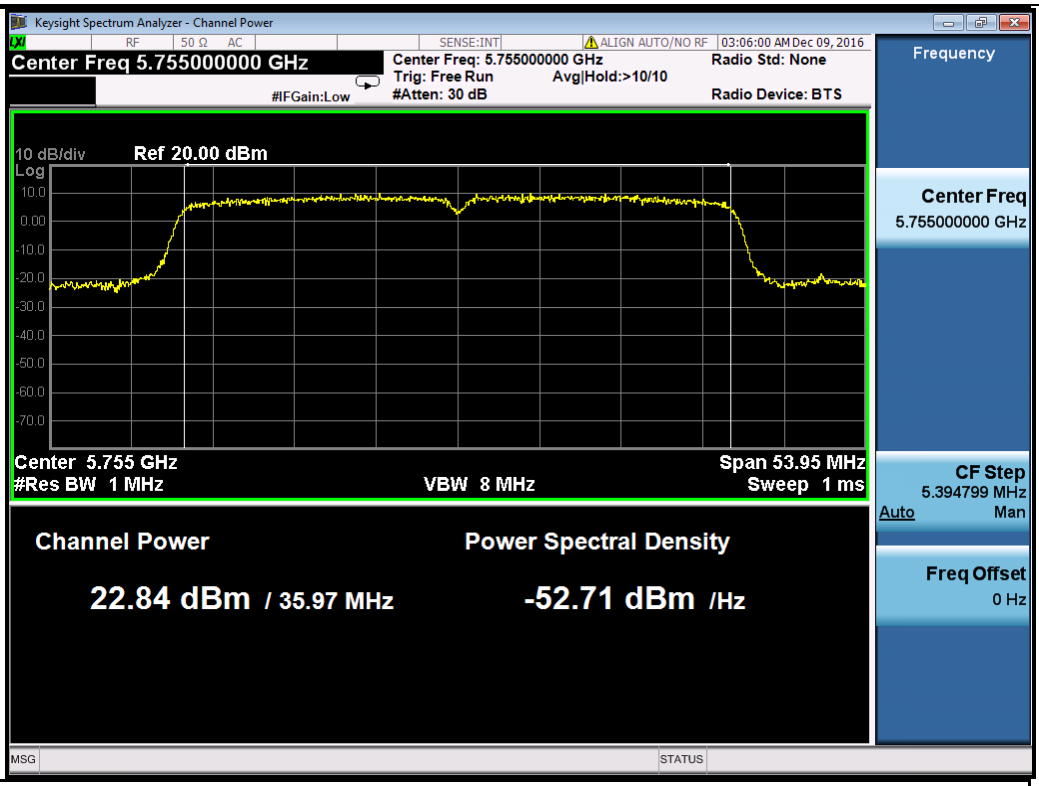
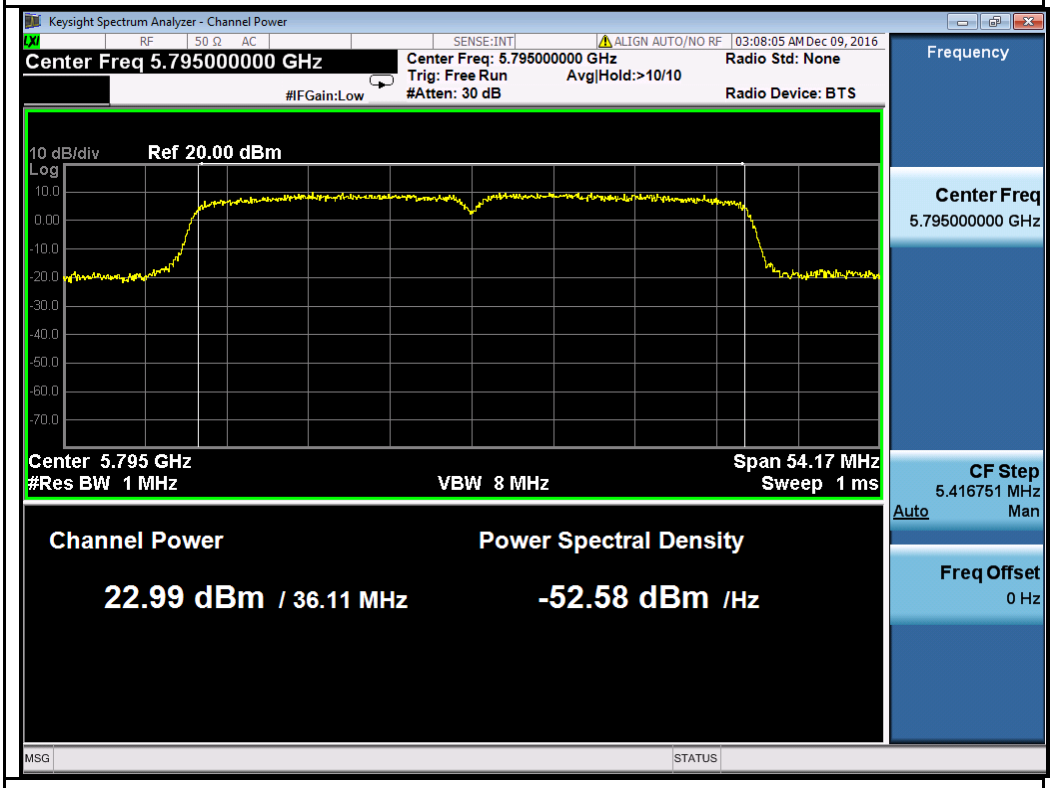
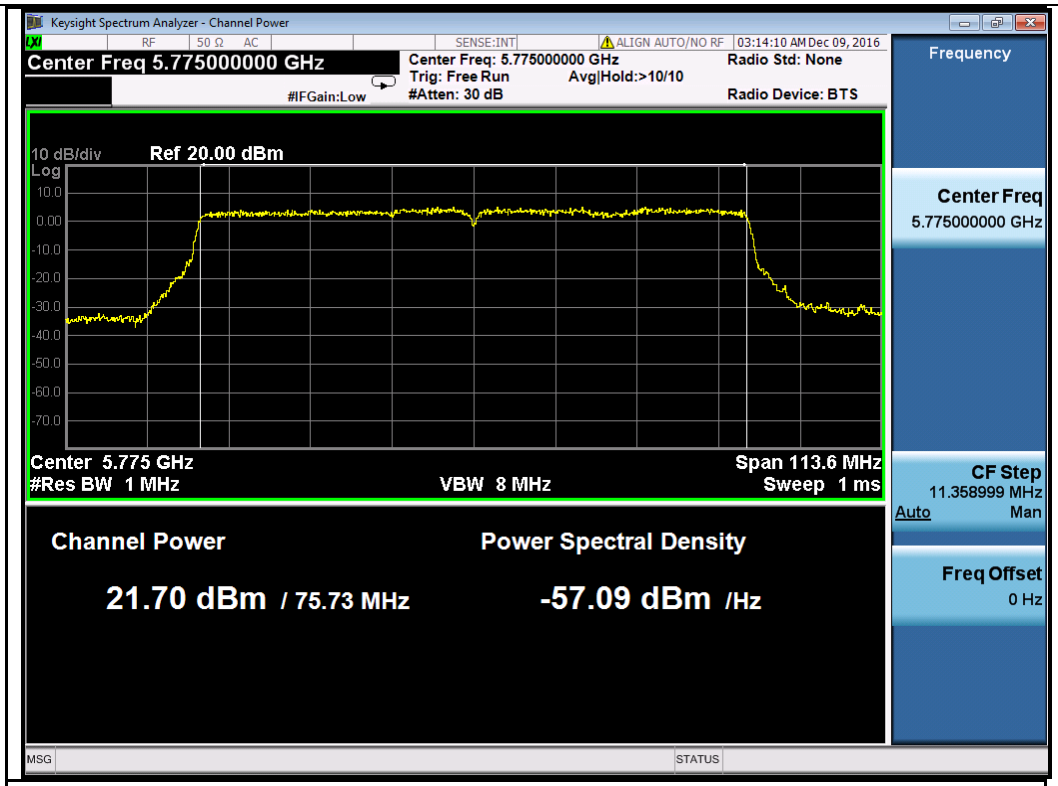



802.11n-HT40 5755M



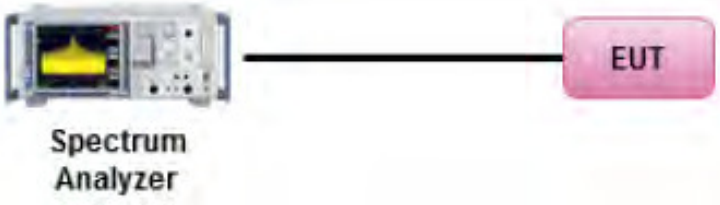

802.11n-HT40 5795M




802.11ac-VHT80 5775M

## 10.4 Peak Spectral Density

**Requirement(s):**

| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| § 15.407 | a)(1)(i) | For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. | ☒ |
| | a)(3) | For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. | ☒ |
| Test Setup |  | | |
| Test Procedure | 789033 D02 General UNII Test Procedures New Rules v01r02, II.F. Method SA-1<br><br>Maximum spectral density measurement procedure<br>- Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.<br>- Set RBW = 1 MHz<br>- Set VBW ≥ 3 MHz<br>- Detector = RMS.<br>- Sweep time = auto couple.<br>- Trace mode = max hold.<br>- Trace average at least 100 traces in power averaging<br>- Use the peak marker function to determine the maximum amplitude level within the RBW. Apply correction to the result if different RBW is used. | | |
| Test Date | 12/05/2016 – 12/20/2016 | Environmental condition | Temperature 22ºC<br>Relative Humidity 42%<br>Atmospheric Pressure 1020mbar |
| Remark | Per KDB 662911 D01 Multiple Transmitter Output v02r01, the direction gain for horizontal polarization and vertical polarization is calculated separately. For 5GHz band, peak antenna gain = 3.5 dBi, directional gain = 3 dB, total gain = 6.5 dBi. Highest of totoal gain is 6.5 dBi. The power limit and PSD limit will be reduced by amount of 0.5 dB. | | |
| Result | ☒ Pass ☐ Fail | | |

**Test Data** ☒ Yes ☐ N/A

**Test Plot** ☒ Yes (See below) ☐ N/A

**Test was done by Shuo Zhang at RF test site.**

**PSD measurement result for 5.2GHz**

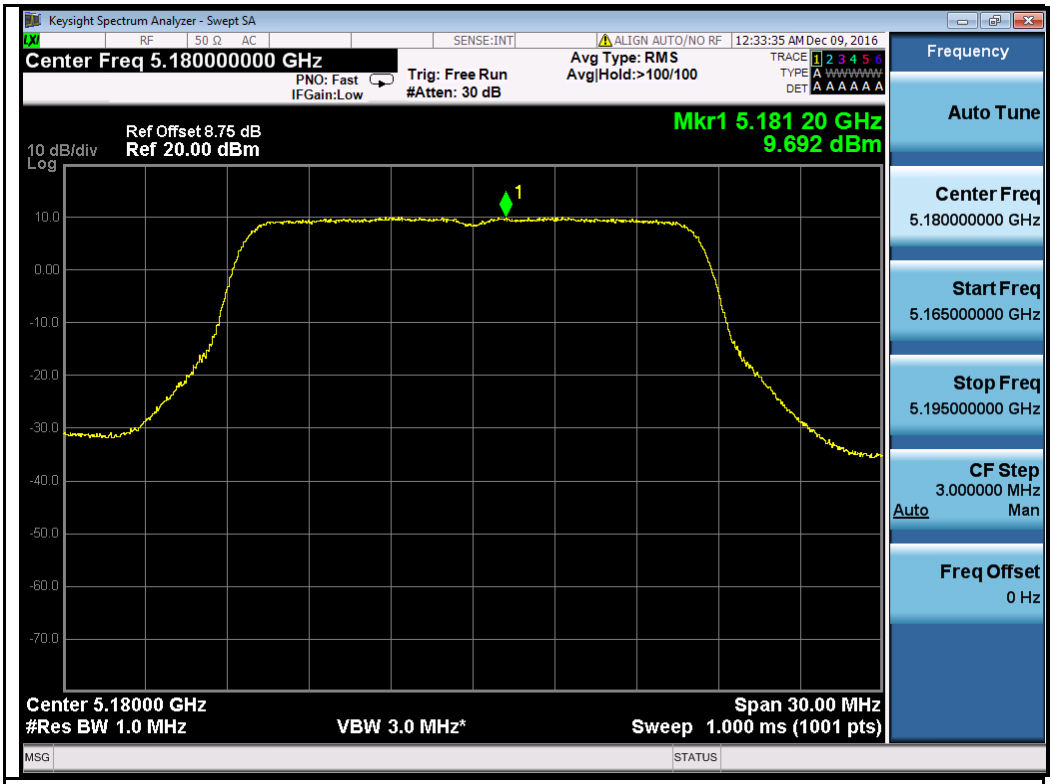
| Type | Test mode | Freq (MHz) | CH | Conducted PSD (dBm/MHz) | | | | | Limit (dBm/MHz) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Chain1 | Chain2 | Chain3 | Chain4 | Combined | | |
| PSD | 802.11a | 5180 | Low | 9.69 | 10.25 | 9.61 | 9.94 | 15.90 | 16.5 | Pass |
| | | 5200 | Mid | 9.64 | 10.06 | 9.75 | 9.58 | 15.78 | 16.5 | Pass |
| | | 5240 | High | 10 | 10.41 | 9.64 | 9.74 | 15.98 | 16.5 | Pass |
| | 802.11n-20 | 5180 | Low | 9.28 | 9.78 | 9.17 | 9.53 | 15.47 | 16.5 | Pass |
| | | 5200 | Mid | 9.18 | 9.75 | 9.29 | 9.5 | 15.46 | 16.5 | Pass |
| | | 5240 | High | 9.46 | 9.5 | 9.38 | 9.47 | 15.47 | 16.5 | Pass |
| | 802.11n-40 | 5190 | Low | 6.65 | 6.68 | 6.69 | 6.78 | 12.72 | 16.5 | Pass |
| | | 5230 | High | 8.42 | 8.89 | 9.19 | 8.7 | 14.83 | 16.5 | Pass |
| | 802.11ac-80 | 5210 | Mid | 3.22 | 3.31 | 3.25 | 3.13 | 9.25 | 16.5 | Pass |

**PSD measurement result for 5.8GHz**

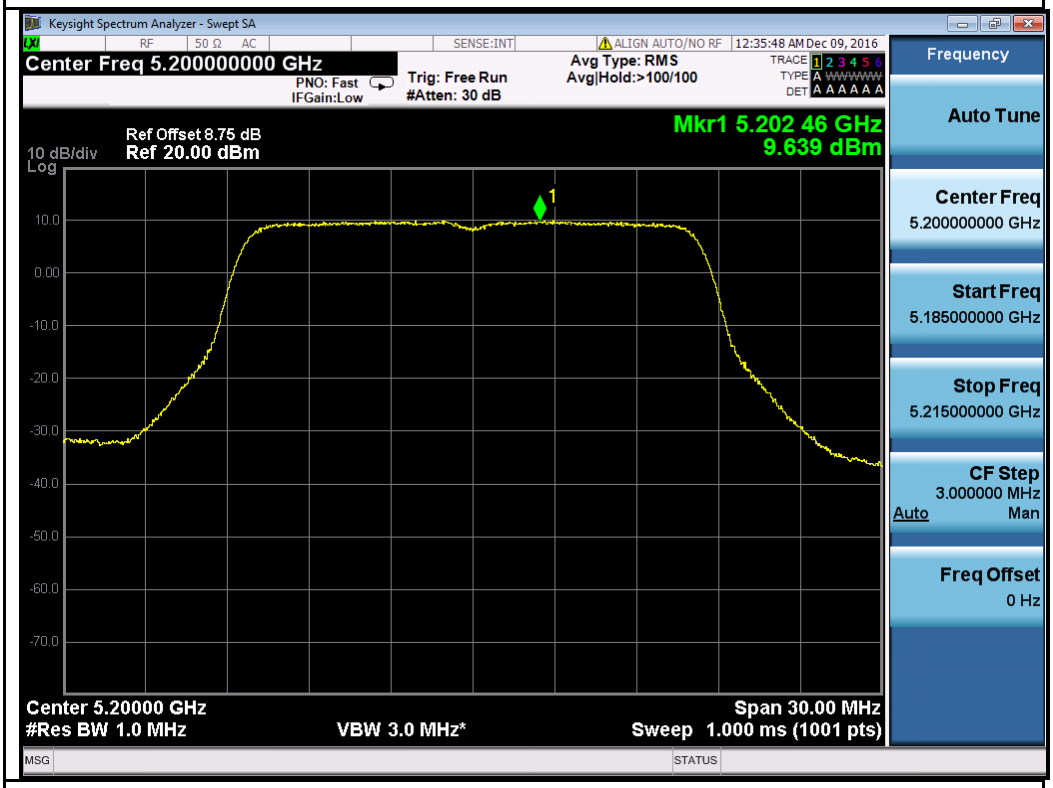
| Test mode | Freq (MHz) | CH | Conducted PSD (dBm/100kHz) | | | | | Correction factor (dB) | PSD (dBm/500 kHz) | Limit (dBm/500kHz) | Result |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Chain1 | Chain2 | Chain3 | Chain4 | Combined | | | | |
| 802.11a | 5745 | Low | 2.31 | 2.84 | 2.71 | 2.45 | 8.60 | 6.99 | 15.59 | 29.5 | Pass |
| | 5785 | Mid | 2.32 | 2.93 | 2.58 | 2.34 | 8.57 | 6.99 | 15.56 | 29.5 | Pass |
| | 5825 | High | 2.73 | 3.08 | 2.94 | 2.76 | 8.90 | 6.99 | 15.89 | 29.5 | Pass |
| 802.11n-20 | 5745 | Low | 1.77 | 2.29 | 2.89 | 2.90 | 8.51 | 6.99 | 15.50 | 29.5 | Pass |
| | 5785 | Mid | 2.02 | 2.90 | 2.33 | 2.63 | 8.50 | 6.99 | 15.49 | 29.5 | Pass |
| | 5825 | High | 2.04 | 2.72 | 2.77 | 2.61 | 8.57 | 6.99 | 15.56 | 29.5 | Pass |
| 802.11n-40 | 5755 | Low | -0.41 | -0.30 | -0.03 | -0.53 | 5.71 | 6.99 | 12.70 | 29.5 | Pass |
| | 5795 | High | -0.65 | -0.03 | 0.2 | -0.38 | 5.82 | 6.99 | 12.81 | 29.5 | Pass |
| 802.11ac-80 | 5775 | Mid | -4.67 | -4.81 | -3.91 | -5.30 | 1.38 | 6.99 | 8.37 | 29.5 | Pass |
| Note | BW correction factor = 10log(500kHz/RBW), RBW was set to 100kHz during test. | | | | | | | | | | |

**Test Plot for W52:**

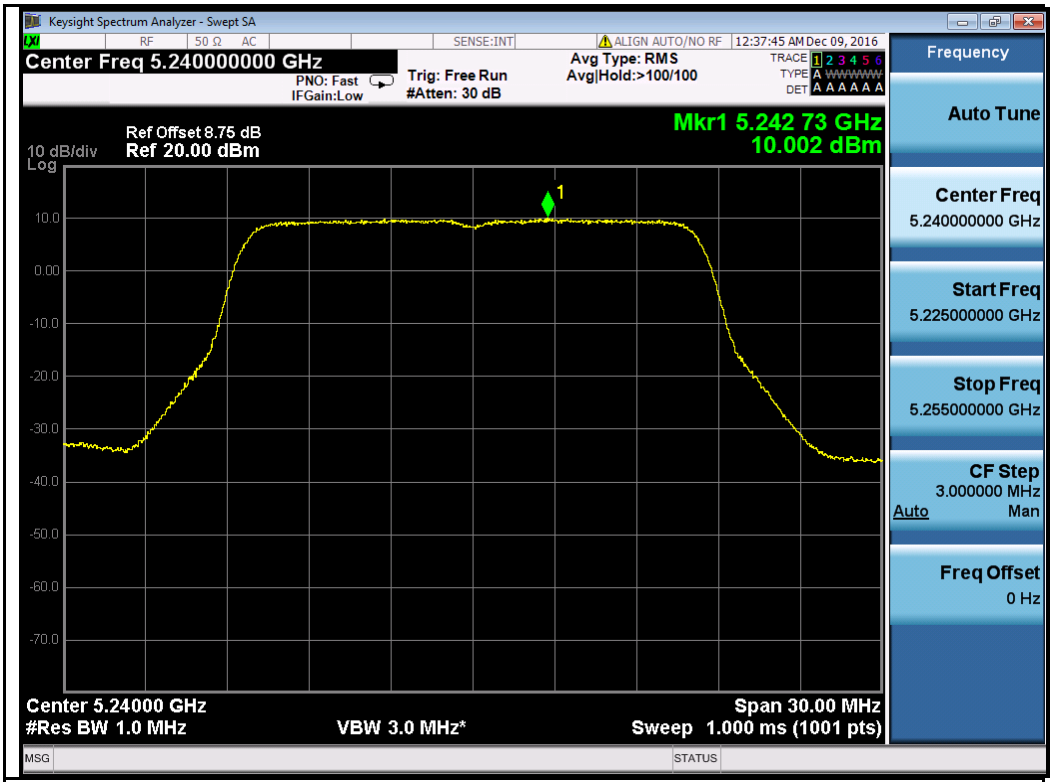
**Chain 1:**



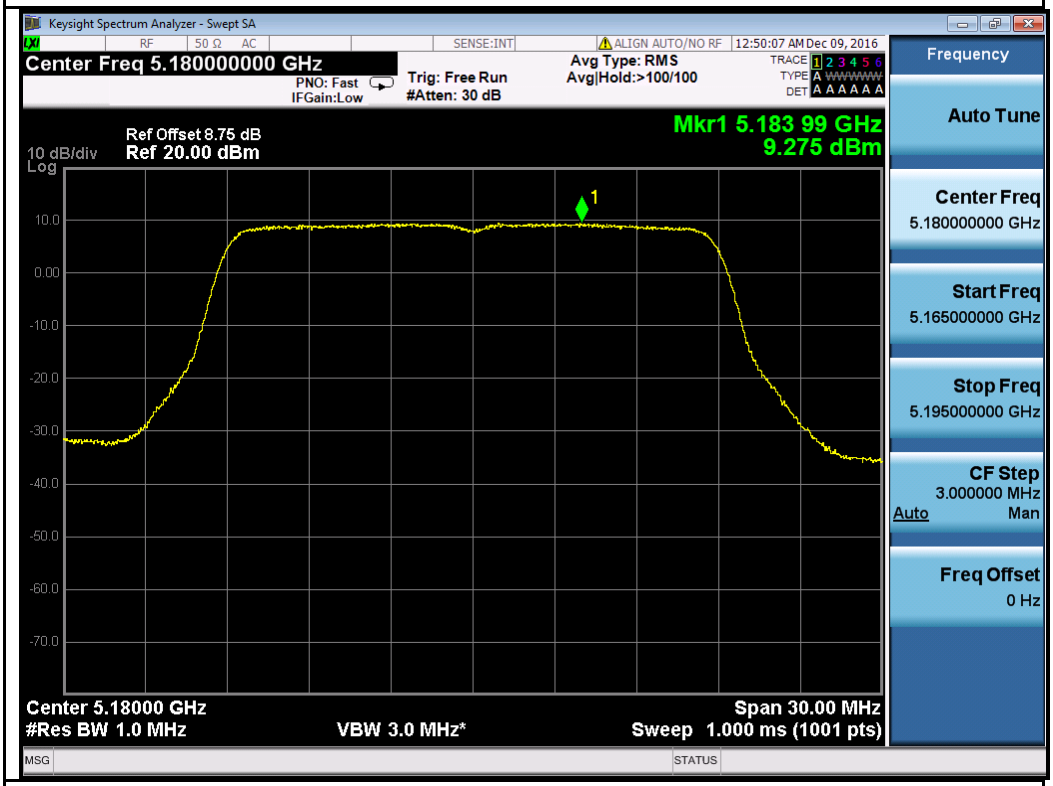

802.11a-5180M



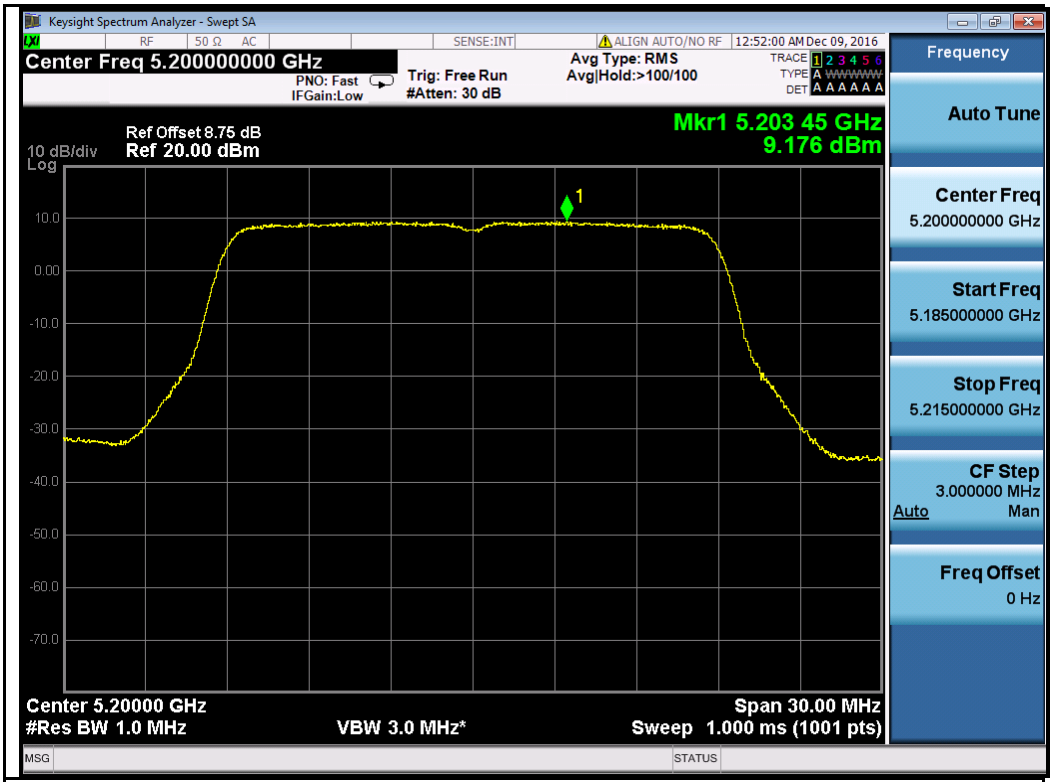

802.11a-5200M



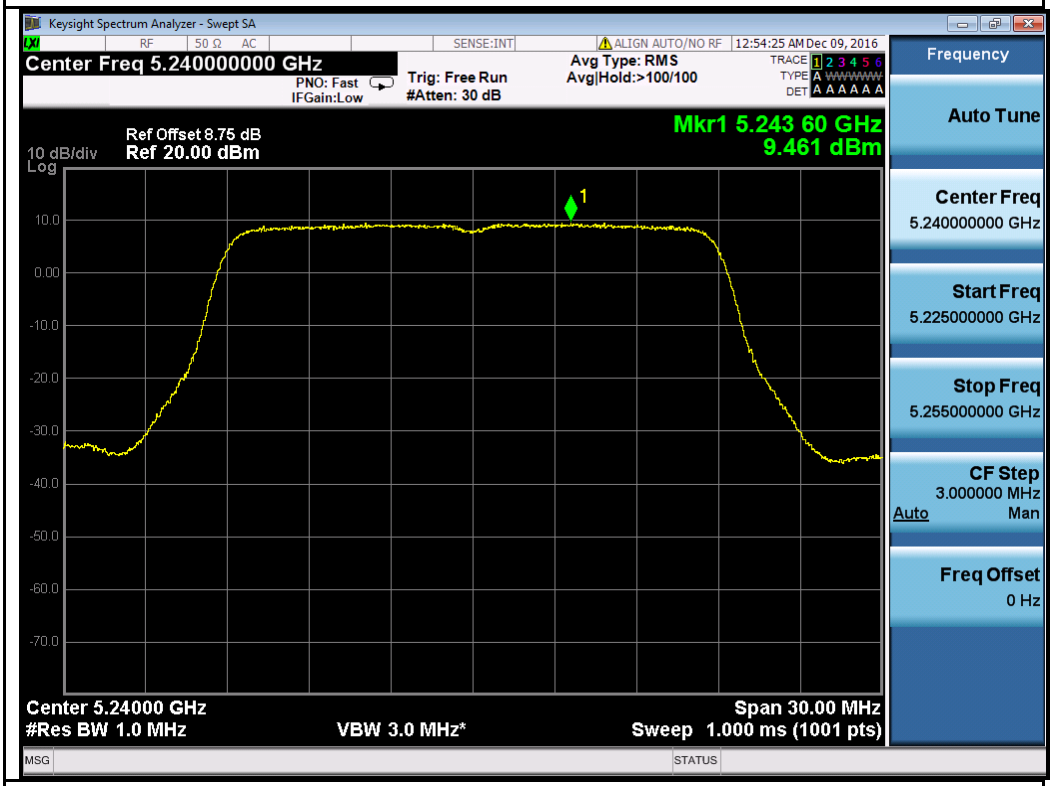

802.11a-5240M



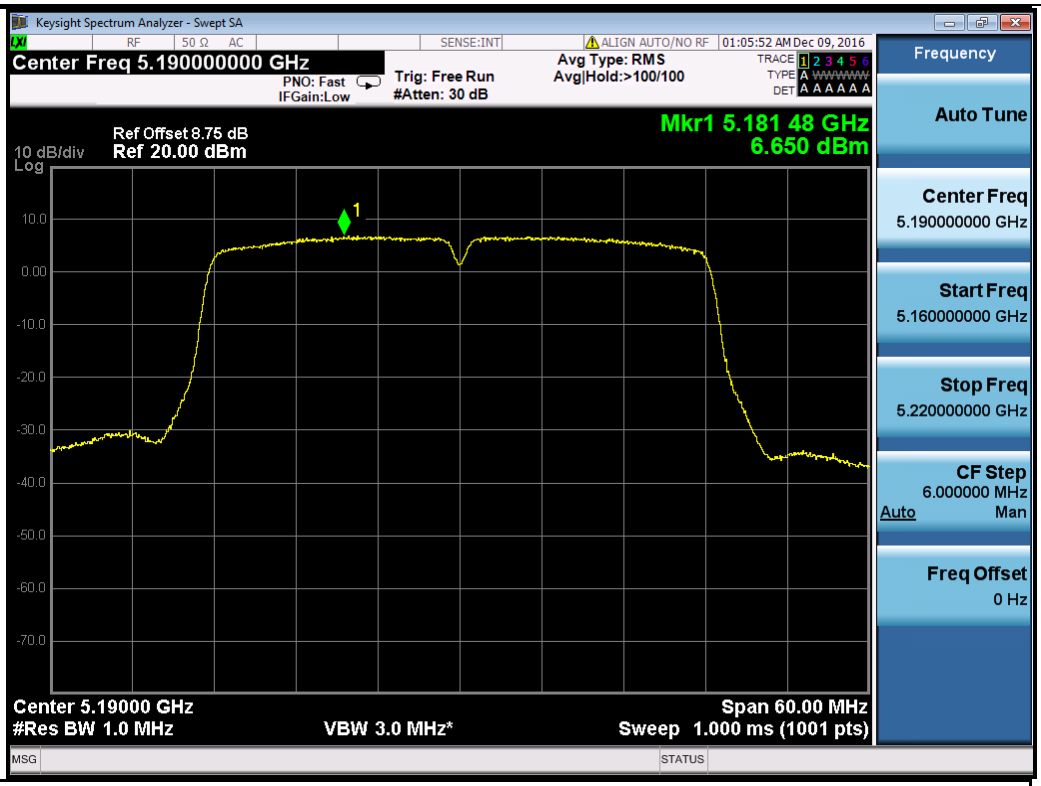

802.11n-HT20 5180M



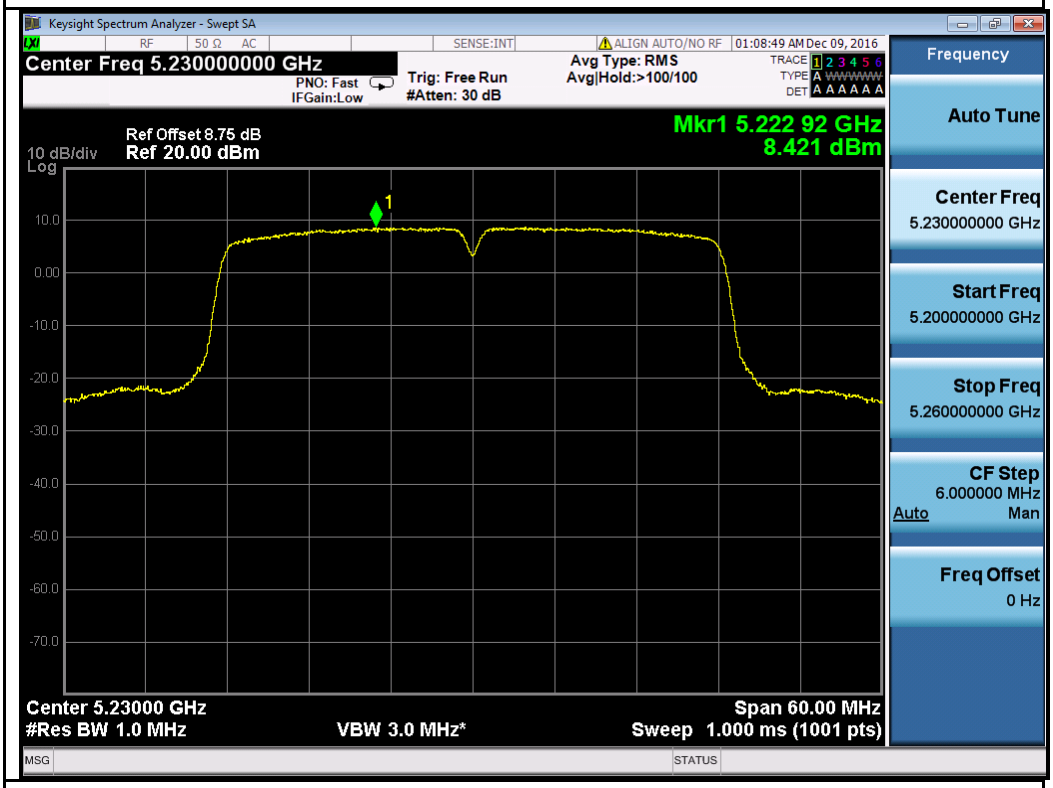

802.11n-HT20 5200M



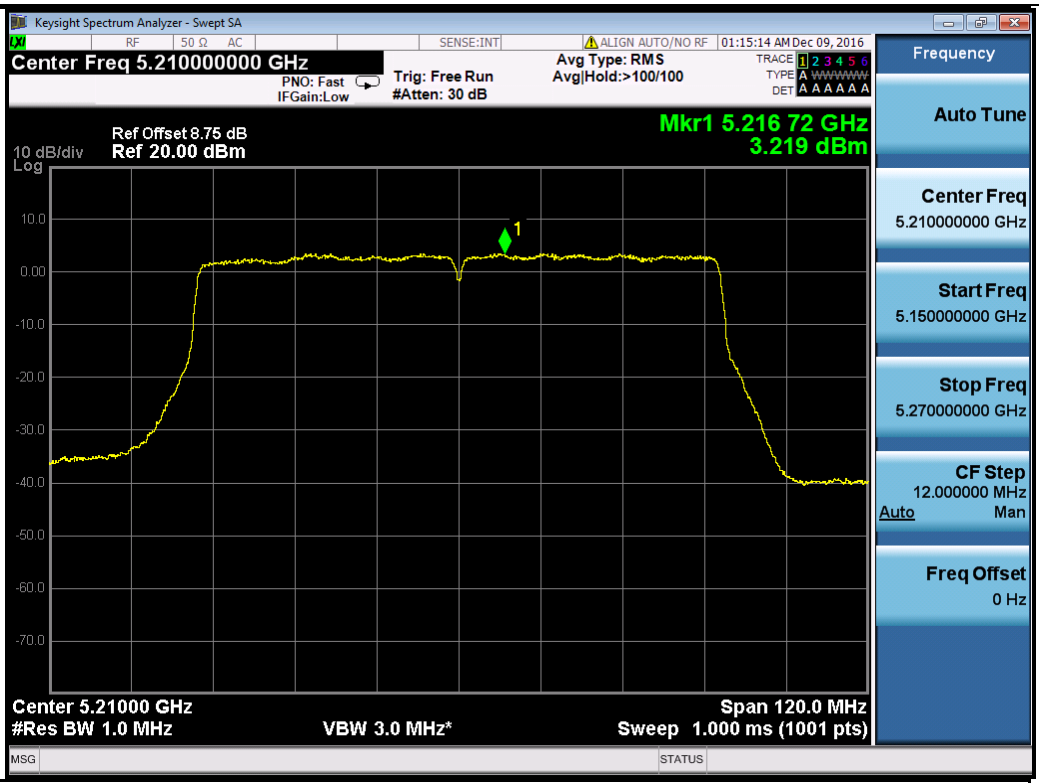

802.11n-HT20 5240M




802.11n-HT40 5190M

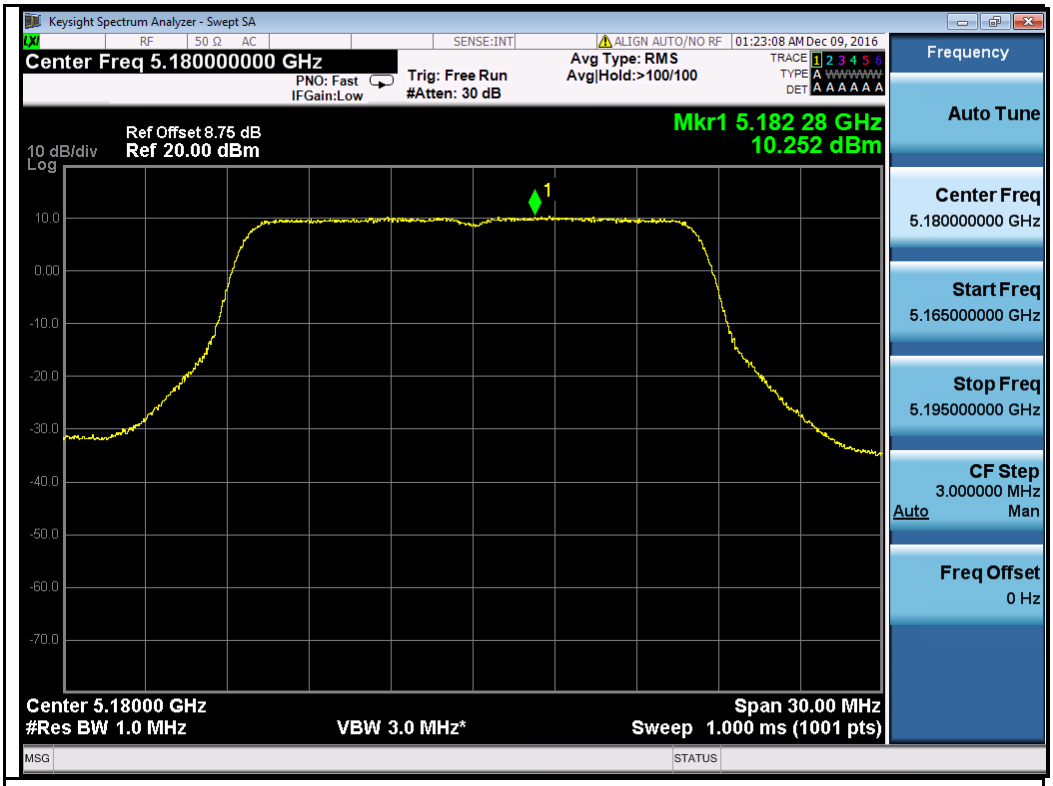



802.11n-HT40 5230M

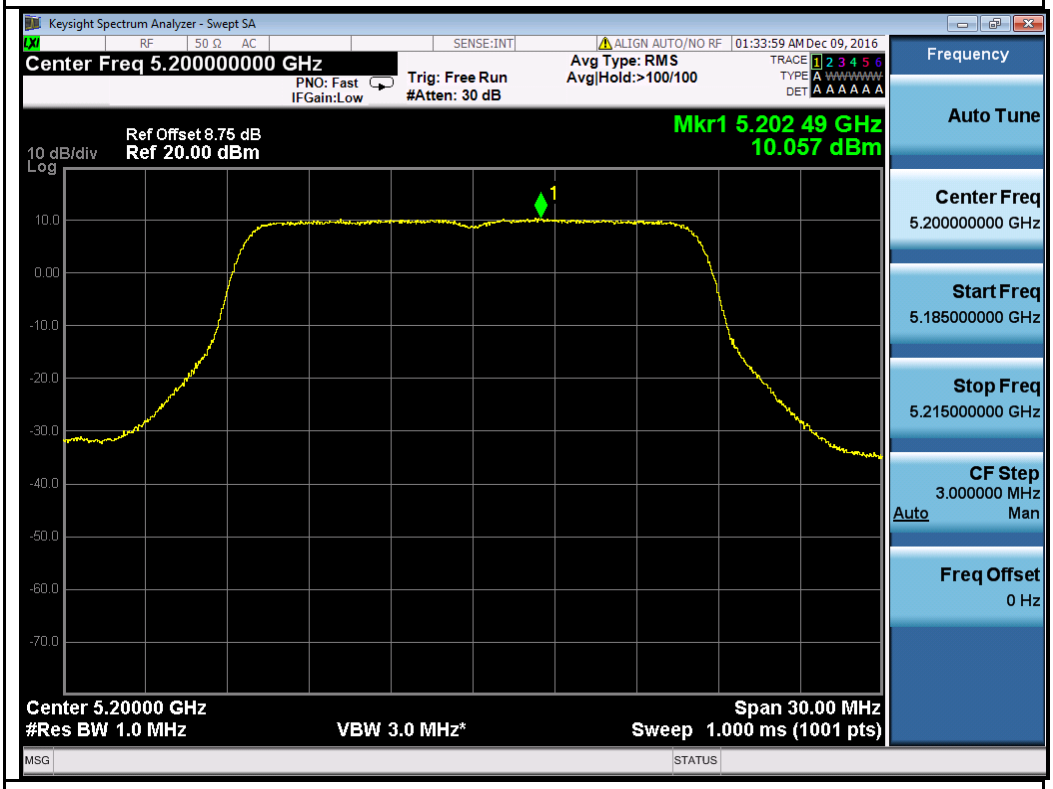



802.11ac-VHT80 5210M

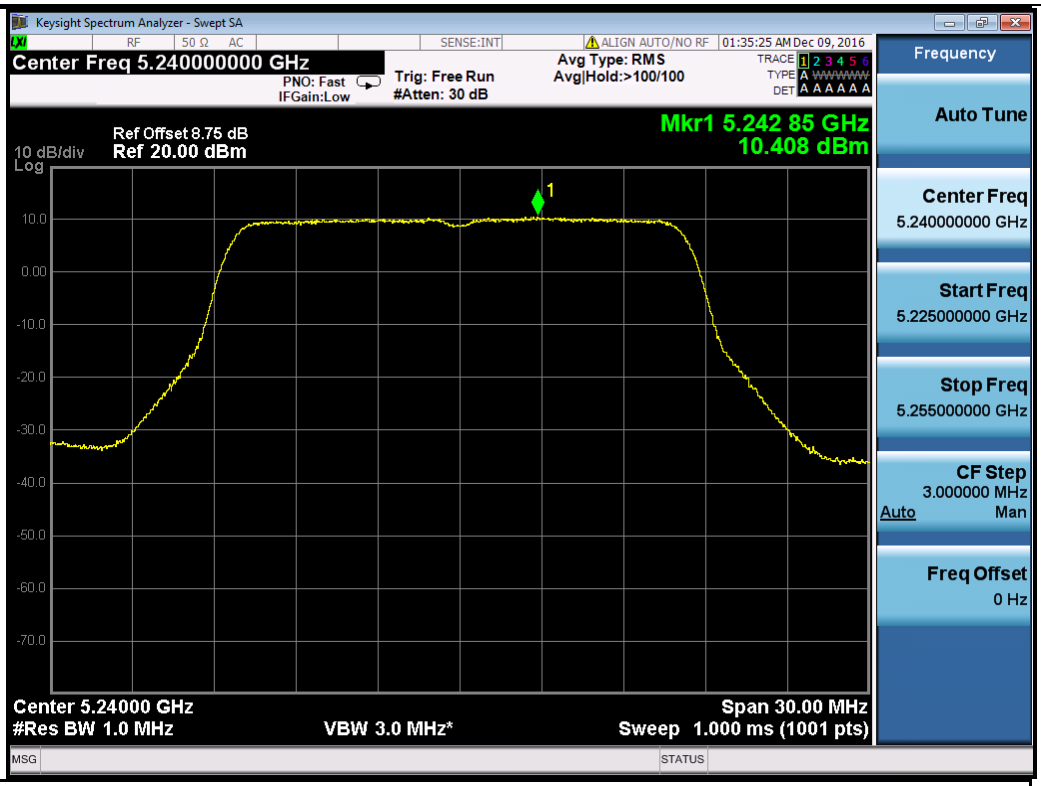
**Chain 2:**



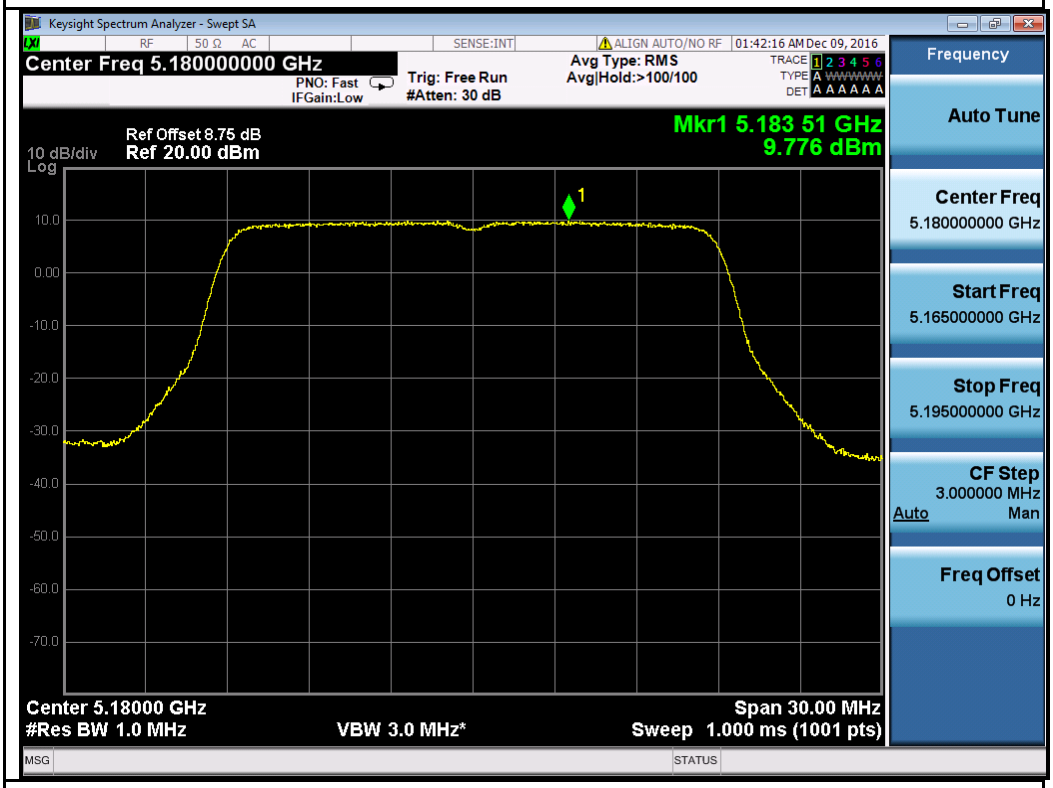

802.11a-5180M



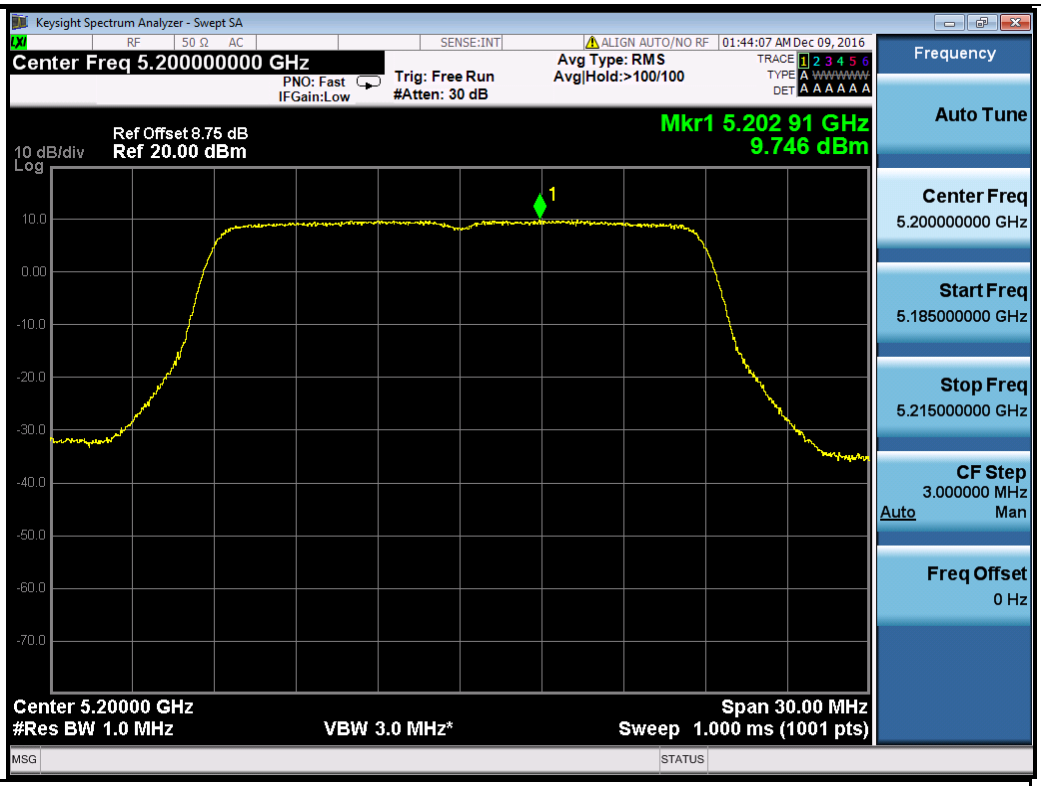

802.11a-5200M



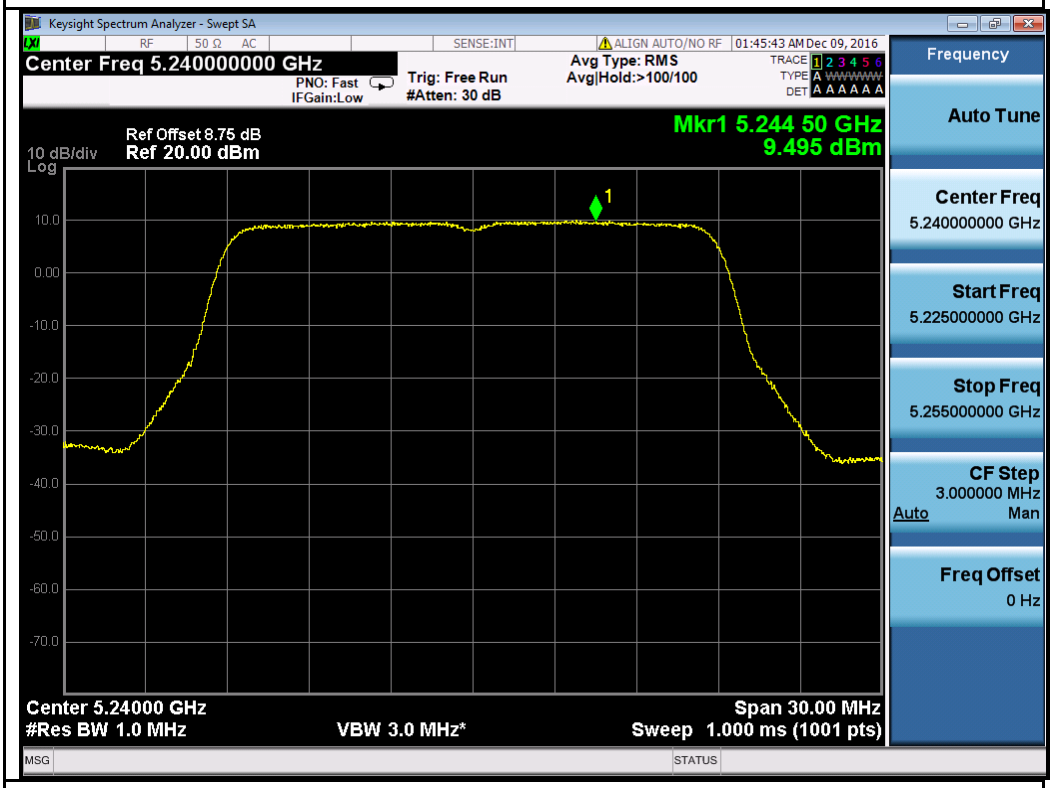

802.11a-5240M



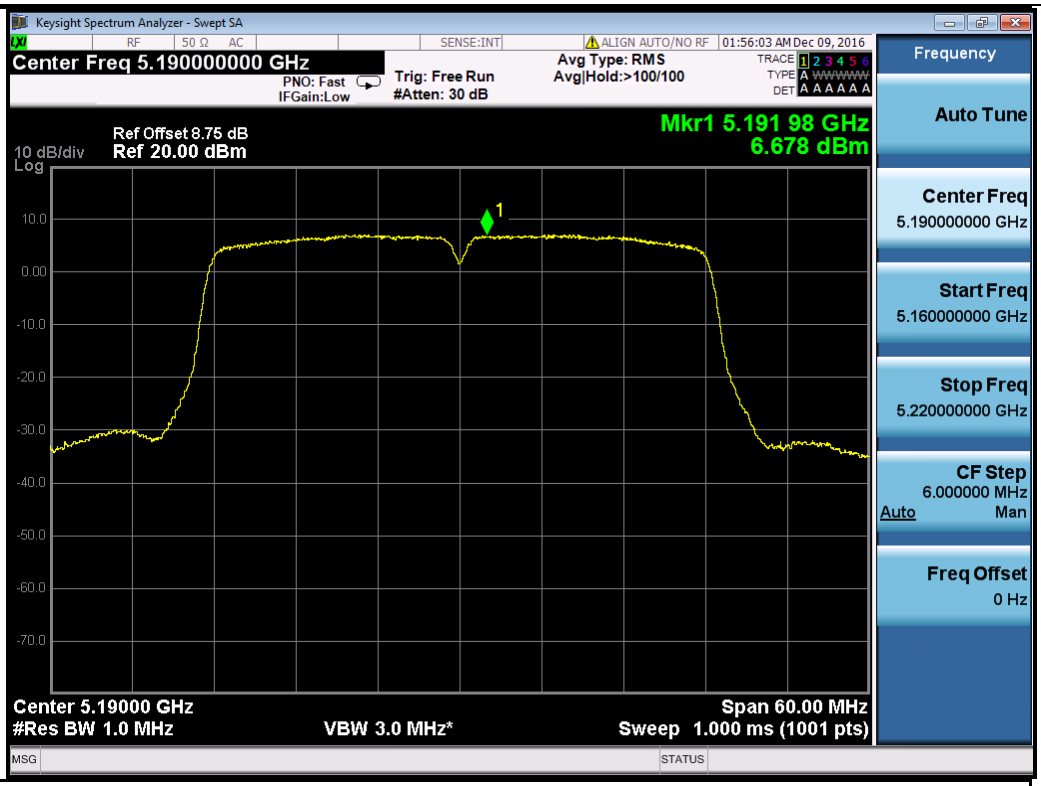

802.11n-HT20 5180M



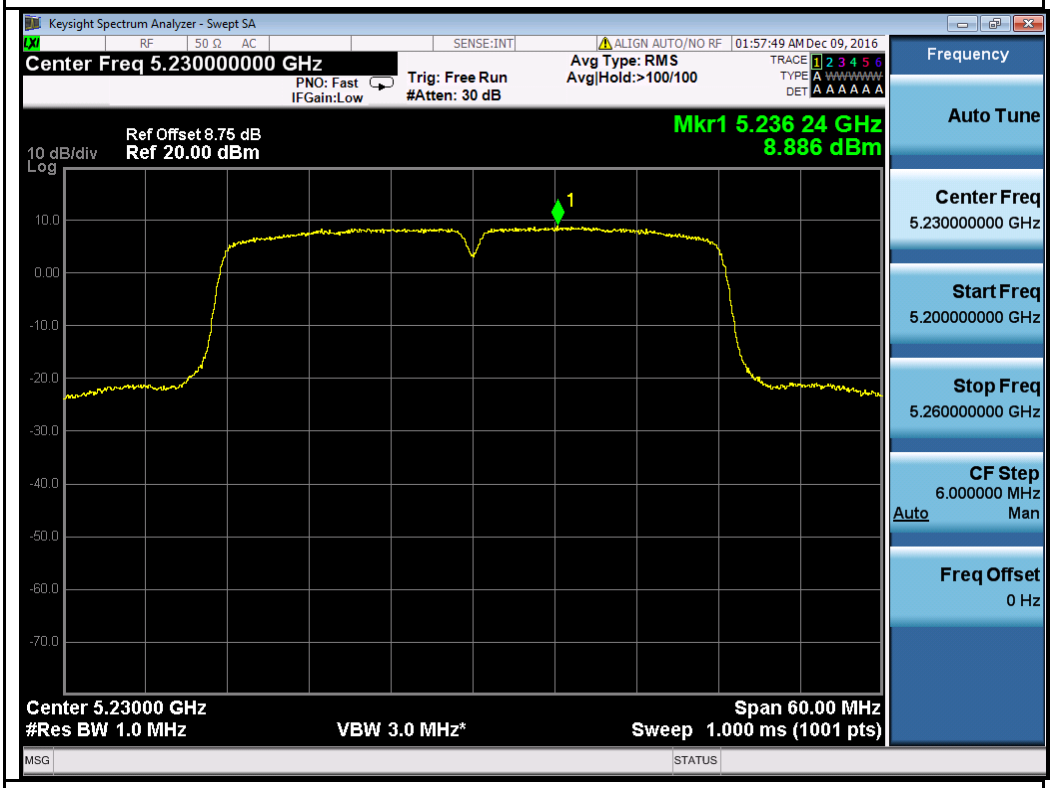

802.11n-HT20 5200M



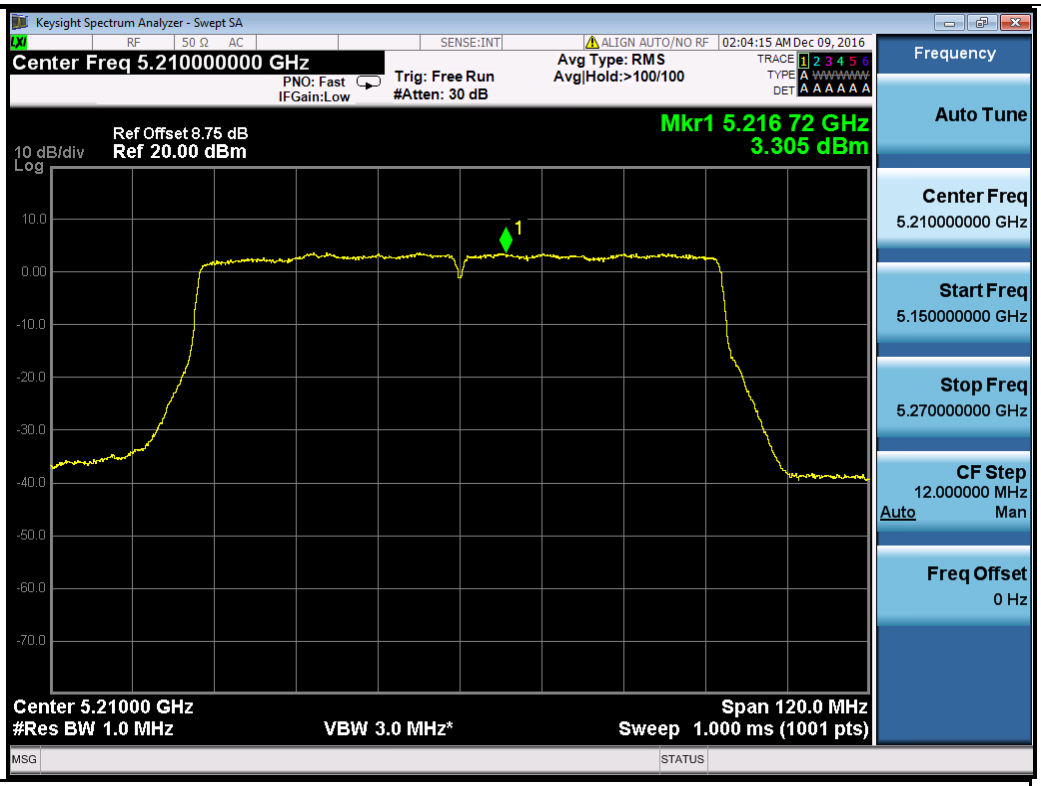

802.11n-HT20 5240M




802.11n-HT40 5190M

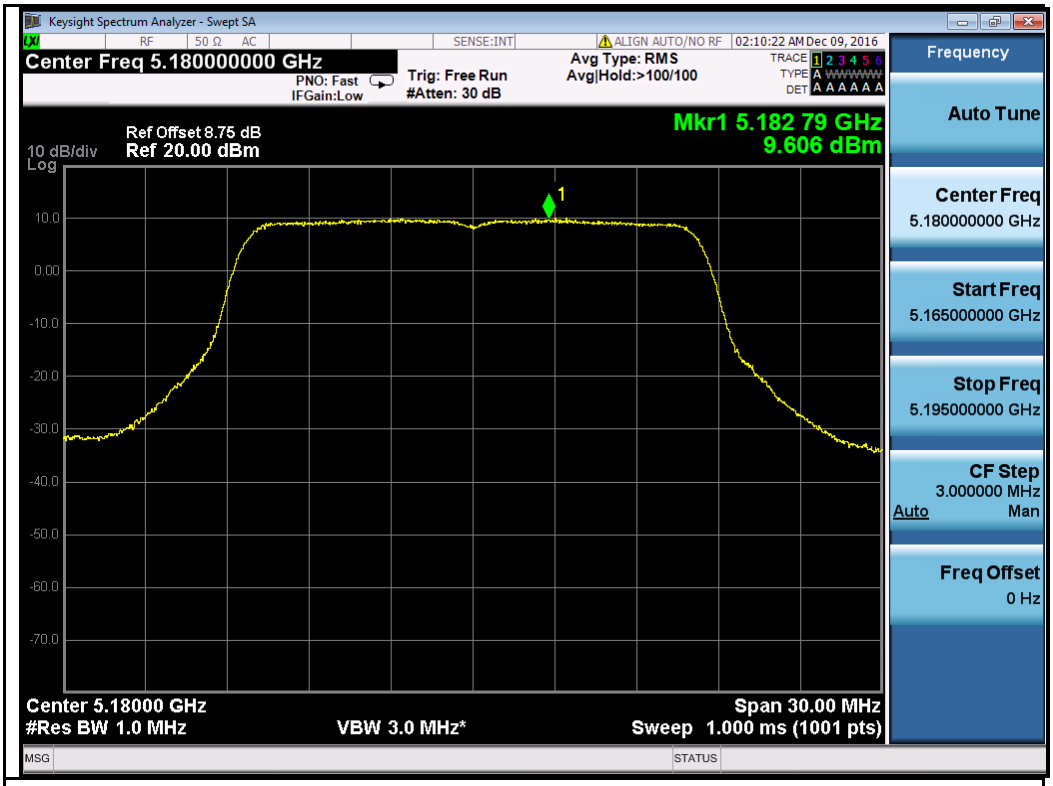



802.11n-HT40 5230M

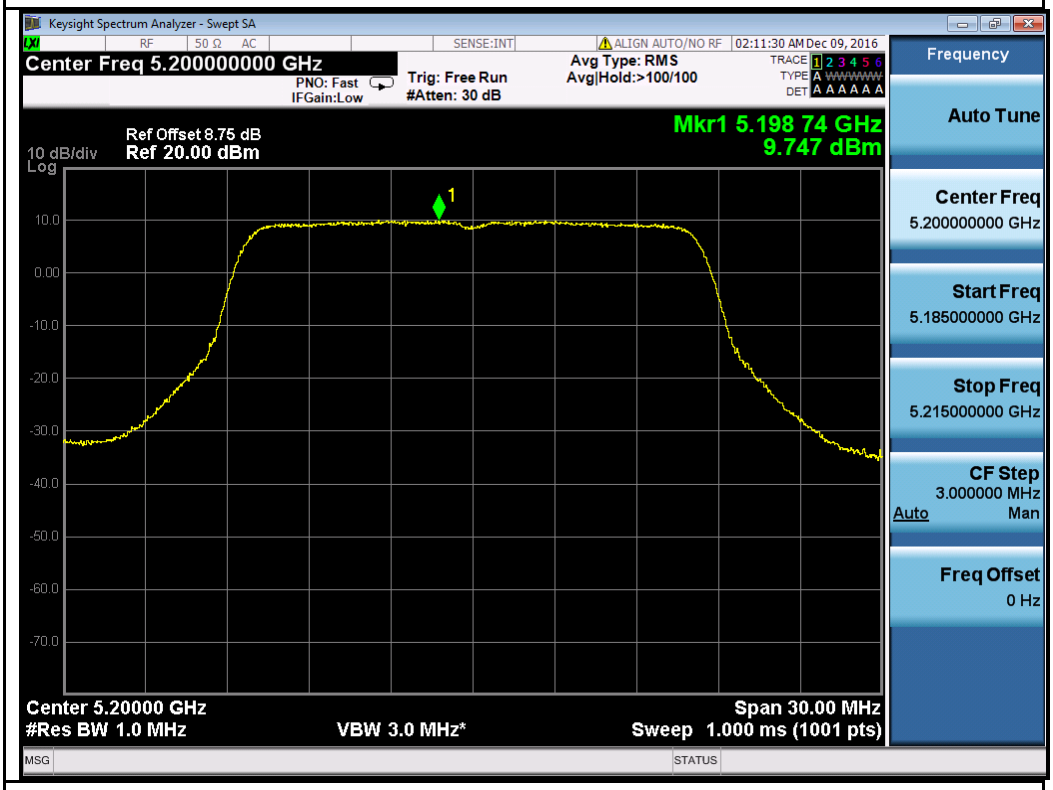



802.11ac-VHT80 5210M

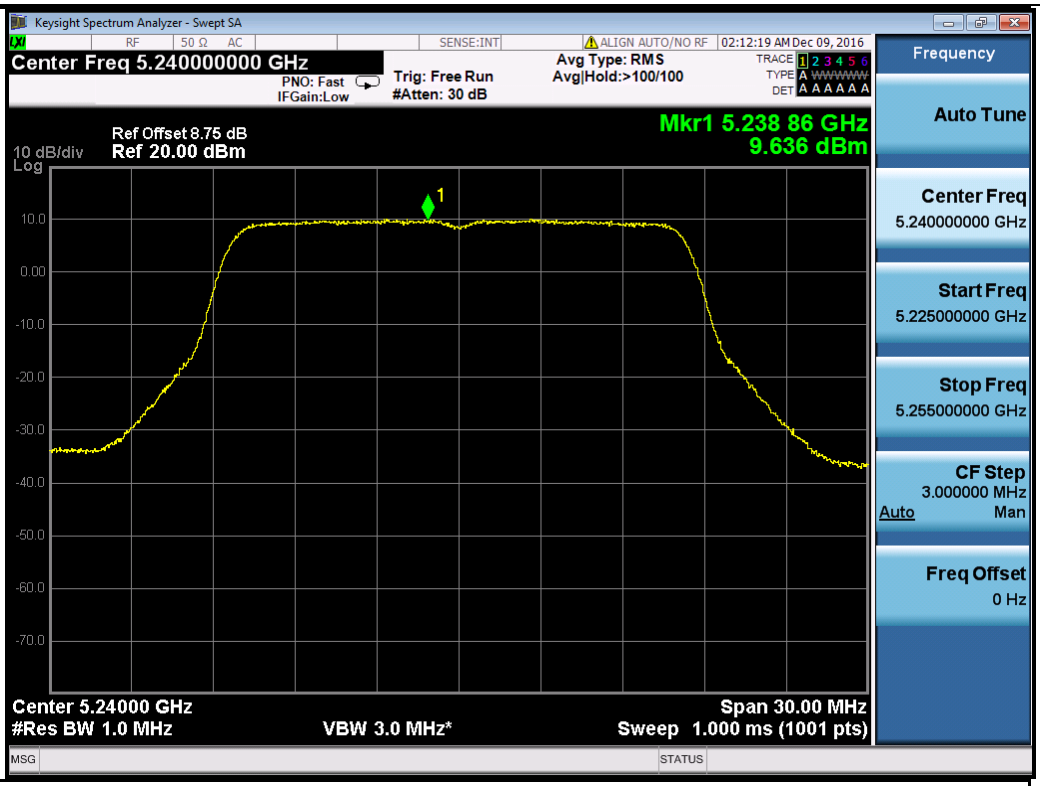
**Chain 3:**



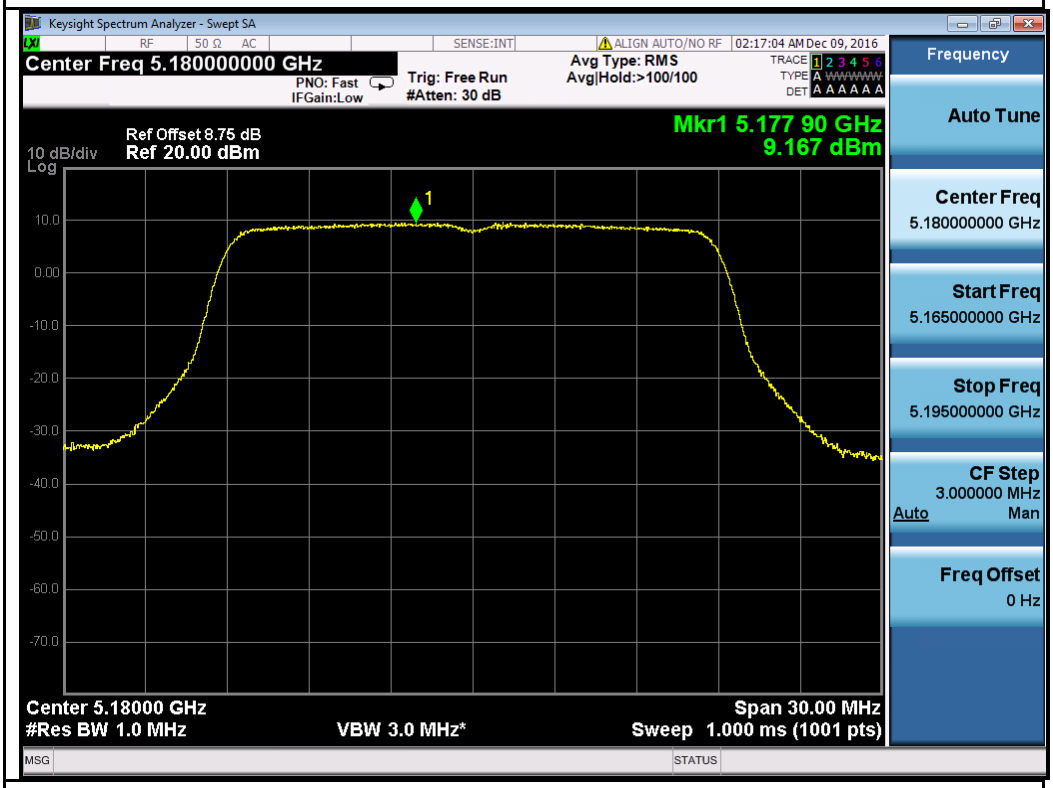

802.11a-5180M



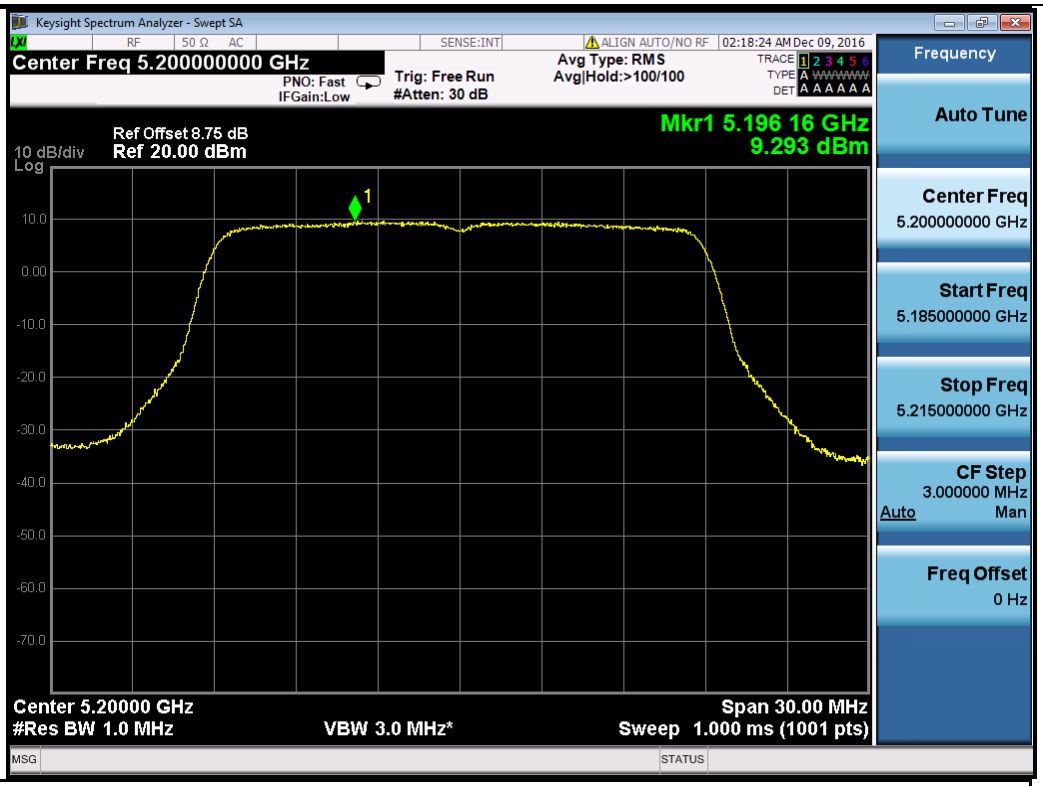

802.11a-5200M



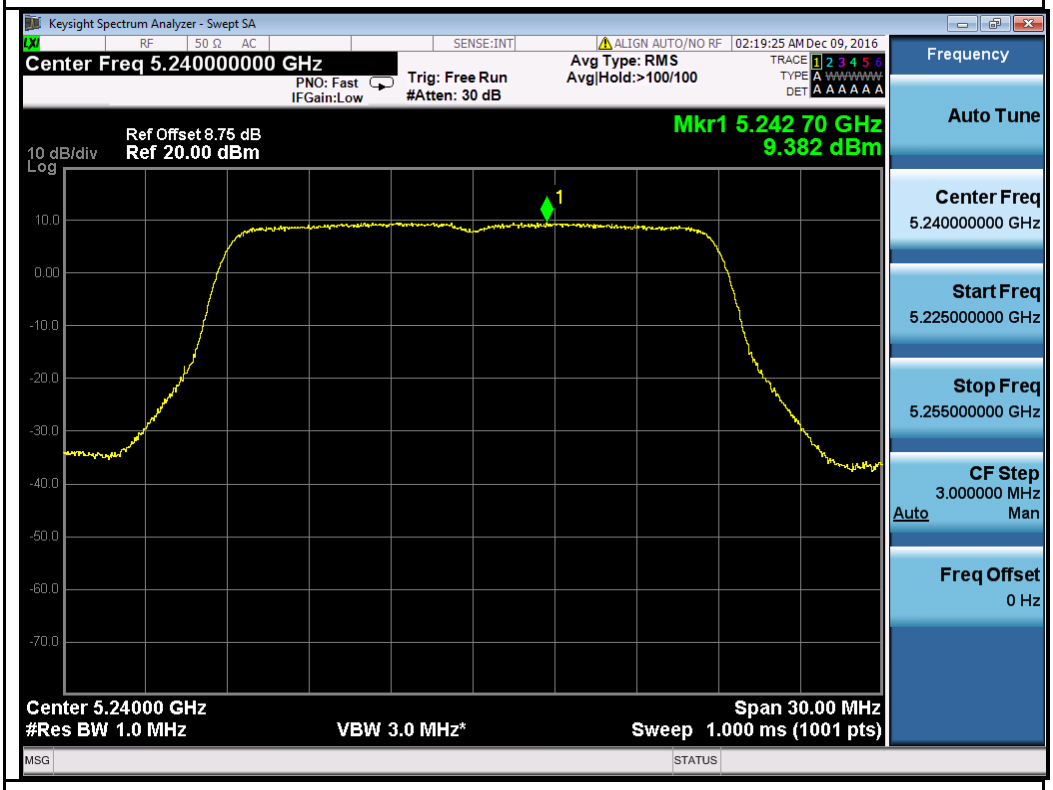

802.11a-5240M



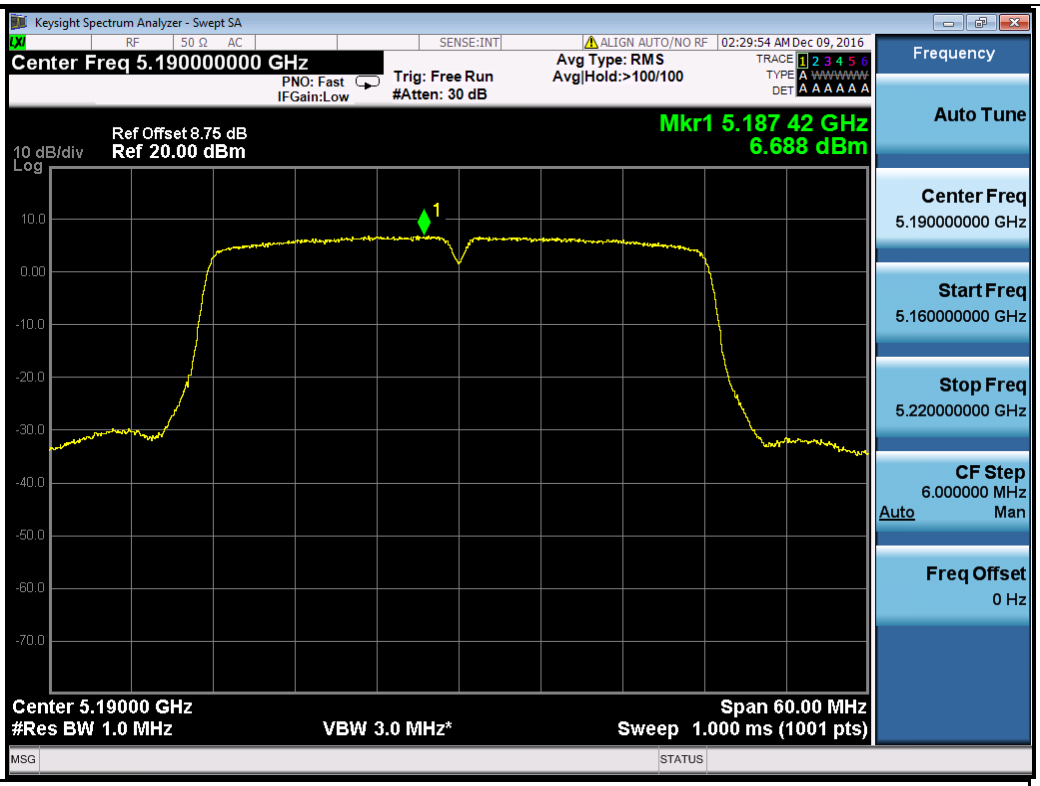

802.11n-HT20 5180M



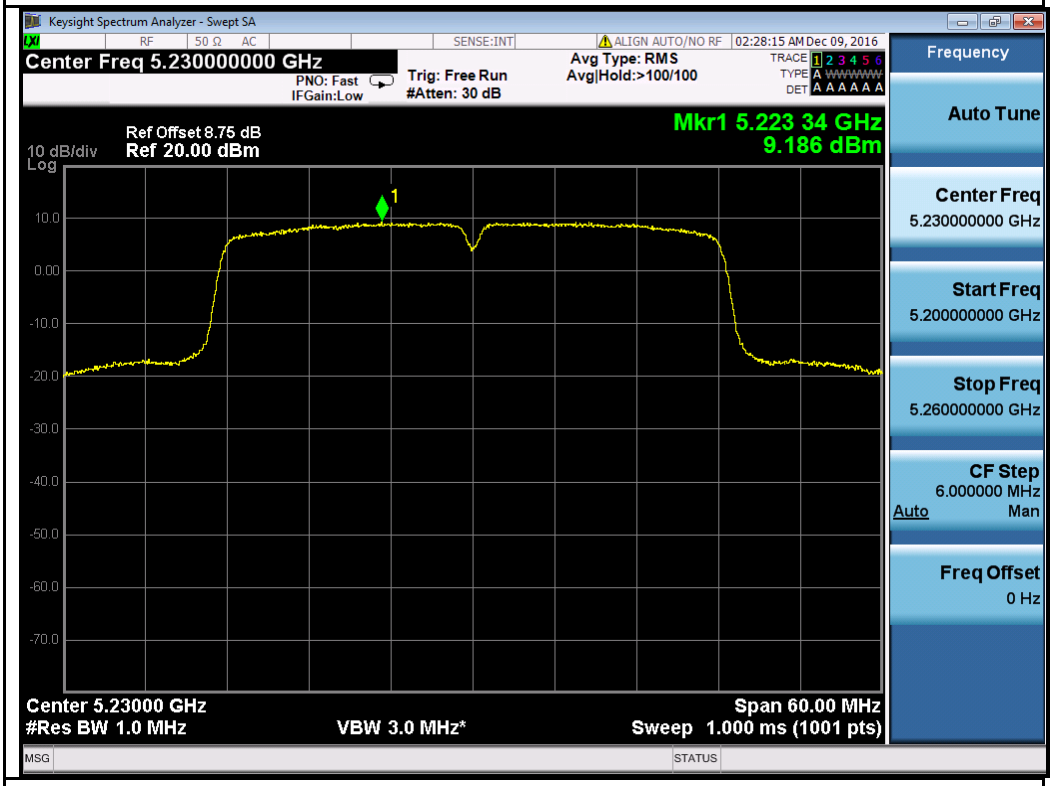

802.11n-HT20 5200M



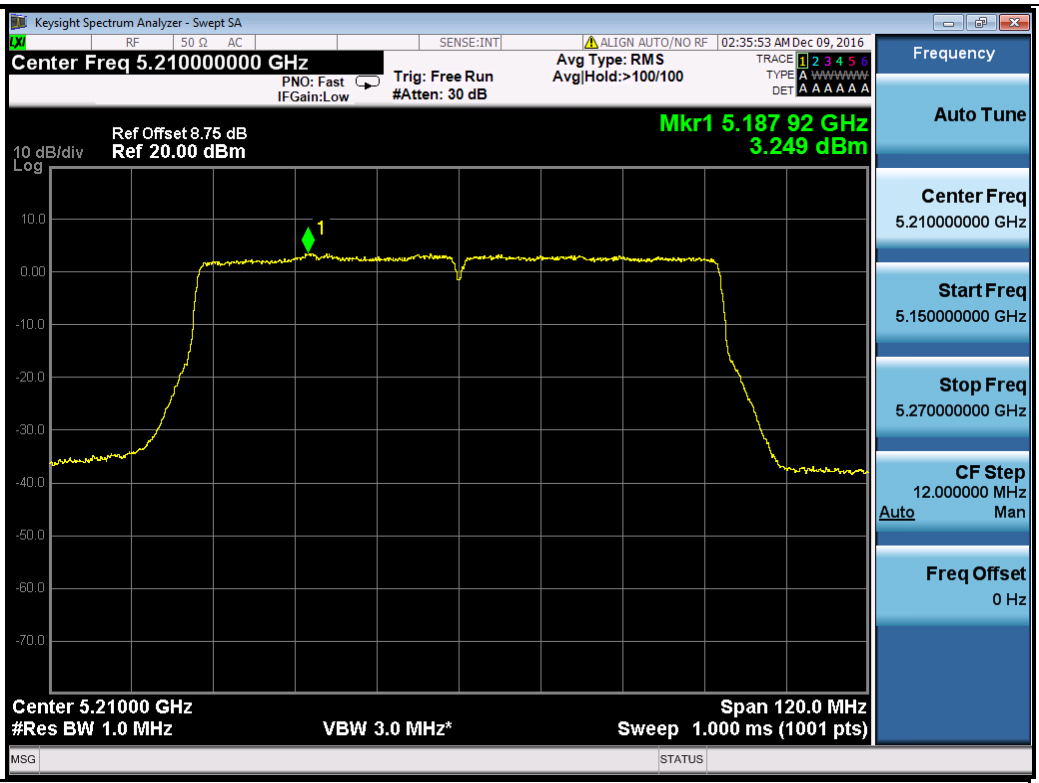

802.11n-HT20 5240M




802.11n-HT40 5190M

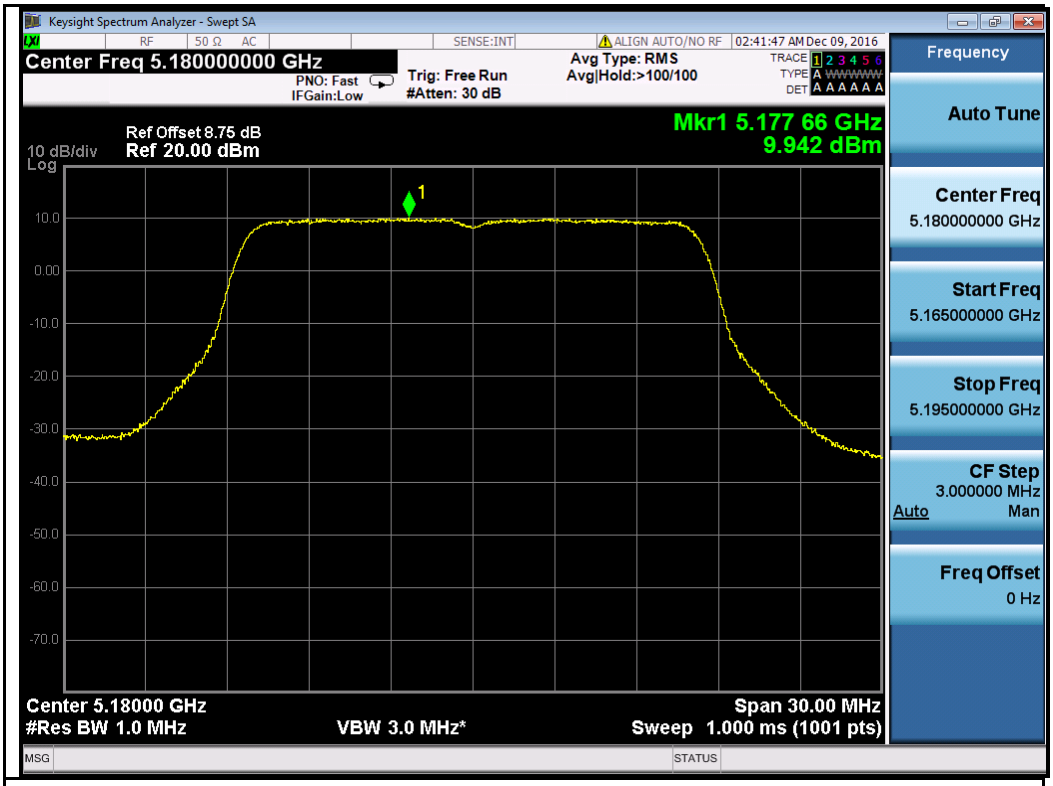



802.11n-HT40 5230M

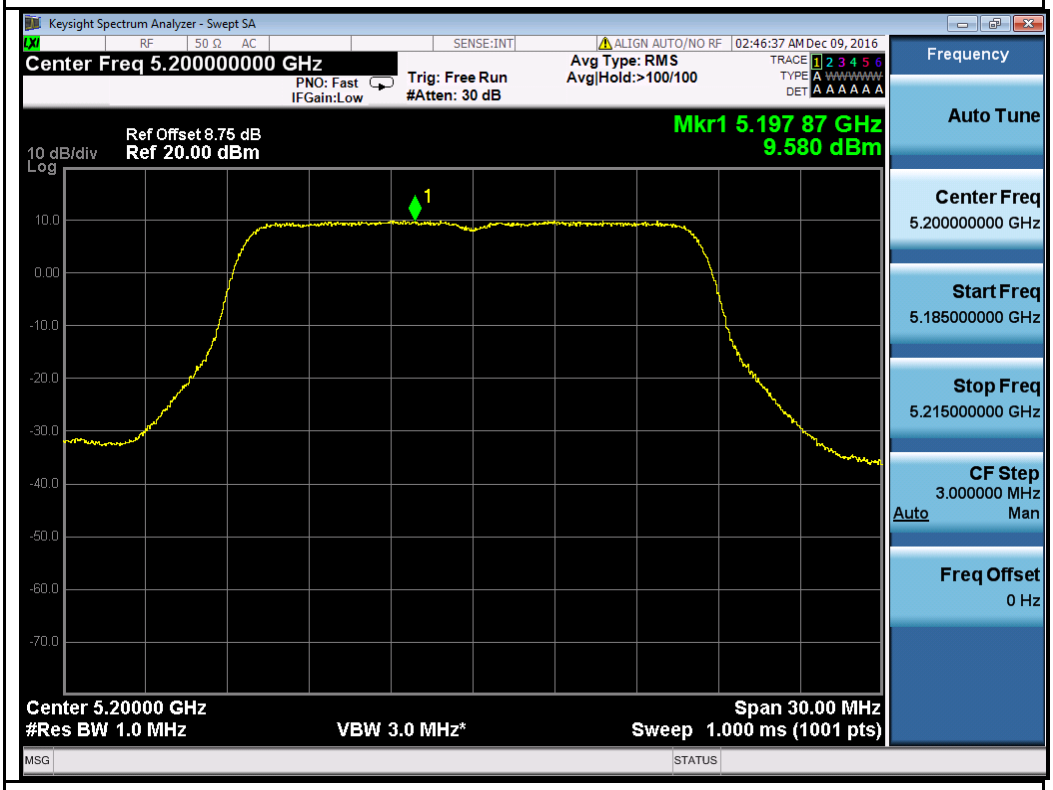



802.11ac-VHT80 5210M

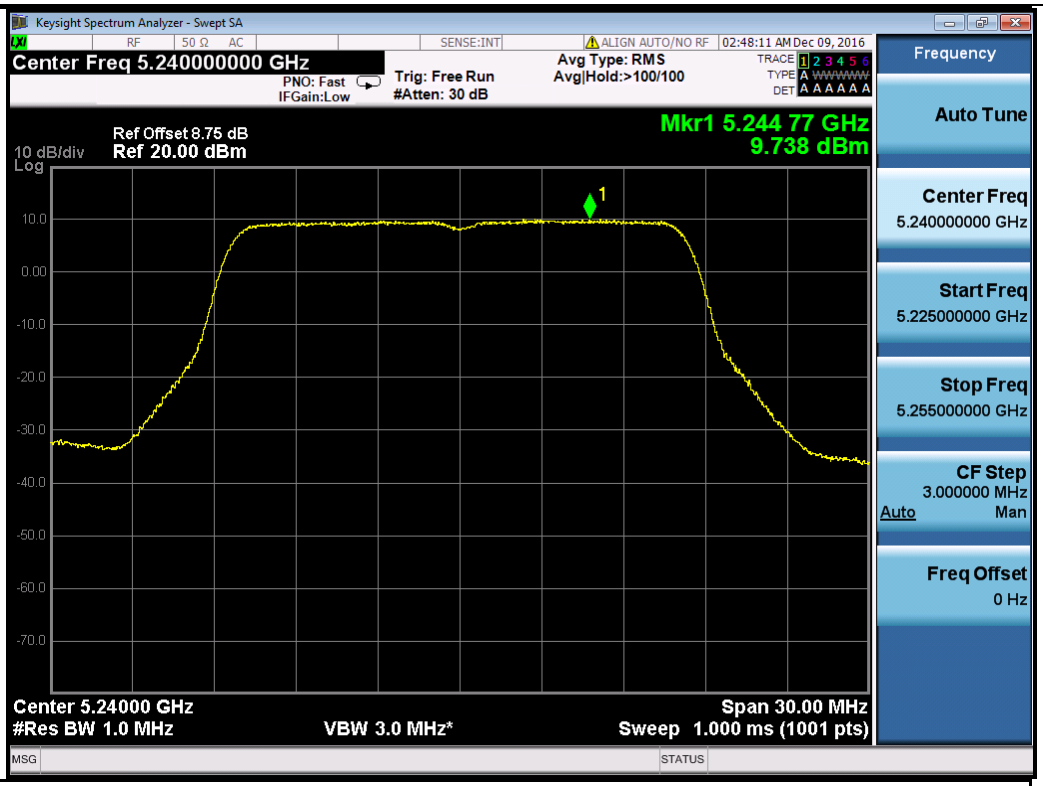
**Chain 4:**



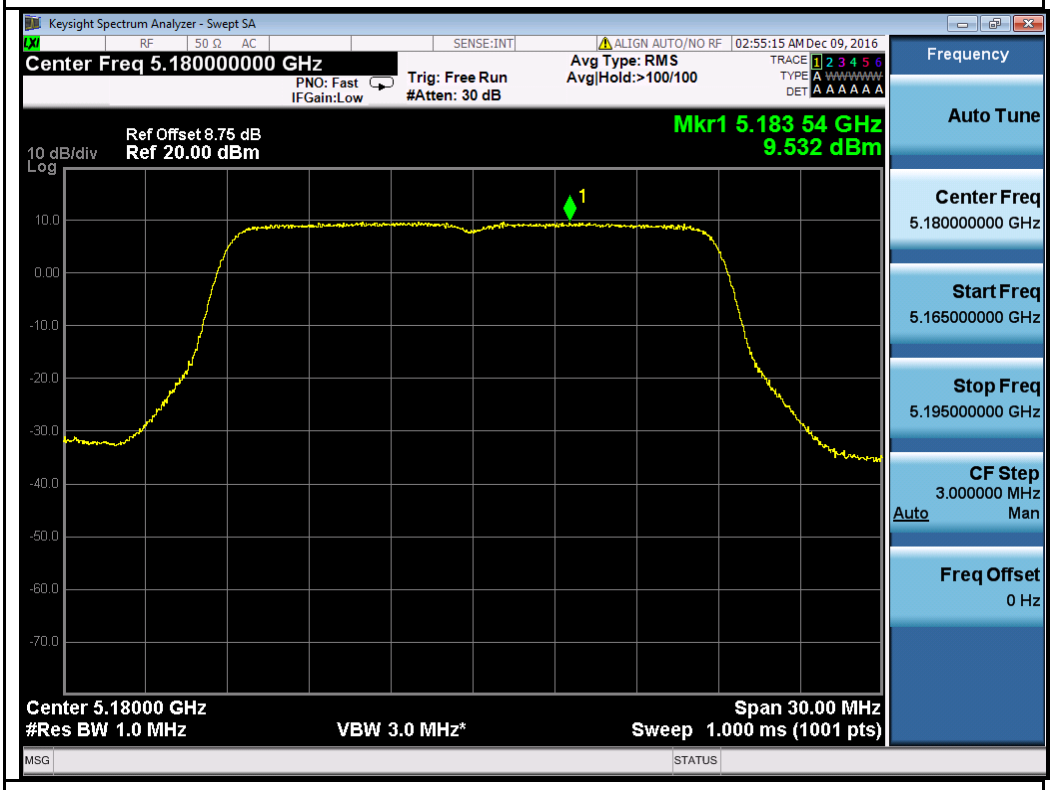

802.11a-5180M




802.11a-5200M

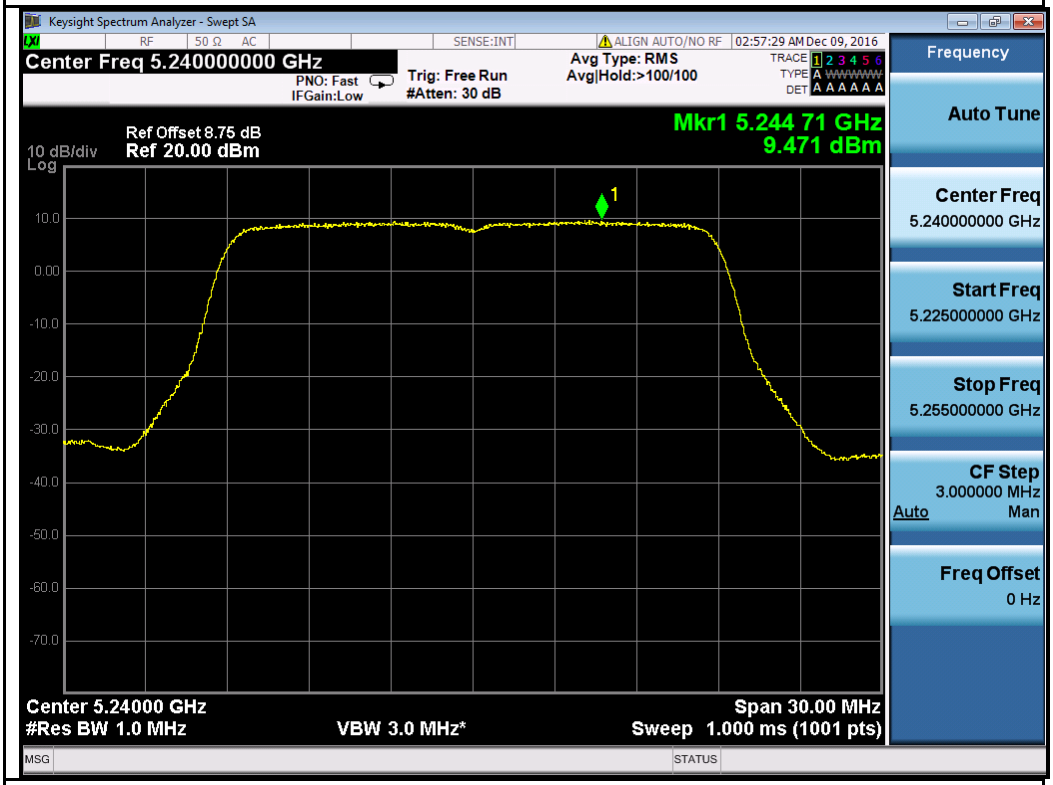



802.11a-5240M

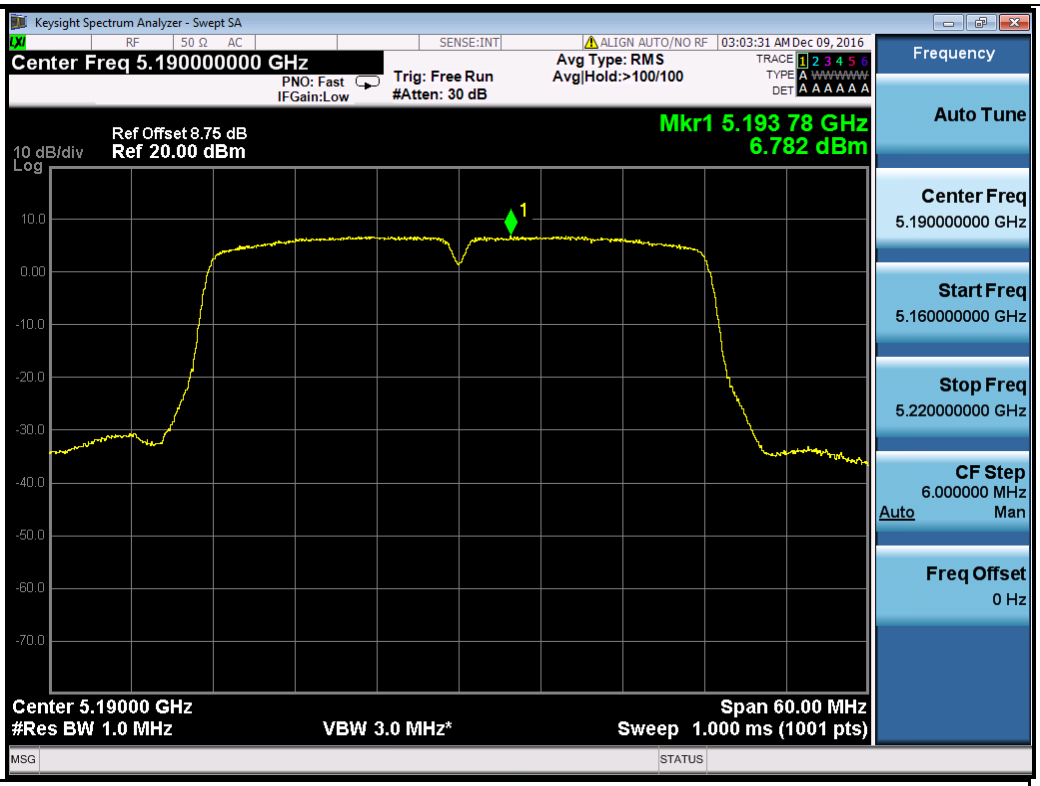



802.11n-HT20 5180M

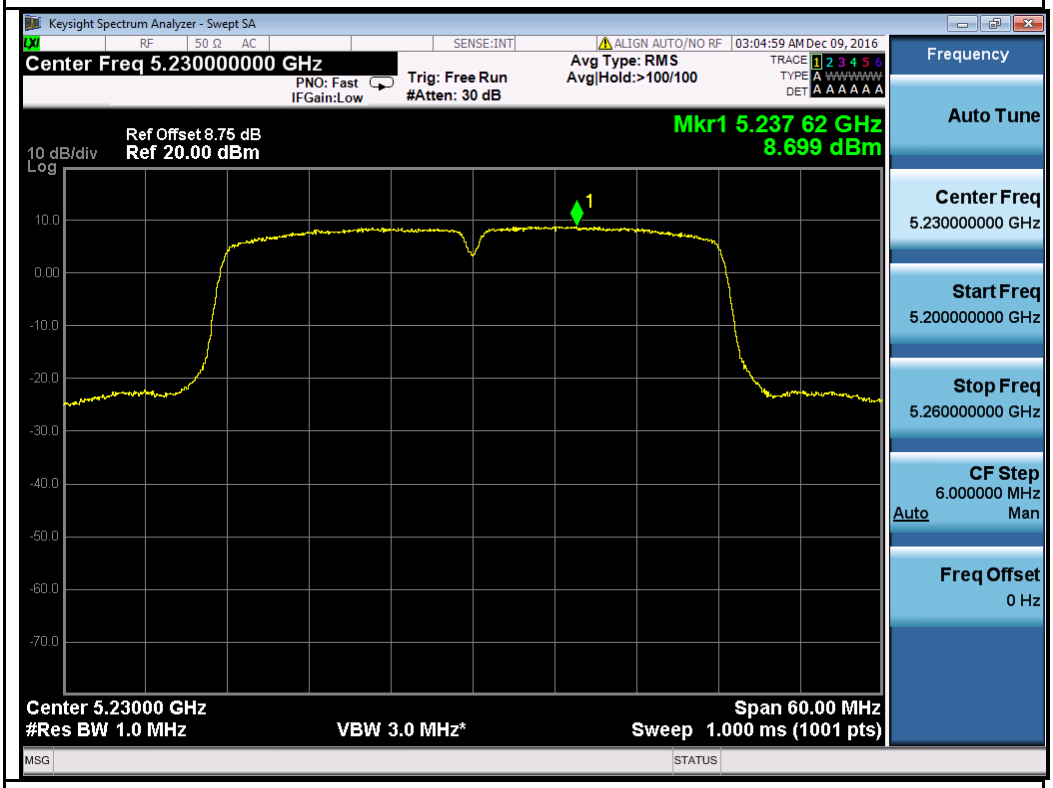
802.11n-HT20 5200M



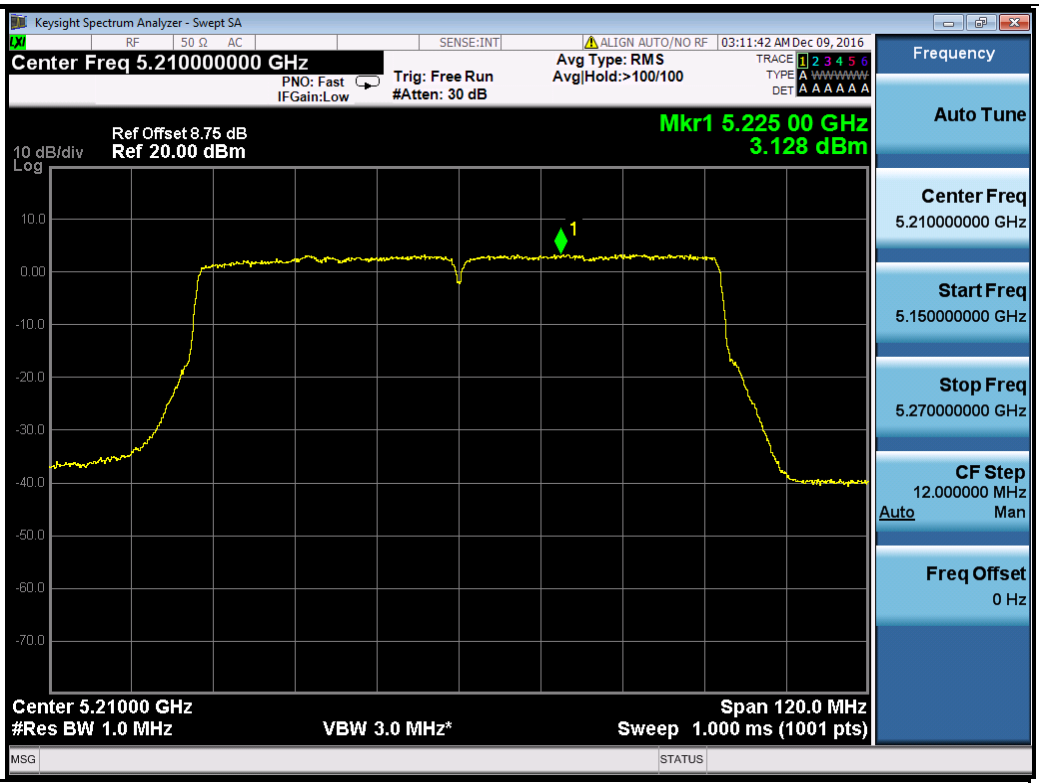

802.11n-HT20 5240M




802.11n-HT40 5190M



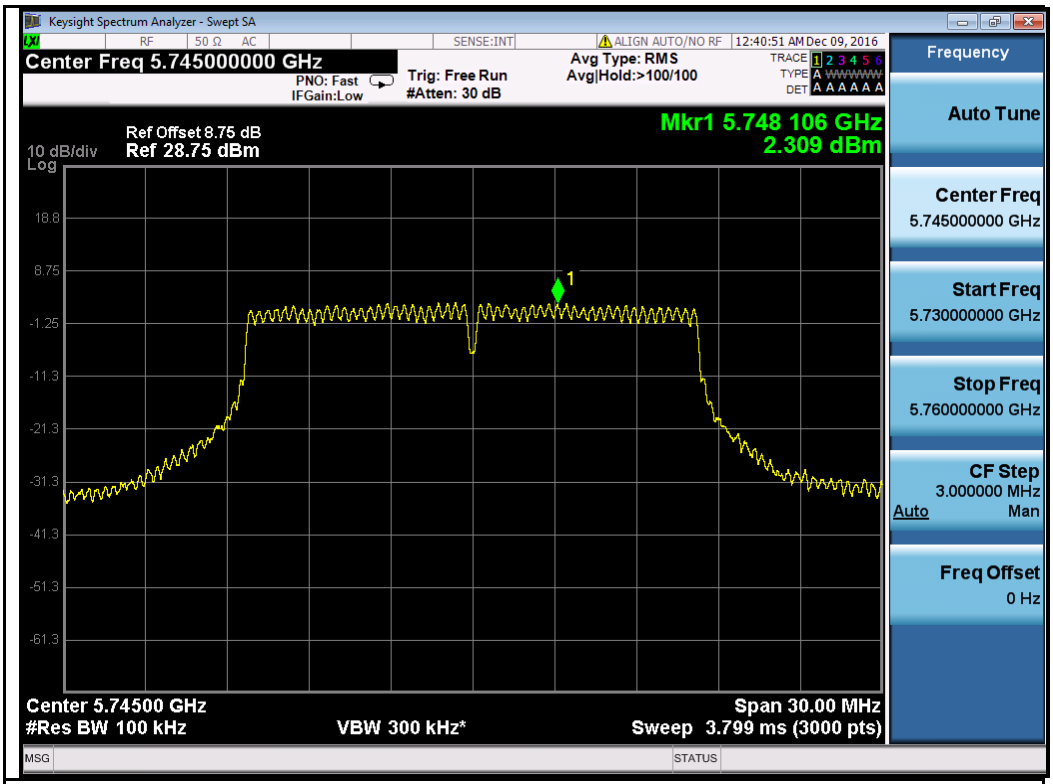

802.11n-HT40 5230M



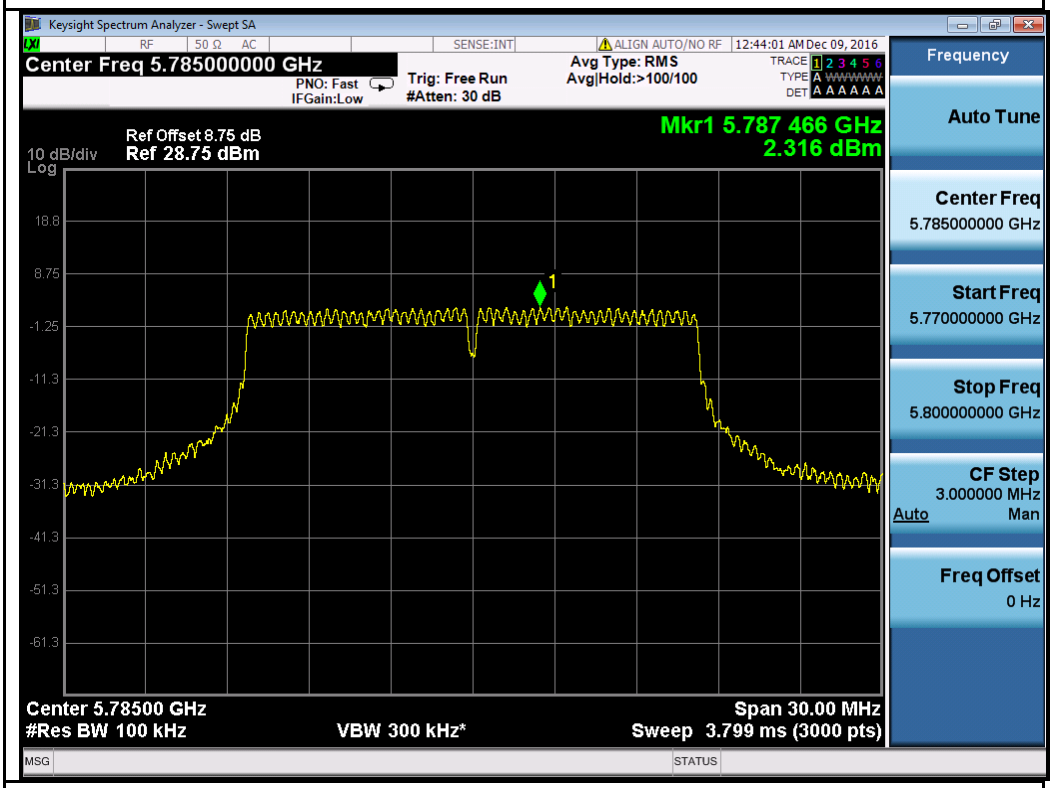

802.11ac-VHT80 5210M

**Test Plot for W58:**

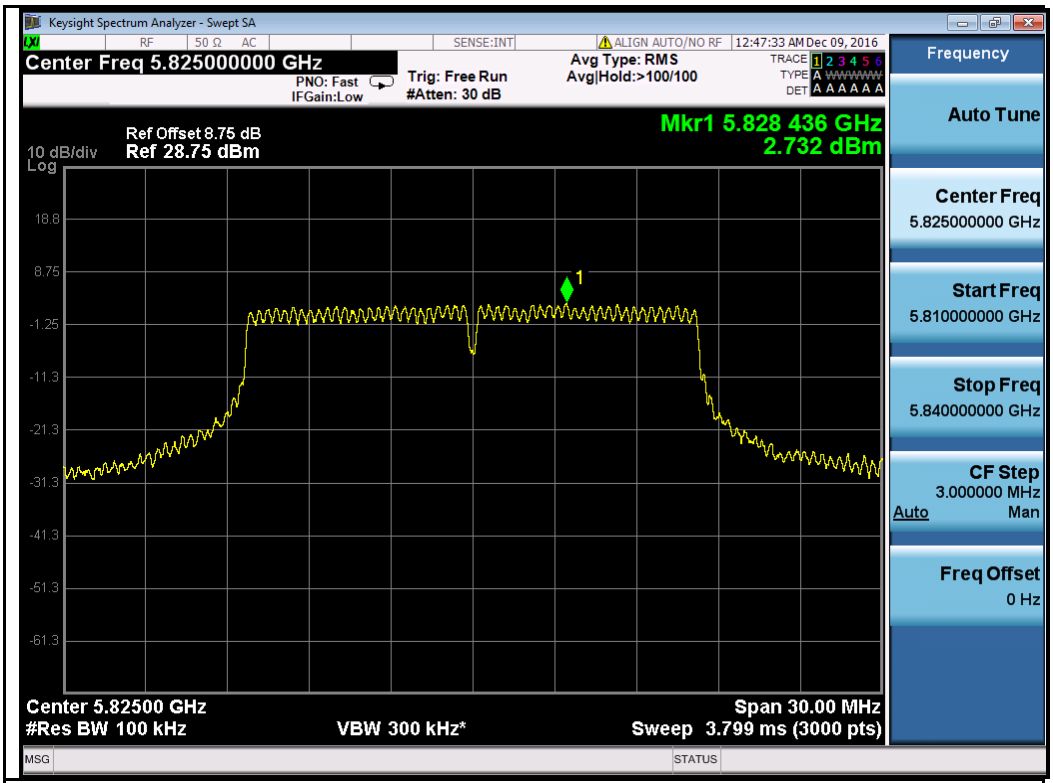
**Chain 1:**



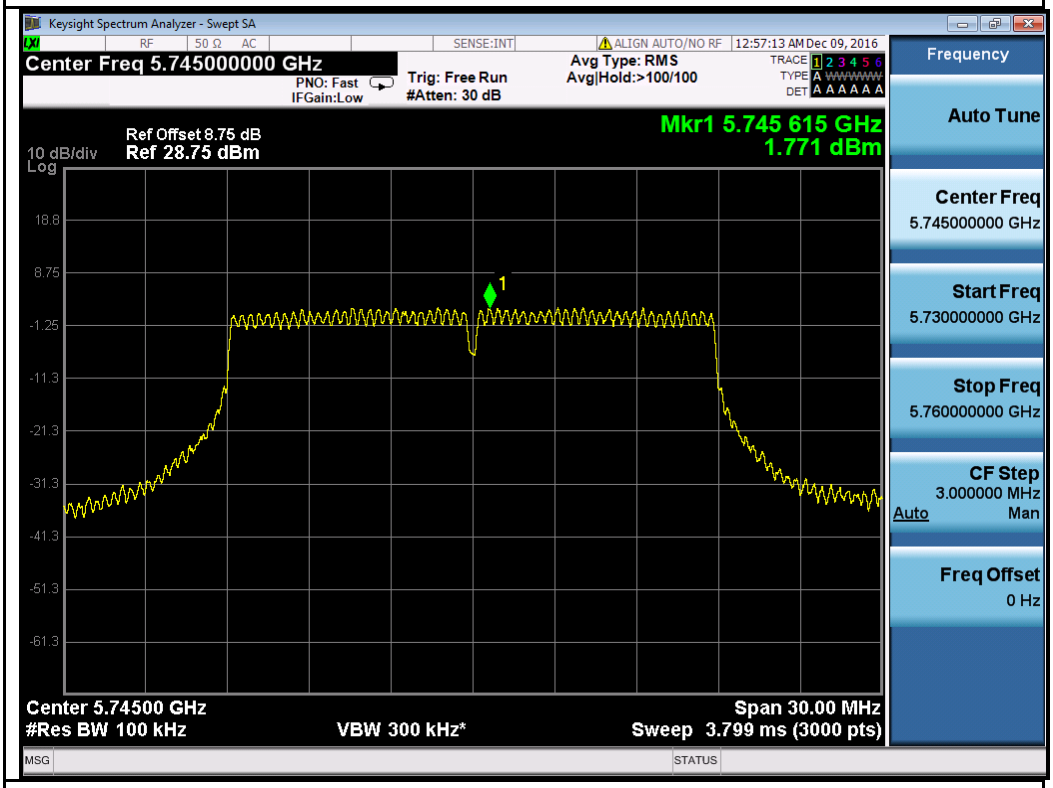

802.11a-5745M



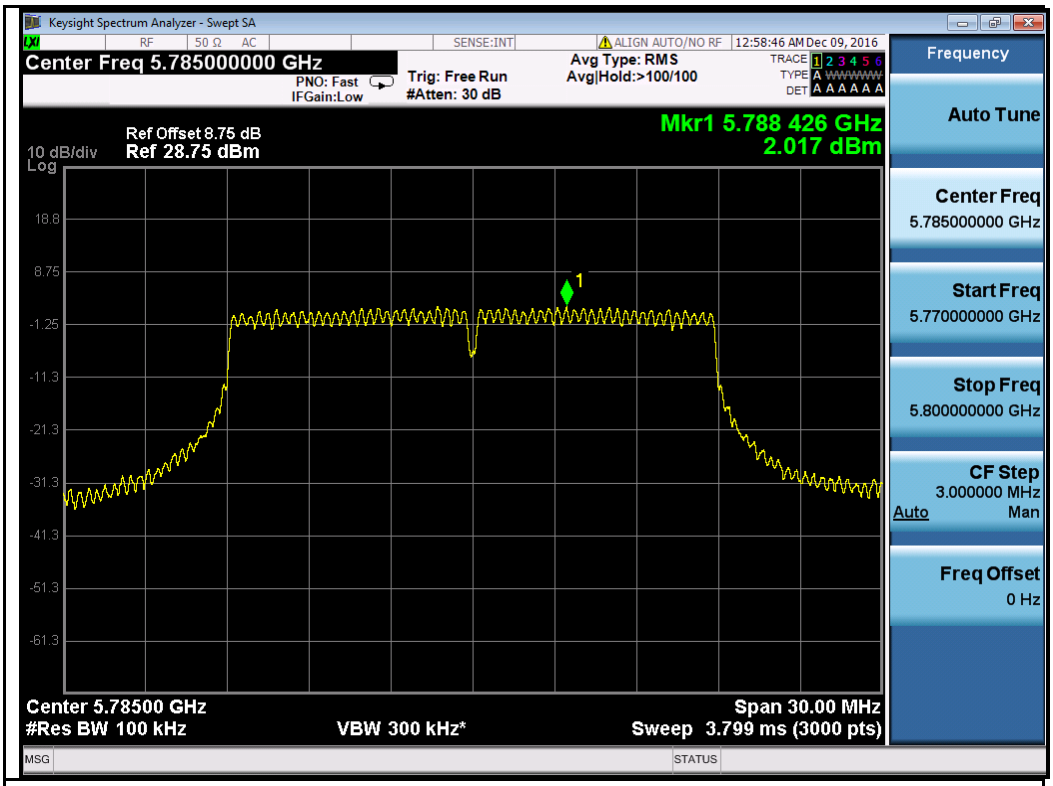

802.11a-5785M



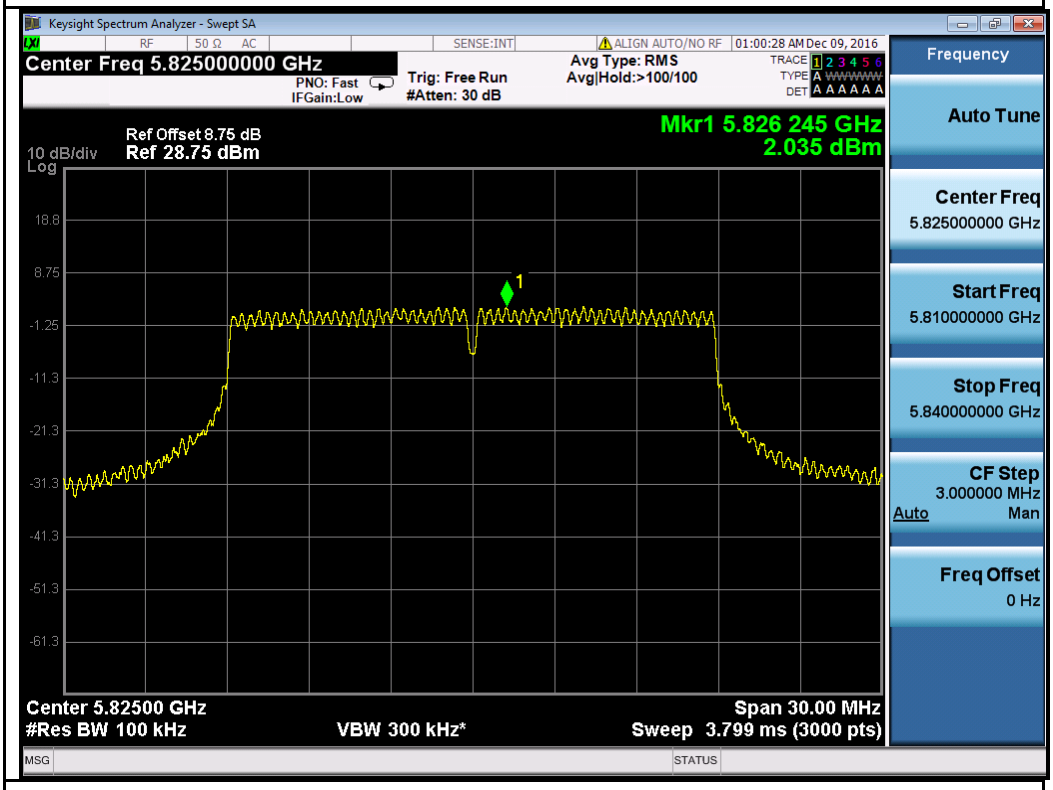

802.11a-5825M



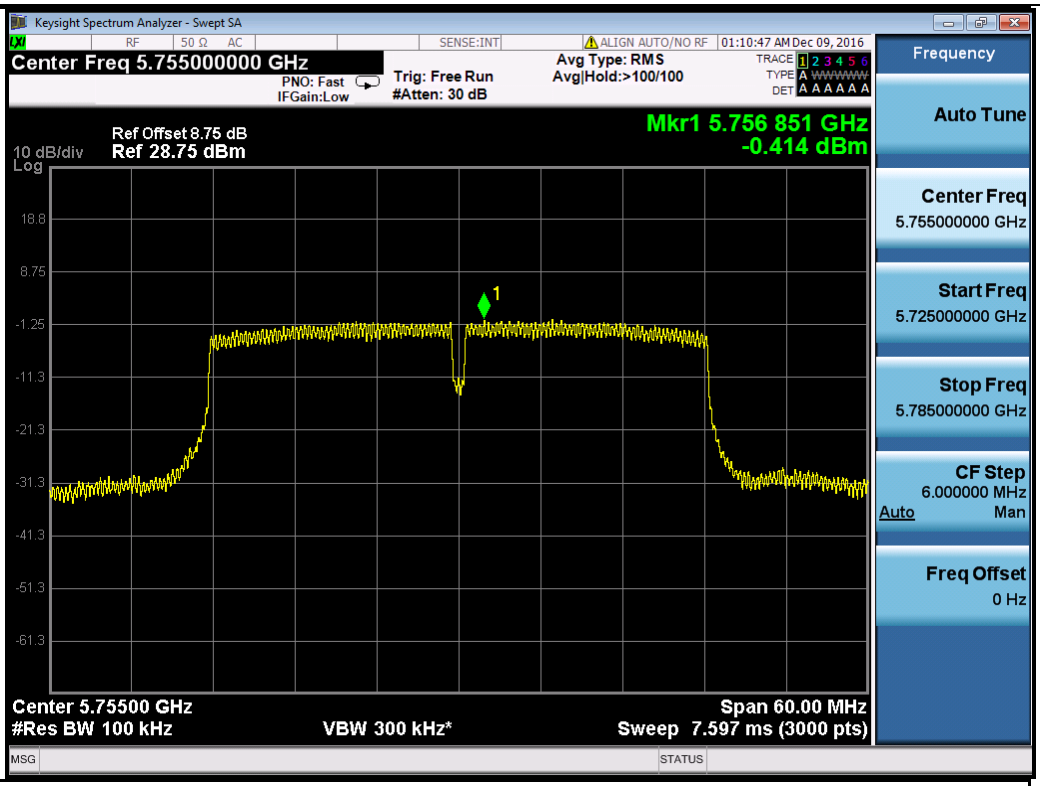

802.11n-HT20 5745M



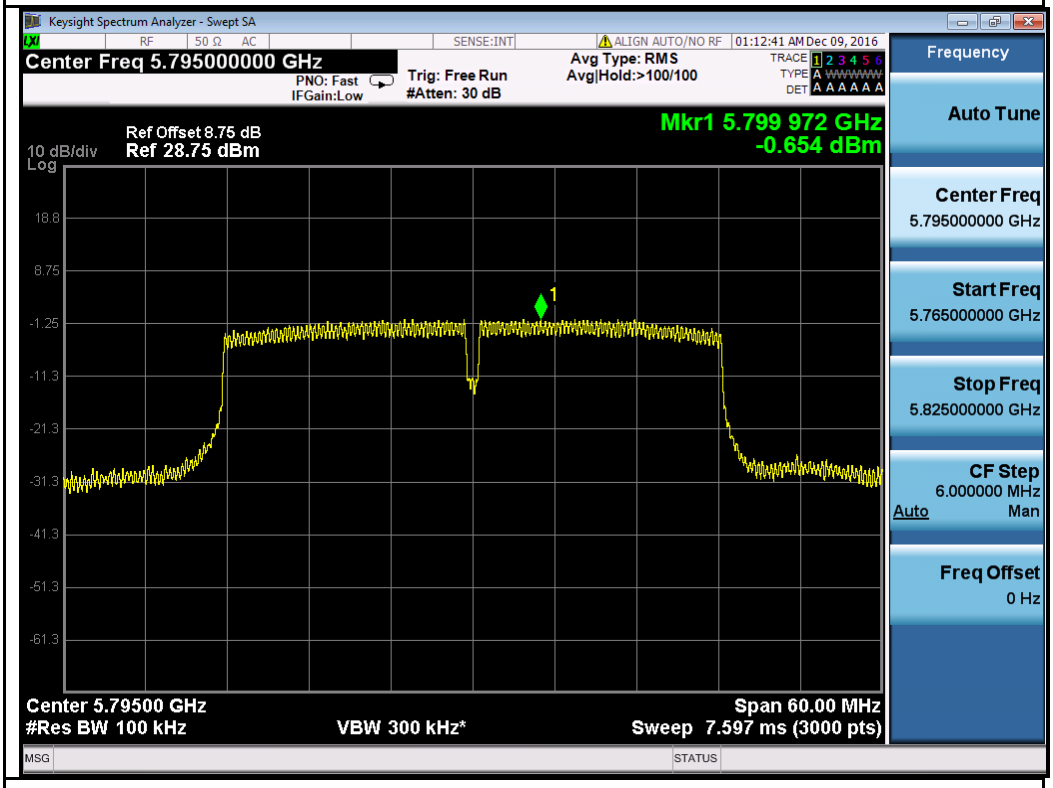

802.11n-HT20 5785M



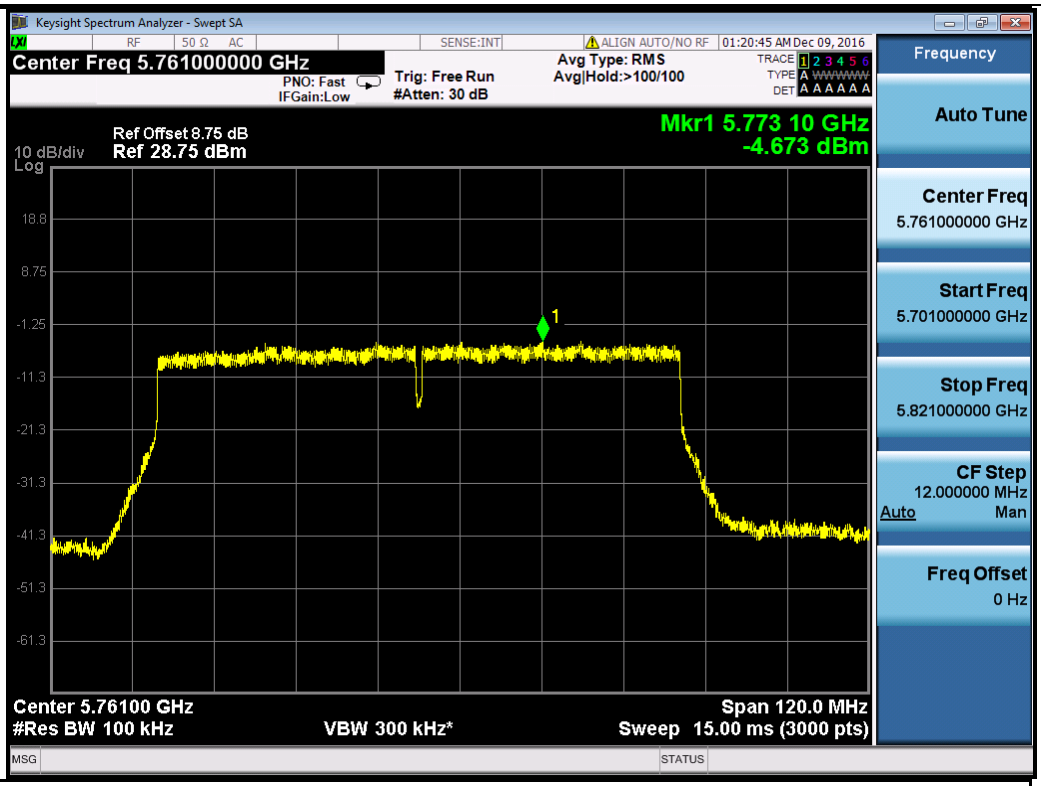

802.11n-HT20 5825M




802.11n-HT40 5755M

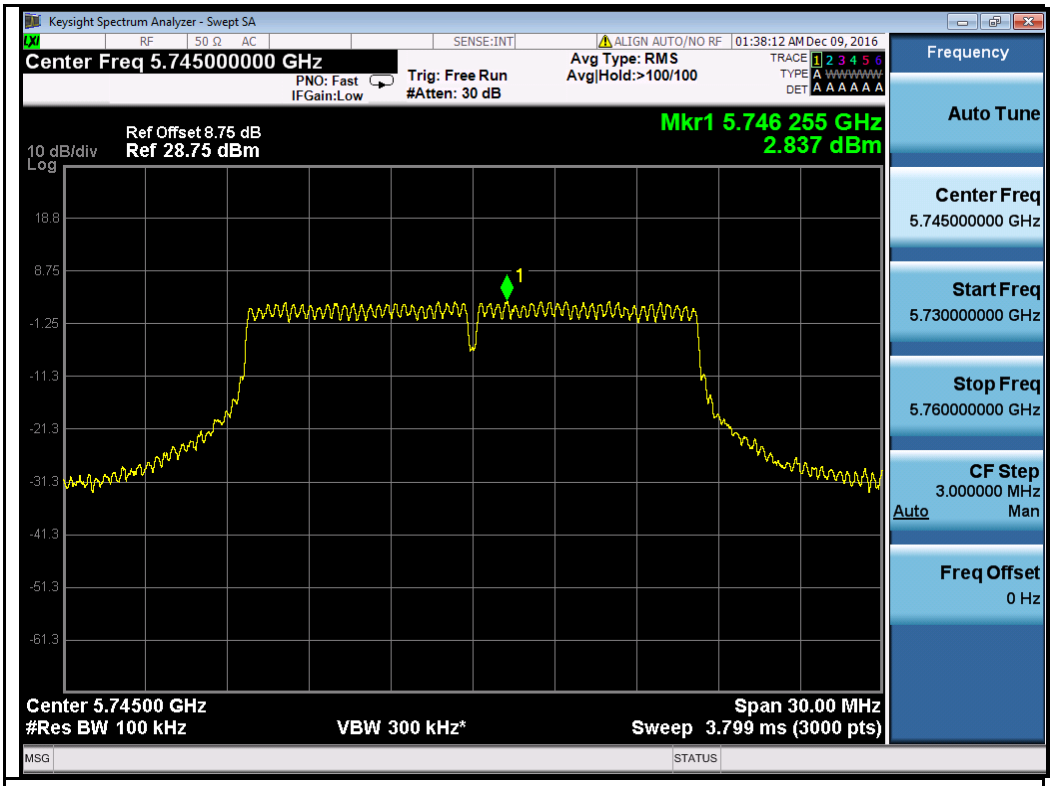



802.11n-HT40 5795M

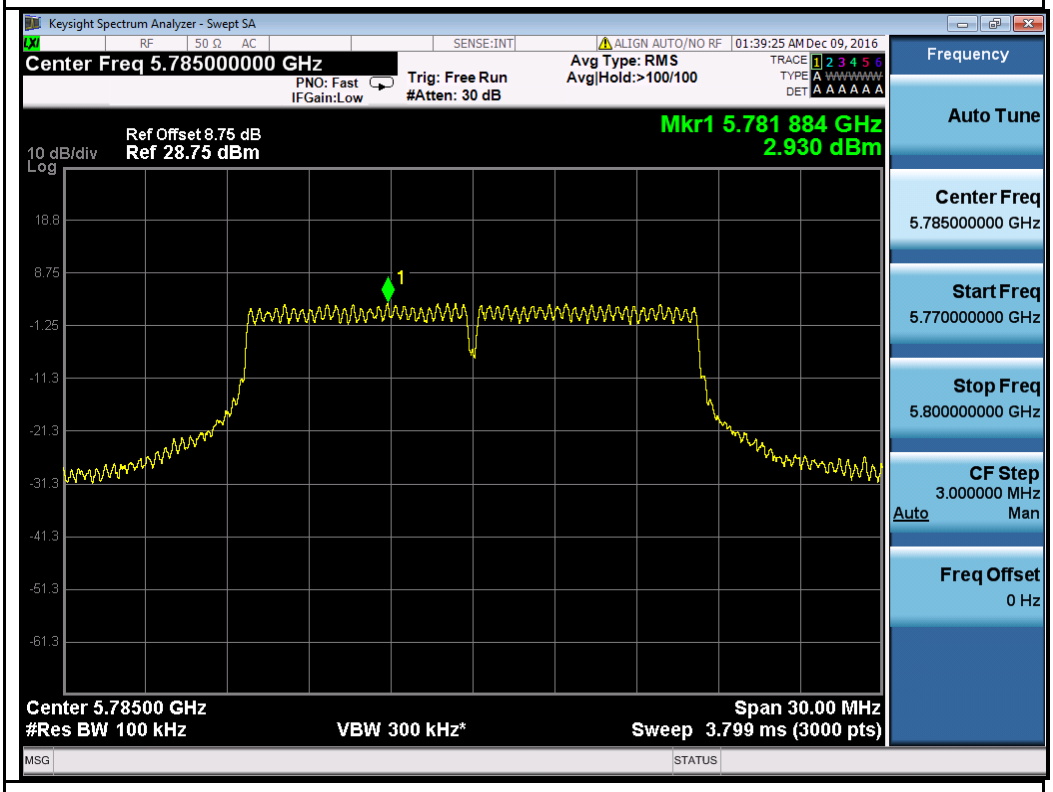



802.11ac-VHT80 5775M

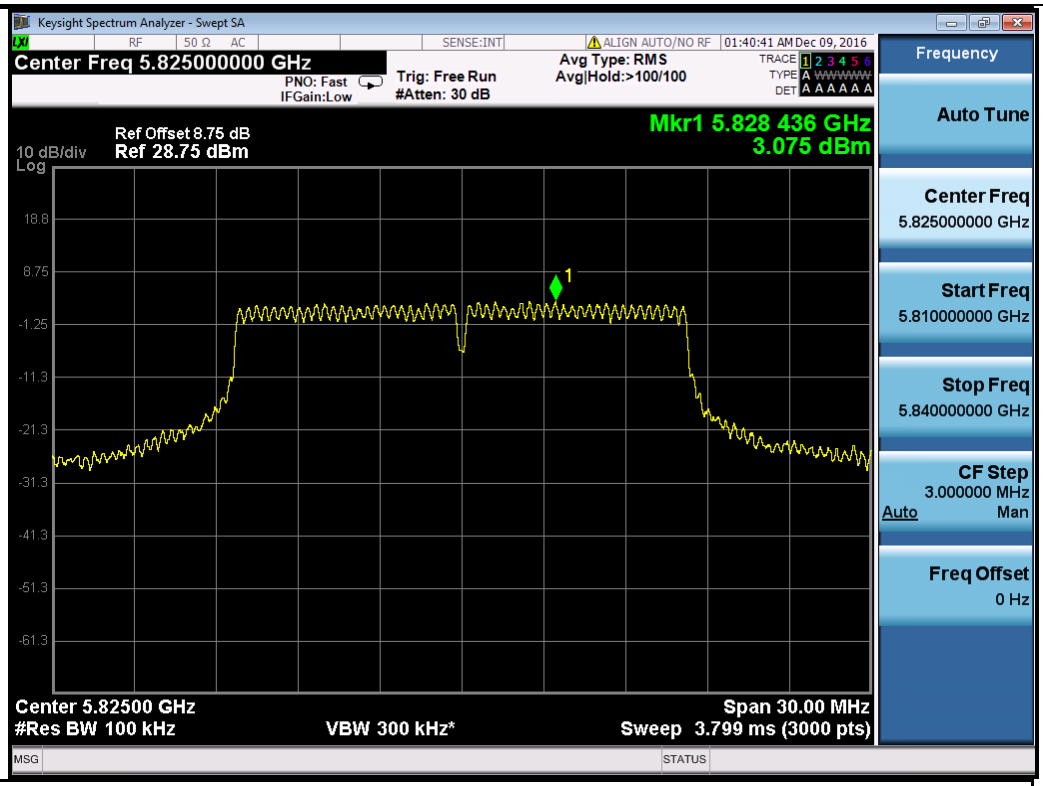
**Chain 2:**



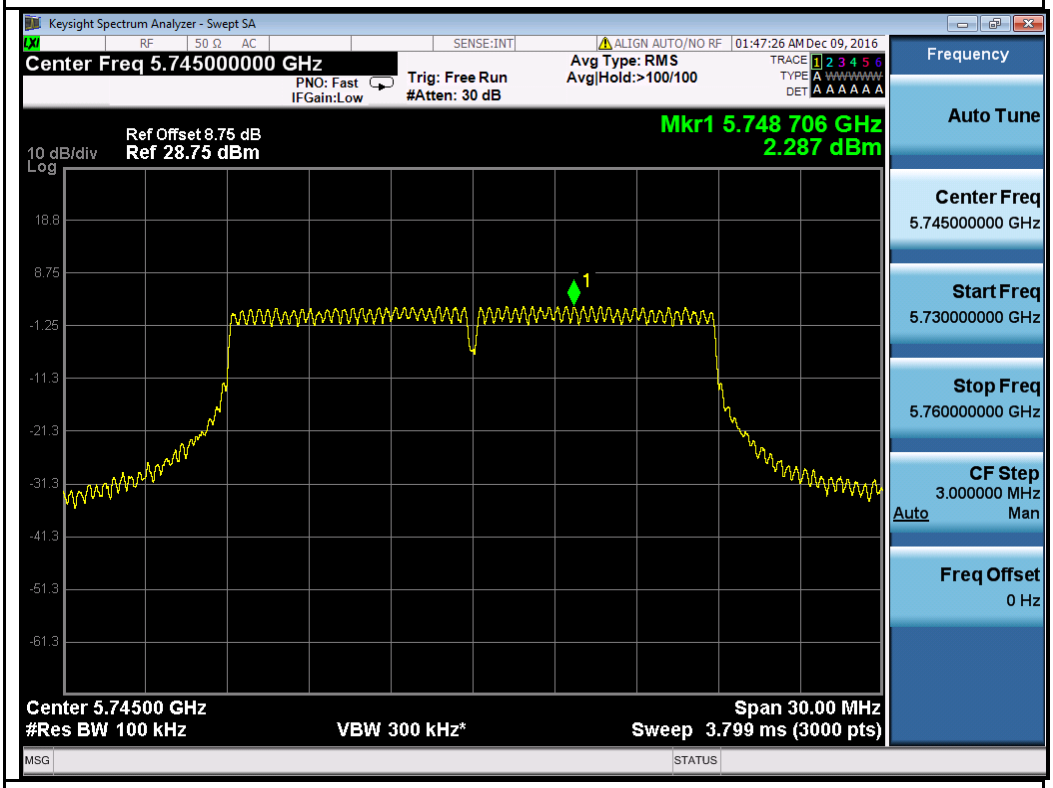

802.11a-5745M



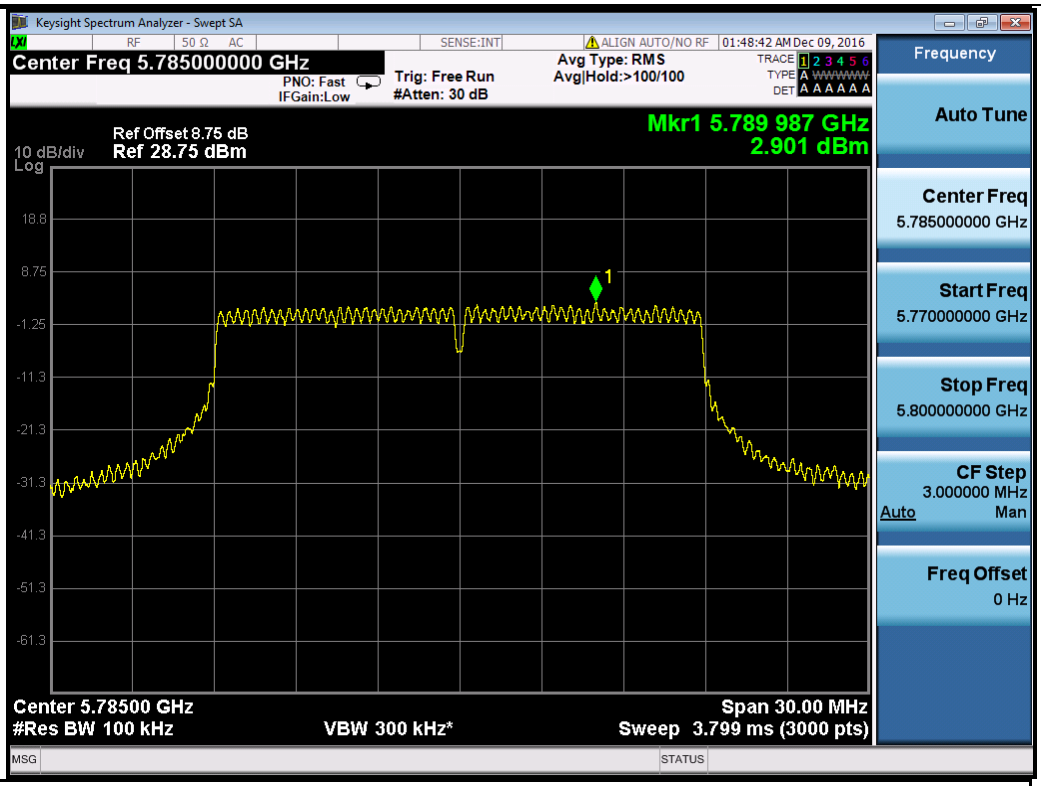

802.11a-5785M



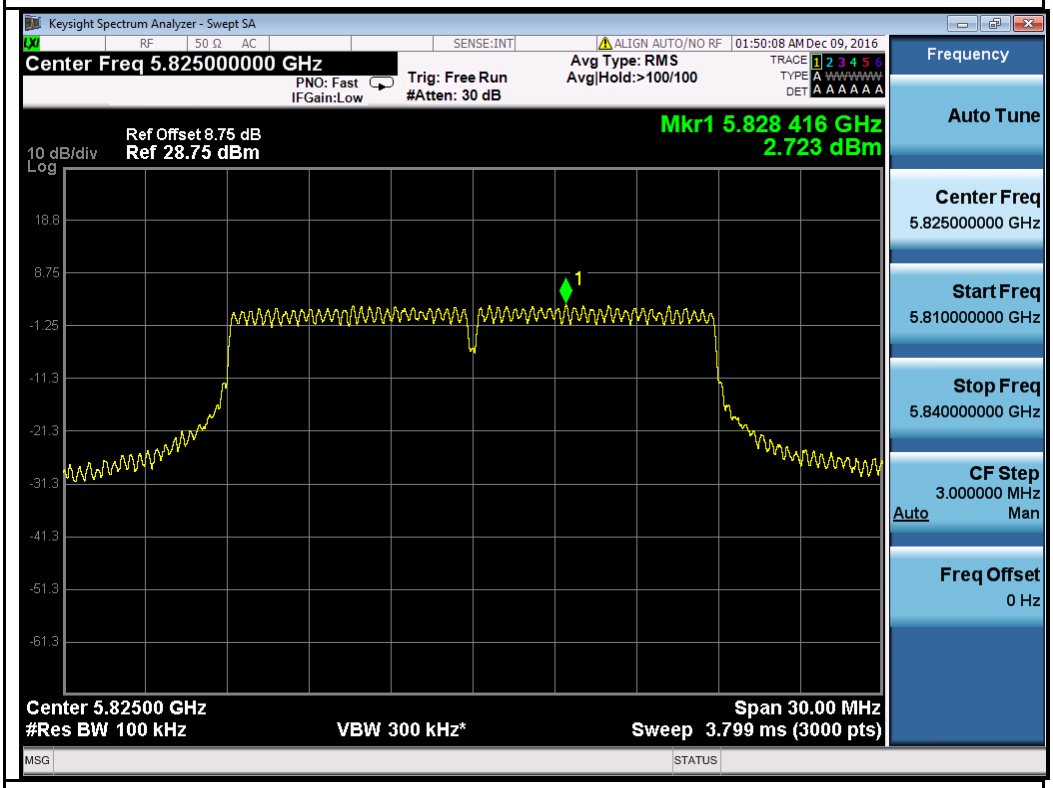

802.11a-5825M



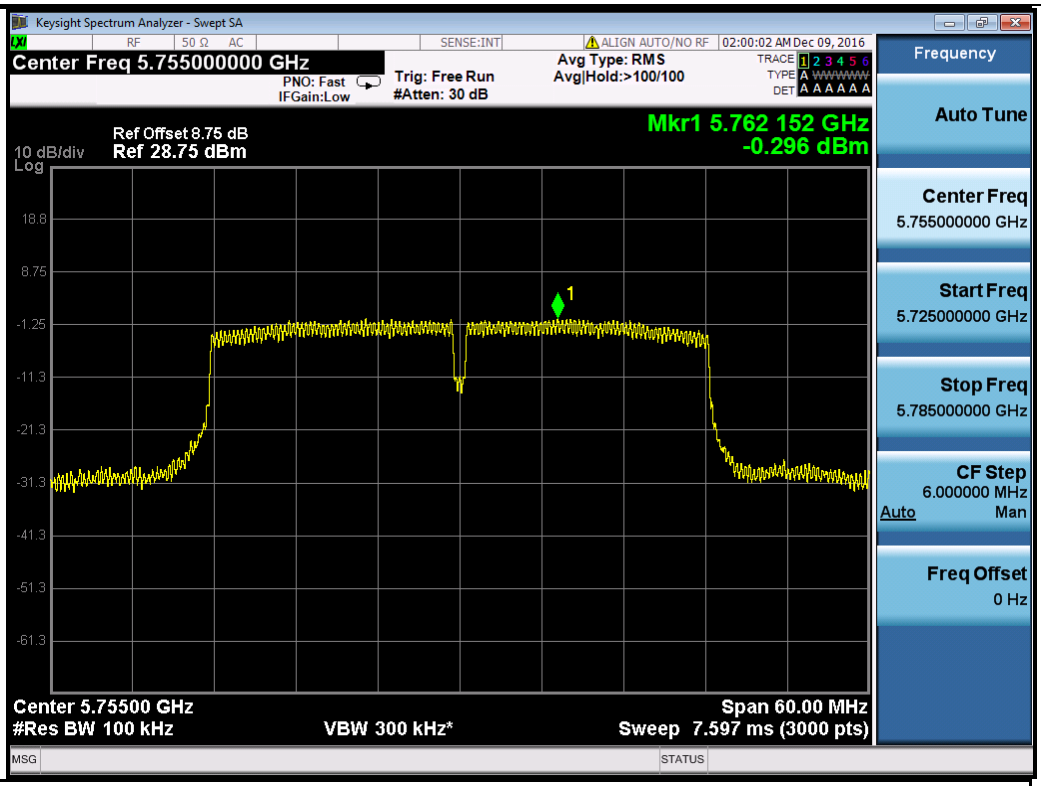

802.11n-HT20 5745M



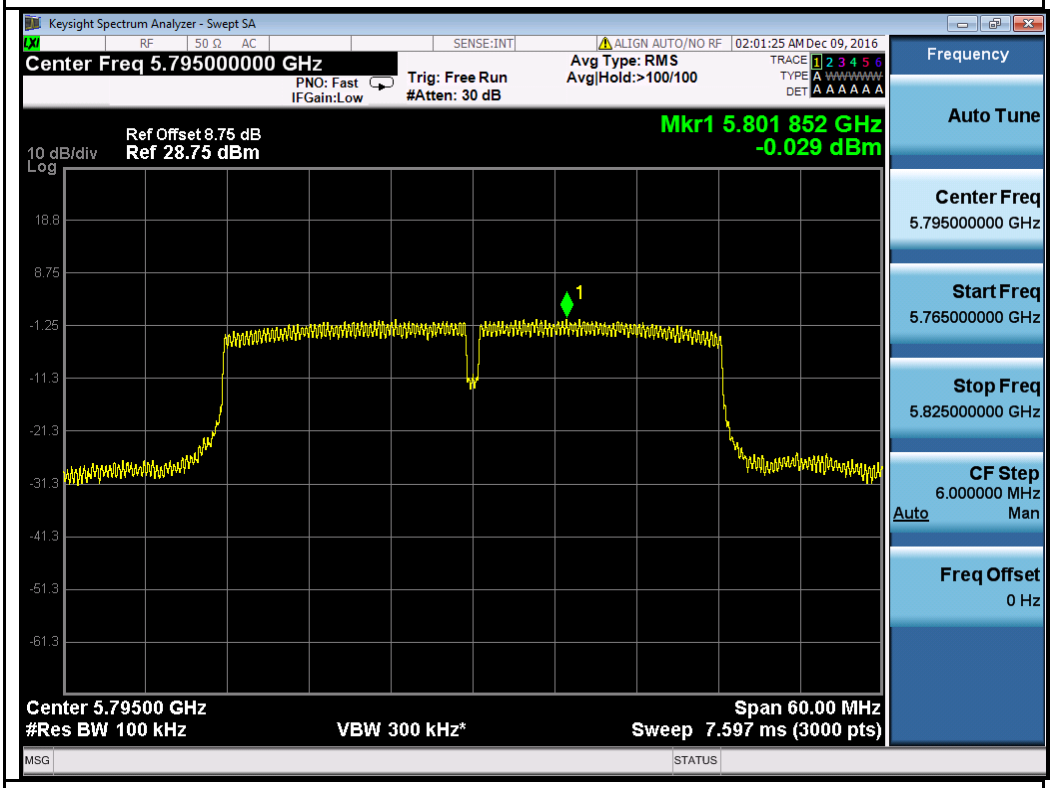

802.11n-HT20 5785M



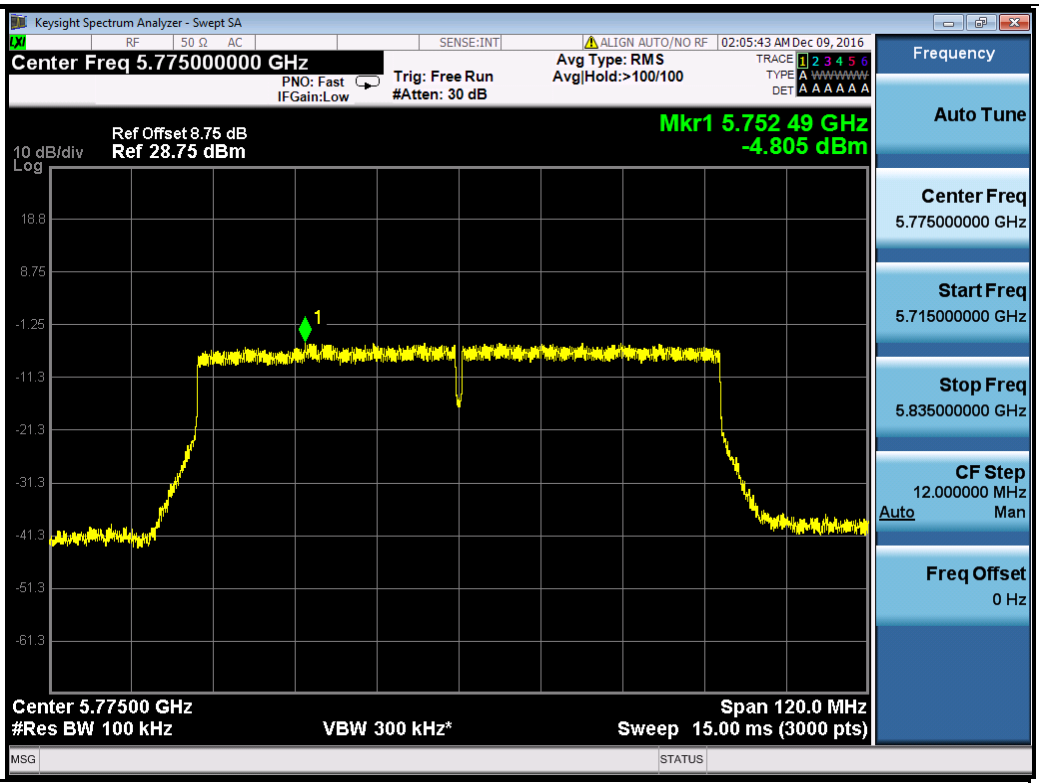

802.11n-HT20 5825M




802.11n-HT40 5755M

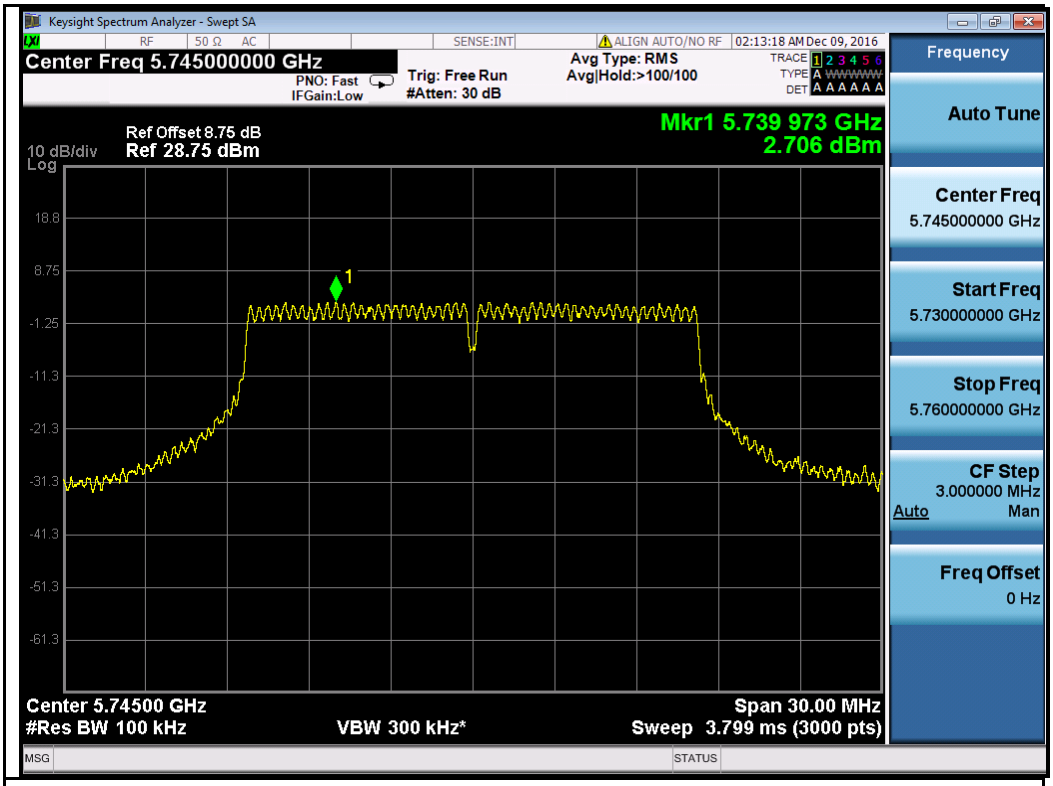



802.11n-HT40 5795M

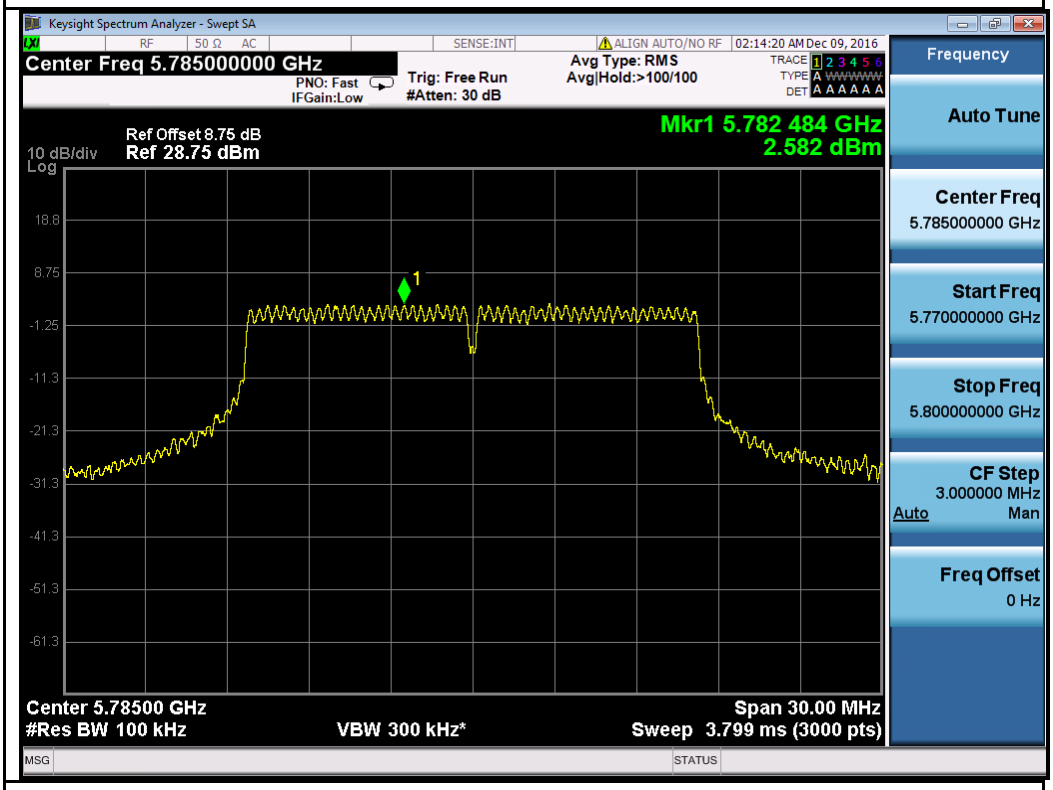



802.11ac-VHT80 5775M

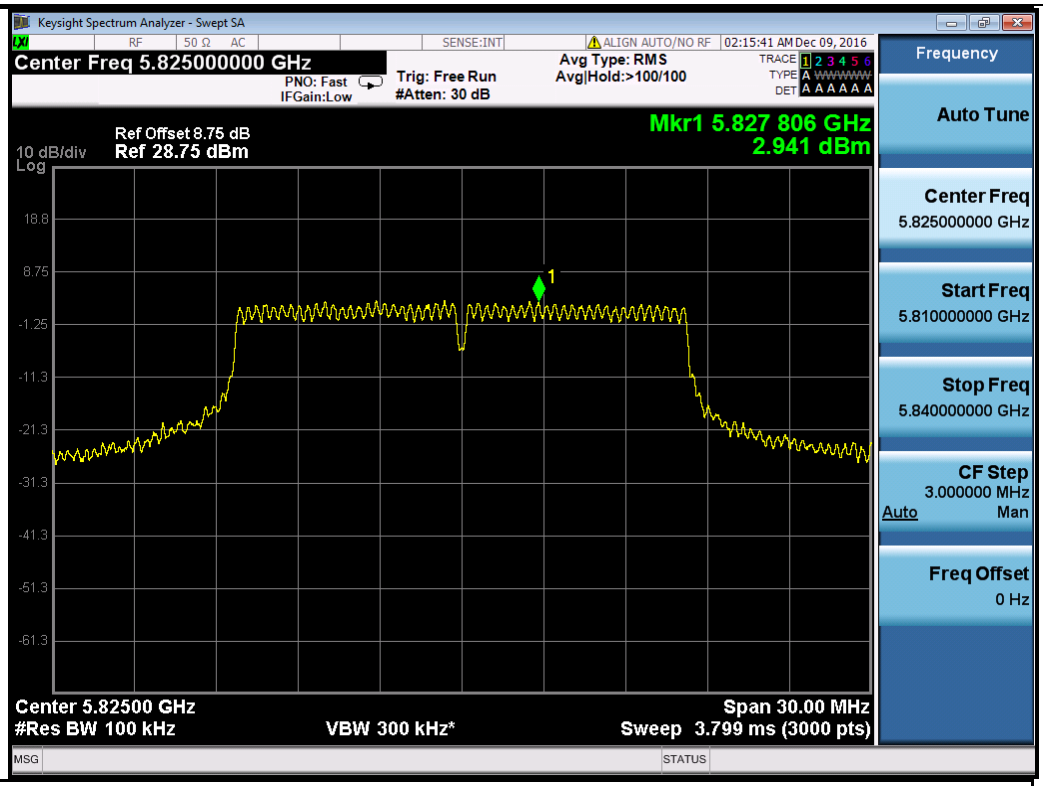
**Chain 3:**



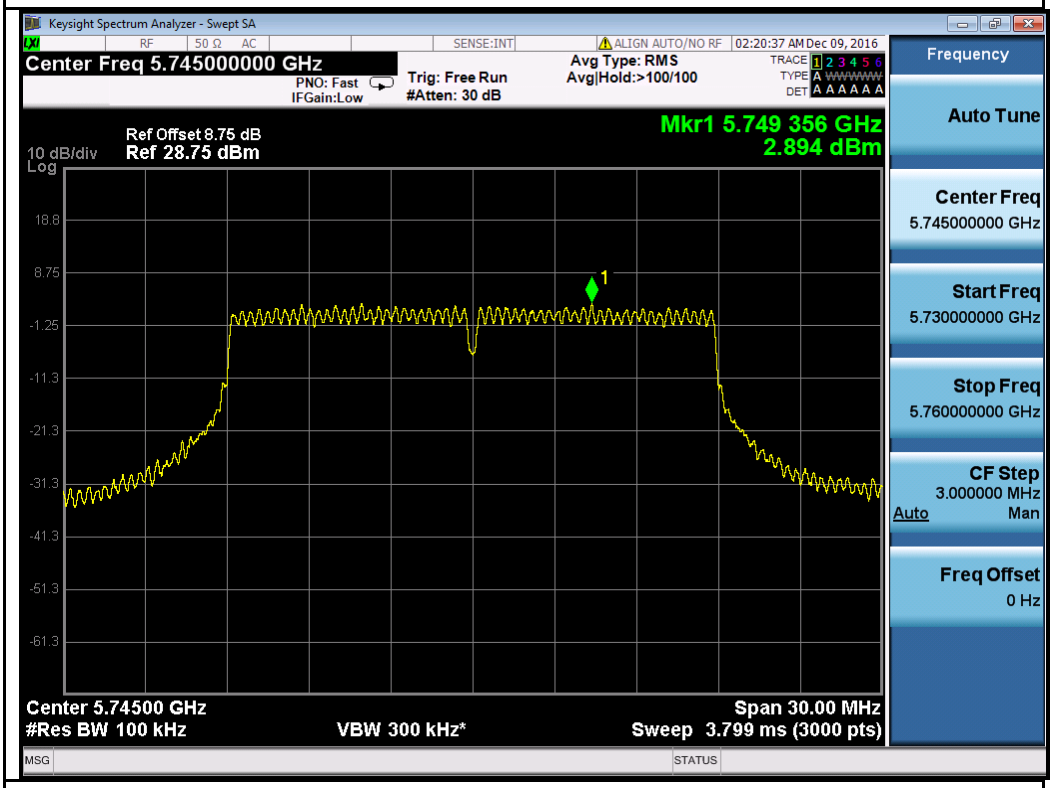

802.11a-5745M



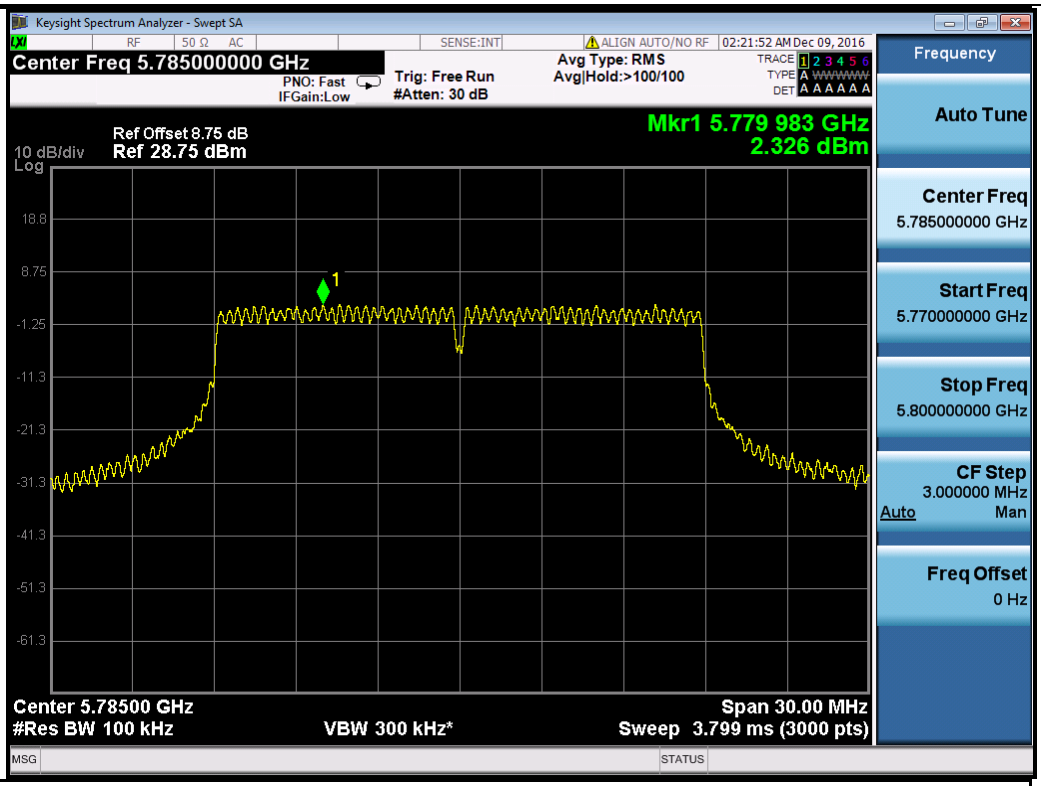

802.11a-5785M



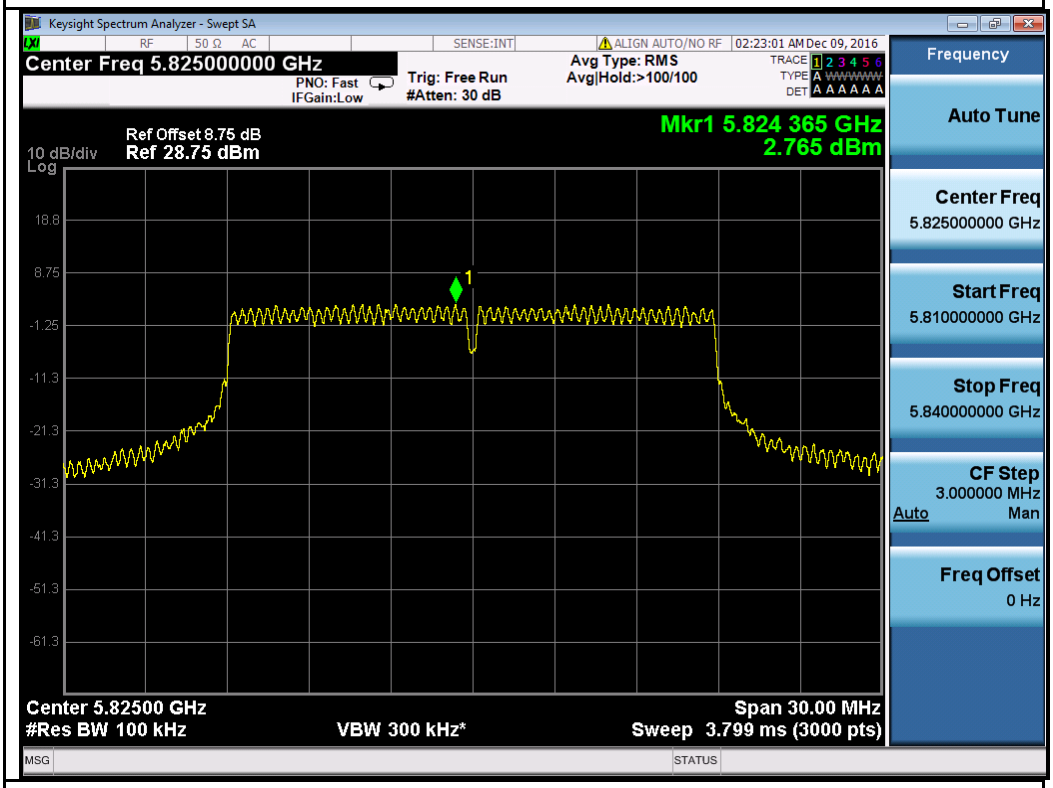

802.11a-5825M



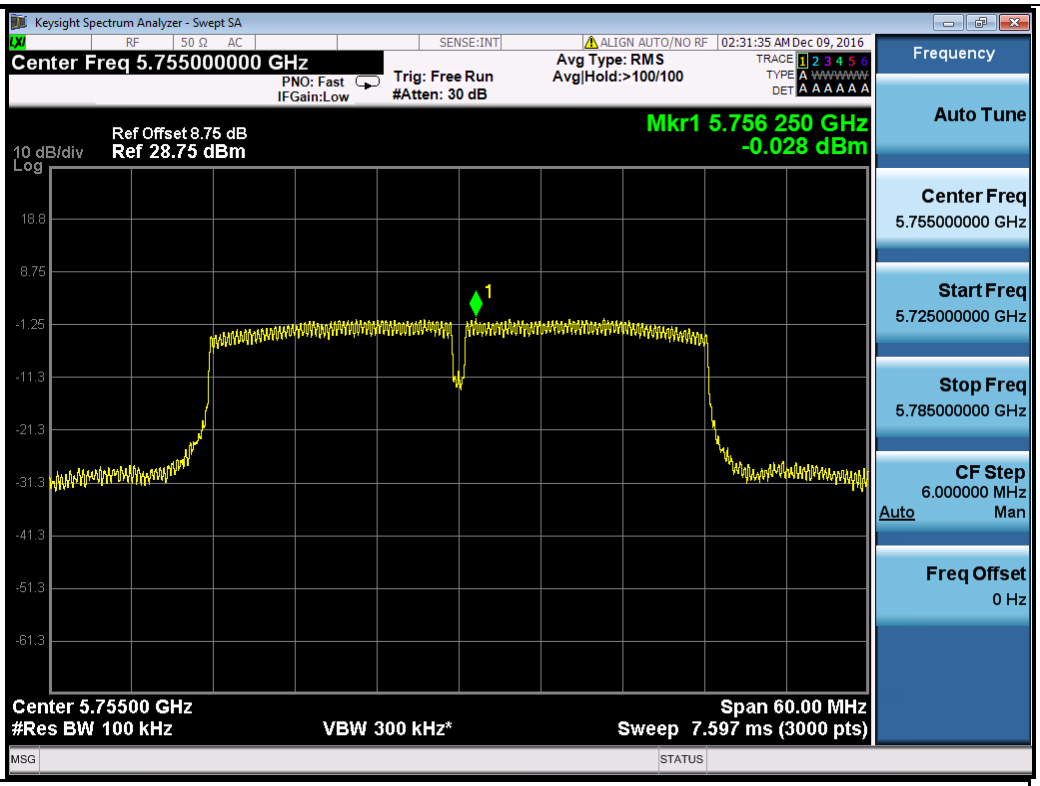

802.11n-HT20 5745M



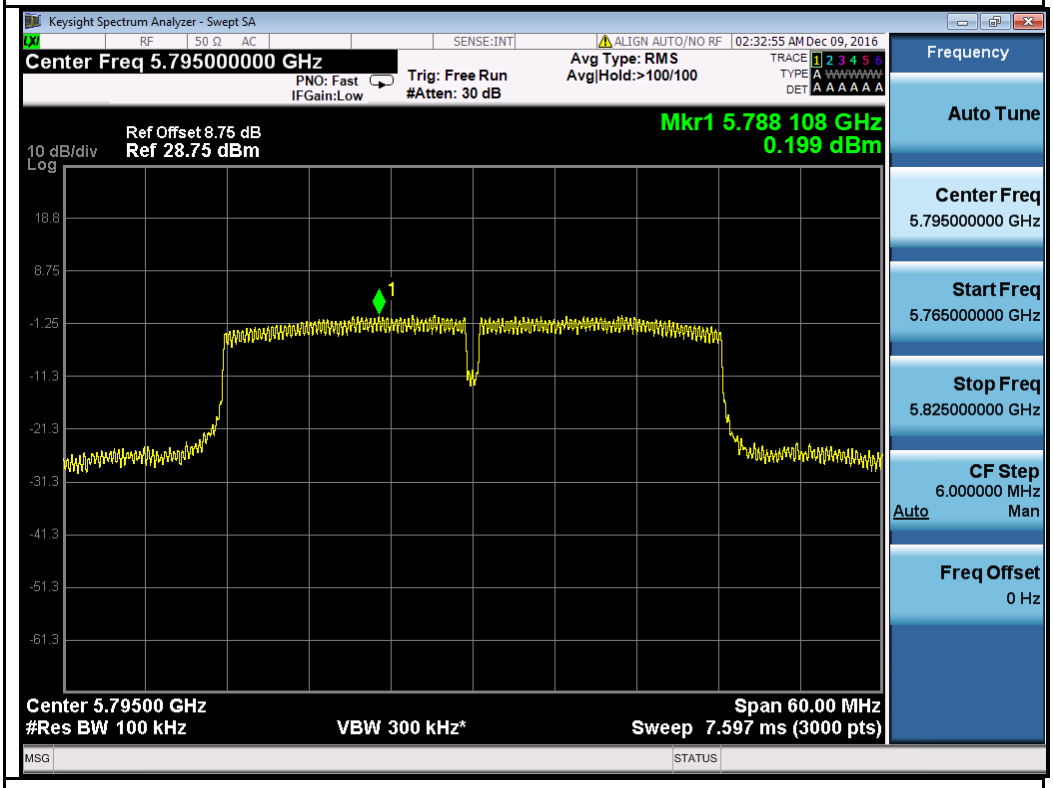

802.11n-HT20 5785M



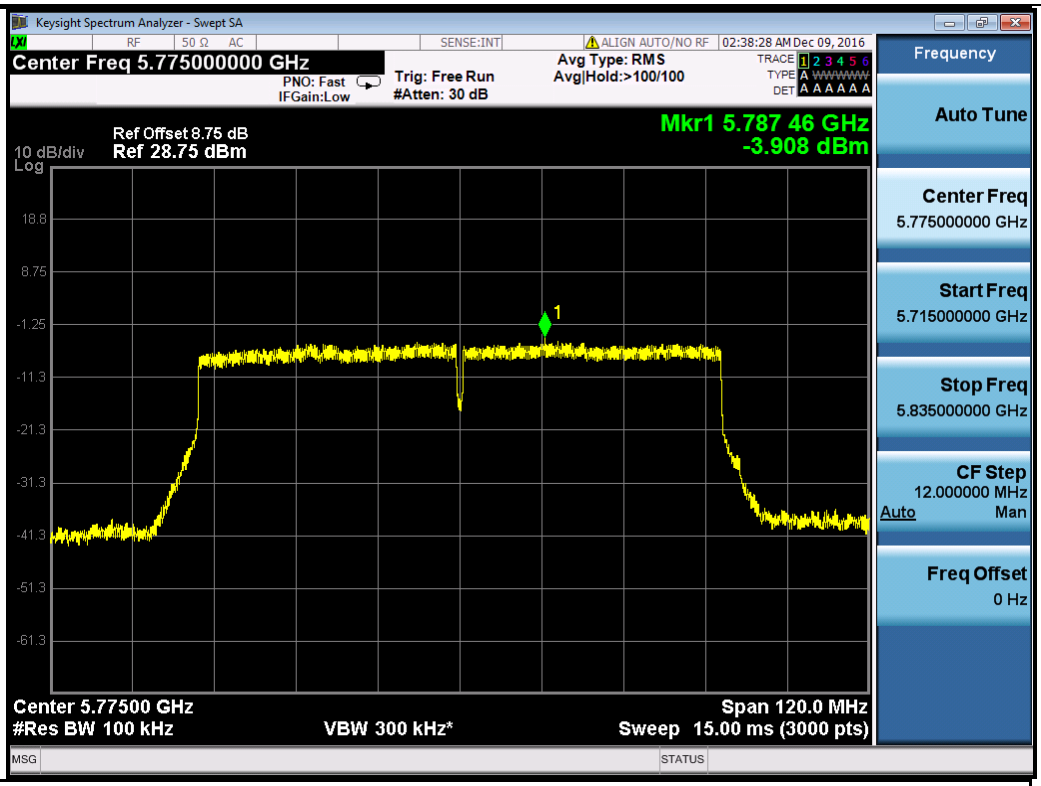

802.11n-HT20 5825M




802.11n-HT40 5755M

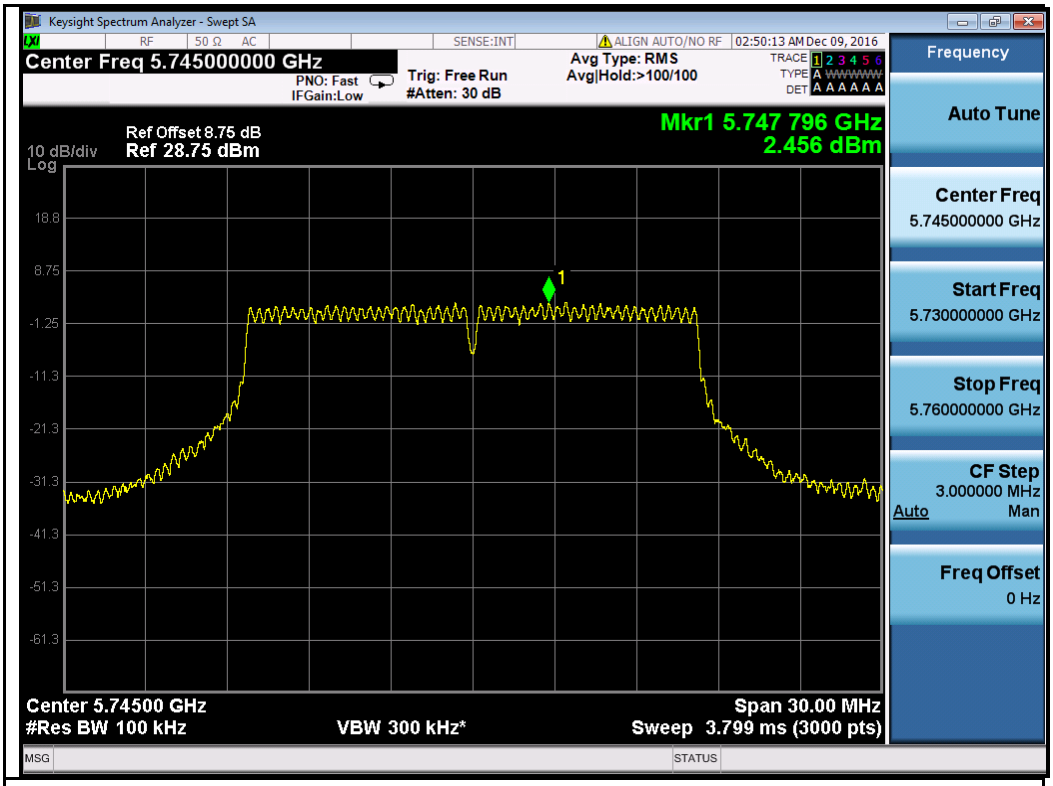



802.11n-HT40 5795M

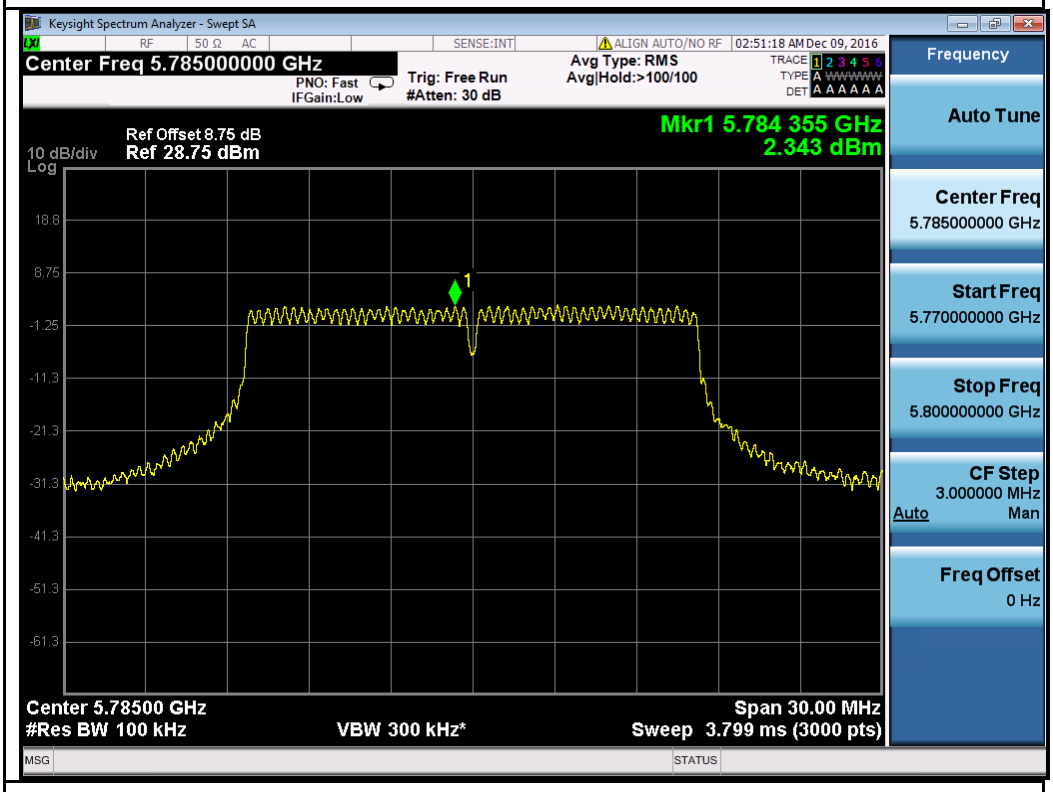



802.11ac-VHT80 5775M

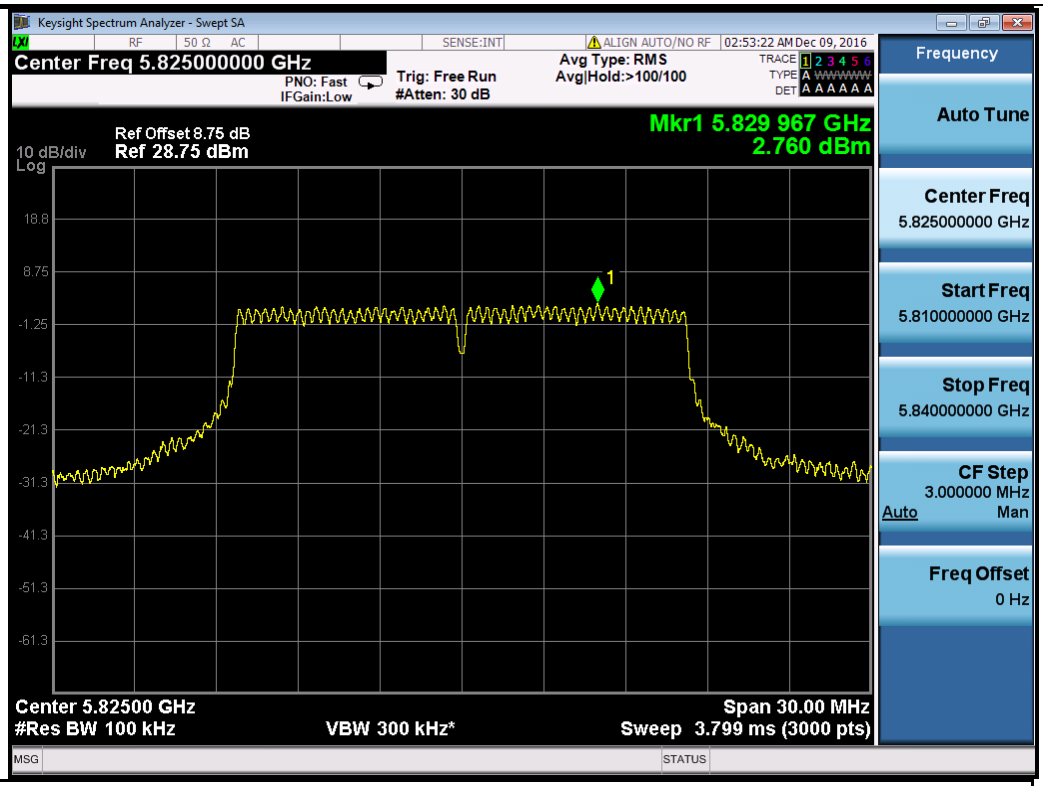
**Chain 4:**



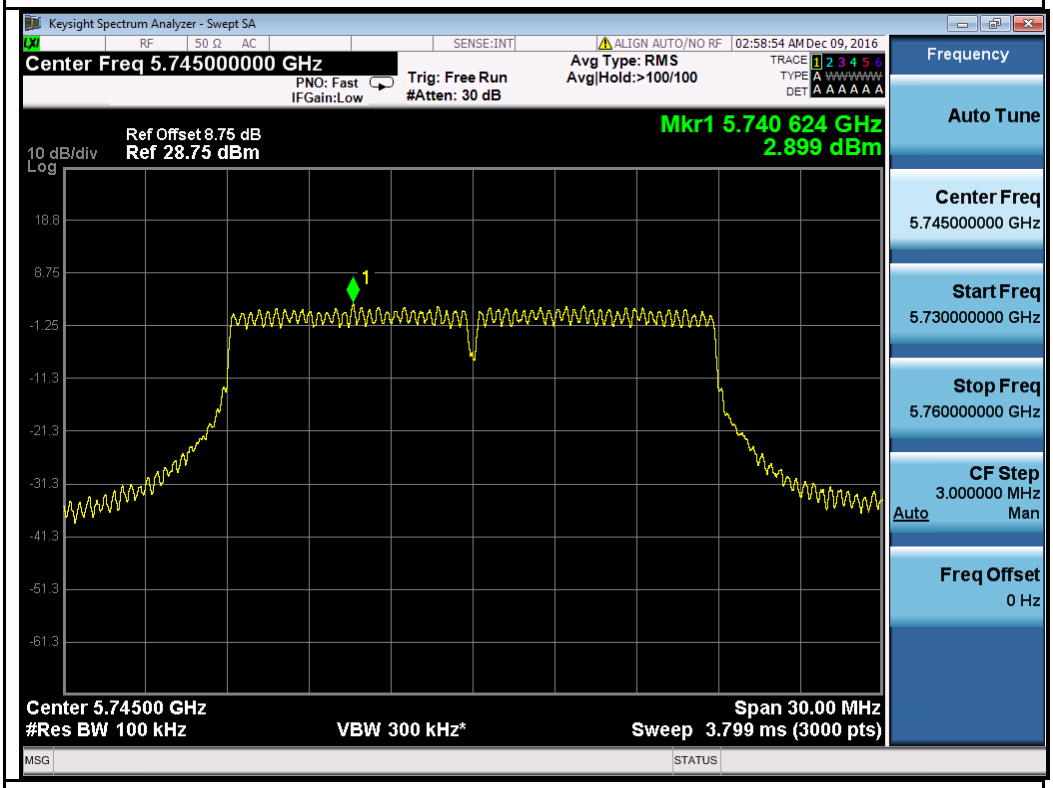

802.11a-5745M



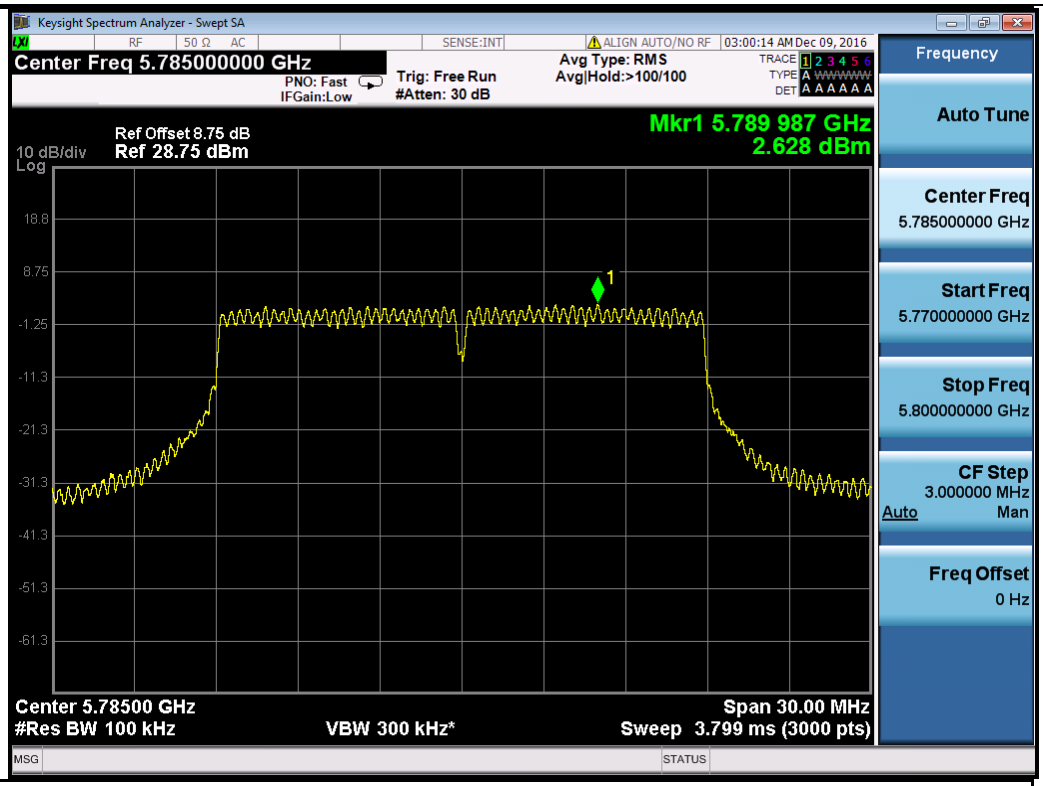

802.11a-5785M



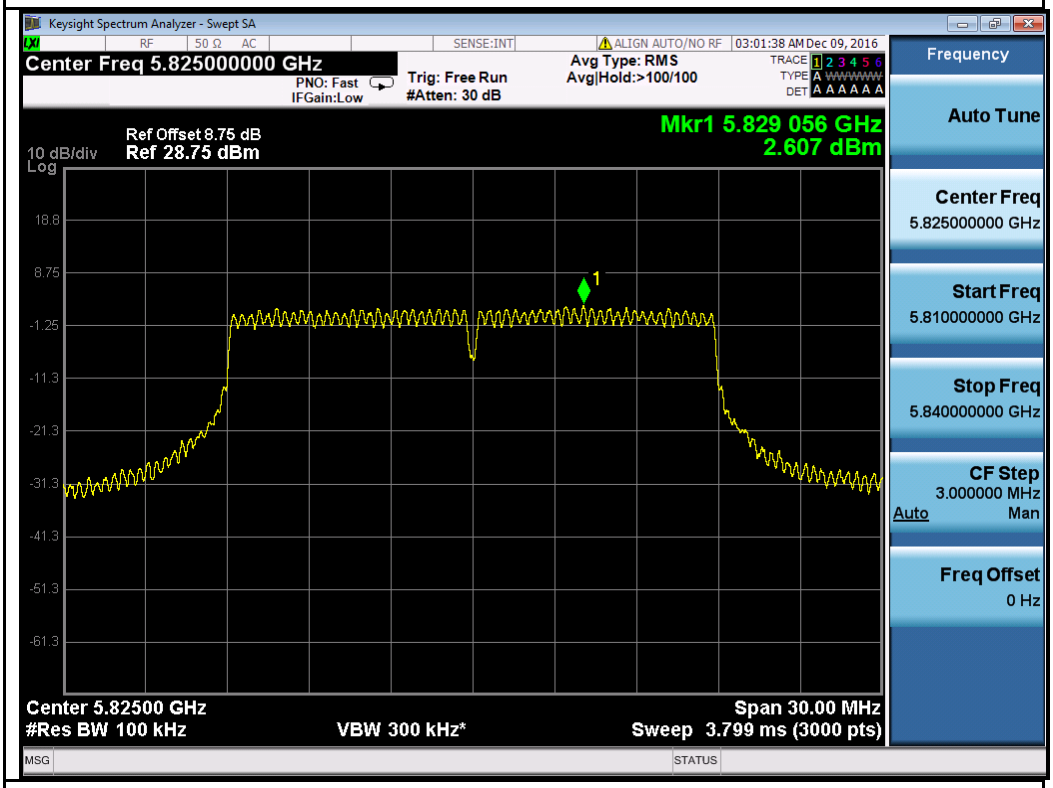

802.11a-5825M



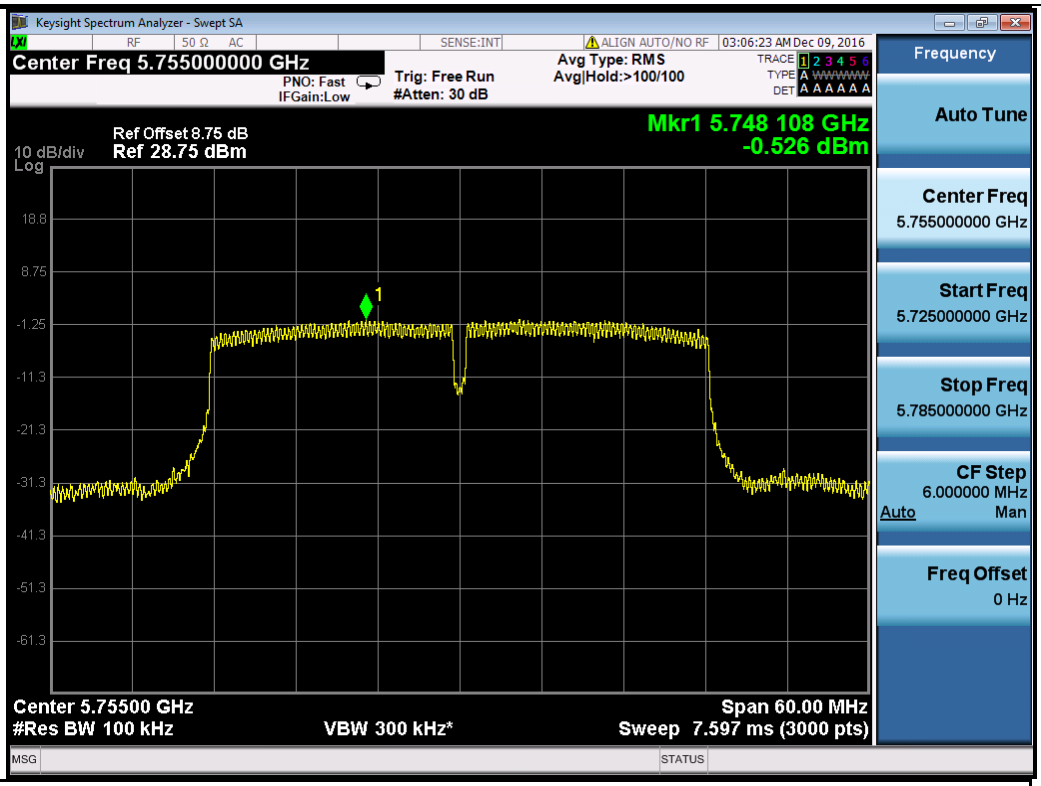

802.11n-HT20 5745M



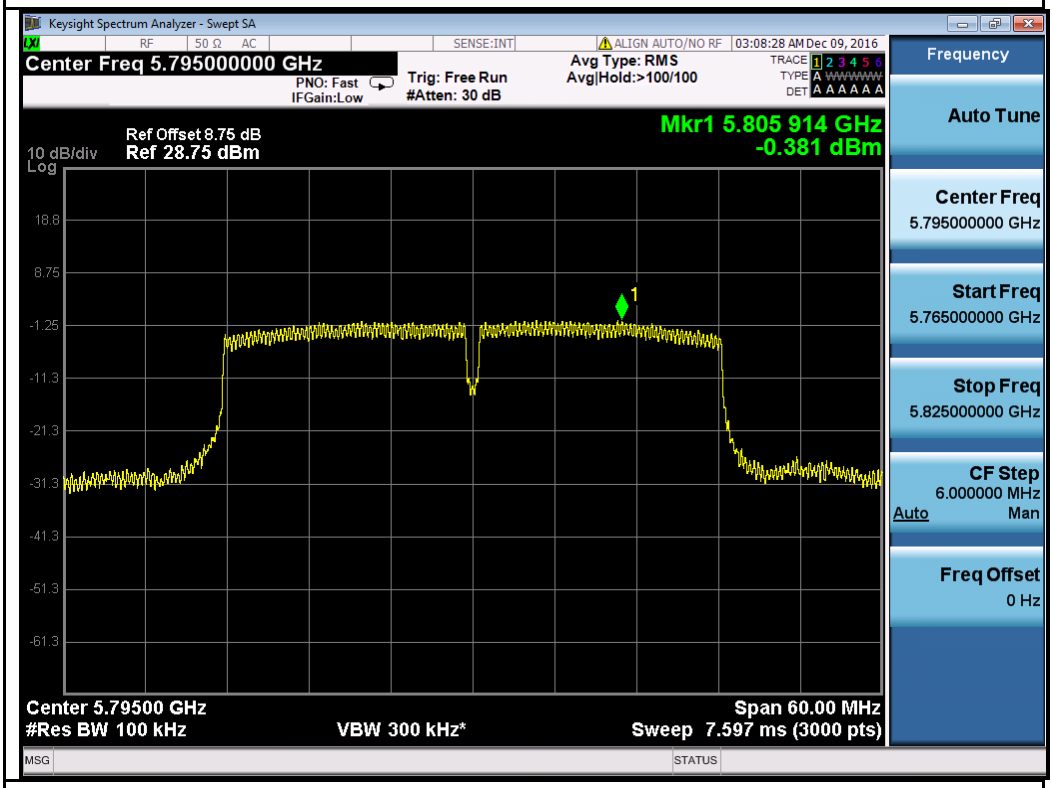

802.11n-HT20 5785M



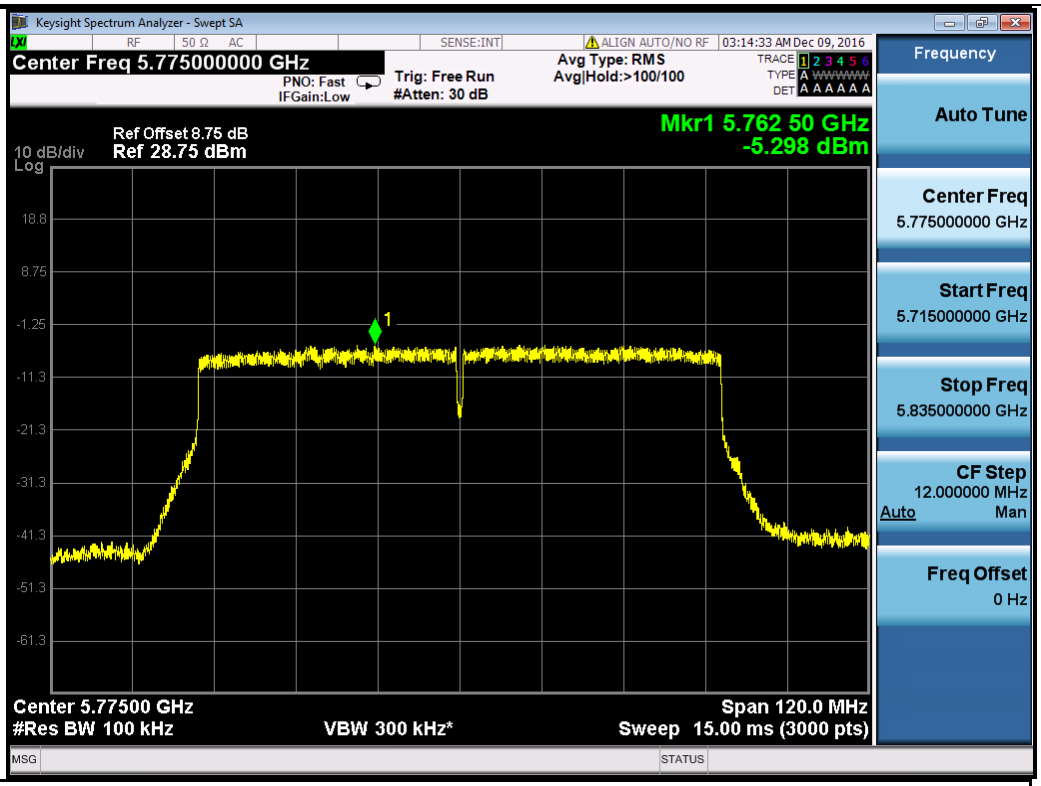

802.11n-HT20 5825M




802.11n-HT40 5755M



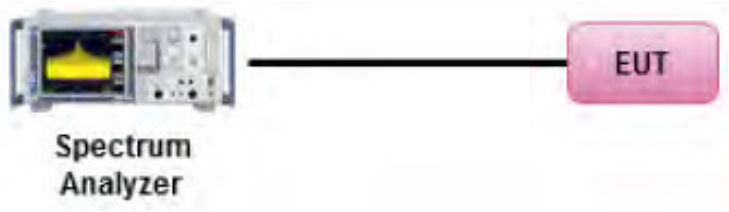

802.11n-HT40 5795M




802.11ac-VHT80 5775M

## 10.5 Band Edge and Emission Mask Measurement

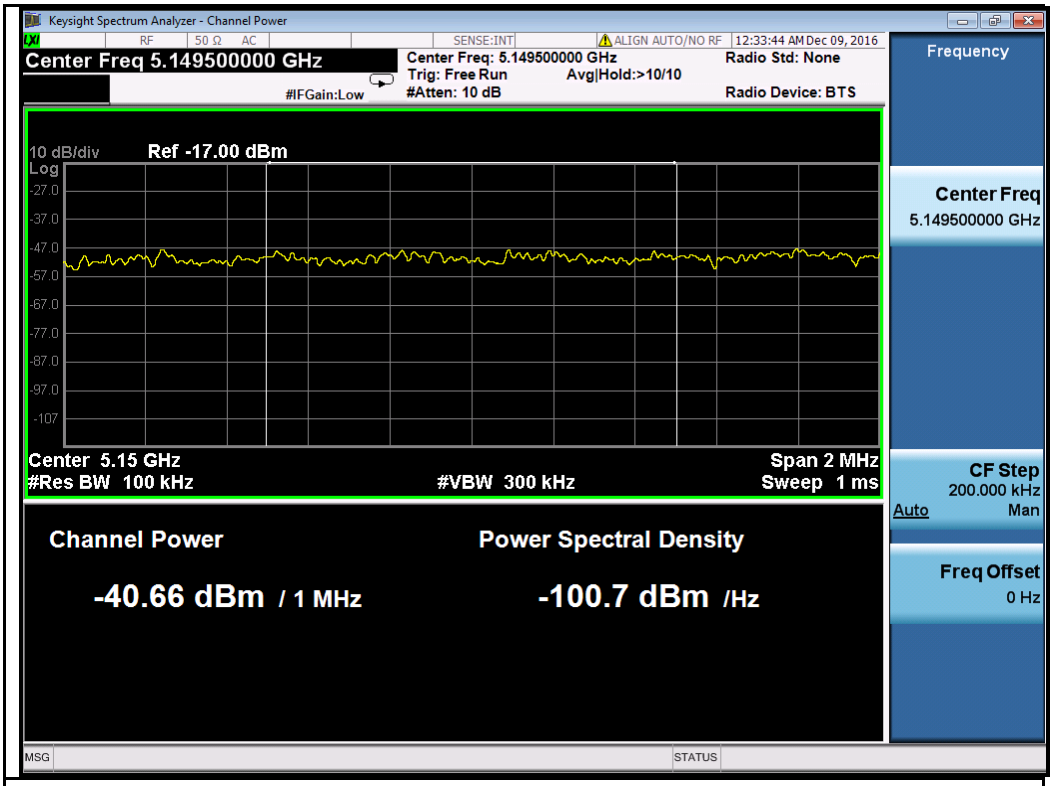
**Requirement(s):**

| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| 47CFR§ 15.407(b)(2), 15.407(b)(6) | (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 EIRP of -27 dBm/MHz. | ☒ |
| | (4) | For transmitters operating in the 5.725-5.825 GHz band: 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. | ☒ |
| Test Setup |  | | |
| Procedure | 789033 D02 General UNII Test Procedures New Rules v01r02, II.F. Method SA-1<br><br>Band Edge measurement:<br>- For average emissions measurements, follow the procedures described in section II.G.6., "Procedures for Average Unwanted Emissions Measurements above 1000 MHz", except for the following changes:<br>- Set RBW=100kHz<br>- Set VBW=300kHz<br>- Perform a band-power integration across the 1 MHz bandwidth in which the band-edge emission level is to be measured. | | |
| Remark | Antenna gain was added to the offset. | | |
| Result | ☒ Pass ☐ Fail | | |

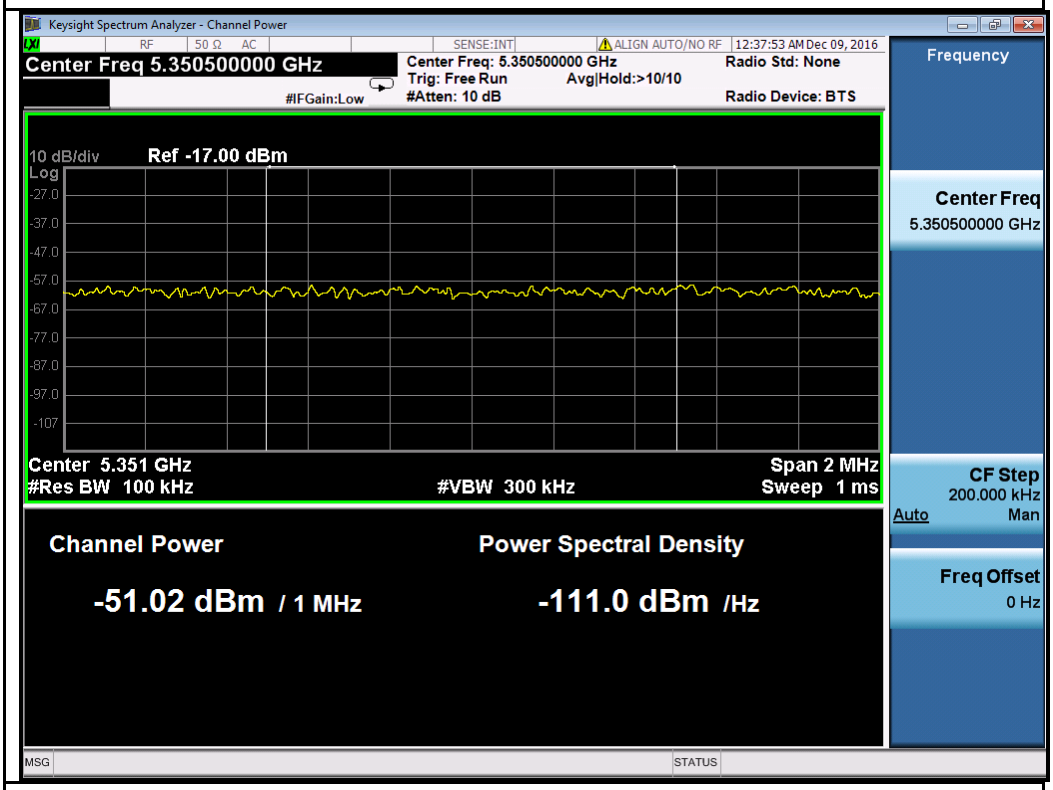
**Test Data** ☐ Yes (See below) ☒ N/A
**Test Plot** ☒ Yes (See below) ☐ N/A

**Test was done by Shuo Zhang at RF test site.**

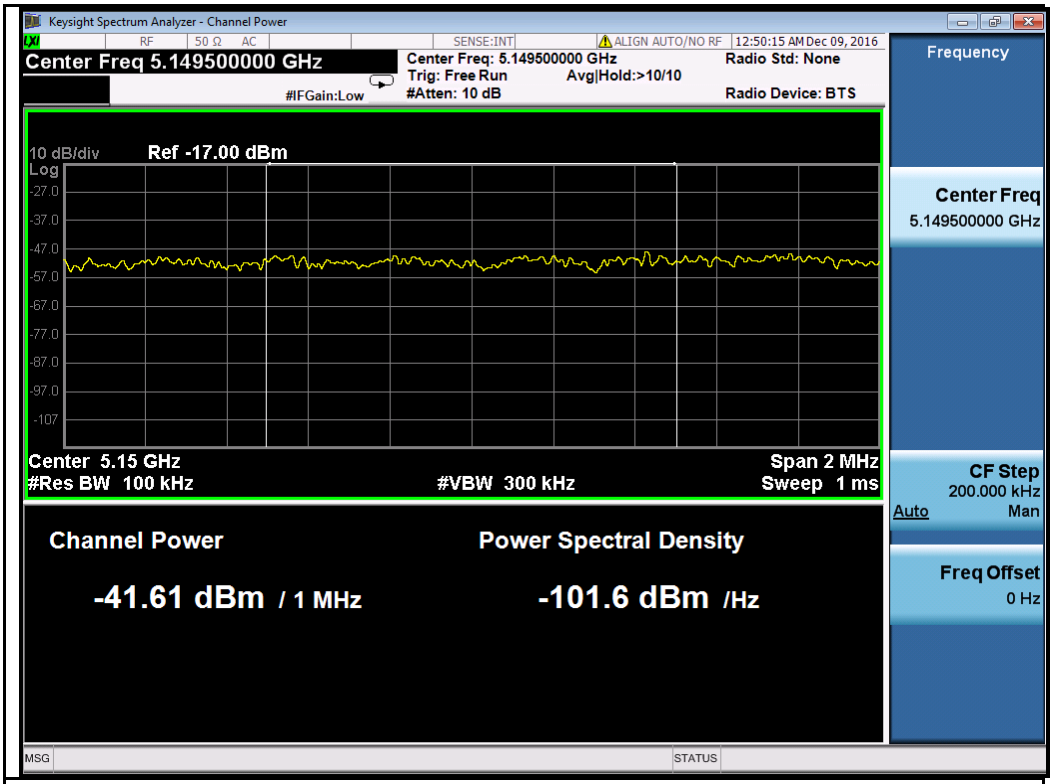
**Test Plots for W52:**
**Chain 1:**



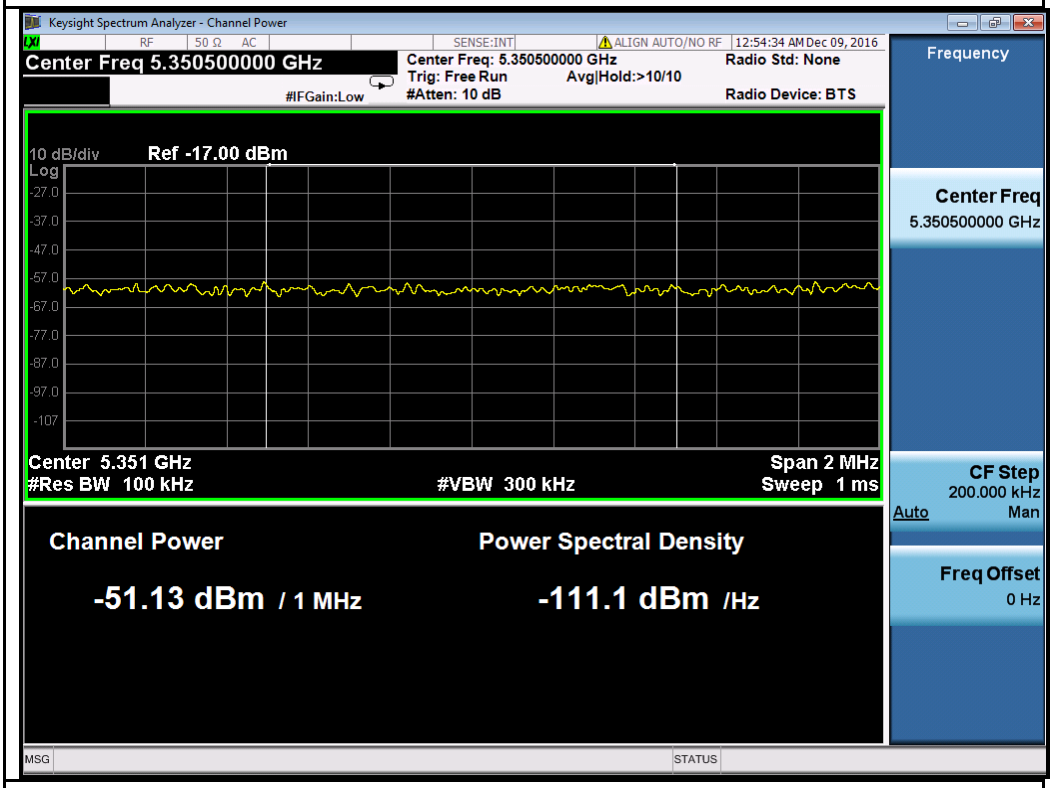

802.11a-5180MHz



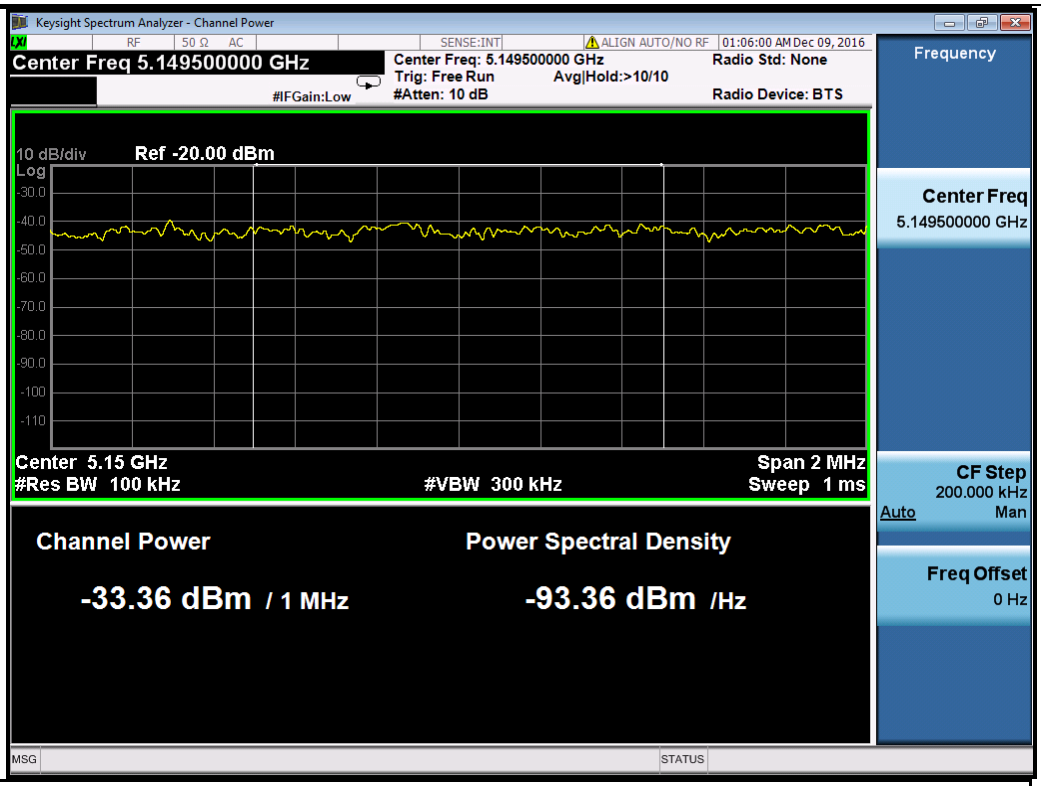

802.11a-5240MHz



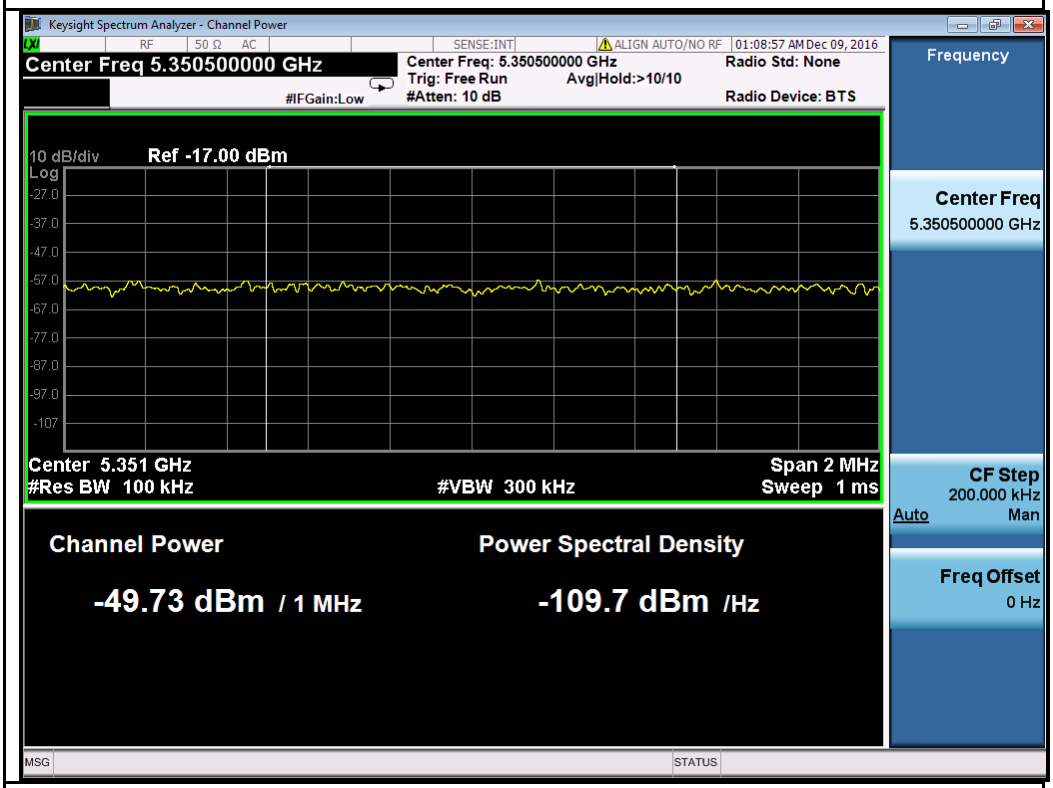

802.11n-HT20-5180MHz



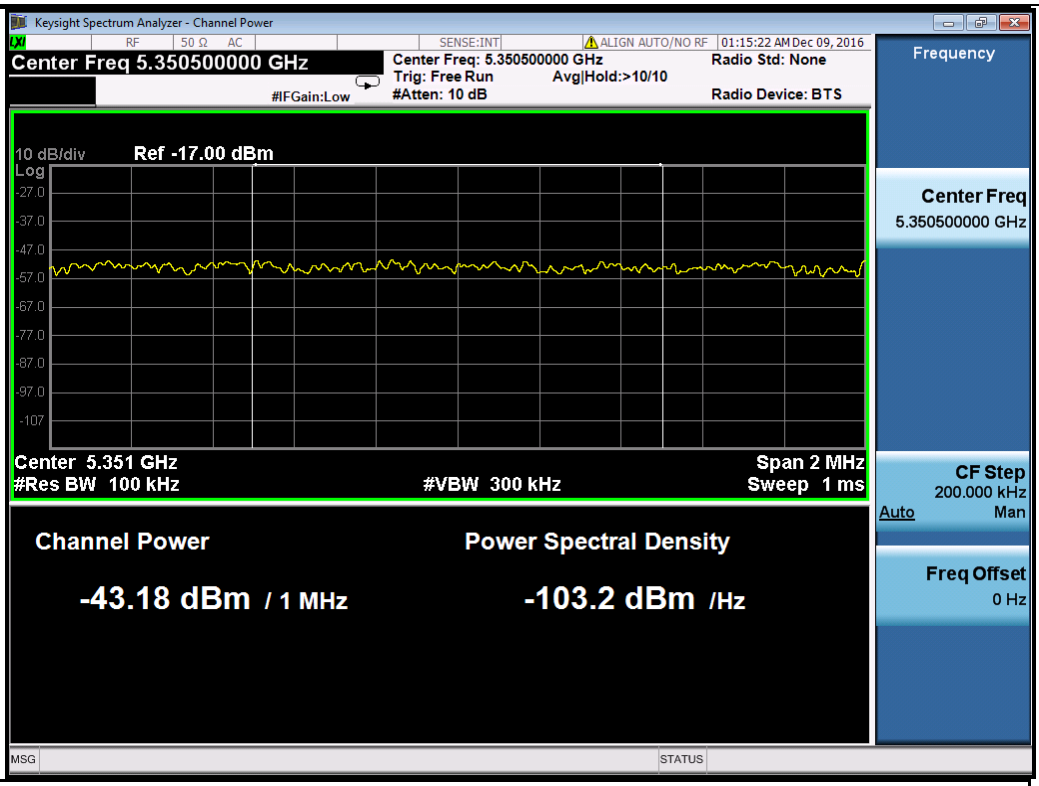

802.11n-HT20-5240MHz




802.11n-HT40-5190MHz

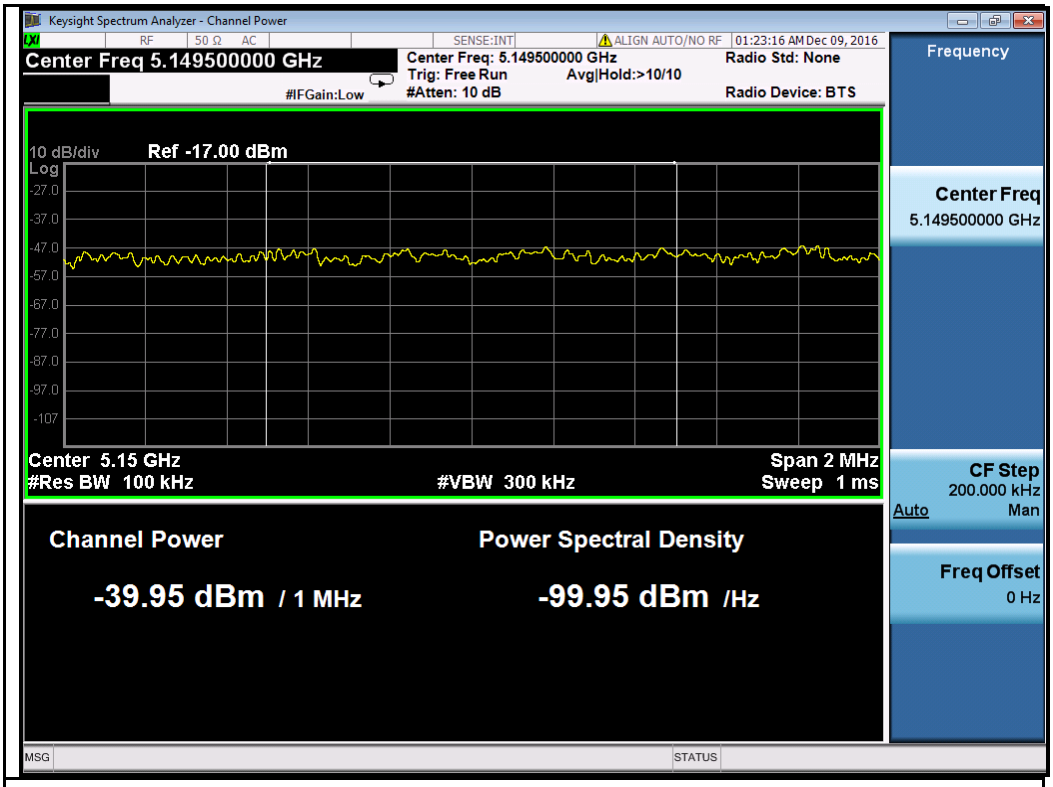



802.11n-HT40-5230MHz

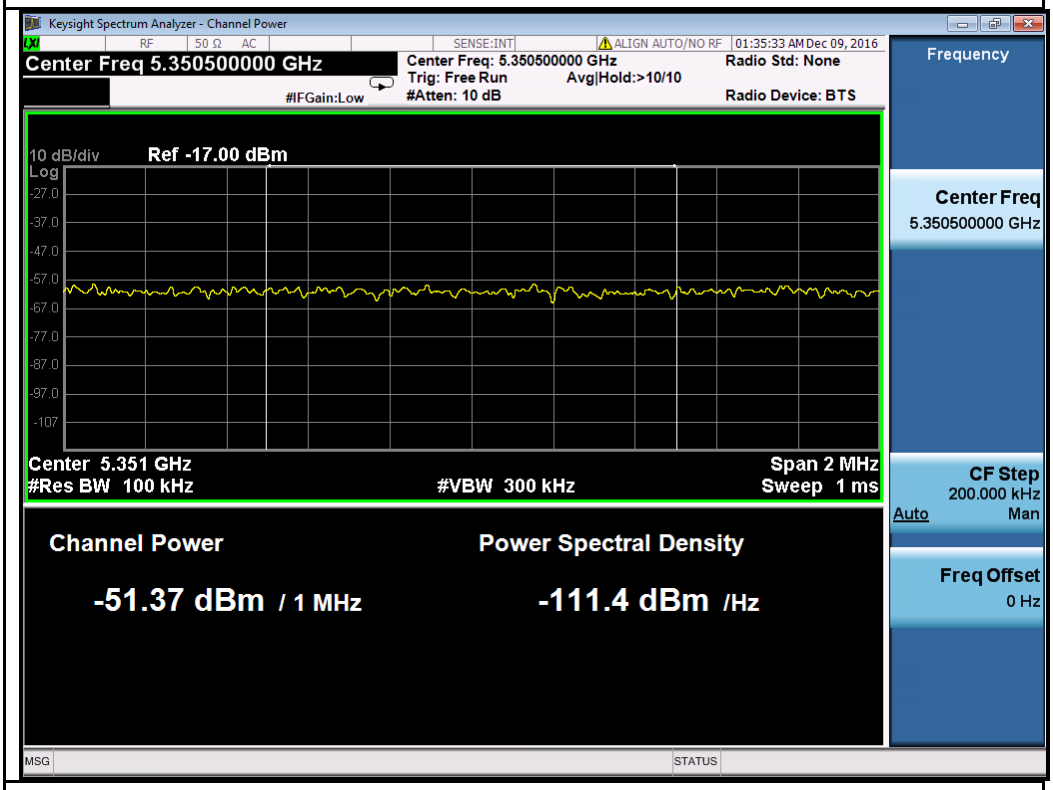



802.11ac-VHT80-5210MHz

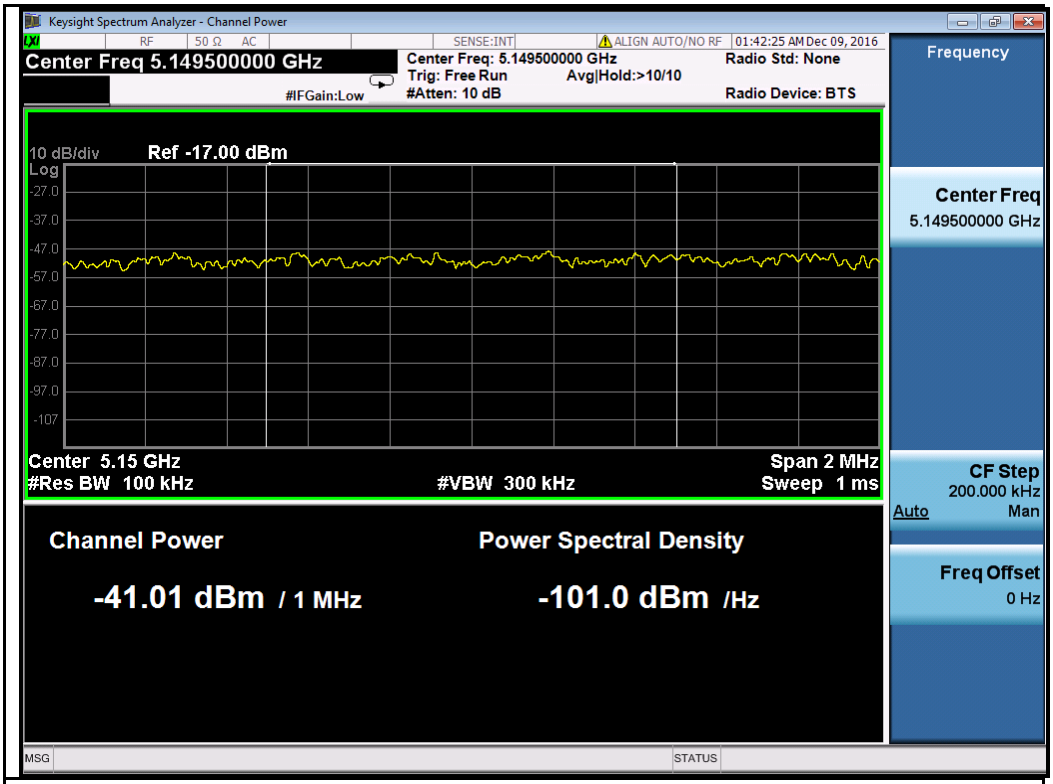
**Chain 2:**



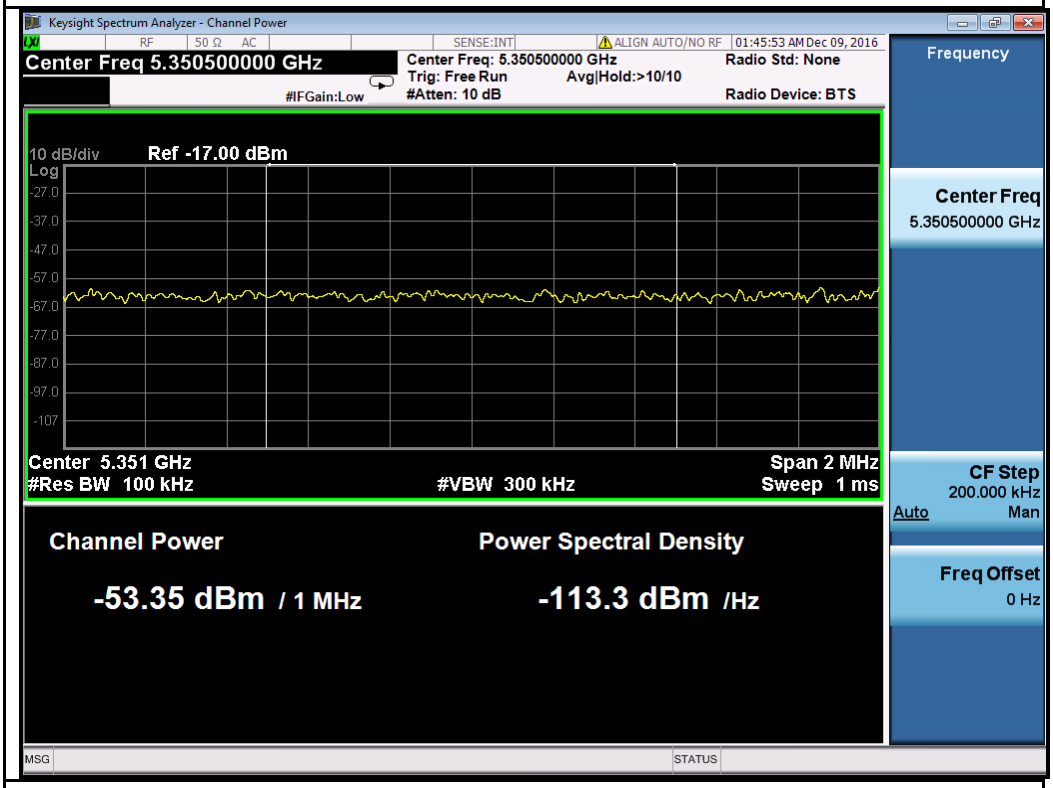

802.11a-5180MHz



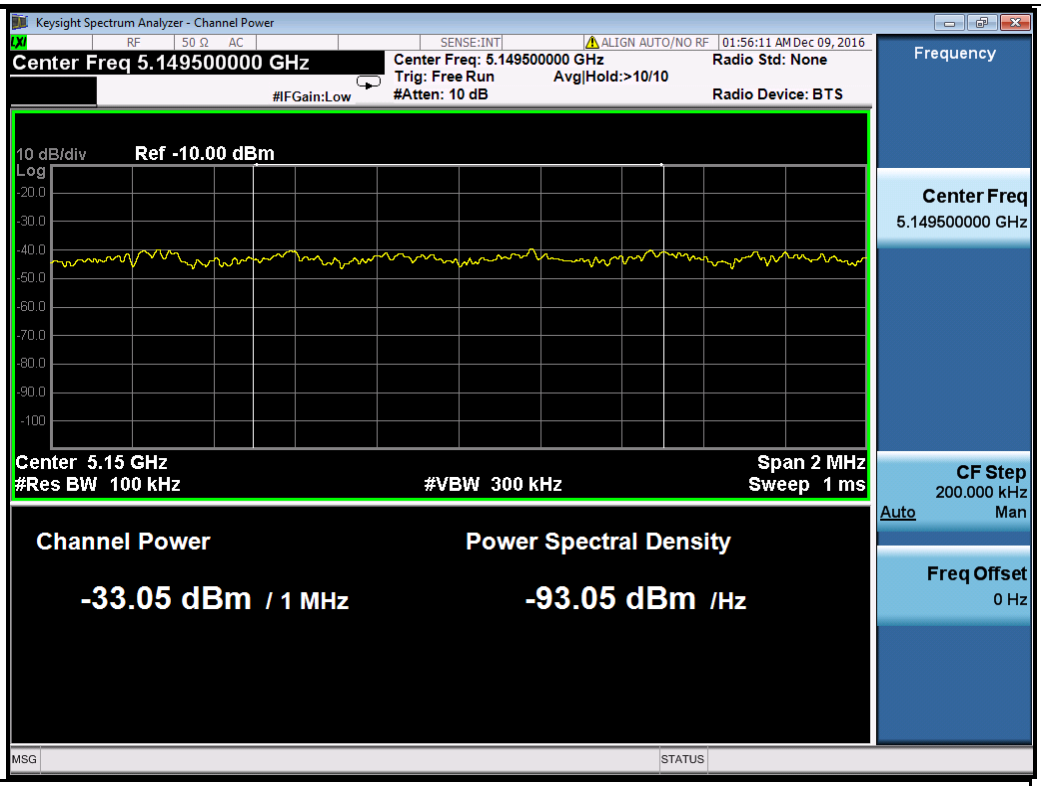

802.11a-5240MHz



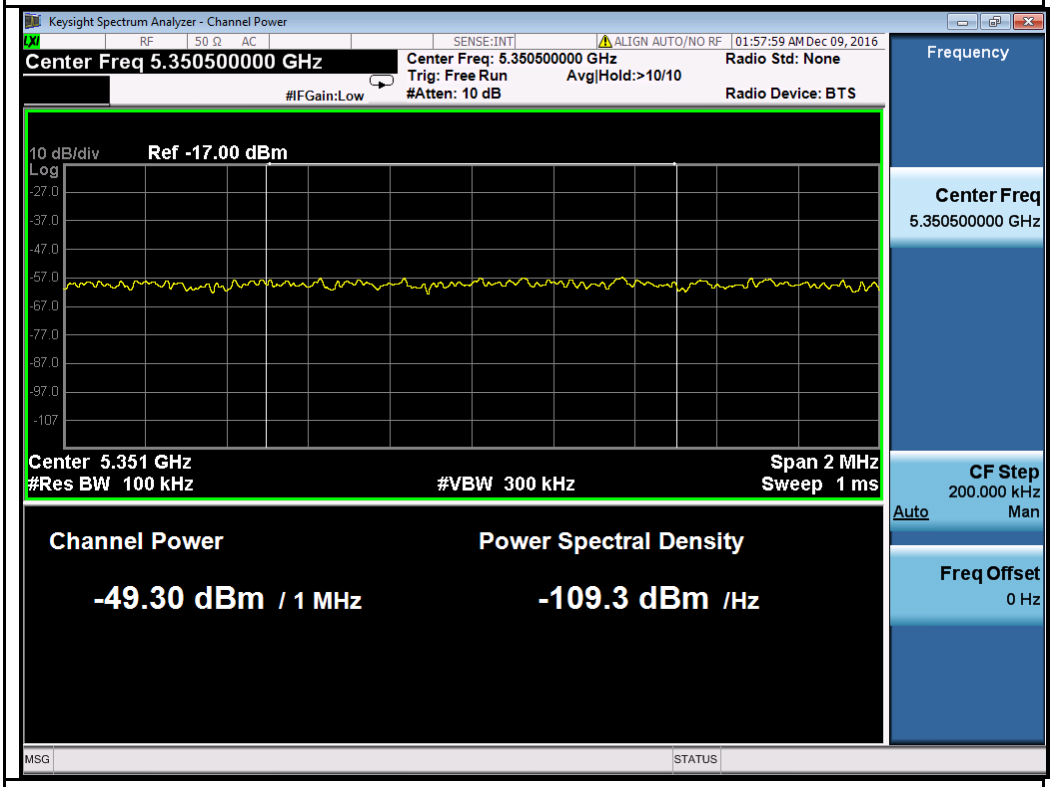

802.11n-HT20-5180MHz



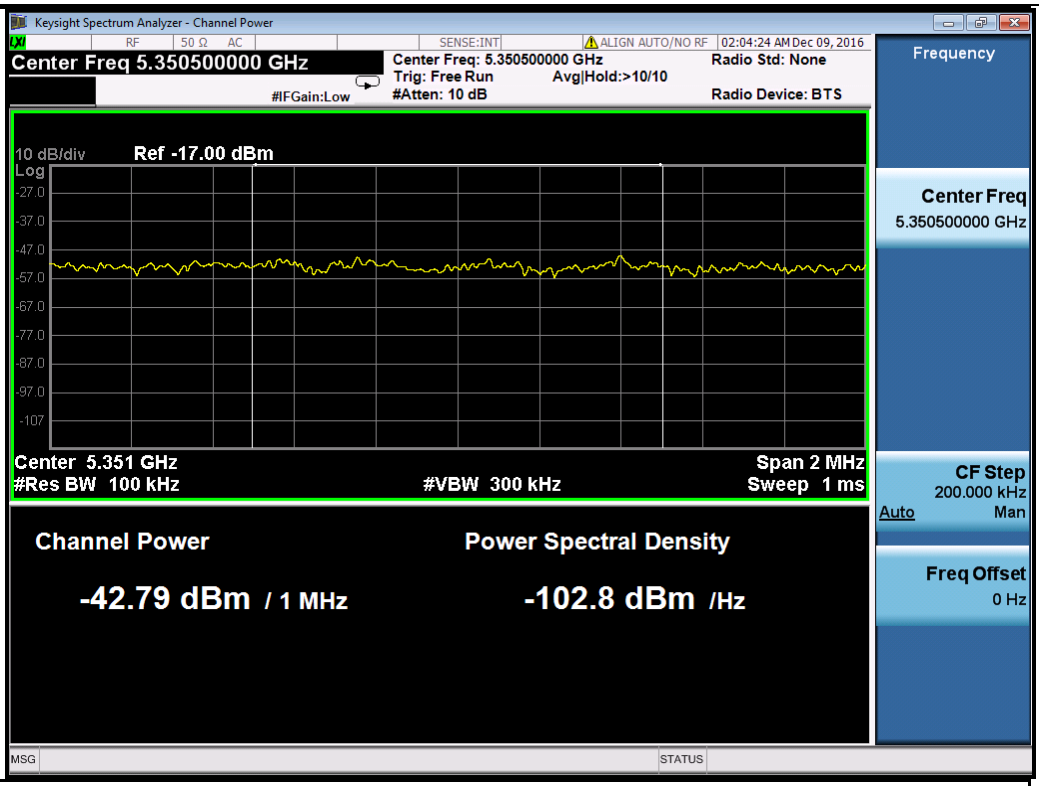

802.11n-HT20-5240MHz




802.11n-HT40-5190MHz

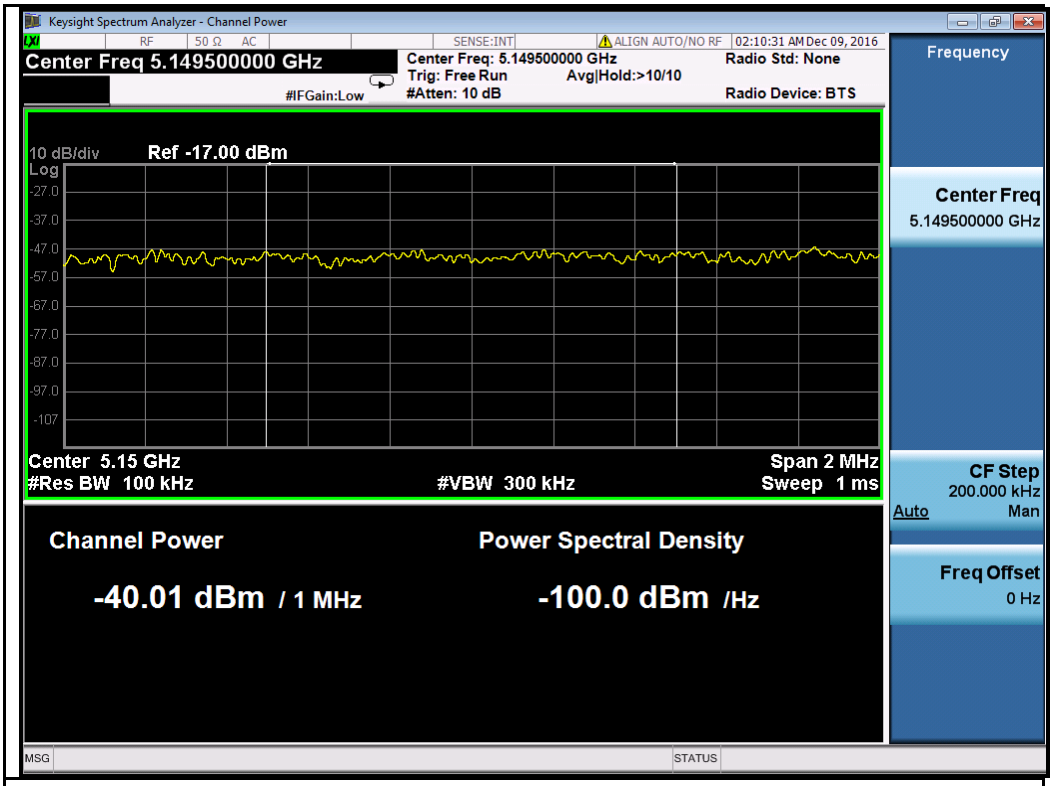



802.11n-HT40-5230MHz

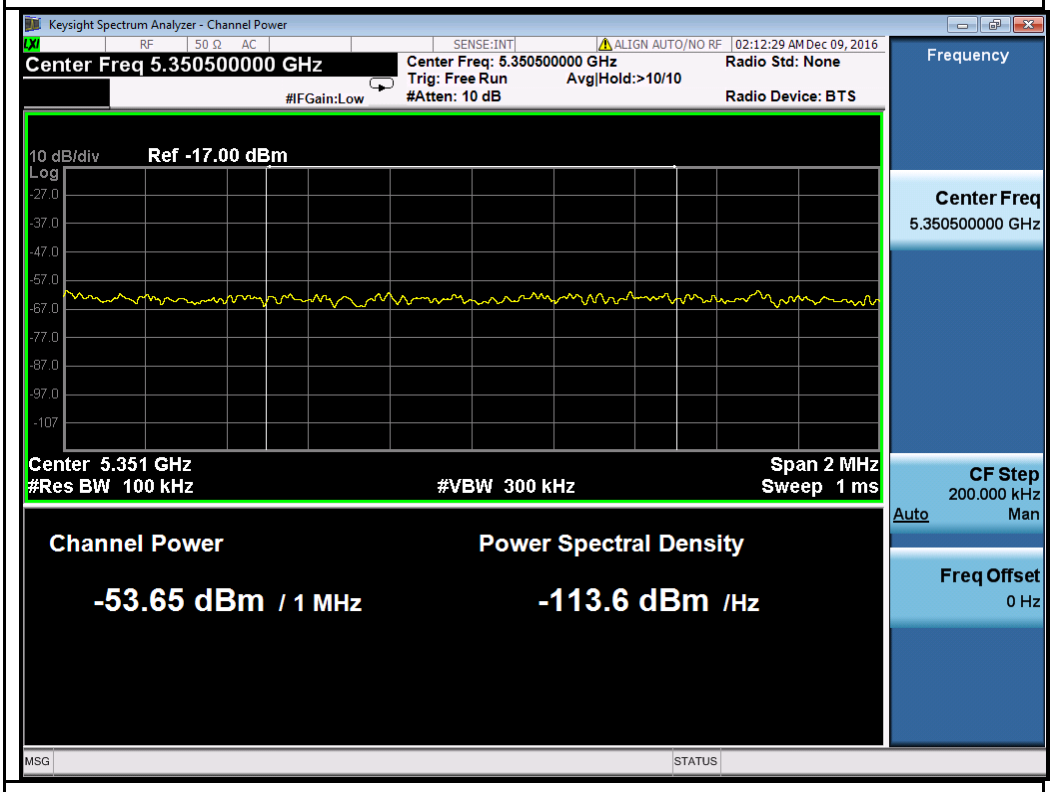



802.11ac-VHT80-5210MHz

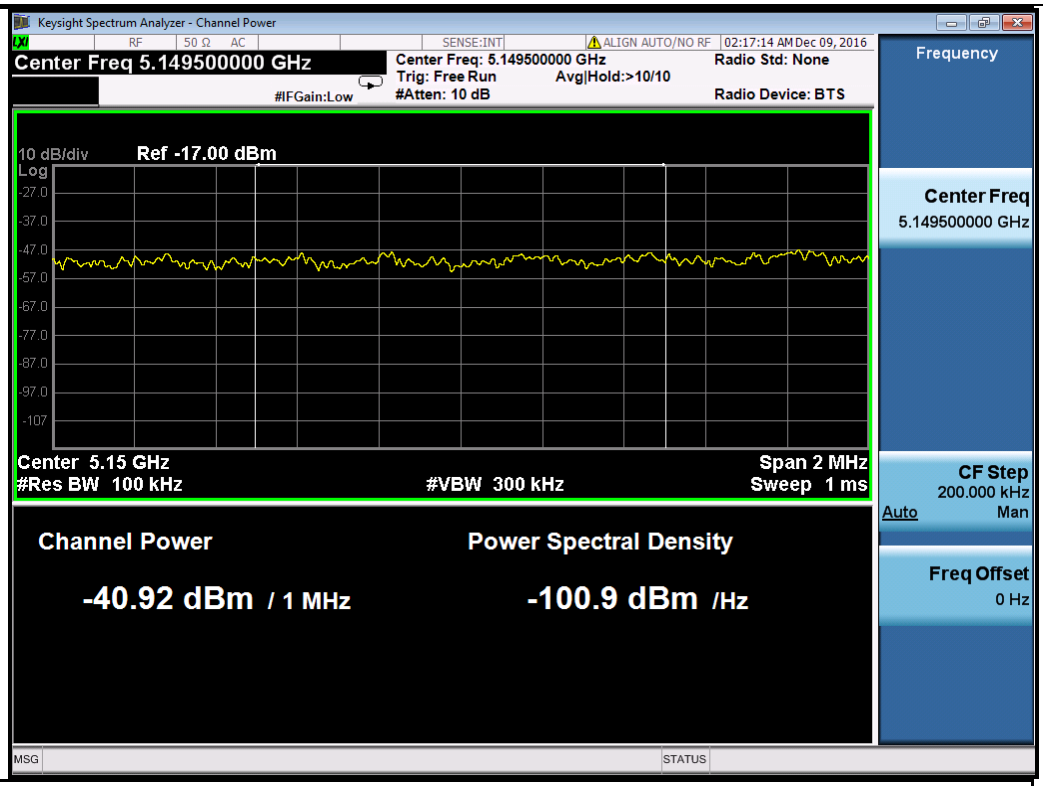
**Chain 3:**



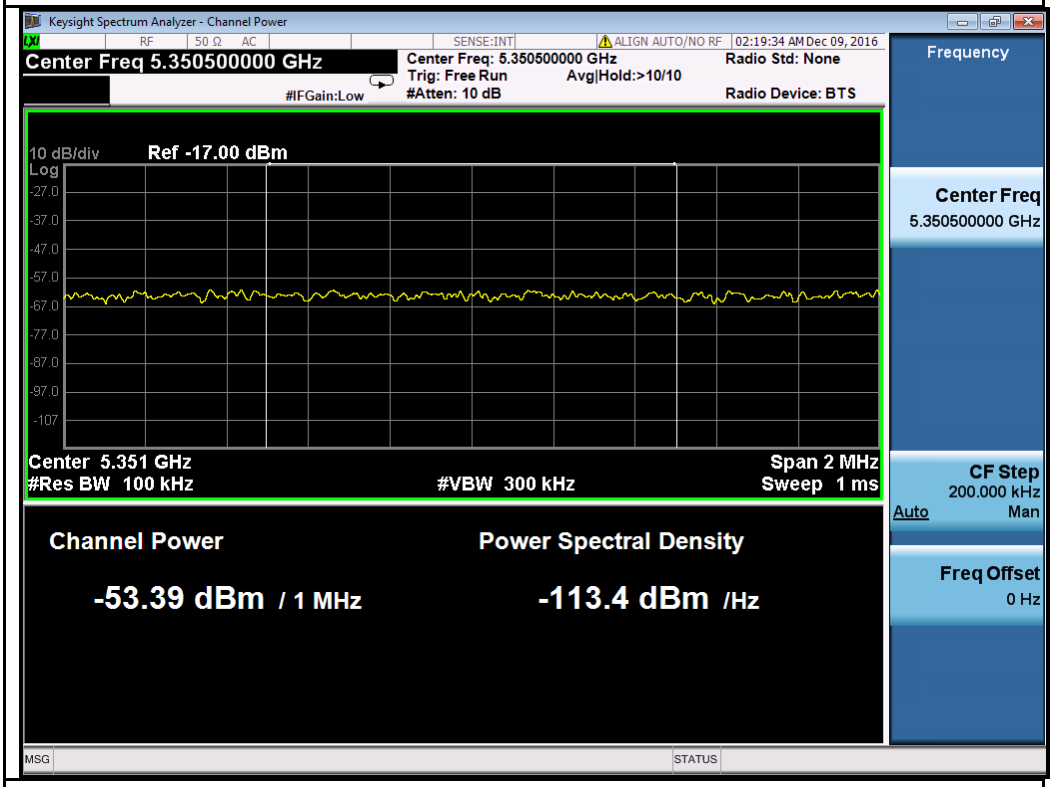

**802.11a-5180MHz**




**802.11a-5240MHz**




802.11n-HT20-5180MHz




802.11n-HT20-5240MHz