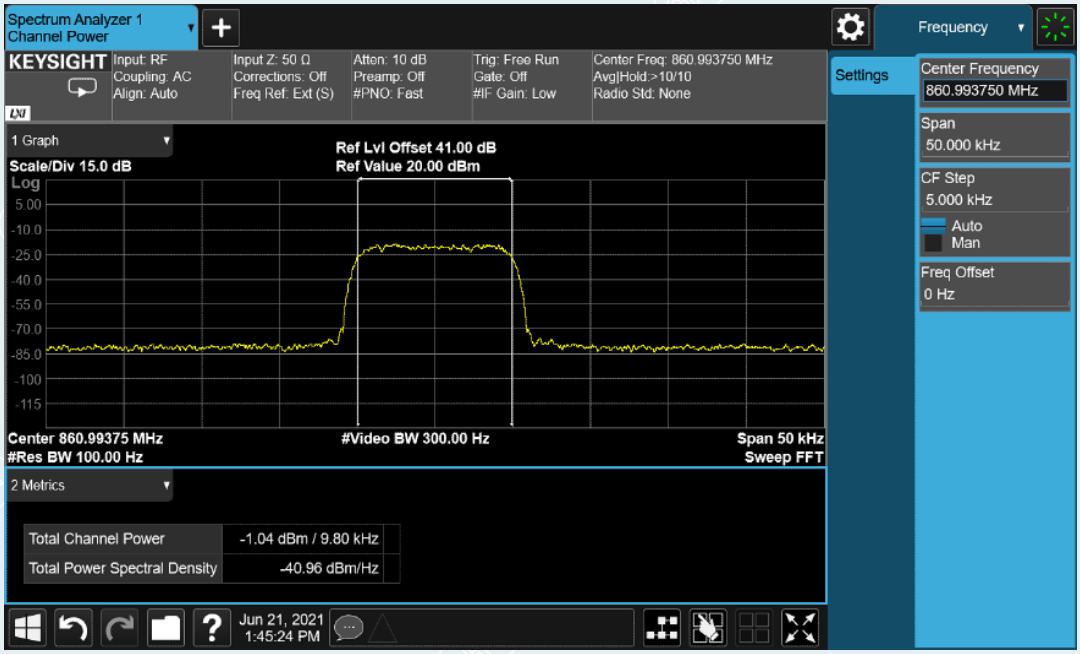
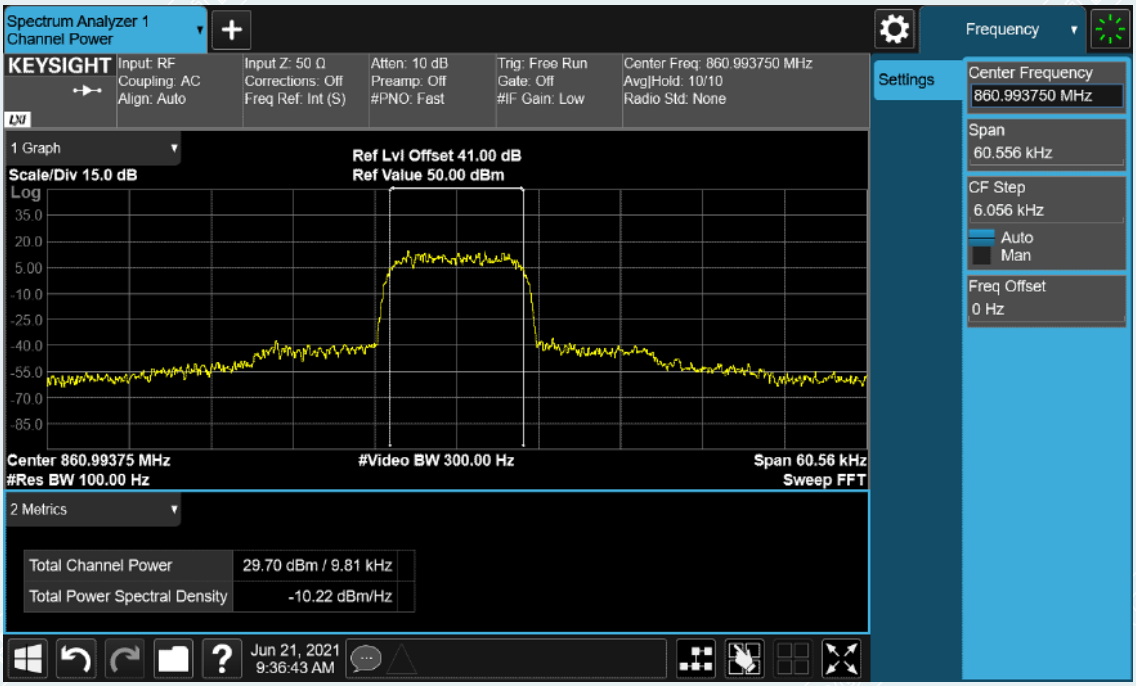
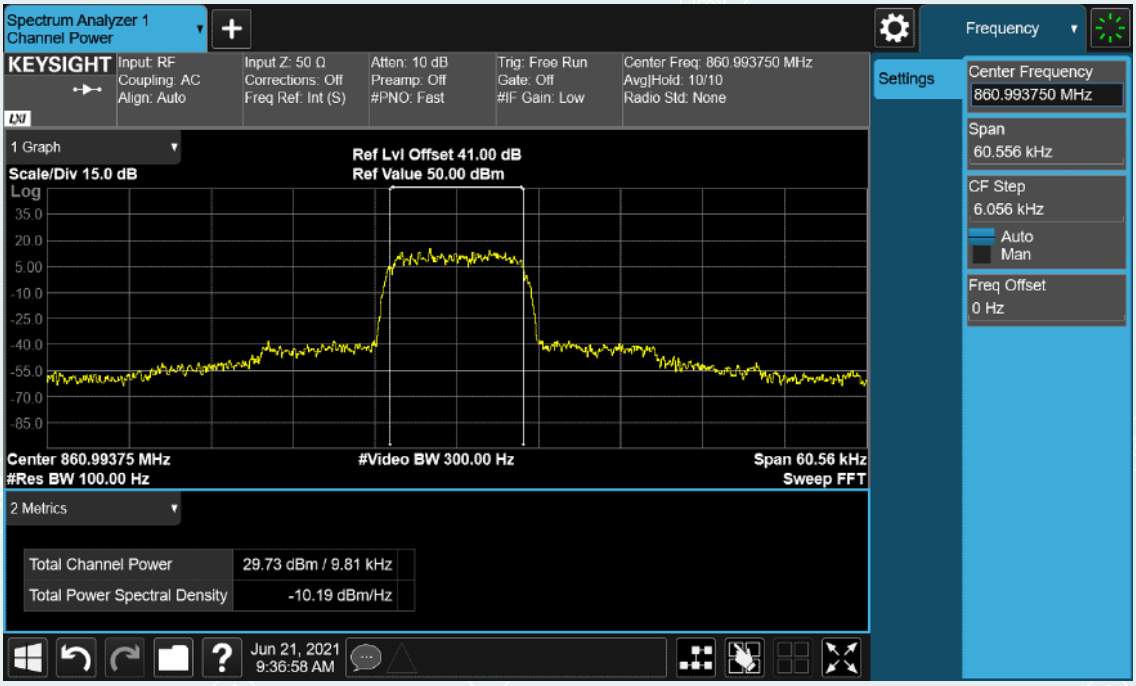



High Frequency: 860.99375MHz, Input occupied BW

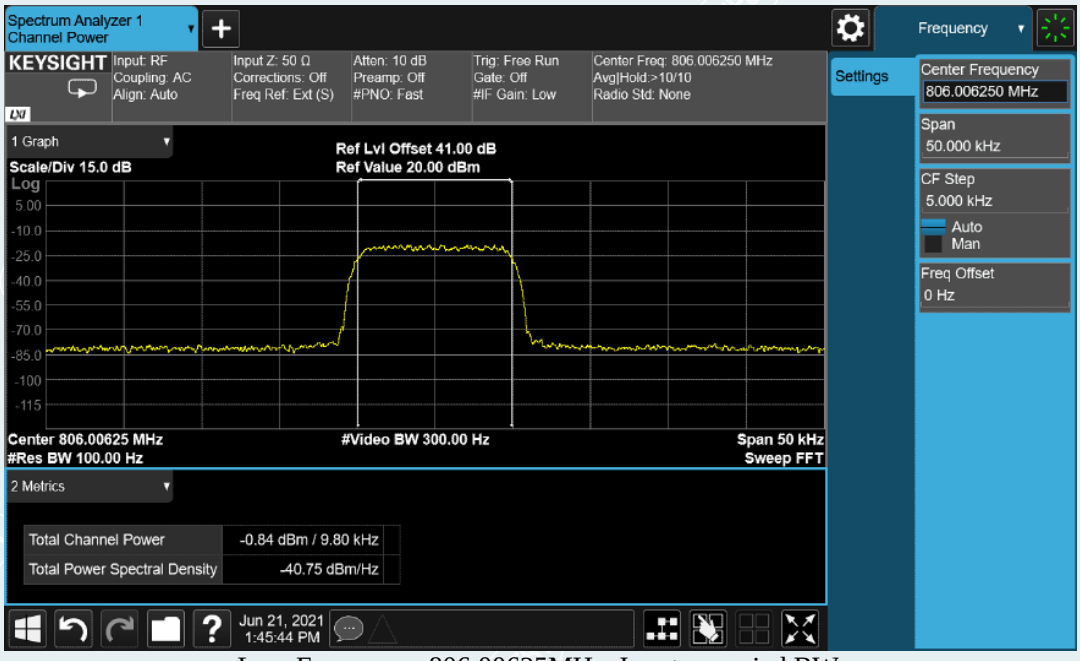



High Frequency: 860.99375MHz, Output occupied BW(AGC)

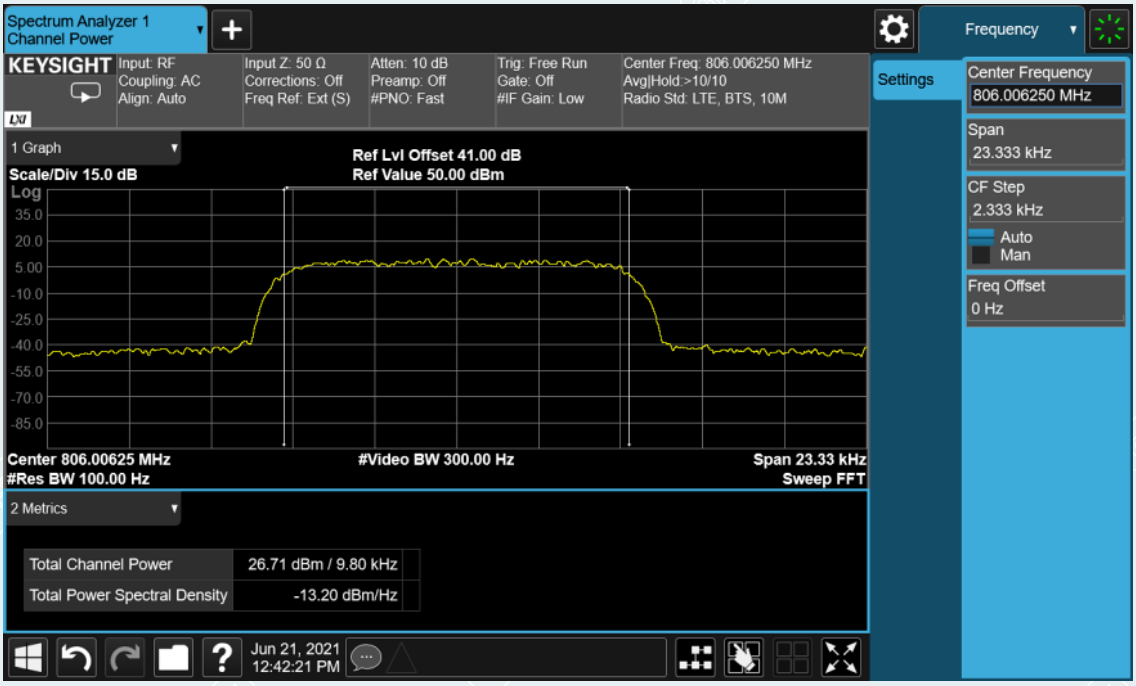



High Frequency: 860.99375MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)

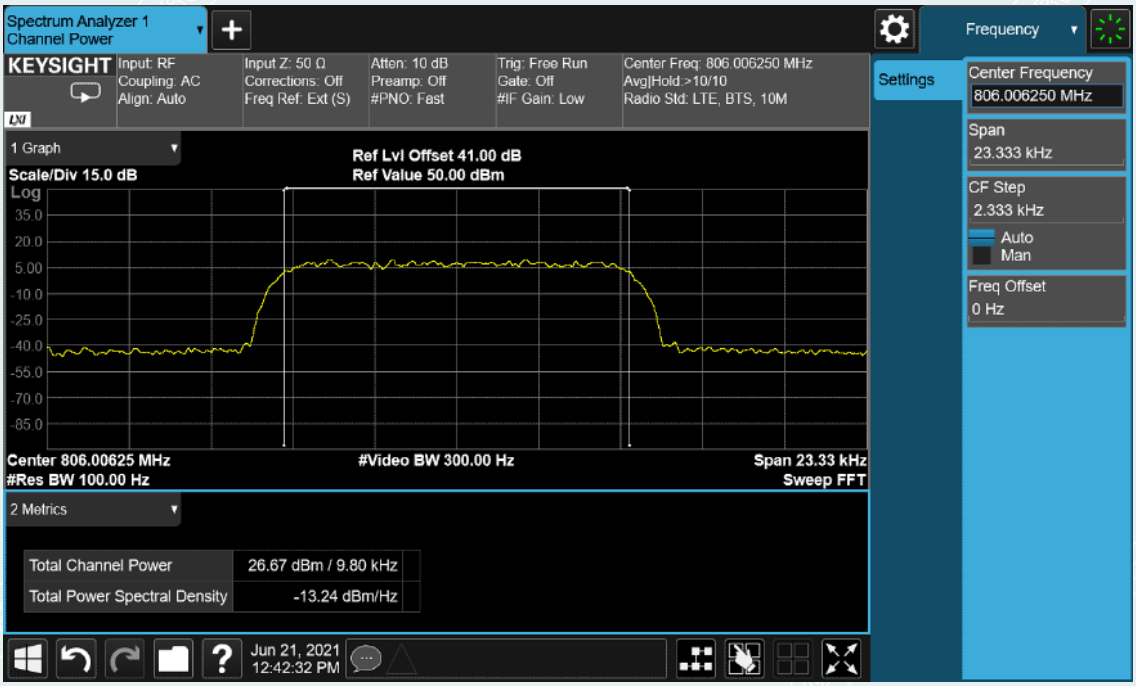
10.5.5.3.2.2.2 Uplink



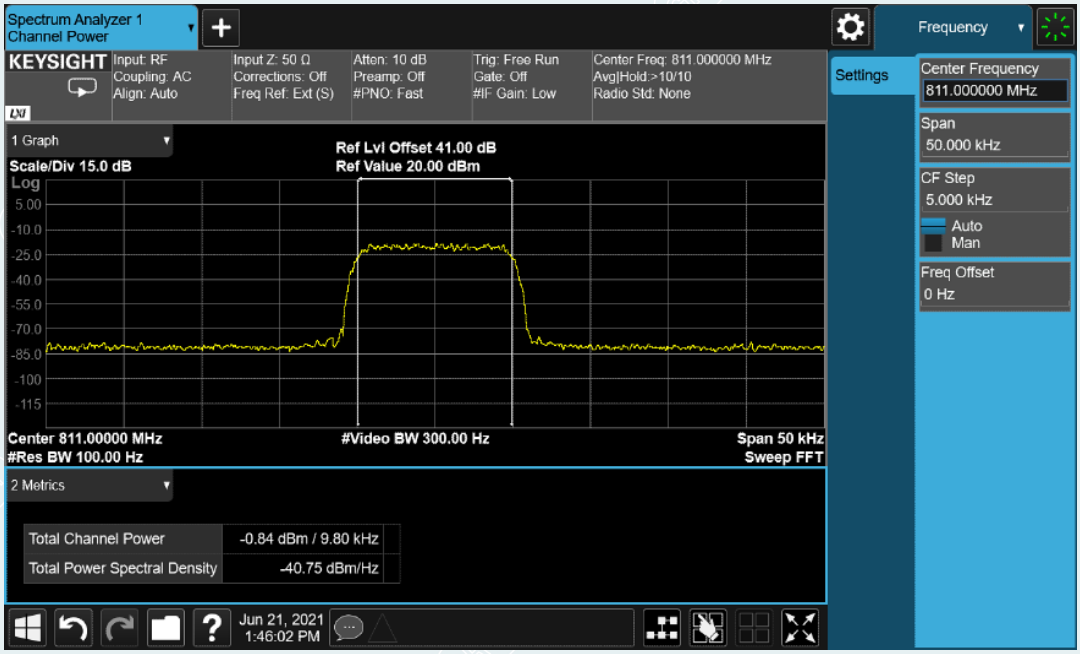

Low Frequency: 806.00625MHz, Input occupied BW



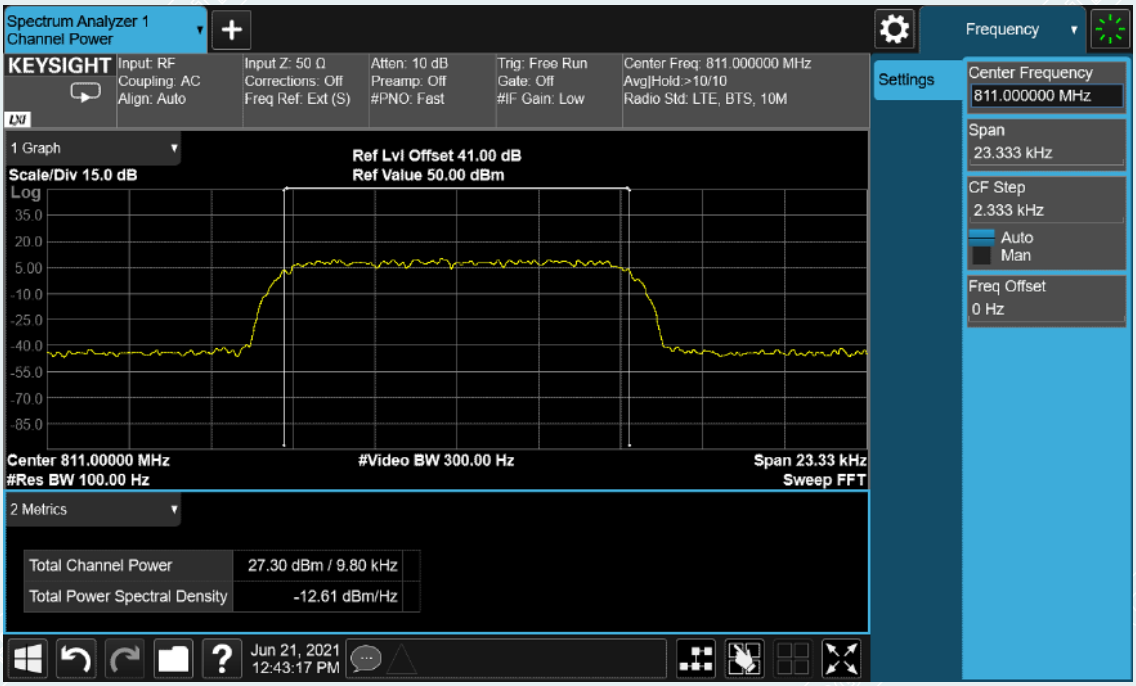

Low Frequency: 806.00625MHz, Output occupied BW(AGC)



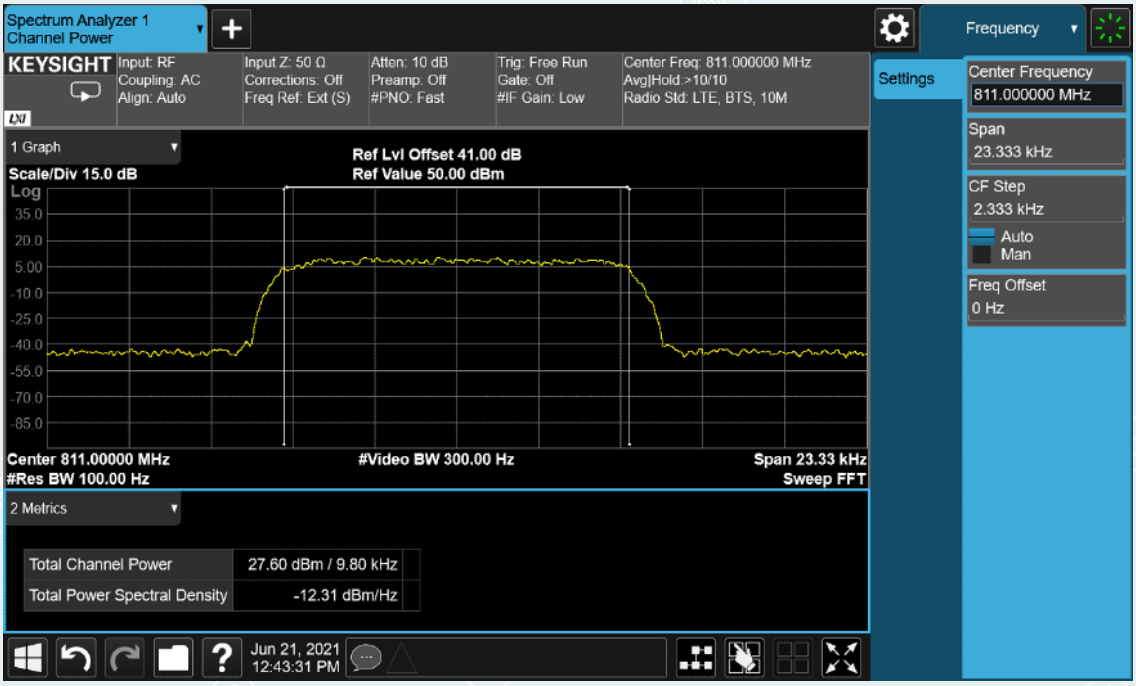

Low Frequency: 806.00625MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)



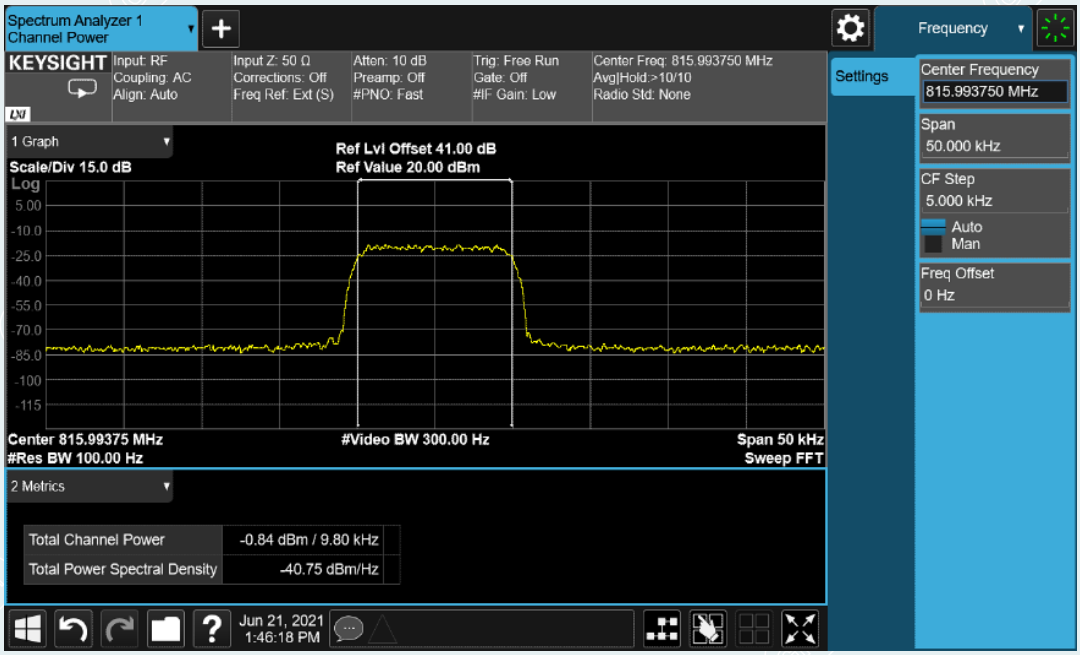

Middle Frequency: 811.0MHz, Input occupied BW



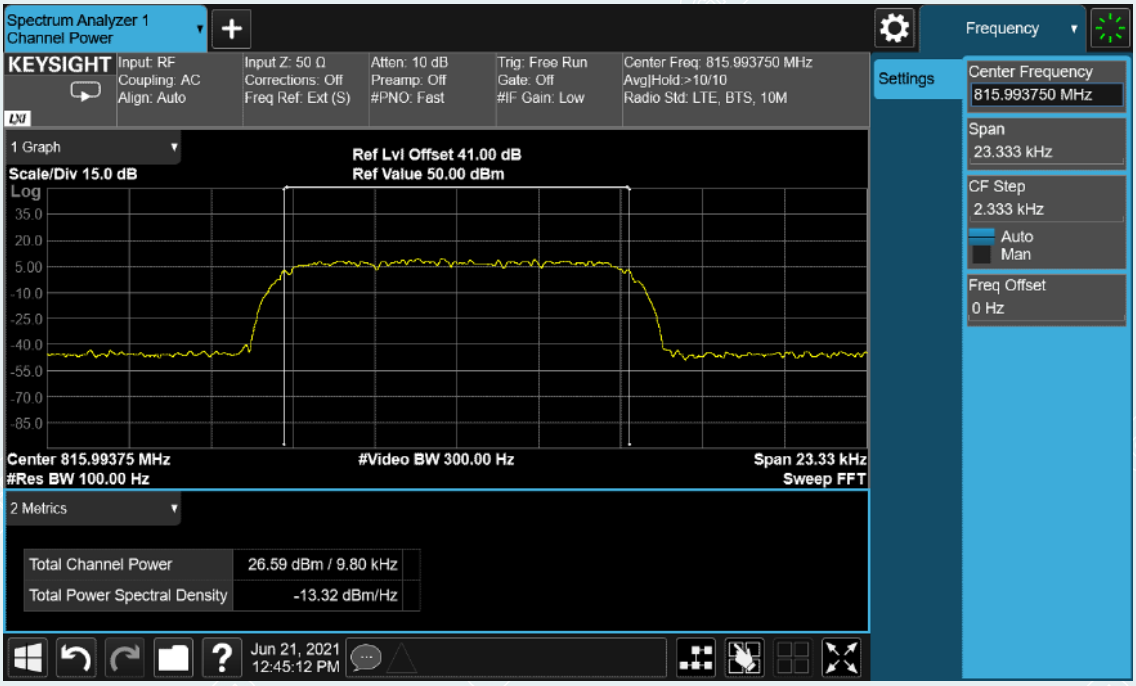

Middle Frequency: 811.0MHz, Output occupied BW(AGC)



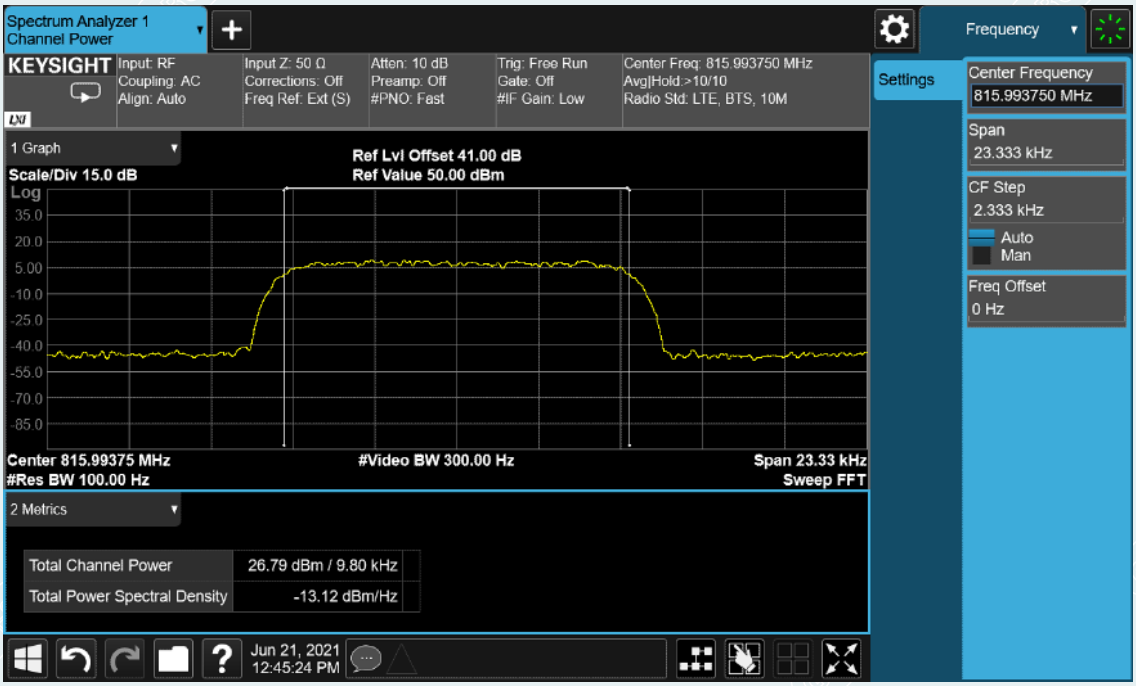

Middle Frequency: 811.0MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)




High Frequency: 815.99375MHz, Input occupied BW



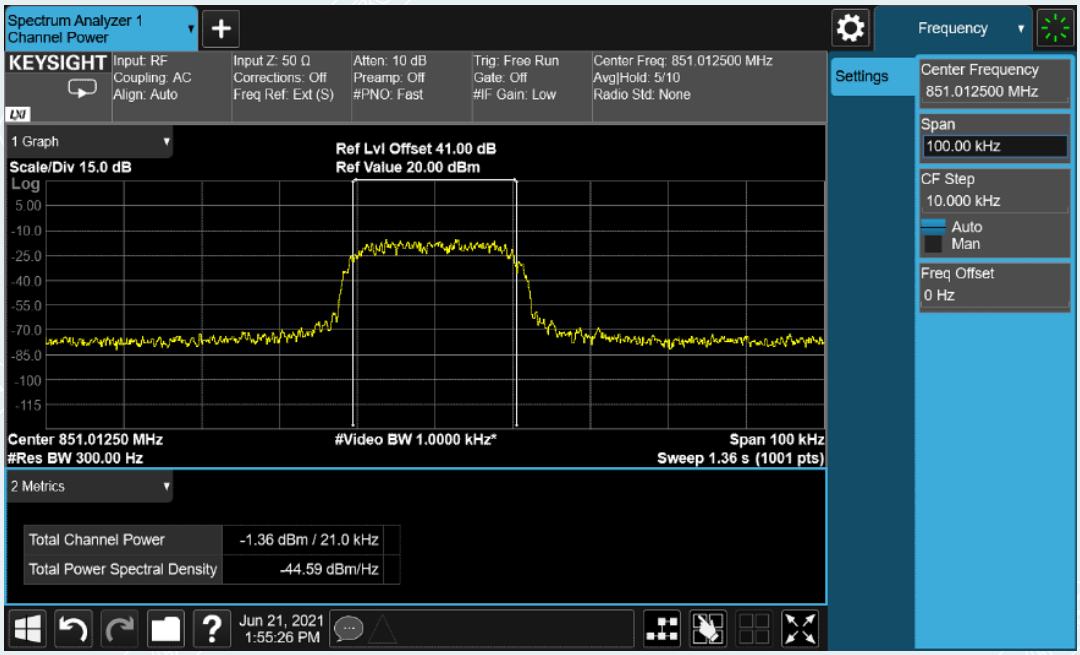

High Frequency: 815.99375MHz, Output occupied BW(AGC)



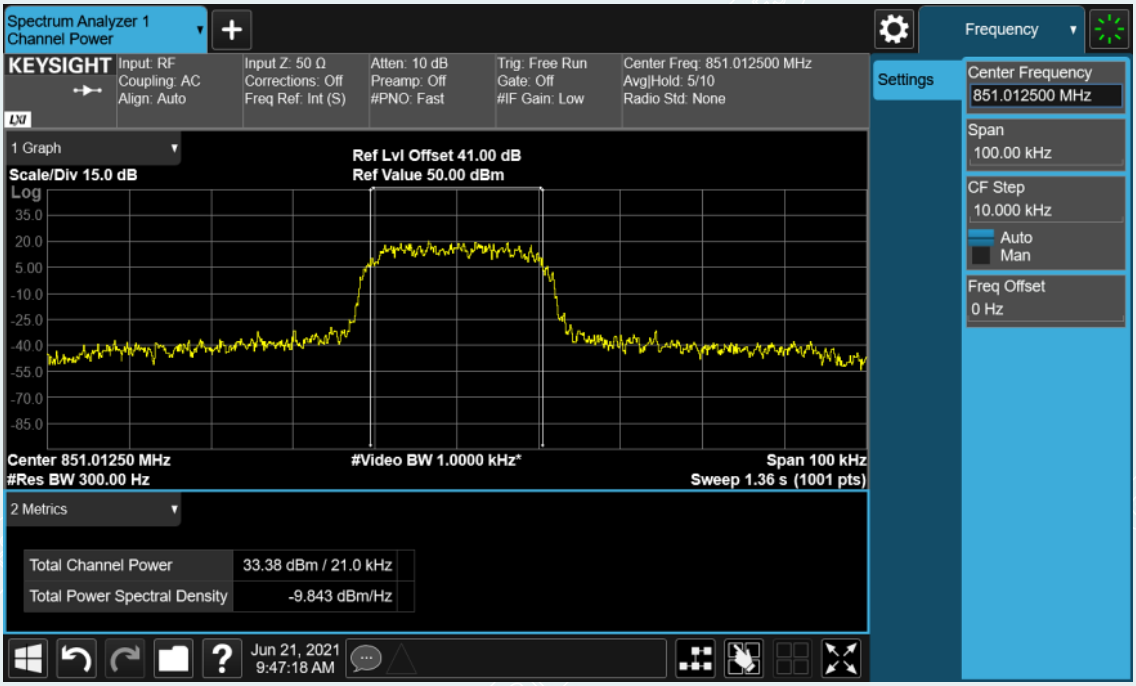

High Frequency: 815.99375MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)

10.5.5.3.2.3 TETRA mode

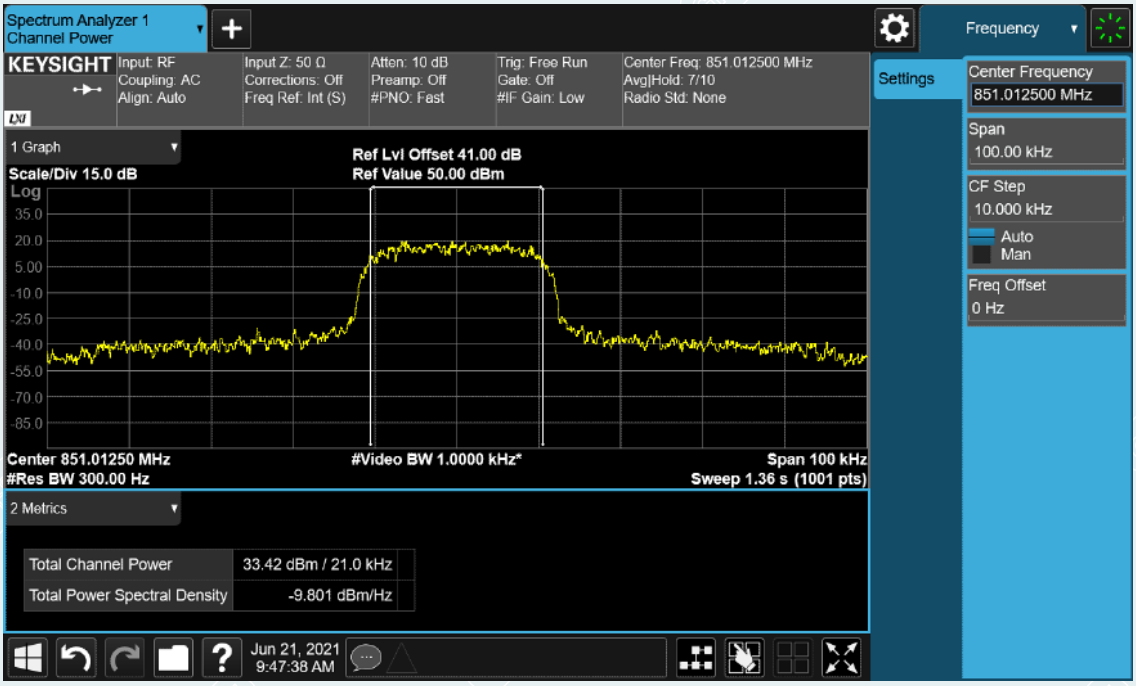
10.5.5.3.2.3.1 Downlink



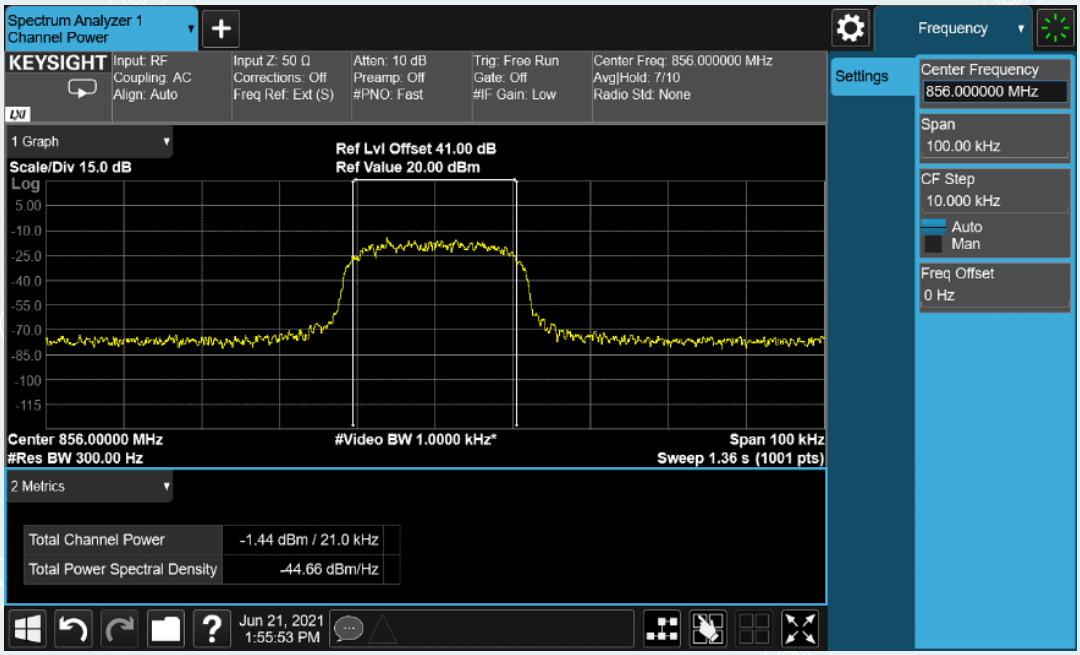

Low Frequency: 851.0125MHz, Input occupied BW



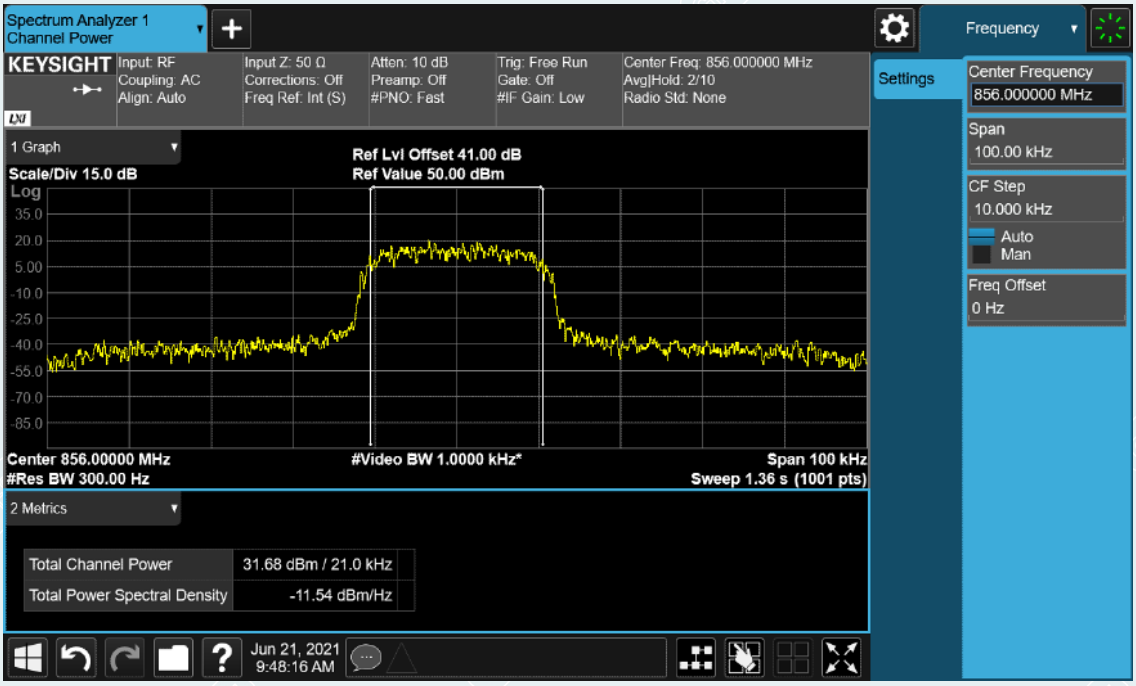

Low Frequency: 851.0125MHz, Output occupied BW(AGC)



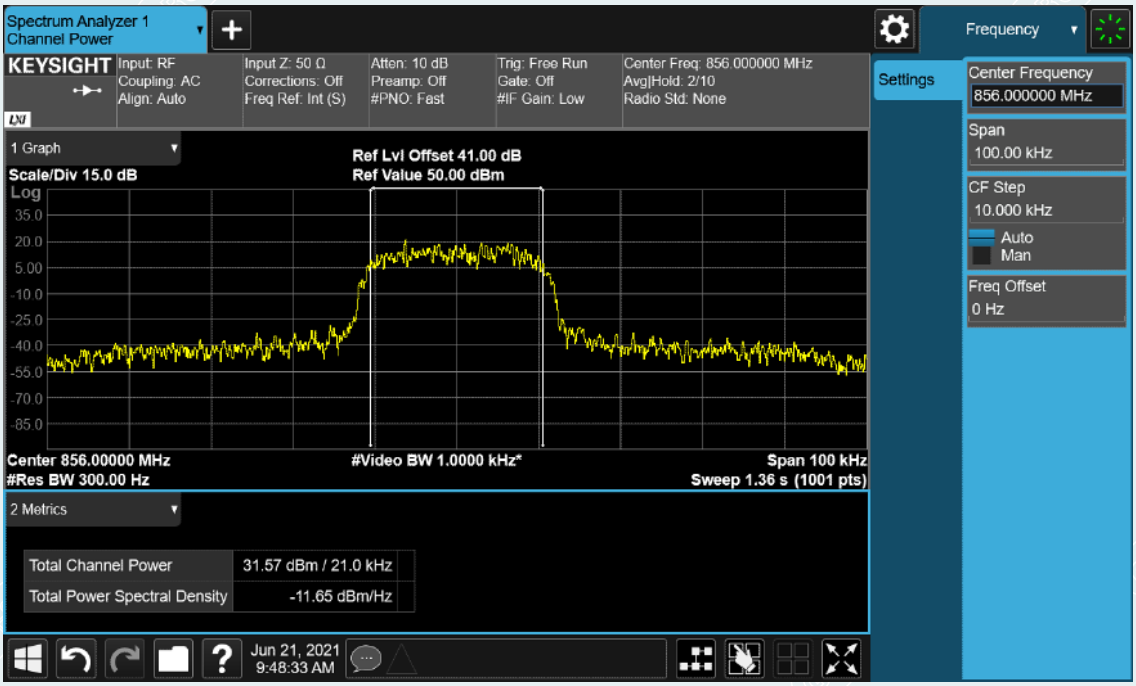

Low Frequency: 851.0125MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)



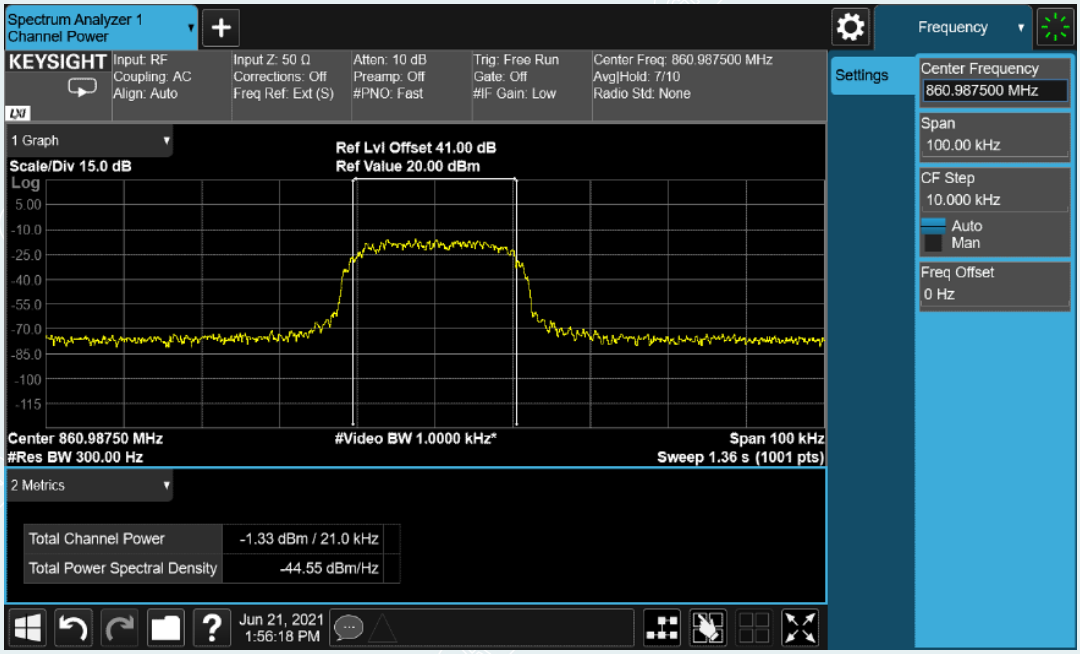

Middle Frequency: 856.0MHz, Input occupied BW



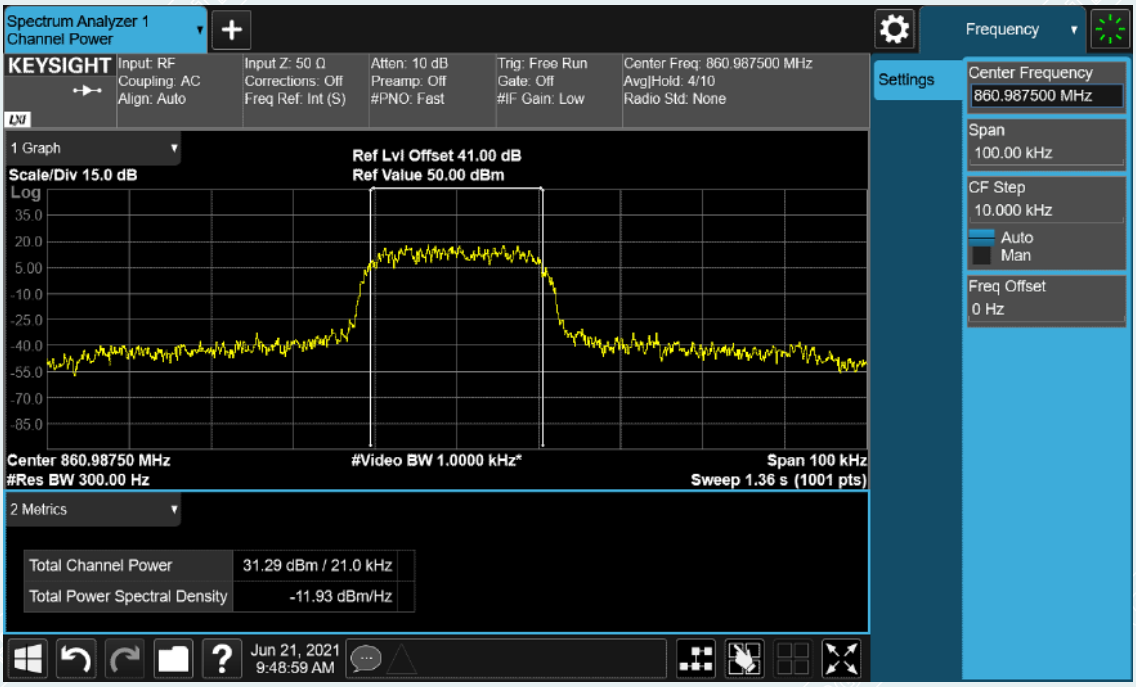

Middle Frequency: 856.0MHz, Output occupied BW(AGC)



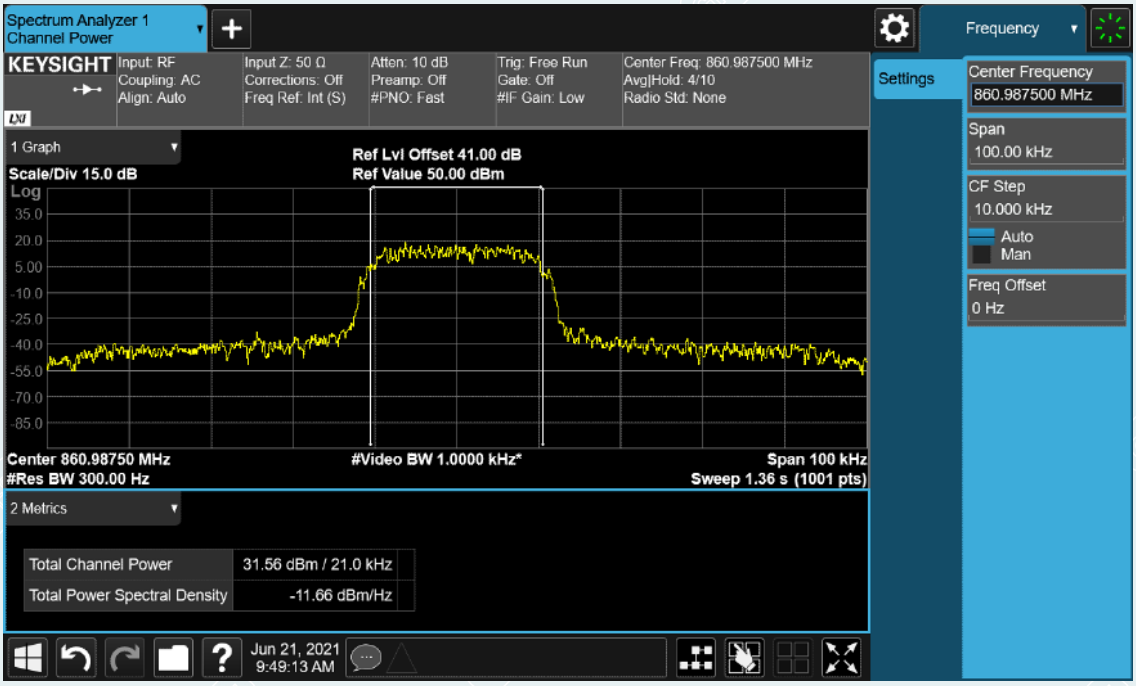

Middle Frequency: 856.0MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)




High Frequency: 860.9875MHz, Input occupied BW

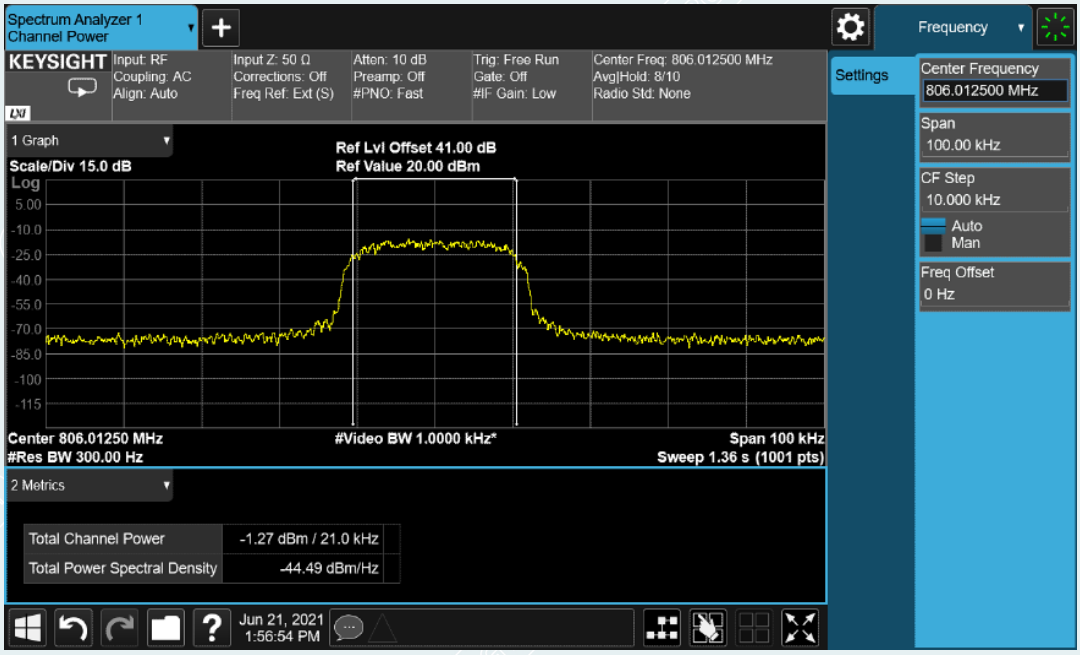



High Frequency: 860.9875MHz, Output occupied BW(AGC)

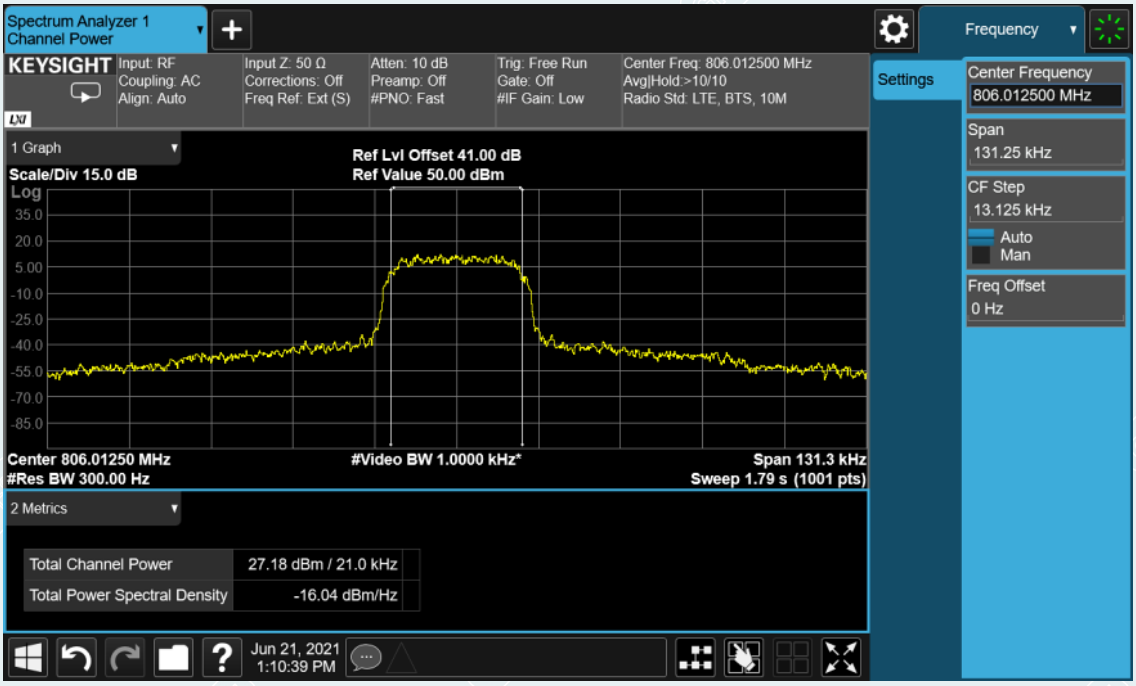



High Frequency: 860.9875MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)

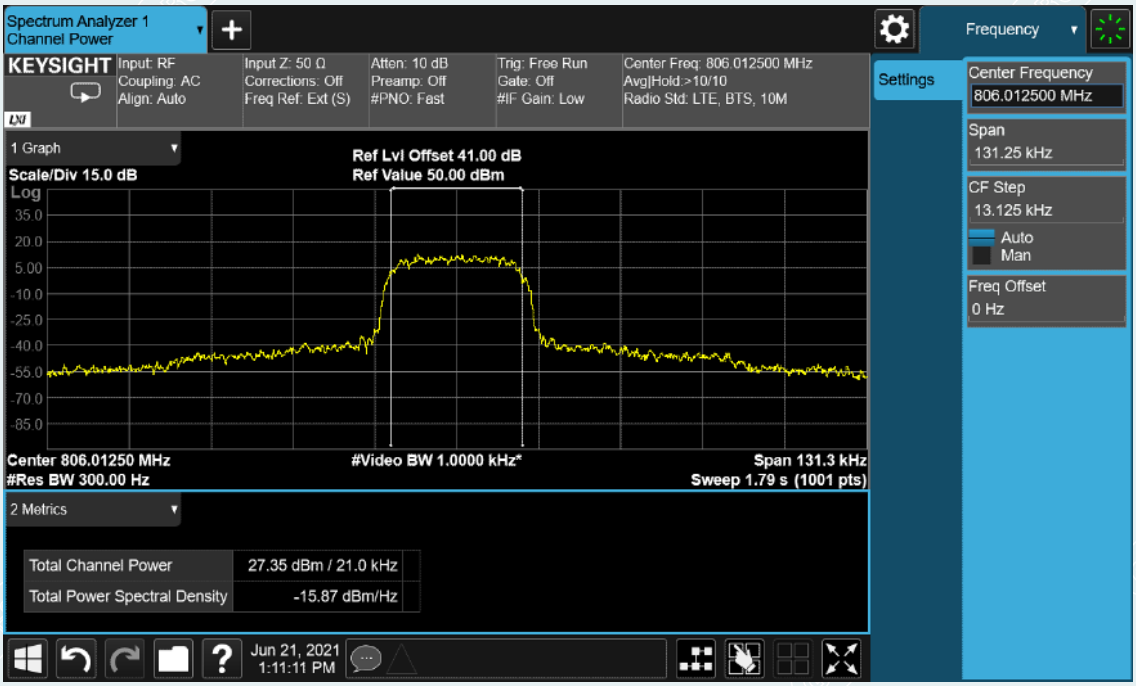
10.5.5.3.2.3.2 Uplink



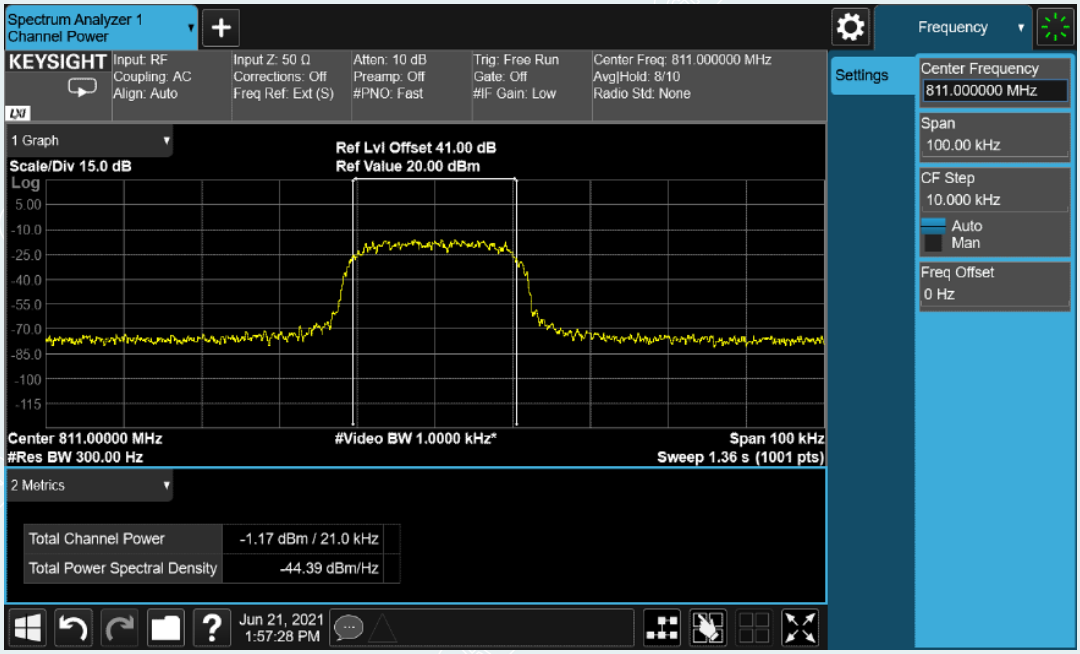

Low Frequency: 806.0125MHz, Input occupied BW



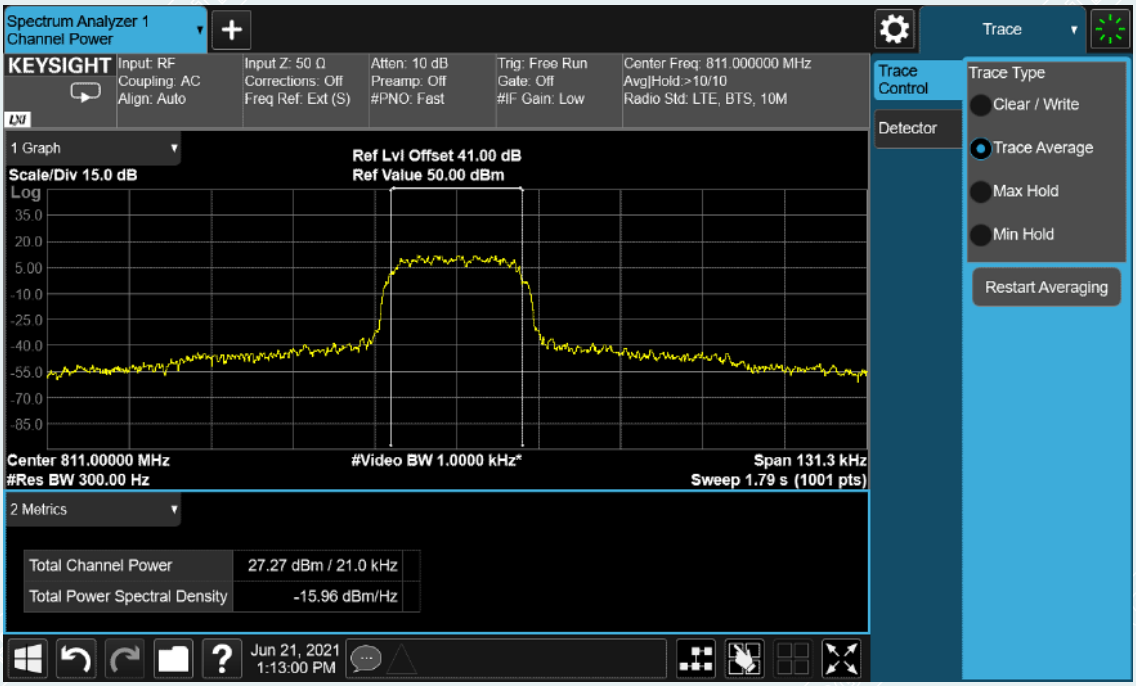

Low Frequency: 806.0125MHz, Output occupied BW(AGC)



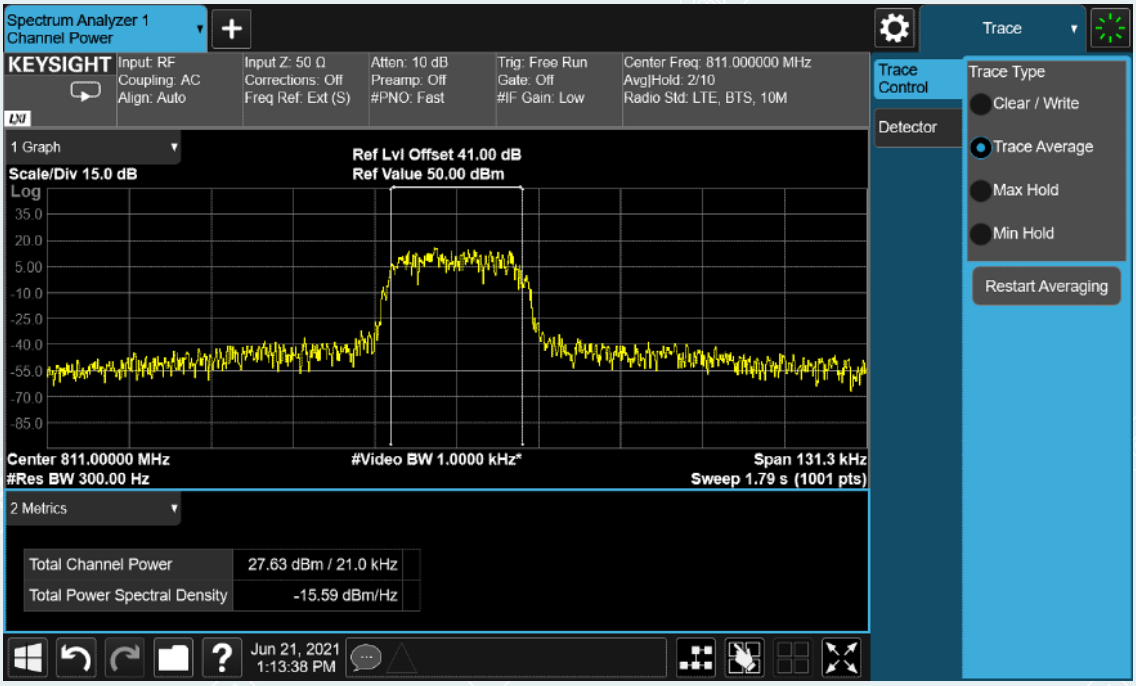

Low Frequency: 806.0125MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)



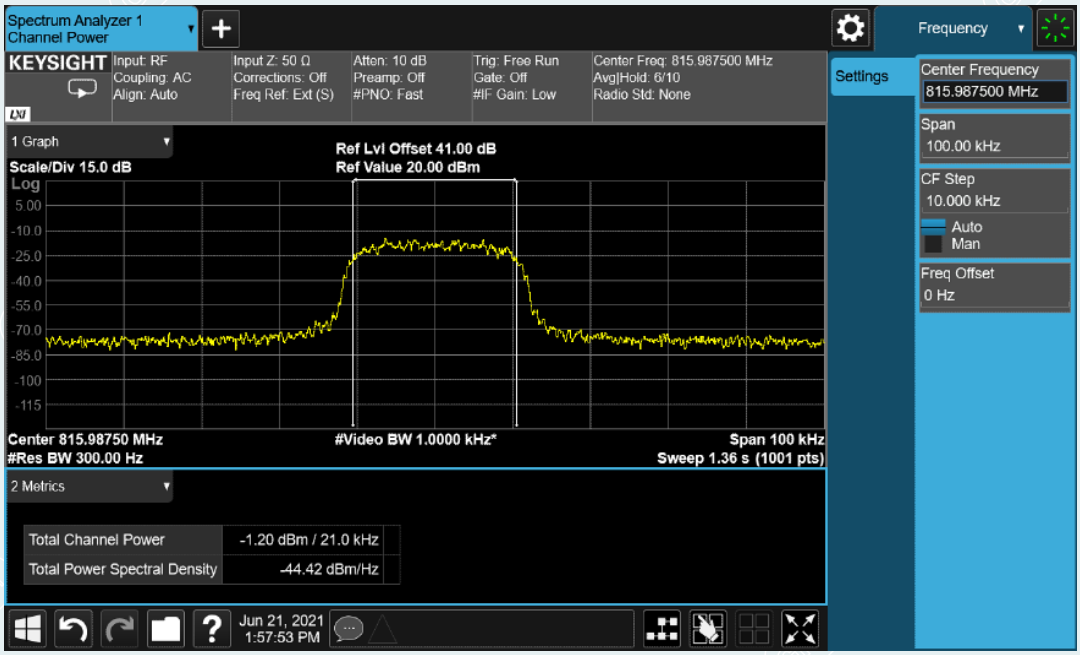

Middle Frequency: 811.0MHz, Input occupied BW



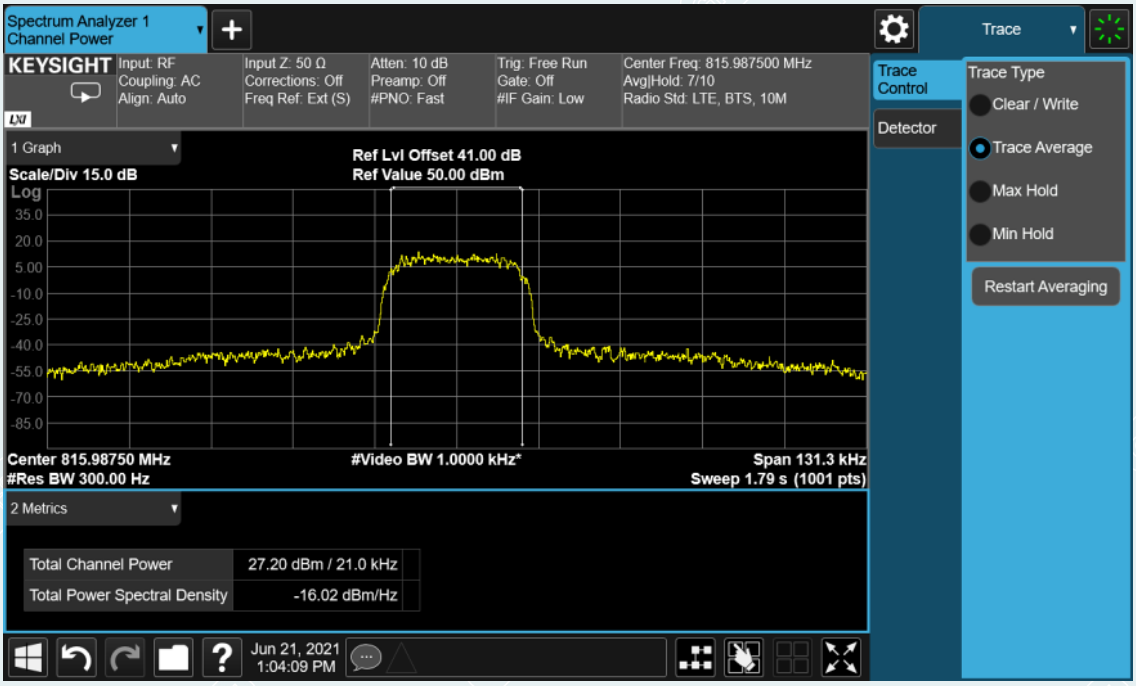

Middle Frequency: 811.0MHz, Output occupied BW(AGC)



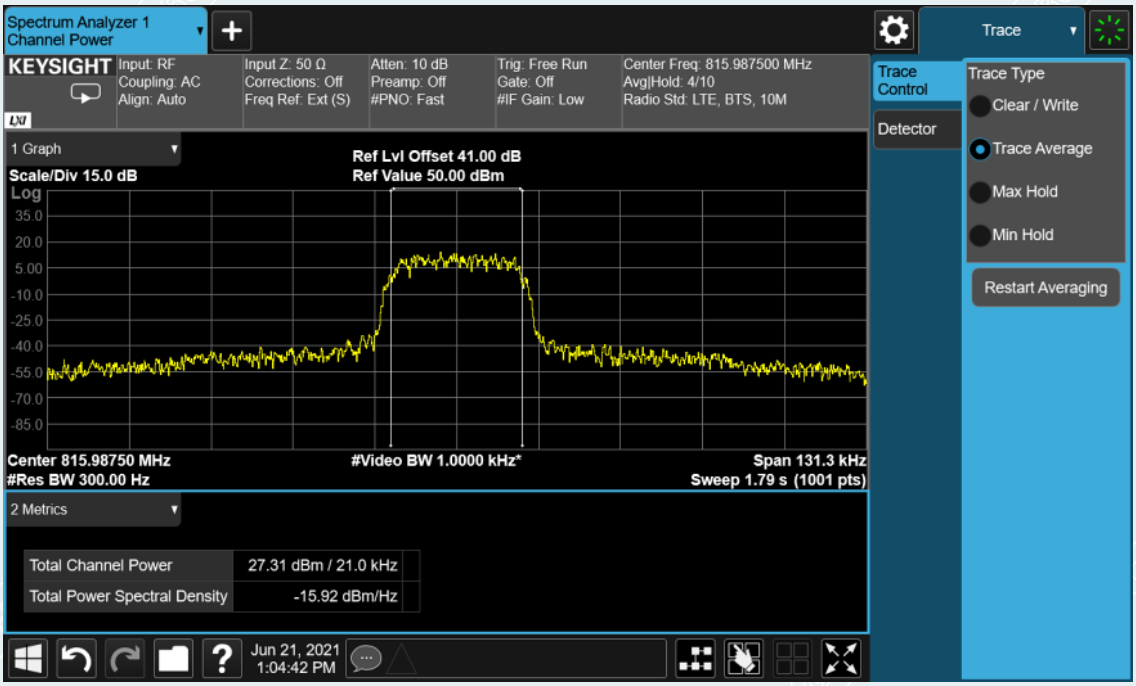

Middle Frequency: 811.0MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)




High Frequency: 815.9875MHz, Input occupied BW



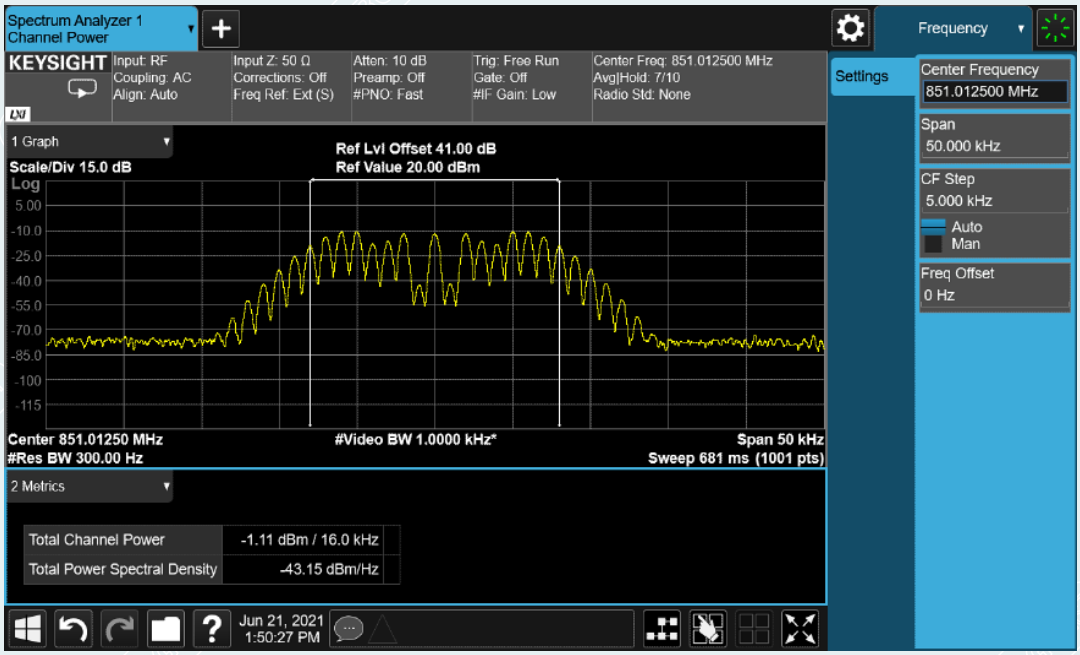

High Frequency: 815.9875MHz, Output occupied BW(AGC)



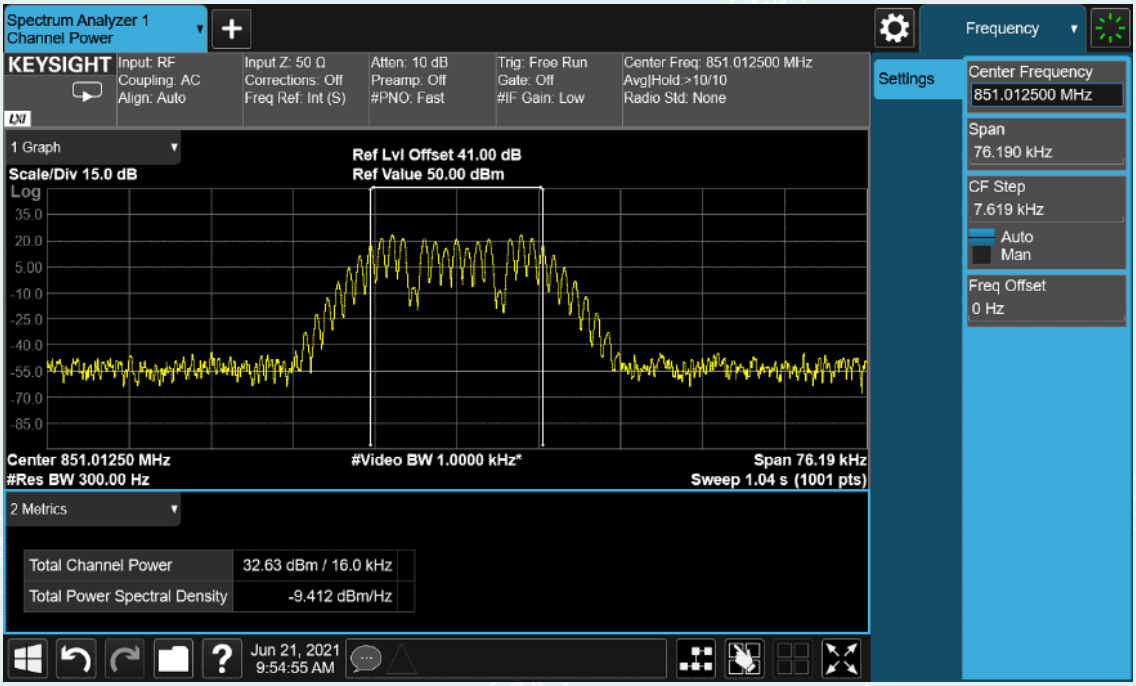

High Frequency: 815.9875MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)

10.5.5.3.2.4 Analog FM mode

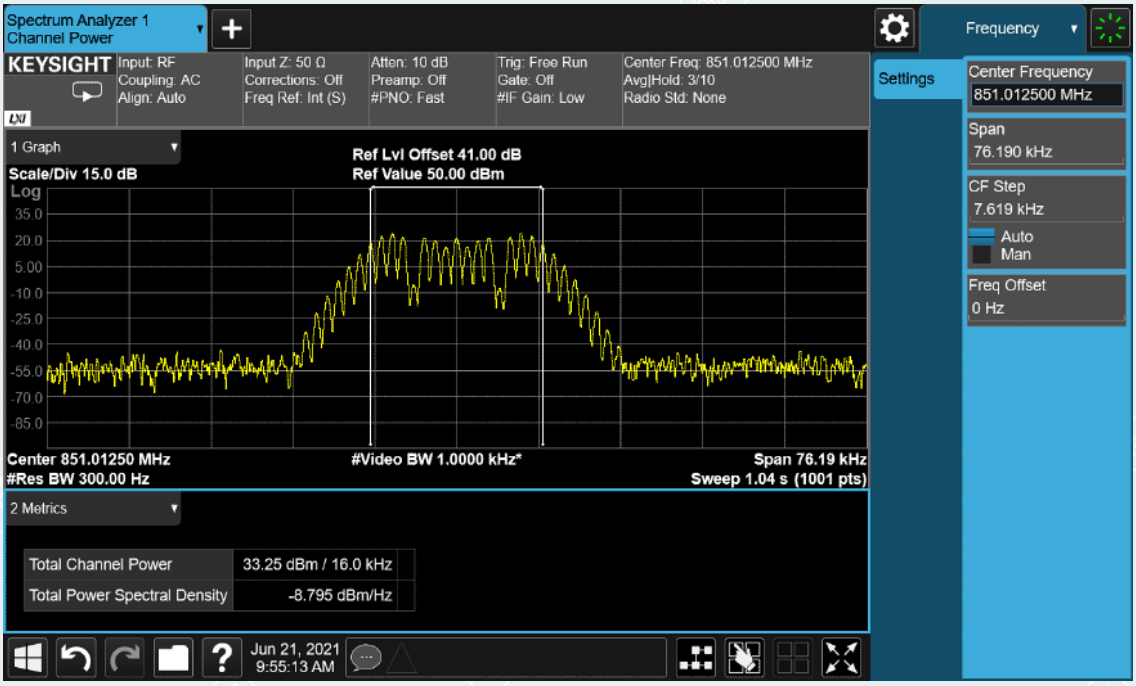
10.5.5.3.2.4.1 Downlink



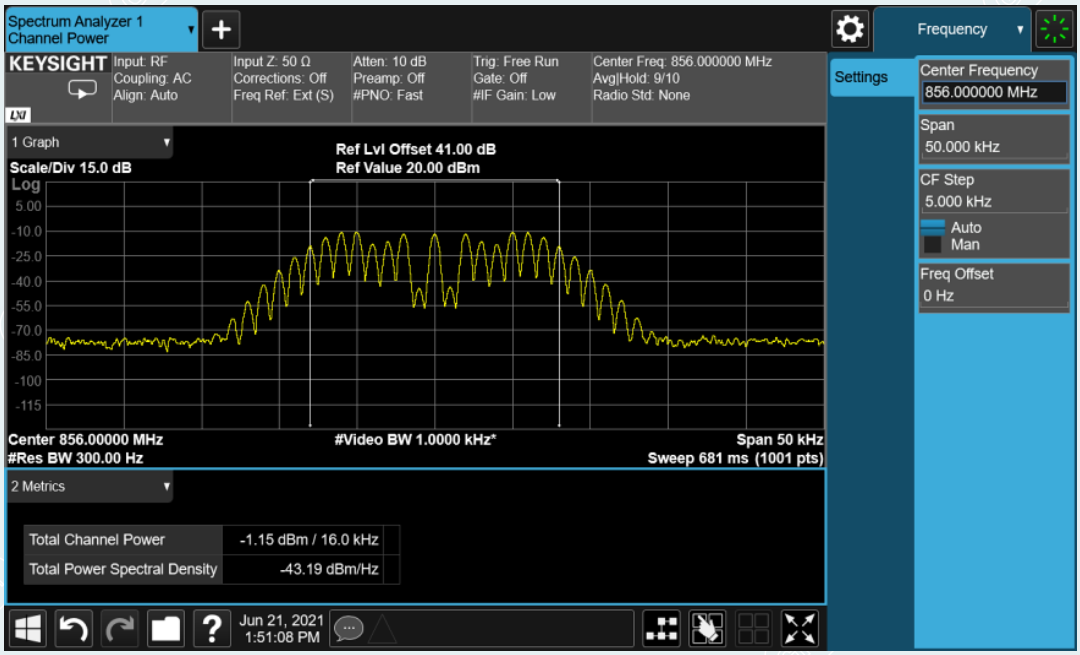

Low Frequency: 851.0125MHz, Input occupied BW



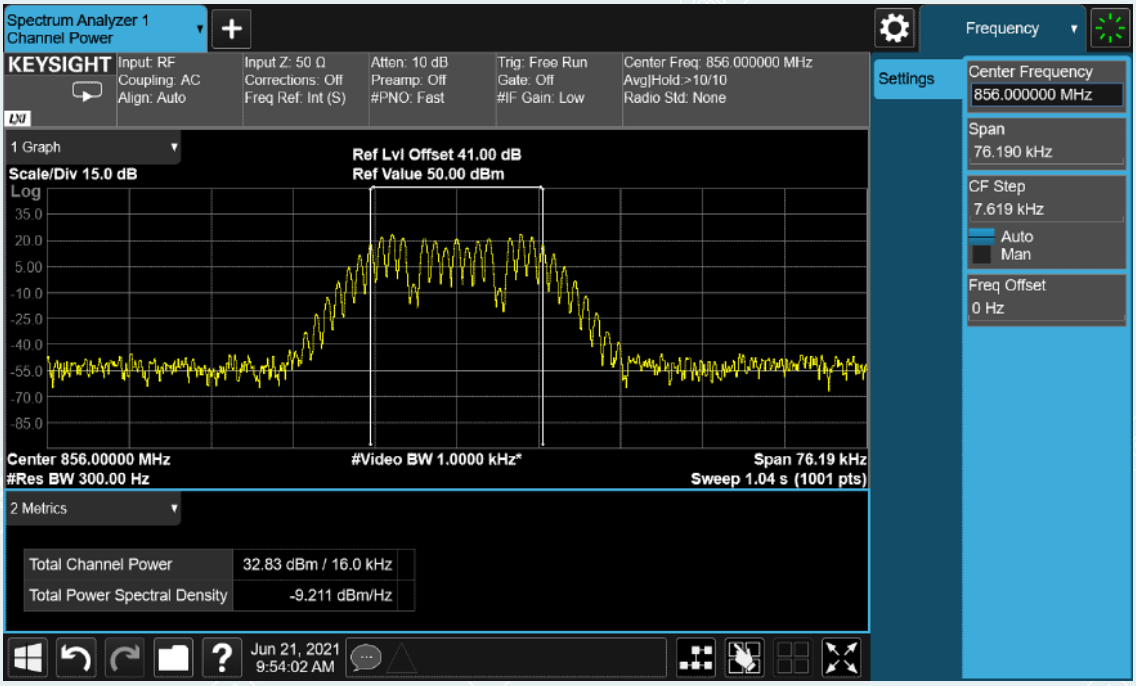

Low Frequency: 851.0125MHz, Output occupied BW(AGC)



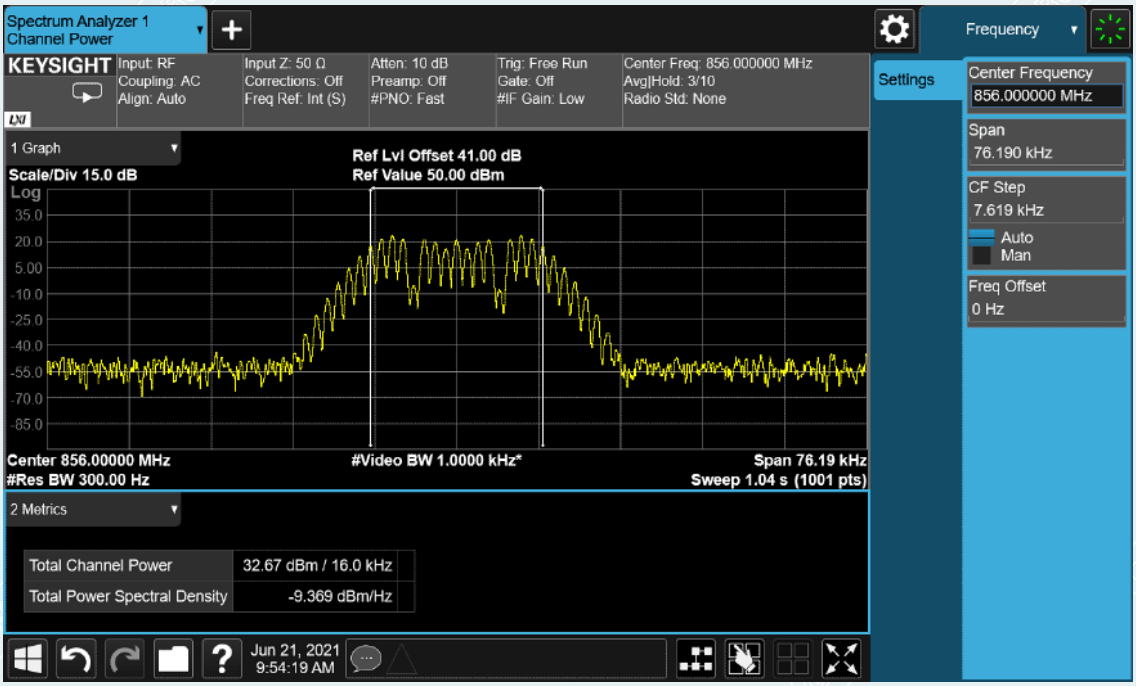

Low Frequency: 851.0125MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)



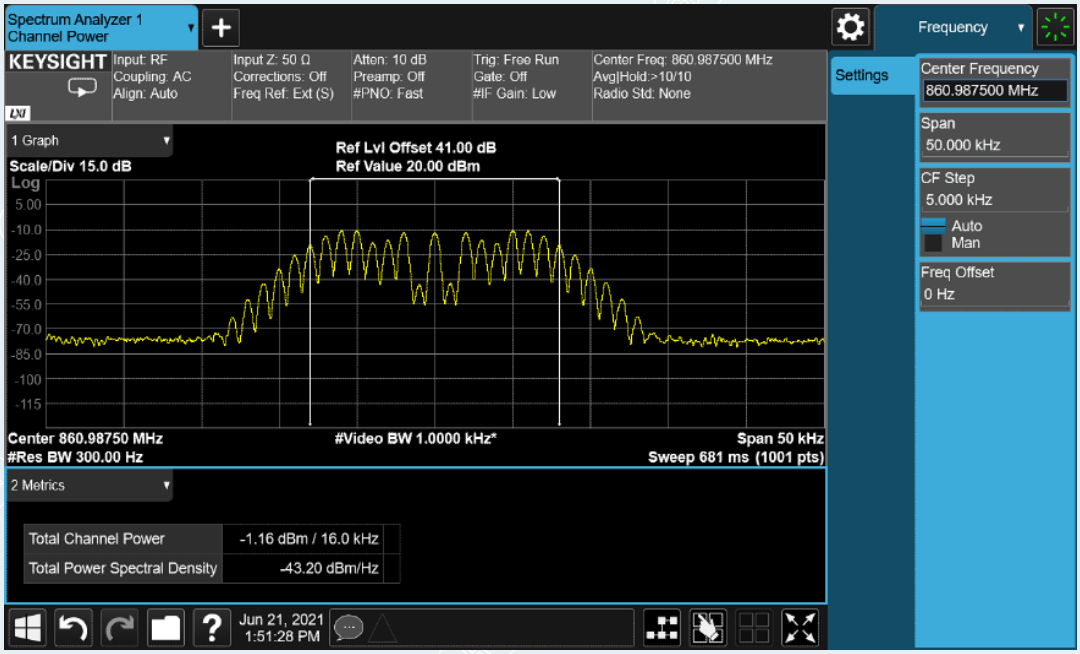

Middle Frequency: 856.0MHz, Input occupied BW



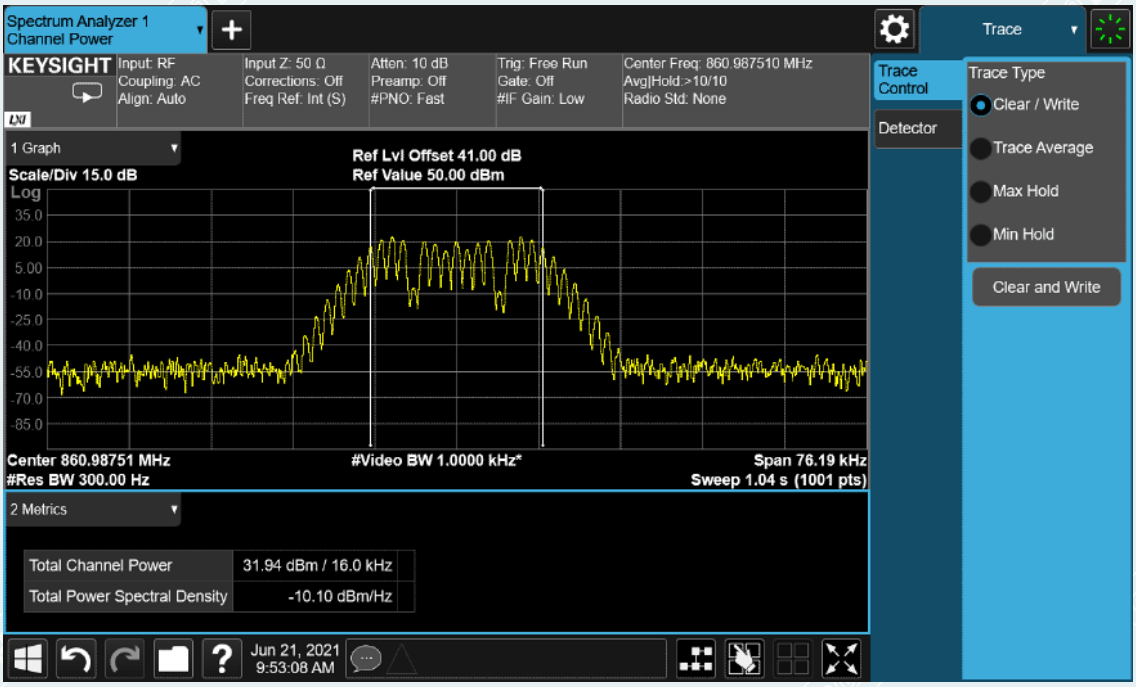

Middle Frequency: 856.0MHz, Output occupied BW(AGC)



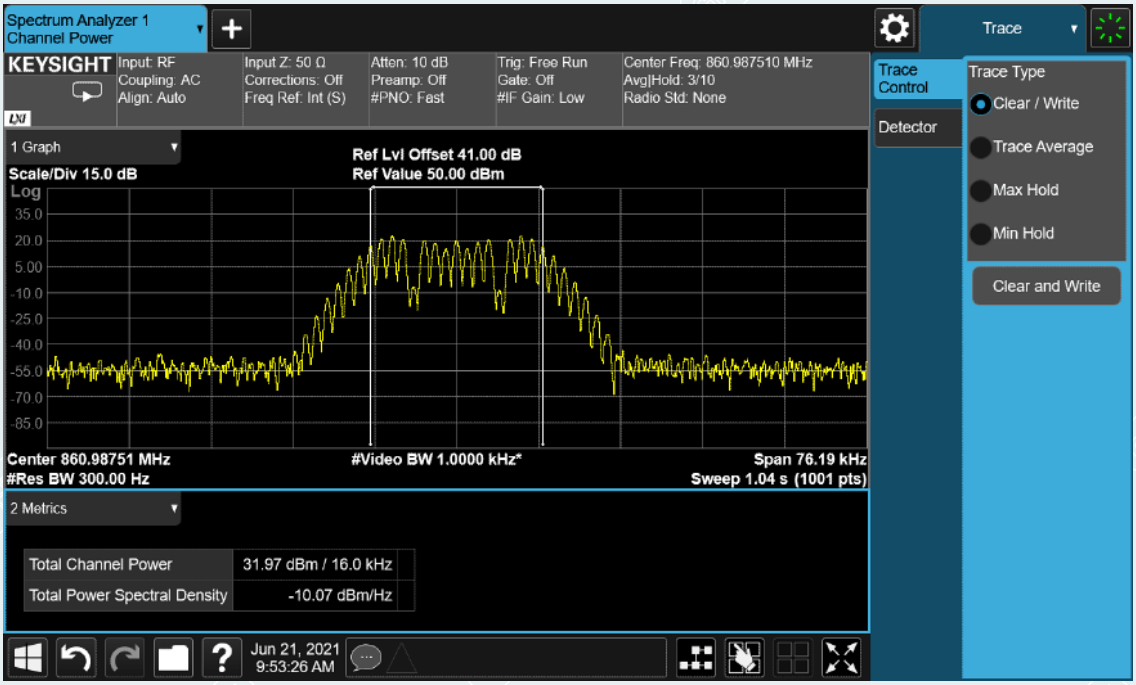

Middle Frequency: 856.0MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)




High Frequency: 860.9875MHz, Input occupied BW

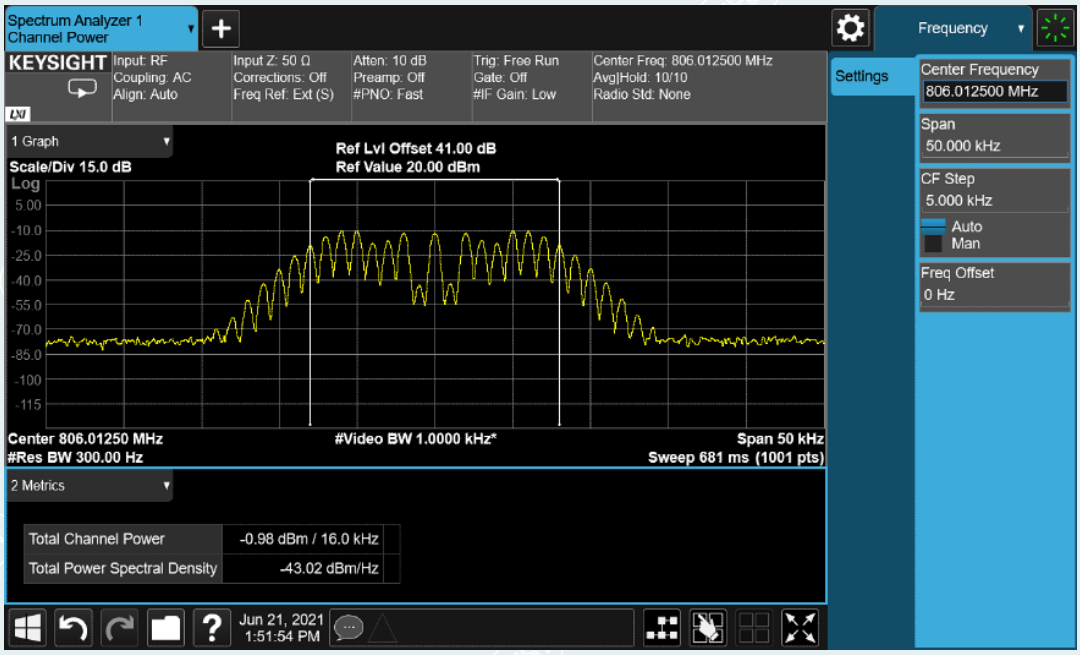



High Frequency: 860.9875MHz, Output occupied BW(AGC)

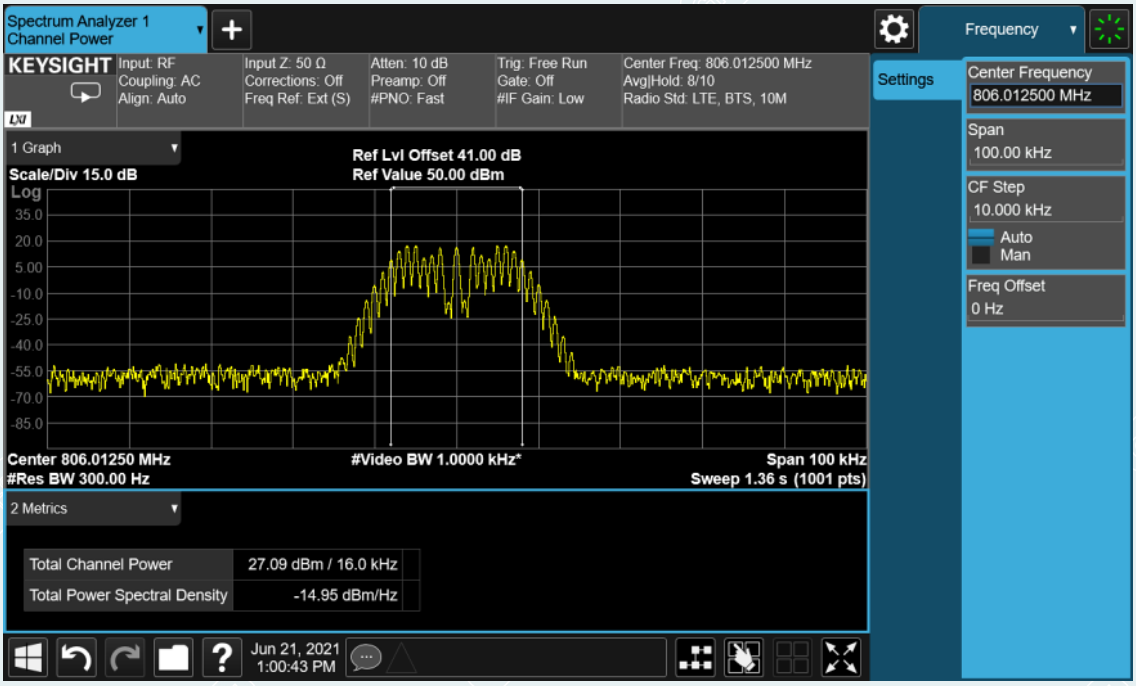



High Frequency: 860.9875MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)

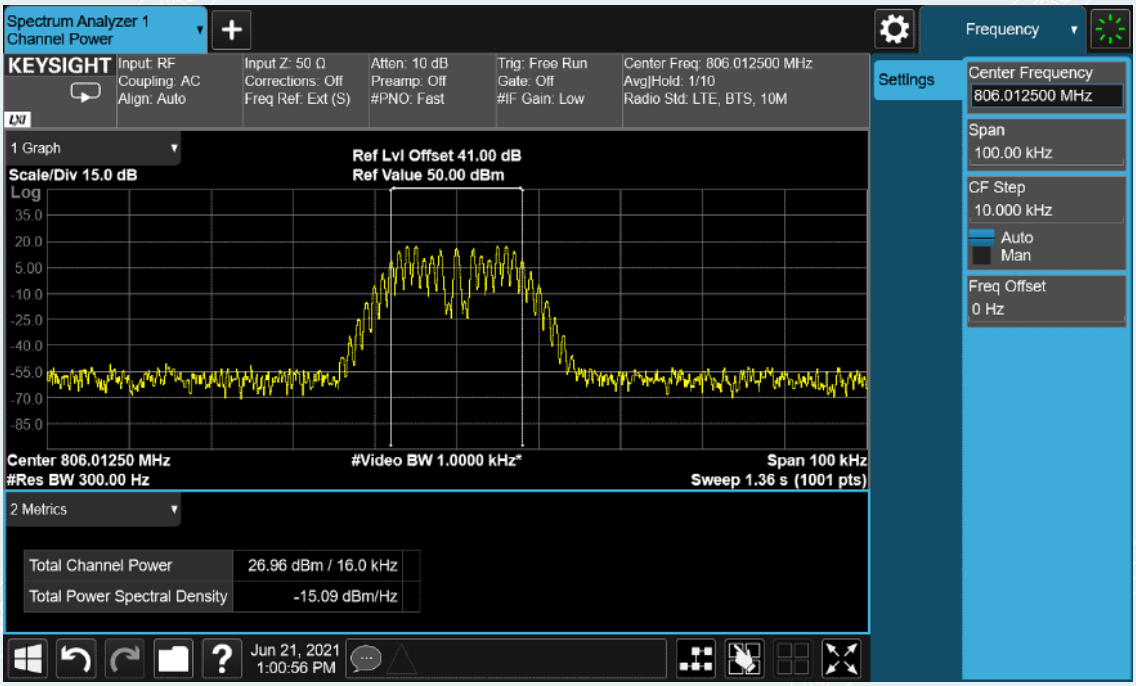
10.5.5.3.2.4.2 Uplink



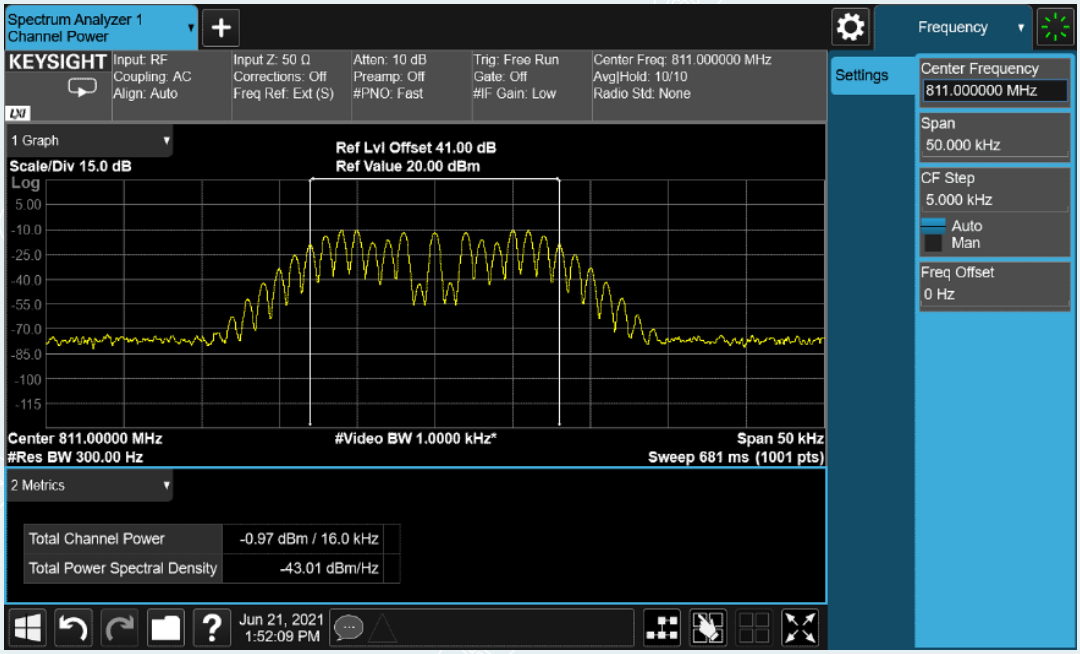

Low Frequency: 806.0125MHz, Input occupied BW



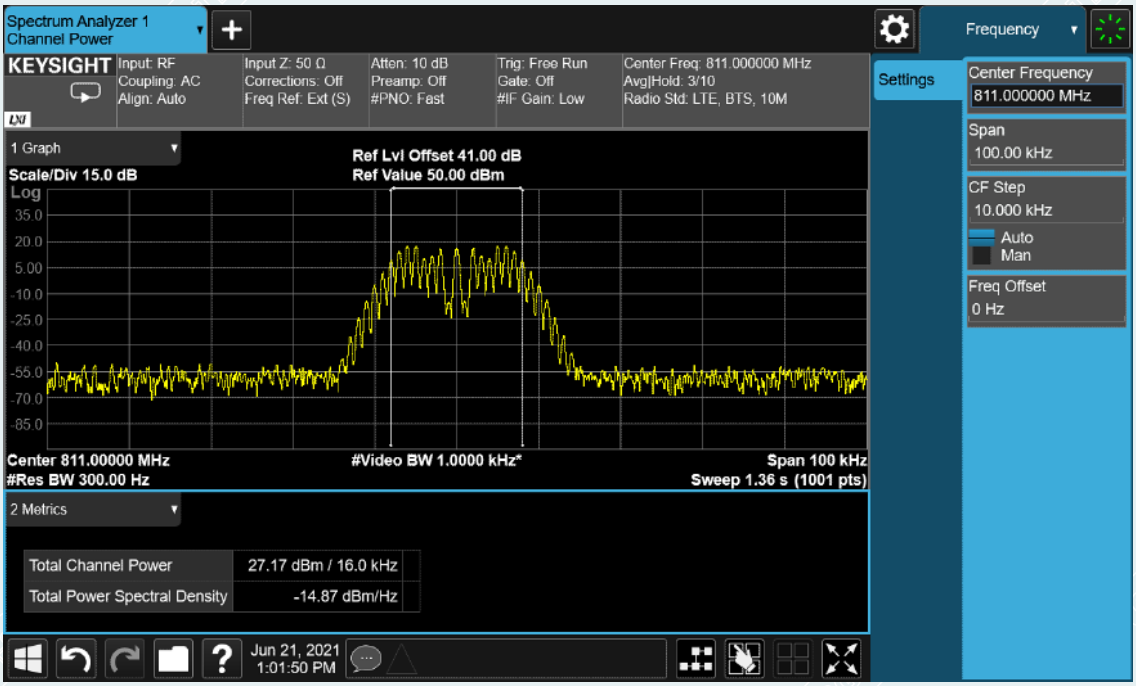

Low Frequency: 806.0125MHz, Output occupied BW(AGC)



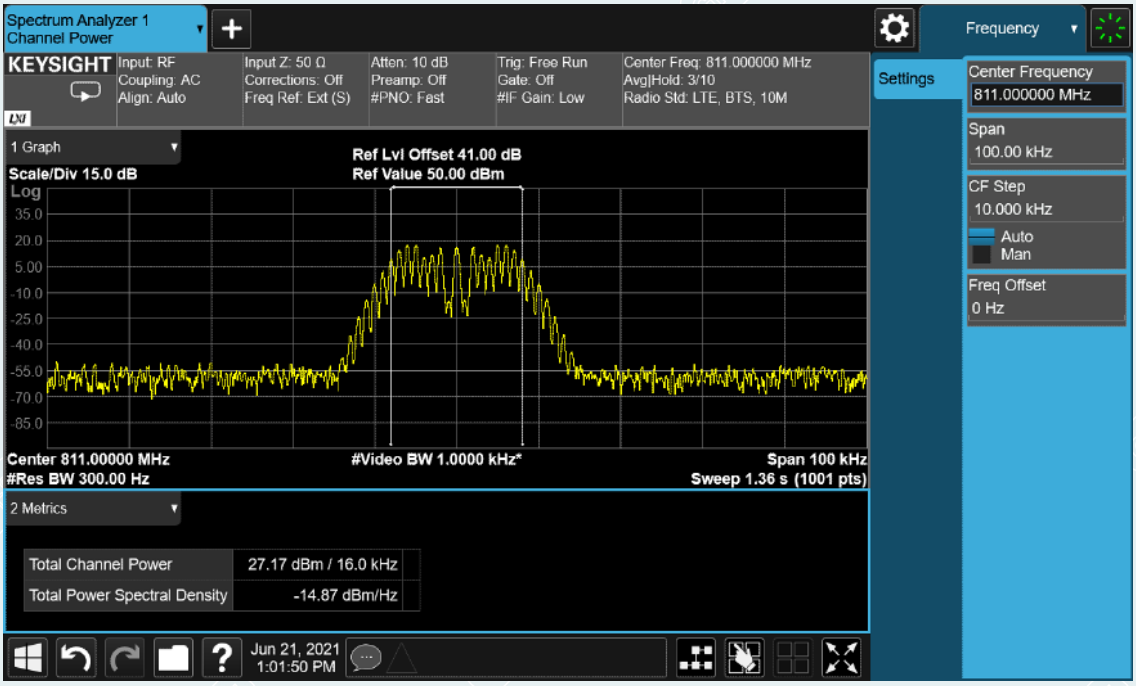

Low Frequency: 806.0125MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)



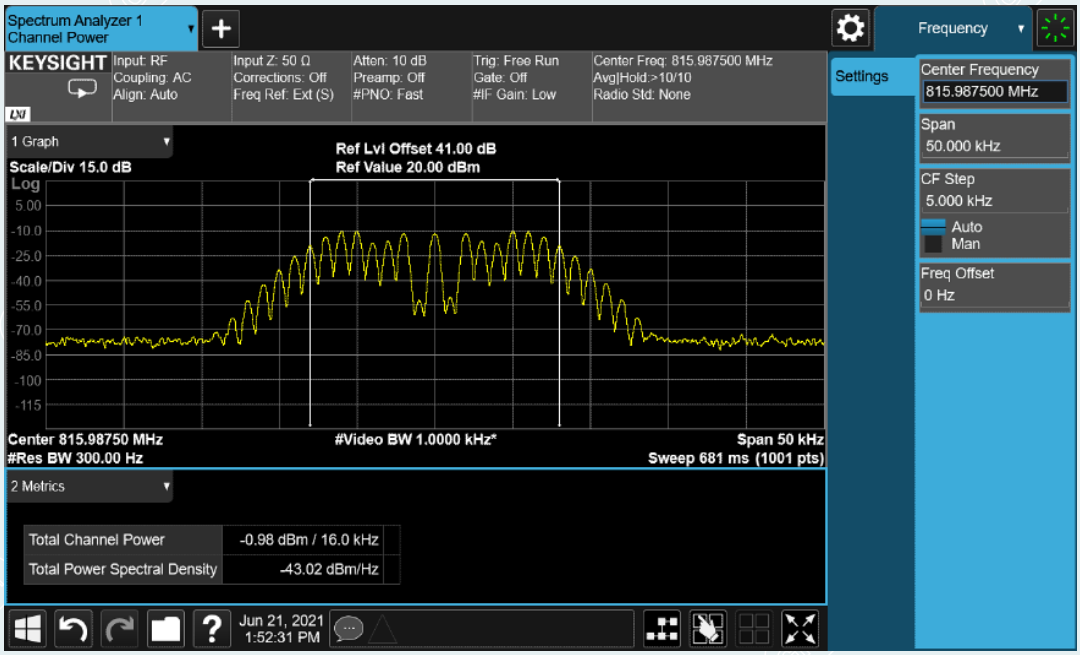

Middle Frequency: 811.0MHz, Input occupied BW



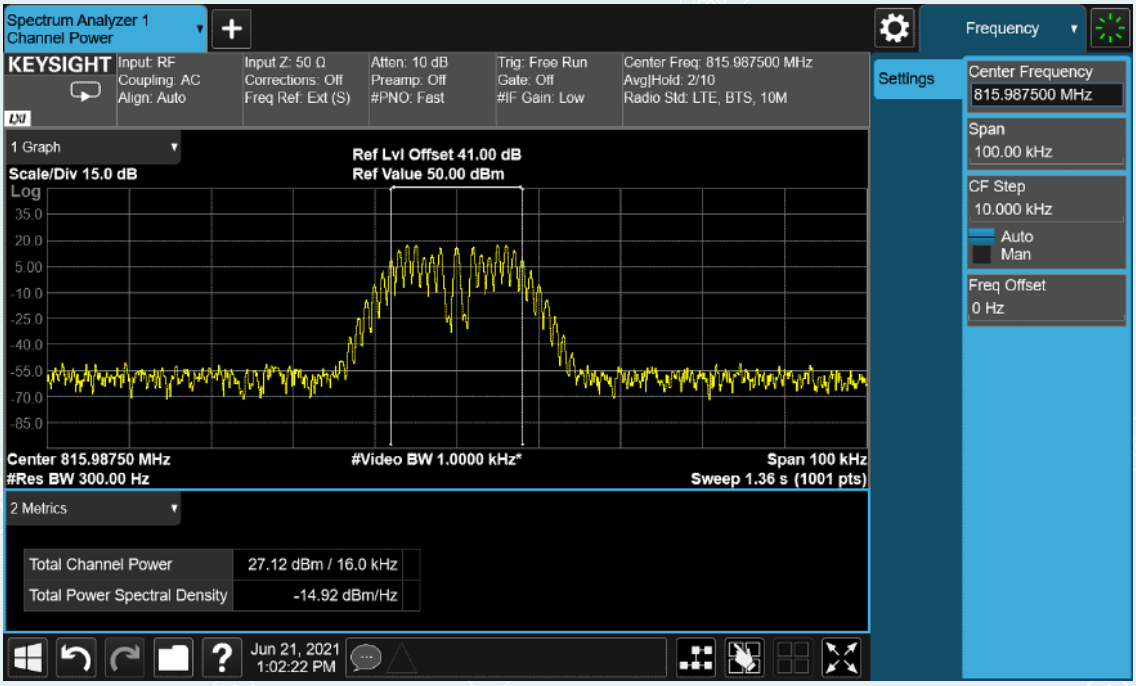

Middle Frequency: 811.0MHz, Output occupied BW(AGC)



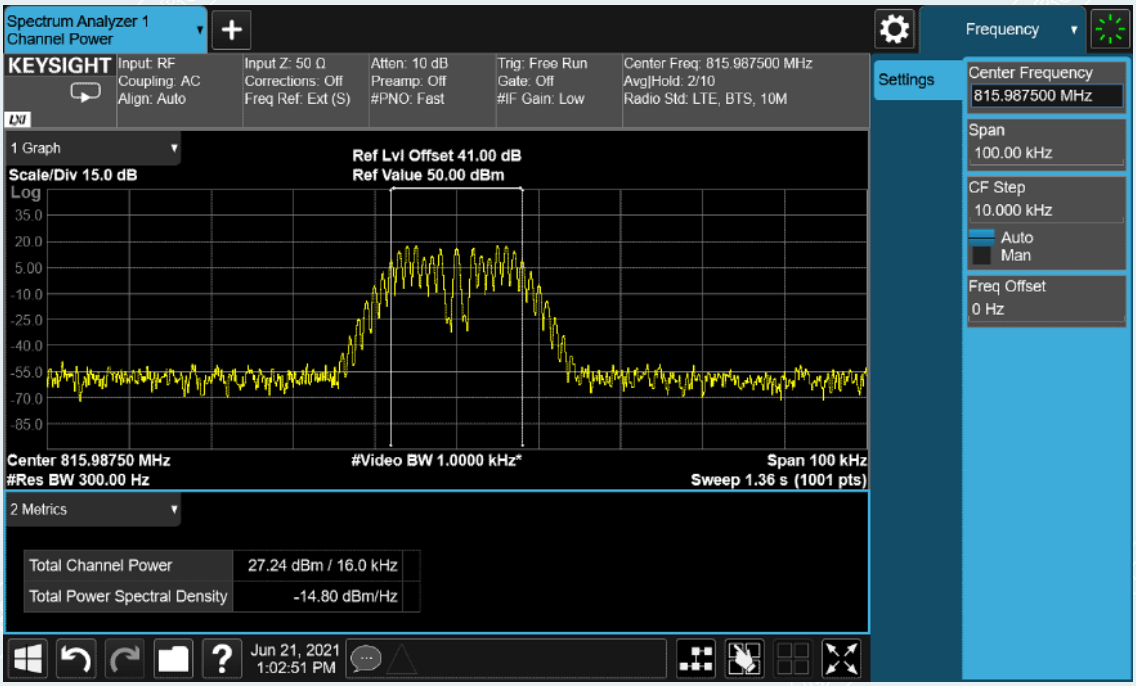

Middle Frequency: 811.0MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)




High Frequency: 815.9875MHz, Input occupied BW




High Frequency: 815.9875MHz, Output occupied BW(AGC)




High Frequency: 815.9875MHz, Output occupied BW (with the input signal amplitude set 3 dB above the AGC threshold)

## 10.6 Mean power and amplifier/booster gain

Test requirement: KDB 935210 D05 clause 4.5
FCC PART 90.219 (e)(1)

Test Method: KDB 935210 D05 clause 4.5

### 10.6.1 Requirements

According to KDB 935210 D05 clause 4.5, the mean input and output power and the amplifier gain was measured by adjusting the internal gain control of the EUT to the maximum gain for which equipment certification is sought. Any EUT attenuation settings were set to their minimum value.

Input power levels (Downlink and Uplink) were set to maximum input ratings while confirming that the device is not capable of operating in saturation (Non-linear mode) at the rated input levels, including during the performance of the input/output power measurements.

FCC PART 90.219 (e)(1) requirement:

(e) *Device Specifications.* In addition to the general rules for equipment certification in §90.203(a)(2) and part 2, subpart J of this chapter, a signal booster must also meet the rules in this paragraph.

(1) The output power capability of a signal booster must be designed for deployments providing a radiated power not exceeding 5 Watts ERP for each retransmitted channel.

### 10.6.2 Test configuration

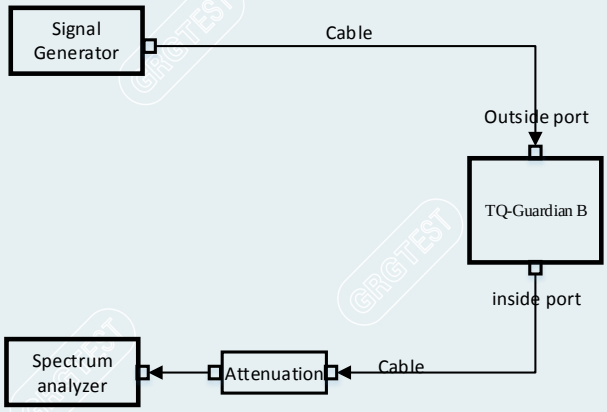



Figure 10.5-1 Downlink connection diagram

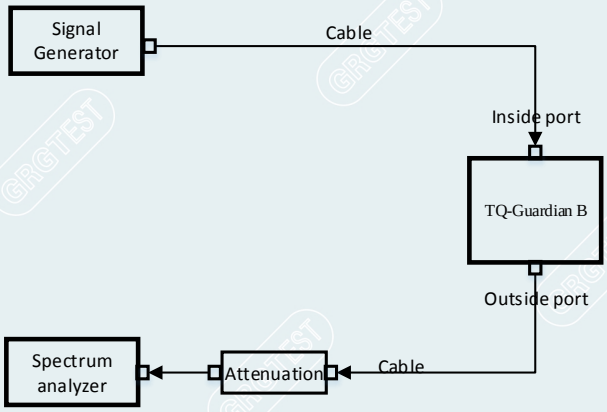



Figure 10.5-2 Uplink connection diagram

### 10.6.3 Test procedures

a) Connect a signal generator to the input of the EUT.
b) Configure to generate the AWGN (broadband) test signal.
c) The frequency of the signal generator shall be set to the frequency $f_0$ as determined from 3.3.
d) Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation as necessary.
e) Set the signal generator output power to a level that produces an EUT output level that is just below the AGC threshold (see 3.2), but not more than 0.5 dB below.
f) Measure and record the output power of the EUT; use 3.5.3 or 3.5.4 for power measurement.
g) Remove the EUT from the measurement setup. Using the same signal generator settings, repeat the power measurement at the signal generator port, which was used as the input signal to the EUT, and record as the input power. EUT gain may be calculated as described in 3.5.5.
h) Repeat steps f) and g) with input signal amplitude set to 3 dB above the AGC threshold level.
i) Repeat steps e) to h) with the narrowband test signal.
j) Repeat steps e) to i) for all frequency bands authorized for use by the EUT.

## 10.6.4 Test results

Test Date (yy-mm-dd): 2021-06-16

Normal condition: Temp: 22.9℃, Humid:35%, Atmospheric Pressure:101kpa

Supply Voltage: AC 110V, 50Hz

### 10.6.4.1 Mean power and gain

#### 10.6.4.1.1 700MHz Band

##### 10.6.4.1.1.1 Downlink: 758~768MHz/ Uplink: 788~798MHz

###### 10.6.4.1.1.1.1 Channel Bandwidth: 5MHz

| Test link | Freq. (MHz) | Sig output power (dBm) | Input Cable Loss (dB) | Peak power (dBm) | Output Atten (dB) | Output Cable Loss (dB) | Output power (dBm) | Output power (W) | Gain (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Down(1) | 763.0 | -48.3 | 1.0 | -7.8 | 40.0 | 1.0 | 33.2 | 2.089 | 82.5 |
| Down(2) | 763.0 | -45.3 | 1.0 | -7.7 | 40.0 | 1.0 | 33.3 | 2.138 | 79.6 |
| Up(1) | 793.0 | -51.9 | 1.0 | -13.3 | 40.0 | 1.0 | 27.7 | 0.589 | 80.6 |
| Up(2) | 793.0 | -48.9 | 1.0 | -13.1 | 40.0 | 1.0 | 27.9 | 0.617 | 77.8 |

NOTE: (1) Level is 0.5 dB below AGC threshold; (2) Level is 3dB above AGC threshold.

###### 10.6.4.1.1.1.2 Channel Bandwidth: 10MHz

| Test link | Freq. (MHz) | Sig output power (dBm) | Input Cable Loss (dB) | Peak power (dBm) | Output Atten (dB) | Output Cable Loss (dB) | Output power (dBm) | Output power (W) | Gain (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Down(1) | 763.0 | -49.3 | 1.0 | -7.8 | 40.0 | 1.0 | 33.2 | 2.089 | 83.5 |
| Down(2) | 763.0 | -46.3 | 1.0 | -7.7 | 40.0 | 1.0 | 33.3 | 2.138 | 80.6 |
| Up(1) | 793.0 | -54.1 | 1.0 | -14.3 | 40.0 | 1.0 | 26.7 | 0.468 | 81.8 |
| Up(2) | 793.0 | -51.1 | 1.0 | -14.3 | 40.0 | 1.0 | 26.7 | 0.468 | 78.8 |

NOTE: (1) Level is 0.5 dB below AGC threshold; (2) Level is 3dB above AGC threshold.

##### 10.6.4.1.1.2 Downlink: 768~775MHz/ Uplink: 798~805MHz

| Test link | Freq. (MHz) | Sig output power (dBm) | Input Cable Loss (dB) | Peak power (dBm) | Output Atten (dB) | Output Cable Loss (dB) | Output power (dBm) | Output power (W) | Gain (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Down(1) | 771.5 | -47.6 | 1.0 | -8.0 | 40.0 | 1.0 | 33.0 | 1.995 | 81.6 |
| Down(2) | 771.5 | -44.6 | 1.0 | -7.9 | 40.0 | 1.0 | 33.1 | 2.042 | 78.7 |
| Up(1) | 801.5 | -54.1 | 1.0 | -14.3 | 40.0 | 1.0 | 26.7 | 0.468 | 81.8 |
| Up(2) | 801.5 | -51.1 | 1.0 | -14.3 | 40.0 | 1.0 | 26.7 | 0.468 | 78.8 |

NOTE: (1) Level is 0.5 dB below AGC threshold; (2) Level is 3dB above AGC threshold.

10.6.4.1.2 800MHz Band

10.6.4.1.2.1 Downlink: 851~861MHz/ Uplink: 806~816MHz

| Test link | Freq. (MHz) | Sig output power (dBm) | Input Cable Loss (dB) | Peak power (dBm) | Output Atten (dB) | Output Cable Loss (dB) | Output power (dBm) | Output power (W) | Gain (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Down(1) | 856.0 | -47.4 | 1.0 | -7.9 | 40.0 | 1.0 | 33.1 | 2.042 | 81.5 |
| Down(2) | 856.0 | -44.4 | 1.0 | -7.8 | 40.0 | 1.0 | 33.2 | 2.089 | 78.6 |
| Up(1) | 811.0 | -49.7 | 1.0 | -13.5 | 40.0 | 1.0 | 27.5 | 0.562 | 78.2 |
| Up(2) | 811.0 | -46.7 | 1.0 | -13.3 | 40.0 | 1.0 | 27.7 | 0.589 | 75.4 |

NOTE: (1) Level is 0.5 dB below AGC threshold; (2) Level is 3dB above AGC threshold.

10.6.4.2 ERP Calculations

10.6.4.2.1 700MHz Band

10.6.4.2.1.1 Downlink: 758~768MHz/ Uplink: 788~798MHz

10.6.4.2.1.1.1 Channel Bandwidth: 5MHz

| Test link | Freq. (MHz) | EUT Max. output power (dBm) | Max. Ant Gain(dBi) | Duty Cycle (%) | ERP (W) | ERP Limit (W) | AGC Mode |
|---|---|---|---|---|---|---|---|
| Down | 763.0 | 33.2 | 3.0 | 100 | 4.169 | 5 | -0.5dB Below |
| Down | 763.0 | 33.3 | 3.0 | 100 | 4.266 | 5 | +3.0dB above |
| Up | 793.0 | 27.7 | 9.0 | 100 | 4.677 | 5 | -0.5dB Below |
| Up | 793.0 | 27.9 | 9.0 | 100 | 4.898 | 5 | +3.0dB above |

10.6.4.2.1.1.2 Channel Bandwidth: 10MHz

| Test link | Freq. (MHz) | EUT Max. output power (dBm) | Max. Ant Gain(dBi) | Duty Cycle (%) | ERP (W) | ERP Limit (W) | AGC Mode |
|---|---|---|---|---|---|---|---|
| Down | 763.0 | 33.2 | 3.0 | 100 | 4.169 | 5 | -0.5dB Below |
| Down | 763.0 | 33.3 | 3.0 | 100 | 4.266 | 5 | +3.0dB above |
| Up | 793.0 | 26.7 | 9.0 | 100 | 3.715 | 5 | -0.5dB Below |
| Up | 793.0 | 26.7 | 9.0 | 100 | 3.715 | 5 | +3.0dB above |

10.6.4.2.1.2 Downlink: 769~775MHz/ Uplink: 799~805MHz

| Test link | Freq. (MHz) | EUT Max. output power (dBm) | Max. Ant Gain(dBi) | Duty Cycle (%) | ERP (W) | ERP Limit (W) | AGC Mode |
|---|---|---|---|---|---|---|---|
| Down | 771.5 | 33.0 | 3.0 | 100 | 3.981 | 5 | -0.5dB Below |
| Down | 771.5 | 33.1 | 3.0 | 100 | 4.074 | 5 | +3.0dB above |
| Up | 801.5 | 26.7 | 9.0 | 100 | 3.715 | 5 | -0.5dB Below |
| Up | 801.5 | 26.7 | 9.0 | 100 | 3.715 | 5 | +3.0dB above |

10.6.4.2.2 800MHz Band

10.6.4.2.2.1 Downlink: 851~861MHz/ Uplink: 806~816MHz

| Test link | Freq. (MHz) | EUT Max. output power (dBm) | Max. Ant Gain(dBi) | Duty Cycle (%) | ERP (W) | ERP Limit (W) | AGC Mode |
|---|---|---|---|---|---|---|---|
| Down | 856.0 | 33.1 | 3.0 | 100 | 4.074 | 5 | -0.5dB Below |
| Down | 856.0 | 33.2 | 3.0 | 100 | 4.169 | 5 | +3.0dB above |
| Up | 811.0 | 27.5 | 9.0 | 100 | 4.467 | 5 | -0.5dB Below |
| Up | 811.0 | 27.7 | 9.0 | 100 | 4.677 | 5 | +3.0dB above |

## 10.7 Noise figure

Test requirement: KDB 935210 D05 clause 4.6
FCC PART 90.219 (e)(2)

Test Method: KDB 935210 D05/4.6

### 10.7.1 Requirements

According to FCC PART 90 § 90.219 (e) (2) requirement, the noise figure limit of a signal booster must are given in table 10.7-1.

Table 10.7-1 Noise figure limits

| frequency range(MHz) | Max. Noise figure limit(dB) |
|---|---|
| 758-775/788~805 | 9 |
| 851-861/806-816 | 9 |

### 10.7.2 Test configuration

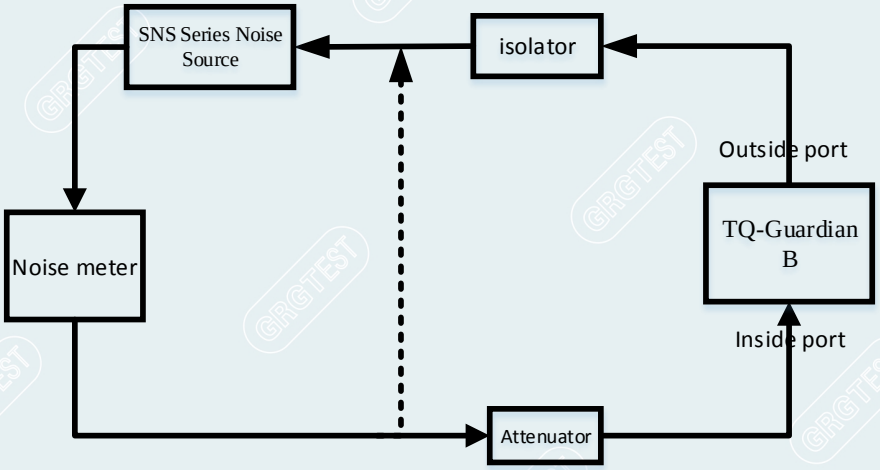



Figure 10.7-1 Downlink connection diagram

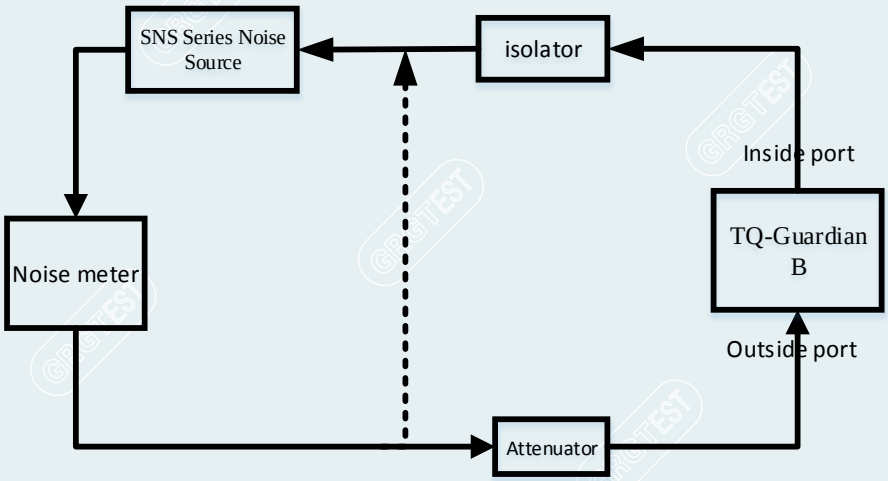



Figure 10.7-2 Uplink connection diagram