



## Appendix D

### RF Test Data for 5.2GWIFI (Conducted Measurement)

Product Name: GNSS Receiver

Test Model: Jupiter

#### Environmental Conditions

|                    |            |
|--------------------|------------|
| Temperature:       | 23.8° C    |
| Relative Humidity: | 52.1%      |
| ATM Pressure:      | 100.0 kPa  |
| Test Engineer:     | Paddi Chen |
| Supervised by:     | Nick Peng  |



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## D.1 -26dB Bandwidth

| Condition | Mode | Frequency (MHz) | Antenna | -26 dB Bandwidth (MHz) | Limit -26 dB Bandwidth (MHz) | Verdict |
|-----------|------|-----------------|---------|------------------------|------------------------------|---------|
| NVNT      | a    | 5180            | Ant1    | 25.061                 | ---                          | Pass    |
| NVNT      | a    | 5200            | Ant1    | 24.12                  | ---                          | Pass    |
| NVNT      | a    | 5240            | Ant1    | 22.377                 | ---                          | Pass    |
| NVNT      | n20  | 5180            | Ant1    | 26.131                 | ---                          | Pass    |
| NVNT      | n20  | 5200            | Ant1    | 25.711                 | ---                          | Pass    |
| NVNT      | n20  | 5240            | Ant1    | 28.088                 | ---                          | Pass    |
| NVNT      | n40  | 5190            | Ant1    | 44.525                 | ---                          | Pass    |
| NVNT      | n40  | 5230            | Ant1    | 43.09                  | ---                          | Pass    |

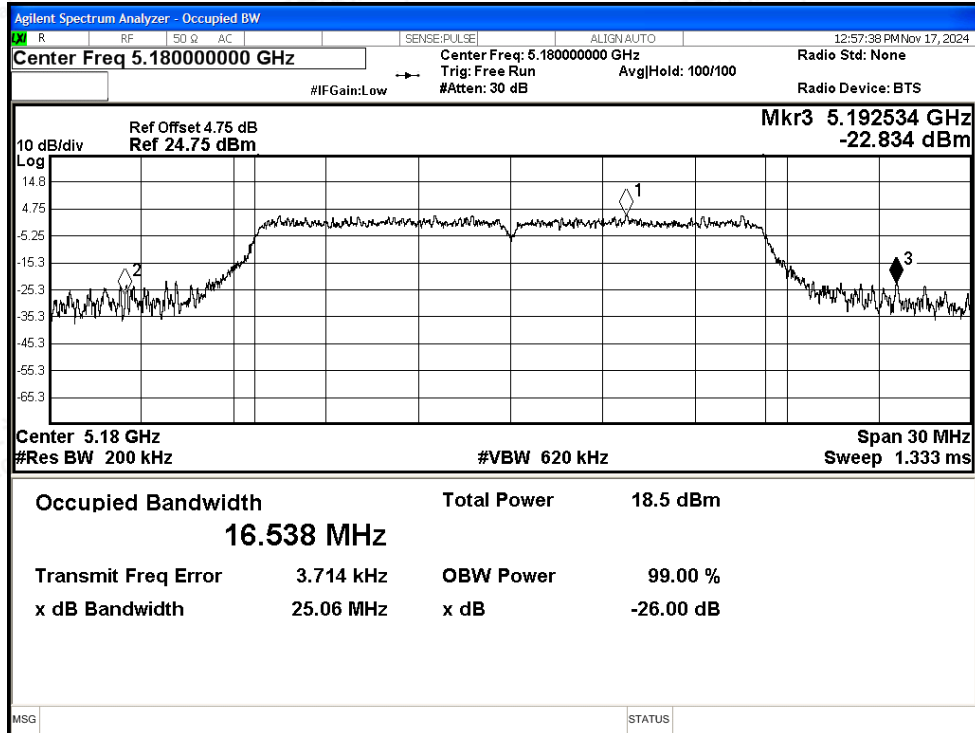


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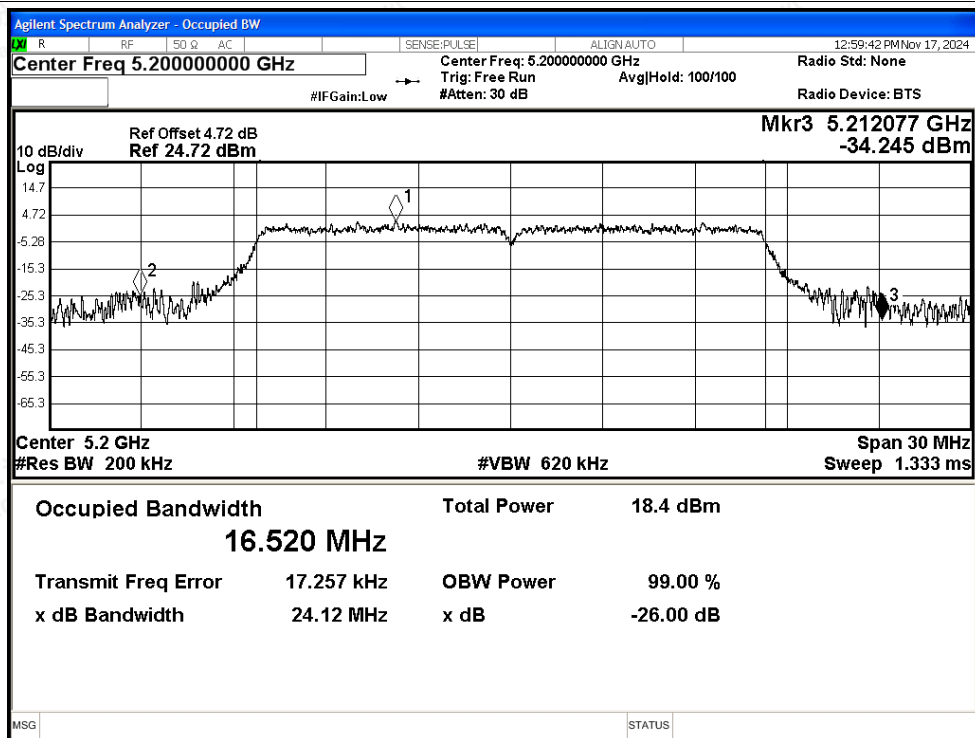


## Test Graphs

-26dB Bandwidth NVNT a 5180MHz Ant1

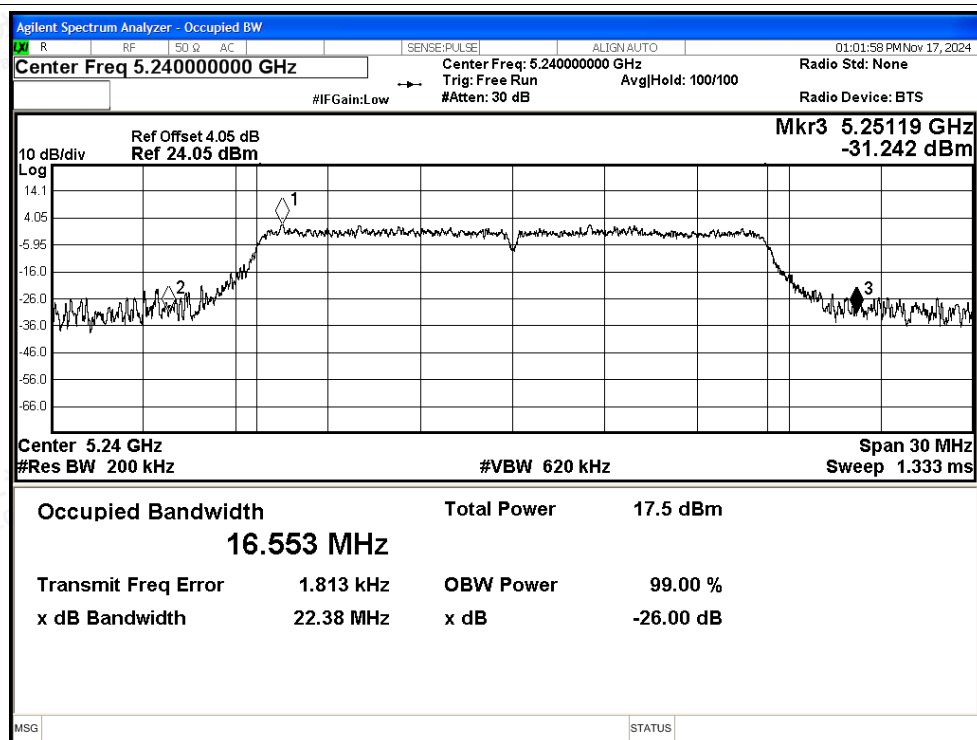


-26dB Bandwidth NVNT a 5200MHz Ant1

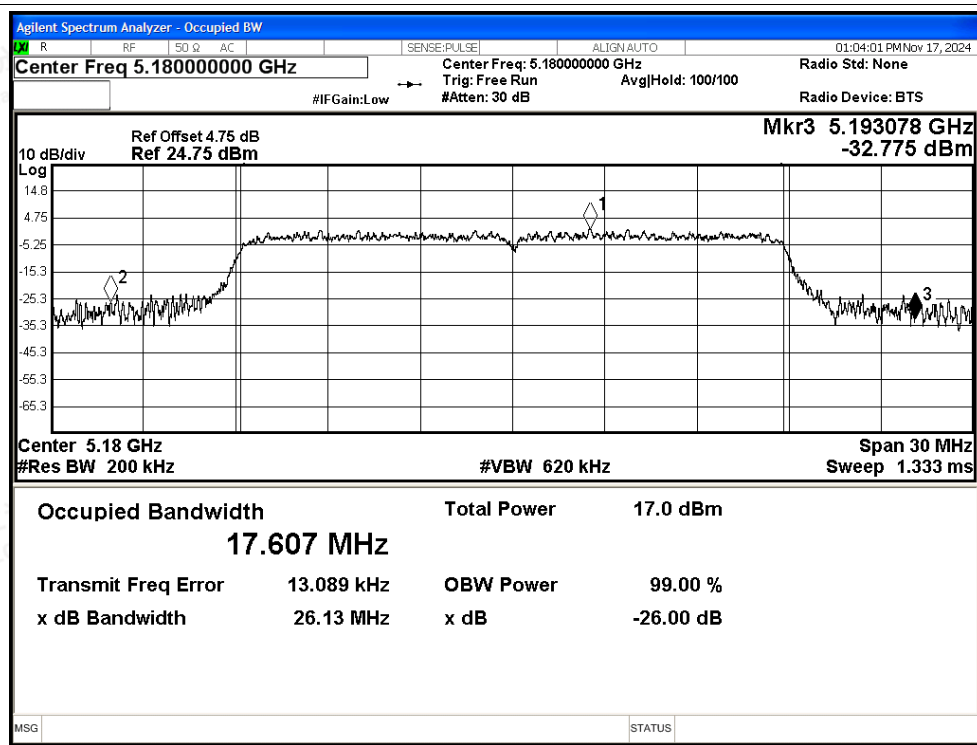


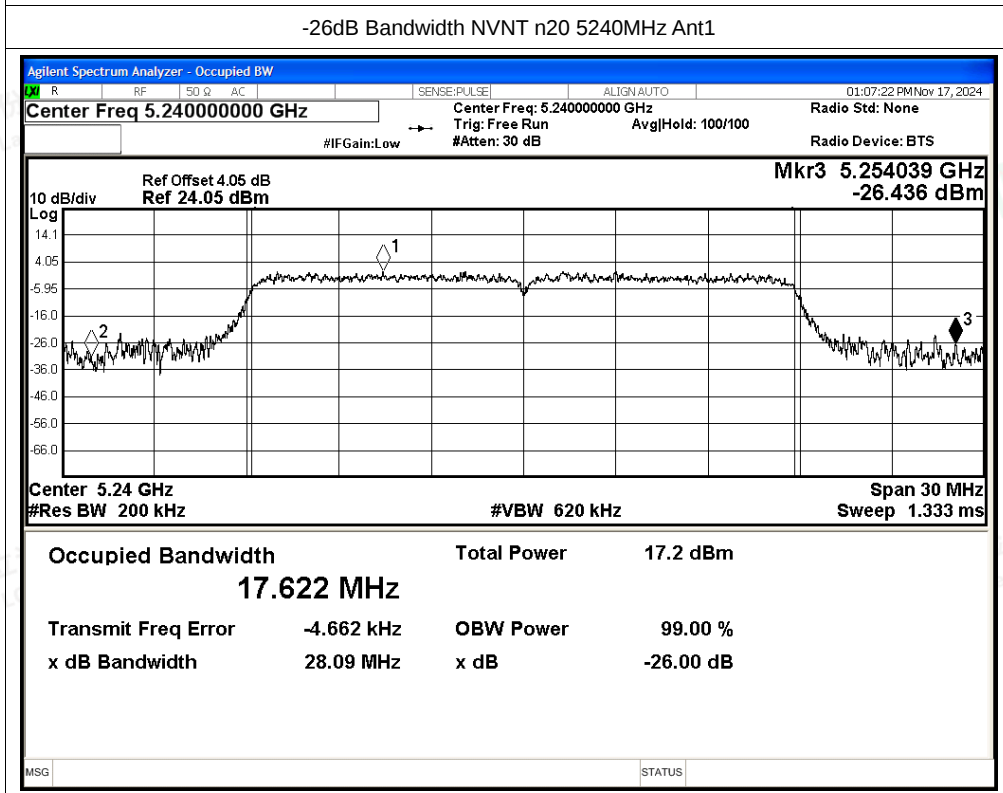
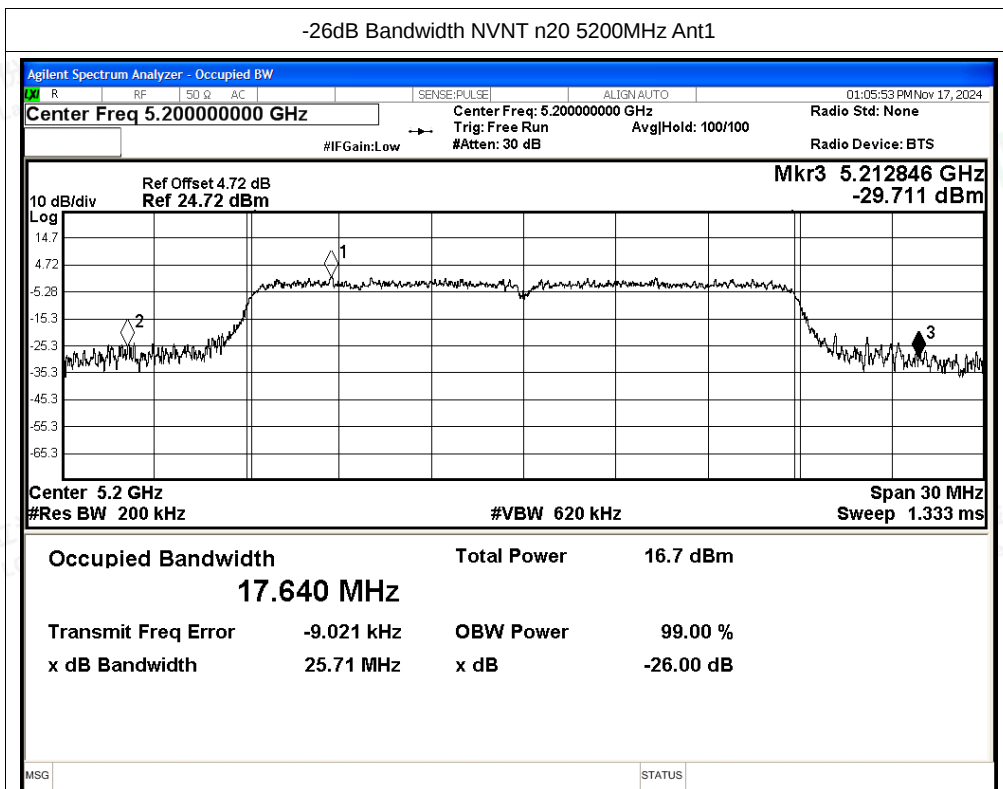


## -26dB Bandwidth NVNT a 5240MHz Ant1



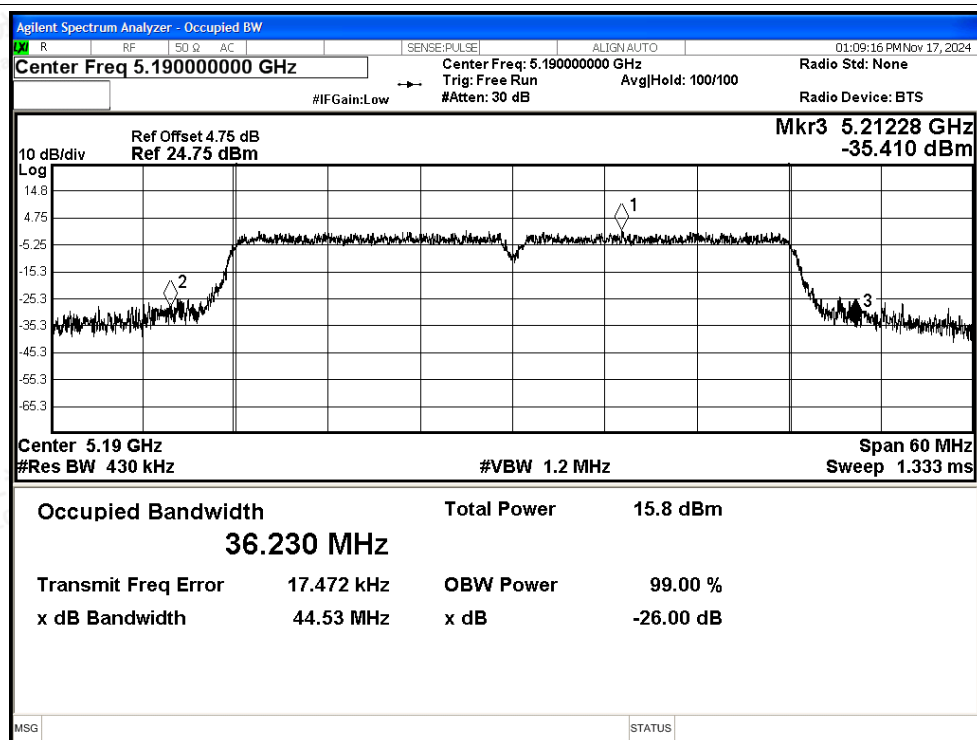
## -26dB Bandwidth NVNT n20 5180MHz Ant1



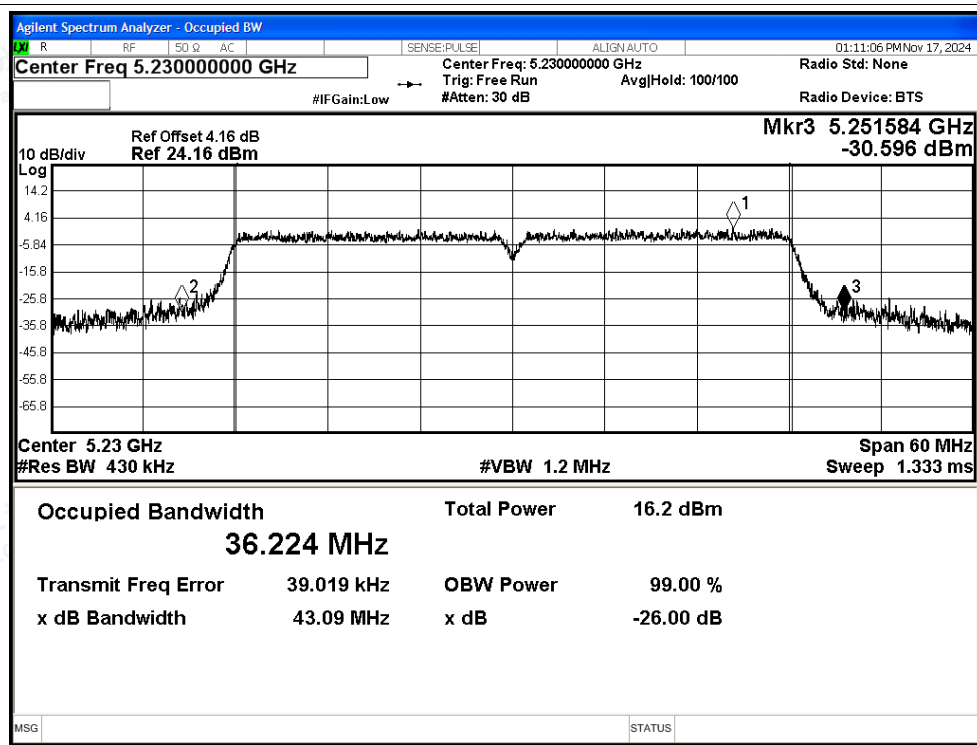




## -26dB Bandwidth NVNT n40 5190MHz Ant1



## -26dB Bandwidth NVNT n40 5230MHz Ant1





## D.2 Maximum Conducted Output Power

| Condition | Mode | Frequency (MHz) | Antenna | Conducted Power (dBm) | Duty Factor (dB) | Total Power (dBm) | Limit (dBm) | Verdict |
|-----------|------|-----------------|---------|-----------------------|------------------|-------------------|-------------|---------|
| NVNT      | a    | 5180            | Ant1    | 12.7                  | 0.24             | 12.94             | 24          | Pass    |
| NVNT      | a    | 5200            | Ant1    | 12.56                 | 0.24             | 12.8              | 24          | Pass    |
| NVNT      | a    | 5240            | Ant1    | 11.72                 | 0.24             | 11.96             | 24          | Pass    |
| NVNT      | n20  | 5180            | Ant1    | 11.45                 | 0.12             | 11.57             | 24          | Pass    |
| NVNT      | n20  | 5200            | Ant1    | 11.25                 | 0.12             | 11.37             | 24          | Pass    |
| NVNT      | n20  | 5240            | Ant1    | 11.46                 | 0.12             | 11.58             | 24          | Pass    |
| NVNT      | n40  | 5190            | Ant1    | 9.87                  | 0.24             | 10.11             | 24          | Pass    |
| NVNT      | n40  | 5230            | Ant1    | 10.17                 | 0.24             | 10.41             | 24          | Pass    |



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### D.3 Maximum Power Spectral Density Level

| Condition | Mode | Frequency (MHz) | Antenna | Conducted PSD (dBm/MHz) | Duty Factor (dB) | Total PSD (dBm/MHz) | Limit (dBm/MHz) | Verdict |
|-----------|------|-----------------|---------|-------------------------|------------------|---------------------|-----------------|---------|
| NVNT      | a    | 5180            | Ant1    | 2.15                    | 0.24             | 2.39                | 11              | Pass    |
| NVNT      | a    | 5200            | Ant1    | 2.24                    | 0.24             | 2.48                | 11              | Pass    |
| NVNT      | a    | 5240            | Ant1    | 1.18                    | 0.24             | 1.42                | 11              | Pass    |
| NVNT      | n20  | 5180            | Ant1    | 0.98                    | 0.12             | 1.1                 | 11              | Pass    |
| NVNT      | n20  | 5200            | Ant1    | 0.38                    | 0.12             | 0.5                 | 11              | Pass    |
| NVNT      | n20  | 5240            | Ant1    | 0.8                     | 0.12             | 0.92                | 11              | Pass    |
| NVNT      | n40  | 5190            | Ant1    | -3.96                   | 0.24             | -3.72               | 11              | Pass    |
| NVNT      | n40  | 5230            | Ant1    | -2.91                   | 0.24             | -2.67               | 11              | Pass    |

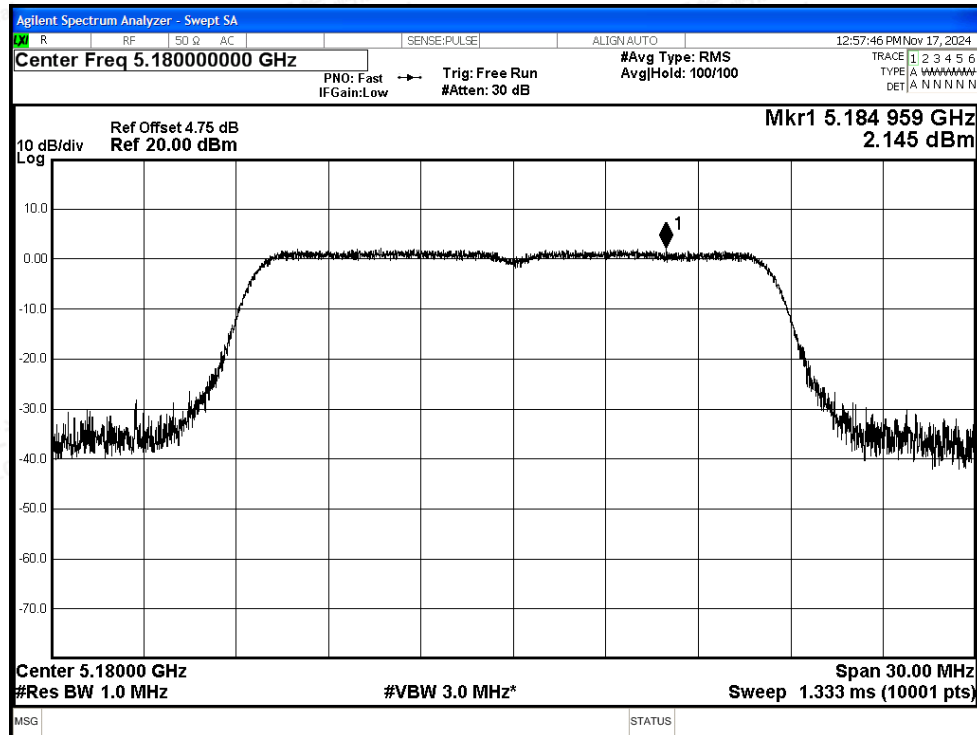


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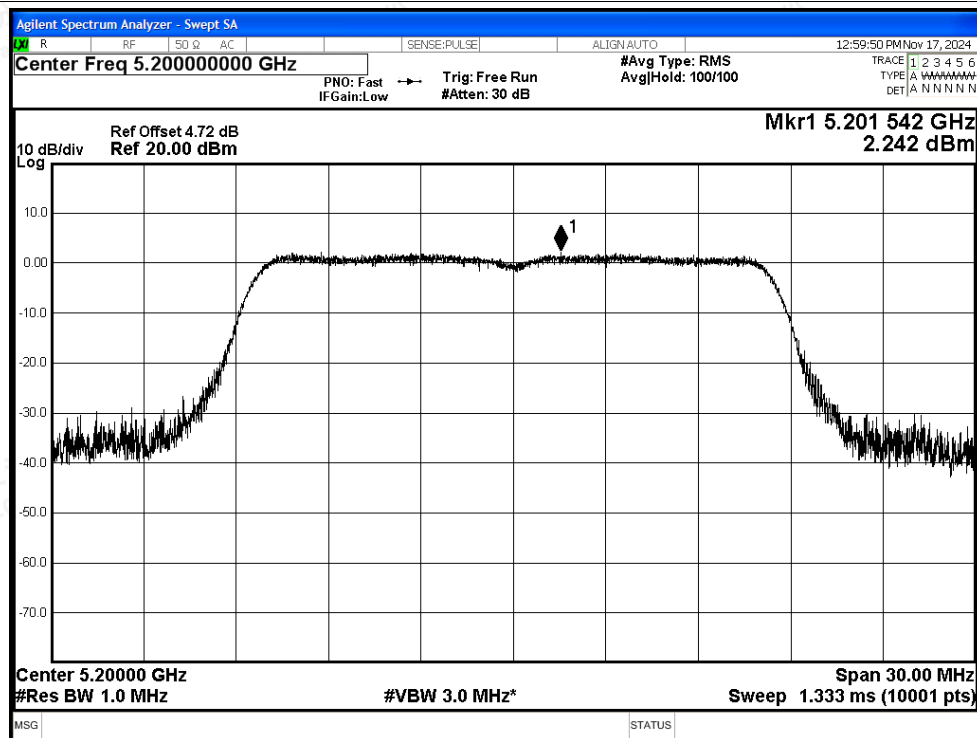


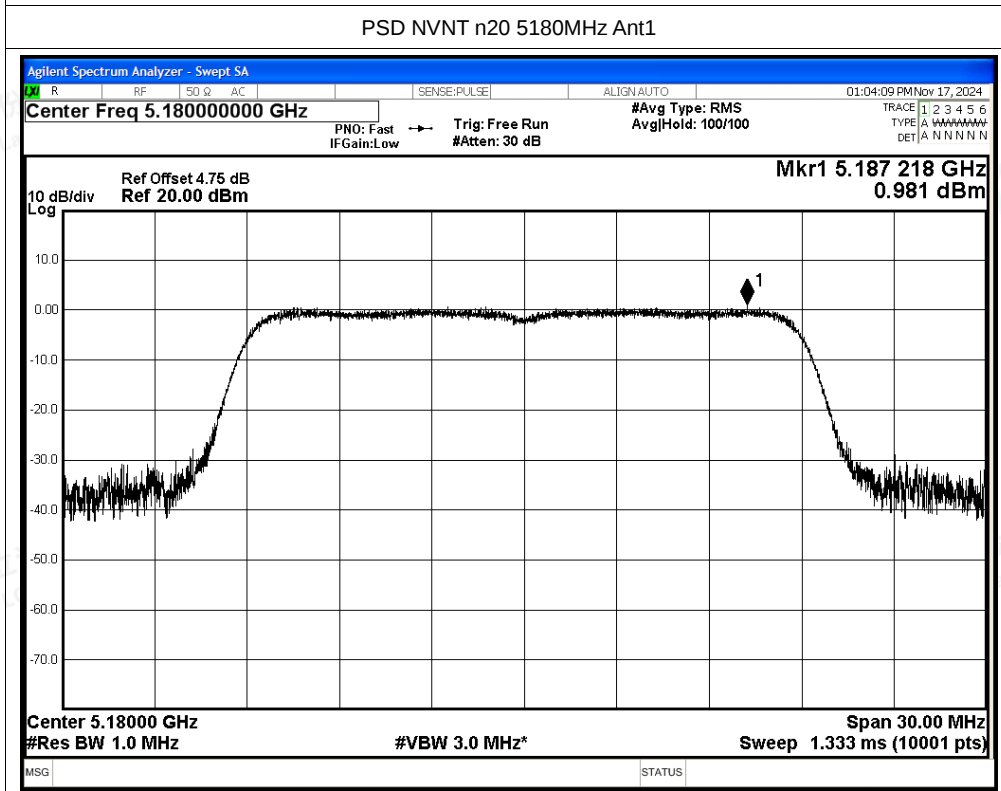
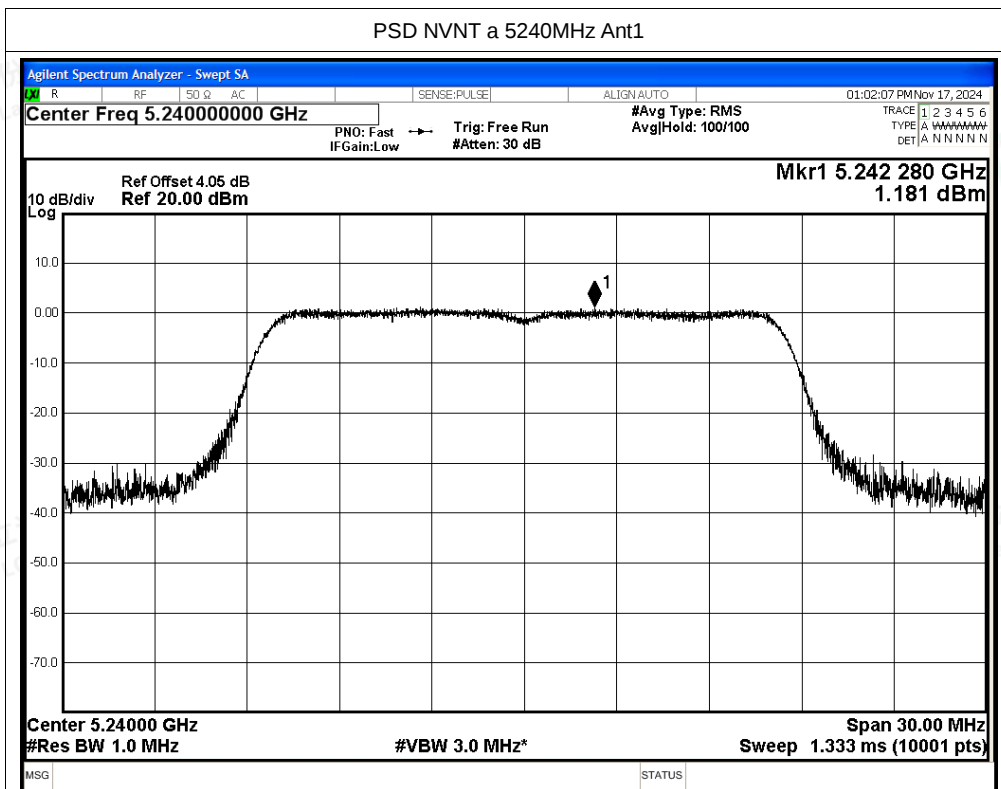
## Test Graphs

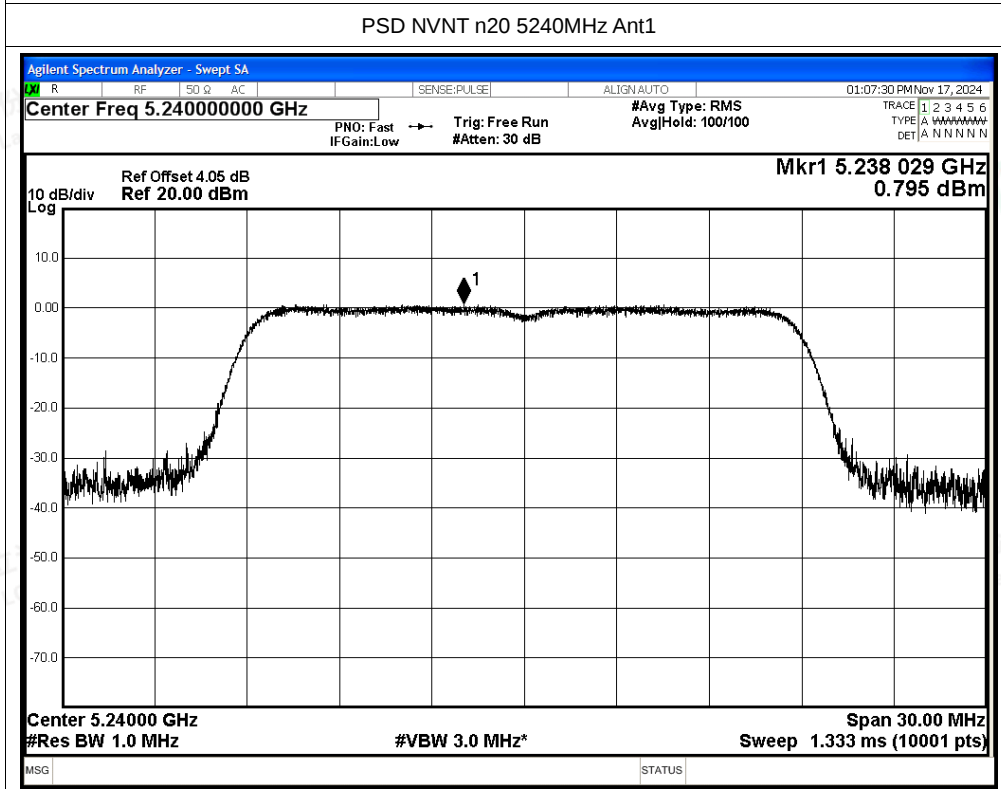
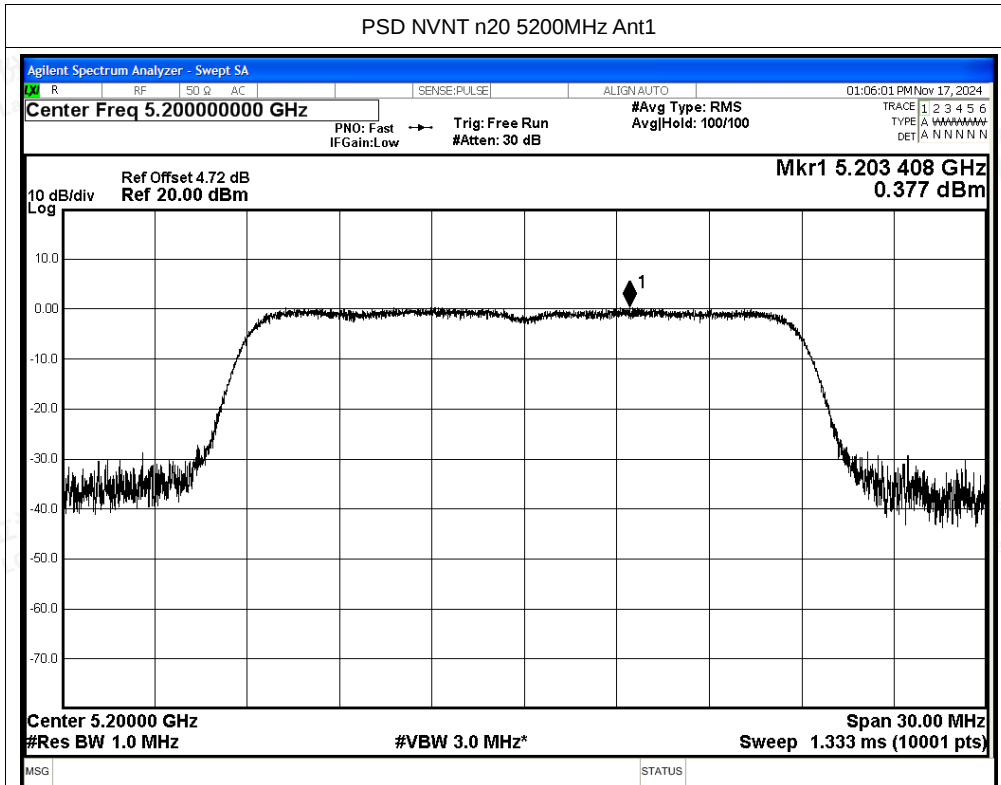
## PSD NVNT a 5180MHz Ant1

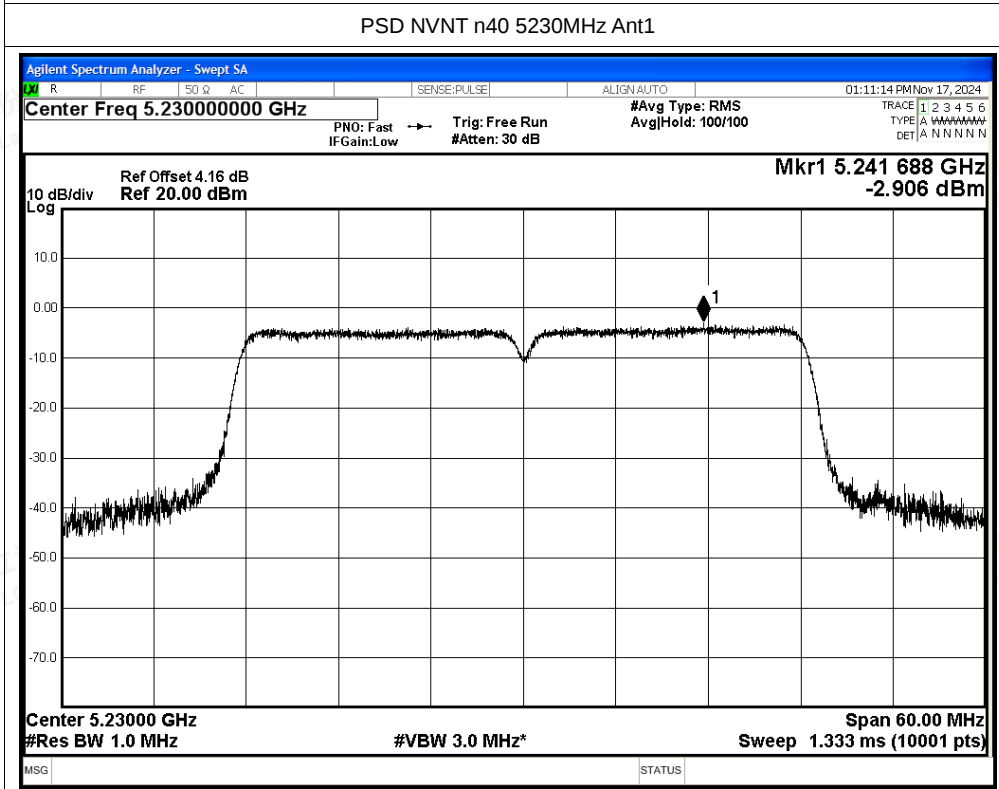
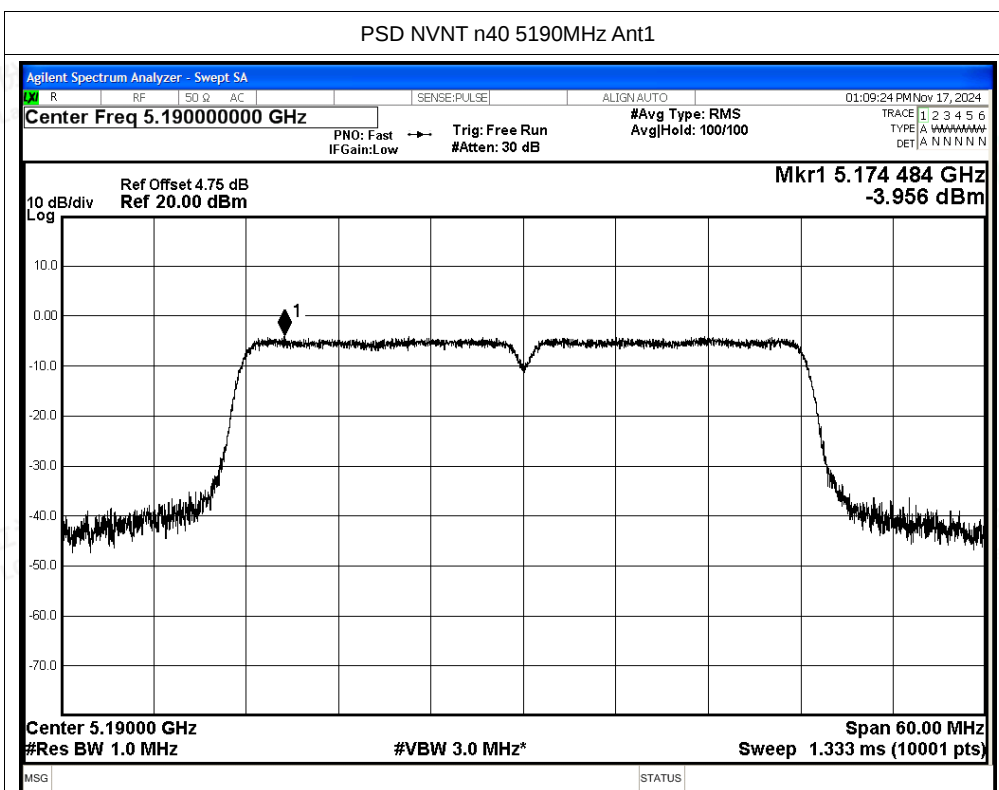


## PSD NVNT a 5200MHz Ant1











## D.4 Restrict Band

| Condition | Mode | Frequency (MHz) | Antenna | Spur Freq (MHz) | Power (dBm) | Gain (dBi) | Duty Factor (dB) | E (dBuV/m) | Detector | Limit (dBuV/m) | Verdict |
|-----------|------|-----------------|---------|-----------------|-------------|------------|------------------|------------|----------|----------------|---------|
| NVNT      | a    | 5180            | Ant1    | 4500            | -49.4       | 5.8        | -                | 51.63      | Peak     | 68.2           | Pass    |
| NVNT      | a    | 5180            | Ant1    | 4500            | -57.19      | 5.8        | 0.24             | 44.08      | Average  | 54             | Pass    |
| NVNT      | a    | 5180            | Ant1    | 5149.6          | -43.93      | 5.8        | -                | 57.10      | Peak     | 68.2           | Pass    |
| NVNT      | a    | 5180            | Ant1    | 5149.6          | -54.62      | 5.8        | 0.24             | 46.65      | Average  | 54             | Pass    |
| NVNT      | a    | 5180            | Ant1    | 5150            | -43.61      | 5.8        | -                | 57.42      | Peak     | 68.2           | Pass    |
| NVNT      | a    | 5180            | Ant1    | 5150            | -54.03      | 5.8        | 0.24             | 47.24      | Average  | 54             | Pass    |
| NVNT      | a    | 5240            | Ant1    | 5350            | -47.18      | 5.8        | -                | 53.85      | Peak     | 68.2           | Pass    |
| NVNT      | a    | 5240            | Ant1    | 5350            | -56.58      | 5.8        | 0.24             | 44.69      | Average  | 54             | Pass    |
| NVNT      | a    | 5240            | Ant1    | 5362.8          | -46.34      | 5.8        | -                | 54.69      | Peak     | 68.2           | Pass    |
| NVNT      | a    | 5240            | Ant1    | 5354.16         | -56.17      | 5.8        | 0.24             | 45.10      | Average  | 54             | Pass    |
| NVNT      | a    | 5240            | Ant1    | 5460            | -49.35      | 5.8        | -                | 51.68      | Peak     | 68.2           | Pass    |
| NVNT      | a    | 5240            | Ant1    | 5460            | -56.89      | 5.8        | 0.24             | 44.38      | Average  | 54             | Pass    |
| NVNT      | n20  | 5180            | Ant1    | 4500            | -49.73      | 5.8        | -                | 51.30      | Peak     | 68.2           | Pass    |
| NVNT      | n20  | 5180            | Ant1    | 4500            | -57.47      | 5.8        | 0.12             | 43.80      | Average  | 54             | Pass    |
| NVNT      | n20  | 5180            | Ant1    | 5149.6          | -40.93      | 5.8        | -                | 60.10      | Peak     | 68.2           | Pass    |
| NVNT      | n20  | 5180            | Ant1    | 5149.6          | -53.63      | 5.8        | 0.12             | 47.64      | Average  | 54             | Pass    |
| NVNT      | n20  | 5180            | Ant1    | 5150            | -41.46      | 5.8        | -                | 59.57      | Peak     | 68.2           | Pass    |
| NVNT      | n20  | 5180            | Ant1    | 5150            | -54.13      | 5.8        | 0.12             | 47.14      | Average  | 54             | Pass    |
| NVNT      | n20  | 5240            | Ant1    | 5350            | -50.95      | 5.8        | -                | 50.08      | Peak     | 68.2           | Pass    |
| NVNT      | n20  | 5240            | Ant1    | 5350            | -56.69      | 5.8        | 0.12             | 44.58      | Average  | 54             | Pass    |
| NVNT      | n20  | 5240            | Ant1    | 5370.48         | -46.73      | 5.8        | -                | 54.30      | Peak     | 68.2           | Pass    |
| NVNT      | n20  | 5240            | Ant1    | 5380.56         | -56.13      | 5.8        | 0.12             | 45.14      | Average  | 54             | Pass    |
| NVNT      | n20  | 5240            | Ant1    | 5460            | -48.18      | 5.8        | -                | 52.85      | Peak     | 68.2           | Pass    |
| NVNT      | n20  | 5240            | Ant1    | 5460            | -57         | 5.8        | 0.12             | 44.27      | Average  | 54             | Pass    |
| NVNT      | n40  | 5190            | Ant1    | 4500            | -48.18      | 5.8        | -                | 52.85      | Peak     | 68.2           | Pass    |
| NVNT      | n40  | 5190            | Ant1    | 4500            | -57.04      | 5.8        | 0.24             | 44.23      | Average  | 54             | Pass    |
| NVNT      | n40  | 5190            | Ant1    | 5149.7          | -41.51      | 5.8        | -                | 59.52      | Peak     | 68.2           | Pass    |
| NVNT      | n40  | 5190            | Ant1    | 5147.51         | -53.79      | 5.8        | 0.24             | 47.48      | Average  | 54             | Pass    |
| NVNT      | n40  | 5190            | Ant1    | 5150            | -41.51      | 5.8        | -                | 59.52      | Peak     | 68.2           | Pass    |
| NVNT      | n40  | 5190            | Ant1    | 5150            | -54.31      | 5.8        | 0.24             | 46.96      | Average  | 54             | Pass    |
| NVNT      | n40  | 5230            | Ant1    | 5350            | -49.22      | 5.8        | -                | 51.81      | Peak     | 68.2           | Pass    |
| NVNT      | n40  | 5230            | Ant1    | 5350            | -57.3       | 5.8        | 0.24             | 43.97      | Average  | 54             | Pass    |
| NVNT      | n40  | 5230            | Ant1    | 5457.3          | -45.81      | 5.8        | -                | 55.22      | Peak     | 68.2           | Pass    |
| NVNT      | n40  | 5230            | Ant1    | 5403.03         | -56.04      | 5.8        | 0.24             | 45.23      | Average  | 54             | Pass    |
| NVNT      | n40  | 5230            | Ant1    | 5460            | -49.36      | 5.8        | -                | 51.67      | Peak     | 68.2           | Pass    |
| NVNT      | n40  | 5230            | Ant1    | 5460            | -57.41      | 5.8        | 0.24             | 43.86      | Average  | 54             | Pass    |



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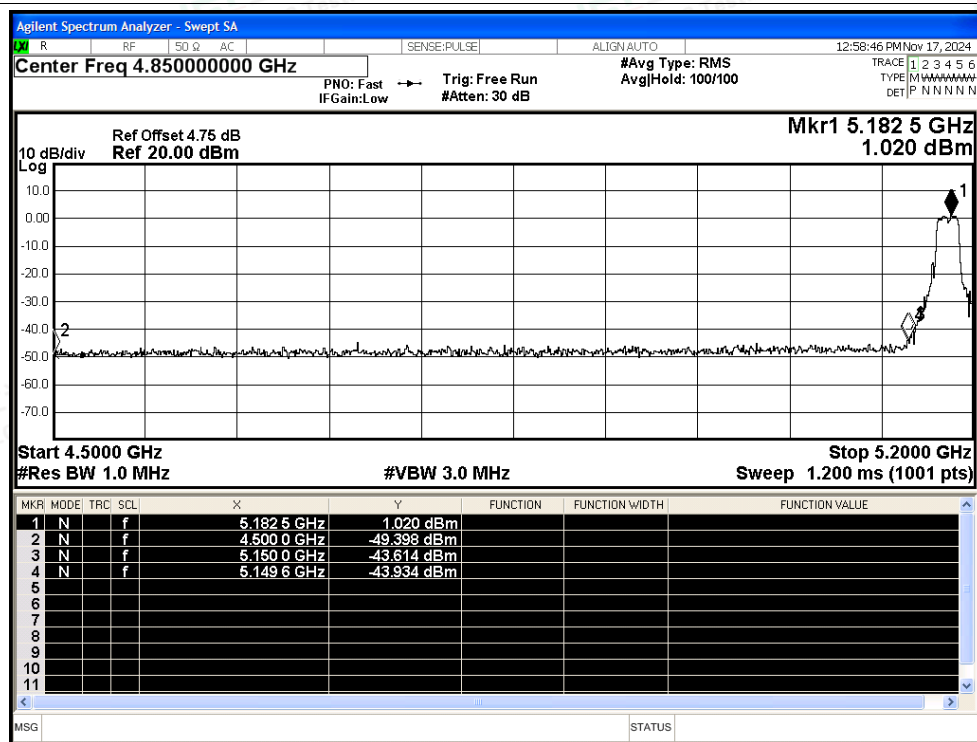
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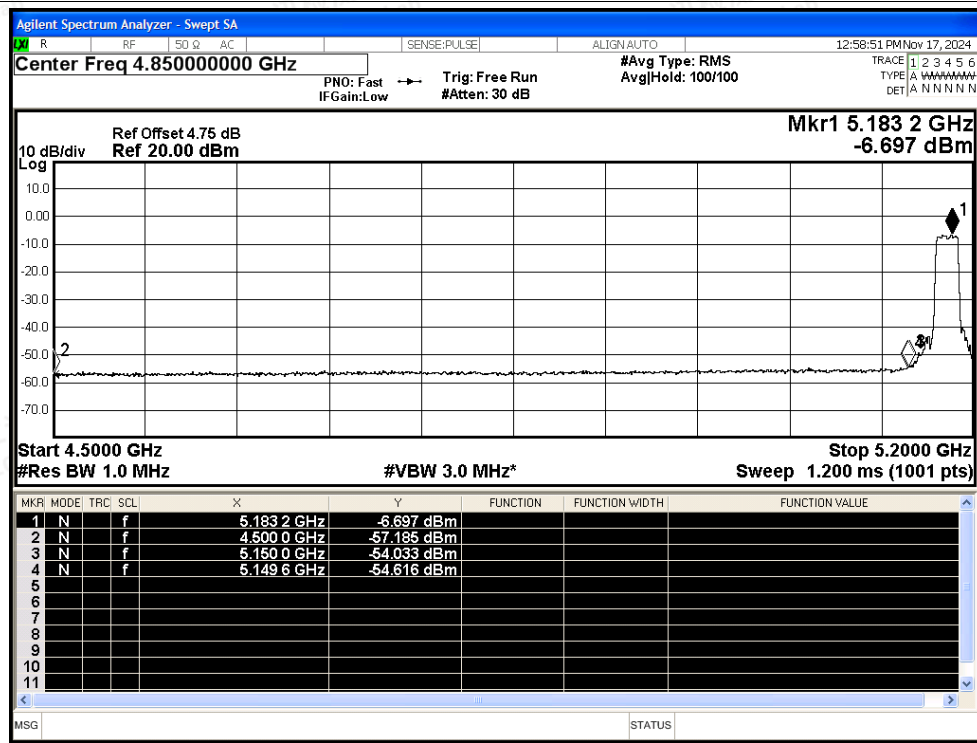


## Test Graphs

## Restrict Band NVNT a 5180MHz Ant1 Peak

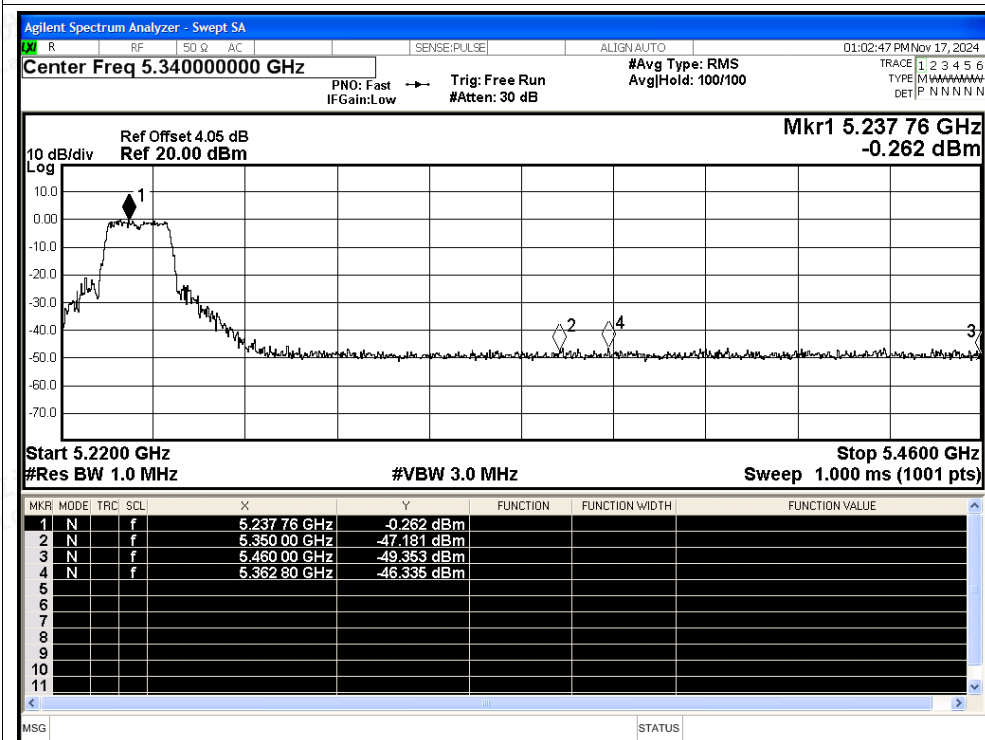


## Restrict Band NVNT a 5180MHz Ant1 Average

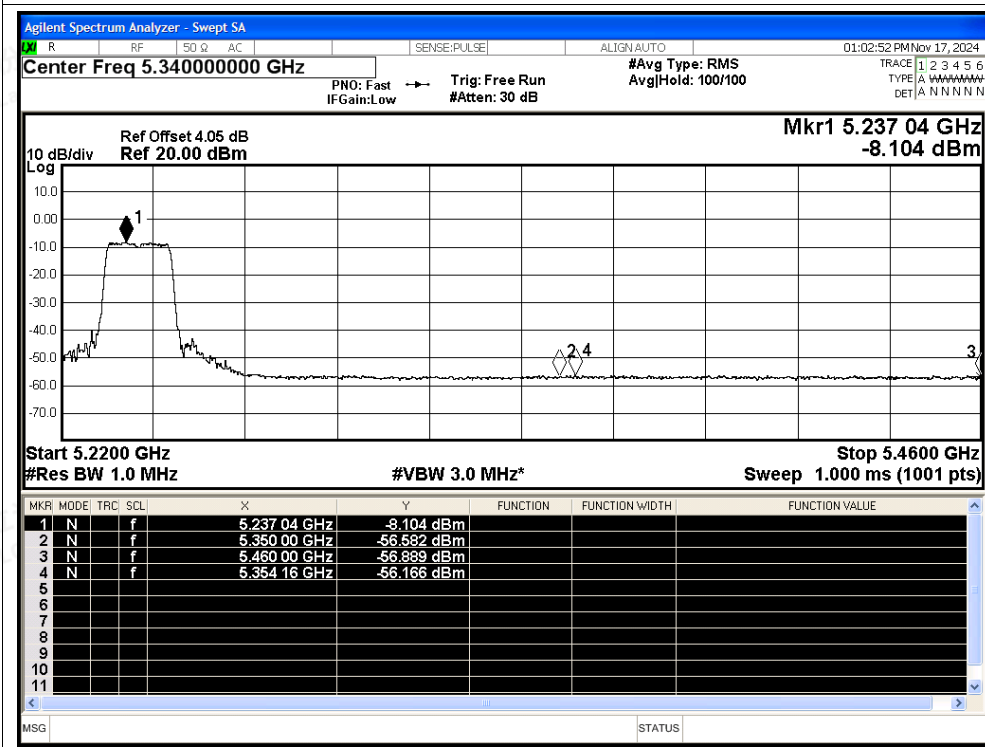




## Restrict Band NVNT a 5240MHz Ant1 Peak

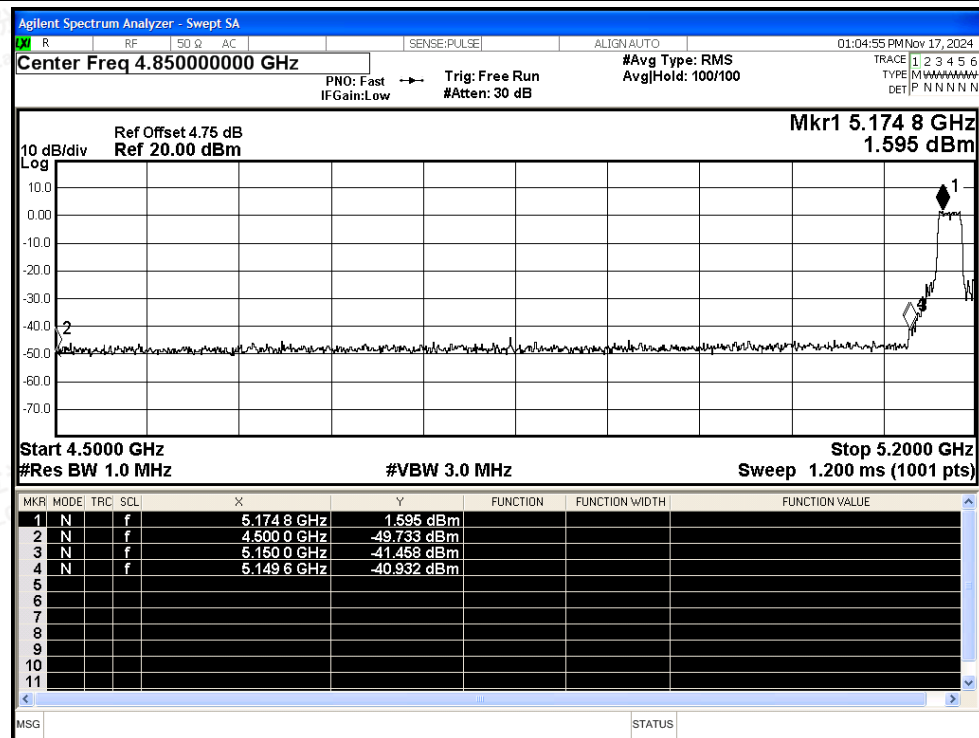


## Restrict Band NVNT a 5240MHz Ant1 Average

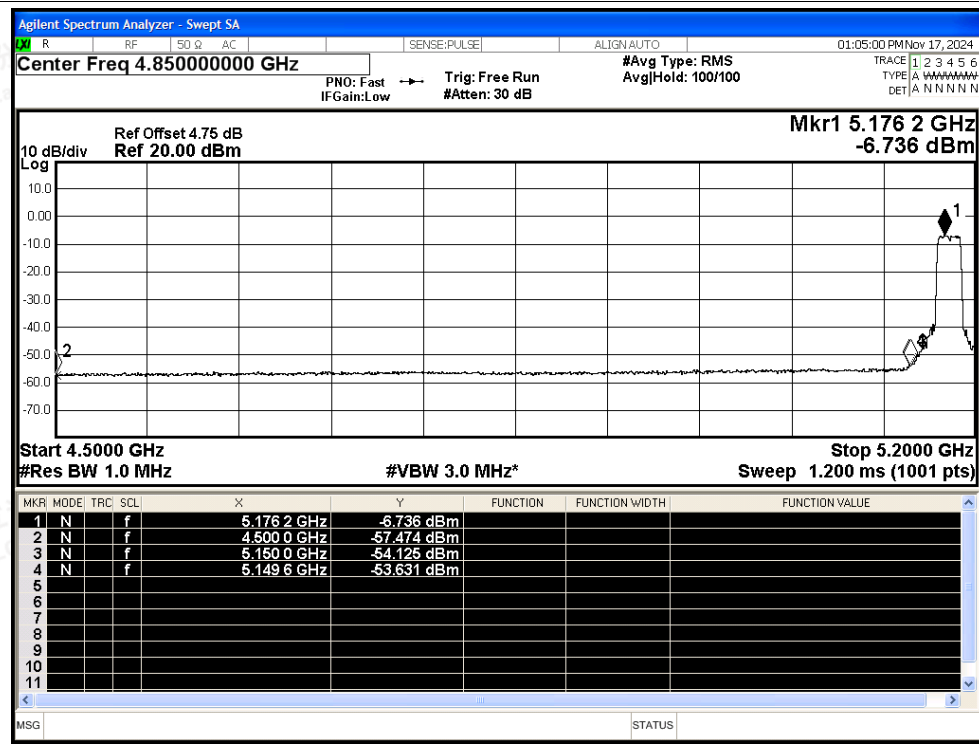




## Restrict Band NVNT n20 5180MHz Ant1 Peak

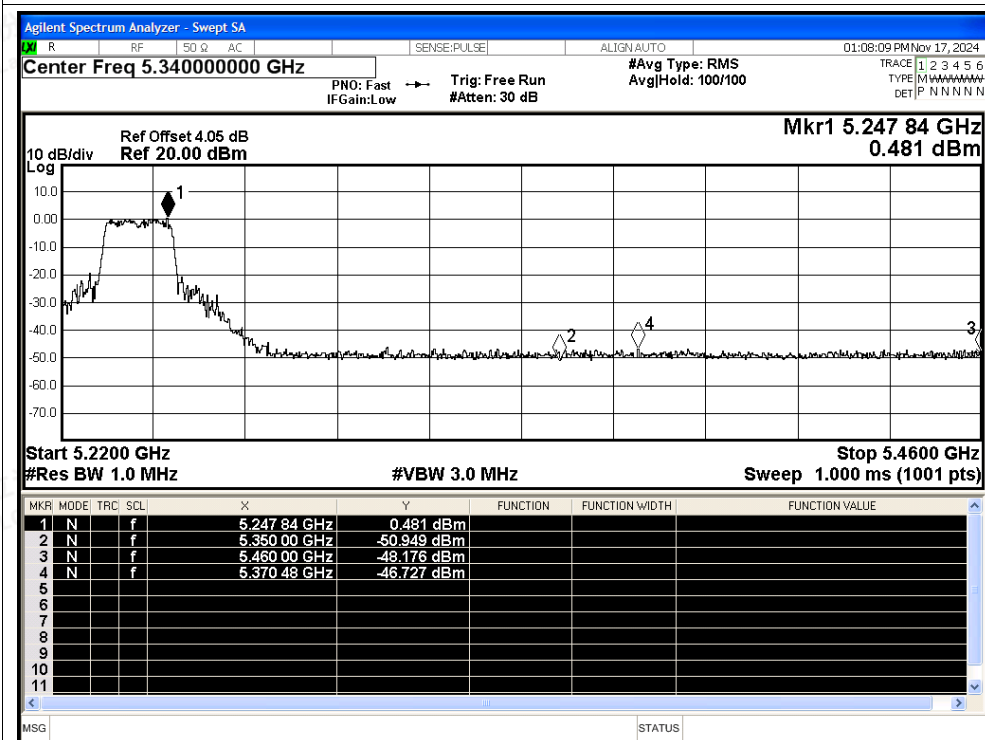


## Restrict Band NVNT n20 5180MHz Ant1 Average

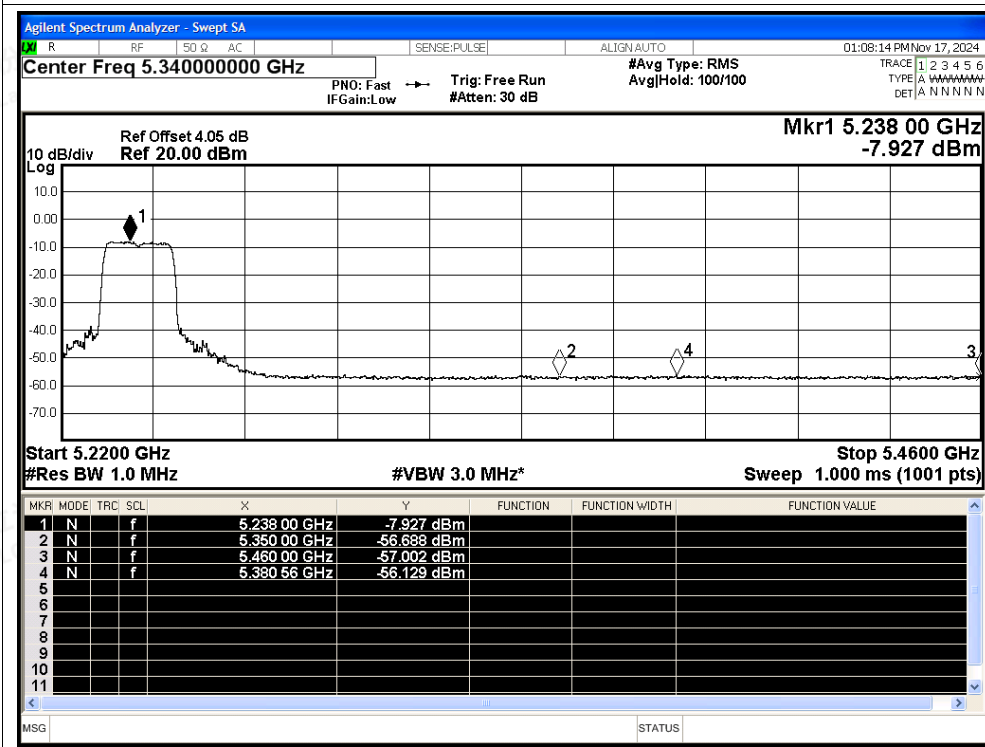




## Restrict Band NVNT n20 5240MHz Ant1 Peak

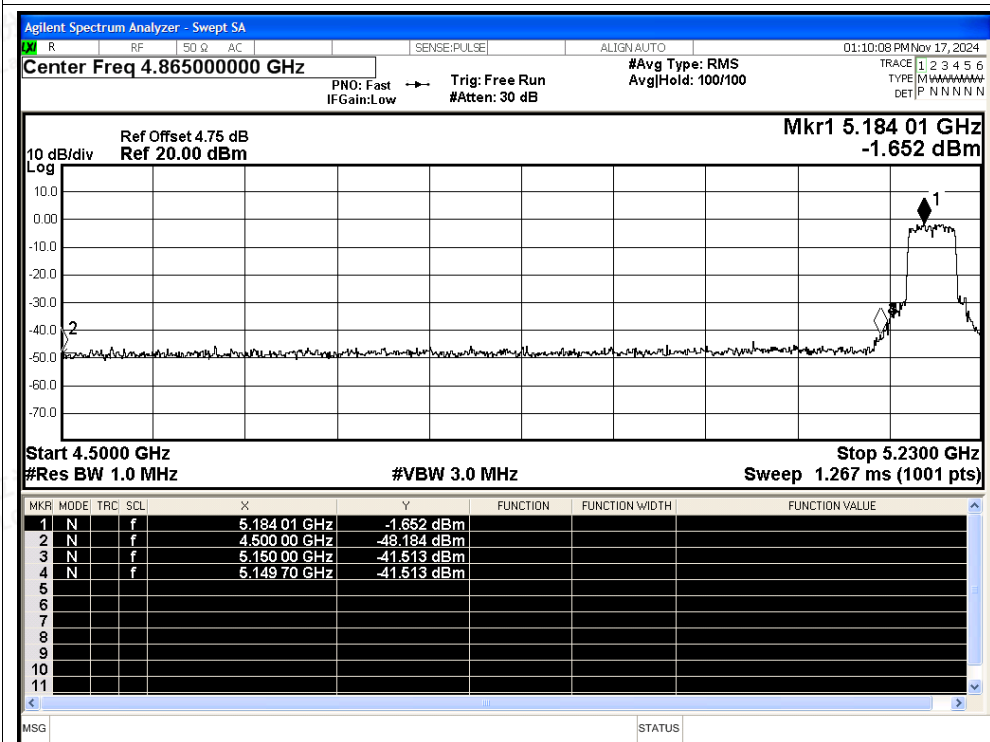


## Restrict Band NVNT n20 5240MHz Ant1 Average

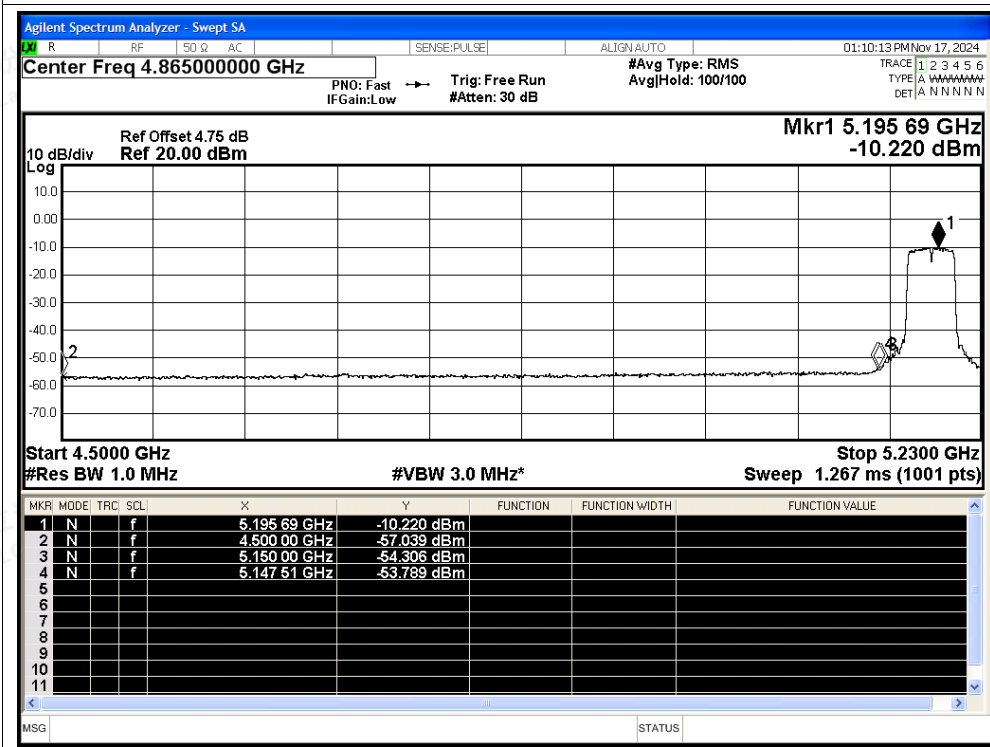




## Restrict Band NVNT n40 5190MHz Ant1 Peak

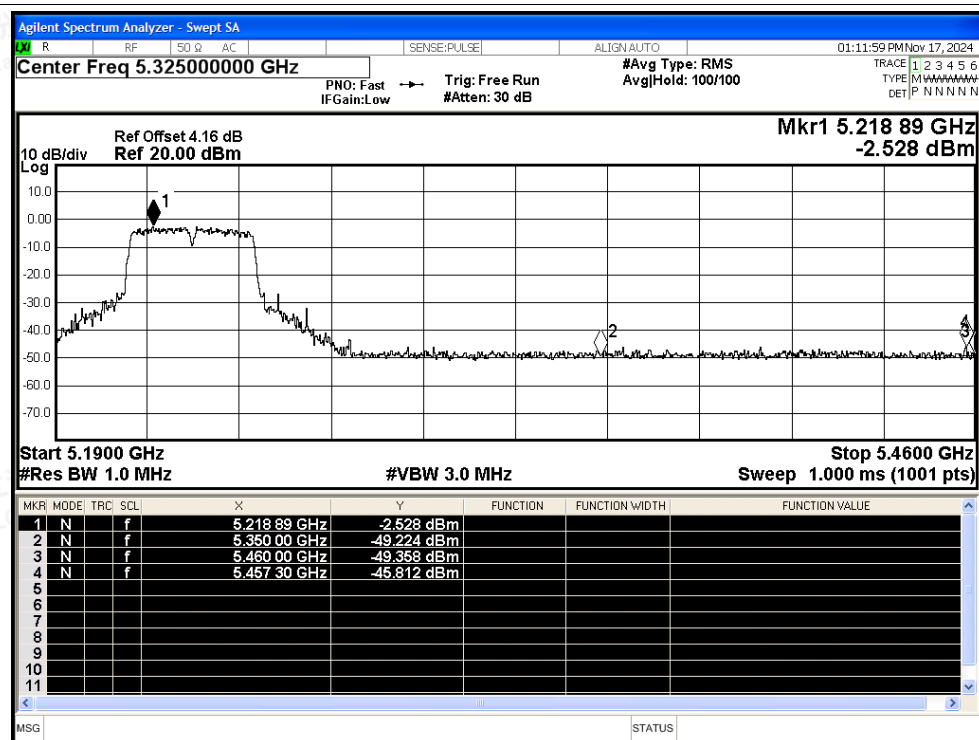


## Restrict Band NVNT n40 5190MHz Ant1 Average

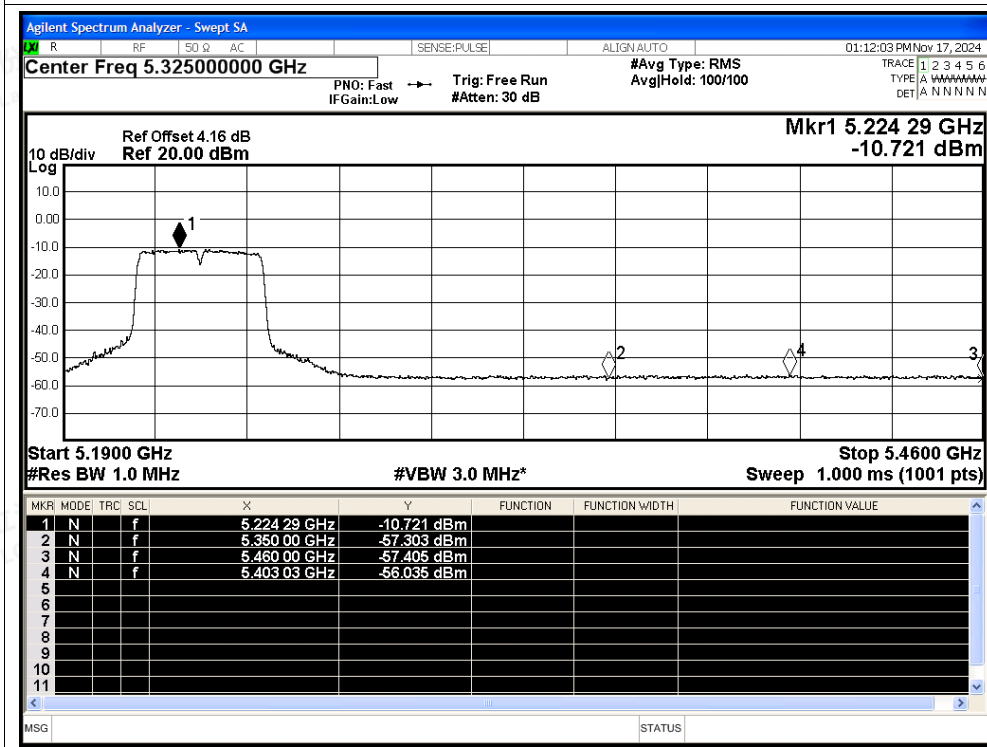




## Restrict Band NVNT n40 5230MHz Ant1 Peak



## Restrict Band NVNT n40 5230MHz Ant1 Average





## D.5 Frequency Stability

| Condition | Mode | Frequency (MHz) | Antenna | Measured Frequency (MHz) | Frequency Error (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
|-----------|------|-----------------|---------|--------------------------|----------------------|-----------------|-------------|---------|
| NVNT      | a    | 5180            | Ant1    | 5180                     | 0                    | 0               | 25          | Pass    |
| NVNT      | a    | 5200            | Ant1    | 5199.98                  | -20000               | -3.85           | 25          | Pass    |
| NVNT      | a    | 5240            | Ant1    | 5239.98                  | -20000               | -3.82           | 25          | Pass    |
| NVNT      | n20  | 5180            | Ant1    | 5179.96                  | -40000               | -7.72           | 25          | Pass    |
| NVNT      | n20  | 5200            | Ant1    | 5199.98                  | -20000               | -3.85           | 25          | Pass    |
| NVNT      | n20  | 5240            | Ant1    | 5239.96                  | -40000               | -7.63           | 25          | Pass    |
| NVNT      | n40  | 5190            | Ant1    | 5189.96                  | -40000               | -7.71           | 25          | Pass    |
| NVNT      | n40  | 5230            | Ant1    | 5230                     | 0                    | 0               | 25          | Pass    |

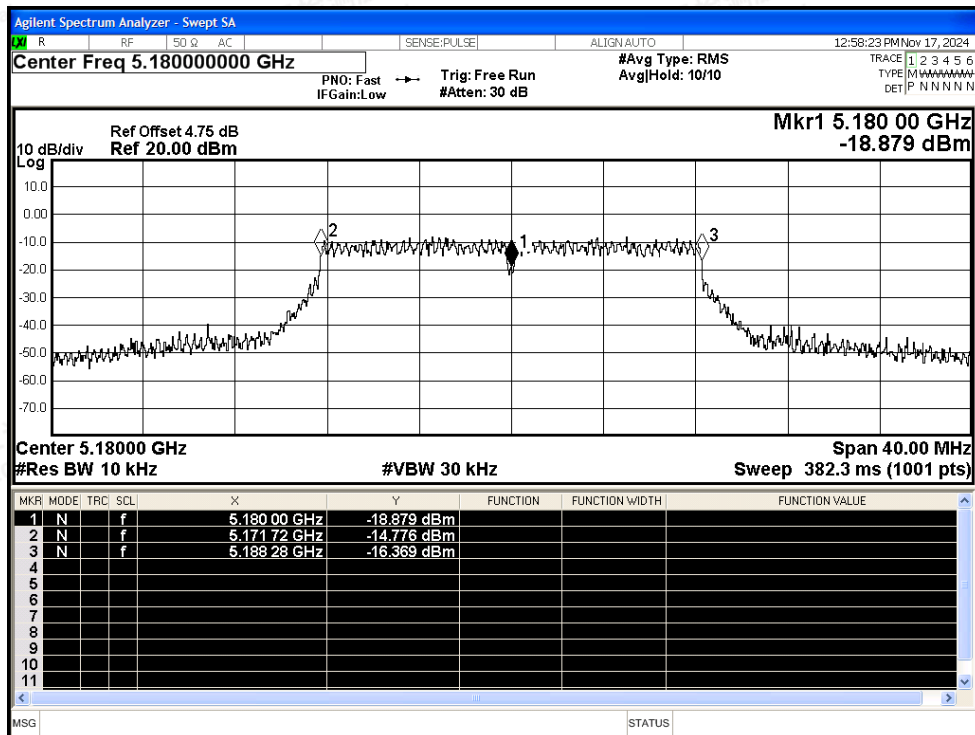


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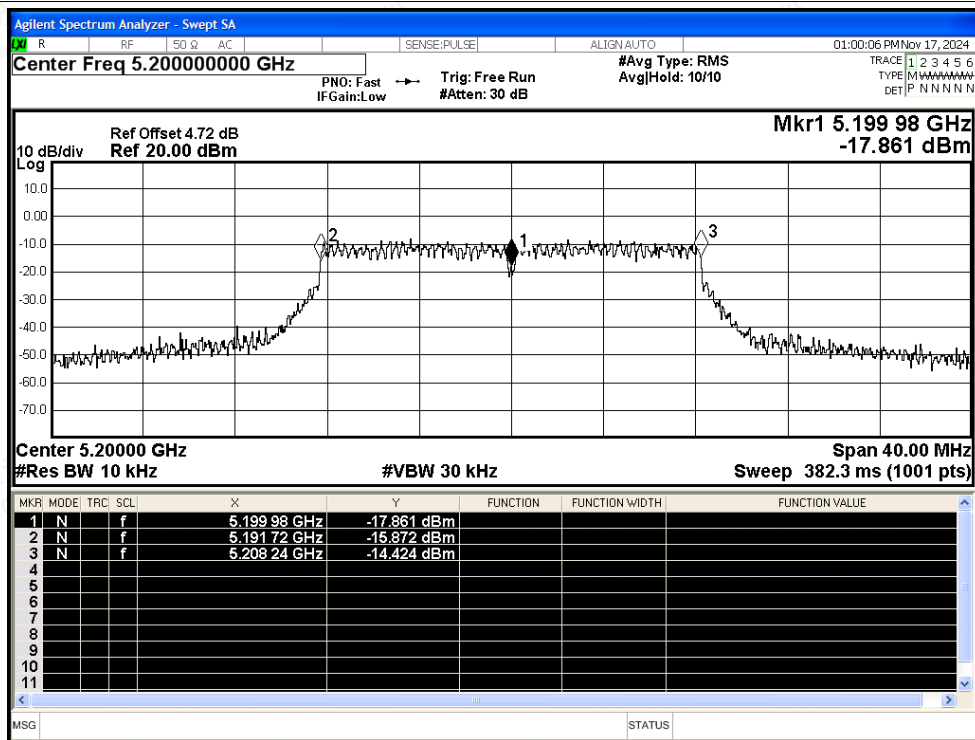


## Test Graphs

## Freq. Stability NVNT a 5180MHz Ant1

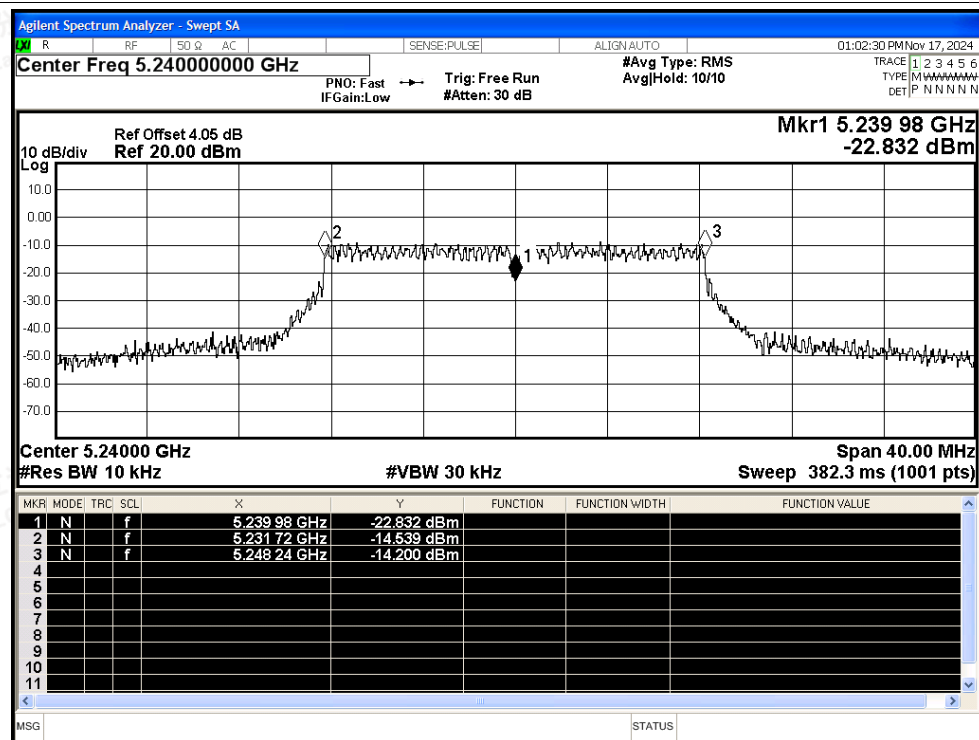


## Freq. Stability NVNT a 5200MHz Ant1

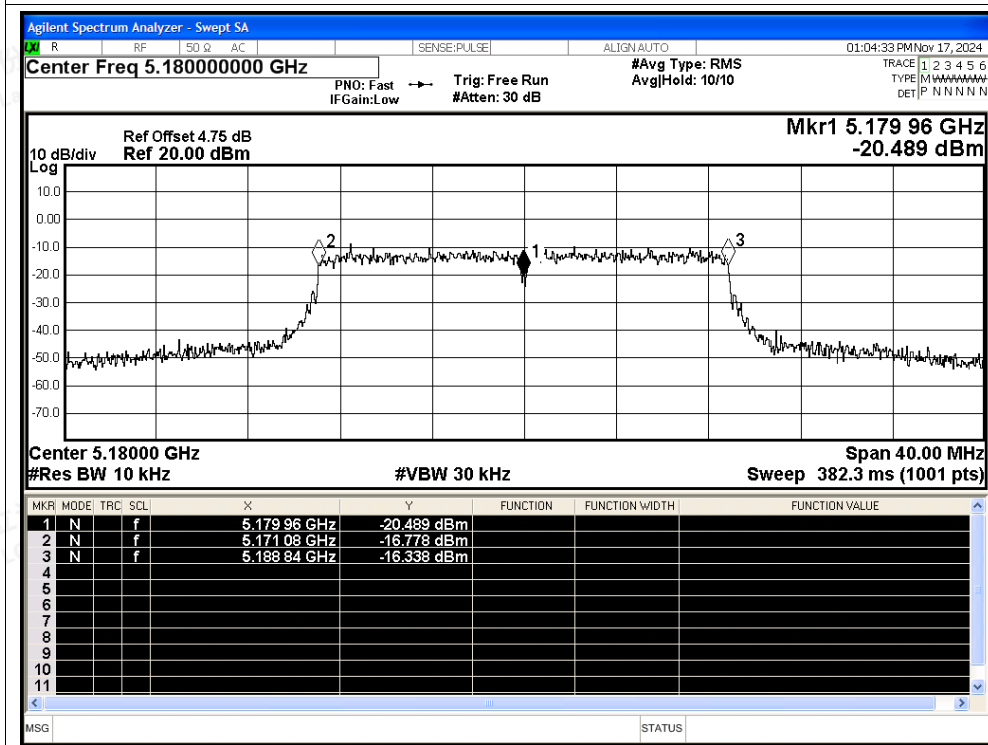




## Freq. Stability NVNT a 5240MHz Ant1

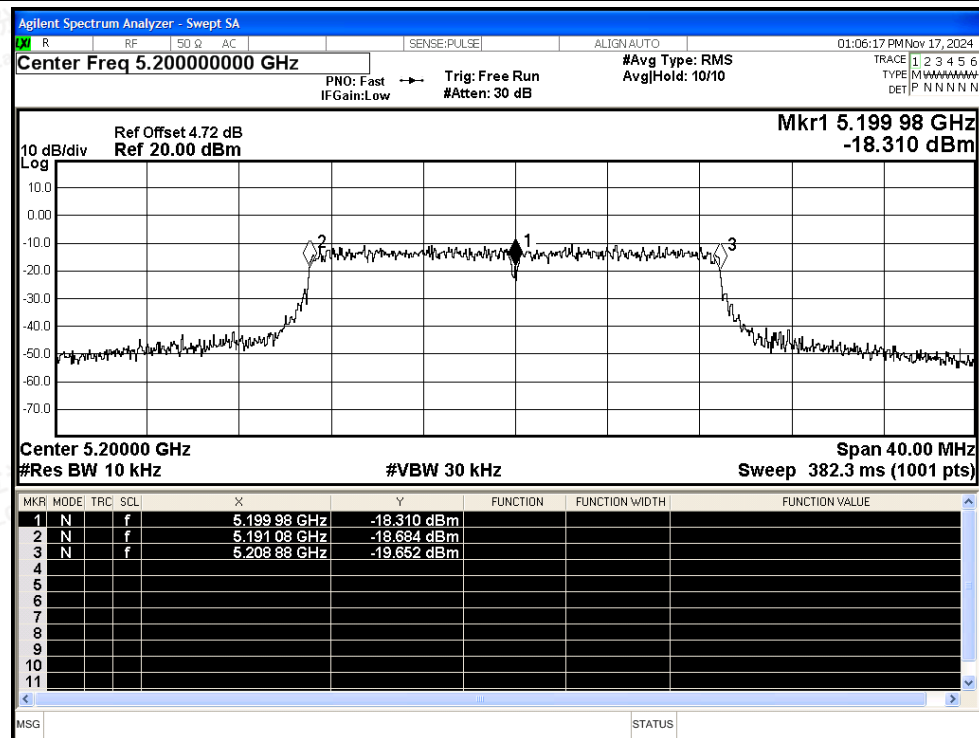


## Freq. Stability NVNT n20 5180MHz Ant1

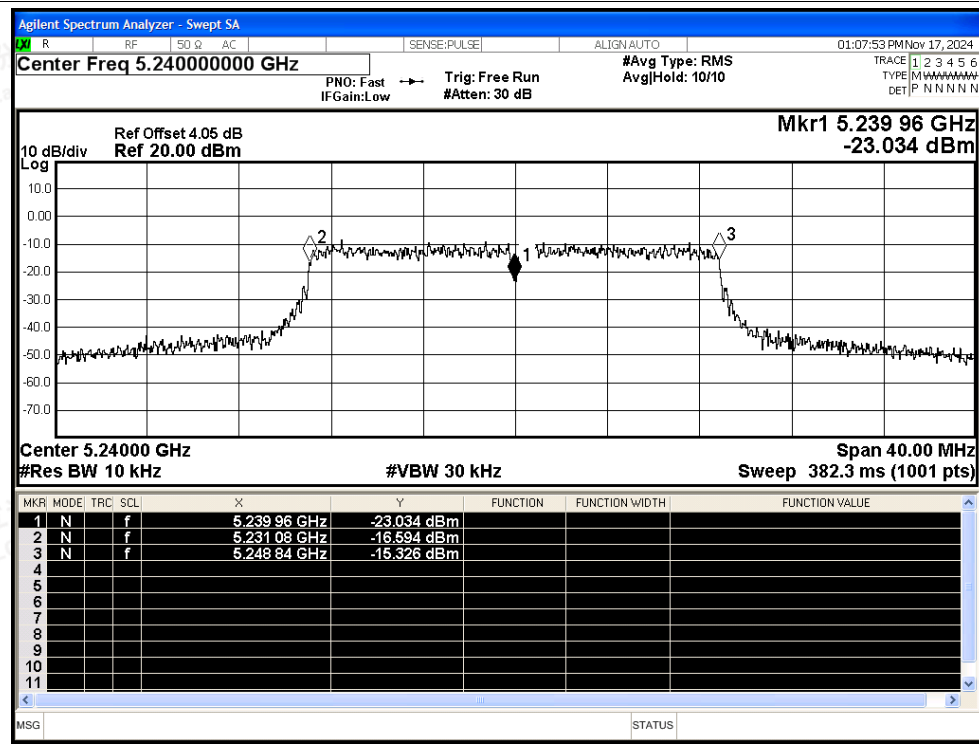




## Freq. Stability NVNT n20 5200MHz Ant1

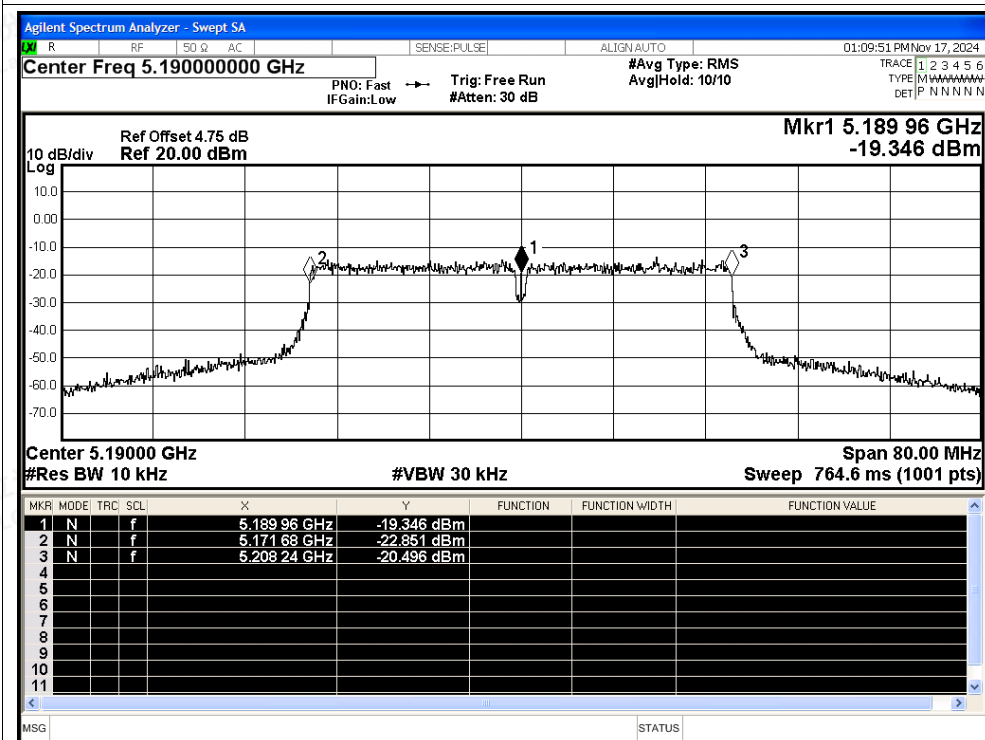


## Freq. Stability NVNT n20 5240MHz Ant1

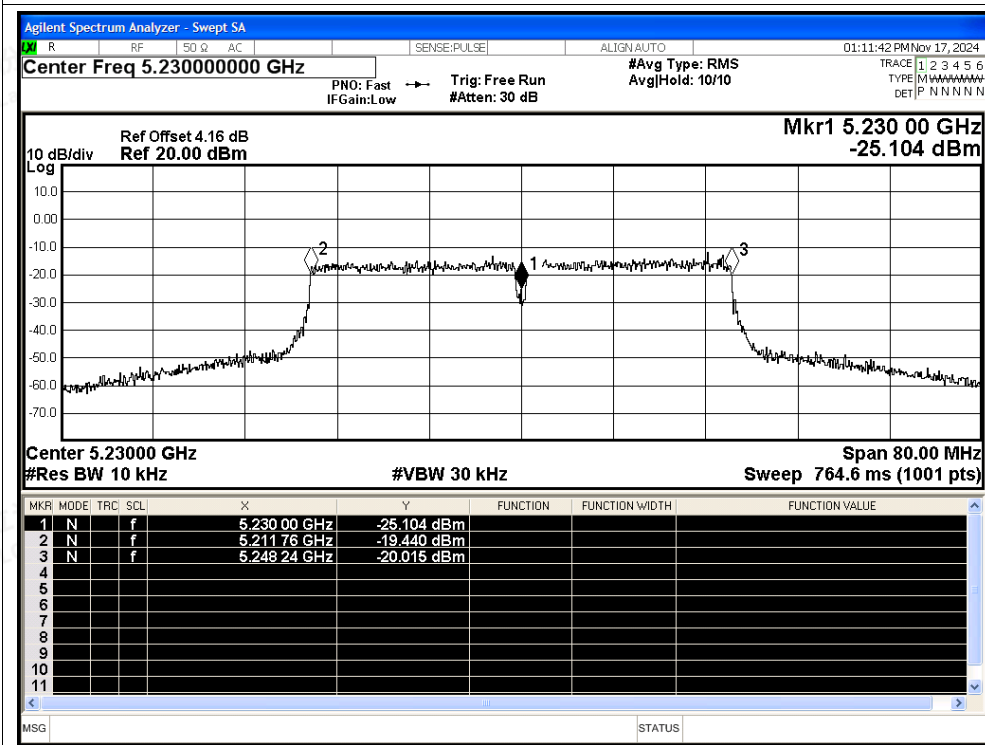




## Freq. Stability NVNT n40 5190MHz Ant1



## Freq. Stability NVNT n40 5230MHz Ant1





## D.6 Duty Cycle

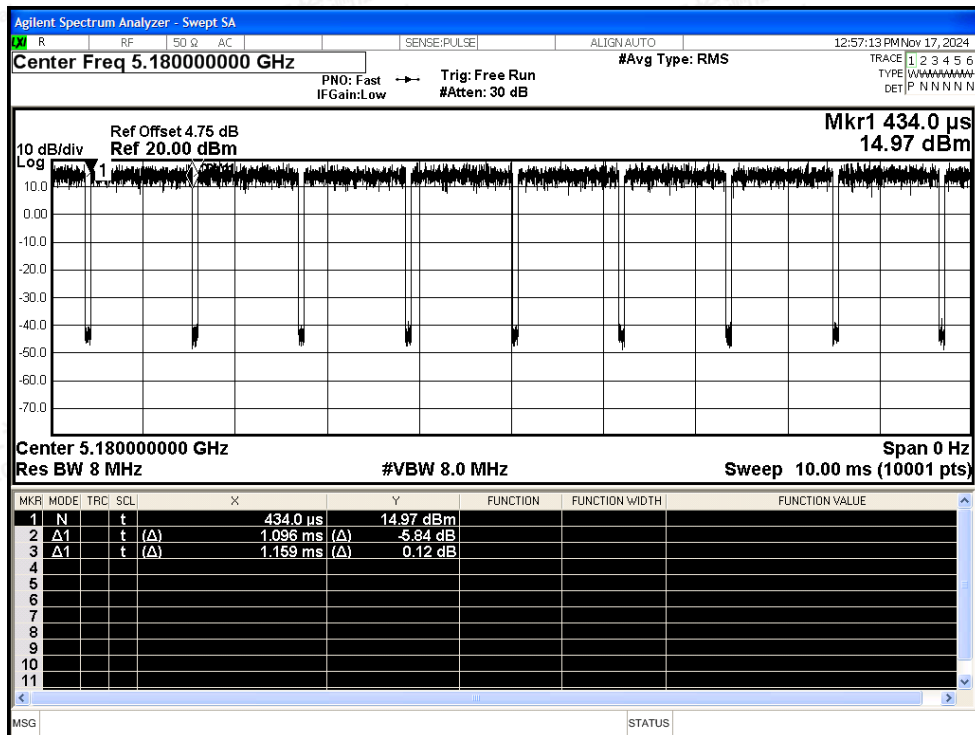
| Condition | Mode | Frequency (MHz) | Antenna | Duty Cycle (%) | Correction Factor (dB) | 1/T (kHz) |
|-----------|------|-----------------|---------|----------------|------------------------|-----------|
| NVNT      | a    | 5180            | Ant1    | 94.56          | 0.24                   | 0.91      |
| NVNT      | a    | 5200            | Ant1    | 94.65          | 0.24                   | 0.91      |
| NVNT      | a    | 5240            | Ant1    | 94.65          | 0.24                   | 0.91      |
| NVNT      | n20  | 5180            | Ant1    | 97.29          | 0.12                   | 0.44      |
| NVNT      | n20  | 5200            | Ant1    | 97.29          | 0.12                   | 0.44      |
| NVNT      | n20  | 5240            | Ant1    | 97.29          | 0.12                   | 0.44      |
| NVNT      | n40  | 5190            | Ant1    | 94.71          | 0.24                   | 0.9       |
| NVNT      | n40  | 5230            | Ant1    | 94.71          | 0.24                   | 0.9       |



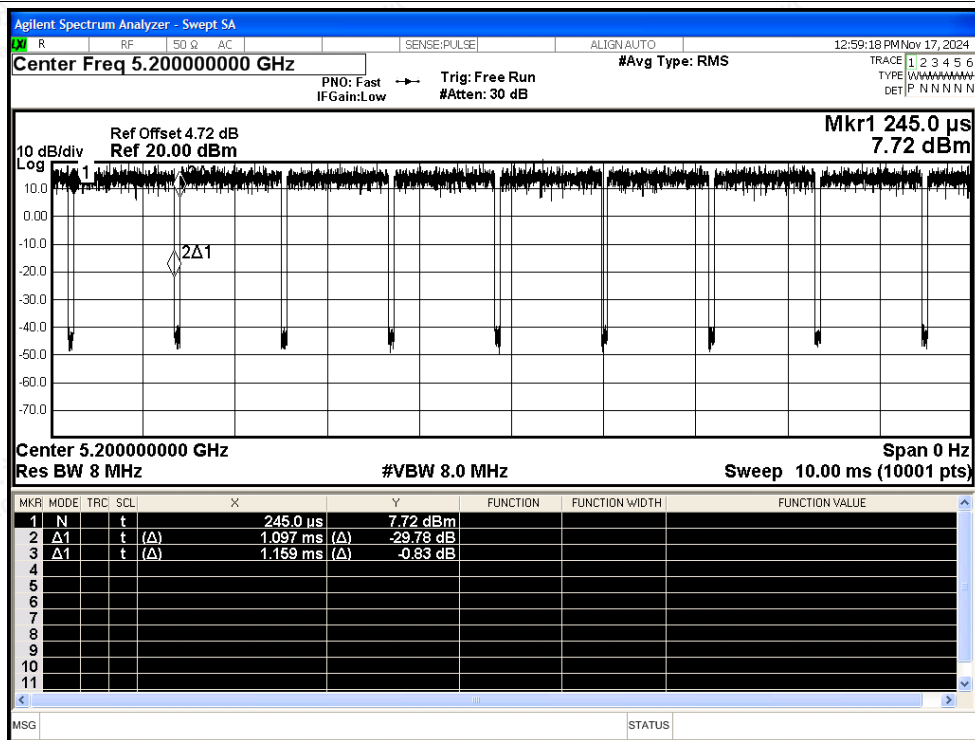


## Test Graphs

## Duty Cycle NVNT a 5180MHz Ant1

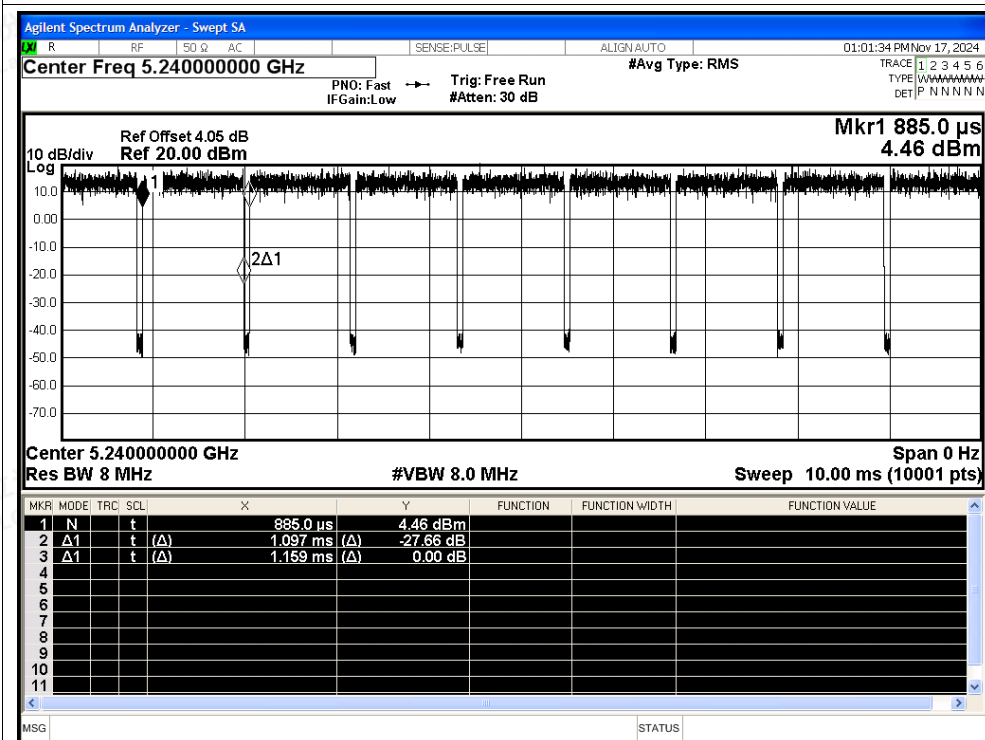


## Duty Cycle NVNT a 5200MHz Ant1

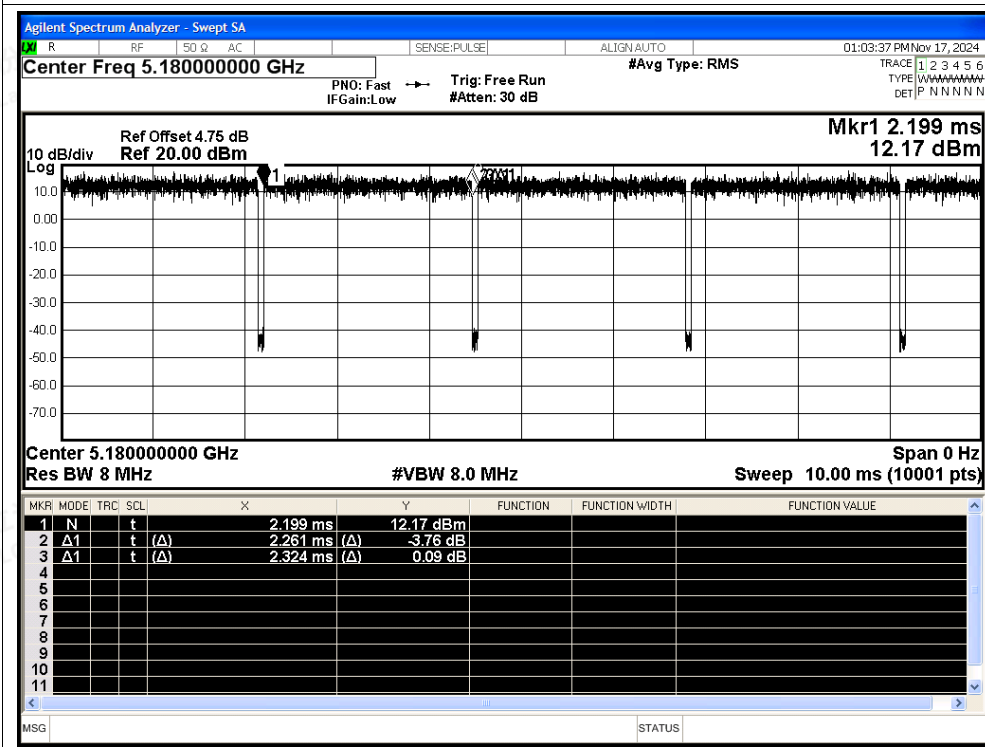


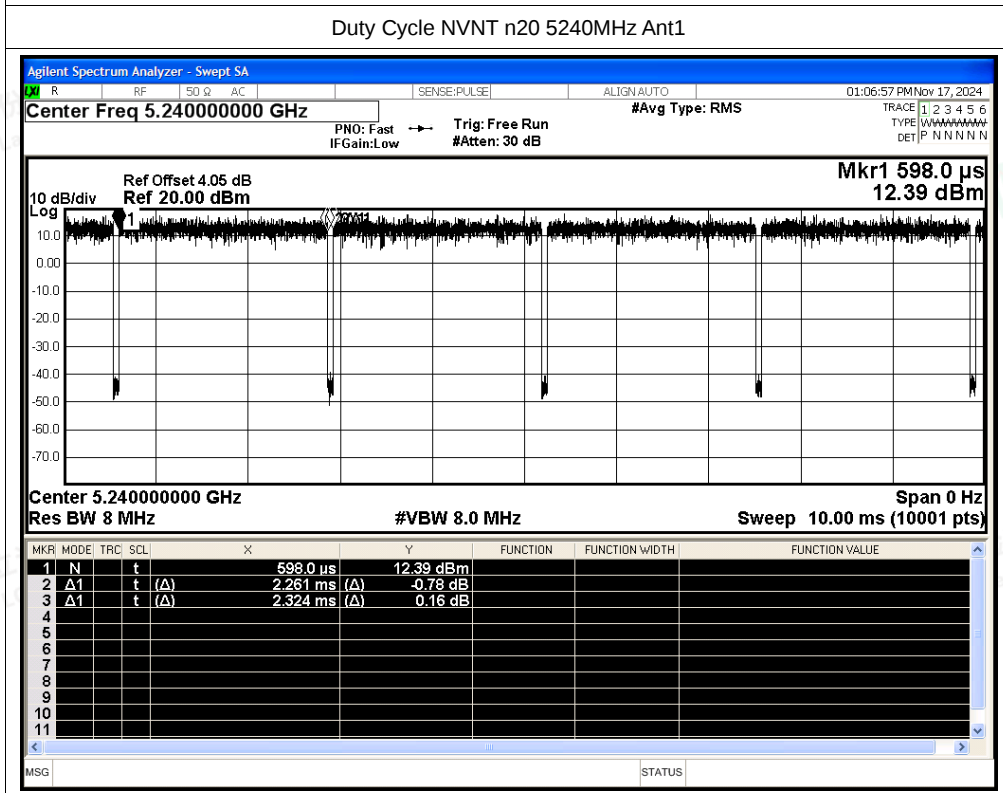
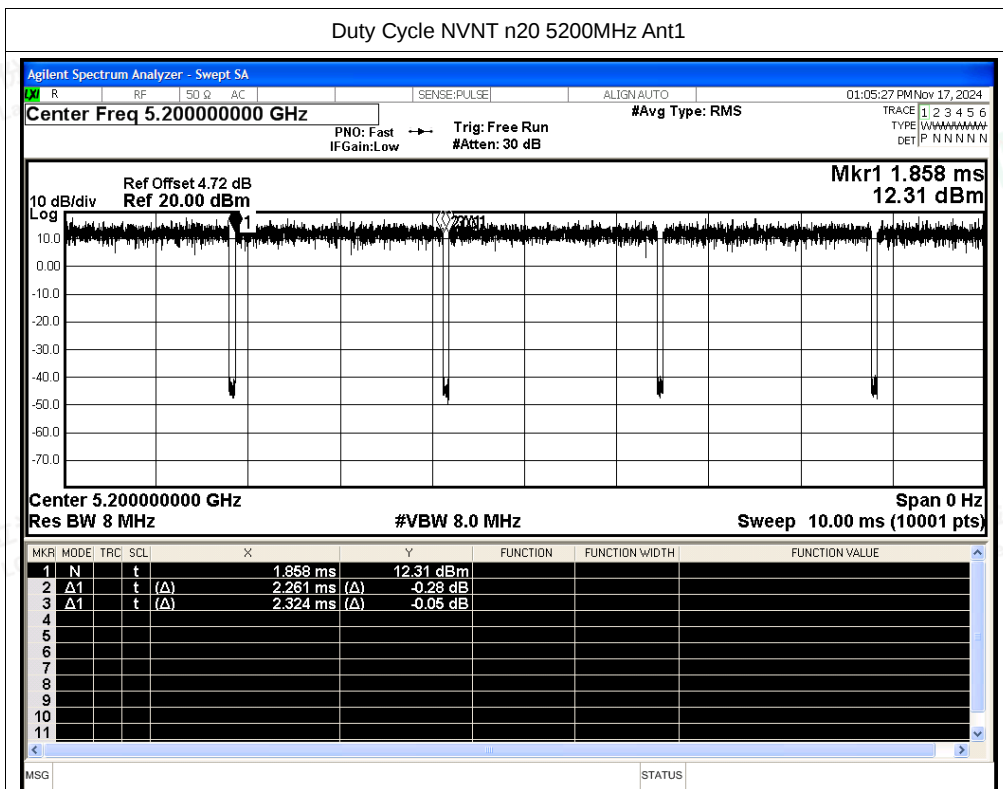


## Duty Cycle NVNT a 5240MHz Ant1



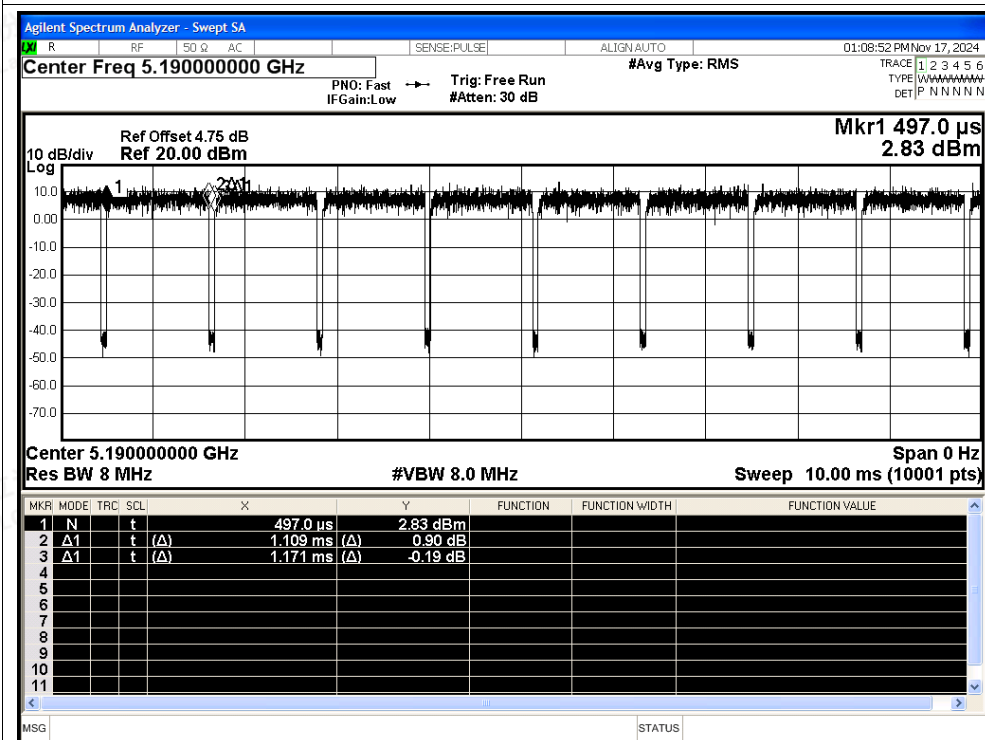
## Duty Cycle NVNT n20 5180MHz Ant1







## Duty Cycle NVNT n40 5190MHz Ant1



## Duty Cycle NVNT n40 5230MHz Ant1

