



Appendix for test report



1Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

| Test Band | Test Mode | Test Channel | Measured[dBm] | ERP [dBm] | Limit [dBm] | Verdict |
|-----------|-----------|--------------|---------------|------------|-------------|---------|
| GSM850 | GSM/TM1 | LCH | 32.78 | 29.23 | 38.5 | PASS |
| | | MCH | 32.69 | 29.14 | 38.5 | PASS |
| | | HCH | 32.74 | 29.19 | 38.5 | PASS |
| | GSM/TM2 | LCH | 26.09 | 22.54 | 38.5 | PASS |
| | | MCH | 25.93 | 22.38 | 38.5 | PASS |
| | | HCH | 25.90 | 22.35 | 38.5 | PASS |
| Test Band | Test Mode | Test Channel | Measured[dBm] | EIRP [dBm] | Limit [dBm] | Verdict |
| PCS1900 | GSM/TM1 | LCH | 30.10 | 29.80 | 33 | PASS |
| | | MCH | 30.18 | 29.88 | 33 | PASS |
| | | HCH | 30.20 | 29.90 | 33 | PASS |
| | GSM/TM2 | LCH | 25.75 | 25.45 | 33 | PASS |
| | | MCH | 26.00 | 25.70 | 33 | PASS |
| | | HCH | 25.97 | 25.67 | 33 | PASS |

Note1:

a, For getting the ERP (Efficient Radiated Power) or EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b, SGP = Signal Generator Level

Note2:

$$\text{SET Span} = 1.5 * \text{OBW}$$

$$\text{SET RBW} = 1\% \text{ of the OBW, not to exceed 1MHz}$$

$$\text{SET VBW} \geq 3 * \text{RBW}$$

SET Sweep time = auto - couple.

Detector: RMS



2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

| Test Band | Test Mode | Test Channel | Measured[dB] | Limit [dB] | Verdict |
|-----------|-----------|--------------|--------------|------------|---------|
| GSM850 | GSM/TM1 | LCH | 1.80 | 13 | PASS |
| | | MCH | 2.11 | 13 | PASS |
| | | HCH | 1.85 | 13 | PASS |
| | GSM/TM2 | LCH | 4.76 | 13 | PASS |
| | | MCH | 4.88 | 13 | PASS |
| | | HCH | 4.52 | 13 | PASS |
| PCS1900 | GSM/TM1 | LCH | 1.80 | 13 | PASS |
| | | MCH | 1.97 | 13 | PASS |
| | | HCH | 1.79 | 13 | PASS |
| | GSM/TM2 | LCH | 5.16 | 13 | PASS |
| | | MCH | 5.25 | 13 | PASS |
| | | HCH | 5.08 | 13 | PASS |

3Appendix_C: Modulation Characteristics

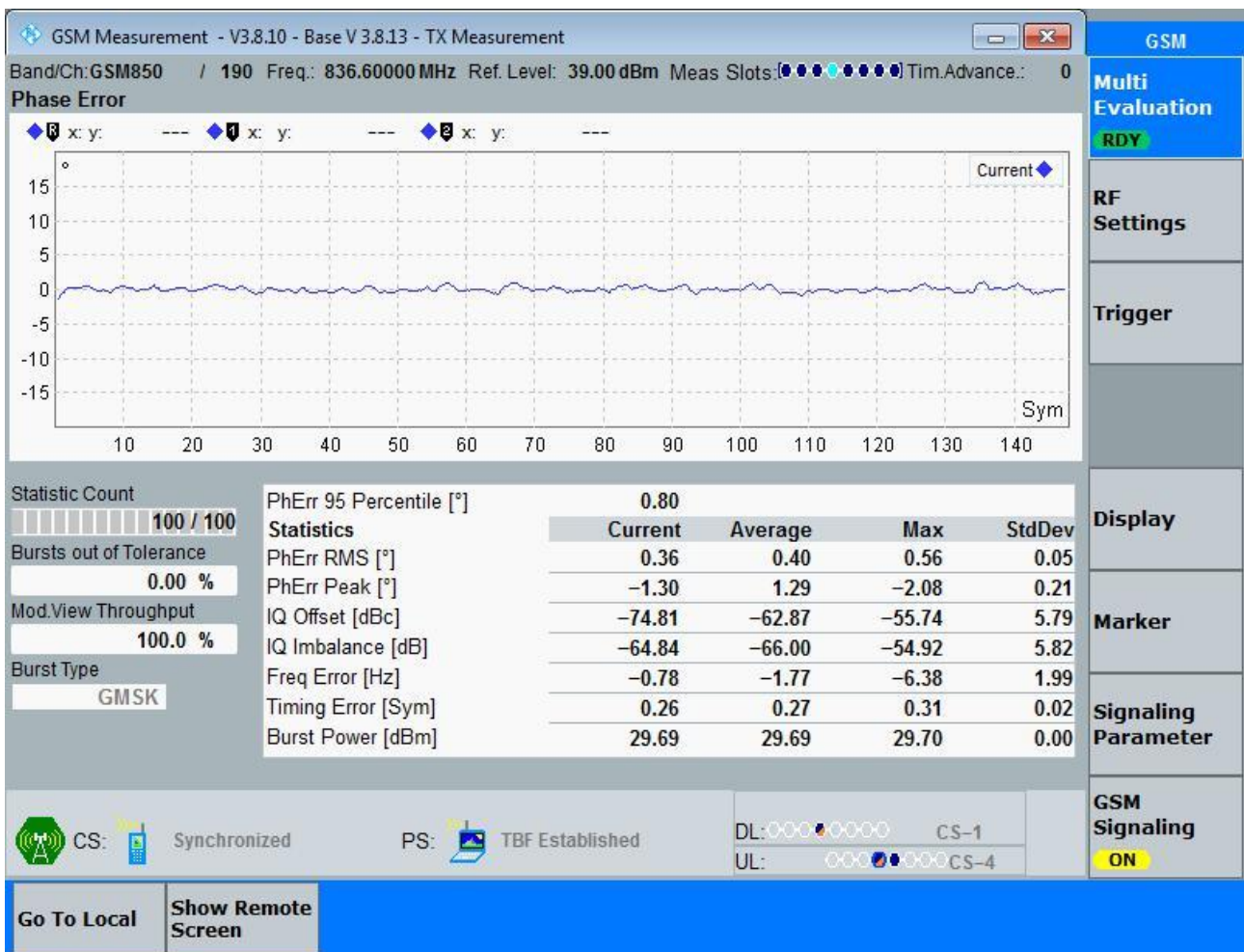
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

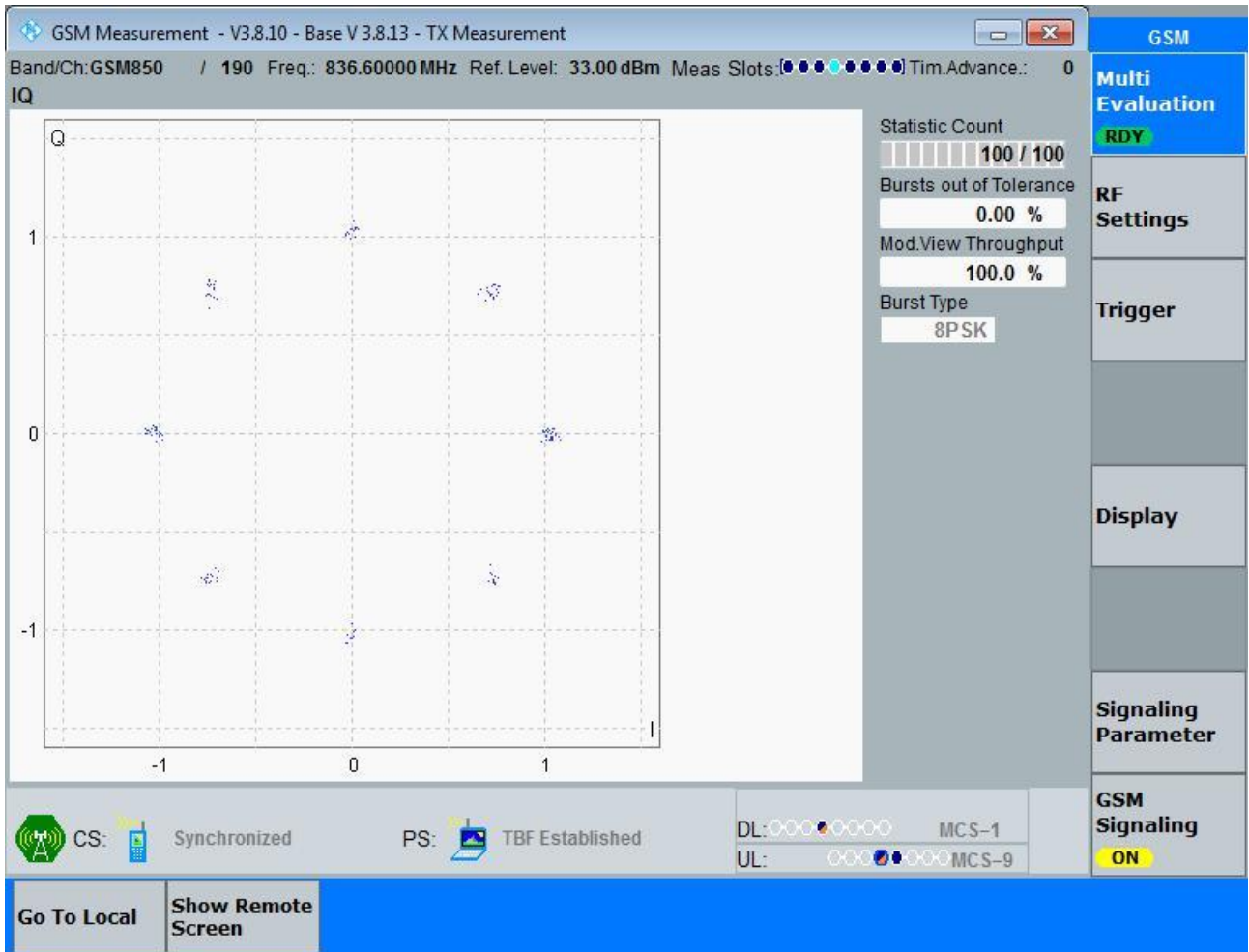
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

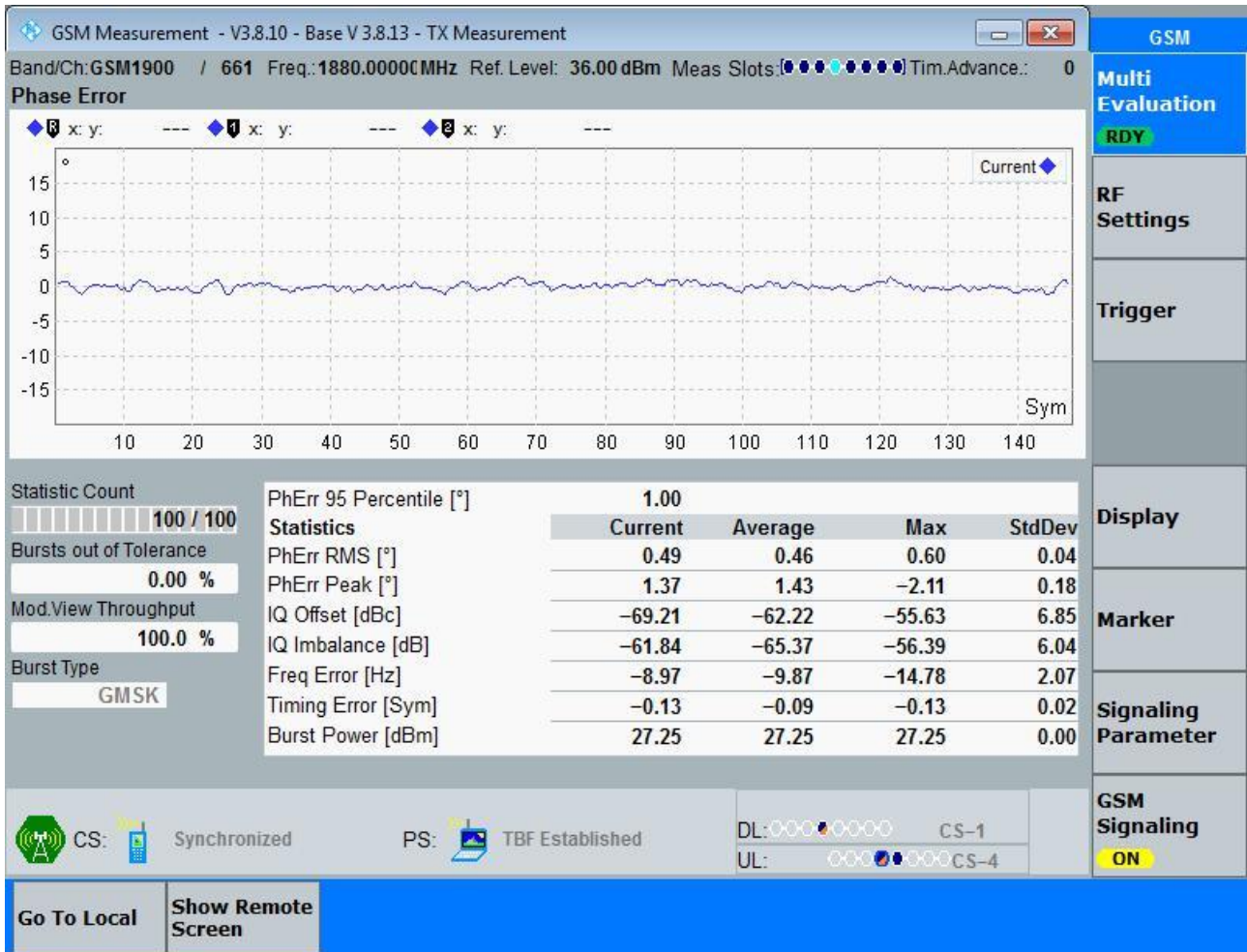
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = PCS1900

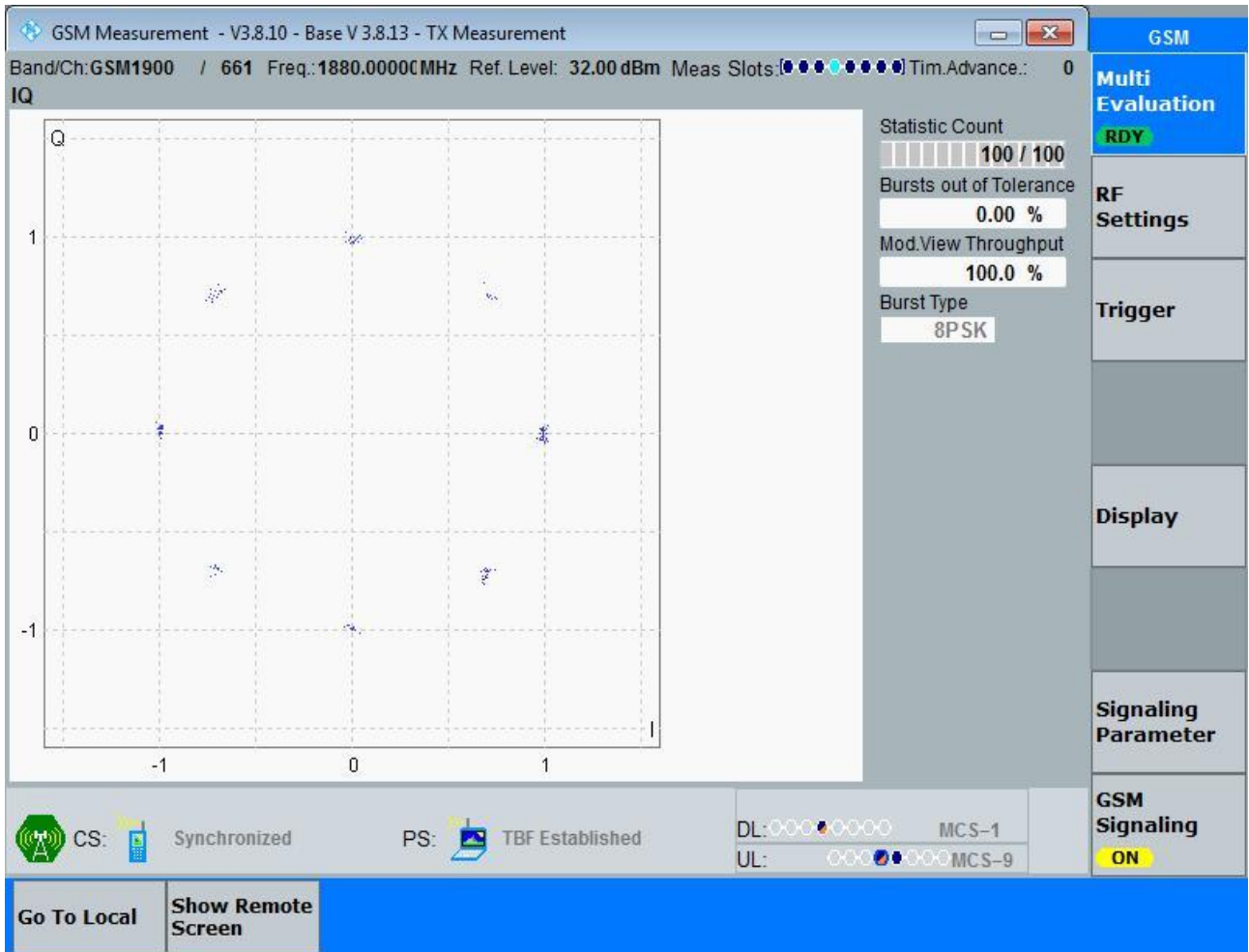
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH





4Appendix_D: Bandwidth

Part I - Test Results

| Test Band | Test Mode | Test Channel | Occupied Bandwidth [kHz] | Emission Bandwidth [kHz] | Verdict |
|-----------|-----------|--------------|--------------------------|--------------------------|---------|
| GSM850 | GSM/TM1 | LCH | 244.68 | 316.3 | Pass |
| | | MCH | 248.69 | 318.5 | Pass |
| | | HCH | 245.87 | 312.4 | Pass |
| | GSM/TM2 | LCH | 250.89 | 322.0 | Pass |
| | | MCH | 249.32 | 320.1 | Pass |
| | | HCH | 249.21 | 321.6 | Pass |
| PCS1900 | GSM/TM1 | LCH | 244.99 | 312.2 | Pass |
| | | MCH | 246.82 | 310.1 | Pass |
| | | HCH | 239.13 | 313.8 | Pass |
| | GSM/TM2 | LCH | 249.70 | 322.0 | Pass |
| | | MCH | 246.43 | 307.4 | Pass |
| | | HCH | 245.32 | 312.9 | Pass |

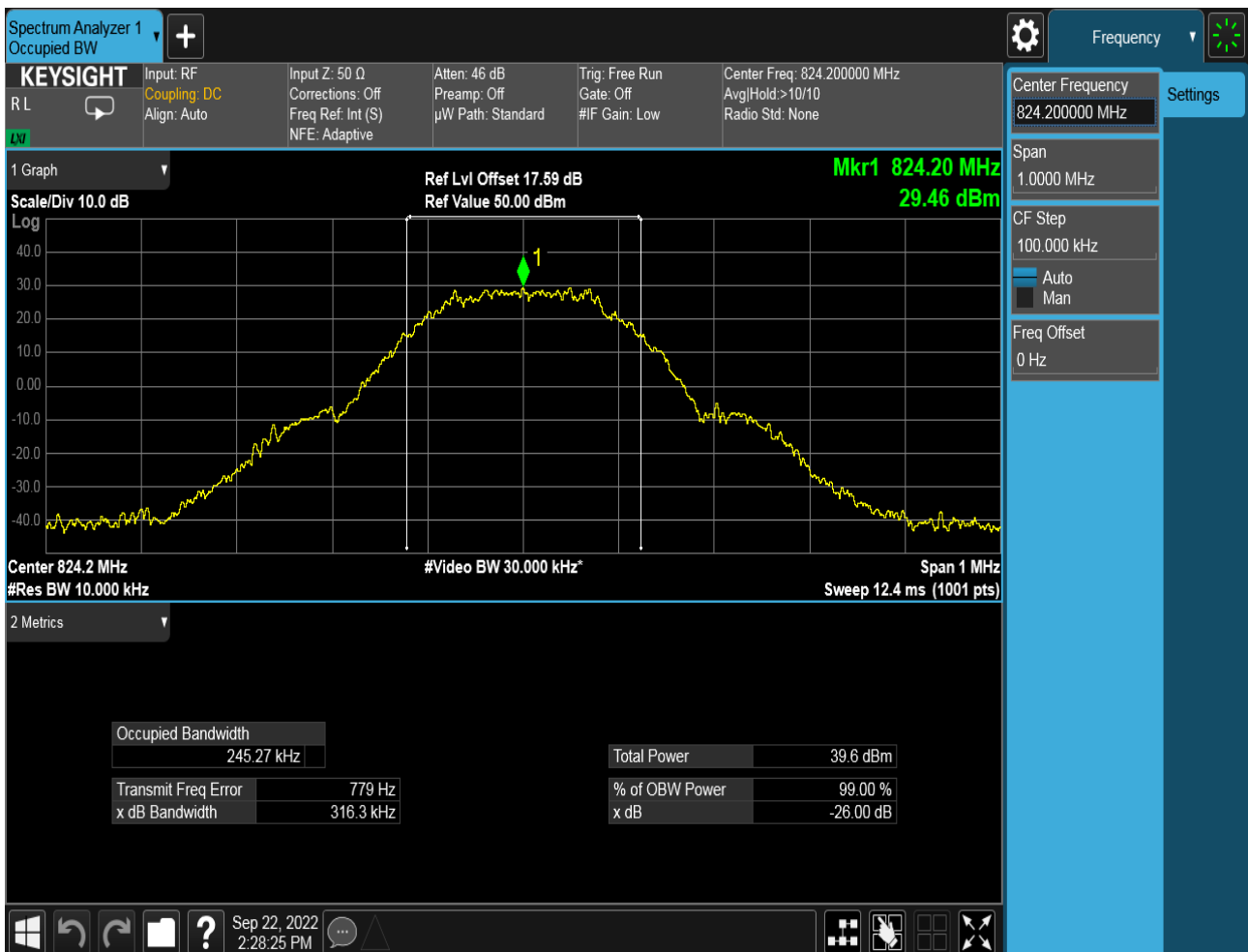
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

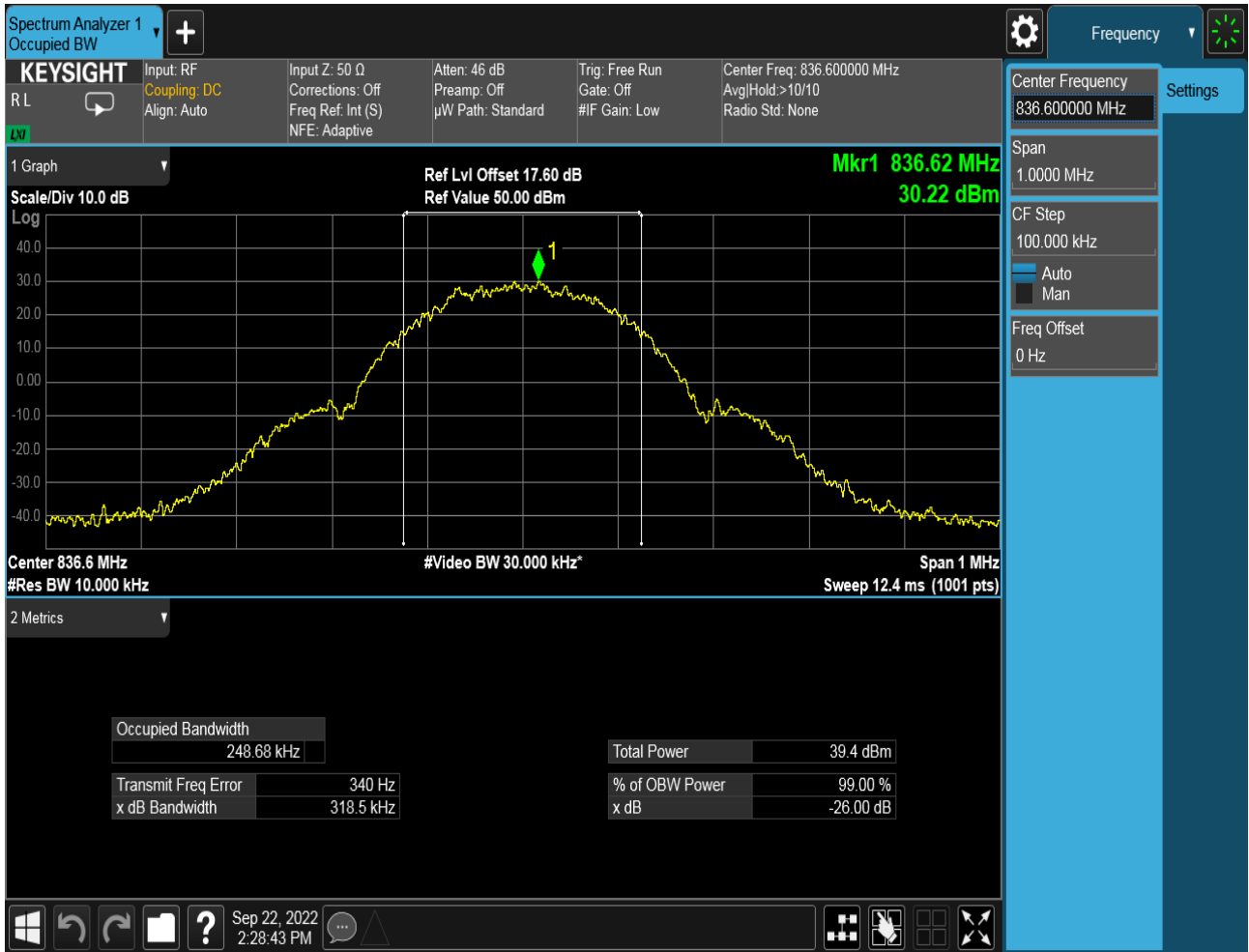
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH





4.1.1.1.2 Test Channel = MCH





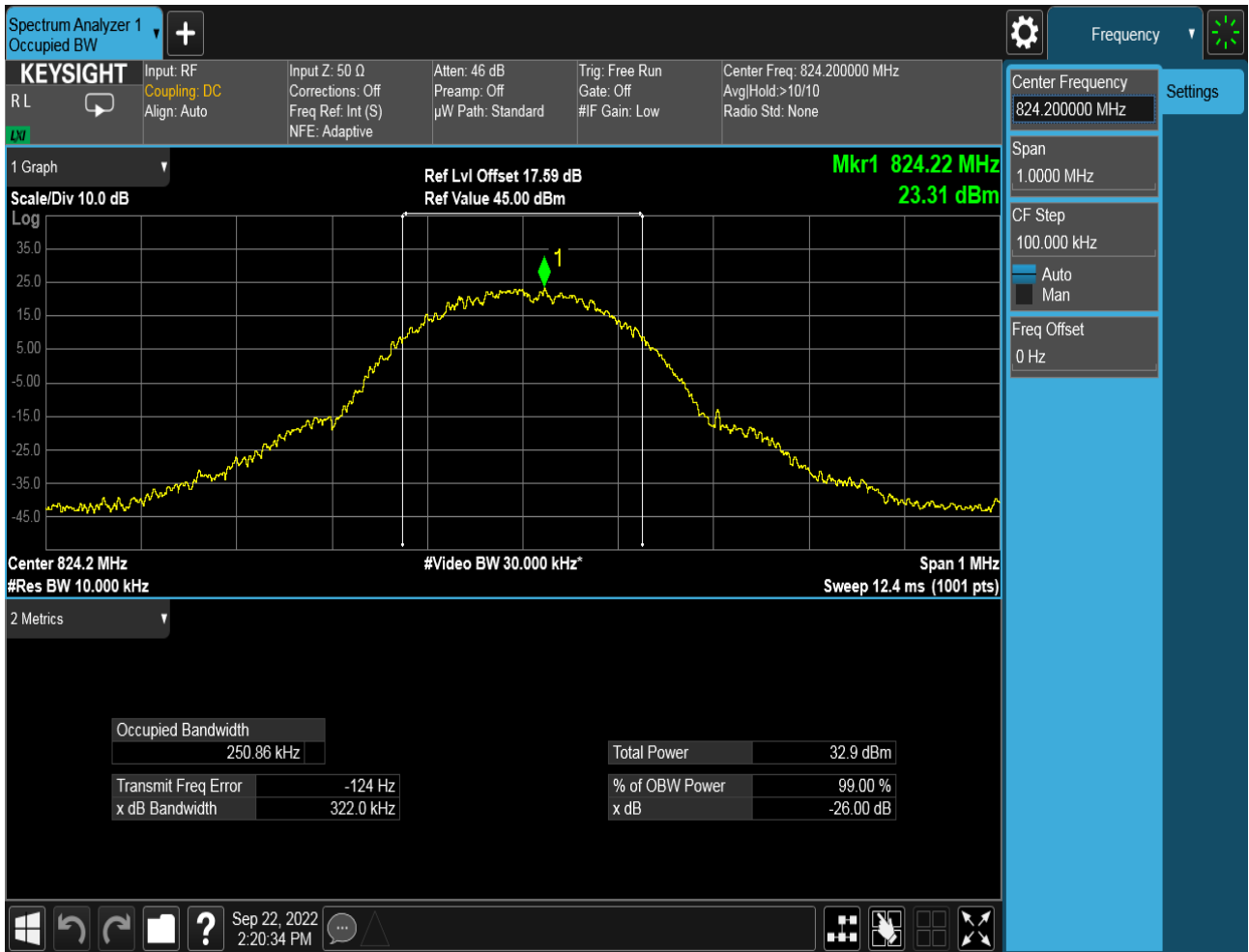
4.1.1.1.3 Test Channel = HCH





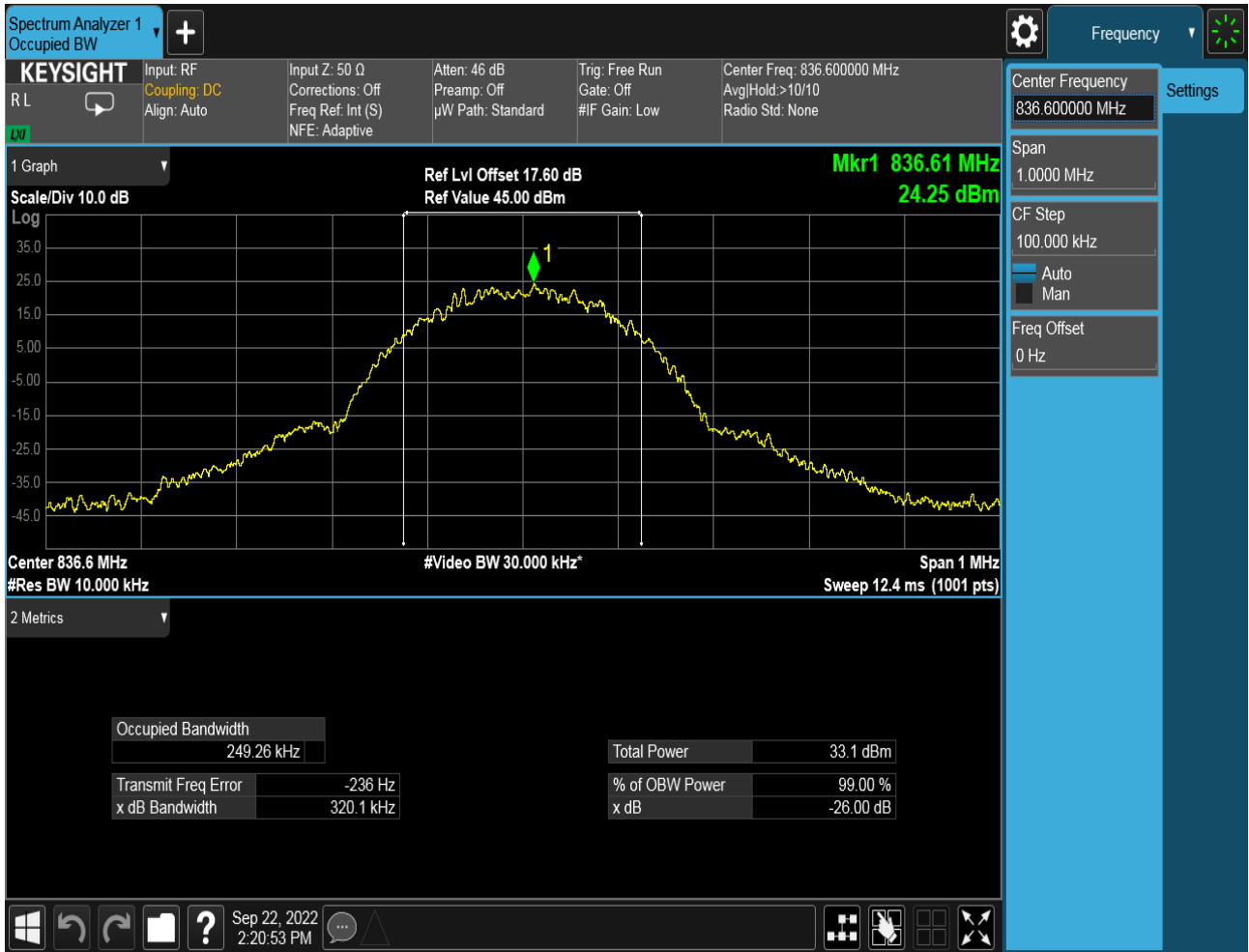
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4.1.1.2.1 Test Channel = LCH



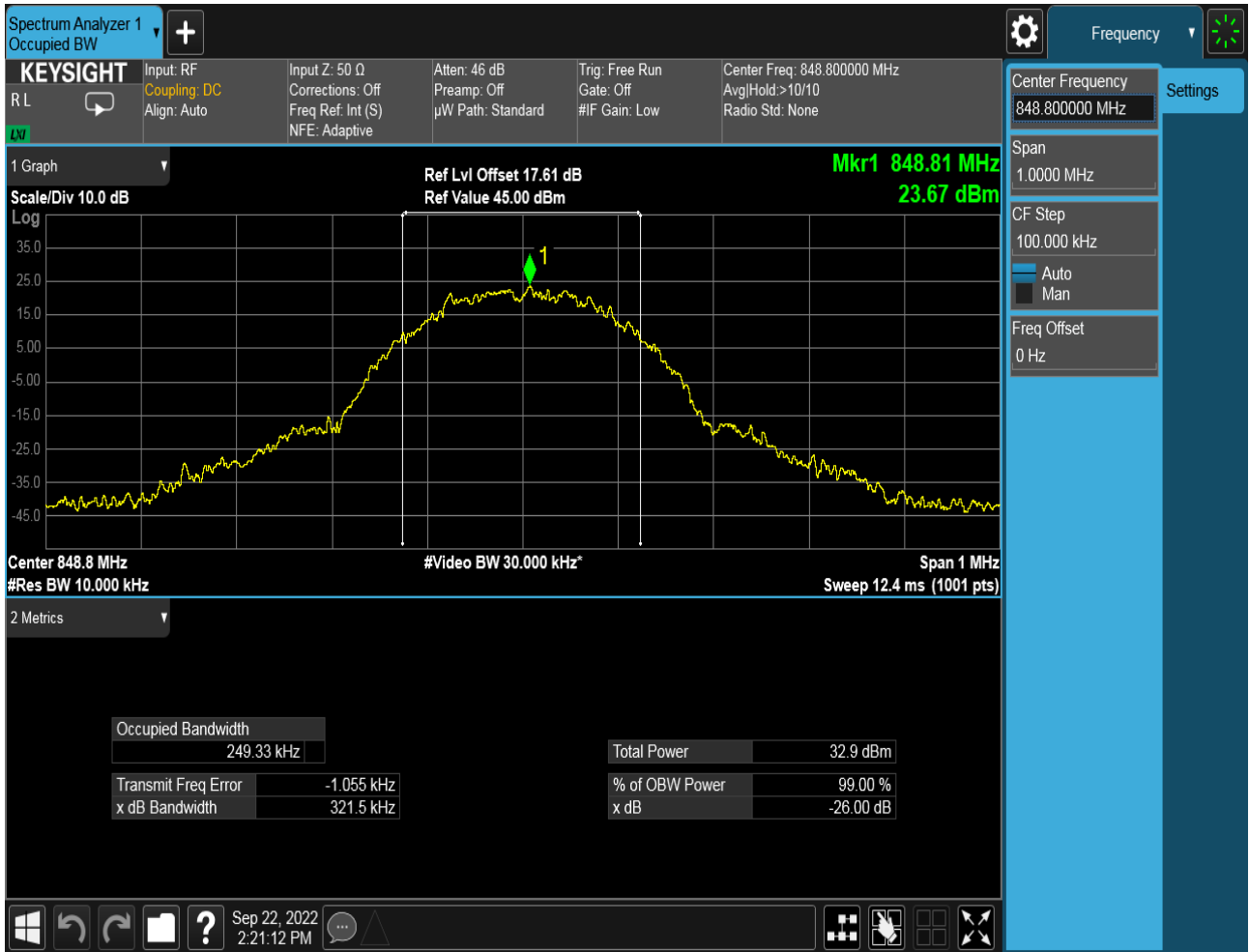


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

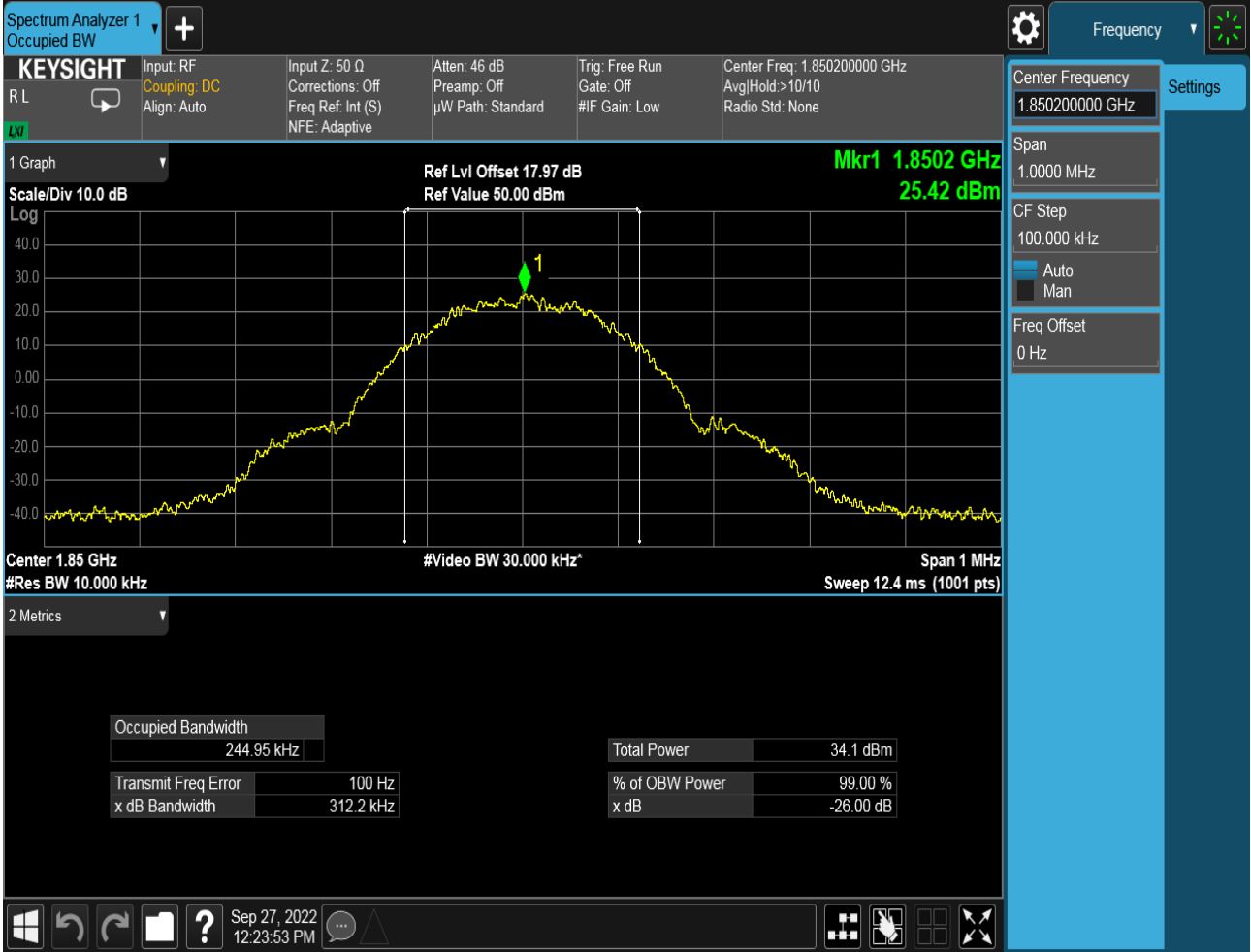




4.1.2 Test Band = PCS1900

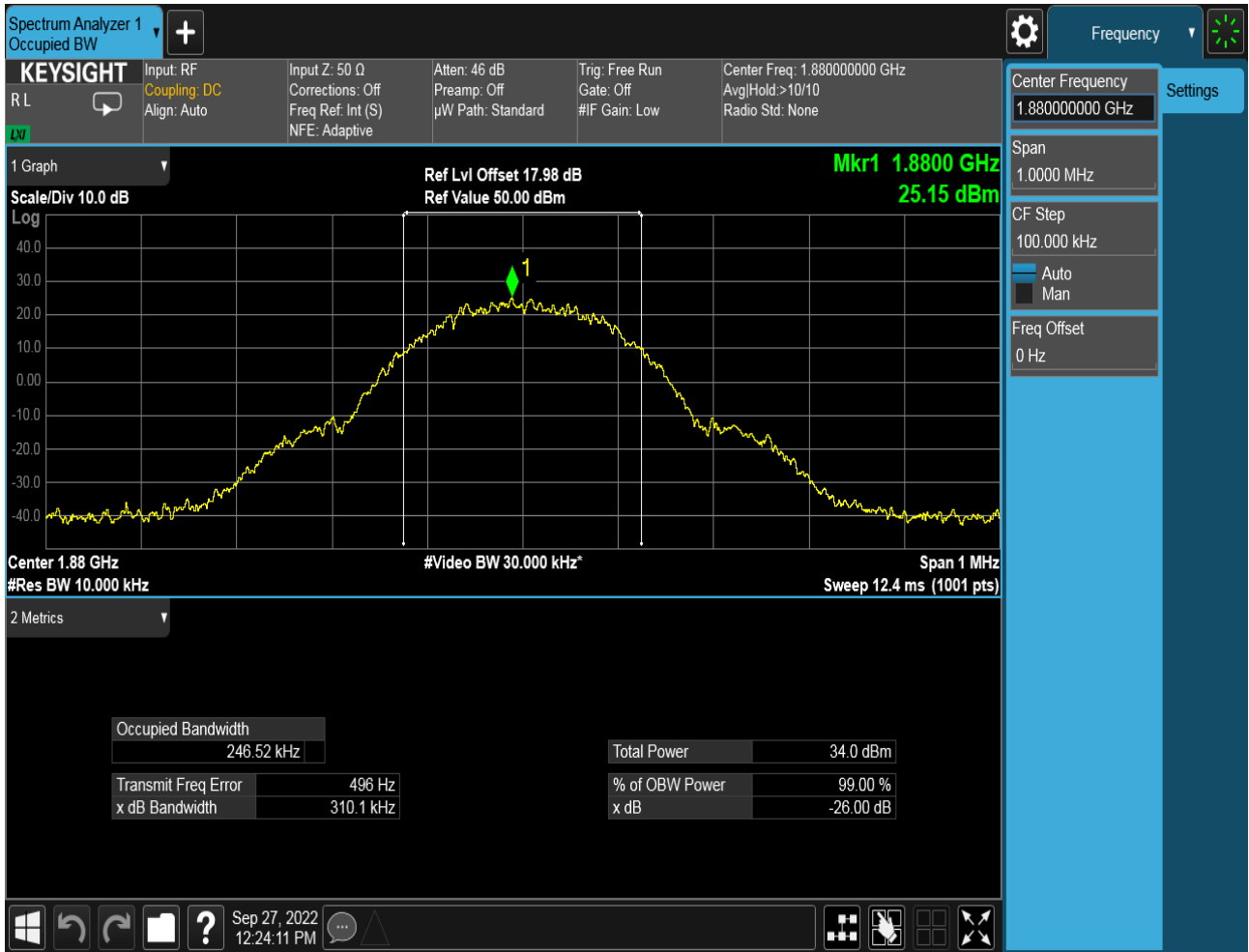
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



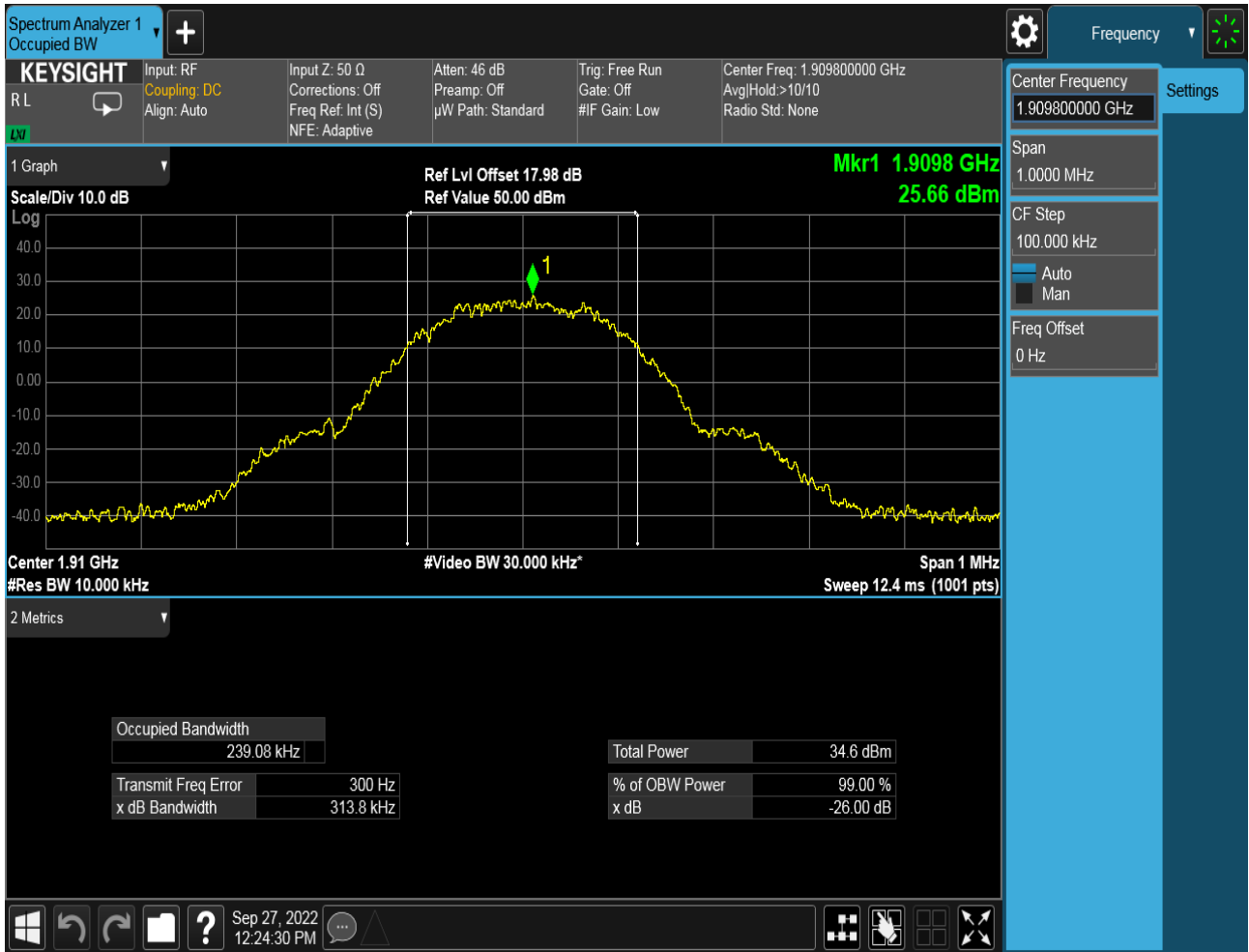


4.1.2.1.2 Test Channel = MCH





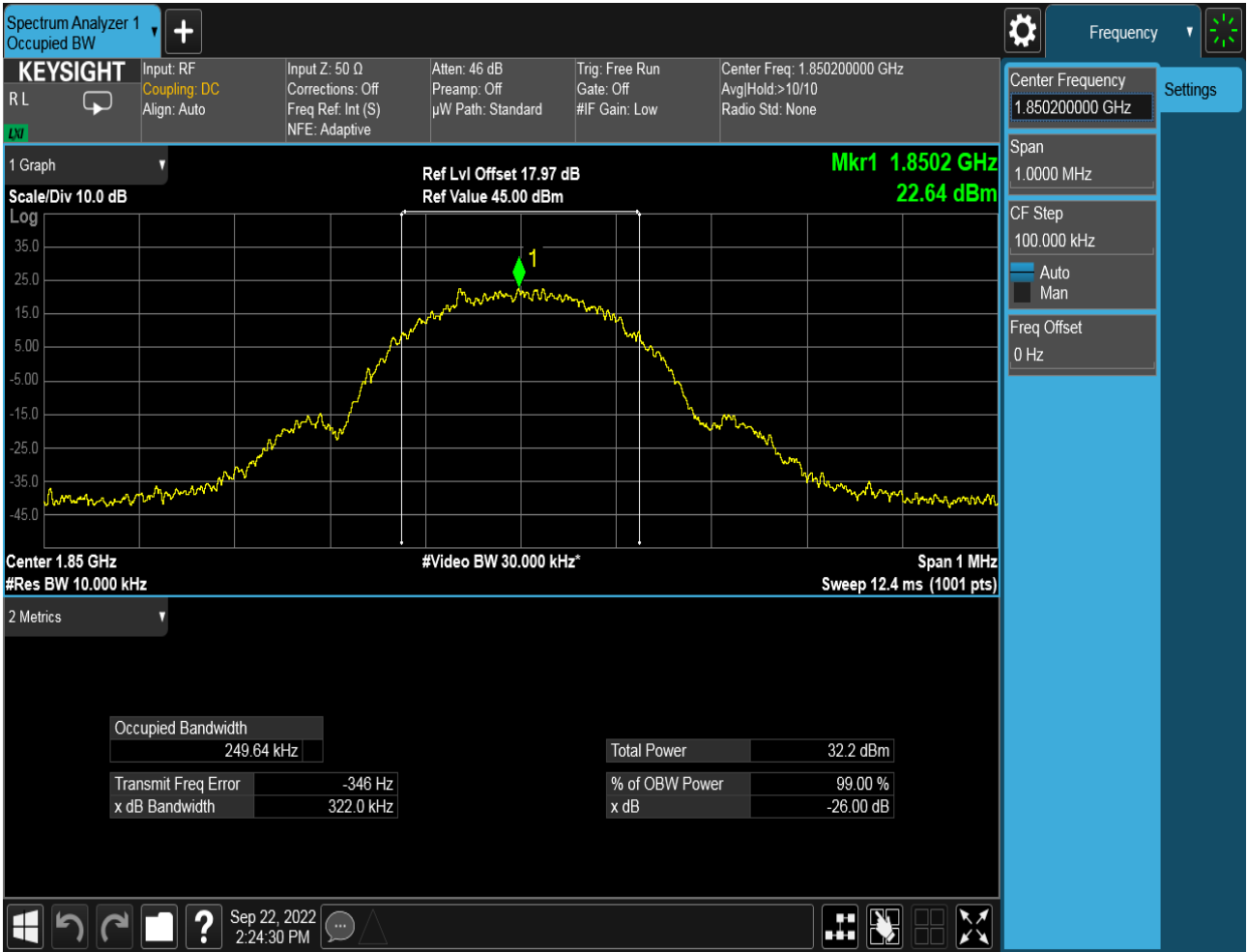
4.1.2.1.3 Test Channel = HCH





4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



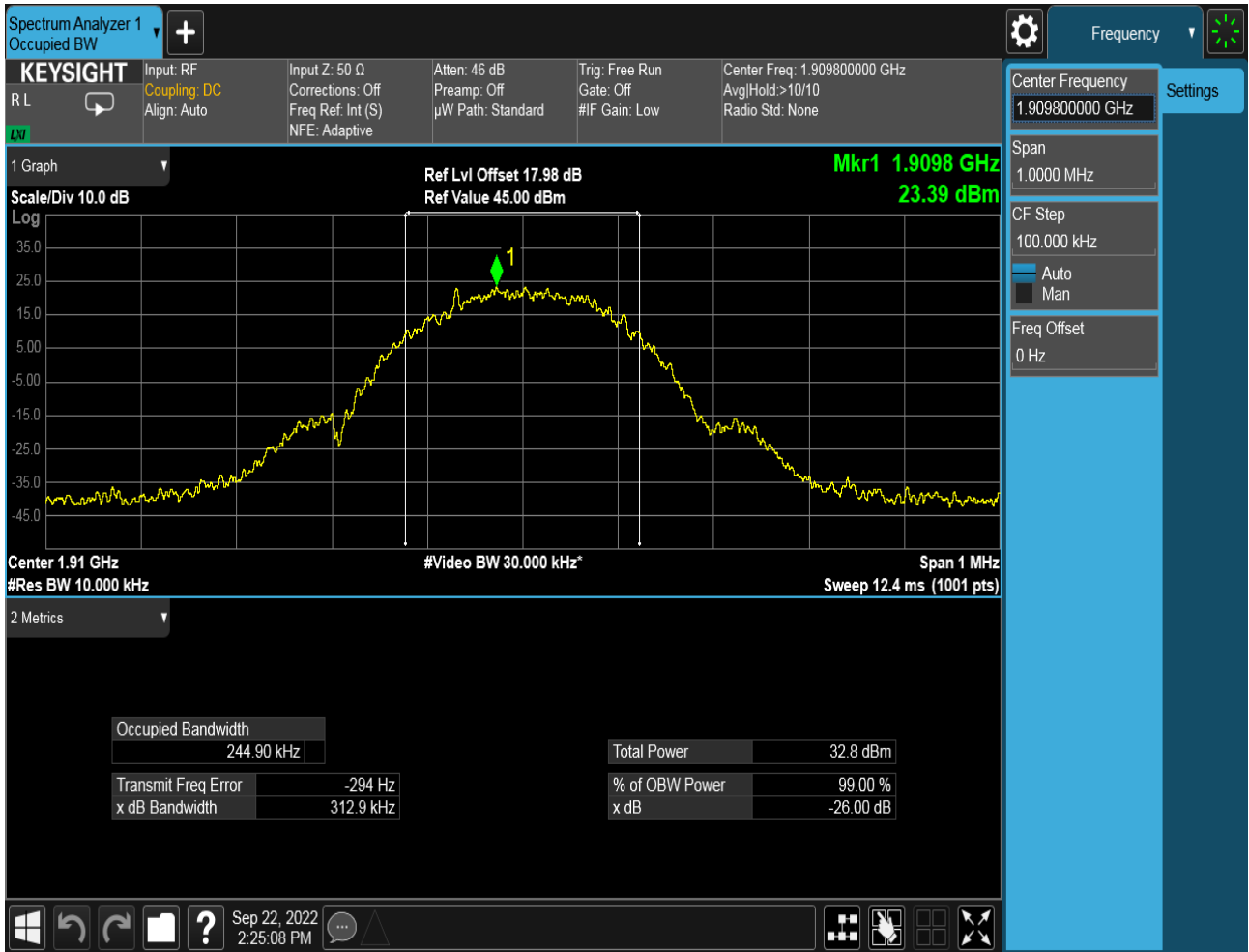


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

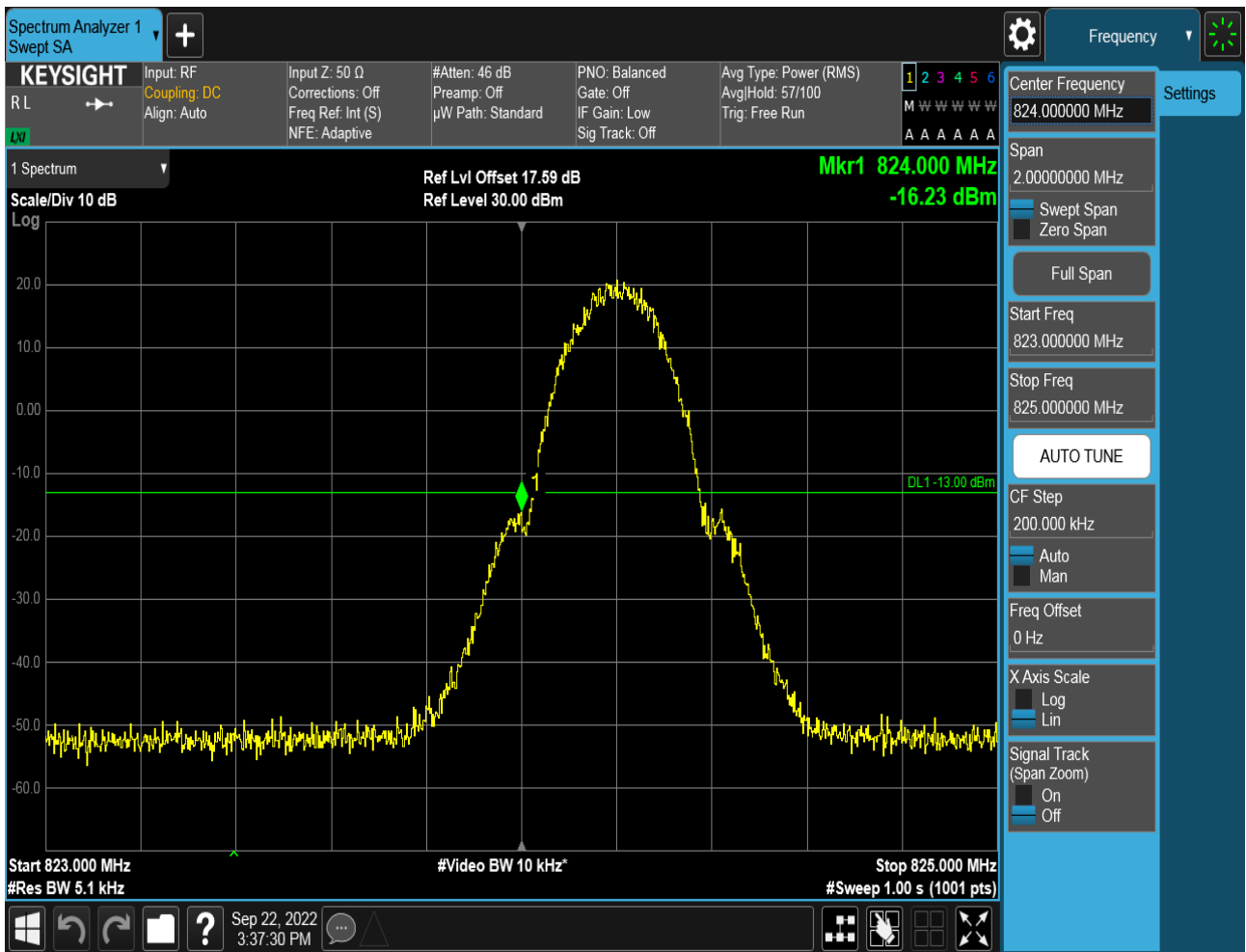
Part I - Test Plots

5.1 For GSM

5.1.1 Test Band = GSM850

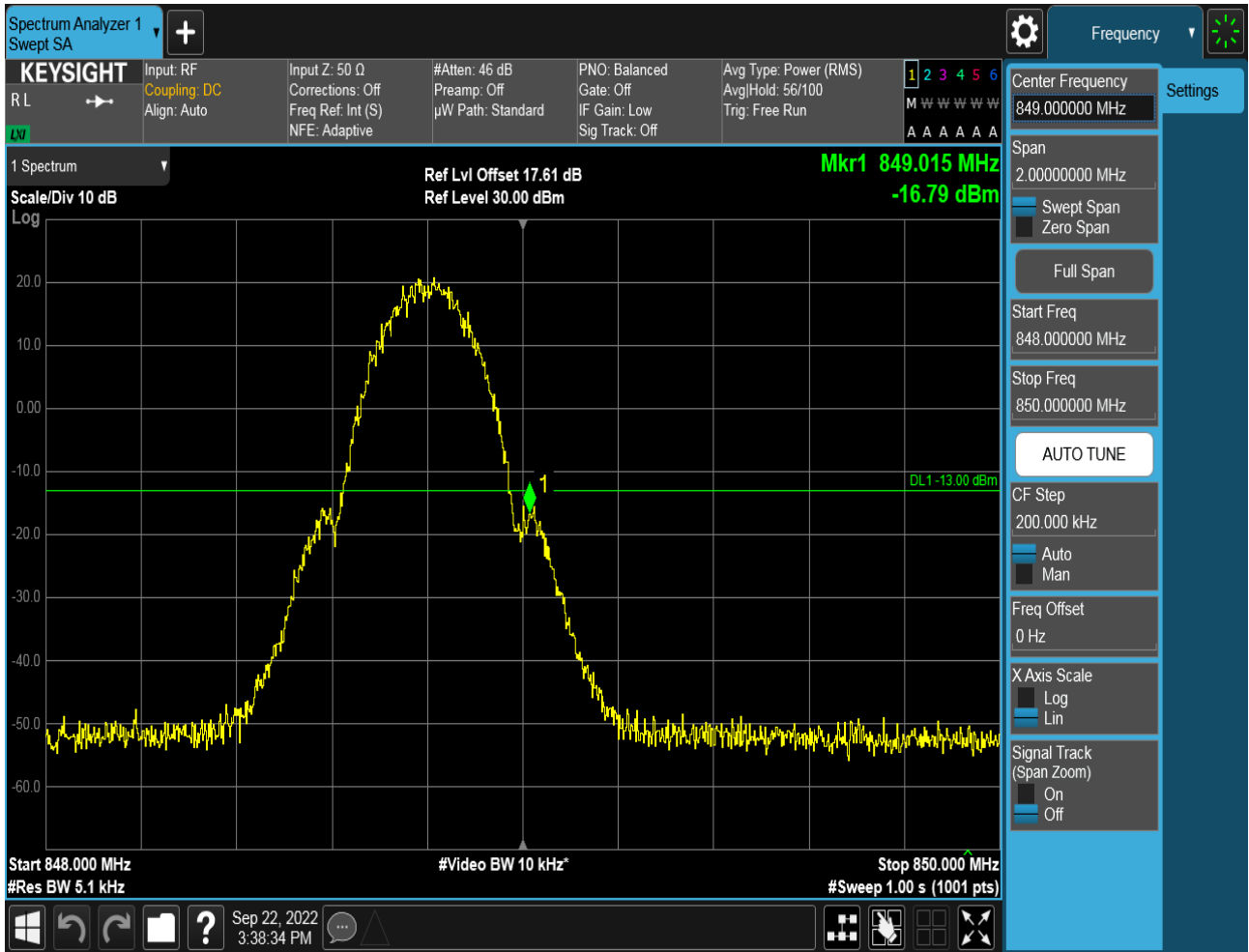
5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH





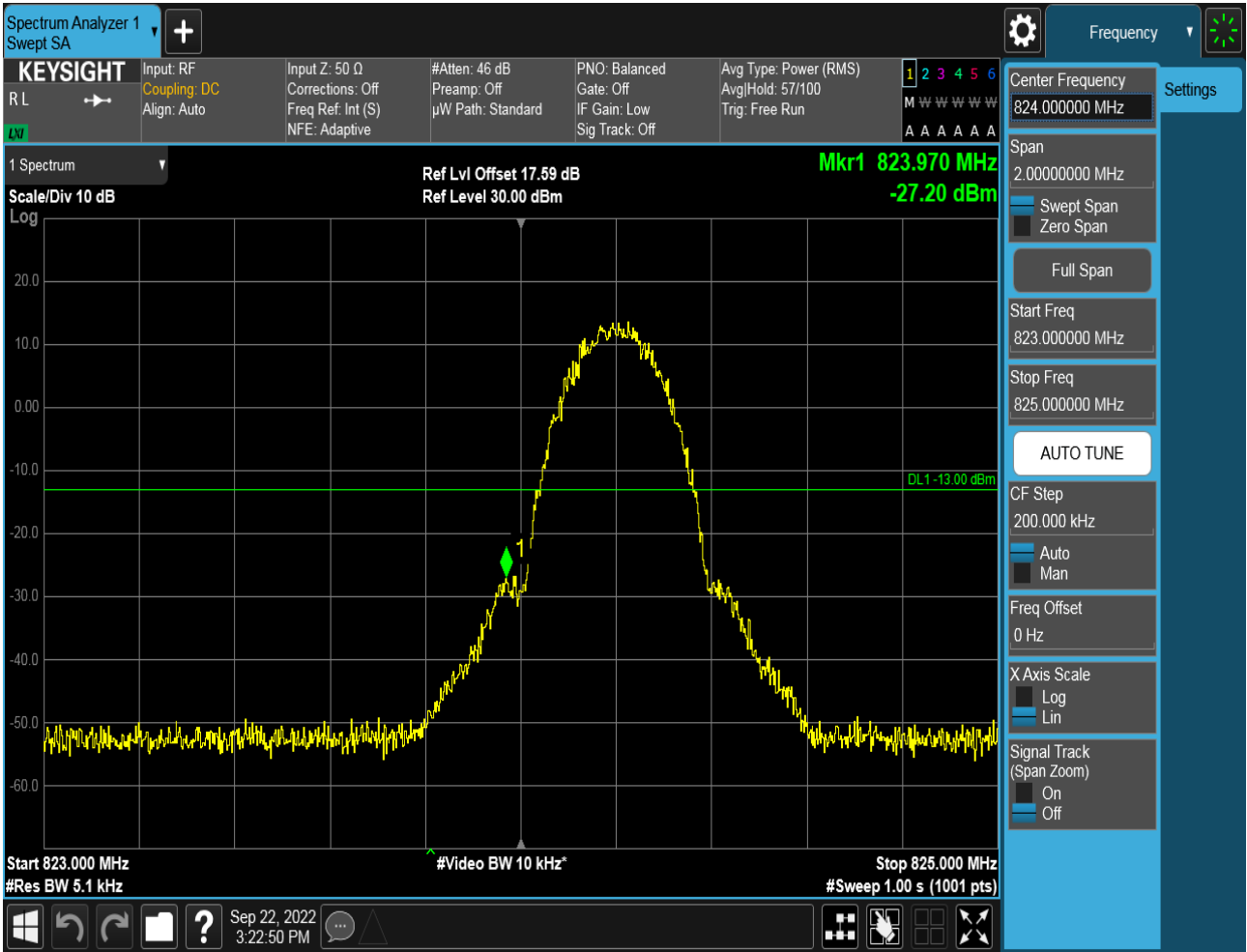
5.1.1.1.2 Test Channel = HCH





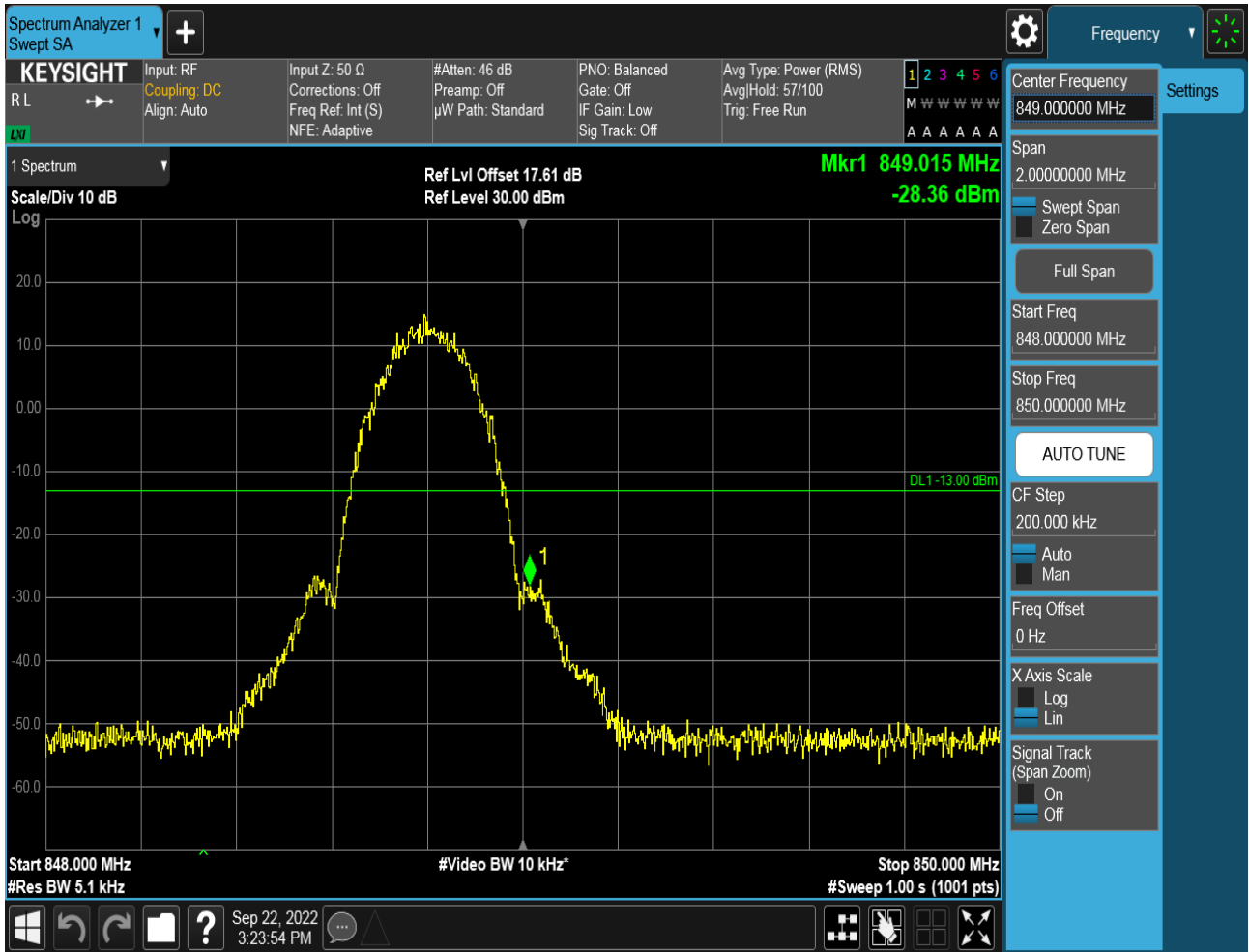
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





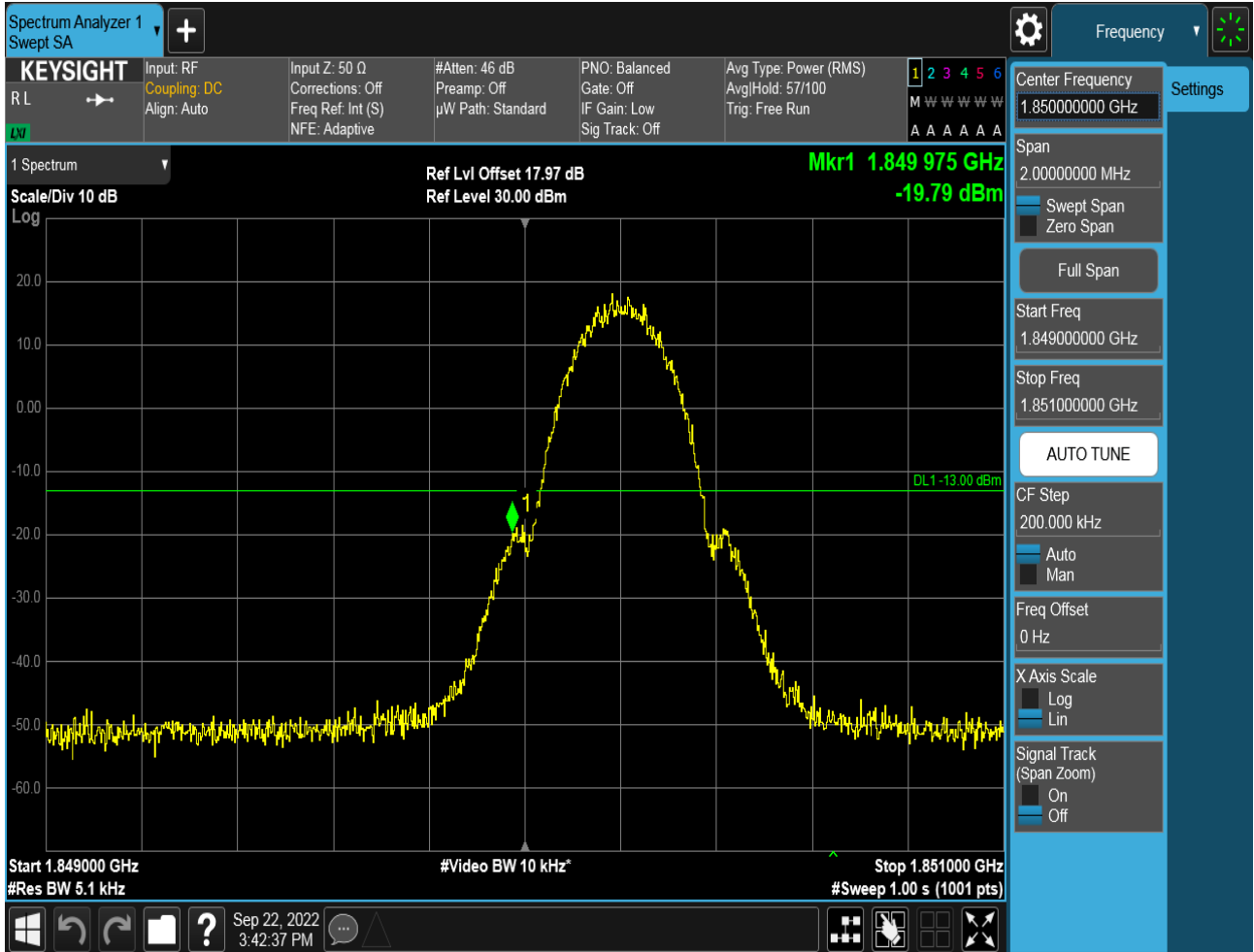
5.1.1.2.2 Test Channel = HCH



5.1.2 Test Band = PCS1900

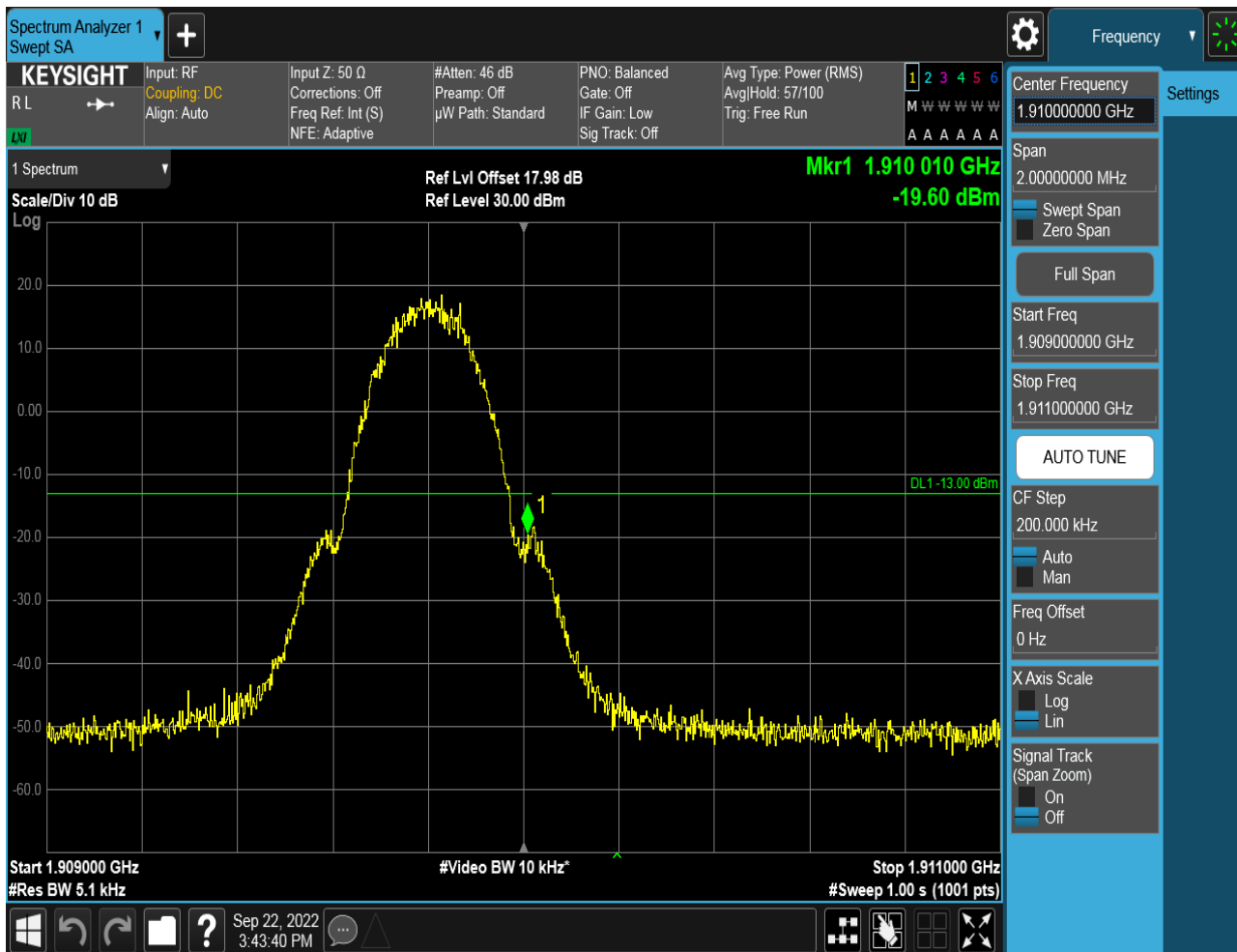
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH





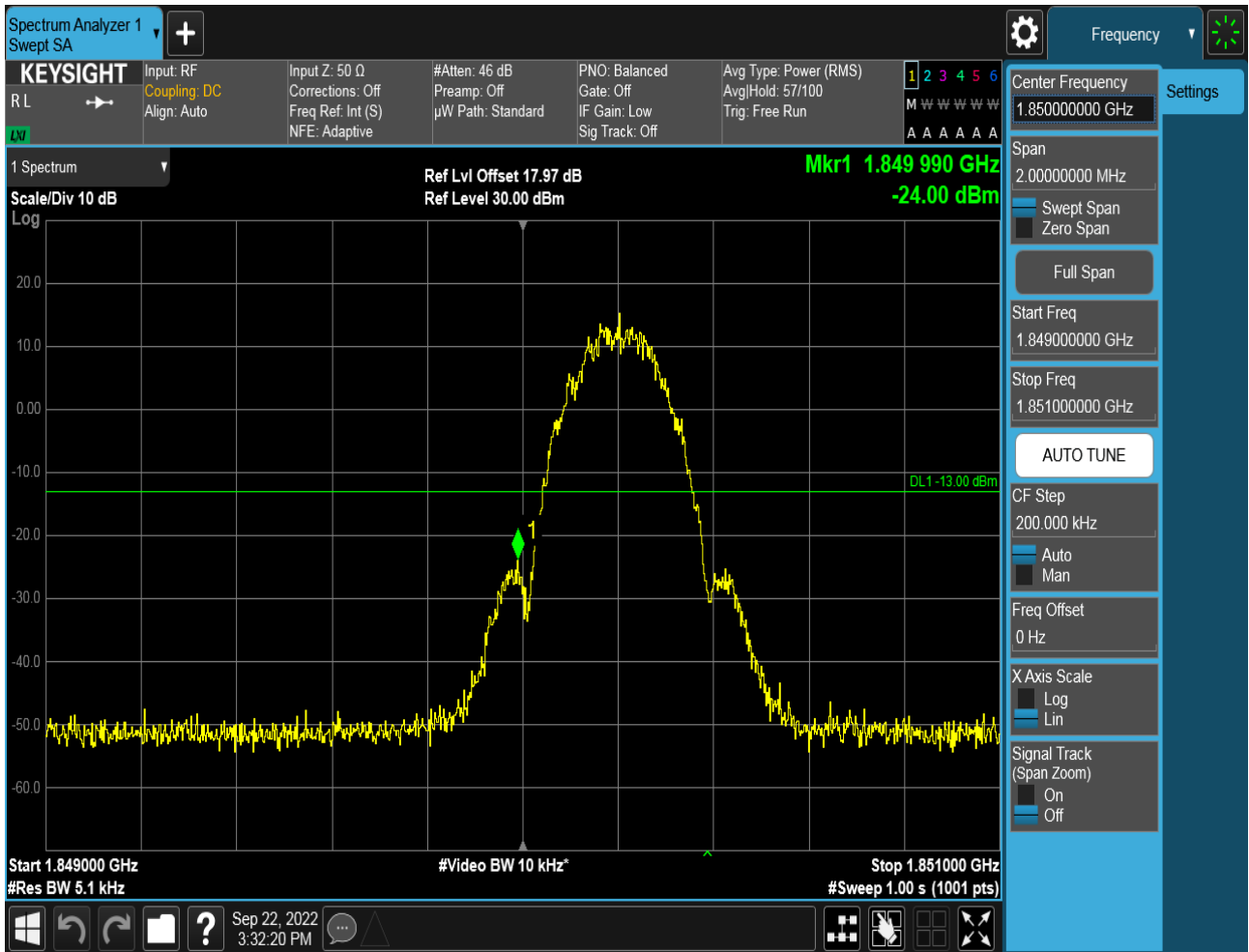
5.1.2.1.2 Test Channel = HCH





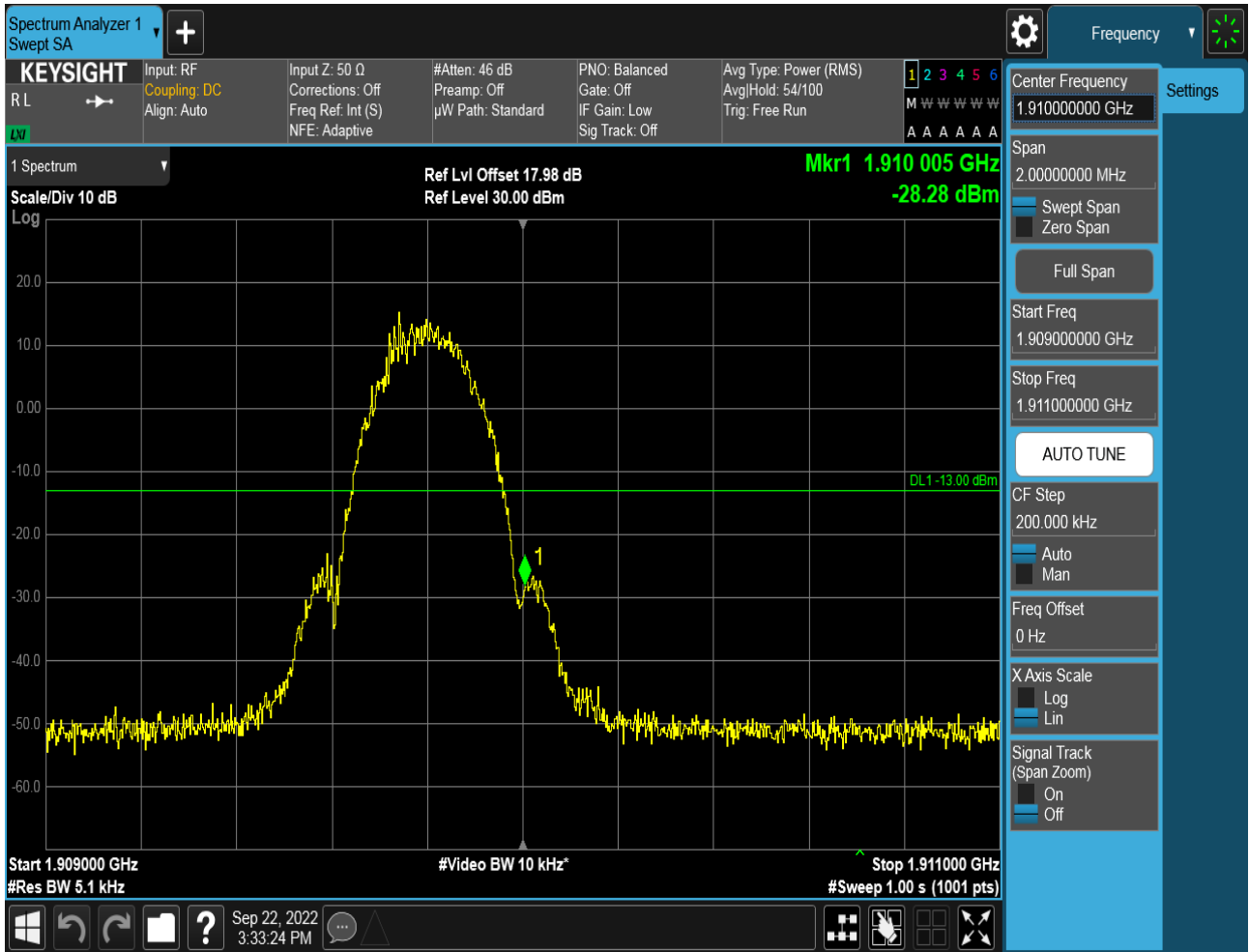
5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH





5.1.2.2.2 Test Channel = HCH



6Appendix_F: Spurious Emission at Antenna Terminal

NOTE: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

Part I - Test Plots

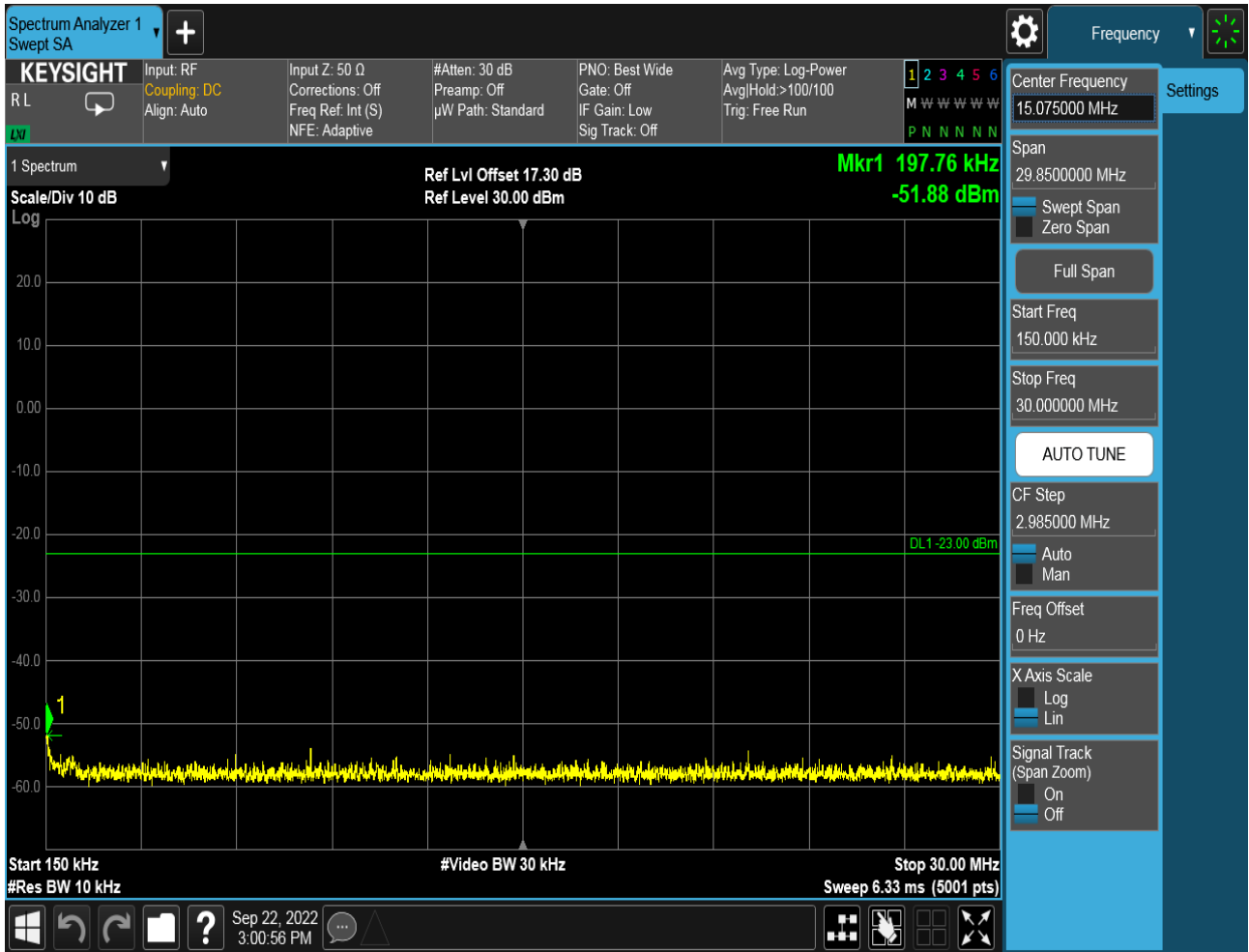
6.1 For GSM

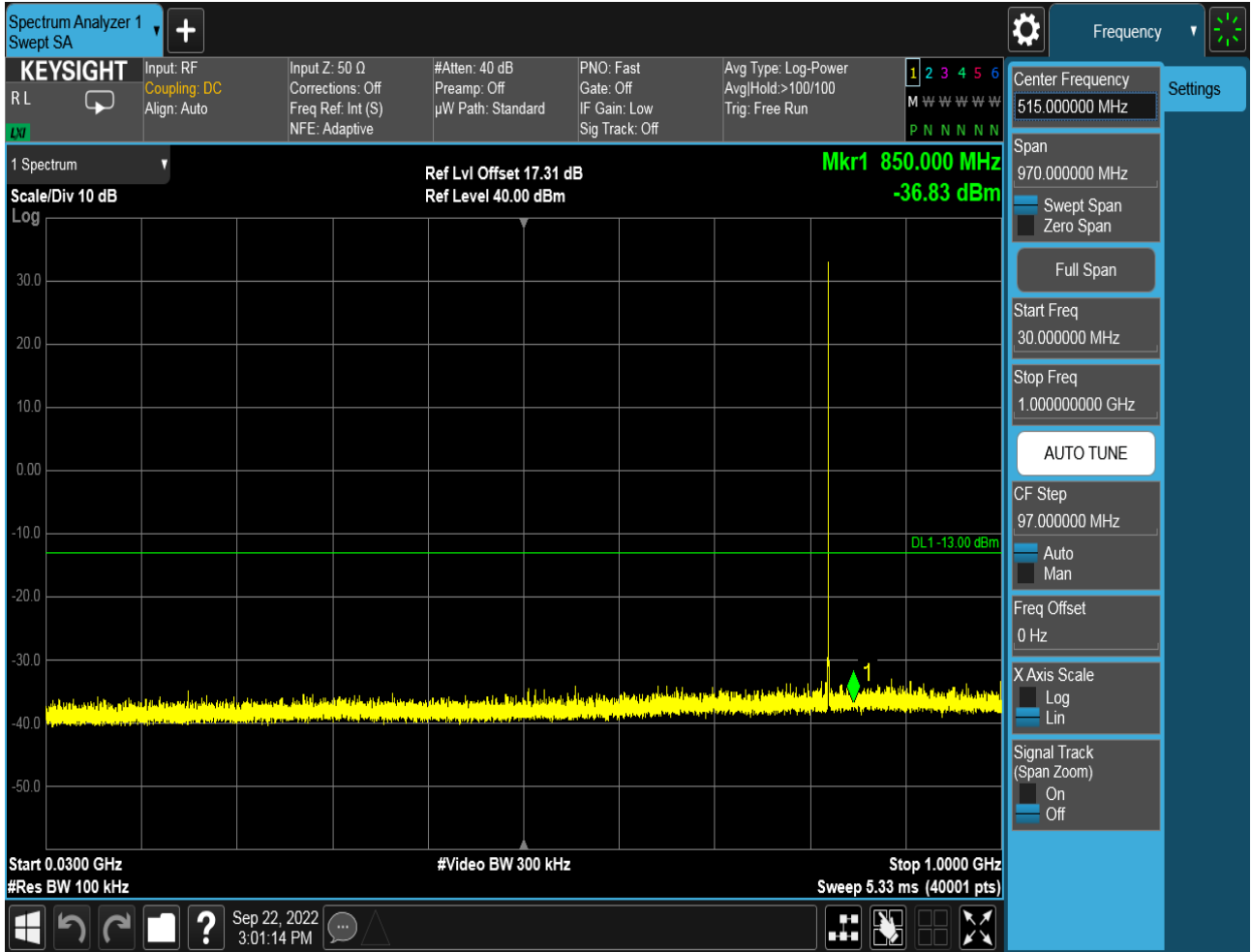
6.1.1 Test Band = GSM850

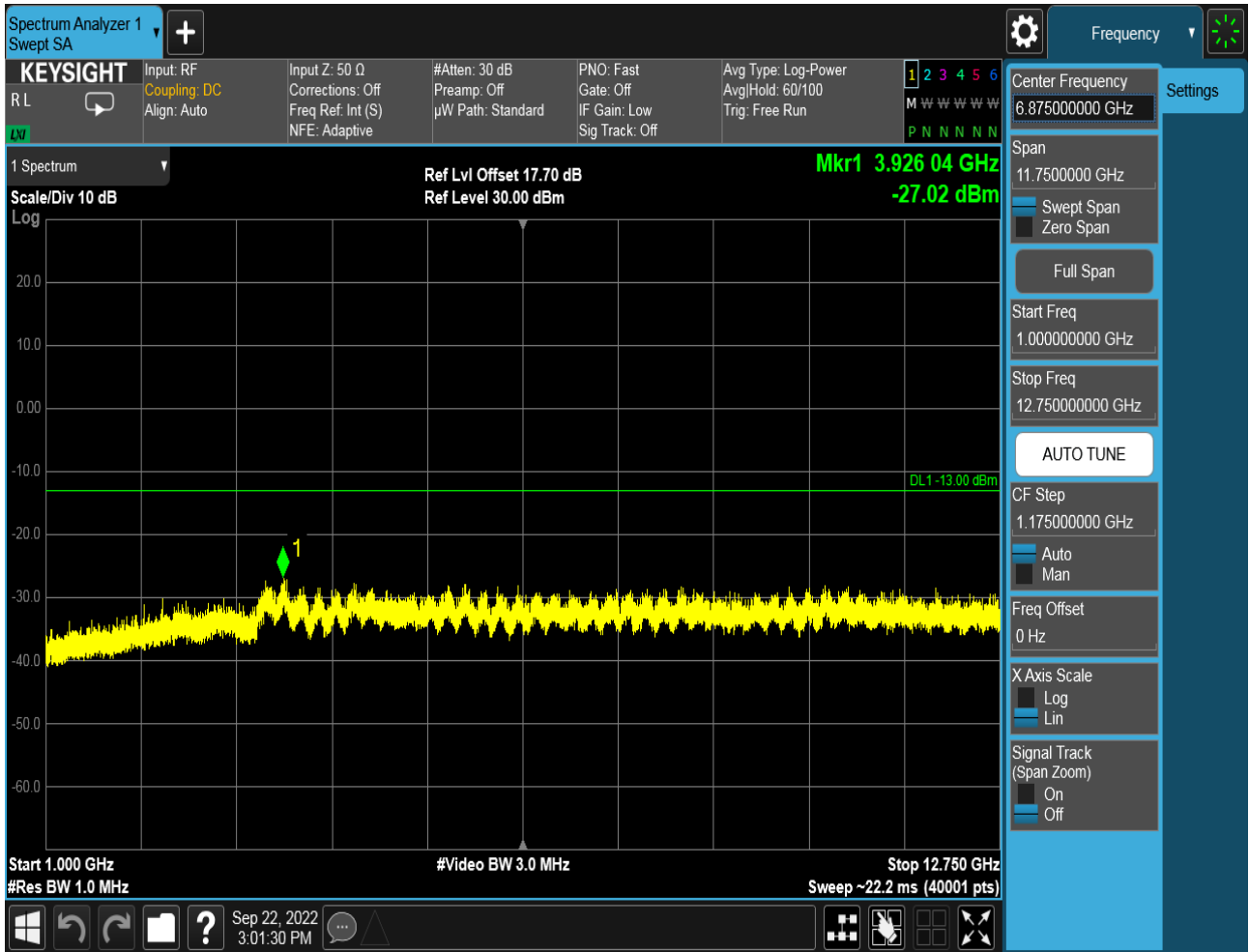
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



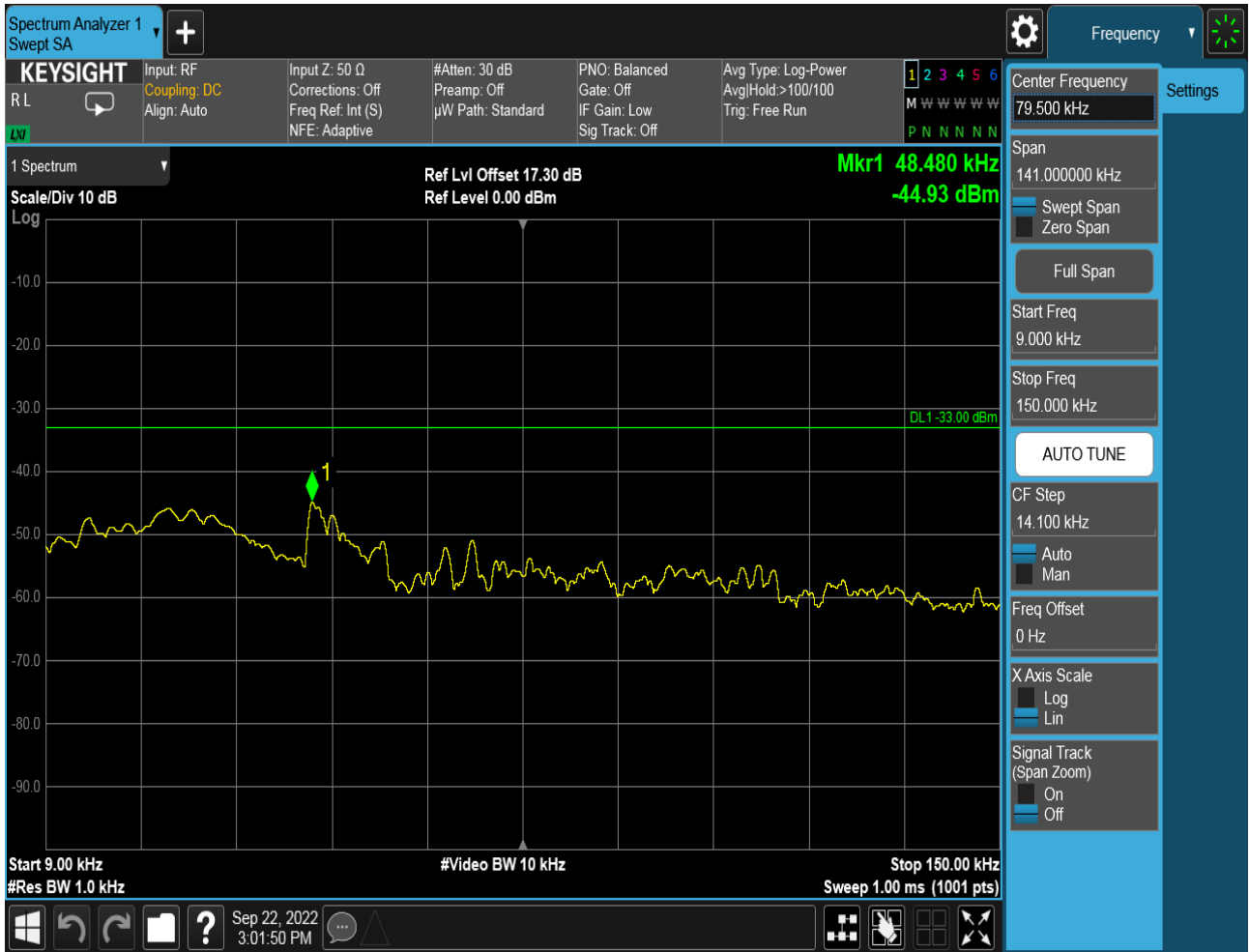


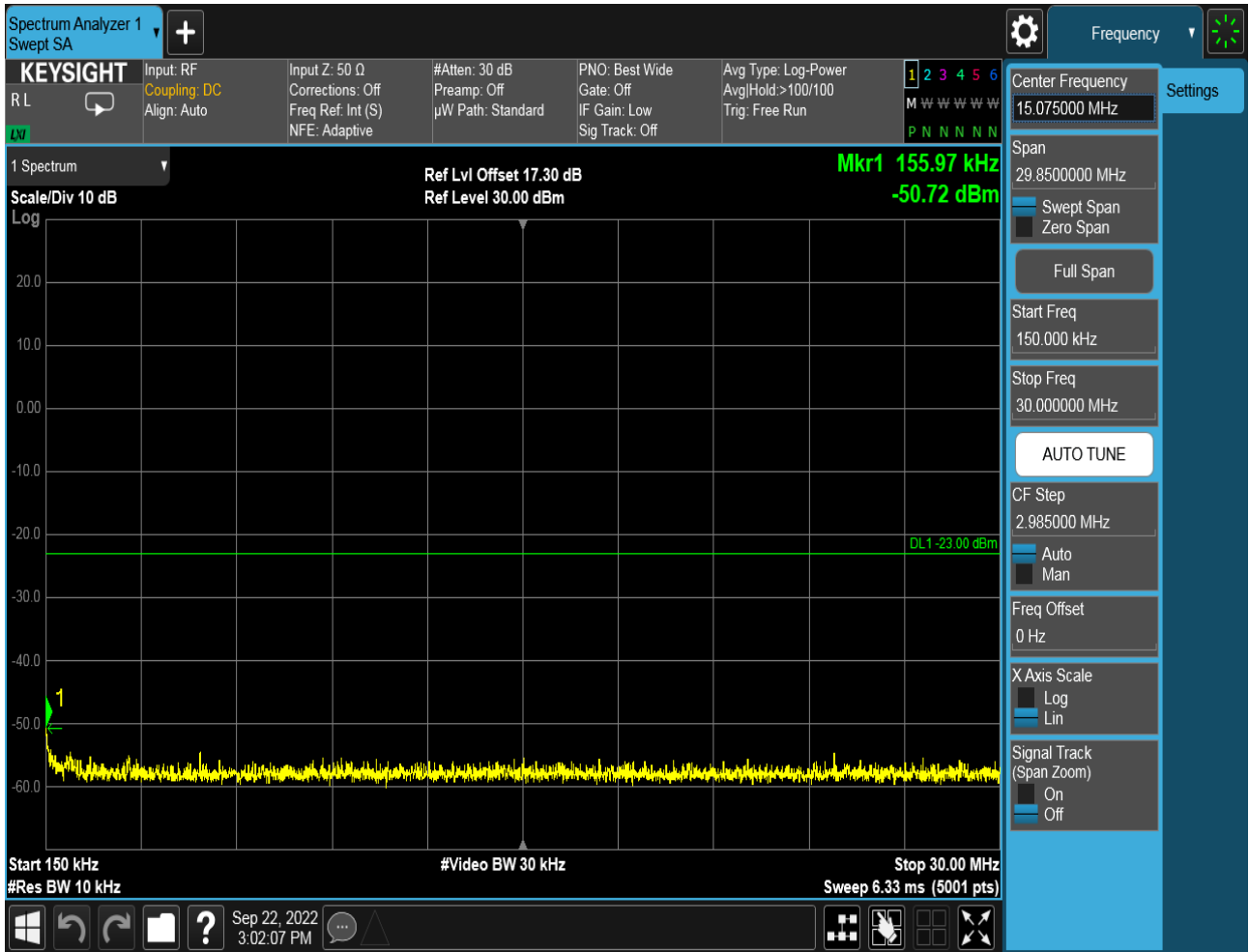


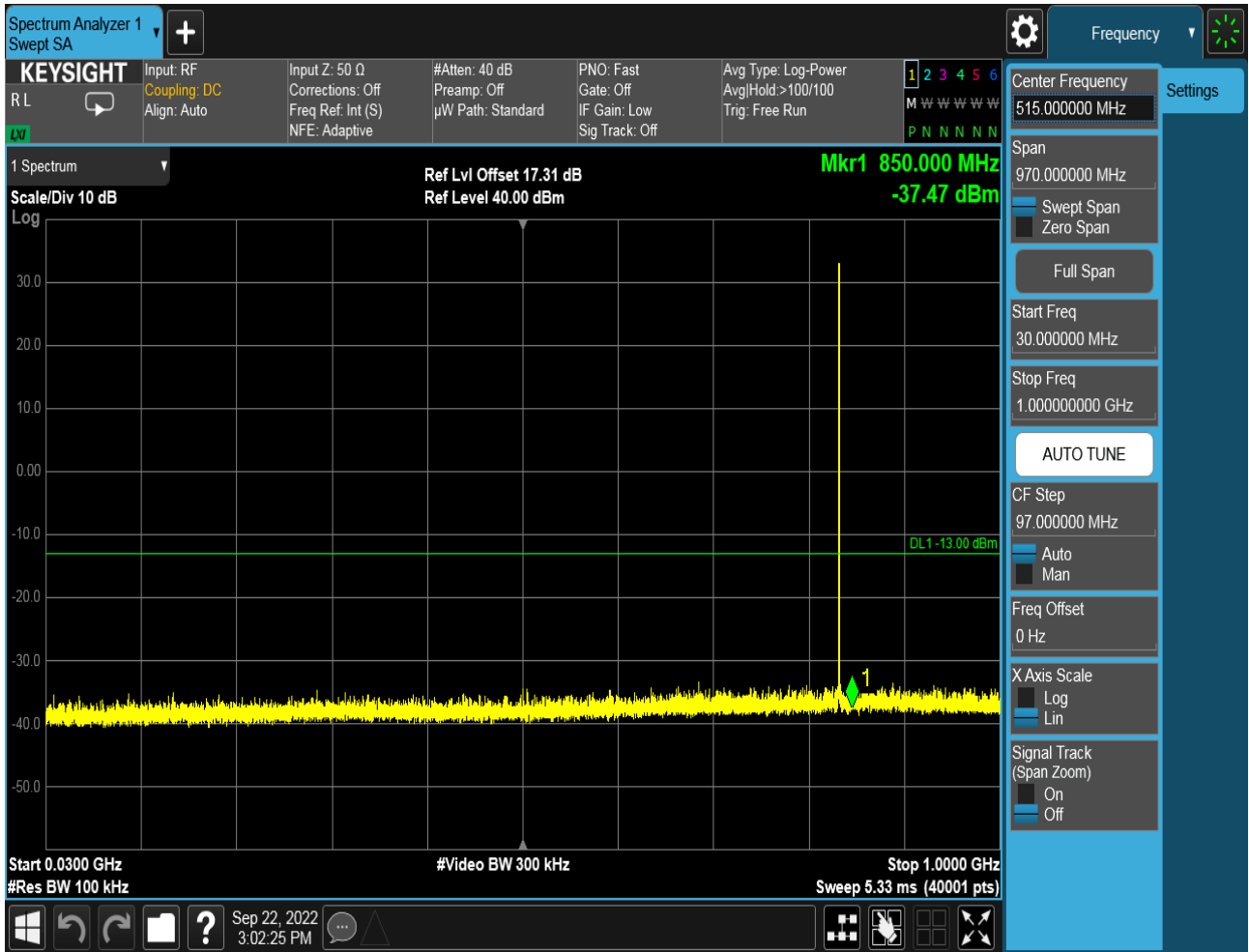


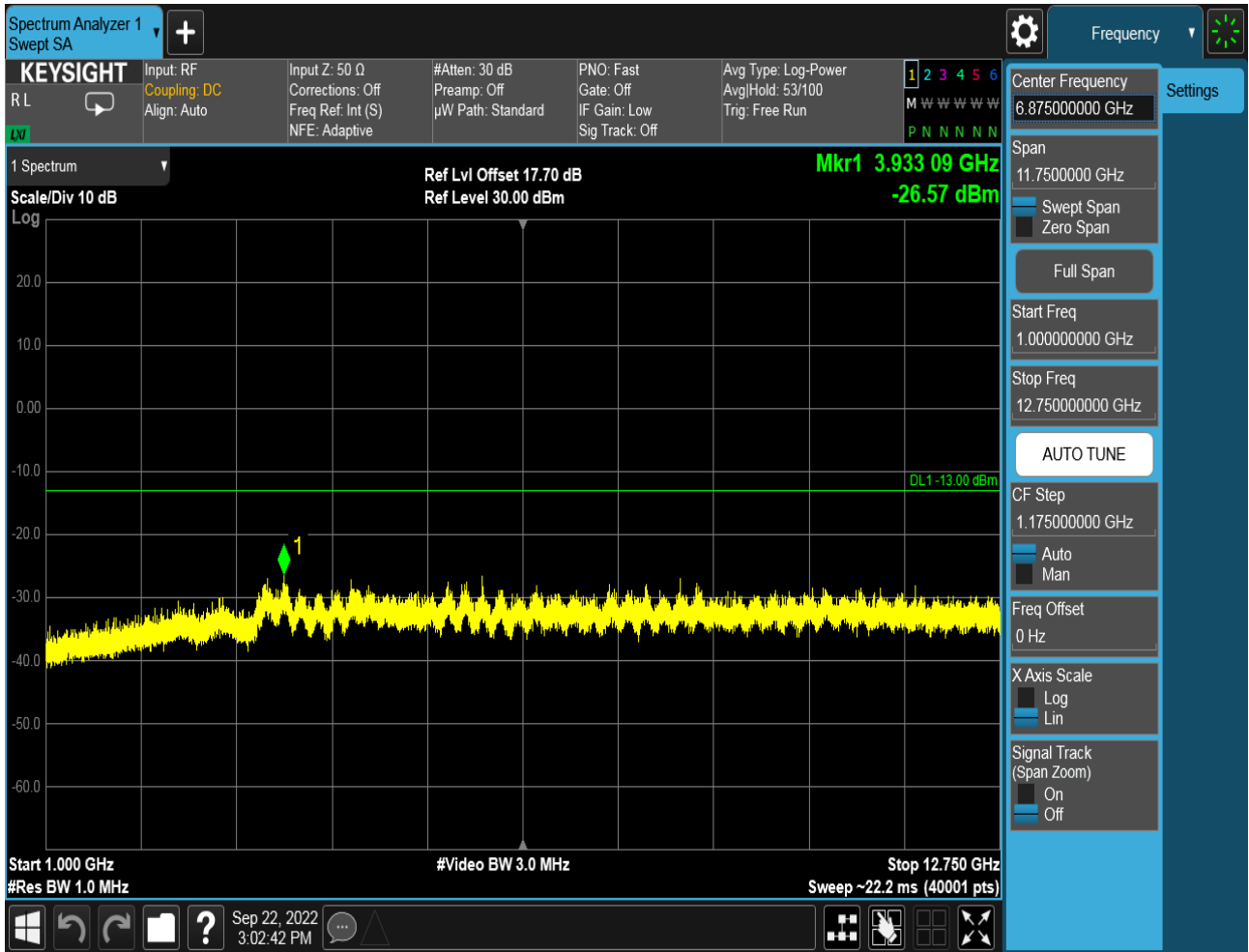


6.1.1.1.2 Test Channel = MCH



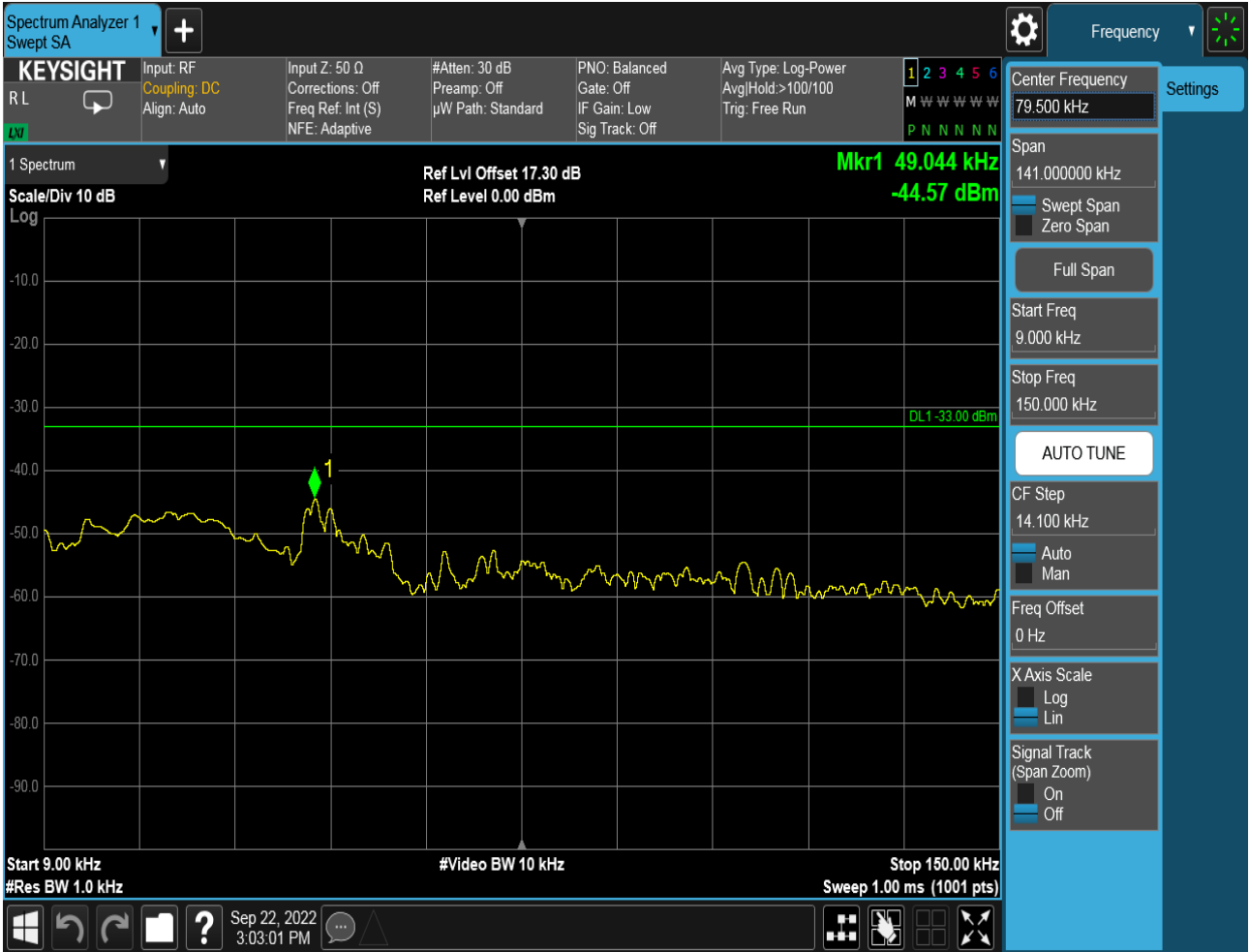


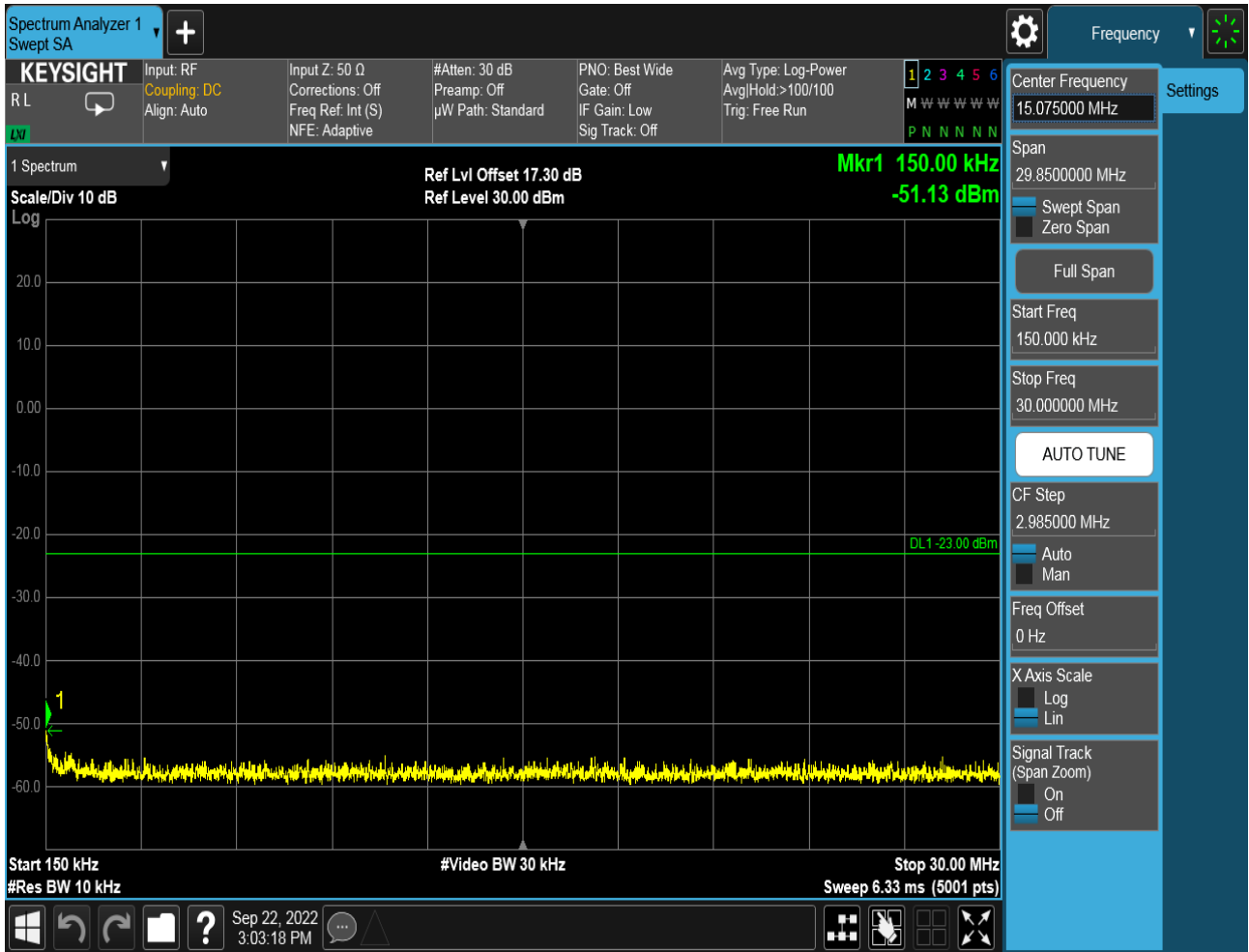


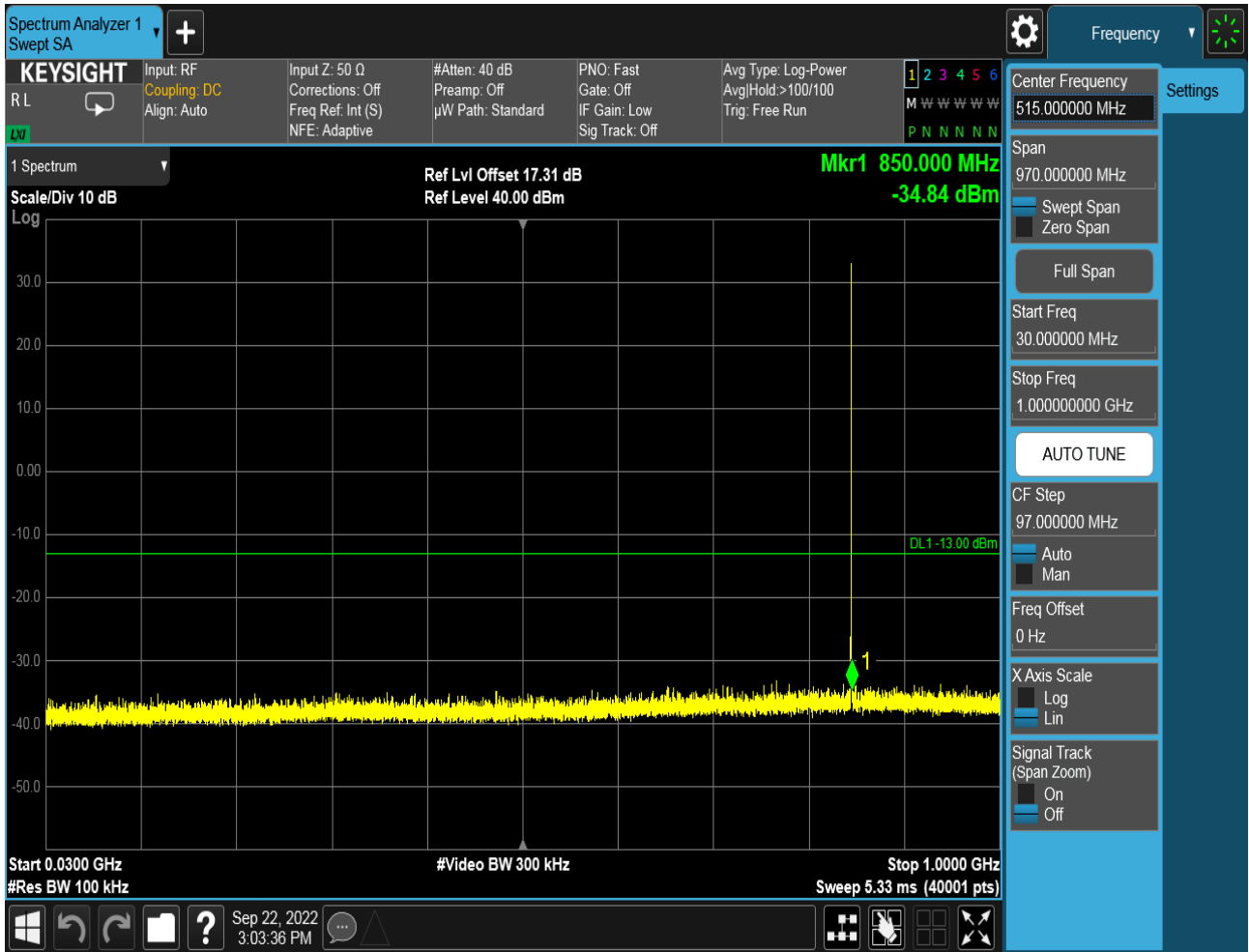


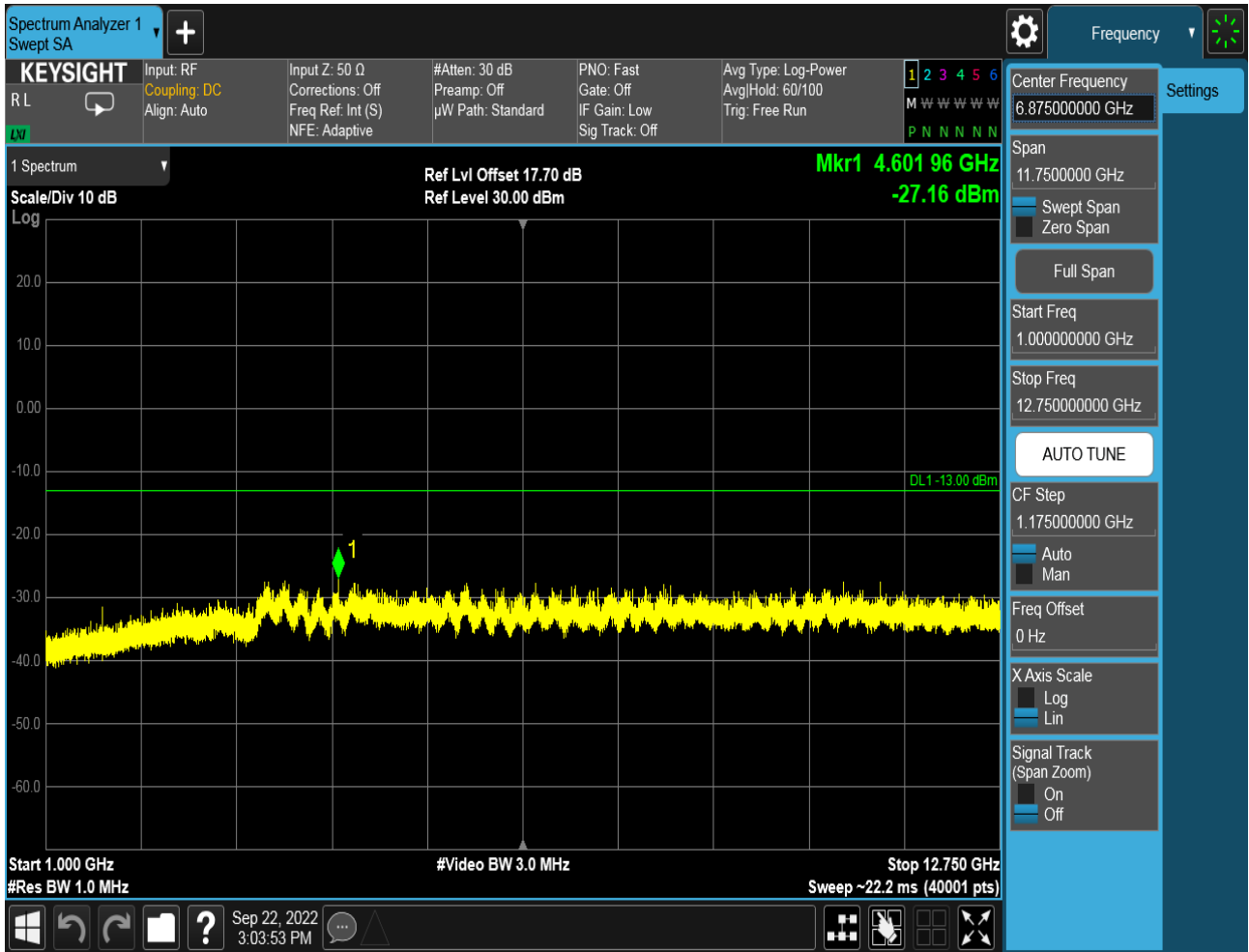


6.1.1.1.3 Test Channel = HCH





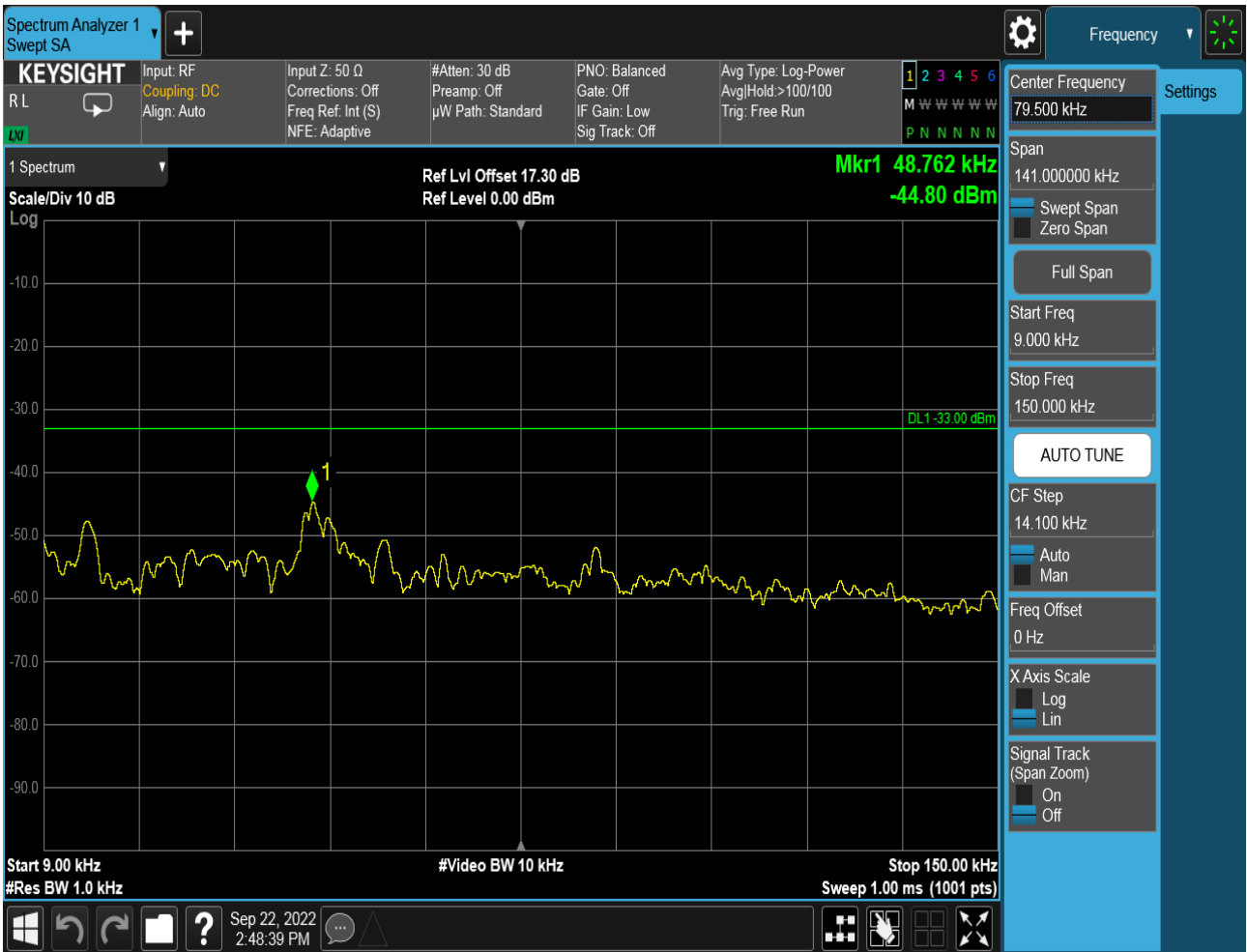


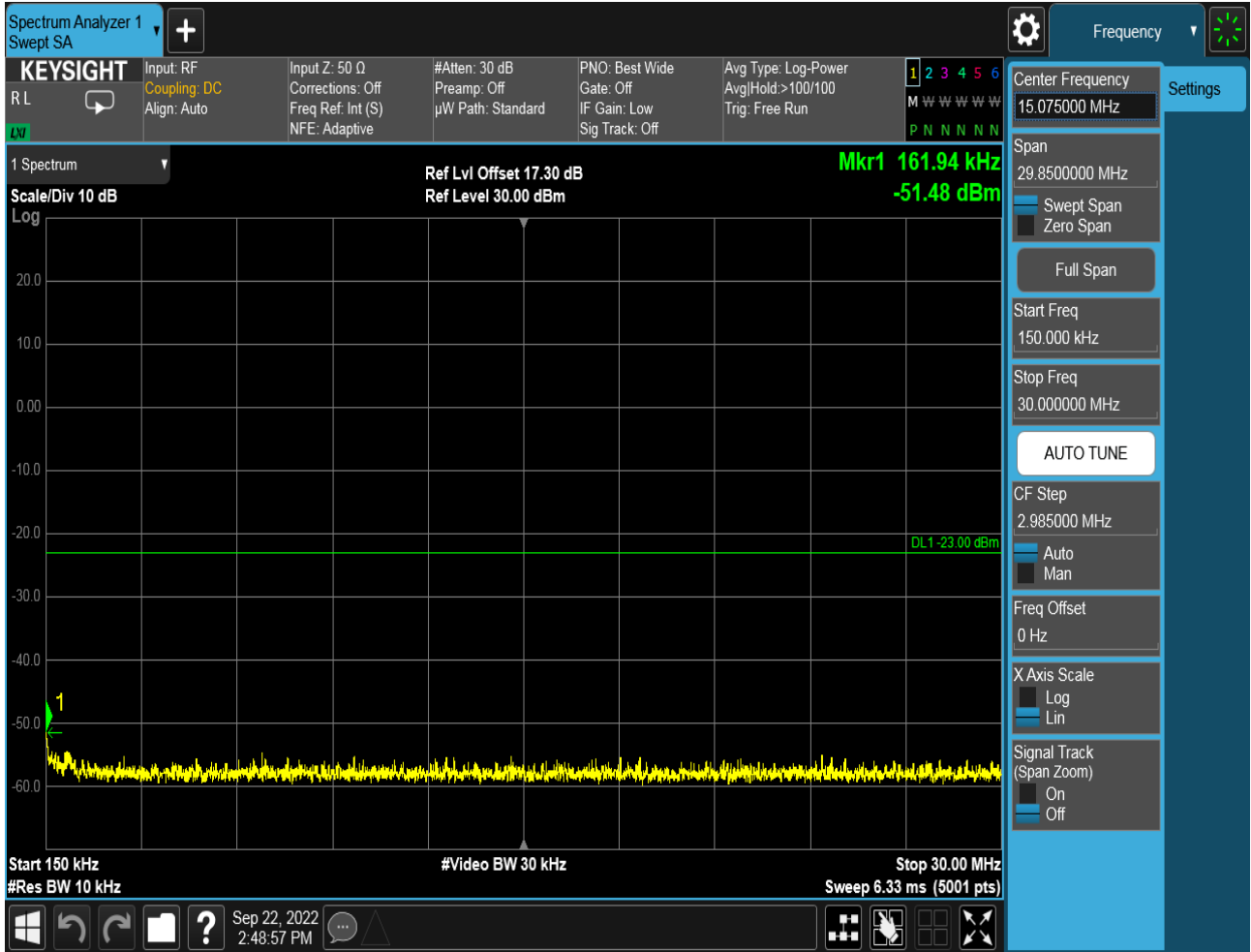


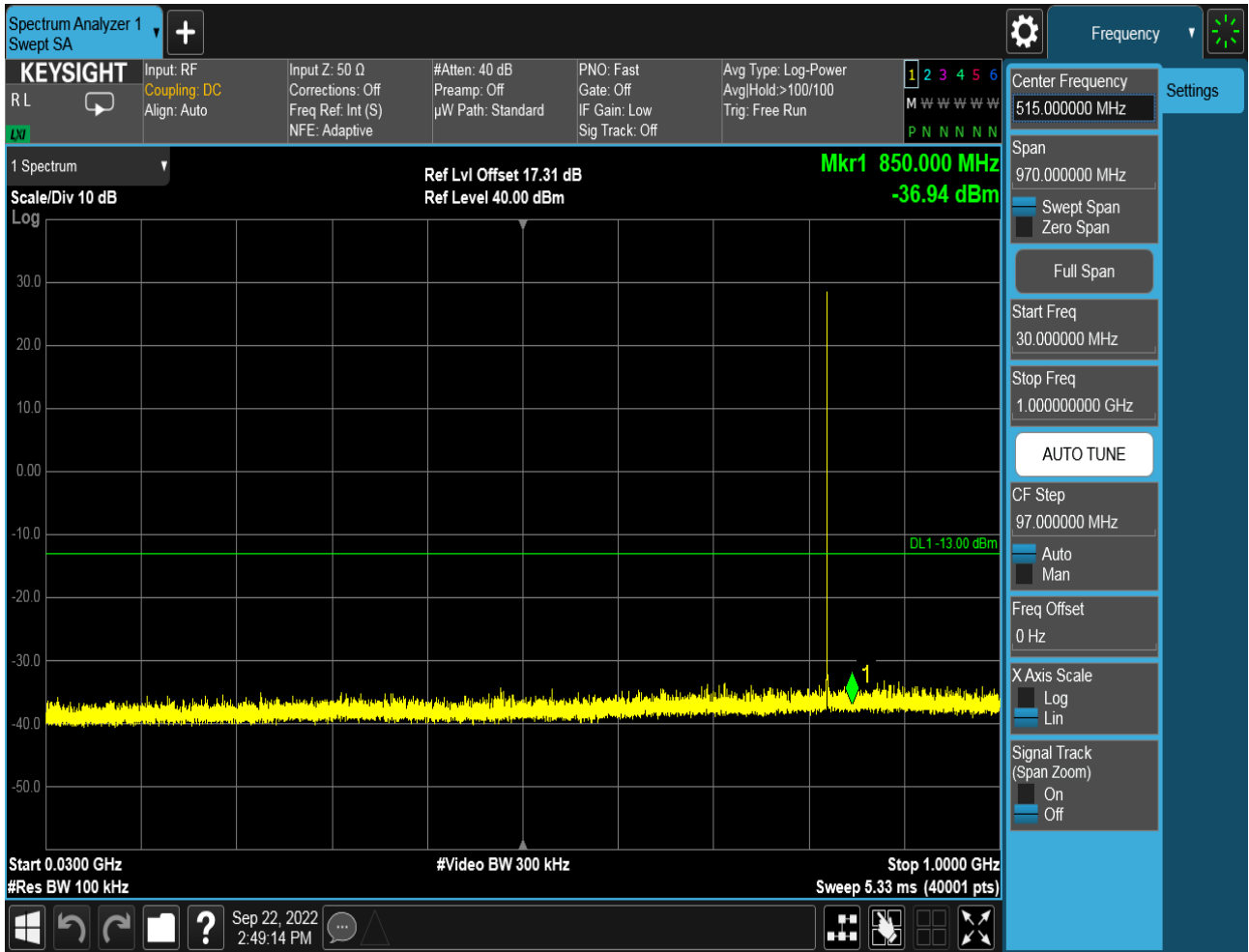


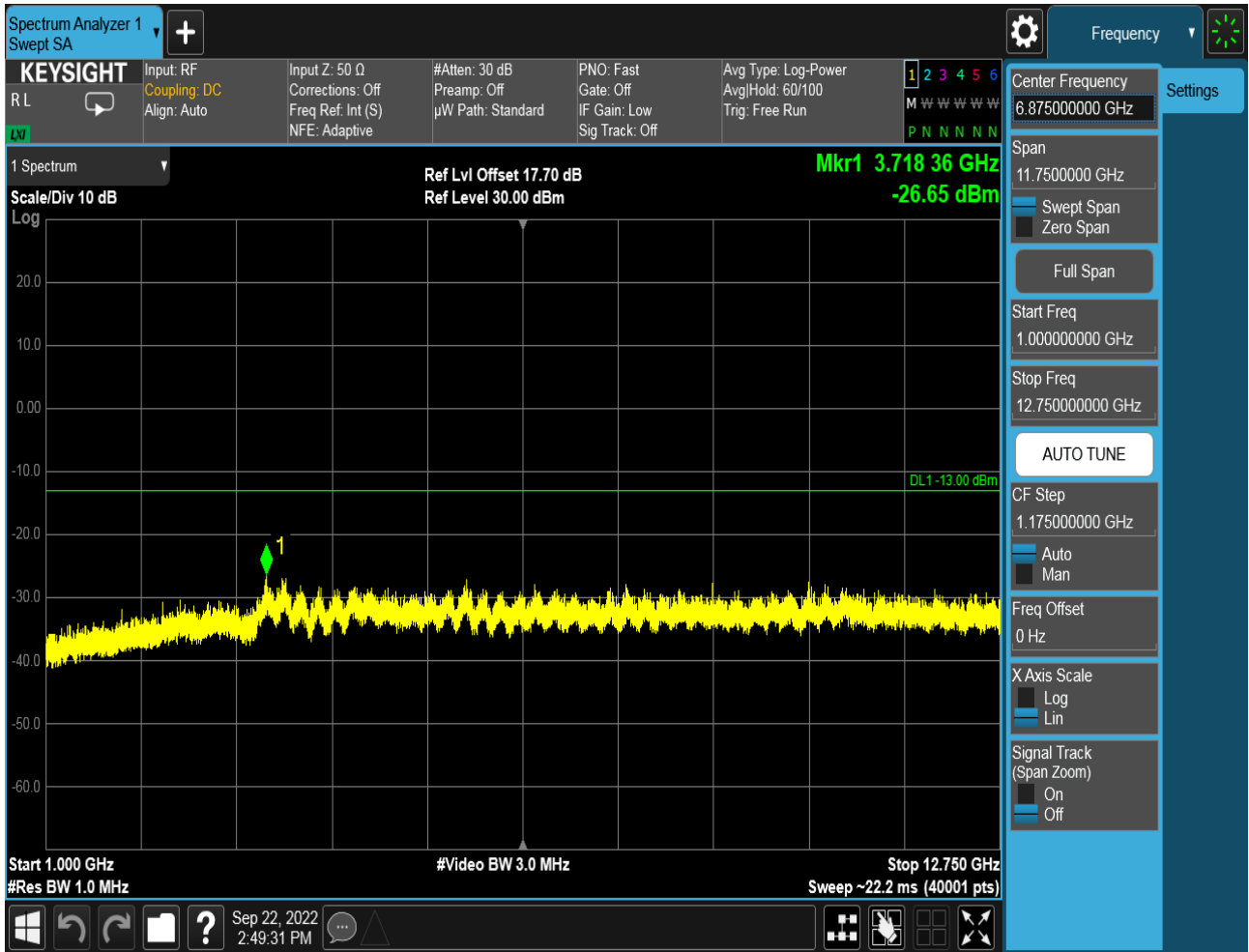
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



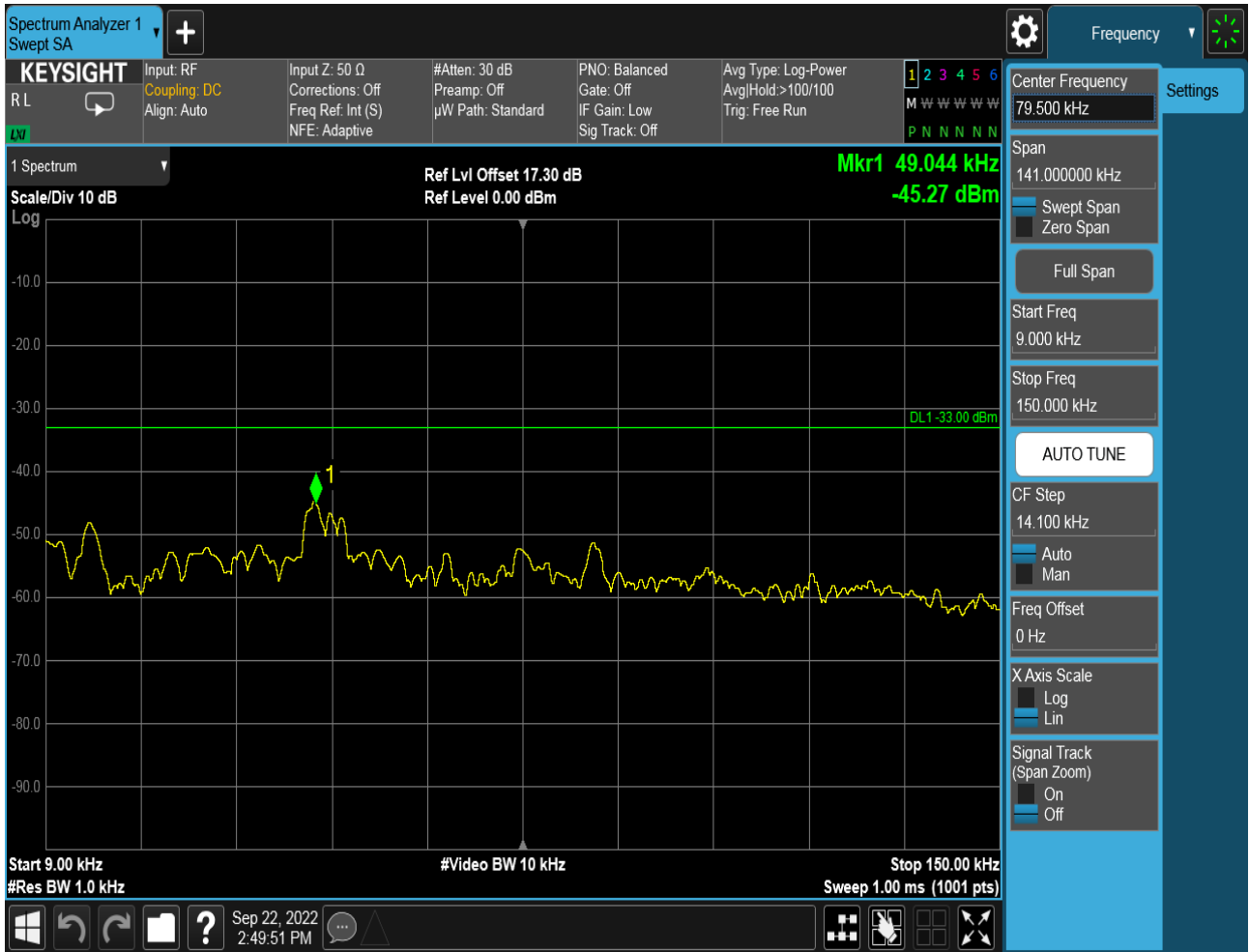


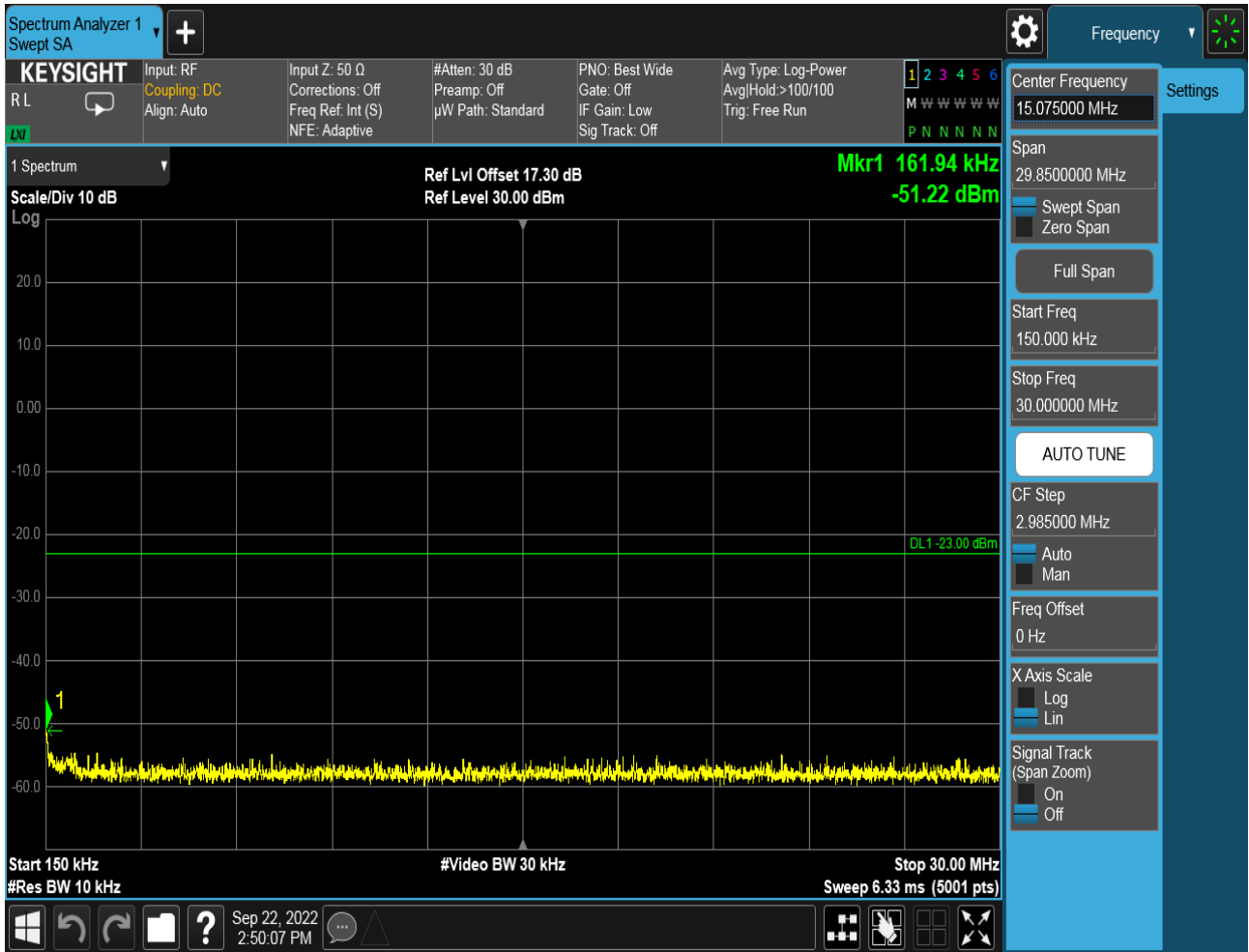


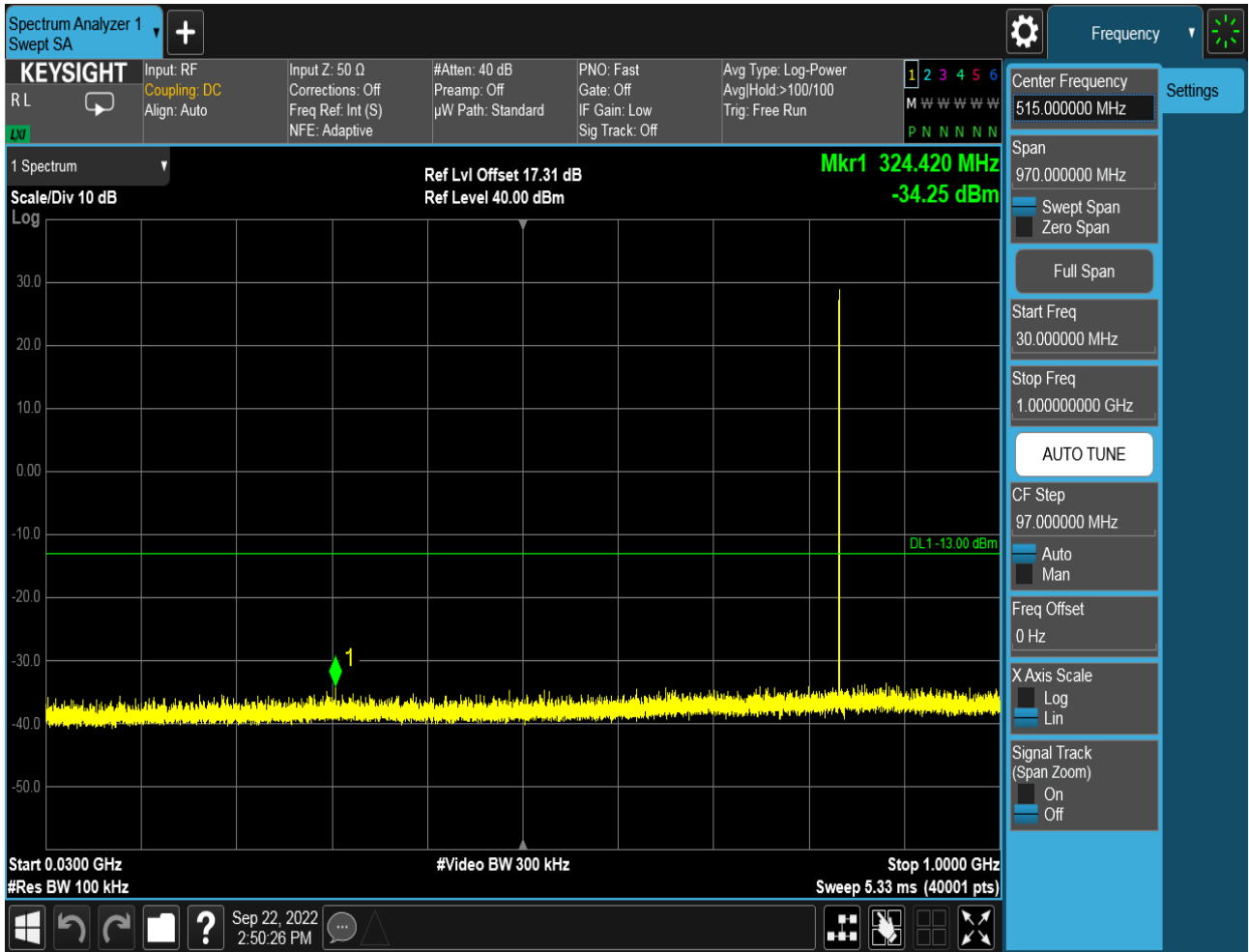


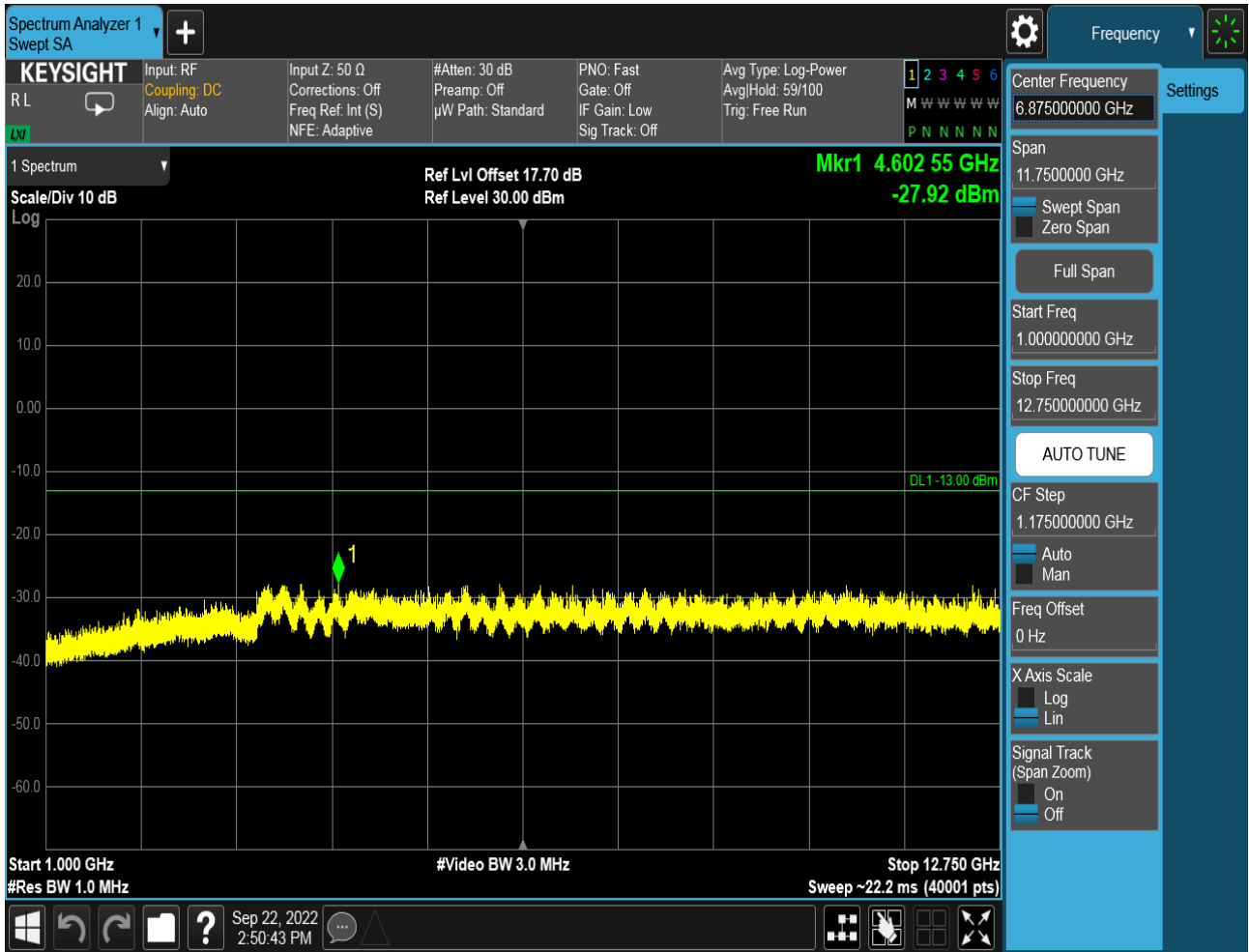


6.1.1.2.2 Test Channel = MCH



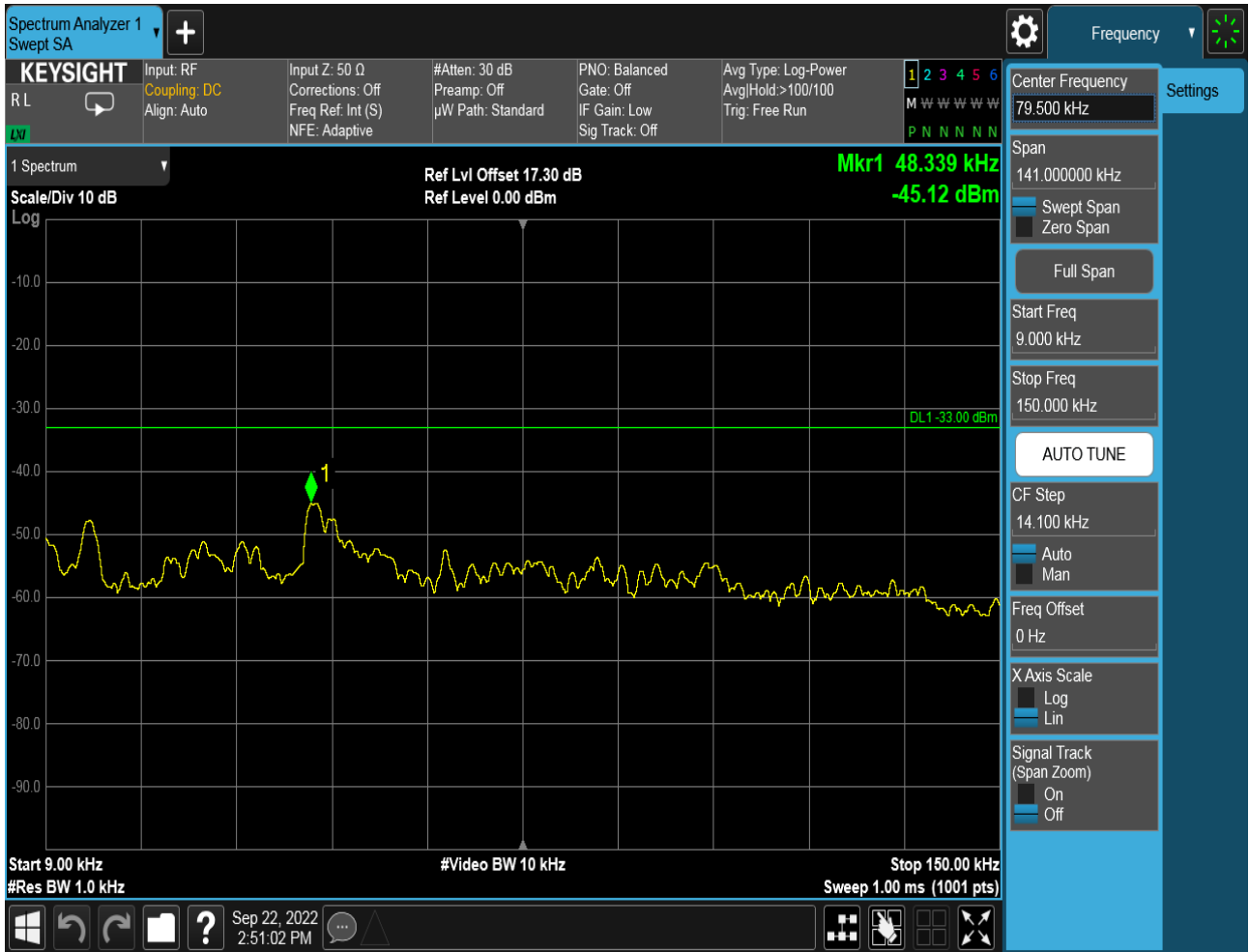


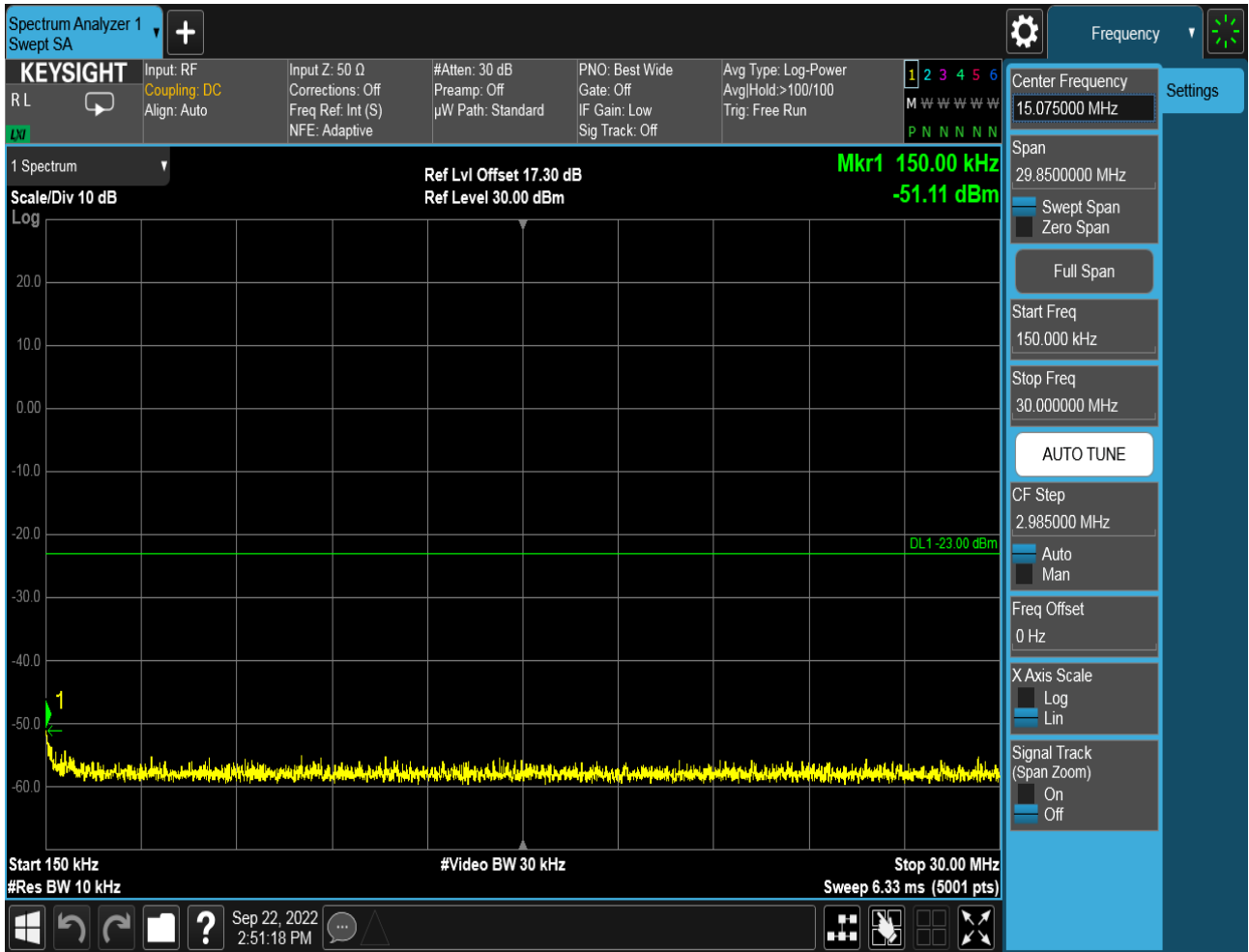


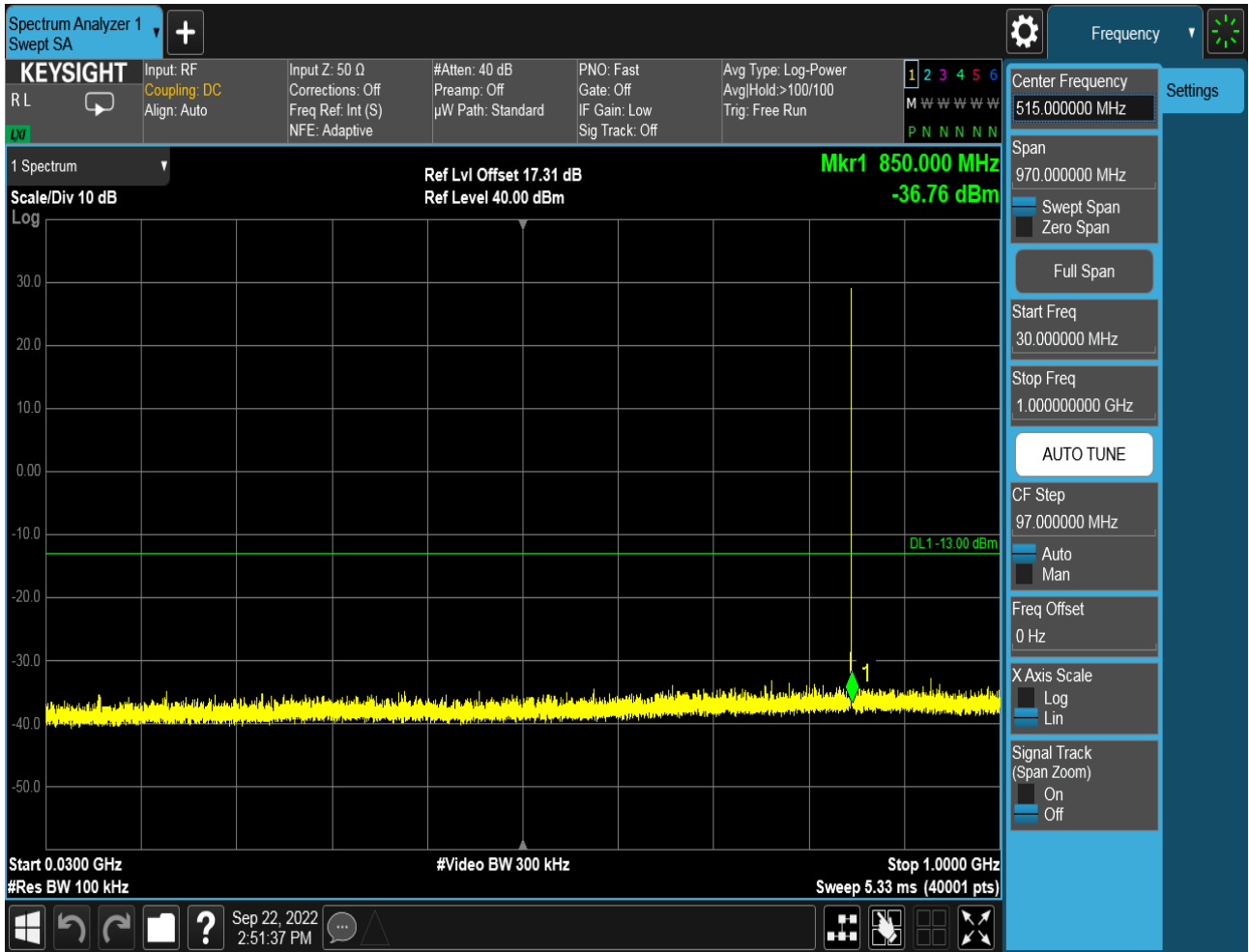


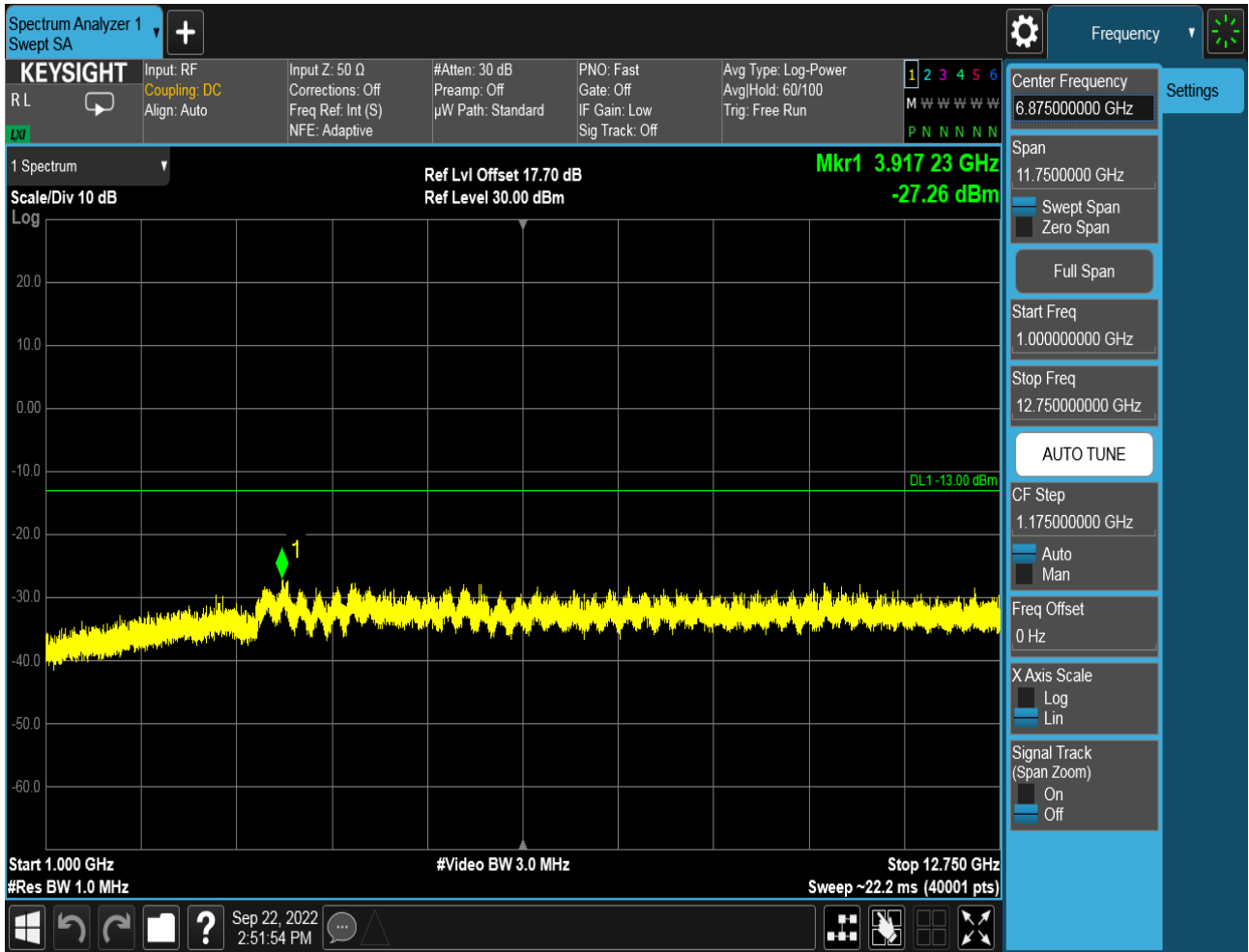


6.1.1.2.3 Test Channel = HCH









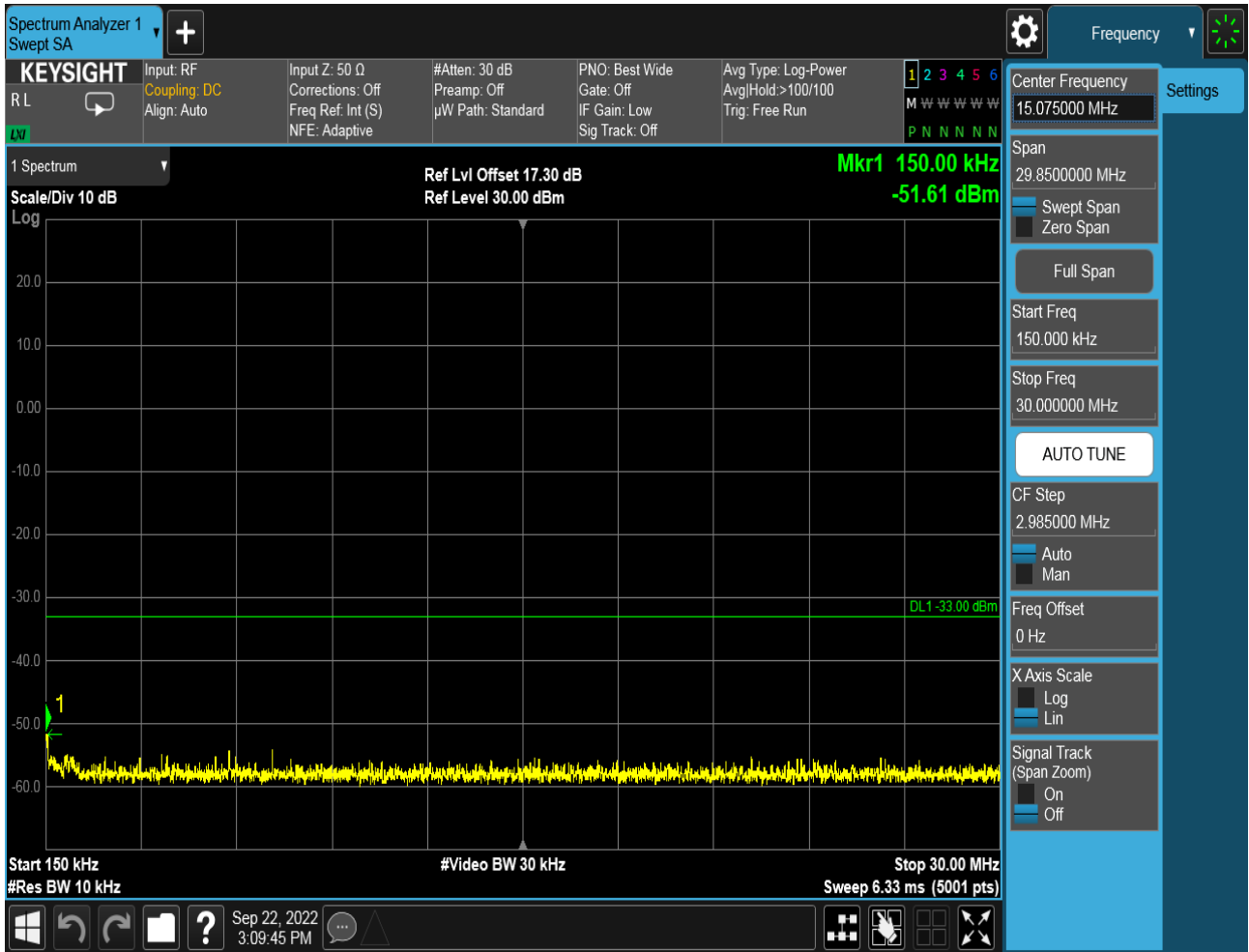


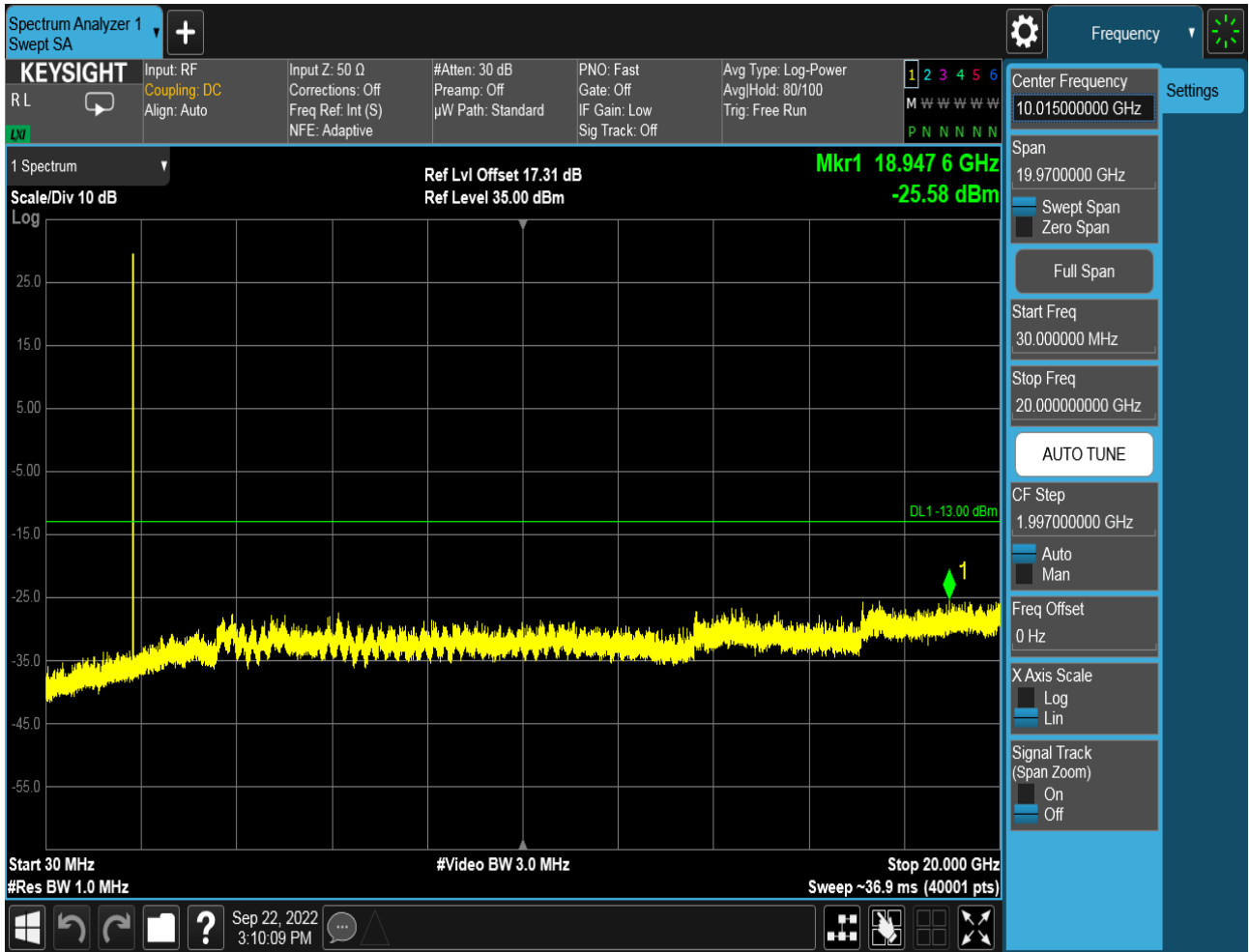
6.1.2 Test Band = PCS1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

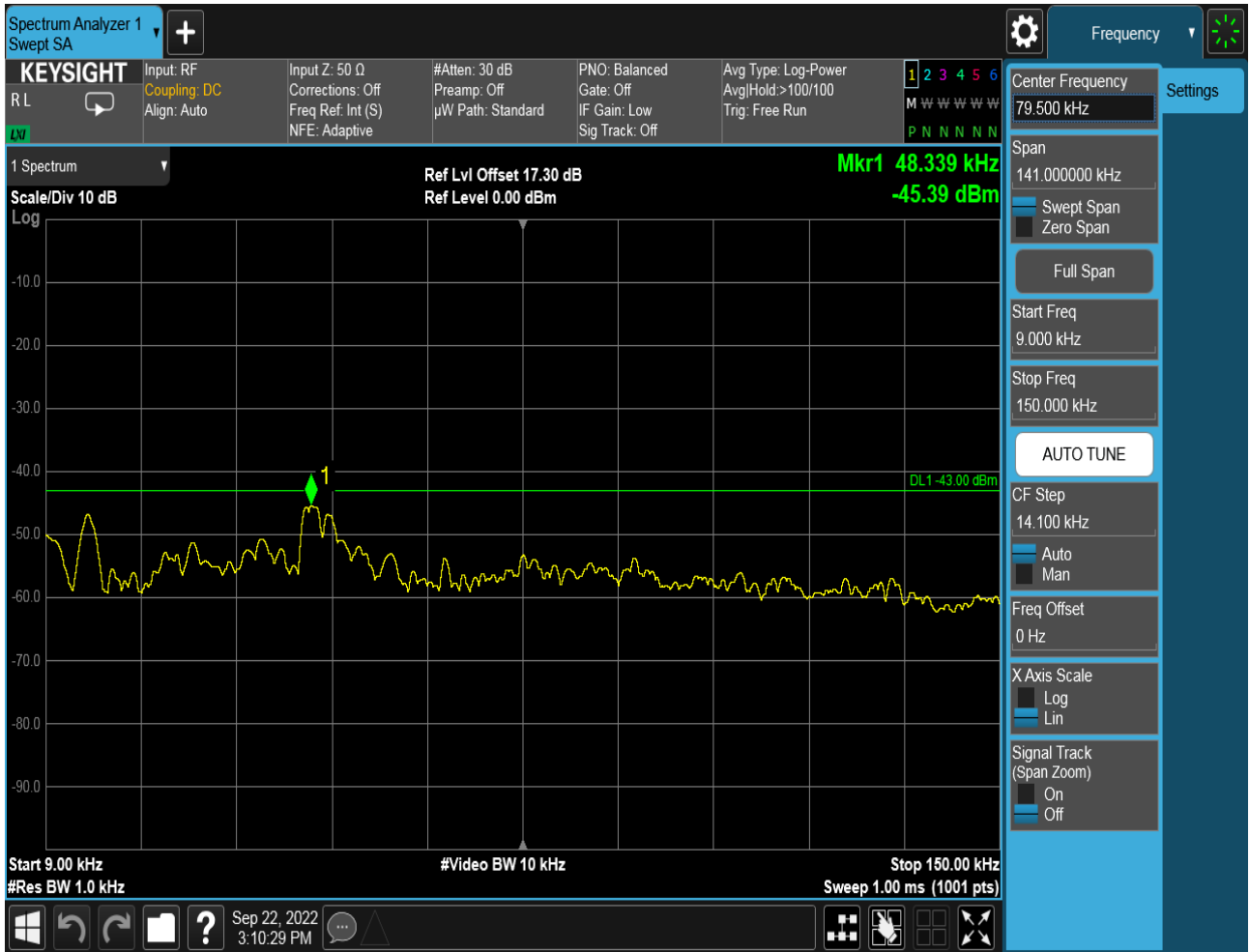


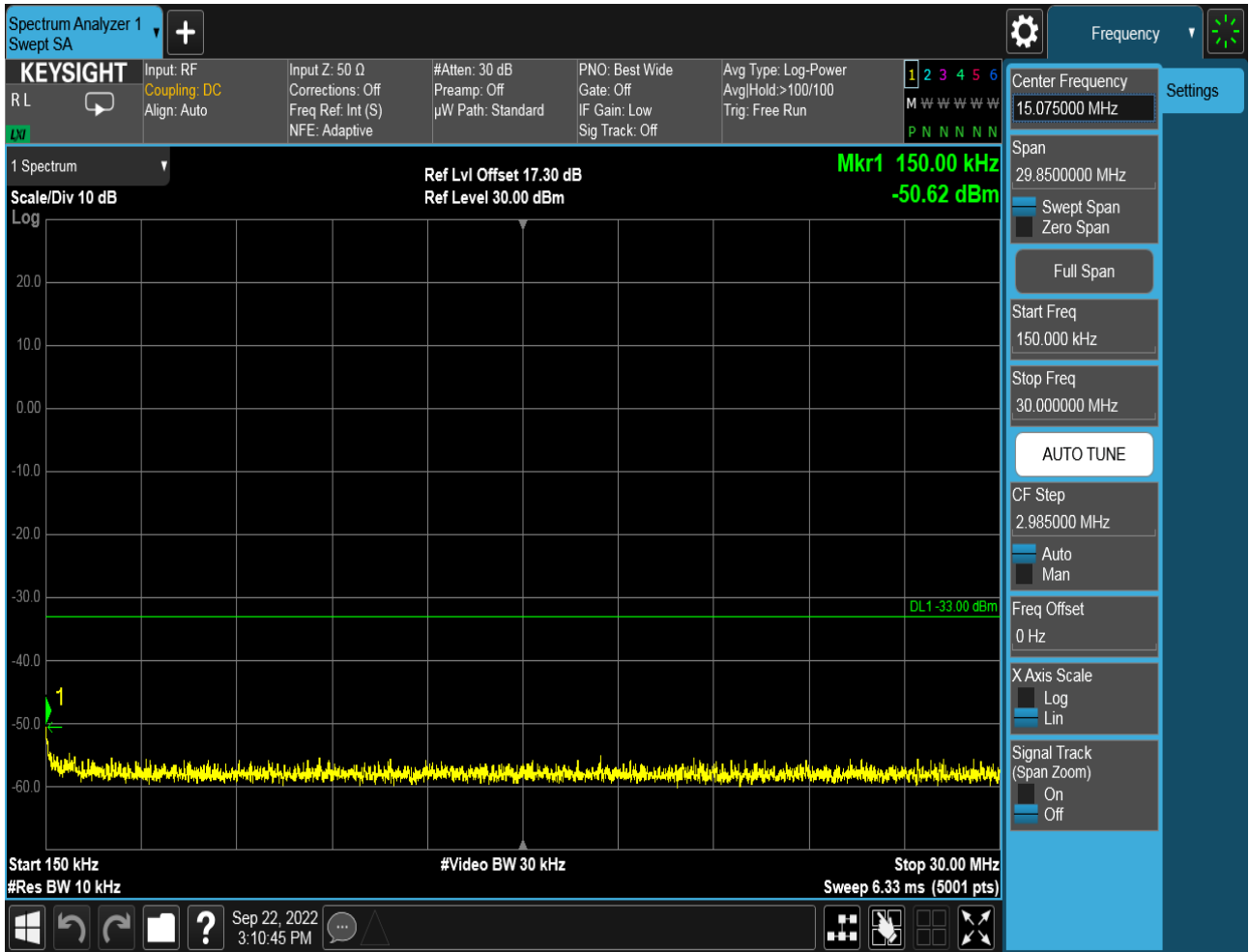


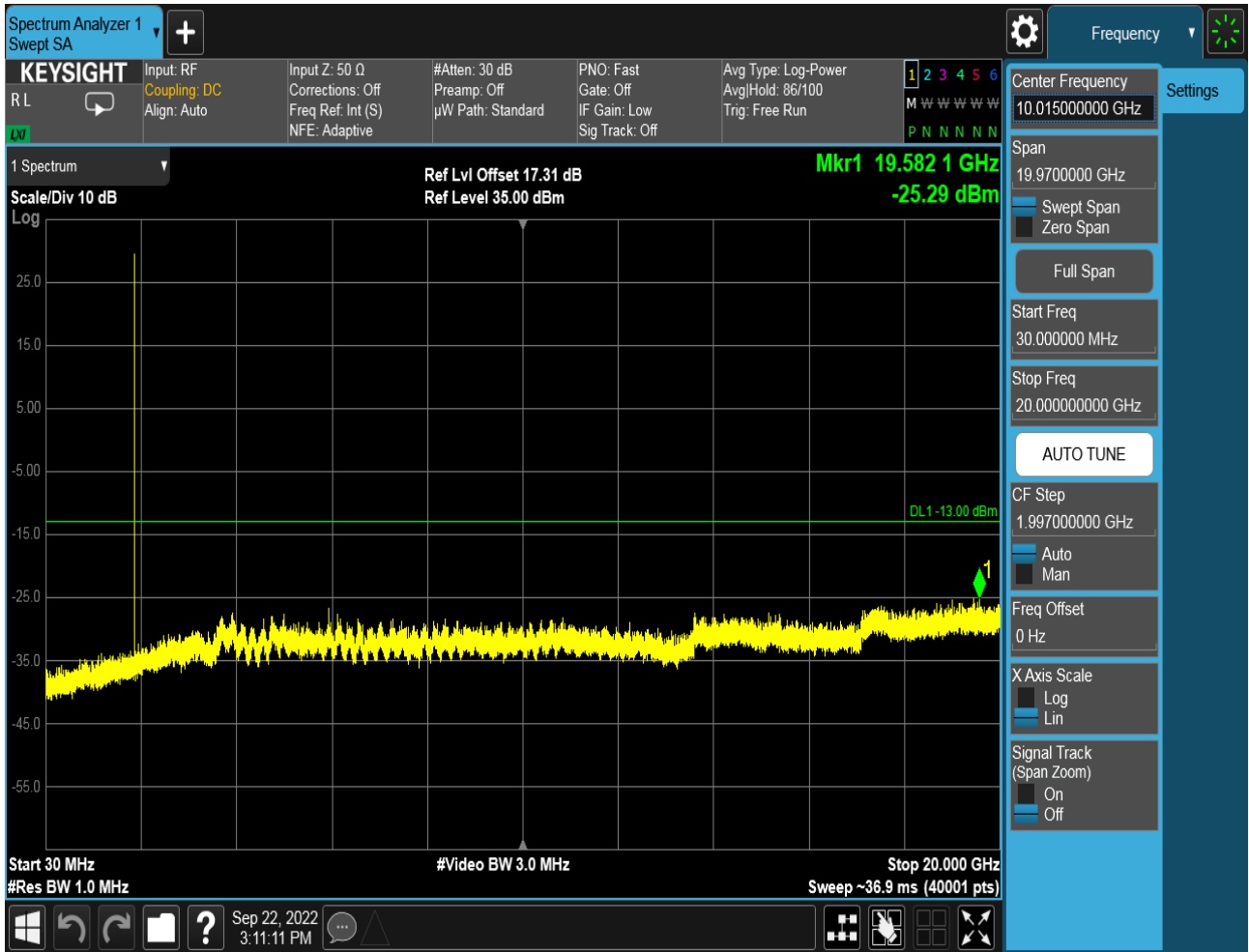




6.1.2.1.2 Test Channel = MCH

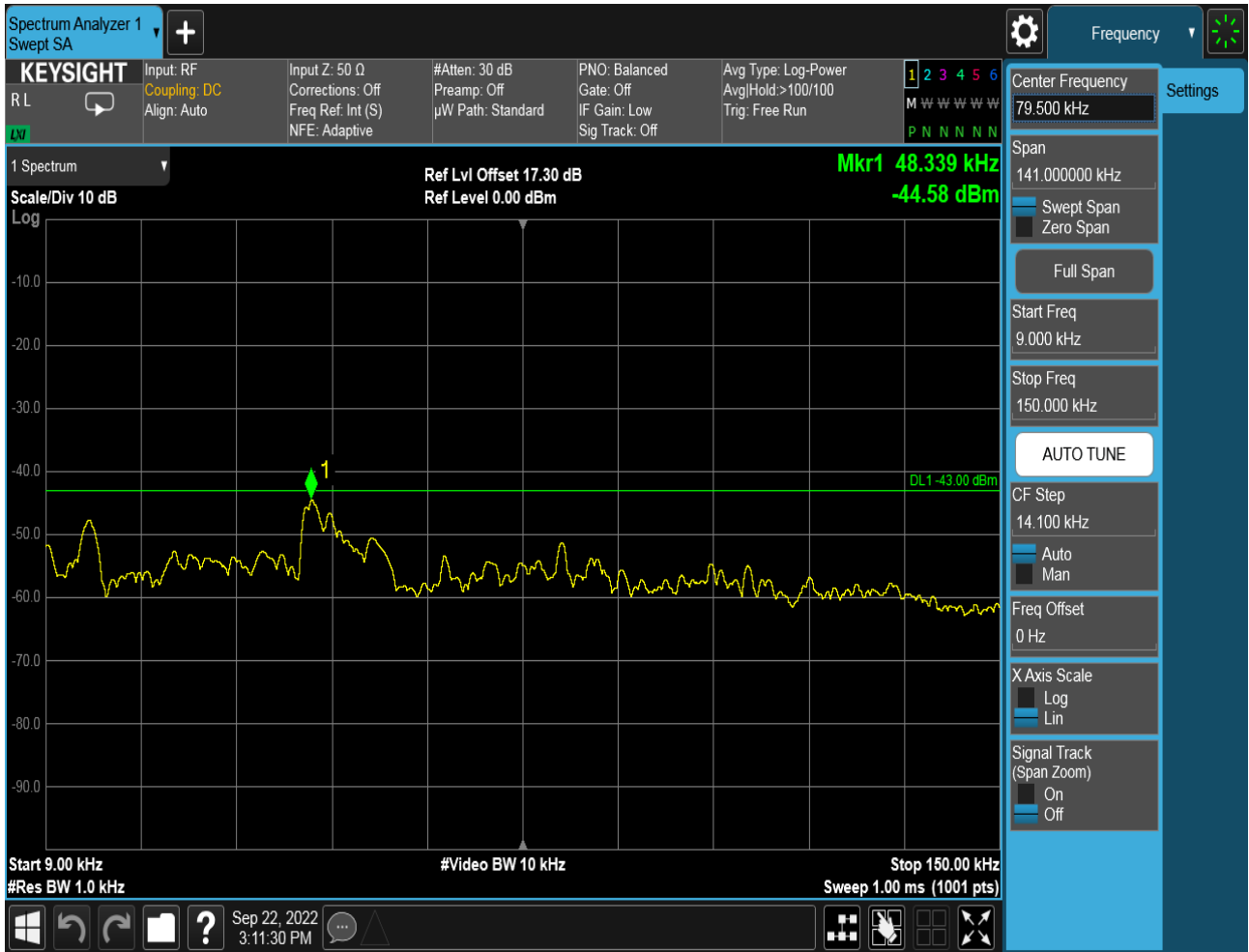


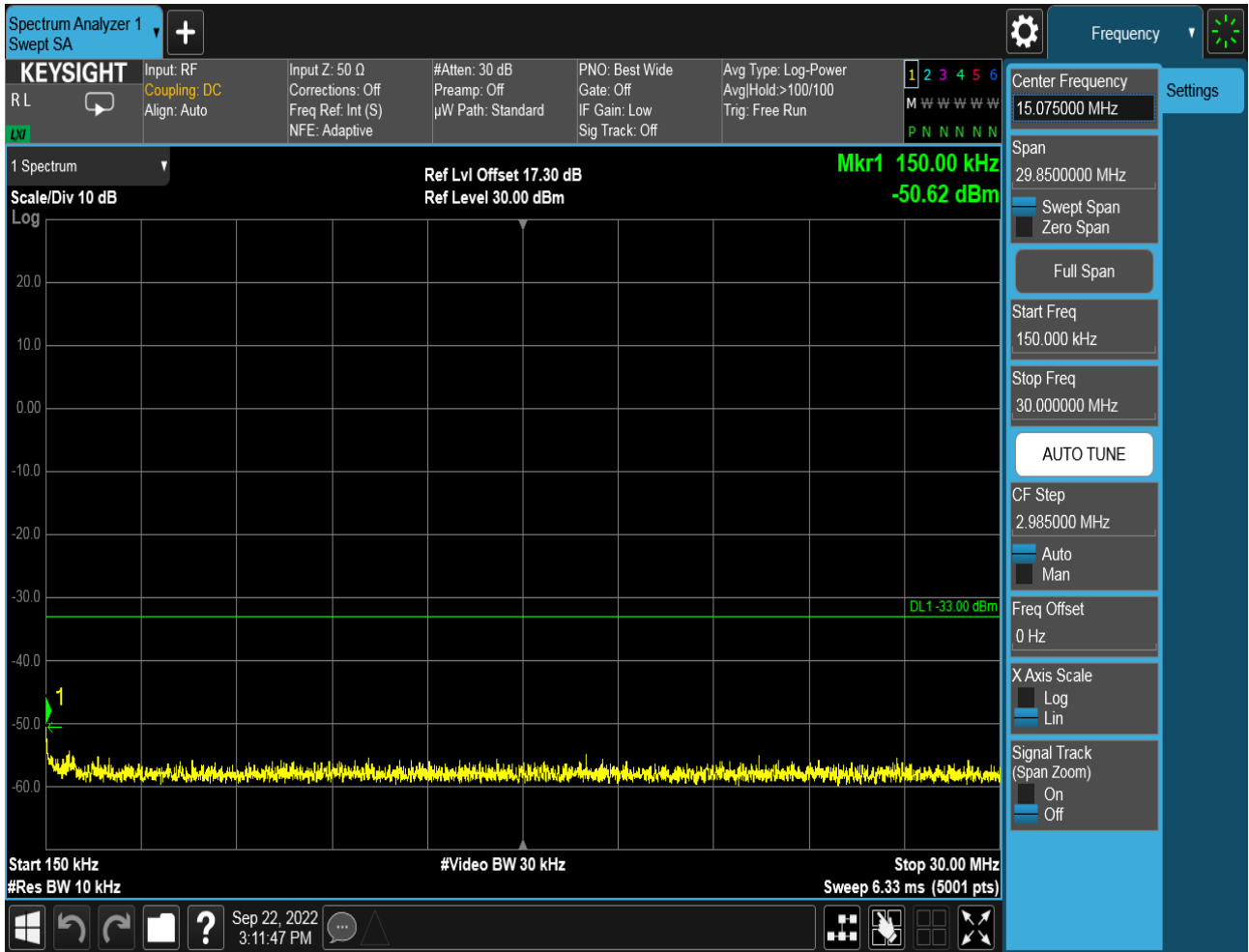


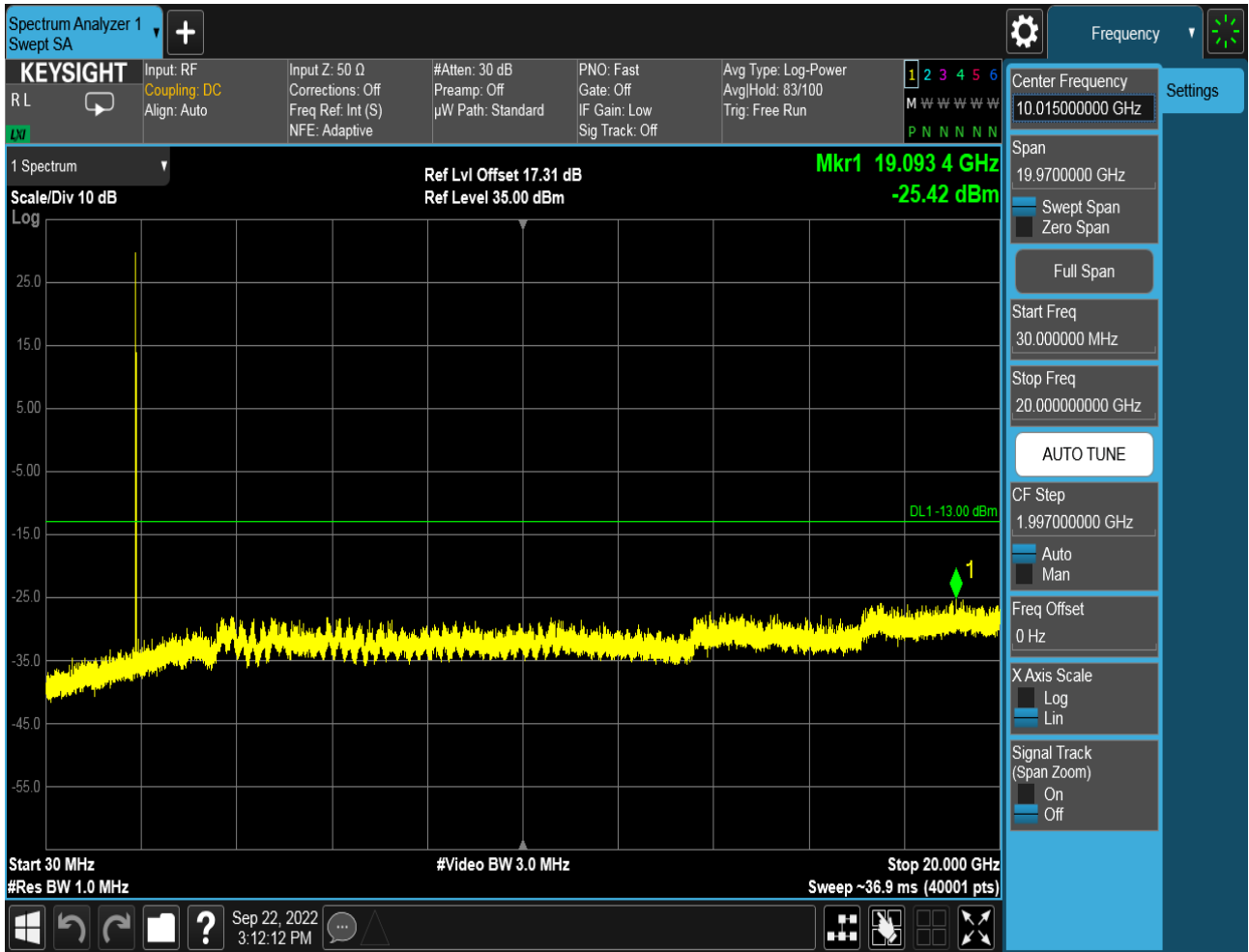




6.1.2.1.3 Test Channel = HCH



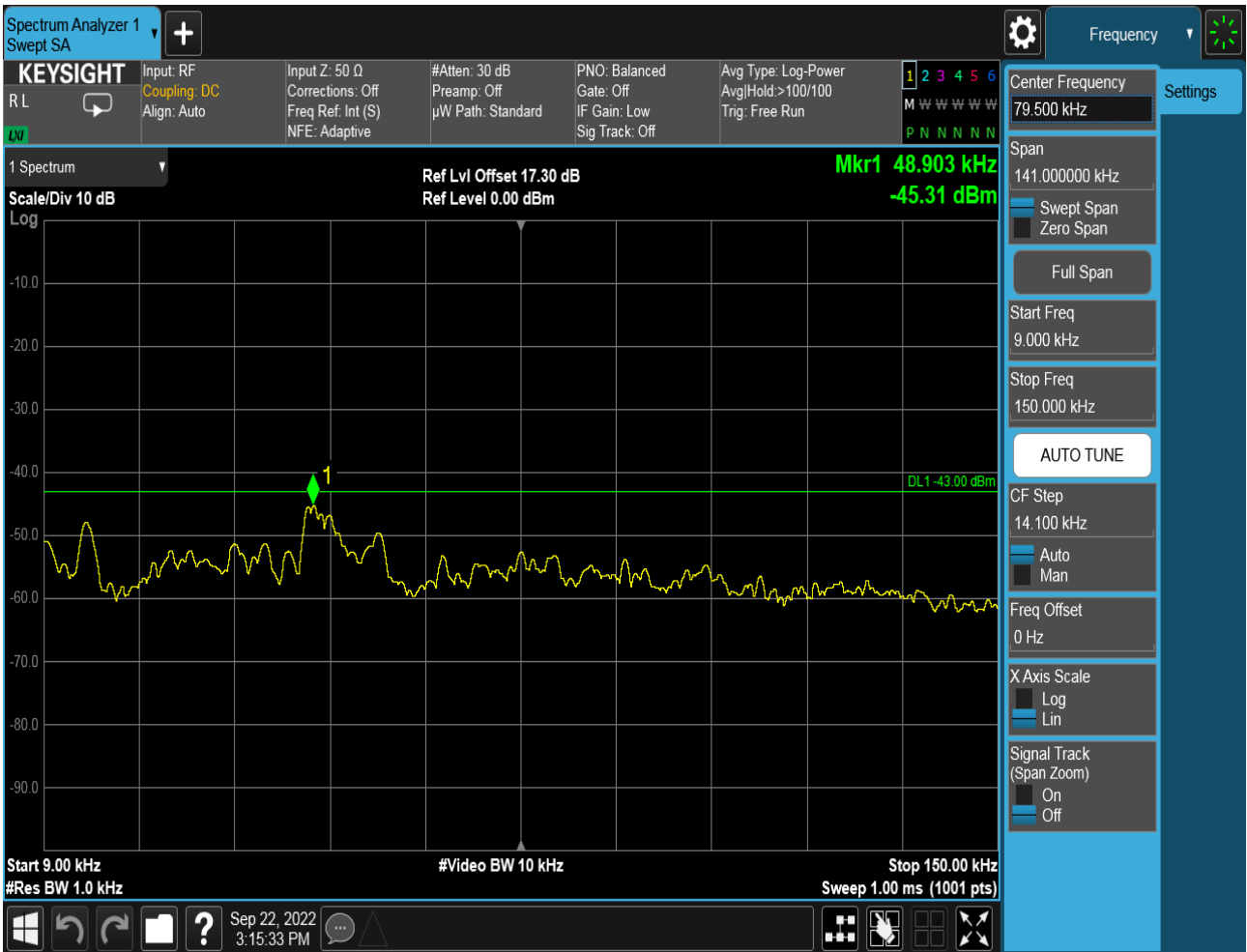


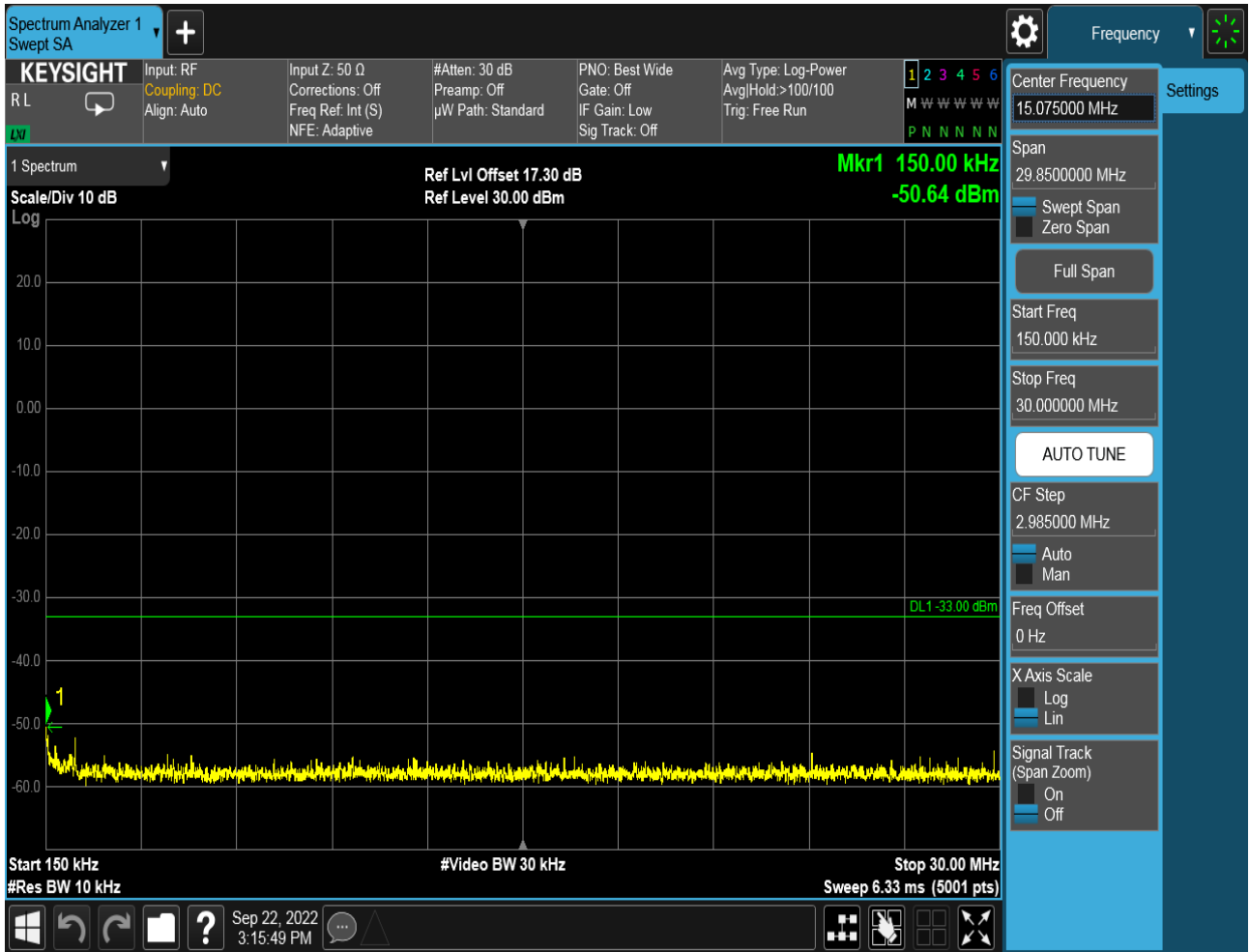


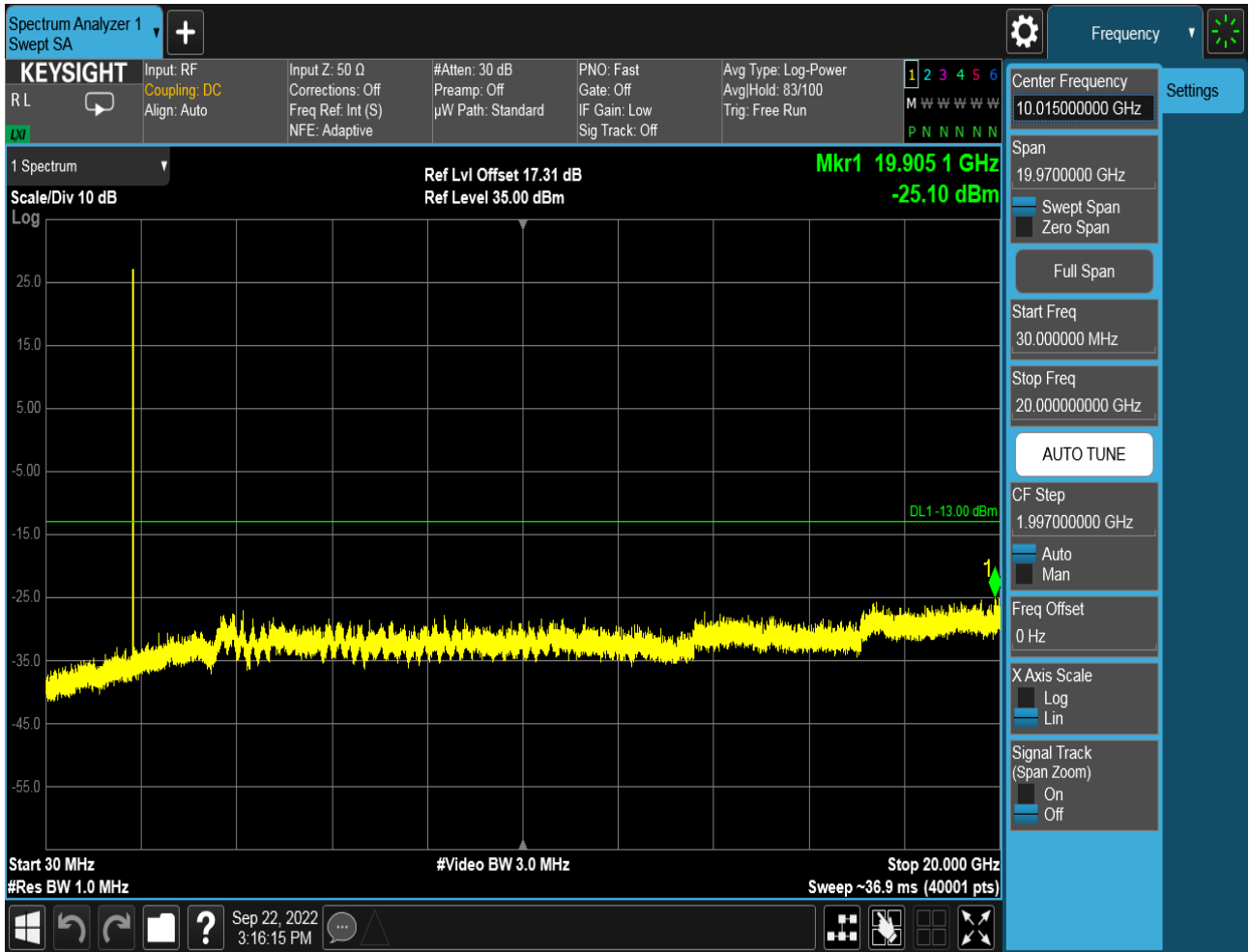


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

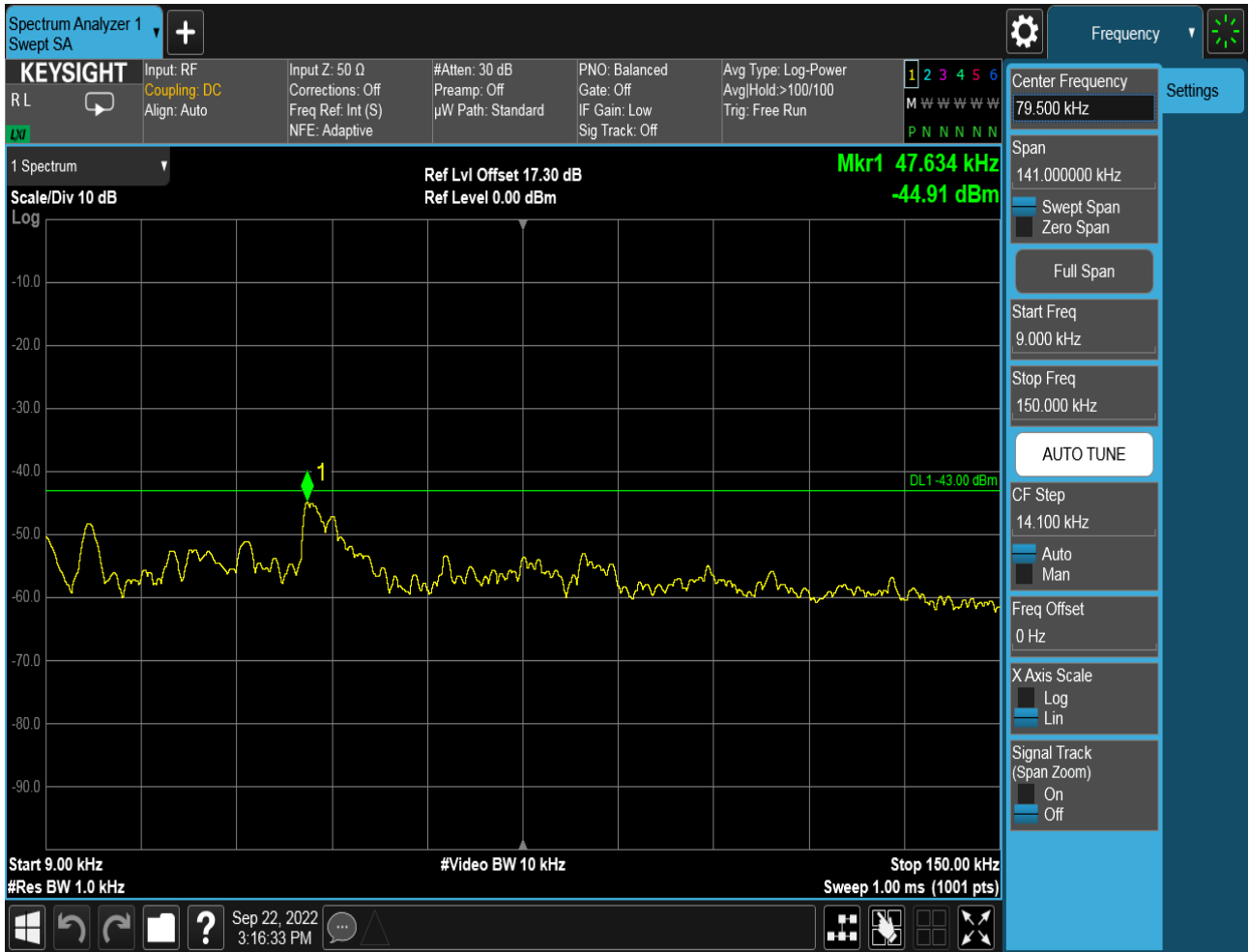


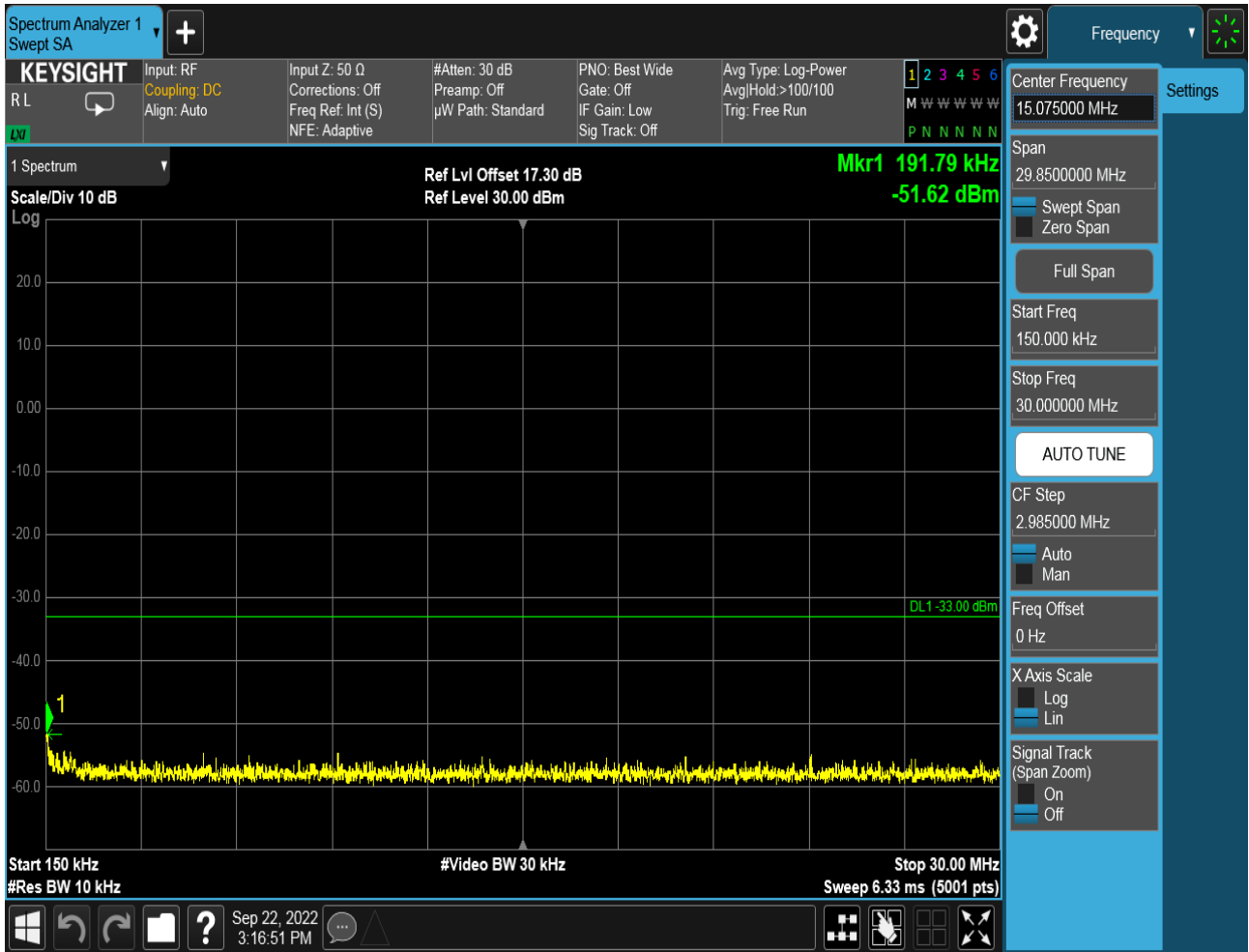


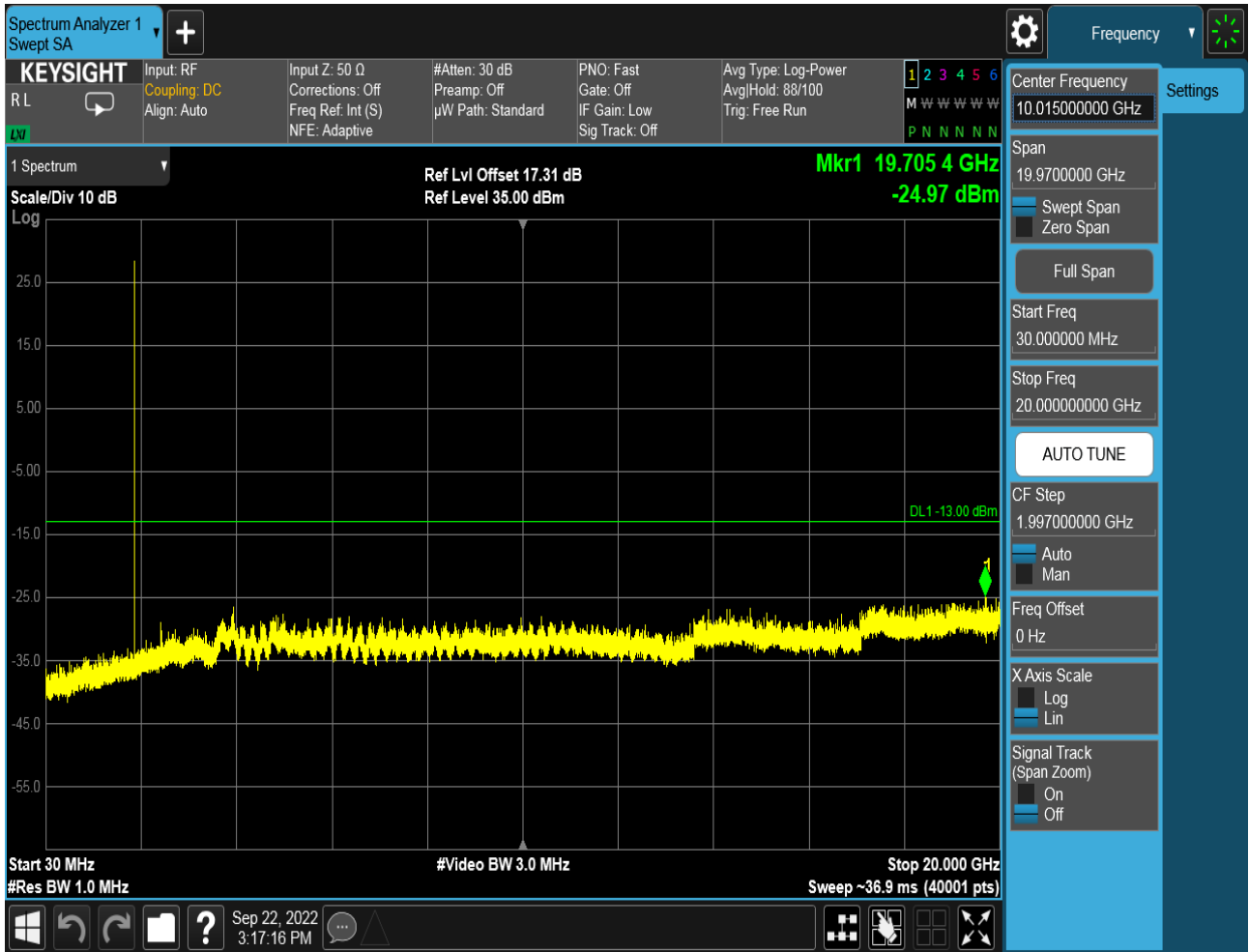




6.1.2.2.2 Test Channel = MCH

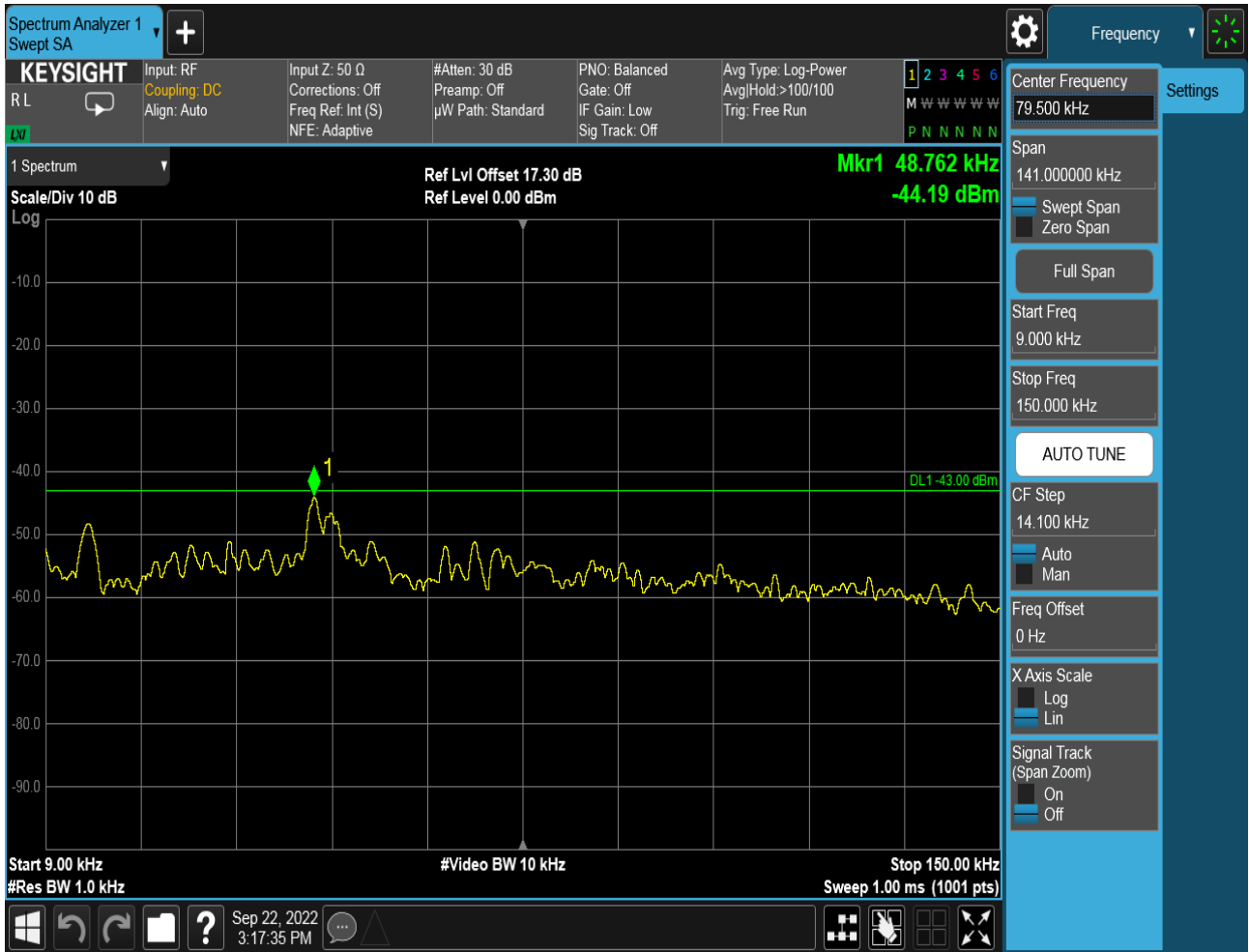


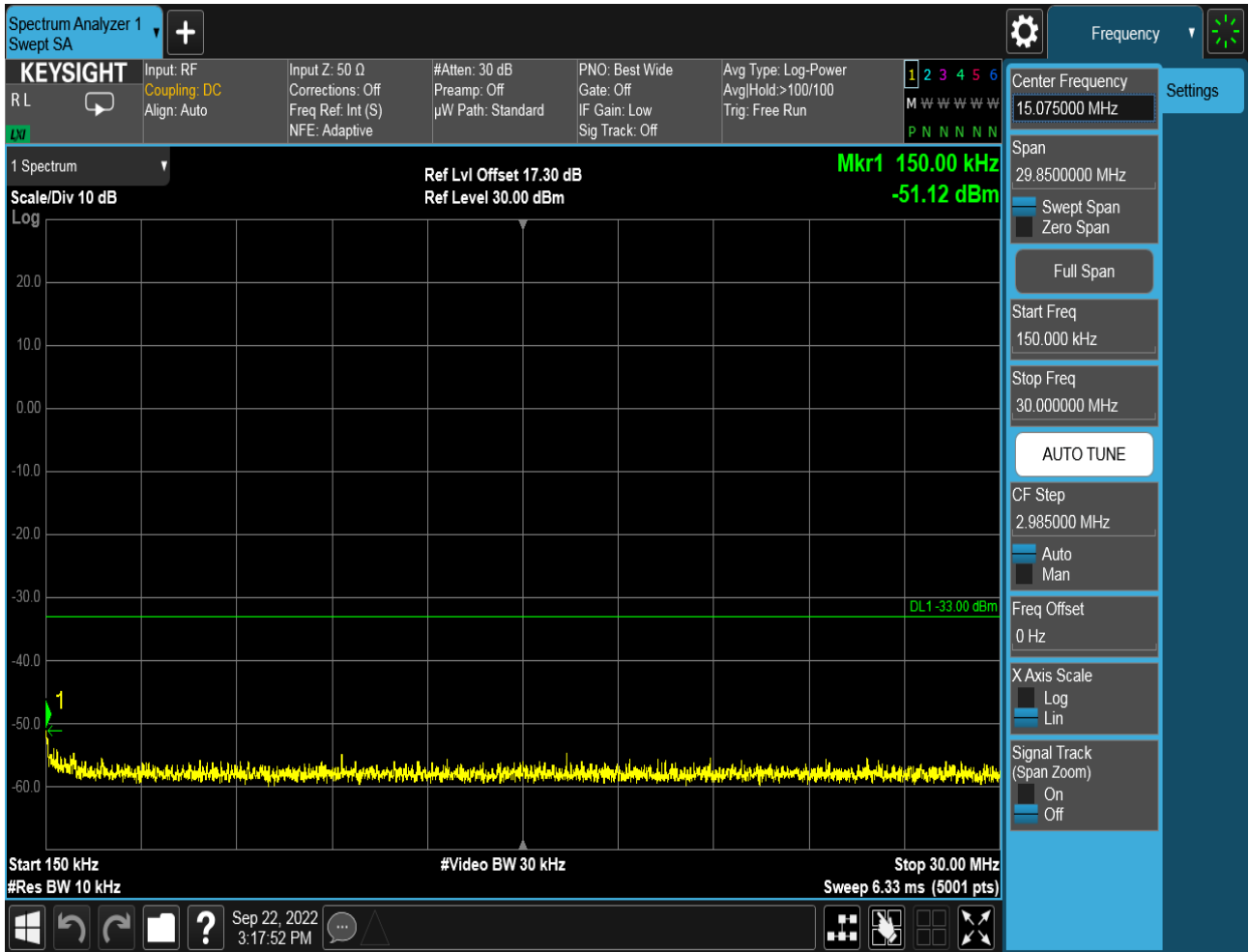


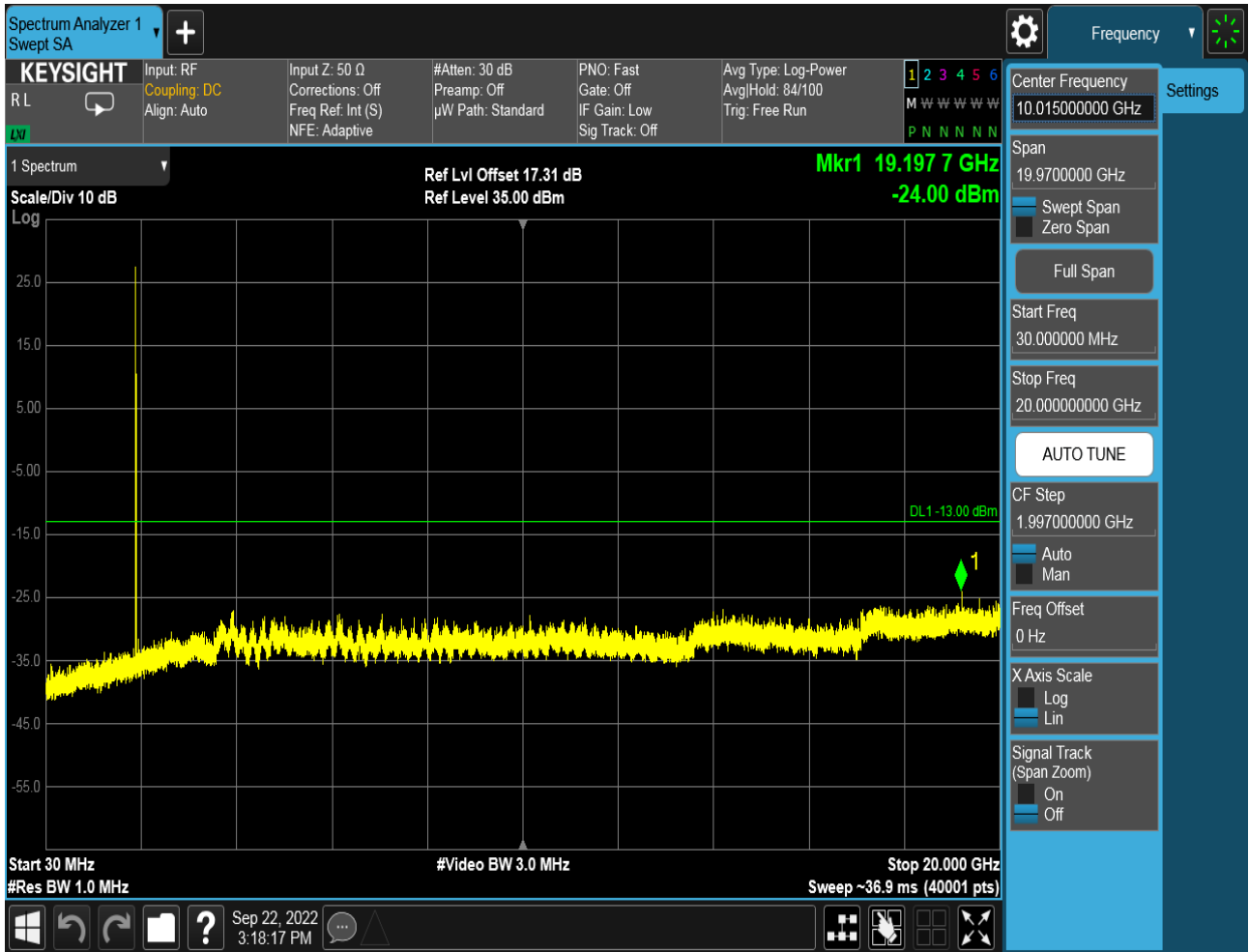




6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note: We tested all modes & antennas, the data presented below is the worst case.

9kHz~150kHz, RBW = 200Hz, VBW = 600 Hz, Detector: PK

150kHz~30MHz, RBW = 9kHz, VBW = 30k Hz, Detector: PK

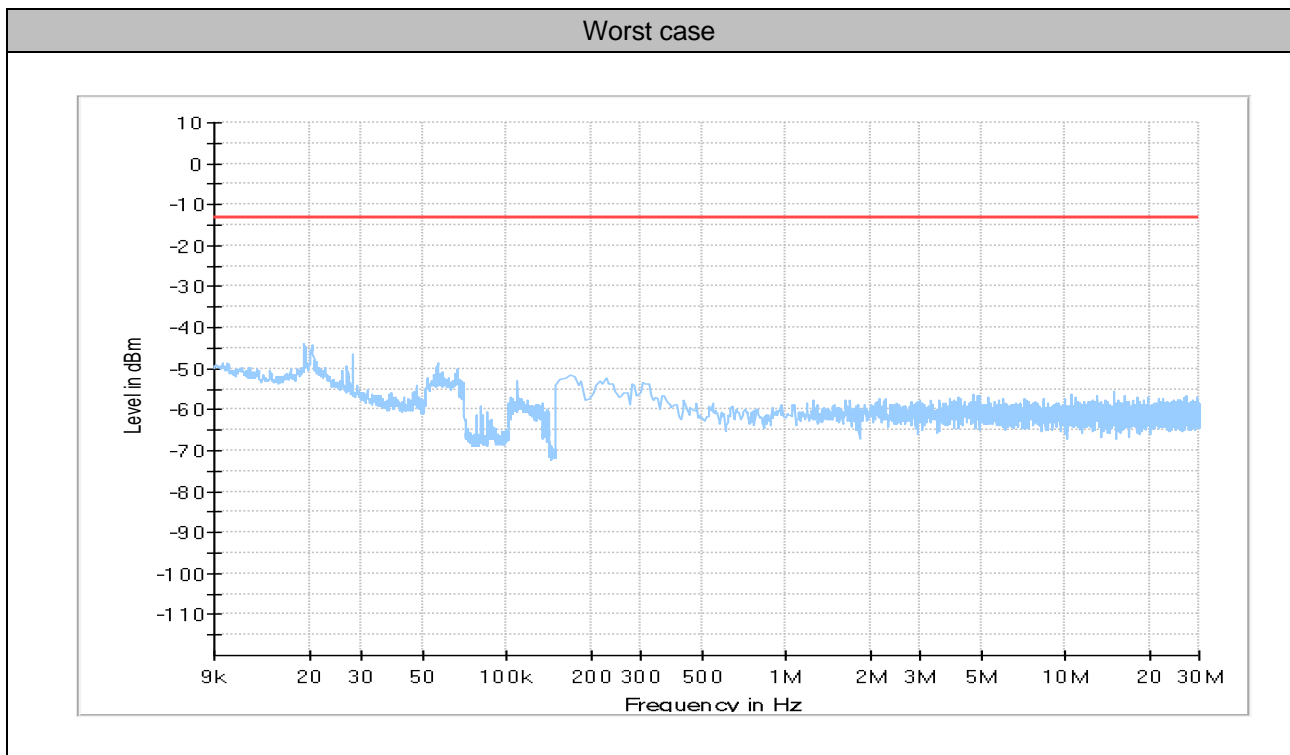
30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

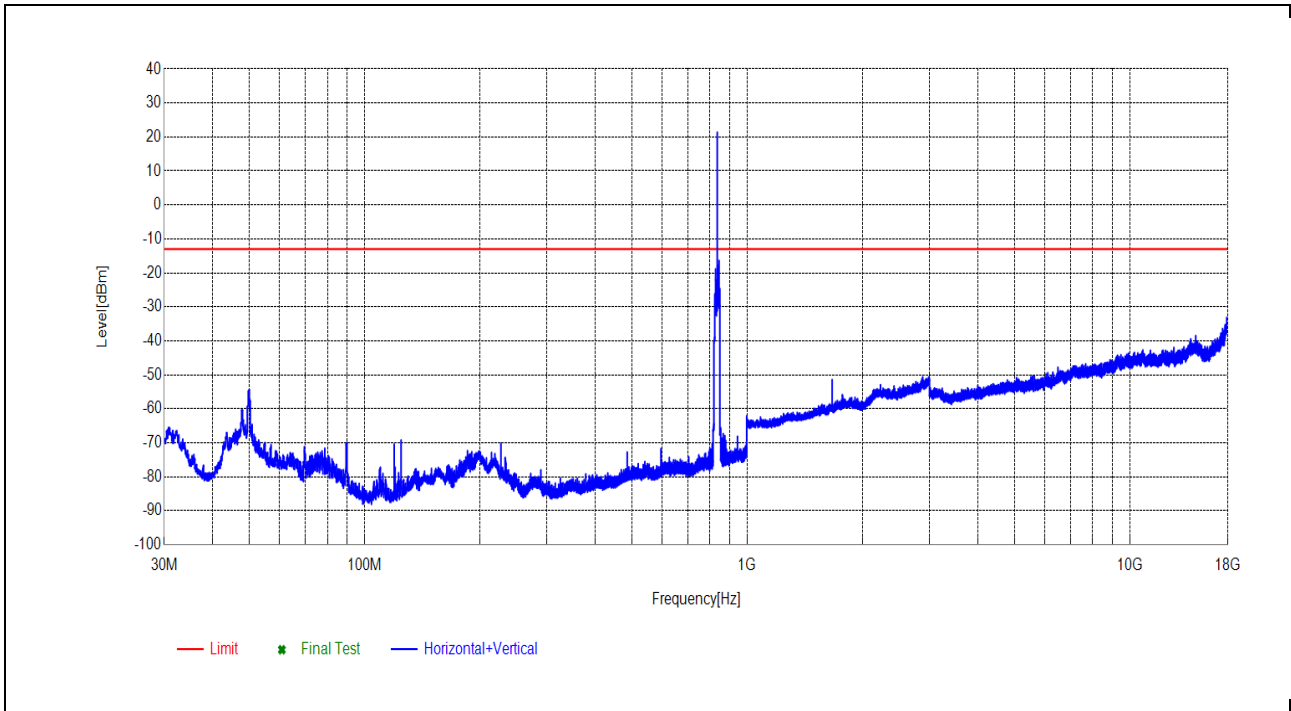
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

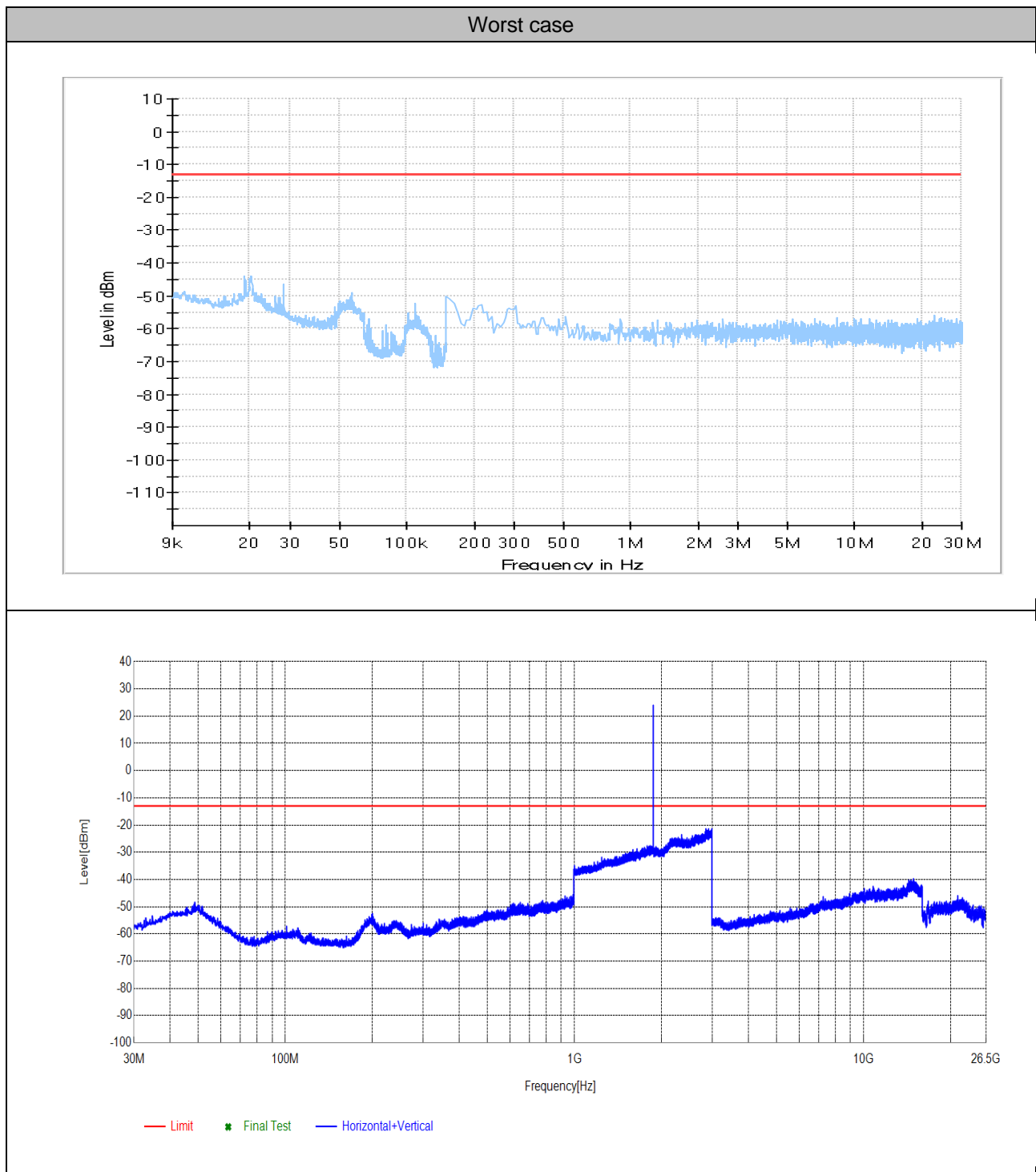
7.1 For GSM_ANT1

7.1.1 Test Band = GSM850





7.1.2 Test Band = PCS1900





8Appendix_H: Frequency Stability

8.1 For GSM

8.1.1 Frequency Error vs. Voltage:

| Test Band | Test Mode | Test Channel | Test Temp. | Test Volt. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
| GSM850 | GSM/TM1 | LCH | TN | VL | -3.08150 | -0.00374 | PASS |
| | | | | VN | 1.43093 | 0.00174 | PASS |
| | | | | VH | -2.01851 | -0.00245 | PASS |
| | | MCH | TN | VL | -1.78284 | -0.00213 | PASS |
| | | | | VN | -0.22589 | -0.00027 | PASS |
| | | | | VH | -1.31529 | -0.00157 | PASS |
| | | HCH | TN | VL | -1.67457 | -0.00197 | PASS |
| | | | | VN | 1.39112 | 0.00164 | PASS |
| | | | | VH | -2.29806 | -0.00271 | PASS |
| | GSM/TM2 | LCH | TN | VL | -1.03213 | -0.00125 | PASS |
| | | | | VN | -2.33752 | -0.00284 | PASS |
| | | | | VH | 0.07383 | 0.00009 | PASS |
| | | MCH | TN | VL | -2.05337 | -0.00245 | PASS |
| | | | | VN | 2.02875 | 0.00242 | PASS |
| | | | | VH | -2.39446 | -0.00286 | PASS |
| | | HCH | TN | VL | 0.60087 | 0.00071 | PASS |
| | | | | VN | -2.00291 | -0.00236 | PASS |
| | | | | VH | -1.08883 | -0.00128 | PASS |
| PCS1900 | GSM/TM1 | LCH | TN | VL | -8.95958 | -0.00484 | PASS |
| | | | | VN | -7.46434 | -0.00403 | PASS |
| | | | | VH | -8.69525 | -0.00470 | PASS |
| | | MCH | TN | VL | -10.02490 | -0.00533 | PASS |
| | | | | VN | -5.39238 | -0.00287 | PASS |
| | | | | VH | -8.70840 | -0.00463 | PASS |
| | | HCH | TN | VL | -9.32794 | -0.00484 | PASS |
| | | | | VN | -7.75386 | -0.00403 | PASS |
| | | | | VH | -9.22422 | -0.00470 | PASS |
| | GSM/TM2 | LCH | TN | VL | -13.86745 | -0.00750 | PASS |
| | | | | VN | -11.95183 | -0.00646 | PASS |
| | | | | VH | -13.09935 | -0.00708 | PASS |
| | | MCH | TN | VL | -12.72563 | -0.00677 | PASS |
| | | | | VN | -13.54805 | -0.00721 | PASS |
| | | | | VH | -12.36478 | -0.00658 | PASS |
| | | HCH | TN | VL | -12.66673 | -0.00750 | PASS |



| Test Band | Test Mode | Test Channel | Test Temp. | Test Volt. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
| | | | | VN | -12.79237 | -0.00646 | PASS |
| | | | | VH | -13.79903 | -0.00708 | PASS |

8.1.2 Frequency Error vs. Temperature:

| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|---------|
| GSM850 | GSM/TM1 | LCH | VN | -30 | 1.33261 | 0.00162 | PASS |
| | | | | -20 | 1.30696 | 0.00159 | PASS |
| | | | | -10 | -1.03595 | -0.00126 | PASS |
| | | | | 0 | -1.66725 | -0.00202 | PASS |
| | | | | 10 | -1.14305 | -0.00139 | PASS |
| | | | | 20 | 1.43093 | 0.00174 | PASS |
| | | | | 30 | -1.18939 | -0.00144 | PASS |
| | | | | 40 | -0.52045 | -0.00063 | PASS |
| | | | | 50 | -0.72285 | -0.00088 | PASS |
| | | MCH | VN | -30 | 0.17411 | 0.00021 | PASS |
| | | | | -20 | 0.36427 | 0.00044 | PASS |
| | | | | -10 | 1.38565 | 0.00166 | PASS |
| | | | | 0 | -0.88374 | -0.00106 | PASS |
| | | | | 10 | 0.11428 | 0.00014 | PASS |
| | | | | 20 | -0.22589 | -0.00027 | PASS |
| | | | | 30 | 0.10343 | 0.00012 | PASS |
| | | | | 40 | 0.91401 | 0.00109 | PASS |
| | | | | 50 | 0.25192 | 0.00030 | PASS |
| | | HCH | VN | -30 | 1.55845 | 0.00184 | PASS |
| | | | | -20 | 0.49384 | 0.00058 | PASS |
| | | | | -10 | 2.60659 | 0.00307 | PASS |
| | | | | 0 | -0.83850 | -0.00099 | PASS |
| | | | | 10 | -1.83212 | -0.00216 | PASS |
| | | | | 20 | 1.39112 | 0.00164 | PASS |
| | 30 | | | -1.18217 | -0.00139 | PASS | |
| | 40 | | | -2.17507 | -0.00256 | PASS | |
| | 50 | | | 0.55284 | 0.00065 | PASS | |
| | GSM/TM2 | LCH | VN | -30 | -0.05518 | -0.00007 | PASS |
| | | | | -20 | -0.99150 | -0.00120 | PASS |
| | | | | -10 | 1.06724 | 0.00129 | PASS |
| 0 | | | | 0.05918 | 0.00007 | PASS | |
| 10 | | | | -0.37289 | -0.00045 | PASS | |
| 20 | | | | -2.33752 | -0.00284 | PASS | |



| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict | | | | | | |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|----------|----------|------|----------|-----------|----------|------|
| | | | | 30 | -0.62605 | -0.00076 | PASS | | | | | | |
| | | | | 40 | -0.02597 | -0.00003 | PASS | | | | | | |
| | | | | 50 | 0.39342 | 0.00048 | PASS | | | | | | |
| | | MCH | VN | | | -30 | 0.35829 | 0.00043 | PASS | | | | |
| | | | | | | -20 | 0.31893 | 0.00038 | PASS | | | | |
| | | | | | | -10 | 0.44480 | 0.00053 | PASS | | | | |
| | | | | | | 0 | 3.17934 | 0.00380 | PASS | | | | |
| | | | | | | 10 | -2.20134 | -0.00263 | PASS | | | | |
| | | | | | | 20 | 2.02875 | 0.00242 | PASS | | | | |
| | | | | | | 30 | 2.18998 | 0.00262 | PASS | | | | |
| | | | | | | 40 | 0.86917 | 0.00104 | PASS | | | | |
| | | | | | | 50 | 0.41015 | 0.00049 | PASS | | | | |
| | | | | | | HCH | VN | | | -30 | -1.56172 | -0.00184 | PASS |
| | | -20 | -1.13284 | -0.00133 | PASS | | | | | | | | |
| | | -10 | -2.35596 | -0.00278 | PASS | | | | | | | | |
| | | 0 | 0.39675 | 0.00047 | PASS | | | | | | | | |
| | | 10 | -1.06983 | -0.00126 | PASS | | | | | | | | |
| | | 20 | -2.00291 | -0.00236 | PASS | | | | | | | | |
| | | 30 | -1.14525 | -0.00135 | PASS | | | | | | | | |
| | | 40 | 1.31154 | 0.00155 | PASS | | | | | | | | |
| | | PCS1900 | GSM/TM1 | LCH | VN | | | | | -30 | -8.54610 | -0.00462 | PASS |
| | | | | | | | | | | -20 | -8.41580 | -0.00455 | PASS |
| | | | | | | | | | | -10 | -6.73683 | -0.00364 | PASS |
| | | | | | | | | | | 0 | -6.52017 | -0.00352 | PASS |
| 10 | -7.40400 | | | | | | | | | -0.00400 | PASS | | |
| 20 | -7.46434 | | | | | | | | | -0.00403 | PASS | | |
| 30 | -6.49836 | | | | | | | | | -0.00351 | PASS | | |
| 40 | -5.01562 | | | | | | | | | -0.00271 | PASS | | |
| 50 | -7.72343 | | | | | | | | | -0.00417 | PASS | | |
| MCH | VN | | | | | | | | | -30 | -10.51910 | -0.00560 | PASS |
| | | | | | | | | | | -20 | -7.69709 | -0.00409 | PASS |
| | | | | | | | | | | -10 | -7.53891 | -0.00401 | PASS |
| | | | | | | | | | | 0 | -8.38700 | -0.00446 | PASS |
| | | | | | | | | | | 10 | -7.07548 | -0.00376 | PASS |
| | | | | | | | | | | 20 | -5.39238 | -0.00287 | PASS |
| | | | | | | | | | | 30 | -7.64728 | -0.00407 | PASS |
| | | | | | | | | | | 40 | -6.75151 | -0.00359 | PASS |
| | | | | | | | | | | 50 | -8.27593 | -0.00440 | PASS |
| HCH | VN | | | | | | | | | -30 | -8.32357 | -0.00436 | PASS |



| Test Band | Test Mode | Test Channel | Test Volt. | Test Temp. | Freq. Error [Hz] | Freq. vs. rated [ppm] | Verdict |
|-----------|-----------|--------------|------------|------------|------------------|-----------------------|-----------|
| | | | | -20 | -8.48728 | -0.00444 | PASS |
| | | | | -10 | -7.64287 | -0.00400 | PASS |
| | | | | 0 | -8.81188 | -0.00461 | PASS |
| | | | | 10 | -8.39296 | -0.00439 | PASS |
| | | | | 20 | -7.75386 | -0.00406 | PASS |
| | | | | 30 | -7.78618 | -0.00408 | PASS |
| | | | | 40 | -7.83899 | -0.00410 | PASS |
| | | | | 50 | -6.91319 | -0.00362 | PASS |
| | GSM/TM2 | LCH | VN | -30 | -15.22920 | -0.00823 | PASS |
| | | | | -20 | -11.57647 | -0.00626 | PASS |
| | | | | -10 | -14.11900 | -0.00763 | PASS |
| | | | | 0 | -11.12502 | -0.00601 | PASS |
| | | | | 10 | -13.38982 | -0.00724 | PASS |
| | | | | 20 | -11.95183 | -0.00646 | PASS |
| | | | | 30 | -13.29900 | -0.00719 | PASS |
| | | | | 40 | -10.25968 | -0.00555 | PASS |
| | | | | 50 | -8.82398 | -0.00477 | PASS |
| | | | | MCH | VN | -30 | -14.59316 |
| | | -20 | -10.79091 | | | -0.00574 | PASS |
| | | -10 | -12.91287 | | | -0.00687 | PASS |
| | | 0 | -12.38294 | | | -0.00659 | PASS |
| | | 10 | -14.20916 | | | -0.00756 | PASS |
| | | 20 | -13.54805 | | | -0.00721 | PASS |
| | | 30 | -11.22116 | | | -0.00597 | PASS |
| | | 40 | -10.82524 | | | -0.00576 | PASS |
| | | HCH | VN | -30 | -15.38290 | -0.00805 | PASS |
| | | | | -20 | -14.43704 | -0.00756 | PASS |
| | | | | -10 | -14.79670 | -0.00775 | PASS |
| | | | | 0 | -11.92352 | -0.00624 | PASS |
| | | | | 10 | -13.28462 | -0.00696 | PASS |
| 20 | | | | -12.79237 | -0.00670 | PASS | |
| 30 | | | | -13.04480 | -0.00683 | PASS | |
| 40 | -12.48471 | | | -0.00654 | PASS | | |
| 50 | -11.13873 | -0.00583 | PASS | | | | |

END