



## Appendix A

### RF Test Data for BT V4.0(DSS) (Conducted Measurement)

**Product Name:** HyBook

**Trade Mark:** HYUNDAI

**Test Model:** HT14CCIC44SG

#### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 21.1℃     |
| Relative Humidity: | 52.2%     |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Jay Li    |
| Supervised by:     | Li Huan   |



## Appendix A.1: 20dB Emission Bandwidth

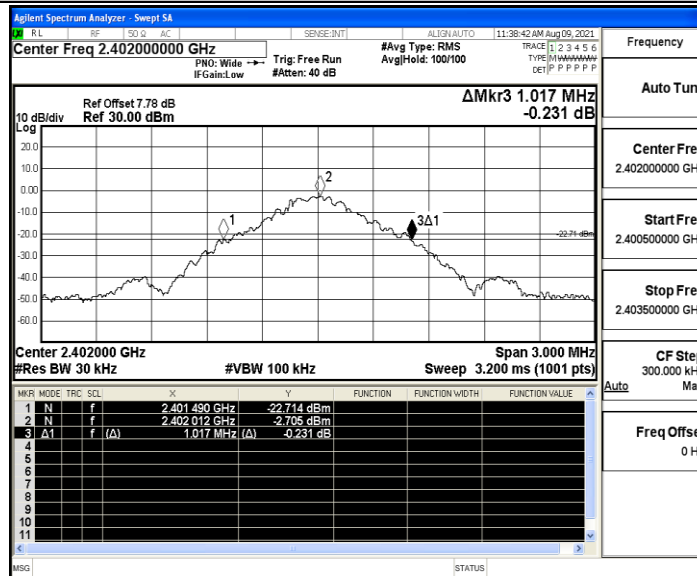
### Test Result

| TestMode | Antenna | Channel | 20db EBW[MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|---------|---------------|----------|----------|------------|---------|
| DH5      | Ant1    | 2402    | 1.017         | 2401.490 | 2402.507 | ---        | PASS    |
|          |         | 2441    | 1.029         | 2440.463 | 2441.492 | ---        | PASS    |
|          |         | 2480    | 1.038         | 2479.460 | 2480.498 | ---        | PASS    |
| 2DH5     | Ant1    | 2402    | 1.320         | 2401.340 | 2402.660 | ---        | PASS    |
|          |         | 2441    | 1.347         | 2440.325 | 2441.672 | ---        | PASS    |
|          |         | 2480    | 1.296         | 2479.358 | 2480.654 | ---        | PASS    |
| 3DH5     | Ant1    | 2402    | 1.311         | 2401.343 | 2402.654 | ---        | PASS    |
|          |         | 2441    | 1.299         | 2440.349 | 2441.648 | ---        | PASS    |
|          |         | 2480    | 1.350         | 2479.319 | 2480.669 | ---        | PASS    |

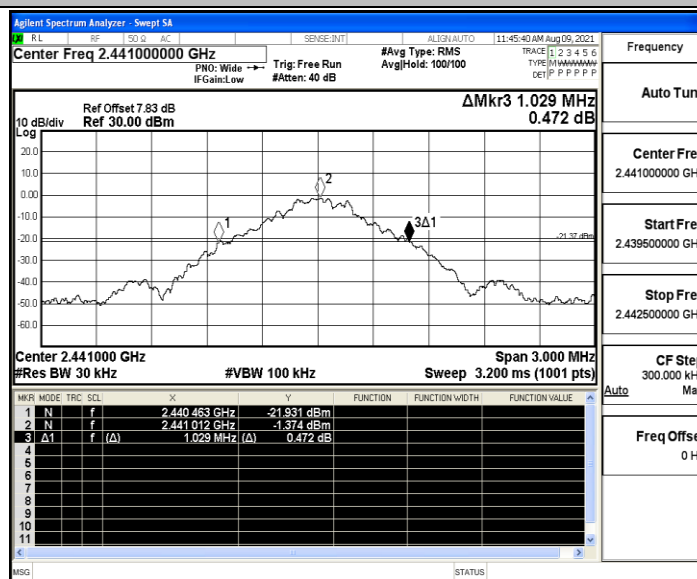


## Test Graphs

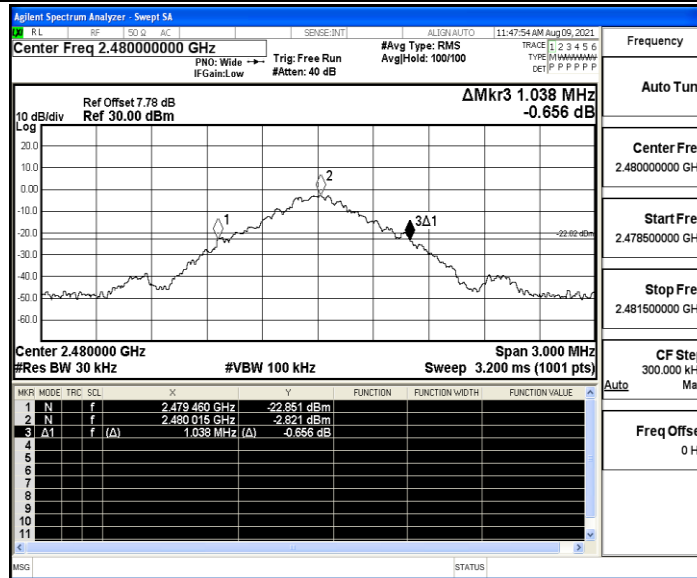
DH5\_Ant1\_2402



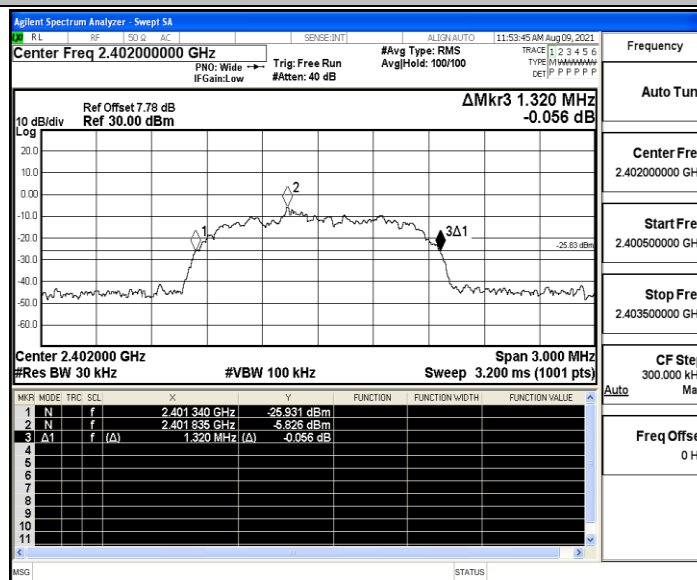
DH5\_Ant1\_2441



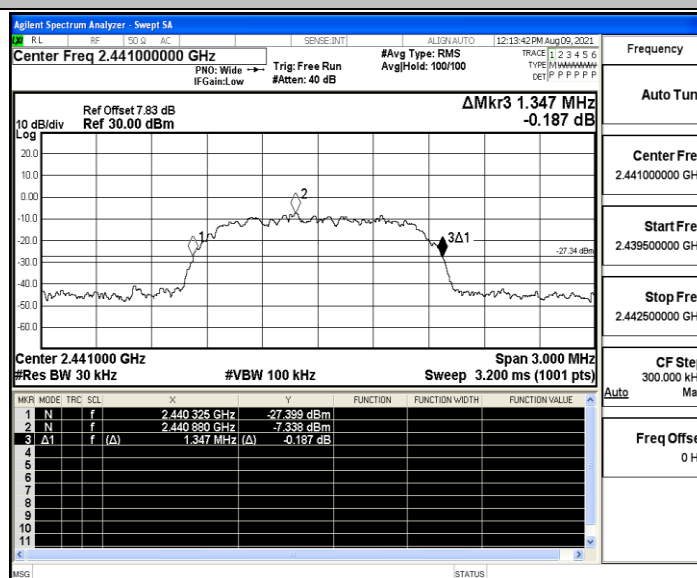
DH5\_Ant1\_2480



2DH5\_Ant1\_2402

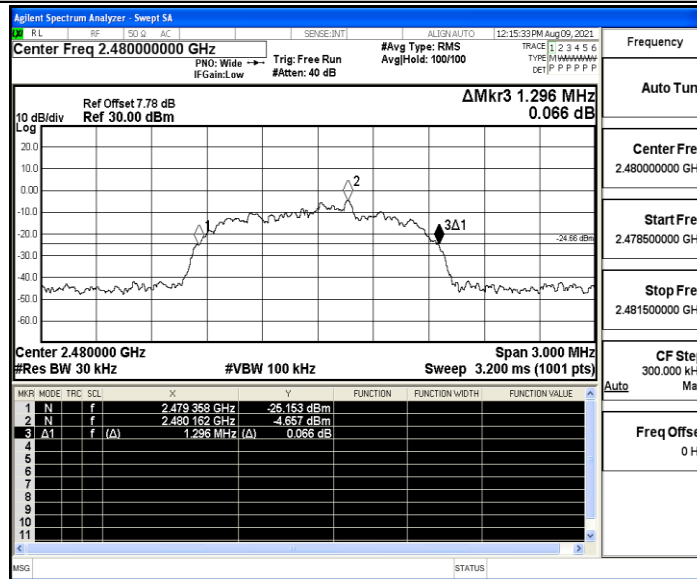


2DH5\_Ant1\_2441

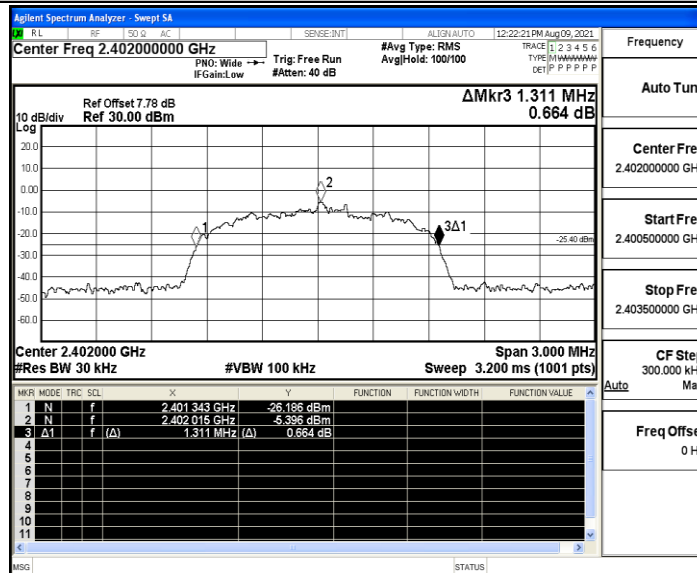




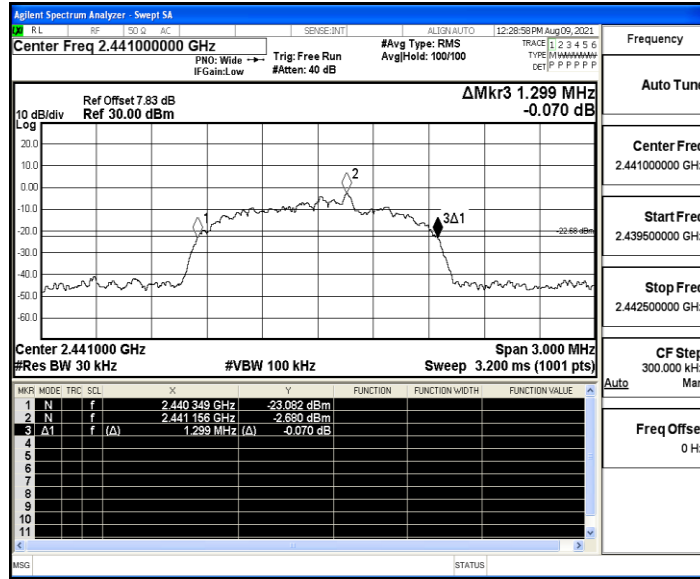
## 2DH5\_Ant1\_2480



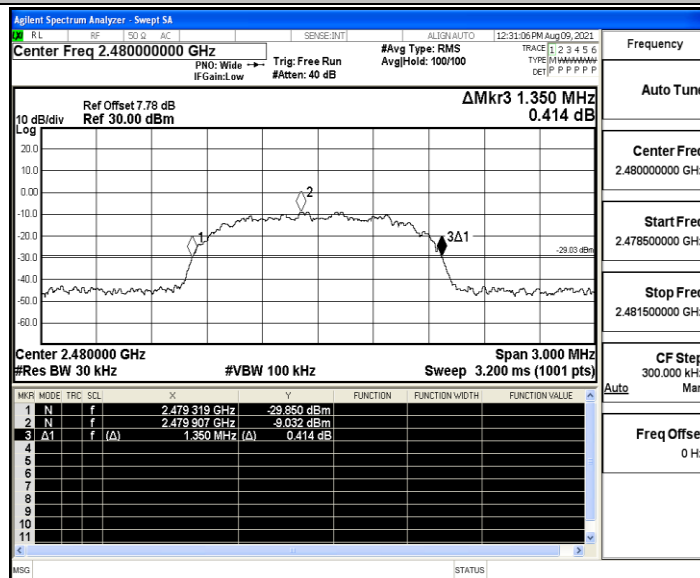
## 3DH5\_Ant1\_2402



## 3DH5\_Ant1\_2441



## 3DH5\_Ant1\_2480





## Appendix A.2: Maximum peak conducted output power

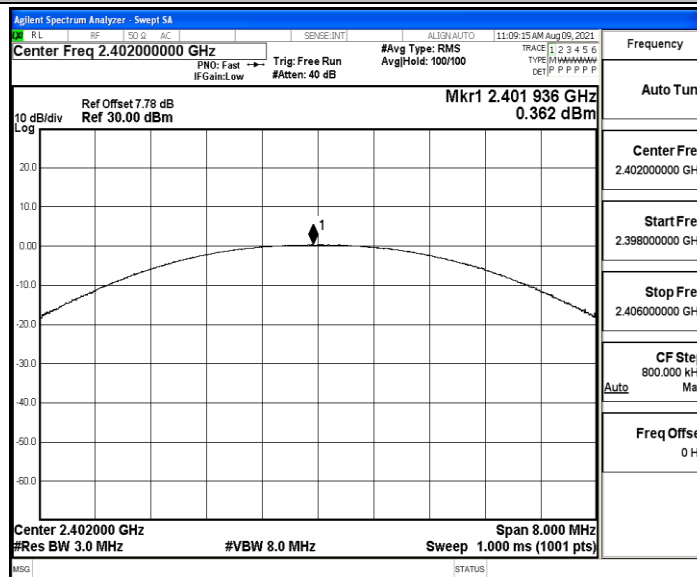
### Test Result

| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm]   | Verdict |
|----------|---------|---------|-------------|--------------|---------|
| DH5      | Ant1    | 2402    | 0.36        | $\leq 20.97$ | PASS    |
|          |         | 2441    | 1.71        | $\leq 20.97$ | PASS    |
|          |         | 2480    | 0.27        | $\leq 20.97$ | PASS    |
| 2DH5     | Ant1    | 2402    | -0.60       | $\leq 20.97$ | PASS    |
|          |         | 2441    | 0.70        | $\leq 20.97$ | PASS    |
|          |         | 2480    | -0.53       | $\leq 20.97$ | PASS    |
| 3DH5     | Ant1    | 2402    | -0.38       | $\leq 20.97$ | PASS    |
|          |         | 2441    | 0.92        | $\leq 20.97$ | PASS    |
|          |         | 2480    | -0.43       | $\leq 20.97$ | PASS    |

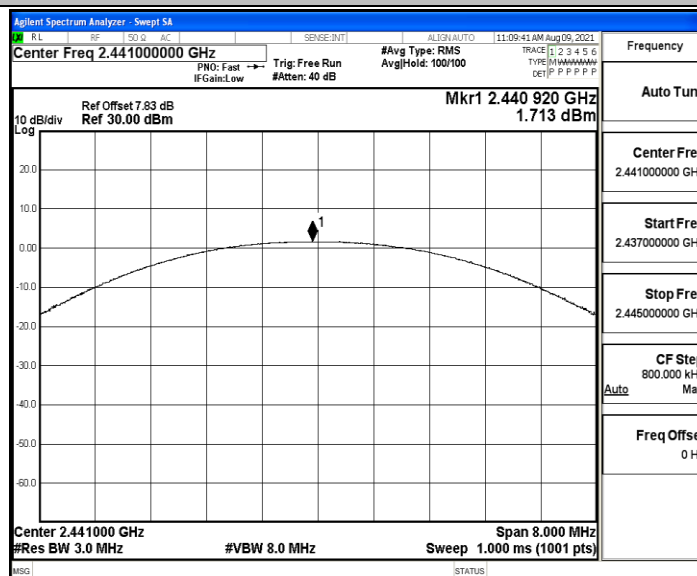


## Test Graphs

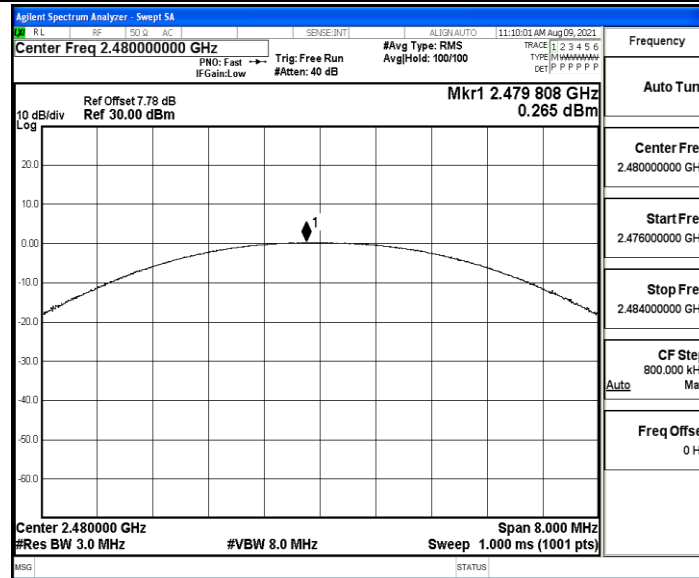
DH5\_Ant1\_2402



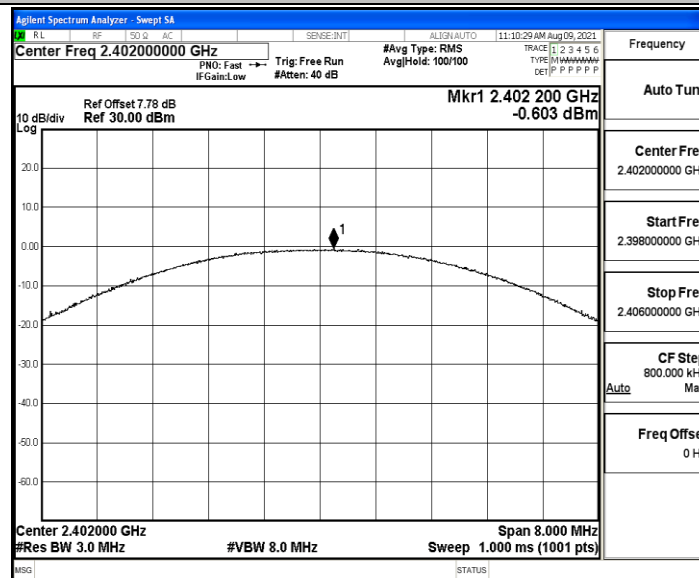
DH5\_Ant1\_2441



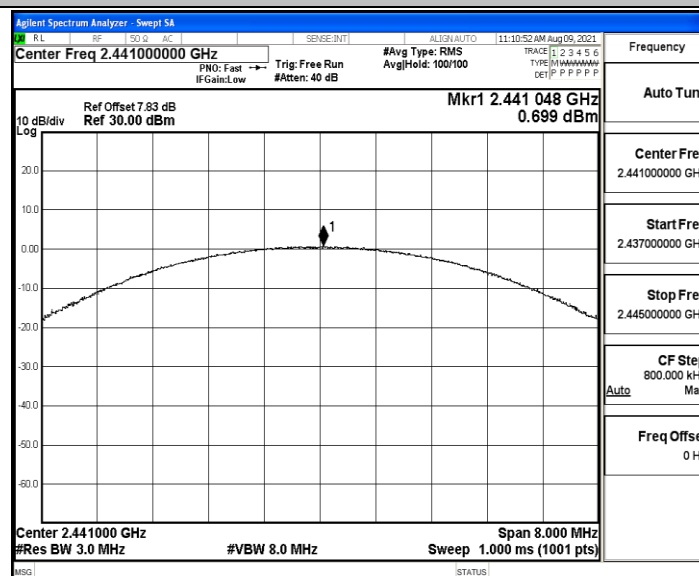
DH5\_Ant1\_2480



2DH5\_Ant1\_2402

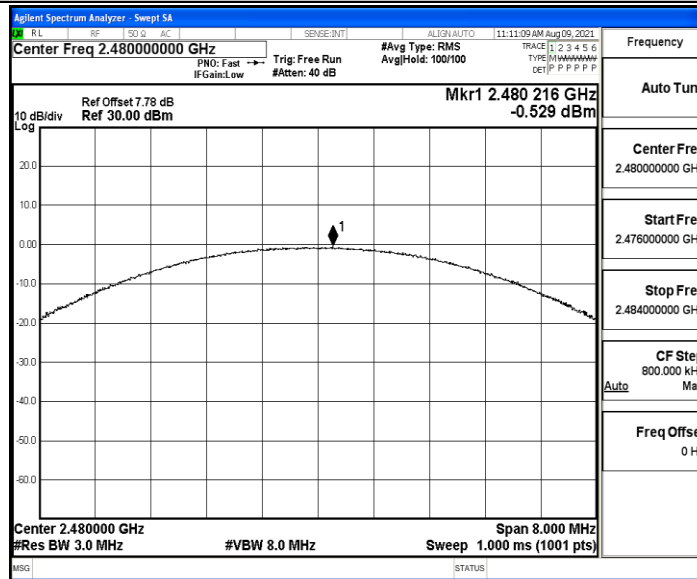


2DH5\_Ant1\_2441

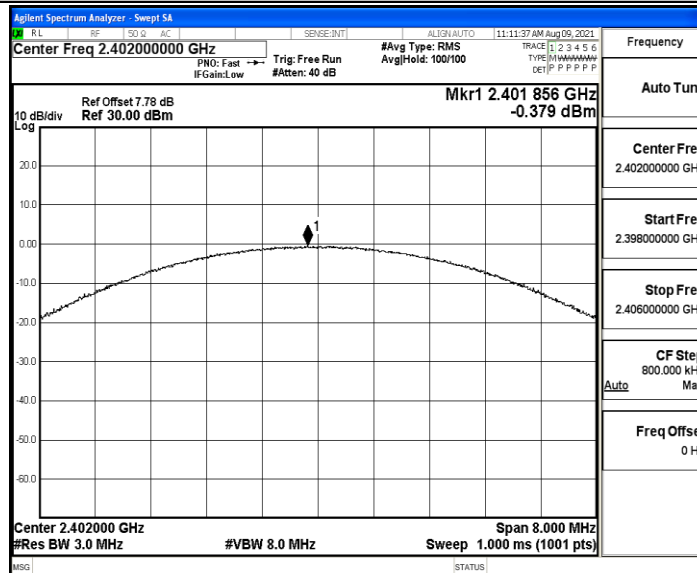




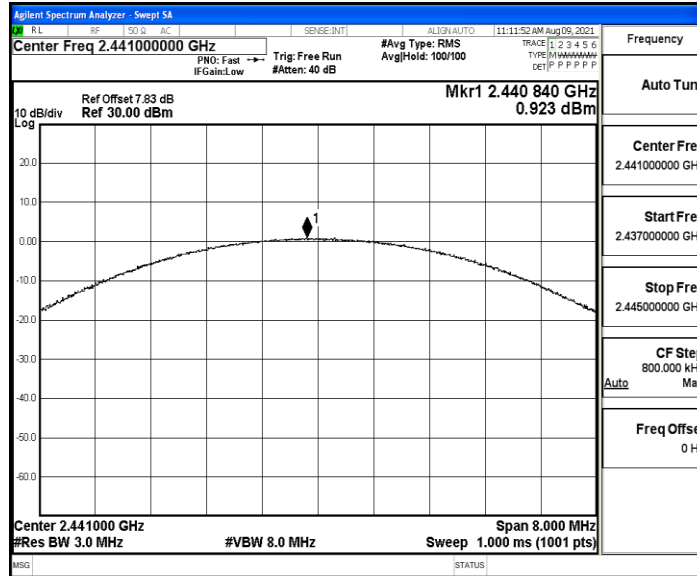
## 2DH5\_Ant1\_2480



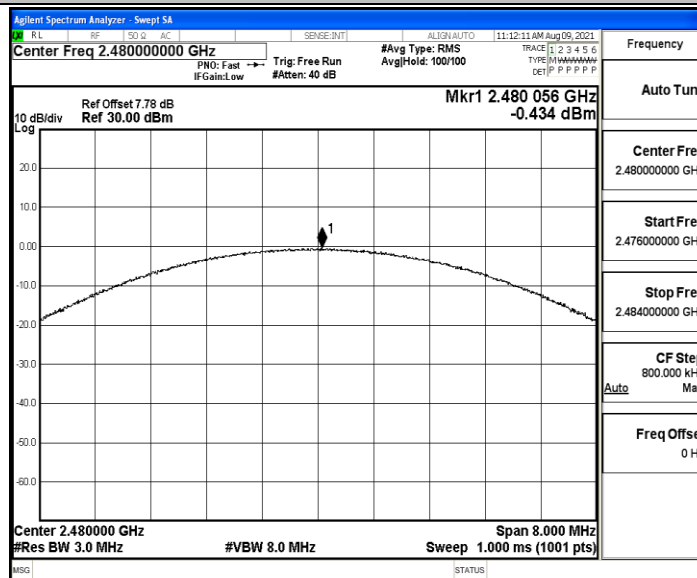
## 3DH5\_Ant1\_2402



## 3DH5\_Ant1\_2441



3DH5\_Ant1\_2480





## Appendix A.3: Carrier frequency separation

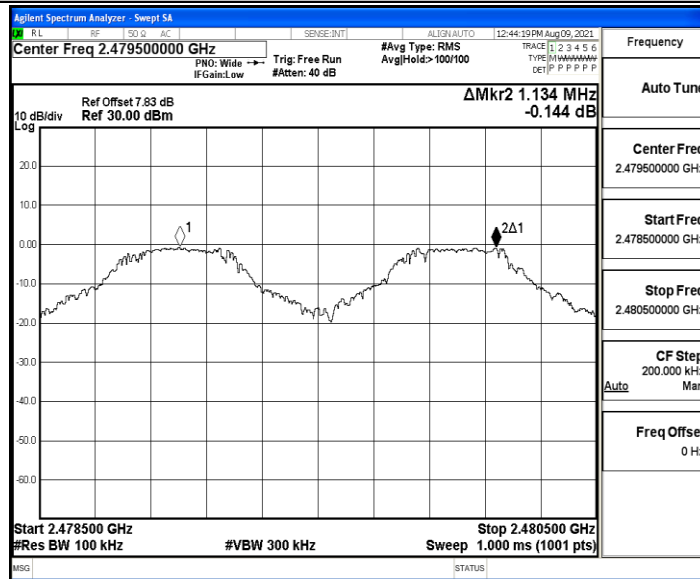
### Test Result

| TestMode | Antenna | Channel | Result[MHz] | Limit[MHz]   | Verdict |
|----------|---------|---------|-------------|--------------|---------|
| DH5      | Ant1    | Hop     | 1.134       | $\geq 0.678$ | PASS    |
| 2DH5     | Ant1    | Hop     | 0.978       | $\geq 0.864$ | PASS    |
| 3DH5     | Ant1    | Hop     | 1.106       | $\geq 0.866$ | PASS    |

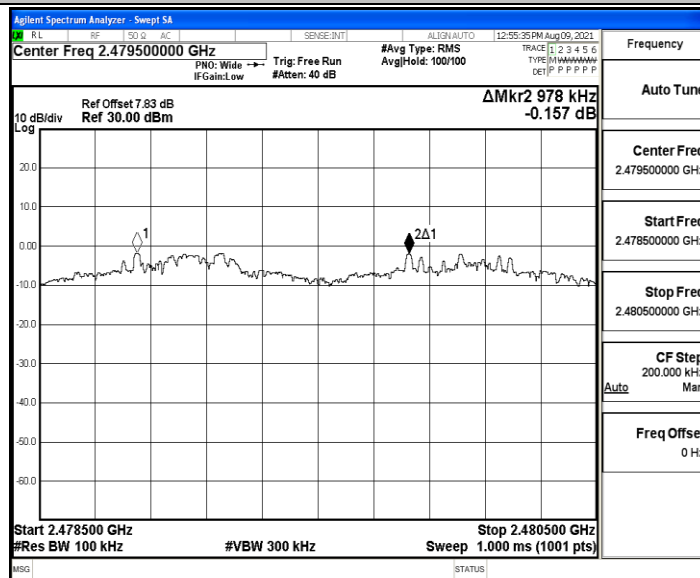


## Test Graphs

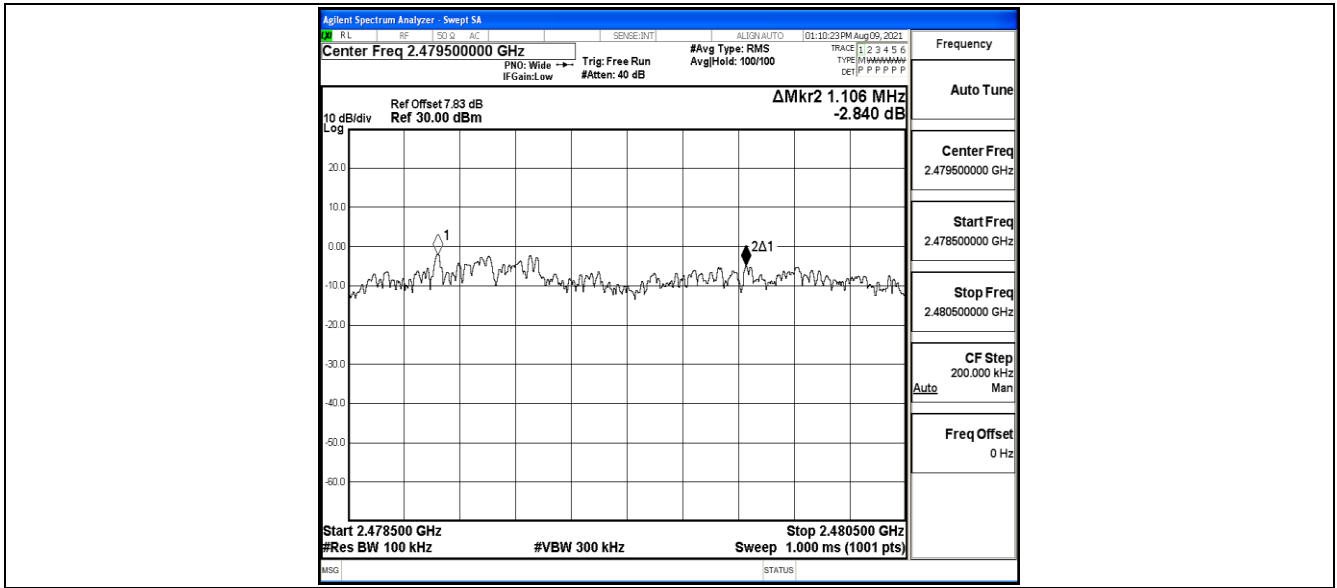
DH5\_Ant1\_Hop



2DH5\_Ant1\_Hop



3DH5\_Ant1\_Hop





## Appendix A.4: Time of occupancy

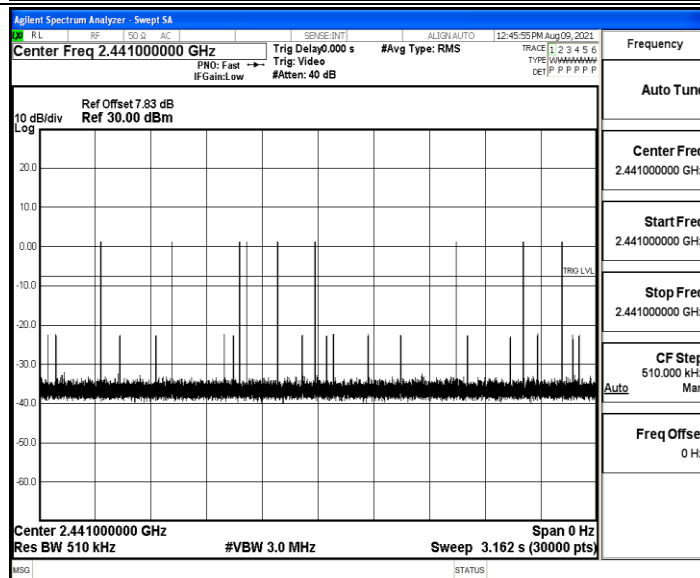
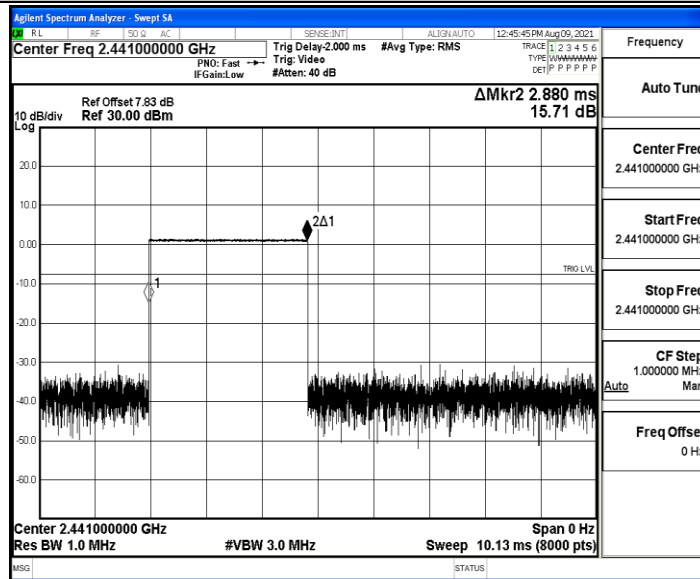
### Test Result

| TestMode | Antenna | Channel | BurstWidth<br>[ms] | TotalHops<br>[Num] | Result[s] | Limit[s] | Verdict |
|----------|---------|---------|--------------------|--------------------|-----------|----------|---------|
| DH5      | Ant1    | Hop     | 2.88               | 100                | 0.288     | ≤0.4     | PASS    |
| 2DH5     | Ant1    | Hop     | 2.88               | 90                 | 0.260     | ≤0.4     | PASS    |
| 3DH5     | Ant1    | Hop     | 2.89               | 120                | 0.347     | ≤0.4     | PASS    |

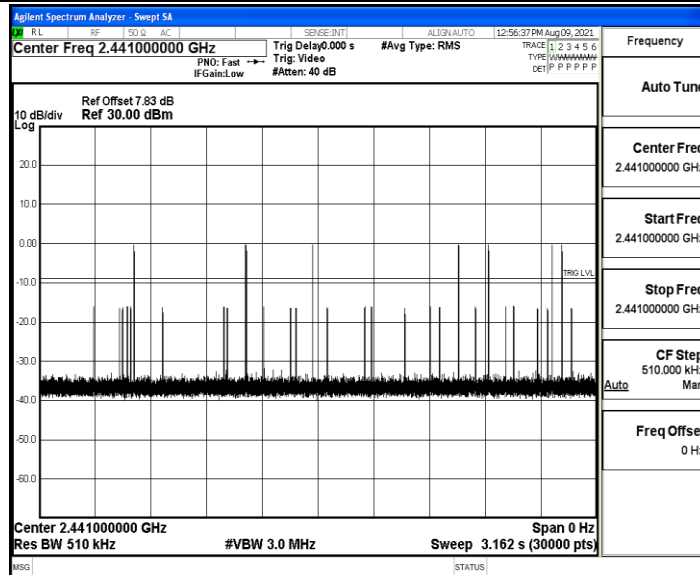
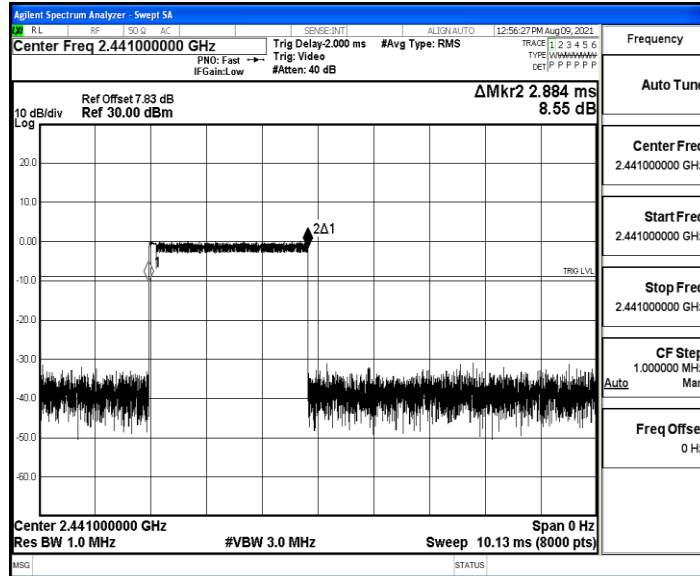


## Test Graphs

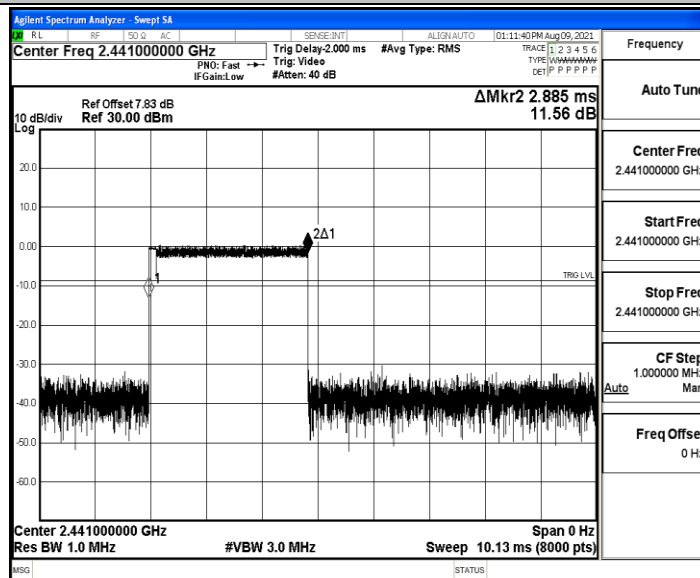
DH5\_Ant1\_Hop

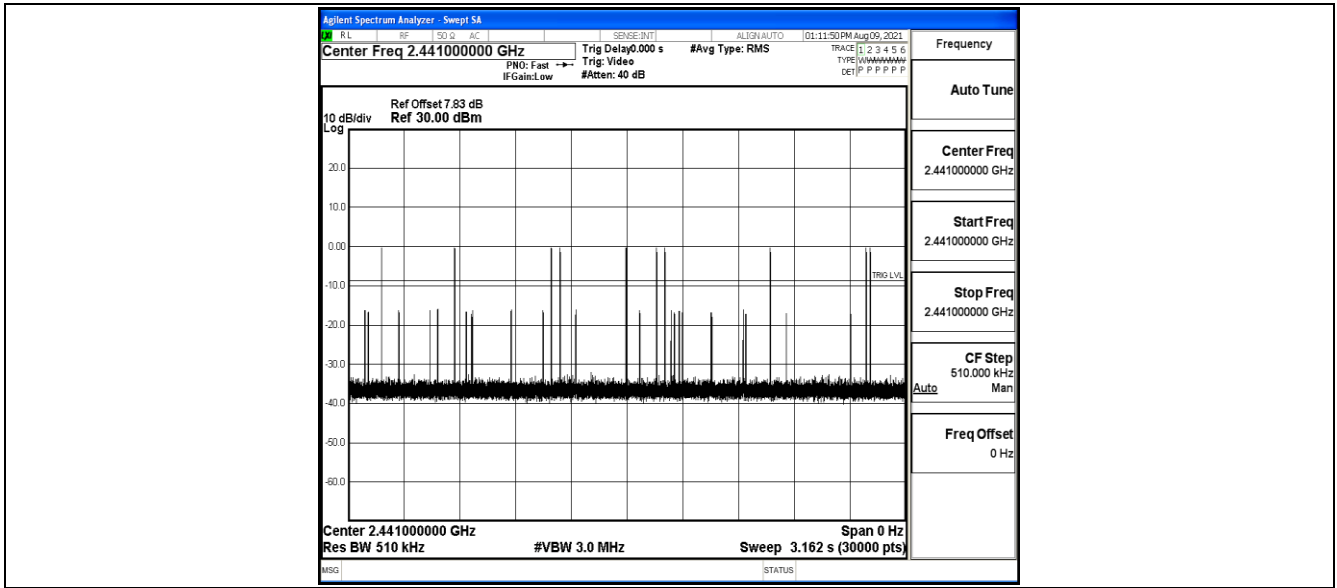


2DH5\_Ant1\_Hop



3DH5\_Ant1\_Hop







## Appendix A.5: Number of hopping channels

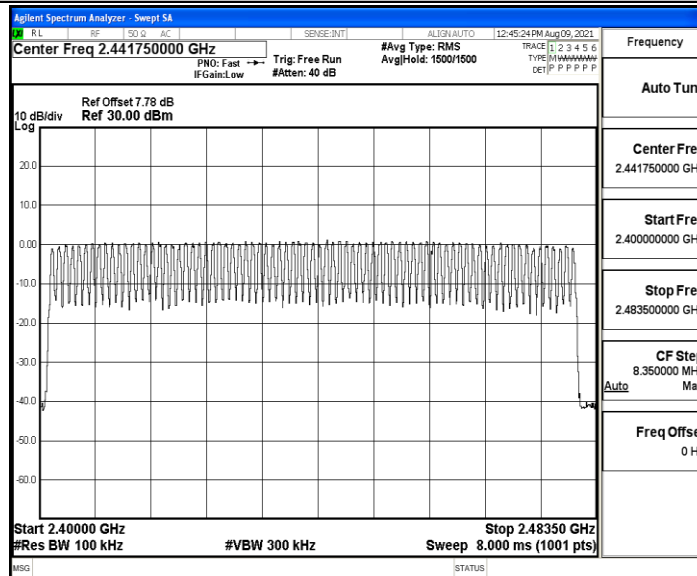
### Test Result

| TestMode | Antenna | Channel | Result[Num] | Limit[Num] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| DH5      | Ant1    | Hop     | 79          | $\geq 15$  | PASS    |
| 2DH5     | Ant1    | Hop     | 79          | $\geq 15$  | PASS    |
| 3DH5     | Ant1    | Hop     | 79          | $\geq 15$  | PASS    |

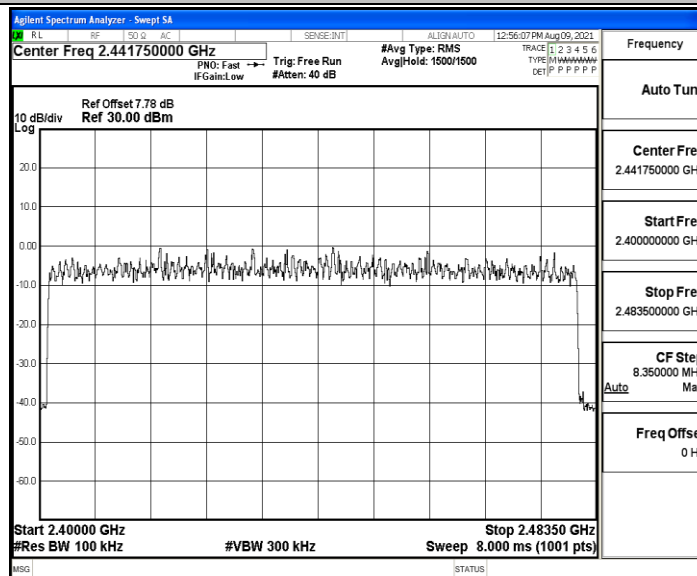


## Test Graphs

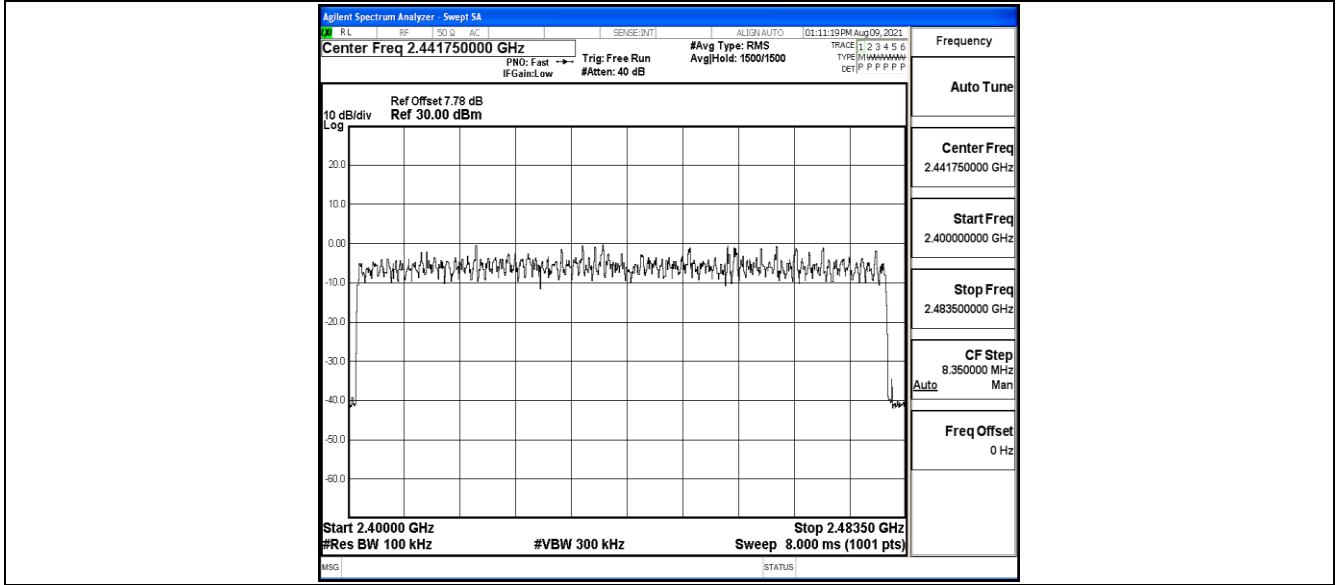
DH5\_Ant1\_Hop



2DH5\_Ant1\_Hop



3DH5\_Ant1\_Hop





## Appendix A.6: Band edge measurements

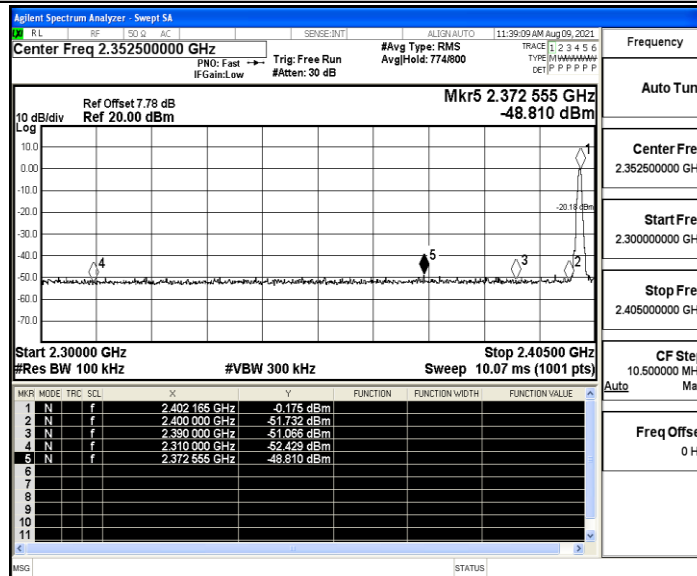
### Test Result

| TestMode | Antenna | ChName | Channel  | RefLevel<br>[dBm] | Result<br>[dBm] | Limit<br>[dBm] | Verdict |
|----------|---------|--------|----------|-------------------|-----------------|----------------|---------|
| DH5      | Ant1    | Low    | 2402     | -0.18             | -48.81          | $\leq -20.18$  | PASS    |
|          |         | High   | 2480     | -0.33             | -48.53          | $\leq -20.33$  | PASS    |
|          |         | Low    | Hop_2402 | -0.07             | -49.71          | $\leq -20.07$  | PASS    |
|          |         | High   | Hop_2480 | 0.01              | -47.94          | $\leq -19.99$  | PASS    |
| 2DH5     | Ant1    | Low    | 2402     | -1.80             | -49.49          | $\leq -21.8$   | PASS    |
|          |         | High   | 2480     | -2.25             | -48.21          | $\leq -22.25$  | PASS    |
|          |         | Low    | Hop_2402 | -3.19             | -49.65          | $\leq -23.19$  | PASS    |
|          |         | High   | Hop_2480 | -3.61             | -48.24          | $\leq -23.61$  | PASS    |
| 3DH5     | Ant1    | Low    | 2402     | -3.25             | -49.73          | $\leq -23.25$  | PASS    |
|          |         | High   | 2480     | -1.78             | -48.61          | $\leq -21.78$  | PASS    |
|          |         | Low    | Hop_2402 | -5.34             | -49.46          | $\leq -25.34$  | PASS    |
|          |         | High   | Hop_2480 | -1.21             | -48.69          | $\leq -21.21$  | PASS    |

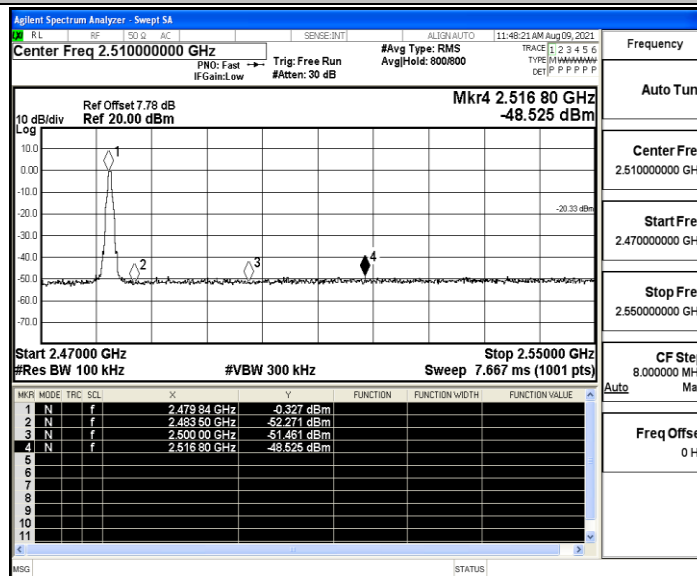


## Test Graphs

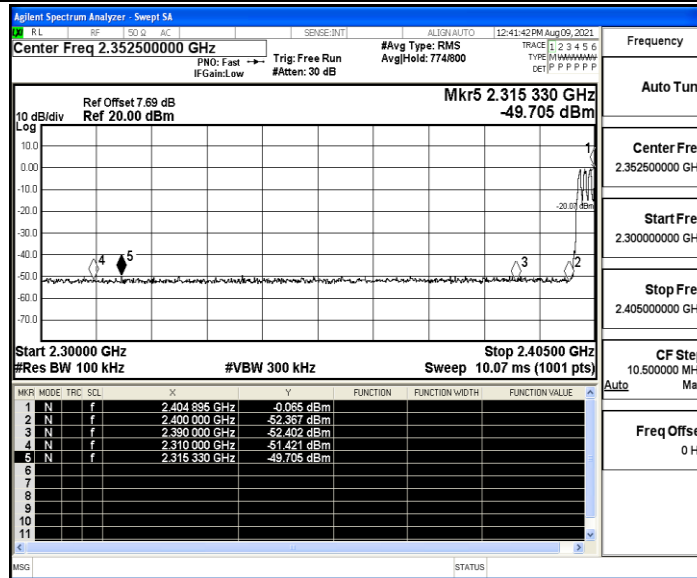
DH5\_Ant1\_Low\_2402



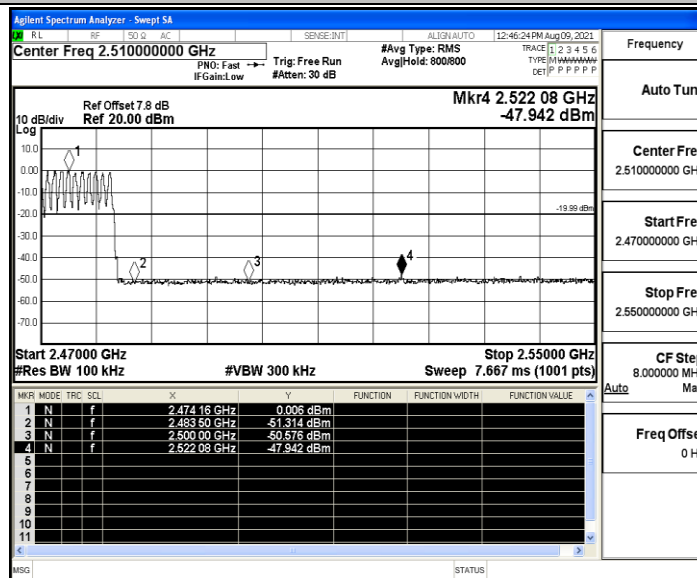
DH5\_Ant1\_High\_2480



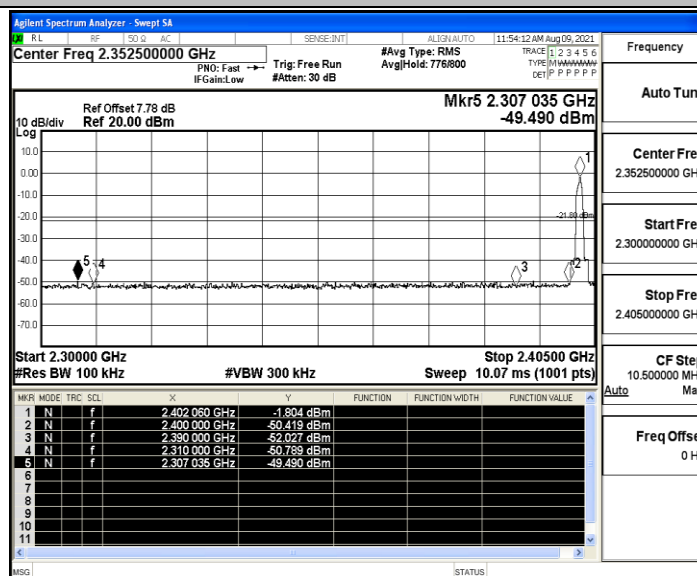
DH5\_Ant1\_Low\_Hop\_2402



## DH5\_Ant1\_High\_Hop\_2480

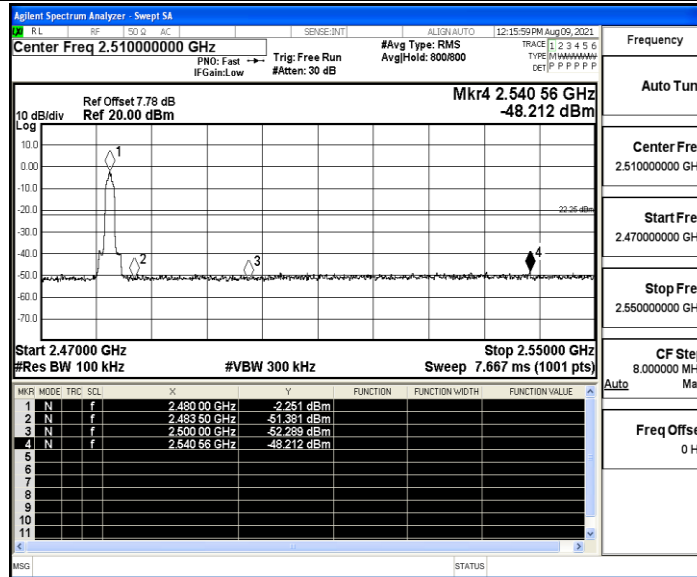


## 2DH5\_Ant1\_Low\_2402

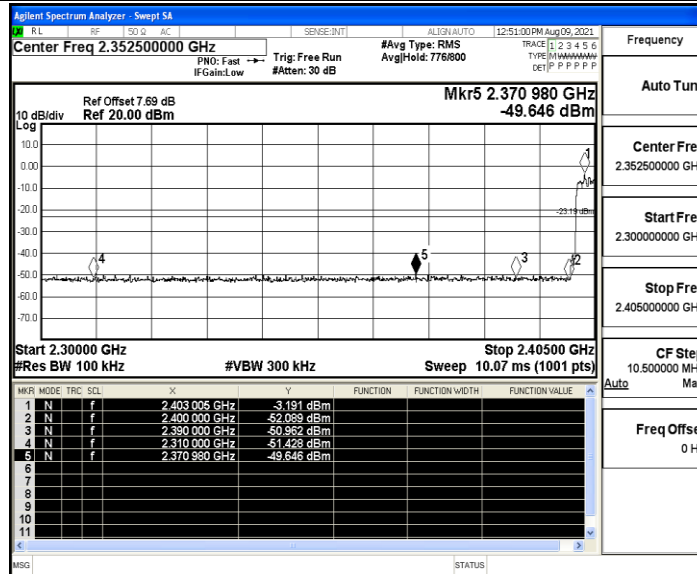




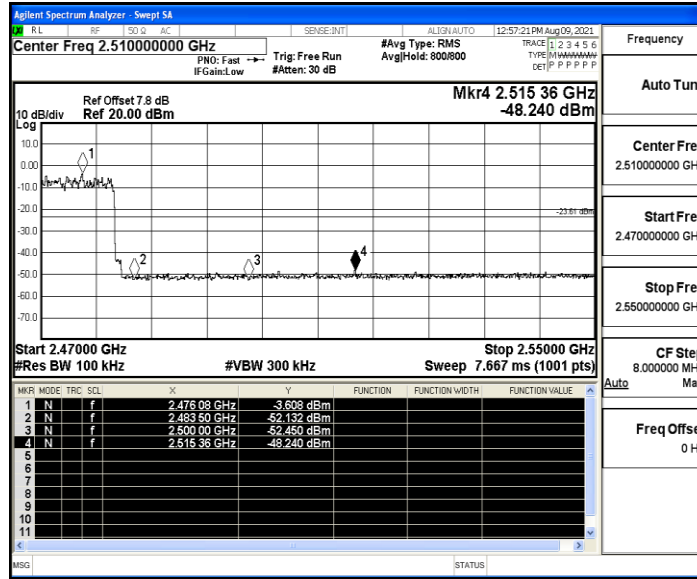
## 2DH5\_Ant1\_High\_2480



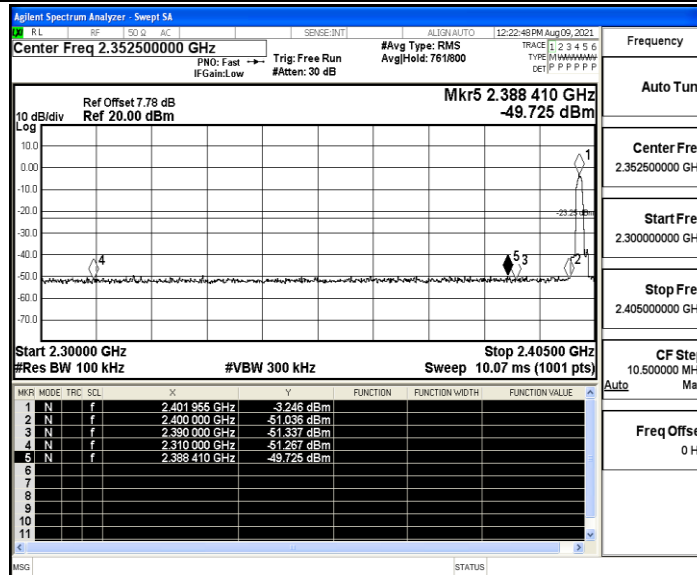
## 2DH5\_Ant1\_Low\_Hop\_2402



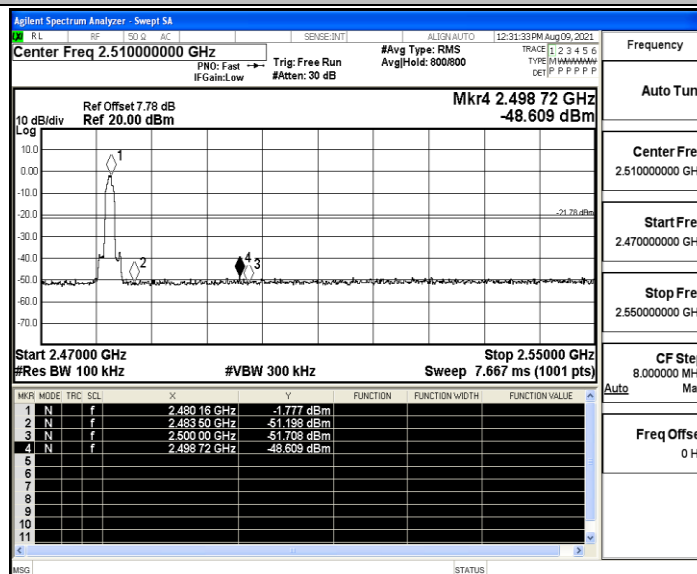
## 2DH5\_Ant1\_High\_Hop\_2480



3DH5\_Ant1\_Low\_2402

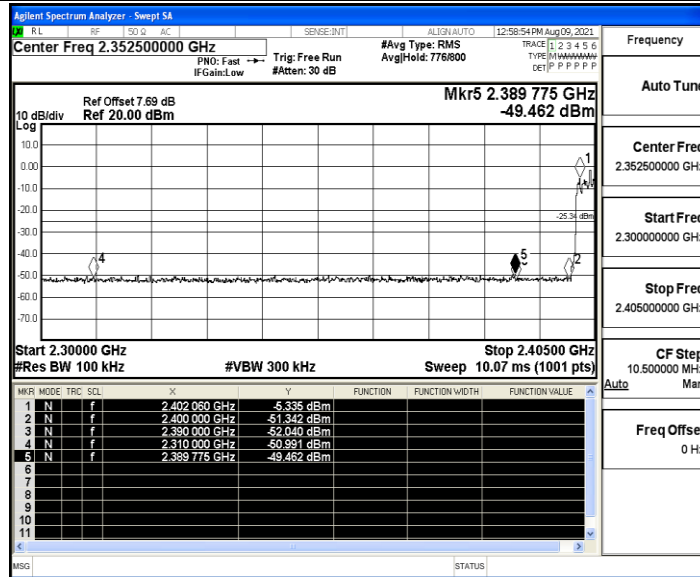


3DH5\_Ant1\_High\_2480

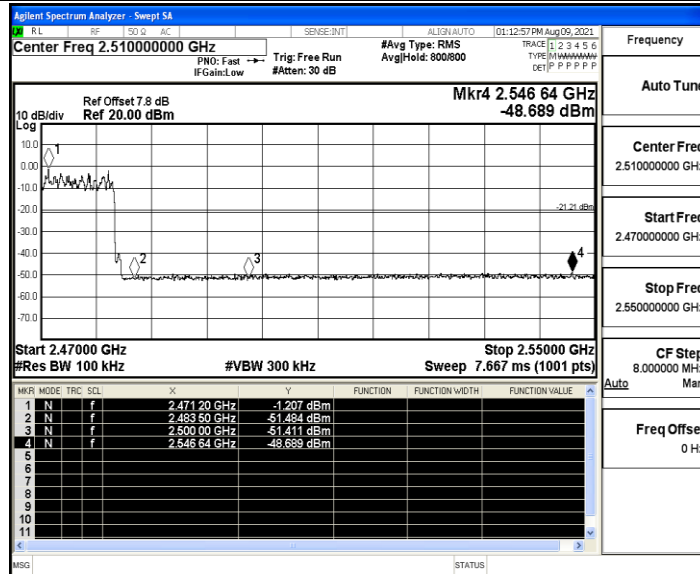




## 3DH5\_Ant1\_Low\_Hop\_2402



## 3DH5\_Ant1\_High\_Hop\_2480





## Appendix A.7: Conducted Spurious Emission

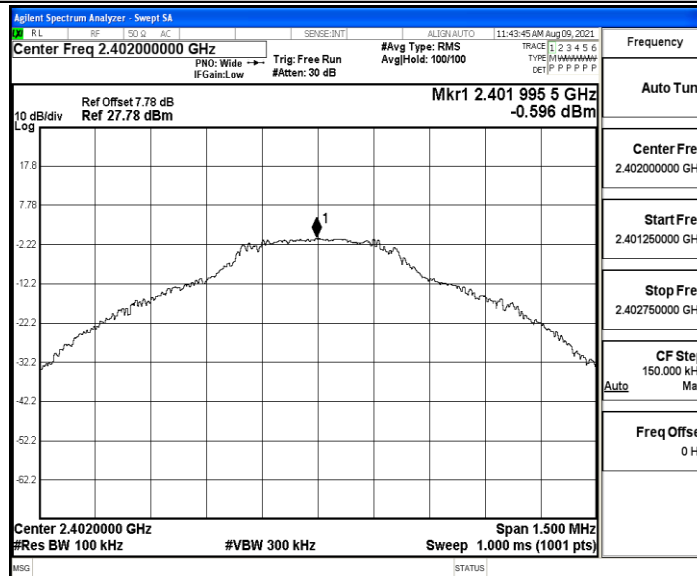
### Test Result

| TestMode | Antenna | Channel | FreqRange<br>[MHz] | RefLevel<br>[dBm] | Result<br>[dBm] | Limit<br>[dBm] | Verdict |
|----------|---------|---------|--------------------|-------------------|-----------------|----------------|---------|
| DH5      | Ant1    | 2402    | Reference          | -0.60             | -0.60           | ---            | PASS    |
|          |         |         | 30~1000            | -0.60             | -61.1           | $\leq -20.6$   | PASS    |
|          |         |         | 1000~26500         | -0.60             | -46.92          | $\leq -20.6$   | PASS    |
|          |         | 2441    | Reference          | 0.91              | 0.91            | ---            | PASS    |
|          |         |         | 30~1000            | 0.91              | -61.32          | $\leq -19.09$  | PASS    |
|          |         |         | 1000~26500         | 0.91              | -46.79          | $\leq -19.09$  | PASS    |
|          |         | 2480    | Reference          | -1.05             | -1.05           | ---            | PASS    |
|          |         |         | 30~1000            | -1.05             | -62.11          | $\leq -21.05$  | PASS    |
|          |         |         | 1000~26500         | -1.05             | -47.57          | $\leq -21.05$  | PASS    |
| 2DH5     | Ant1    | 2402    | Reference          | -1.78             | -1.78           | ---            | PASS    |
|          |         |         | 30~1000            | -1.78             | -61.83          | $\leq -21.78$  | PASS    |
|          |         |         | 1000~26500         | -1.78             | -47.93          | $\leq -21.78$  | PASS    |
|          |         | 2441    | Reference          | -3.89             | -3.89           | ---            | PASS    |
|          |         |         | 30~1000            | -3.89             | -61.49          | $\leq -23.89$  | PASS    |
|          |         |         | 1000~26500         | -3.89             | -46.13          | $\leq -23.89$  | PASS    |
|          |         | 2480    | Reference          | -1.95             | -1.95           | ---            | PASS    |
|          |         |         | 30~1000            | -1.95             | -61.82          | $\leq -21.95$  | PASS    |
|          |         |         | 1000~26500         | -1.95             | -47.43          | $\leq -21.95$  | PASS    |
| 3DH5     | Ant1    | 2402    | Reference          | -4.02             | -4.02           | ---            | PASS    |
|          |         |         | 30~1000            | -4.02             | -61.71          | $\leq -24.02$  | PASS    |
|          |         |         | 1000~26500         | -4.02             | -47.13          | $\leq -24.02$  | PASS    |
|          |         | 2441    | Reference          | -3.74             | -3.74           | ---            | PASS    |
|          |         |         | 30~1000            | -3.74             | -62.2           | $\leq -23.74$  | PASS    |
|          |         |         | 1000~26500         | -3.74             | -46.94          | $\leq -23.74$  | PASS    |
|          |         | 2480    | Reference          | -1.83             | -1.83           | ---            | PASS    |
|          |         |         | 30~1000            | -1.83             | -61.87          | $\leq -21.83$  | PASS    |
|          |         |         | 1000~26500         | -1.83             | -47.32          | $\leq -21.83$  | PASS    |

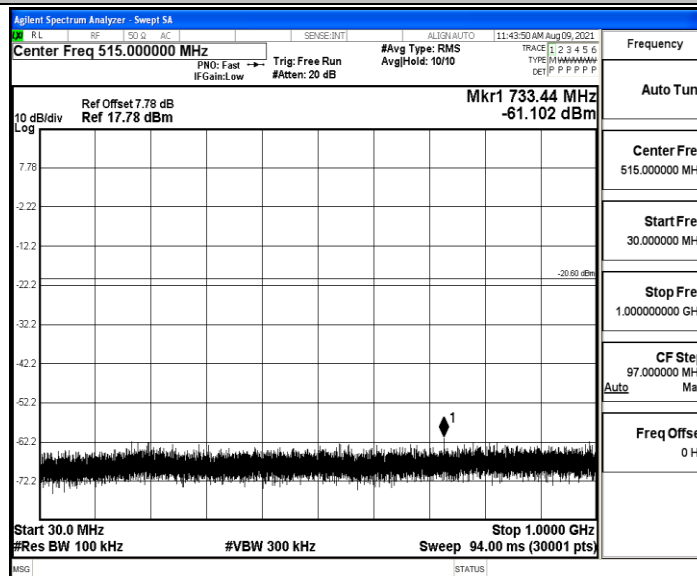


## Test Graphs

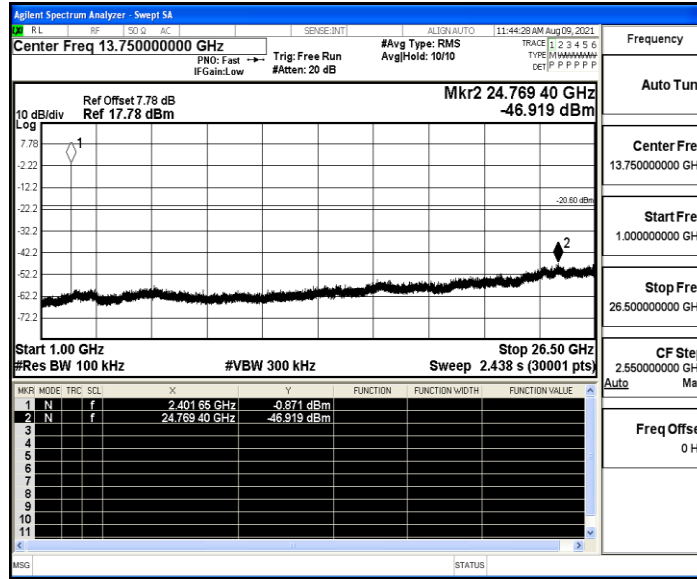
DH5\_Ant1\_2402\_0~Reference



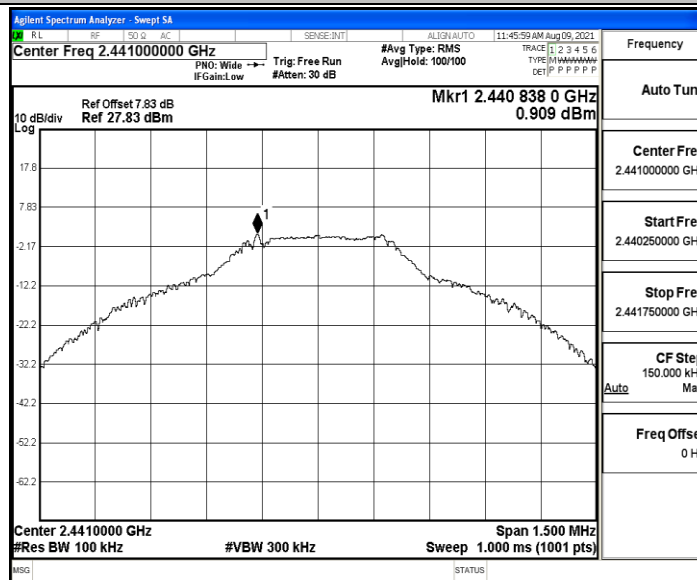
DH5\_Ant1\_2402\_30~1000



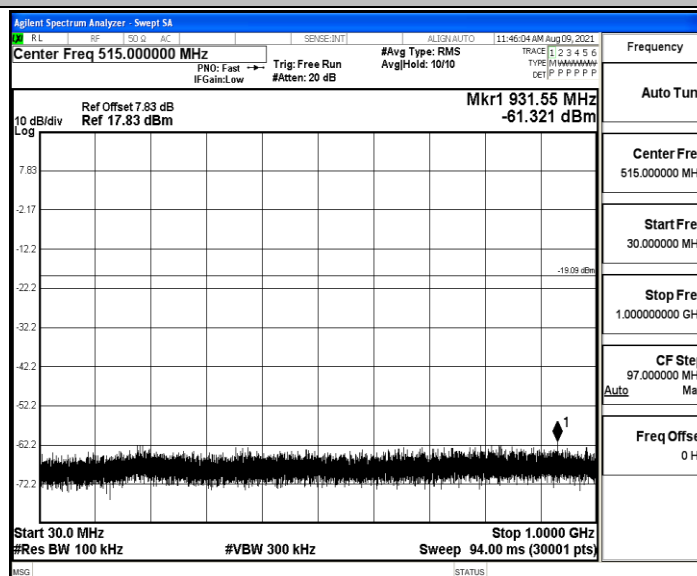
DH5\_Ant1\_2402\_1000~26500



## DH5\_Ant1\_2441\_0~Reference

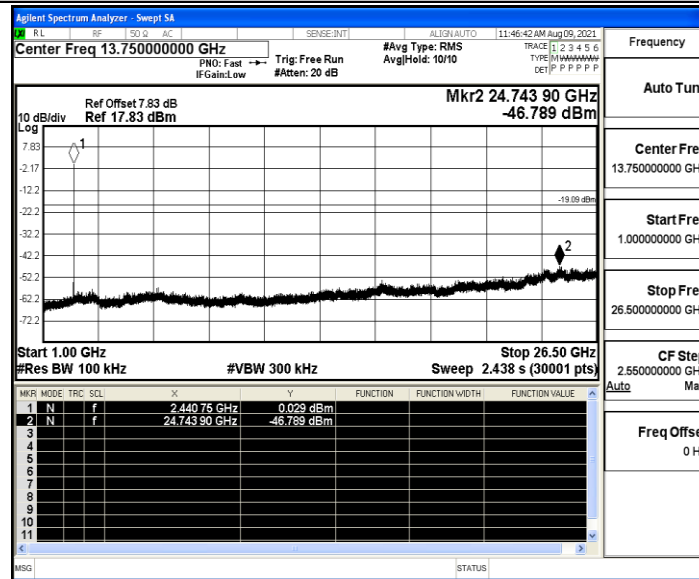


## DH5\_Ant1\_2441\_30~1000

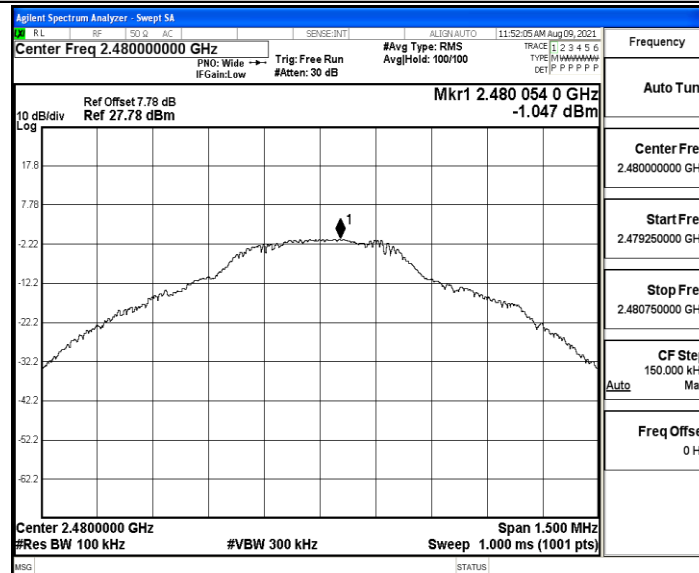




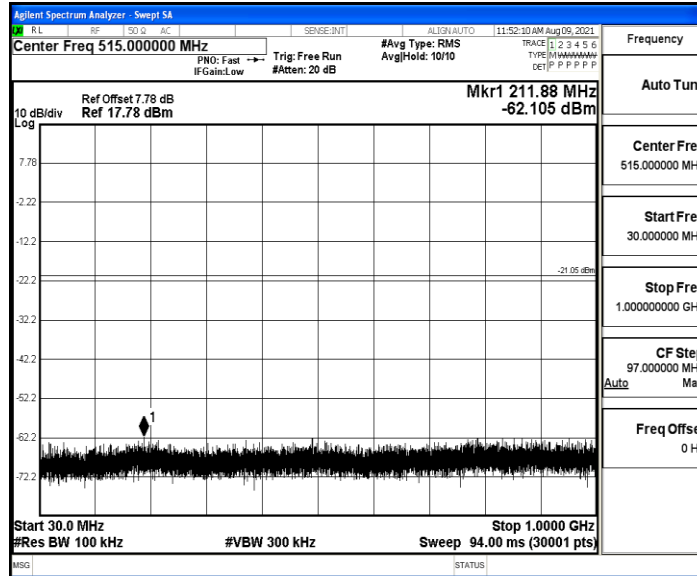
## DH5\_Ant1\_2441\_1000~26500



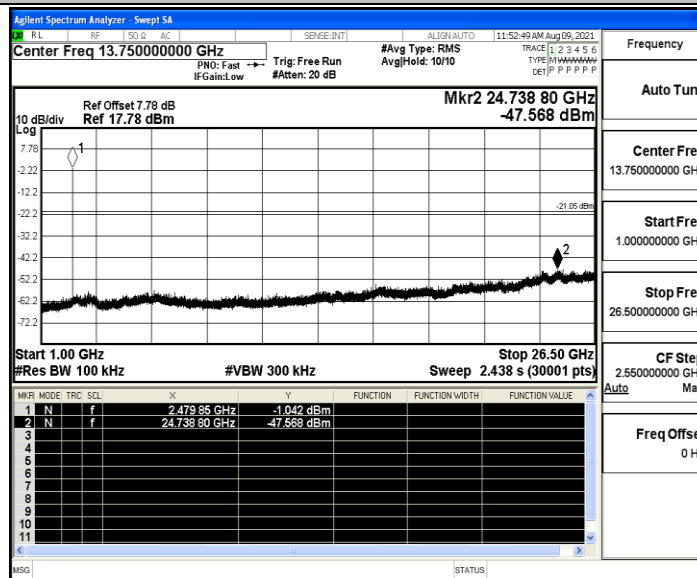
## DH5\_Ant1\_2480\_0~Reference



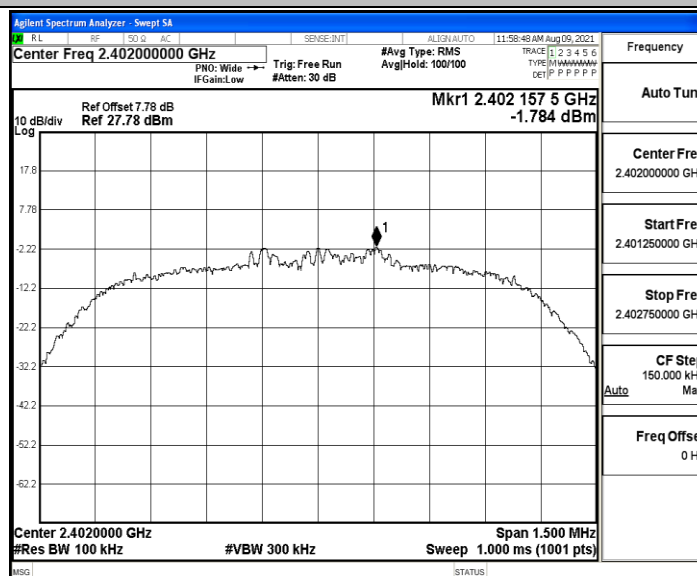
## DH5\_Ant1\_2480\_30~1000



DH5\_Ant1\_2480\_1000~26500

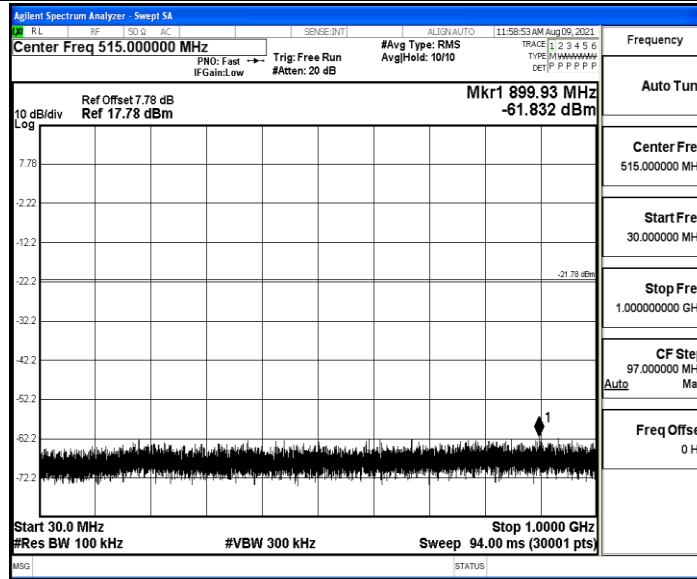


2DH5\_Ant1\_2402\_0~Reference

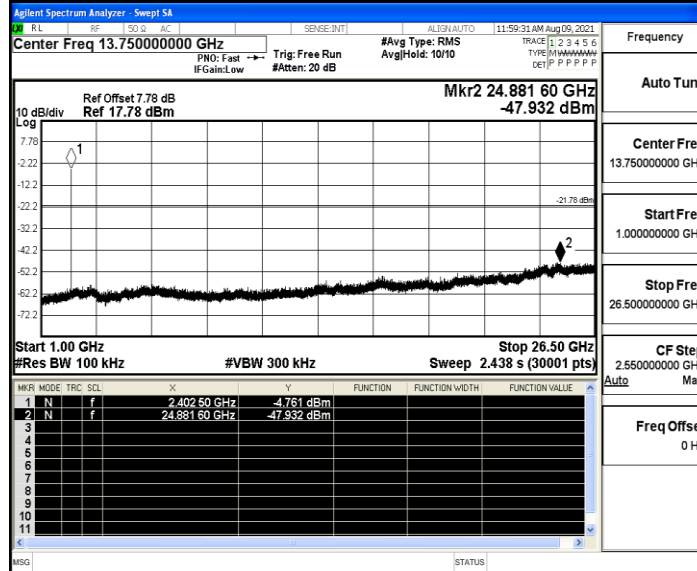




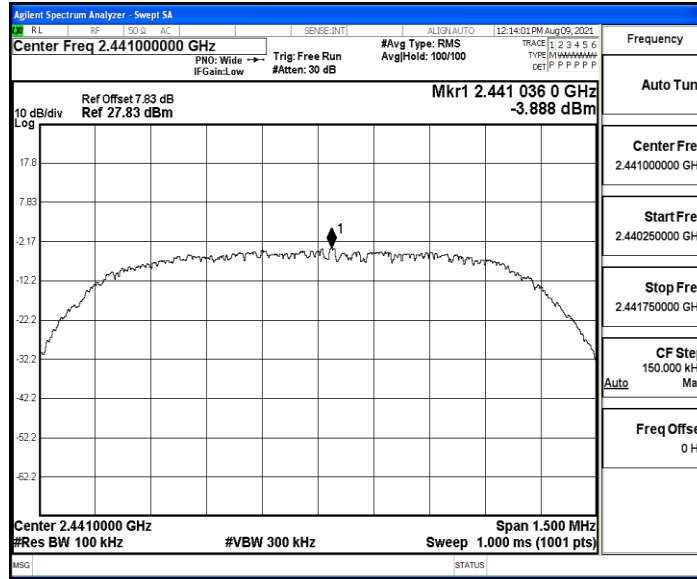
## 2DH5\_Ant1\_2402\_30~1000



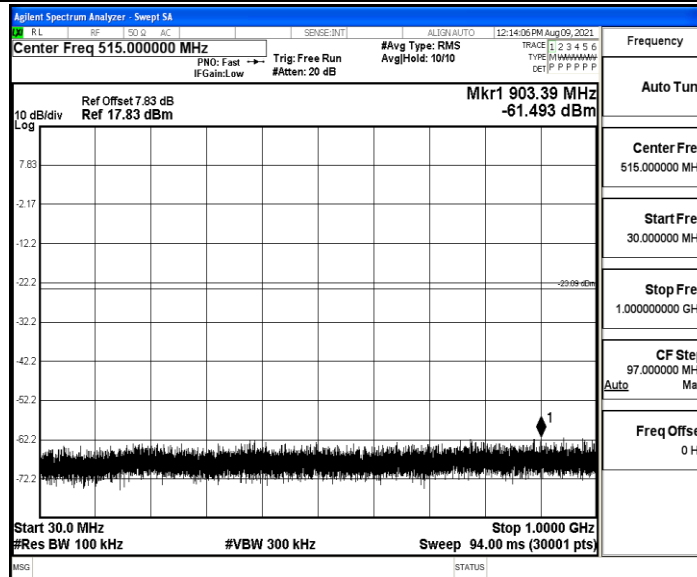
## 2DH5\_Ant1\_2402\_1000~26500



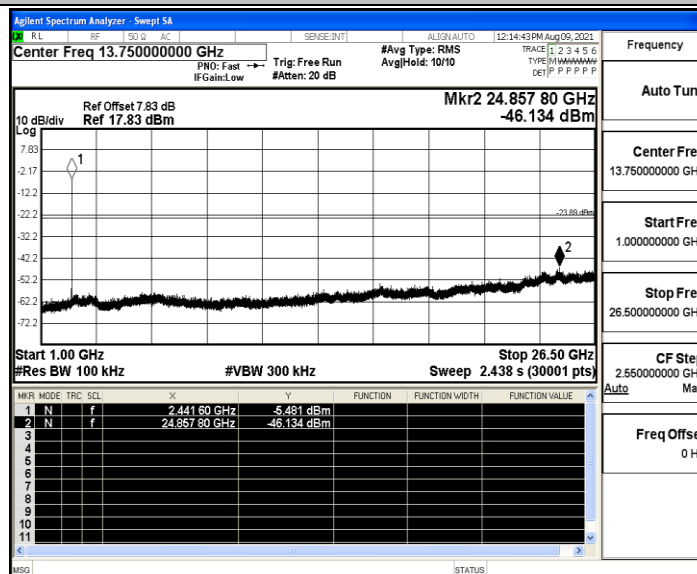
## 2DH5\_Ant1\_2441\_0~Reference



2DH5\_Ant1\_2441\_30~1000

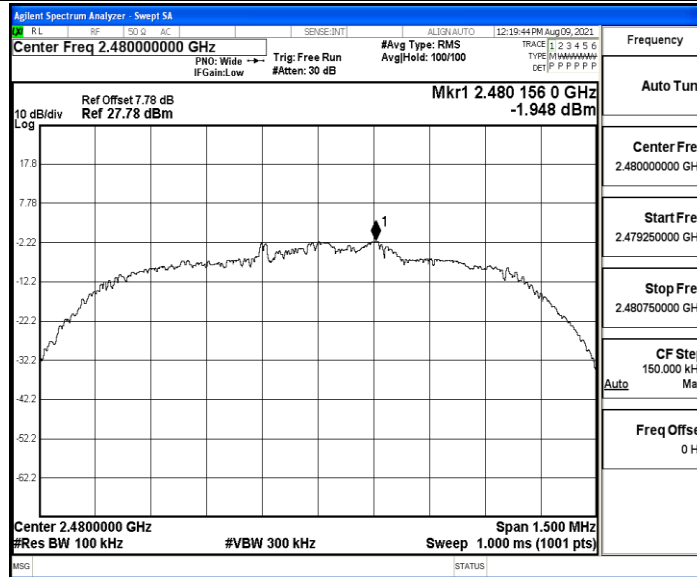


2DH5\_Ant1\_2441\_1000~26500

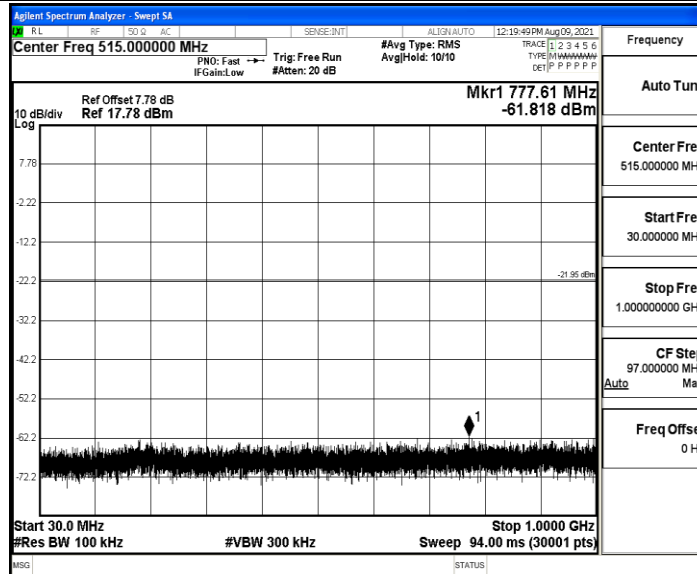




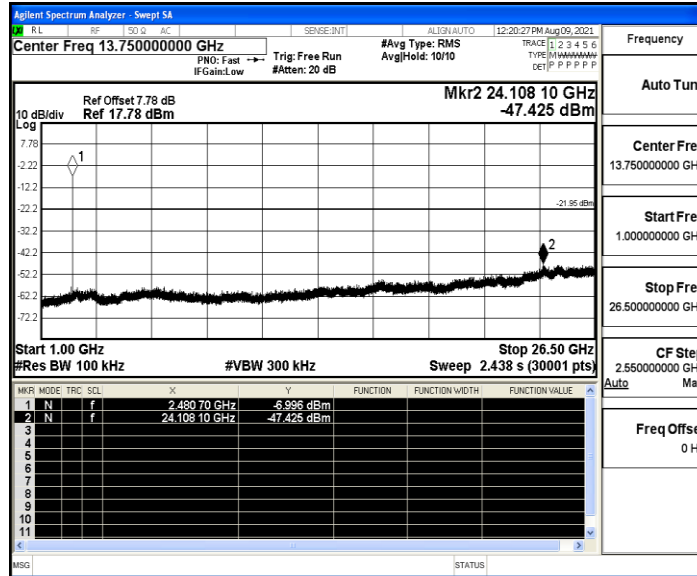
## 2DH5\_Ant1\_2480\_0~Reference



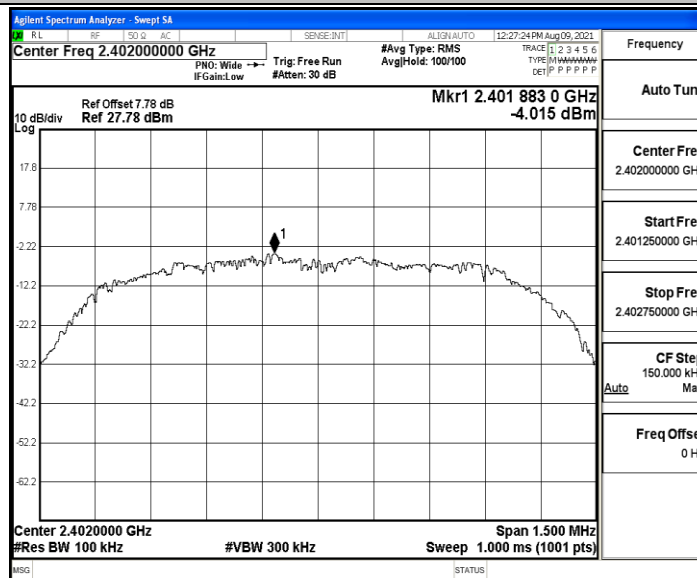
## 2DH5\_Ant1\_2480\_30~1000



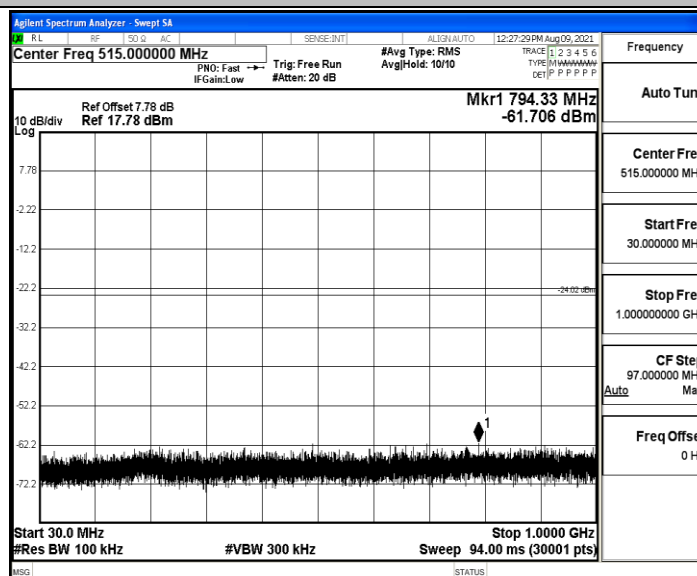
## 2DH5\_Ant1\_2480\_1000~26500



3DH5\_Ant1\_2402\_0~Reference

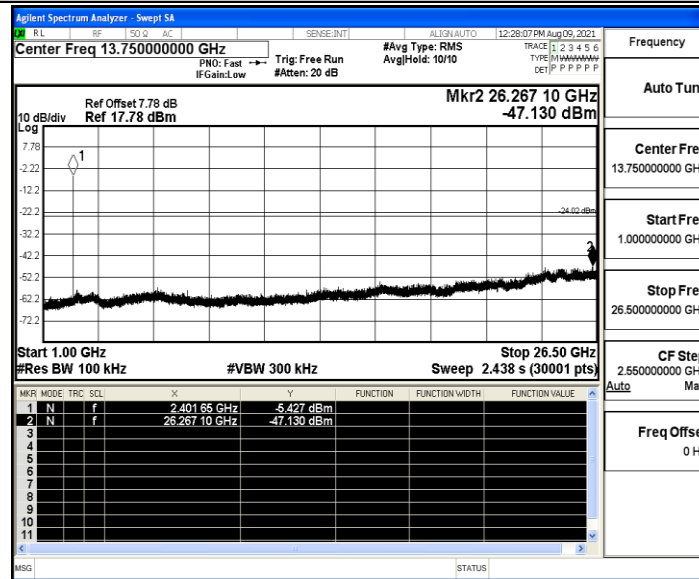


3DH5\_Ant1\_2402\_30~1000

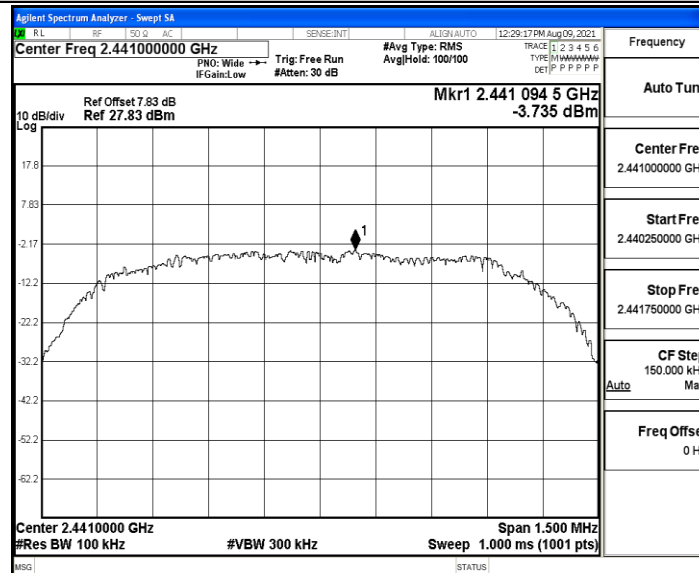




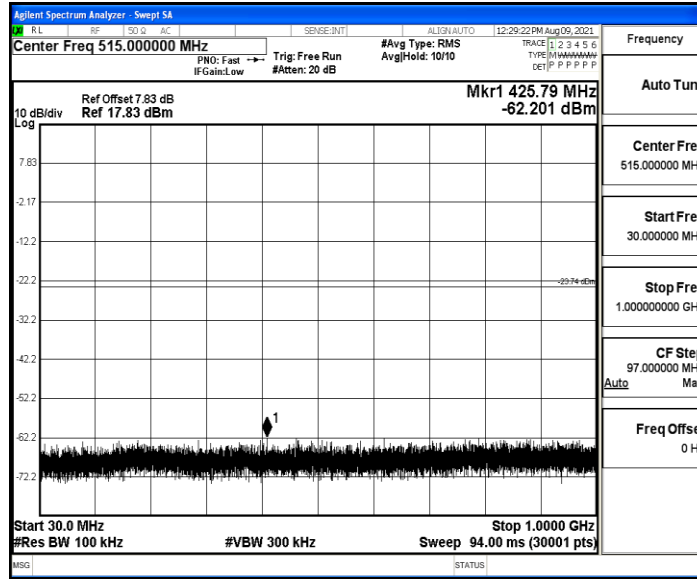
## 3DH5\_Ant1\_2402\_1000~26500



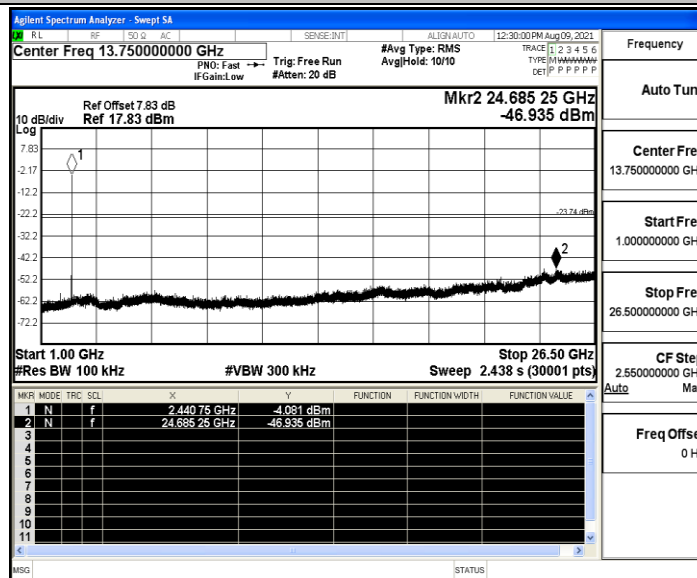
## 3DH5\_Ant1\_2441\_0~Reference



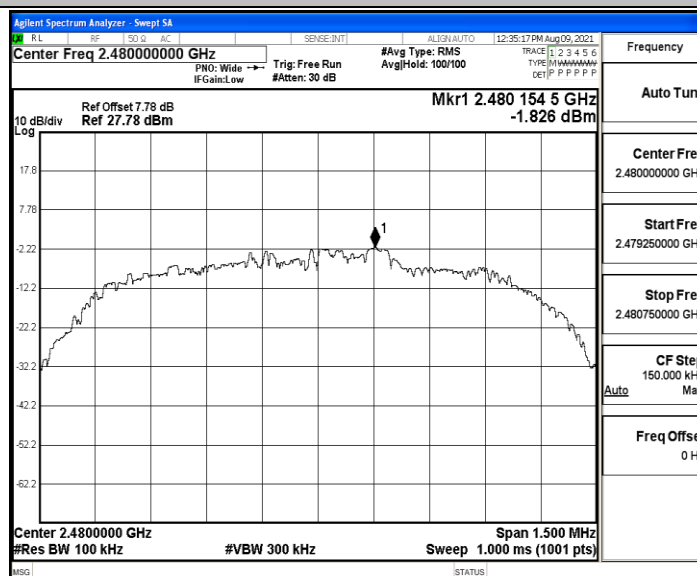
## 3DH5\_Ant1\_2441\_30~1000



3DH5\_Ant1\_2441\_1000~26500

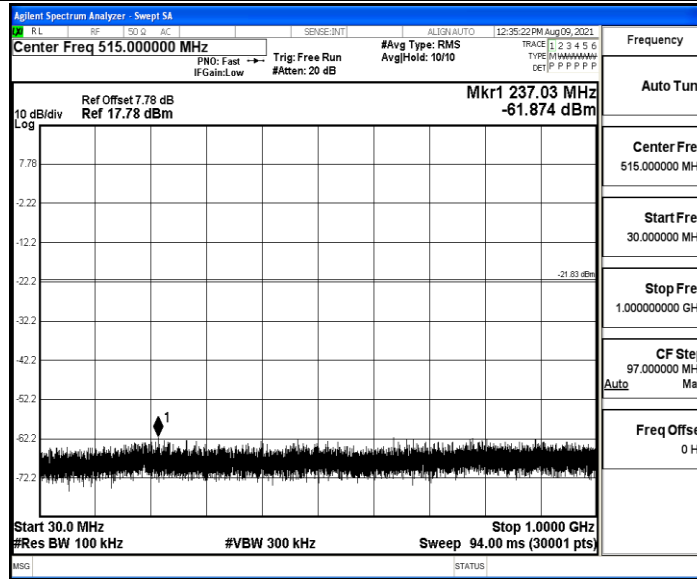


3DH5\_Ant1\_2480\_0~Reference

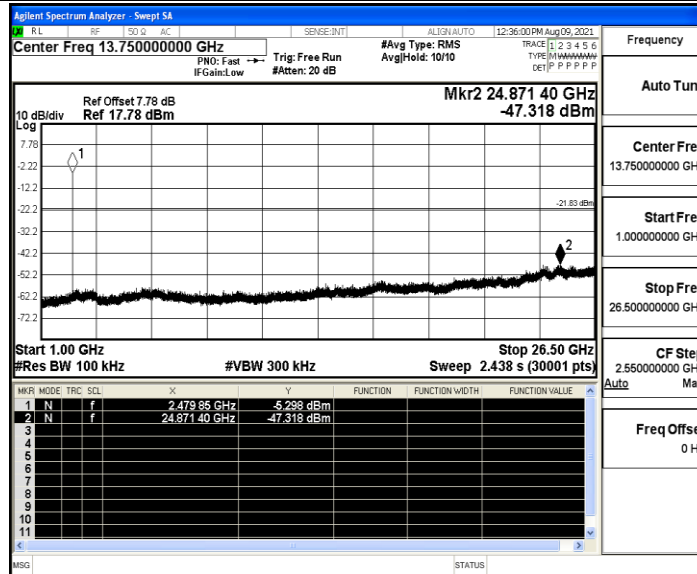




## 3DH5\_Ant1\_2480\_30~1000



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





## Appendix A.8: Emissions in Restricted Bands

### Test Result

| TestMod<br>e | Antenn<br>a | ChNam<br>e | Channe<br>l | Detector | Freq.<br>[MHz] | Result<br>[dBm] | Limit<br>[dBm] | Result<br>[dBuV/<br>m] | Limit<br>[dBuV/<br>m] | Verdict |
|--------------|-------------|------------|-------------|----------|----------------|-----------------|----------------|------------------------|-----------------------|---------|
| DH5          | Ant1        | Low        | 2402        | AV       | 2310.000       | -48.97          | ≤-41.20        | 46.23                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2388.935       | -48.4           | ≤-41.20        | 46.80                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2390.000       | -48.57          | ≤-41.20        | 46.63                  | ≤54                   | PASS    |
|              |             |            |             | Peak     | 2310.000       | -40.82          | ≤-21.20        | 54.38                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2381.795       | -37.71          | ≤-21.20        | 57.49                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2390.000       | -39.92          | ≤-21.20        | 55.28                  | ≤74                   | PASS    |
|              |             | High       | 2480        | AV       | 2483.500       | -47.92          | ≤-41.20        | 47.28                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2496.400       | -47.83          | ≤-41.20        | 47.37                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2500.000       | -47.91          | ≤-41.20        | 47.29                  | ≤54                   | PASS    |
|              |             |            |             | Peak     | 2483.500       | -39.94          | ≤-21.20        | 55.26                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2492.400       | -37.65          | ≤-21.20        | 57.55                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2500.000       | -39.82          | ≤-21.20        | 55.38                  | ≤74                   | PASS    |
| 2DH5         | Ant1        | Low        | 2402        | AV       | 2310.000       | -48.78          | ≤-41.20        | 46.42                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2385.785       | -48.4           | ≤-41.20        | 46.80                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2390.000       | -48.47          | ≤-41.20        | 46.73                  | ≤54                   | PASS    |
|              |             |            |             | Peak     | 2310.000       | -40.8           | ≤-21.20        | 54.40                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2341.265       | -38.41          | ≤-21.20        | 56.79                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2390.000       | -39.73          | ≤-21.20        | 55.47                  | ≤74                   | PASS    |
|              |             | High       | 2480        | AV       | 2483.500       | -47.87          | ≤-41.20        | 47.33                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2497.520       | -47.8           | ≤-41.20        | 47.40                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2500.000       | -47.95          | ≤-41.20        | 47.25                  | ≤54                   | PASS    |
|              |             |            |             | Peak     | 2483.500       | -39.51          | ≤-21.20        | 55.69                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2493.840       | -37.81          | ≤-21.20        | 57.39                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2500.000       | -39.75          | ≤-21.20        | 55.45                  | ≤74                   | PASS    |
| 3DH5         | Ant1        | Low        | 2402        | AV       | 2310.000       | -48.85          | ≤-41.20        | 46.35                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2387.465       | -48.4           | ≤-41.20        | 46.80                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2390.000       | -48.46          | ≤-41.20        | 46.74                  | ≤54                   | PASS    |
|              |             |            |             | Peak     | 2310.000       | -40.8           | ≤-21.20        | 54.40                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2320.895       | -38.1           | ≤-21.20        | 57.10                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2390.000       | -39.25          | ≤-21.20        | 55.95                  | ≤74                   | PASS    |
|              |             | High       | 2480        | AV       | 2483.500       | -47.74          | ≤-41.20        | 47.46                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2483.520       | -47.74          | ≤-41.20        | 47.46                  | ≤54                   | PASS    |
|              |             |            |             | AV       | 2500.000       | -47.8           | ≤-41.20        | 47.40                  | ≤54                   | PASS    |
|              |             |            |             | Peak     | 2483.500       | -39.32          | ≤-21.20        | 55.88                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2487.280       | -37.79          | ≤-21.20        | 57.41                  | ≤74                   | PASS    |
|              |             |            |             | Peak     | 2500.000       | -39.28          | ≤-21.20        | 55.92                  | ≤74                   | PASS    |



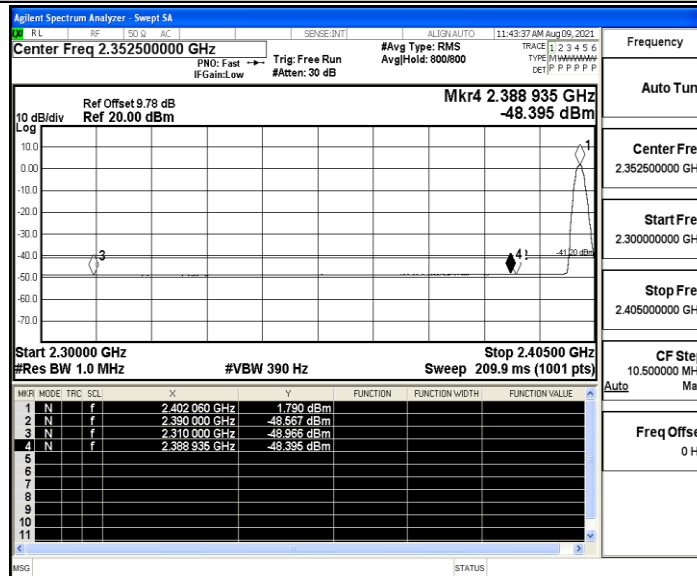
Note:

1. The Antenna Gain is compensated in the graph.
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.

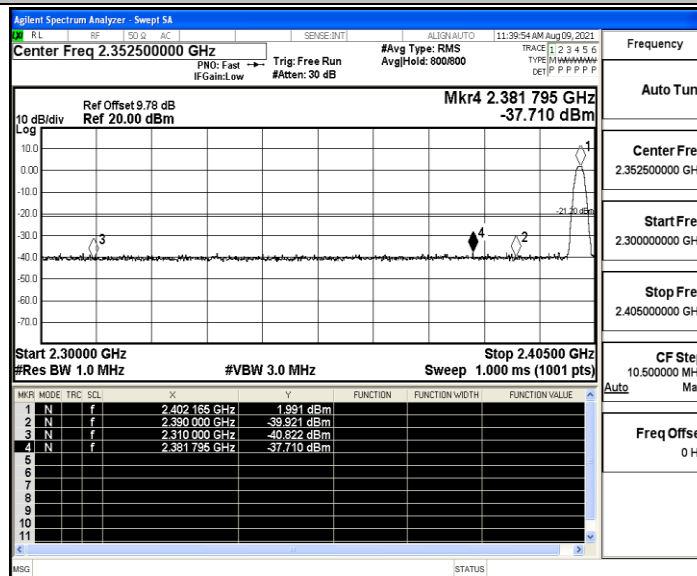


## Test Graphs

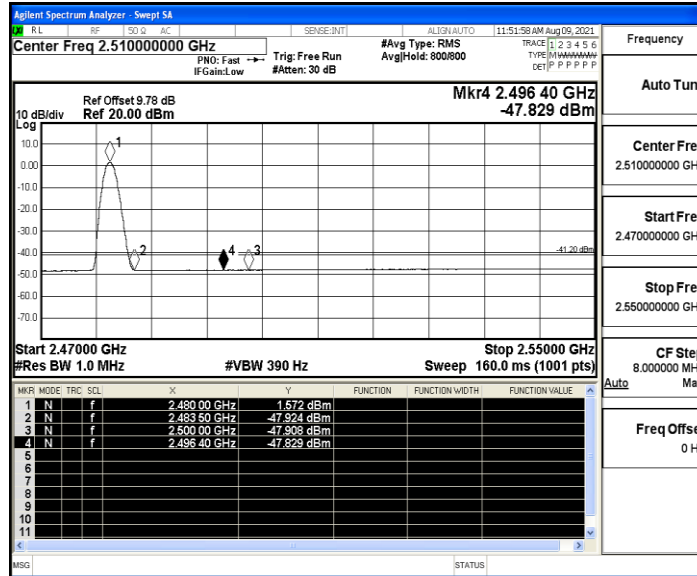
DH5\_Ant1\_Low\_2402\_AV



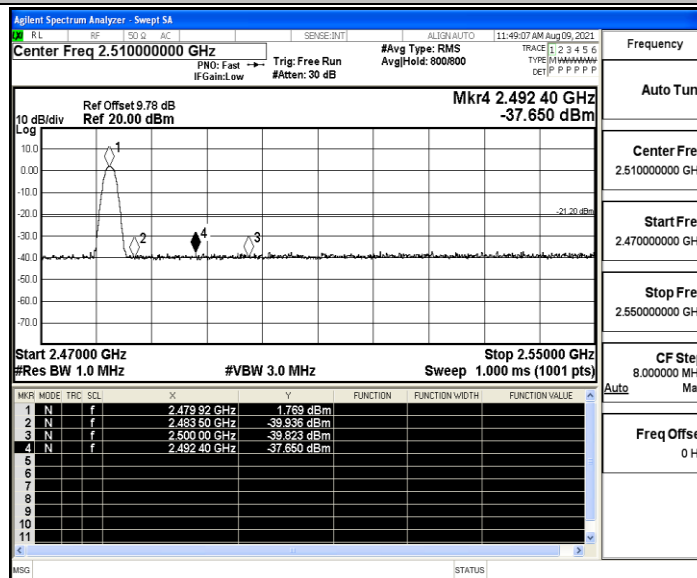
DH5\_Ant1\_Low\_2402\_Peak



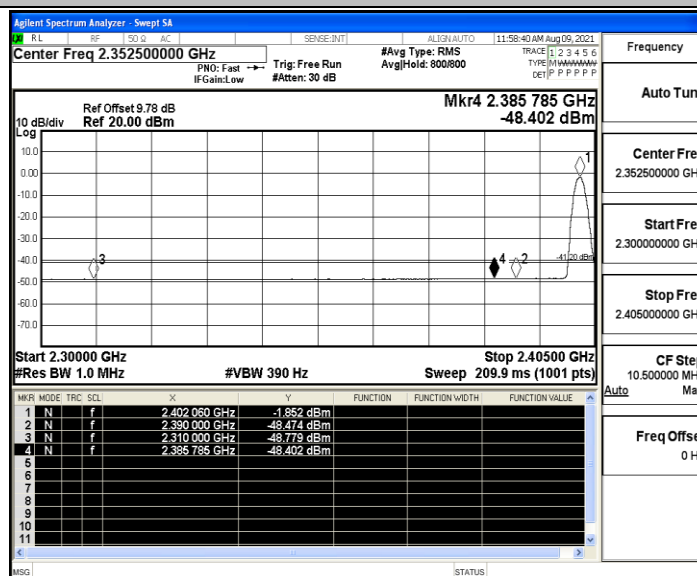
DH5\_Ant1\_High\_2480\_AV



## DH5\_Ant1\_High\_2480\_Peak

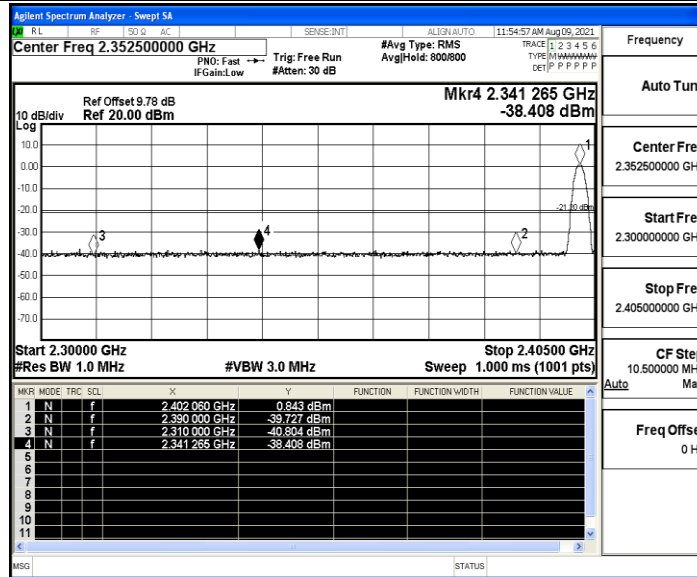


## 2DH5\_Ant1\_Low\_2402\_AV

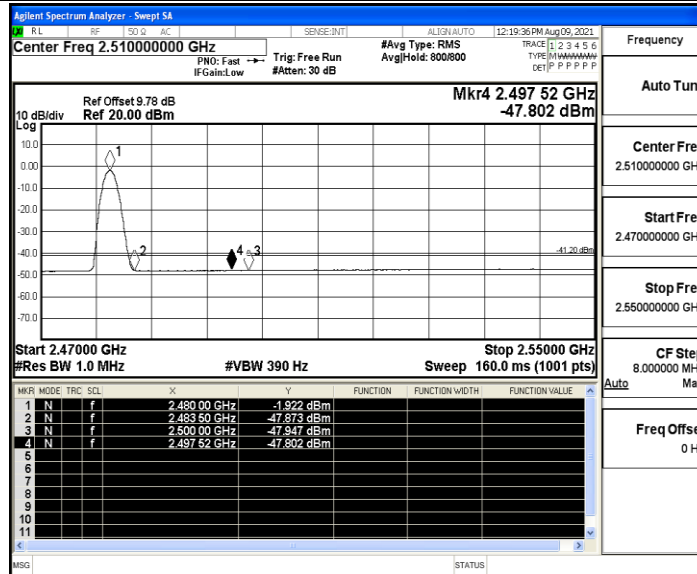




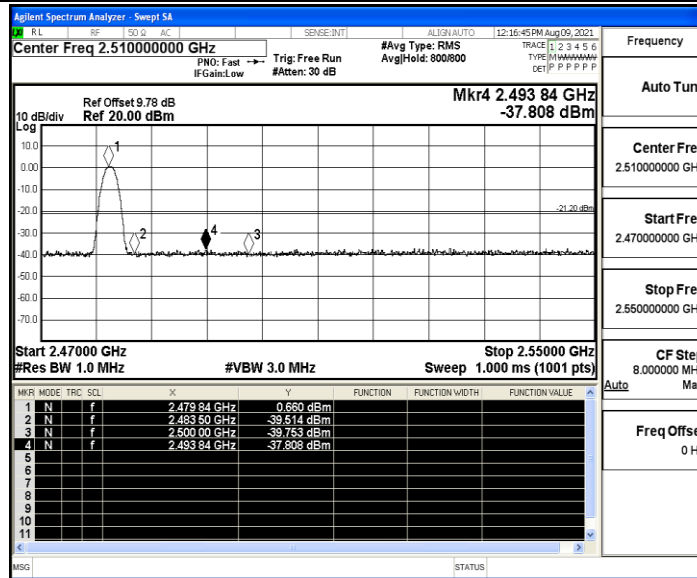
## 2DH5\_Ant1\_Low\_2402\_Peak



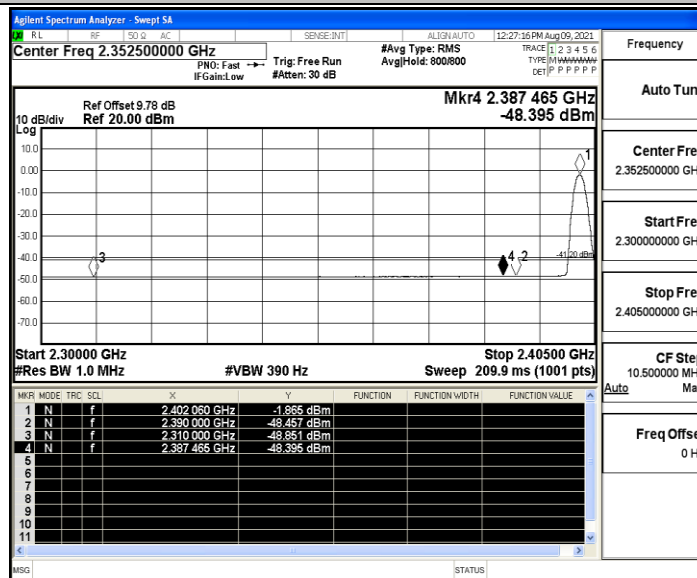
## 2DH5\_Ant1\_High\_2480\_AV



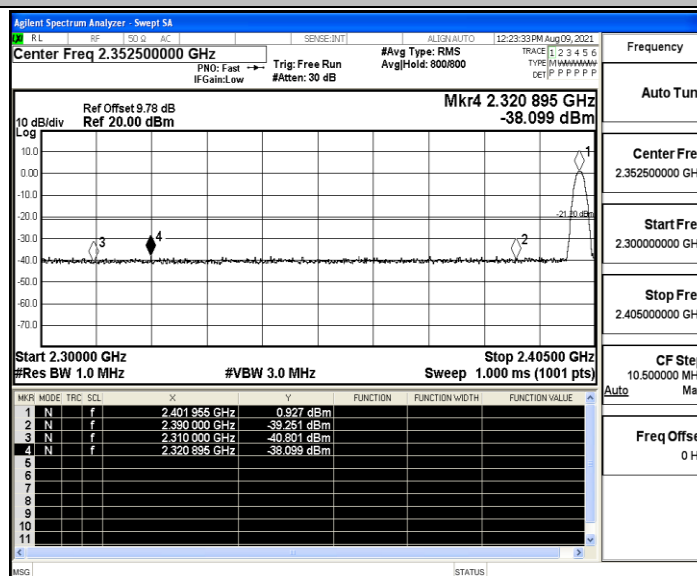
## 2DH5\_Ant1\_High\_2480\_Peak



3DH5\_Ant1\_Low\_2402\_AV

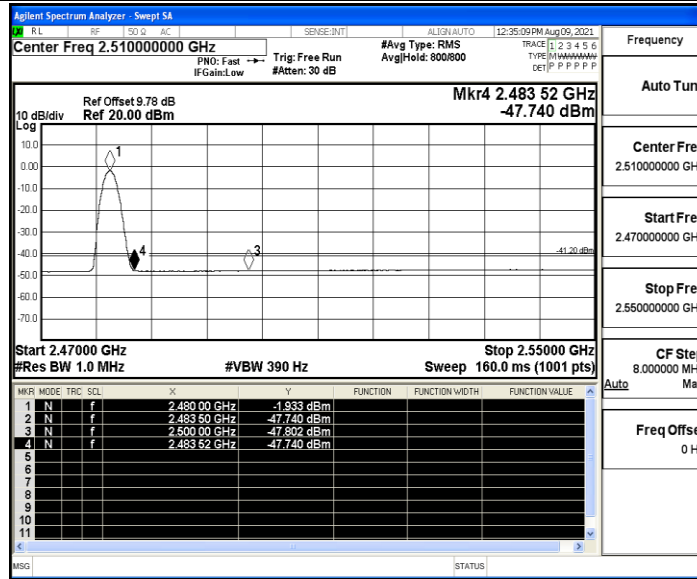


3DH5\_Ant1\_Low\_2402\_Peak



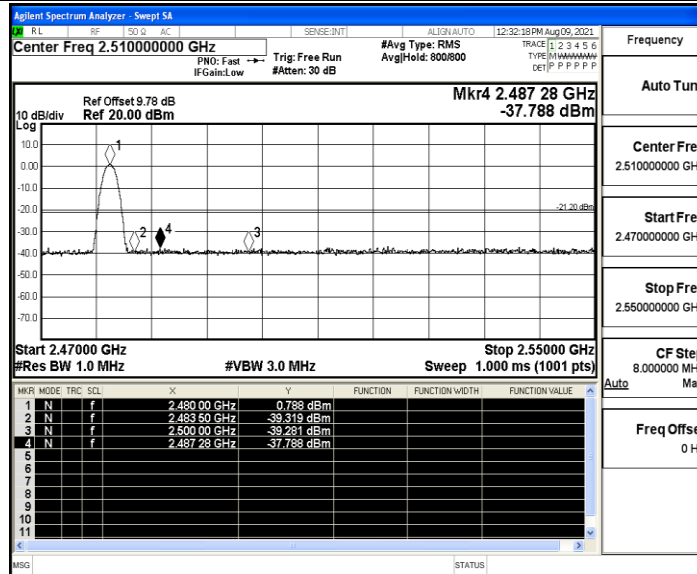


## 3DH5\_Ant1\_High\_2480\_AV



|                                |
|--------------------------------|
| Frequency                      |
| Auto Tune                      |
| Center Freq<br>2.510000000 GHz |
| Start Freq<br>2.470000000 GHz  |
| Stop Freq<br>2.550000000 GHz   |
| CF Step<br>8.000000 MHz        |
| Auto                           |
| Freq Offset<br>0 Hz            |

## 3DH5\_Ant1\_High\_2480\_Peak



|                                |
|--------------------------------|
| Frequency                      |
| Auto Tune                      |
| Center Freq<br>2.510000000 GHz |
| Start Freq<br>2.470000000 GHz  |
| Stop Freq<br>2.550000000 GHz   |
| CF Step<br>8.000000 MHz        |
| Auto                           |
| Freq Offset<br>0 Hz            |