| | |
|---|---|
| **Case No. :** GTS20240903013-1-01 | |
| **Ambient Condition**: 23 ℃, 52 %RH | |
| **According Standard:** ■Part15C | |
| **Test Date:** 2024.9.24 | **Test Engineer:** Evan ouyang |

# Appendix A.1: 20dB Emission Bandwidth

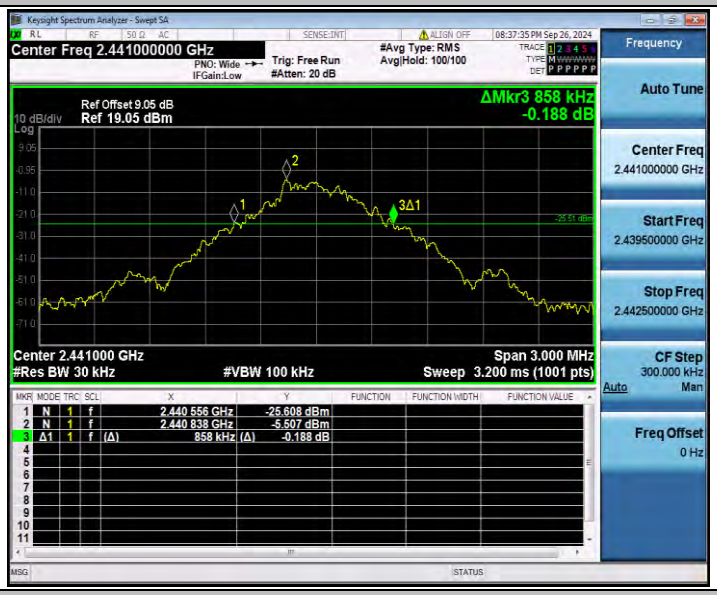
## Test Result

| TestMode | Antenna | Freq(MHz) | 20dB EBW[MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH1 | Ant1 | 2402 | 0.852 | 2401.568 | 2402.420 | --- | --- |
| | | 2441 | 0.858 | 2440.556 | 2441.414 | --- | --- |
| | | 2480 | 0.846 | 2479.562 | 2480.408 | --- | --- |
| 2DH1 | Ant1 | 2402 | 1.290 | 2401.337 | 2402.627 | --- | --- |
| | | 2441 | 1.227 | 2440.370 | 2441.597 | --- | --- |
| | | 2480 | 1.245 | 2479.370 | 2480.615 | --- | --- |

## Test Graphs

DH1_Ant1_2402

DH1_Ant1_2441




DH1_Ant1_2480

2DH1_Ant1_2402

2DH1_Ant1_2441

| 2DH1_Ant1_2480 |
| --- |
| |

# Appendix A.2: Occupied Channel Bandwidth

## Test Result

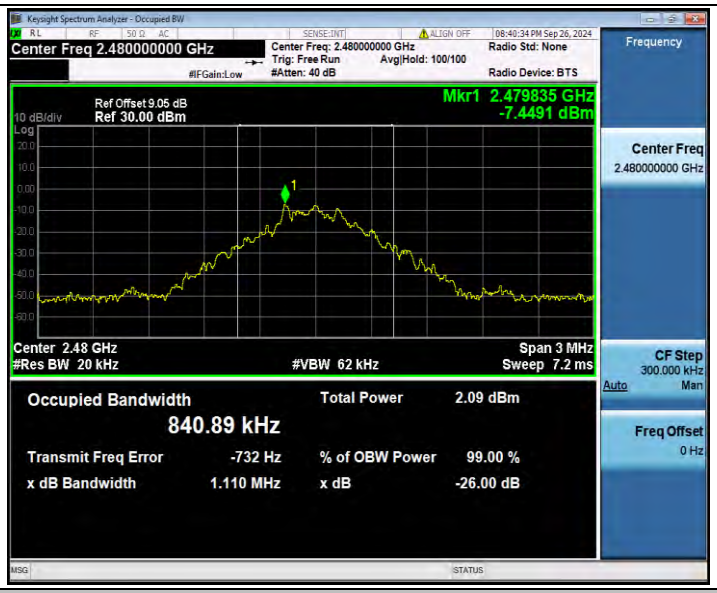
| TestMode | Antenna | Freq(MHz) | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH1 | Ant1 | 2402 | 0.83357 | 2401.5807 | 2402.4142 | --- | --- |
| | | 2441 | 0.83079 | 2440.5876 | 2441.4184 | --- | --- |
| | | 2480 | 0.84089 | 2479.5788 | 2480.4197 | --- | --- |
| 2DH1 | Ant1 | 2402 | 1.1589 | 2401.4127 | 2402.5716 | --- | --- |
| | | 2441 | 1.1616 | 2440.4128 | 2441.5744 | --- | --- |
| | | 2480 | 1.1652 | 2479.4107 | 2480.5759 | --- | --- |

## Test Graphs

DH1_Ant1_2402

DH1_Ant1_2441

DH1_Ant1_2480




2DH1_Ant1_2402

2DH1_Ant1_2441

| 2DH1_Ant1_2480 |
| --- |
| |

# Appendix A.3: Maximum conducted output power

## Test Result Peak

| Test Mode | Antenna | Freq(MHz) | Conducted Peak Powert[dBm] | Conducted Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| DH1 | Ant1 | 2402 | -4.21 | ≤20.97 | PASS |
| | | 2441 | -3.42 | ≤20.97 | PASS |
| | | 2480 | -3.60 | ≤20.97 | PASS |
| 2DH1 | Ant1 | 2402 | -3.31 | ≤20.97 | PASS |
| | | 2441 | -2.64 | ≤20.97 | PASS |
| | | 2480 | -2.82 | ≤20.97 | PASS |

# Appendix A.4: Carrier frequency separation

## Test Result

| TestMode | Antenna | Freq(MHz) | Result[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|
| DH1 | Ant1 | Hop_2402 | 0.816 | ≥0.572 | PASS |
| | | Hop_2441 | 0.994 | ≥0.572 | PASS |
| | | Hop_2480 | 0.998 | ≥0.572 | PASS |
| 2DH1 | Ant1 | Hop_2402 | 1 | ≥0.860 | PASS |
| | | Hop_2441 | 0.872 | ≥0.860 | PASS |
| | | Hop_2480 | 0.996 | ≥0.860 | PASS |

## Test Graphs

DH1_Ant1_Hop_2402

DH1_Ant1_Hop_2441

DH1_Ant1_Hop_2480

2DH1_Ant1_Hop_2402

2DH1_Ant1_Hop_2441

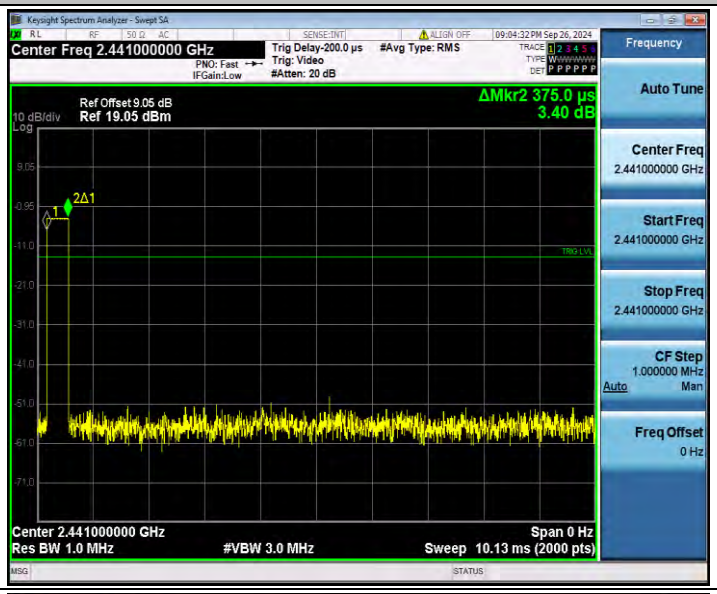
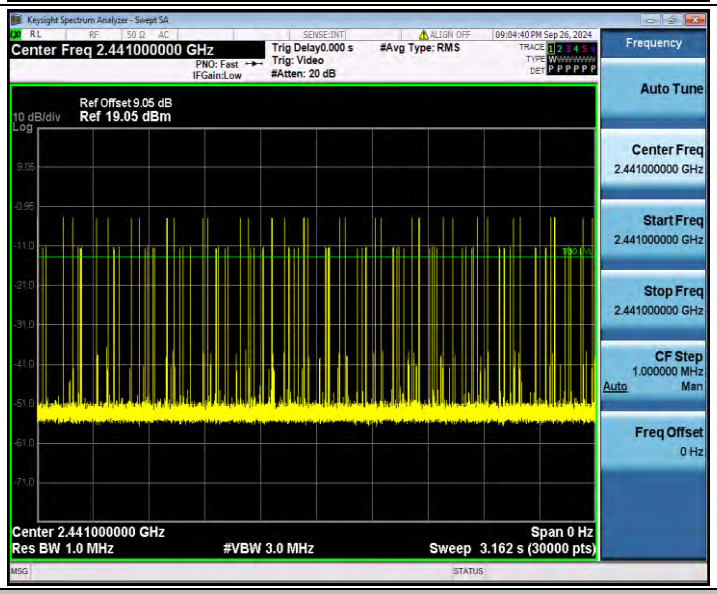
| 2DH1_Ant1_Hop_2480 |
| --- |
| |

# Appendix A.5: Time of occupancy

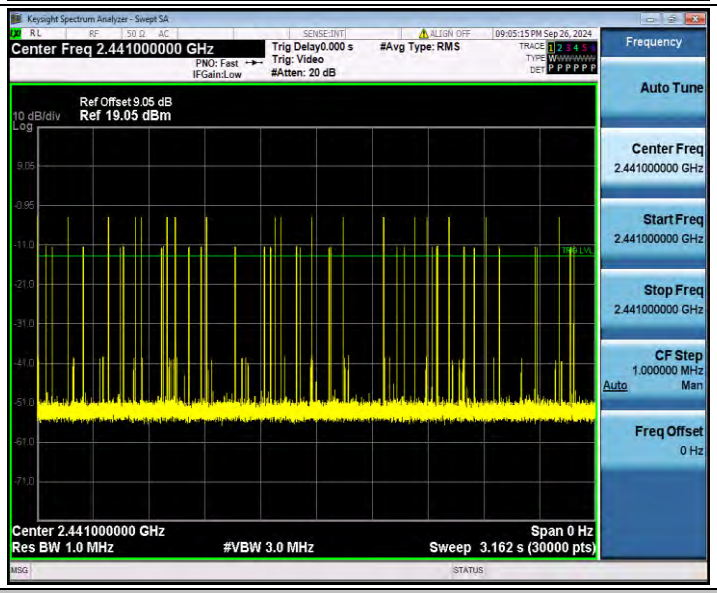
## Test Result

| TestMode | Antenna | Freq(MHz) | BurstWidth [ms] | TotalHops [Num] | Result[s] | Limit[s] | Verdict |
|---|---|---|---|---|---|---|---|
| DH1 | Ant1 | Hop | 0.375 | 330 | 0.124 | ≤0.4 | PASS |
| DH3 | Ant1 | Hop | 1.631 | 180 | 0.294 | ≤0.4 | PASS |
| DH5 | Ant1 | Hop | 2.883 | 120 | 0.346 | ≤0.4 | PASS |
| 2DH1 | Ant1 | Hop | 0.385 | 330 | 0.127 | ≤0.4 | PASS |
| 2DH3 | Ant1 | Hop | 1.631 | 140 | 0.228 | ≤0.4 | PASS |
| 2DH5 | Ant1 | Hop | 2.883 | 100 | 0.288 | ≤0.4 | PASS |

## Test Graphs

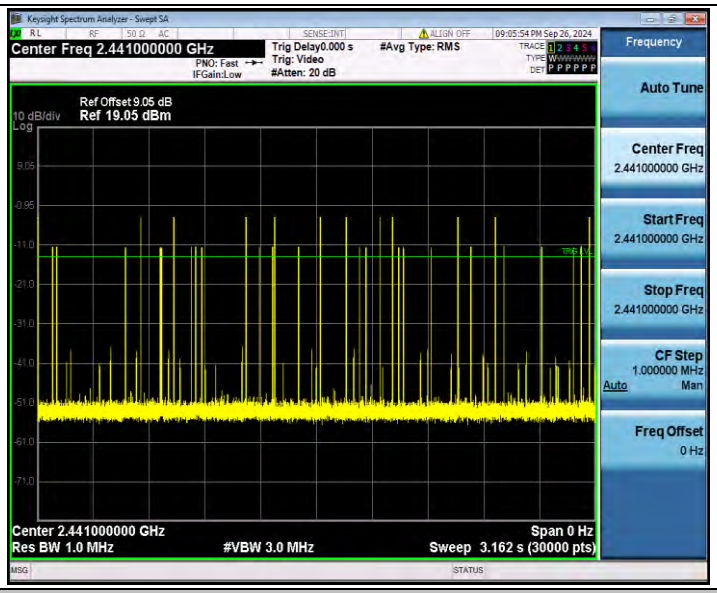
| DH1_Ant1_Hop |
|---|
|  |
|  |
| DH3_Ant1_Hop |

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-200.0 µs
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
PNO: Fast
IFGain:Low
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
ΔMkr2 1.631 ms
0.05 dB
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 10.13 ms (2000 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

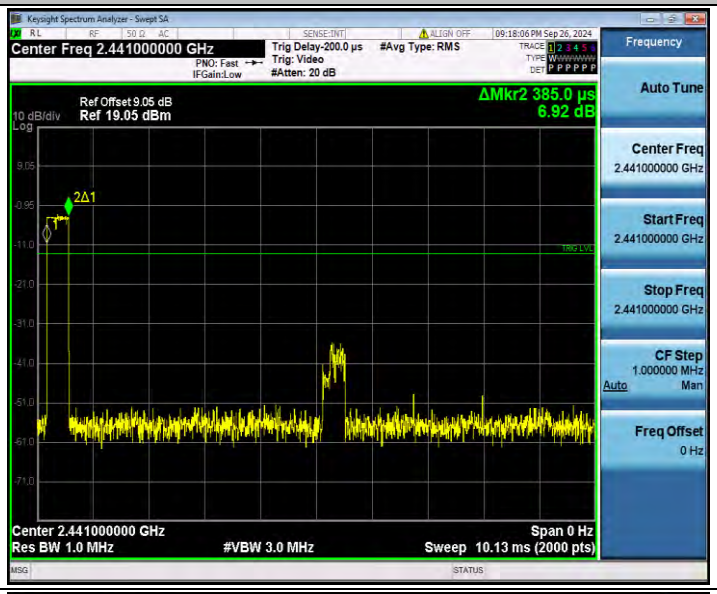

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
PNO: Fast
IFGain:Low
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 3.162 s (30000 pts)
Frequency
Auto Tune
Center 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

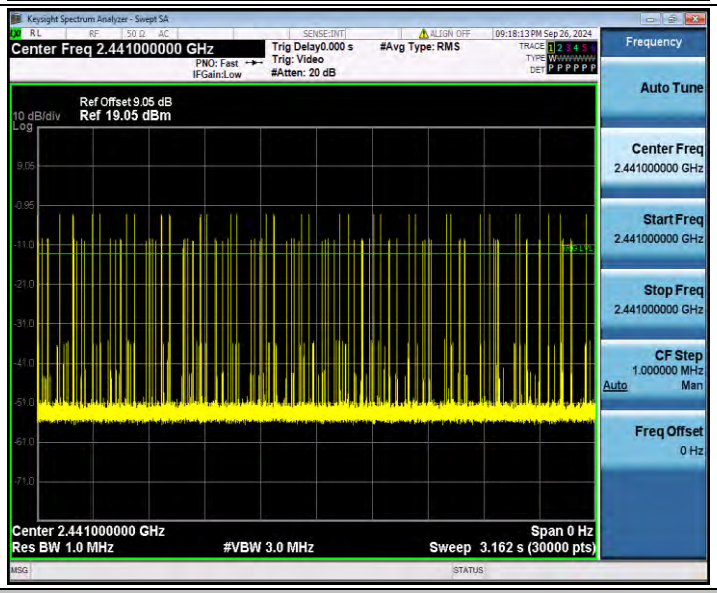
DH5_Ant1_Hop

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-200.0 µs
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
PNO: Fast
IFGain:Low
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
ΔMkr2 2.883 ms
13.33 dB
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 10.13 ms (2000 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

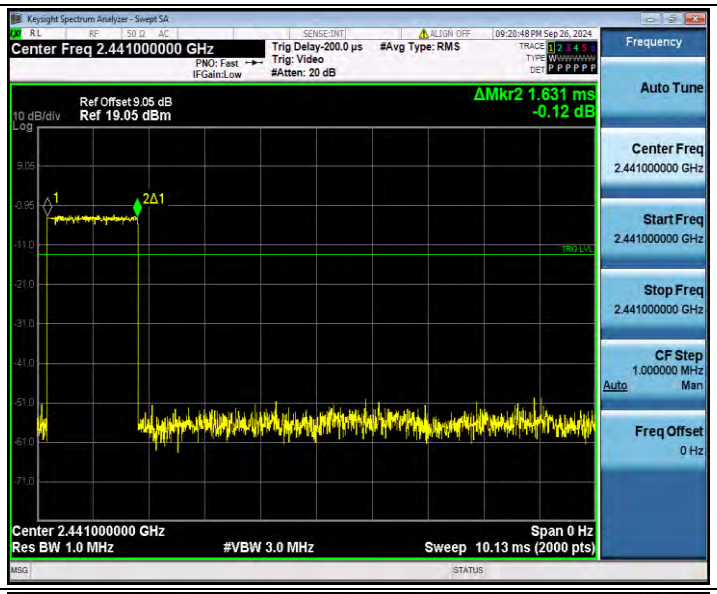


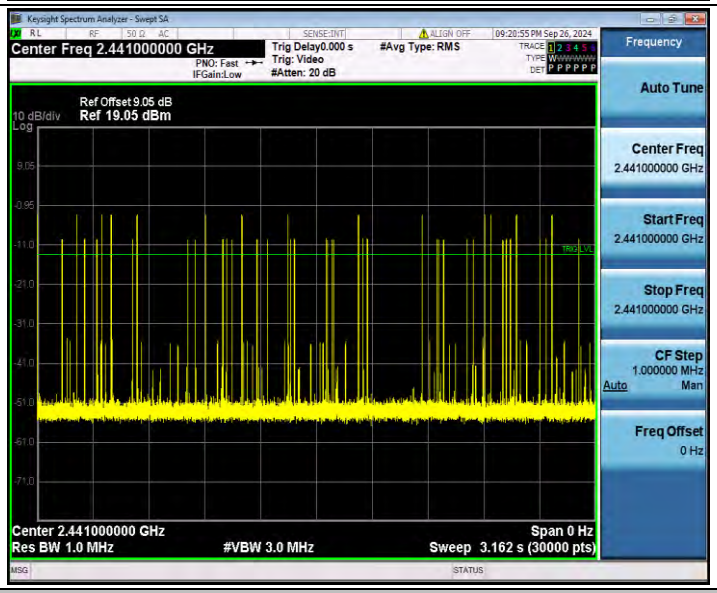

2DH1_Ant1_Hop



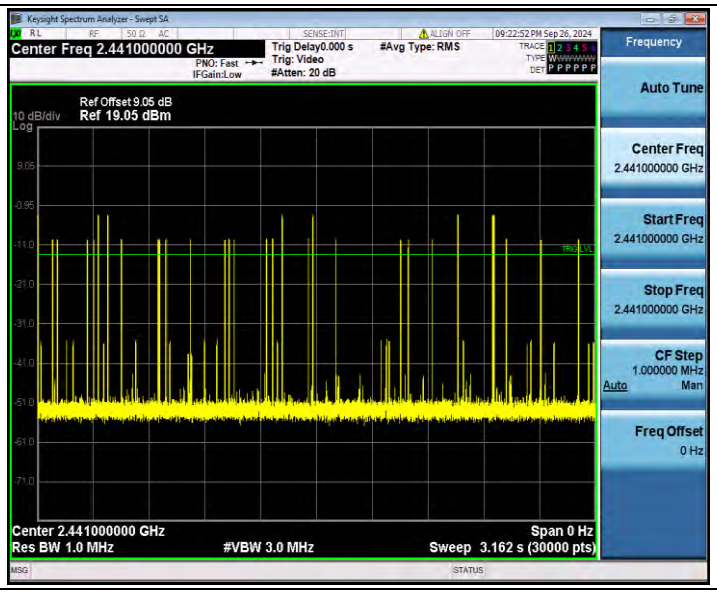




2DH3_Ant1_Hop




2DH5_Ant1_Hop

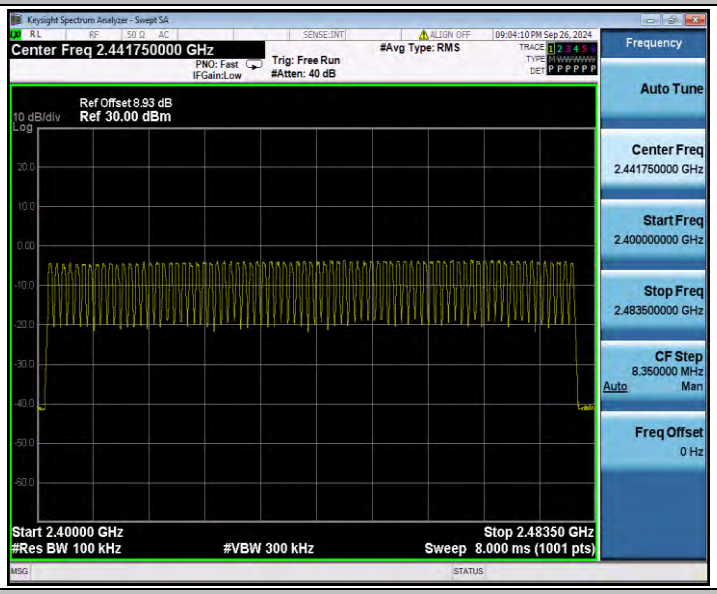

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 20 dB
Ref Offset 9.05 dB
10 dB/div
Ref 19.05 dBm
Log
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 3.162 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz

# Appendix A.6: Number of hopping channels

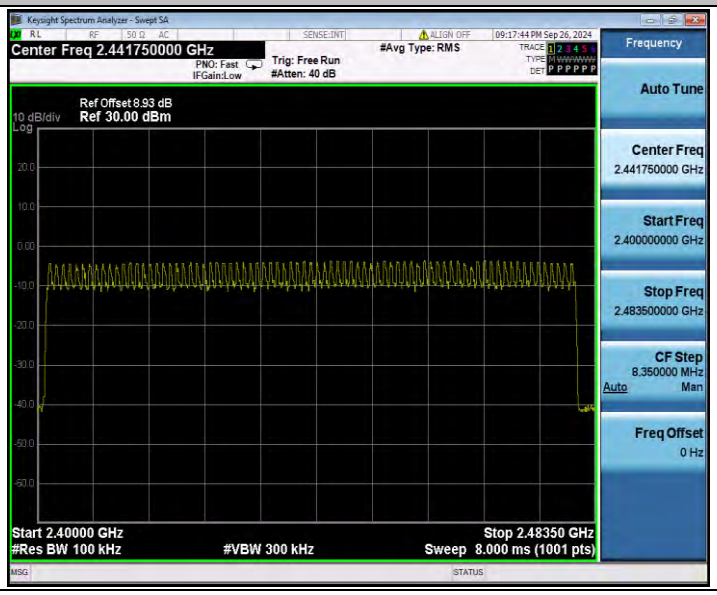
## Test Result

| TestMode | Antenna | Freq(MHz) | Result[Num] | Limit[Num] | Verdict |
|---|---|---|---|---|---|
| DH1 | Ant1 | Hop | 79 | ≥15 | PASS |
| 2DH1 | Ant1 | Hop | 79 | ≥15 | PASS |

## Test Graphs

| DH1_Ant1_Hop |
|---|
|  |



| 2DH1_Ant1_Hop |
|---|
|  |

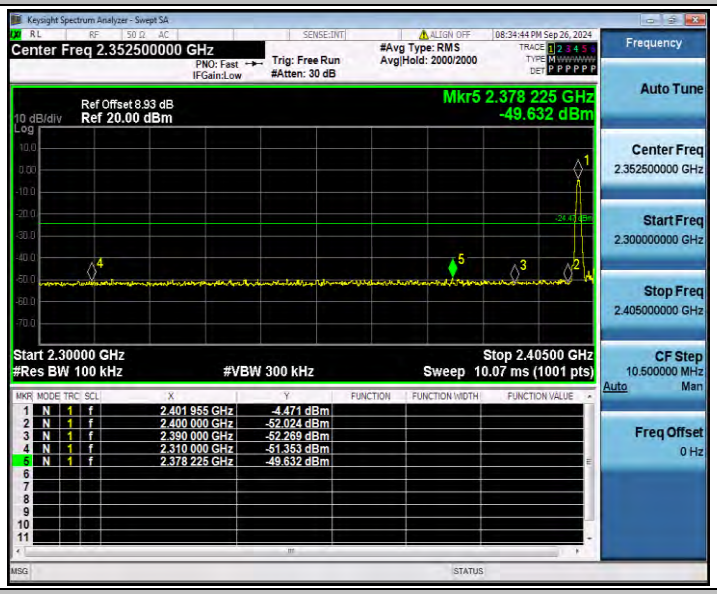
# Appendix A.7: Band edge measurements

## Test Result

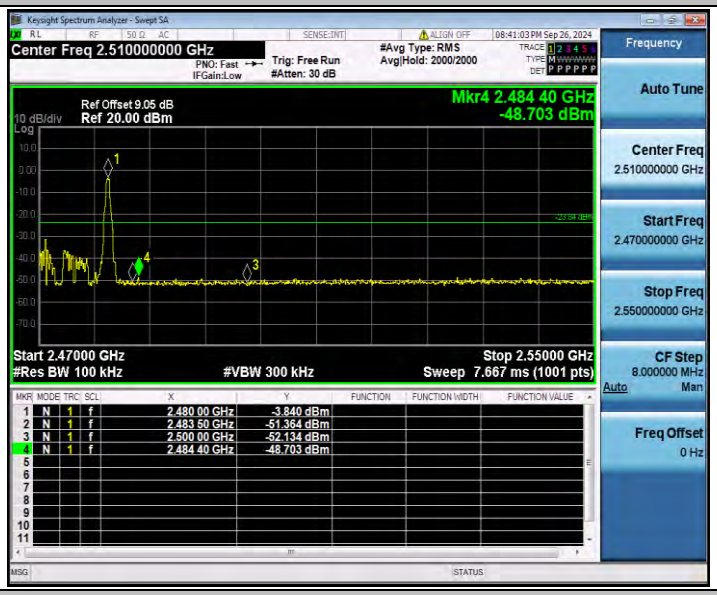
| TestMode | Antenna | ChName | Freq(MHz) | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH1 | Ant1 | Low | 2402 | -4.47 | -49.63 | ≤-24.47 | PASS |
| | | High | 2480 | -3.84 | -48.7 | ≤-23.84 | PASS |
| | | Low | Hop_2402 | -4.58 | -48.18 | ≤-24.58 | PASS |
| | | High | Hop_2480 | -4.23 | -48.46 | ≤-24.23 | PASS |
| 2DH1 | Ant1 | Low | 2402 | -4.61 | -49.41 | ≤-24.61 | PASS |
| | | High | 2480 | -3.85 | -47.84 | ≤-23.85 | PASS |
| | | Low | Hop_2402 | -4.62 | -49 | ≤-24.62 | PASS |
| | | High | Hop_2480 | -5.21 | -48.35 | ≤-25.21 | PASS |

## Test Graphs

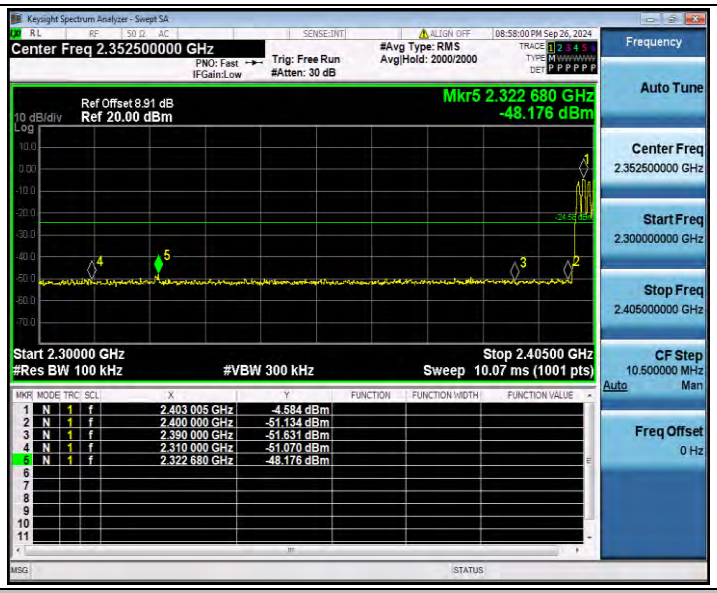
DH1_Ant1_Low_2402



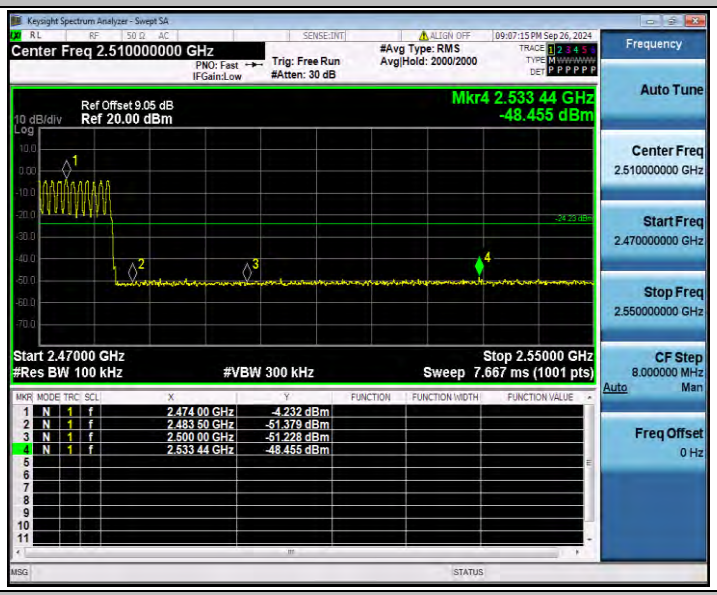

DH1_Ant1_High_2480



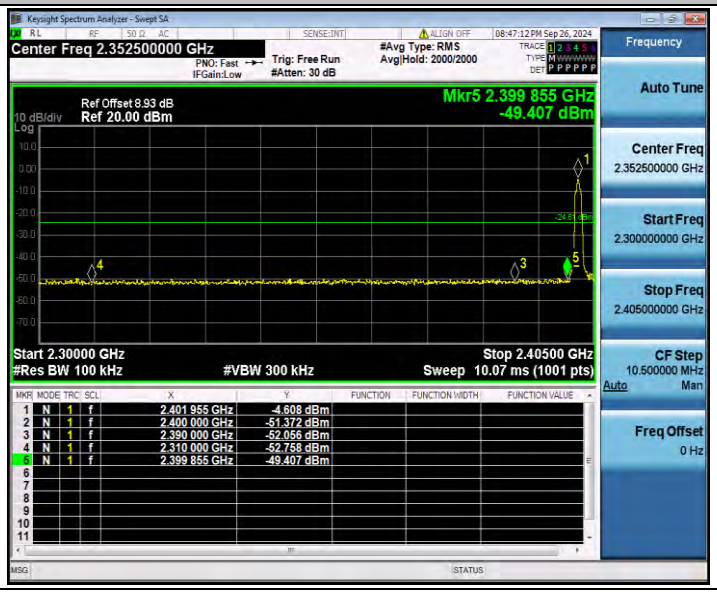

DH1_Ant1_Low_Hop_2402



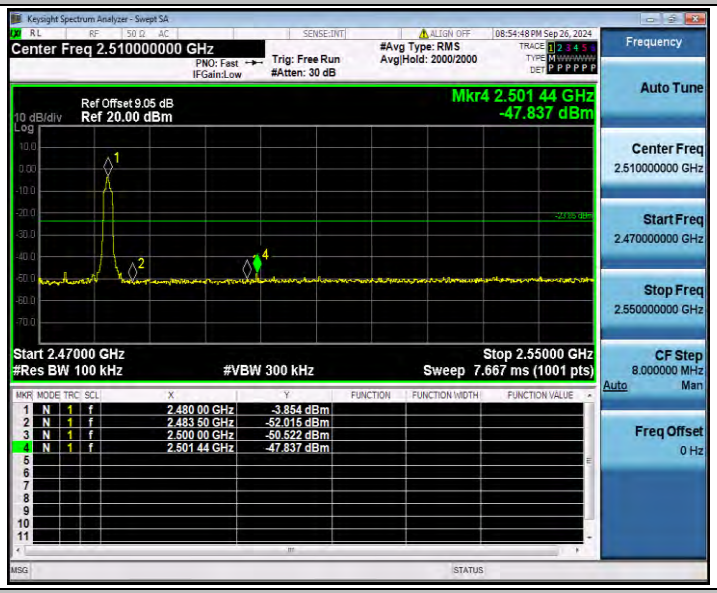

DH1_Ant1_High_Hop_2480



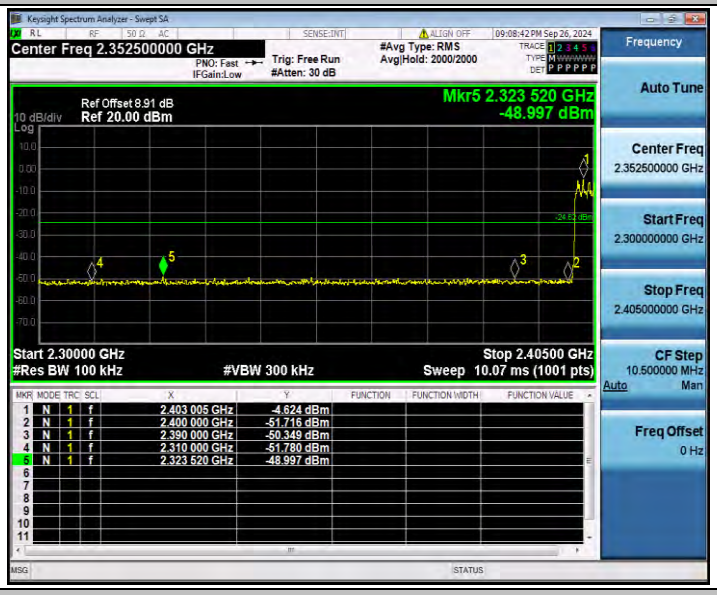

2DH1_Ant1_Low_2402



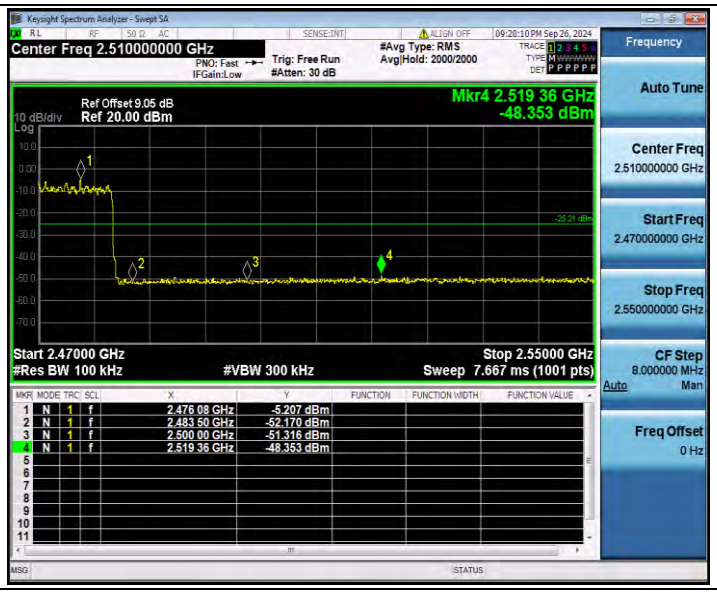
2DH1_Ant1_High_2480




2DH1_Ant1_Low_Hop_2402




2DH1_Ant1_High_Hop_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.510000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 2000/2000
09:28:10 PM Sep 26, 2024
Frequency
Auto Tune
Center Freq
2.510000000 GHz
Start Freq
2.470000000 GHz
Stop Freq
2.550000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
Ref Offset 9.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr4 2.519 36 GHz
-48.353 dBm
-25.21 dBm
Start 2.47000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.55000 GHz
Sweep 7.667 ms (1001 pts)
1 N 1 f 2.476 08 GHz -5.207 dBm
2 N 1 f 2.483 50 GHz -52.170 dBm
3 N 1 f 2.500 00 GHz -51.316 dBm
4 N 1 f 2.519 36 GHz -48.353 dBm
MSG
STATUS

# Appendix A.8: Conducted Spurious Emission

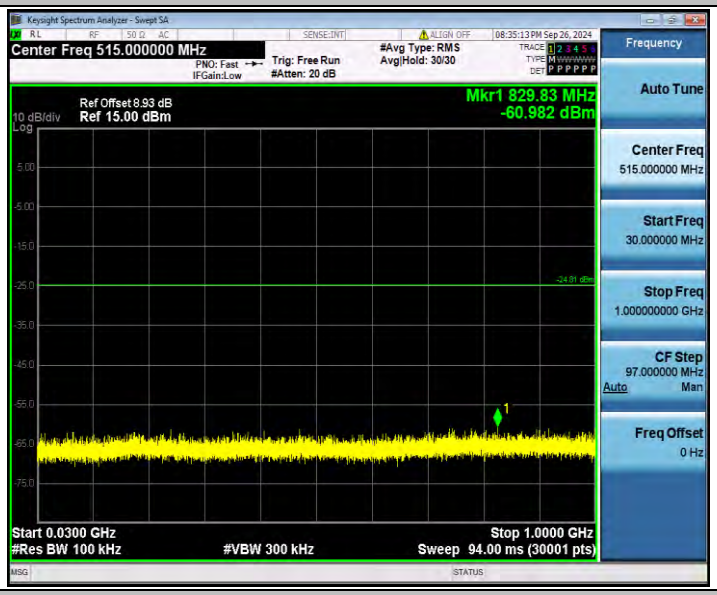
## Test Result

| TestMode | Antenna | Freq(MHz) | FreqRange [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH1 | Ant1 | 2402 | Reference | -4.81 | -4.81 | --- | PASS |
| | | | 30~1000 | -4.81 | -60.98 | ≤-24.81 | PASS |
| | | | 1000~26500 | -4.81 | -46.93 | ≤-24.81 | PASS |
| | | 2441 | Reference | -3.99 | -3.99 | --- | PASS |
| | | | 30~1000 | -3.99 | -59.77 | ≤-23.99 | PASS |
| | | | 1000~26500 | -3.99 | -45.33 | ≤-23.99 | PASS |
| | | 2480 | Reference | -4.17 | -4.17 | --- | PASS |
| | | | 30~1000 | -4.17 | -60.57 | ≤-24.17 | PASS |
| | | | 1000~26500 | -4.17 | -47.53 | ≤-24.17 | PASS |
| 2DH1 | Ant1 | 2402 | Reference | -4.88 | -4.88 | --- | PASS |
| | | | 30~1000 | -4.88 | -60.23 | ≤-24.88 | PASS |
| | | | 1000~26500 | -4.88 | -48.05 | ≤-24.88 | PASS |
| | | 2441 | Reference | -3.98 | -3.98 | --- | PASS |
| | | | 30~1000 | -3.98 | -58.57 | ≤-23.98 | PASS |
| | | | 1000~26500 | -3.98 | -46.97 | ≤-23.98 | PASS |
| | | 2480 | Reference | -4.31 | -4.31 | --- | PASS |
| | | | 30~1000 | -4.31 | -60.84 | ≤-24.31 | PASS |
| | | | 1000~26500 | -4.31 | -46.37 | ≤-24.31 | PASS |

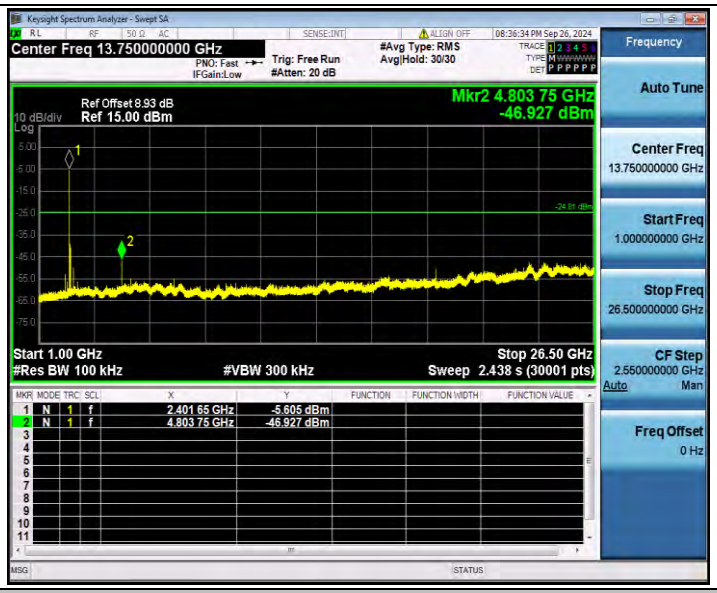
## Test Graphs

DH1_Ant1_2402_0~Reference

DH1_Ant1_2402_30~1000



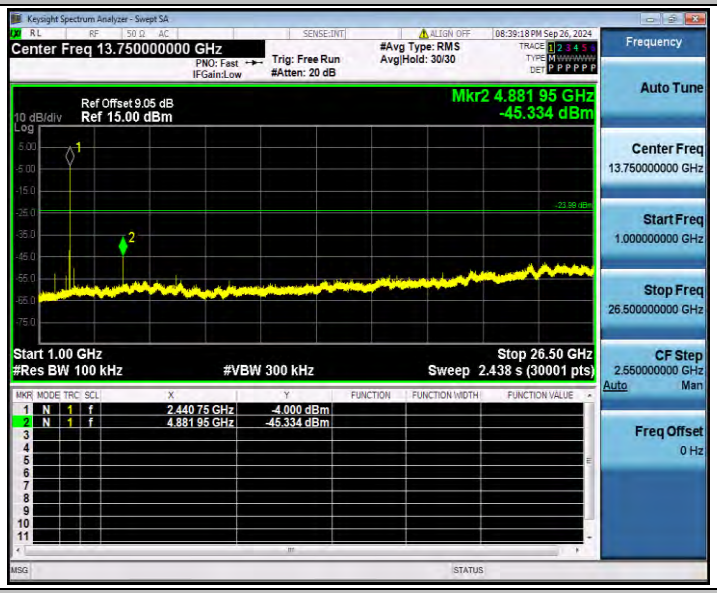

DH1_Ant1_2402_1000~26500




DH1_Ant1_2441_0~Reference

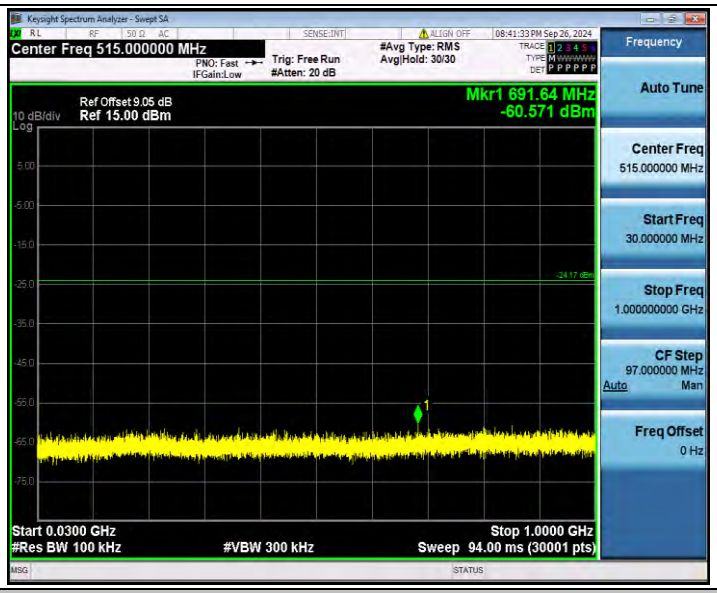
DH1_Ant1_2441_30~1000

DH1_Ant1_2441_1000~26500

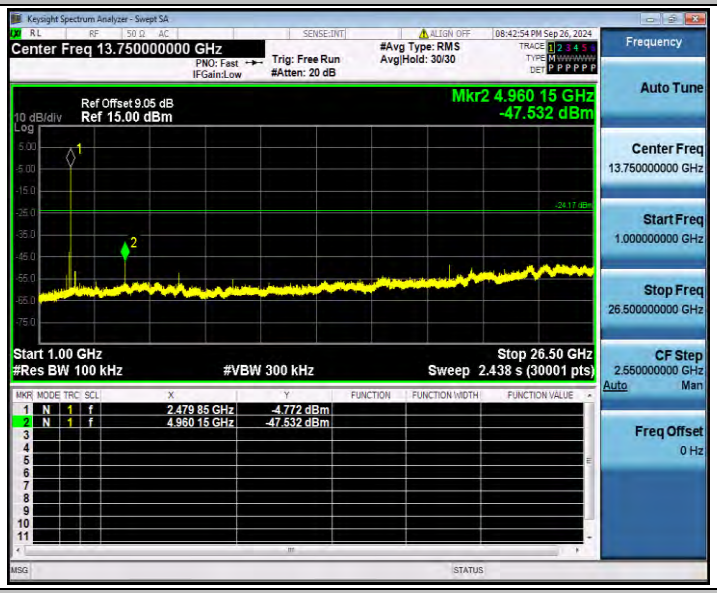



DH1_Ant1_2480_0~Reference

DH1_Ant1_2480_30~1000

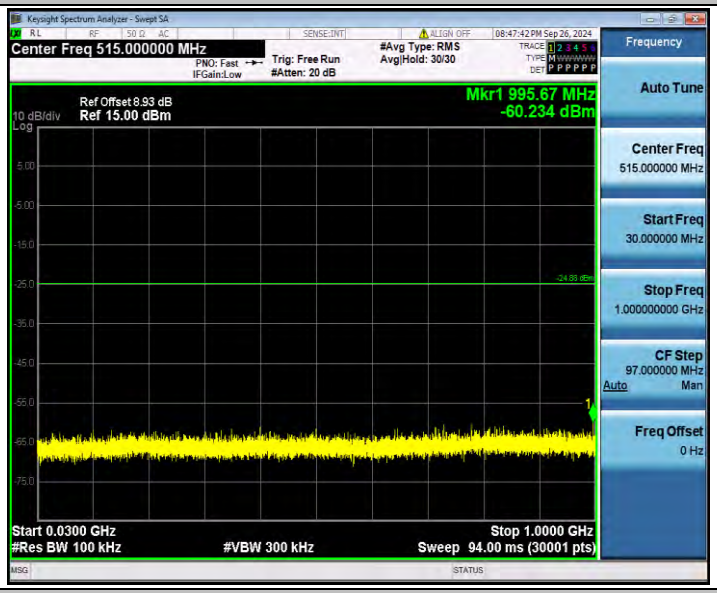



DH1_Ant1_2480_1000~26500

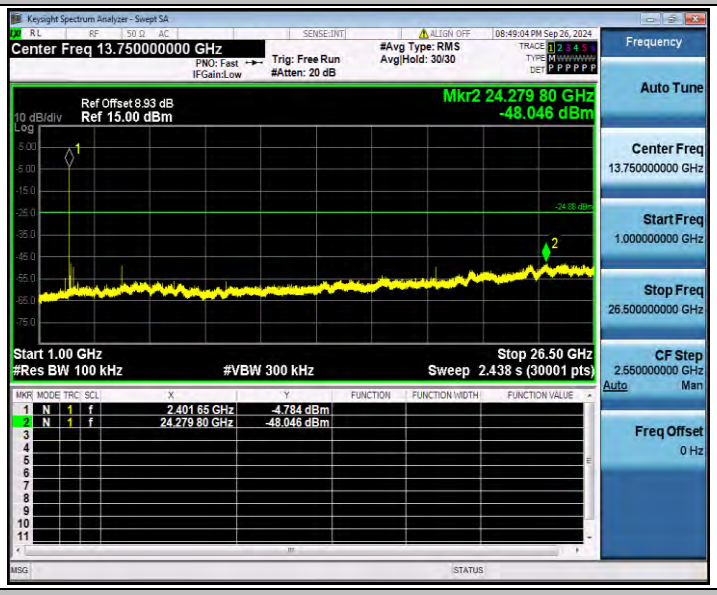



2DH1_Ant1_2402_0~Reference

2DH1_Ant1_2402_30~1000



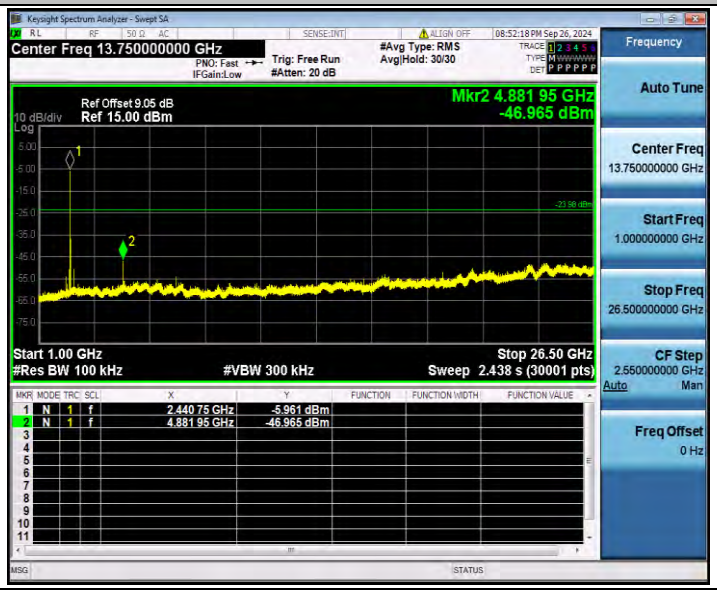

2DH1_Ant1_2402_1000~26500




2DH1_Ant1_2441_0~Reference

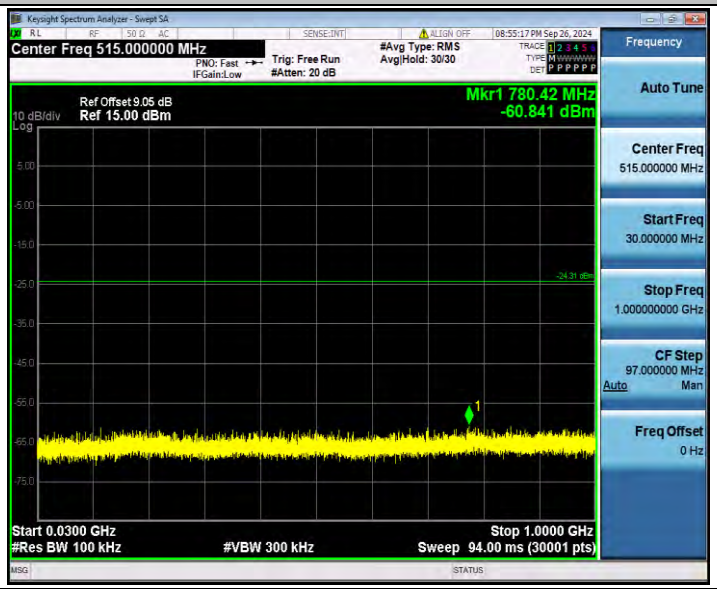
2DH1_Ant1_2441_30~1000

2DH1_Ant1_2441_1000~26500

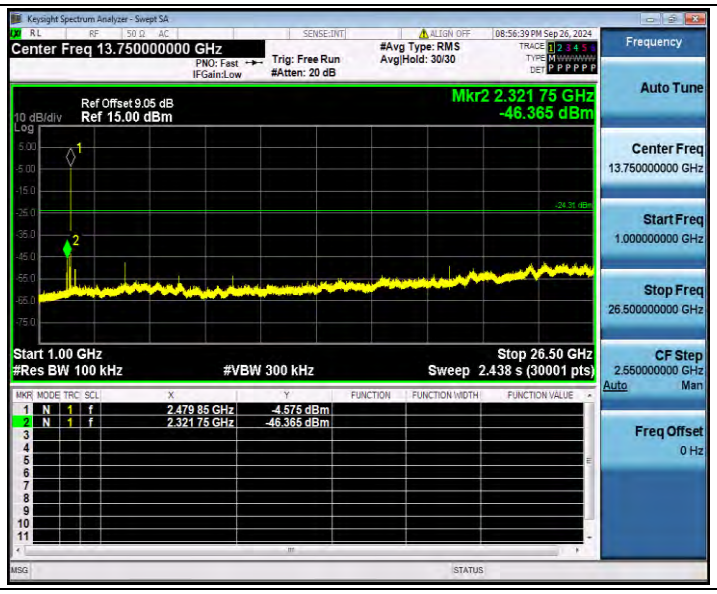


2DH1_Ant1_2480_0~Reference

2DH1_Ant1_2480_30~1000




2DH1_Ant1_2480_1000~26500


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 30/30
08:56:39 PM Sep 26, 2024
Ref Offset 9.05 dB
10 dB/div
Ref 15.00 dBm
Log
Mkr2 2.321 75 GHz
-46.365 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.438 s (30001 pts)
1 N 1 f 2.479 85 GHz -4.575 dBm
2 N 1 f 2.321 75 GHz -46.365 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz

# Appendix A.9: Emissions in Restricted Bands

## Test Result

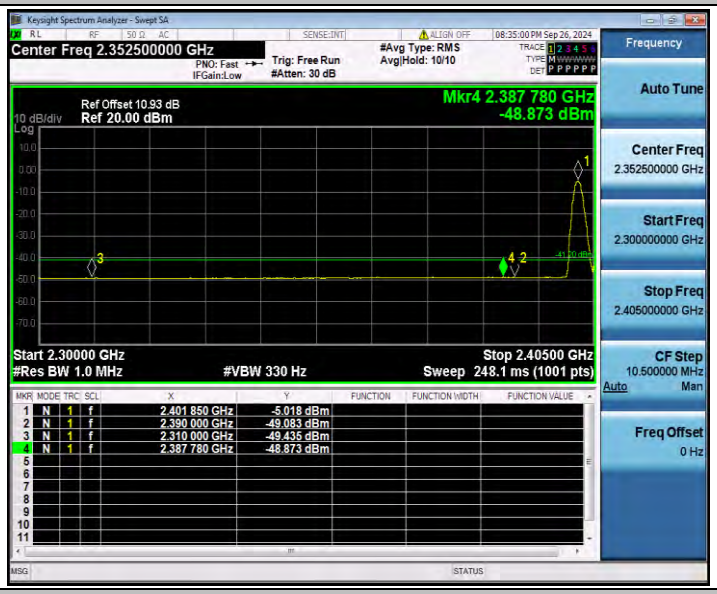
| TestMode | Antenna | ChName | Freq(MHz) | Detector | Freq [MHz] | Result [dBm] | Limit [dBm] | Result [dBuV/m] | Limit [dBuV/m] | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| DH1 | Ant1 | Low | 2402 | AV | 2310.000 | -49.44 | ≤-41.20 | 45.76 | ≤54 | PASS |
| | | | | AV | 2387.780 | -48.87 | ≤-41.20 | 46.33 | ≤54 | PASS |
| | | | | AV | 2390.000 | -49.08 | ≤-41.20 | 46.12 | ≤54 | PASS |
| | | | | Peak | 2310.000 | -42.03 | ≤-21.20 | 53.17 | ≤74 | PASS |
| | | | | Peak | 2312.180 | -38.98 | ≤-21.20 | 56.22 | ≤74 | PASS |
| | | | | Peak | 2390.000 | -40.44 | ≤-21.20 | 54.76 | ≤74 | PASS |
| | | High | 2480 | AV | 2483.500 | -48.88 | ≤-41.20 | 46.32 | ≤54 | PASS |
| | | | | AV | 2498.160 | -48.65 | ≤-41.20 | 46.55 | ≤54 | PASS |
| | | | | AV | 2500.000 | -48.75 | ≤-41.20 | 46.45 | ≤54 | PASS |
| | | | | Peak | 2483.500 | -41.6 | ≤-21.20 | 53.60 | ≤74 | PASS |
| | | | | Peak | 2490.560 | -38.15 | ≤-21.20 | 57.05 | ≤74 | PASS |
| | | | | Peak | 2500.000 | -41.56 | ≤-21.20 | 53.64 | ≤74 | PASS |
| 2DH1 | Ant1 | Low | 2402 | AV | 2310.000 | -49.41 | ≤-41.20 | 45.79 | ≤54 | PASS |
| | | | | AV | 2367.095 | -48.91 | ≤-41.20 | 46.29 | ≤54 | PASS |
| | | | | AV | 2390.000 | -49.18 | ≤-41.20 | 46.02 | ≤54 | PASS |
| | | | | Peak | 2310.000 | -41.86 | ≤-21.20 | 53.34 | ≤74 | PASS |
| | | | | Peak | 2344.730 | -39.1 | ≤-21.20 | 56.10 | ≤74 | PASS |
| | | | | Peak | 2390.000 | -41.84 | ≤-21.20 | 53.36 | ≤74 | PASS |
| | | High | 2480 | AV | 2483.500 | -49.04 | ≤-41.20 | 46.16 | ≤54 | PASS |
| | | | | AV | 2497.040 | -48.67 | ≤-41.20 | 46.53 | ≤54 | PASS |
| | | | | AV | 2500.000 | -48.75 | ≤-41.20 | 46.45 | ≤54 | PASS |
| | | | | Peak | 2483.500 | -40.26 | ≤-21.20 | 54.94 | ≤74 | PASS |
| | | | | Peak | 2484.400 | -38.58 | ≤-21.20 | 56.62 | ≤74 | PASS |
| | | | | Peak | 2500.000 | -40.82 | ≤-21.20 | 54.38 | ≤74 | PASS |

Note：

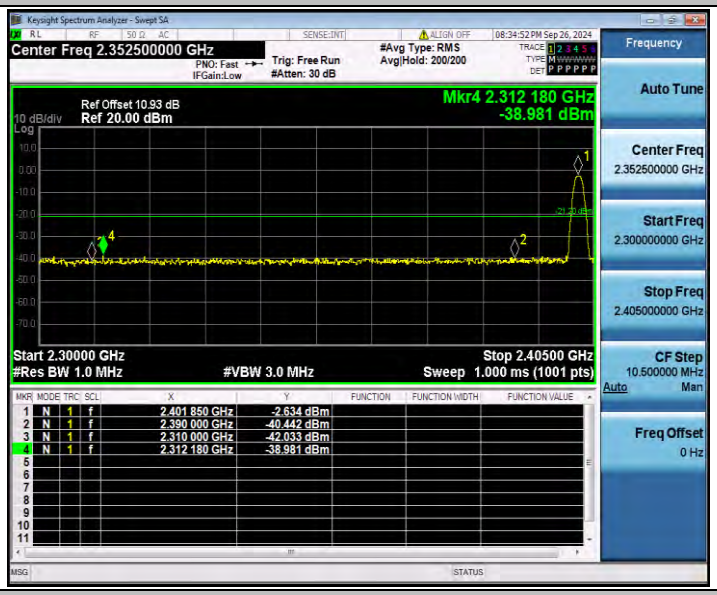
1. The Antenna Gain is compensated in the graph.
2. The Duty Cycle Factor and RBW Factor is compensated in the graph.
3. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

## Test Graphs

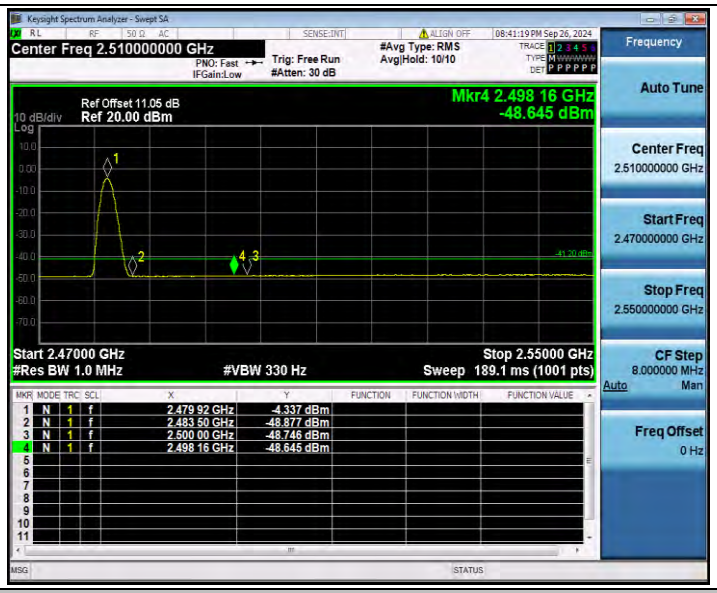
DH1_Ant1_Low_2402_AV



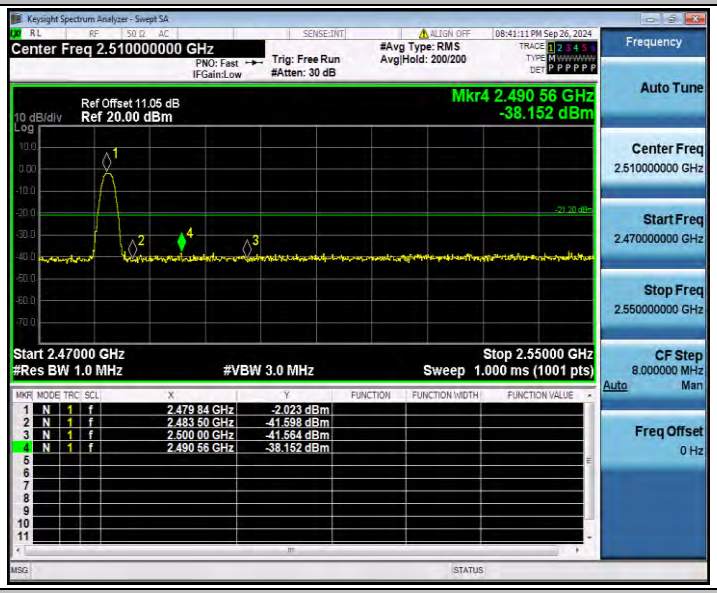

DH1_Ant1_Low_2402_Peak



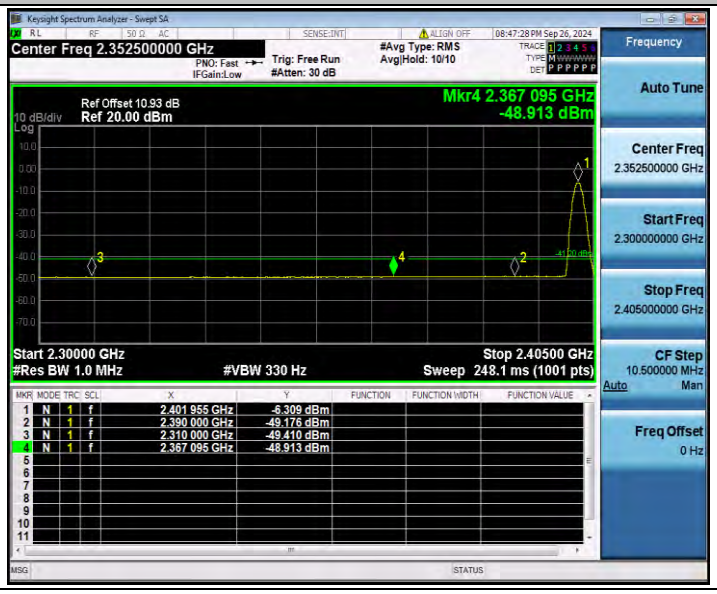

DH1_Ant1_High_2480_AV



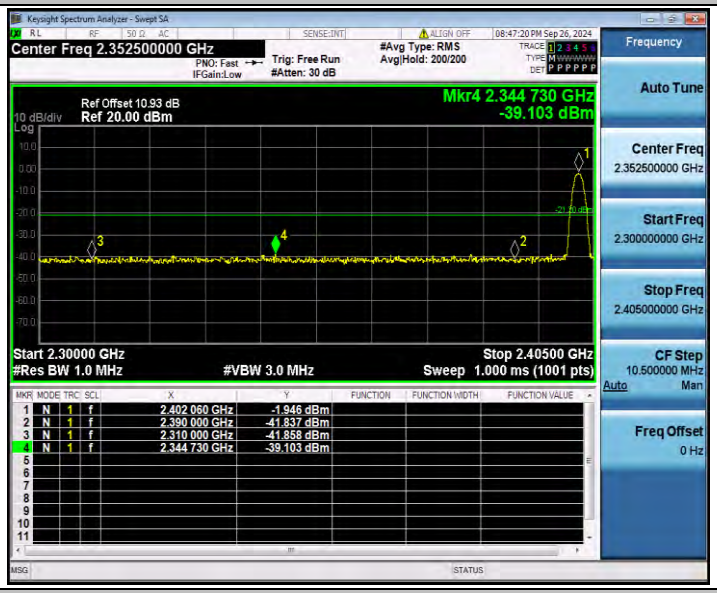

DH1_Ant1_High_2480_Peak



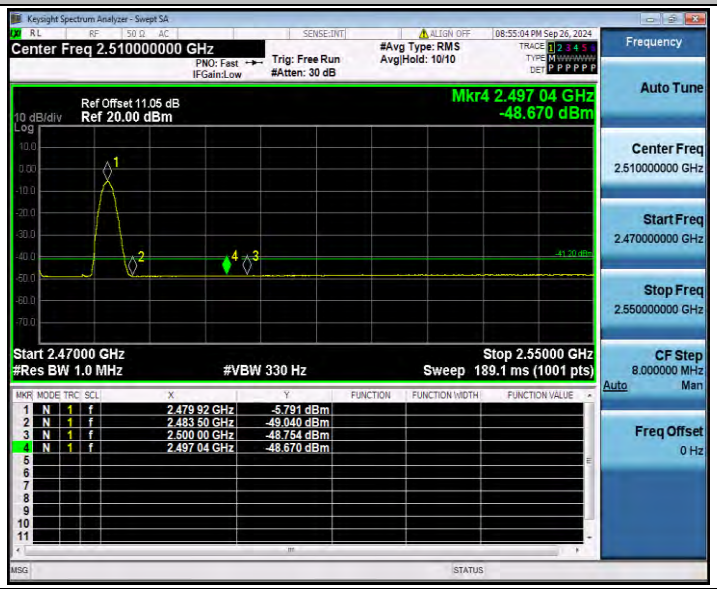

2DH1_Ant1_Low_2402_AV



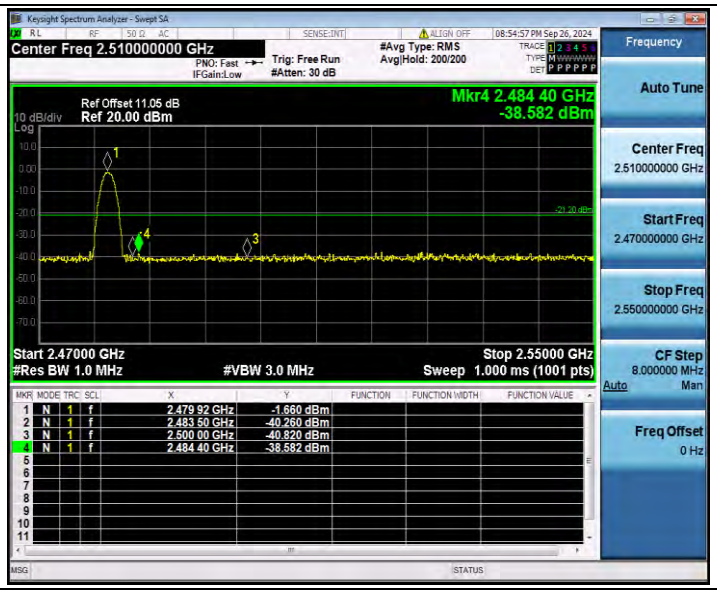
2DH1_Ant1_Low_2402_Peak




2DH1_Ant1_High_2480_AV




2DH1_Ant1_High_2480_Peak


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.510000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 200/200
08:54:57 PM Sep 26, 2024
Frequency
Auto Tune
Center Freq
2.510000000 GHz
Start Freq
2.470000000 GHz
Stop Freq
2.550000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
Ref Offset 11.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr4 2.484 40 GHz
-38.582 dBm
Start 2.47000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 2.55000 GHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 2.479 92 GHz -1.660 dBm
2 N 1 f 2.483 50 GHz -40.260 dBm
3 N 1 f 2.500 00 GHz -40.820 dBm
4 N 1 f 2.484 40 GHz -38.582 dBm