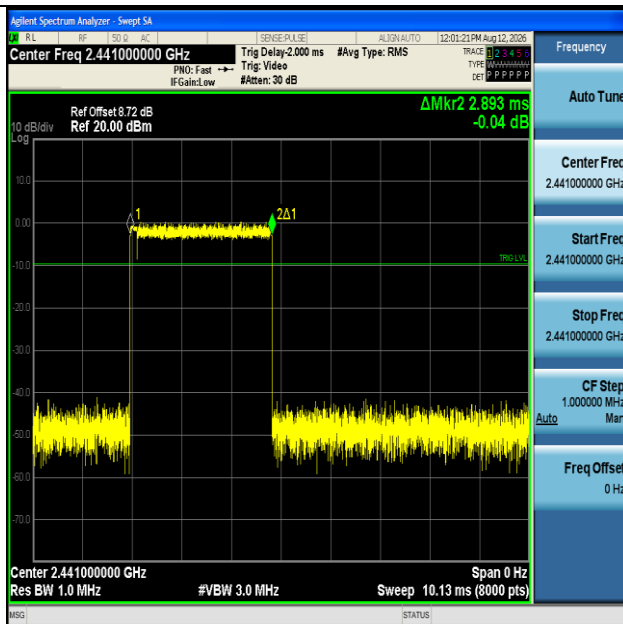
## Test Graphs



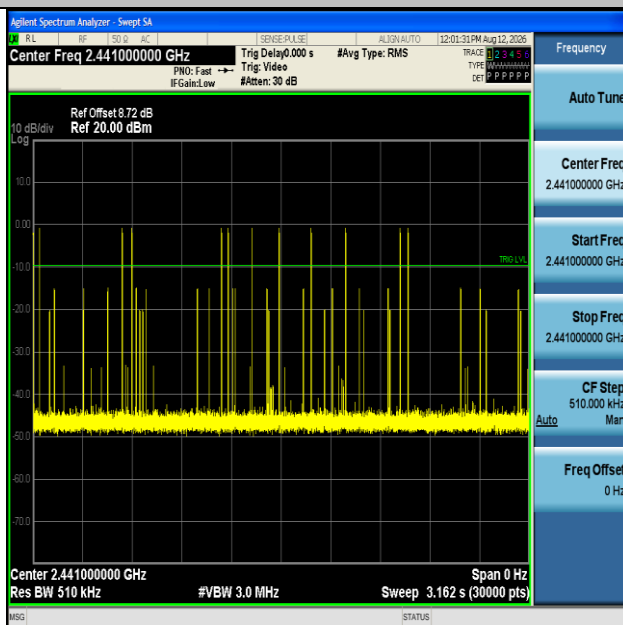


### 2DH5-Ant1-Hop-PASS





### 3DH5-Ant1-Hop-PASS





## Appendix F: Number of hopping channels

### Test Result

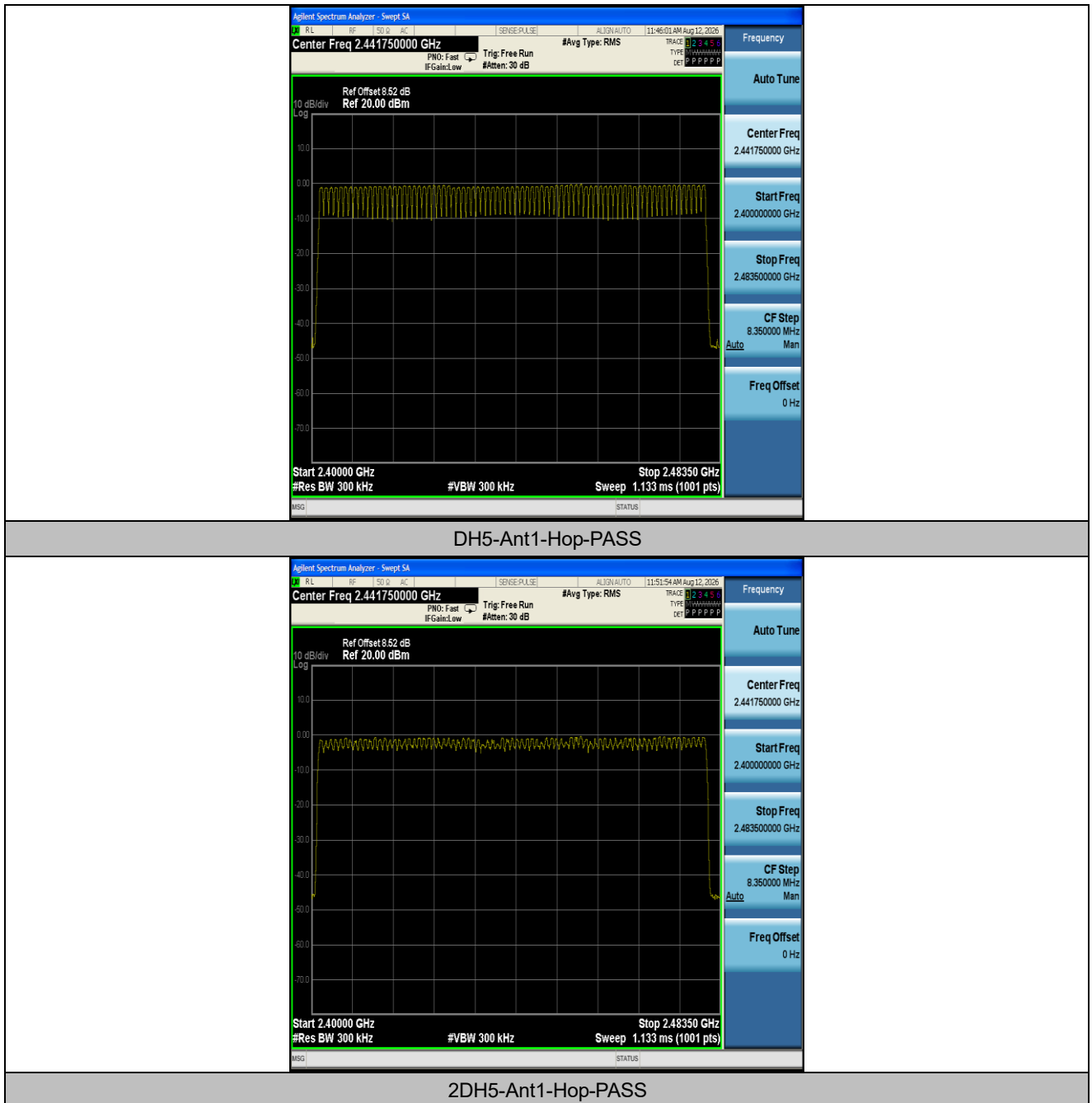
| Test Mode | Antenna | Frequency<br>[MHz] | Result<br>[Num] | Limit<br>[Num] | Verdict |
|-----------|---------|--------------------|-----------------|----------------|---------|
| DH5       | Ant1    | Hop                | 79              | ≥15            | PASS    |
| 2DH5      | Ant1    | Hop                | 79              | ≥15            | PASS    |
| 3DH5      | Ant1    | Hop                | 79              | ≥15            | PASS    |

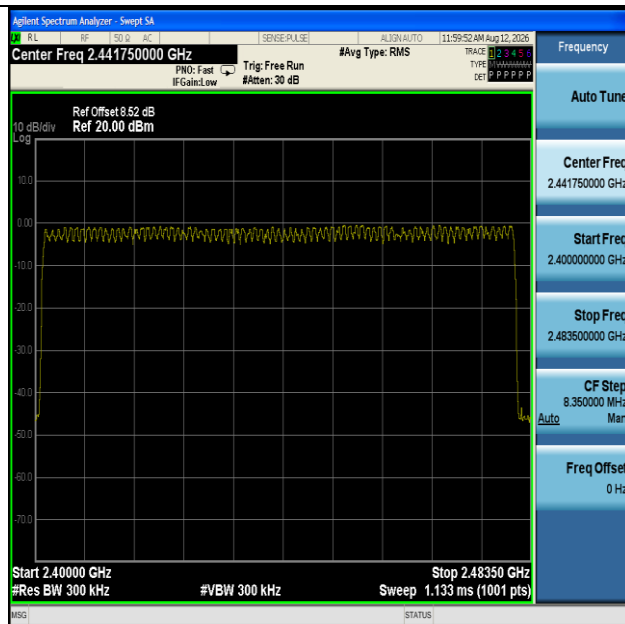
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)





## Test Graphs





3DH5-Ant1-Hop-PASS





## Appendix G: Band edge measurements

### Test Result

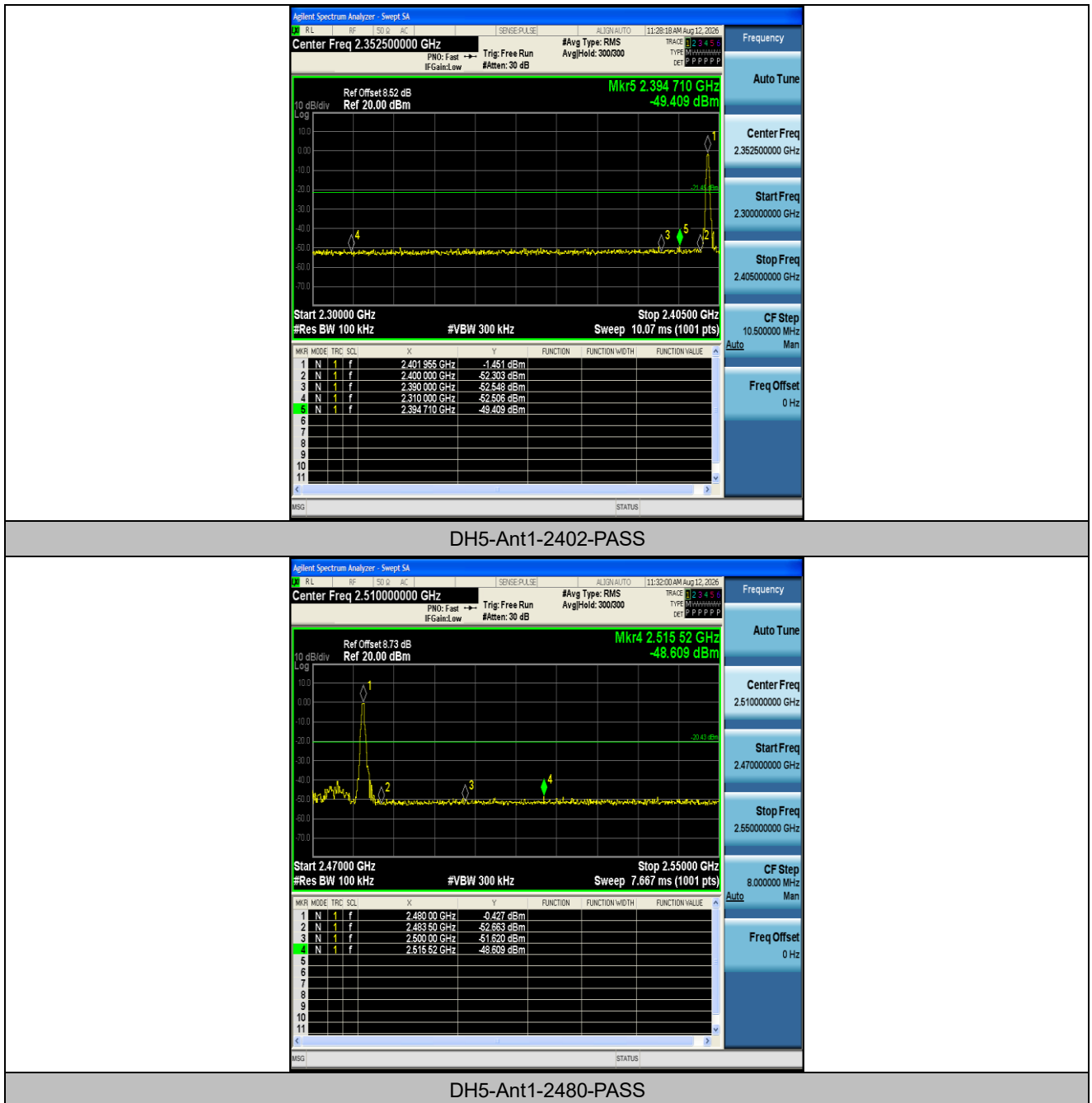
| Test Mode | Antenna | Ch.Name | Frequency [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|-----------|---------|---------|-----------------|----------------|--------------|-------------|---------|
| DH5       | Ant1    | Low     | 2402            | -1.45          | -49.41       | ≤-21.45     | PASS    |
| DH5       | Ant1    | High    | 2480            | -0.43          | -48.61       | ≤-20.43     | PASS    |
| DH5       | Ant1    | Low     | Hop_2402        | -2.02          | -49.77       | ≤-22.02     | PASS    |
| DH5       | Ant1    | High    | Hop_2480        | -1.54          | -48.85       | ≤-21.54     | PASS    |
| 2DH5      | Ant1    | Low     | 2402            | -1.48          | -48.89       | ≤-21.48     | PASS    |
| 2DH5      | Ant1    | High    | 2480            | -0.69          | -48.46       | ≤-20.69     | PASS    |
| 2DH5      | Ant1    | Low     | Hop_2402        | -3.45          | -49.12       | ≤-23.45     | PASS    |
| 2DH5      | Ant1    | High    | Hop_2480        | -2.42          | -48.39       | ≤-22.42     | PASS    |
| 3DH5      | Ant1    | Low     | 2402            | -1.83          | -49.65       | ≤-21.83     | PASS    |
| 3DH5      | Ant1    | High    | 2480            | -0.72          | -48.71       | ≤-20.72     | PASS    |
| 3DH5      | Ant1    | Low     | Hop_2402        | -5.05          | -48.93       | ≤-25.05     | PASS    |
| 3DH5      | Ant1    | High    | Hop_2480        | -2.93          | -49.12       | ≤-22.93     | PASS    |

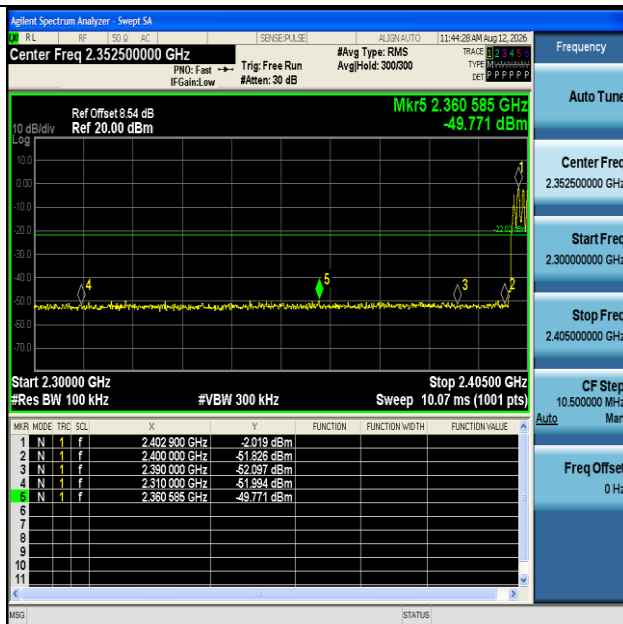
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



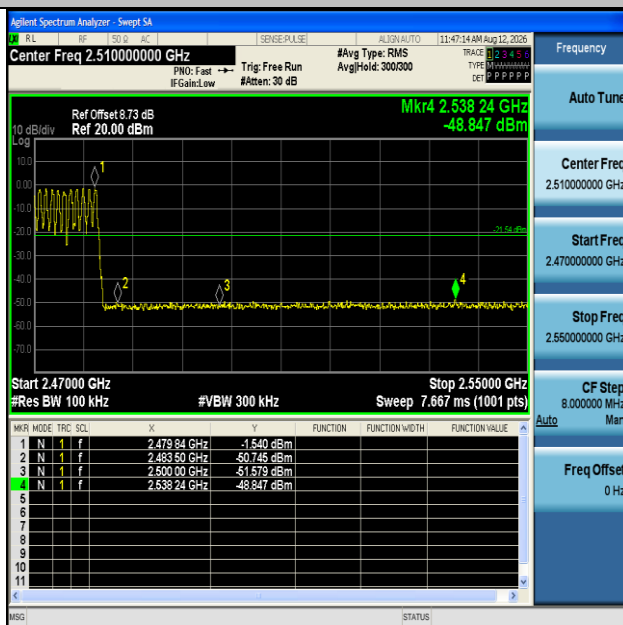


## Test Graphs



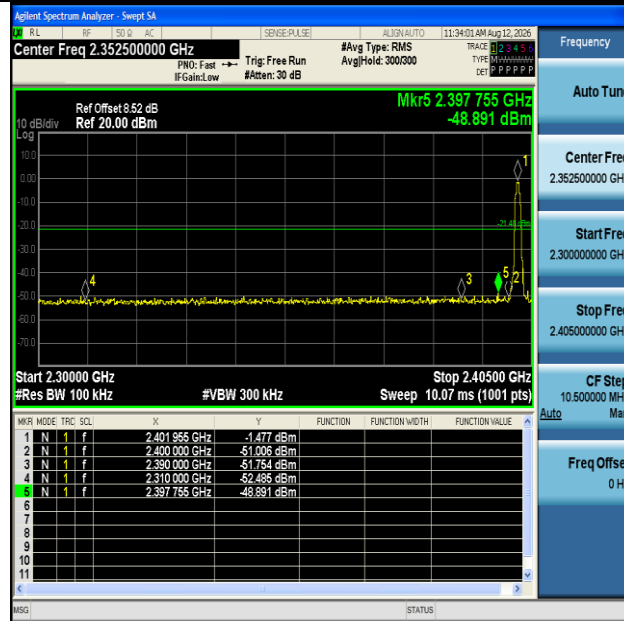


DH5-Ant1-Hop\_2402-PASS

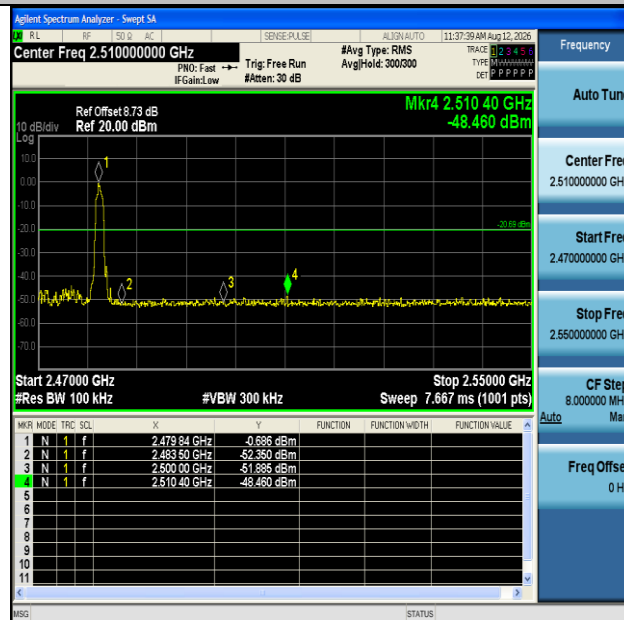


DH5-Ant1-Hop\_2480-PASS



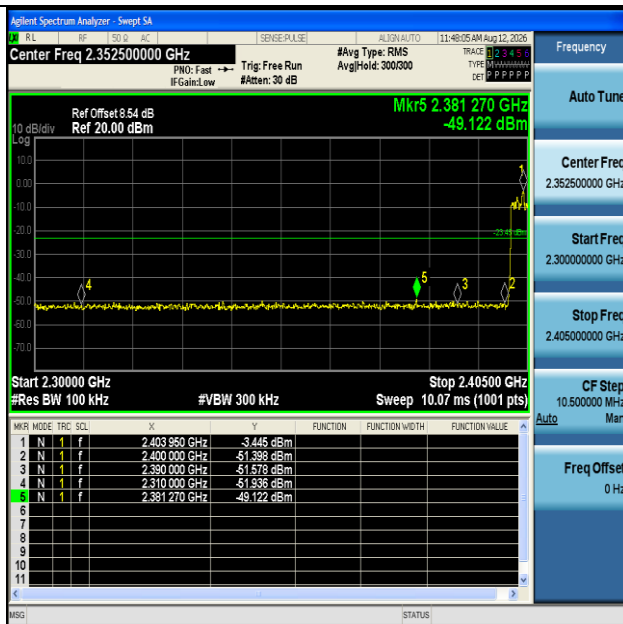


2DH5-Ant1-2402-PASS

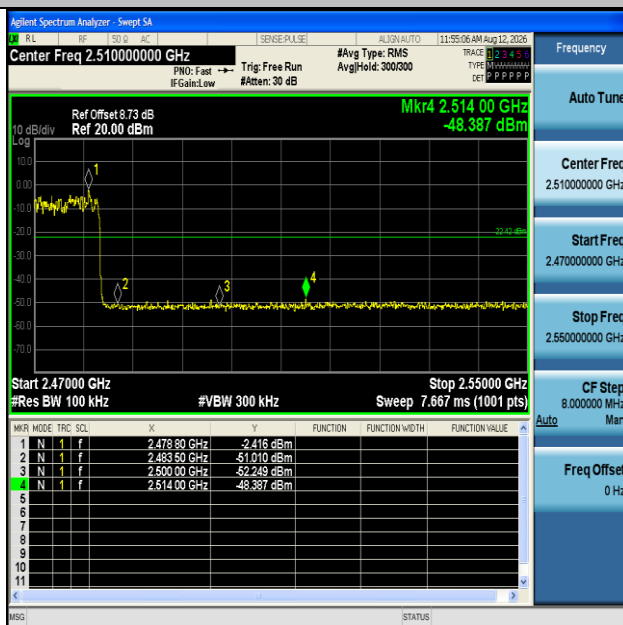


2DH5-Ant1-2480-PASS



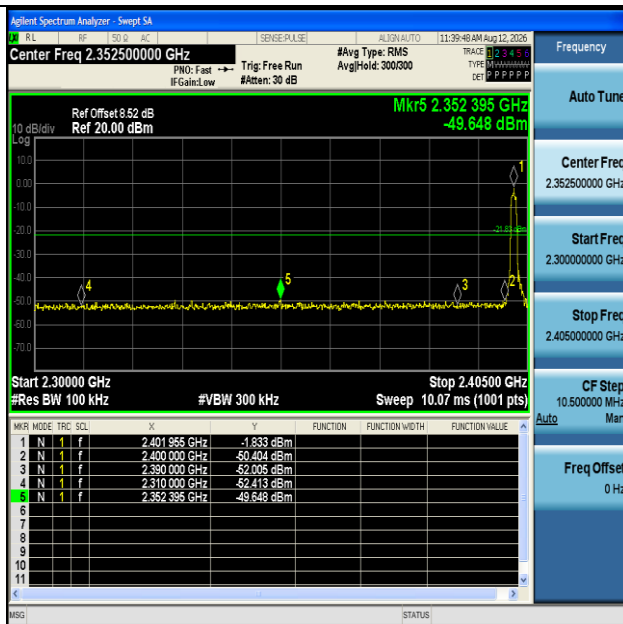


2DH5-Ant1-Hop\_2402-PASS

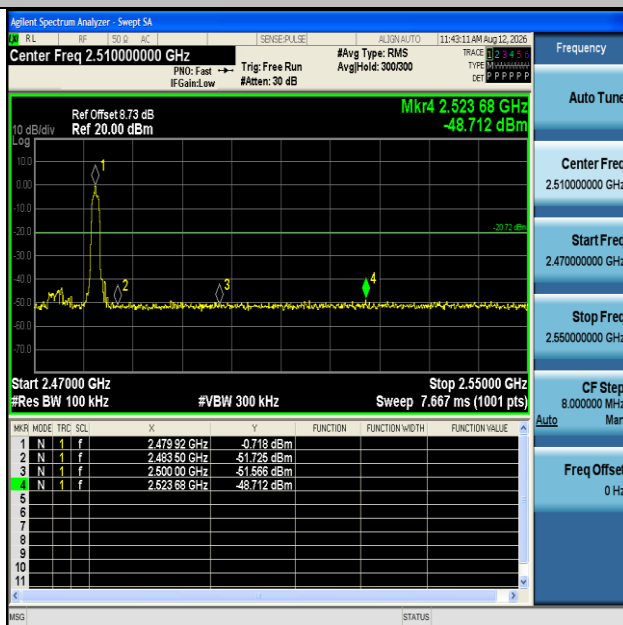


2DH5-Ant1-Hop\_2480-PASS



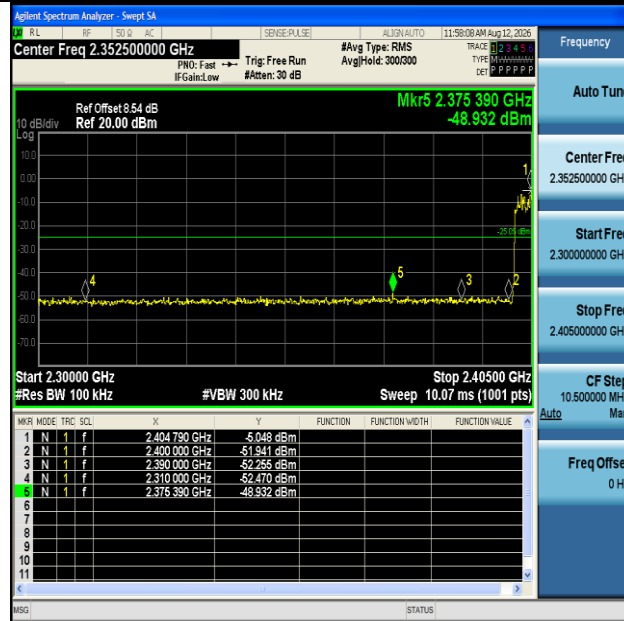


3DH5-Ant1-2402-PASS

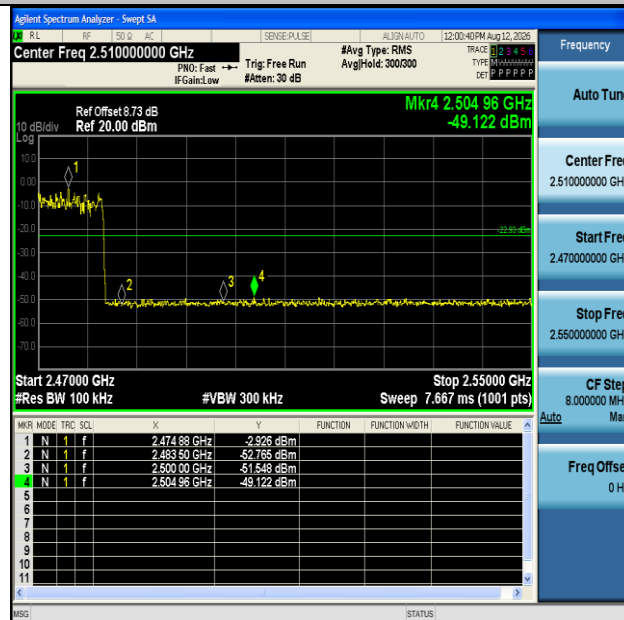


3DH5-Ant1-2480-PASS





3DH5-Ant1-Hop\_2402-PASS



3DH5-Ant1-Hop\_2480-PASS





## 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       | -1.55            | -1.55        | ---         | PASS    |
| DH5       | Ant1    | 2402            | 30~1000           | -1.55            | -52.7        | ≤-21.55     | PASS    |
| DH5       | Ant1    | 2402            | 1000~26500        | -1.55            | -28.24       | ≤-21.55     | PASS    |
| DH5       | Ant1    | 2441            | 0~Reference       | -1.66            | -1.66        | ---         | PASS    |
| DH5       | Ant1    | 2441            | 30~1000           | -1.66            | -52.69       | ≤-21.66     | PASS    |
| DH5       | Ant1    | 2441            | 1000~26500        | -1.66            | -27.27       | ≤-21.66     | PASS    |
| DH5       | Ant1    | 2480            | 0~Reference       | -1.32            | -1.32        | ---         | PASS    |
| DH5       | Ant1    | 2480            | 30~1000           | -1.32            | -52.88       | ≤-21.32     | PASS    |
| DH5       | Ant1    | 2480            | 1000~26500        | -1.32            | -26.84       | ≤-21.32     | PASS    |
| 2DH5      | Ant1    | 2402            | 0~Reference       | -1.61            | -1.61        | ---         | PASS    |
| 2DH5      | Ant1    | 2402            | 30~1000           | -1.61            | -52.67       | ≤-21.61     | PASS    |
| 2DH5      | Ant1    | 2402            | 1000~26500        | -1.61            | -28.03       | ≤-21.61     | PASS    |
| 2DH5      | Ant1    | 2441            | 0~Reference       | -5.03            | -5.03        | ---         | PASS    |
| 2DH5      | Ant1    | 2441            | 30~1000           | -5.03            | -53.48       | ≤-25.03     | PASS    |
| 2DH5      | Ant1    | 2441            | 1000~26500        | -5.03            | -28.02       | ≤-25.03     | PASS    |
| 2DH5      | Ant1    | 2480            | 0~Reference       | -1.23            | -1.23        | ---         | PASS    |
| 2DH5      | Ant1    | 2480            | 30~1000           | -1.23            | -52.76       | ≤-21.23     | PASS    |
| 2DH5      | Ant1    | 2480            | 1000~26500        | -1.23            | -28.65       | ≤-21.23     | PASS    |
| 3DH5      | Ant1    | 2402            | 0~Reference       | -5.31            | -5.31        | ---         | PASS    |
| 3DH5      | Ant1    | 2402            | 30~1000           | -5.31            | -53.7        | ≤-25.31     | PASS    |
| 3DH5      | Ant1    | 2402            | 1000~26500        | -5.31            | -27.71       | ≤-25.31     | PASS    |
| 3DH5      | Ant1    | 2441            | 0~Reference       | -2.71            | -2.71        | ---         | PASS    |
| 3DH5      | Ant1    | 2441            | 30~1000           | -2.71            | -52.86       | ≤-22.71     | PASS    |
| 3DH5      | Ant1    | 2441            | 1000~26500        | -2.71            | -28.1        | ≤-22.71     | PASS    |
| 3DH5      | Ant1    | 2480            | 0~Reference       | -4.24            | -4.24        | ---         | PASS    |
| 3DH5      | Ant1    | 2480            | 30~1000           | -4.24            | -53.12       | ≤-24.24     | PASS    |
| 3DH5      | Ant1    | 2480            | 1000~26500        | -4.24            | -28.66       | ≤-24.24     | 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.

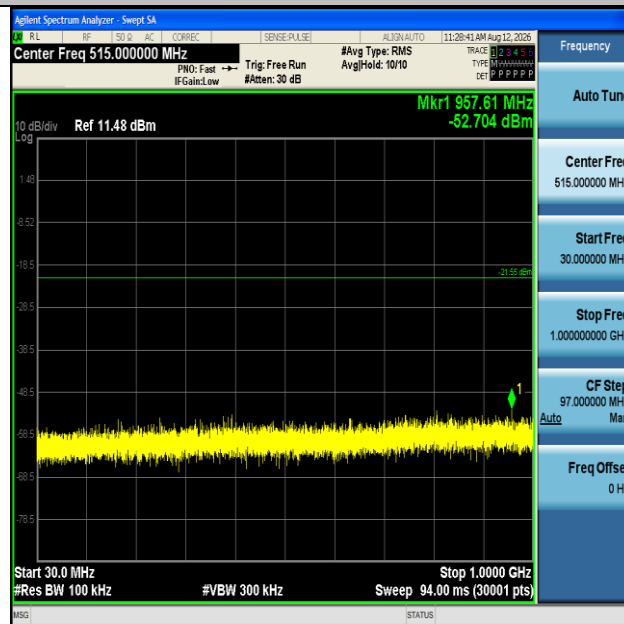




## Test Graphs

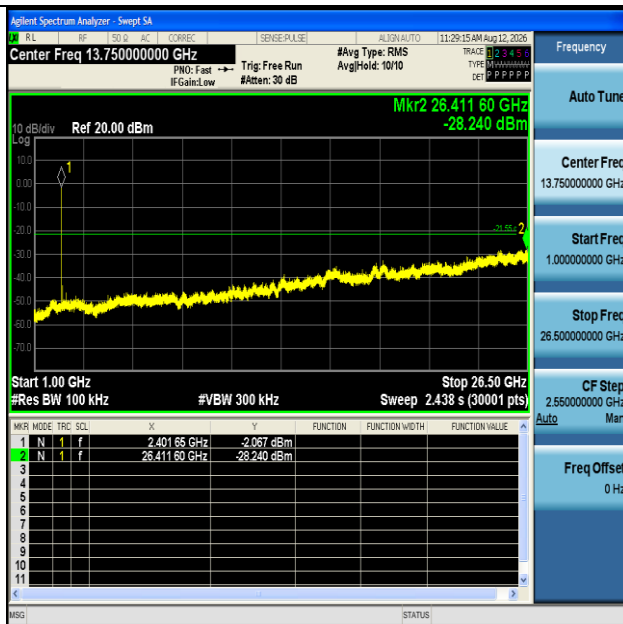


DH5-Ant1-2402-0~Reference-PASS

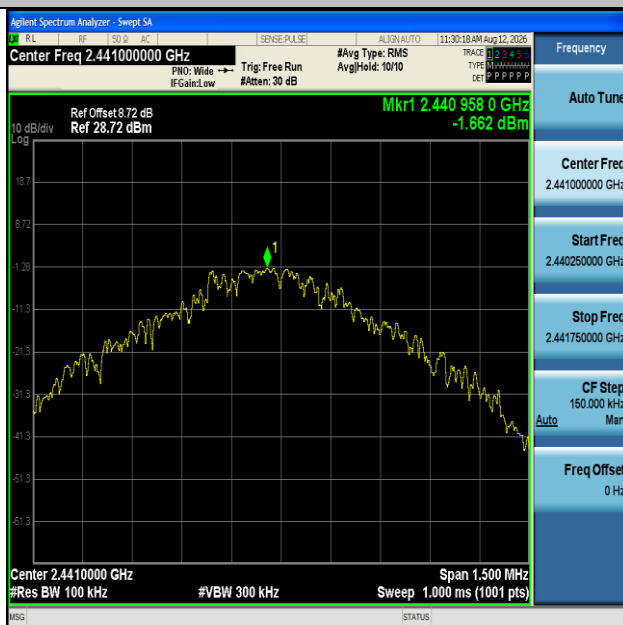


DH5-Ant1-2402-30~1000-PASS



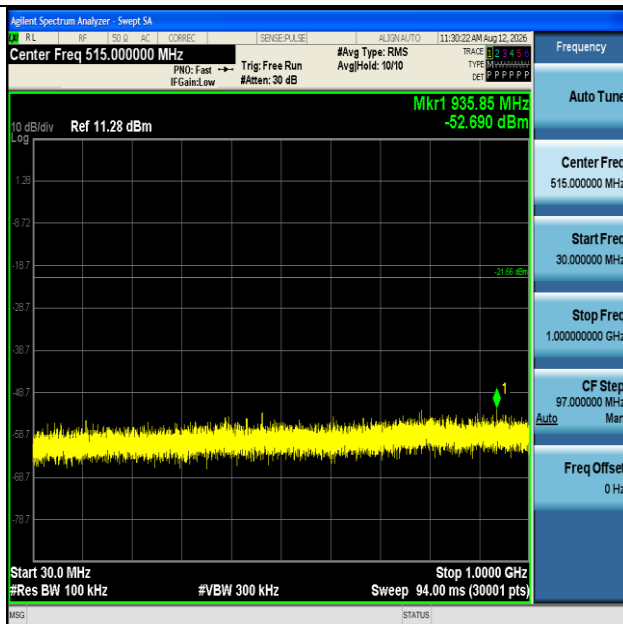


DH5-Ant1-2402-1000~26500-PASS

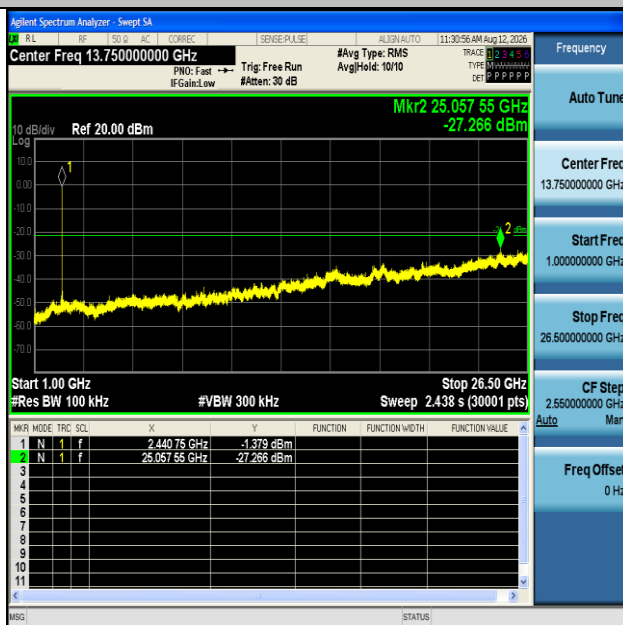


DH5-Ant1-2441-0~Reference-PASS



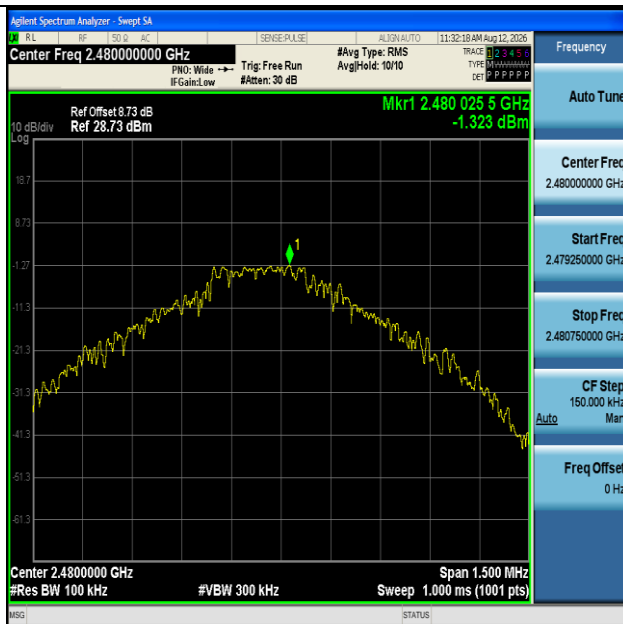


DH5-Ant1-2441-30~1000-PASS

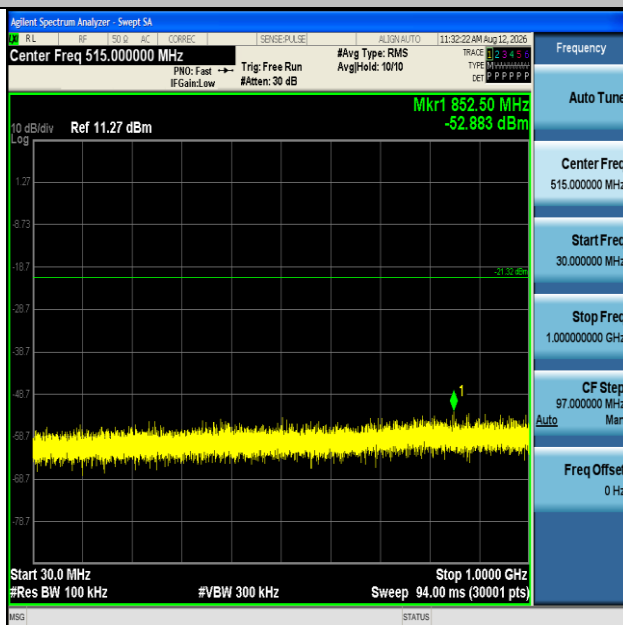


DH5-Ant1-2441-1000~26500-PASS



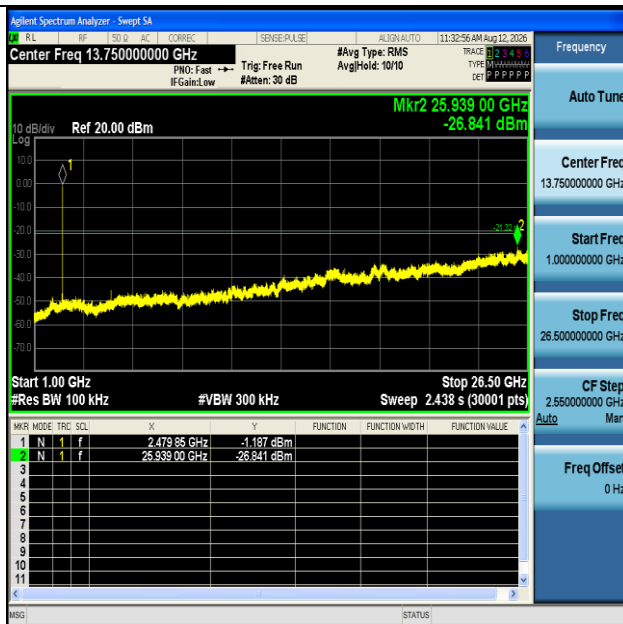


DH5-Ant1-2480-0~Reference-PASS

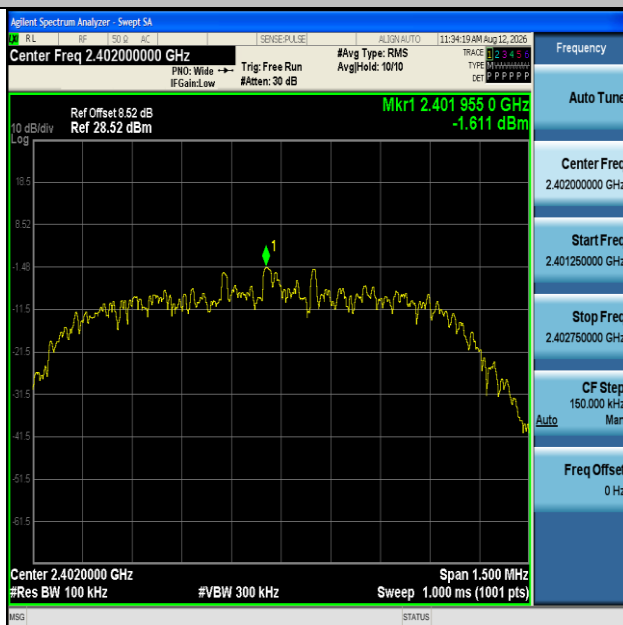


DH5-Ant1-2480-30~1000-PASS



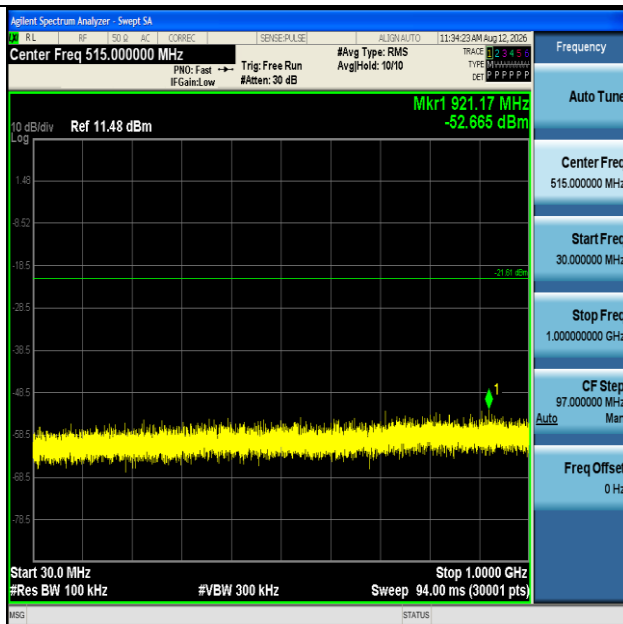


DH5-Ant1-2480-1000~26500-PASS

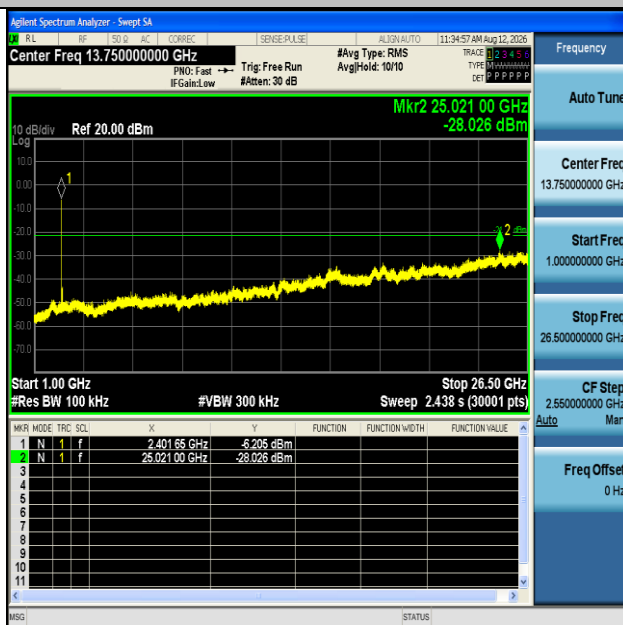


2DH5-Ant1-2402-0~Reference-PASS





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

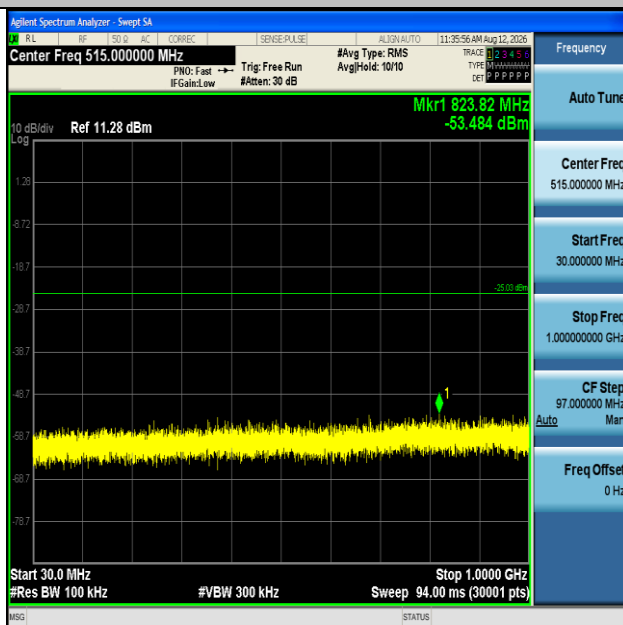


2DH5-Ant1-2402-1000~26500-PASS



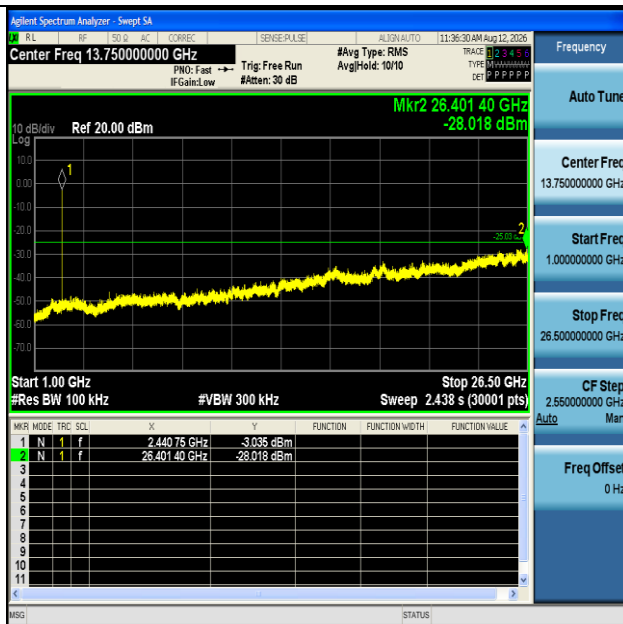


2DH5-Ant1-2441-0~Reference-PASS



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



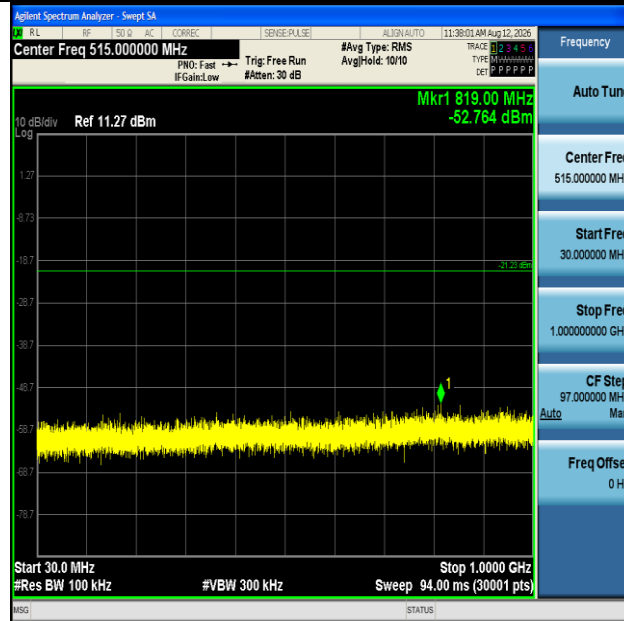


2DH5-Ant1-2441-1000~26500-PASS

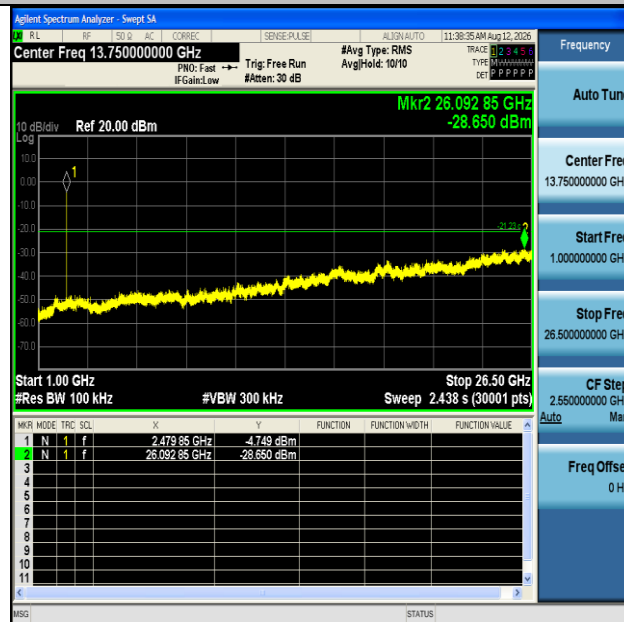


2DH5-Ant1-2480-0~Reference-PASS



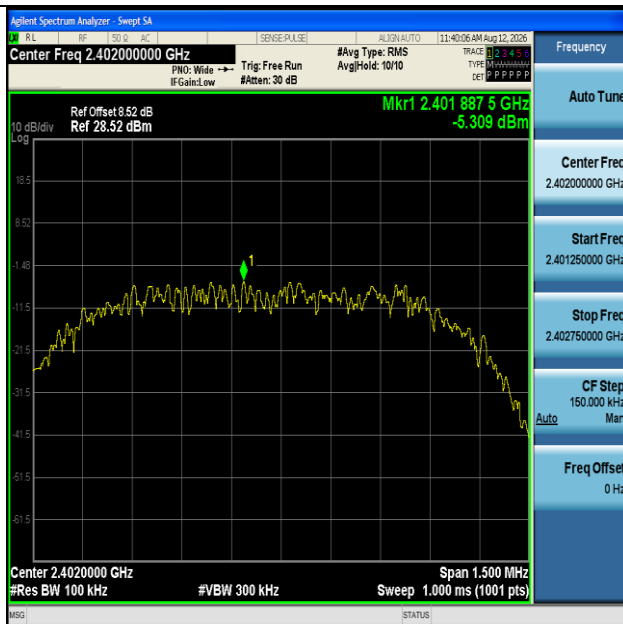


2DH5-Ant1-2480-30~1000-PASS

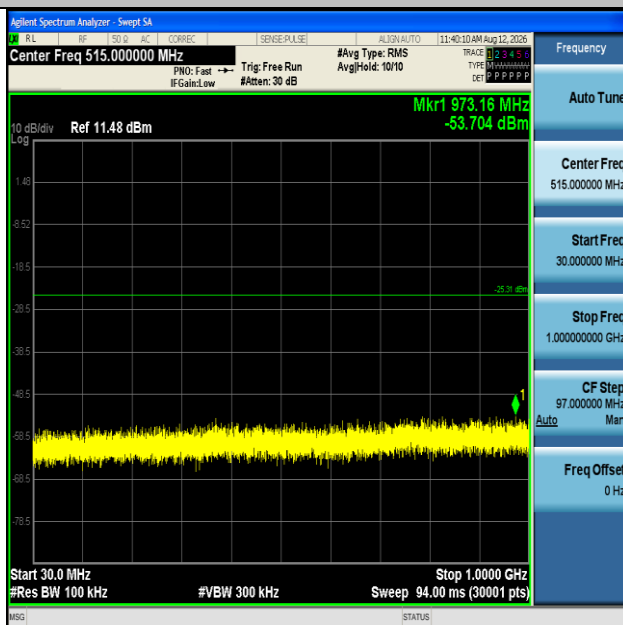


2DH5-Ant1-2480-1000~26500-PASS



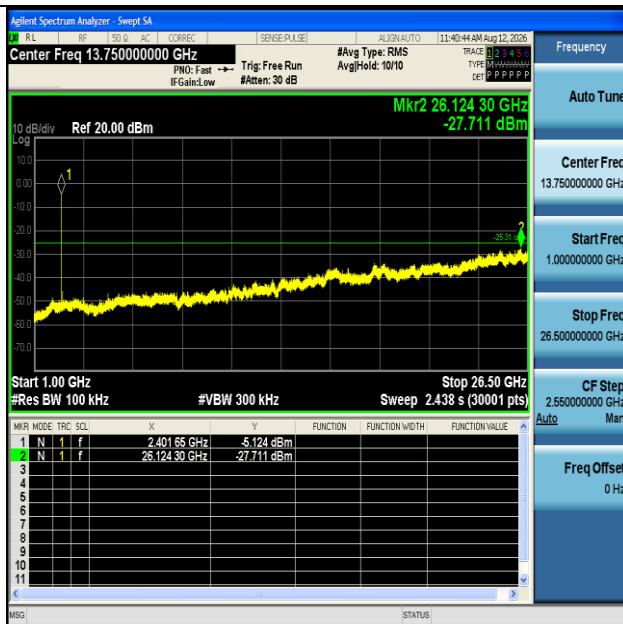


3DH5-Ant1-2402-0~Reference-PASS

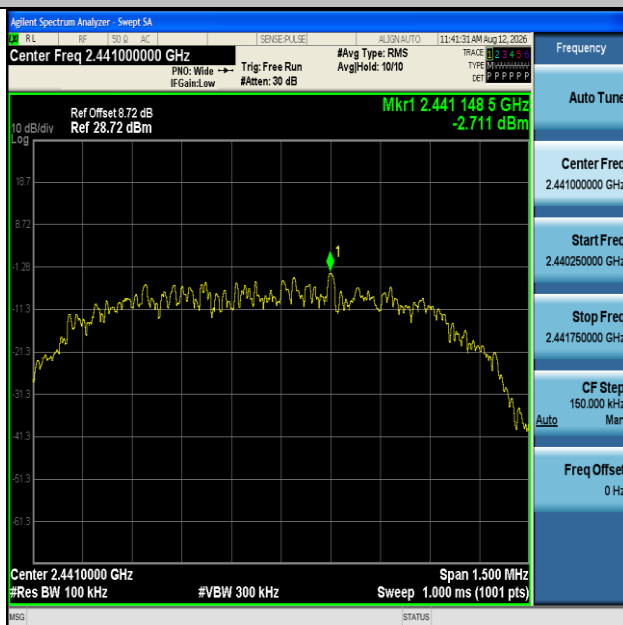


3DH5-Ant1-2402-30~1000-PASS



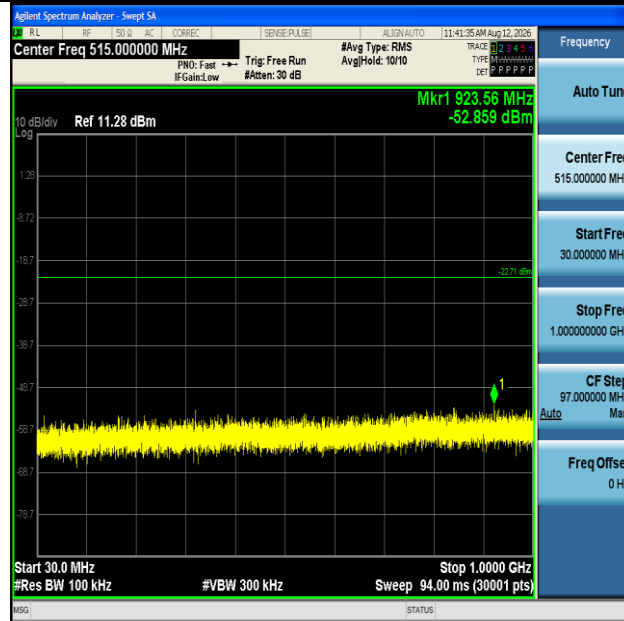


3DH5-Ant1-2402-1000~26500-PASS

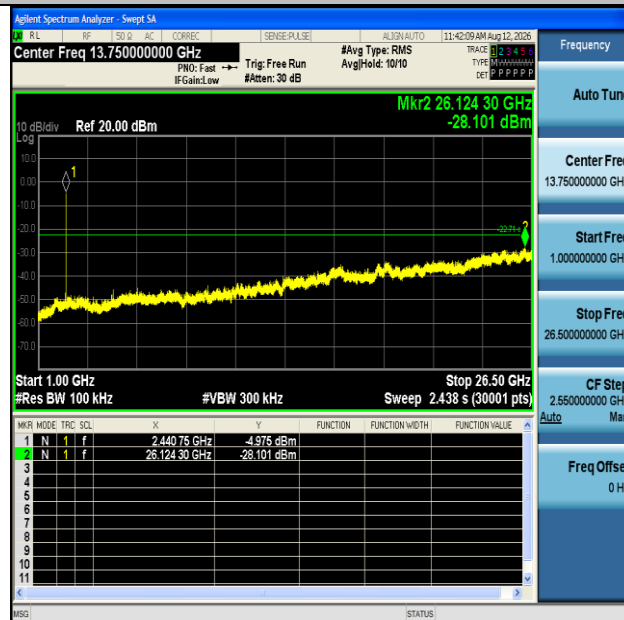


3DH5-Ant1-2441-0~Reference-PASS



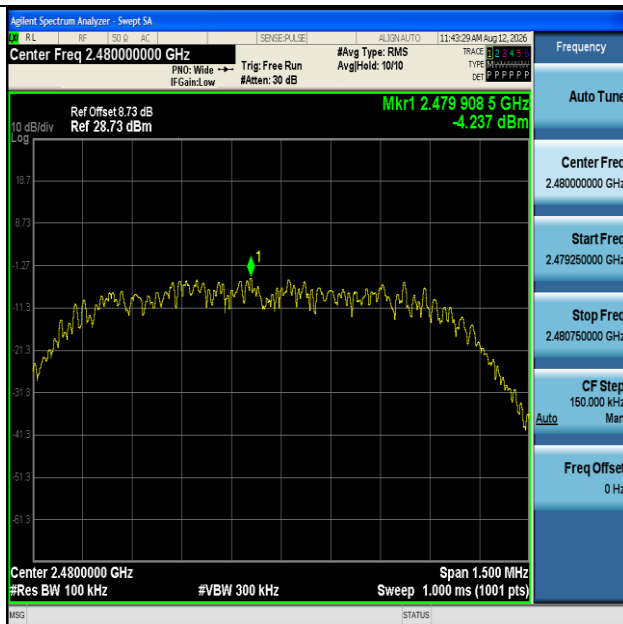


3DH5-Ant1-2441-30~1000-PASS

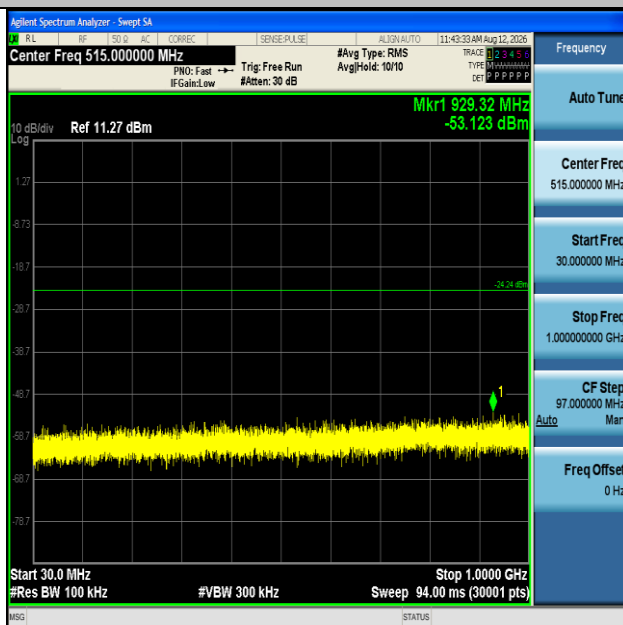


3DH5-Ant1-2441-1000~26500-PASS



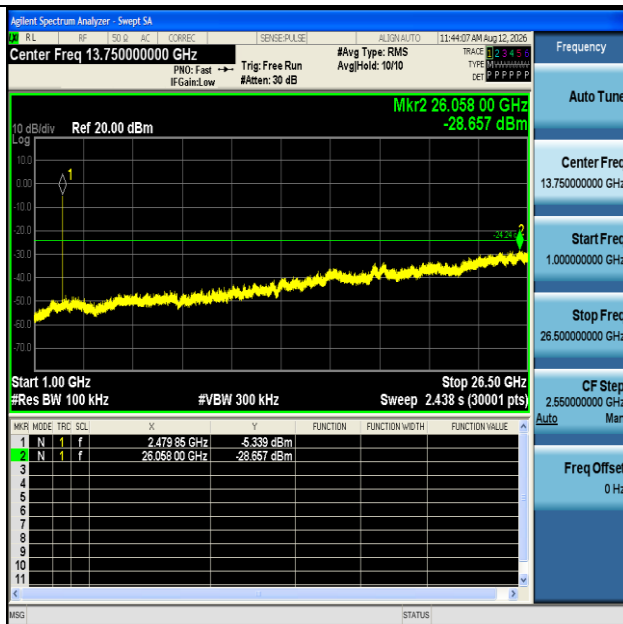


3DH5-Ant1-2480-0~Reference-PASS



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





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





## Appendix I: Duty Cycle

### Test Result

| Test Mode | Antenna | Frequency<br>[MHz] | ON Time<br>[ms] | Period<br>[ms] | Duty Cycle<br>[%] | Duty Cycle<br>Factor<br>[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               | 2.89            | 3.74           | 77.27             | 1.12                         |
| 2DH5      | Ant1    | 2441               | 2.89            | 3.75           | 77.07             | 1.13                         |
| 2DH5      | Ant1    | 2480               | 2.89            | 3.75           | 77.07             | 1.13                         |
| 3DH5      | Ant1    | 2402               | 2.89            | 3.75           | 77.07             | 1.13                         |
| 3DH5      | Ant1    | 2441               | 2.89            | 3.75           | 77.07             | 1.13                         |
| 3DH5      | Ant1    | 2480               | 2.89            | 3.75           | 77.07             | 1.13                         |

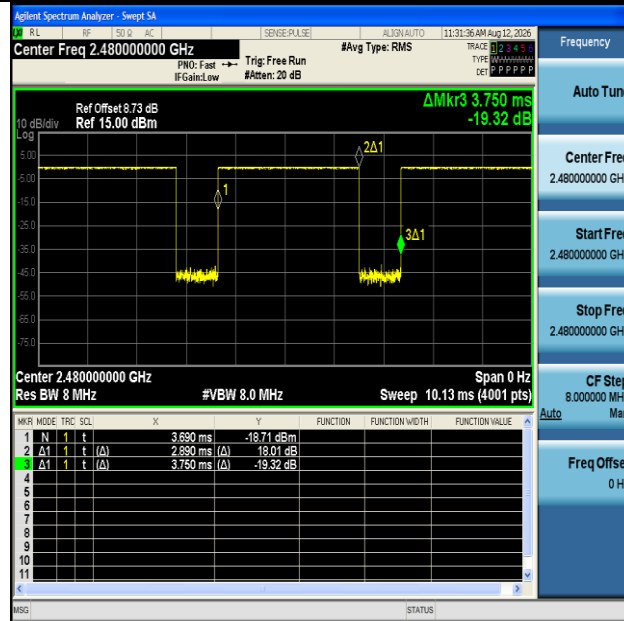
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



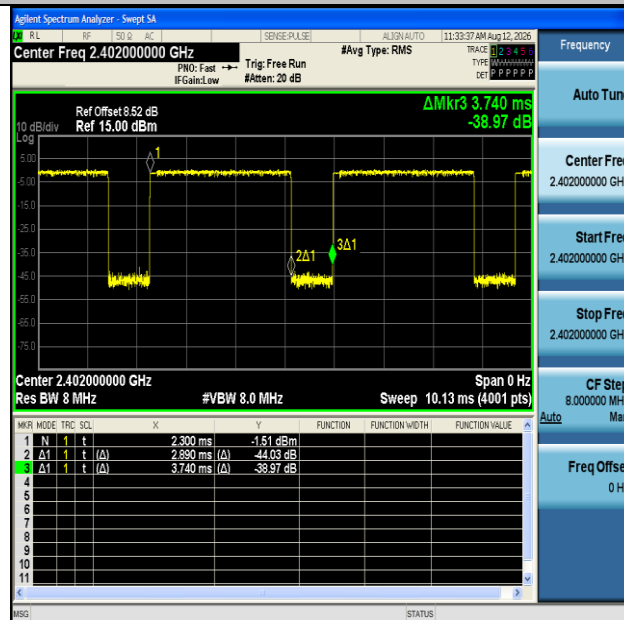


## Test Graphs



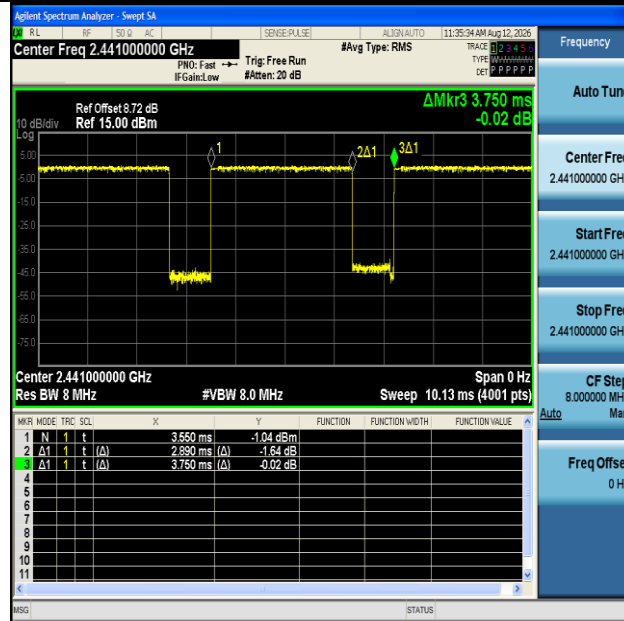


NTNV-DH5-Ant1-2480

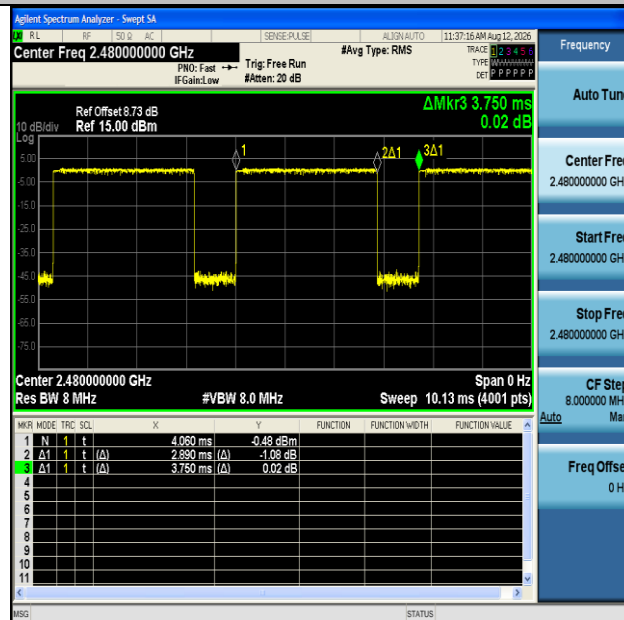


NTNV-2DH5-Ant1-2402



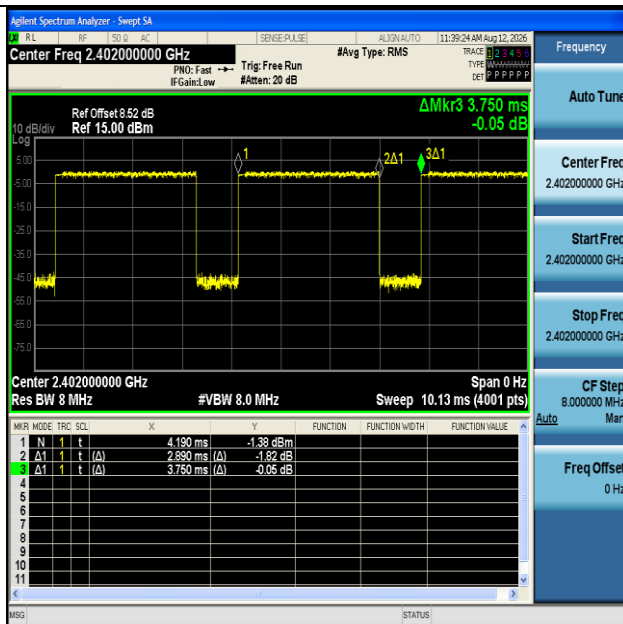


NTNV-2DH5-Ant1-2441

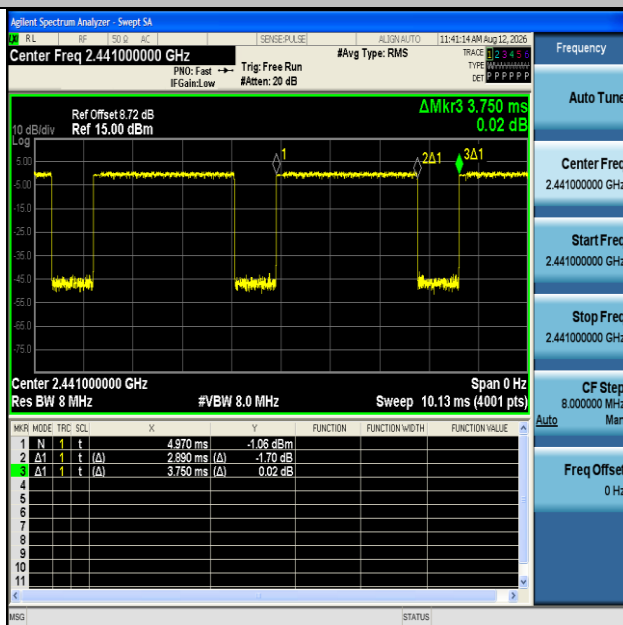


NTNV-2DH5-Ant1-2480



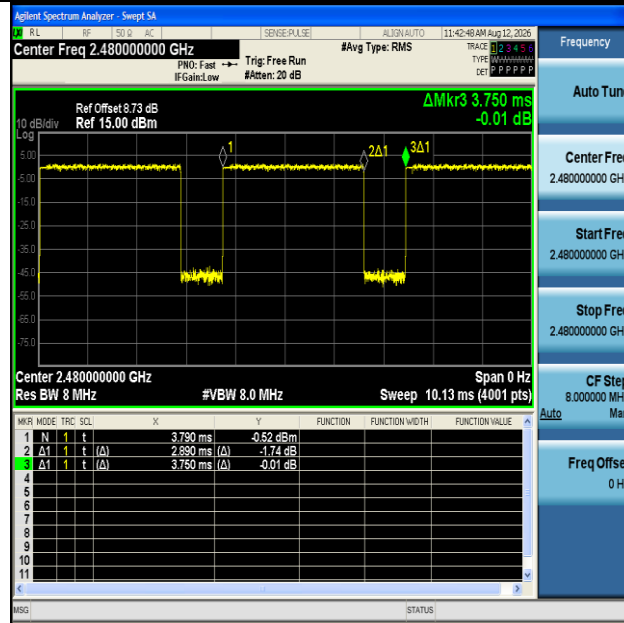


NTNV-3DH5-Ant1-2402



NTNV-3DH5-Ant1-2441





NTNV-3DH5-Ant1-2480

