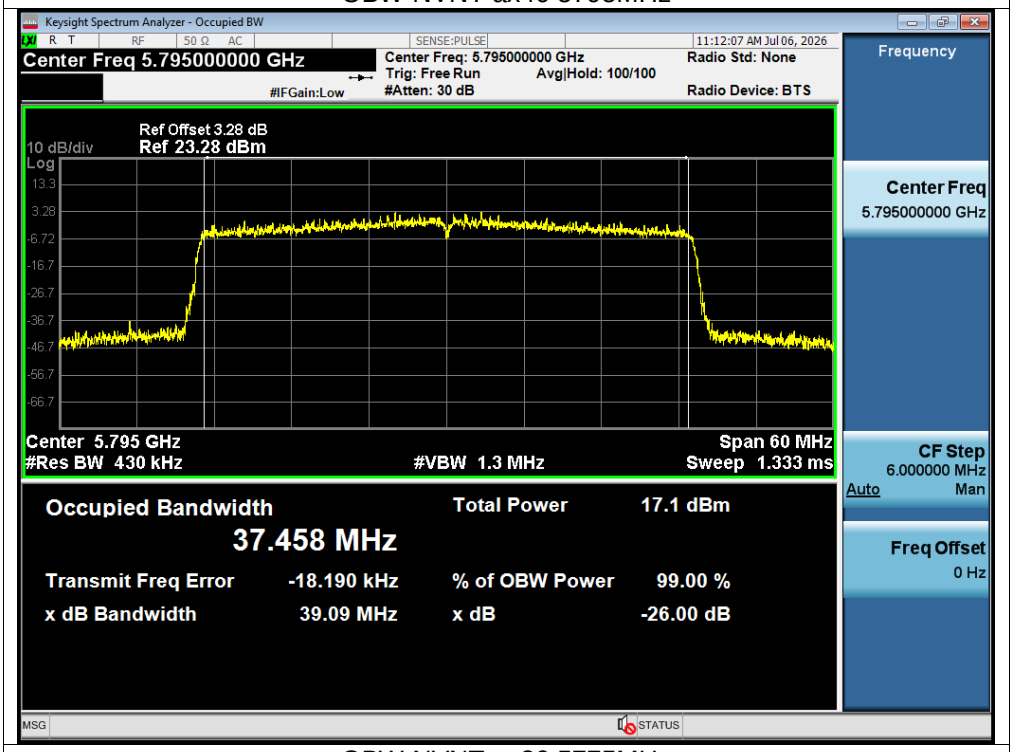
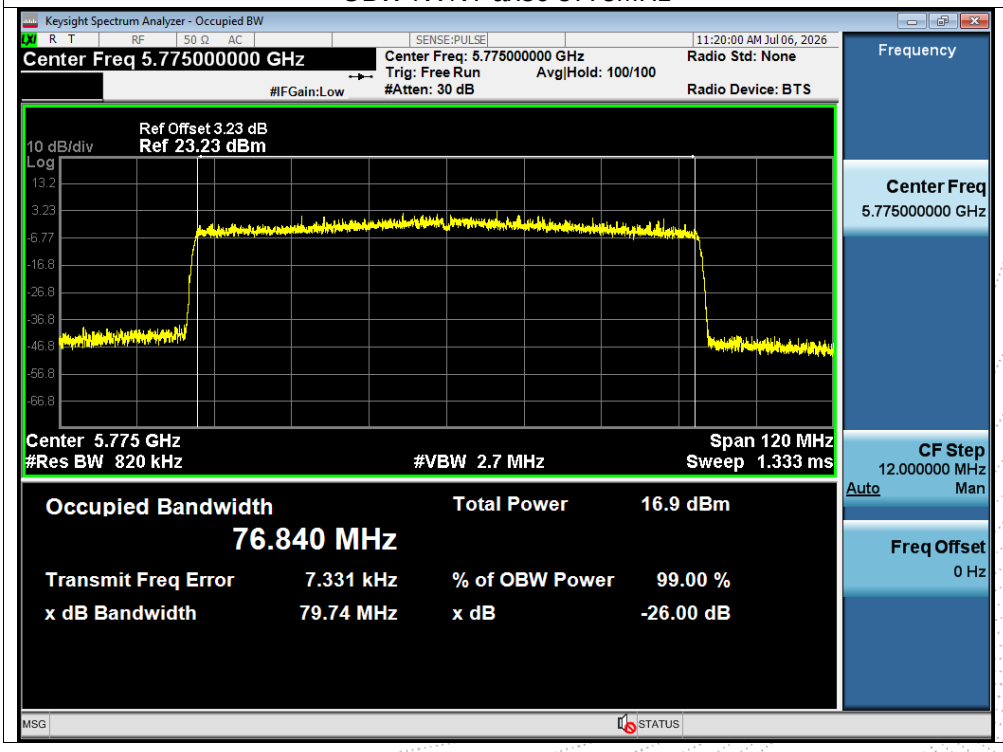
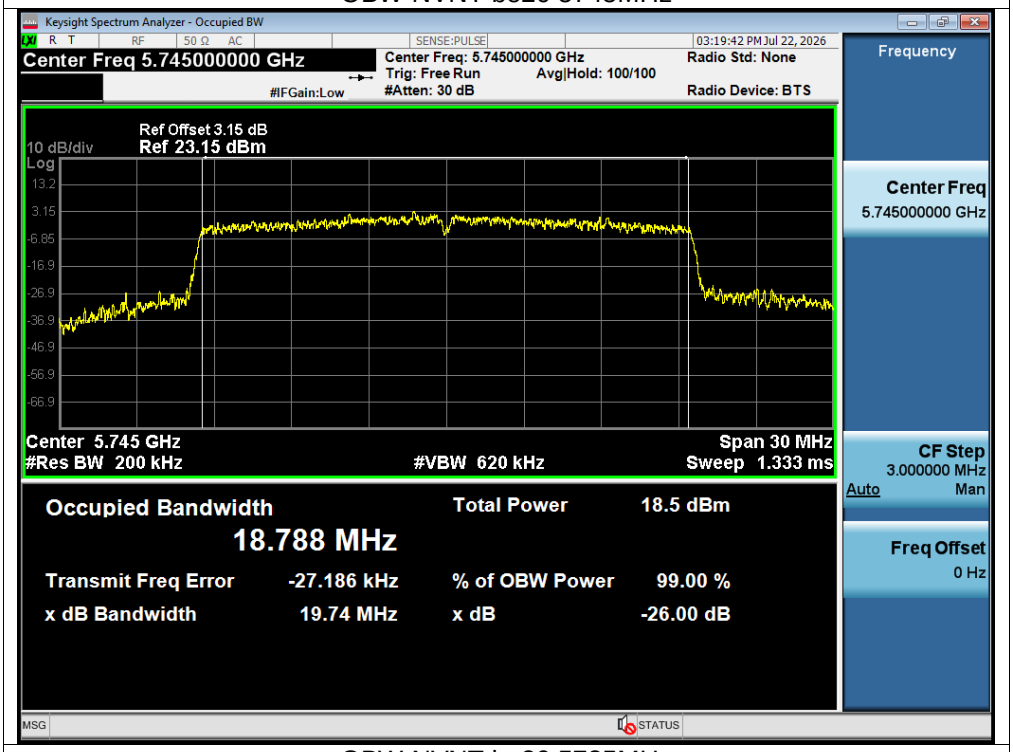
OBW NVNT ax40 5795MHz



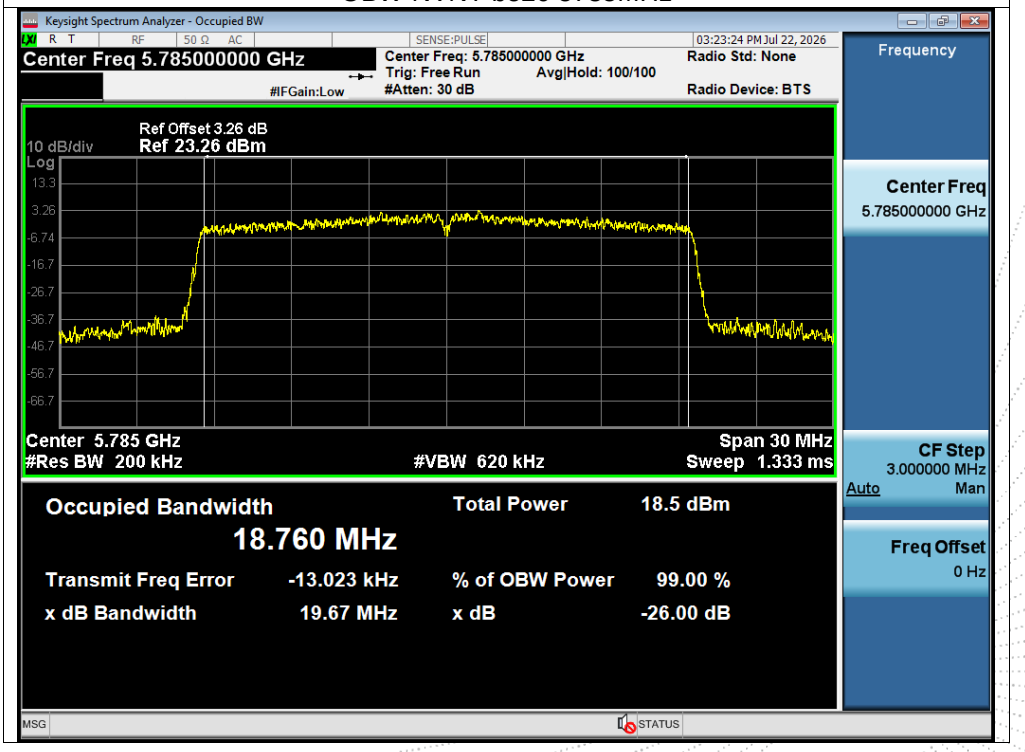

OBW NVNT ax80 5775MHz



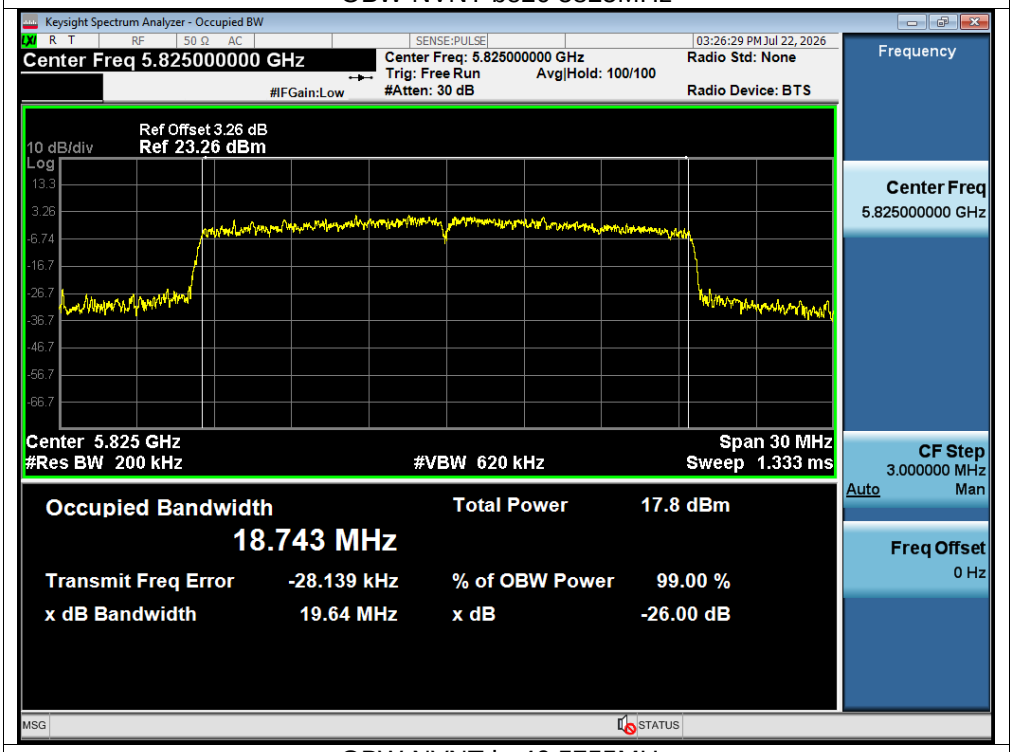
OBW NVNT be20 5745MHz




OBW NVNT be20 5785MHz

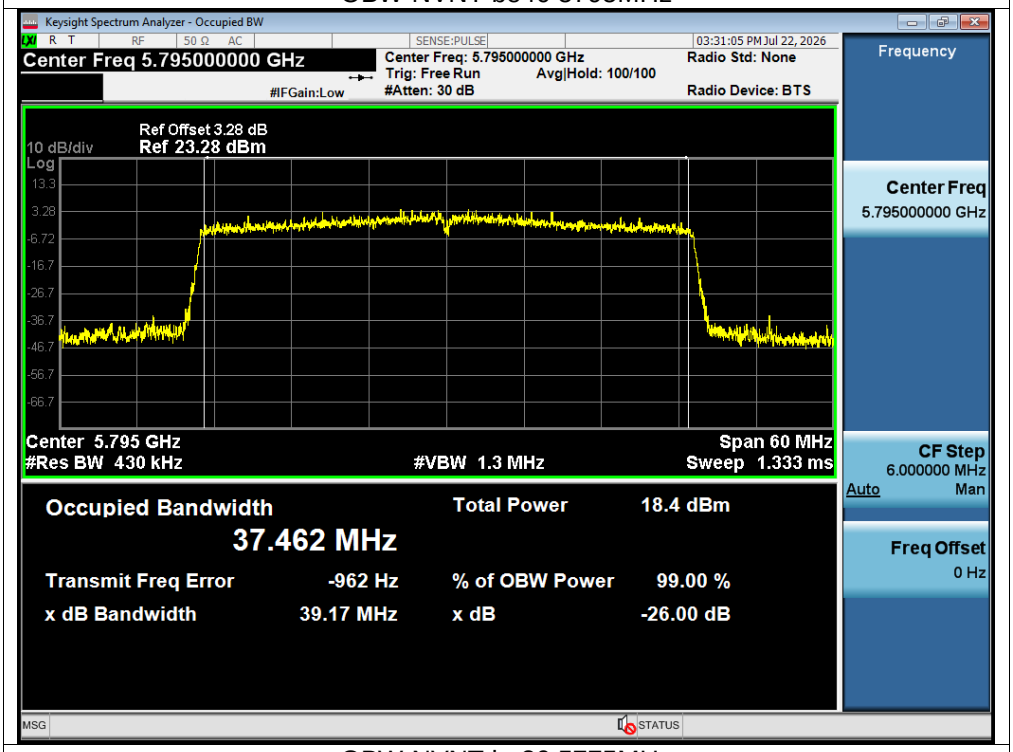


OBW NVNT be20 5825MHz

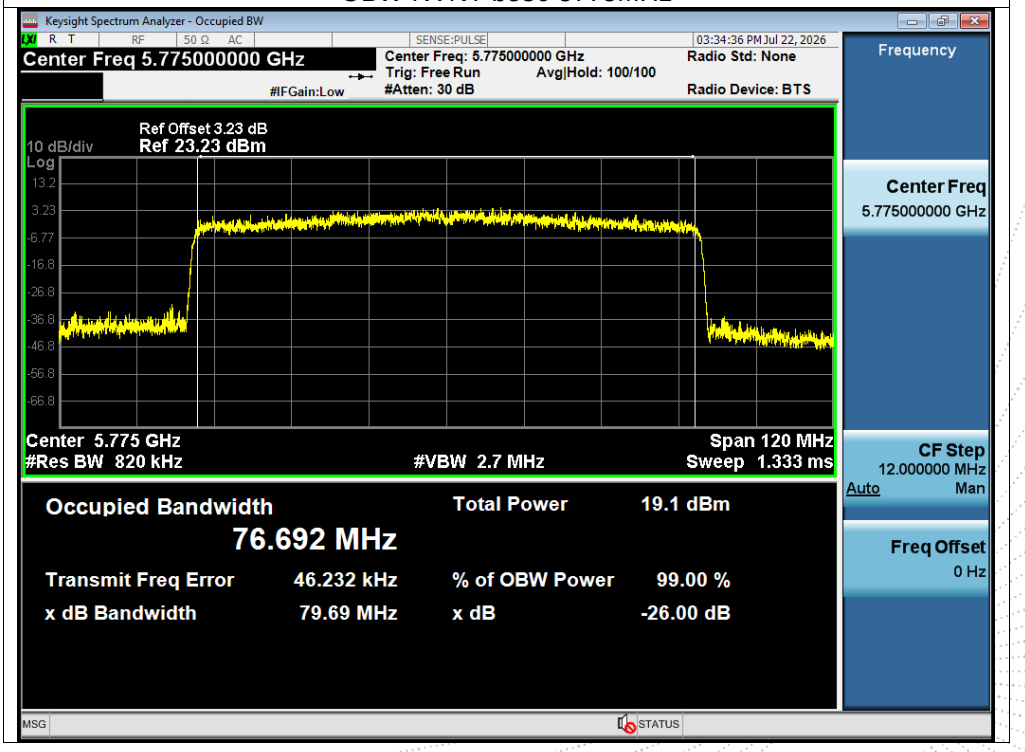



OBW NVNT be40 5755MHz

OBW NVNT be40 5795MHz

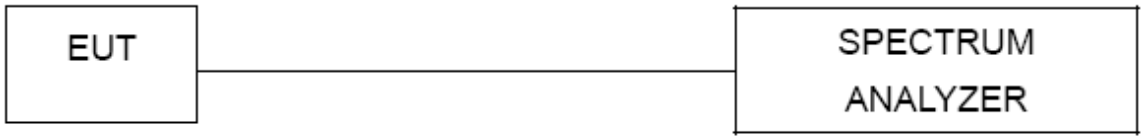



OBW NVNT be80 5775MHz



# 10. Maximum Conducted Output Power

## 10.1 Block Diagram Of Test Setup




## 10.2 Limit

**According to FCC §15.407**

The maximum conduced output power should not exceed**:**

| Frequency Band(MHz) | Limit |
|---|---|
| 5150~5250 | 0.25W |
| 5250~5350 | 250 mW or 11 dBm + 10log B, whichever is less. |
| 5470~5725 | 250 mW or 11 dBm + 10log B, whichever is less. |
| 5725~5850 | 1W |
| Note: Where “B” is the 26 dB emissions bandwidth in MHz. | |

## 10.3 Test Procedure

**Method SA-1** or **method SA-1A (alternative)** shall be applied if either of the following conditions can be satisfied:

1) The EUT transmits continuously (or with a *D* ≥ 98%).

Method SA-1 uses trace averaging with the EUT transmitting at full power throughout each sweep. The procedure for this method is as follows:

a) Set span to encompass the entire 99% OBW of the signal.

b) Set RBW = 1 MHz.

c) Set VBW ≥ 3 MHz.

d) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)

e) Sweep time = auto.

f) Detector = Power averaging (rms), if available. Otherwise, use sample detector mode.

g) If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle ≥ 98%, and if each transmission is entirely at the maximum power control level, then the

trigger shall be set to “free run.”

h) Trace average at least 100 traces in power averaging (rms) mode.

i) Compute power by integrating the spectrum across the 99% OBW of the signal using the instrument’s band-power measurement function, with band limits set equal to the OBW band-edges. If the instrument does not have a band-power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 99% OBW of the spectrum.

**Method SA-2** or **method SA-2A (alternative)** shall be applied if the conditions of the preceding item a) cannot be achieved, and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2%.

Method SA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:

a) Measure the duty cycle *D* of the transmitter output signal as described in 12.2.

b) Set span to encompass the entire 99% OBW of the signal.

c) Set RBW = 1 MHz.

d) Set VBW ≥ 3 MHz.

e) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)

f) Sweep time = auto.

g) Detector = Power averaging (rms), if available. Otherwise, use sample detector mode.

h) Do not use sweep triggering. Allow the sweep to “free run.”

i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.

j) Compute power by integrating the spectrum across the 99% OBW of the signal using the instrument’s band-power measurement function with band limits set equal to the EBW or OBW band-edges. If the instrument does not have a band-power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 99% OBW of the spectrum.

k) Add [10 log (1 / *D*)], where *D* is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add [10 log (1 / 0.25)] = 6 dB if the duty cycle is 25%.

## 10.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

## 10.5 Test Result

| Temperature: | 26 ℃ | Relative Humidity: | 54% |
|---|---|---|---|
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | 5180-5240MHz | | |

| Condition | Mode | Frequency (MHz) | Conducted Power (dBm) | | | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| | | | Ant A | Ant B | Total | | |
| NVNT | a | 5180 | 13.73 | 13.77 | / | 24 | Pass |
| NVNT | a | 5200 | 13.58 | 13.56 | / | 24 | Pass |
| NVNT | a | 5240 | 13.79 | 14.44 | / | 24 | Pass |
| NVNT | n20 | 5180 | 11.57 | 11.59 | 14.59 | 24 | Pass |
| NVNT | n20 | 5200 | 11.63 | 11.62 | 14.64 | 24 | Pass |
| NVNT | n20 | 5240 | 12.04 | 11.96 | 15.01 | 24 | Pass |
| NVNT | n40 | 5190 | 10.3 | 10.23 | 13.28 | 24 | Pass |
| NVNT | n40 | 5230 | 10.48 | 10.26 | 13.38 | 24 | Pass |
| NVNT | ac20 | 5180 | 12.09 | 11.88 | 15.00 | 24 | Pass |
| NVNT | ac20 | 5200 | 11.92 | 12.01 | 14.98 | 24 | Pass |
| NVNT | ac20 | 5240 | 11.98 | 12.13 | 15.07 | 24 | Pass |
| NVNT | ac40 | 5190 | 10.37 | 10.62 | 13.51 | 24 | Pass |
| NVNT | ac40 | 5230 | 10.52 | 10.43 | 13.49 | 24 | Pass |
| NVNT | ac80 | 5210 | 9.17 | 10.01 | 12.62 | 24 | Pass |
| NVNT | ax20 | 5180 | 11.79 | 12.22 | 15.02 | 24 | Pass |
| NVNT | ax20 | 5200 | 11.9 | 12.12 | 15.02 | 24 | Pass |
| NVNT | ax20 | 5240 | 12.42 | 12.33 | 15.39 | 24 | Pass |
| NVNT | ax40 | 5190 | 10.72 | 10.78 | 13.76 | 24 | Pass |
| NVNT | ax40 | 5230 | 10.85 | 10.88 | 13.88 | 24 | Pass |
| NVNT | ax80 | 5210 | 9.58 | 10.23 | 12.93 | 24 | Pass |
| NVNT | be20 | 5180 | 13.07 | 13.1 | 16.10 | 24 | Pass |
| NVNT | be20 | 5200 | 13.54 | 12.94 | 16.26 | 24 | Pass |
| NVNT | be20 | 5240 | 13.31 | 13.38 | 16.36 | 24 | Pass |
| NVNT | be40 | 5190 | 13.32 | 13.27 | 16.31 | 24 | Pass |
| NVNT | be40 | 5230 | 13.44 | 13.53 | 16.50 | 24 | Pass |
| NVNT | be80 | 5210 | 13.34 | 13.54 | 16.45 | 24 | Pass |

Note:
For power measurements.
The Array gain=0 for NANT≤4
So the directional gain foe Power measurements is 1.95 dBi

| Temperature: | 26 ℃ | Relative Humidity: | 54% |
|---|---|---|---|
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | 5260-5320MHz | | |

| Condition | Mode | Frequency (MHz) | Conducted Power (dBm) | | | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| | | | Ant A | Ant B | Total | | |
| NVNT | a | 5260 | 12.87 | 12.57 | / | 24 | Pass |
| NVNT | a | 5280 | 12.48 | 11.95 | / | 24 | Pass |
| NVNT | a | 5320 | 12.48 | 12.39 | / | 24 | Pass |
| NVNT | n20 | 5260 | 11.86 | 11.61 | 14.75 | 24 | Pass |
| NVNT | n20 | 5280 | 11.73 | 11.62 | 14.69 | 24 | Pass |
| NVNT | n20 | 5320 | 11.36 | 11.75 | 14.57 | 24 | Pass |
| NVNT | n40 | 5270 | 10.85 | 10.59 | 13.73 | 24 | Pass |
| NVNT | n40 | 5310 | 10.58 | 10.56 | 13.58 | 24 | Pass |
| NVNT | ac20 | 5260 | 11.84 | 11.82 | 14.84 | 24 | Pass |
| NVNT | ac20 | 5280 | 11.7 | 11.96 | 14.84 | 24 | Pass |
| NVNT | ac20 | 5320 | 11.67 | 11.84 | 14.77 | 24 | Pass |
| NVNT | ac40 | 5270 | 11.02 | 10.94 | 13.99 | 24 | Pass |
| NVNT | ac40 | 5310 | 11.01 | 10.78 | 13.91 | 24 | Pass |
| NVNT | ac80 | 5290 | 9.45 | 9.86 | 12.67 | 24 | Pass |
| NVNT | ax20 | 5260 | 12.04 | 12.12 | 15.09 | 24 | Pass |
| NVNT | ax20 | 5280 | 12.21 | 12.21 | 15.22 | 24 | Pass |
| NVNT | ax20 | 5320 | 11.84 | 11.85 | 14.86 | 24 | Pass |
| NVNT | ax40 | 5270 | 11.35 | 11.34 | 14.36 | 24 | Pass |
| NVNT | ax40 | 5310 | 10.95 | 11.18 | 14.08 | 24 | Pass |
| NVNT | ax80 | 5290 | 9.8 | 9.71 | 12.77 | 24 | Pass |
| NVNT | be20 | 5260 | 13.23 | 12.84 | 16.05 | 24 | Pass |
| NVNT | be20 | 5280 | 12.99 | 13.07 | 16.04 | 24 | Pass |
| NVNT | be20 | 5320 | 13.03 | 13.12 | 16.09 | 24 | Pass |
| NVNT | be40 | 5270 | 12.66 | 9.68 | 14.43 | 24 | Pass |
| NVNT | be40 | 5310 | 12.83 | 9.65 | 14.50 | 24 | Pass |
| NVNT | be80 | 5290 | 13.01 | 9.31 | 14.55 | 24 | Pass |

Note:
For power measurements.
The Array gain=0 for NANT≤4
So the directional gain foe Power measurements is 1.95 dBi

| Temperature: | 26 ℃ | Relative Humidity: | 54% |
|---|---|---|---|
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | 5500-5700MHz | | |

| Condition | Mode | Frequency (MHz) | Conducted Power (dBm) | | | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| | | | Ant A | Ant B | Total | | |
| NVNT | a | 5500 | 14.45 | 13.91 | / | 24 | Pass |
| NVNT | a | 5580 | 14.09 | 13.78 | / | 24 | Pass |
| NVNT | a | 5700 | 13.39 | 11.21 | / | 24 | Pass |
| NVNT | n20 | 5500 | 11.64 | 12.04 | 14.85 | 24 | Pass |
| NVNT | n20 | 5580 | 12.38 | 11.79 | 15.11 | 24 | Pass |
| NVNT | n20 | 5700 | 11.24 | 11.61 | 14.44 | 24 | Pass |
| NVNT | n40 | 5510 | 10.31 | 10.29 | 13.31 | 24 | Pass |
| NVNT | n40 | 5550 | 10.33 | 10.02 | 13.19 | 24 | Pass |
| NVNT | n40 | 5670 | 9.94 | 9.93 | 12.95 | 24 | Pass |
| NVNT | ac20 | 5500 | 12.18 | 11.98 | 15.09 | 24 | Pass |
| NVNT | ac20 | 5580 | 12.6 | 11.89 | 15.27 | 24 | Pass |
| NVNT | ac20 | 5700 | 11.39 | 9.83 | 13.69 | 24 | Pass |
| NVNT | ac40 | 5510 | 10.38 | 10.5 | 13.45 | 24 | Pass |
| NVNT | ac40 | 5550 | 10.16 | 10.44 | 13.31 | 24 | Pass |
| NVNT | ac40 | 5670 | 10.05 | 9.04 | 12.58 | 24 | Pass |
| NVNT | ac80 | 5530 | 9.58 | 9.67 | 12.64 | 24 | Pass |
| NVNT | ax20 | 5500 | 12.14 | 12.45 | 15.31 | 24 | Pass |
| NVNT | ax20 | 5580 | 12.77 | 12.11 | 15.46 | 24 | Pass |
| NVNT | ax20 | 5700 | 11.47 | 10.05 | 13.83 | 24 | Pass |
| NVNT | ax40 | 5510 | 10.78 | 10.55 | 13.68 | 24 | Pass |
| NVNT | ax40 | 5550 | 10.61 | 10.48 | 13.56 | 24 | Pass |
| NVNT | ax40 | 5670 | 10.33 | 9.11 | 12.77 | 24 | Pass |
| NVNT | ax80 | 5530 | 9.89 | 9.82 | 12.87 | 24 | Pass |
| NVNT | be20 | 5500 | 12.84 | 13.64 | 16.27 | 24 | Pass |
| NVNT | be20 | 5580 | 13.42 | 13.18 | 16.31 | 24 | Pass |
| NVNT | be20 | 5700 | 12.22 | 12.24 | 15.24 | 24 | Pass |
| NVNT | be40 | 5510 | 12.8 | 13.22 | 16.03 | 24 | Pass |
| NVNT | be40 | 5550 | 12.45 | 12.8 | 15.64 | 24 | Pass |
| NVNT | be40 | 5670 | 11.41 | 12.22 | 14.84 | 24 | Pass |
| NVNT | be80 | 5530 | 12.83 | 12.5 | 15.68 | 24 | Pass |

Note:
For power measurements.
The Array gain=0 for NANT≤4
So the directional gain foe Power measurements is 1.95 dBi

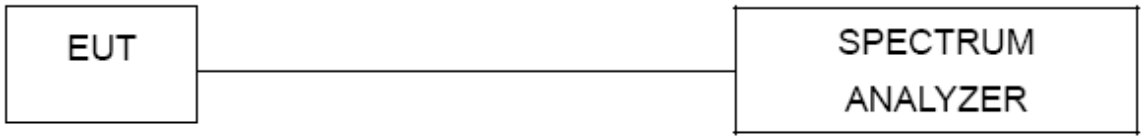
| Temperature: | 26 ℃ | Relative Humidity: | 54% |
|---|---|---|---|
| Pressure: | 101KPa | Test Voltage: | AC 120V/60Hz |
| Test Mode: | 5745-5825MHz | | |

| Condition | Mode | Frequency (MHz) | Conducted Power (dBm) | | | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| | | | Ant A | Ant B | Total | | |
| NVNT | a | 5745 | 13.97 | 12.94 | / | 30 | Pass |
| NVNT | a | 5785 | 13.58 | 12.46 | / | 30 | Pass |
| NVNT | a | 5825 | 12.88 | 12.57 | / | 30 | Pass |
| NVNT | n20 | 5745 | 12.15 | 11.02 | 14.63 | 30 | Pass |
| NVNT | n20 | 5785 | 11.75 | 10.51 | 14.18 | 30 | Pass |
| NVNT | n20 | 5825 | 11.15 | 10.4 | 13.80 | 30 | Pass |
| NVNT | n40 | 5755 | 10.61 | 9.62 | 13.15 | 30 | Pass |
| NVNT | n40 | 5795 | 10.29 | 9.31 | 12.84 | 30 | Pass |
| NVNT | ac20 | 5745 | 12.34 | 11.05 | 14.75 | 30 | Pass |
| NVNT | ac20 | 5785 | 11.95 | 11.05 | 14.53 | 30 | Pass |
| NVNT | ac20 | 5825 | 11.39 | 10.86 | 14.14 | 30 | Pass |
| NVNT | ac40 | 5755 | 10.8 | 9.45 | 13.19 | 30 | Pass |
| NVNT | ac40 | 5795 | 10.36 | 9.7 | 13.05 | 30 | Pass |
| NVNT | ac80 | 5775 | 9.61 | 8.13 | 11.94 | 30 | Pass |
| NVNT | ax20 | 5745 | 12.53 | 11.36 | 14.99 | 30 | Pass |
| NVNT | ax20 | 5785 | 11.91 | 11.08 | 14.53 | 30 | Pass |
| NVNT | ax20 | 5825 | 11.45 | 10.87 | 14.18 | 30 | Pass |
| NVNT | ax40 | 5755 | 11.09 | 9.84 | 13.52 | 30 | Pass |
| NVNT | ax40 | 5795 | 10.69 | 9.49 | 13.14 | 30 | Pass |
| NVNT | ax80 | 5775 | 9.62 | 8.86 | 12.27 | 30 | Pass |
| NVNT | be20 | 5745 | 12.98 | 12.37 | 15.70 | 30 | Pass |
| NVNT | be20 | 5785 | 12.58 | 12.33 | 15.47 | 30 | Pass |
| NVNT | be20 | 5825 | 12 | 11.27 | 14.66 | 30 | Pass |
| NVNT | be40 | 5755 | 12.69 | 11.7 | 15.23 | 30 | Pass |
| NVNT | be40 | 5795 | 12.61 | 11.41 | 15.06 | 30 | Pass |
| NVNT | be80 | 5775 | 12.69 | 11.8 | 15.28 | 30 | Pass |

Note:
For power measurements.
The Array gain=0 for NANT≤4
So the directional gain foe Power measurements is 1.95 dBi

# 11. Out Of Band Emissions

## 11.1 Block Diagram Of Test Setup




## 11.2 Limit

According to FCC §15.407(b)
Undesirable emission limits. Except as shown in paragraph (b)(10) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz (68.2 dBuV/m@3m).
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz (68.2 dBuV/m@3m).
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz (68.2 dBuV/m@3m).
(4) For transmitters operating solely in the 5.725-5.850 GHz band:
(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

## 11.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

## 11.4 EUT Operating Conditions

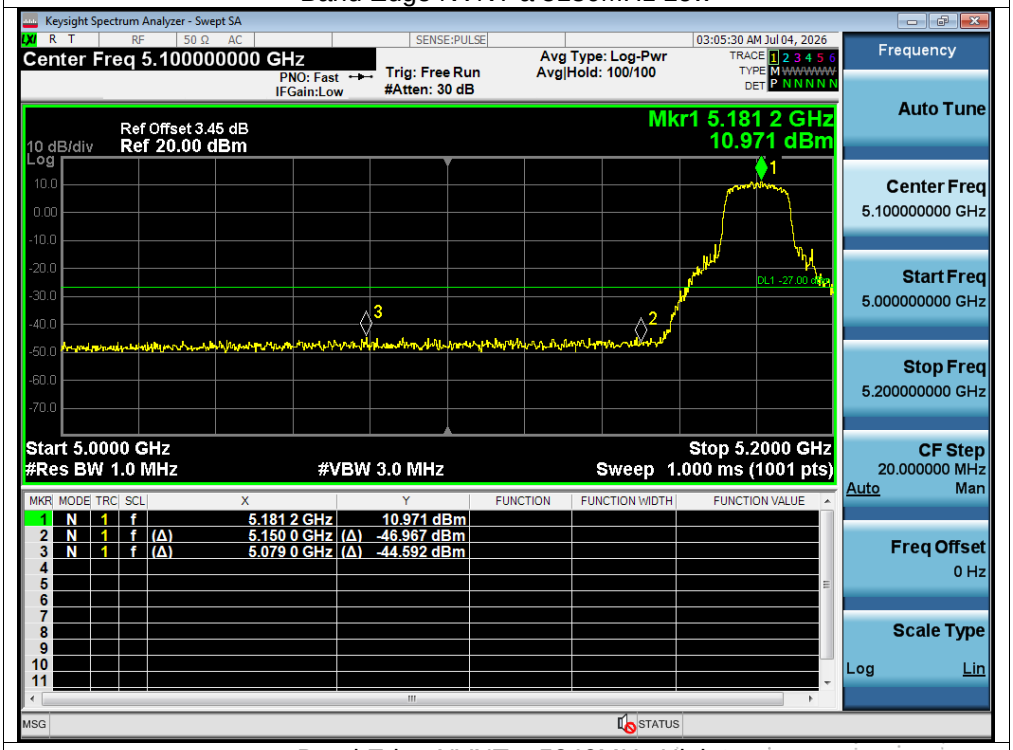
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data

## 11.5 Test Result

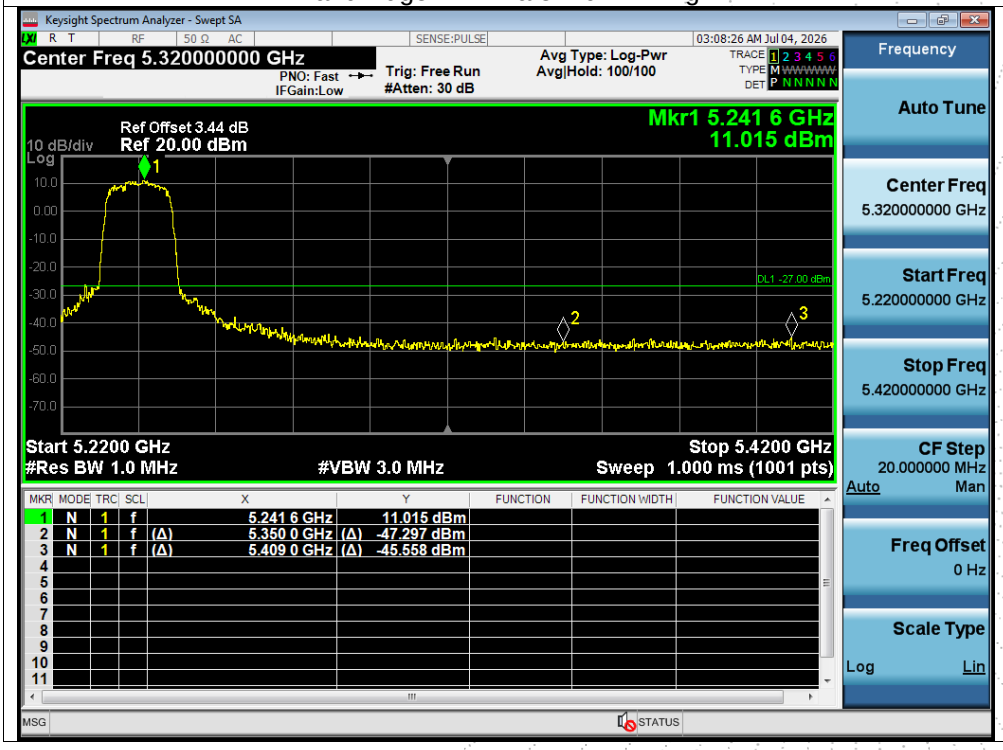
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A. Plot.

Test Graphs

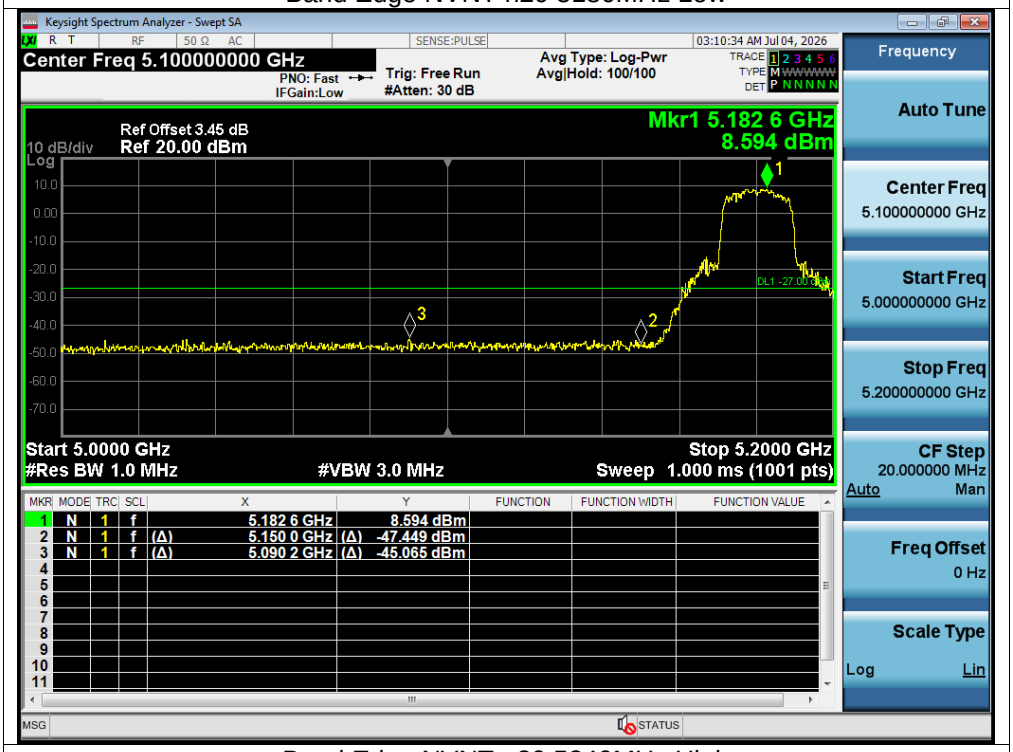
Band Edge NVNT a 5180MHz Low



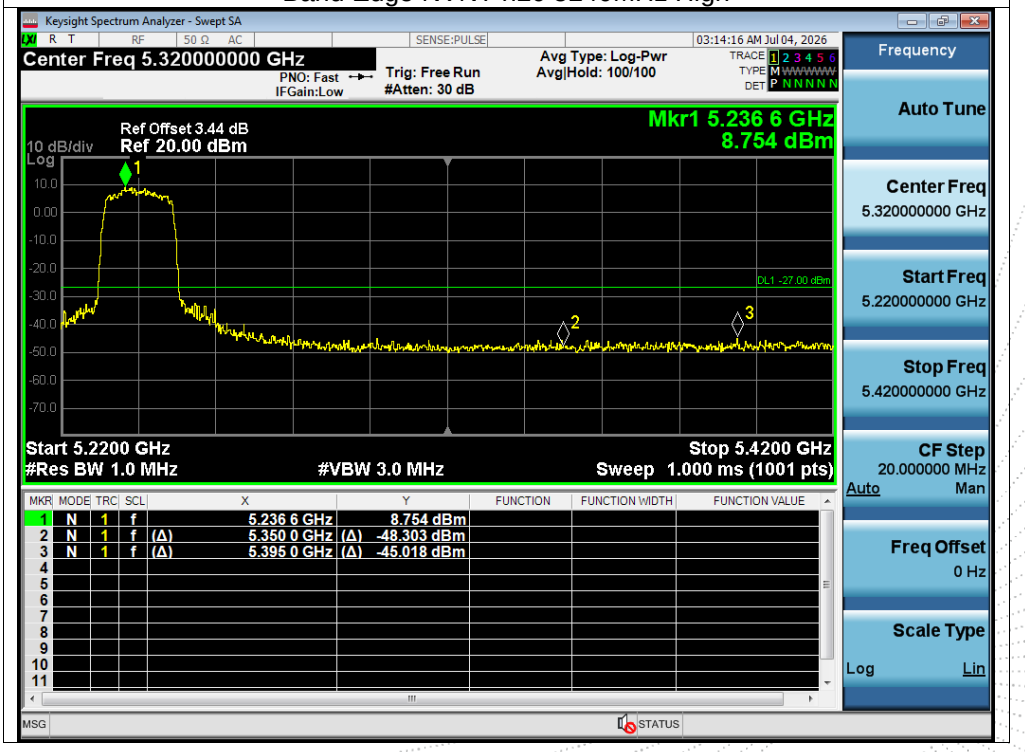

Band Edge NVNT a 5240MHz High



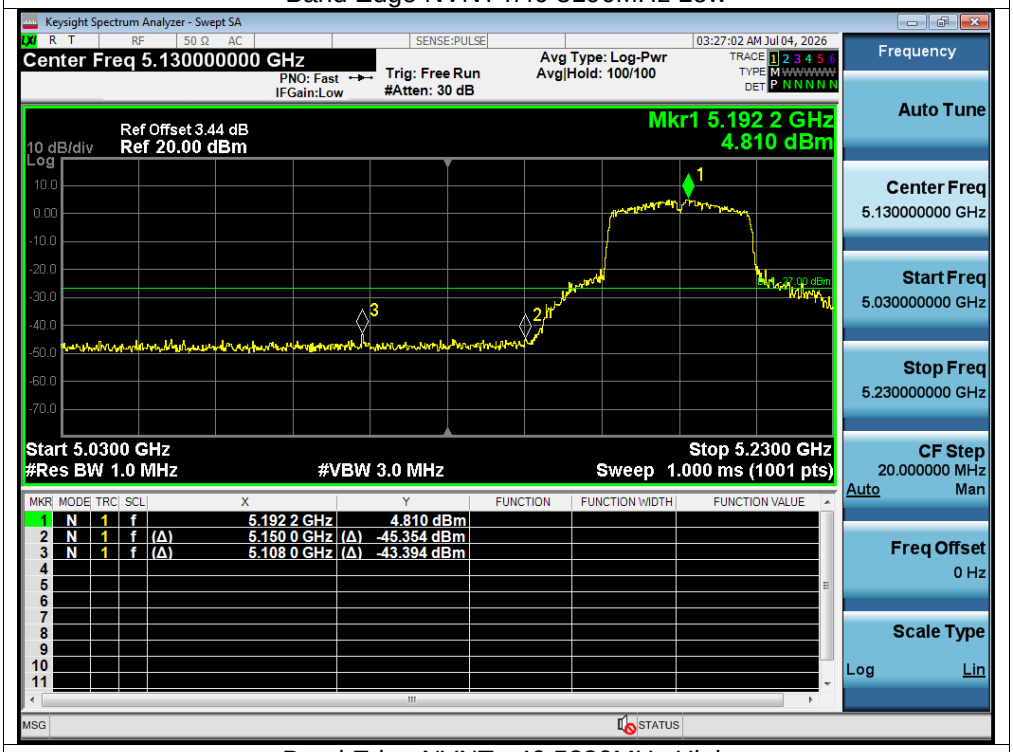
Band Edge NVNT n20 5180MHz Low



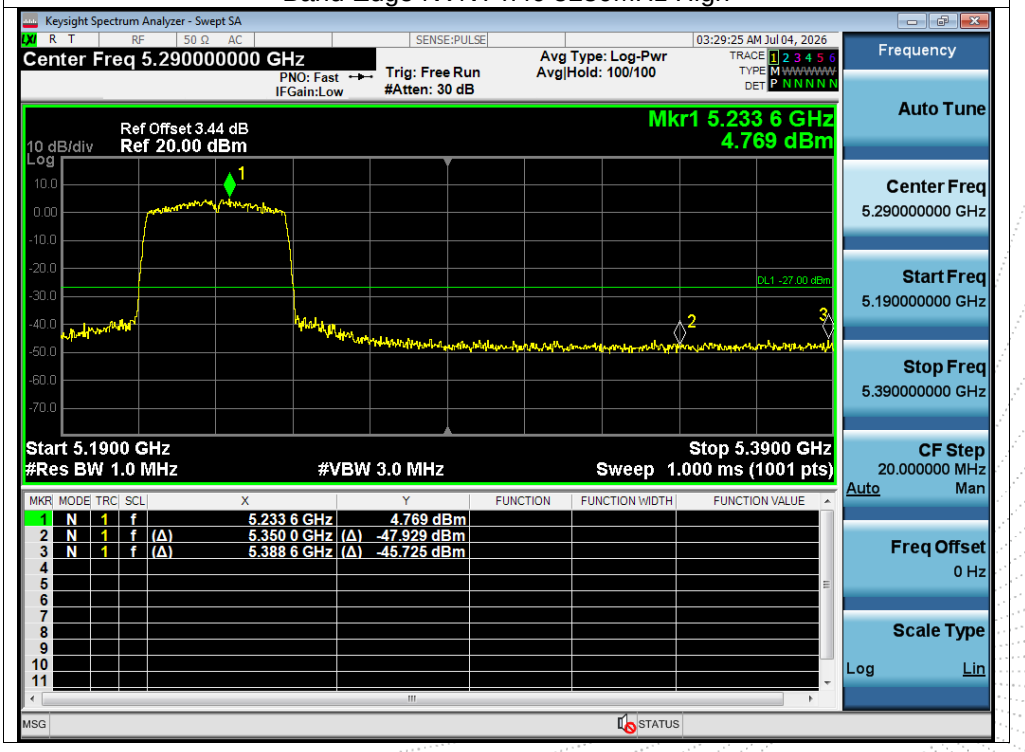

Band Edge NVNT n20 5240MHz High



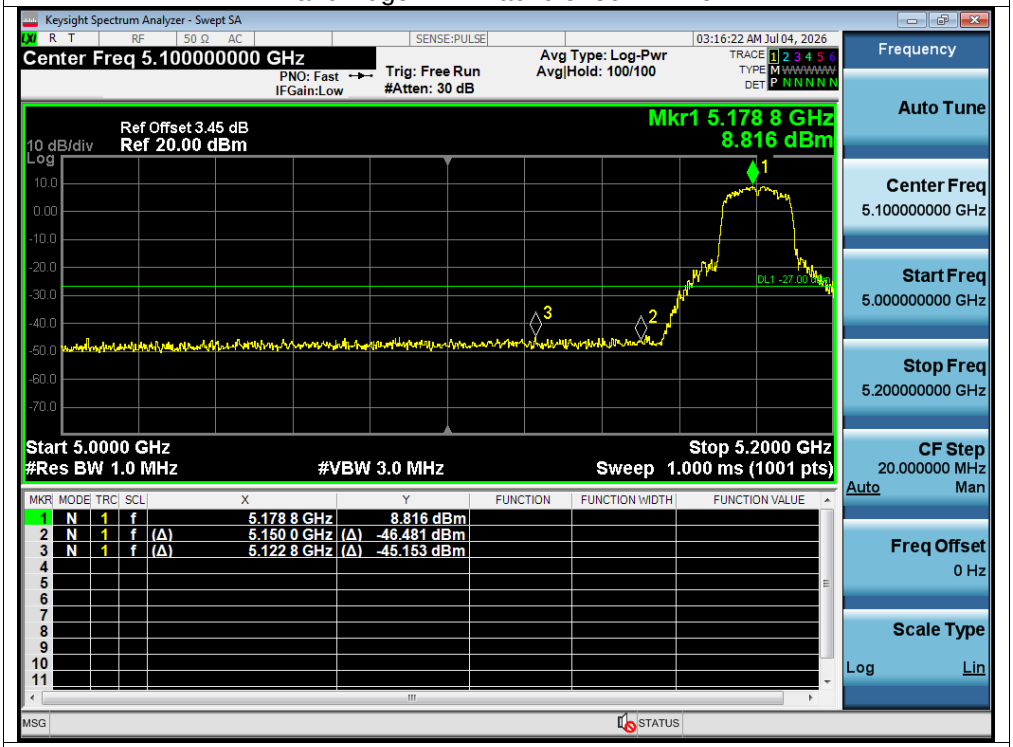
Band Edge NVNT n40 5190MHz Low



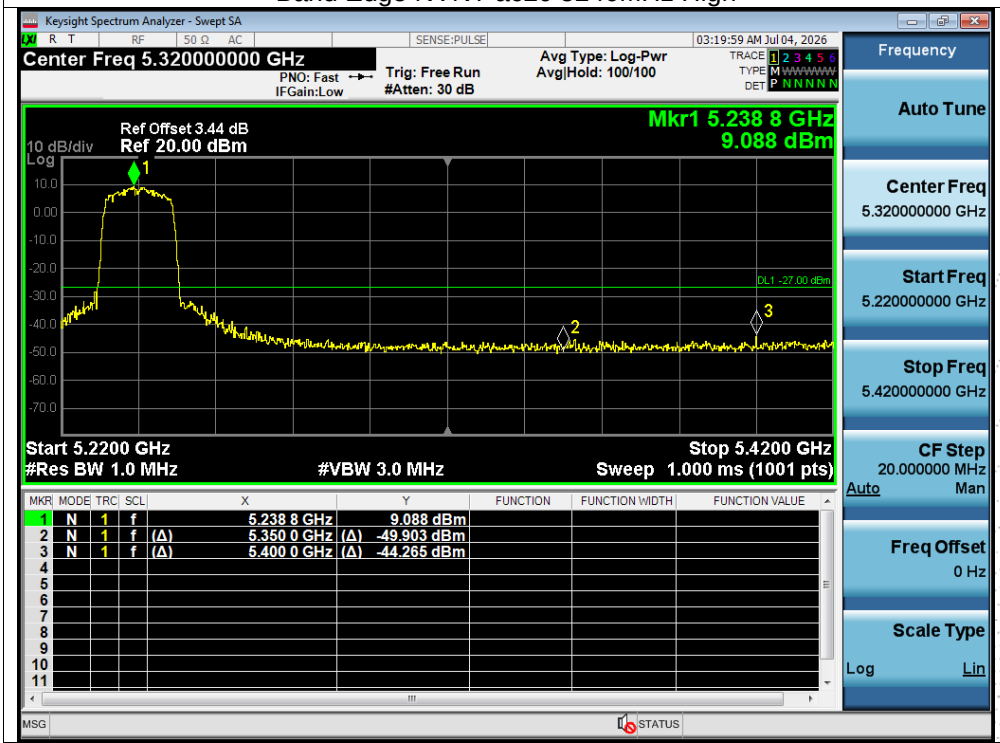

Band Edge NVNT n40 5230MHz High



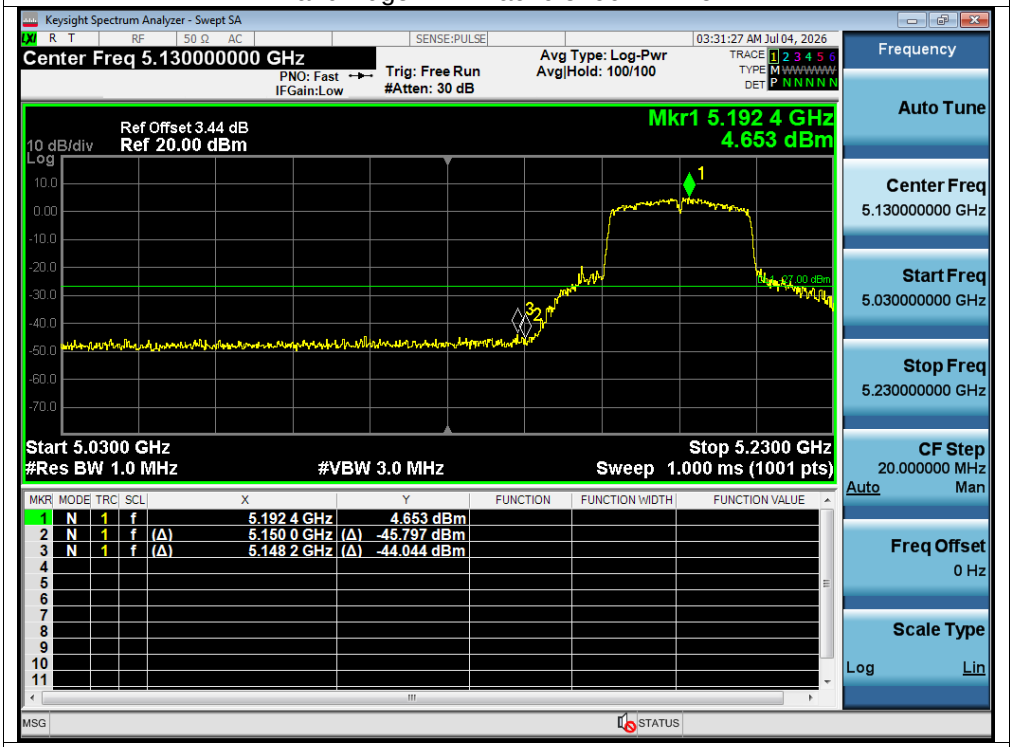
Band Edge NVNT ac20 5180MHz Low



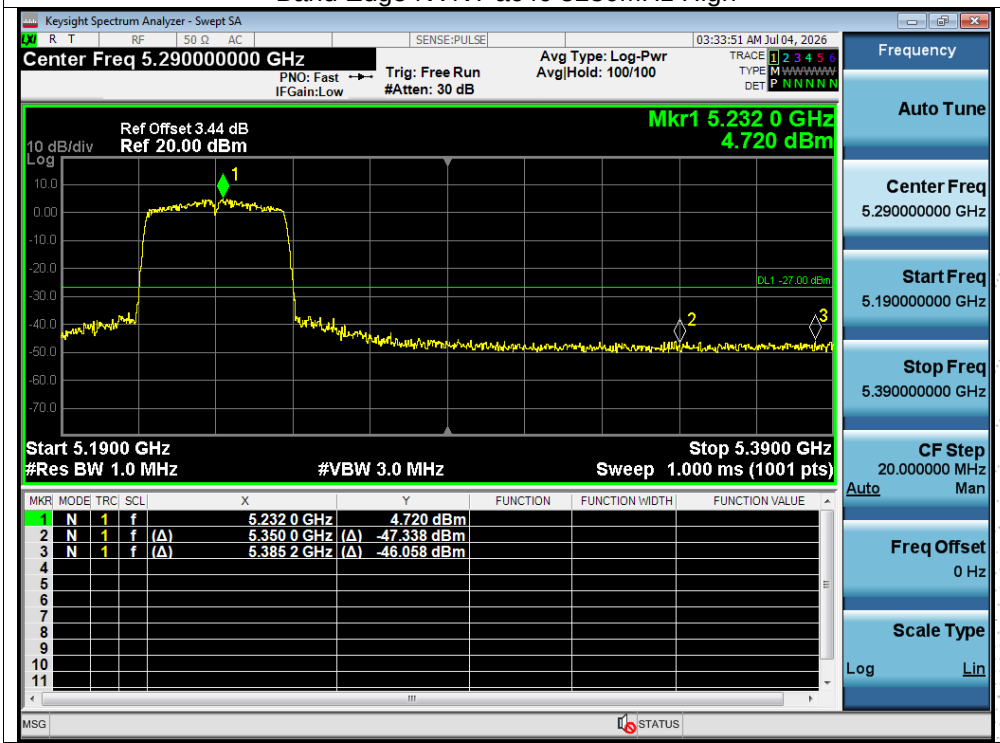

Band Edge NVNT ac20 5240MHz High



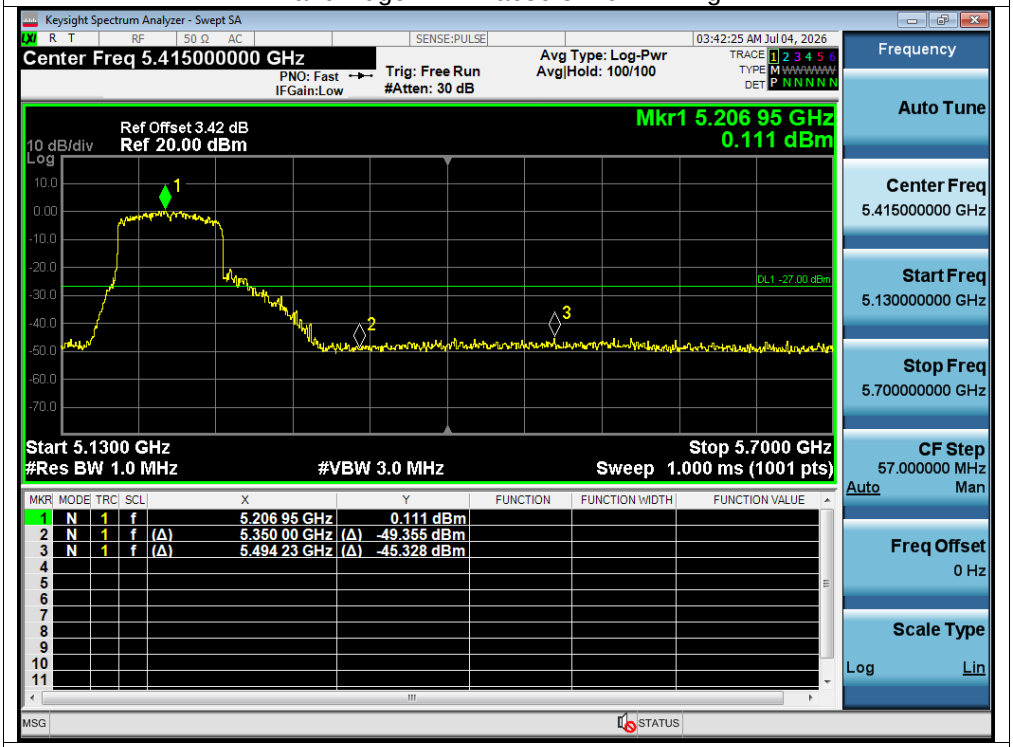
Band Edge NVNT ac40 5190MHz Low



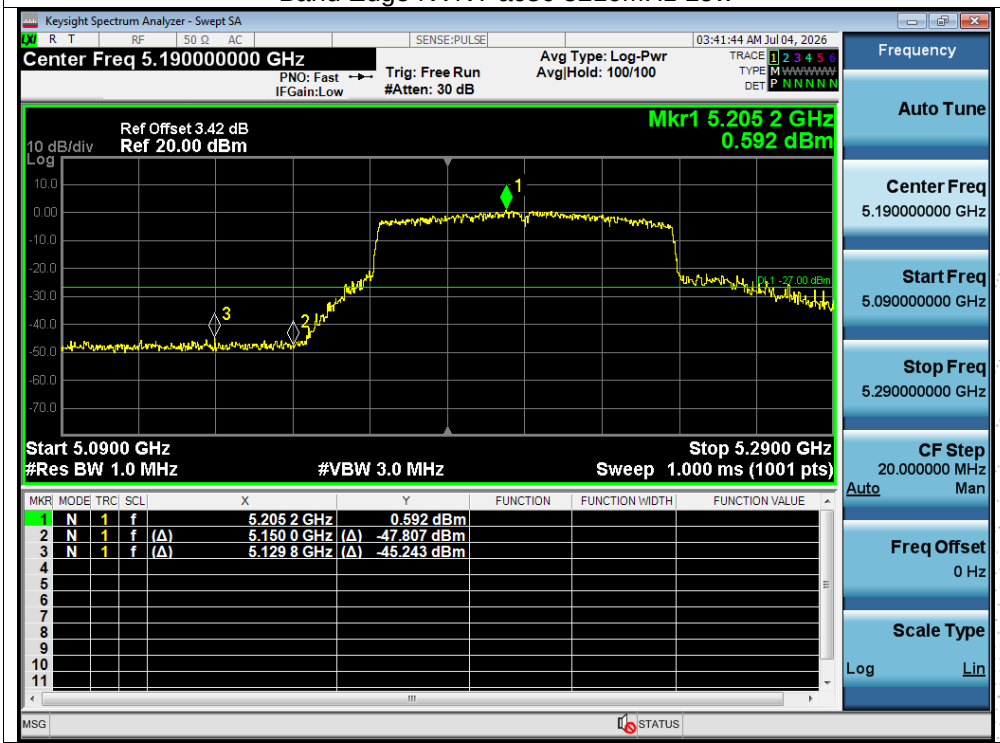

Band Edge NVNT ac40 5230MHz High



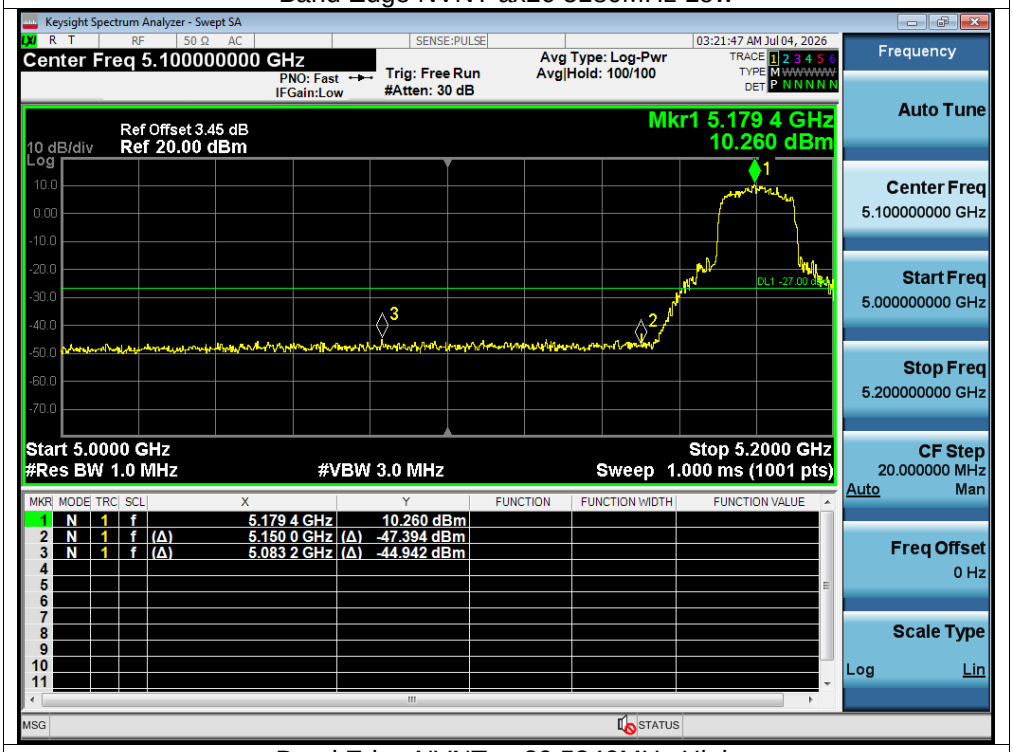
Band Edge NVNT ac80 5210MHz High



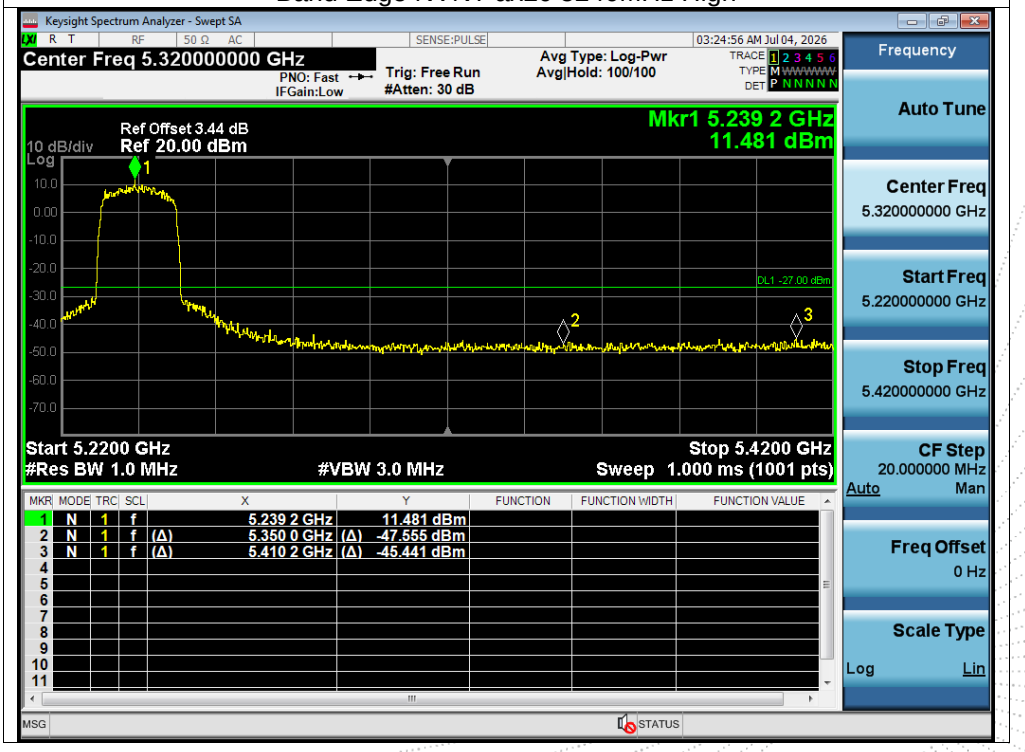

Band Edge NVNT ac80 5210MHz Low



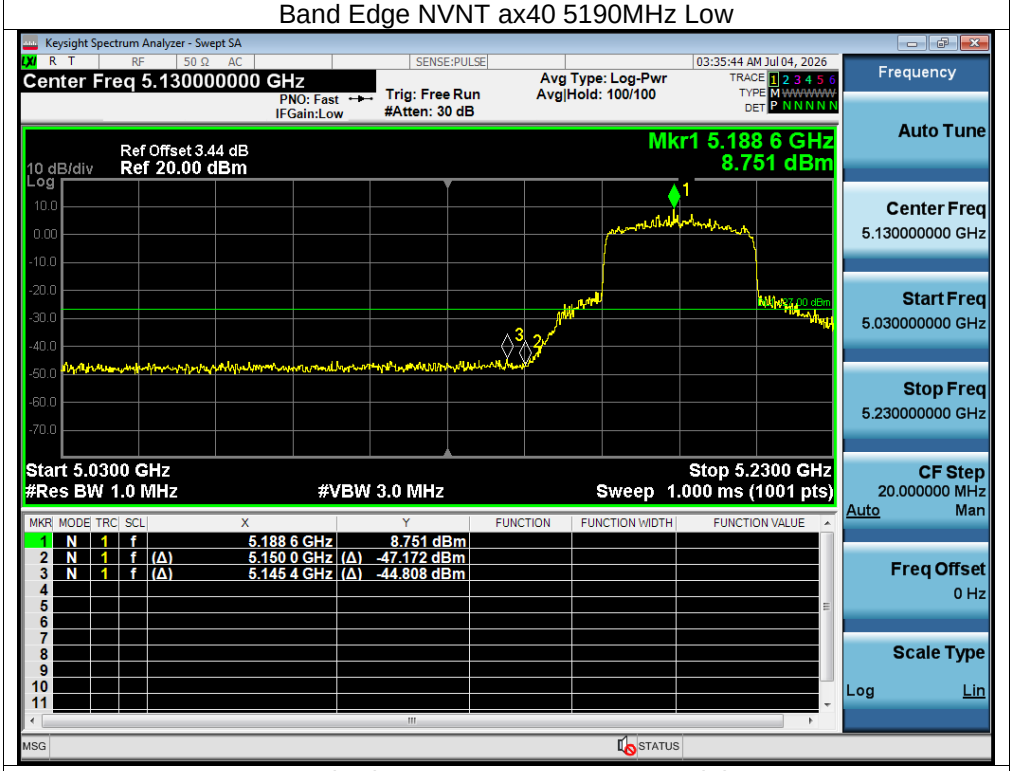
Band Edge NVNT ax20 5180MHz Low



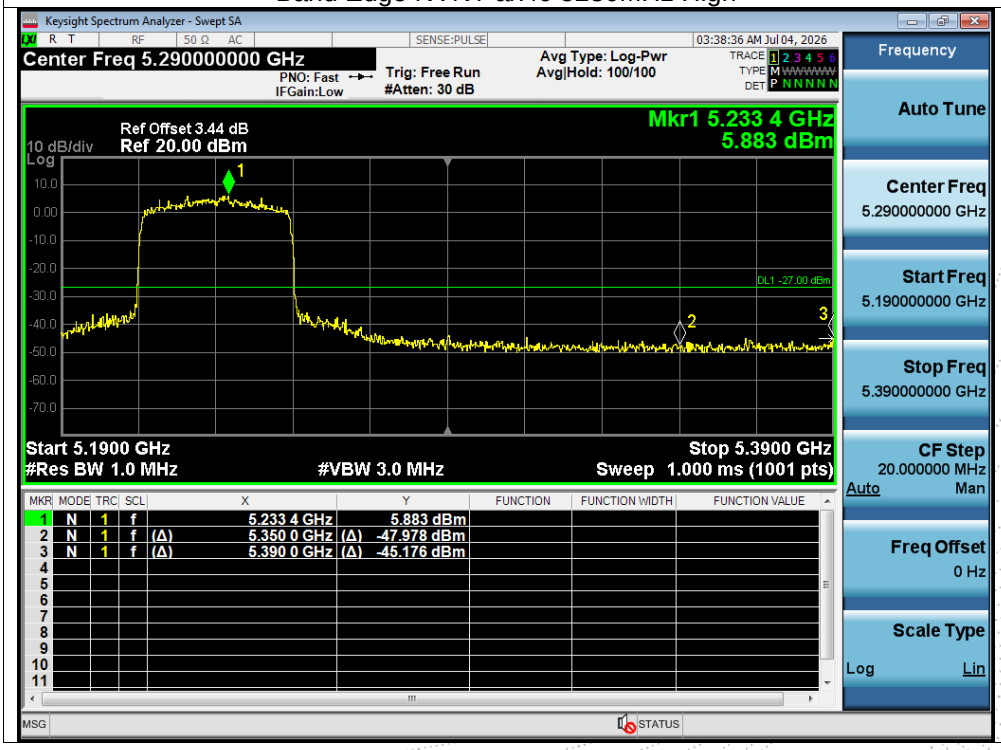

Band Edge NVNT ax20 5240MHz High



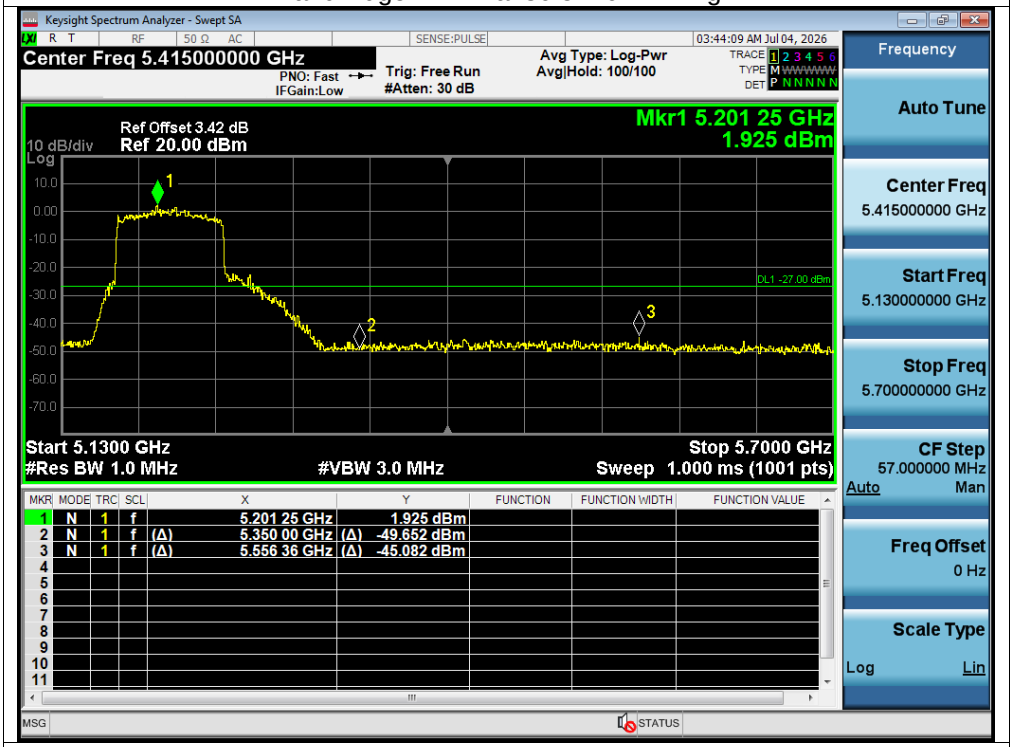
Band Edge NVNT ax40 5190MHz Low



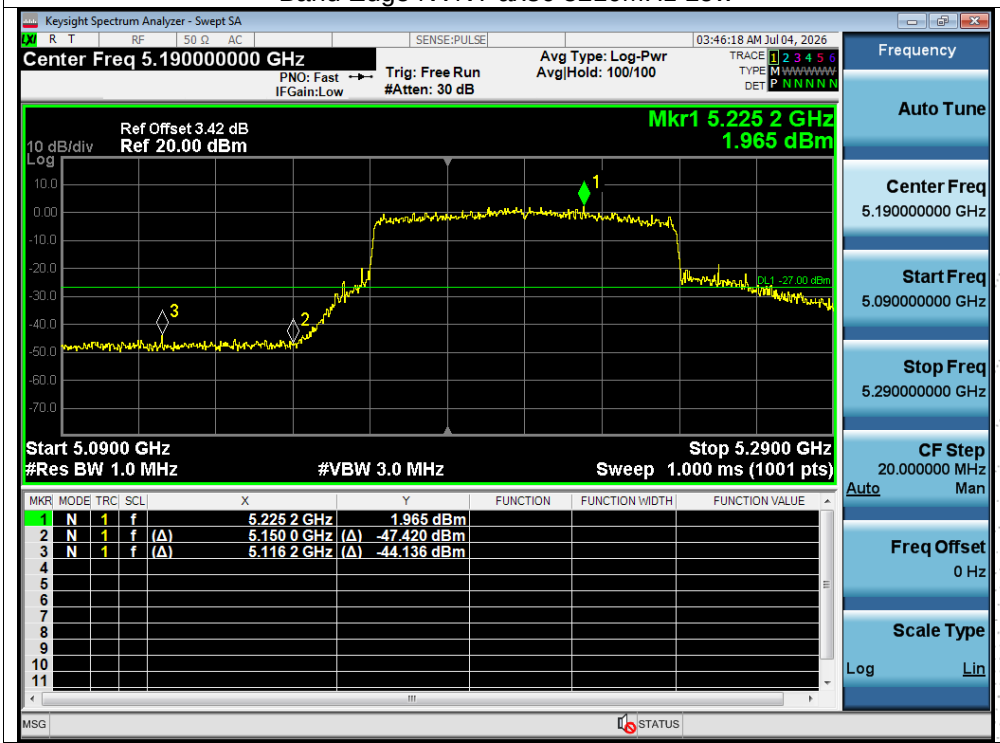

Band Edge NVNT ax40 5230MHz High



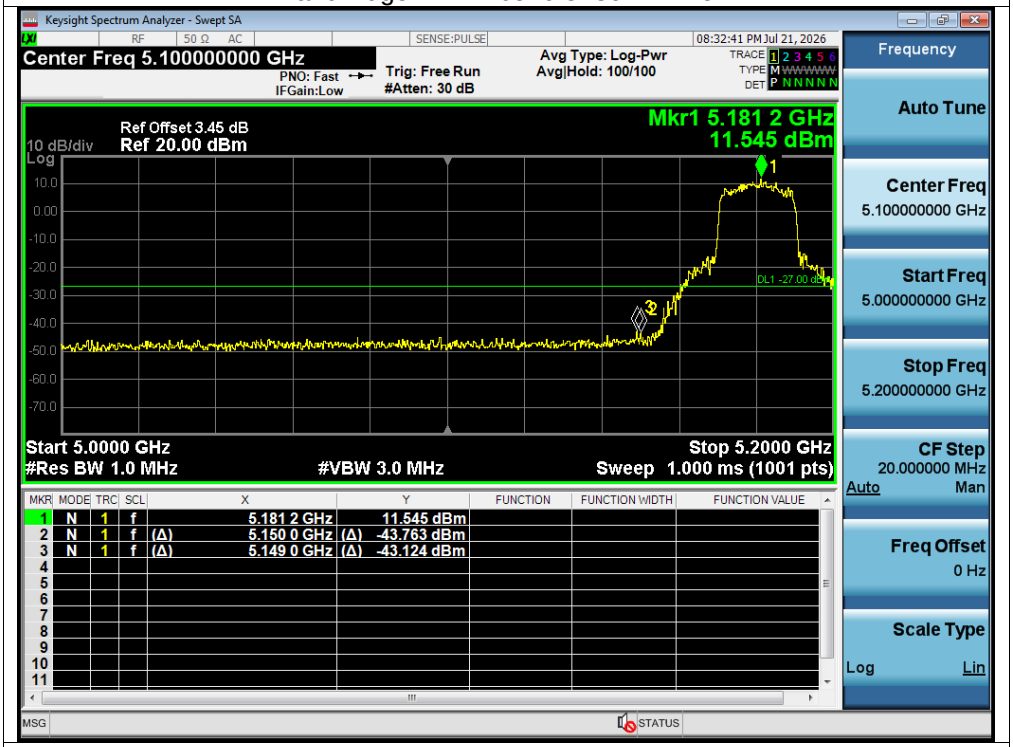
Band Edge NVNT ax80 5210MHz High



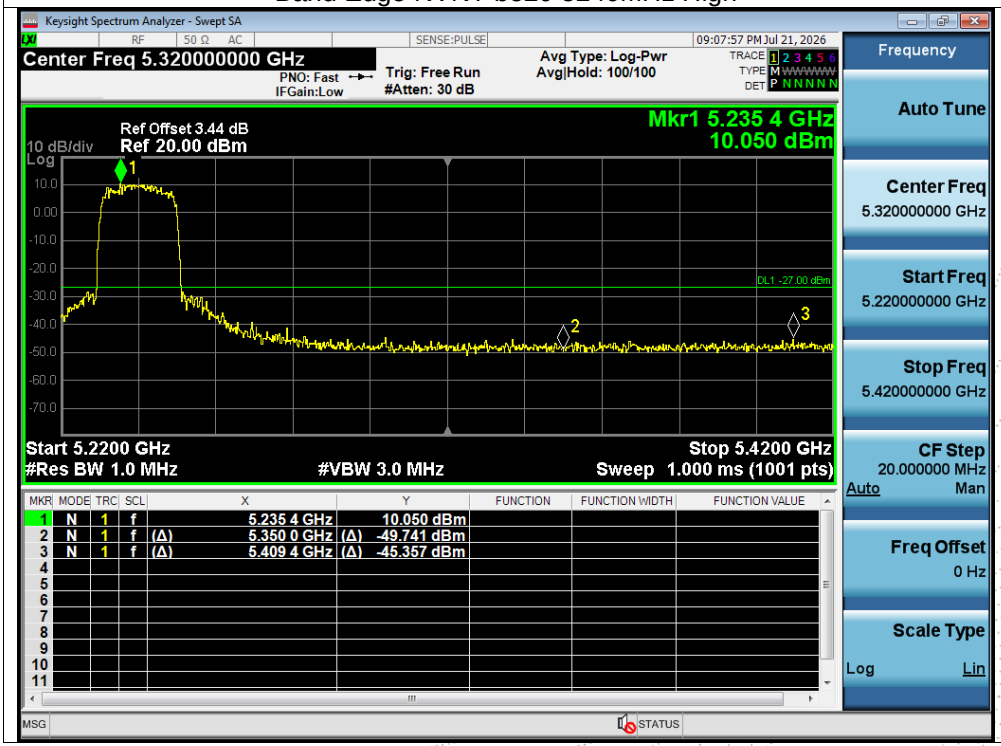

Band Edge NVNT ax80 5210MHz Low



Band Edge NVNT be20 5180MHz Low

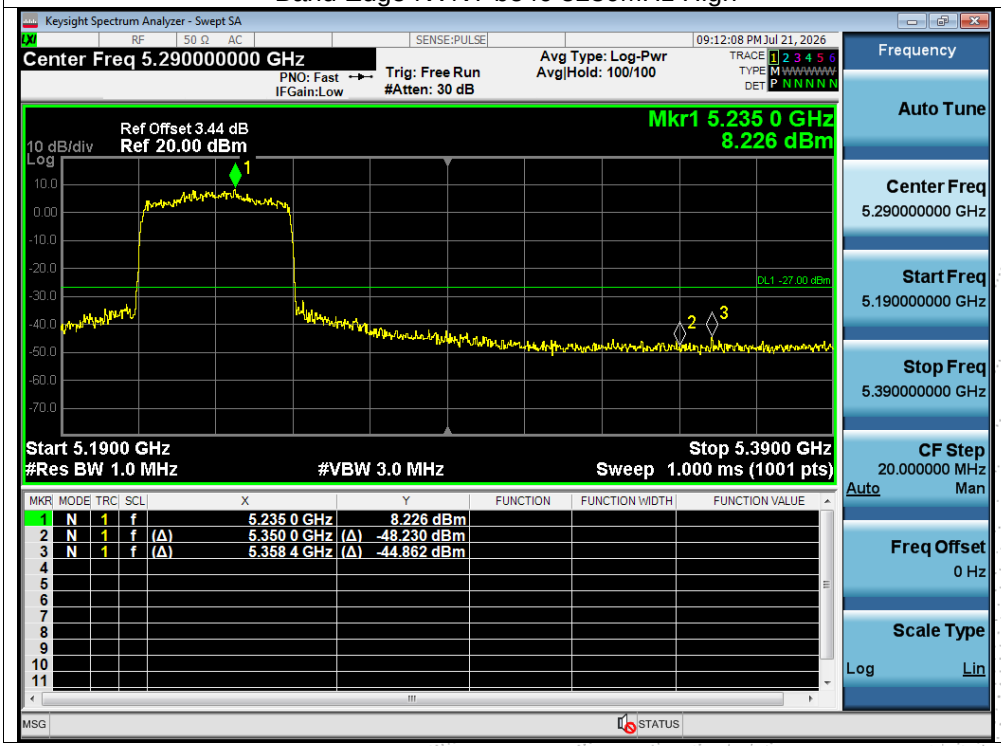



Band Edge NVNT be20 5240MHz High



Band Edge NVNT be40 5190MHz Low


Band Edge NVNT be40 5230MHz High



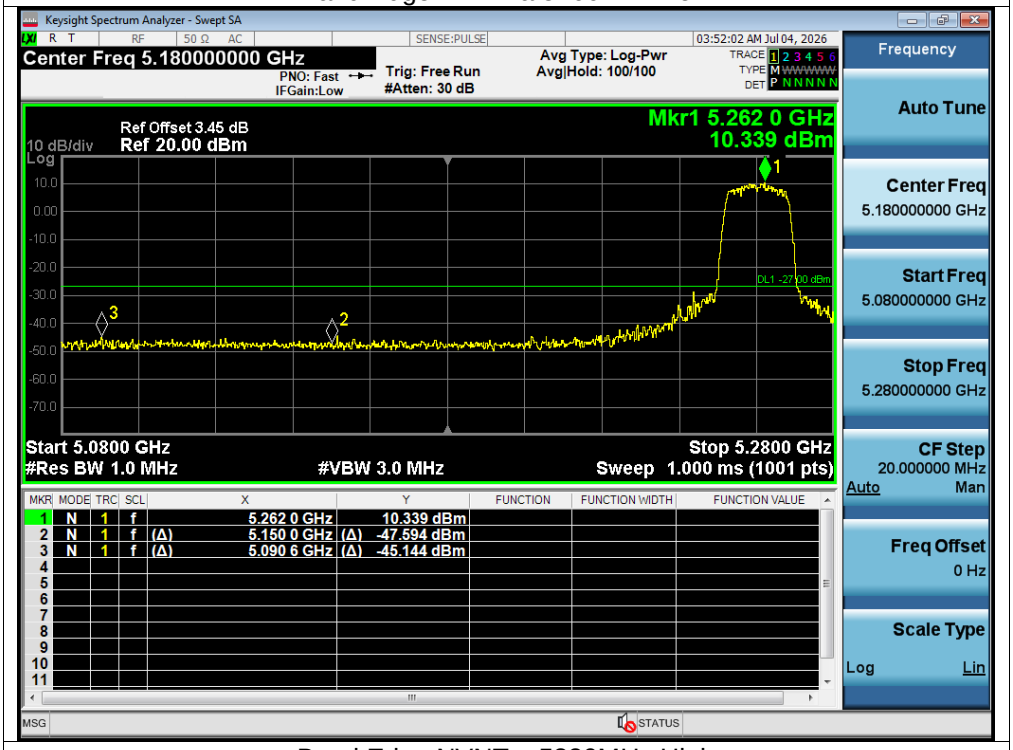
Band Edge NVNT be80 5210MHz High


Band Edge NVNT be80 5210MHz Low

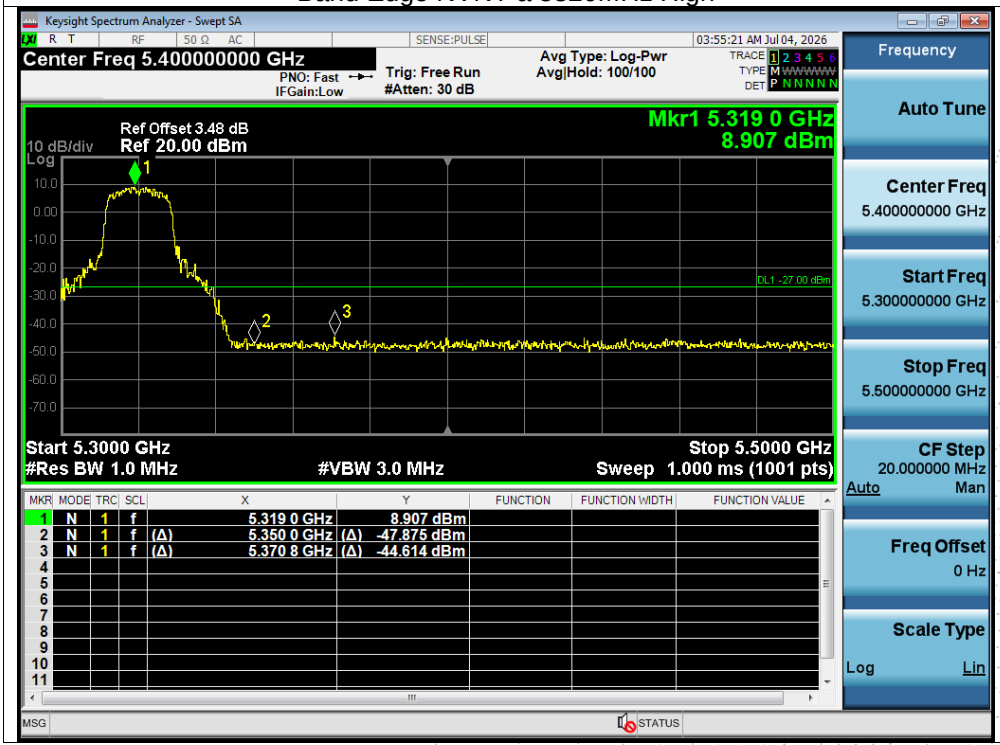
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A. Plot.

Test Graphs

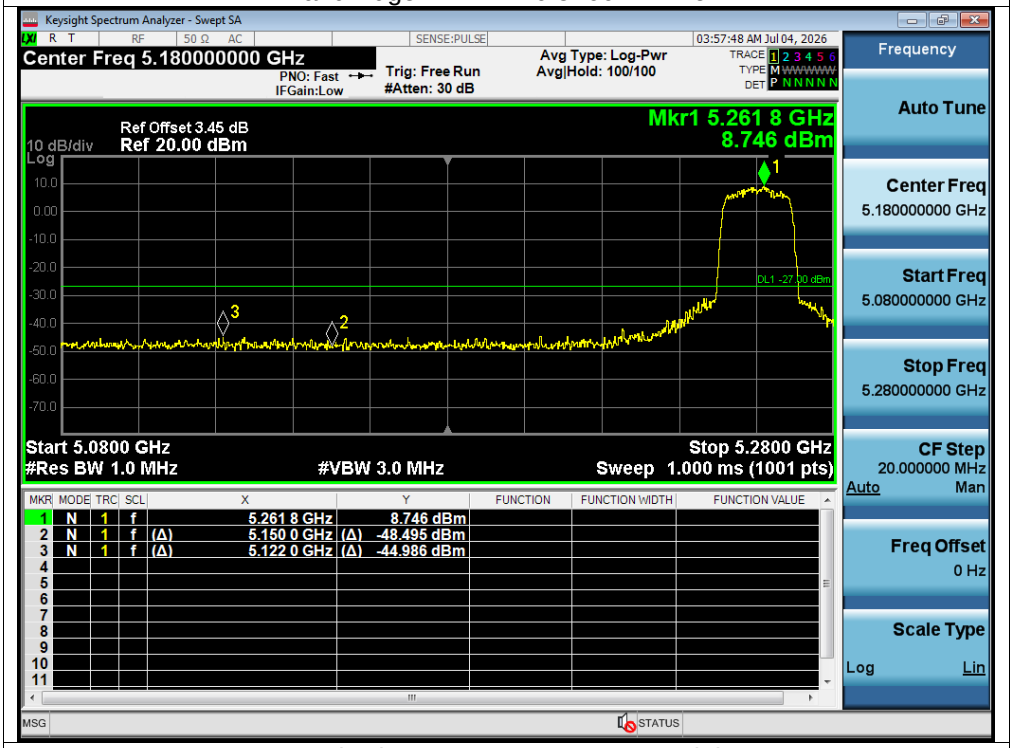
Band Edge NVNT a 5260MHz Low



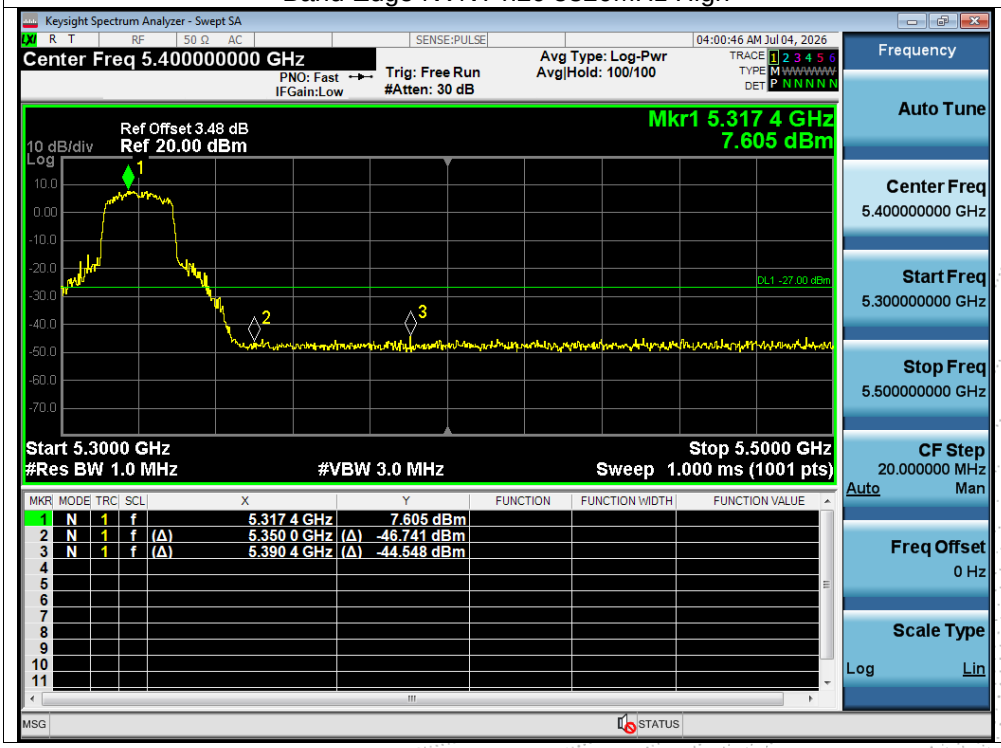

Band Edge NVNT a 5320MHz High



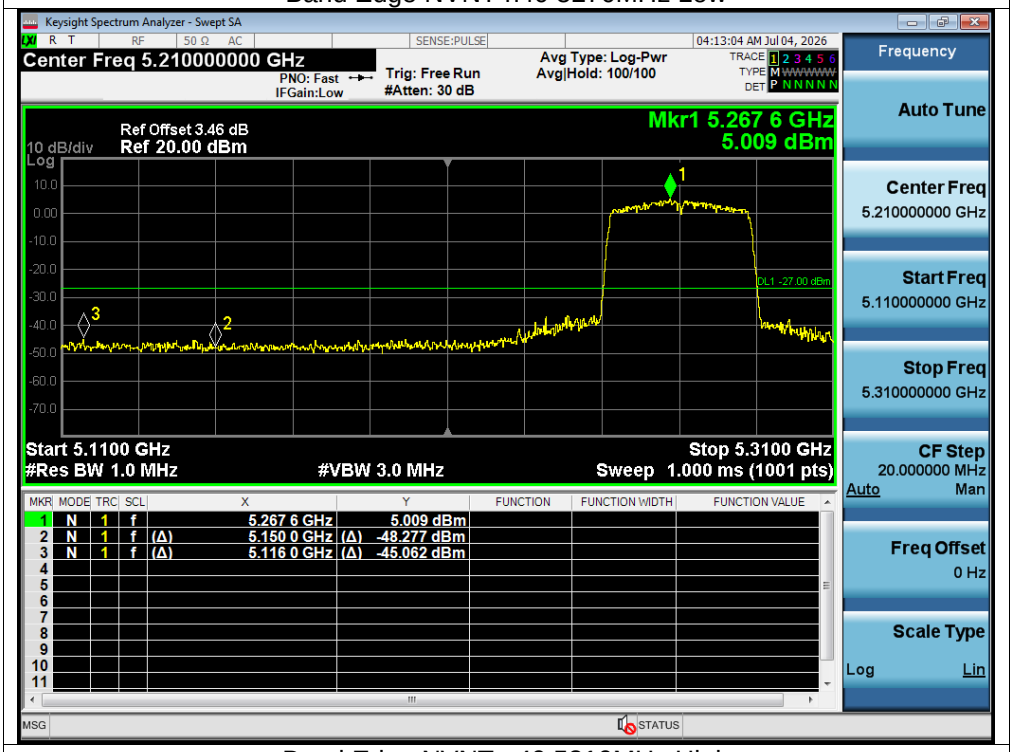
Band Edge NVNT n20 5260MHz Low



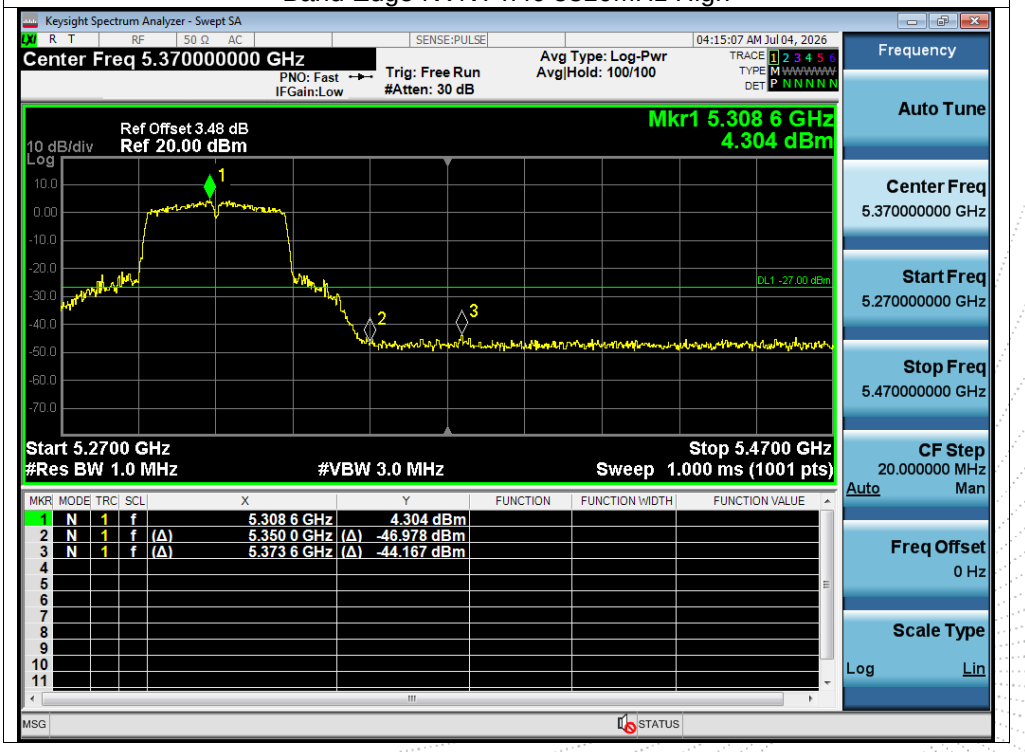

Band Edge NVNT n20 5320MHz High



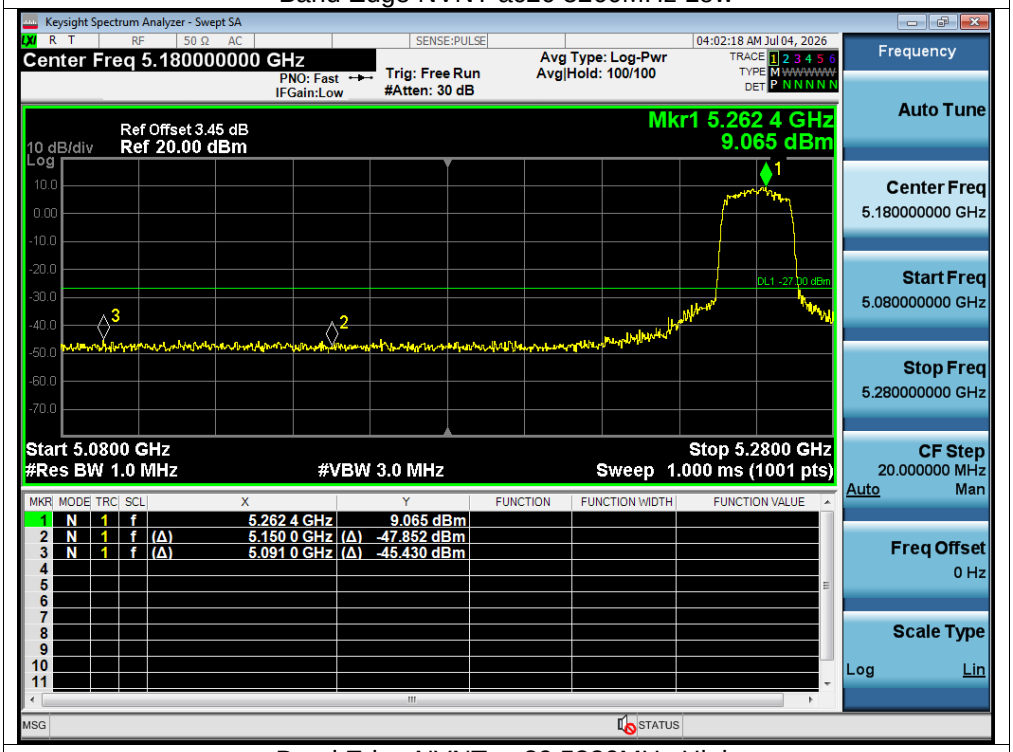
Band Edge NVNT n40 5270MHz Low



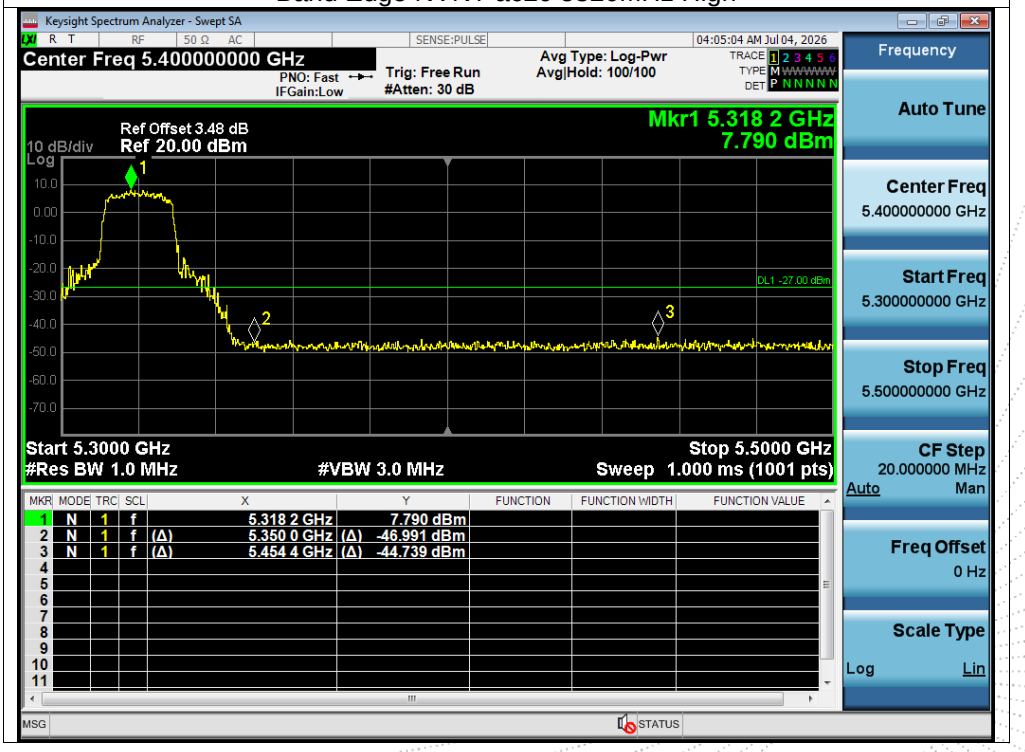

Band Edge NVNT n40 5310MHz High



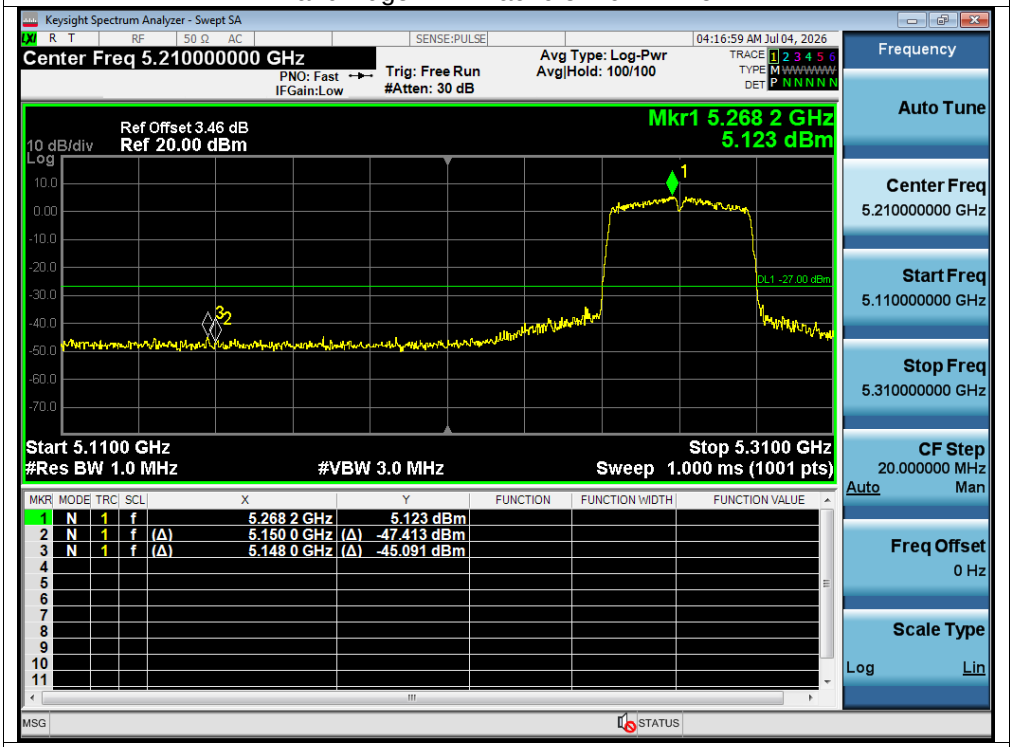
Band Edge NVNT ac20 5260MHz Low



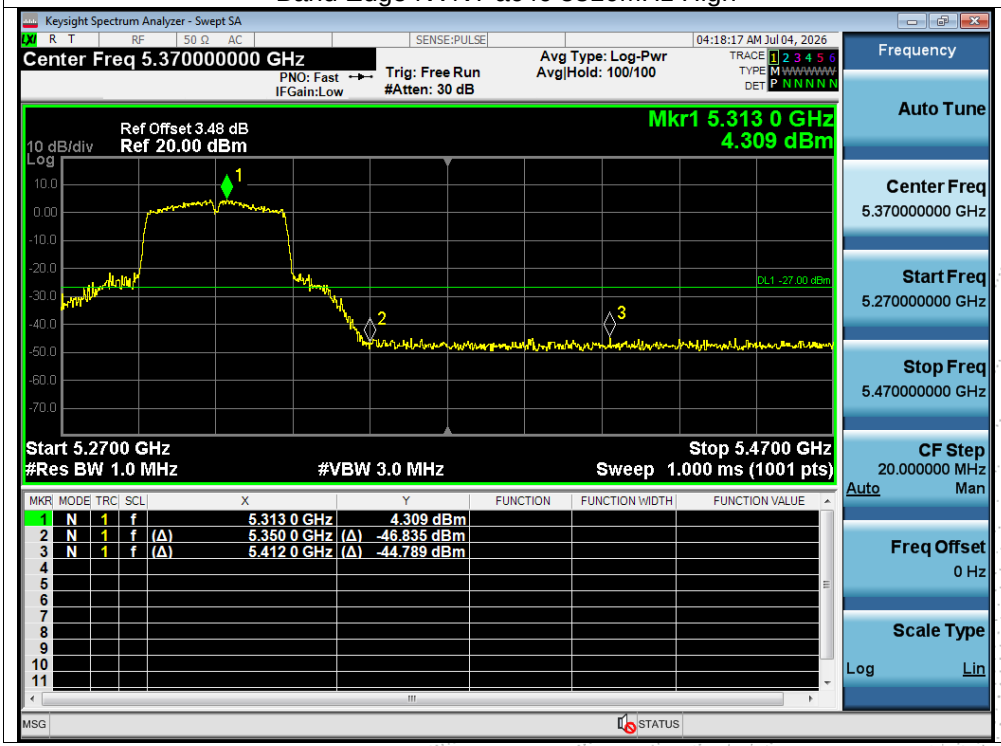

Band Edge NVNT ac20 5320MHz High



Band Edge NVNT ac40 5270MHz Low

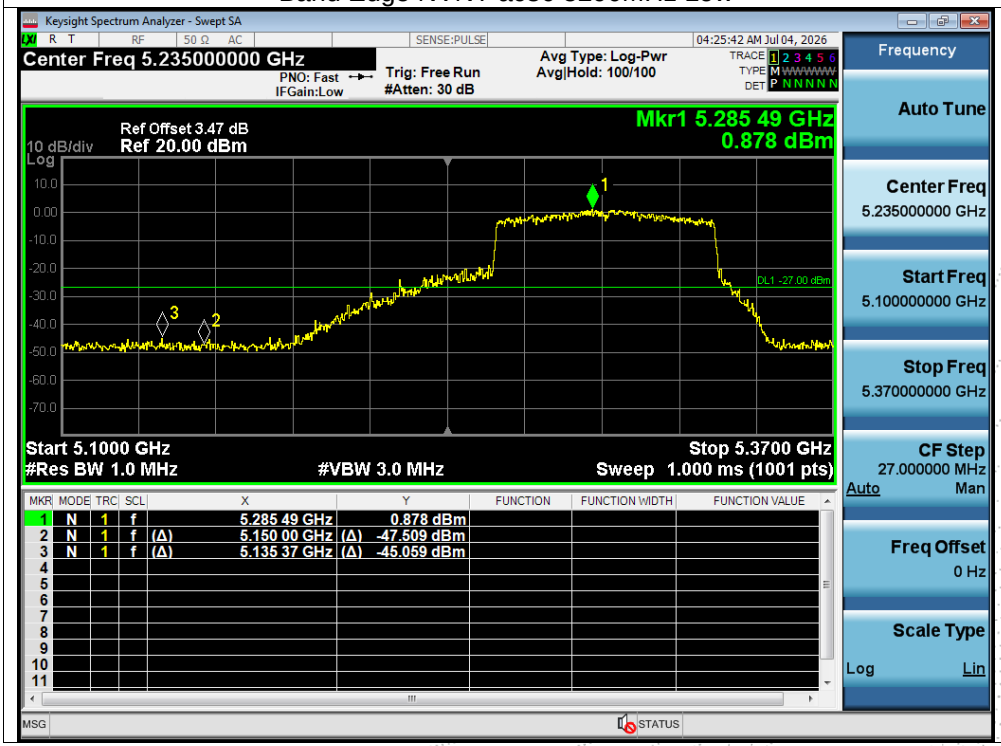



Band Edge NVNT ac40 5310MHz High

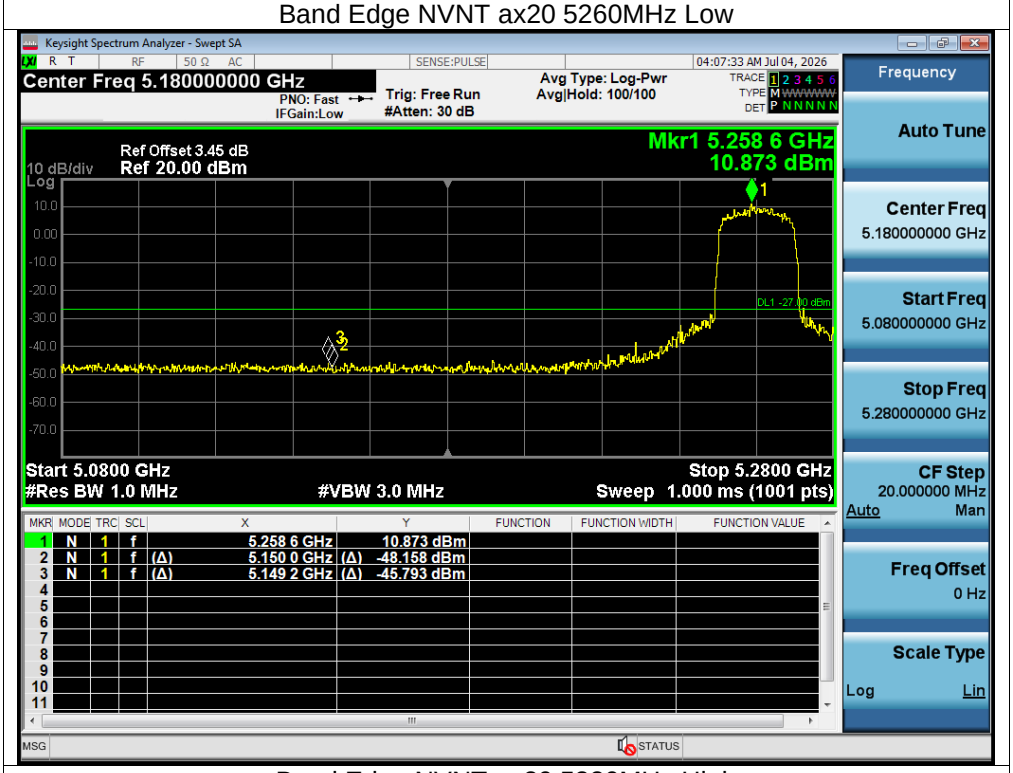


Band Edge NVNT ac80 5290MHz High

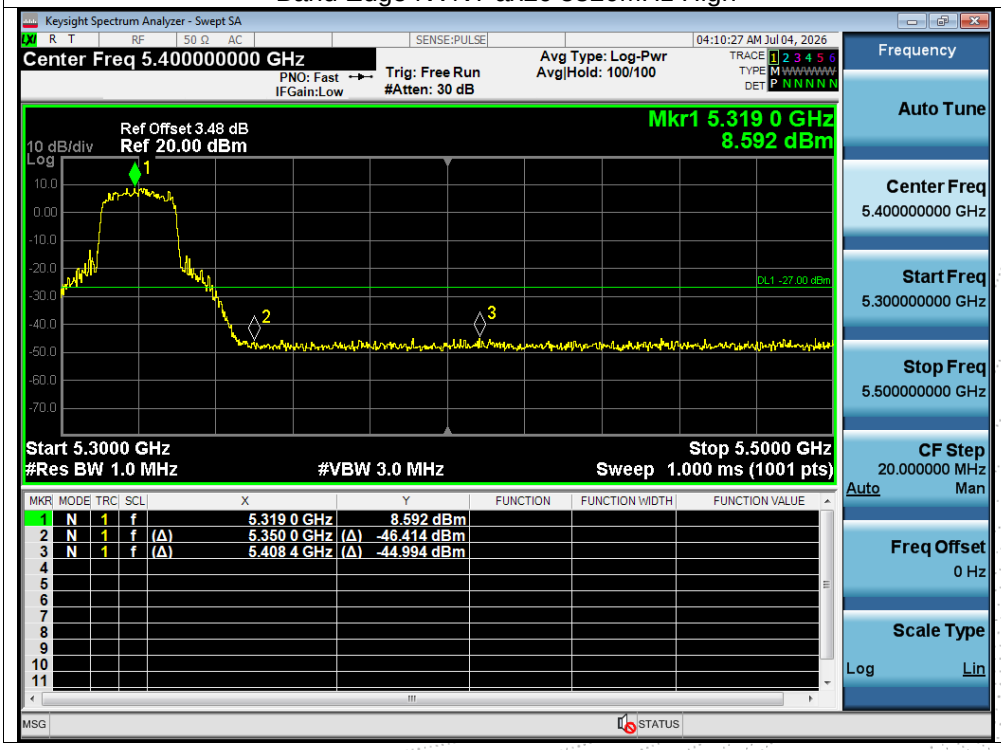

Band Edge NVNT ac80 5290MHz Low



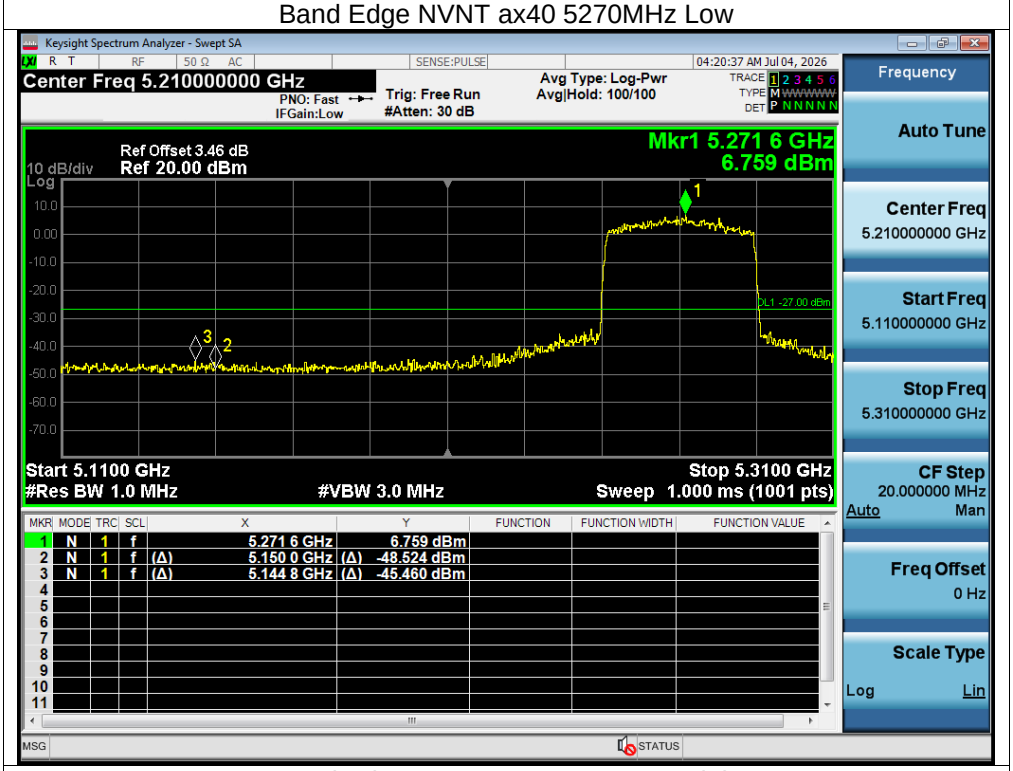
Band Edge NVNT ax20 5260MHz Low



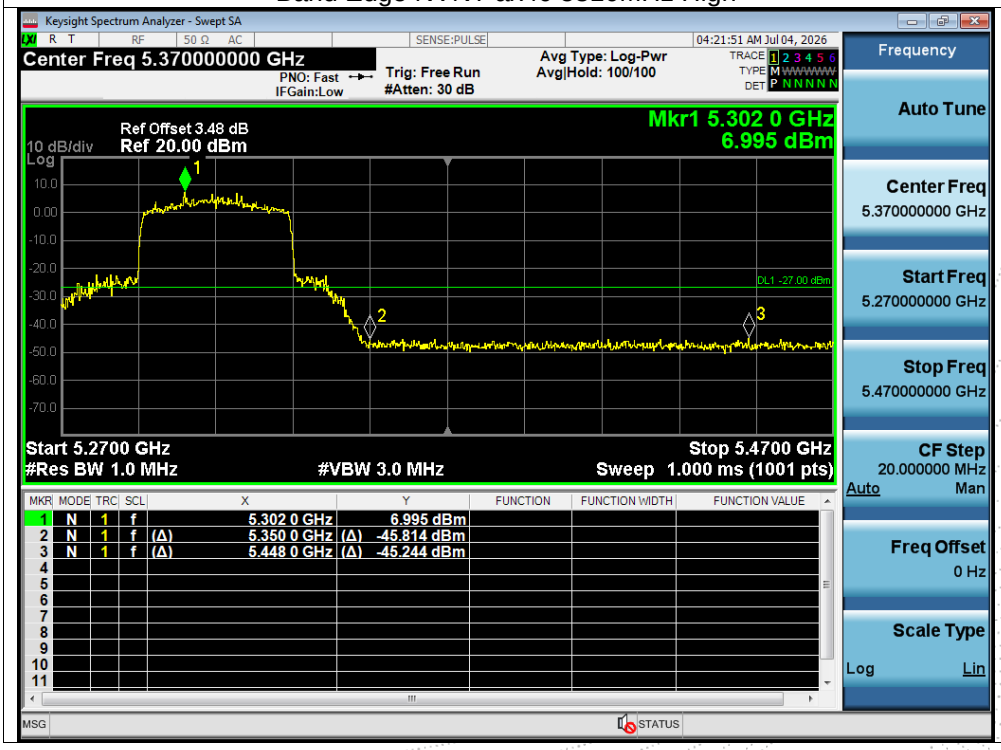

Band Edge NVNT ax20 5320MHz High



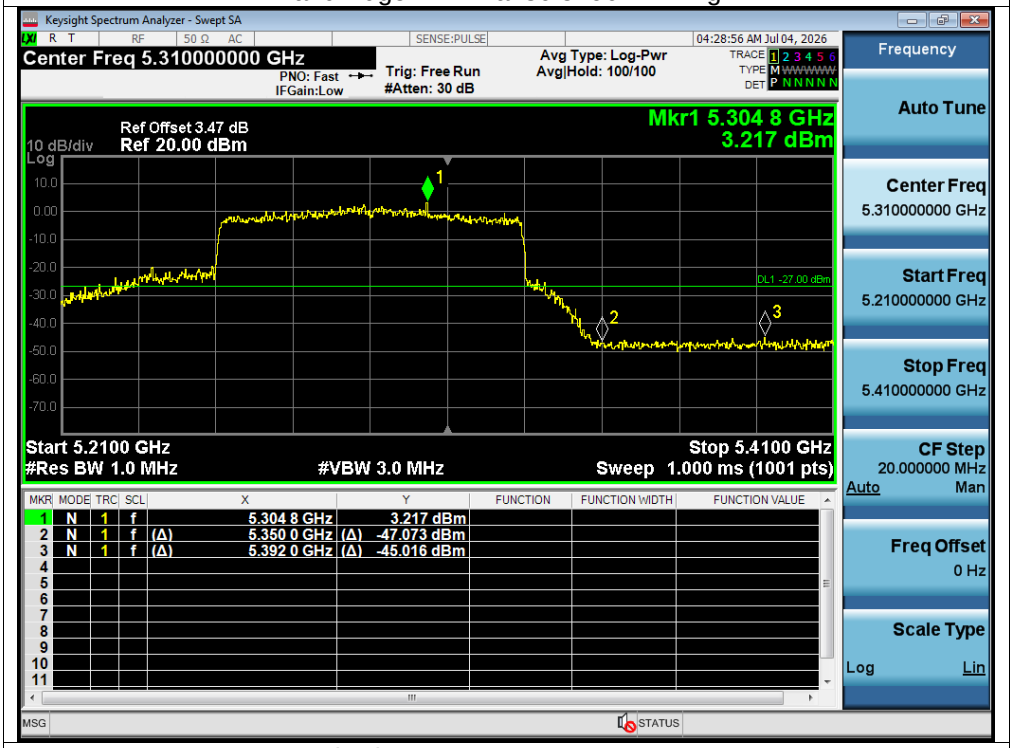
Band Edge NVNT ax40 5270MHz Low



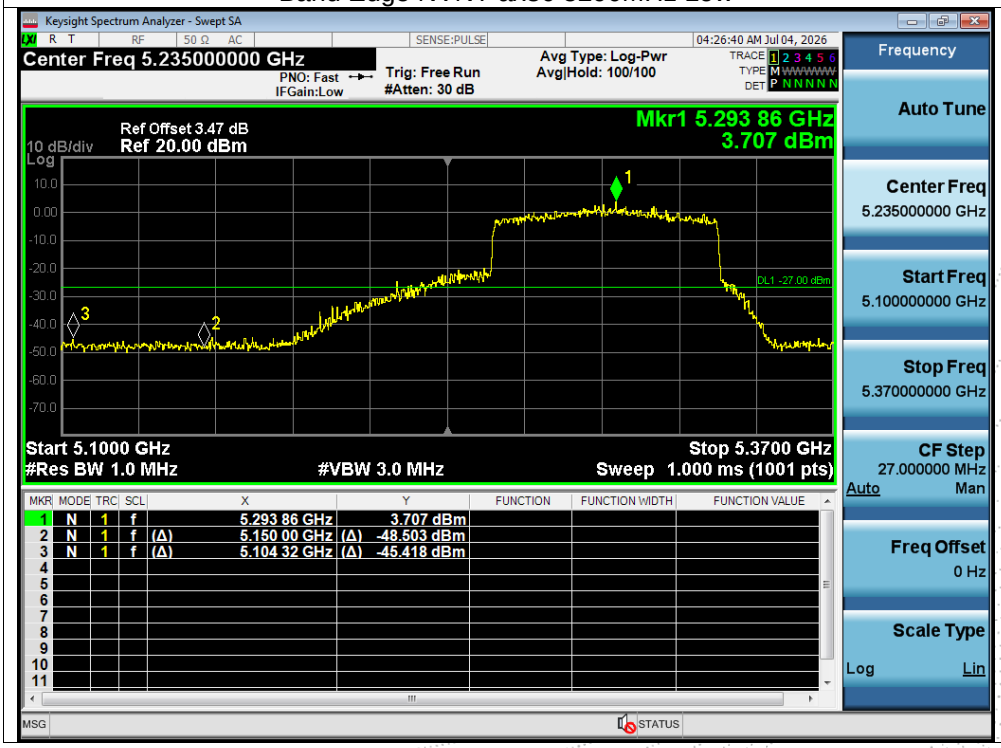

Band Edge NVNT ax40 5310MHz High



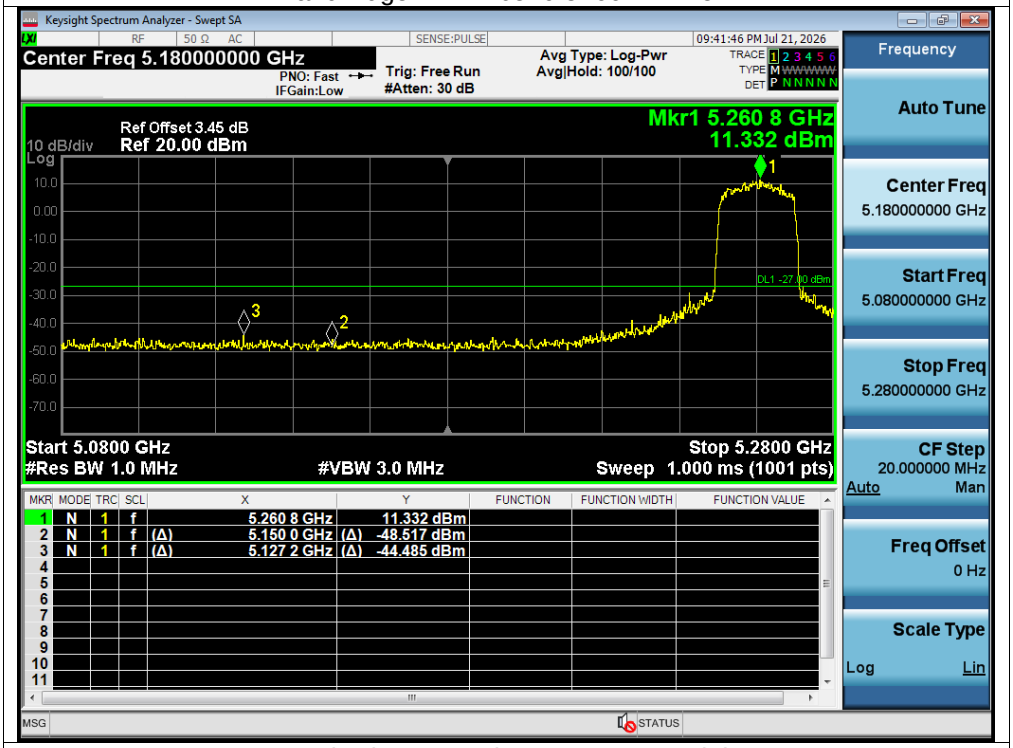
Band Edge NVNT ax80 5290MHz High



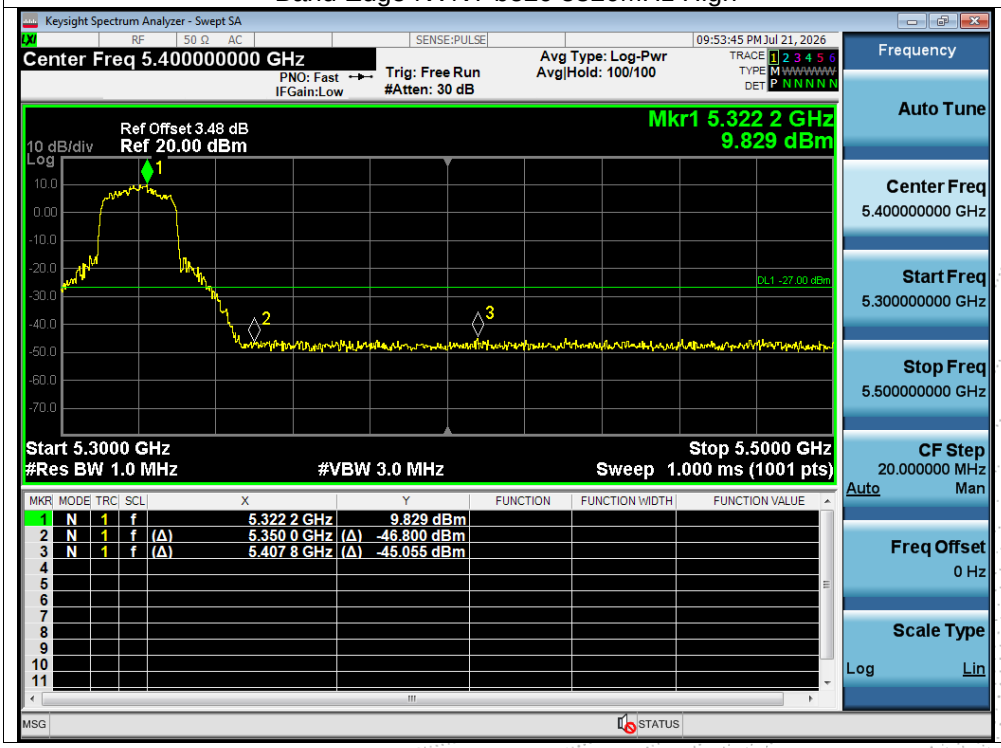

Band Edge NVNT ax80 5290MHz Low



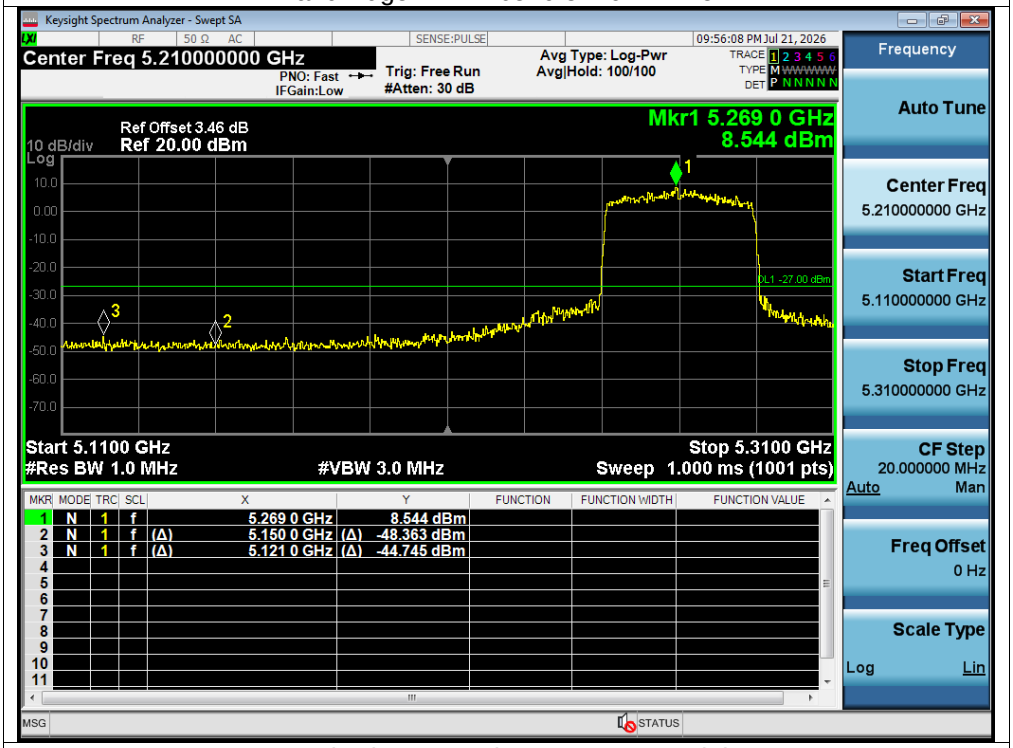
Band Edge NVNT be20 5260MHz Low



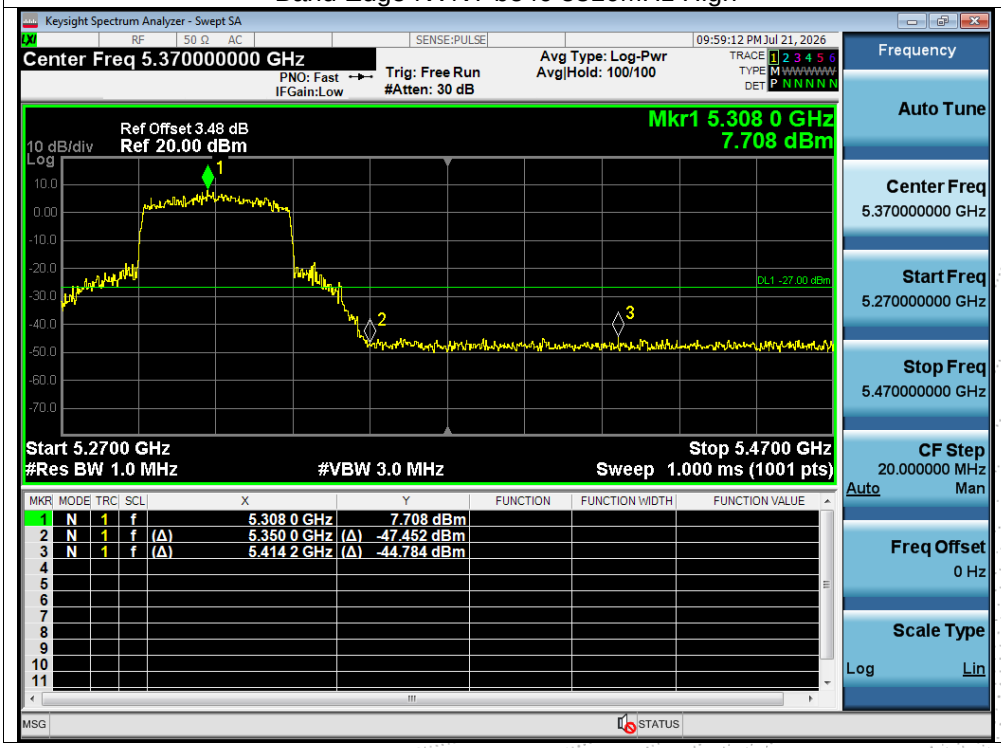

Band Edge NVNT be20 5320MHz High



Band Edge NVNT be40 5270MHz Low

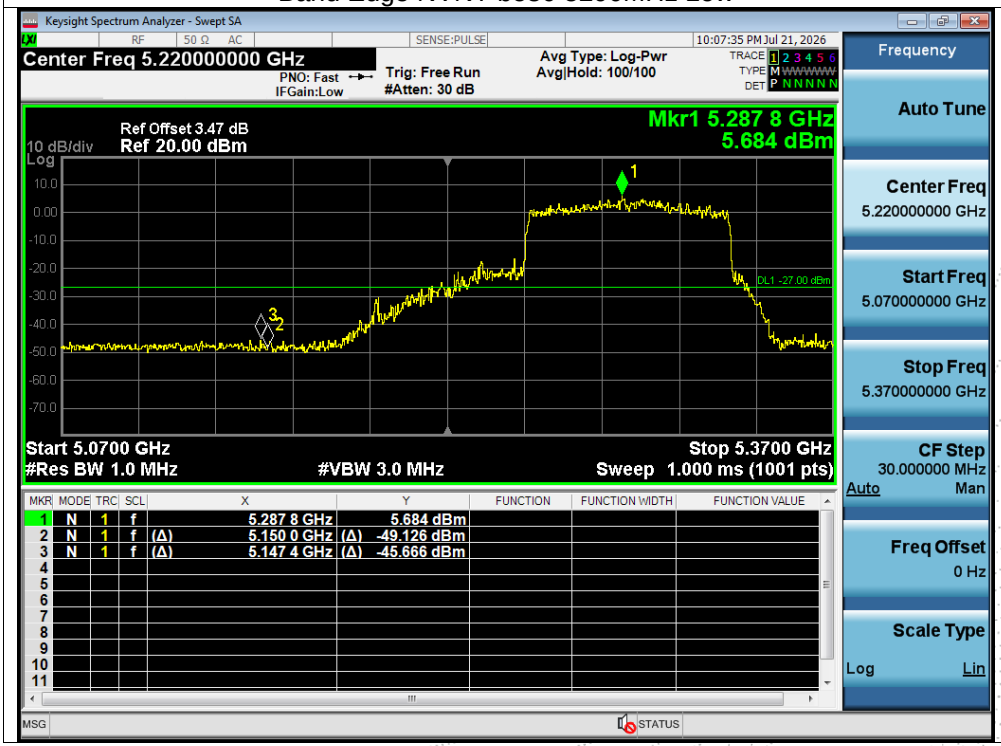



Band Edge NVNT be40 5310MHz High



Band Edge NVNT be80 5290MHz High


Band Edge NVNT be80 5290MHz Low

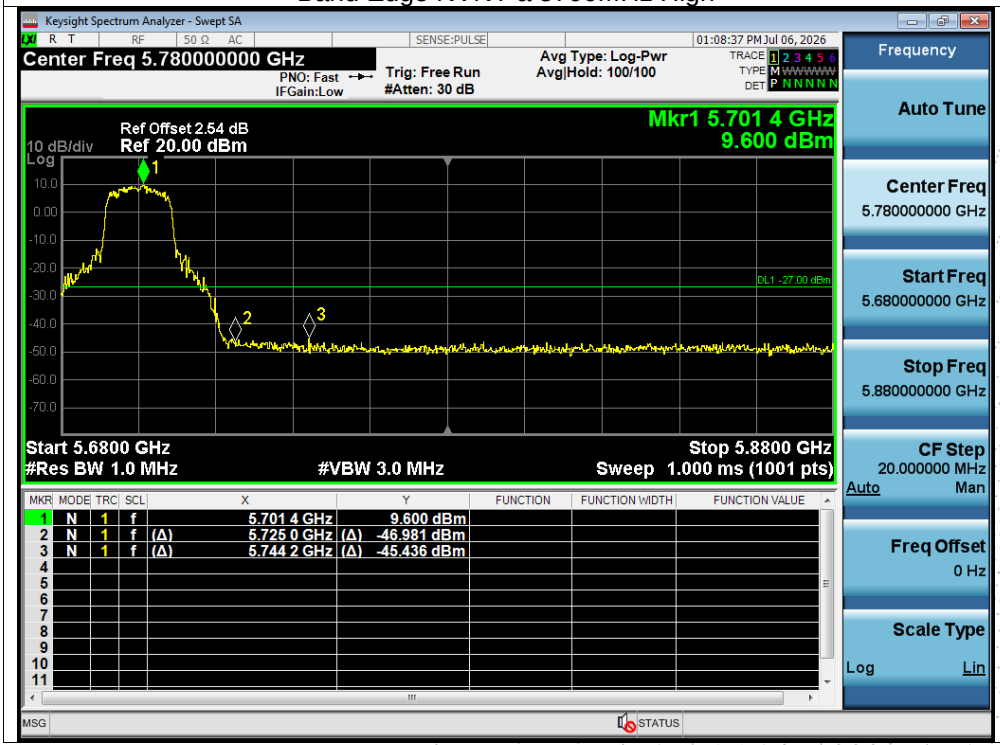


Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A. Plot.

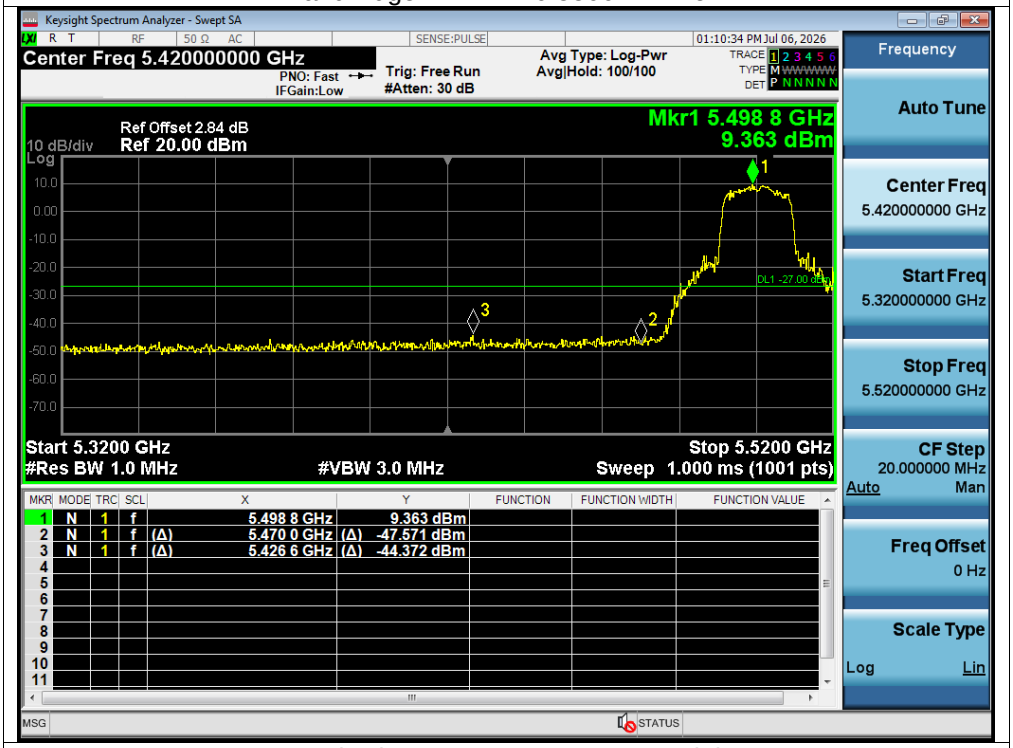
Test Graphs

Band Edge NVNT a 5500MHz Low

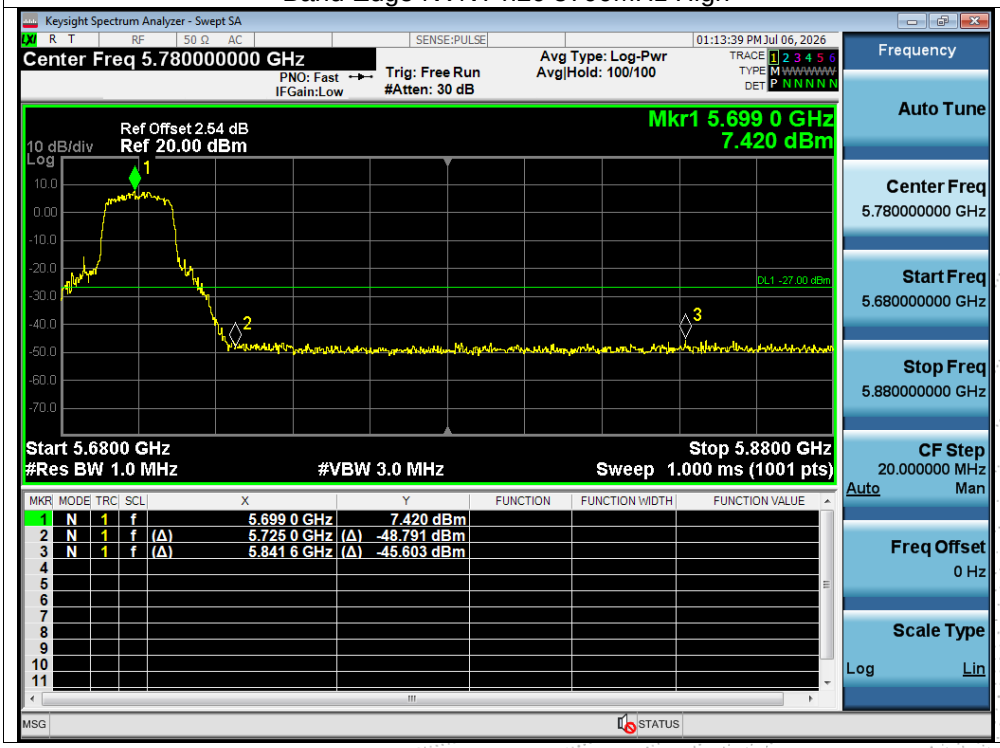

Band Edge NVNT a 5700MHz High



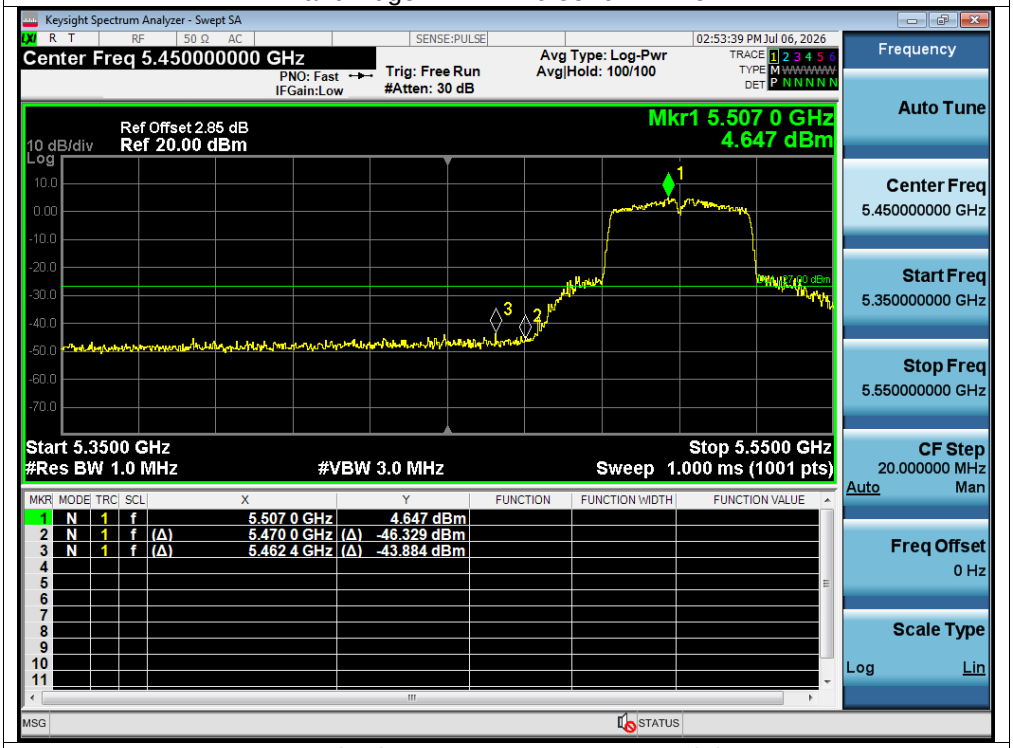
Band Edge NVNT n20 5500MHz Low



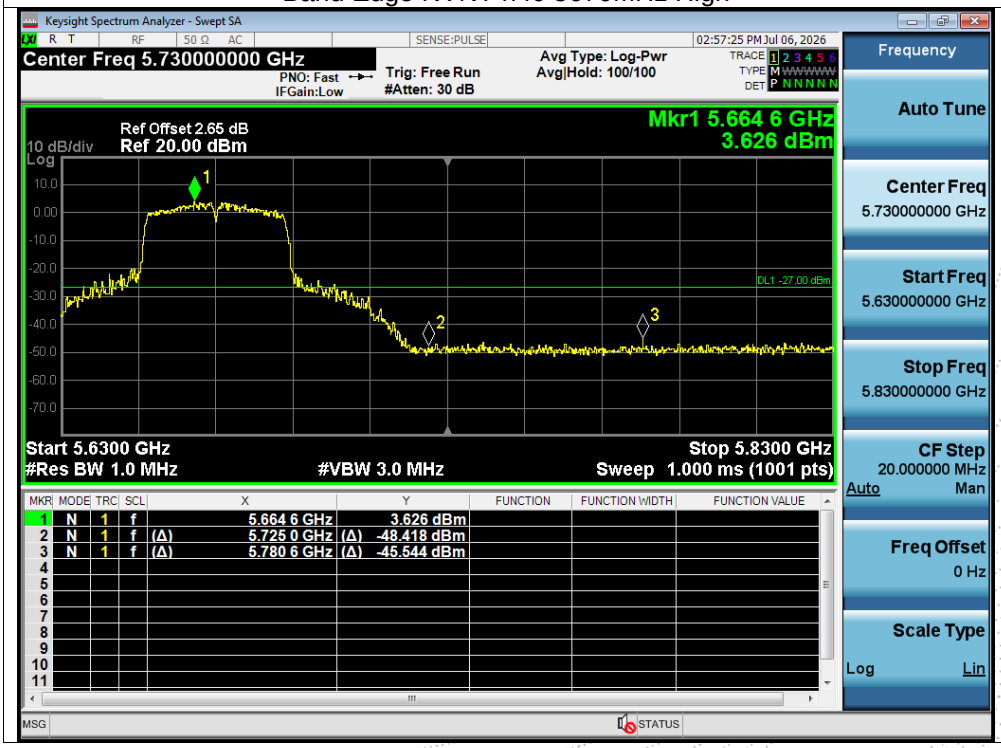

Band Edge NVNT n20 5700MHz High



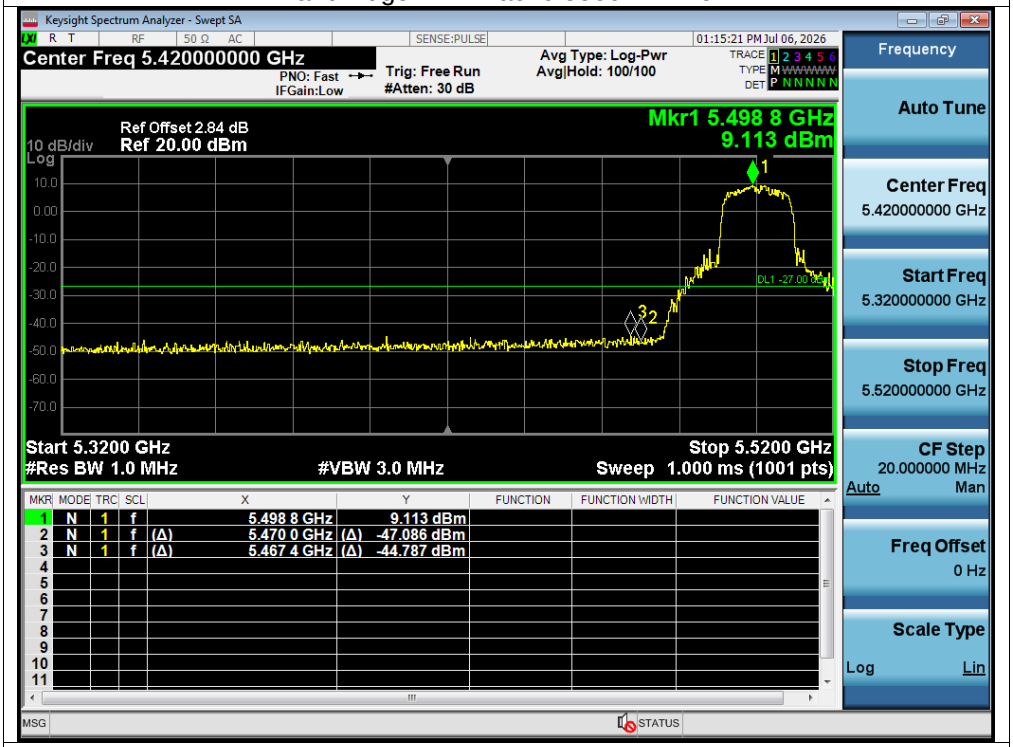
Band Edge NVNT n40 5510MHz Low



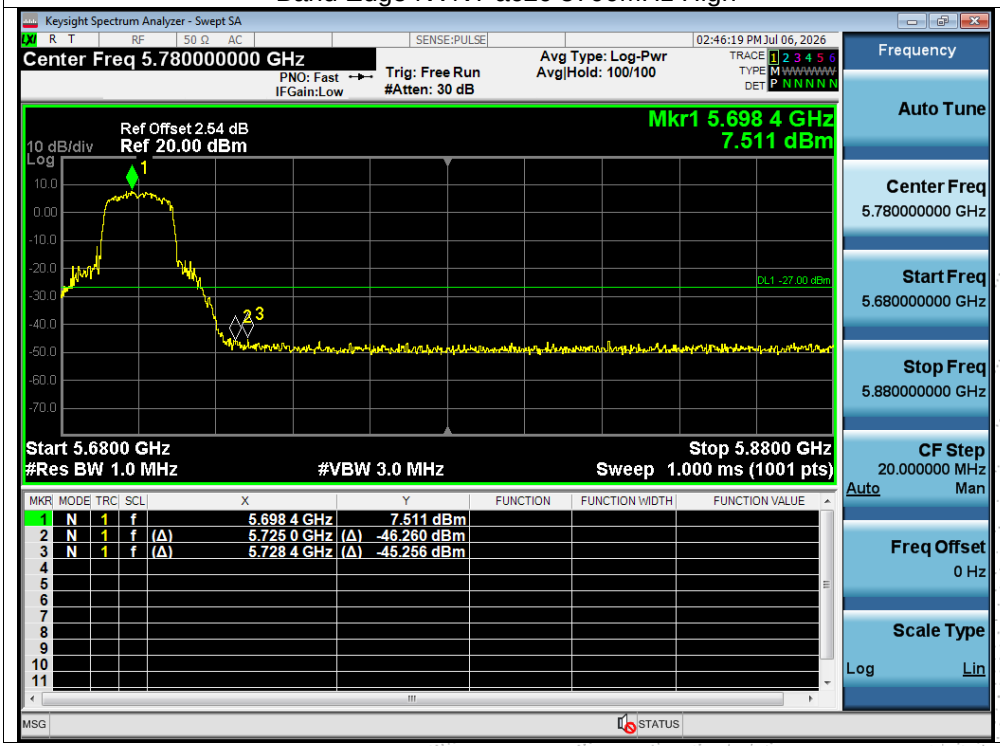

Band Edge NVNT n40 5670MHz High



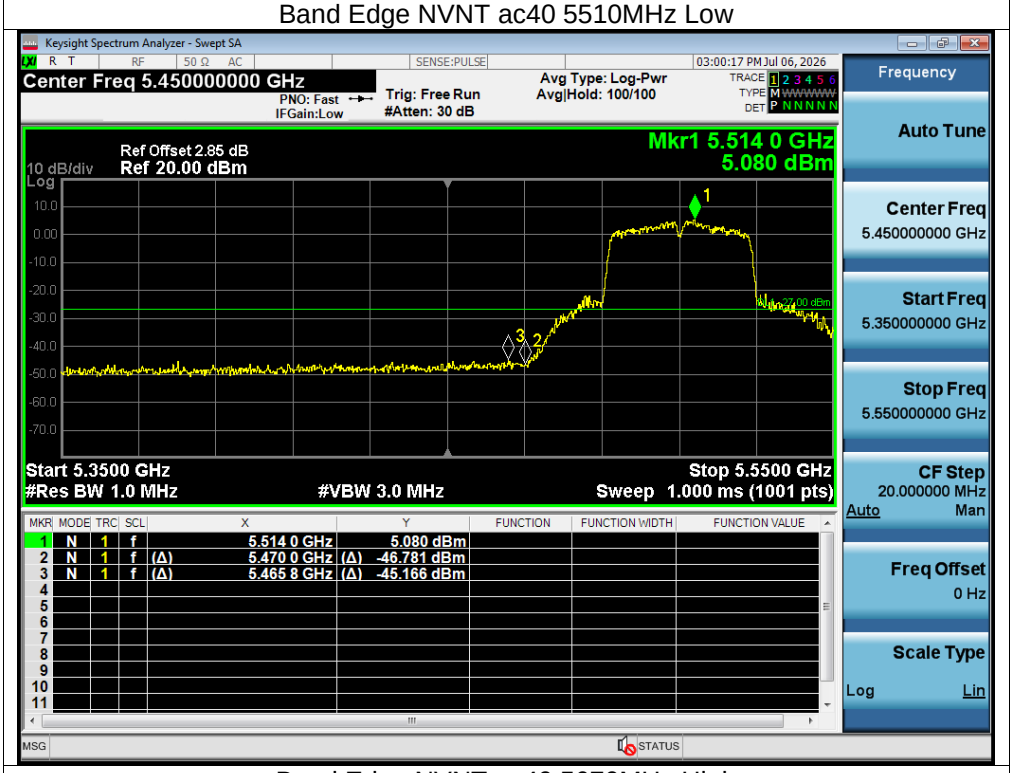
Band Edge NVNT ac20 5500MHz Low



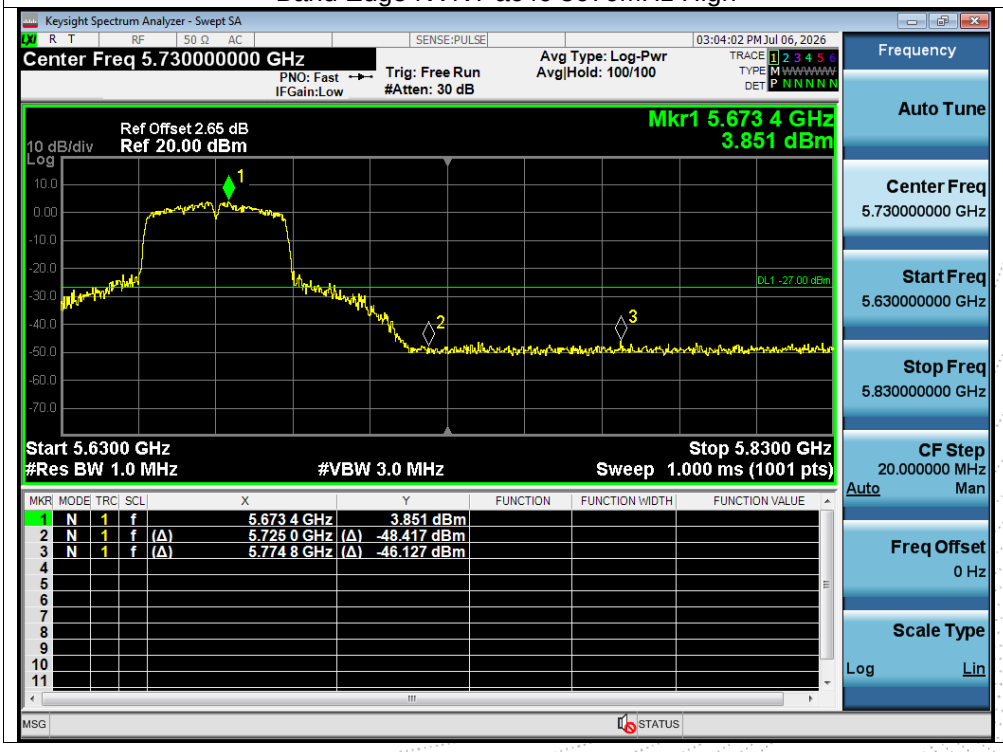

Band Edge NVNT ac20 5700MHz High



Band Edge NVNT ac40 5510MHz Low

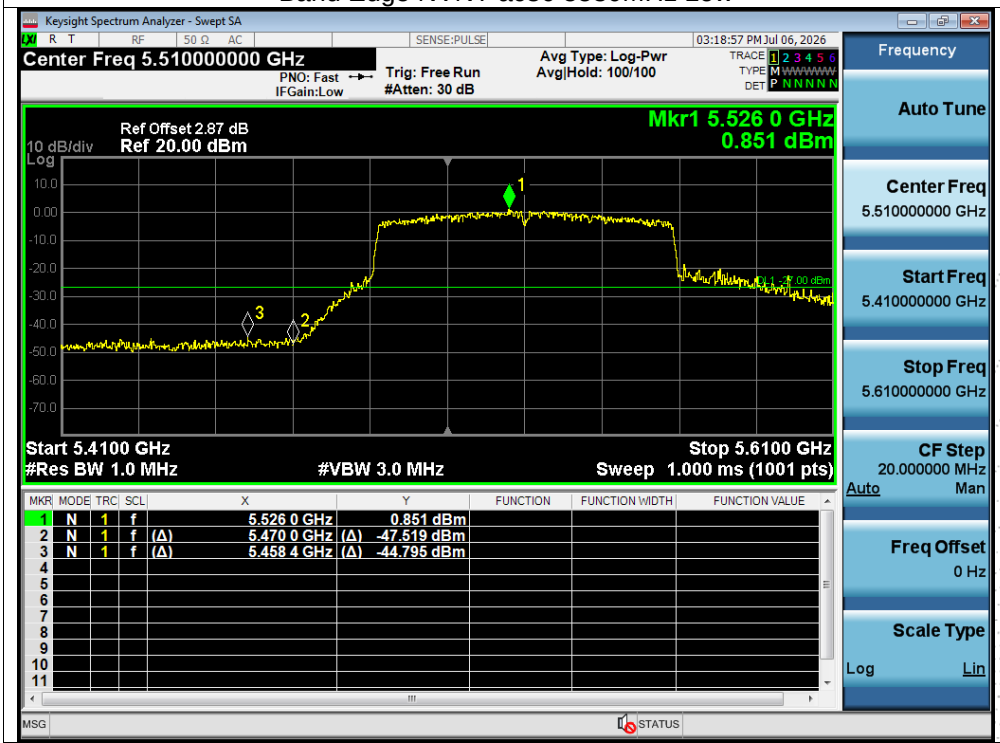



Band Edge NVNT ac40 5670MHz High

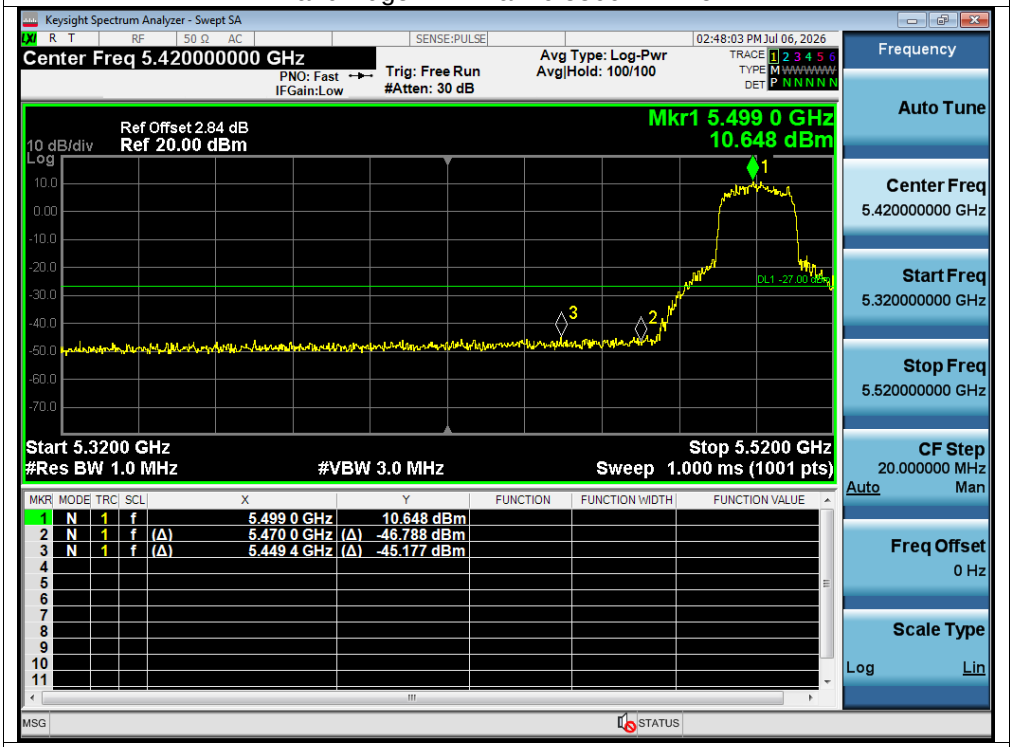


Band Edge NVNT ac80 5530MHz High

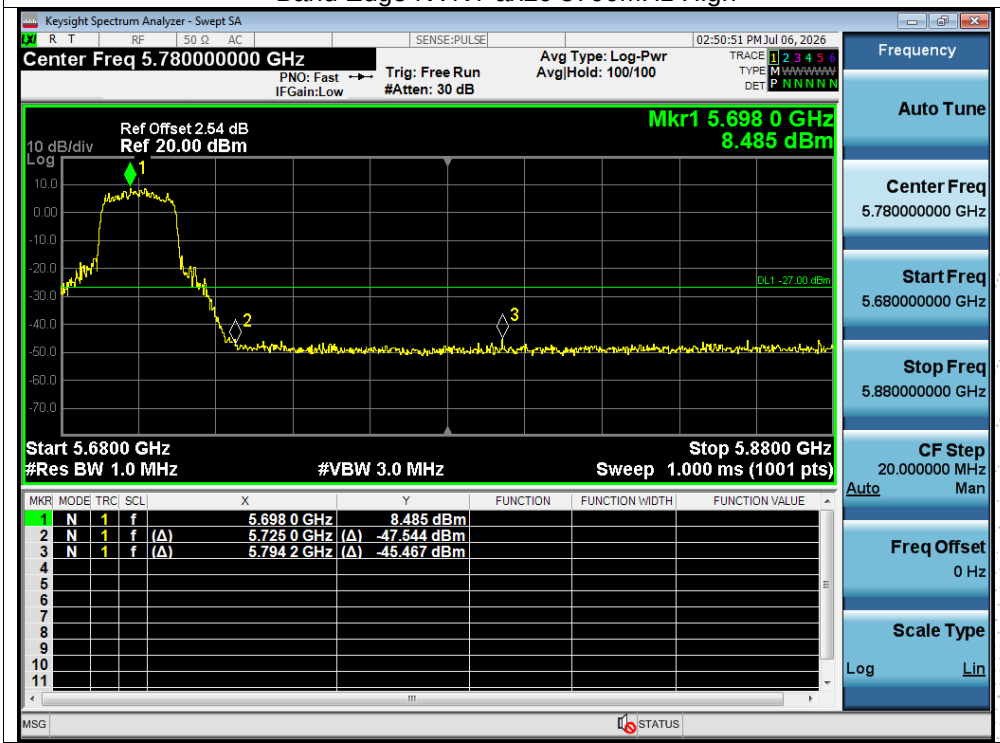

Band Edge NVNT ac80 5530MHz Low



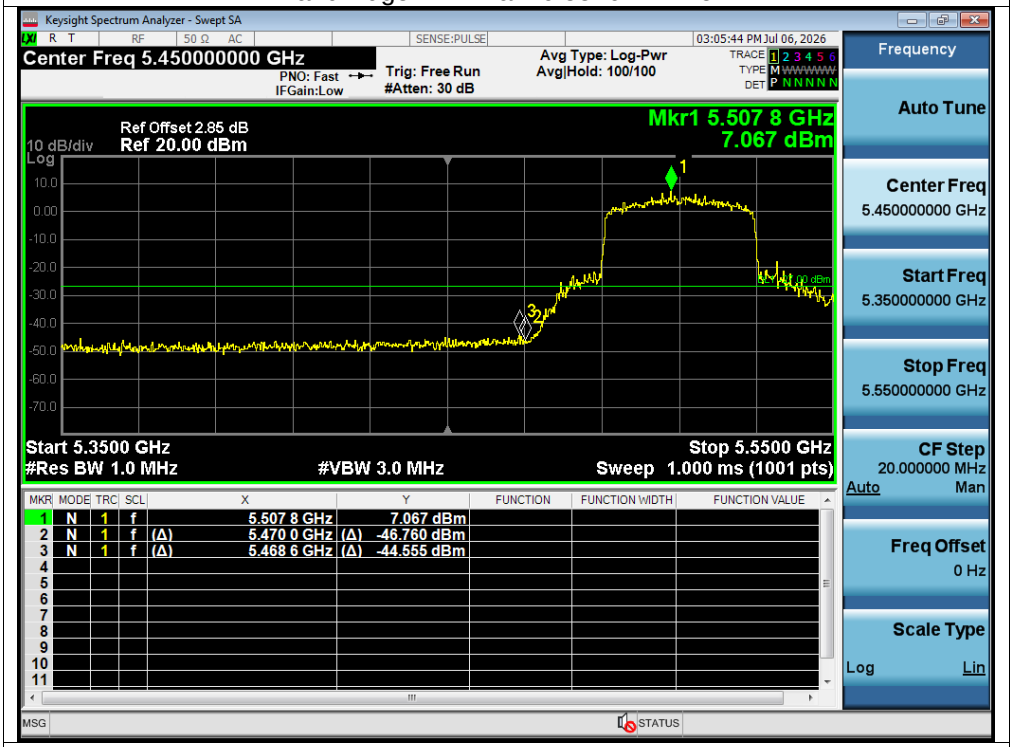
Band Edge NVNT ax20 5500MHz Low



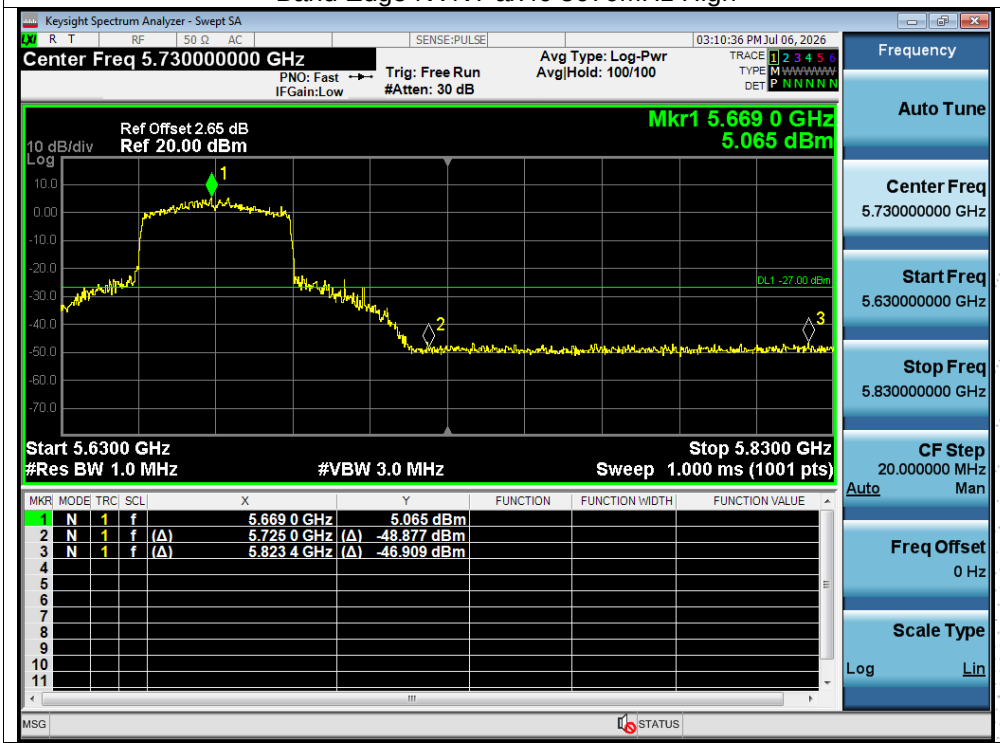

Band Edge NVNT ax20 5700MHz High



Band Edge NVNT ax40 5510MHz Low



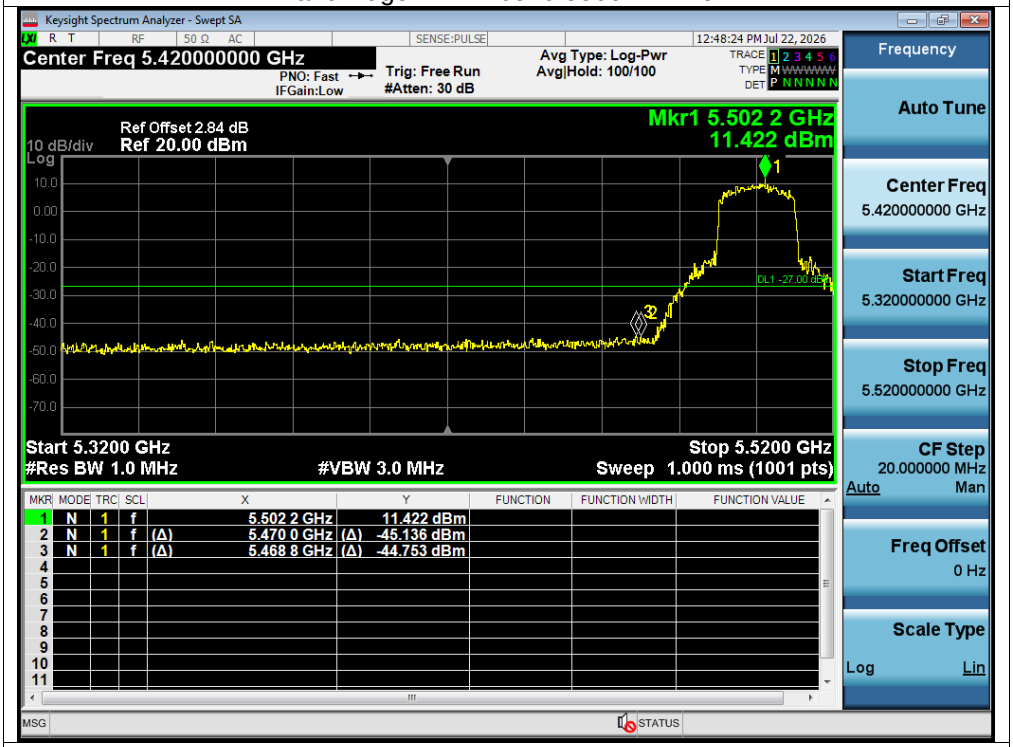

Band Edge NVNT ax40 5670MHz High



Band Edge NVNT ax80 5530MHz High


Band Edge NVNT ax80 5530MHz Low

Band Edge NVNT be20 5500MHz Low



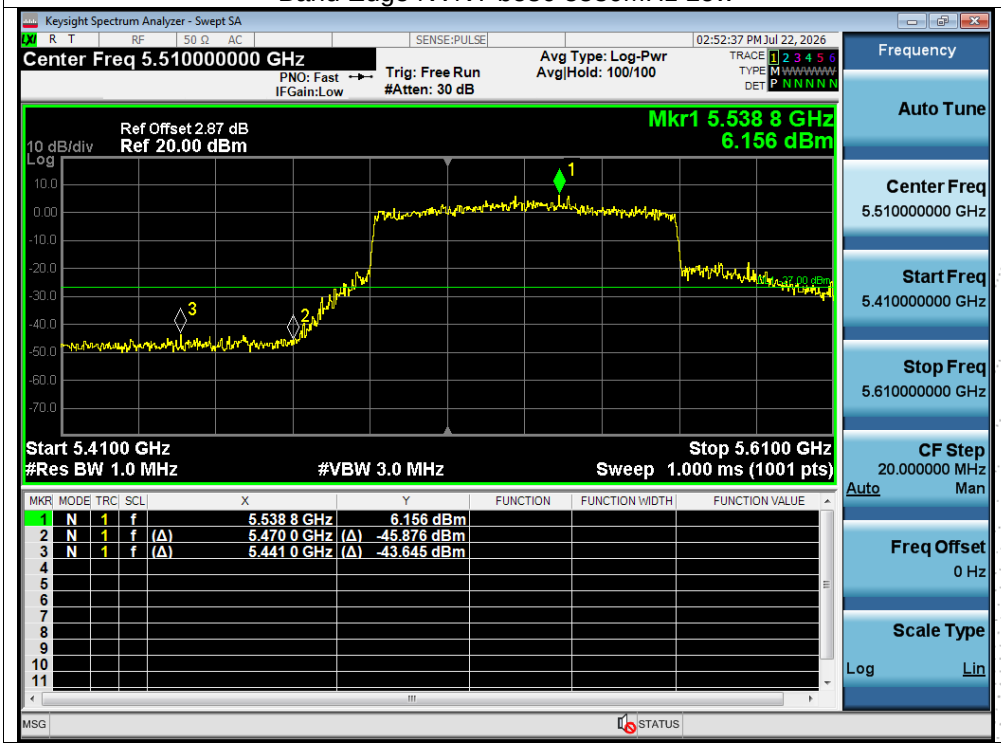

Band Edge NVNT be20 5700MHz High

Band Edge NVNT be40 5510MHz Low


Band Edge NVNT be40 5670MHz High

Band Edge NVNT be80 5530MHz High

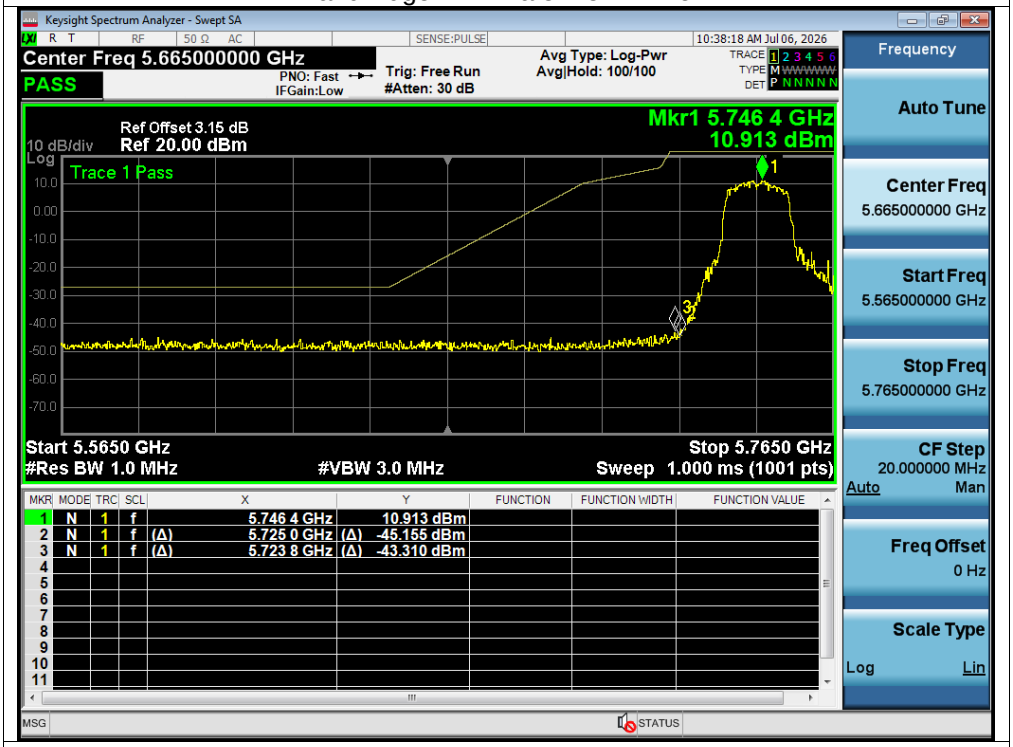

Band Edge NVNT be80 5530MHz Low



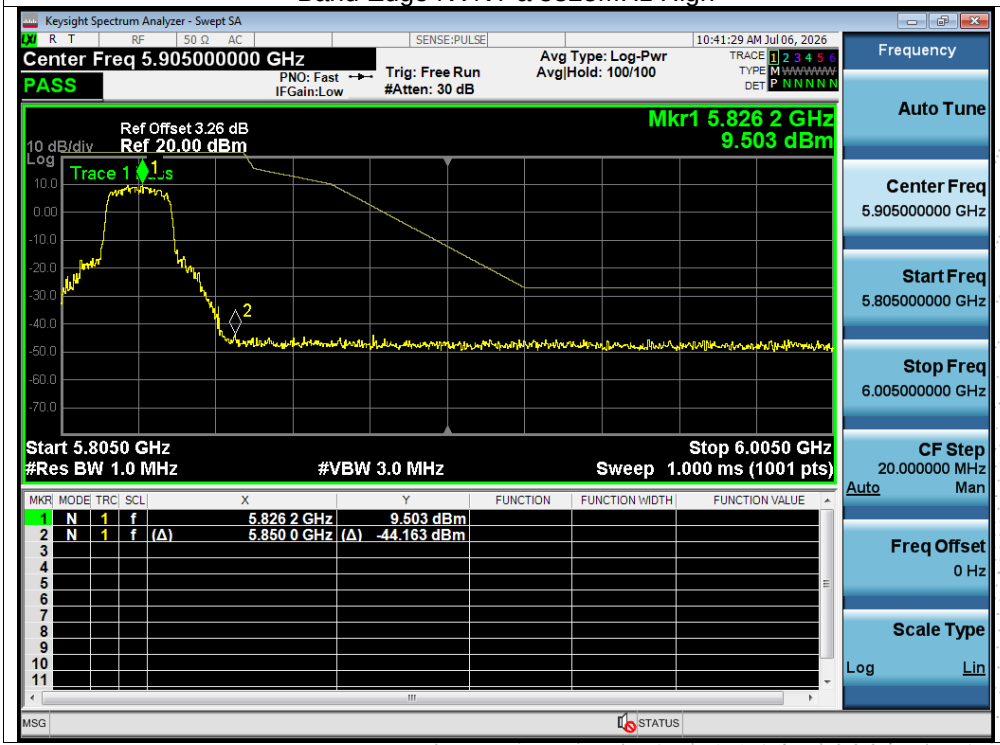
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A. Plot.

Test Graphs

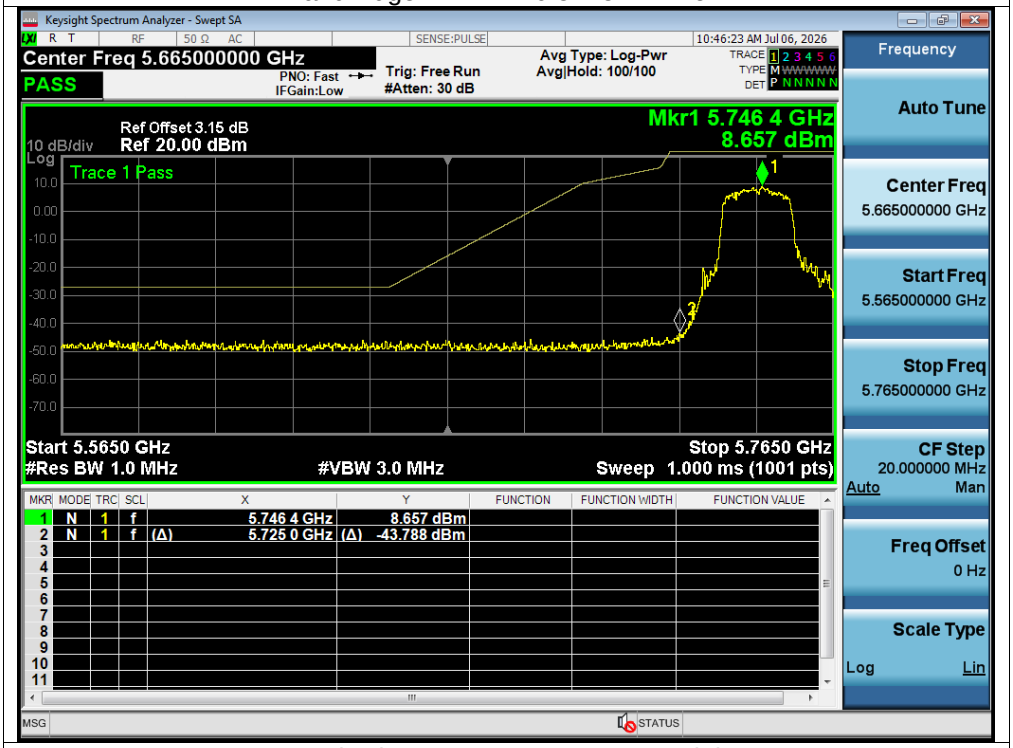
Band Edge NVNT a 5745MHz Low



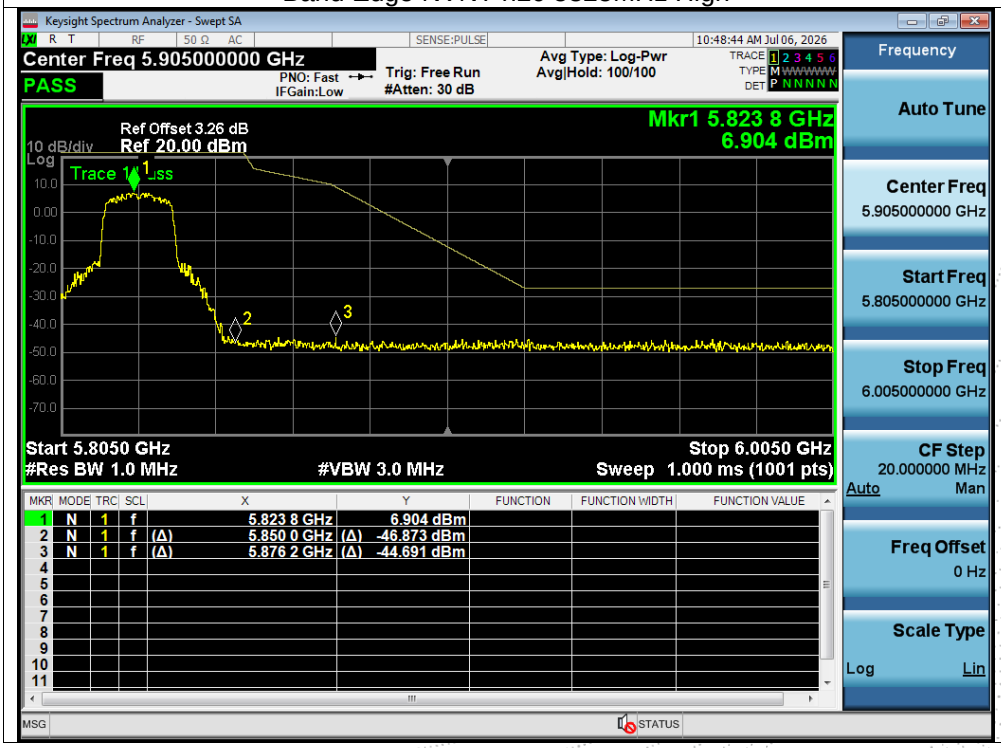

Band Edge NVNT a 5825MHz High



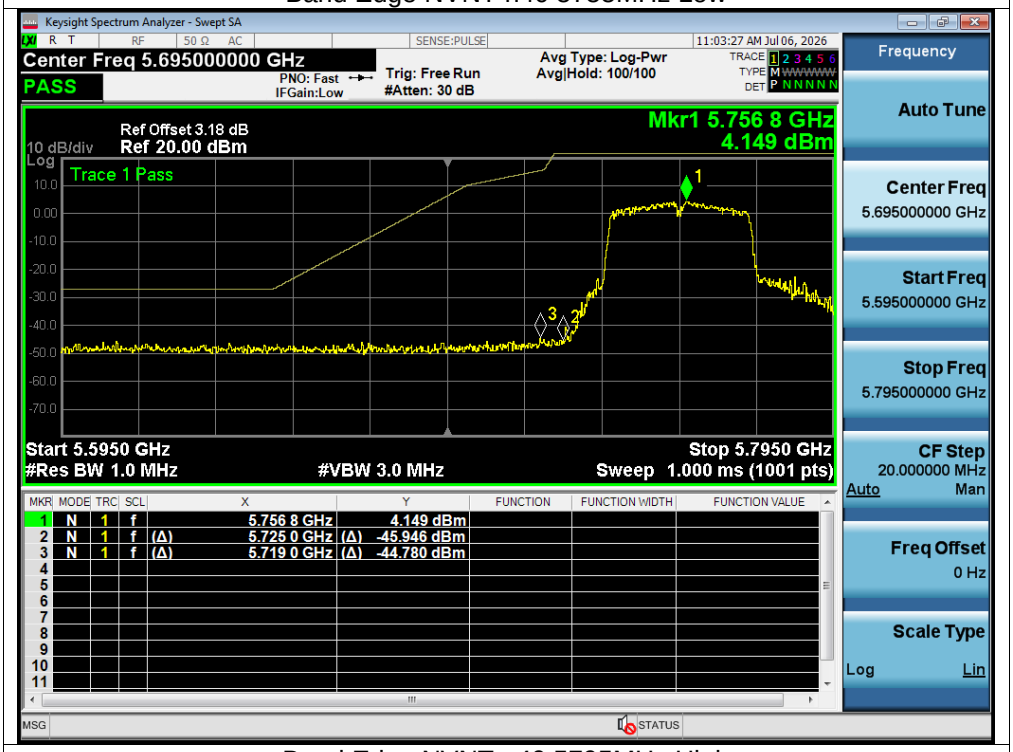
Band Edge NVNT n20 5745MHz Low




Band Edge NVNT n20 5825MHz High



Band Edge NVNT n40 5755MHz Low




Band Edge NVNT n40 5795MHz High