

## Appendix A

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

Product Name: Bluetooth music transmitter

Trade Mark: ZIOCOM

Test Model: ZM004879

FCC ID: RCT-ZM004879

### Environmental Conditions

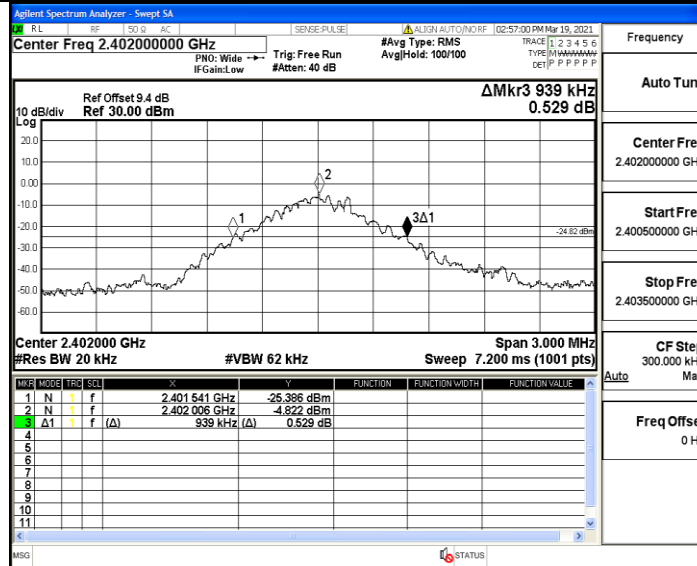
|                    |           |
|--------------------|-----------|
| Temperature:       | 22.8° C   |
| Relative Humidity: | 56%       |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Nancy Li  |
| Supervised by:     | Hugo Chen |

#### A.1 20 dB Bandwidth

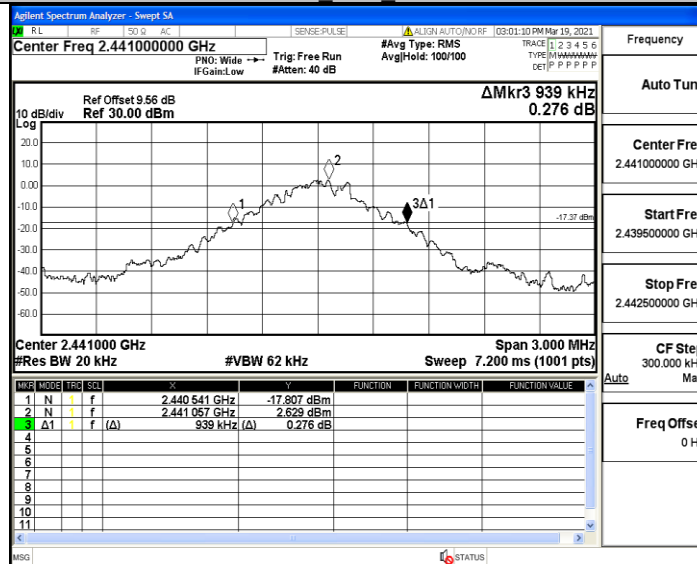
| TestMode | Antenna | Channel | 20db EBW[MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|---------|---------------|----------|----------|------------|---------|
| DH5      | Ant1    | 2402    | 0.939         | 2401.541 | 2402.480 | ---        | PASS    |
|          |         | 2441    | 0.939         | 2440.541 | 2441.480 | ---        | PASS    |
|          |         | 2480    | 0.939         | 2479.538 | 2480.477 | ---        | PASS    |
| 2DH5     | Ant1    | 2402    | 1.218         | 2401.385 | 2402.603 | ---        | PASS    |
|          |         | 2441    | 1.329         | 2440.334 | 2441.663 | ---        | PASS    |
|          |         | 2480    | 1.230         | 2479.373 | 2480.603 | ---        | PASS    |
| 3DH5     | Ant1    | 2402    | 1.248         | 2401.367 | 2402.615 | ---        | PASS    |
|          |         | 2441    | 1.275         | 2440.355 | 2441.630 | ---        | PASS    |
|          |         | 2480    | 1.275         | 2479.355 | 2480.630 | ---        | PASS    |

## Test Graph

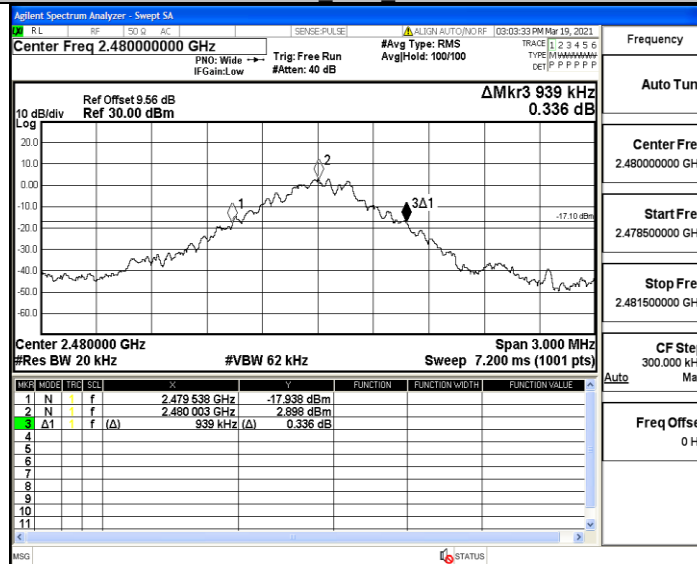
DH5\_Ant1\_2402



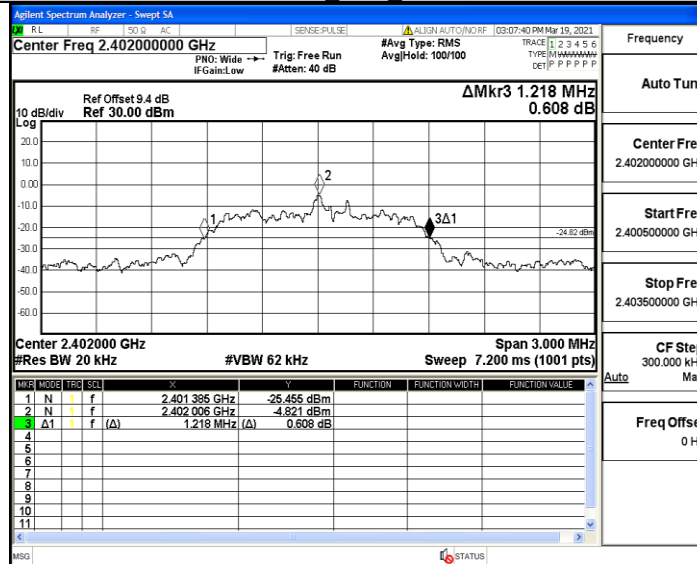
DH5\_Ant1\_2441



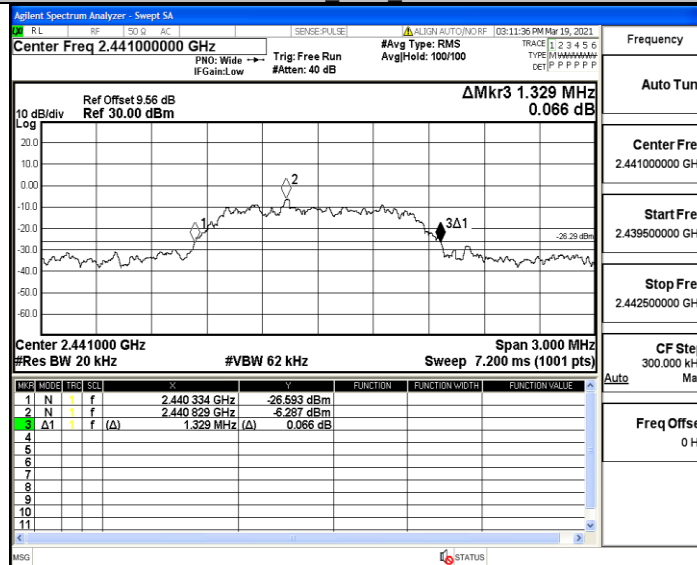
DH5\_Ant1\_2480



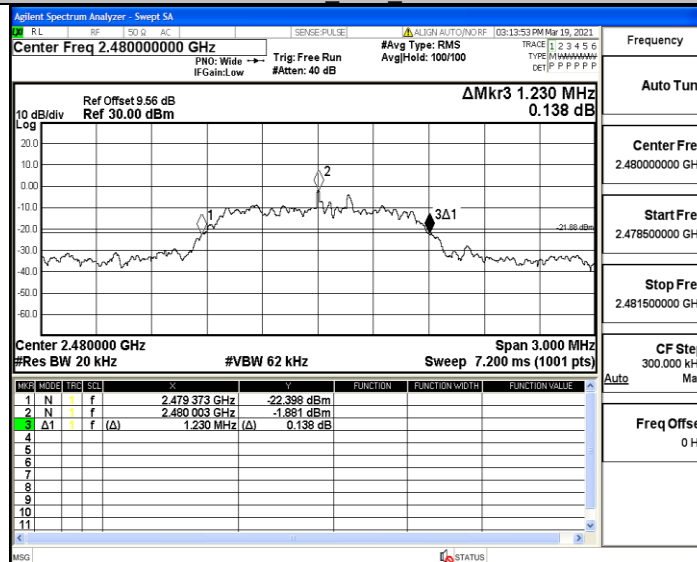
## 2DH5\_Ant1\_2402



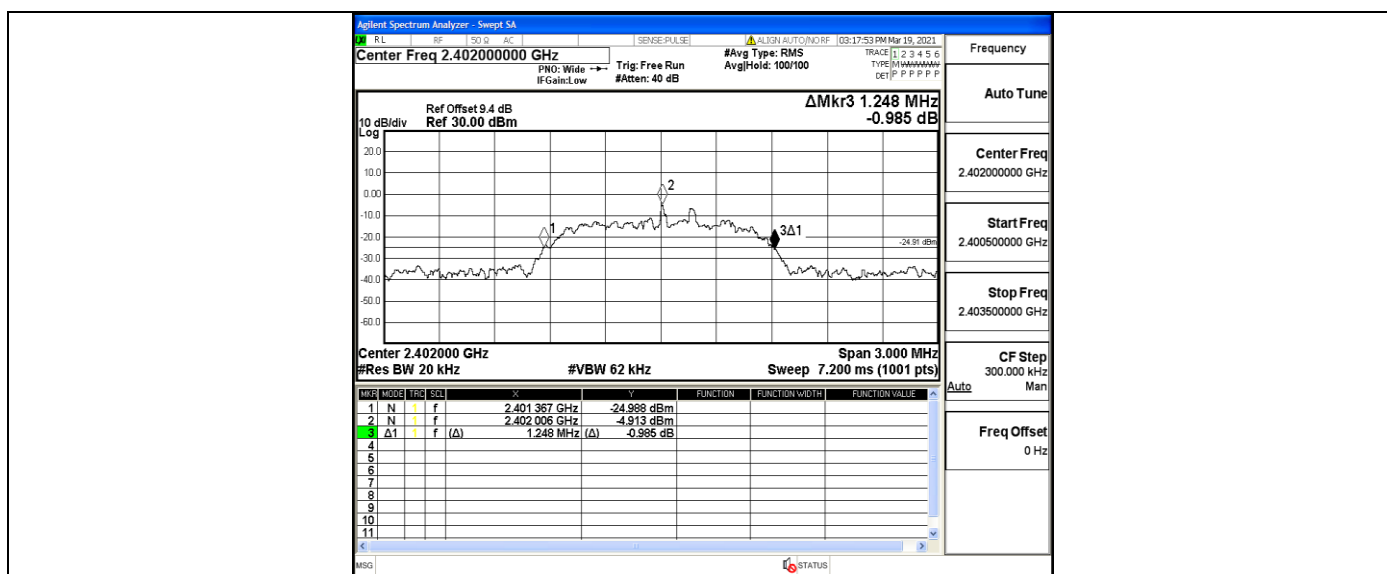
## 2DH5\_Ant1\_2441



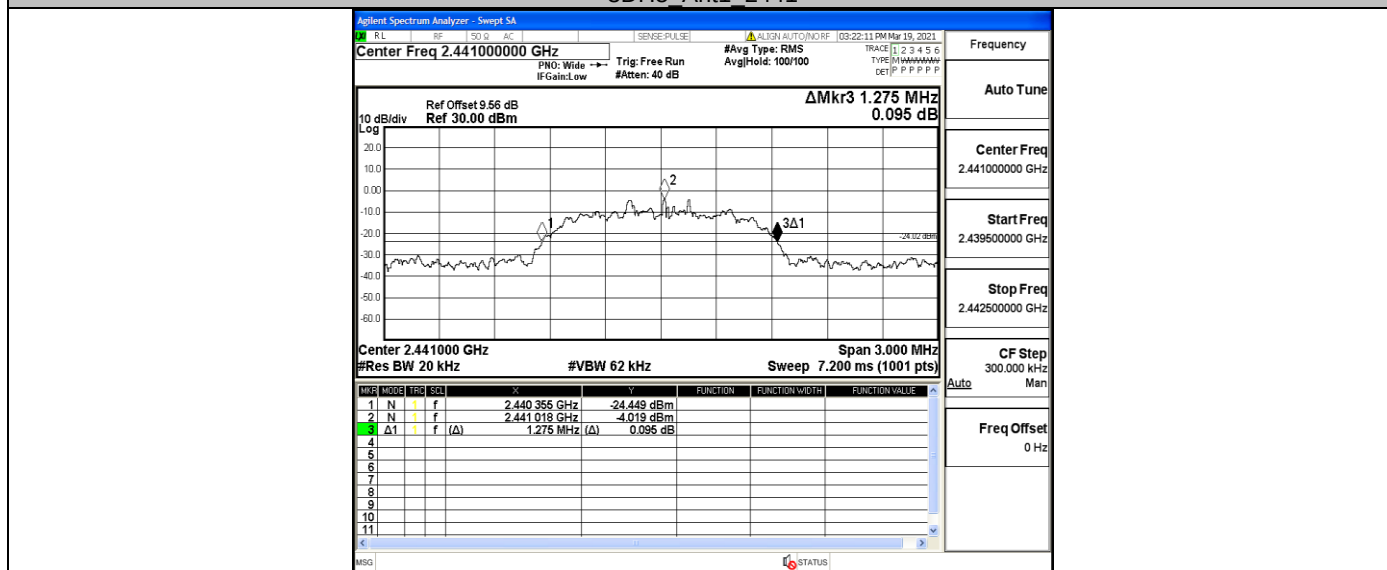
## 2DH5\_Ant1\_2480



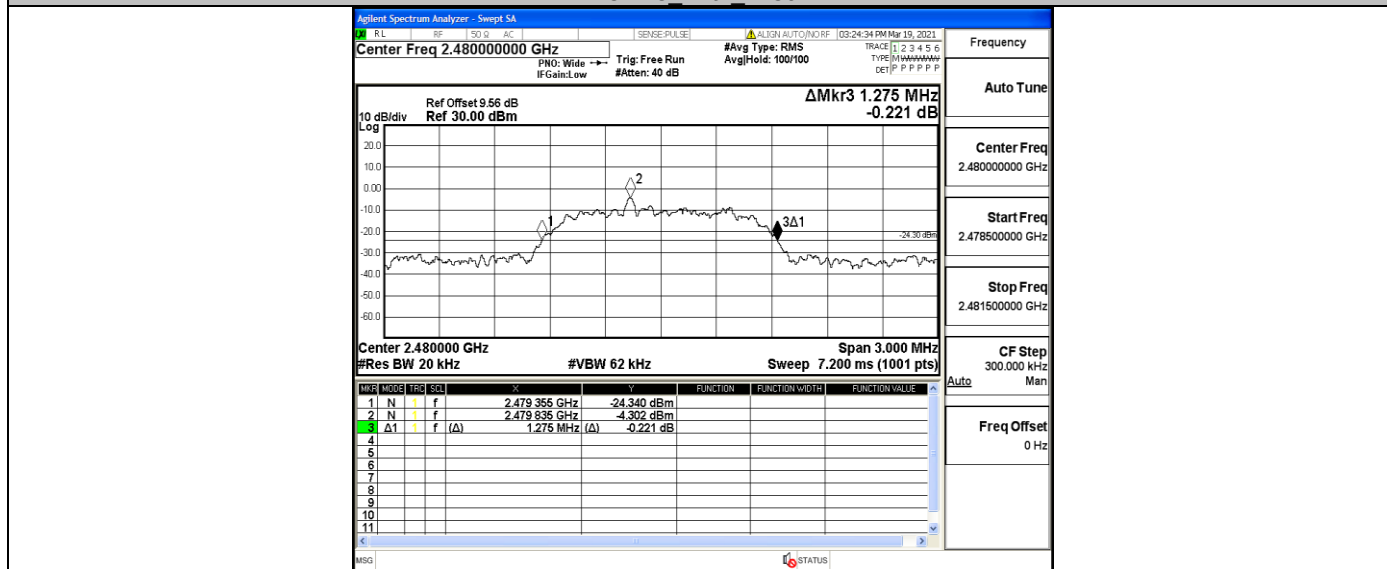
## 3DH5\_Ant1\_2402



## 3DH5 Ant1 2441



## 3DH5 Ant1 2480

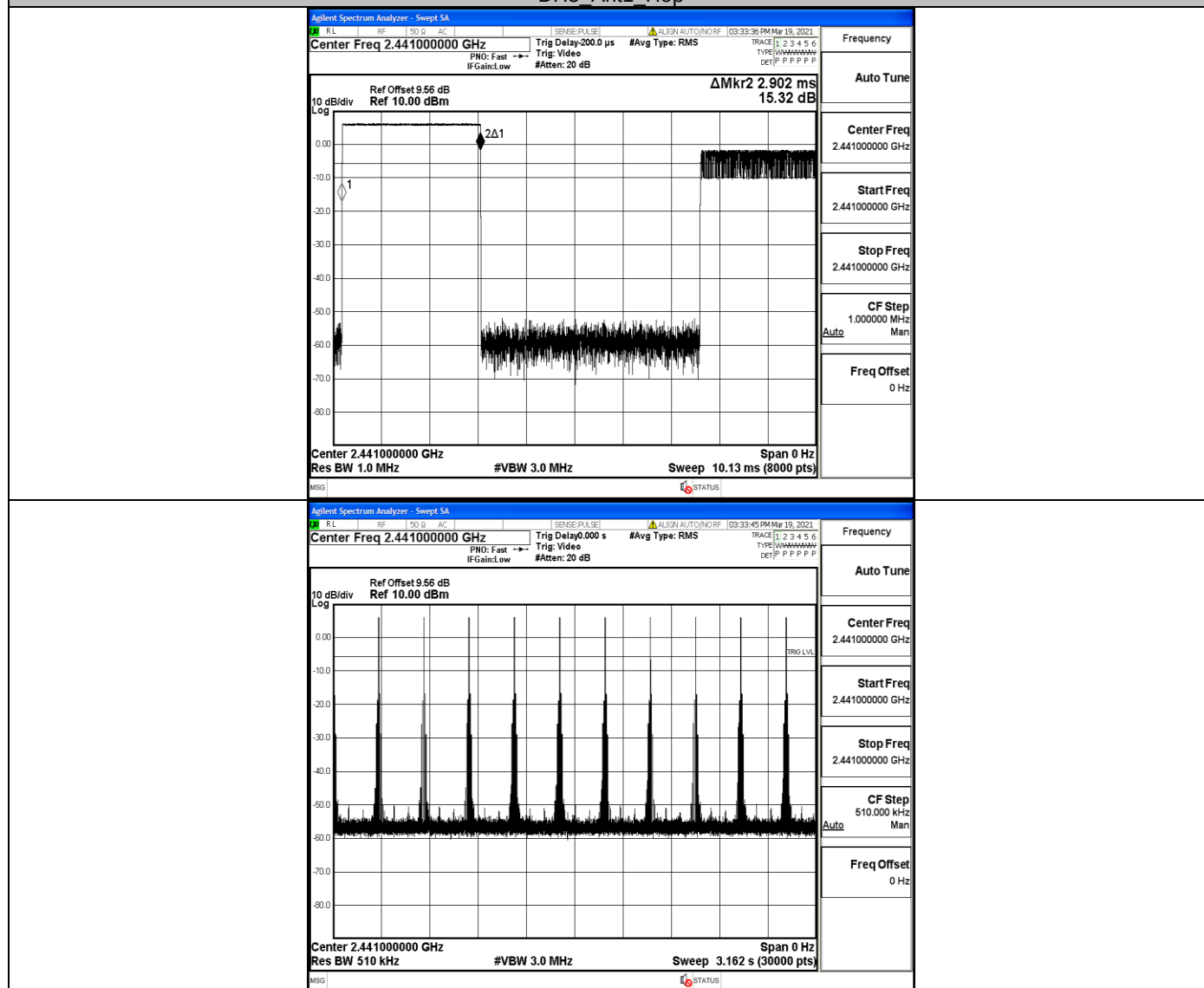


**A.2 Dwell Time**

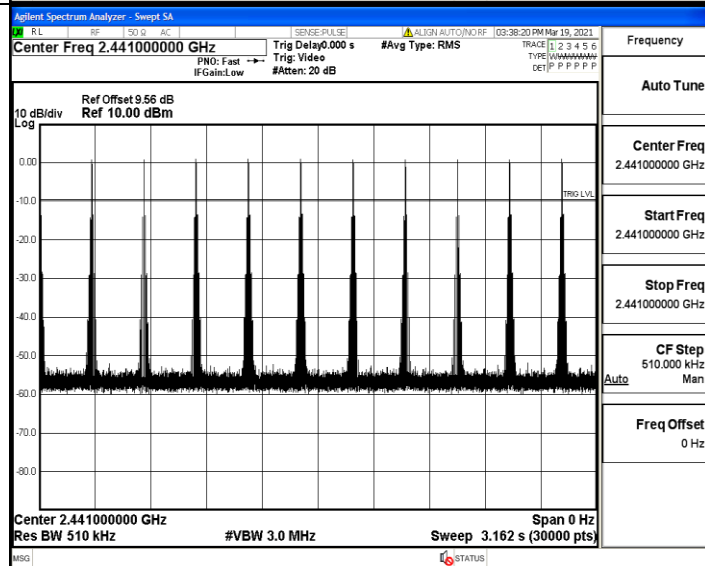
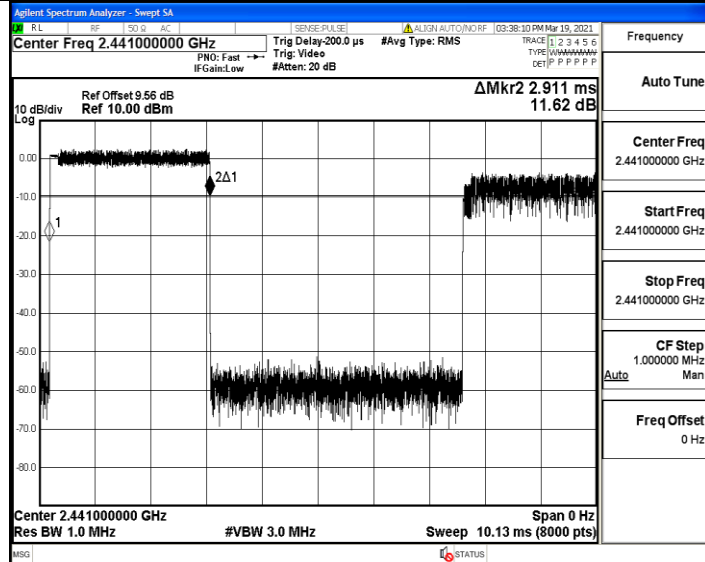
| TestMode | Antenna | Channel | BurstWidth<br>[ms] | TotalHops<br>[Num] | Result[s] | Limit[s] | Verdict |
|----------|---------|---------|--------------------|--------------------|-----------|----------|---------|
| DH5      | Ant1    | Hop     | 2.90               | 110                | 0.319     | <=0.4    | PASS    |
| 2DH5     | Ant1    | Hop     | 2.91               | 110                | 0.32      | <=0.4    | PASS    |
| 3DH5     | Ant1    | Hop     | 2.91               | 110                | 0.32      | <=0.4    | PASS    |

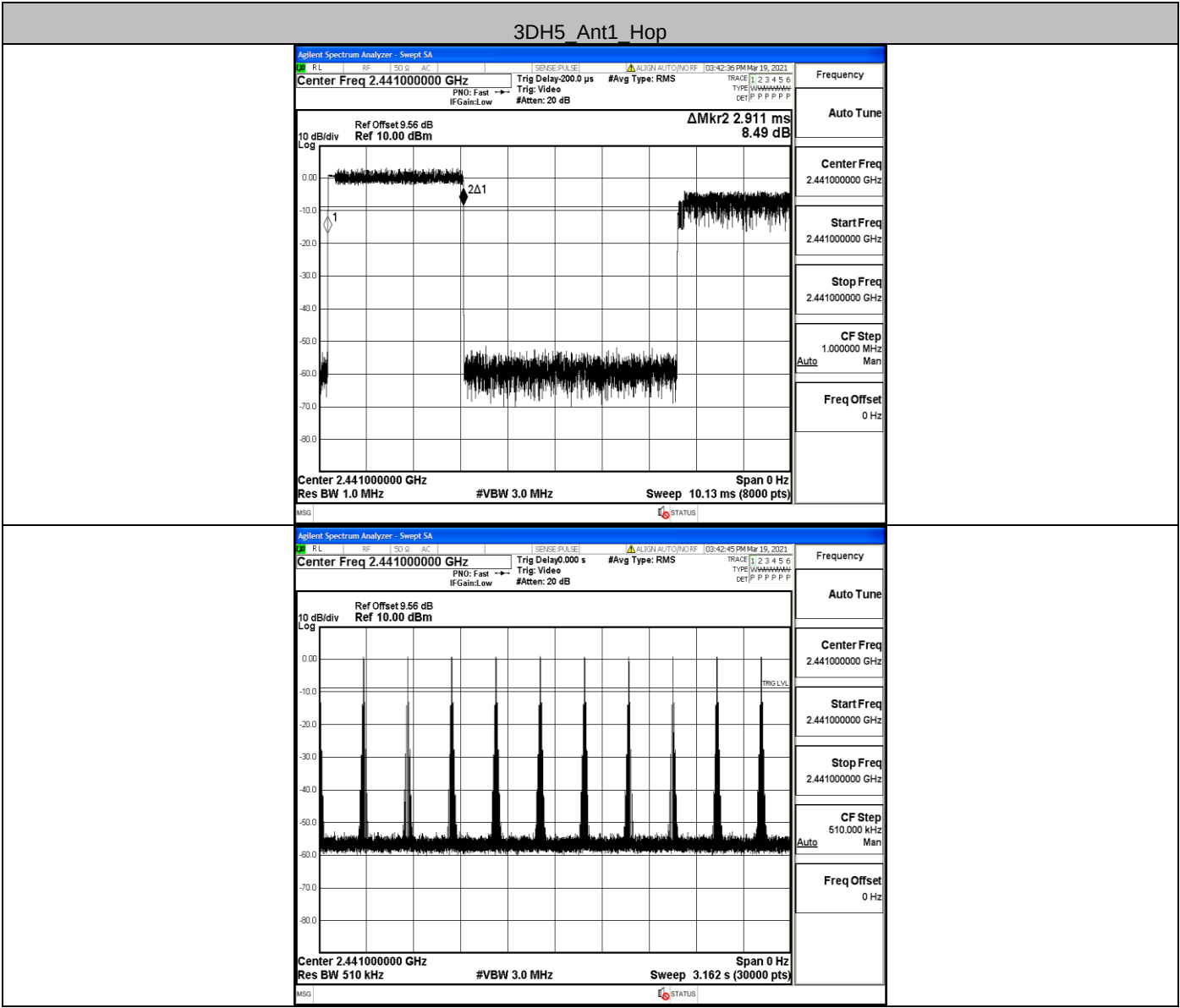
## Test Graph

DH5\_Ant1\_Hop



## 2DH5\_Ant1\_Hop



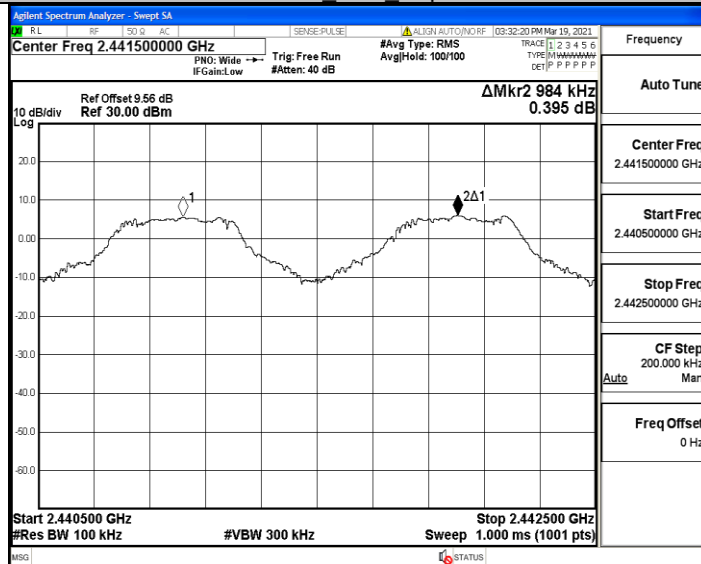


### A.3 Carrier Frequency Separation

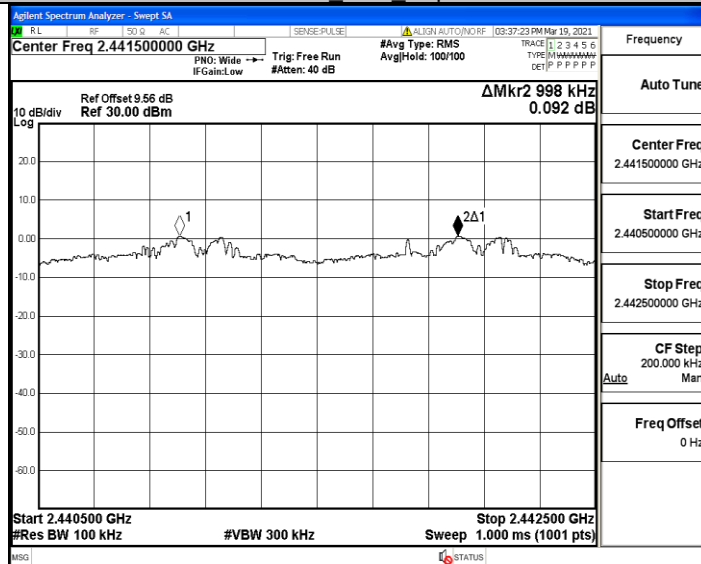
| TestMode | Antenna | Channel | Result[MHz] | Limit[MHz]   | Verdict |
|----------|---------|---------|-------------|--------------|---------|
| DH5      | Ant1    | Hop     | 0.984       | $\geq 0.939$ | PASS    |
| 2DH5     | Ant1    | Hop     | 0.998       | $\geq 0.886$ | PASS    |
| 3DH5     | Ant1    | Hop     | 0.992       | $\geq 0.850$ | PASS    |

## Test Graph

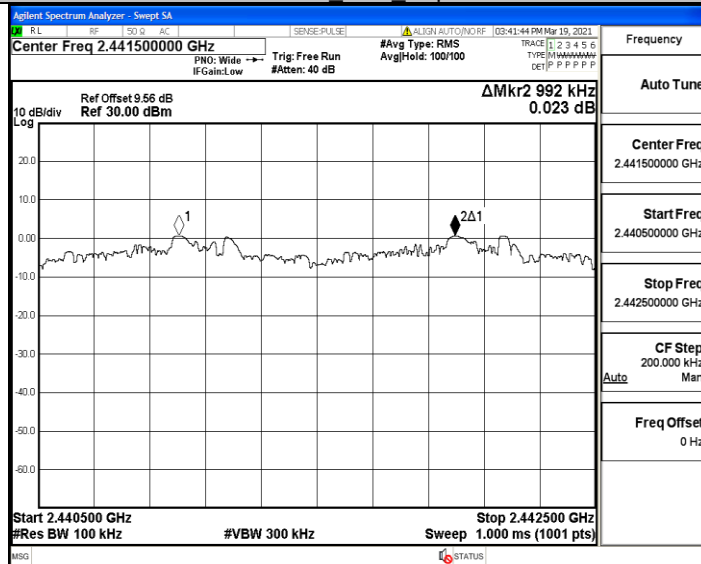
DH5\_Ant1\_Hop



2DH5\_Ant1\_Hop



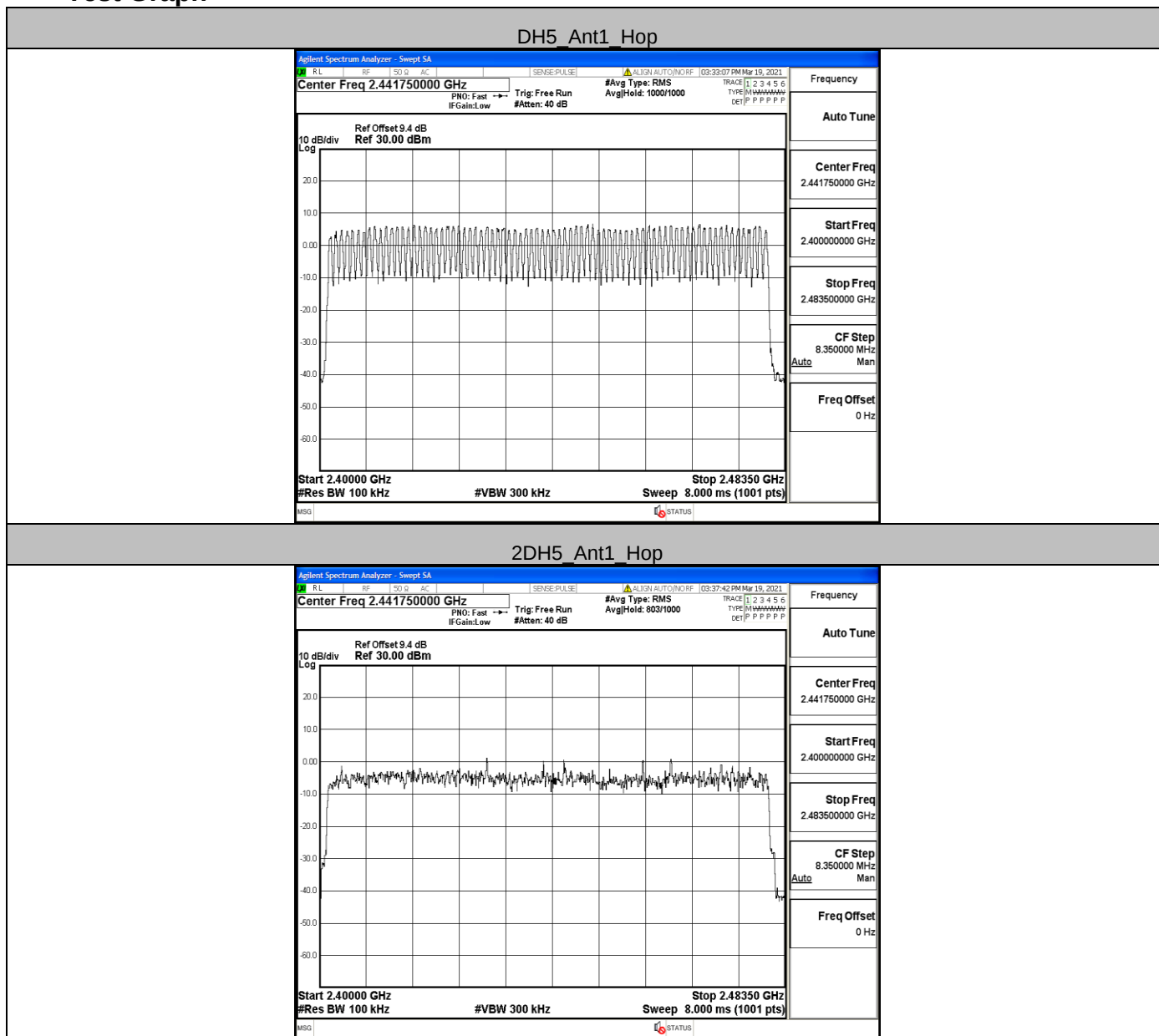
3DH5\_Ant1\_Hop

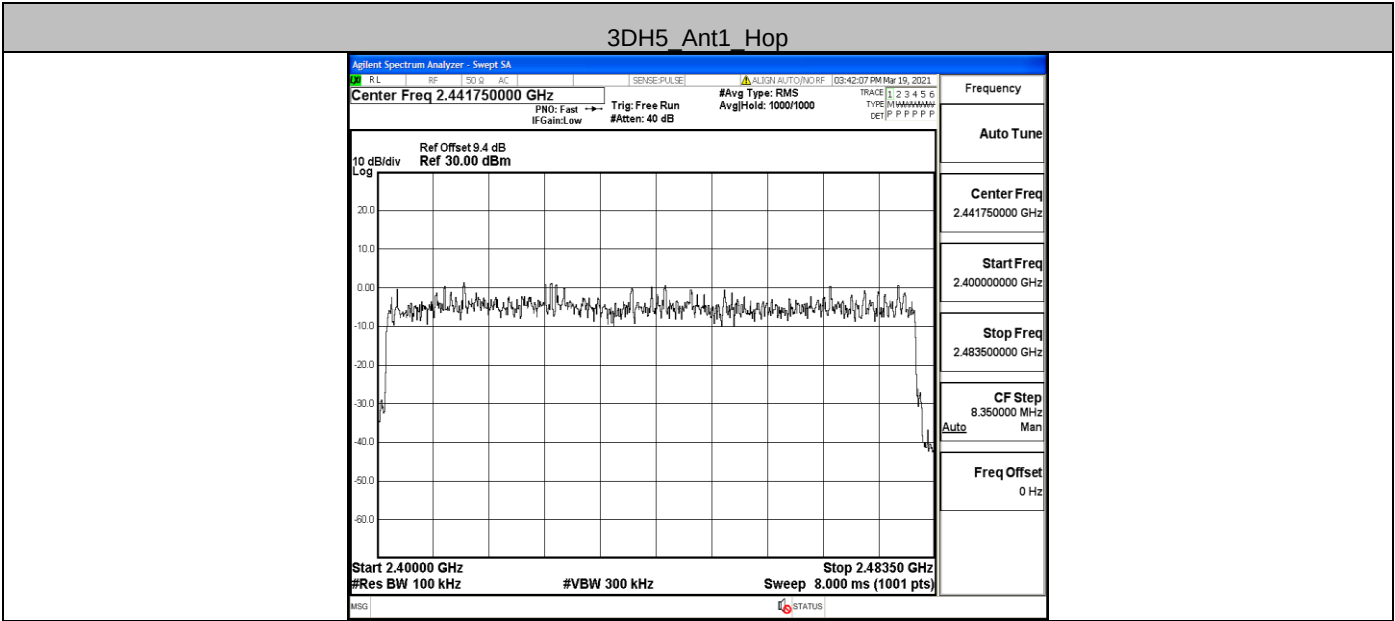


## A.4 Hopping Channel Number

| TestMode | 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 Graph



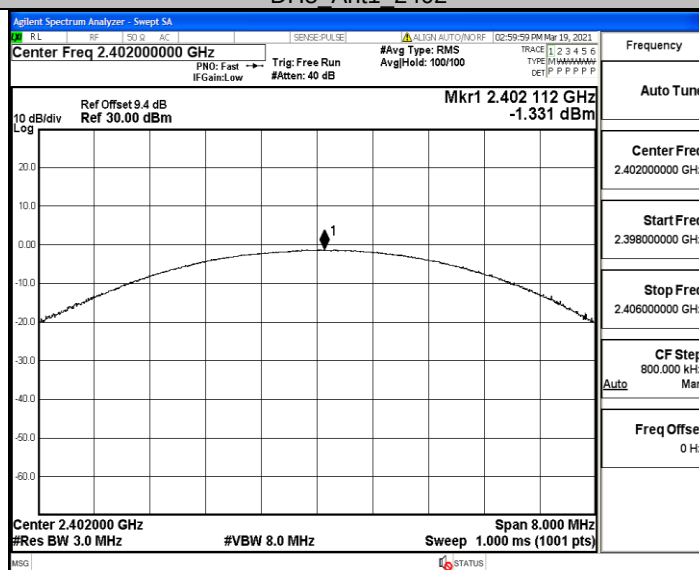


**A.5 Conducted Peak Output Power**

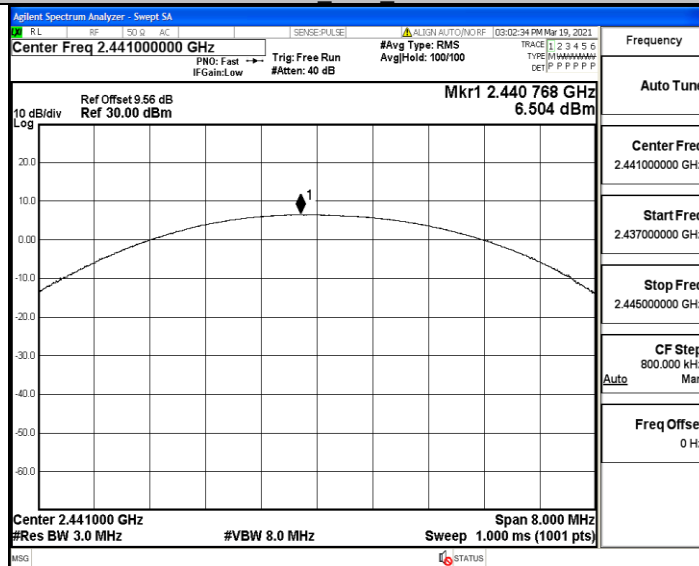
| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| DH5      | Ant1    | 2402    | -1.33       | <=20.97    | PASS    |
|          |         | 2441    | 6.5         | <=20.97    | PASS    |
|          |         | 2480    | 6.78        | <=20.97    | PASS    |
| 2DH5     | Ant1    | 2402    | 0.69        | <=20.97    | PASS    |
|          |         | 2441    | 3.42        | <=20.97    | PASS    |
|          |         | 2480    | 3.6         | <=20.97    | PASS    |
| 3DH5     | Ant1    | 2402    | 1.3         | <=20.97    | PASS    |
|          |         | 2441    | 4.08        | <=20.97    | PASS    |
|          |         | 2480    | 4.18        | <=20.97    | PASS    |

**Test Graph**

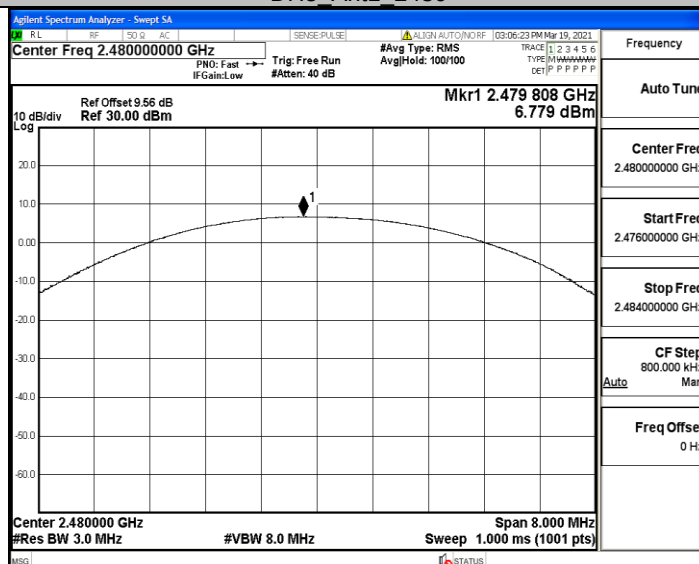
DH5 Ant1 2402



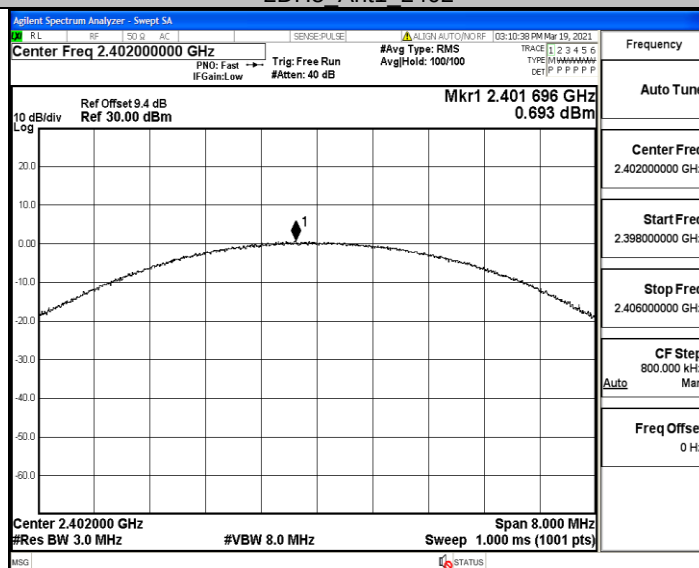
DH5 Ant1 2441



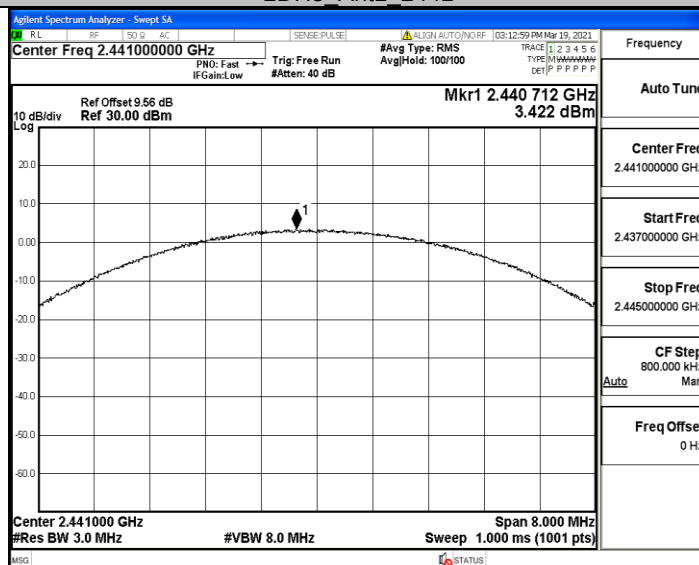
## DH5 Ant1\_2480



## 2DH5 Ant1\_2402



## 2DH5 Ant1\_2441



Agilent Spectrum Analyzer - Sweep SA

IF IL IF SO G AC SENSE:PLANE

Center Freq 2.480000000 GHz

Ref Offset 9.56 dB

Ref 30.00 dBm

Trig: Free Run

#Attenu: 40 dB

#Avg Type: RMS

Avg/Hold: 100/100

Mkr1 2.479 904 GHz

3.603 dBm

Span 8.000 MHz

#Res BW 3.0 MHz

#VBW 8.0 MHz

Sweep 1.000 ms (1001 pts)

Frequency

Auto Tun

Center Freq

2.480000000 GHz

Start Freq

2.476000000 GHz

Stop Freq

2.484000000 GHz

CF Step

800.000 kHz

Auto

Freq Offset

0 Hz

Agilent Spectrum Analyzer - Sweep SA

RL RF SO G AC SENSE/USE

Center Freq 2.402000000 GHz

Ref Offset 9.4 dB  
Ref 30.00 dBm

Trig: Free Run  
#Atten: 40 dB

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

Trace 1: 2 3 4 5 6  
Type: Normal  
Det: P P P P P P

Frequency

Auto Tun

Mkr1 2.402 096 GHz  
1.297 dBm

10 dB/div  
Log

Ref Offset 9.4 dB  
Ref 30.00 dBm

Mkr1 2.402 096 GHz  
1.297 dBm

Center Freq  
2.402000000 GHz

Start Freq  
2.398000000 GHz

Stop Freq  
2.406000000 GHz

CF Step  
800.000 kHz  
Auto

Freq Offset  
0 Hz

Center 2.402000 GHz  
#Res BW 3.0 MHz

#VBW 8.0 MHz

Span 8.000 MHz  
Sweep 1.000 ms (1001 pts)

use1

STATUS

Agilent Spectrum Analyzer - Swept SA

RL RF SO G AC SENSE:PLA SE ALIGN AUTO INORF 03:23:34 PM Mar 19, 2021

Center Freq 2.441000000 GHz #Avg Type: RMS AvgHold: 100/100

PNG: Fast Trig: Free Run #Atten: 40 dB

TRACE 1 2 3 4 5 6 TYPE:RAW WAVE DET:PPPP P

Frequency Auto Tuning

Center Freq 2.441000000 GHz

Start Freq 2.437000000 GHz

Stop Freq 2.445000000 GHz

CF Step 800.000 kHz

Auto

Freq Offset 0 Hz

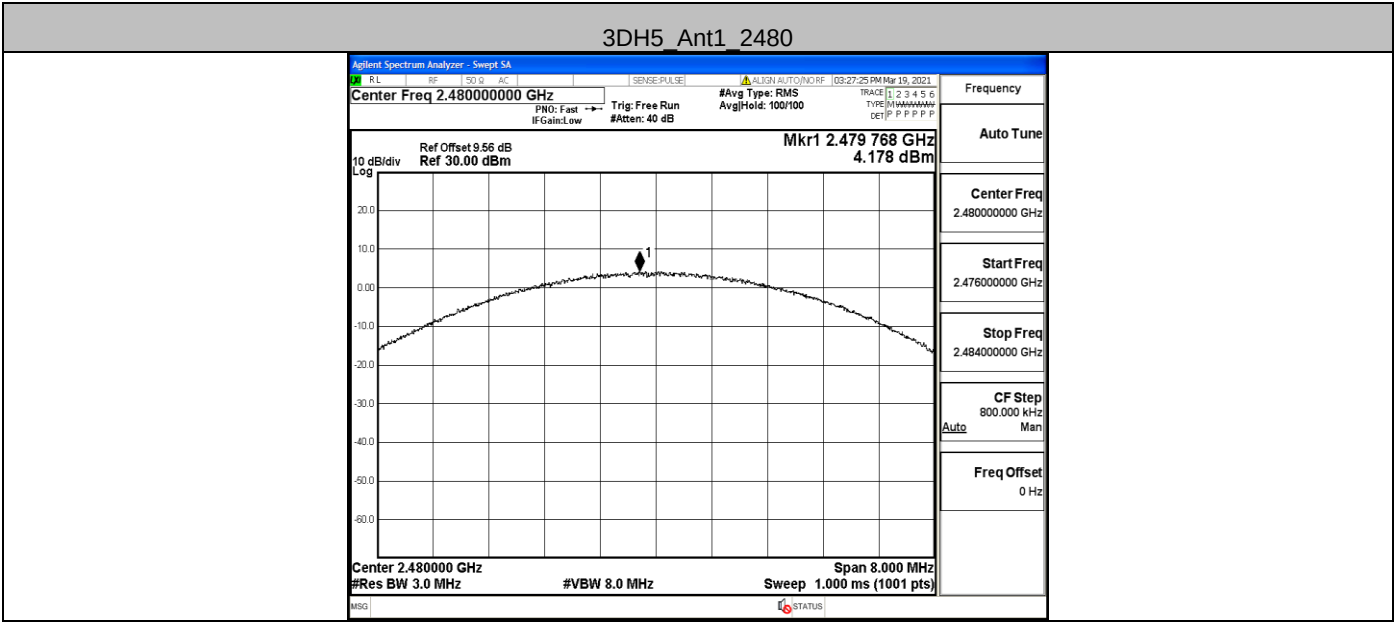
10 dB/div Ref Offset 9.56 dB Mkr1 2.440 896 GHz

Log Ref 30.00 dBm 4.078 dBm

Center 2.441000 GHz Span 8.000 MHz

#Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.000 ms (1001 pts)

usm

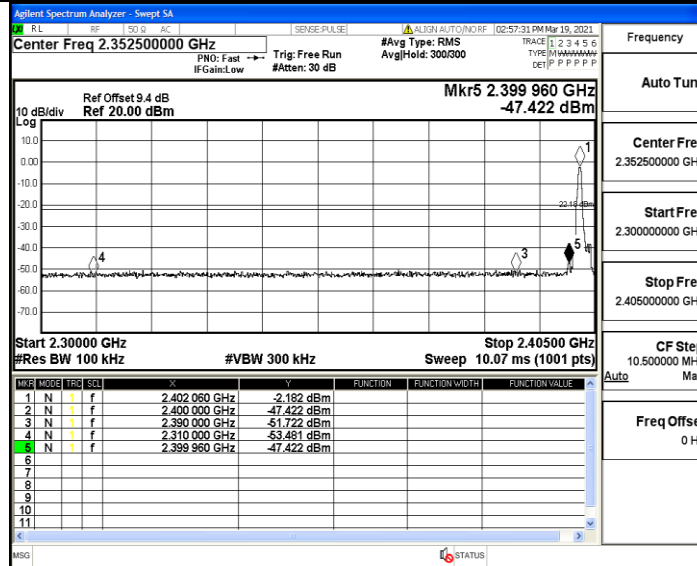


**A.6 Band-edge for RF Conducted Emissions**

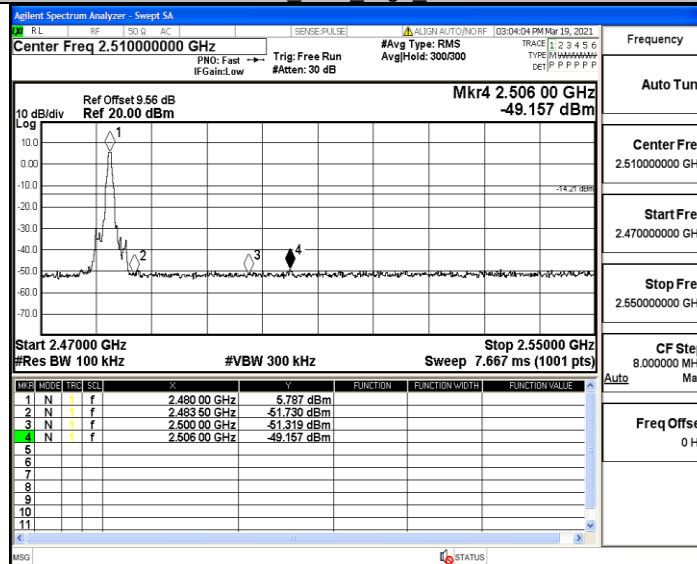
| TestMode | Antenna | ChName | Channel  | RefLevel<br>[dBm] | Result<br>[dBm] | Limit<br>[dBm] | Verdict |
|----------|---------|--------|----------|-------------------|-----------------|----------------|---------|
| DH5      | Ant1    | Low    | 2402     | -2.18             | -47.42          | <=-22.18       | PASS    |
|          |         | High   | 2480     | 5.79              | -49.16          | <=-14.21       | PASS    |
|          |         | Low    | Hop_2402 | 4.77              | -46.52          | <=-15.23       | PASS    |
|          |         | High   | Hop_2480 | 6.30              | -45.78          | <=-13.71       | PASS    |
| 2DH5     | Ant1    | Low    | 2402     | -2.42             | -39.47          | <=-22.43       | PASS    |
|          |         | High   | 2480     | 0.87              | -48.78          | <=-19.13       | PASS    |
|          |         | Low    | Hop_2402 | -5.31             | -49.19          | <=-25.31       | PASS    |
|          |         | High   | Hop_2480 | 0.35              | -48.82          | <=-19.65       | PASS    |
| 3DH5     | Ant1    | Low    | 2402     | -2.10             | -40.4           | <=-22.1        | PASS    |
|          |         | High   | 2480     | 1.03              | -48.87          | <=-18.97       | PASS    |
|          |         | Low    | Hop_2402 | -2.82             | -49.55          | <=-22.82       | PASS    |
|          |         | High   | Hop_2480 | -2.81             | -48.74          | <=-22.81       | PASS    |

## Test Graph

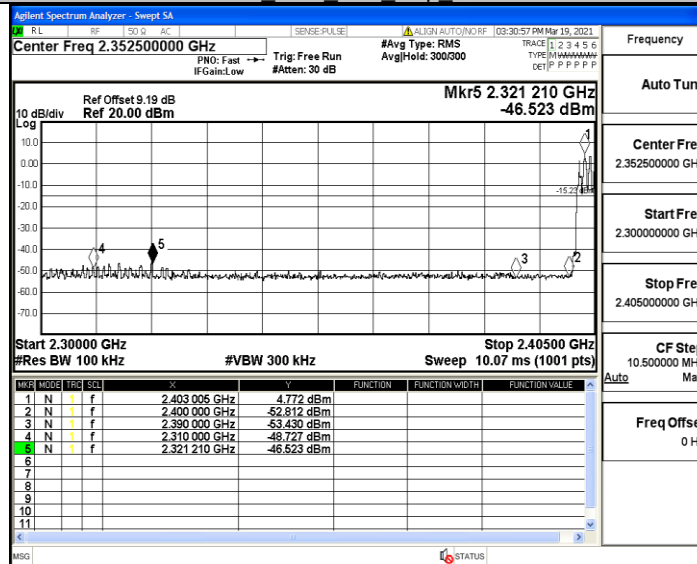
DH5\_Ant1\_Low\_2402



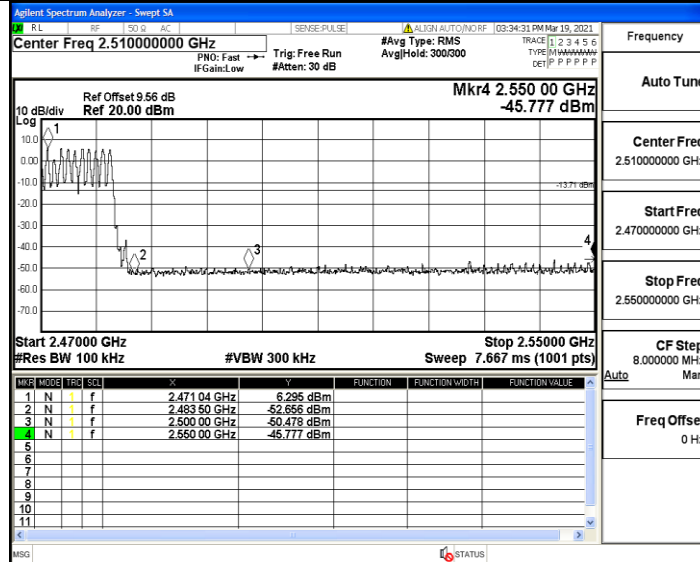
DH5\_Ant1\_High\_2480



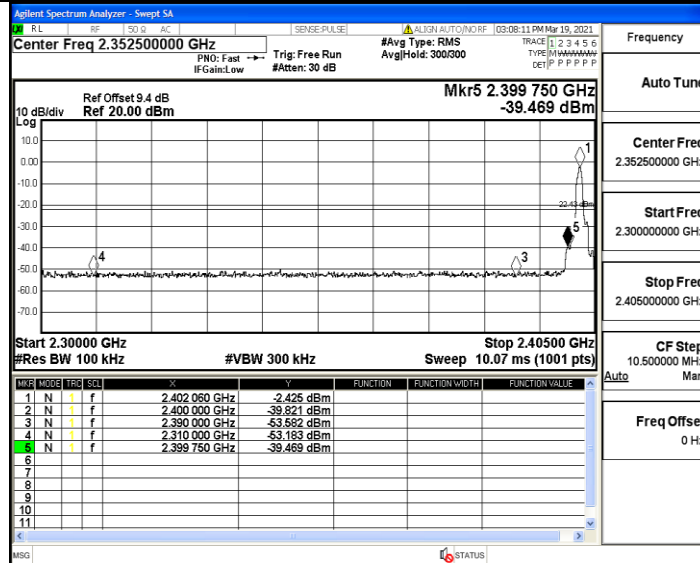
DH5\_Ant1\_Low\_Hop\_2402



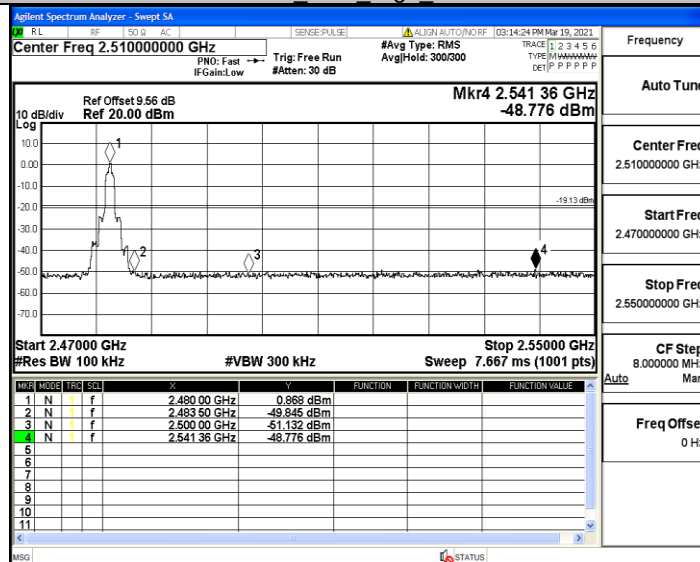
## DH5 Ant1 High Hop 2480



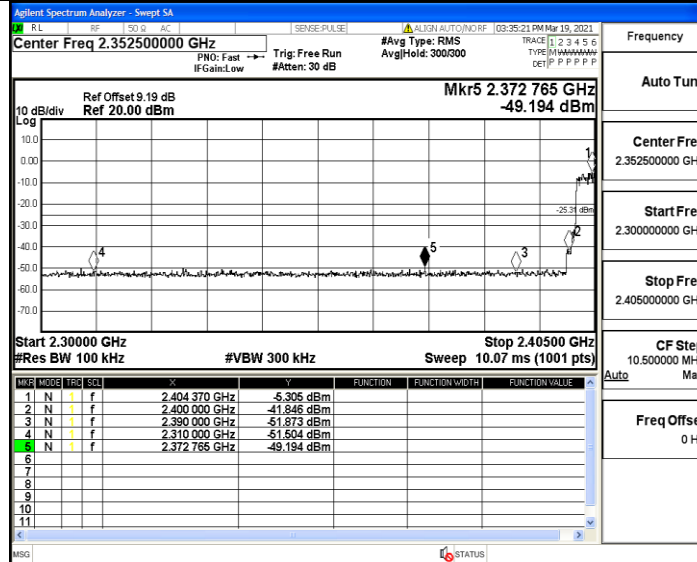
## 2DH5 Ant1 Low 2402



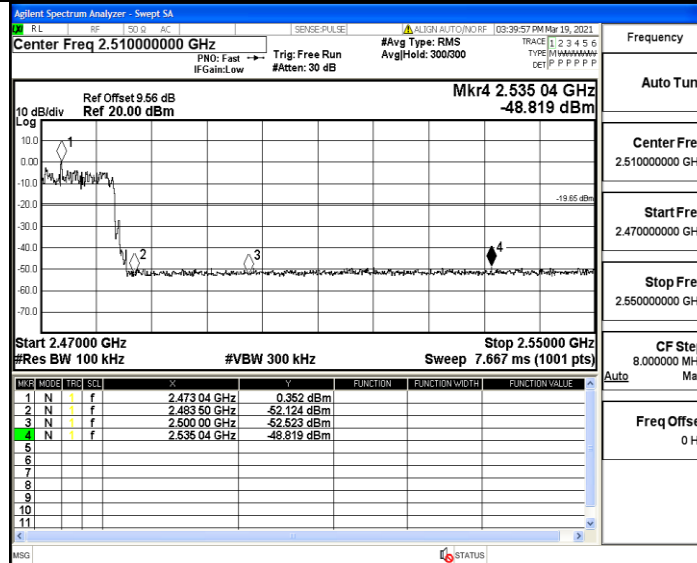
## 2DH5 Ant1 High 2480



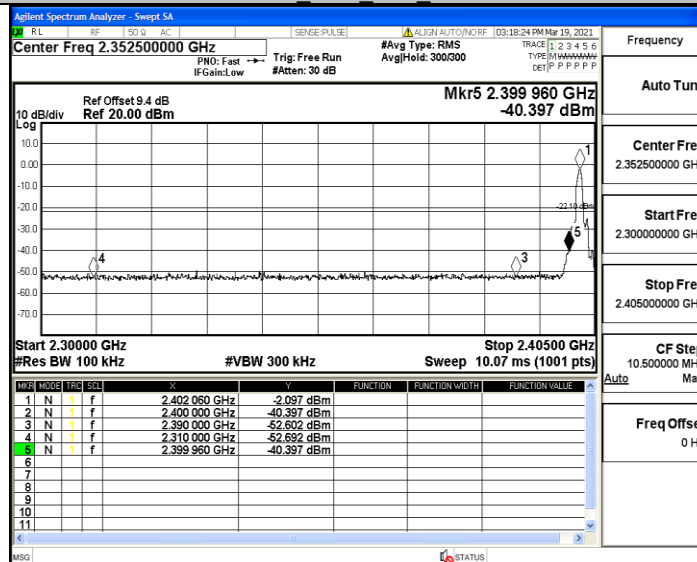
## 2DH5 Ant1 Low Hop 2402



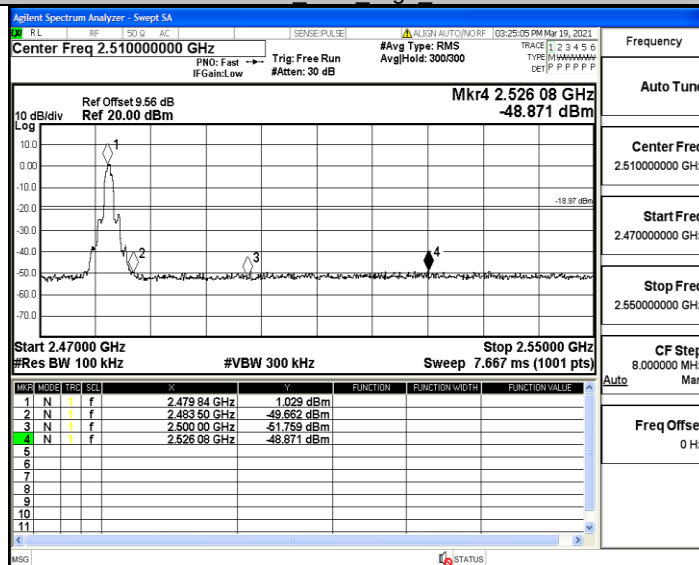
## 2DH5 Ant1 High Hop 2480



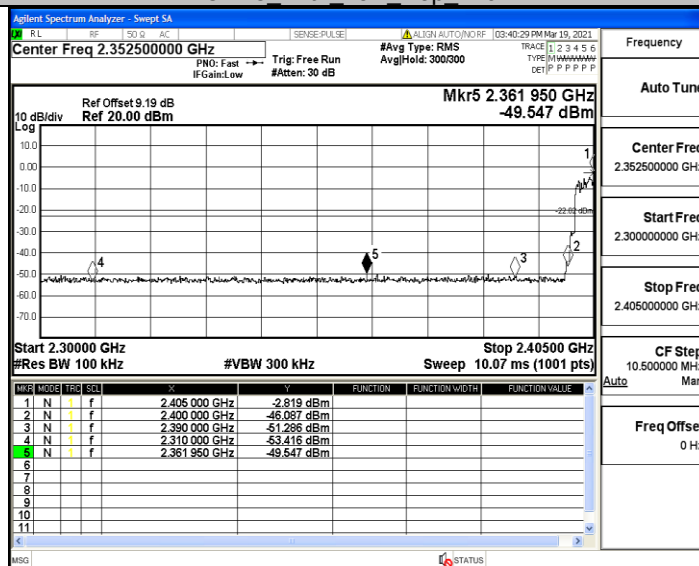
## 3DH5 Ant1 Low 2402



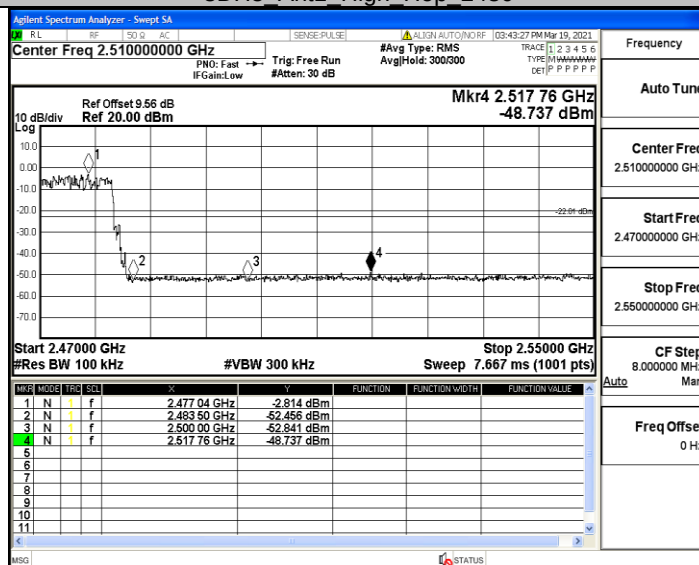
## 3DH5 Ant1\_High 2480



## 3DH5 Ant1\_Low Hop 2402



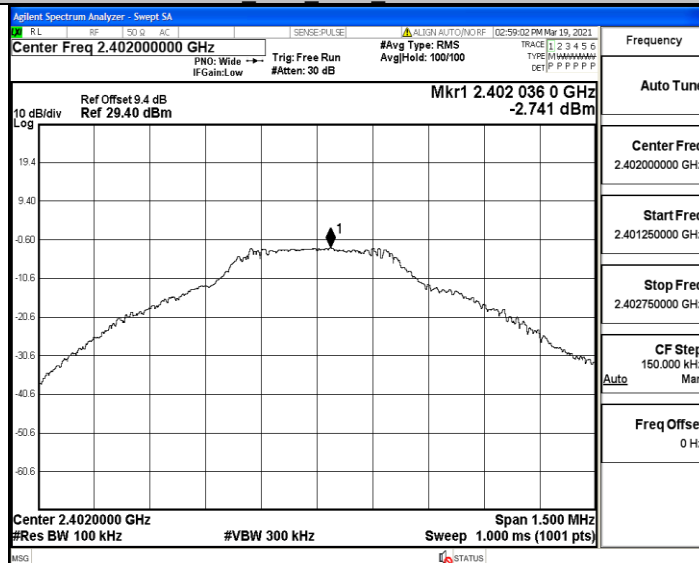
## 3DH5 Ant1\_High Hop 2480



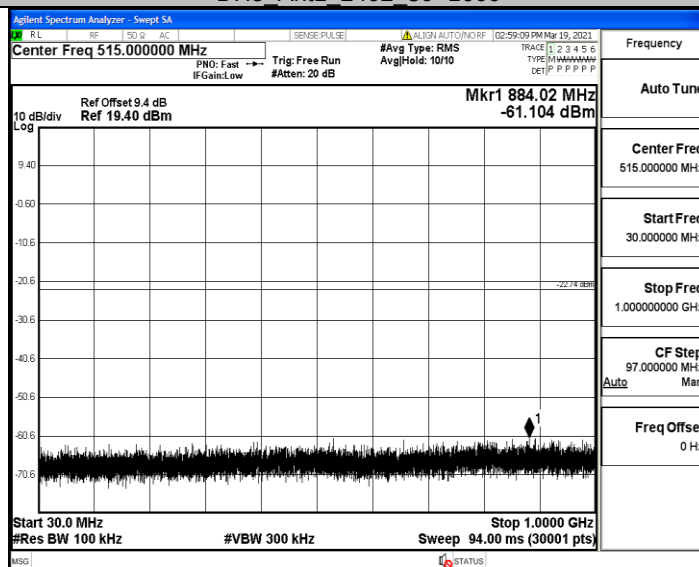
## A.7 RF Conducted Spurious Emissions

### Test Graph

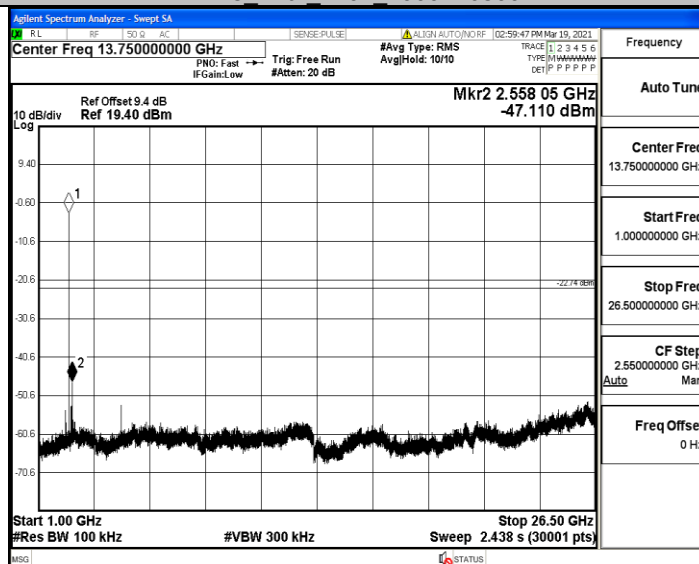
DH5\_Ant1\_2402\_0-Reference



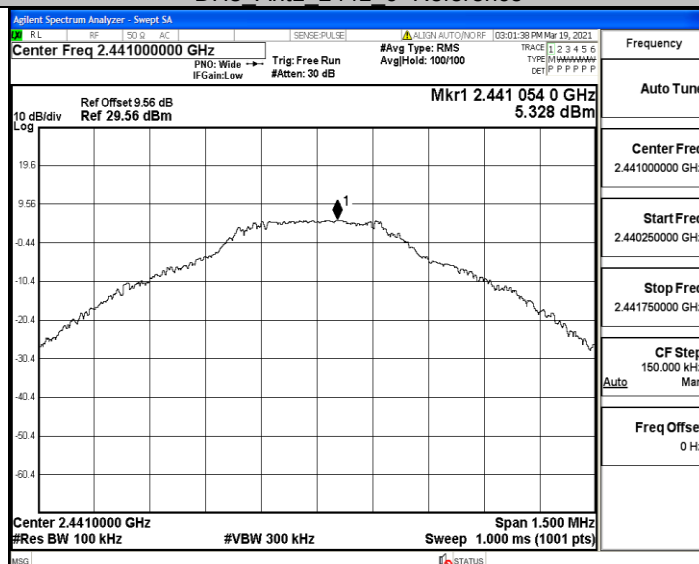
DH5\_Ant1\_2402\_30~1000



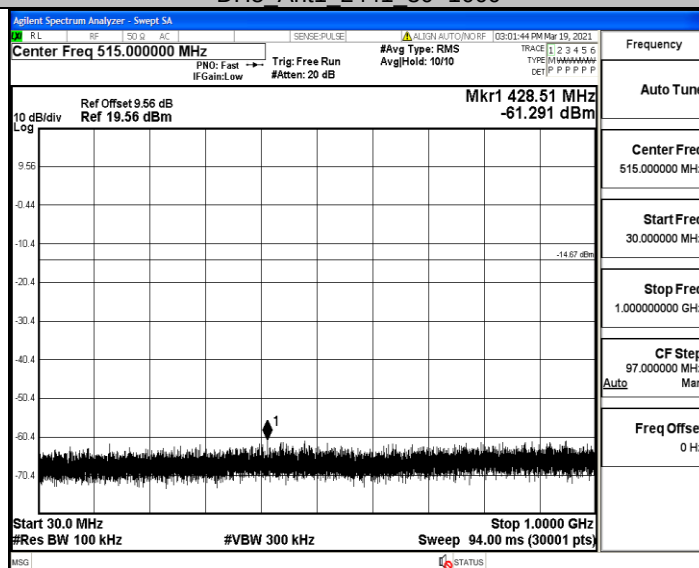
DH5\_Ant1\_2402\_1000~26500



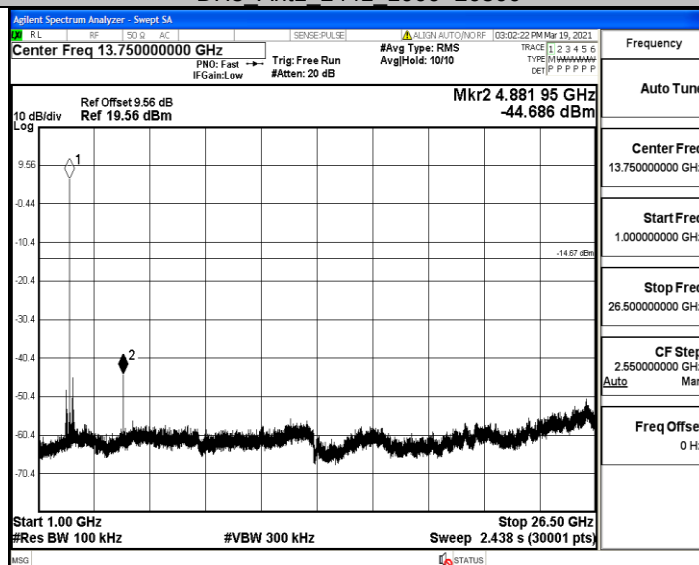
## DH5\_Ant1\_2441\_0-Reference



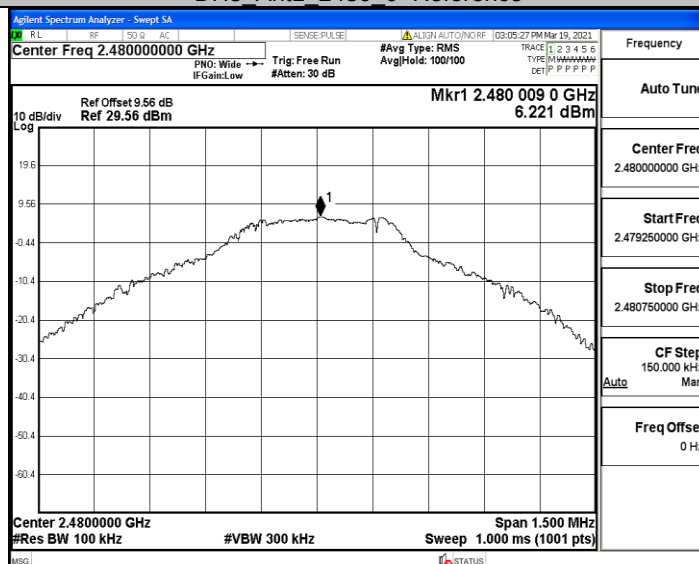
## DH5\_Ant1\_2441\_30~1000



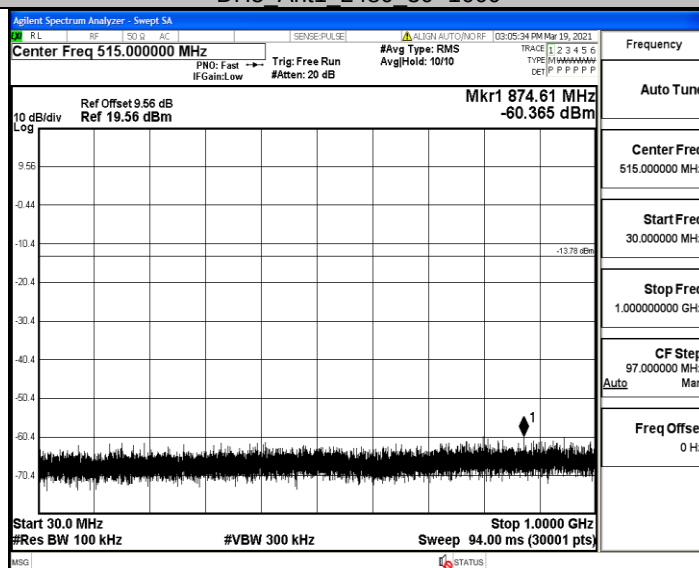
## DH5\_Ant1\_2441\_1000~26500



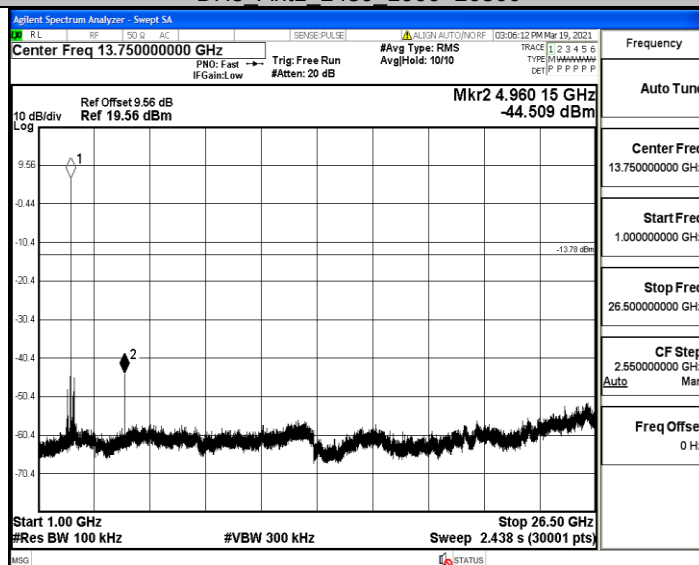
## DH5\_Ant1\_2480\_0-Reference



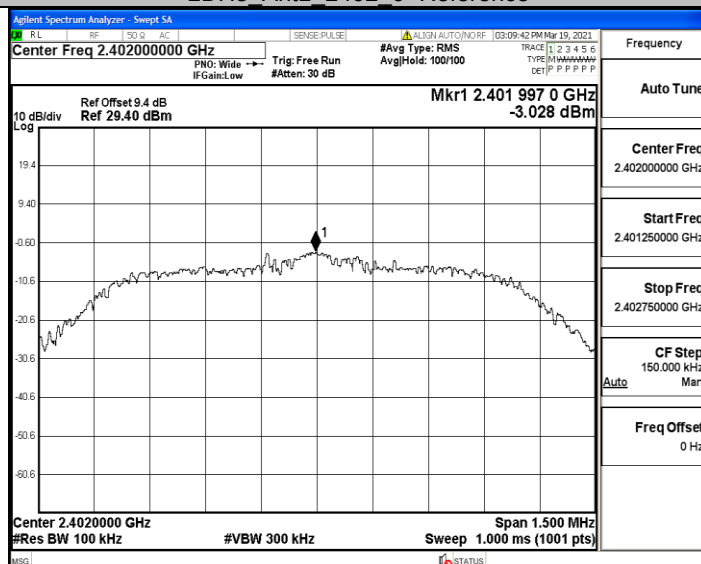
## DH5\_Ant1\_2480\_30~1000



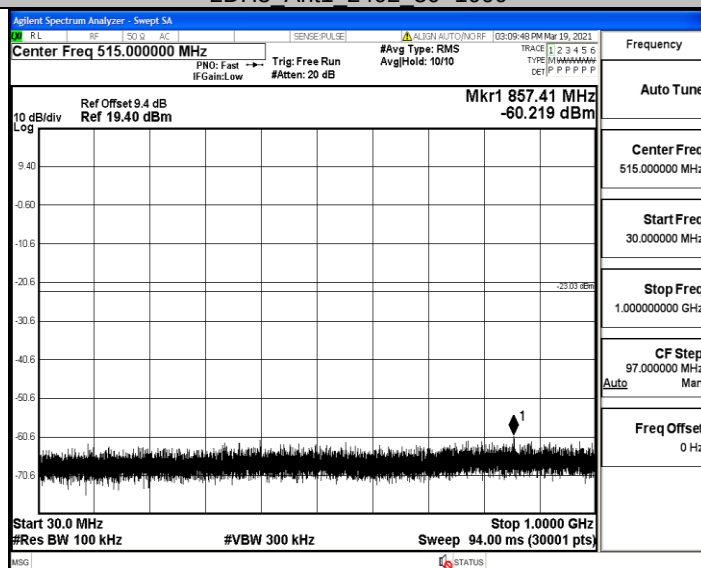
## DH5\_Ant1\_2480\_1000~26500



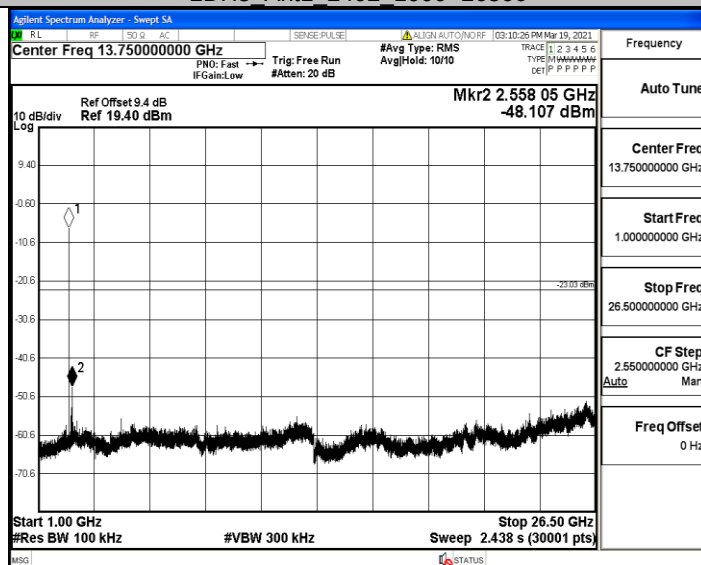
## 2DH5\_Ant1\_2402\_0~Reference



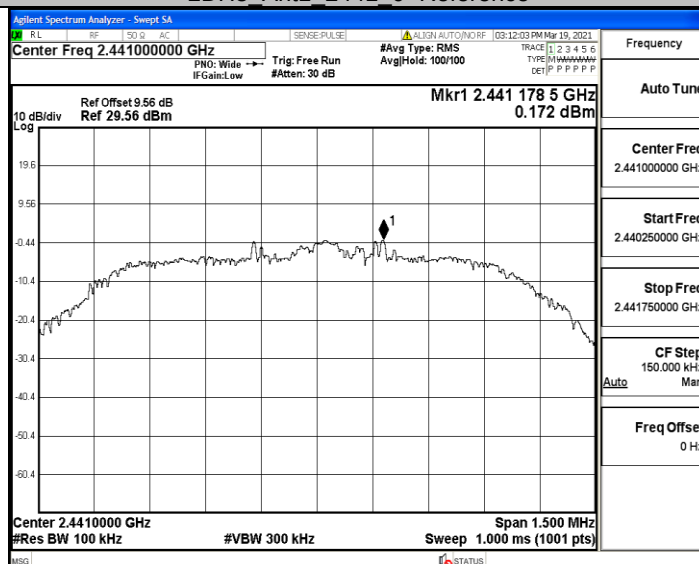
## 2DH5\_Ant1\_2402\_30~1000



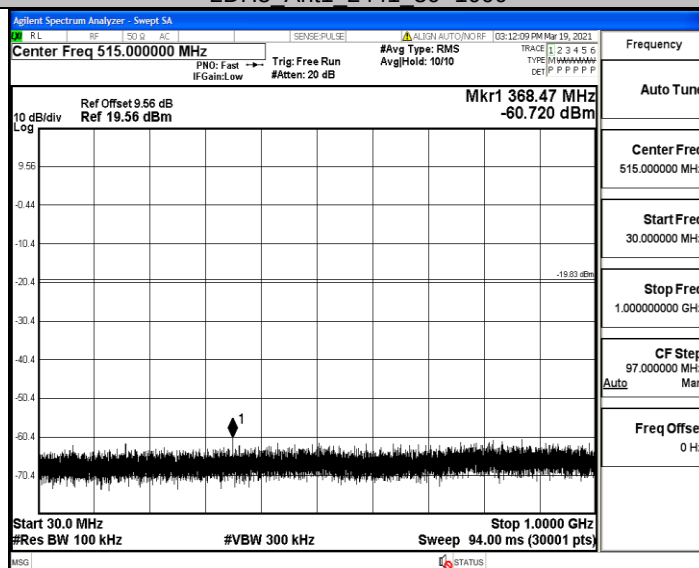
## 2DH5\_Ant1\_2402\_1000~26500



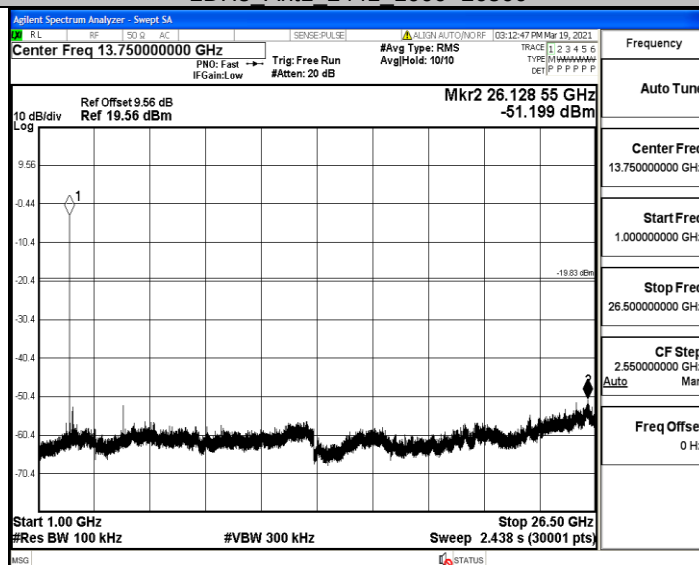
## 2DH5\_Ant1\_2441\_0~Reference



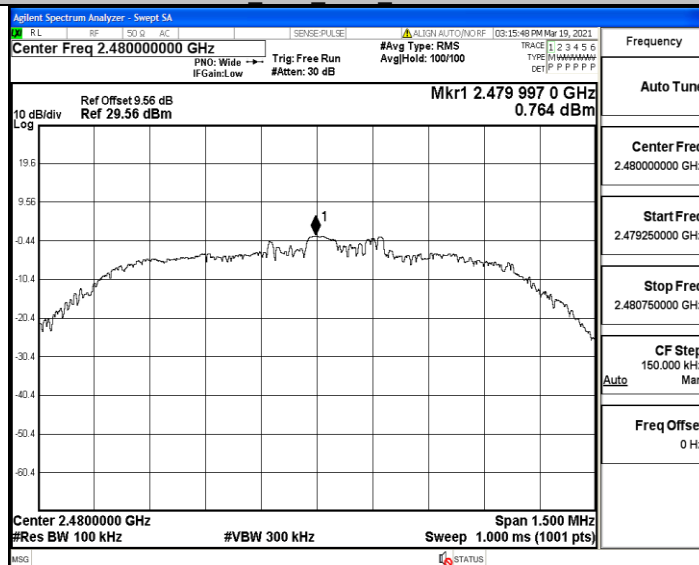
## 2DH5\_Ant1\_2441\_30~1000



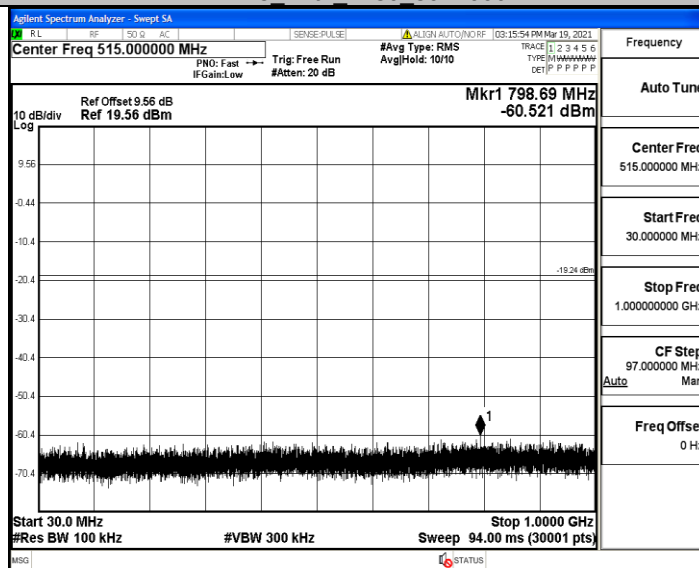
## 2DH5\_Ant1\_2441\_1000~26500



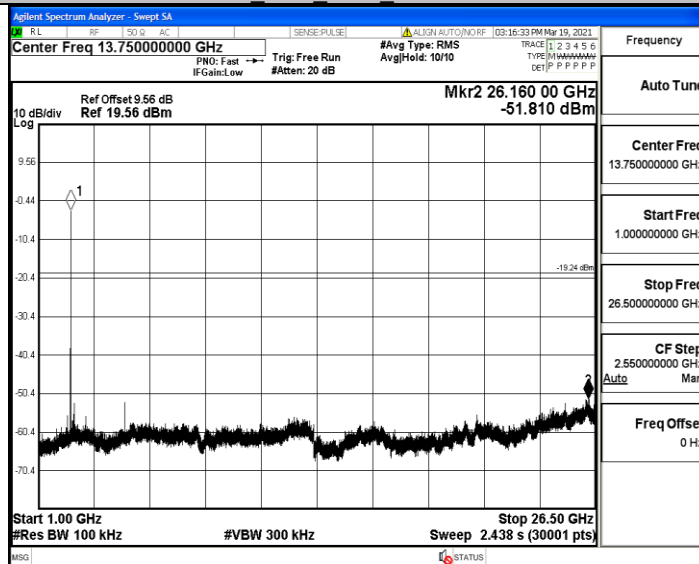
## 2DH5\_Ant1\_2480\_0~Reference



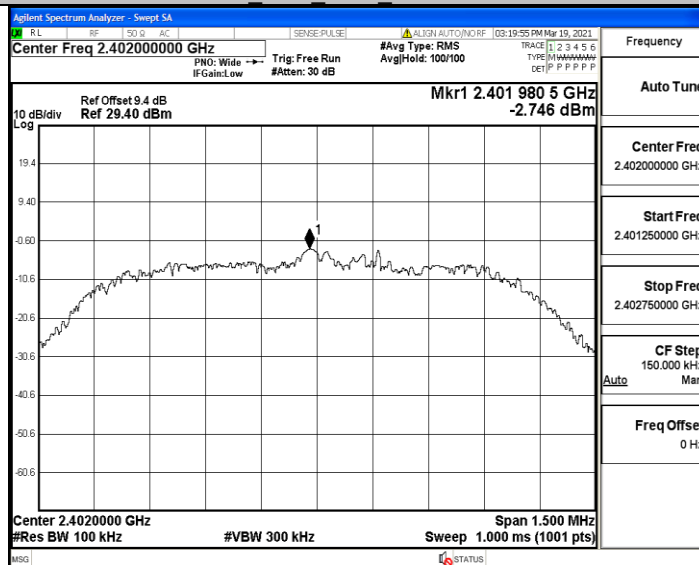
## 2DH5\_Ant1\_2480\_30~1000



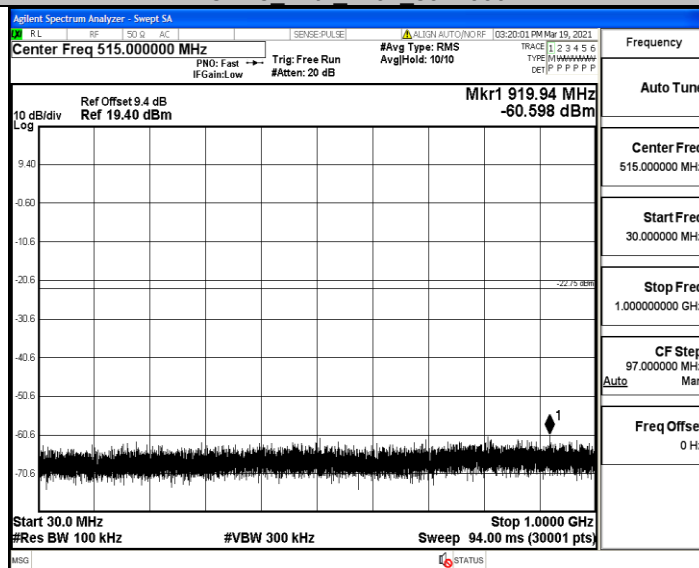
## 2DH5\_Ant1\_2480\_1000~26500



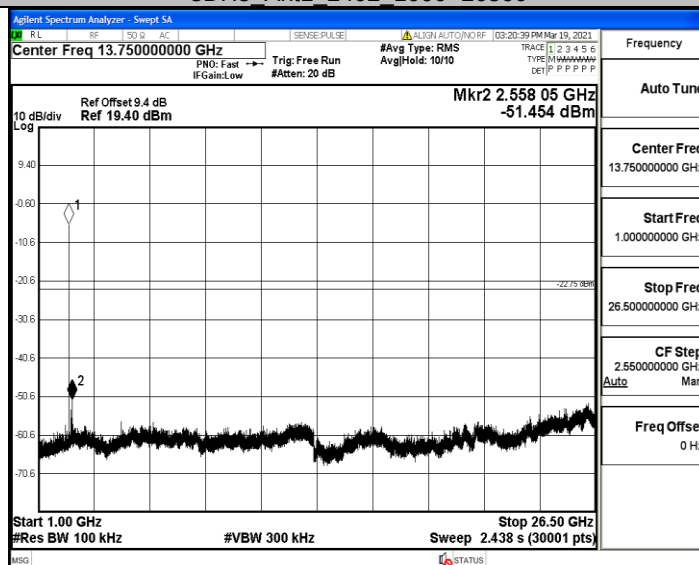
## 3DH5\_Ant1\_2402\_0~Reference



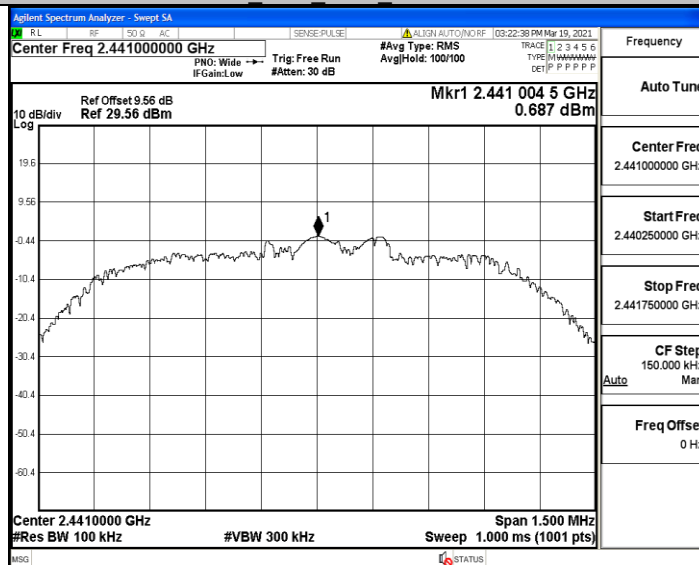
## 3DH5\_Ant1\_2402\_30~1000



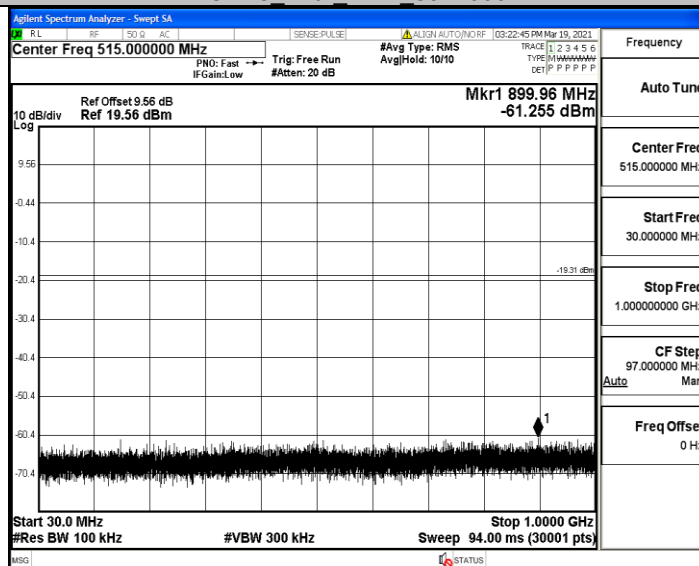
## 3DH5\_Ant1\_2402\_1000~26500



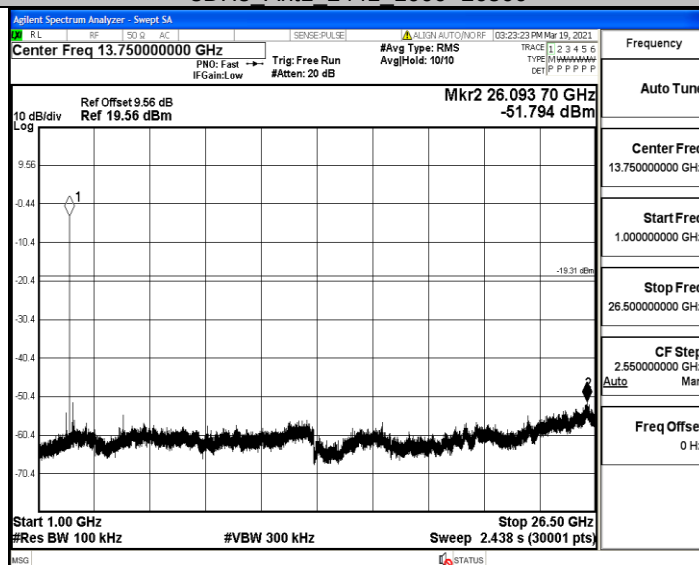
## 3DH5\_Ant1\_2441\_0~Reference



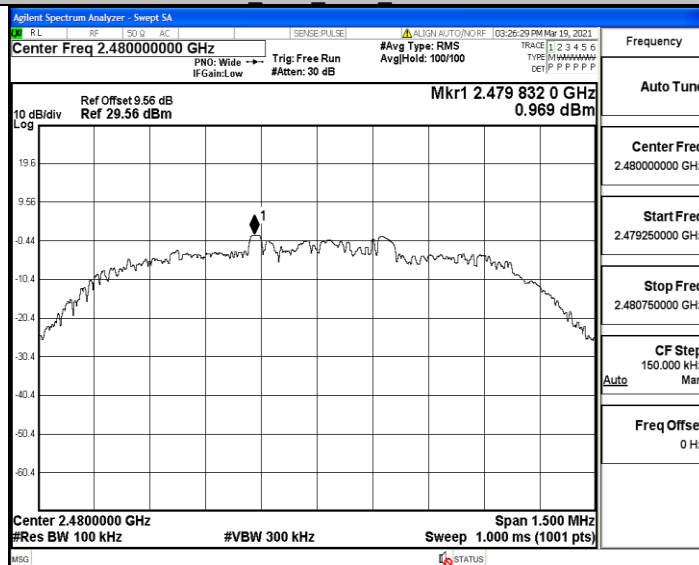
## 3DH5\_Ant1\_2441\_30~1000



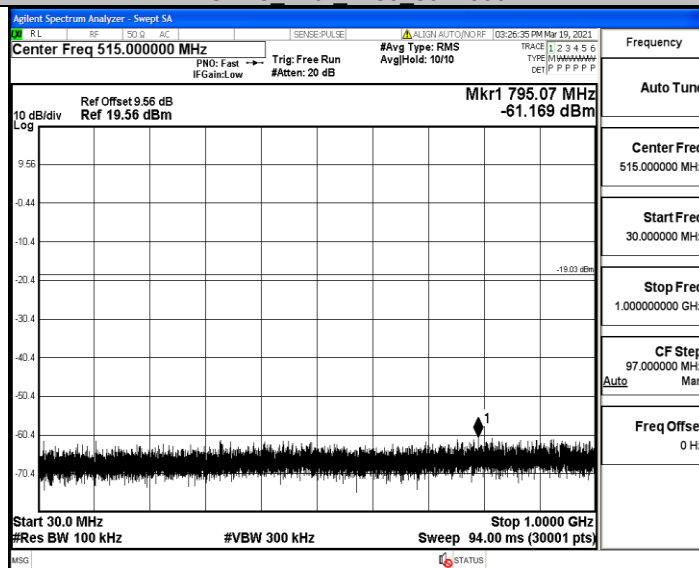
## 3DH5\_Ant1\_2441\_1000~26500



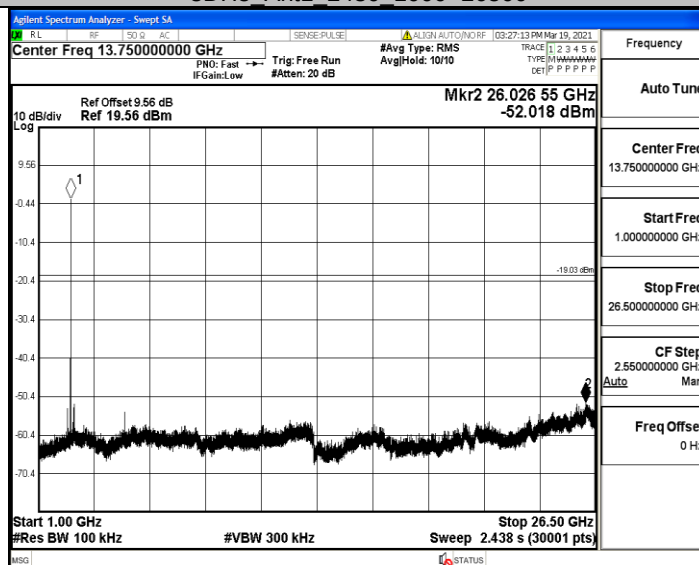
## 3DH5\_Ant1\_2480\_0~Reference



## 3DH5\_Ant1\_2480\_30~1000



## 3DH5\_Ant1\_2480\_1000~26500



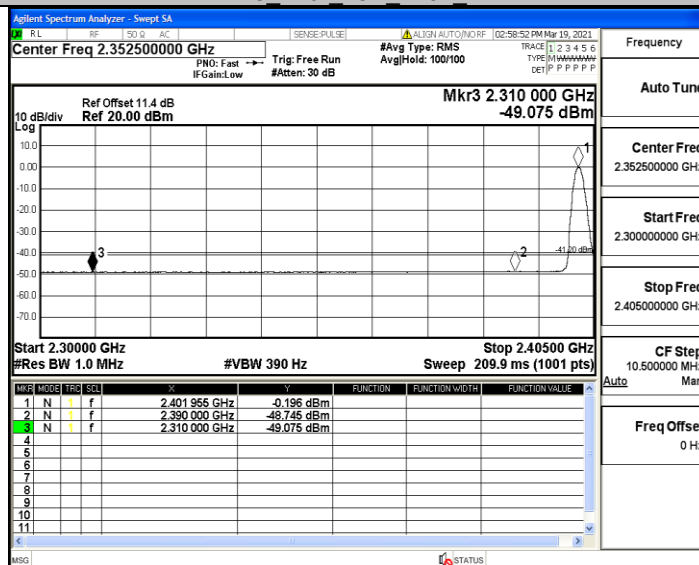
## A.8 Restrict-band band-edge measurements

| TestMode | Antenna | ChName | Channel | Detector | Freq(MHz) | Result(dBm) | Limit(dBm) | Verdict |
|----------|---------|--------|---------|----------|-----------|-------------|------------|---------|
| DH5      | Ant1    | Low    | 2402    | AV       | 2310.000  | -49.08      | <=-41.20   | PASS    |
|          |         |        |         | AV       | 2390.000  | -48.75      | <=-41.20   | PASS    |
|          |         |        |         | Peak     | 2310.000  | -41.46      | <=-21.20   | PASS    |
|          |         |        |         | Peak     | 2390.000  | -41.69      | <=-21.20   | PASS    |
|          |         | High   | 2480    | AV       | 2483.500  | -45.22      | <=-41.20   | PASS    |
|          |         |        |         | AV       | 2500.000  | -48.00      | <=-41.20   | PASS    |
|          |         |        |         | Peak     | 2483.500  | -38.77      | <=-21.20   | PASS    |
|          |         |        |         | Peak     | 2500.000  | -39.83      | <=-21.20   | PASS    |
| 2DH5     | Ant1    | Low    | 2402    | AV       | 2310.000  | -49.05      | <=-41.20   | PASS    |
|          |         |        |         | AV       | 2390.000  | -48.70      | <=-41.20   | PASS    |
|          |         |        |         | Peak     | 2310.000  | -42.05      | <=-21.20   | PASS    |
|          |         |        |         | Peak     | 2390.000  | -42.34      | <=-21.20   | PASS    |
|          |         | High   | 2480    | AV       | 2483.500  | -45.39      | <=-41.20   | PASS    |
|          |         |        |         | AV       | 2500.000  | -47.99      | <=-41.20   | PASS    |
|          |         |        |         | Peak     | 2483.500  | -34.54      | <=-21.20   | PASS    |
|          |         |        |         | Peak     | 2500.000  | -41.75      | <=-21.20   | PASS    |
| 3DH5     | Ant1    | Low    | 2402    | AV       | 2310.000  | -49.06      | <=-41.20   | PASS    |
|          |         |        |         | AV       | 2390.000  | -48.70      | <=-41.20   | PASS    |
|          |         |        |         | Peak     | 2310.000  | -40.87      | <=-21.20   | PASS    |
|          |         |        |         | Peak     | 2390.000  | -42.06      | <=-21.20   | PASS    |
|          |         | High   | 2480    | AV       | 2483.500  | -45.46      | <=-41.20   | PASS    |
|          |         |        |         | AV       | 2500.000  | -48.12      | <=-41.20   | PASS    |
|          |         |        |         | Peak     | 2483.500  | -34.98      | <=-21.20   | PASS    |
|          |         |        |         | Peak     | 2500.000  | -40.93      | <=-21.20   | PASS    |

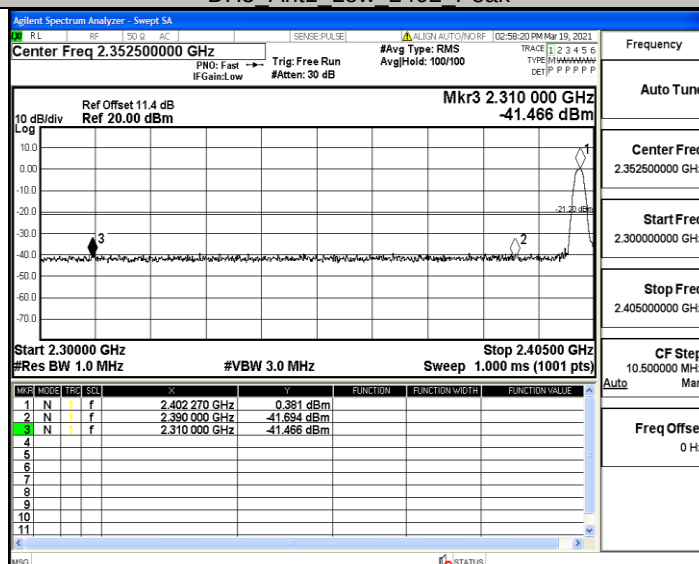
1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

## Test Graphs

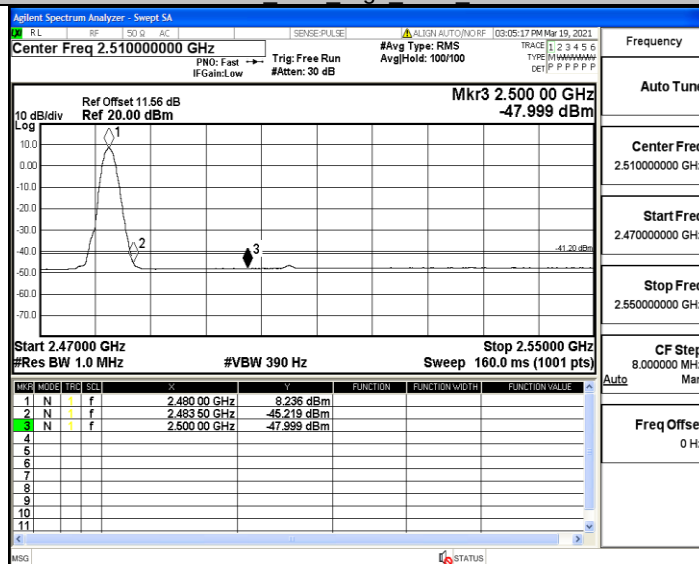
DH5 Ant1 Low 2402 AV



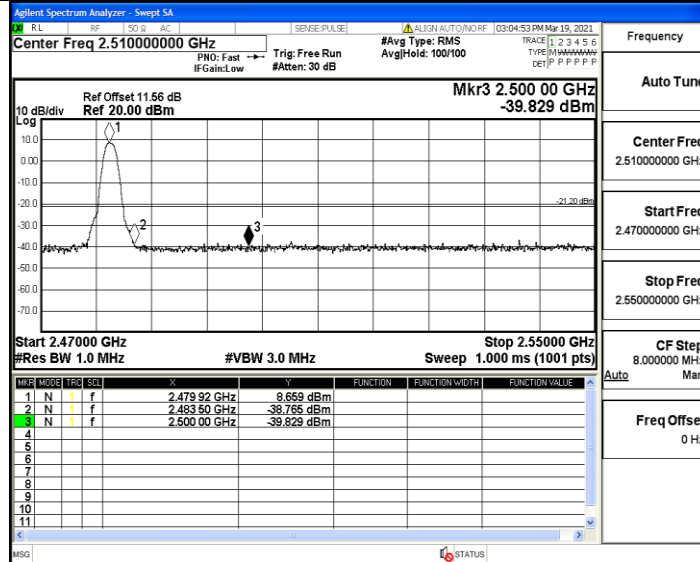
DH5 Ant1 Low 2402 Peak



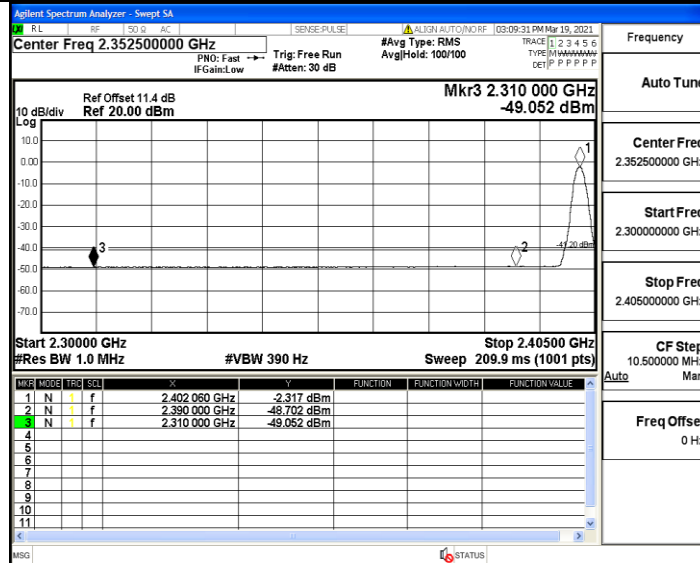
DH5 Ant1 High 2480 AV



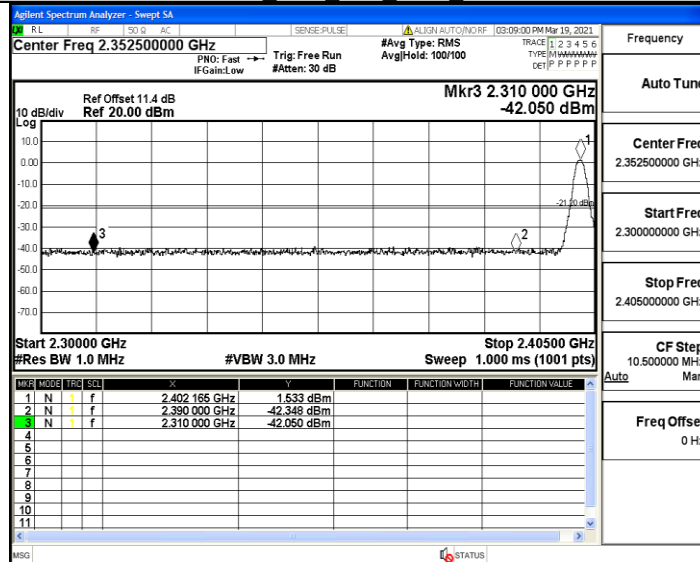
## DH5 Ant1 High 2480 Peak



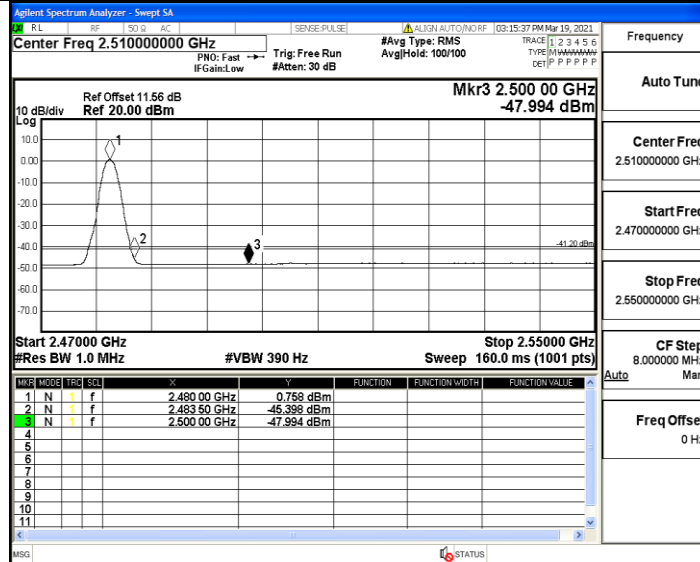
## 2DH5 Ant1 Low 2402 AV



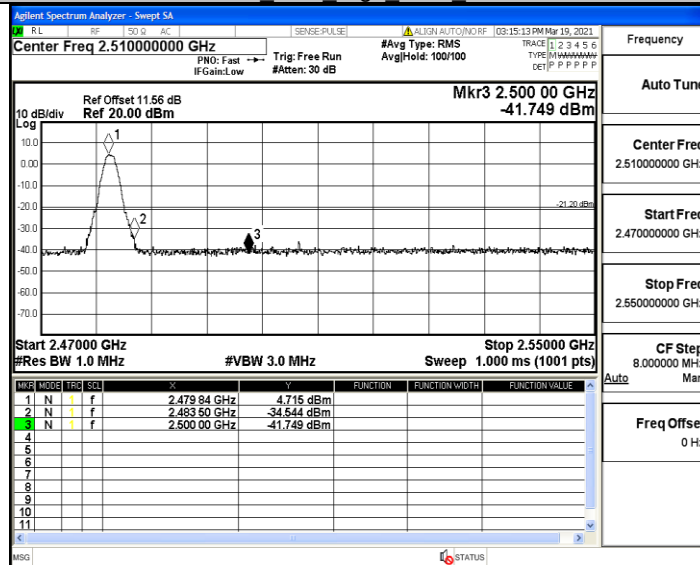
## 2DH5 Ant1 Low 2402 Peak



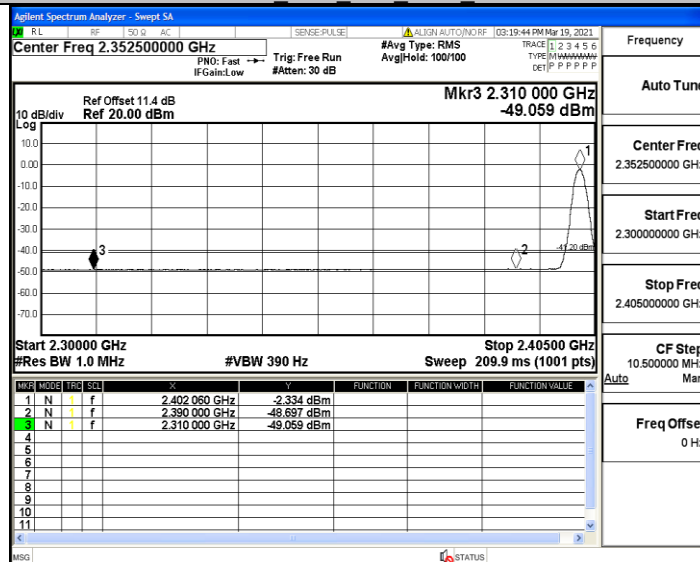
## 2DH5 Ant1 High 2480 AV



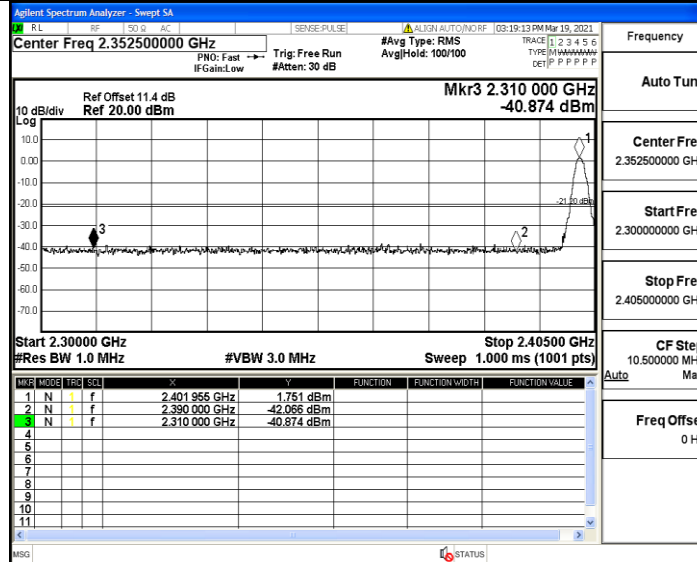
## 2DH5 Ant1 High 2480 Peak



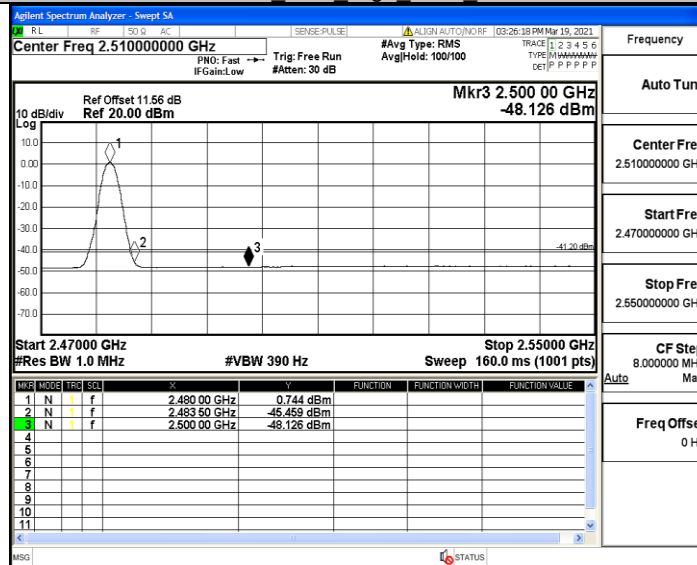
## 3DH5 Ant1 Low 2402 AV



## 3DH5 Ant1 Low 2402 Peak



## 3DH5 Ant1 High 2480 AV



## 3DH5 Ant1 High 2480 Peak

