

## 7. OUT OF BAND EMISSIONS

### RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238 and §27.53

### LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

### TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

Set display line at -13 dBm

Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

### **MODES TESTED**

LTE Band 2

LTE Band 4

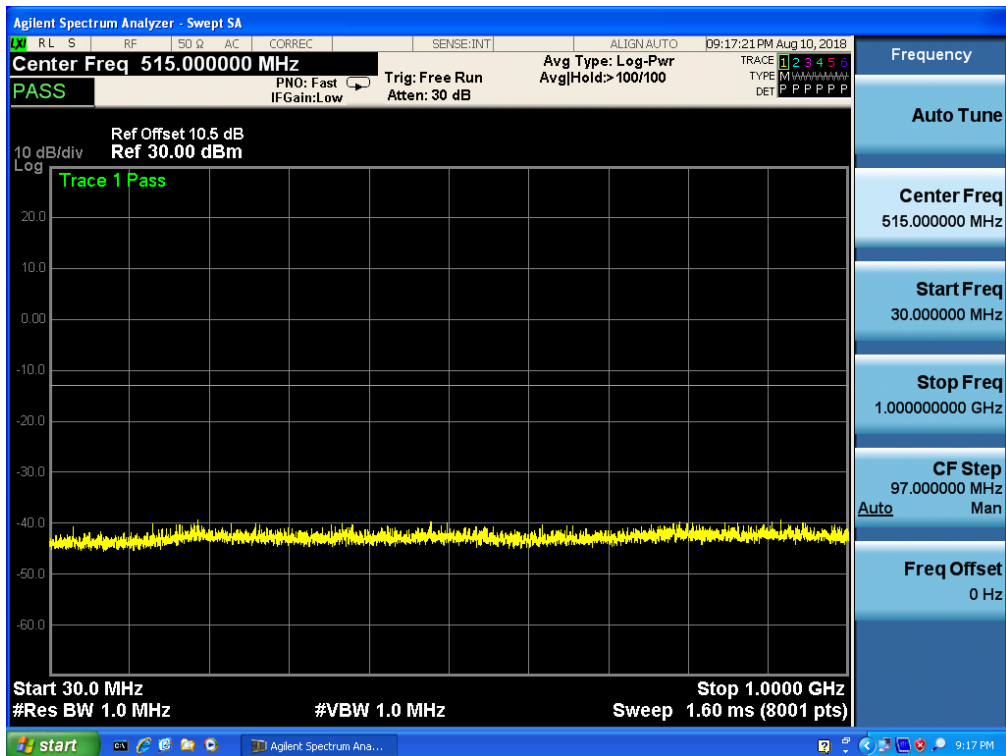
LTE Band 13

### 7.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

### 7.1 LTE BAND 2

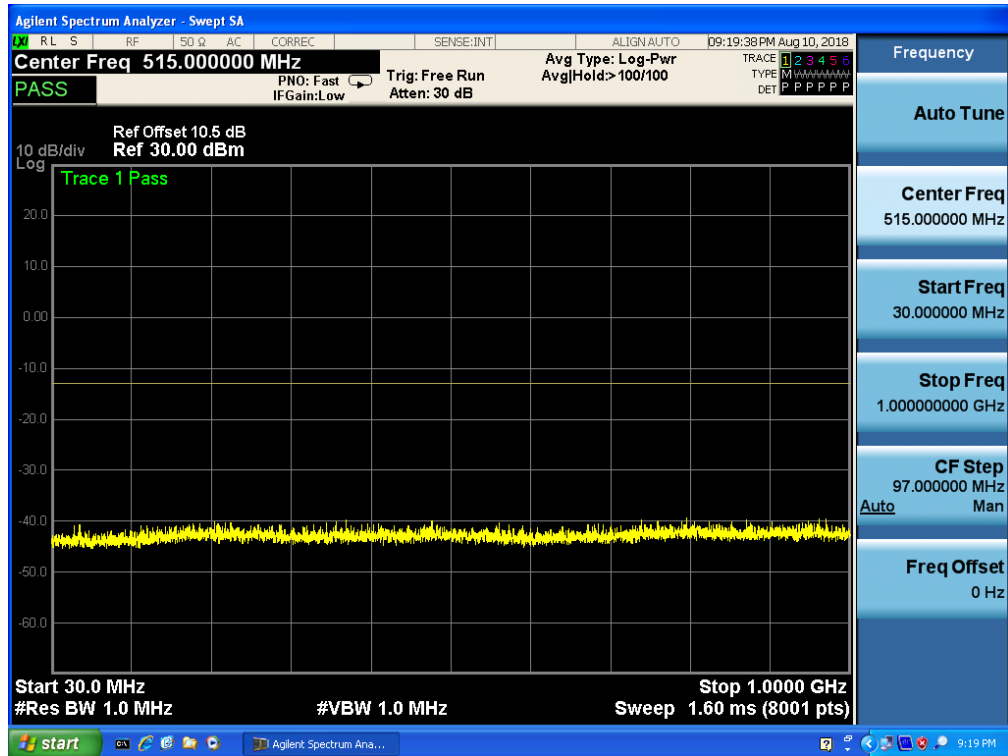
*Band 2, UL Channel 18607, UL Frequency 1850.7, BW 1.4, NO. RB 6, RB POS. Low, QPSK*



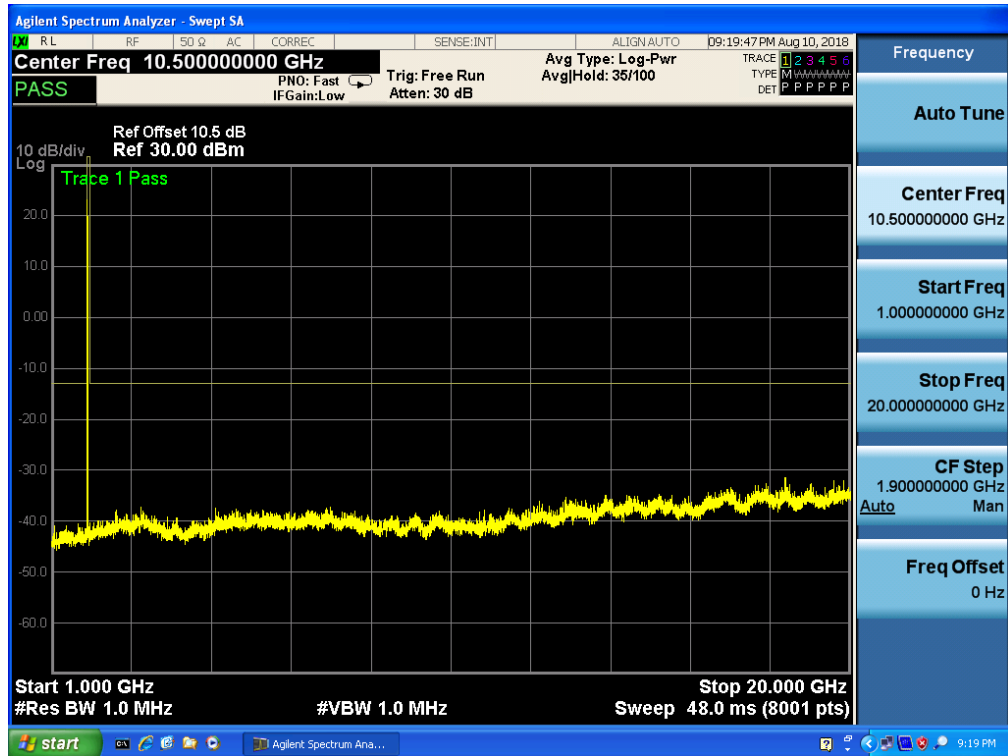
*Band 2, UL Channel 18607, UL Frequency 1850.7, BW 1.4, NO. RB 6, RB POS. Low, QPSK*



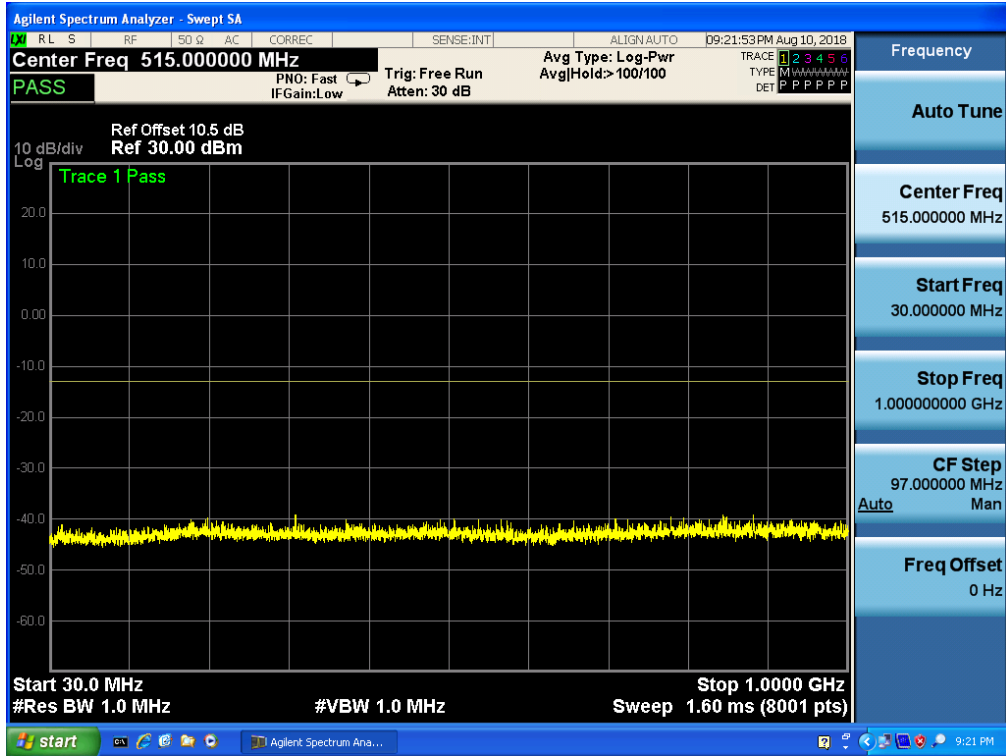
Band 2, UL Channel 18607, UL Frequency 1850.7, BW 1.4, NO. RB 6, RB POS. Low, 16QAM



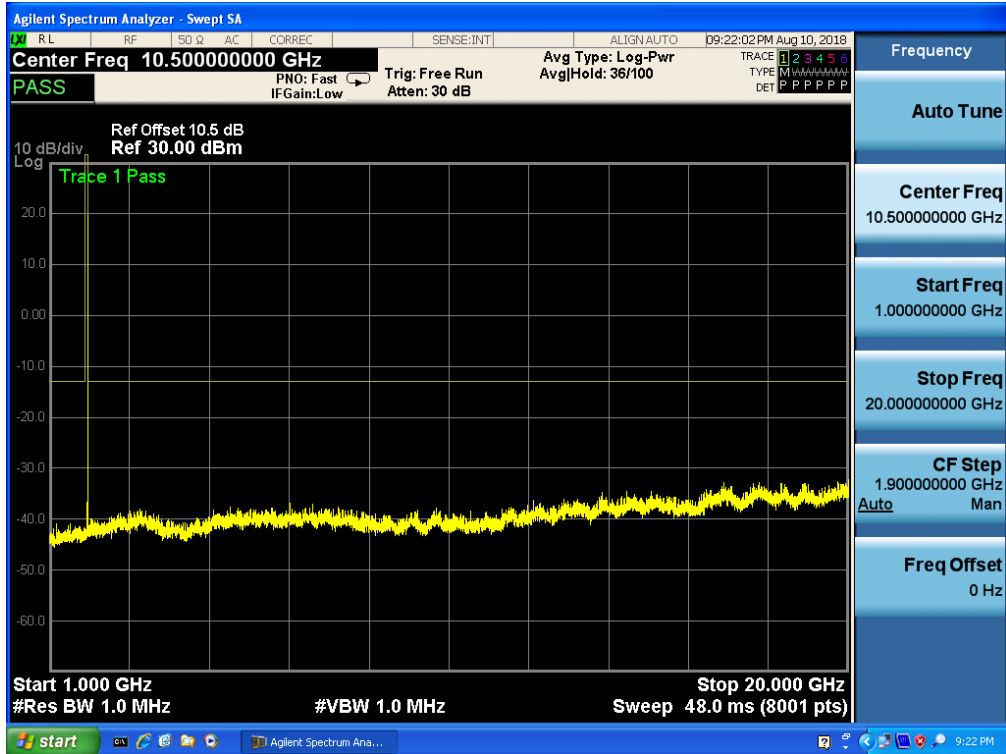
Band 2, UL Channel 18607, UL Frequency 1850.7, BW 1.4, NO. RB 6, RB POS. Low, 16QAM



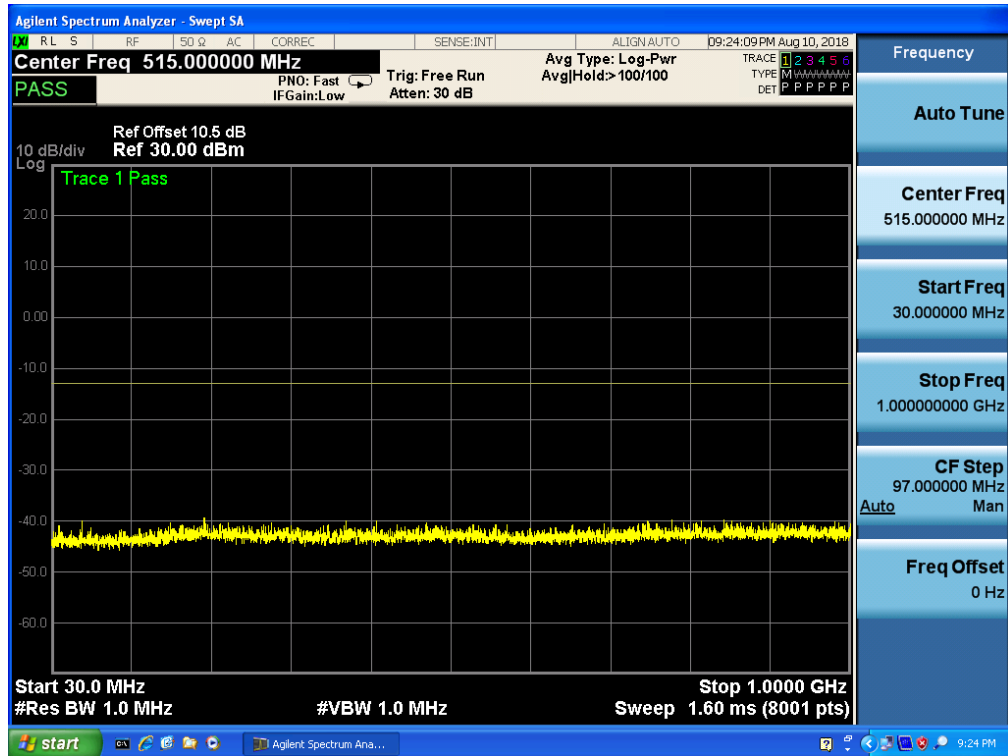
Band 2, UL Channel 19193, UL Frequency 1909.3, BW 1.4, NO. RB 6, RB POS. Low, QPSK



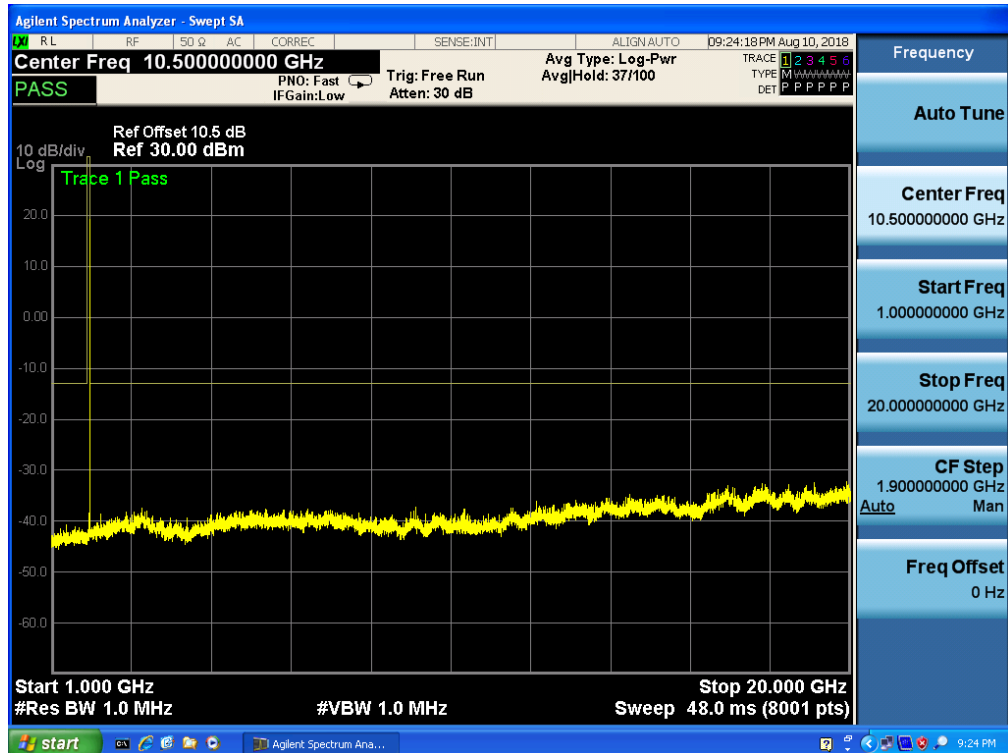
Band 2, UL Channel 19193, UL Frequency 1909.3, BW 1.4, NO. RB 6, RB POS. Low, QPSK



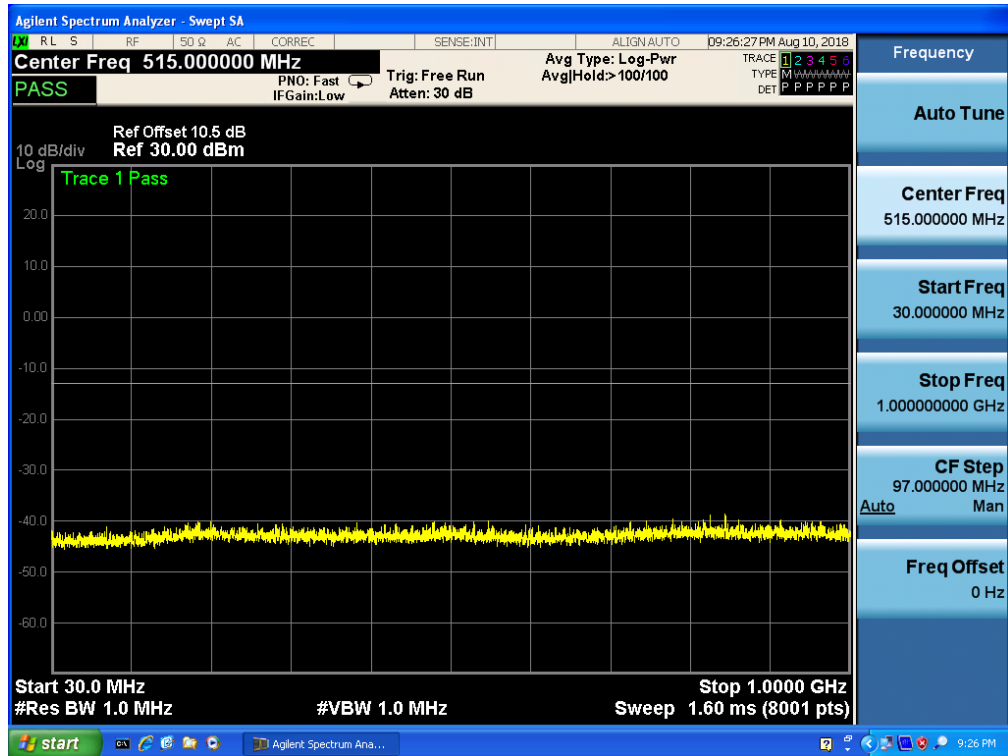
Band 2, UL Channel 19193, UL Frequency 1909.3, BW 1.4, NO. RB 6, RB POS. Low, 16QAM



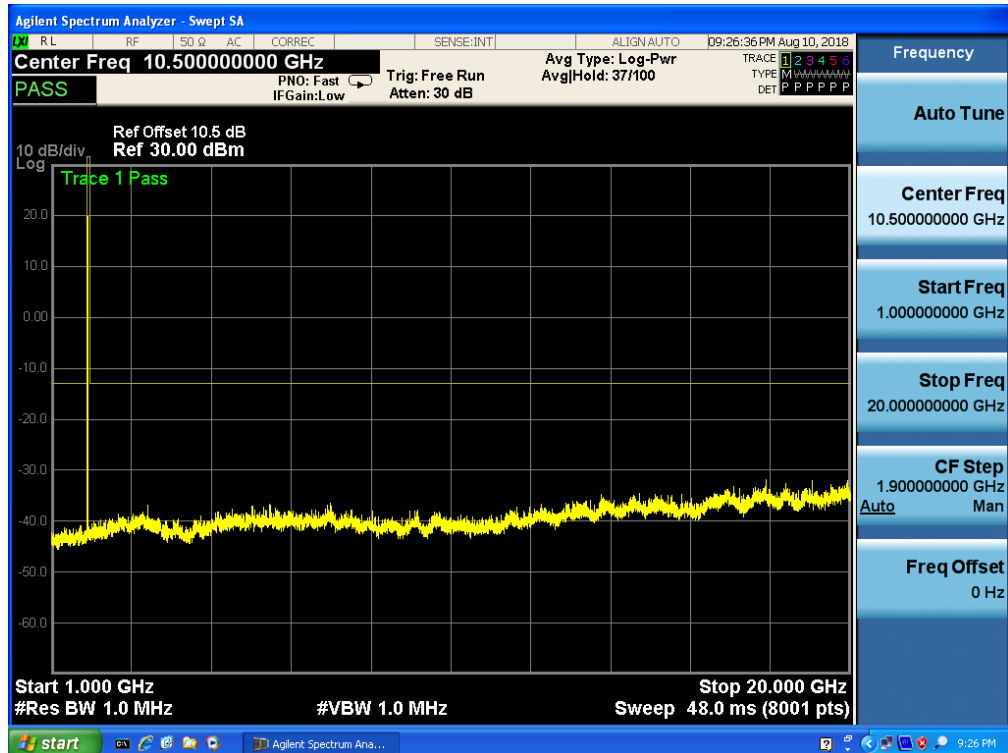
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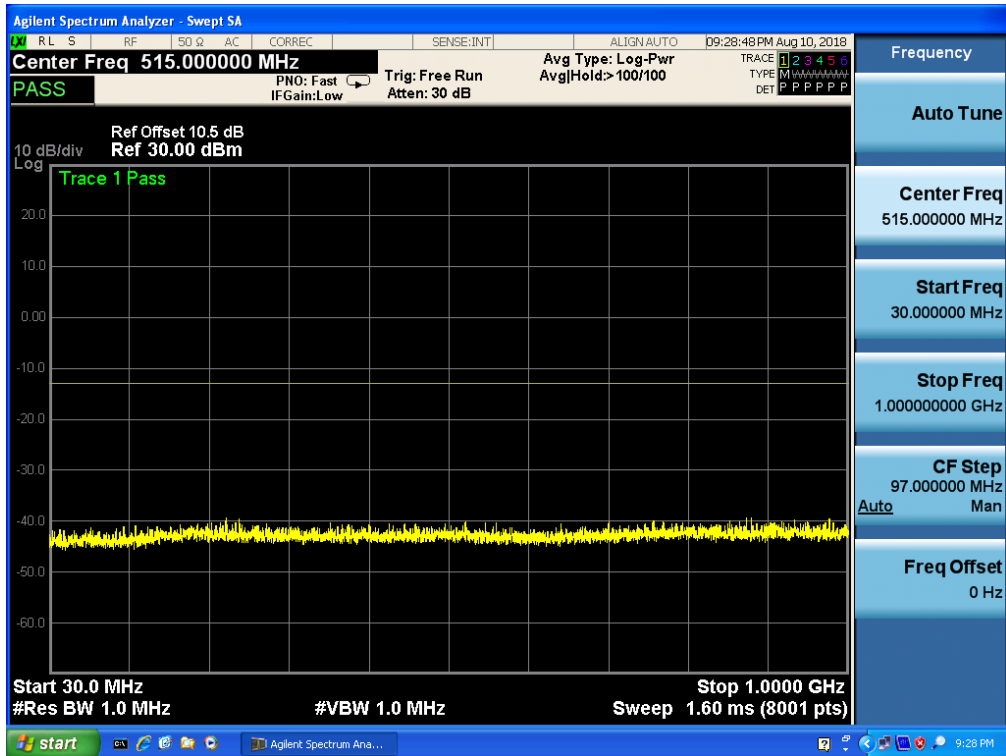
Band 2, UL Channel 18615, UL Frequency 1851.5, BW 3.0, NO. RB 15, RB POS. Low, QPSK



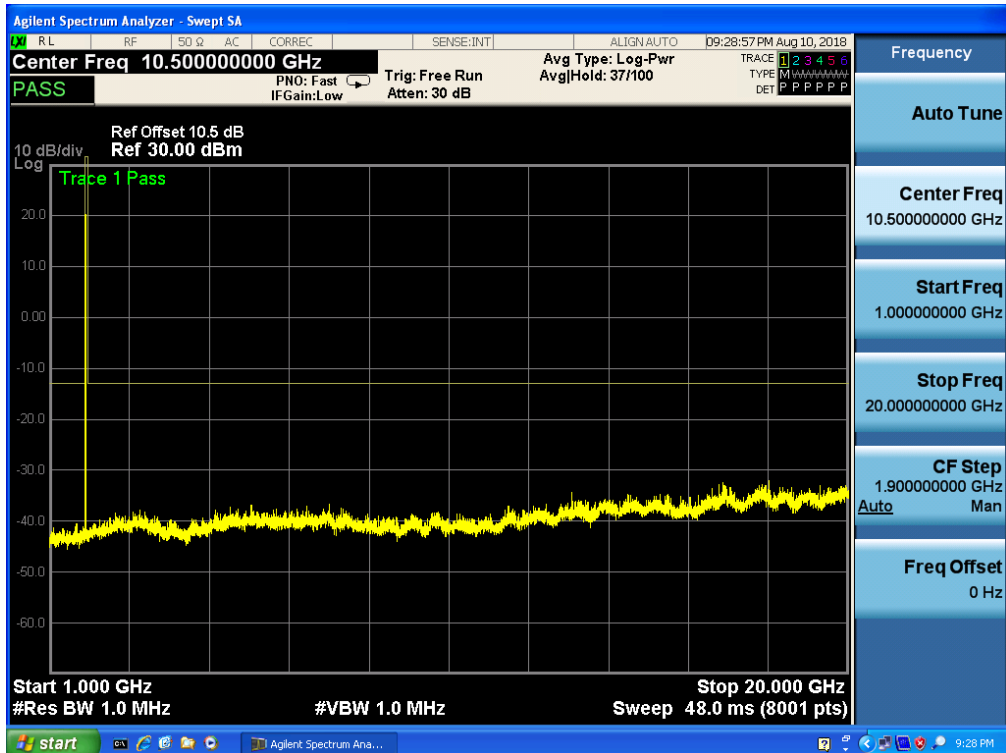
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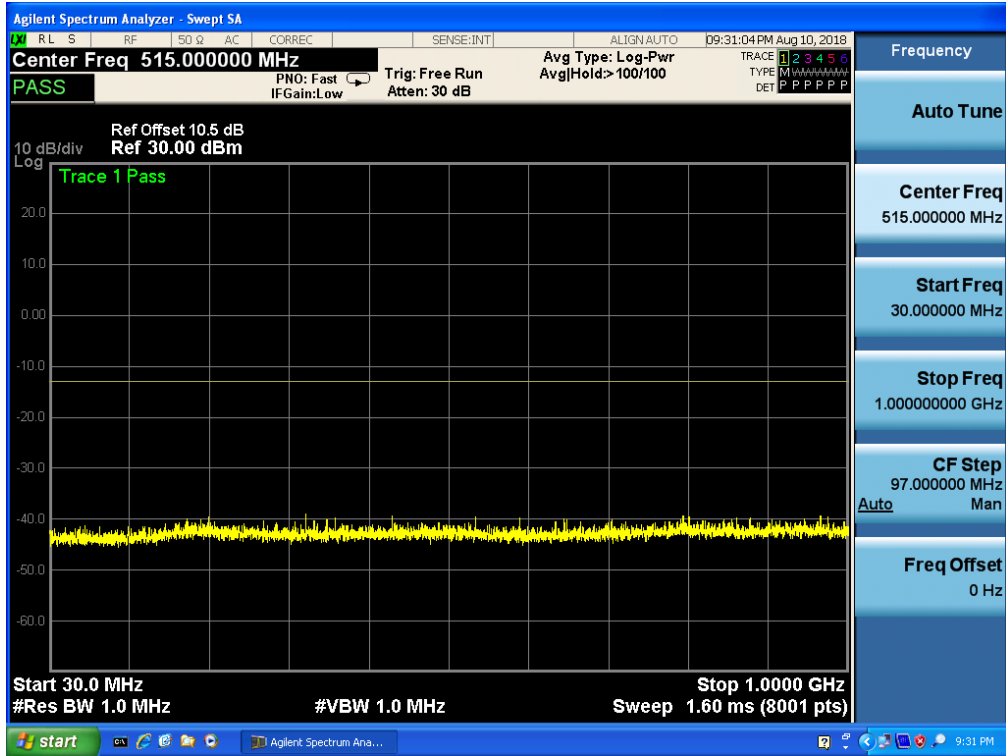
Band 2, UL Channel 18615, UL Frequency 1851.5, BW 3.0, NO. RB 15, RB POS. Low, 16QAM



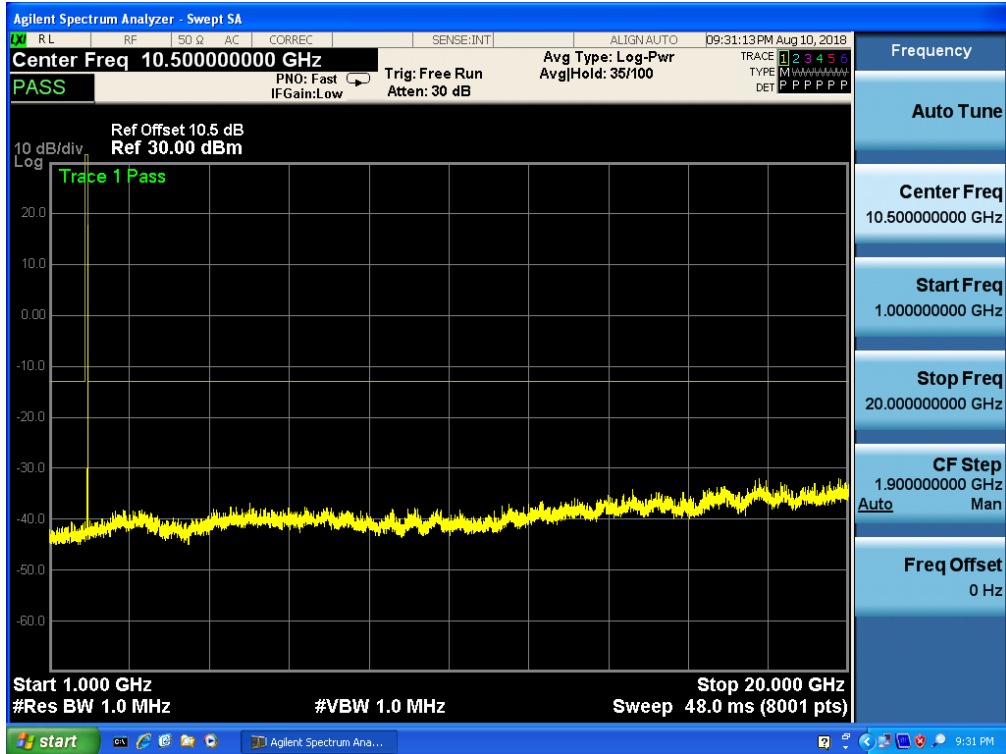
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Band 2, UL Channel 19185, UL Frequency 1908.5, BW 3.0, NO. RB 15, RB POS. Low, QPSK

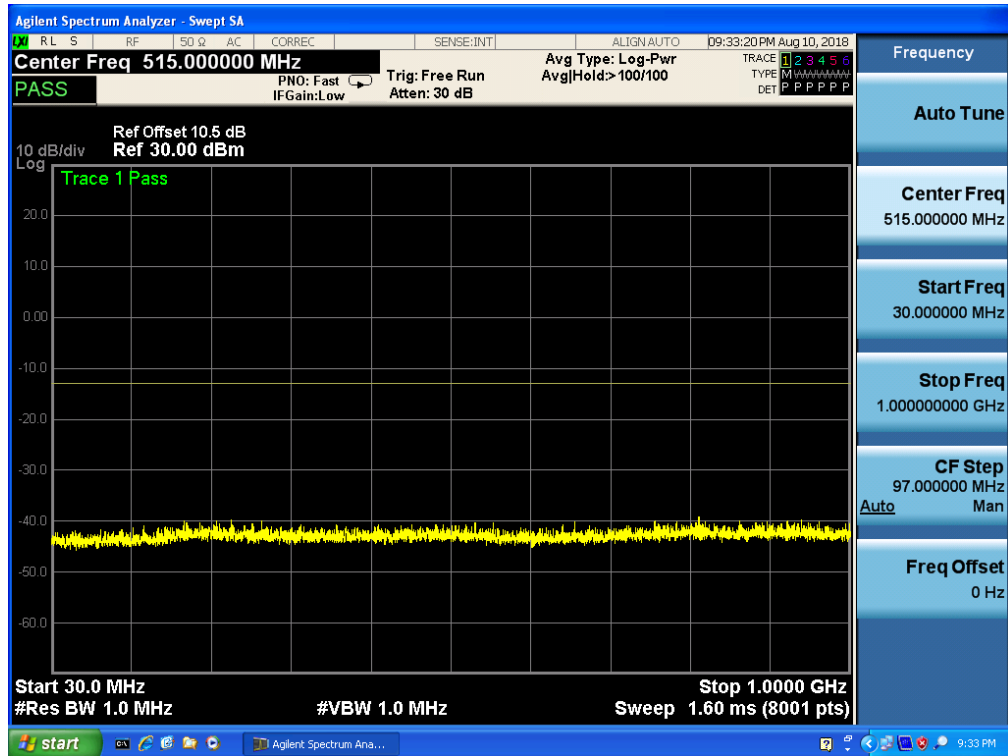


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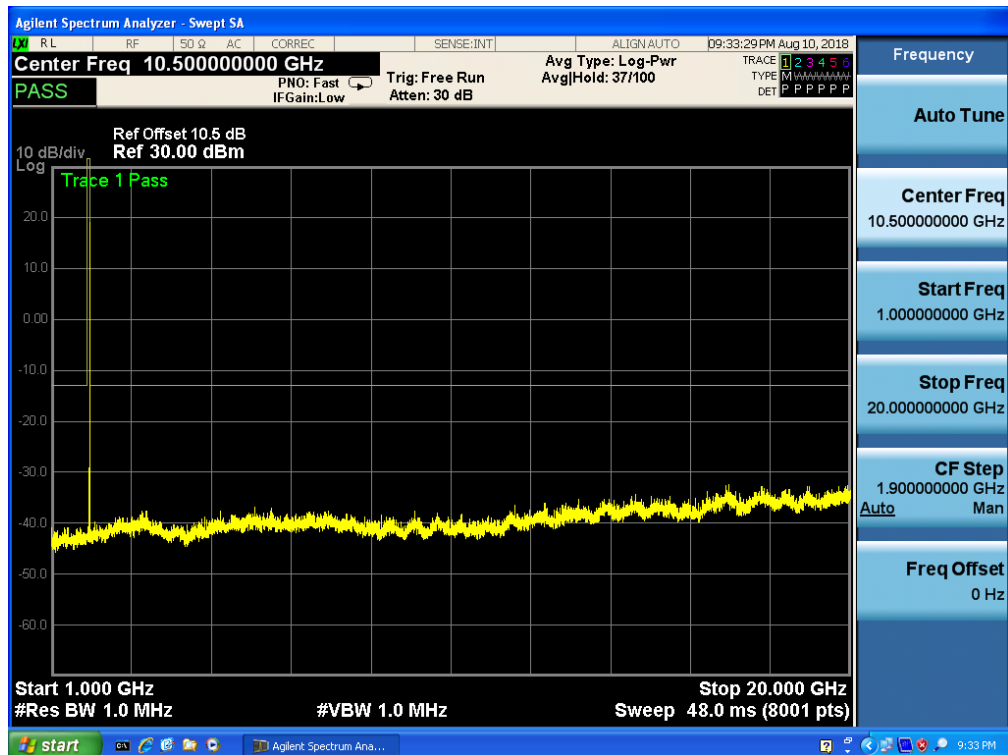




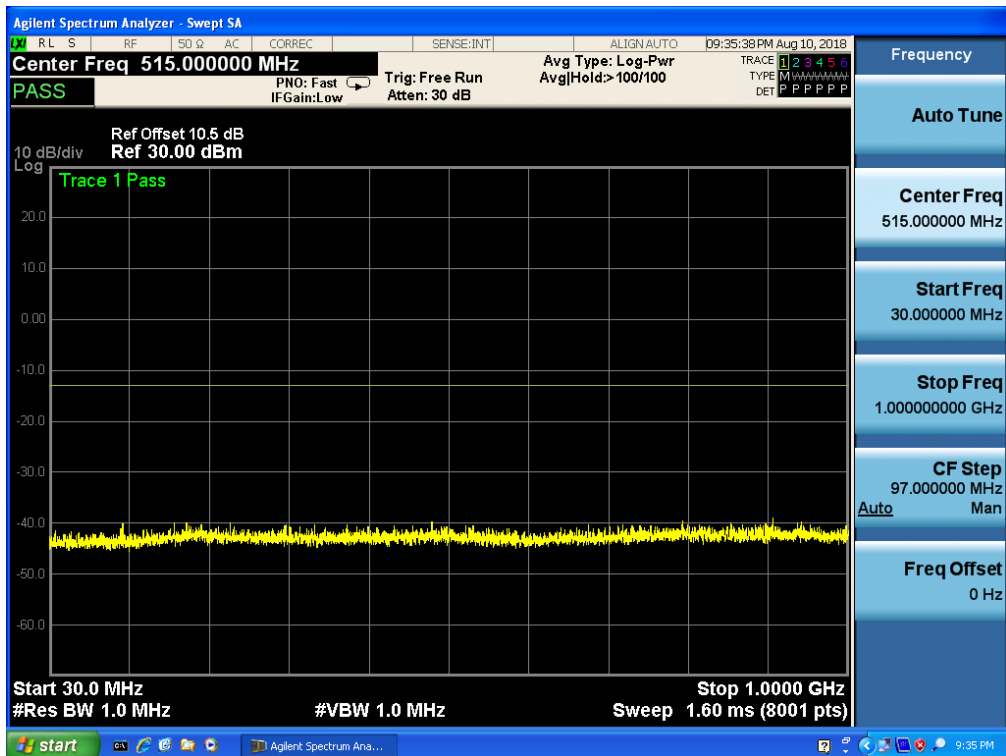
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Band 2, UL Channel 19185, UL Frequency 1908.5, BW 3.0, NO. RB 15, RB POS. Low, 16QAM



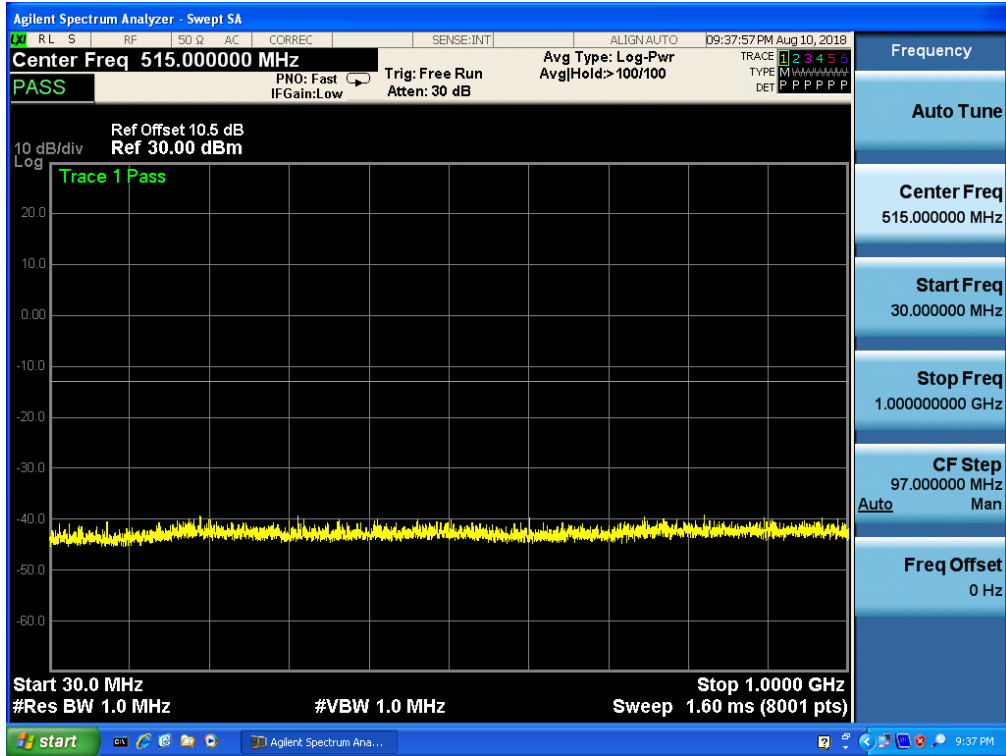
Band 2, UL Channel 18625, UL Frequency 1852.5, BW 5.0, NO. RB 25, RB POS. Low, QPSK



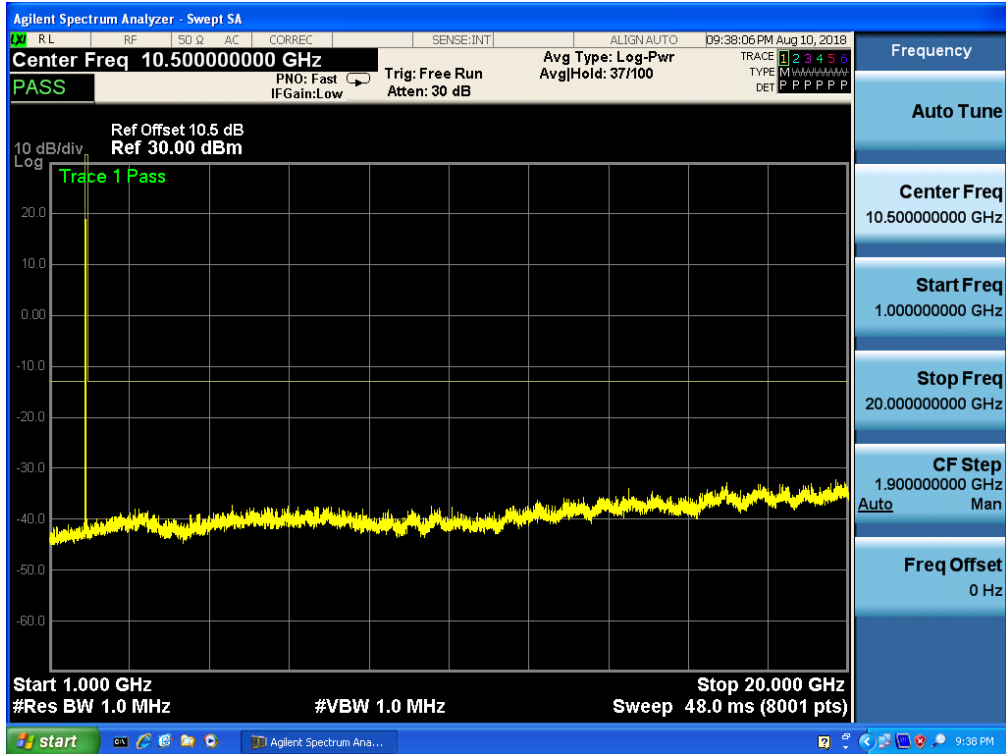
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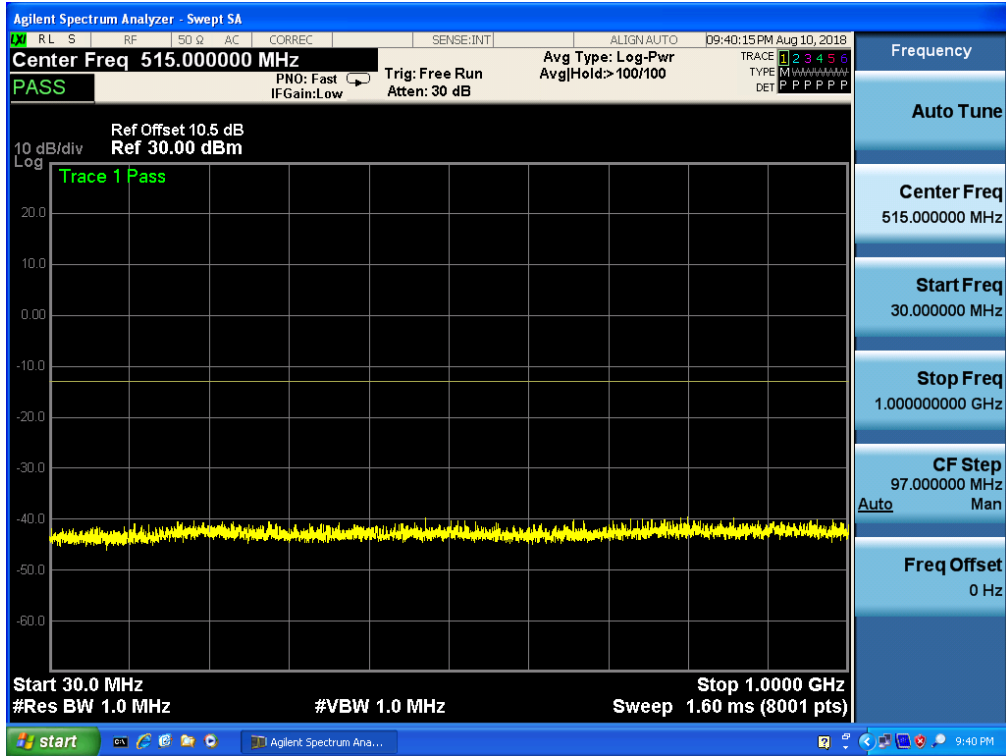
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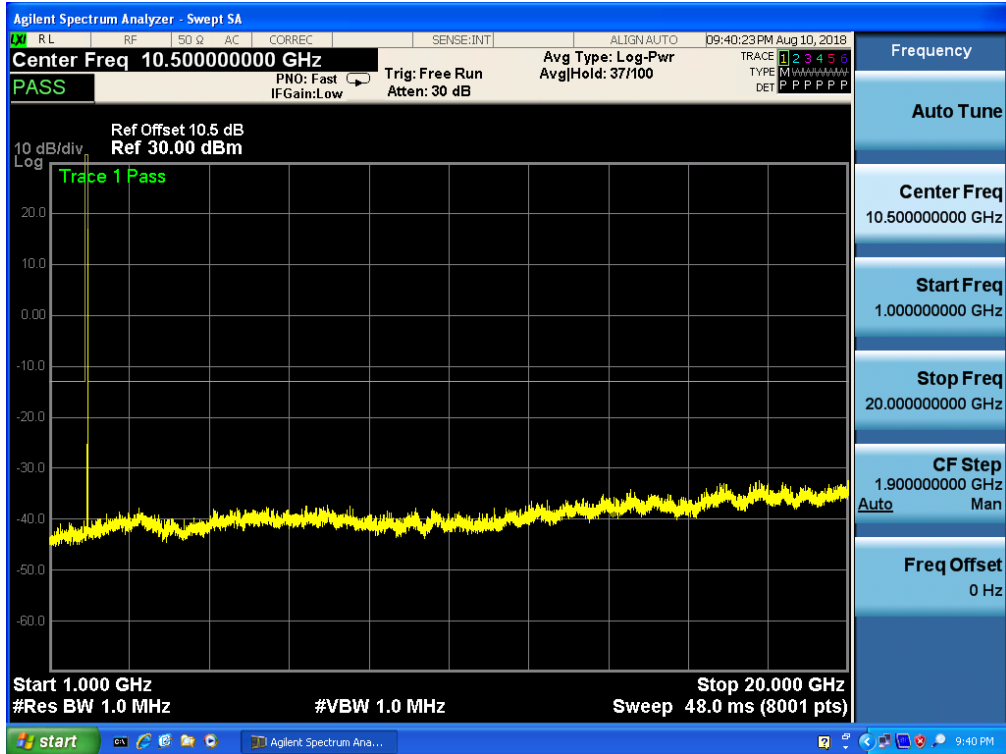
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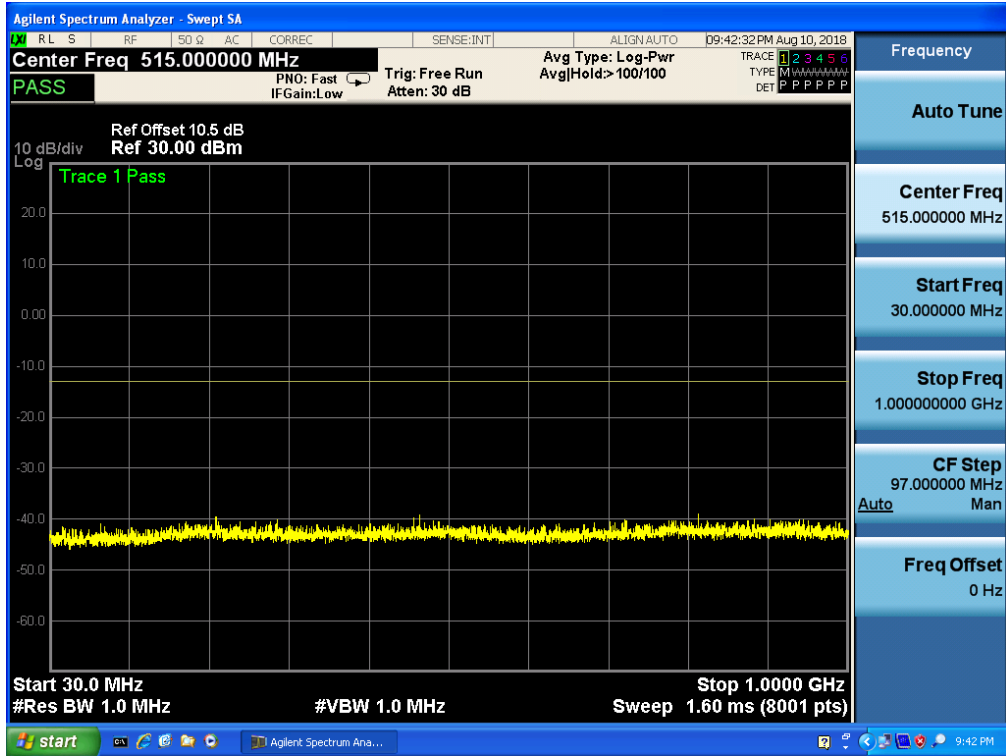
Band 2, UL Channel 19175, UL Frequency 1907.5, BW 5.0, NO. RB 25, RB POS. Low, QPSK



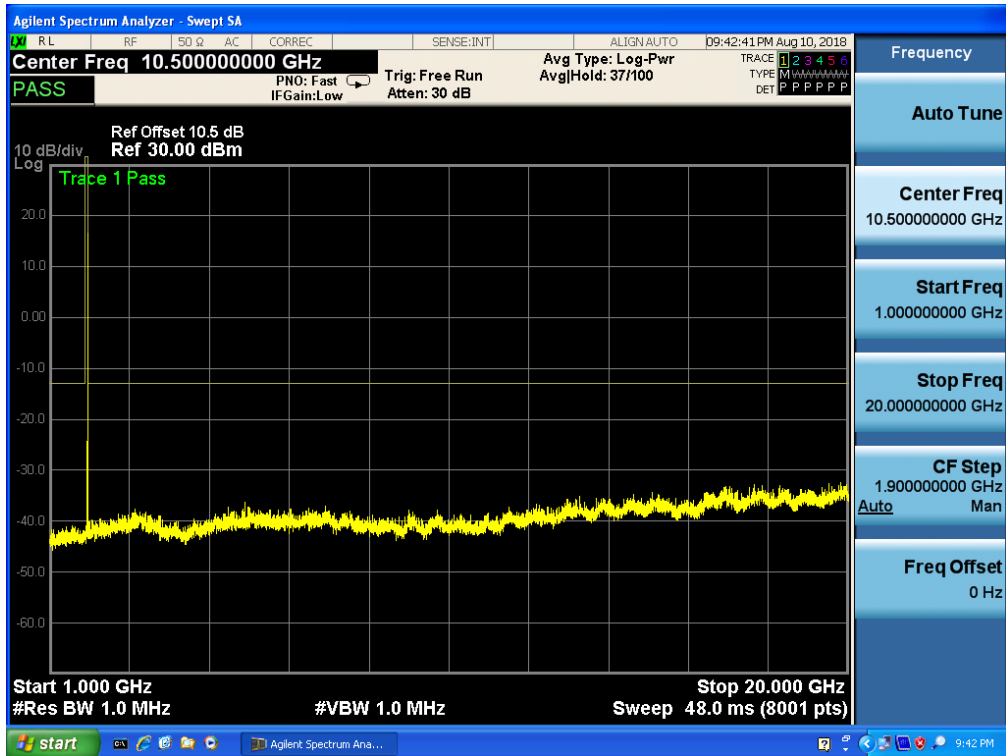
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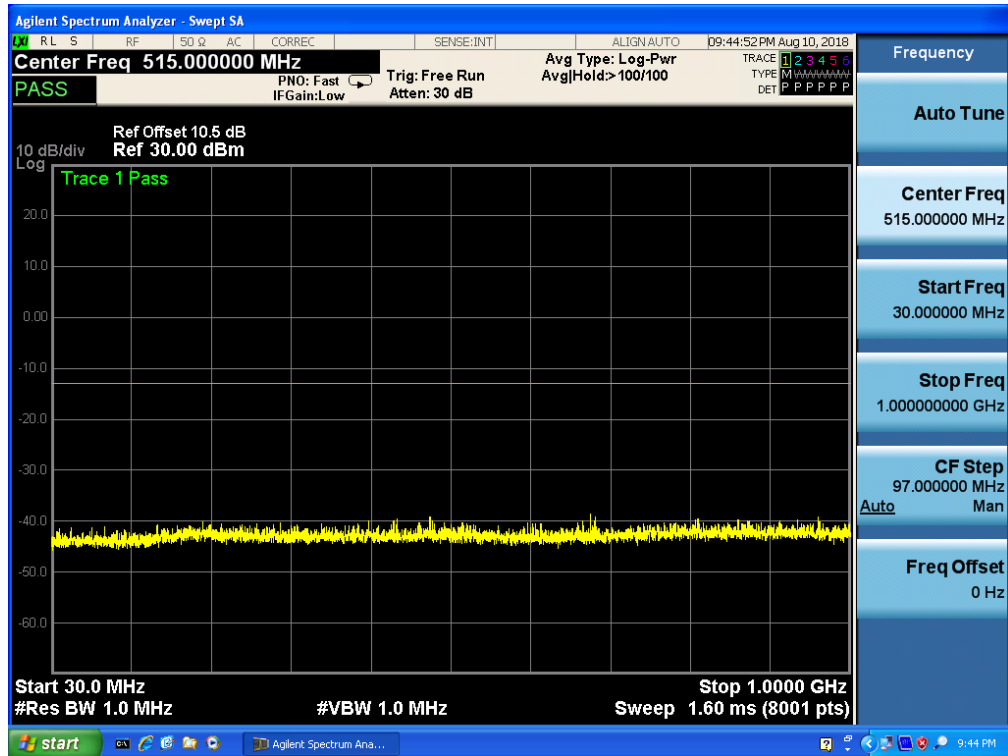
Band 2, UL Channel 19175, UL Frequency 1907.5, BW 5.0, NO. RB 25, RB POS. Low, 16QAM



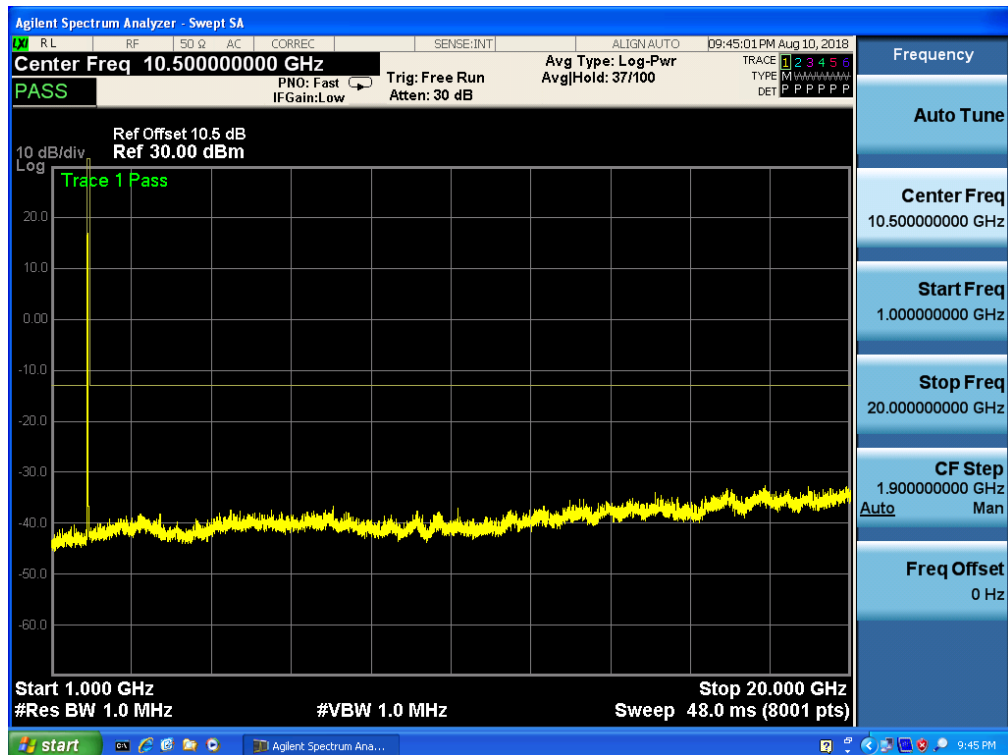
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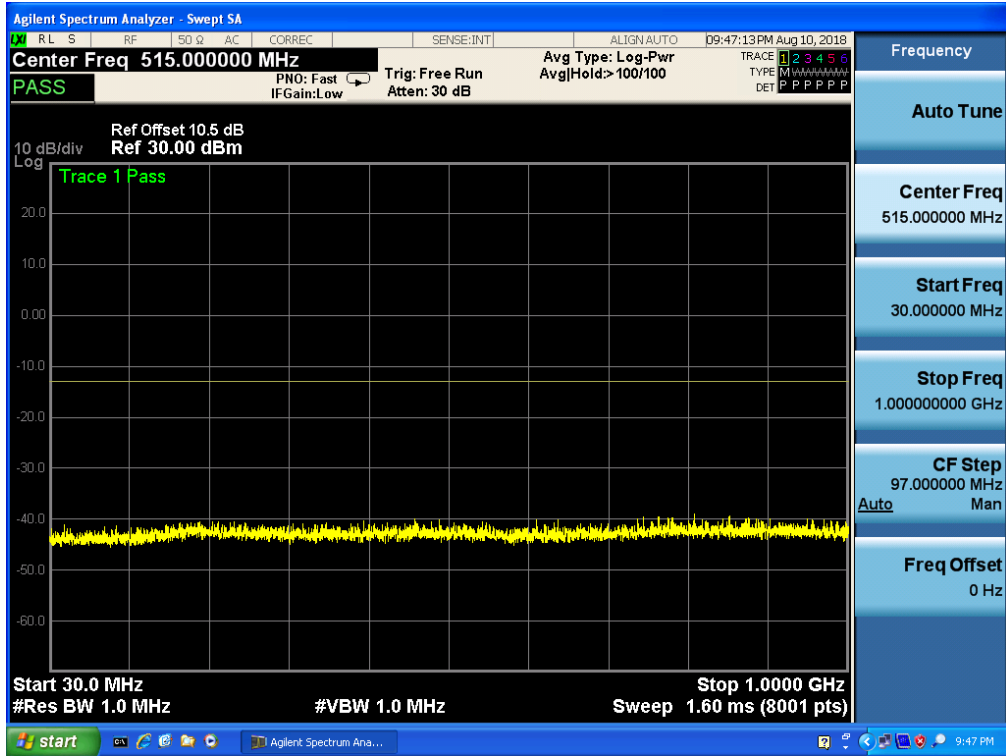
Band 2, UL Channel 18650, UL Frequency 1855.0, BW 10.0, NO. RB 50, RB POS. Low, QPSK



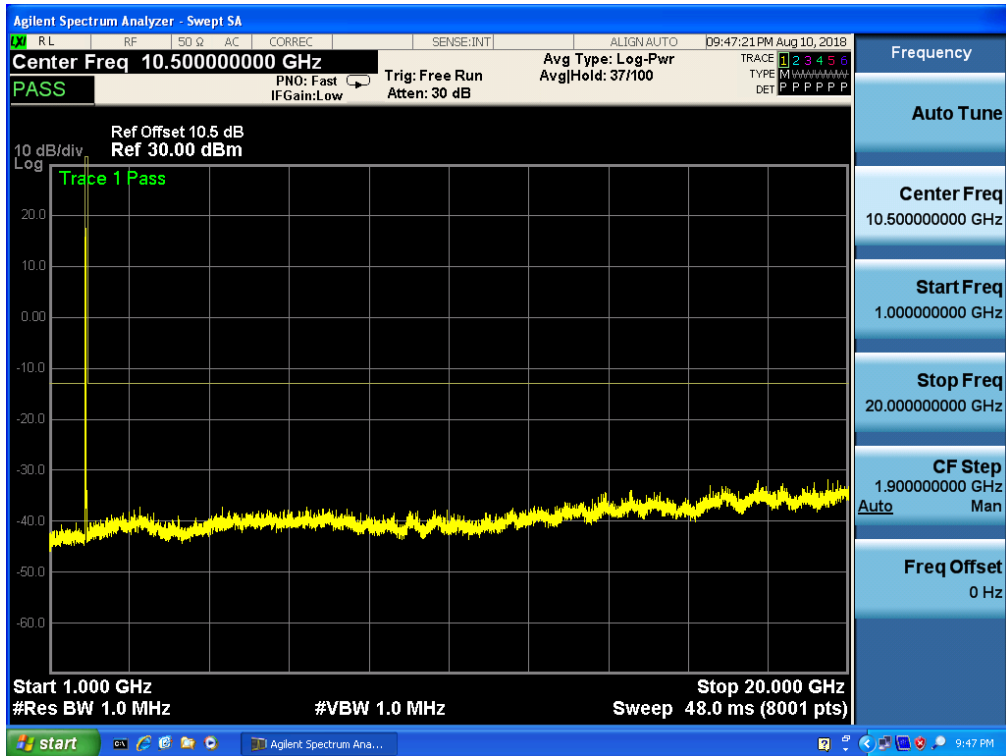
Band 2, UL Channel 18650, UL Frequency 1855.0, BW 10.0, NO. RB 50, RB POS. Low, QPSK



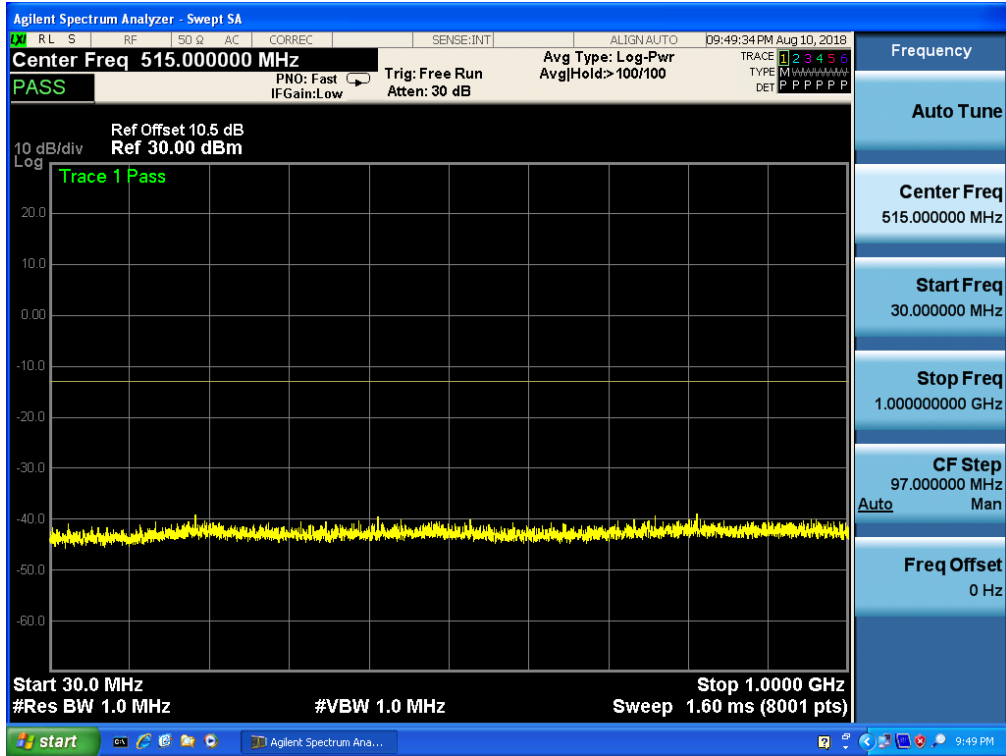
Band 2, UL Channel 18650, UL Frequency 1855.0, BW 10.0, NO. RB 50, RB POS. Low, 16QAM



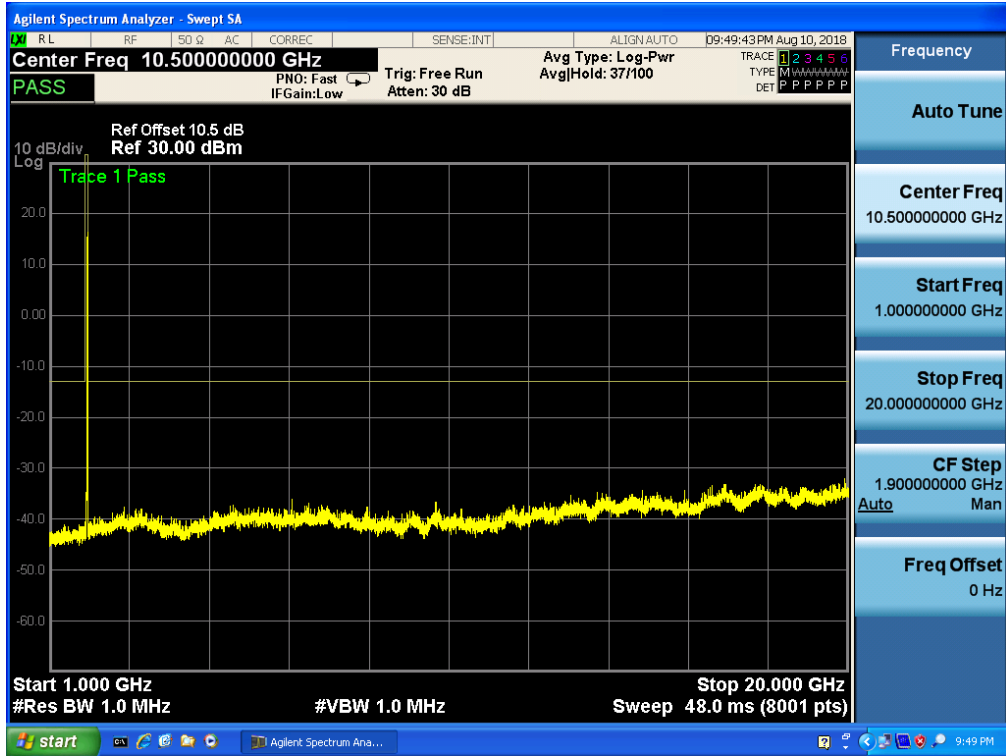
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Band 2, UL Channel 19150, UL Frequency 1905.0, BW 10.0, NO. RB 50, RB POS. Low, QPSK

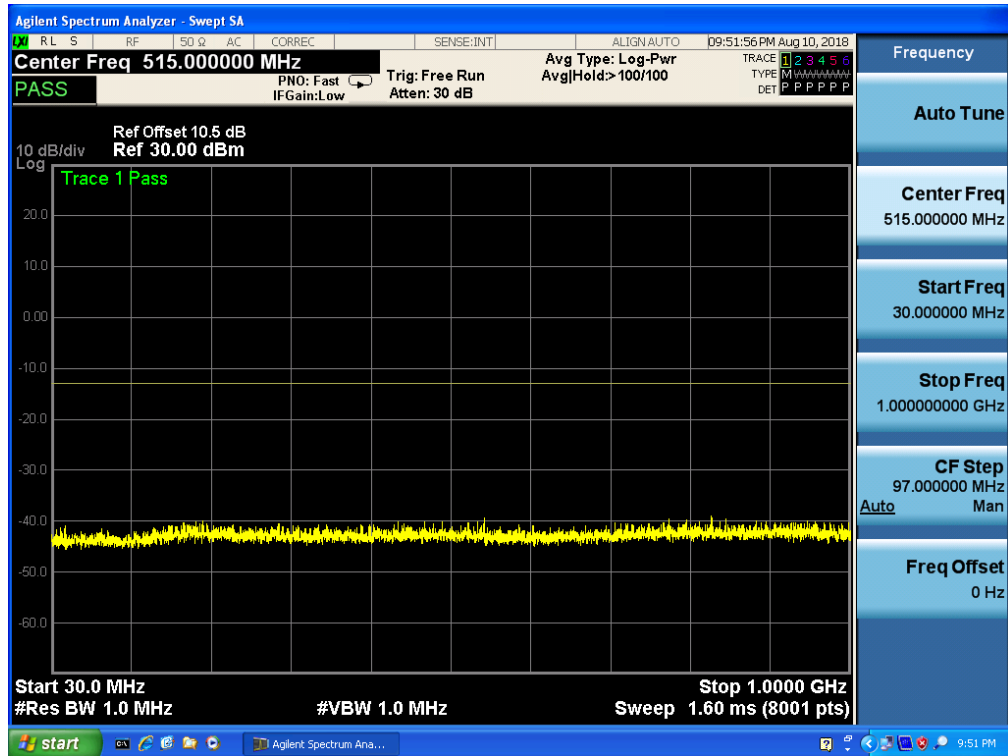


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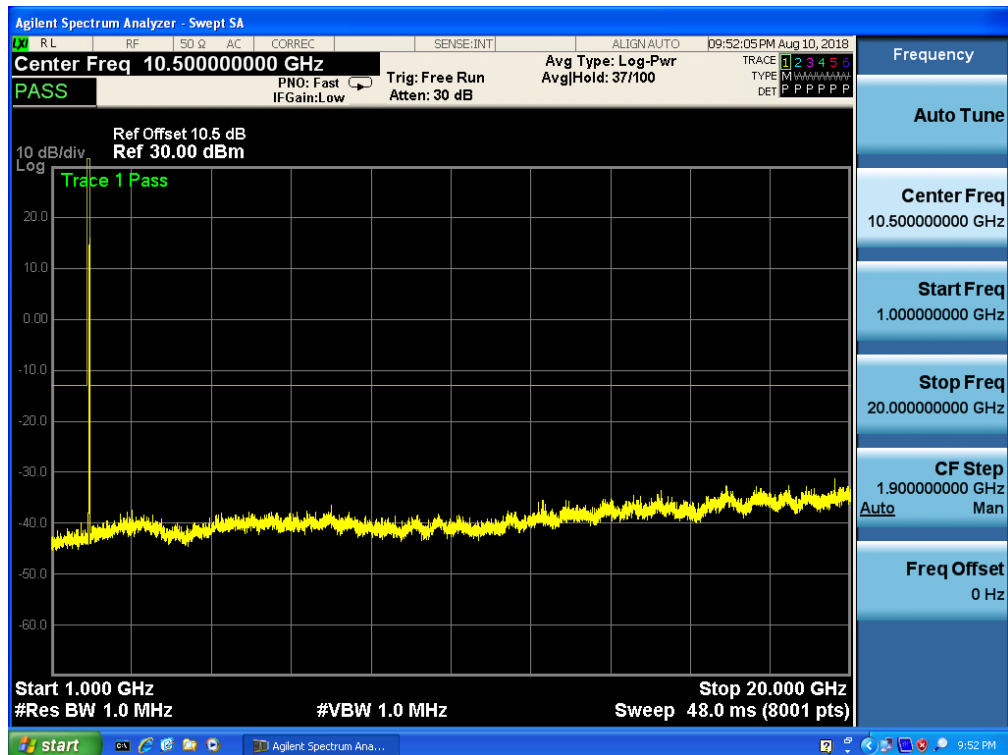




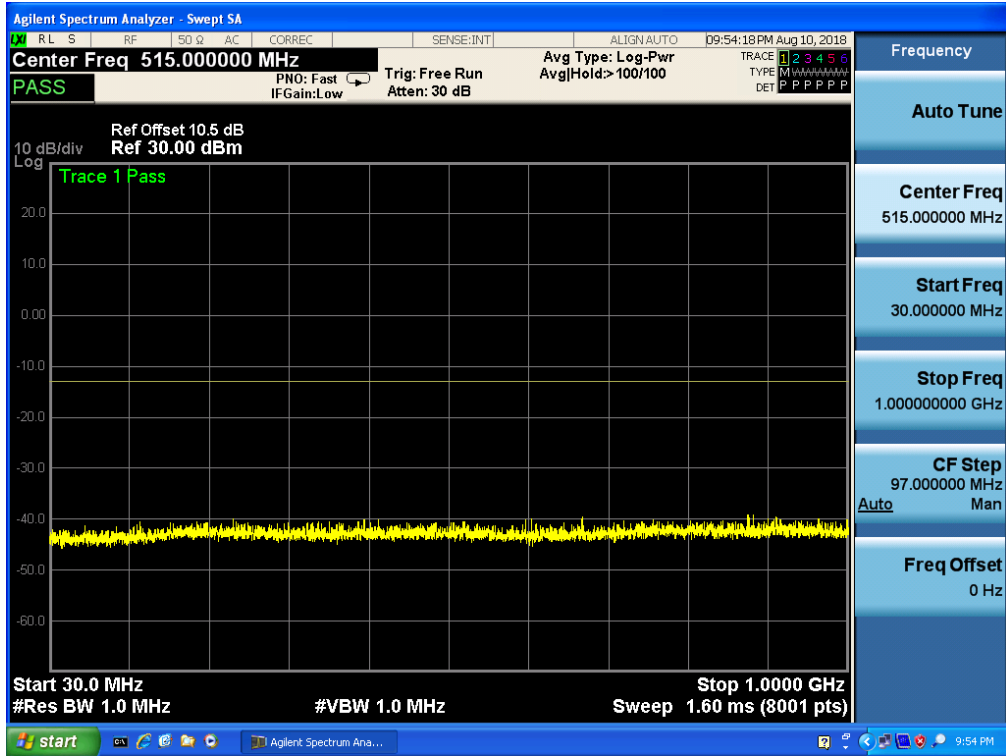
Band 2, UL Channel 19150, UL Frequency 1905.0, BW 10.0, NO. RB 50, RB POS. Low, 16QAM



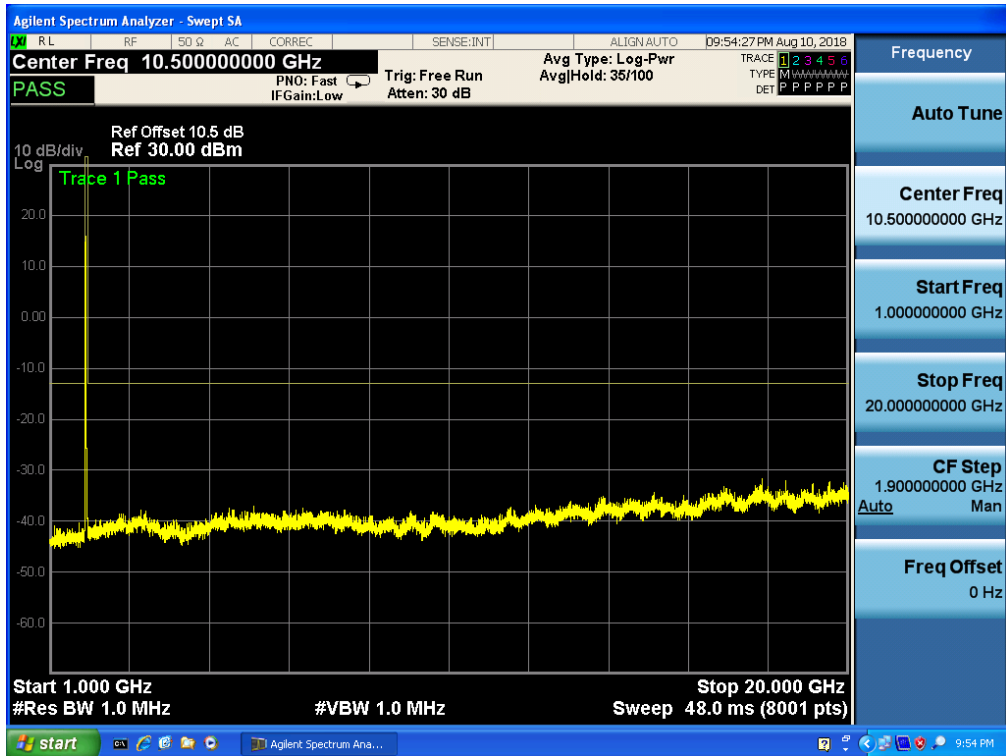
Band 2, UL Channel 19150, UL Frequency 1905.0, BW 10.0, NO. RB 50, RB POS. Low, 16QAM



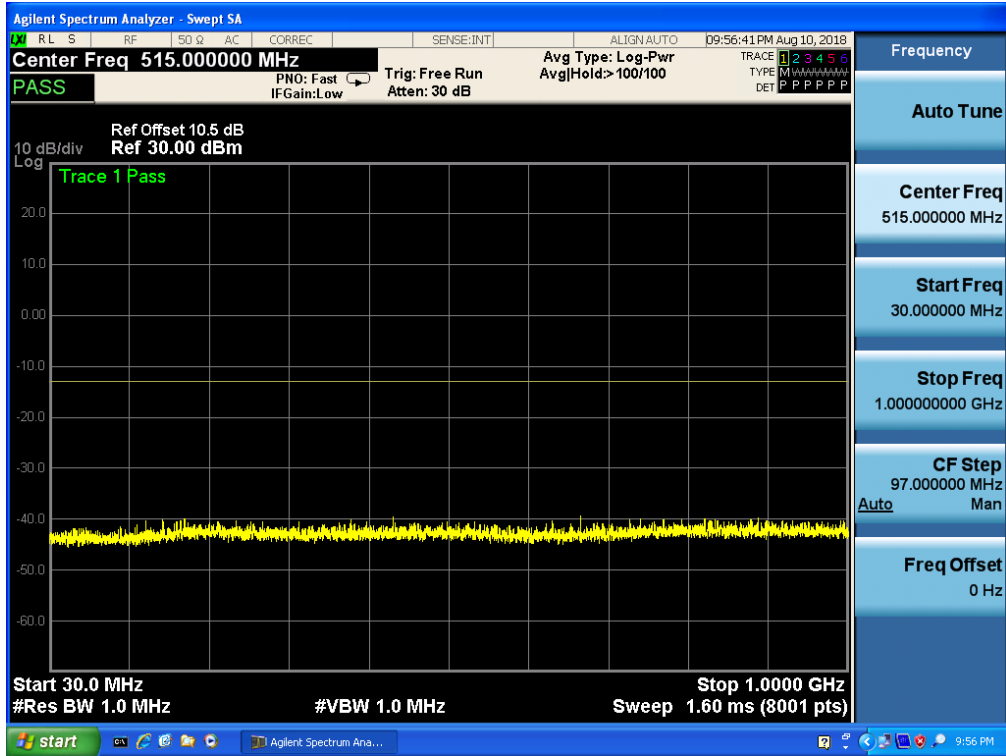
Band 2, UL Channel 18675, UL Frequency 1857.5, BW 15.0, NO. RB 75, RB POS. Low, QPSK



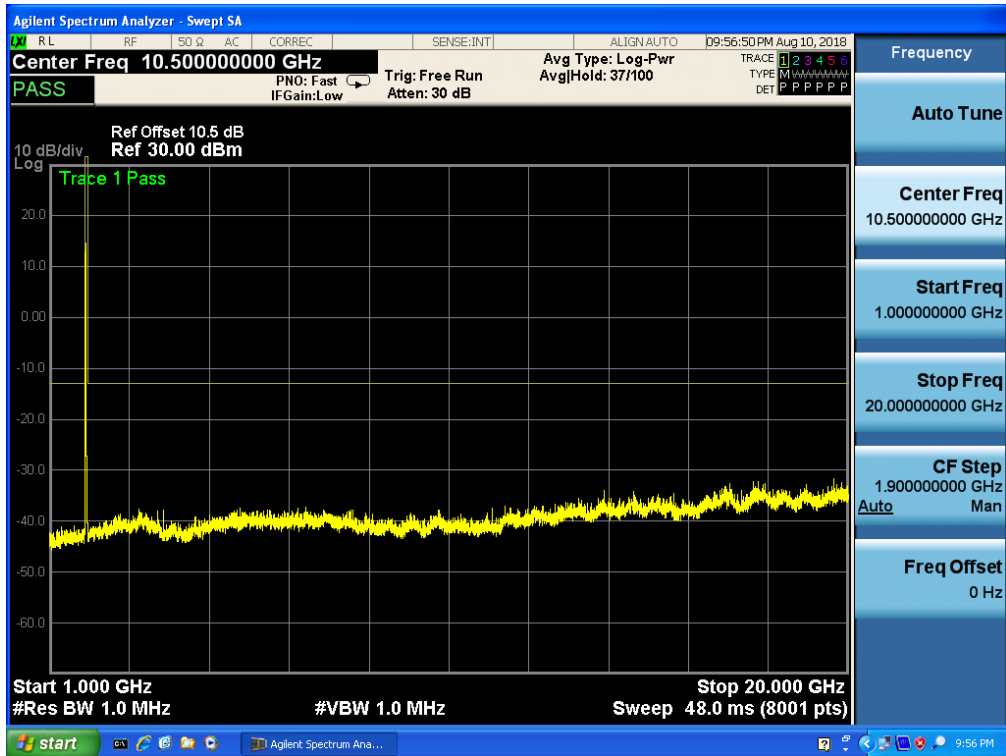
Band 2, UL Channel 18675, UL Frequency 1857.5, BW 15.0, NO. RB 75, RB POS. Low, QPSK



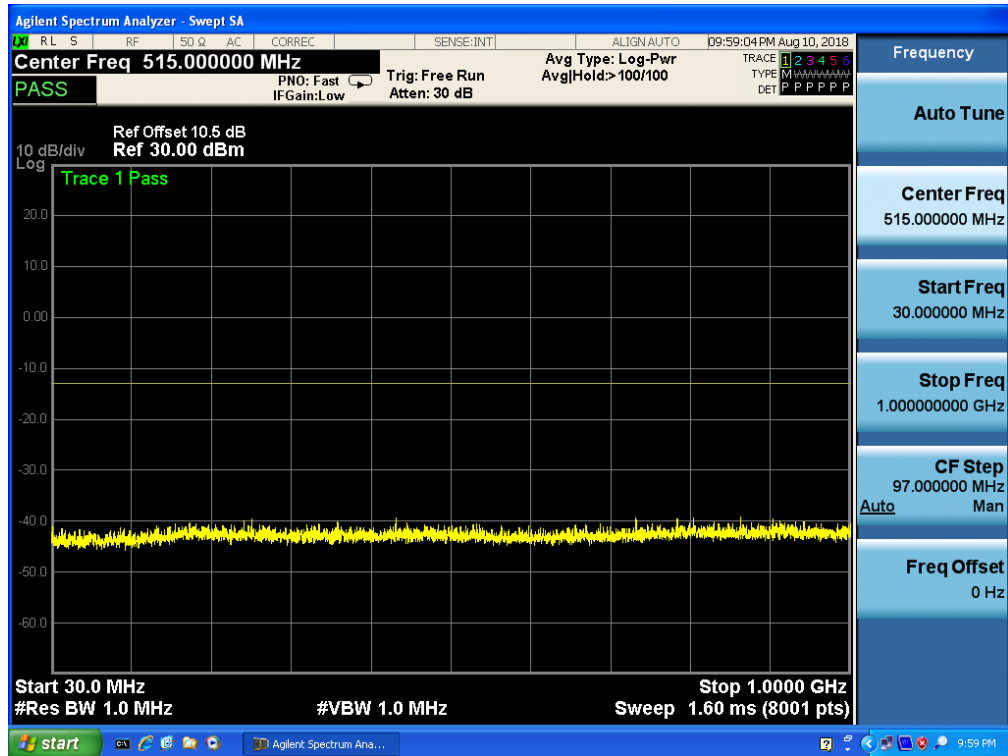
Band 2, UL Channel 18675, UL Frequency 1857.5, BW 15.0, NO. RB 75, RB POS. Low, 16QAM



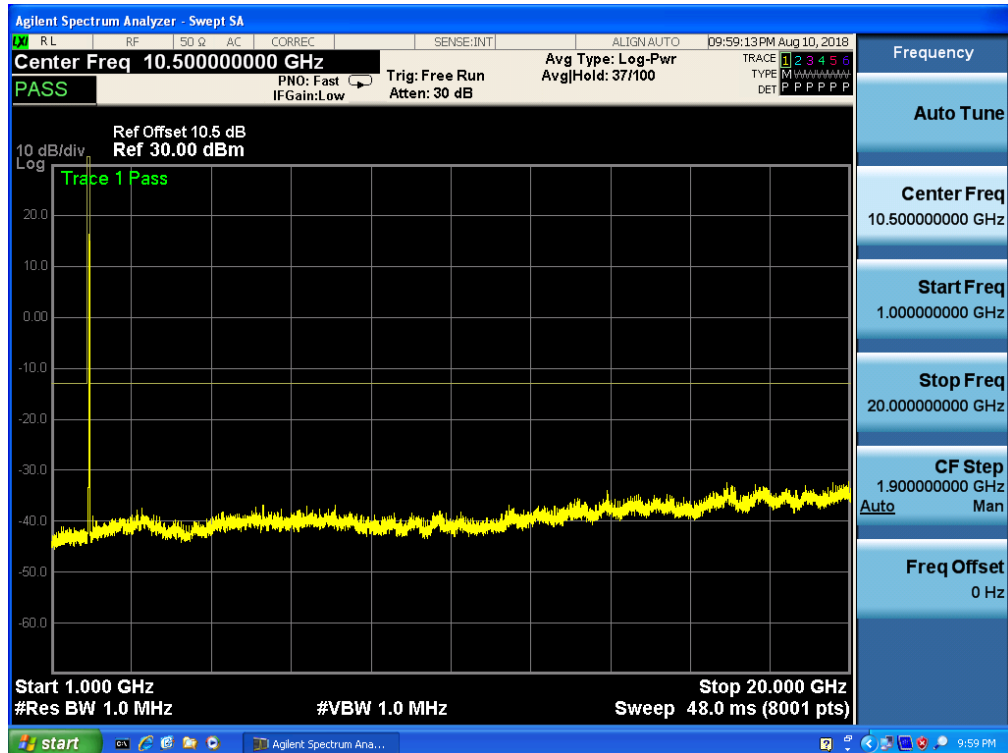
Band 2, UL Channel 18675, UL Frequency 1857.5, BW 15.0, NO. RB 75, RB POS. Low, 16QAM



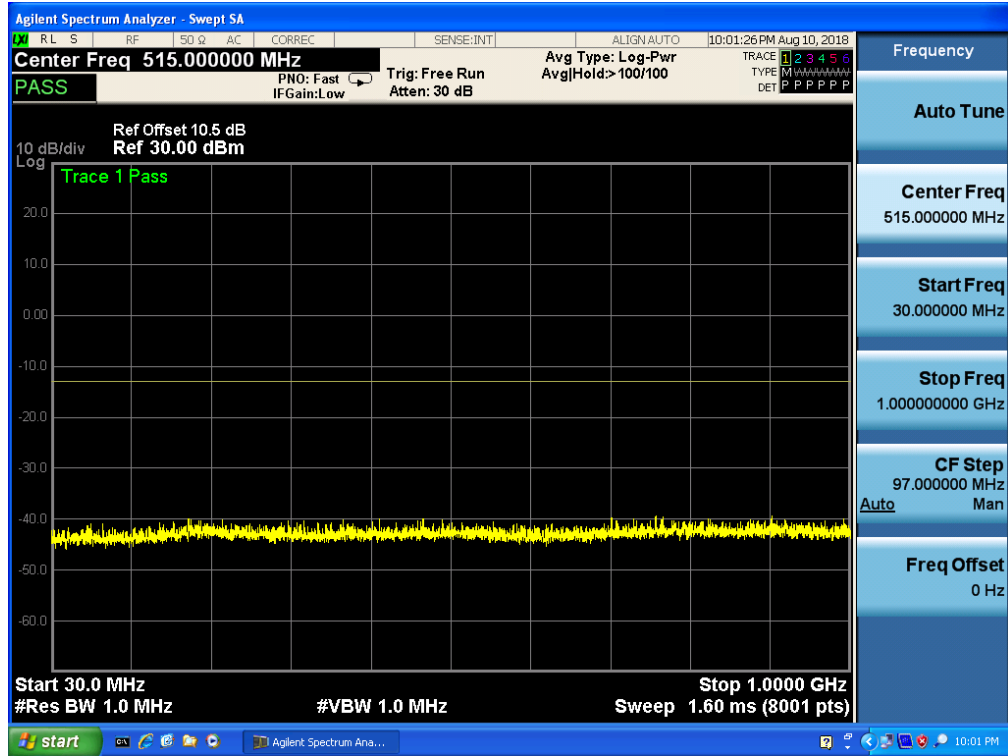
Band 2, UL Channel 19125, UL Frequency 1902.5, BW 15.0, NO. RB 75, RB POS. Low, QPSK



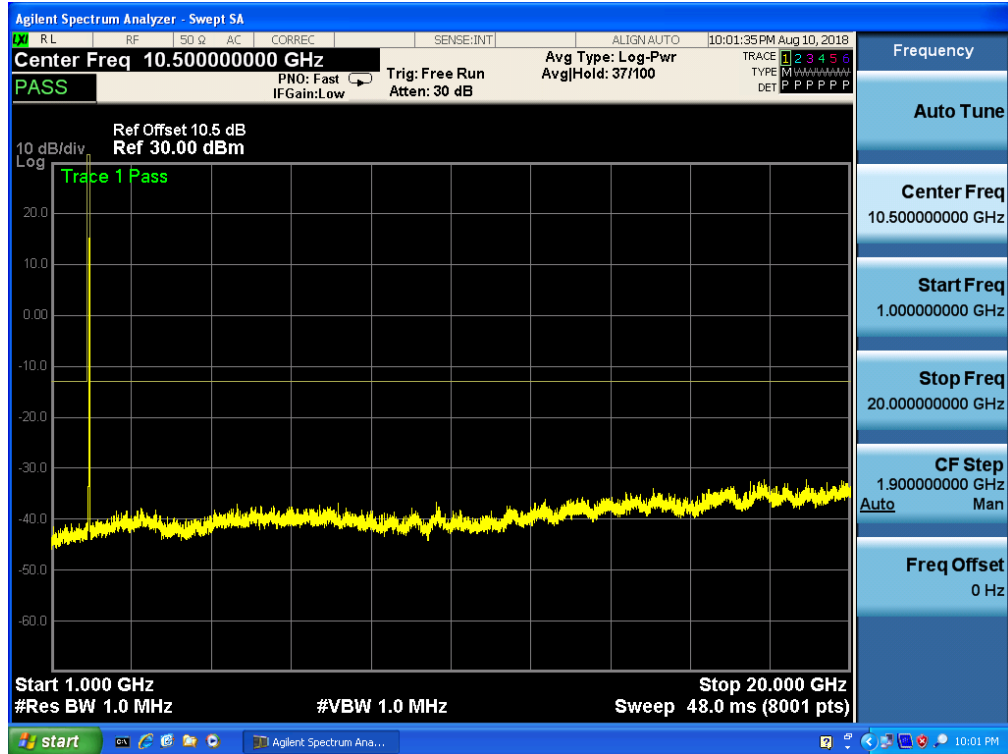
Band 2, UL Channel 19125, UL Frequency 1902.5, BW 15.0, NO. RB 75, RB POS. Low, QPSK



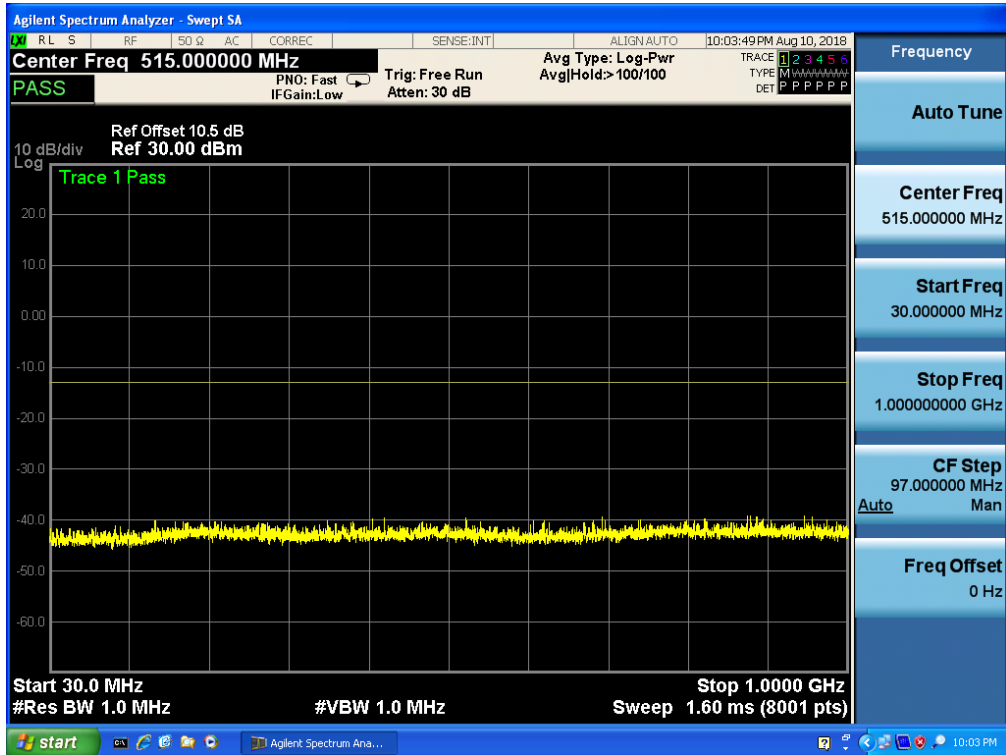
Band 2, UL Channel 19125, UL Frequency 1902.5, BW 15.0, NO. RB 75, RB POS. Low, 16QAM



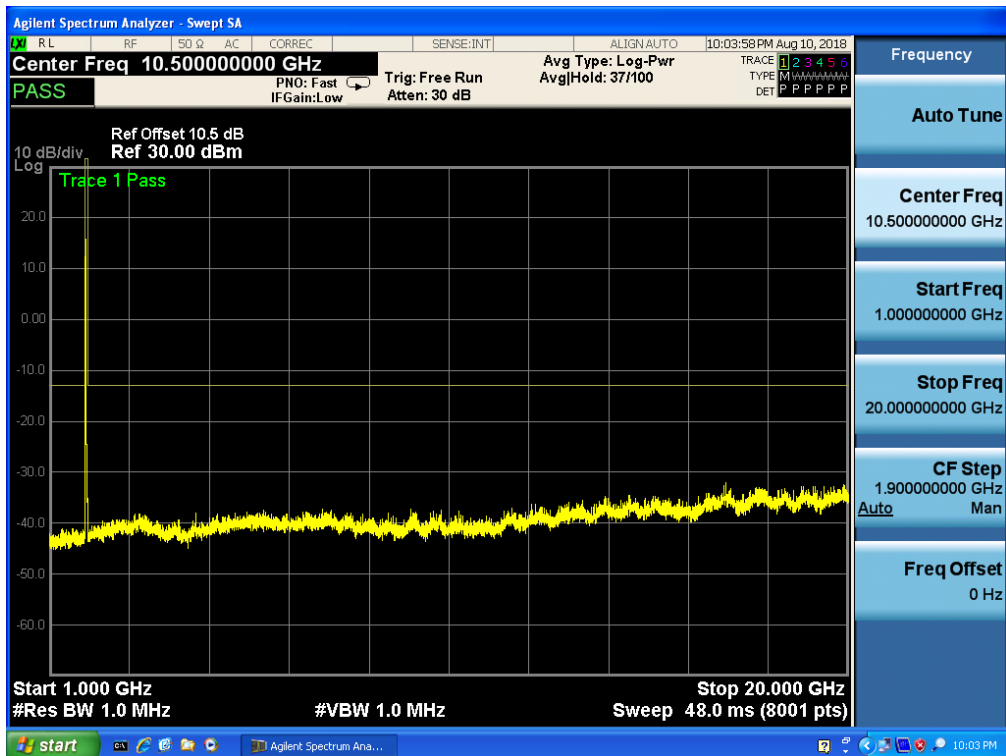
Band 2, UL Channel 19125, UL Frequency 1902.5, BW 15.0, NO. RB 75, RB POS. Low, 16QAM



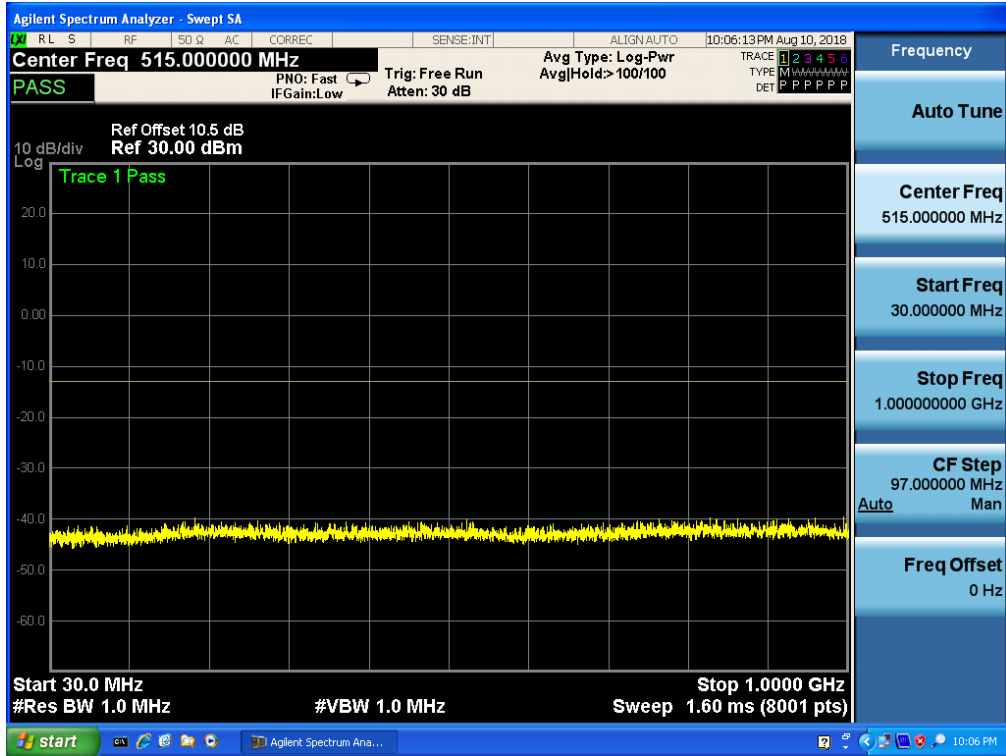
Band 2, UL Channel 18700, UL Frequency 1860.0, BW 20.0, NO. RB 100, RB POS. Low, QPSK



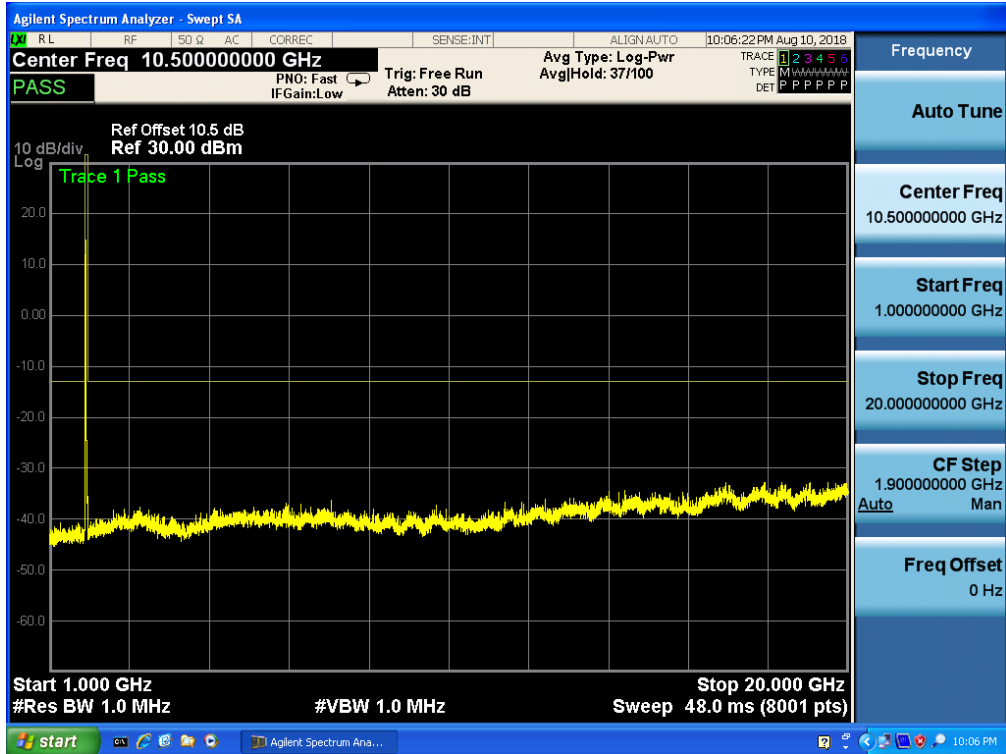
Band 2, UL Channel 18700, UL Frequency 1860.0, BW 20.0, NO. RB 100, RB POS. Low, QPSK



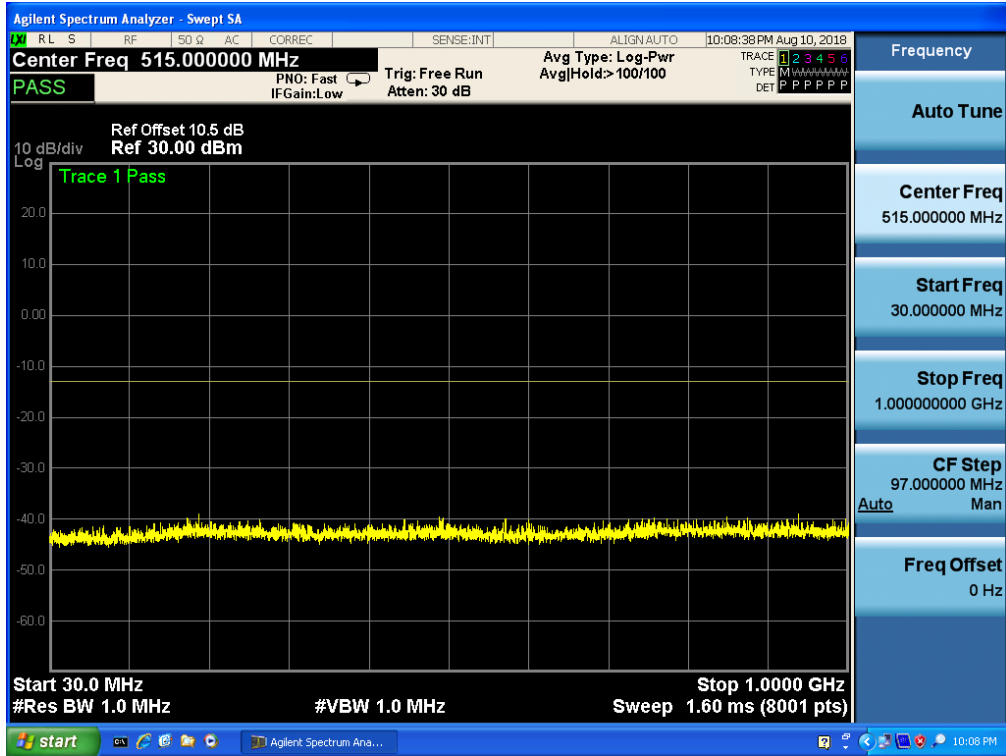
Band 2, UL Channel 18700, UL Frequency 1860.0, BW 20.0, NO. RB 100, RB POS. Low, 16QAM



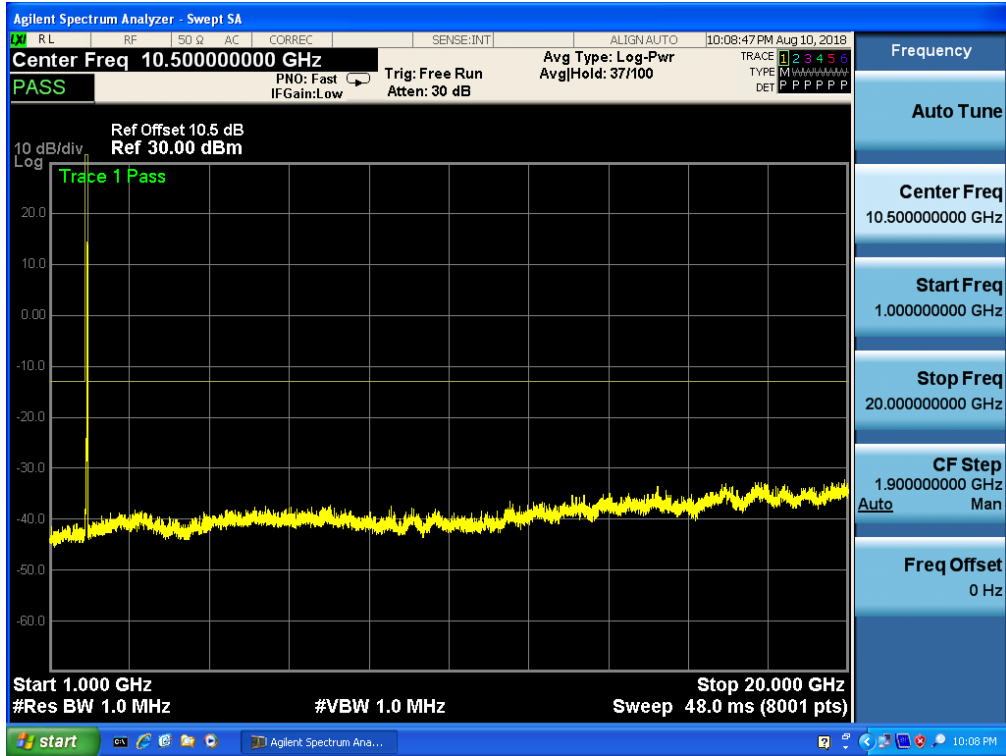
Band 2, UL Channel 18700, UL Frequency 1860.0, BW 20.0, NO. RB 100, RB POS. Low, 16QAM



Band 2, UL Channel 19100, UL Frequency 1900.0, BW 20.0, NO. RB 100, RB POS. Low, QPSK

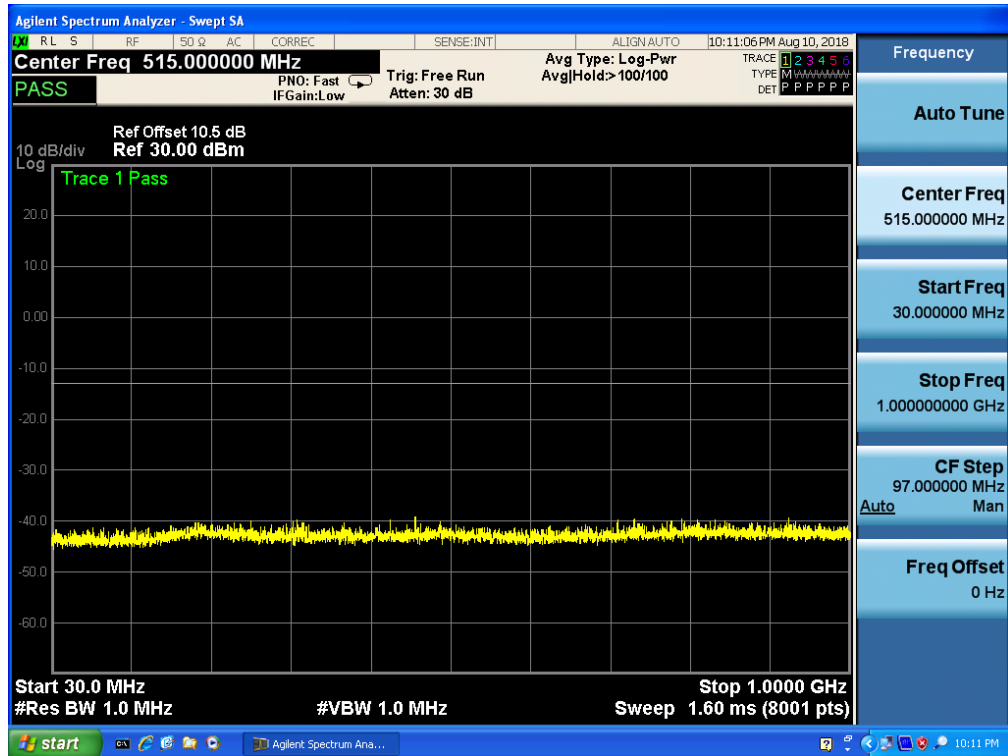


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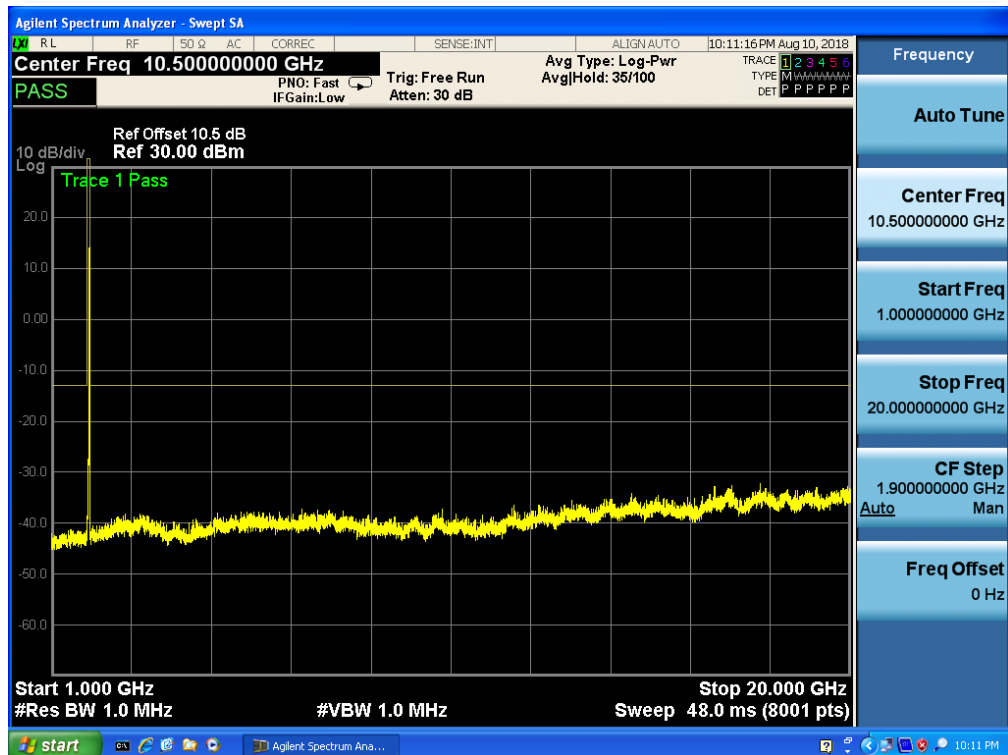




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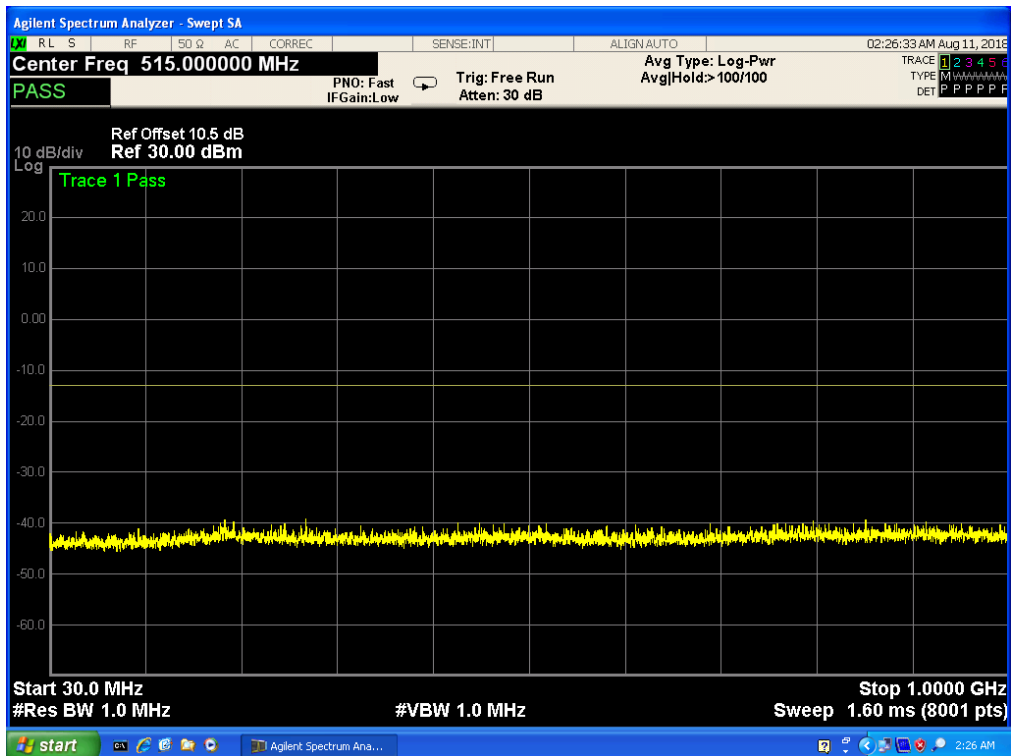


Band 2, UL Channel 19100, UL Frequency 1900.0, BW 20.0, NO. RB 100, RB POS. Low, 16QAM

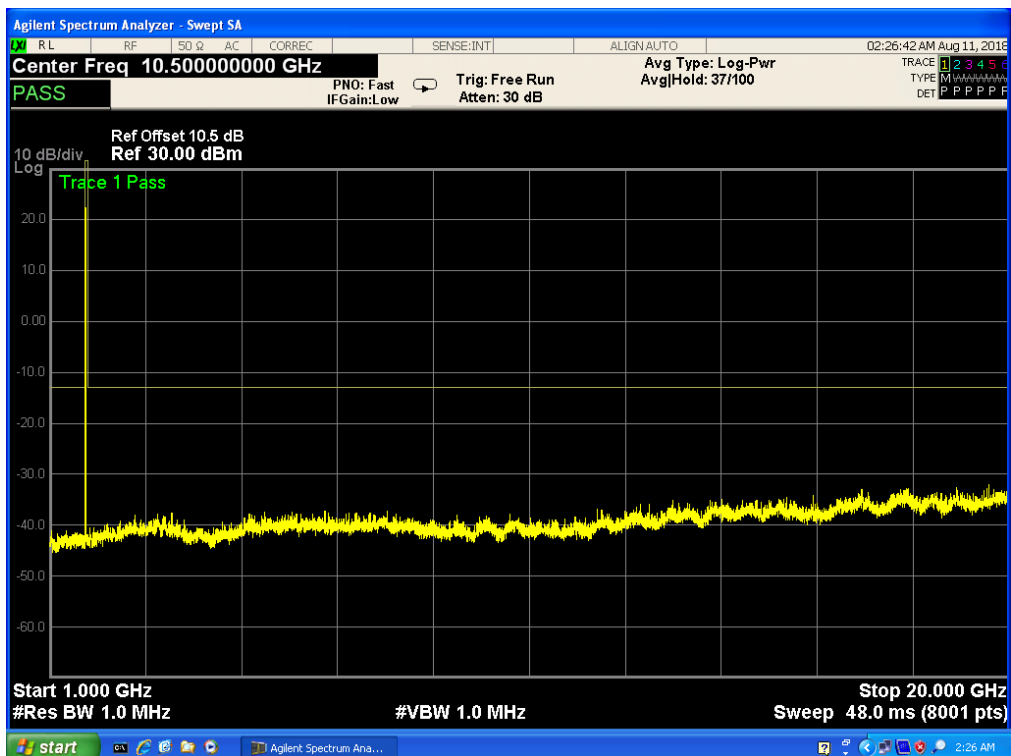


### 7.2 LTE BAND 4

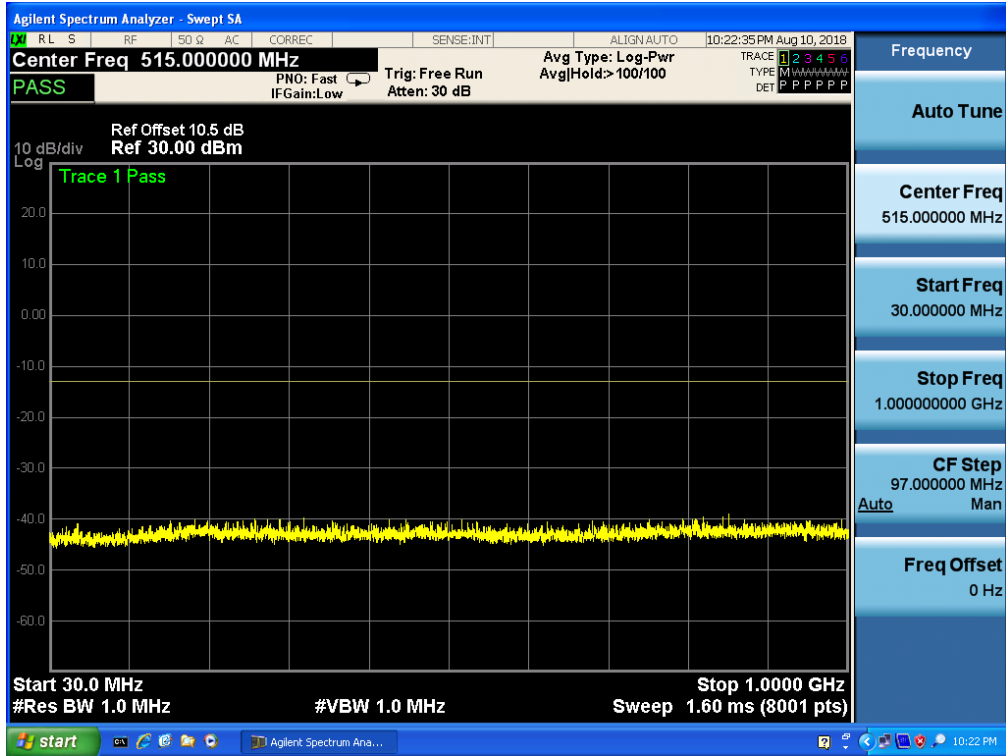
*Band 4, UL Channel 19957, UL Frequency 1710.7, BW 1.4, NO. RB 6, RB POS. Low, QPSK*



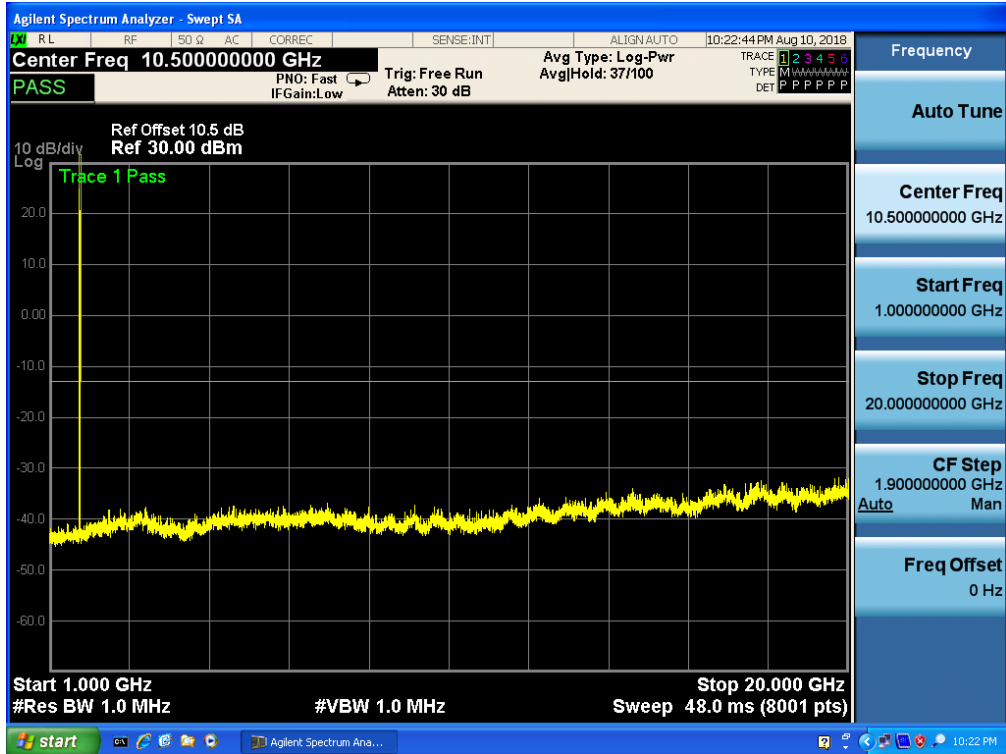
*Band 4, UL Channel 19957, UL Frequency 1710.7, BW 1.4, NO. RB 6, RB POS. Low, QPSK*



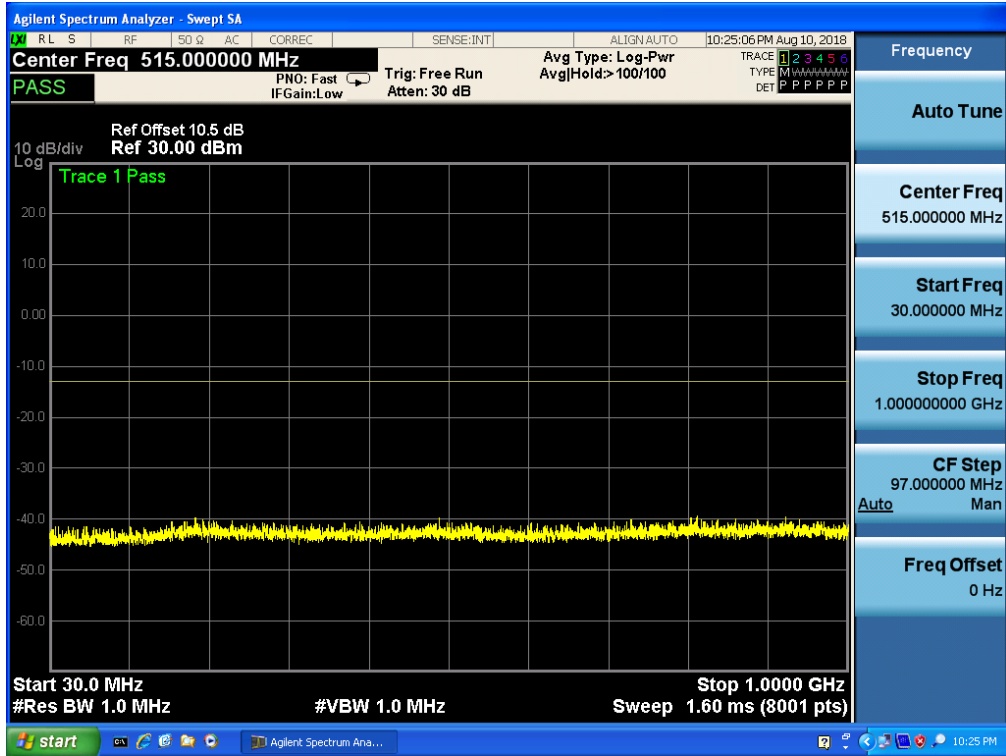
Band 4, UL Channel 19957, UL Frequency 1710.7, BW 1.4, NO. RB 6, RB POS. Low, 16-QAM



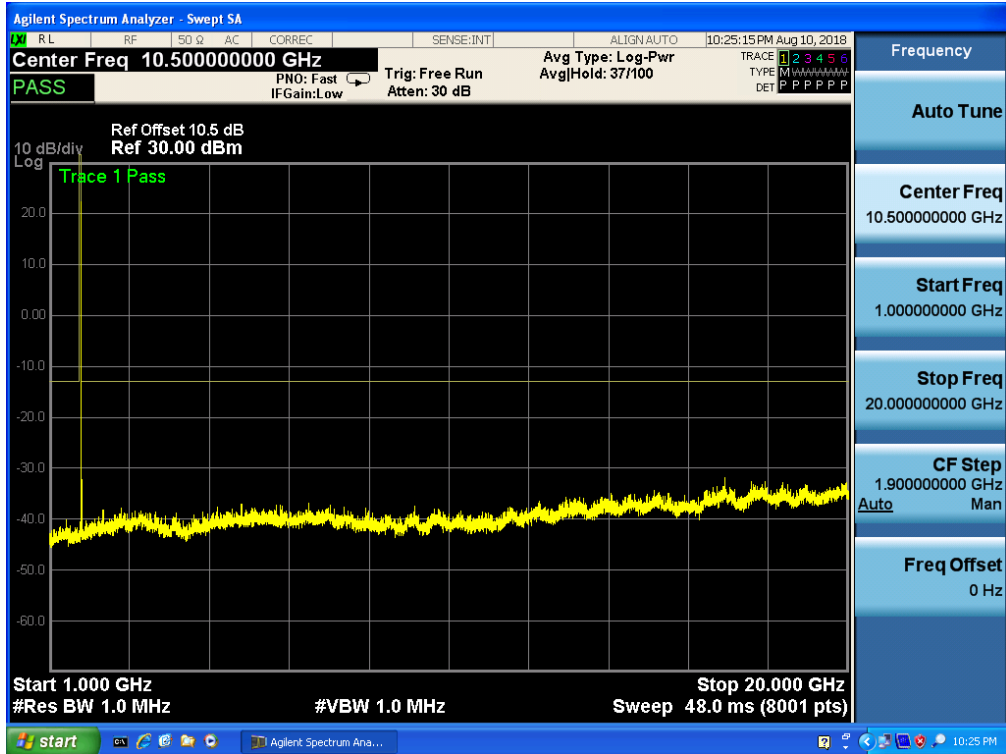
Band 4, UL Channel 19957, UL Frequency 1710.7, BW 1.4, NO. RB 6, RB POS. Low, 16-QAM



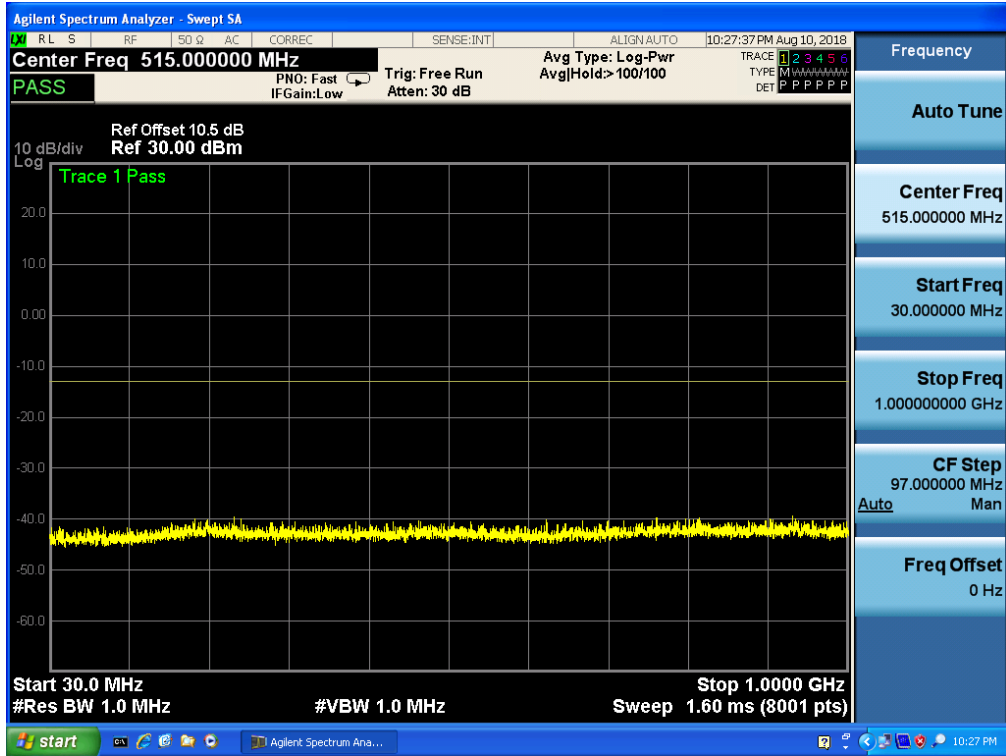
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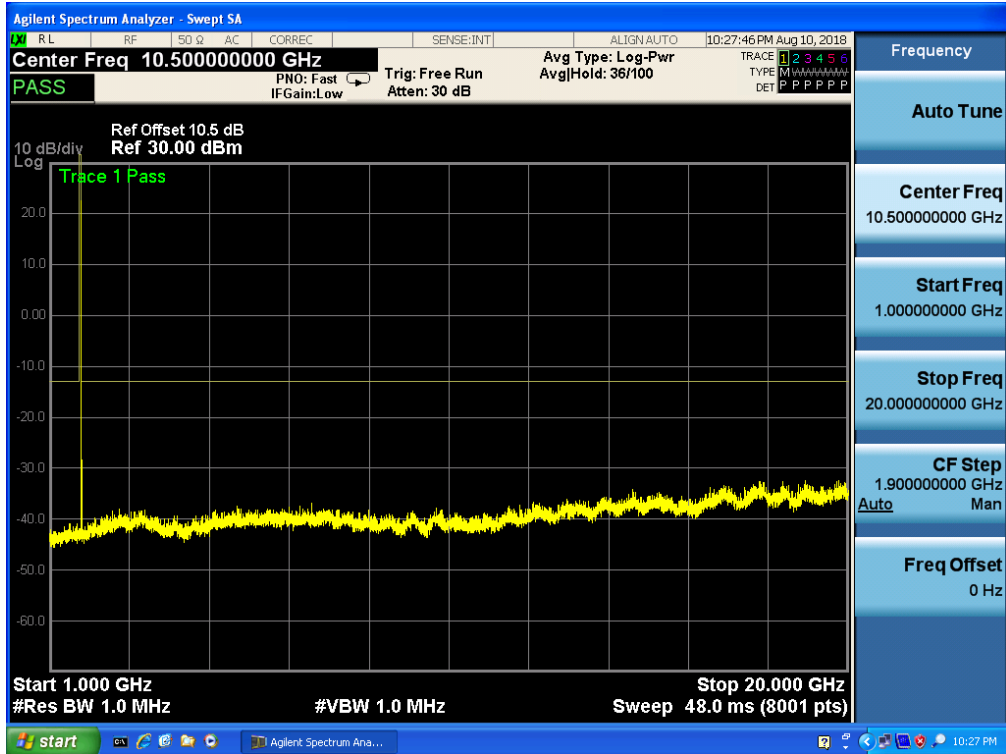
Band 4, UL Channel 20393, UL Frequency 1754.3, BW 1.4, NO. RB 6, RB POS. Low, QPSK



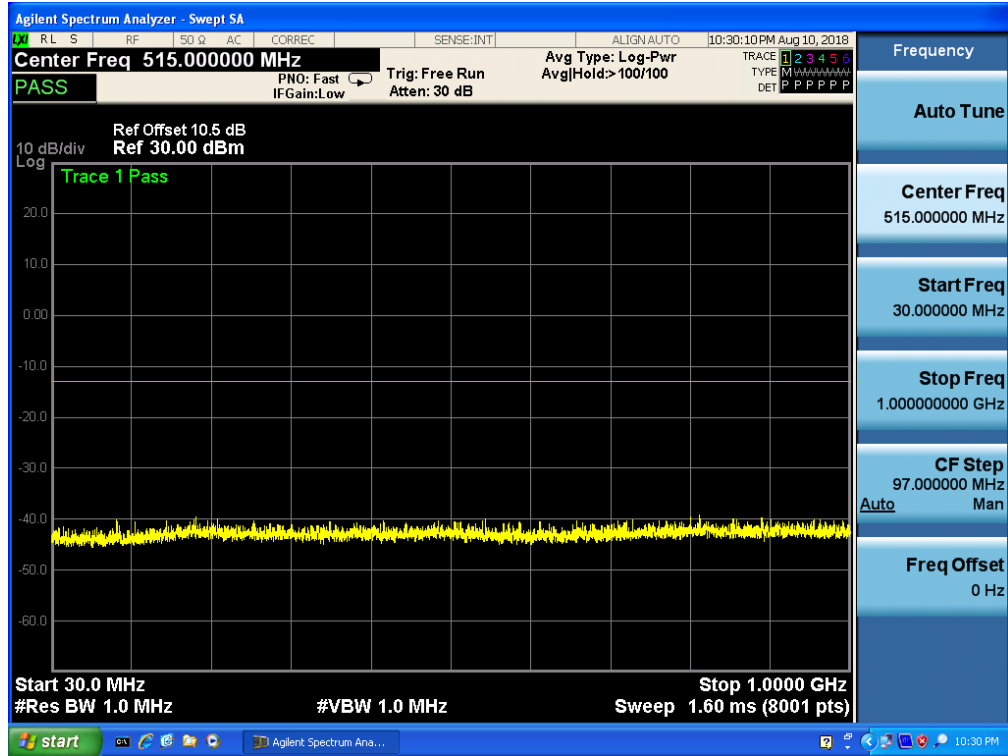
Band 4, UL Channel 20393, UL Frequency 1754.3, BW 1.4, NO. RB 6, RB POS. Low, 16-QAM



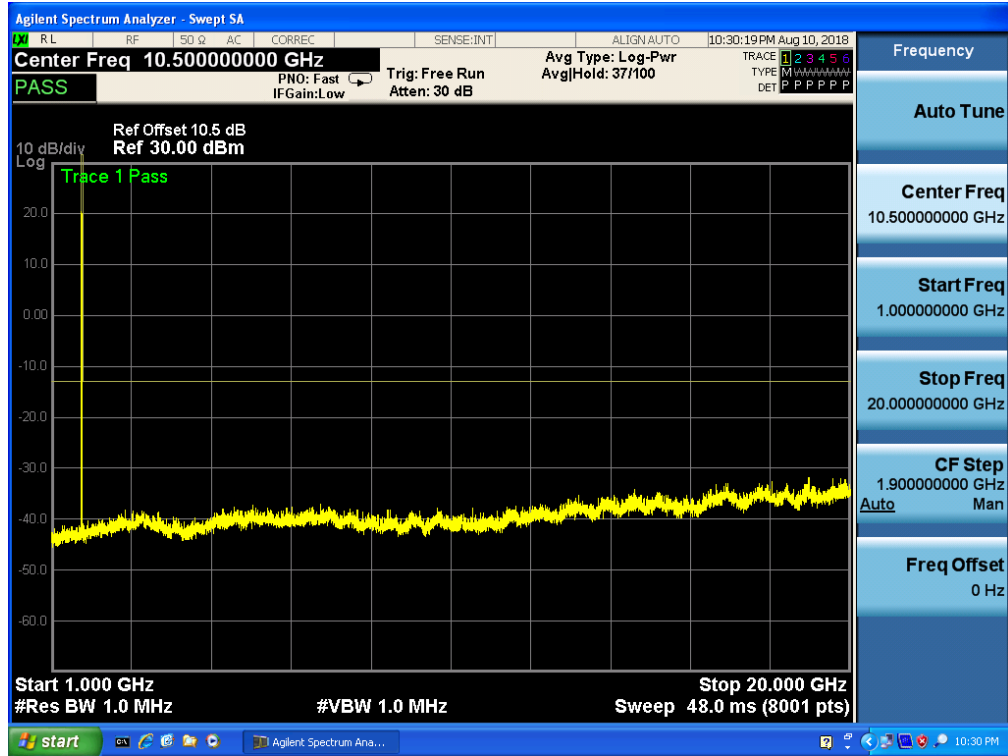
Band 4, UL Channel 20393, UL Frequency 1754.3, BW 1.4, NO. RB 6, RB POS. Low, 16-QAM



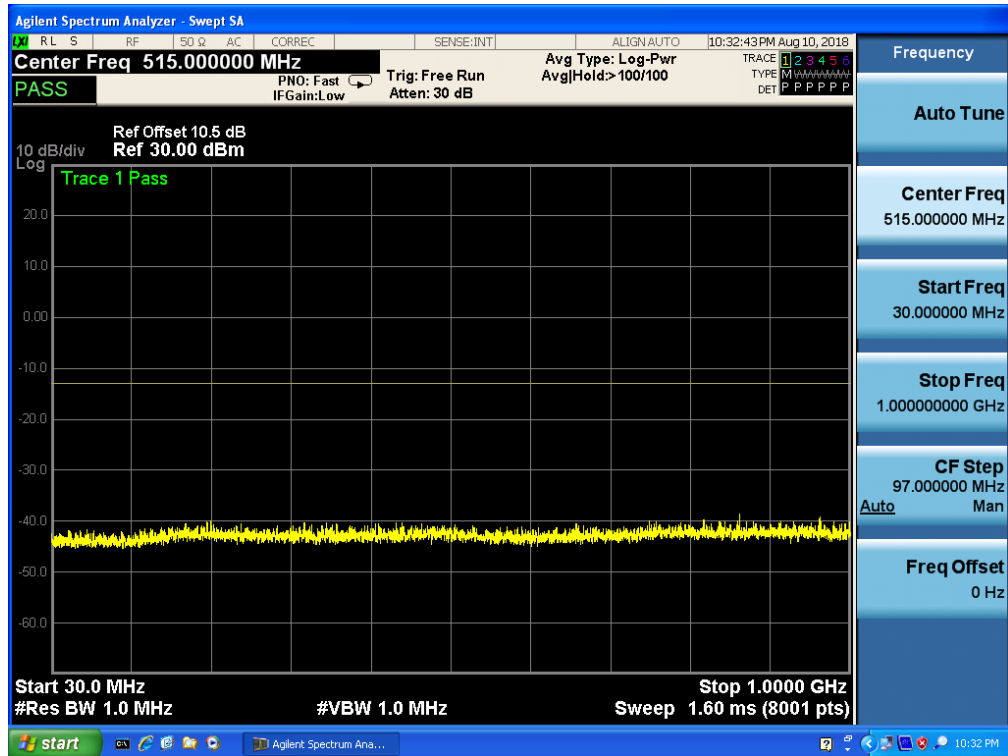
Band 4, UL Channel 19965, UL Frequency 1711.5, BW 3.0, NO. RB 15, RB POS. Low, QPSK



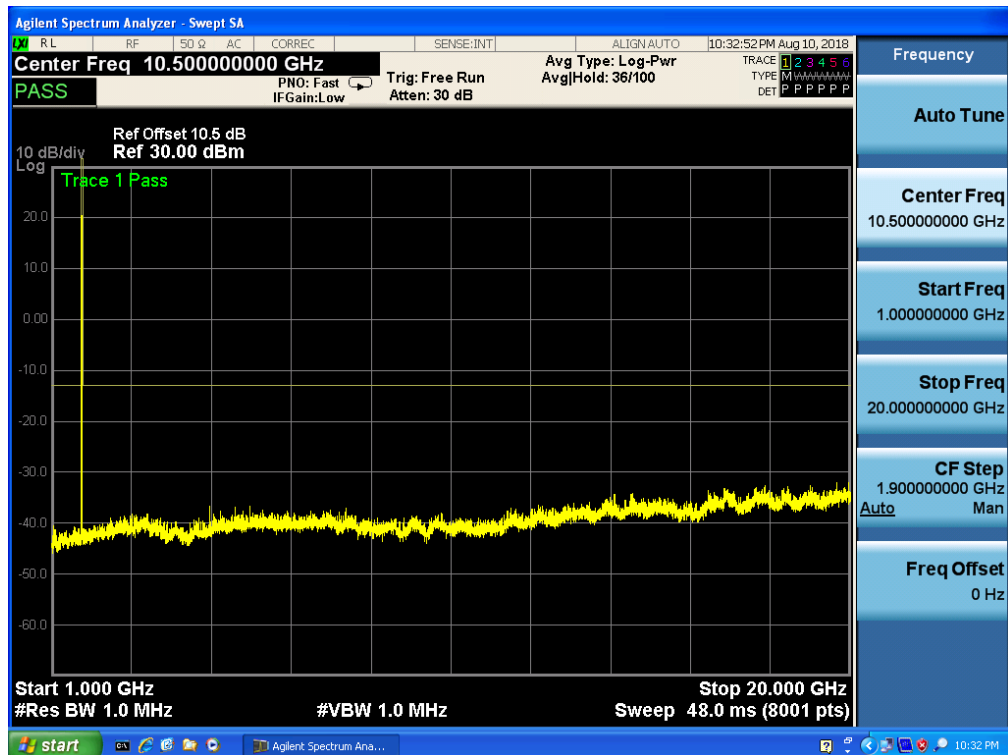
Band 4, UL Channel 19965, UL Frequency 1711.5, BW 3.0, NO. RB 15, RB POS. Low, QPSK



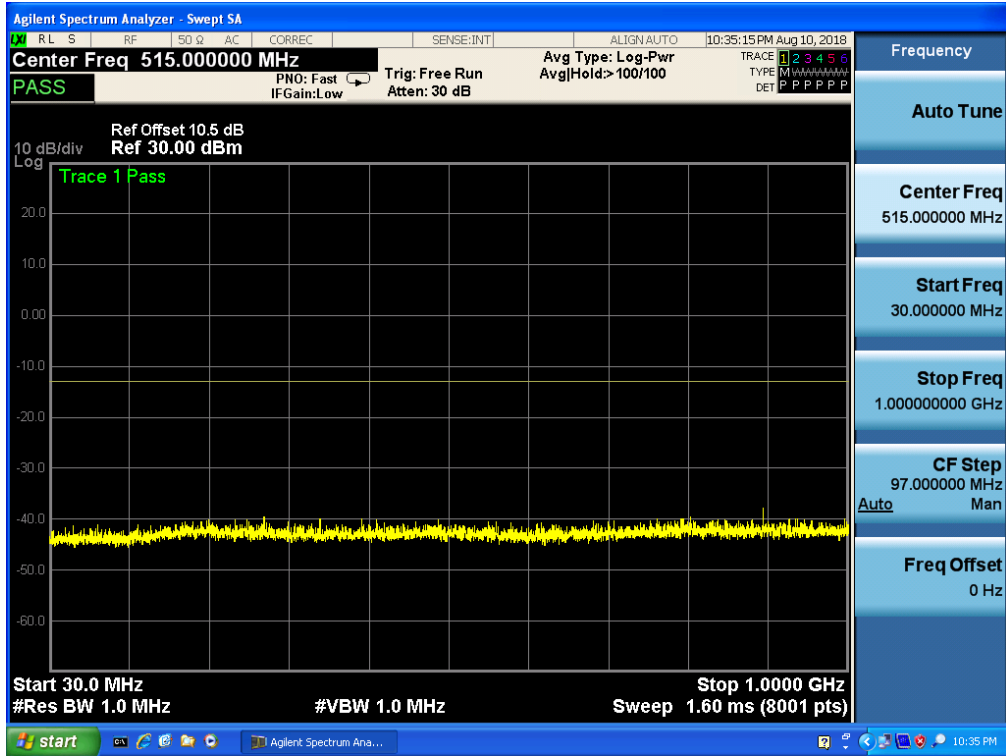
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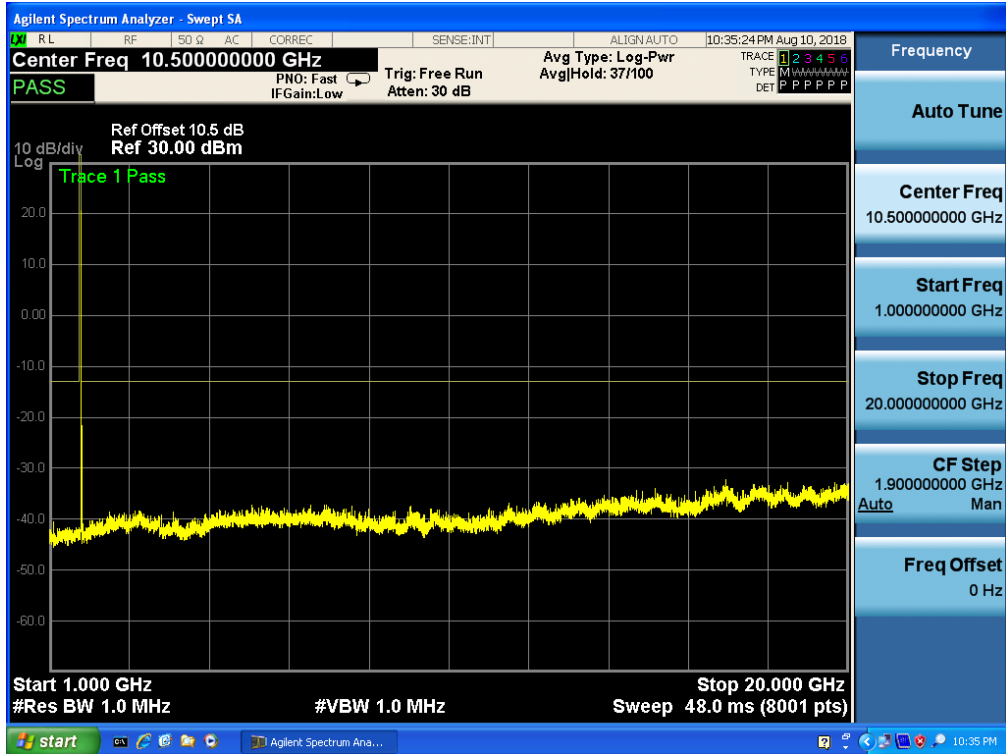
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Band 4, UL Channel 20385, UL Frequency 1753.5, BW 3.0, NO. RB 15, RB POS. Low, QPSK

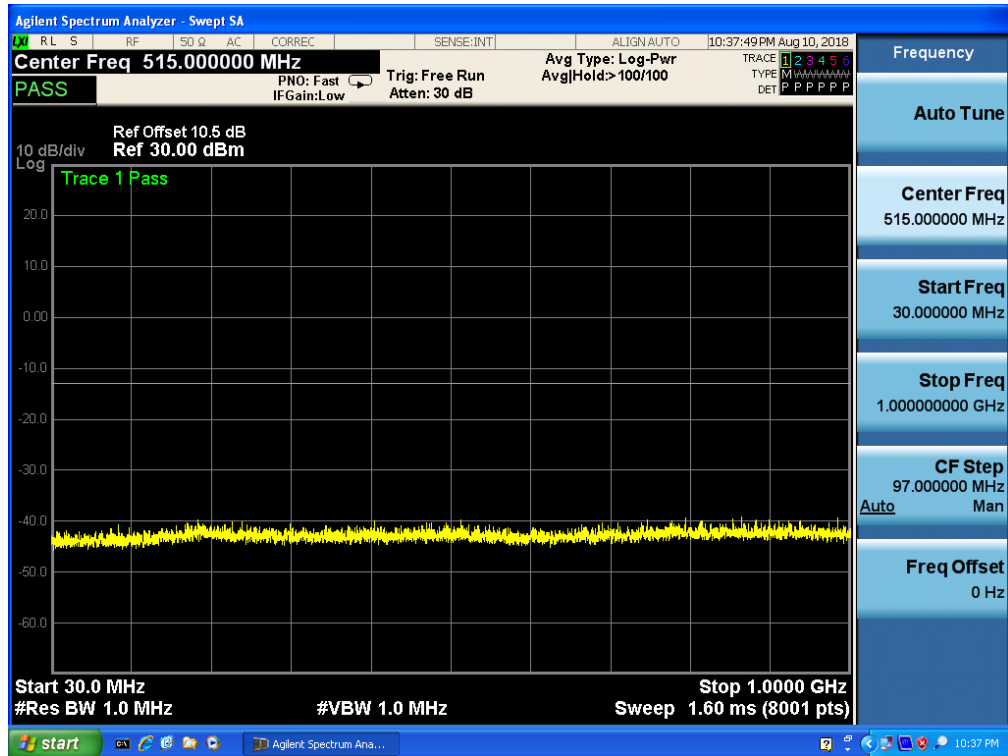


Band 4, UL Channel 20385, UL Frequency 1753.5, BW 3.0, NO. RB 15, RB POS. Low, QPSK

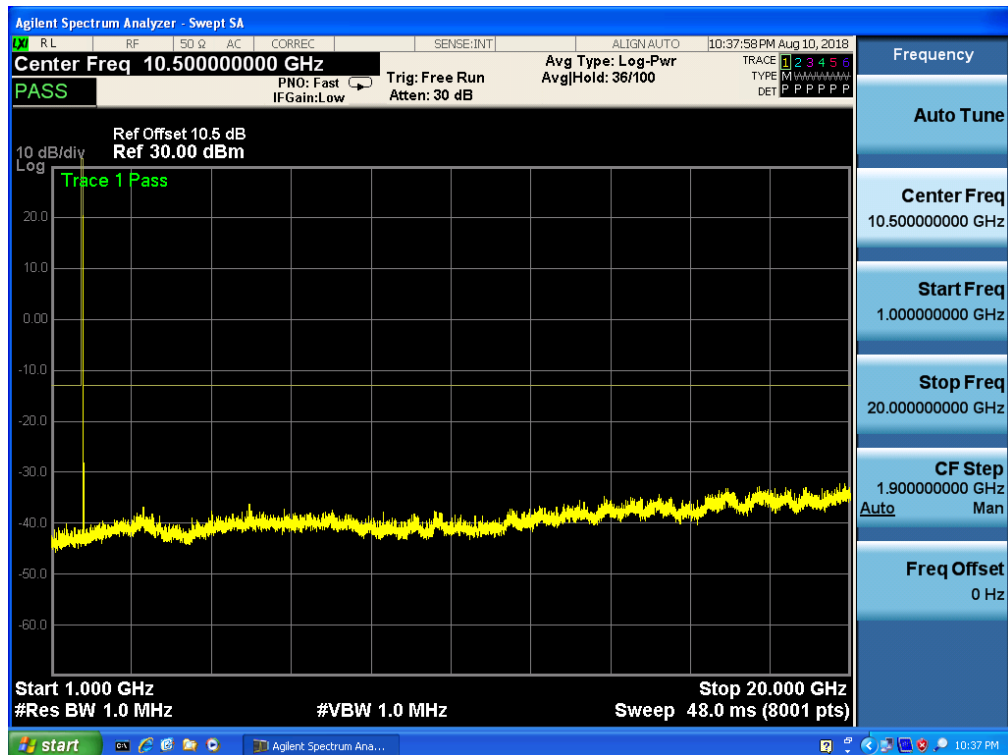




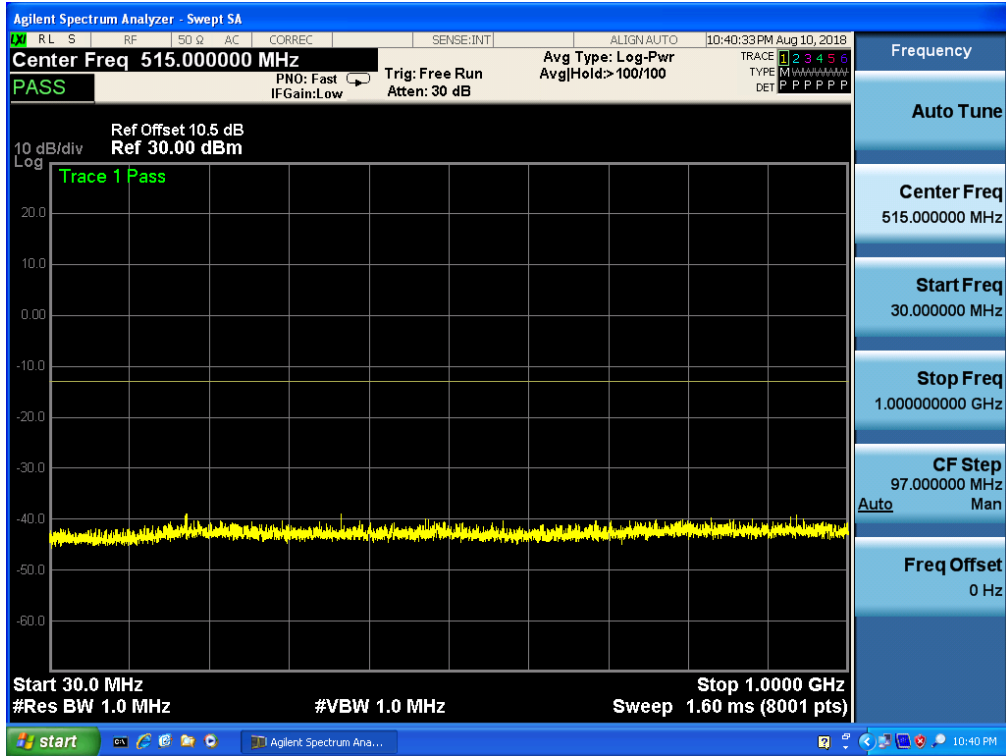
Band 4, UL Channel 20385, UL Frequency 1753.5, BW 3.0, NO. RB 15, RB POS. Low, 16-QAM



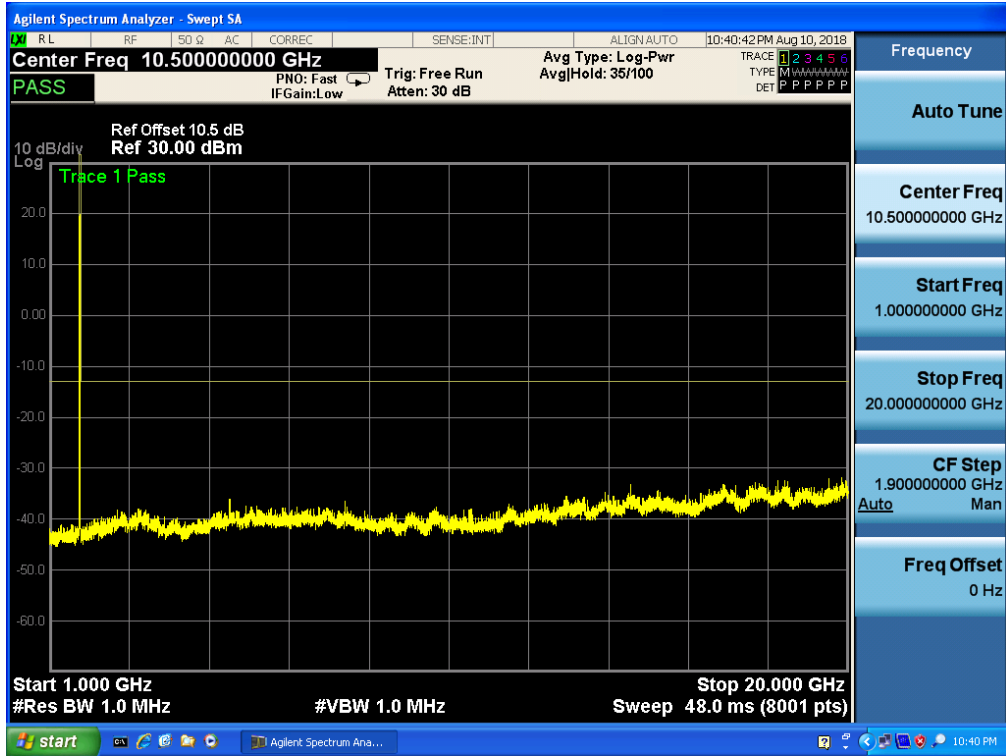
Band 4, UL Channel 20385, UL Frequency 1753.5, BW 3.0, NO. RB 15, RB POS. Low, 16-QAM



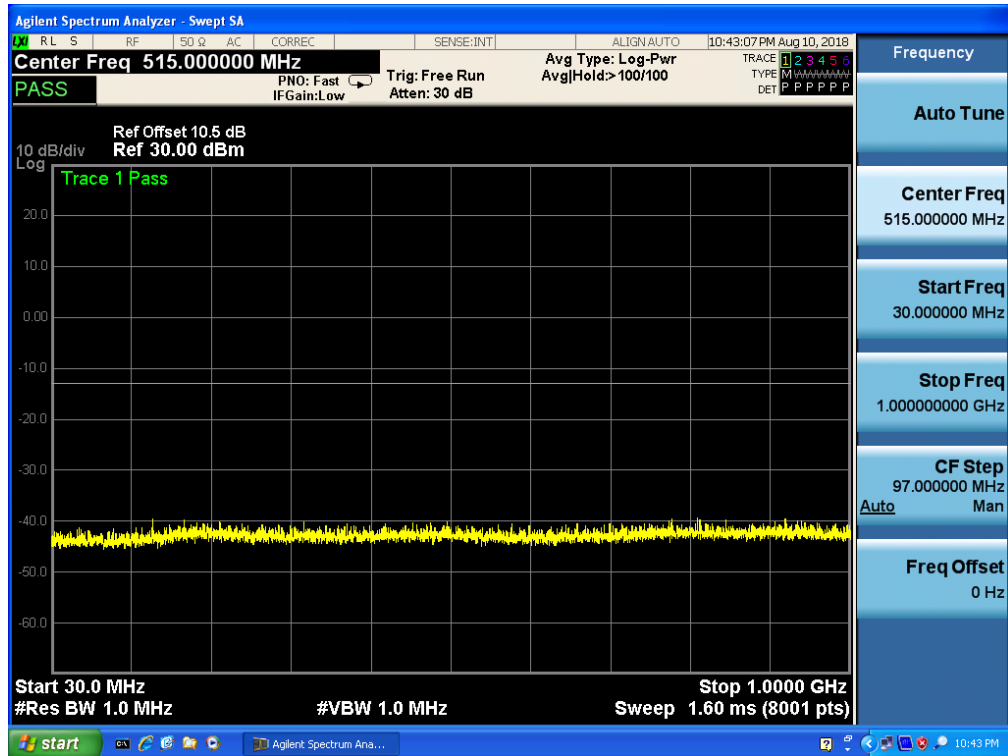
Band 4, UL Channel 19975, UL Frequency 1712.5, BW 5.0, NO. RB 25, RB POS. Low, QPSK



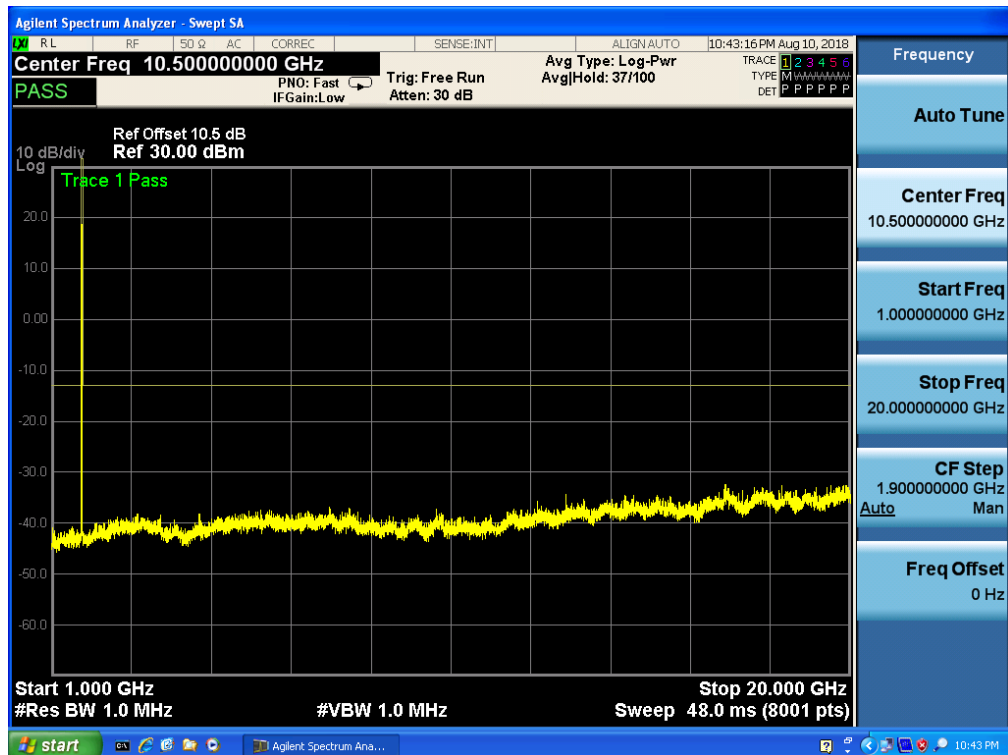
Band 4, UL Channel 19975, UL Frequency 1712.5, BW 5.0, NO. RB 25, RB POS. Low, QPSK



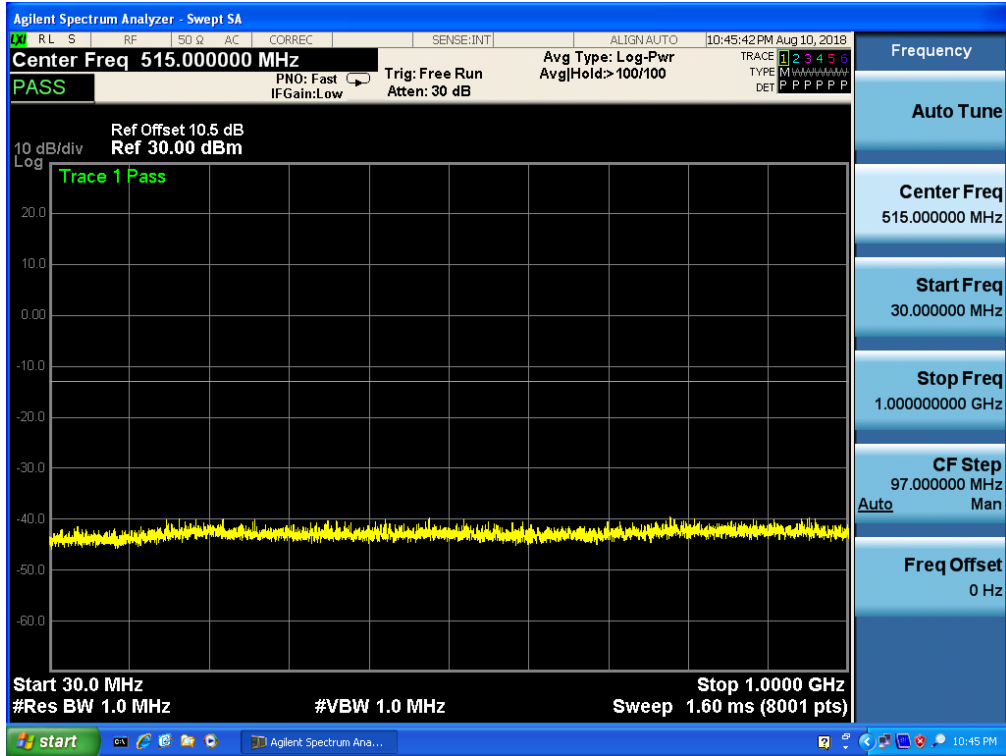
Band 4, UL Channel 19975, UL Frequency 1712.5, BW 5.0, NO. RB 25, RB POS. Low, 16-QAM



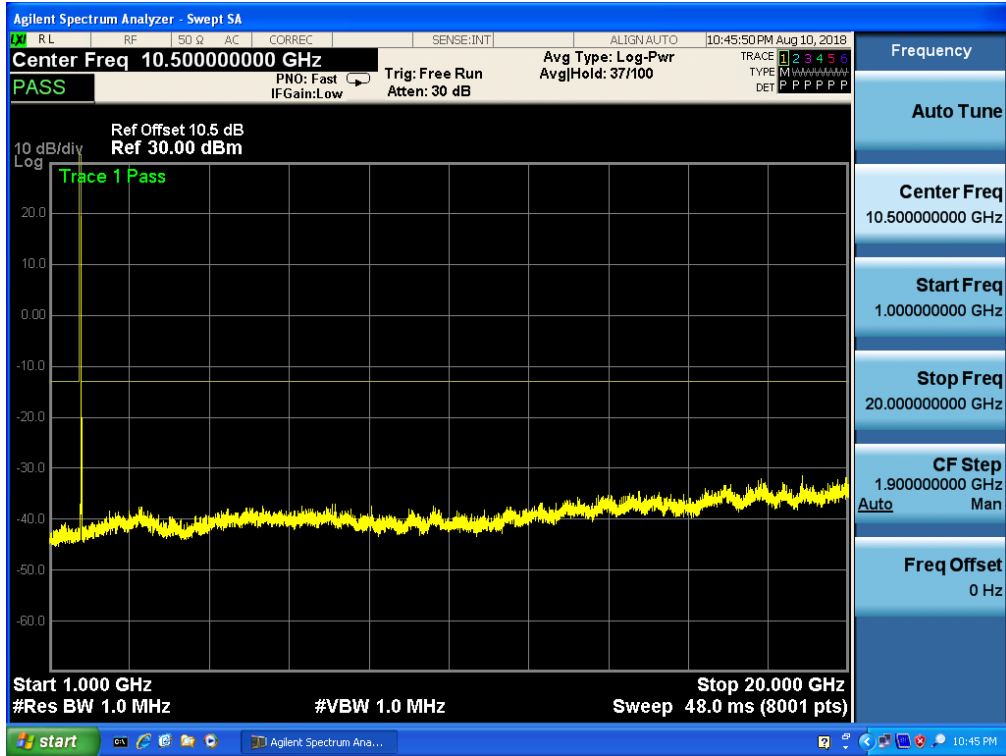
Band 4, UL Channel 19975, UL Frequency 1712.5, BW 5.0, NO. RB 25, RB POS. Low, 16-QAM



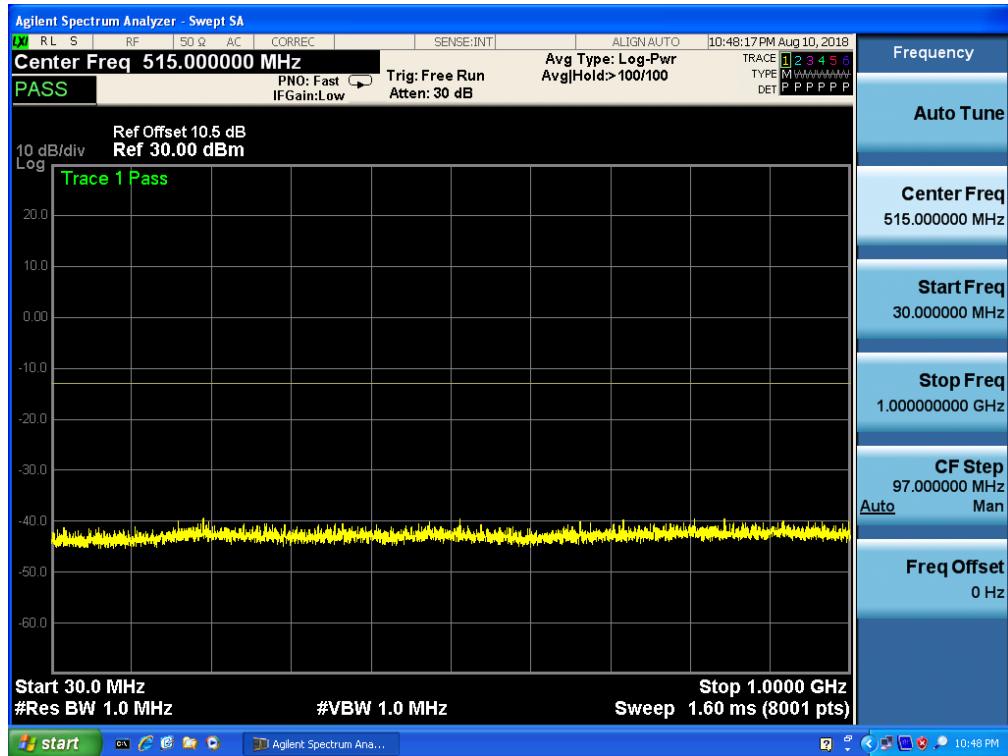
Band 4, UL Channel 20375, UL Frequency 1752.5, BW 5.0, NO. RB 25, RB POS. Low, QPSK



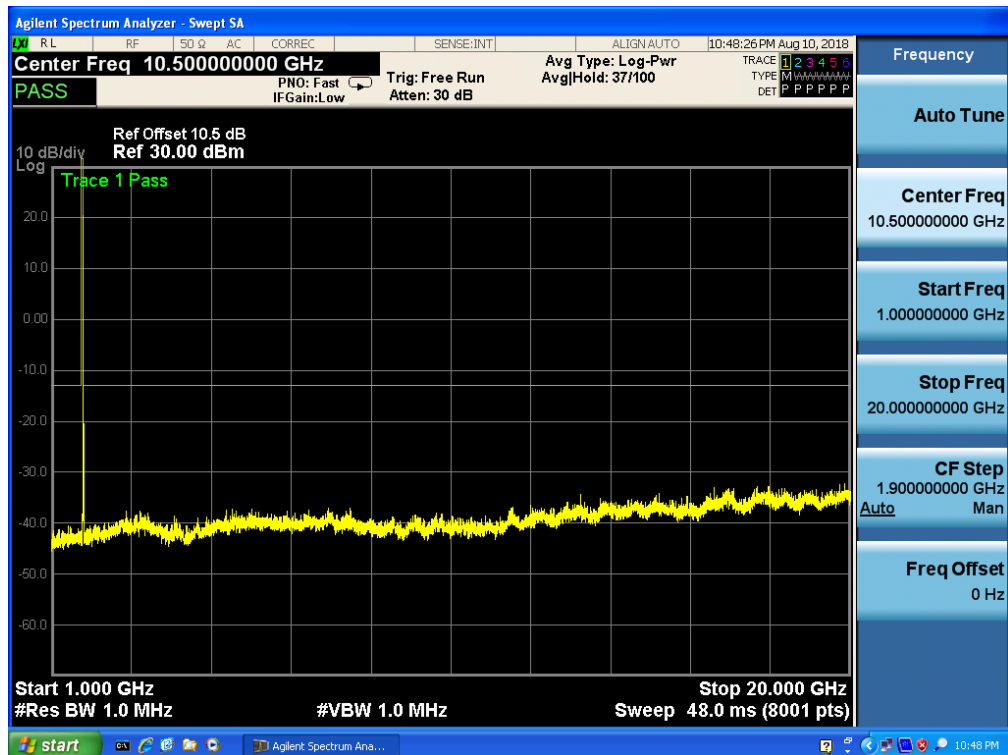
Band 4, UL Channel 20375, UL Frequency 1752.5, BW 5.0, NO. RB 25, RB POS. Low, QPSK



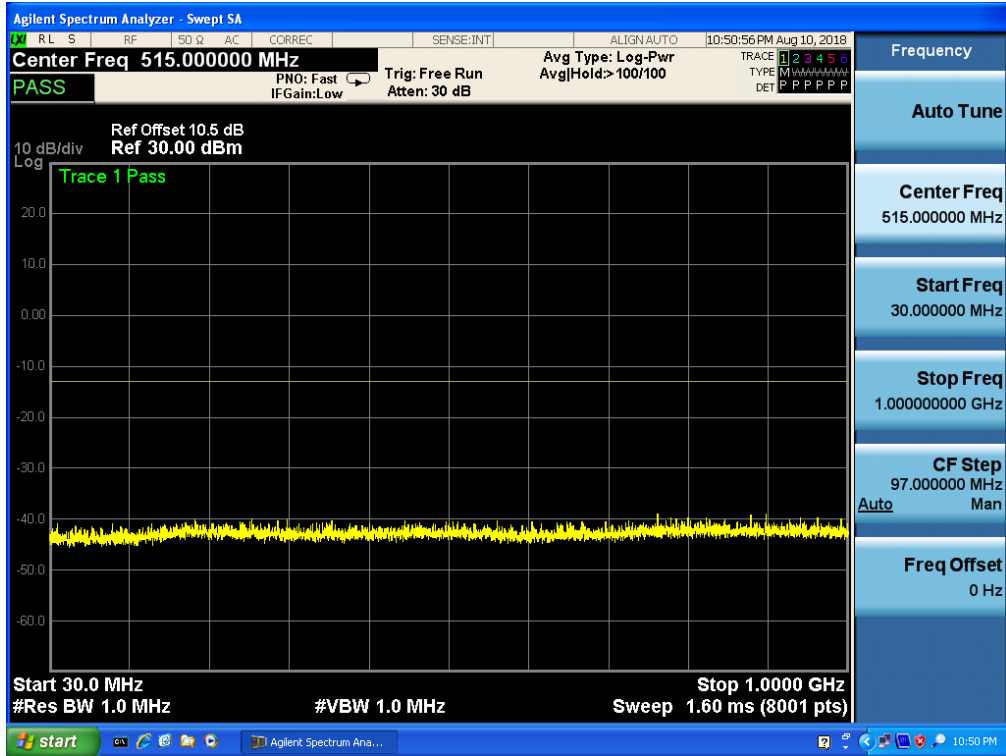
Band 4, UL Channel 20375, UL Frequency 1752.5, BW 5.0, NO. RB 25, RB POS. Low, 16-QAM



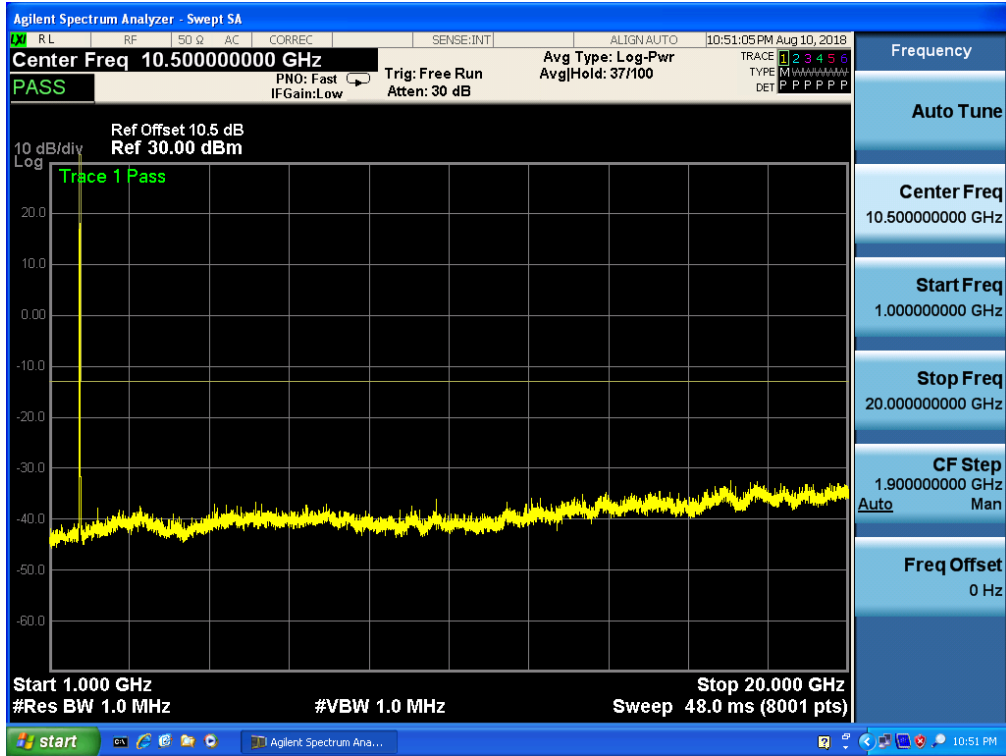
Band 4, UL Channel 20375, UL Frequency 1752.5, BW 5.0, NO. RB 25, RB POS. Low, 16-QAM



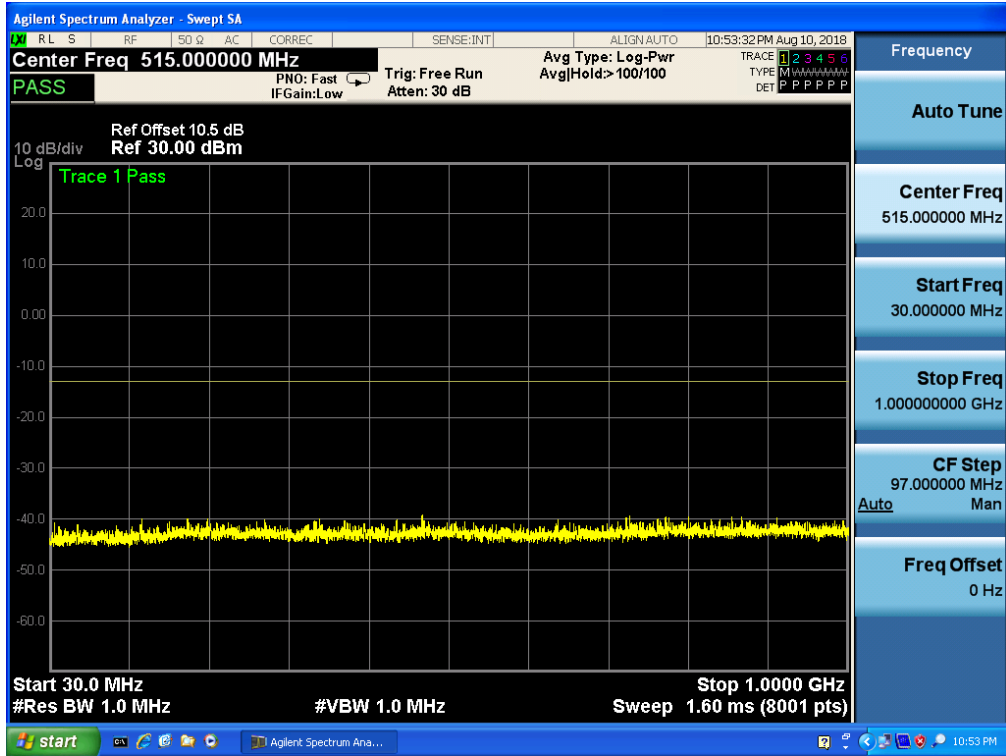
Band 4, UL Channel 2000, UL Frequency 1715.0, BW 10.0, NO. RB 50, RB POS. Low, QPSK



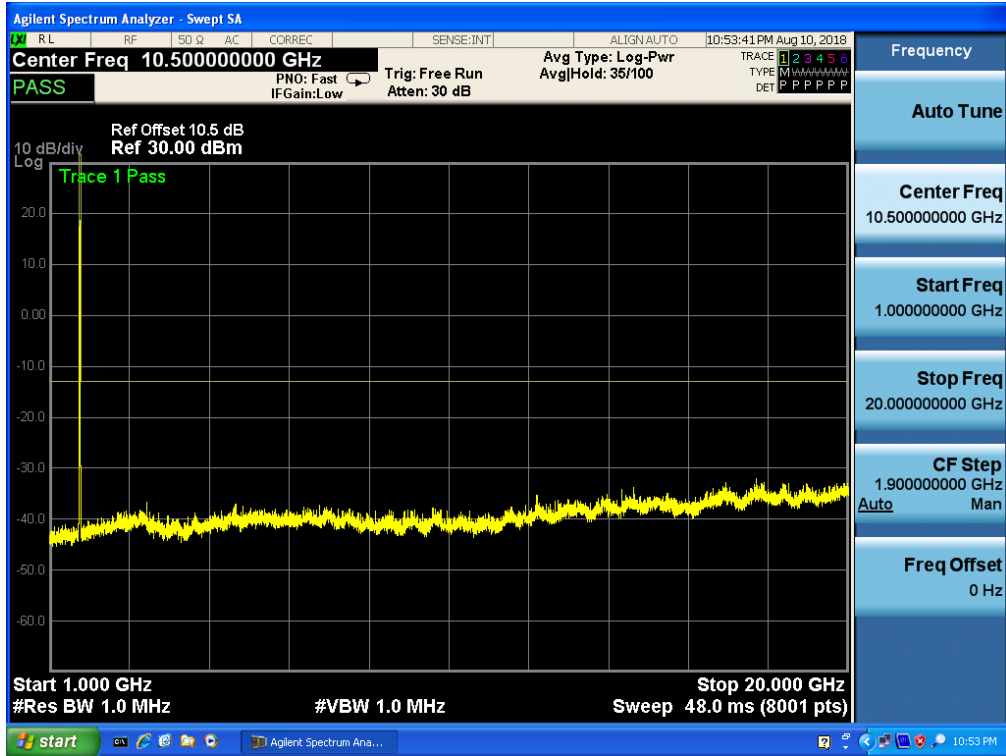
Band 4, UL Channel 2000, UL Frequency 1715.0, BW 10.0, NO. RB 50, RB POS. Low, QPSK



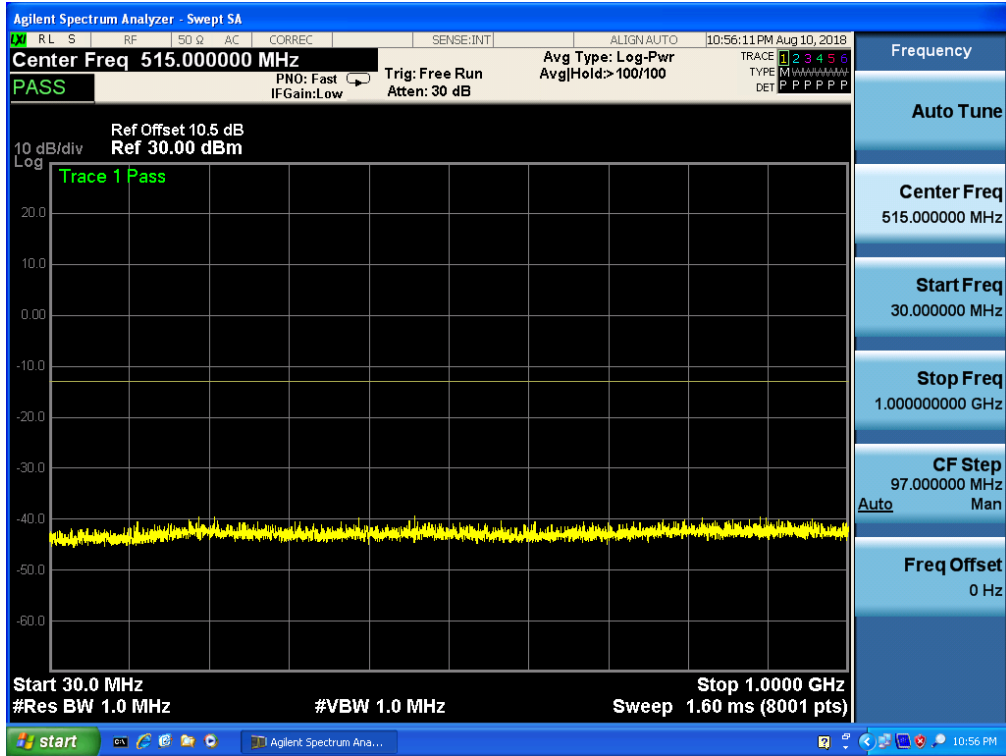
Band 4, UL Channel 2000, UL Frequency 1715.0, BW 10.0, NO. RB 50, RB POS. Low, 16-QAM



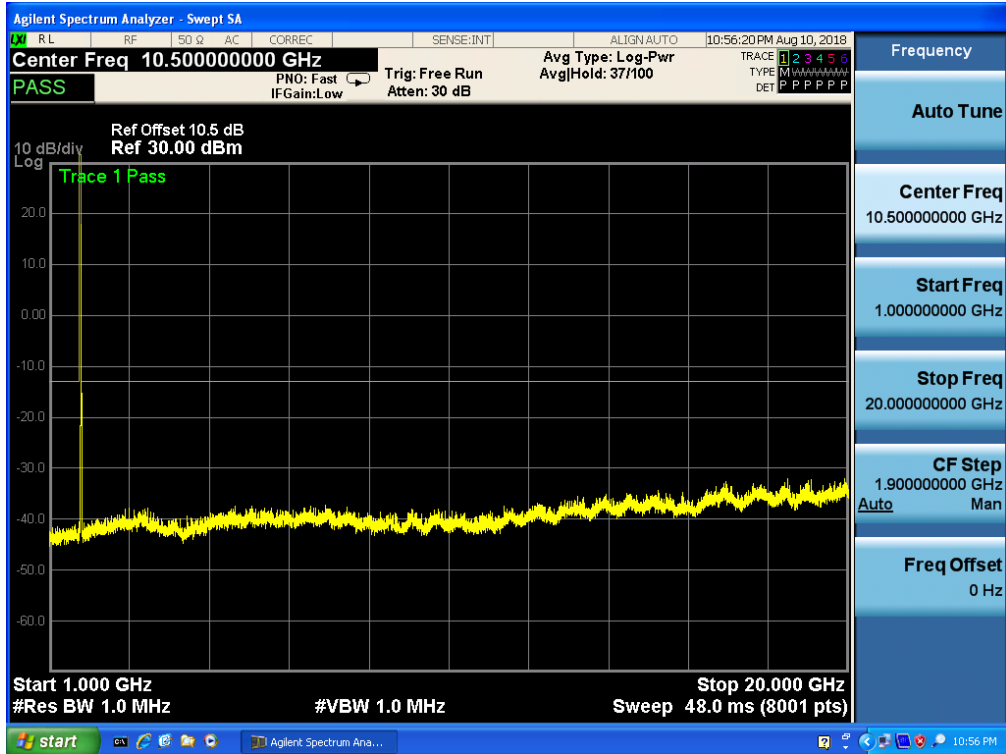
Band 4, UL Channel 2000, UL Frequency 1715.0, BW 10.0, NO. RB 50, RB POS. Low, 16-QAM



Band 4, UL Channel 20350, UL Frequency 1750.0, BW 10.0, NO. RB 50, RB POS. Low, QPSK

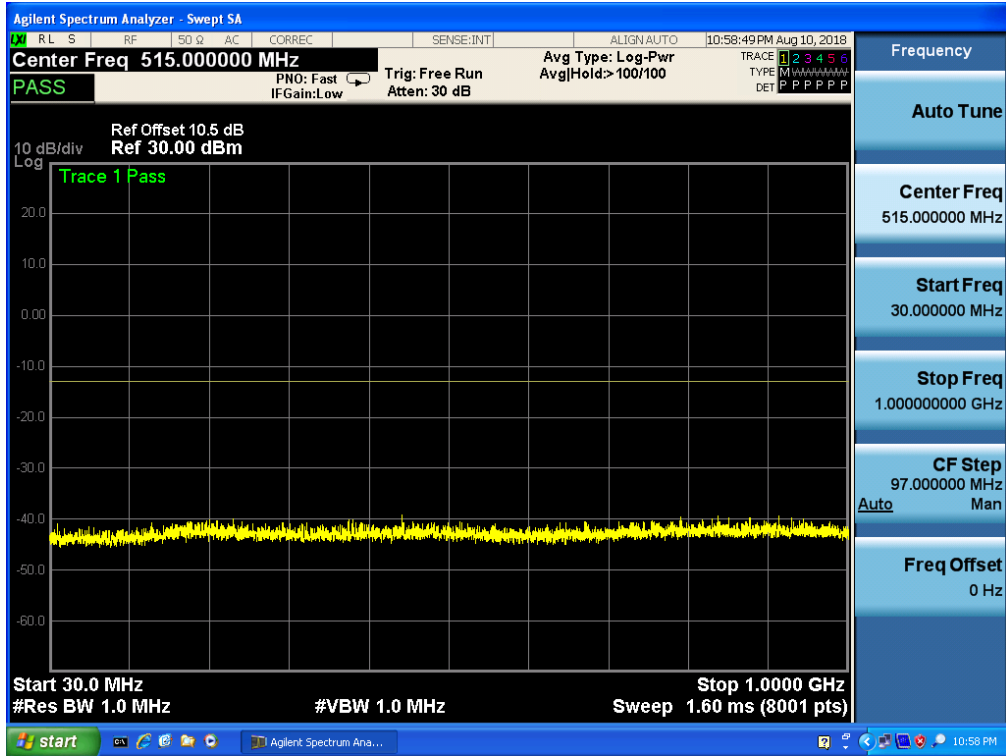


Band 4, UL Channel 20350, UL Frequency 1750.0, BW 10.0, NO. RB 50, RB POS. Low, QPSK

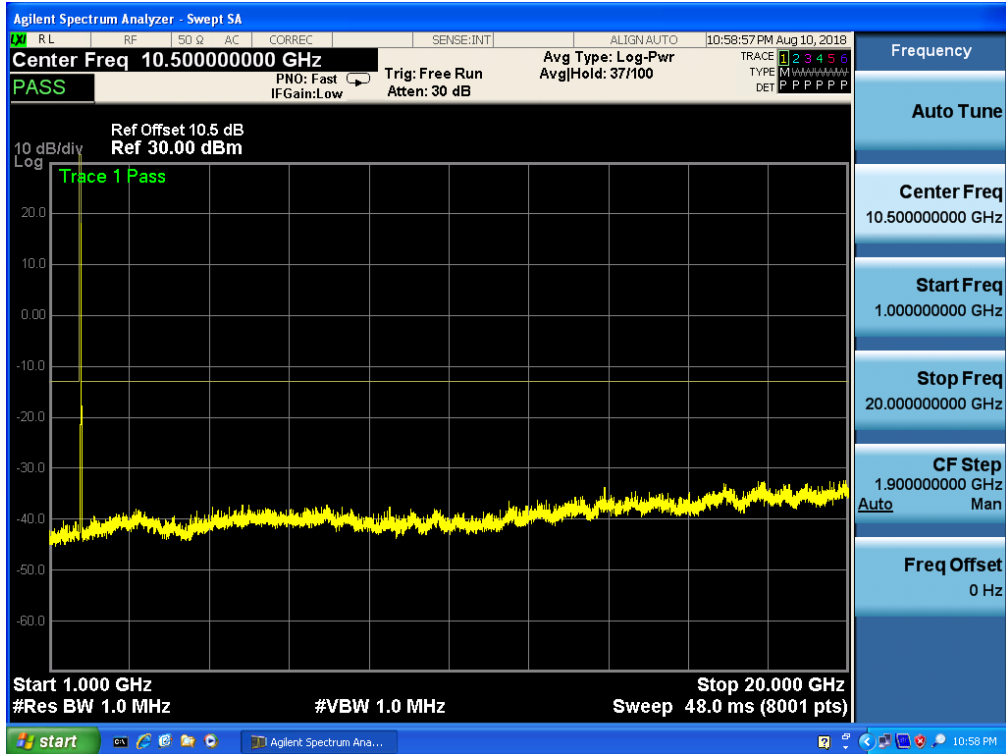




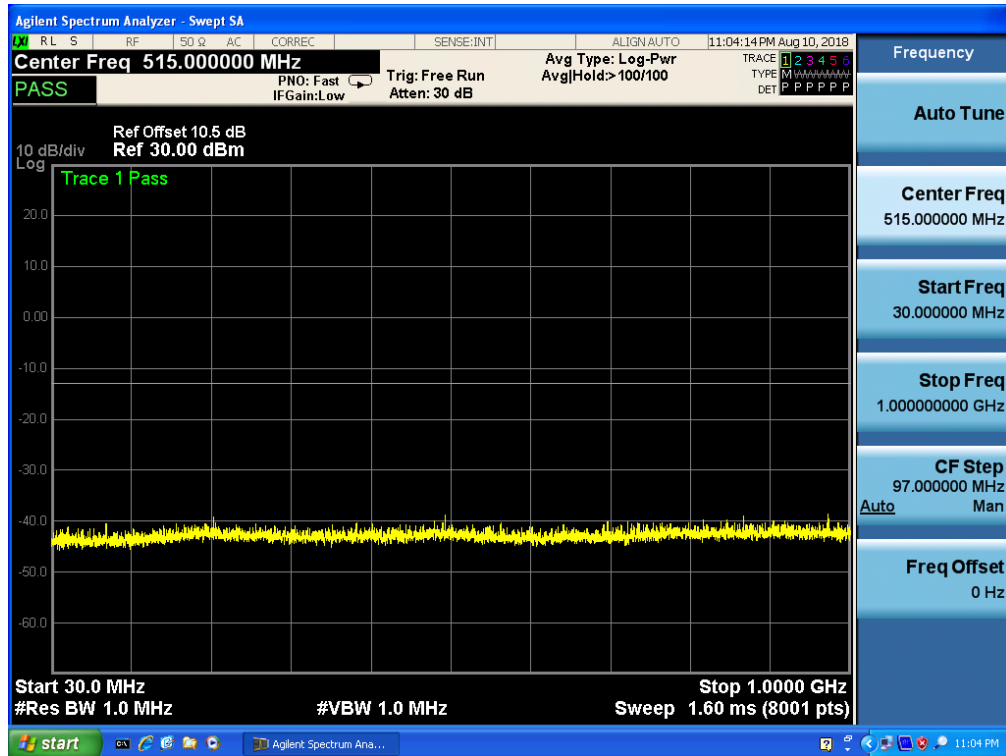
Band 4, UL Channel 20350, UL Frequency 1750.0, BW 10.0, NO. RB 50, RB POS. Low, 16-QAM



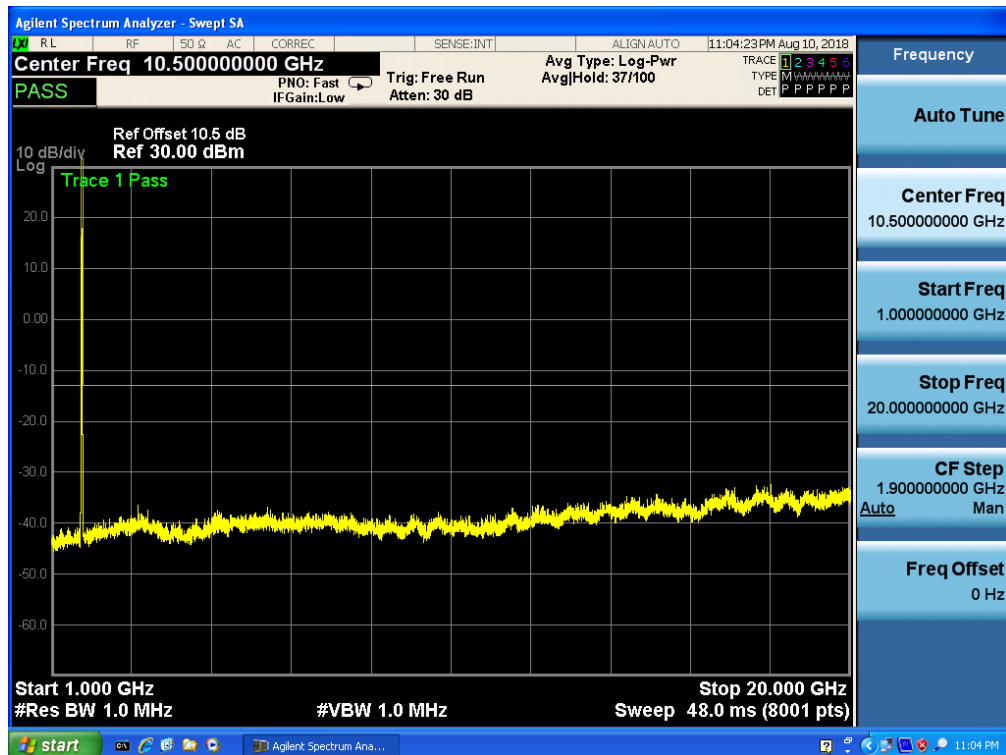
Band 4, UL Channel 20350, UL Frequency 1750.0, BW 10.0, NO. RB 50, RB POS. Low, 16-QAM



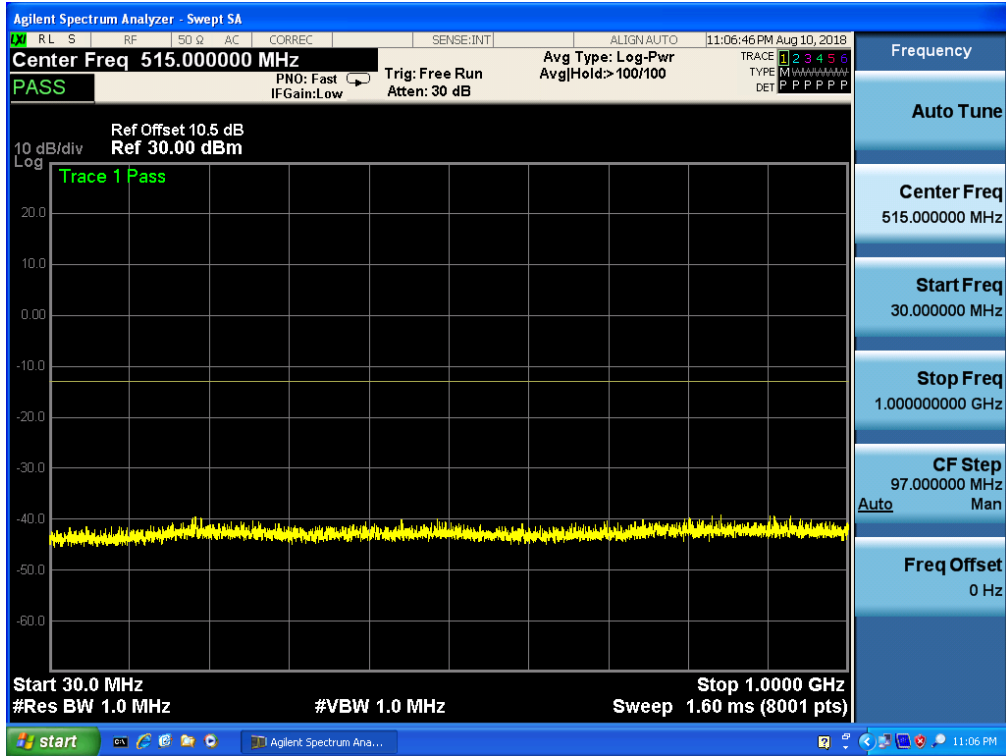
Band 4, UL Channel 20025, UL Frequency 1717.5, BW 15.0, NO. RB 75, RB POS. Low, QPSK



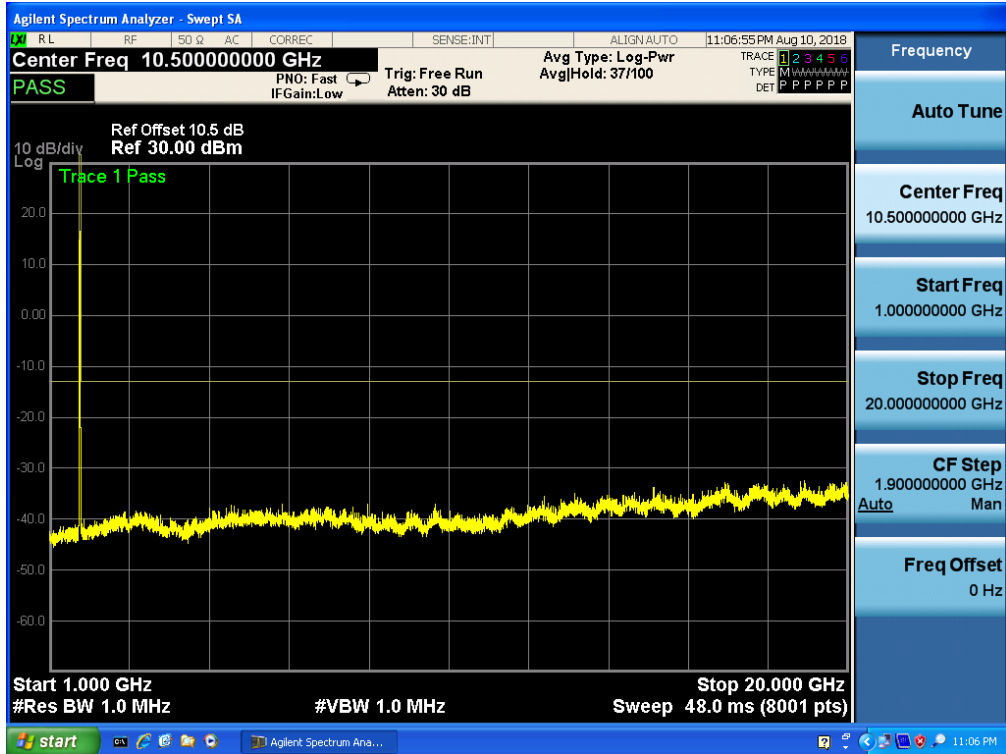
Band 4, UL Channel 20025, UL Frequency 1717.5, BW 15.0, NO. RB 75, RB POS. Low, QPSK



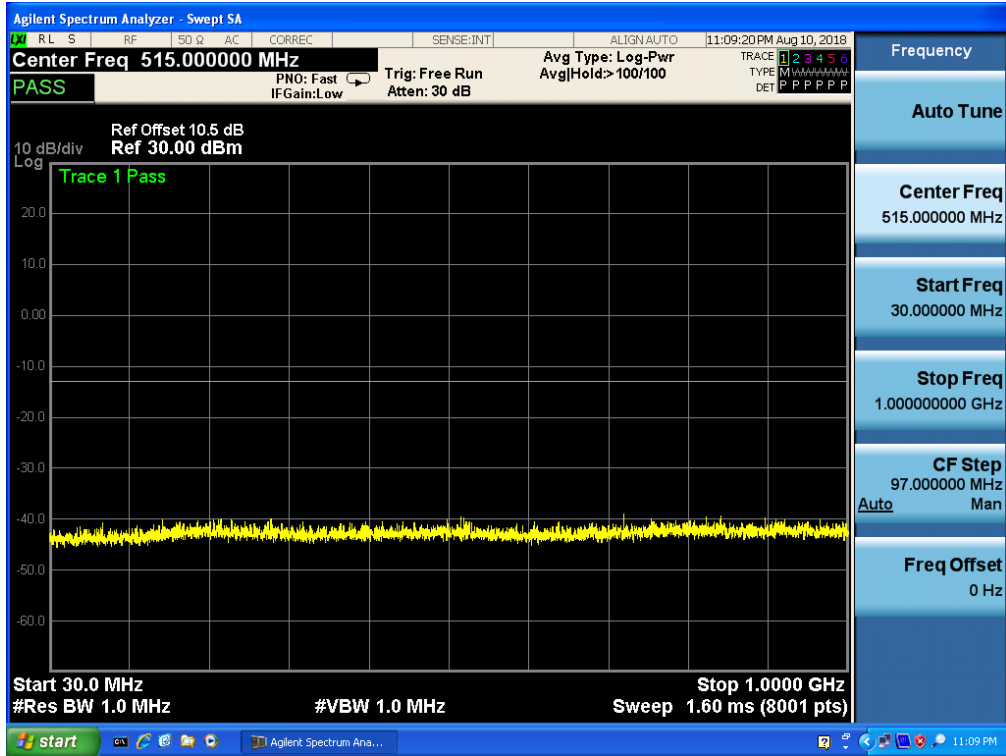
Band 4, UL Channel 20025, UL Frequency 1717.5, BW 15.0, NO. RB 75, RB POS. Low, 16-QAM



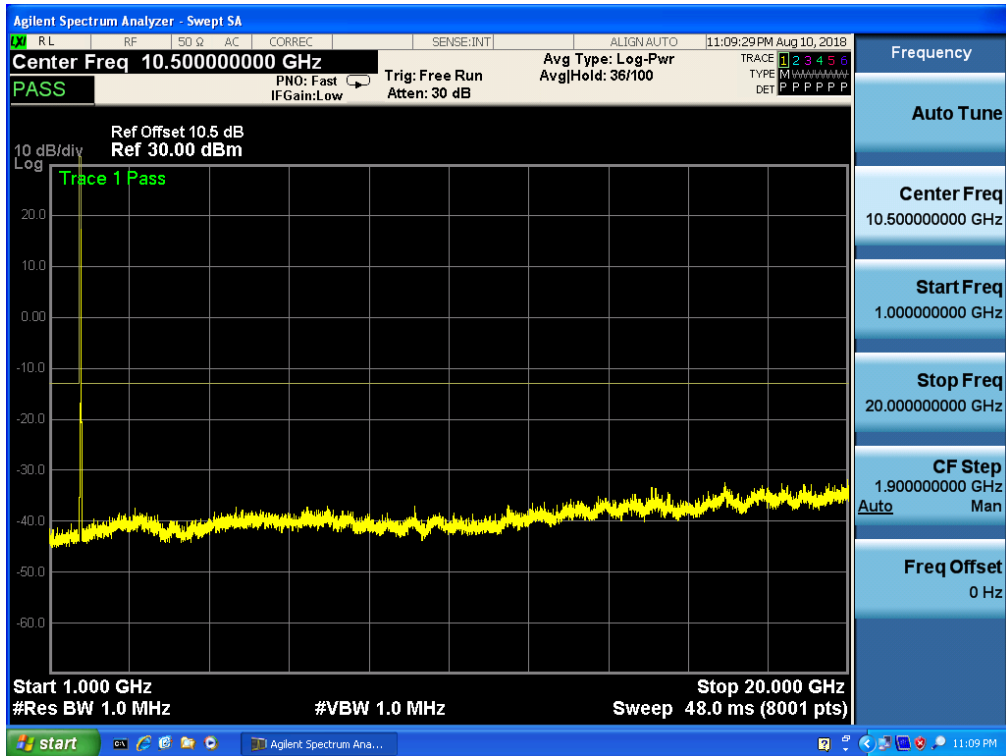
Band 4, UL Channel 20025, UL Frequency 1717.5, BW 15.0, NO. RB 75, RB POS. Low, 16-QAM



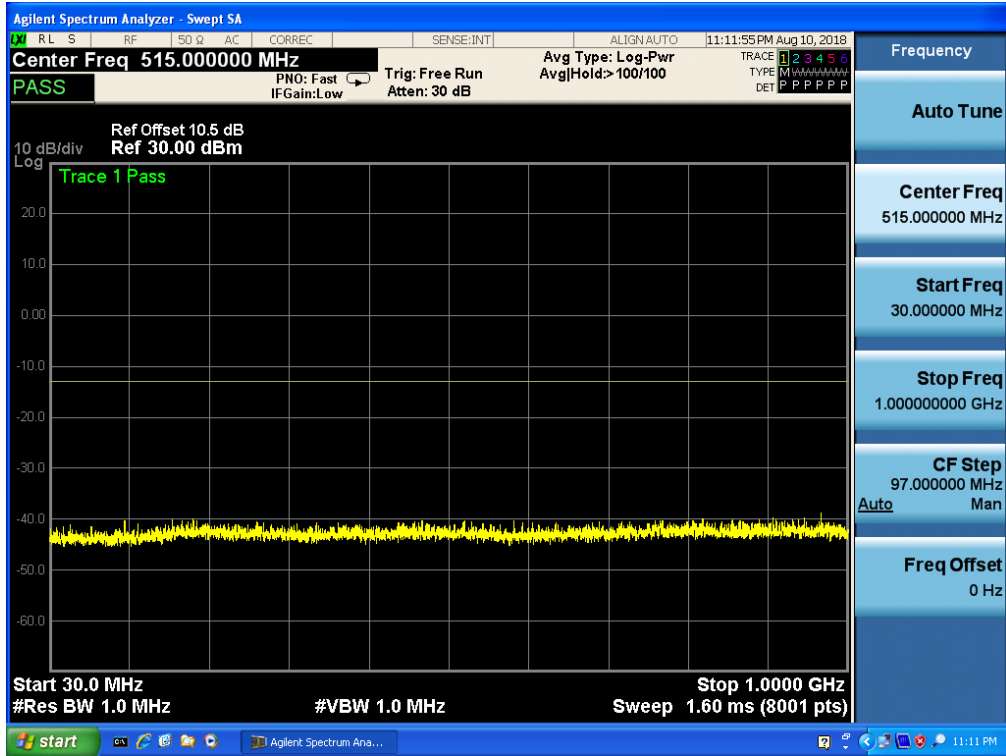
Band 4, UL Channel 20325, UL Frequency 1747.5, BW 15.0, NO. RB 75, RB POS. Low, QPSK



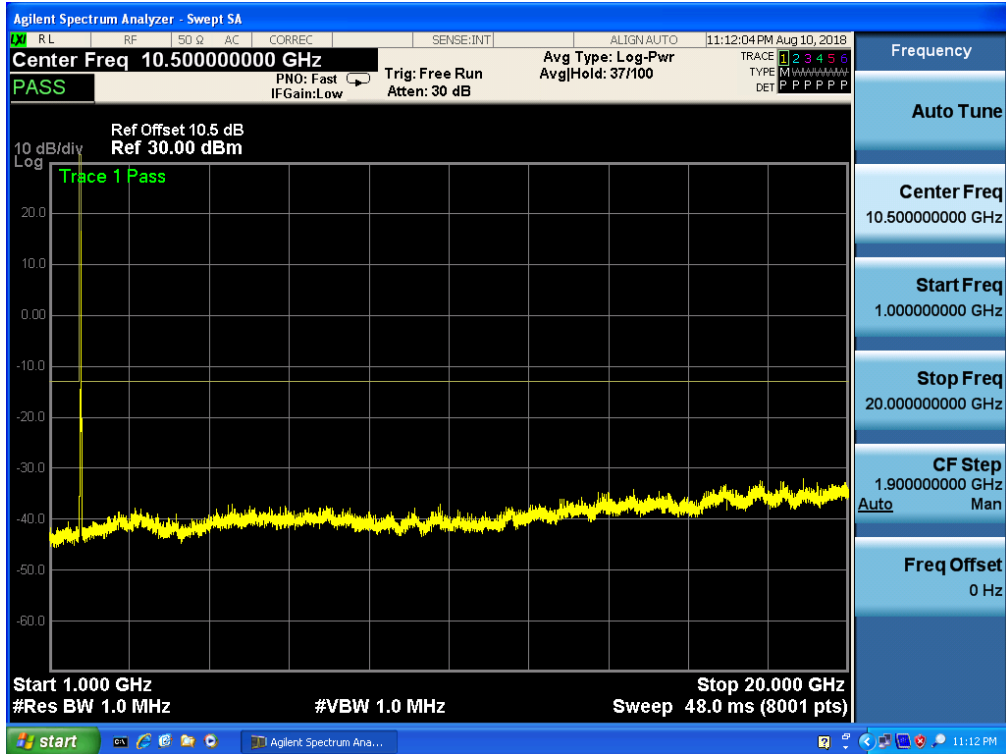
Band 4, UL Channel 20325, UL Frequency 1747.5, BW 15.0, NO. RB 75, RB POS. Low, QPSK



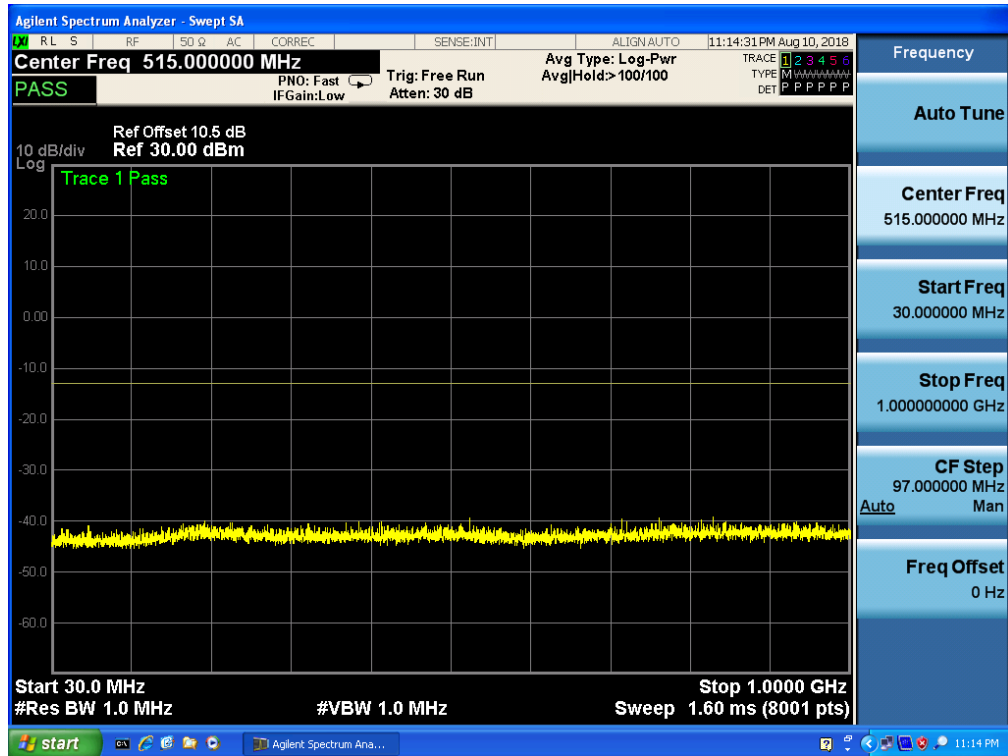
Band 4, UL Channel 20325, UL Frequency 1747.5, BW 15.0, NO. RB 75, RB POS. Low, 16-QAM



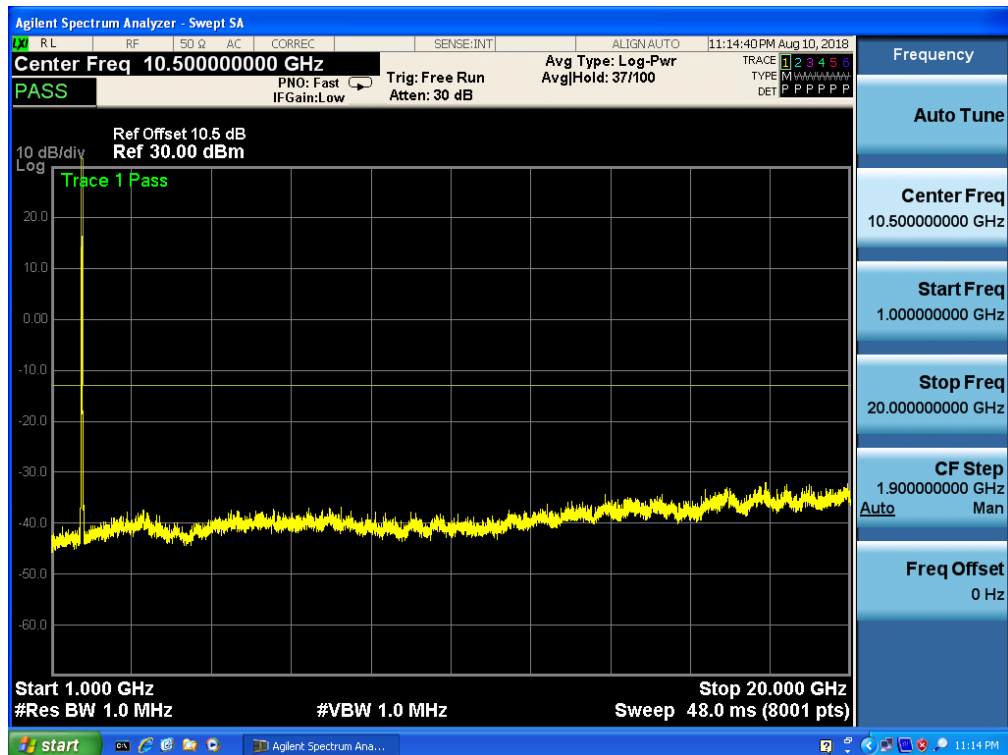
Band 4, UL Channel 20325, UL Frequency 1747.5, BW 15.0, NO. RB 75, RB POS. Low, 16-QAM



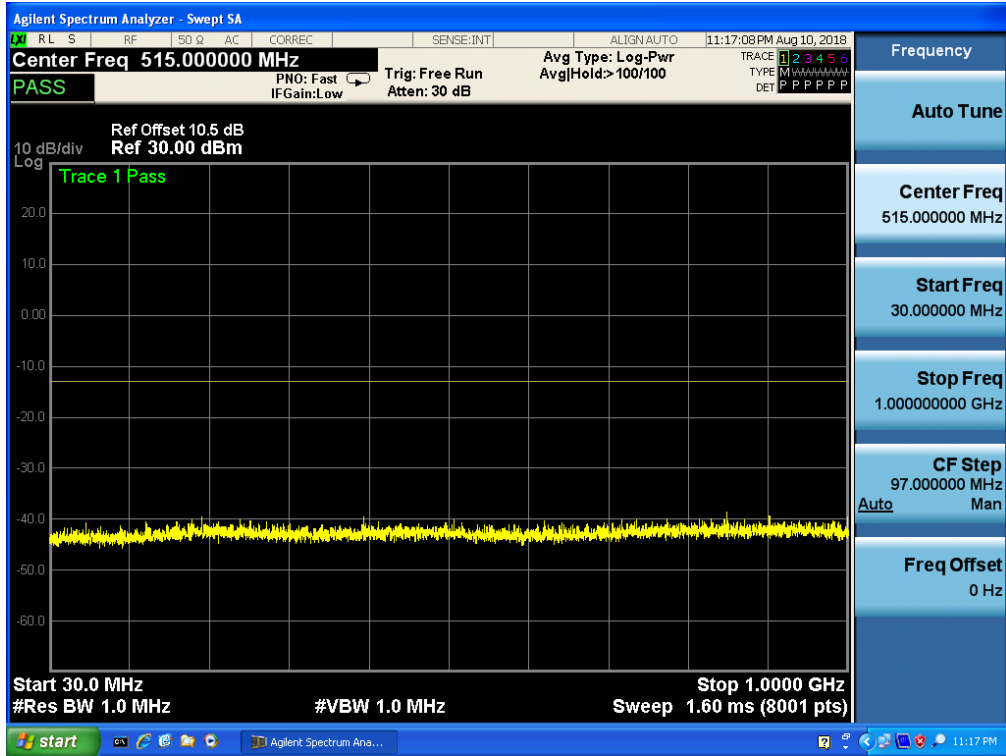
Band 4, UL Channel 2050, UL Frequency 1720.0, BW 20.0, NO. RB 100, RB POS. Low, QPSK



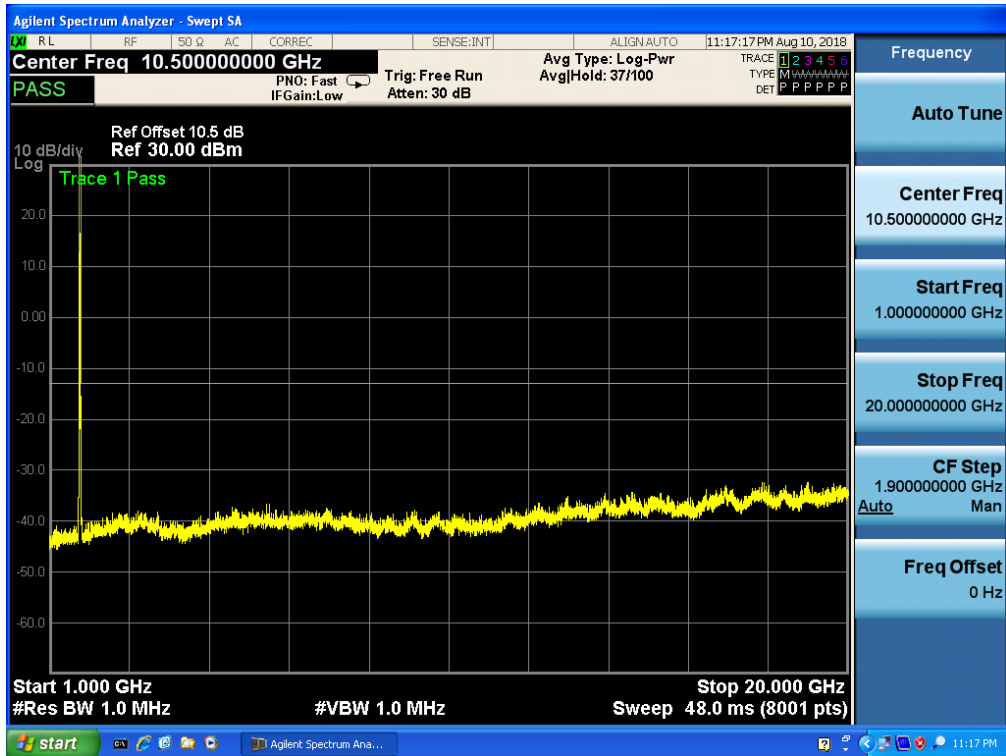
Band 4, UL Channel 2050, UL Frequency 1720.0, BW 20.0, NO. RB 100, RB POS. Low, QPSK



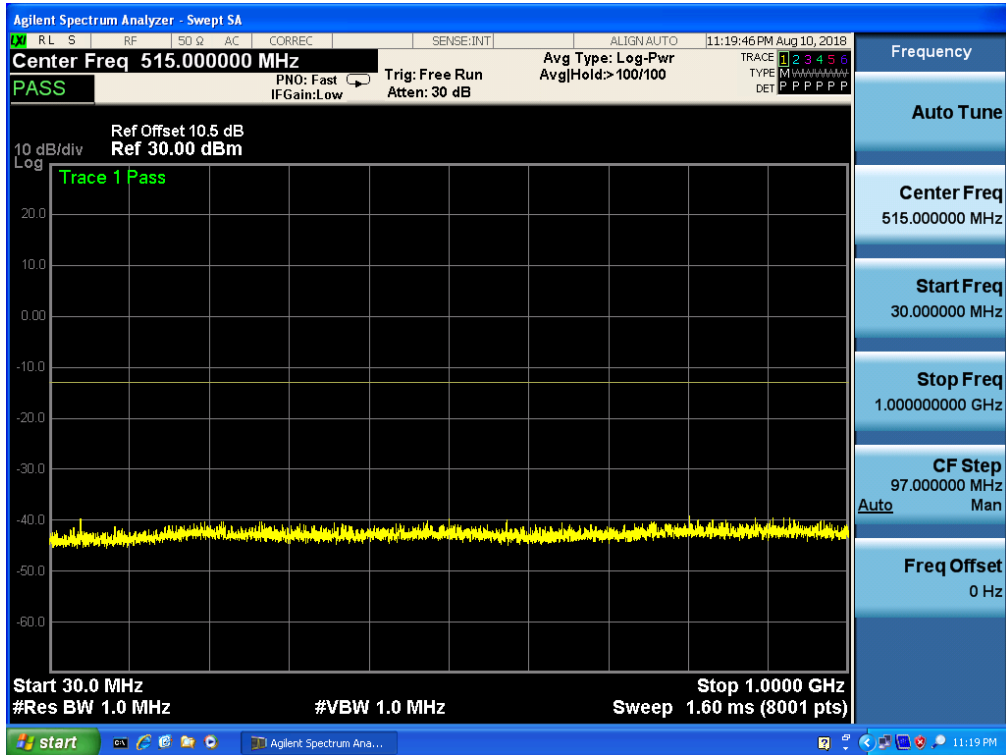
Band 4, UL Channel 20050, UL Frequency 1720.0, BW 20.0, NO. RB 100, RB POS. Low, 16QAM



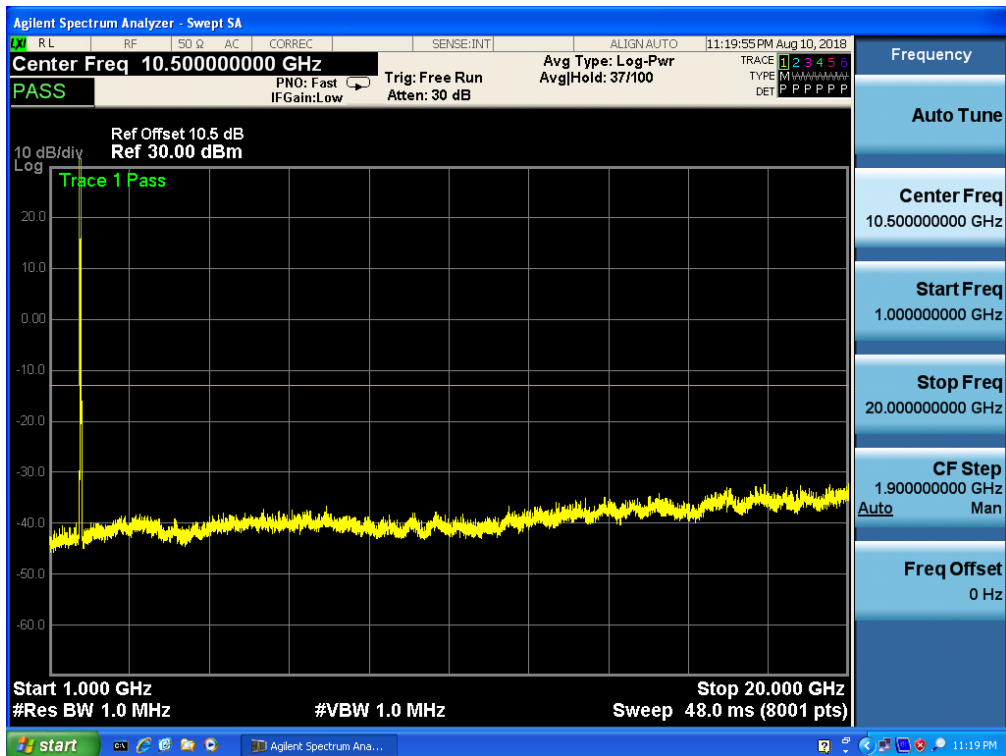
Band 4, UL Channel 20050, UL Frequency 1720.0, BW 20.0, NO. RB 100, RB POS. Low, 16QAM



Band 4, UL Channel 20300, UL Frequency 1745.0, BW 20.0, NO. RB 100, RB POS. Low, QPSK

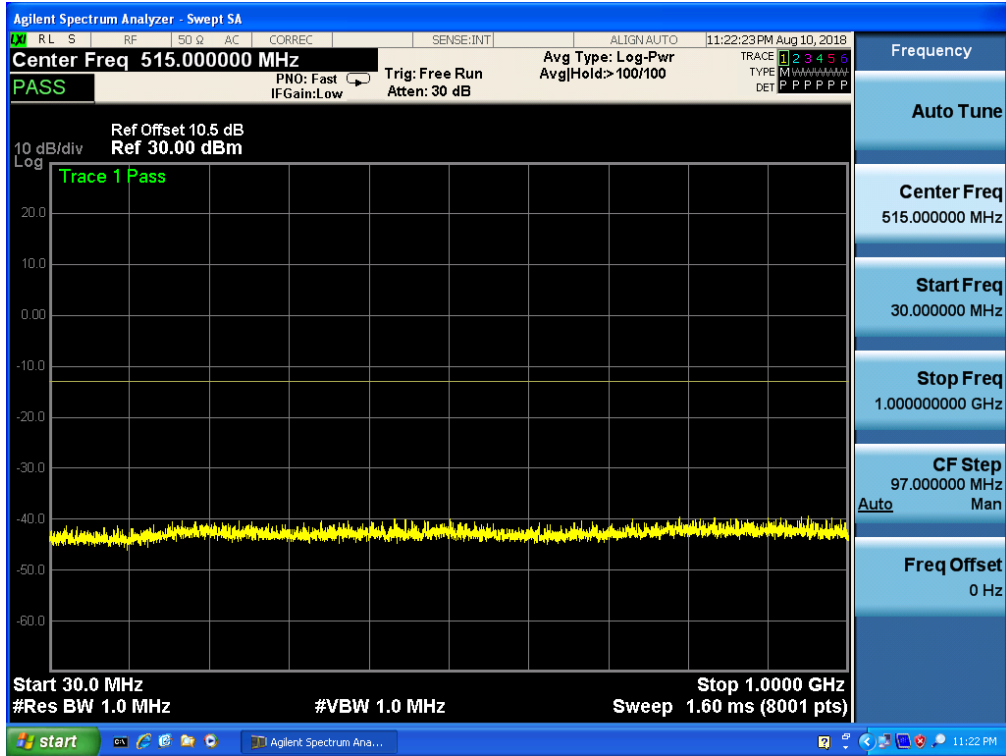


Band 4, UL Channel 20300, UL Frequency 1745.0, BW 20.0, NO. RB 100, RB POS. Low, QPSK

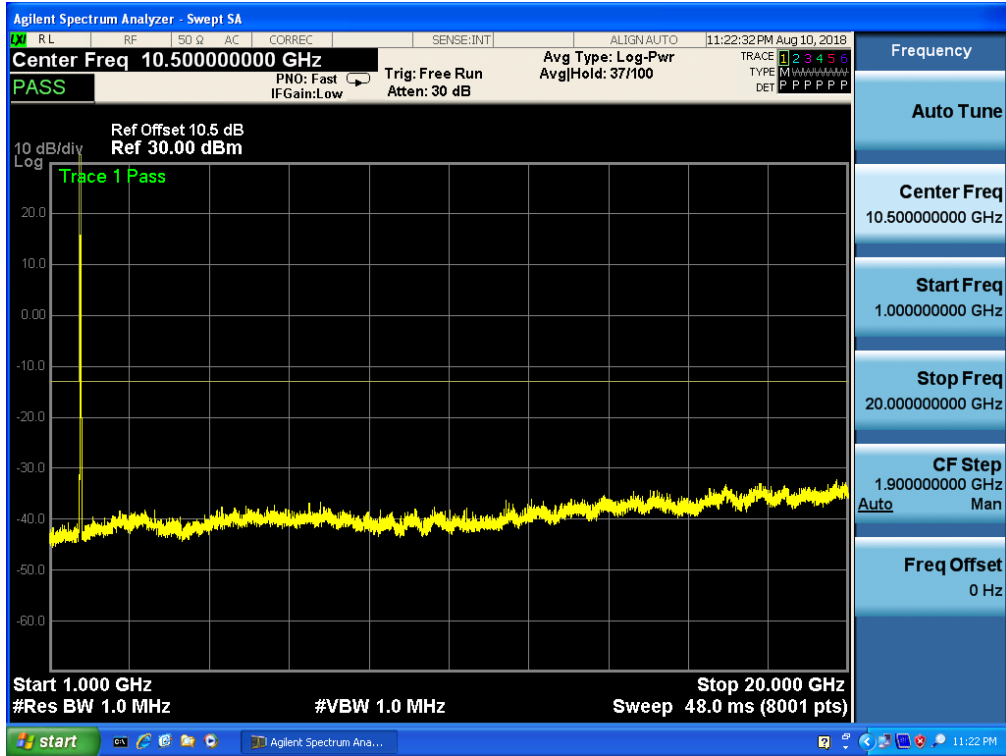




Band 4, UL Channel 20300, UL Frequency 1745.0, BW 20.0, NO. RB 100, RB POS. Low, 16-QAM

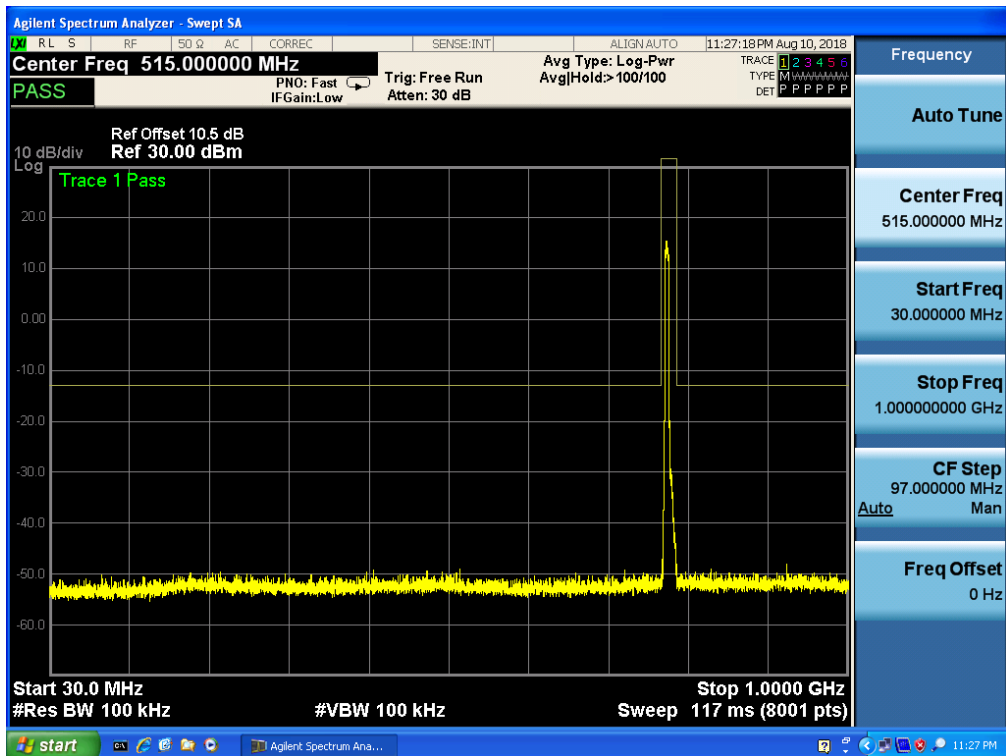


Band 4, UL Channel 20300, UL Frequency 1745.0, BW 20.0, NO. RB 100, RB POS. Low, 16-QAM



### 7.3 LTE BAND 13

*Band 13, UL Channel 23205, UL Frequency 779.5, BW 5.0, NO. RB 25, RB POS. Low, QPSK*



*Band 13, UL Channel 23205, UL Frequency 779.5, BW 5.0, NO. RB 25, RB POS. Low, QPSK*

