# Appendix Test Data

| | | | |
|---|---|---|---|
| Report No.: | 18220WC20020701 | Test Sample No.: | 1-2-2 |
| Start Test Date: | 2022.2.17 | Finish Test Date: | 2022.2.22 |
| Test Engineer: | Tony.He | Auditor: | Edward.Pan |
| Temperature: | 24.3℃ | Relative Humidity: | 56 % |
| Pressure: | 1012 hPa | | |

## Appendix A: 20dB Emission Bandwidth

### Test Result

| Test Mode | Antenna | Channel | 20db EBW[MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 0.948 | 2401.541 | 2402.489 | --- | PASS |
| | | 2441 | 0.948 | 2440.541 | 2441.489 | --- | PASS |
| | | 2480 | 0.951 | 2479.541 | 2480.492 | --- | PASS |
| 2DH5 | Ant1 | 2402 | 1.317 | 2401.343 | 2402.660 | --- | PASS |
| | | 2441 | 1.326 | 2440.340 | 2441.666 | --- | PASS |
| | | 2480 | 1.317 | 2479.343 | 2480.660 | --- | PASS |
| 3DH5 | Ant1 | 2402 | 1.314 | 2401.346 | 2402.660 | --- | PASS |
| | | 2441 | 1.341 | 2440.328 | 2441.669 | --- | PASS |
| | | 2480 | 1.311 | 2479.349 | 2480.660 | --- | PASS |

## Test Graphs

DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

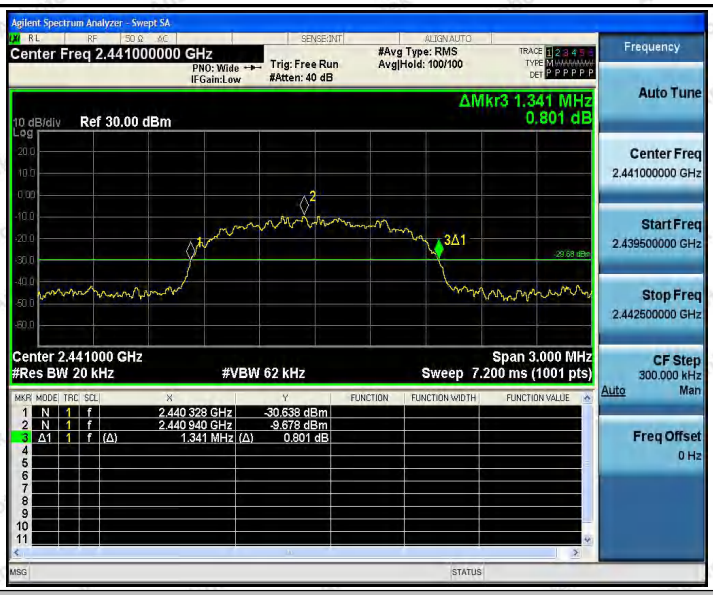
2DH5_Ant1_2402

2DH5_Ant1_2441

2DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441




3DH5_Ant1_2480

# Appendix B: Occupied Channel Bandwidth

## Test Result

| Test Mode | Antenna | Channel | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 0.88768 | 2401.561 | 2402.449 | --- | PASS |
| | | 2441 | 0.88530 | 2440.562 | 2441.448 | --- | PASS |
| | | 2480 | 0.89468 | 2479.556 | 2480.451 | --- | PASS |
| 2DH5 | Ant1 | 2402 | 1.2052 | 2401.402 | 2402.607 | --- | PASS |
| | | 2441 | 1.1985 | 2440.404 | 2441.602 | --- | PASS |
| | | 2480 | 1.1869 | 2479.409 | 2480.596 | --- | PASS |
| 3DH5 | Ant1 | 2402 | 1.2105 | 2401.389 | 2402.599 | --- | PASS |
| | | 2441 | 1.2158 | 2440.386 | 2441.602 | --- | PASS |
| | | 2480 | 1.1991 | 2479.396 | 2480.595 | --- | PASS |

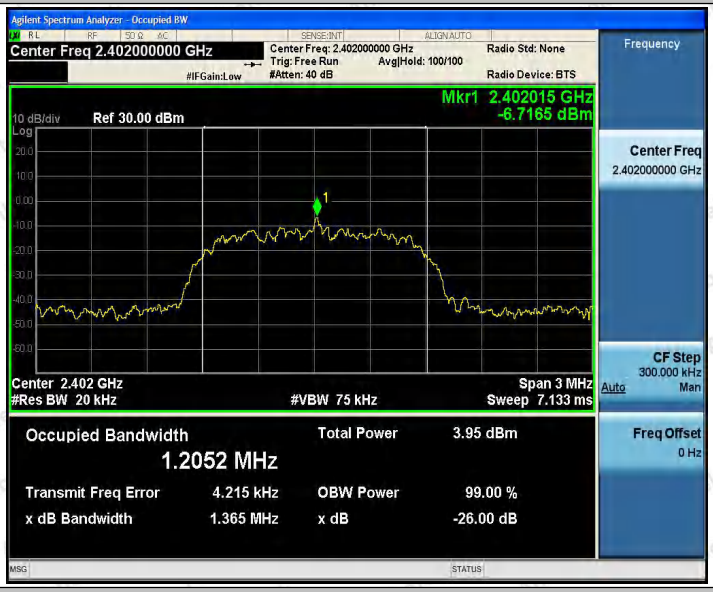
## Test Graphs

DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

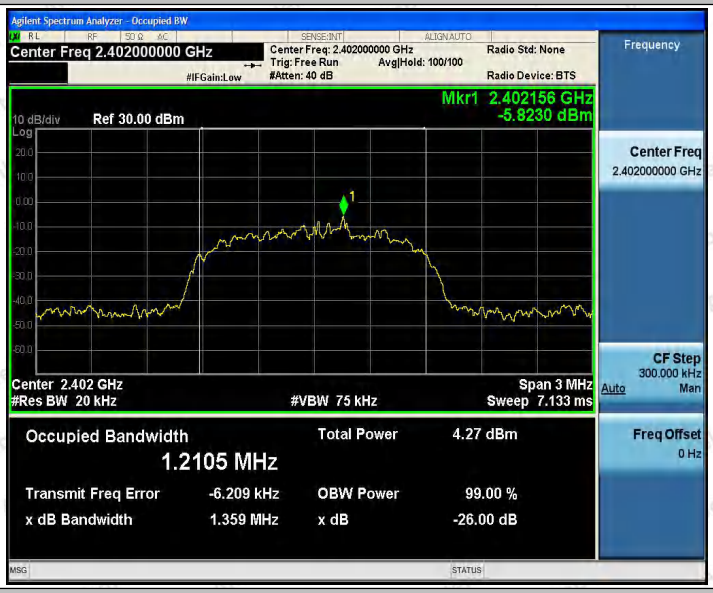
2DH5_Ant1_2402



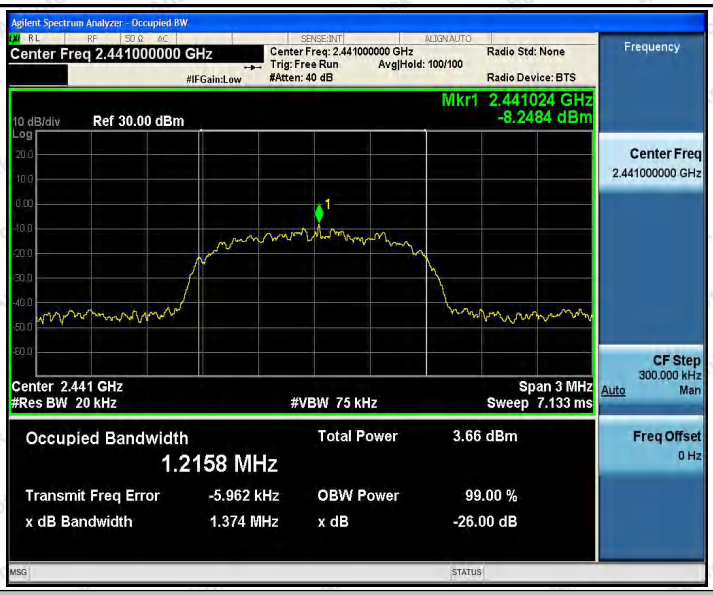

2DH5_Ant1_2441

2DH5_Ant1_2480

3DH5_Ant1_2402




3DH5_Ant1_2441




3DH5_Ant1_2480

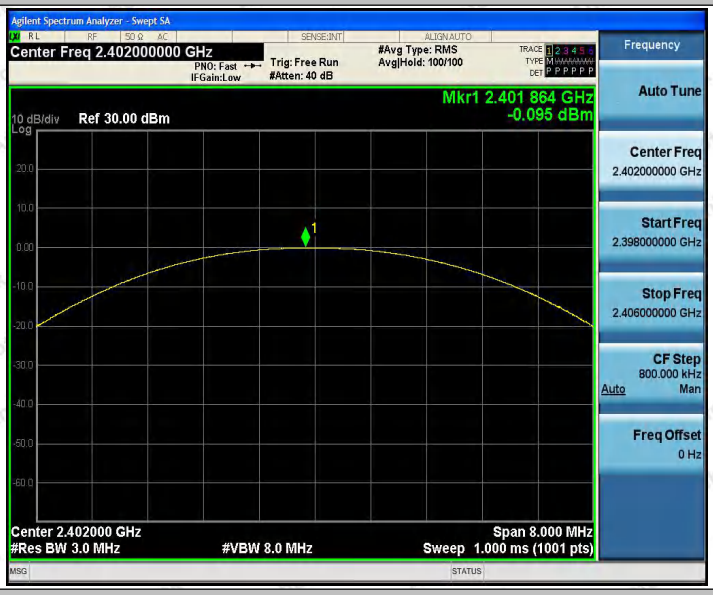
# Appendix C: Maximum conducted output power

## Test Result

| Test Mode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | -0.1 | ≤20.97 | PASS |
| | | 2441 | -0.28 | ≤20.97 | PASS |
| | | 2480 | 0.48 | ≤20.97 | PASS |
| 2DH5 | Ant1 | 2402 | -0.79 | ≤20.97 | PASS |
| | | 2441 | -0.99 | ≤20.97 | PASS |
| | | 2480 | -0.22 | ≤20.97 | PASS |
| 3DH5 | Ant1 | 2402 | -0.74 | ≤20.97 | PASS |
| | | 2441 | -0.88 | ≤20.97 | PASS |
| | | 2480 | -0.1 | ≤20.97 | PASS |

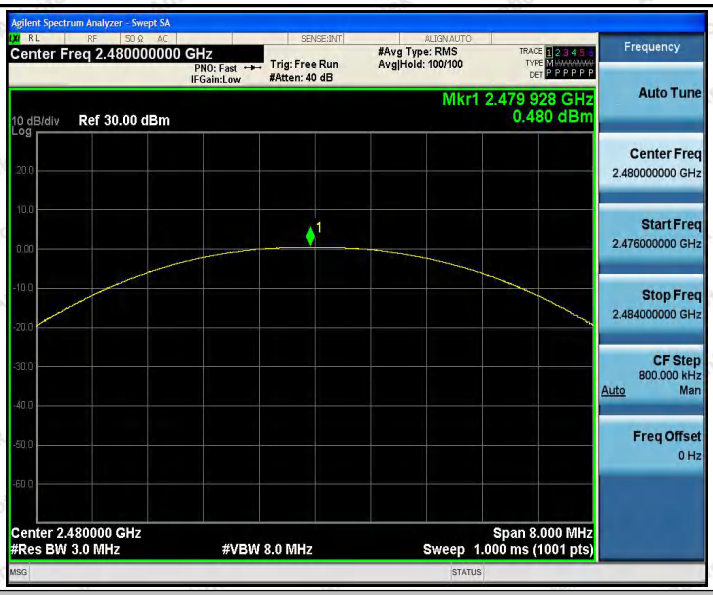
## Test Graphs

DH5_Ant1_2402

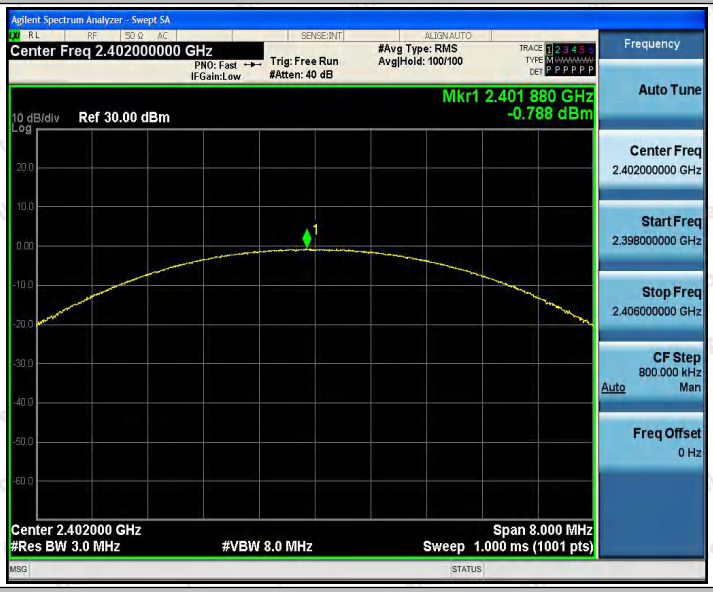



DH5_Ant1_2441

DH5_Ant1_2480

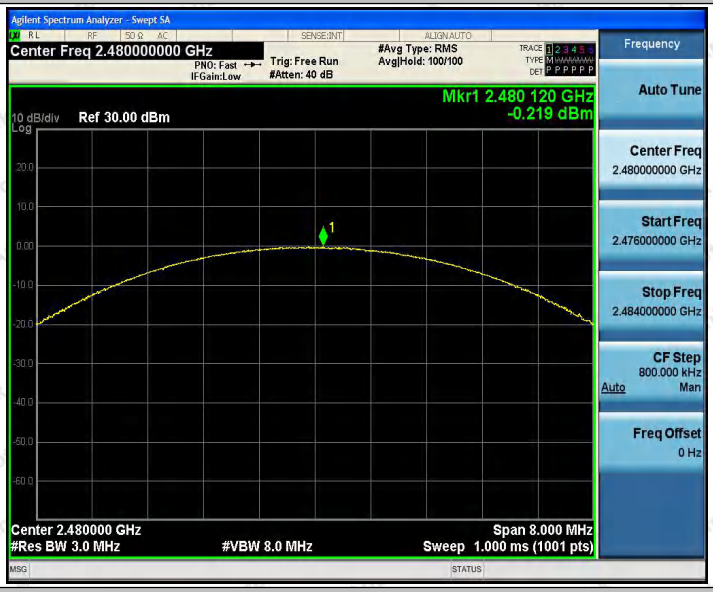



2DH5_Ant1_2402

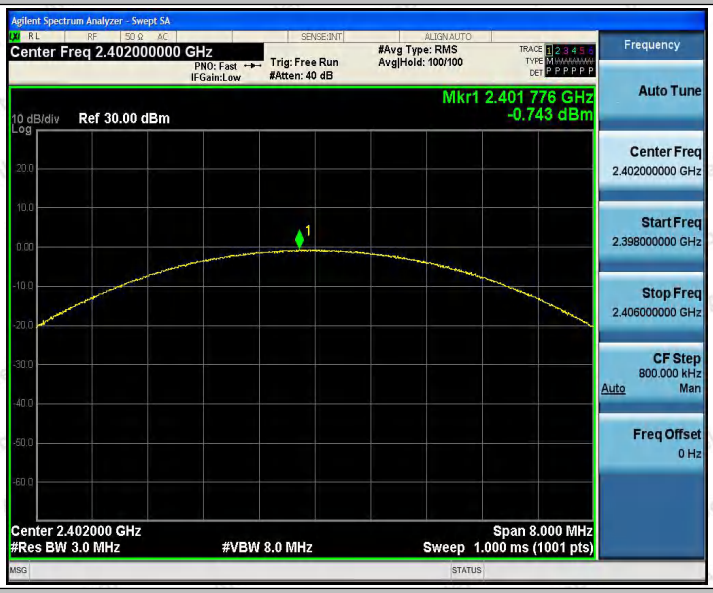



2DH5_Ant1_2441

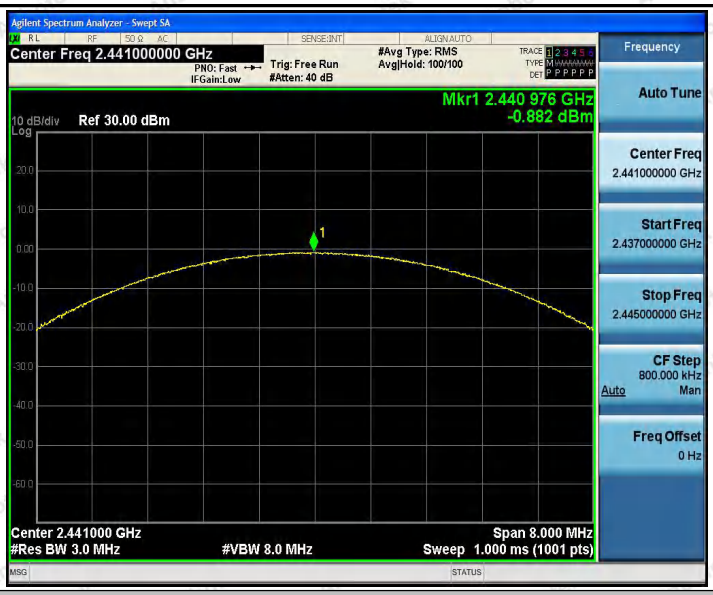
2DH5_Ant1_2480



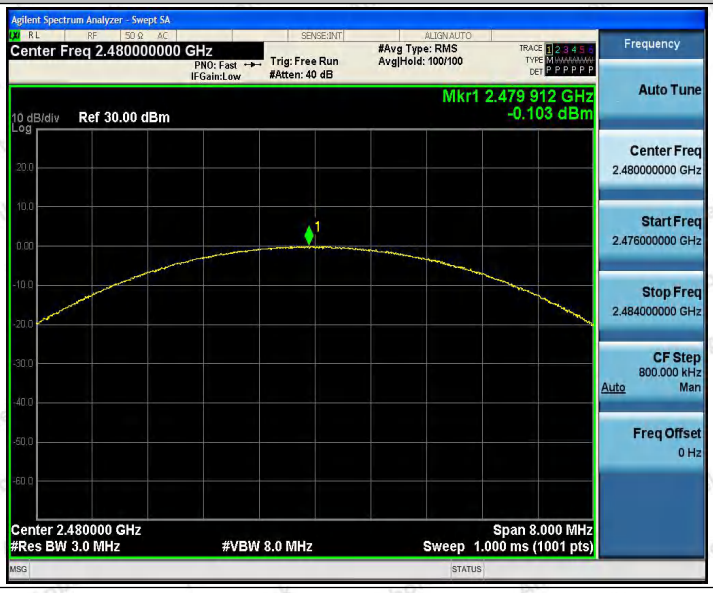

3DH5_Ant1_2402




3DH5_Ant1_2441




3DH5_Ant1_2480



# Appendix D: Carrier frequency separation

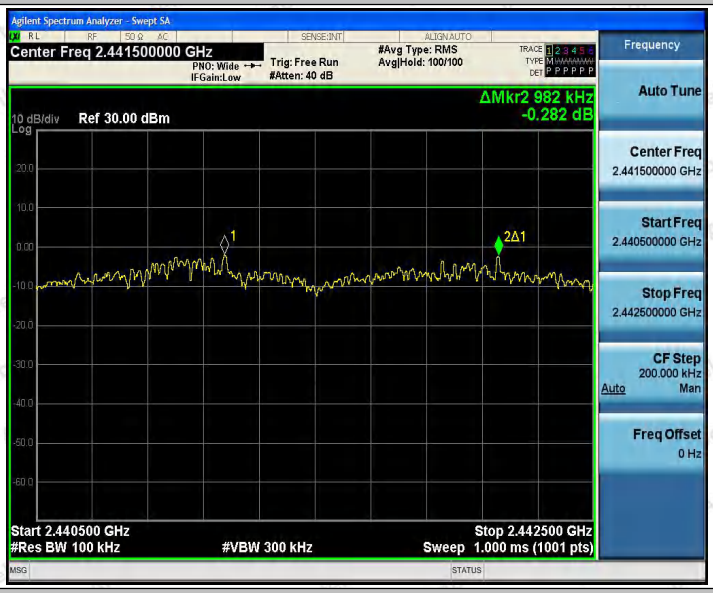
## Test Result

| Test Mode | Antenna | Channel | Result[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 0.816 | ≥0.634 | PASS |
| 2DH5 | Ant1 | Hop | 0.982 | ≥0.884 | PASS |
| 3DH5 | Ant1 | Hop | 1.012 | ≥0.894 | PASS |

## Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop




3DH5_Ant1_Hop

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441500000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
ΔMkr2 1.012 MHz
-0.211 dB
10 dB/div
Log
Ref 30.00 dBm
Start 2.440500 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.442500 GHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.441500000 GHz
Start Freq
2.440500000 GHz
Stop Freq
2.442500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

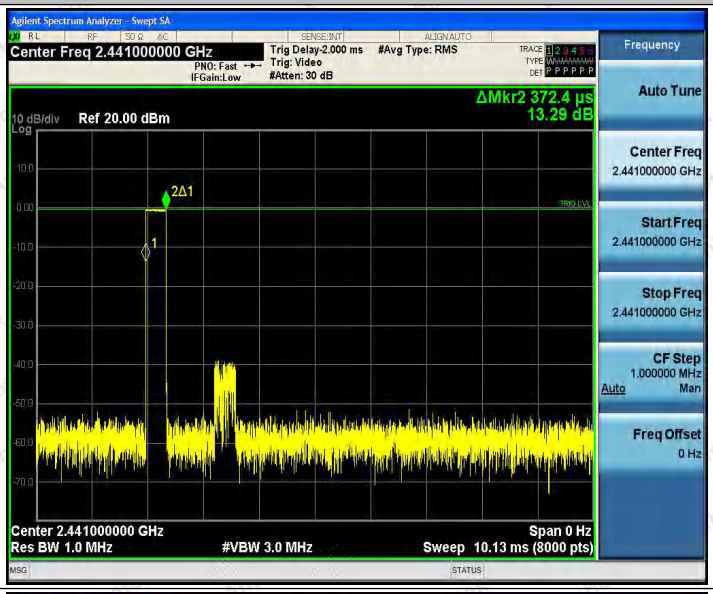
# Appendix E: Time of occupancy

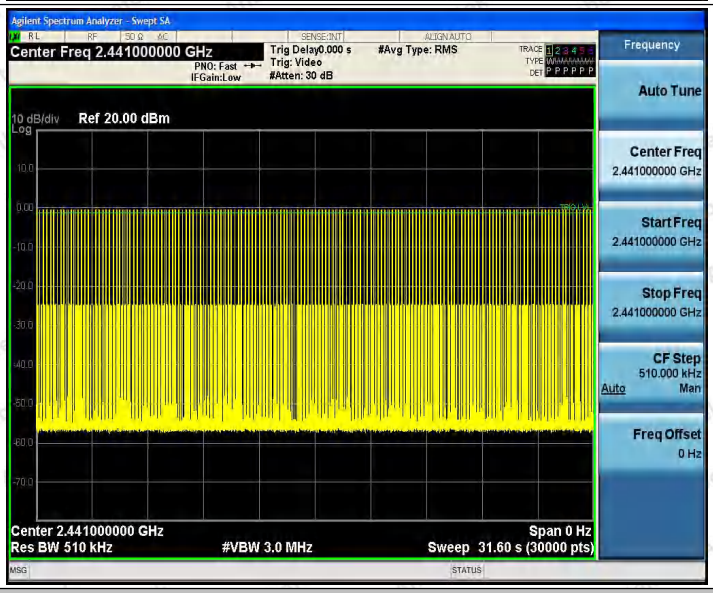
## Test Result

| Test Mode | Antenna | Channel | Burst Width [ms] | Total Hops [Num] | Result[s] | Limit[s] | Verdict |
|---|---|---|---|---|---|---|---|
| DH1 | Ant1 | Hop | 0.37 | 314 | 0.117 | ≤0.4 | PASS |
| DH3 | Ant1 | Hop | 1.63 | 157 | 0.256 | ≤0.4 | PASS |
| DH5 | Ant1 | Hop | 2.88 | 101 | 0.291 | ≤0.4 | PASS |
| 2DH1 | Ant1 | Hop | 0.38 | 314 | 0.119 | ≤0.4 | PASS |
| 2DH3 | Ant1 | Hop | 1.63 | 161 | 0.263 | ≤0.4 | PASS |
| 2DH5 | Ant1 | Hop | 2.88 | 100 | 0.288 | ≤0.4 | PASS |
| 3DH1 | Ant1 | Hop | 0.38 | 314 | 0.12 | ≤0.4 | PASS |
| 3DH3 | Ant1 | Hop | 1.63 | 156 | 0.255 | ≤0.4 | PASS |
| 3DH5 | Ant1 | Hop | 2.88 | 100 | 0.288 | ≤0.4 | PASS |

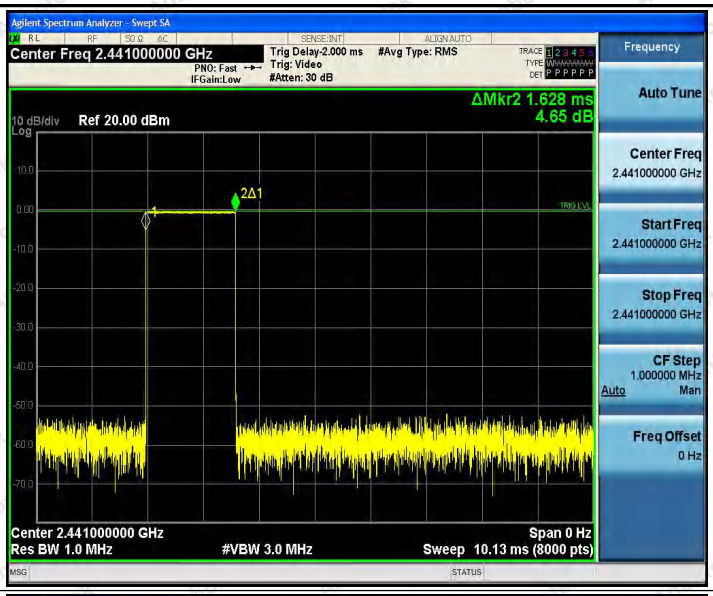
## Test Graphs

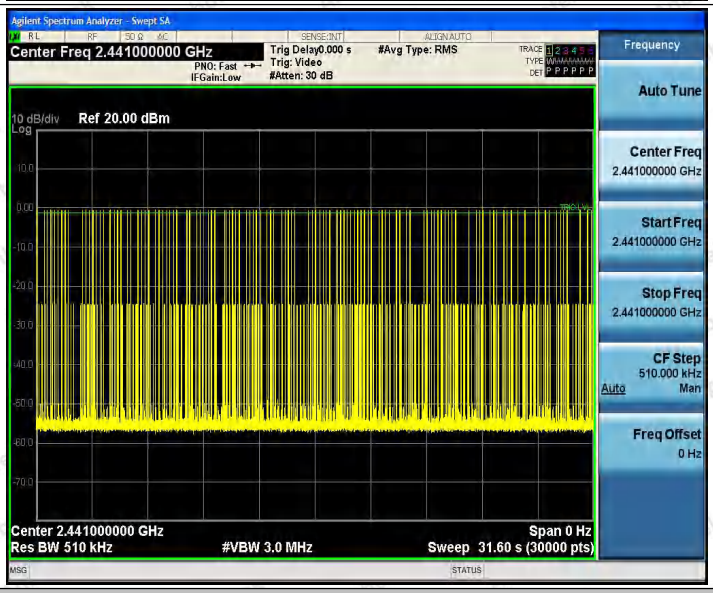
DH1_Ant1_Hop



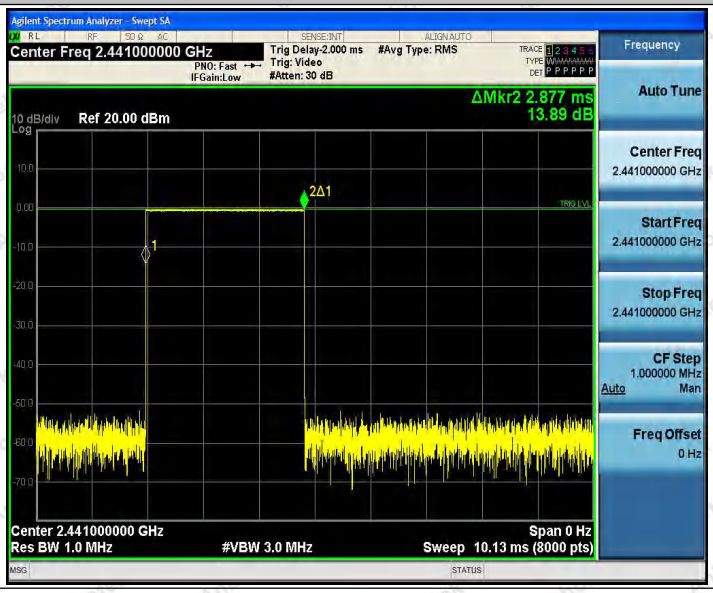



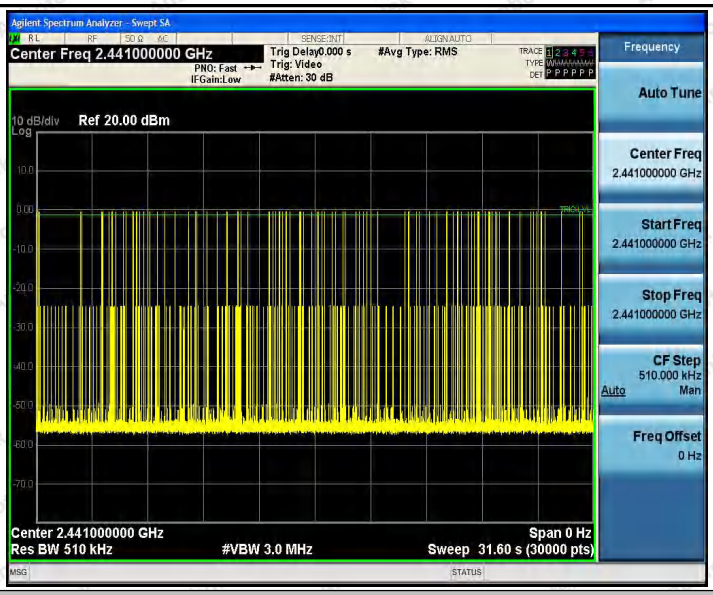

DH3_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 30 dB
PNO: Fast
IFGain:Low
ΔMkr2 1.628 ms
4.65 dB
10 dB/div
Ref 20.00 dBm
Log
2Δ1
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz

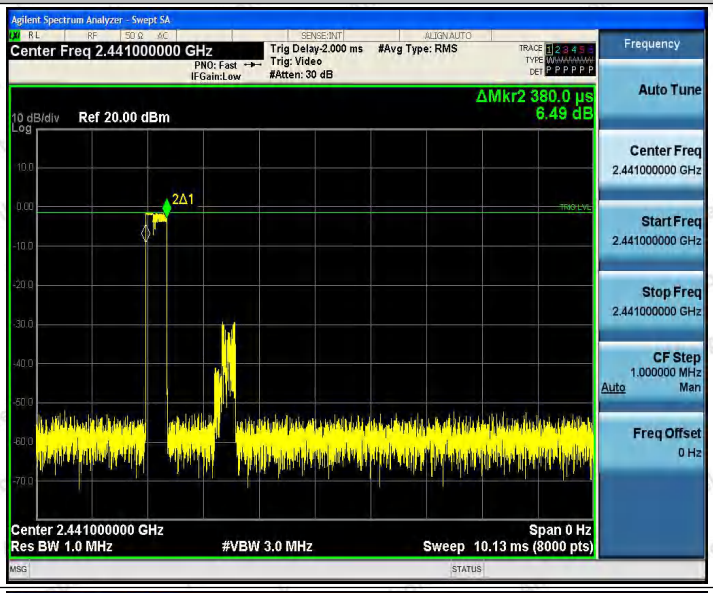

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 30 dB
PNO: Fast
IFGain:Low
10 dB/div
Ref 20.00 dBm
Log
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz

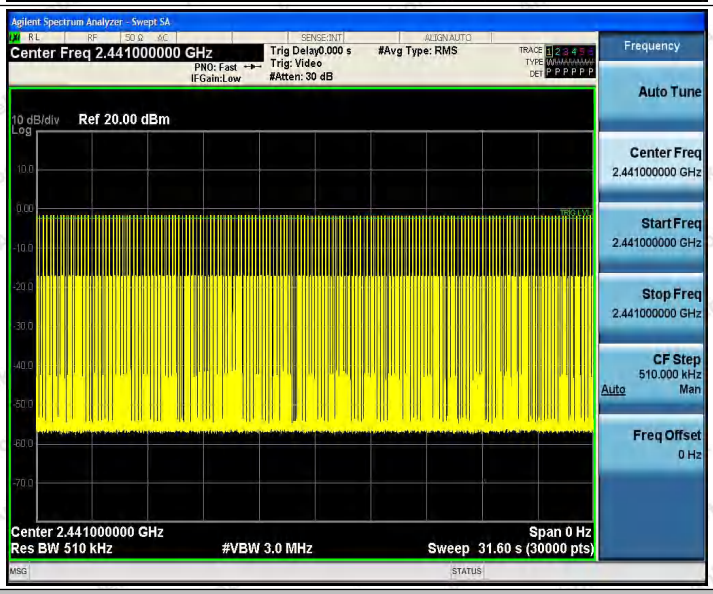
DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 30 dB
PNO: Fast
IFGain:Low
ΔMkr2 2.877 ms
13.89 dB
10 dB/div
Ref 20.00 dBm
Log
2Δ1
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz

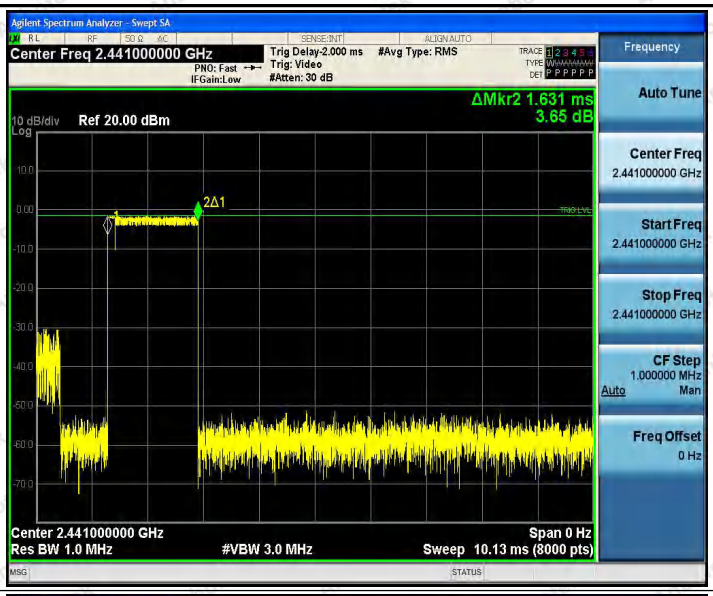


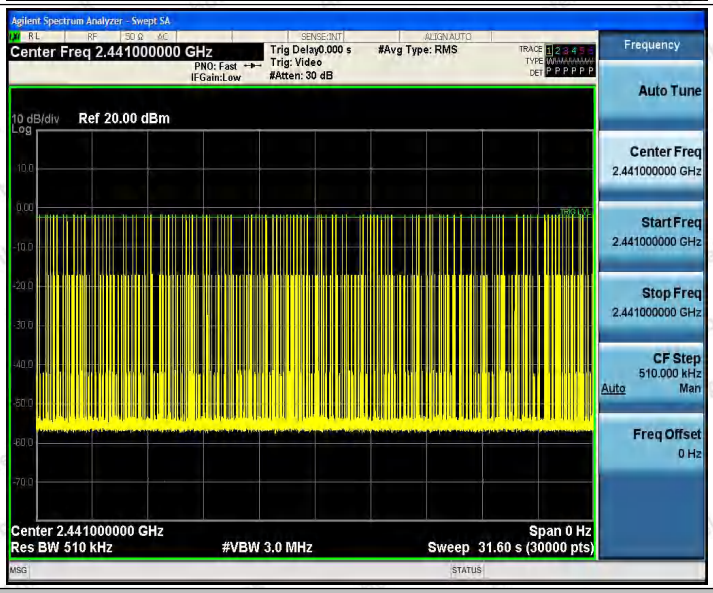

2DH1_Ant1_Hop



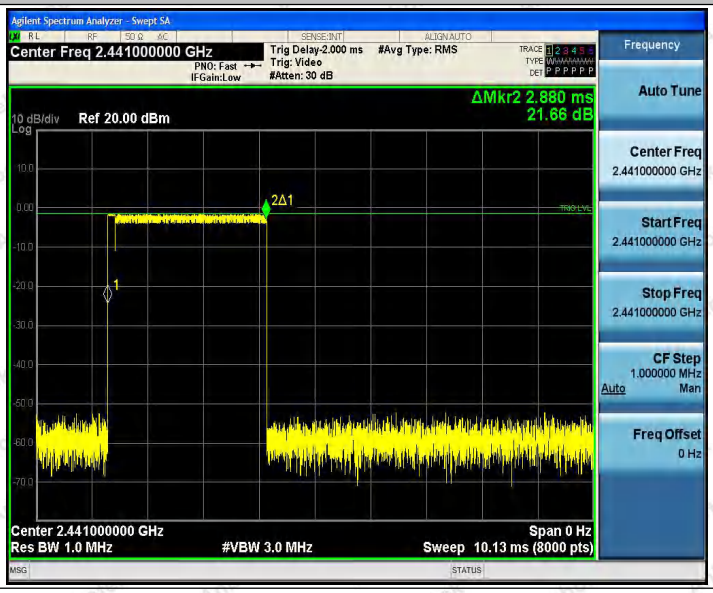



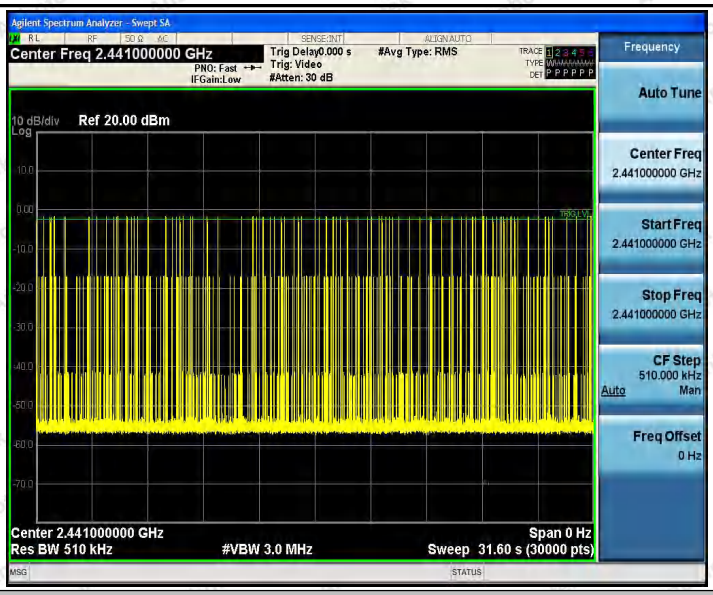

2DH3_Ant1_Hop



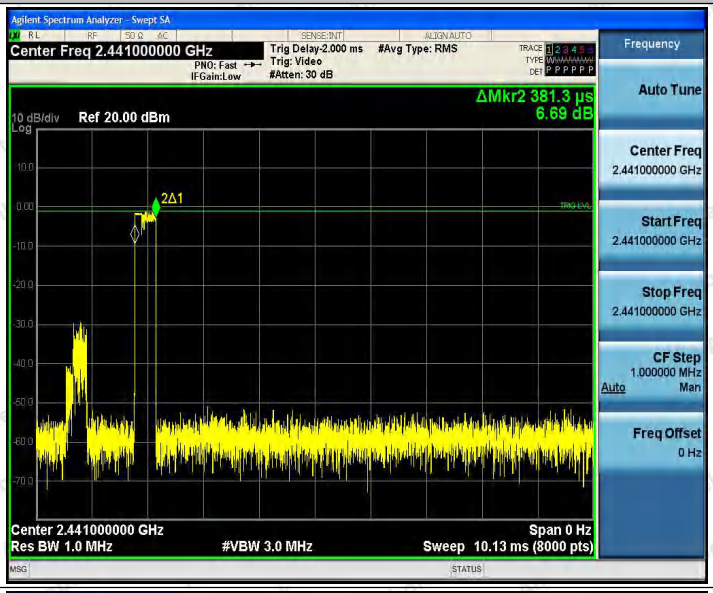



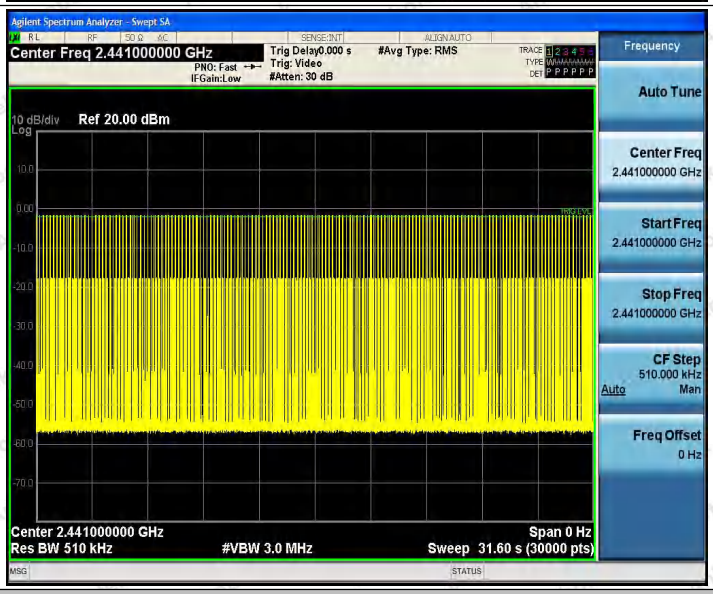

2DH5_Ant1_Hop



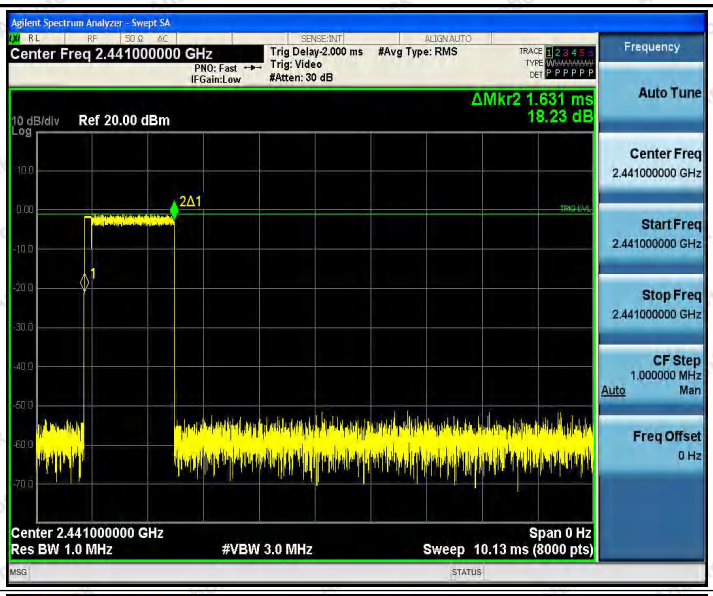


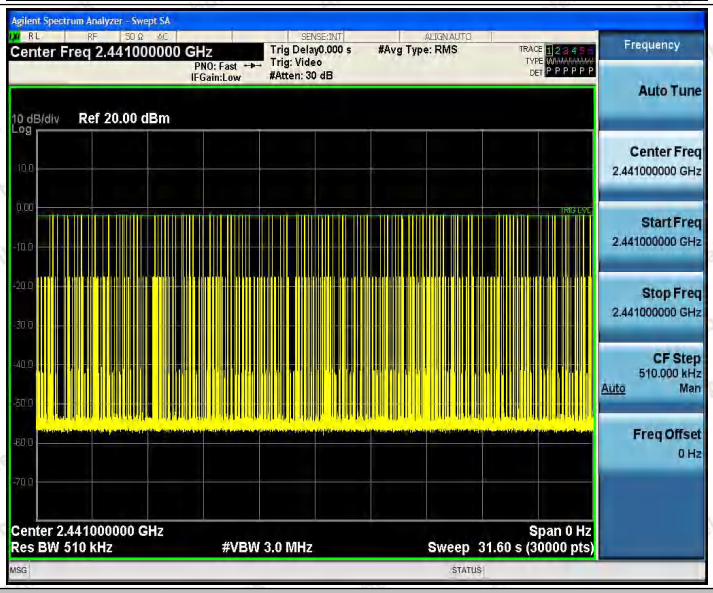

3DH1_Ant1_Hop



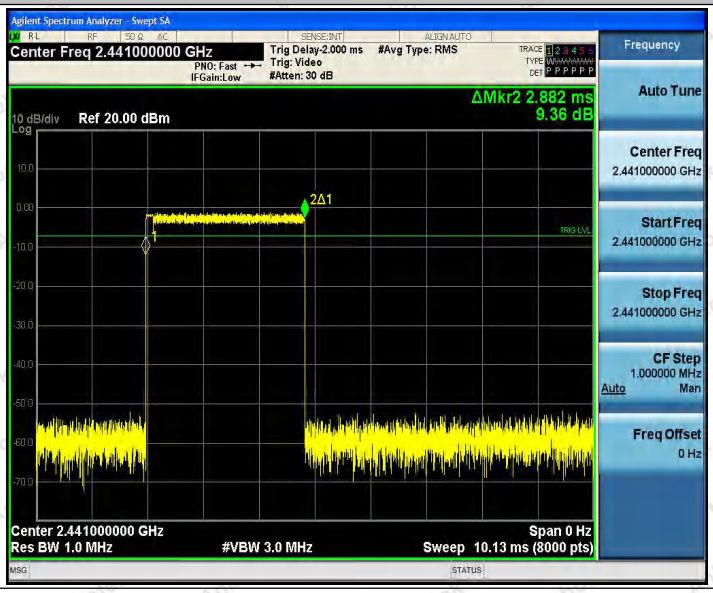



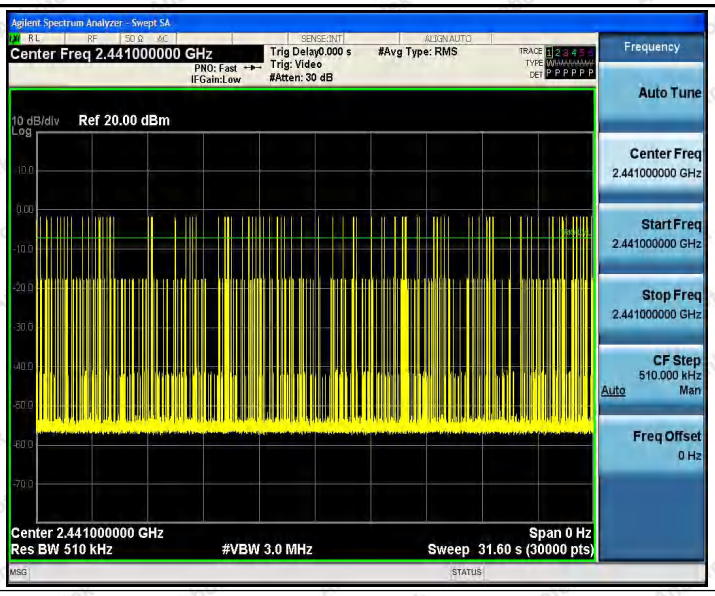

3DH3_Ant1_Hop




3DH5_Ant1_Hop




Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 30 dB
#Avg Type: RMS
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz
10 dB/div
Log
Ref 20.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)

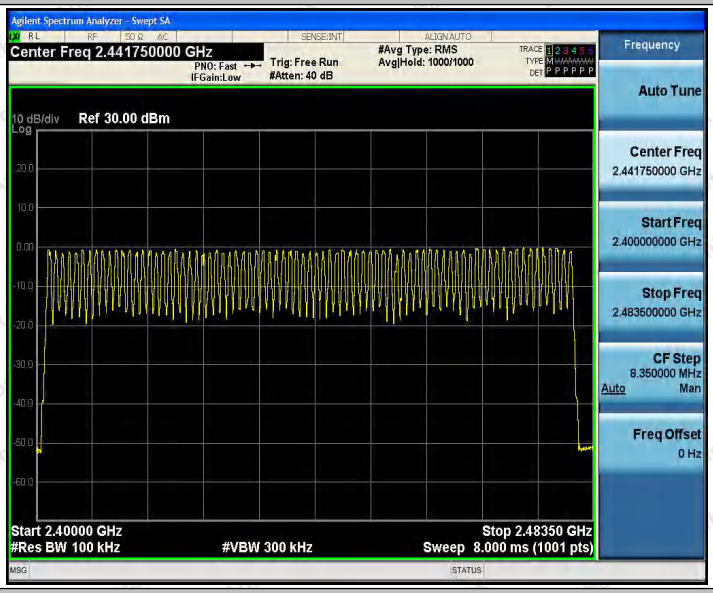
# Appendix F: Number of hopping channels

## Test Result

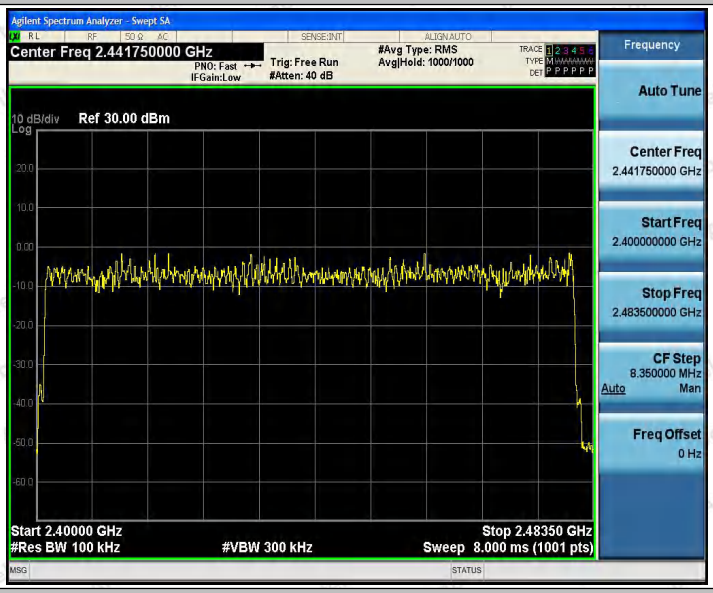
| Test Mode | Antenna | Channel | Result[Num] | Limit[Num] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 79 | ≥15 | PASS |
| 2DH5 | Ant1 | Hop | 79 | ≥15 | PASS |
| 3DH5 | Ant1 | Hop | 79 | ≥15 | PASS |

## Test Graphs

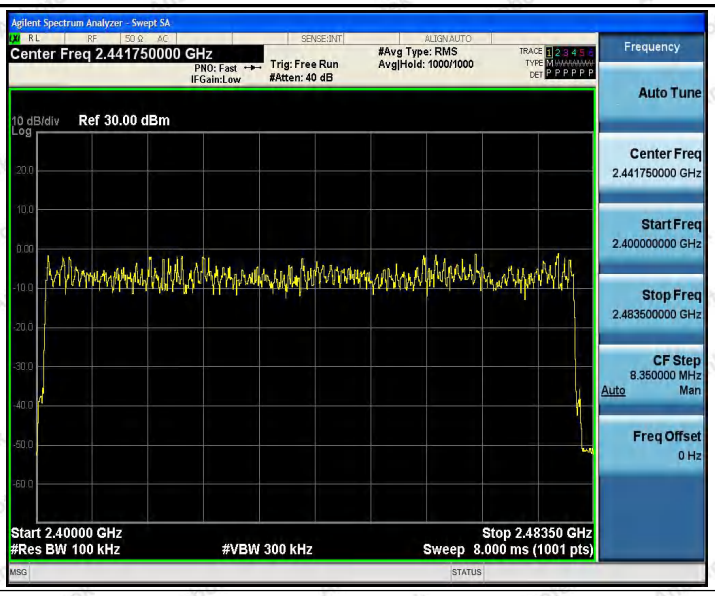
DH5_Ant1_Hop




2DH5_Ant1_Hop




3DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 1000/1000
Frequency
Auto Tune
Center Freq
2.441750000 GHz
Start Freq
2.400000000 GHz
Stop Freq
2.483500000 GHz
CF Step
8.350000 MHz
Auto
Man
Freq Offset
0 Hz
10 dB/div
Log
Ref 30.00 dBm
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (1001 pts)

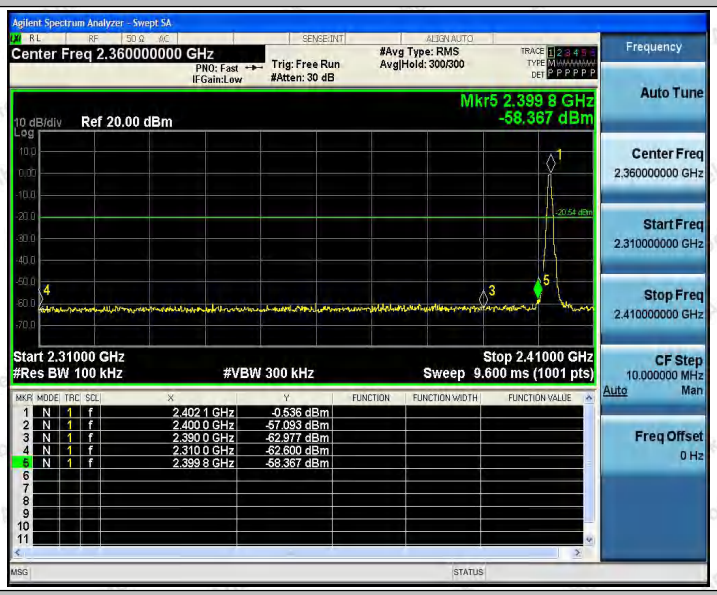
# Appendix G: Band edge measurements

## Test Result

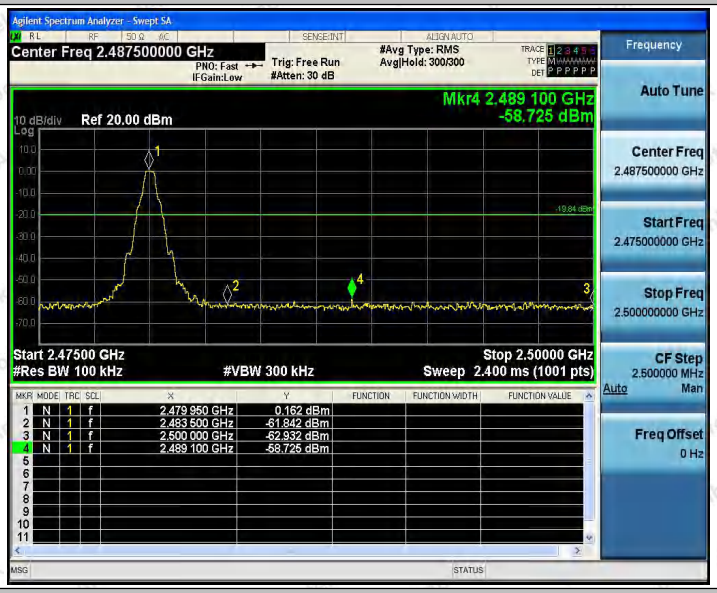
| Test Mode | Antenna | Ch Name | Channel | Ref Level [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | Low | 2402 | -0.54 | -58.37 | ≤-20.54 | PASS |
| | | High | 2480 | 0.16 | -58.73 | ≤-19.84 | PASS |
| | | Low | Hop | -0.57 | -59.74 | ≤-20.57 | PASS |
| | | High | Hop | -0.32 | -62.18 | ≤-20.32 | PASS |
| 2DH5 | Ant1 | Low | 2402 | -2.11 | -57.66 | ≤-22.11 | PASS |
| | | High | 2480 | -1.07 | -58.2 | ≤-21.07 | PASS |
| | | Low | Hop | -1.70 | -60.2 | ≤-21.7 | PASS |
| | | High | Hop | -2.20 | -61.76 | ≤-22.2 | PASS |
| 3DH5 | Ant1 | Low | 2402 | -2.03 | -57.5 | ≤-22.03 | PASS |
| | | High | 2480 | -1.30 | -59.32 | ≤-21.3 | PASS |
| | | Low | Hop | -1.86 | -59.51 | ≤-21.86 | PASS |
| | | High | Hop | -4.38 | -62.93 | ≤-24.38 | PASS |

## Test Graphs

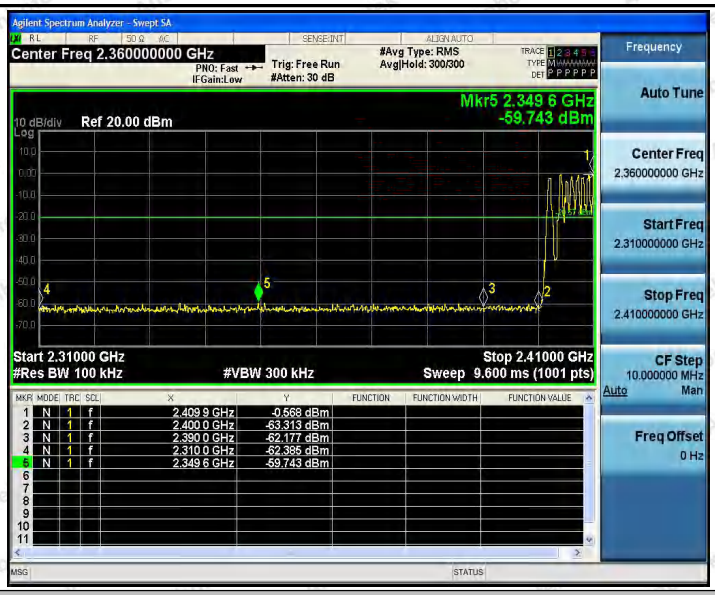
DH5_Ant1_Low_2402



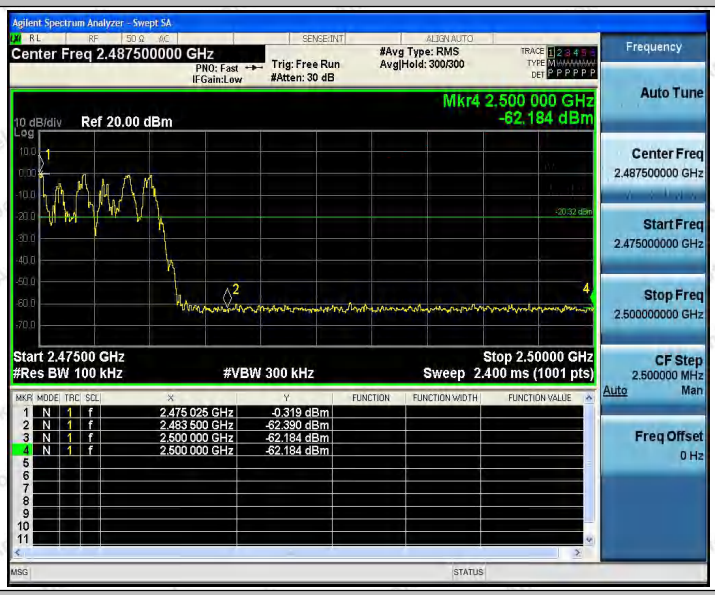

DH5_Ant1_High_2480



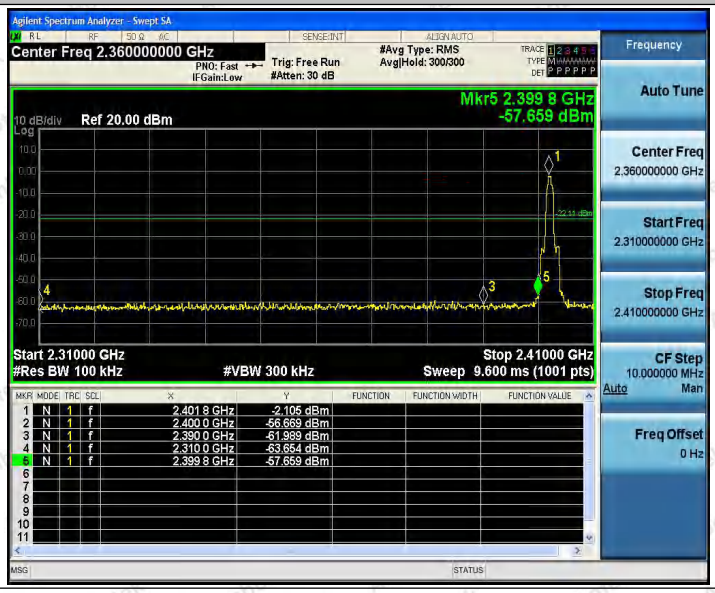

DH5_Ant1_Low_Hop



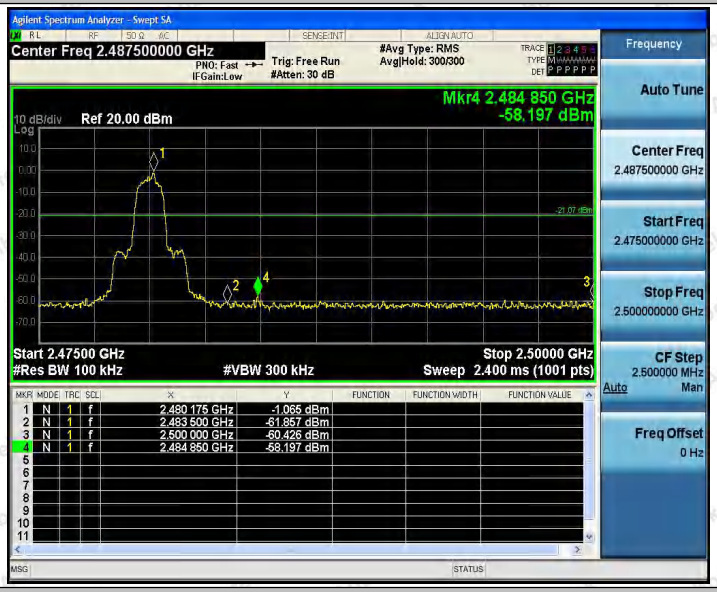

DH5_Ant1_High_Hop



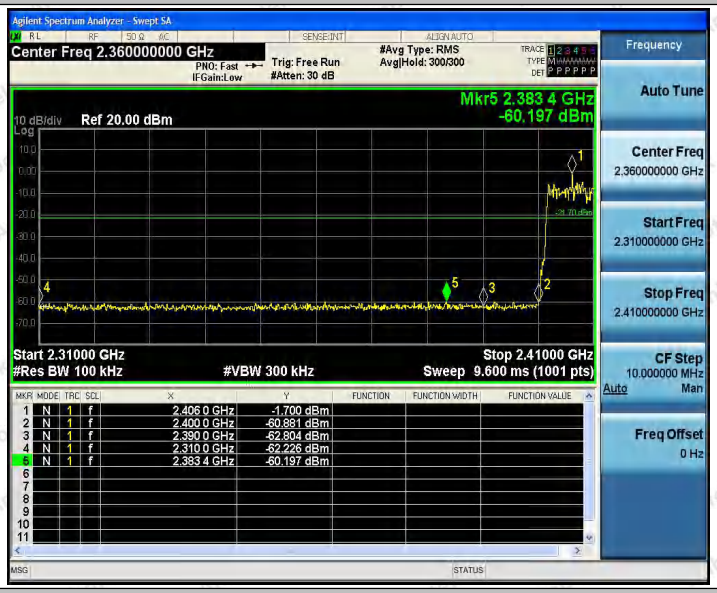

2DH5_Ant1_Low_2402



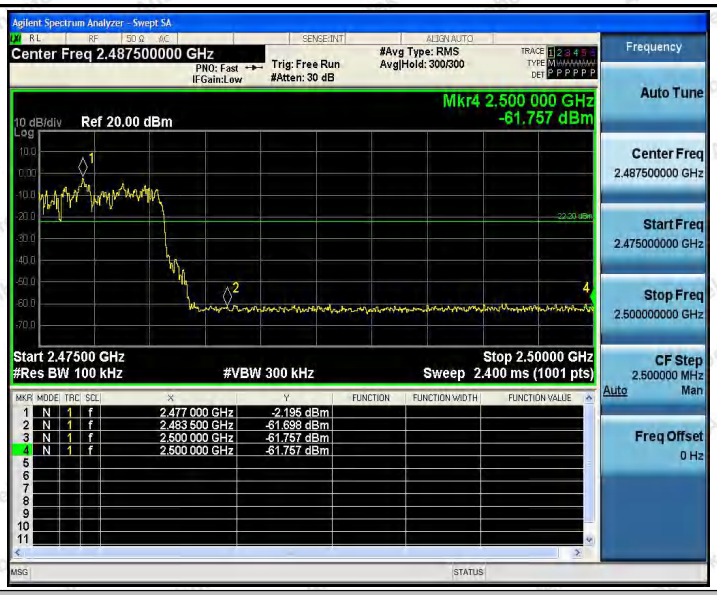
2DH5_Ant1_High_2480



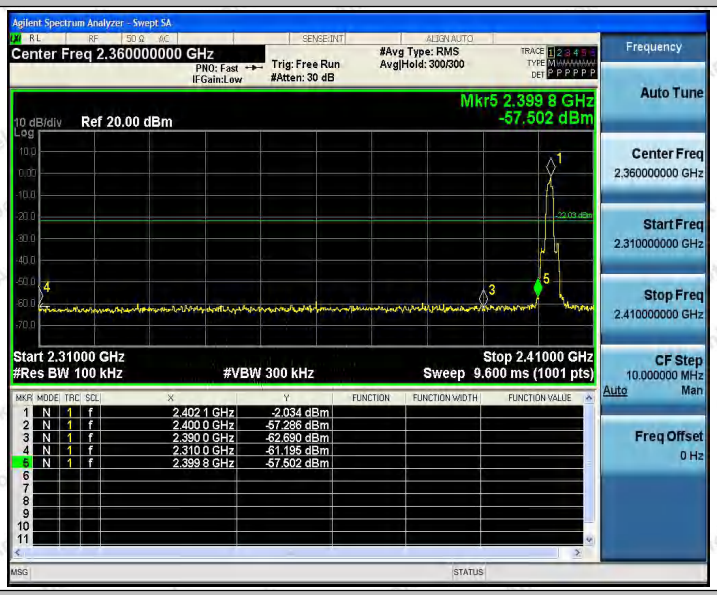

2DH5_Ant1_Low_Hop



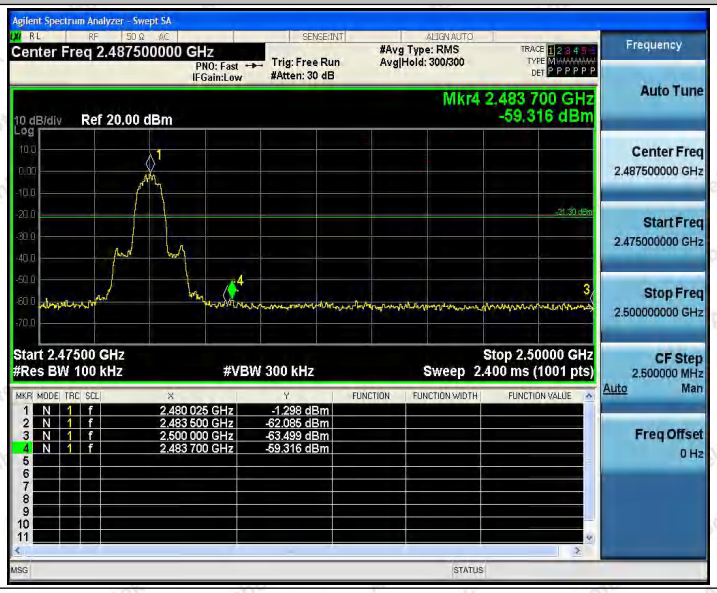

2DH5_Ant1_High_Hop



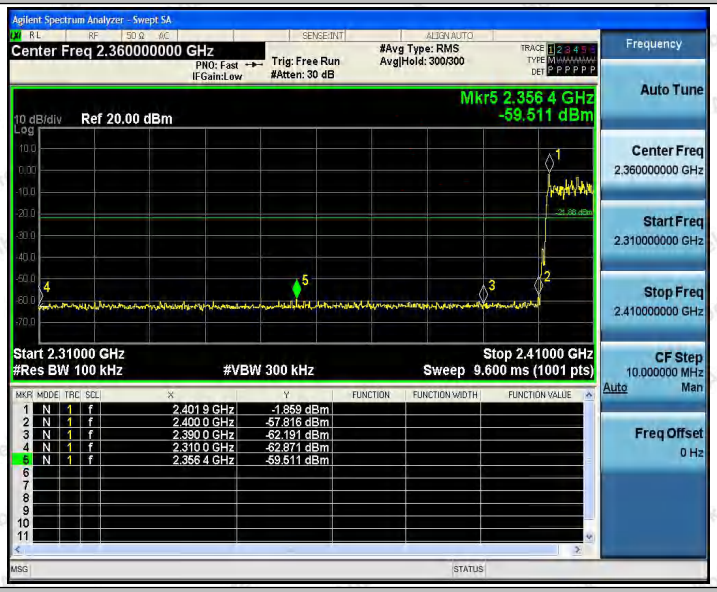

3DH5_Ant1_Low_2402




3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop




3DH5_Ant1_High_Hop

# Appendix H: Conducted Spurious Emission

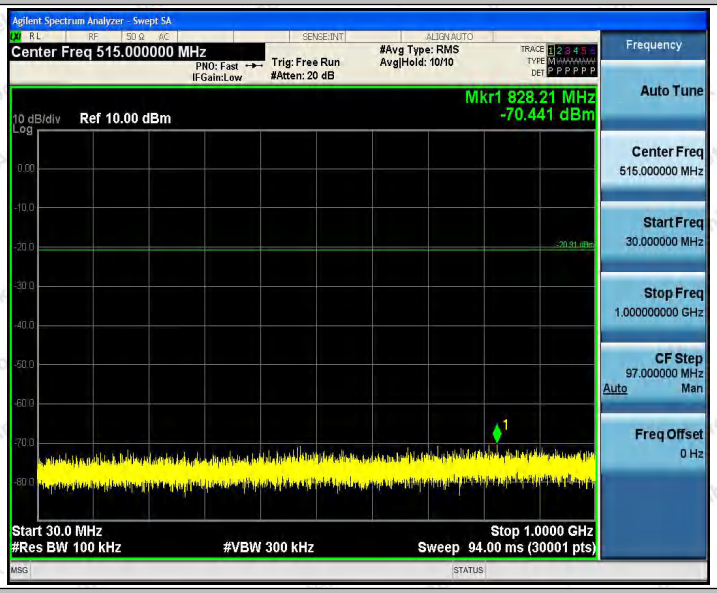
## Test Result

| Test Mode | Antenna | Channel | Freq Range[MHz] | Ref Level [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | Reference | -0.91 | -0.91 | --- | PASS |
| | | | 30~1000 | -0.91 | -70.44 | ≤-20.91 | PASS |
| | | | 1000~26500 | -0.91 | -56.29 | ≤-20.91 | PASS |
| | | 2441 | Reference | -0.80 | -0.80 | --- | PASS |
| | | | 30~1000 | -0.80 | -70.78 | ≤-20.8 | PASS |
| | | | 1000~26500 | -0.80 | -54.48 | ≤-20.8 | PASS |
| | | 2480 | Reference | -0.20 | -0.20 | --- | PASS |
| | | | 30~1000 | -0.20 | -69.65 | ≤-20.2 | PASS |
| | | | 1000~26500 | -0.20 | -55.4 | ≤-20.2 | PASS |
| 2DH5 | Ant1 | 2402 | Reference | -1.71 | -1.71 | --- | PASS |
| | | | 30~1000 | -1.71 | -69.99 | ≤-21.71 | PASS |
| | | | 1000~26500 | -1.71 | -54.5 | ≤-21.71 | PASS |
| | | 2441 | Reference | -2.03 | -2.03 | --- | PASS |
| | | | 30~1000 | -2.03 | -70.95 | ≤-22.03 | PASS |
| | | | 1000~26500 | -2.03 | -55.52 | ≤-22.03 | PASS |
| | | 2480 | Reference | -1.19 | -1.19 | --- | PASS |
| | | | 30~1000 | -1.19 | -70.15 | ≤-21.19 | PASS |
| | | | 1000~26500 | -1.19 | -55.54 | ≤-21.19 | PASS |
| 3DH5 | Ant1 | 2402 | Reference | -2.29 | -2.29 | --- | PASS |
| | | | 30~1000 | -2.29 | -71.01 | ≤-22.29 | PASS |
| | | | 1000~26500 | -2.29 | -55.38 | ≤-22.29 | PASS |
| | | 2441 | Reference | -2.32 | -2.32 | --- | PASS |
| | | | 30~1000 | -2.32 | -69.96 | ≤-22.32 | PASS |
| | | | 1000~26500 | -2.32 | -56.03 | ≤-22.32 | PASS |
| | | 2480 | Reference | -1.09 | -1.09 | --- | PASS |
| | | | 30~1000 | -1.09 | -70.43 | ≤-21.09 | PASS |
| | | | 1000~26500 | -1.09 | -56.19 | ≤-21.09 | PASS |

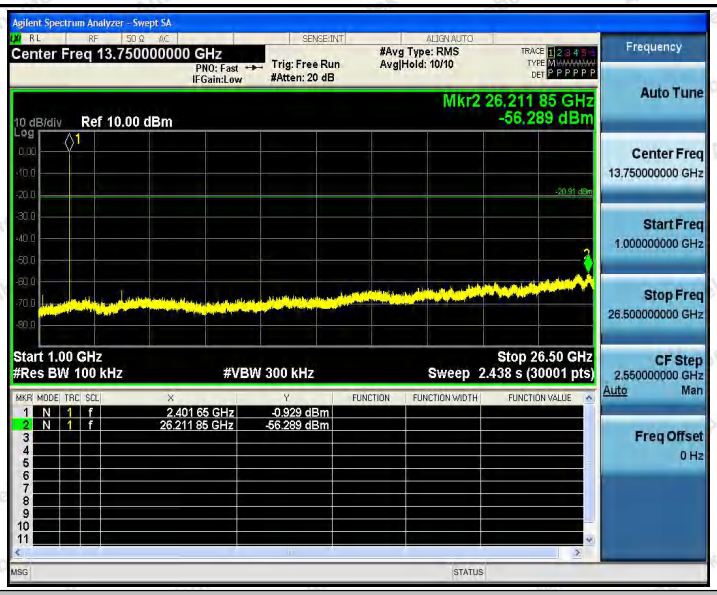
## Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

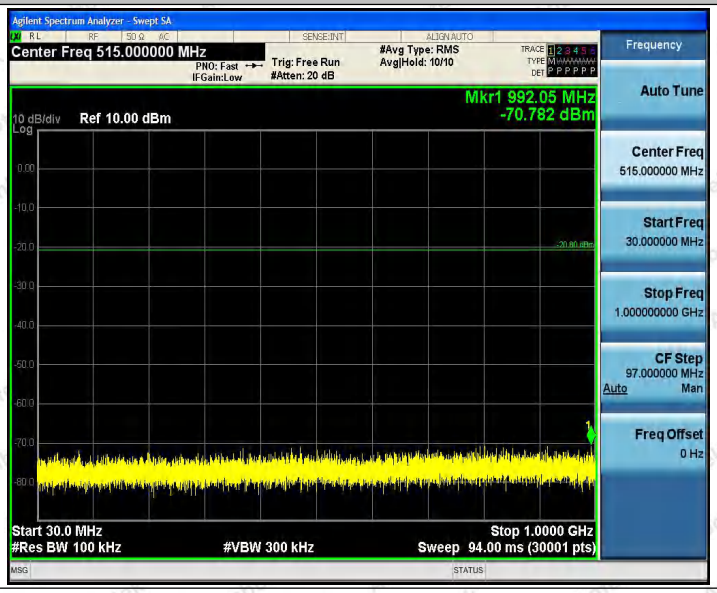



DH5_Ant1_2402_1000~26500

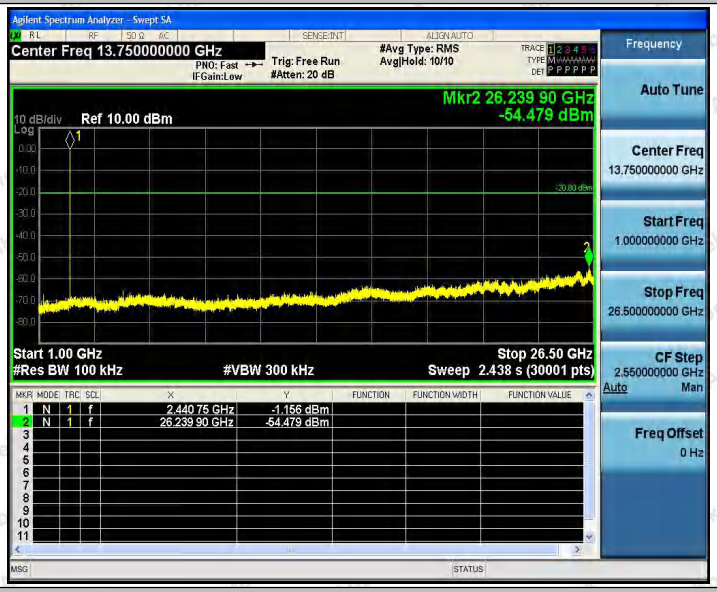



DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

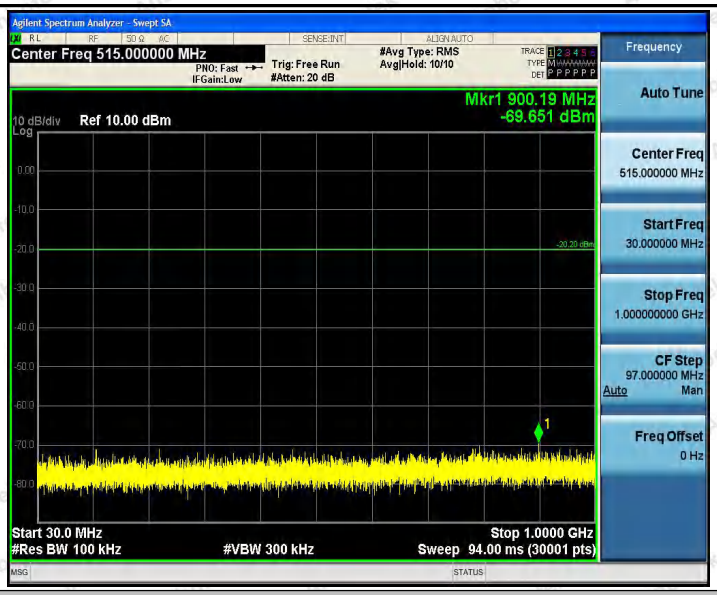


DH5_Ant1_2441_1000~26500

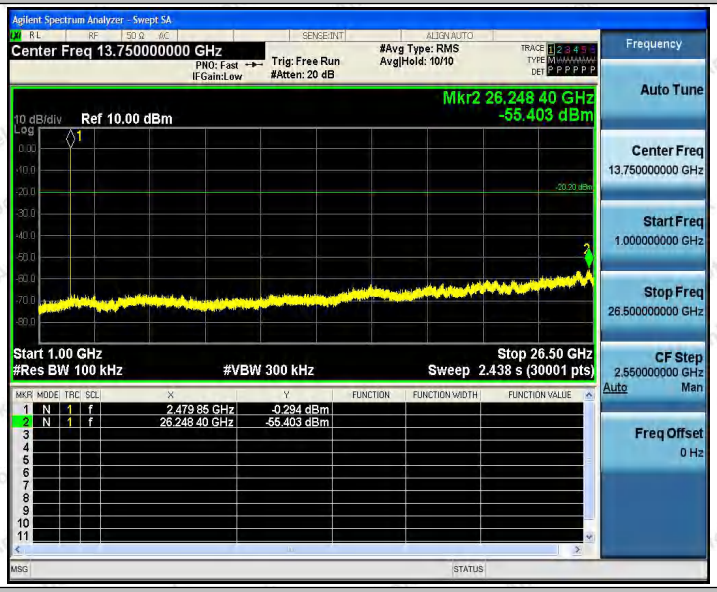



DH5_Ant1_2480_0~Reference

DH5_Ant1_2480_30~1000

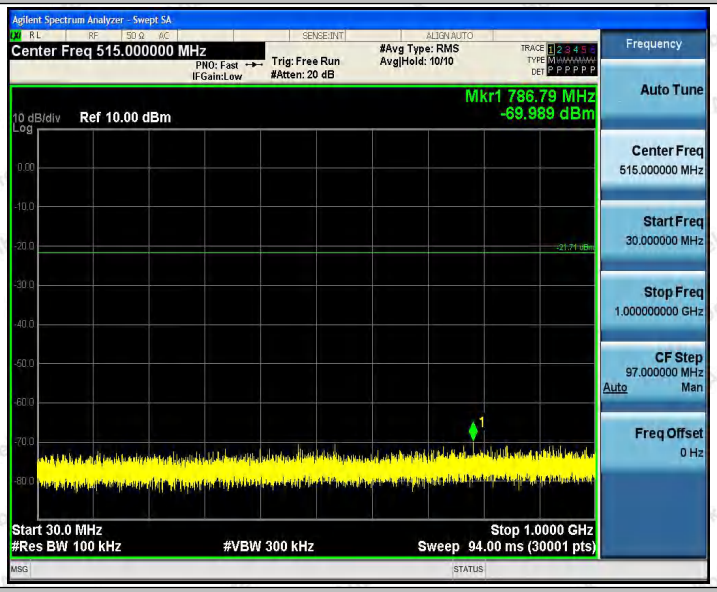



DH5_Ant1_2480_1000~26500

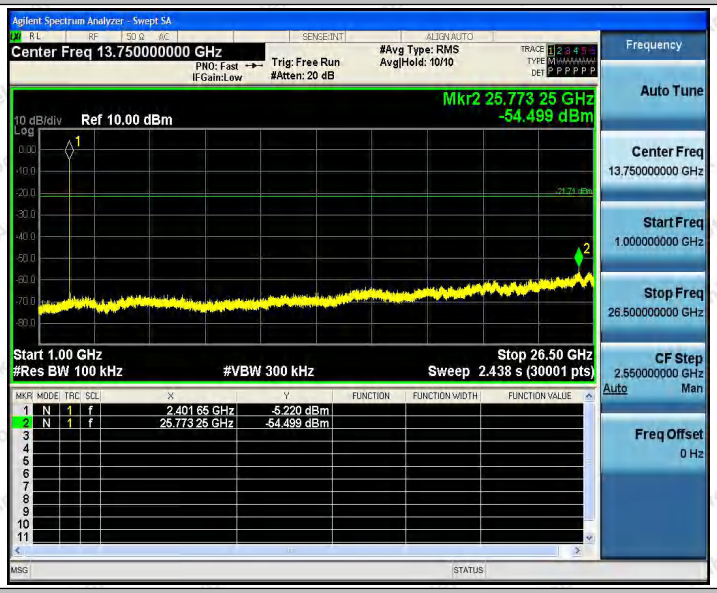



2DH5_Ant1_2402_0~Reference

2DH5_Ant1_2402_30~1000

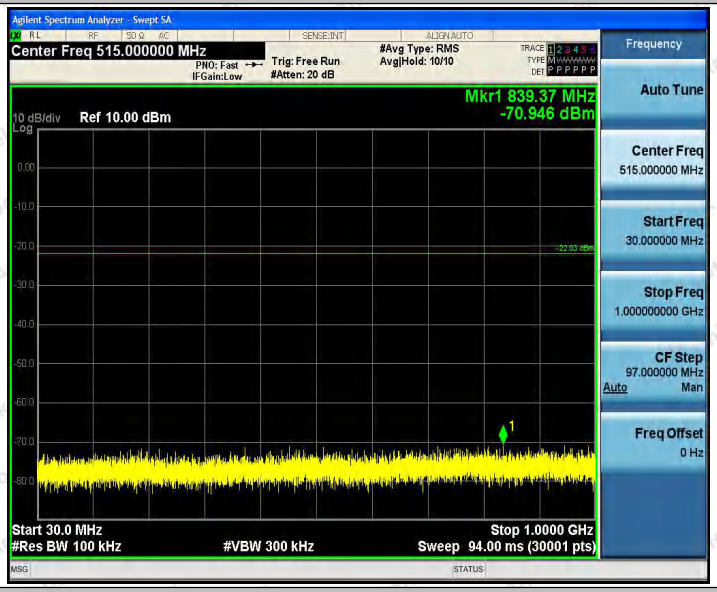



2DH5_Ant1_2402_1000~26500

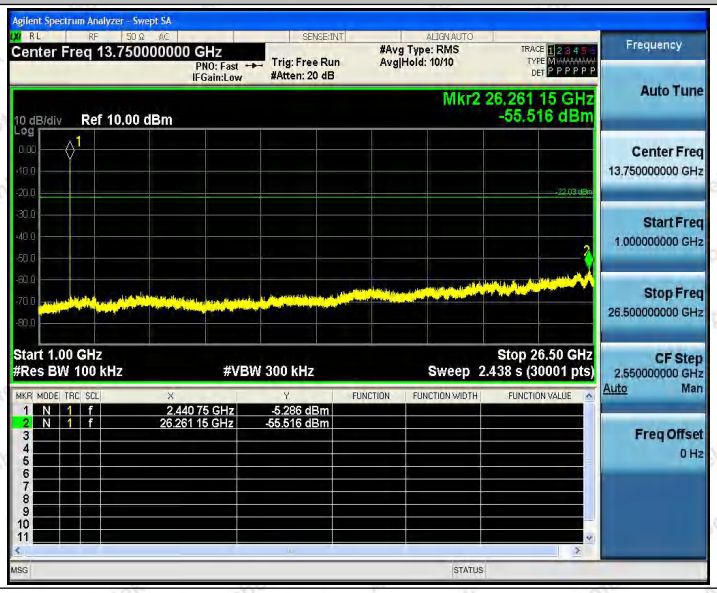



2DH5_Ant1_2441_0~Reference

2DH5_Ant1_2441_30~1000

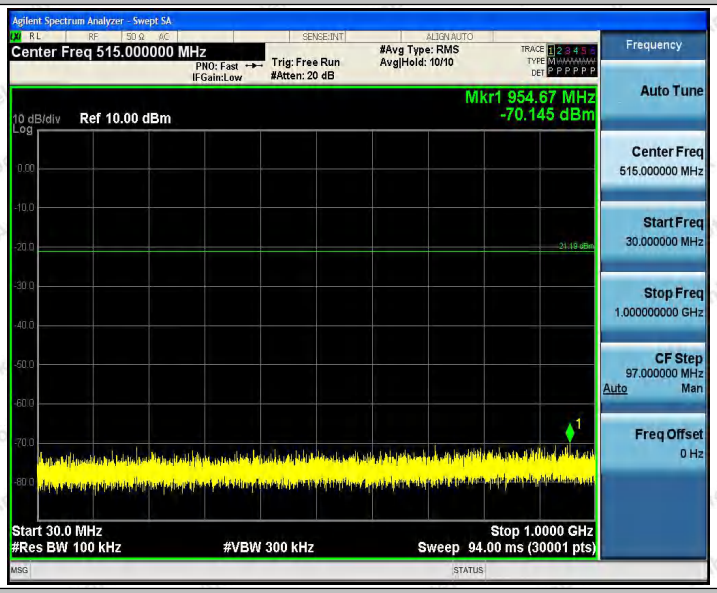



2DH5_Ant1_2441_1000~26500

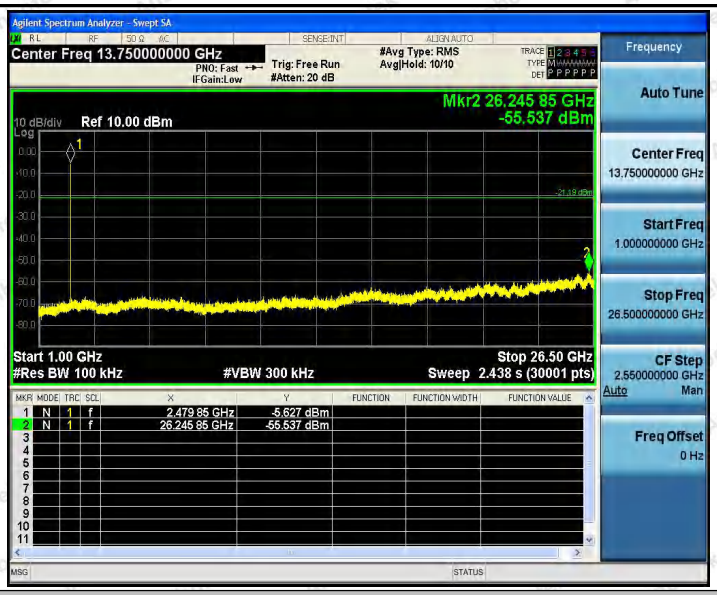


2DH5_Ant1_2480_0~Reference

2DH5_Ant1_2480_30~1000

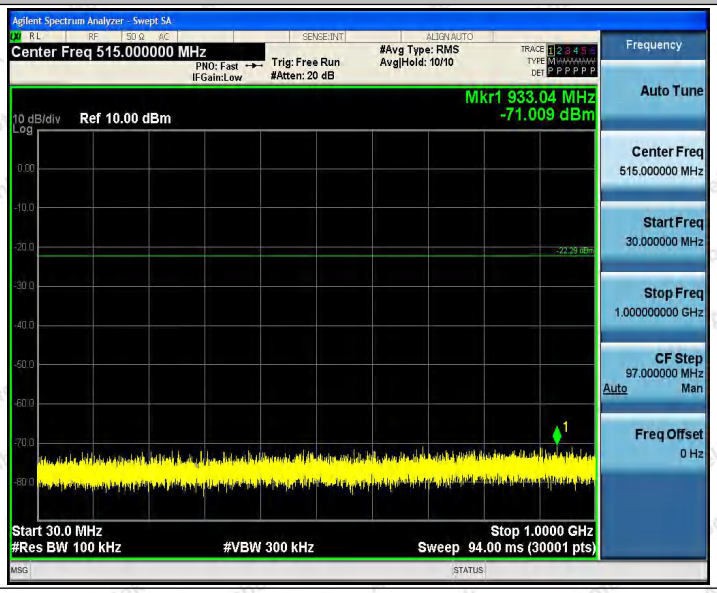



2DH5_Ant1_2480_1000~26500

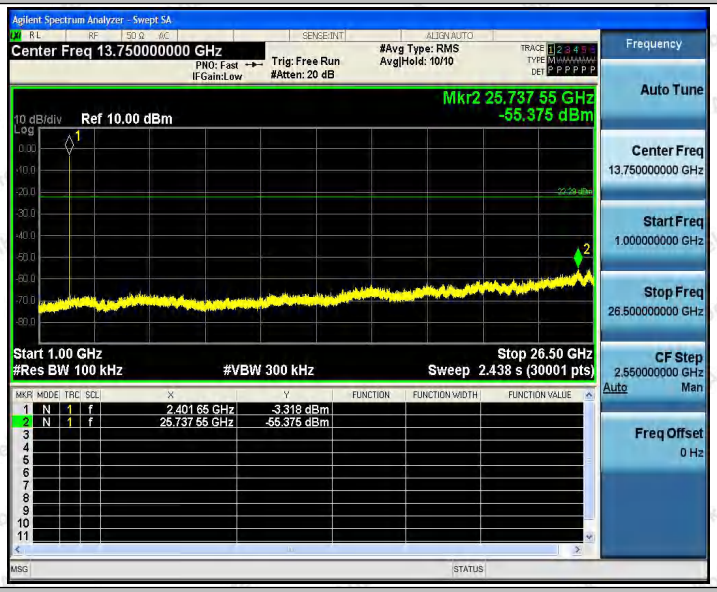



3DH5_Ant1_2402_0~Reference

3DH5_Ant1_2402_30~1000

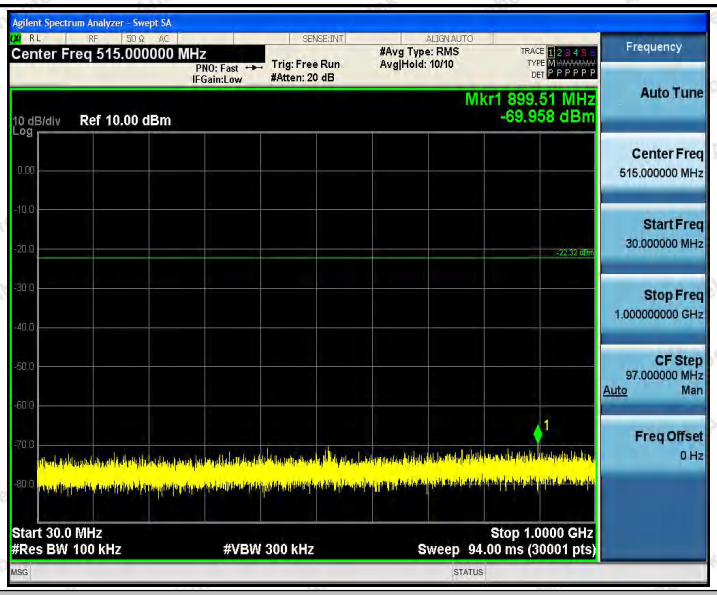


3DH5_Ant1_2402_1000~26500

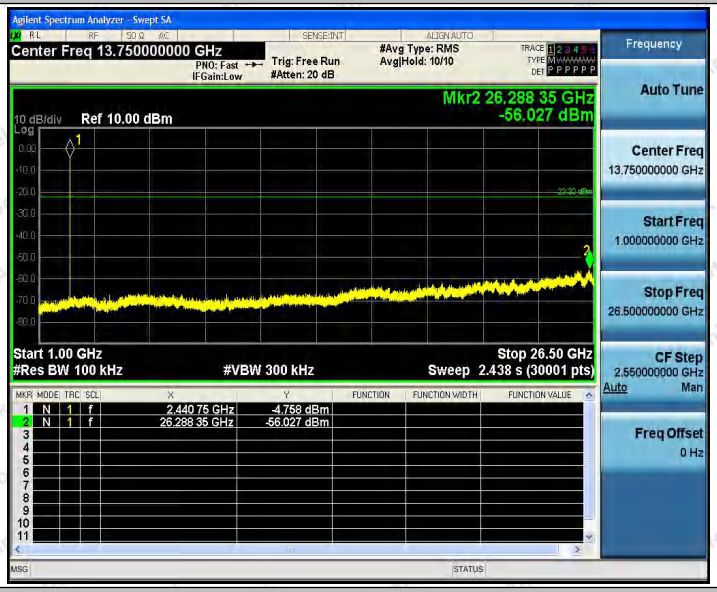



3DH5_Ant1_2441_0~Reference

3DH5_Ant1_2441_30~1000

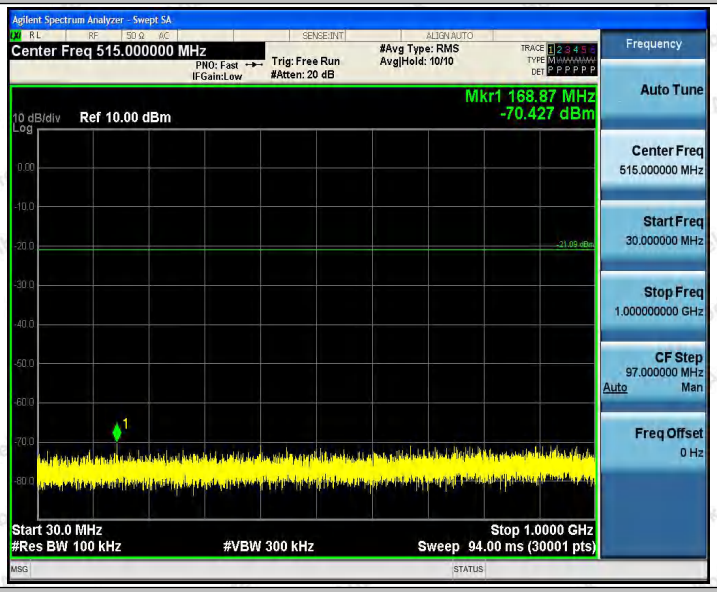



3DH5_Ant1_2441_1000~26500

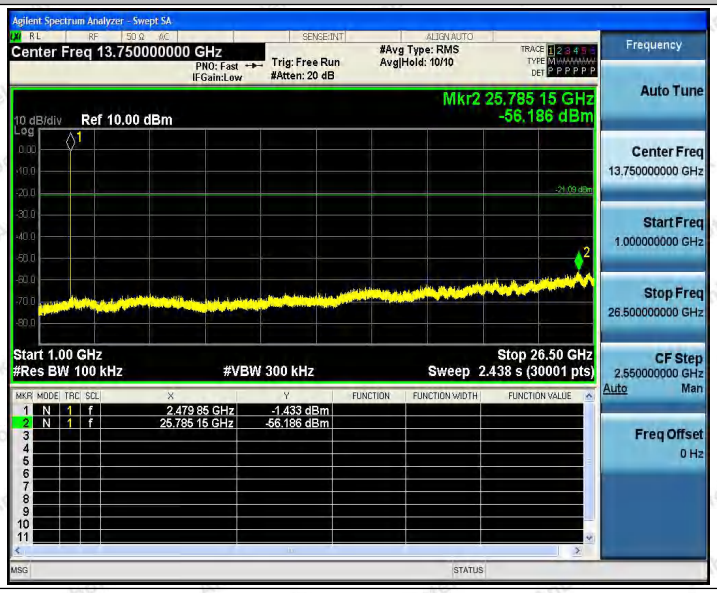



3DH5_Ant1_2480_0~Reference

3DH5_Ant1_2480_30~1000




3DH5_Ant1_2480_1000~26500



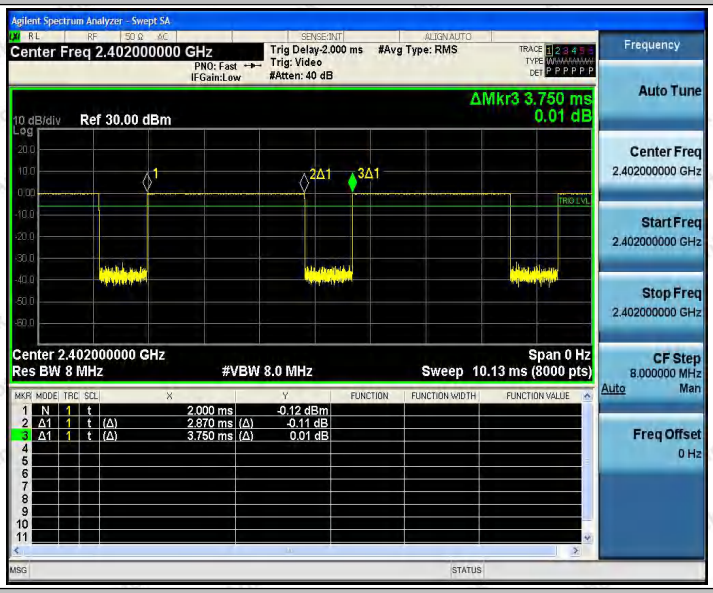
# Appendix I: Duty Cycle

## Test Result

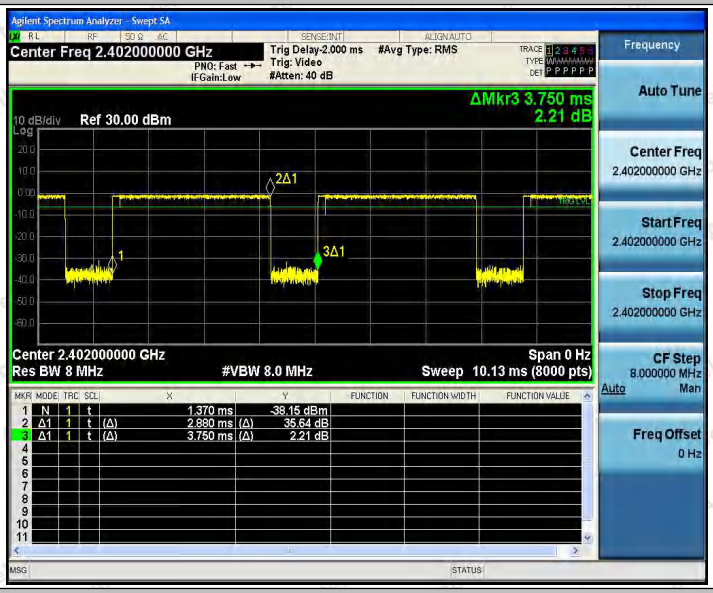
| Test Mode | Antenna | Channel | ON Time [ms] | Period [ms] | X | DC [%] | X Factor | Limit | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 2.87 | 3.75 | 0.7653 | 76.53 | 1.16 | --- | PASS |
| 2DH5 | Ant1 | 2402 | 2.88 | 3.75 | 0.7680 | 76.80 | 1.15 | --- | PASS |
| 3DH5 | Ant1 | 2402 | 2.89 | 3.75 | 0.7707 | 77.07 | 1.13 | --- | PASS |

## Test Graphs

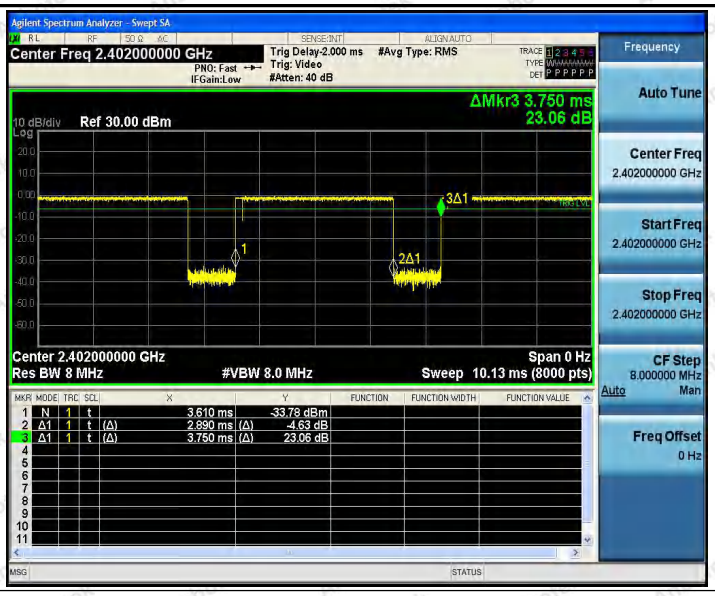
DH5_Ant1_2402




2DH5_Ant1_2402




3DH5_Ant1_2402


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.402000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
ΔMkr3 3.750 ms
23.06 dB
10 dB/div
Ref 30.00 dBm
Center 2.402000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
1 N 1 t 3.610 ms -33.78 dBm
2 Δ1 1 t (Δ) 2.890 ms (Δ) -4.63 dB
3 Δ1 1 t (Δ) 3.750 ms (Δ) 23.06 dB
Frequency
Auto Tune
Center Freq
2.402000000 GHz
Start Freq
2.402000000 GHz
Stop Freq
2.402000000 GHz
CF Step
8.000000 MHz
Auto Man
Freq Offset
0 Hz

---End---