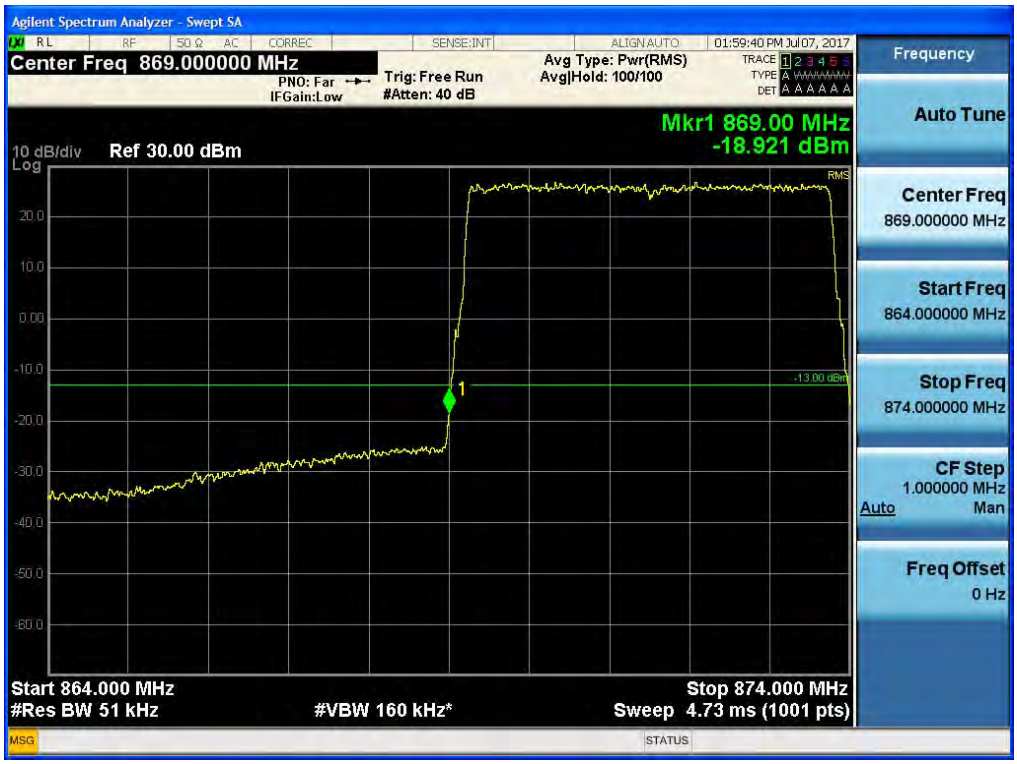
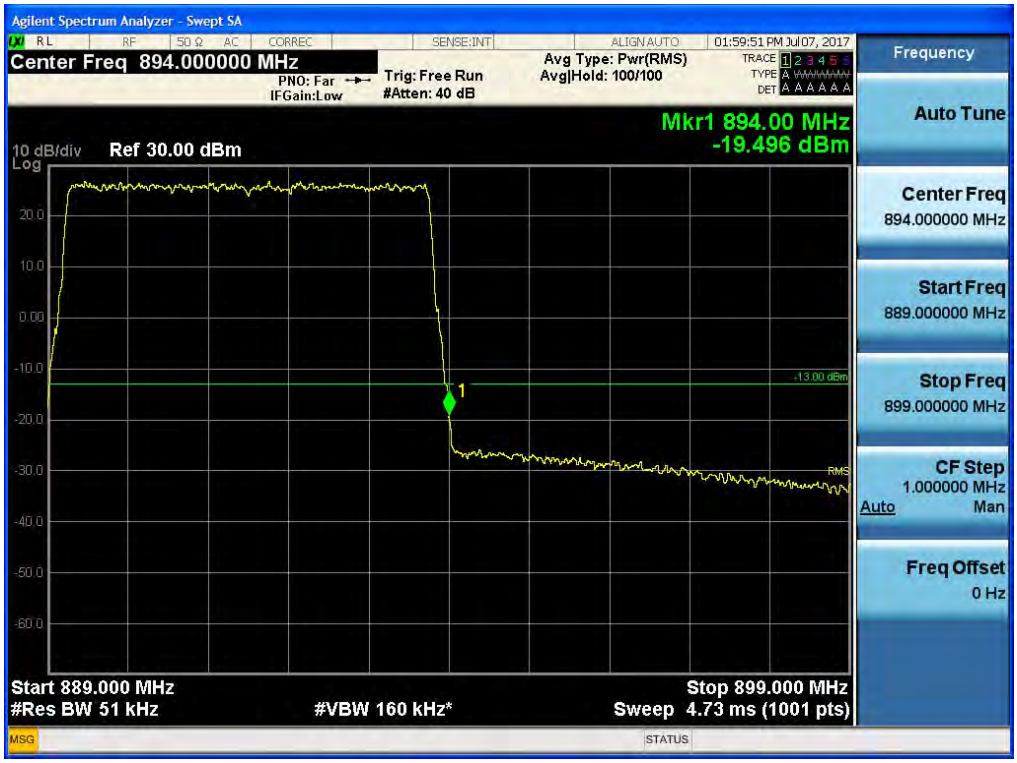
(256QAM Low)

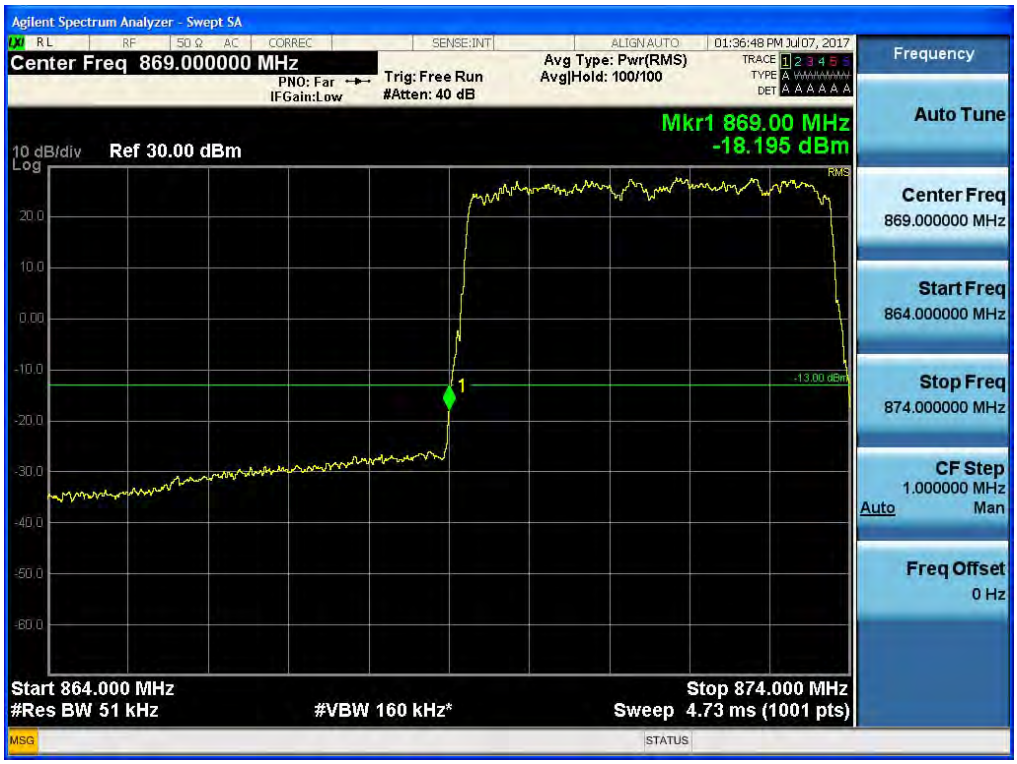


(256QAM High)

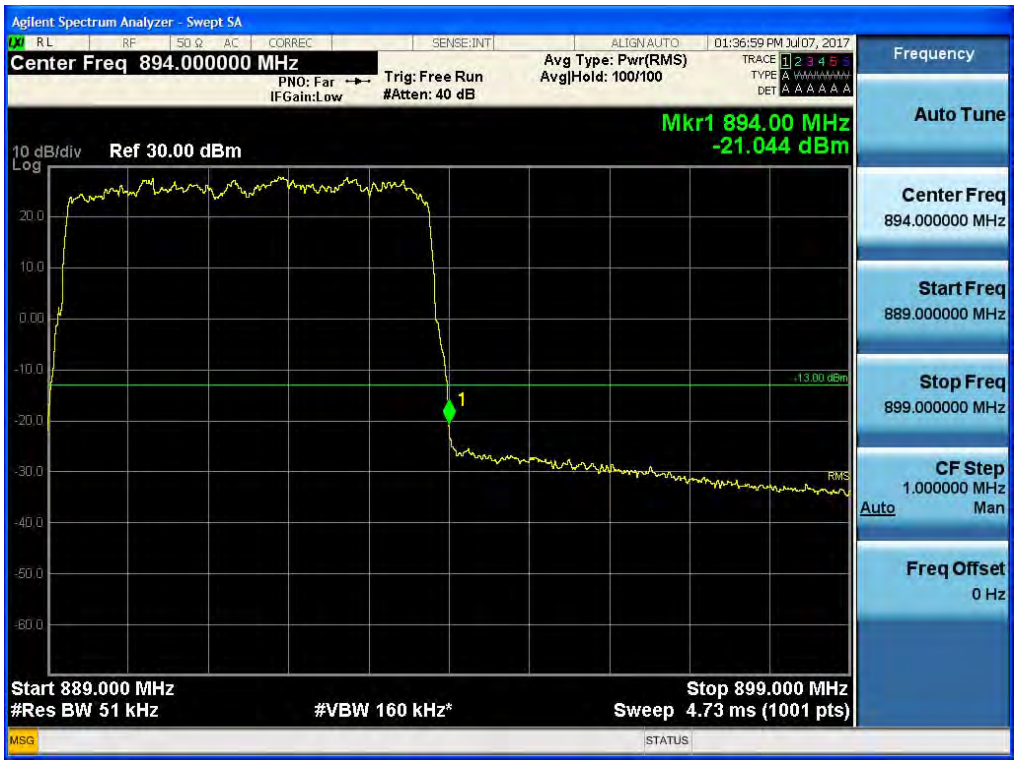


Test Data at Output Port 2 (2 paths)

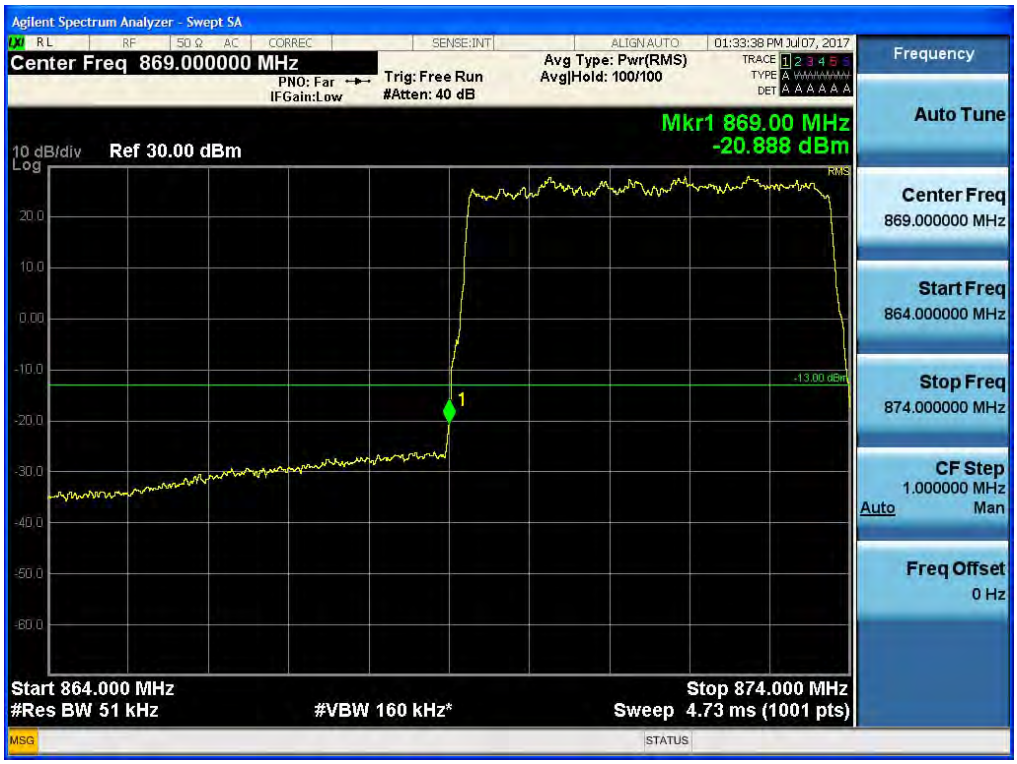
(QPSK Low)



(QPSK High)

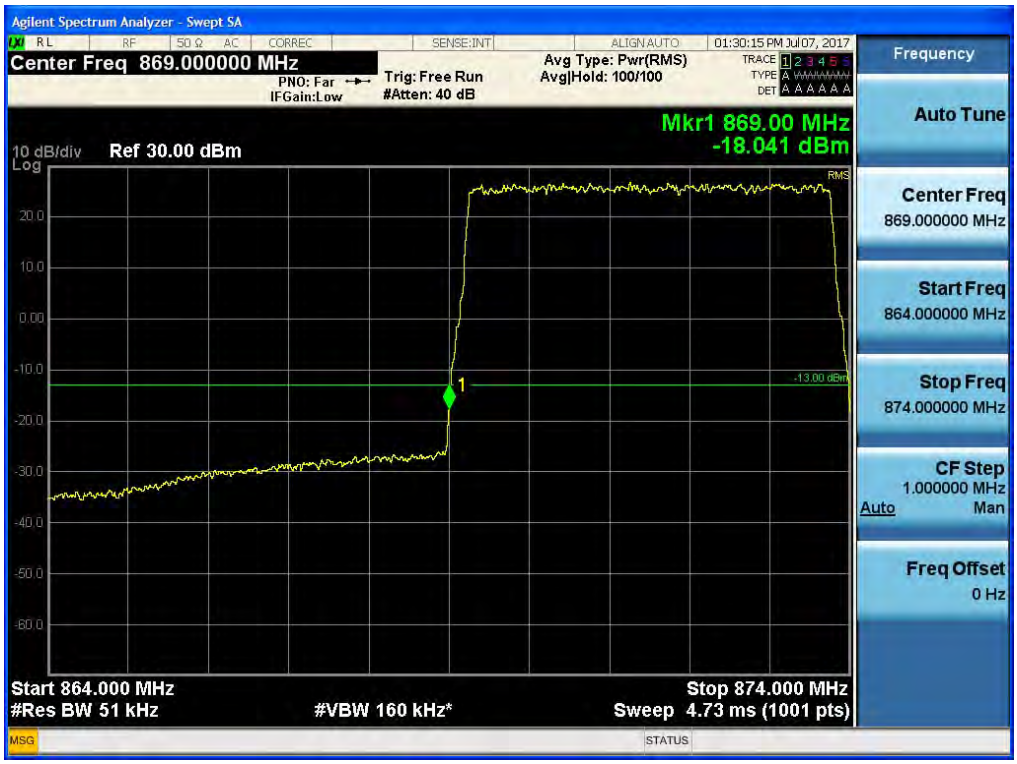


(16QAM Low)



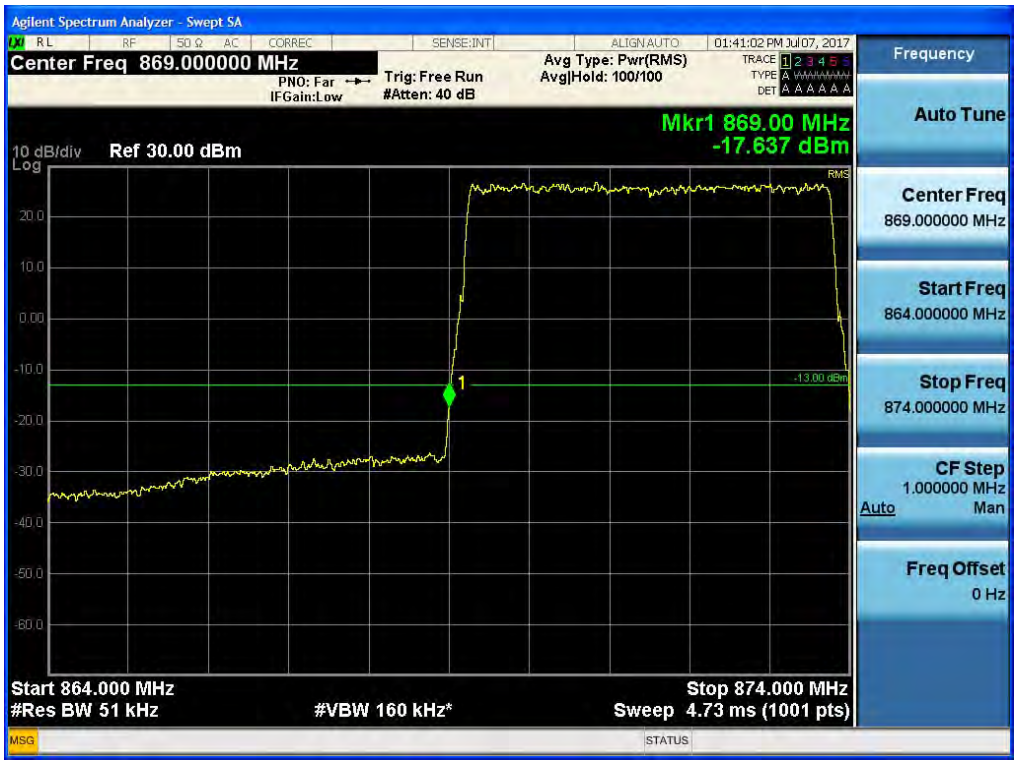
(16QAM High)

(64QAM Low)

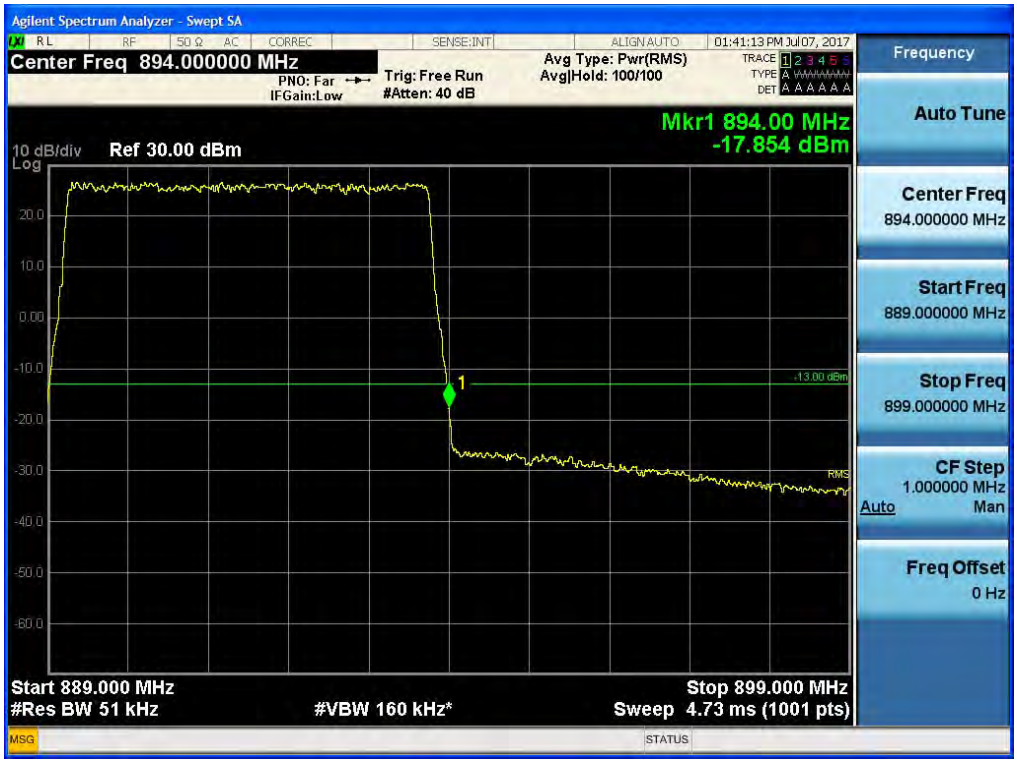


(64QAM High)

(256QAM Low)

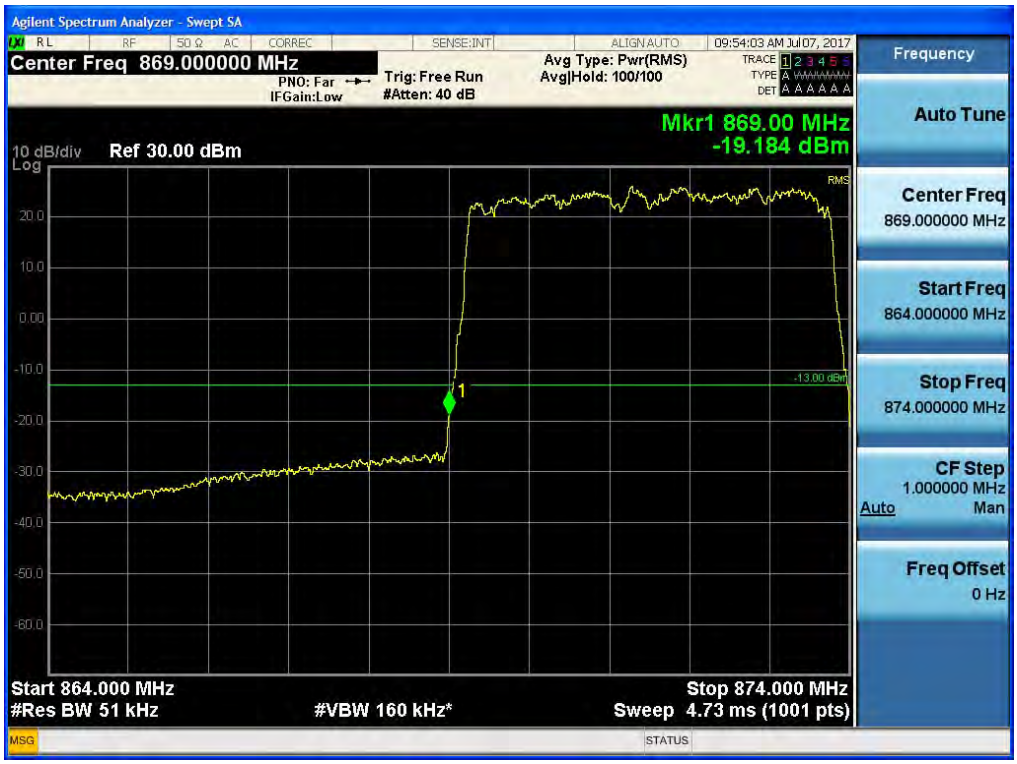


(256QAM High)

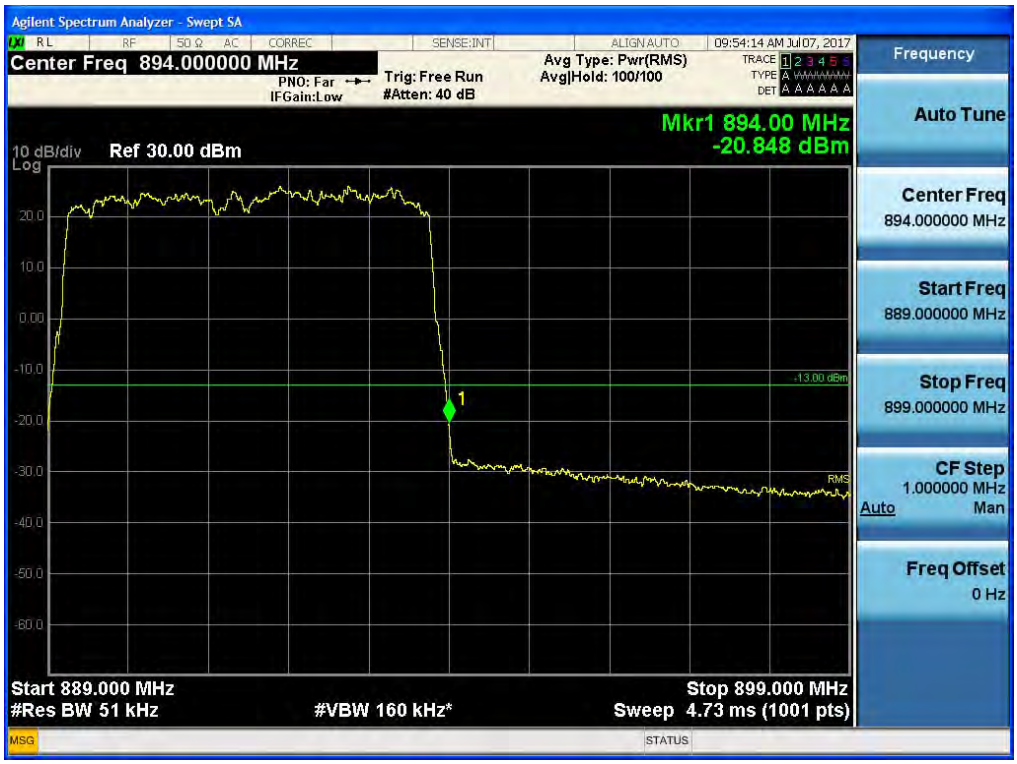


Test Data at Output Port 3 (4 paths)

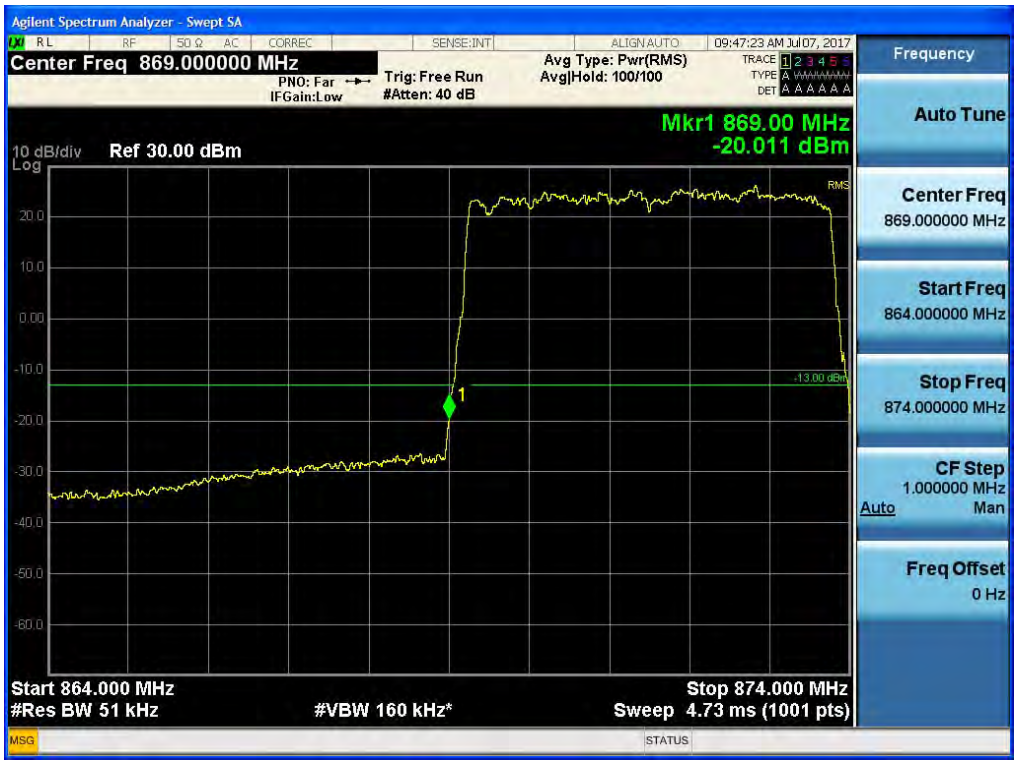
(QPSK Low)



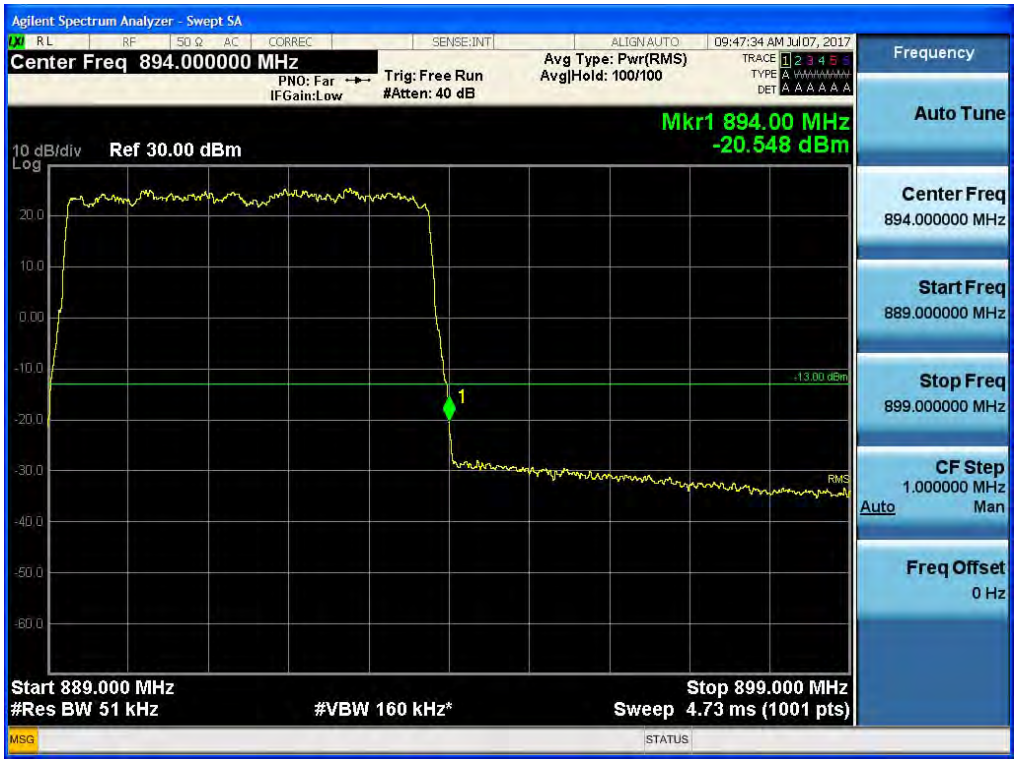
(QPSK High)



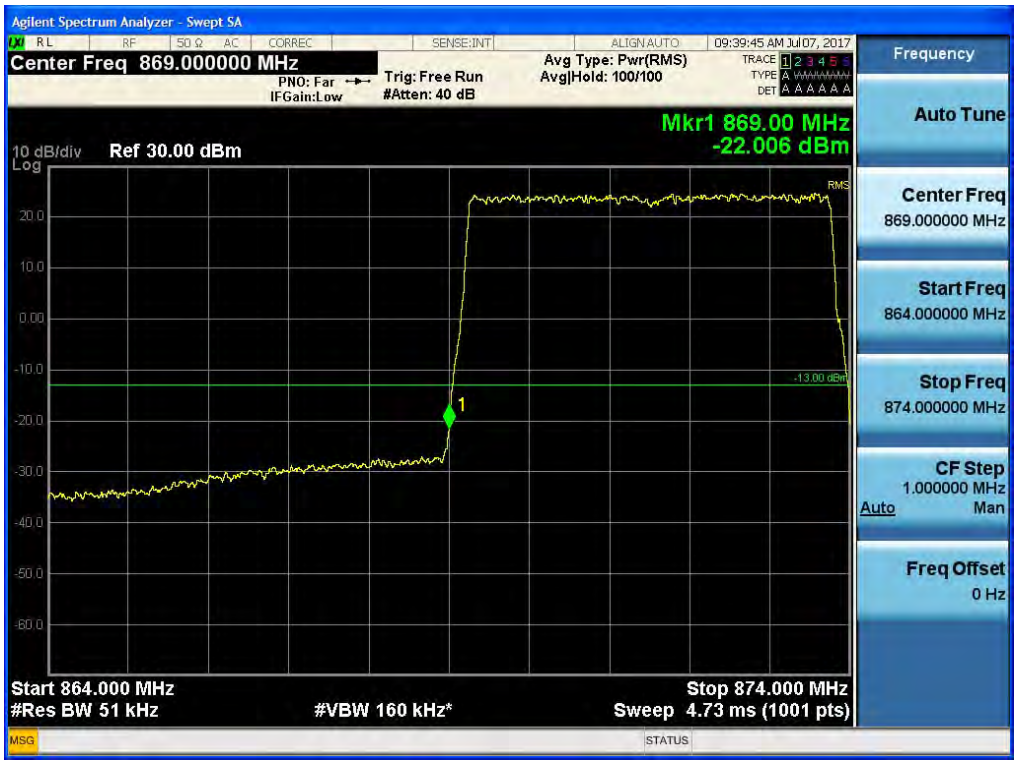
(16QAM Low)



(16QAM High)

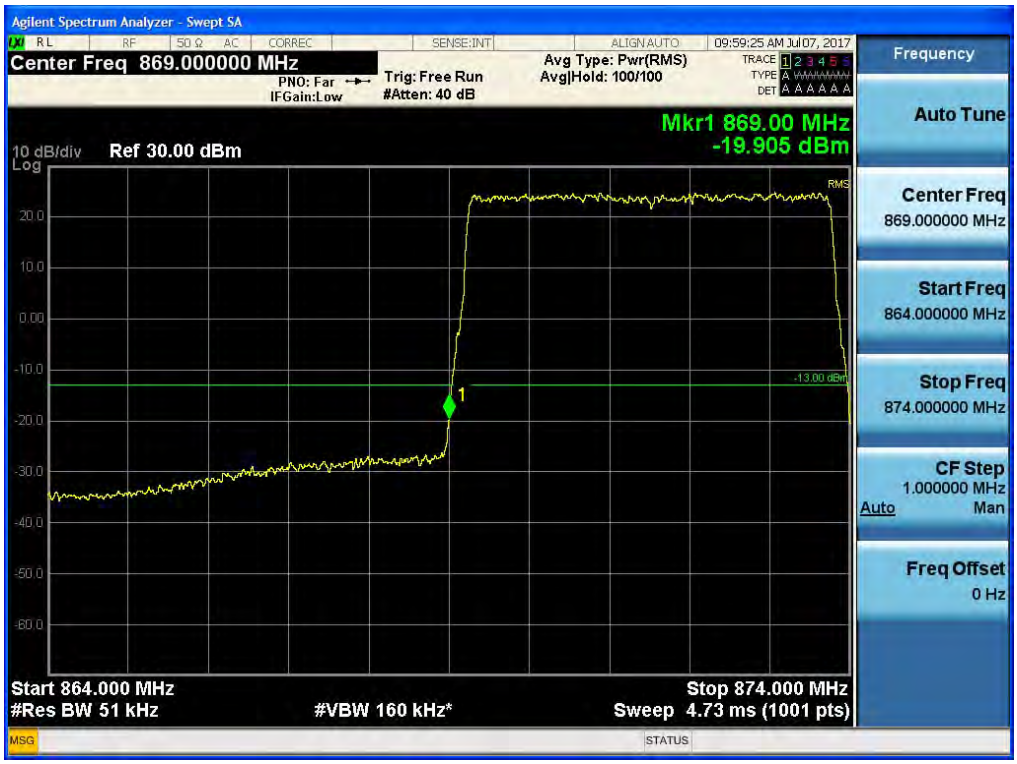


(64QAM Low)

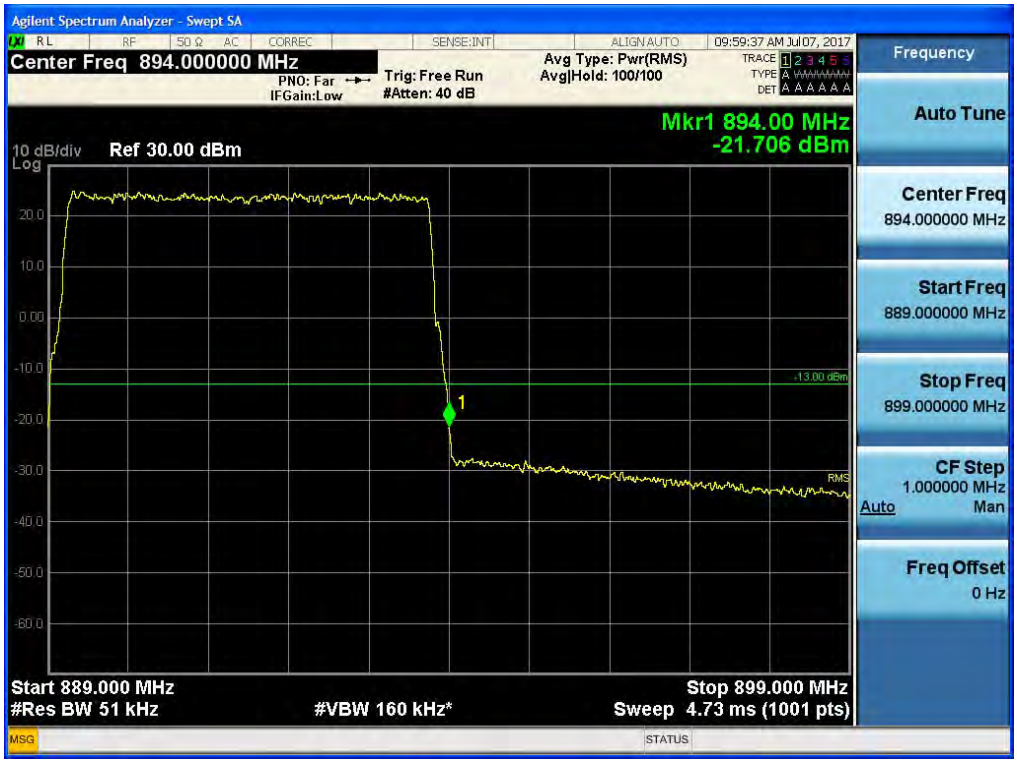


(64QAM High)

(256QAM Low)

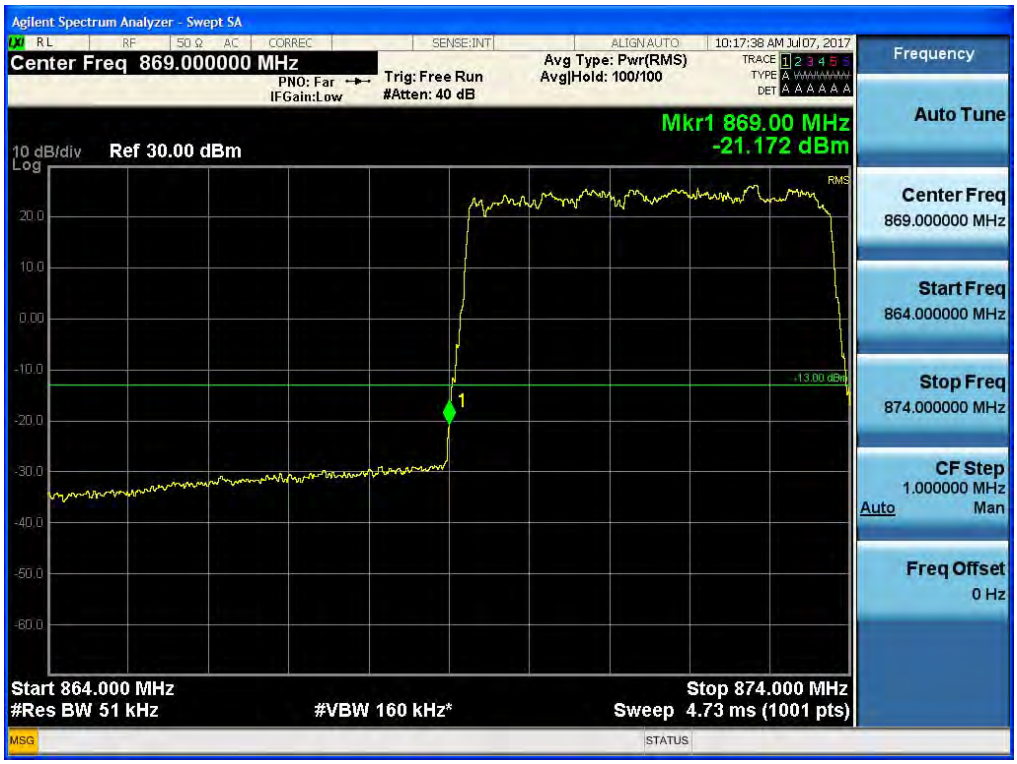


(256QAM High)

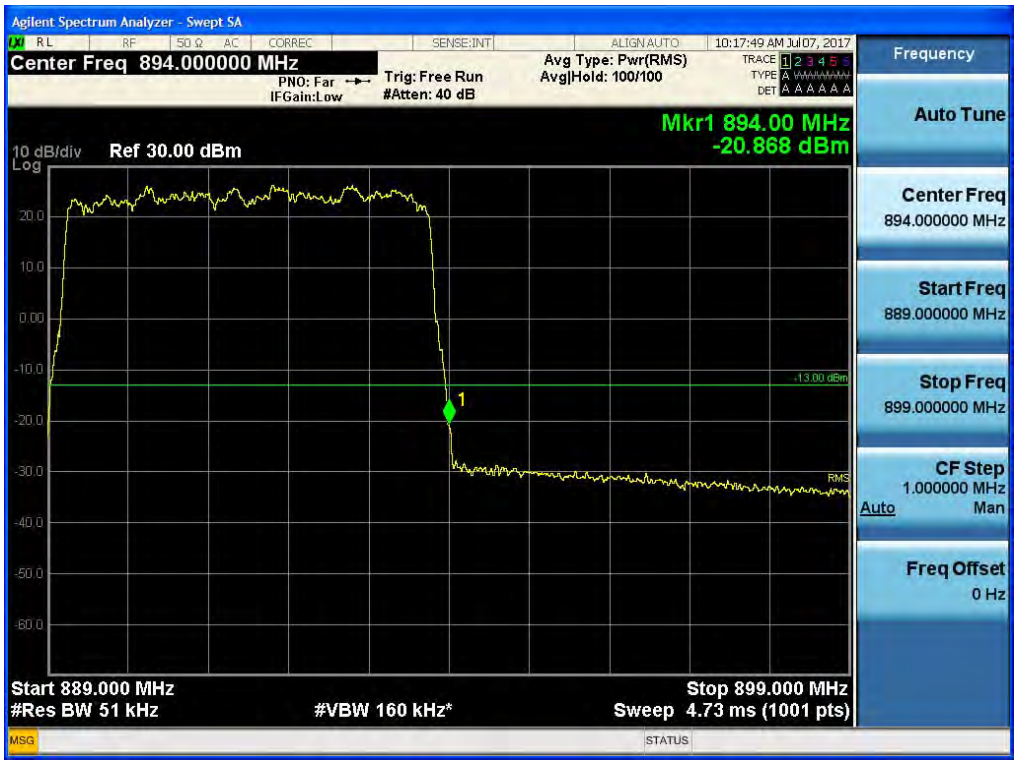


Test Data at Output Port 4 (4 paths)

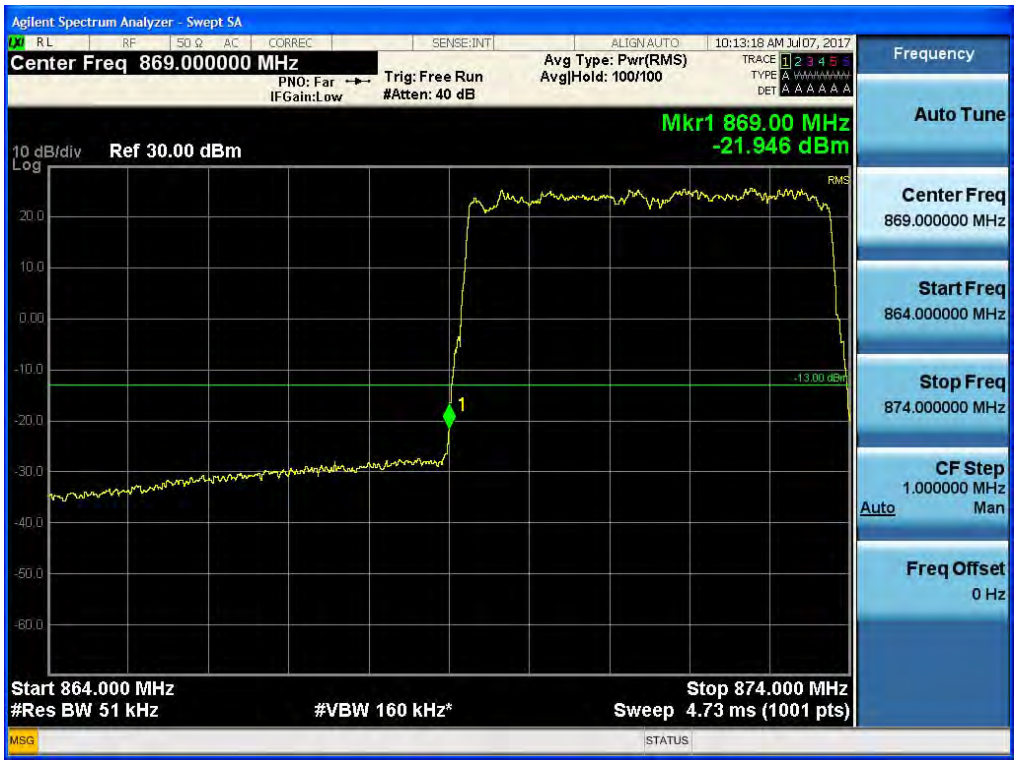
(QPSK Low)



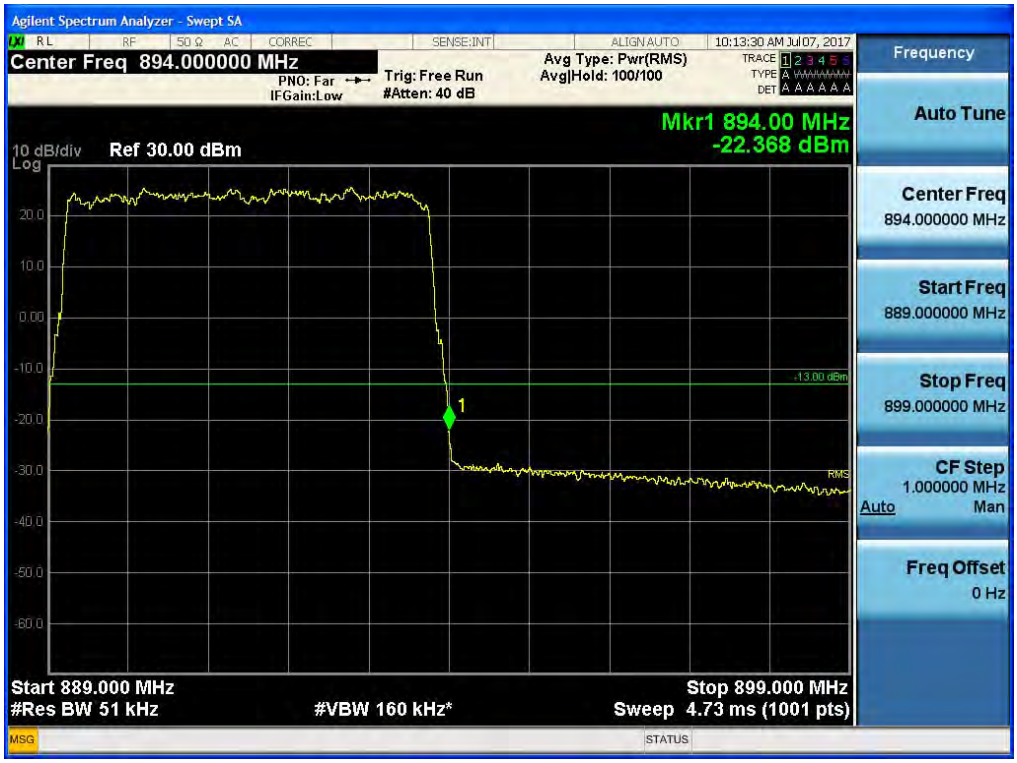
(QPSK High)



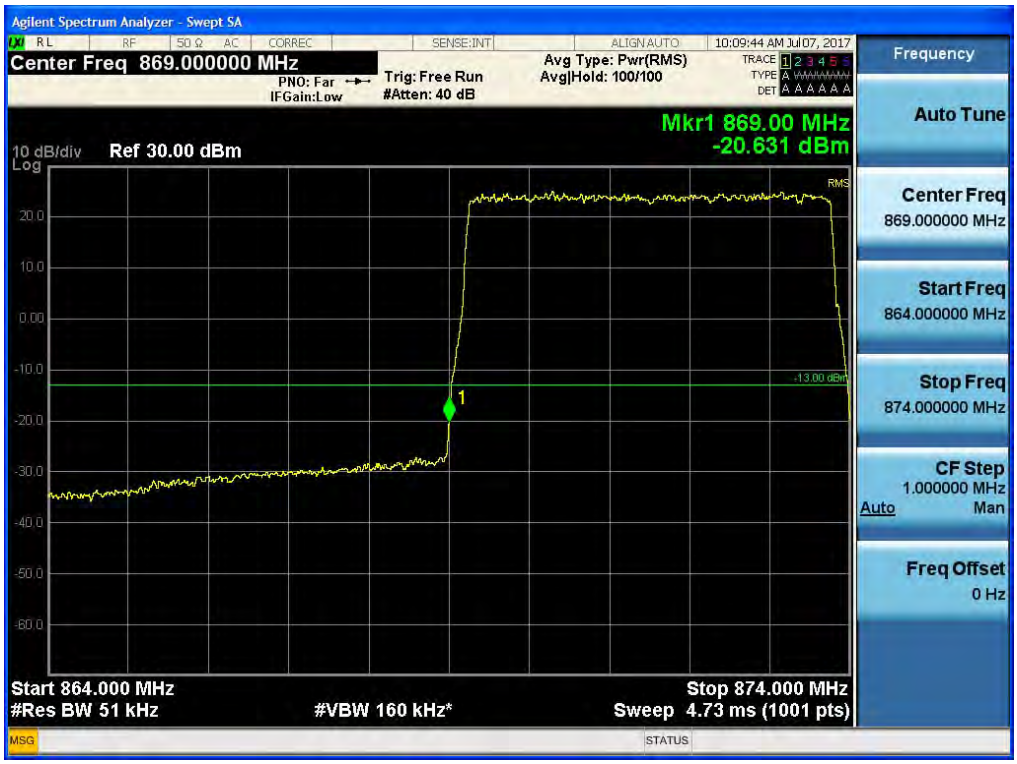
(16QAM Low)



(16QAM High)

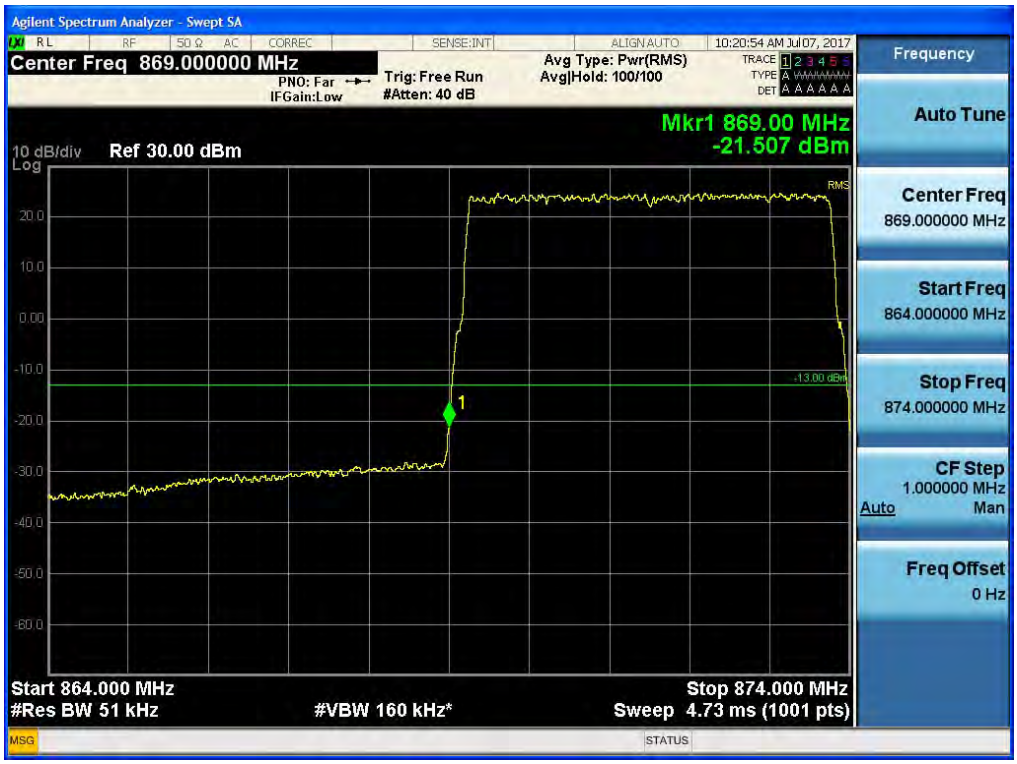


(64QAM Low)

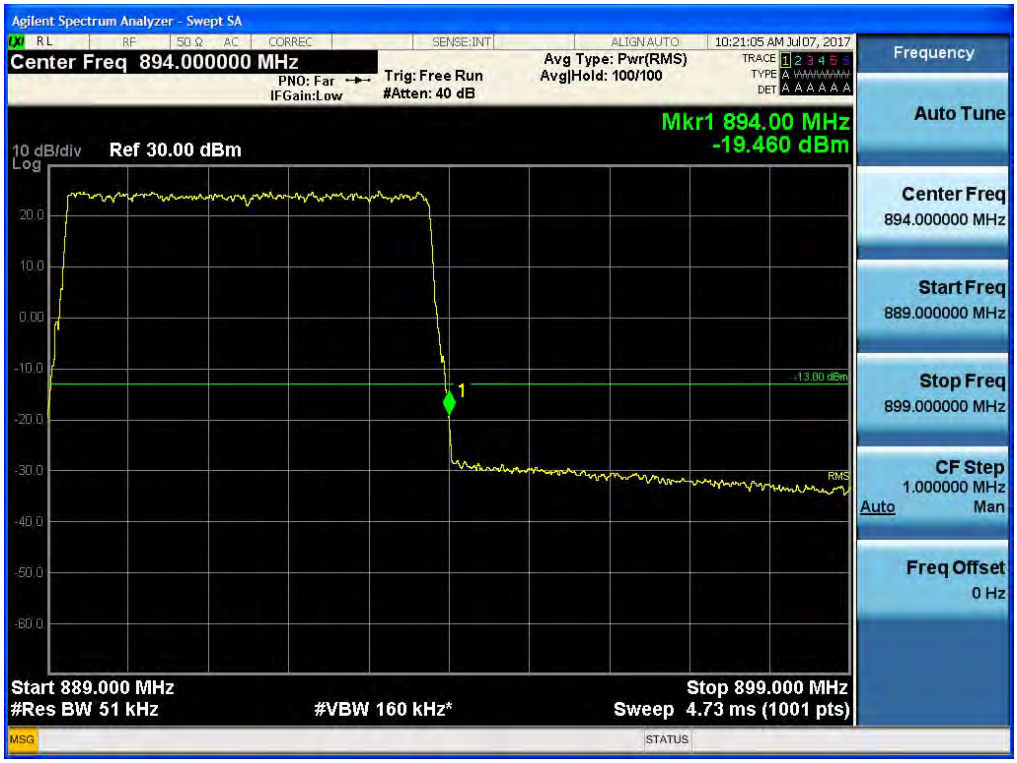


(64QAM High)

(256QAM Low)



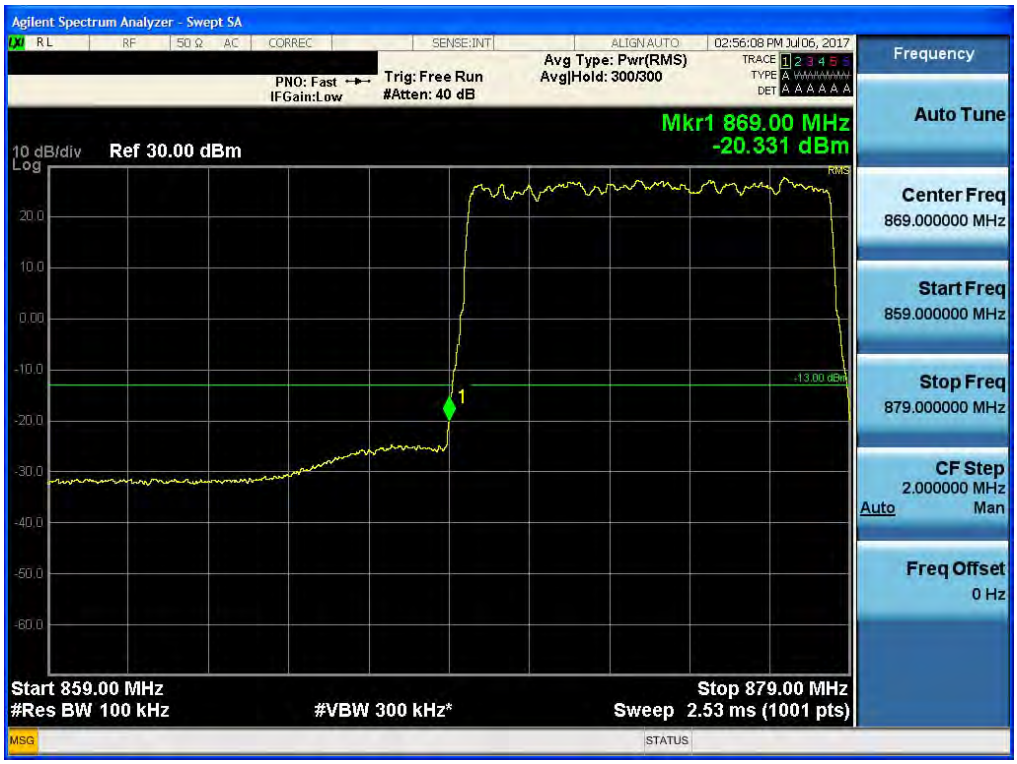
(256QAM High)



LTE Band 5_2 Carrier (10 MHz)

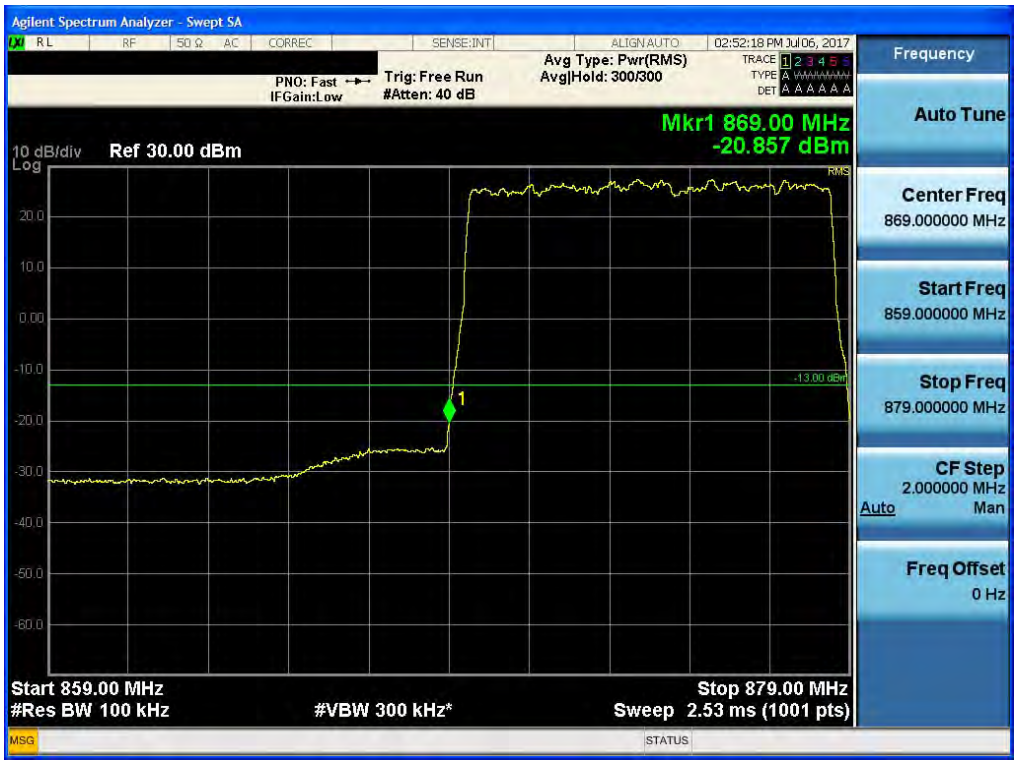
Test Data at Output Port 1 (2 paths)

(QPSK Low)



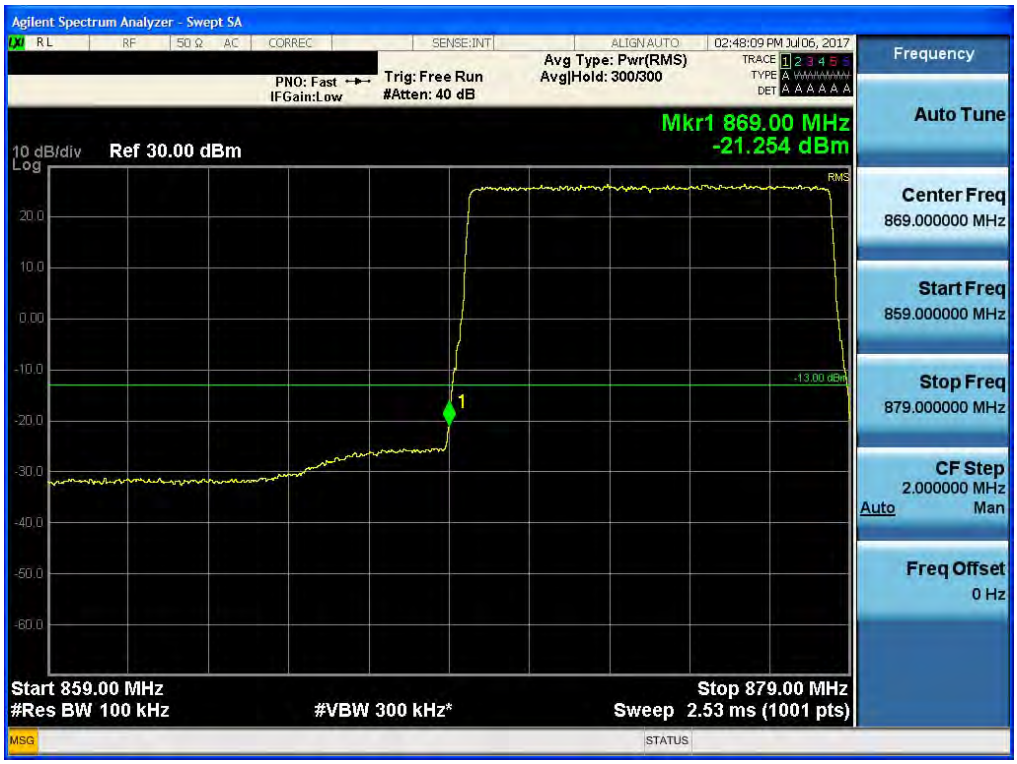
(QPSK High)

(16QAM Low)



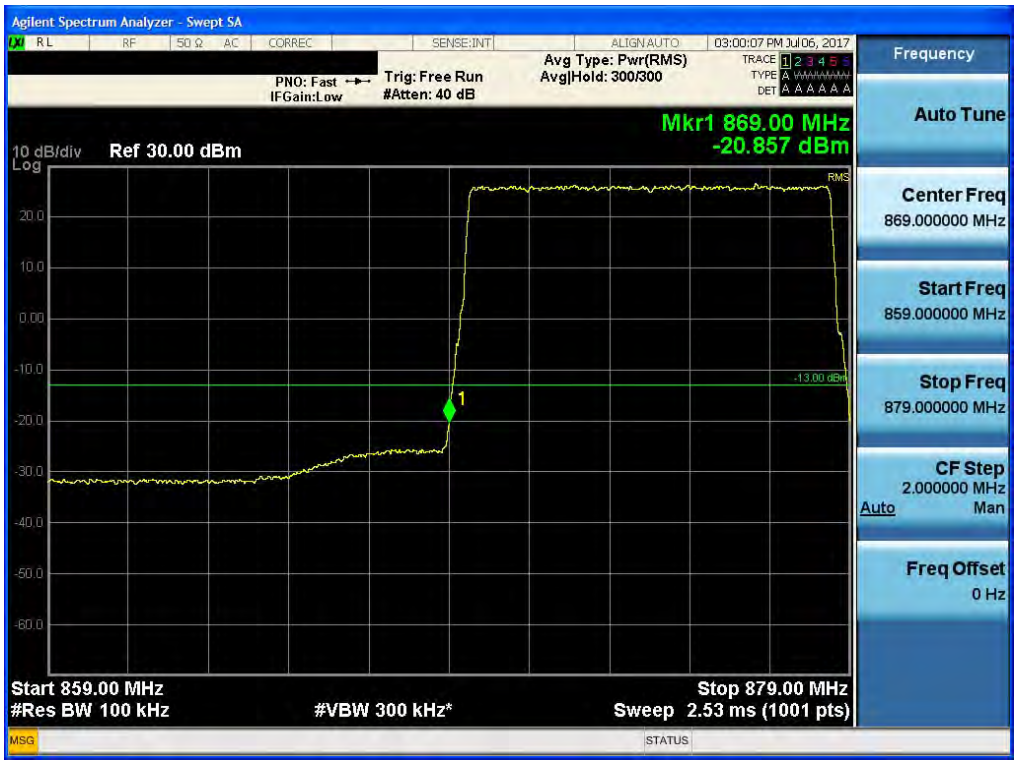
(16QAM High)

(64QAM Low)

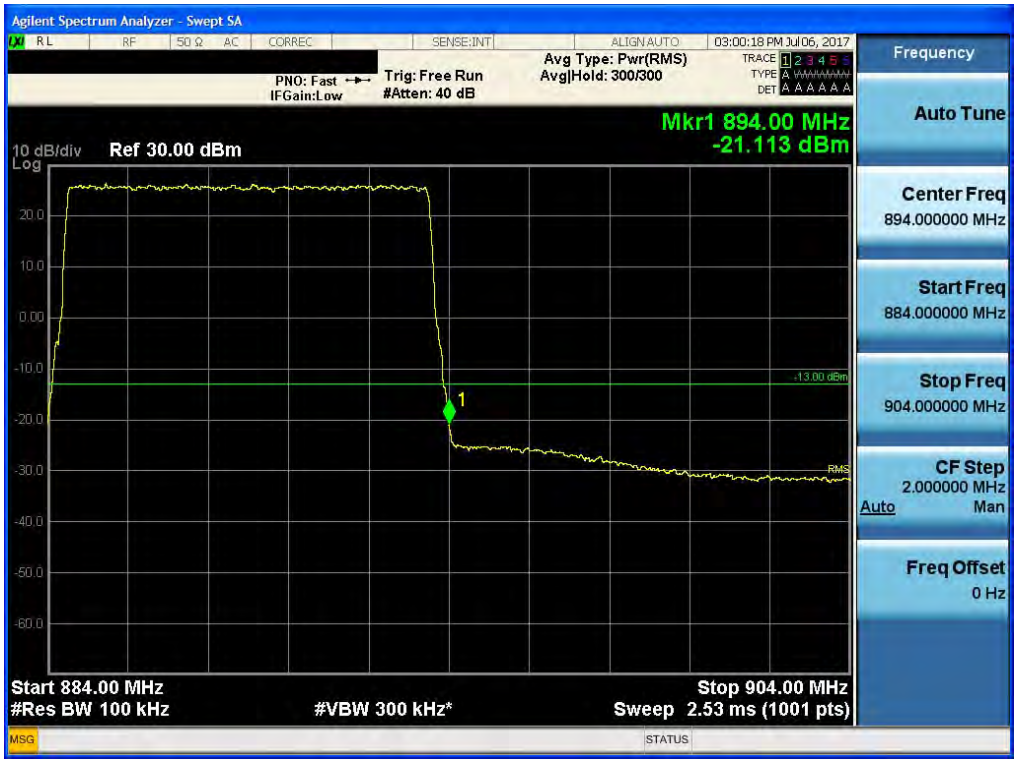


(64QAM High)

(256QAM Low)



(256QAM High)

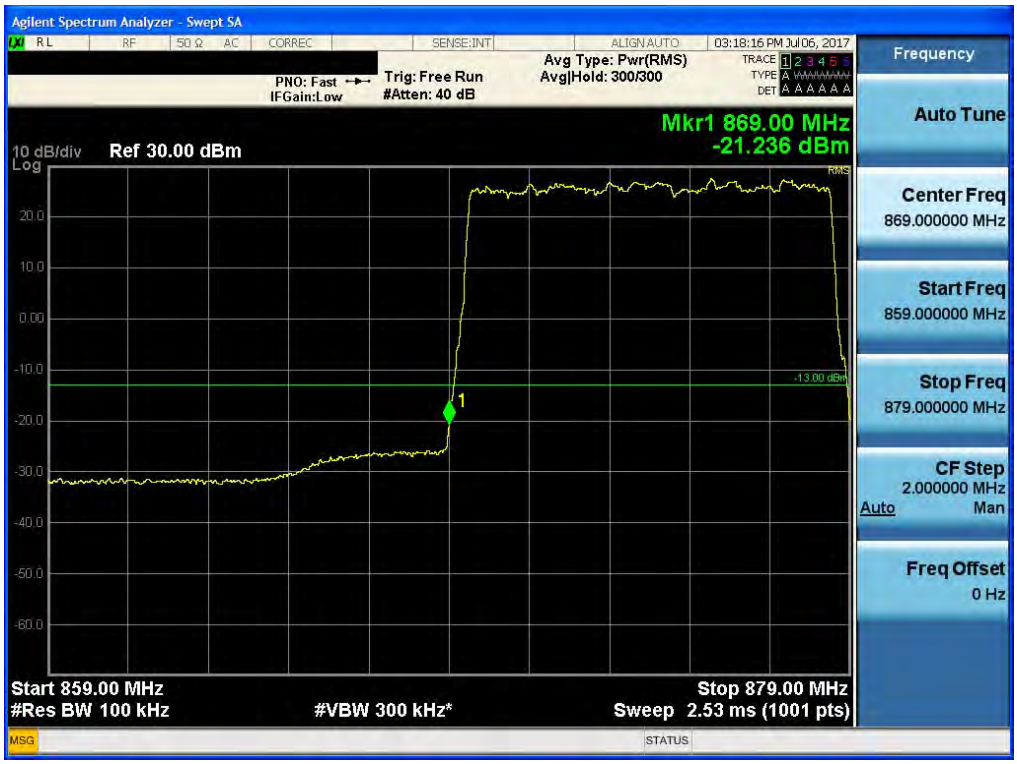


Test Data at Output Port 2 (2 paths)

(QPSK Low)

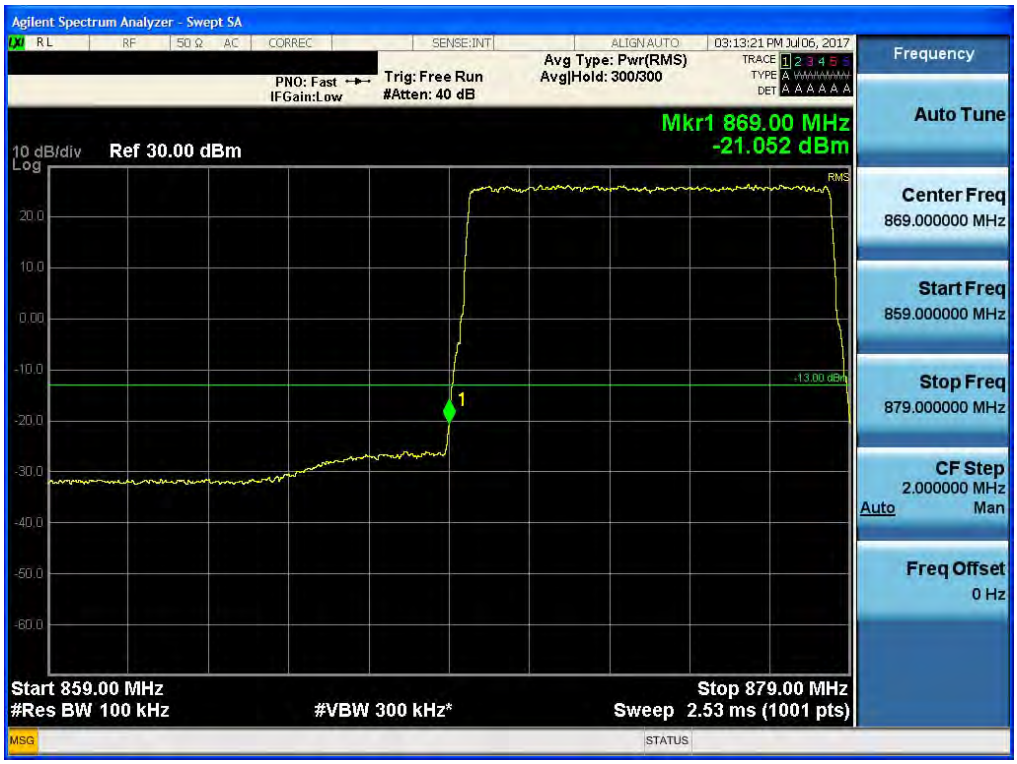
(QPSK High)

(16QAM Low)

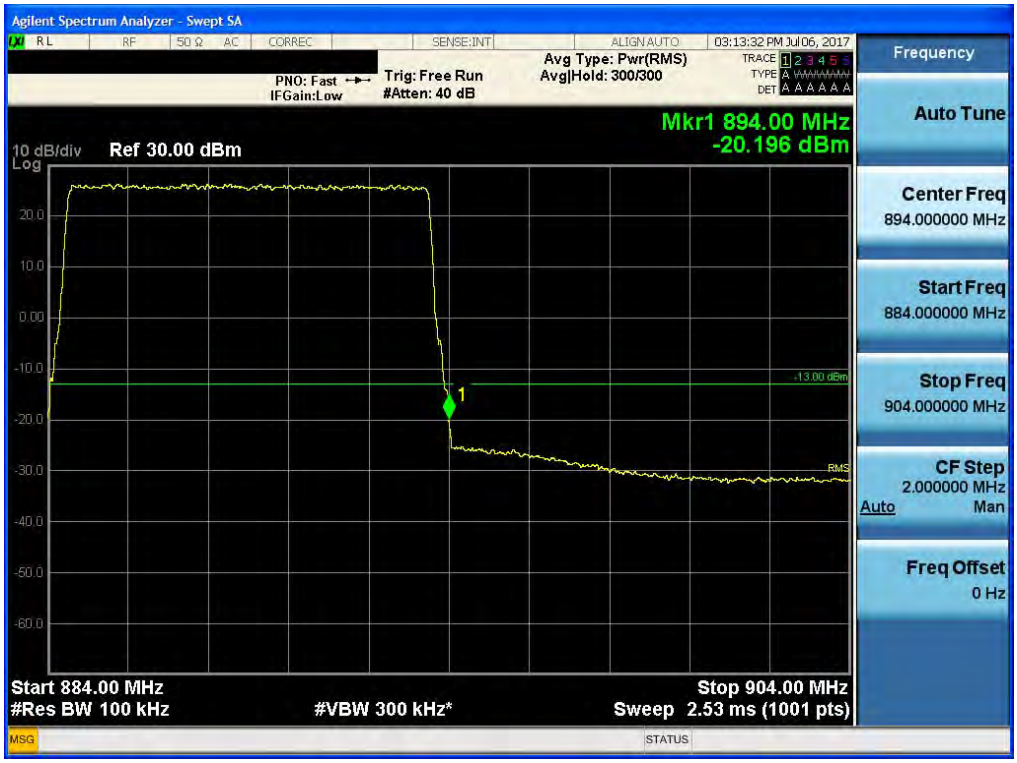


(16QAM High)

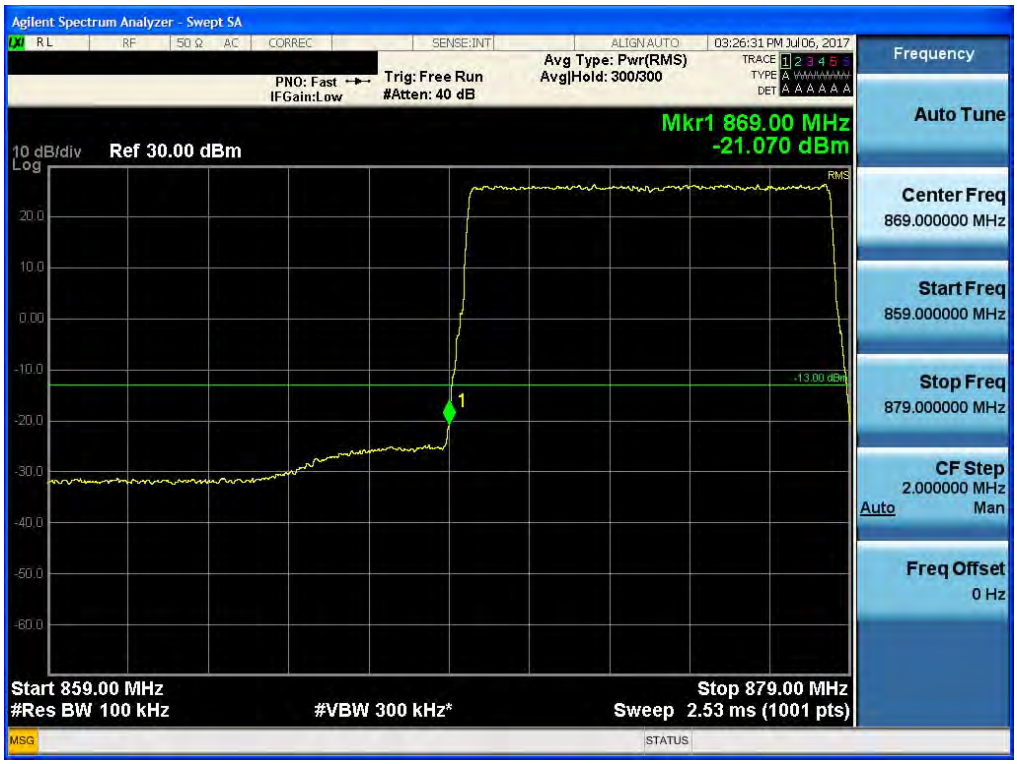
(64QAM Low)



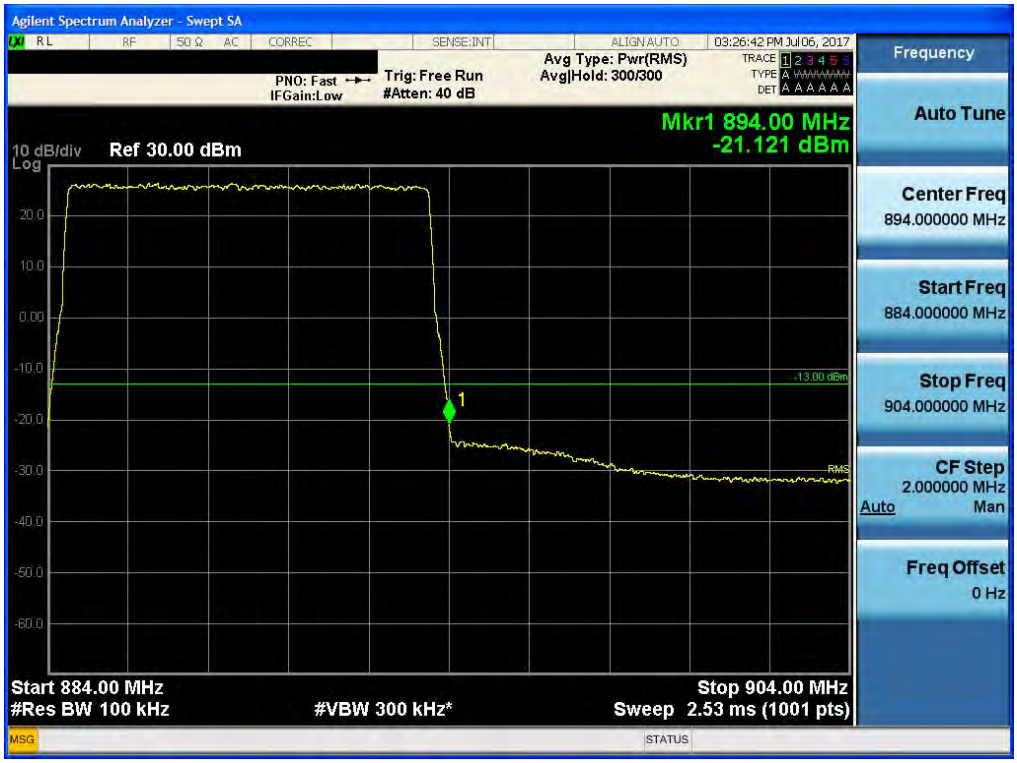
(64QAM High)



(256QAM Low)

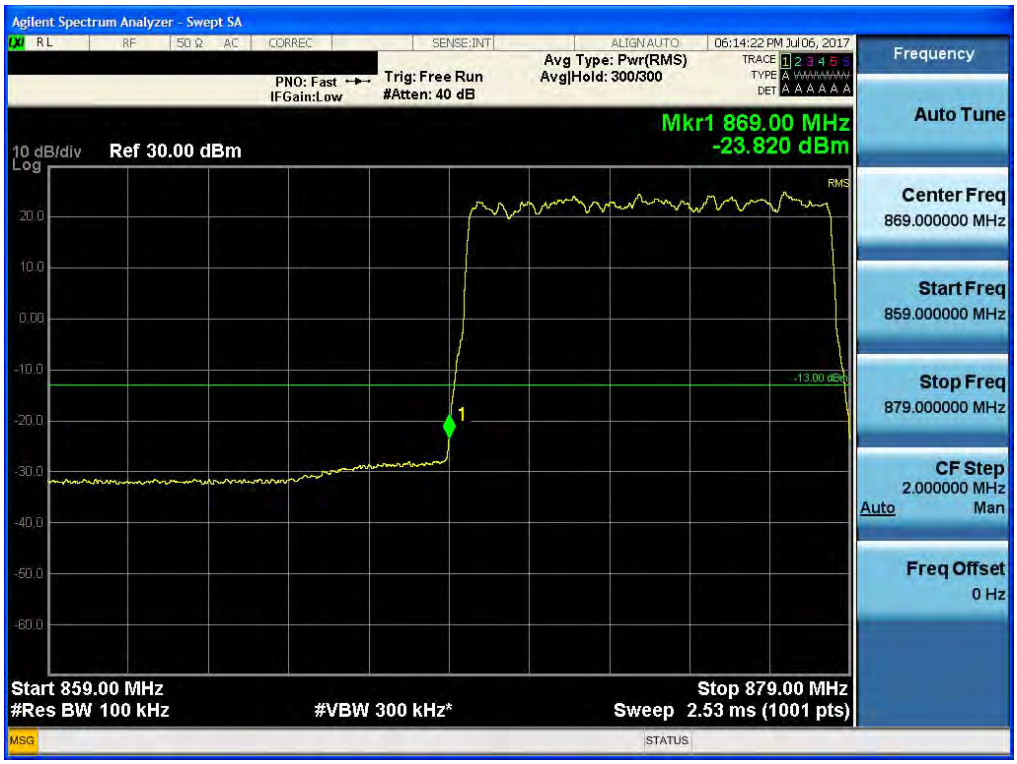


(256QAM High)



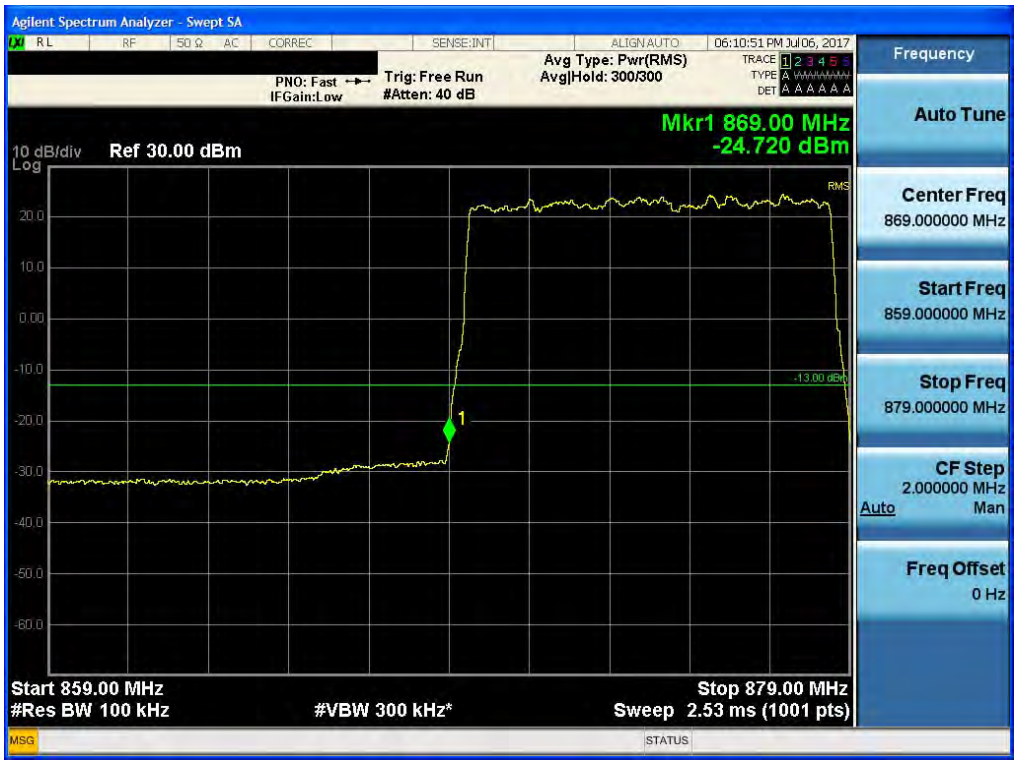
Test Data at Output Port 3 (4 paths)

(QPSK Low)



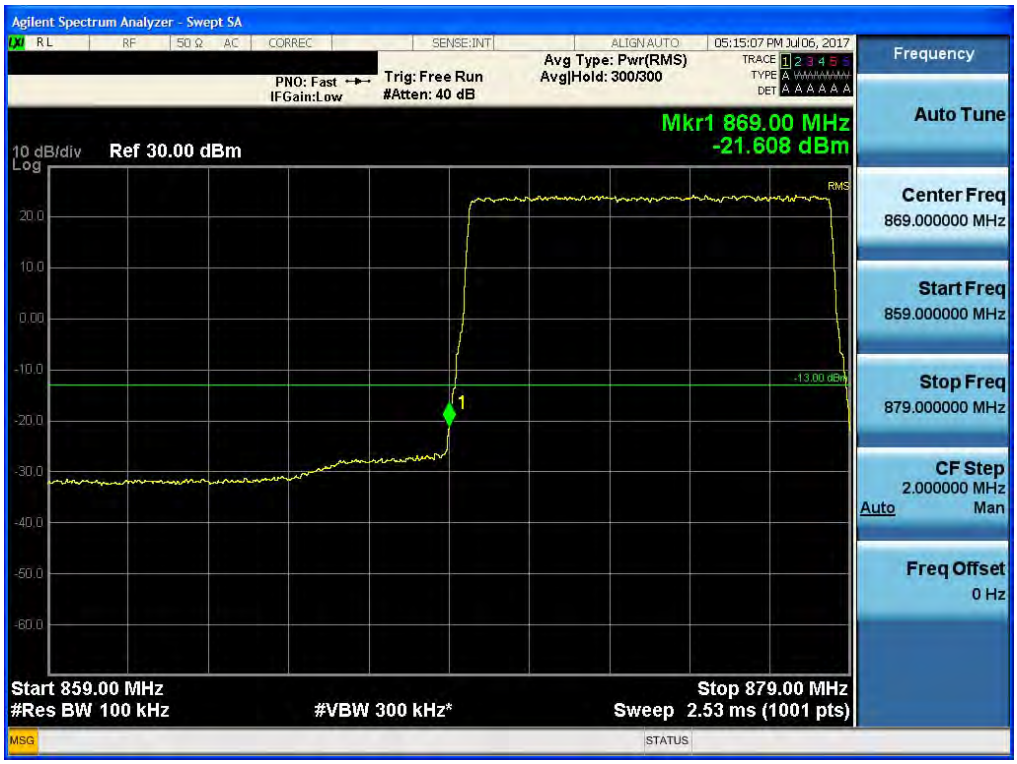
(QPSK High)

(16QAM Low)



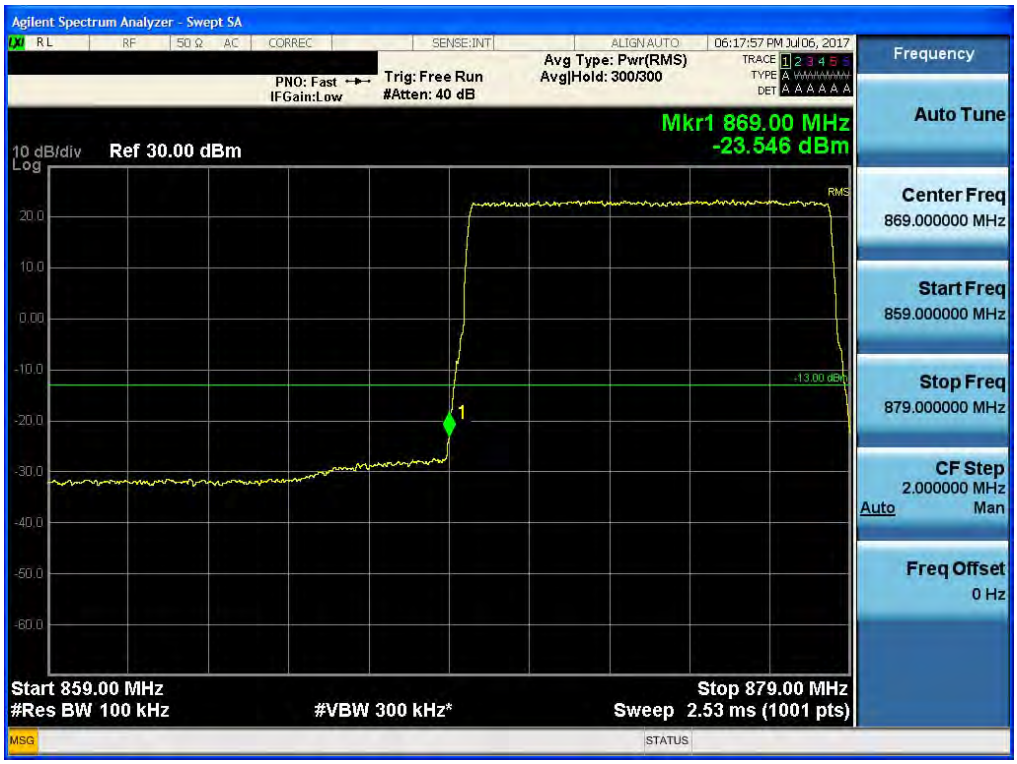
(16QAM High)

(64QAM Low)

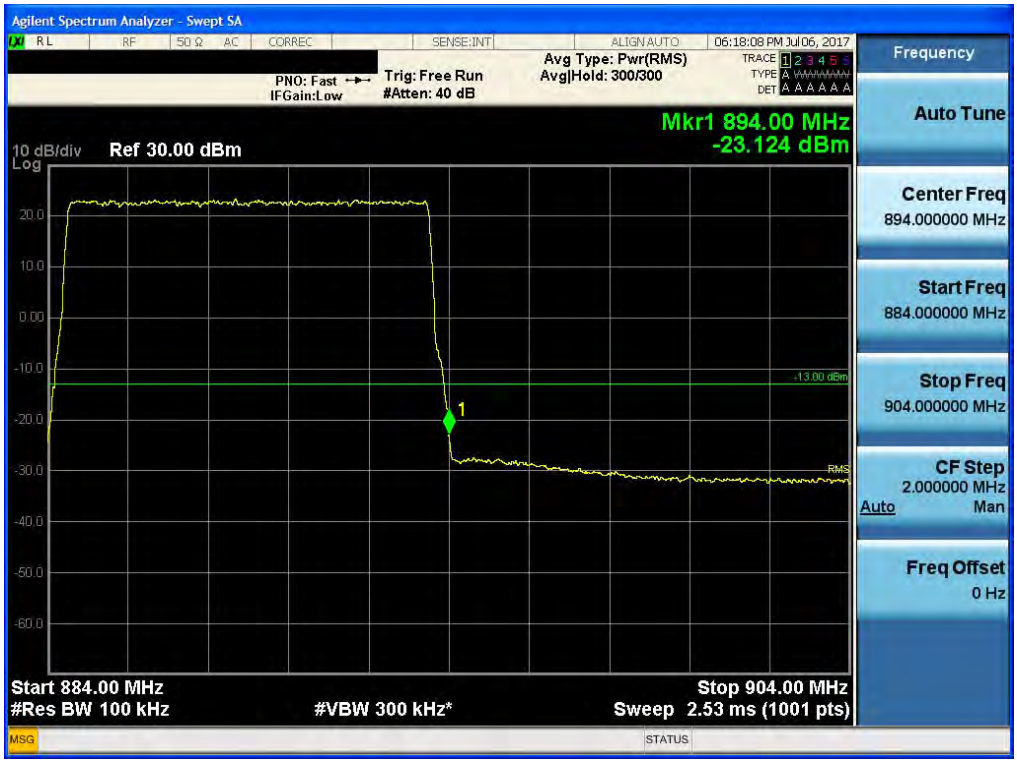


(64QAM High)

(256QAM Low)



(256QAM High)



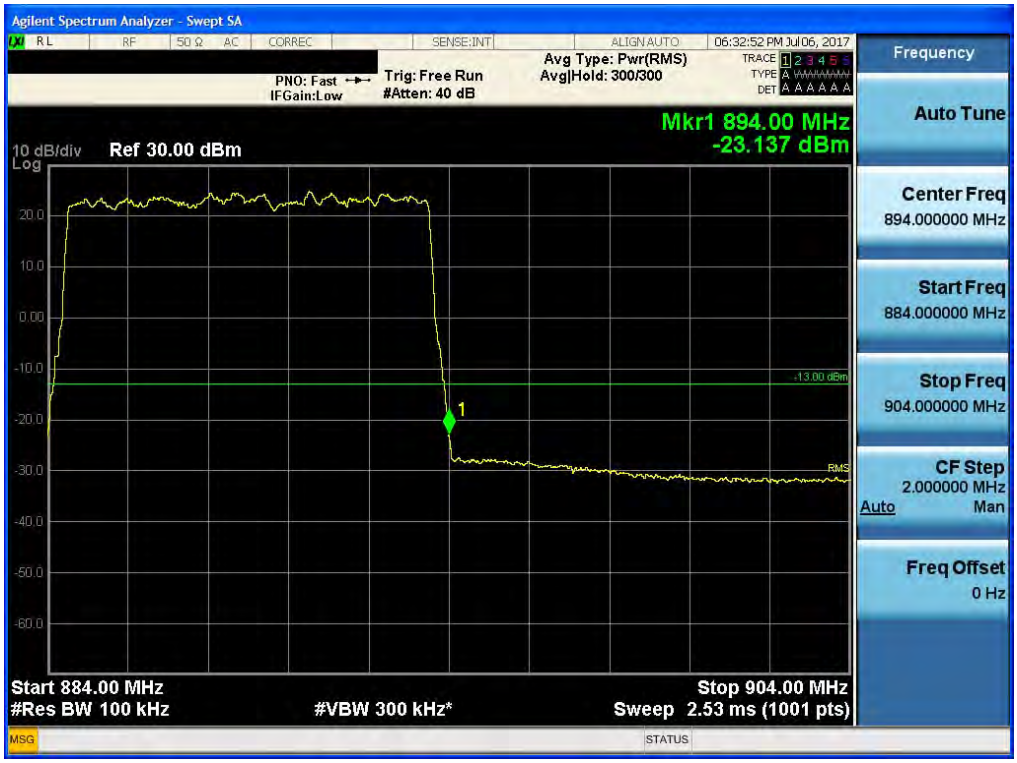
Test Data at Output Port 4 (4 paths)

(QPSK Low)

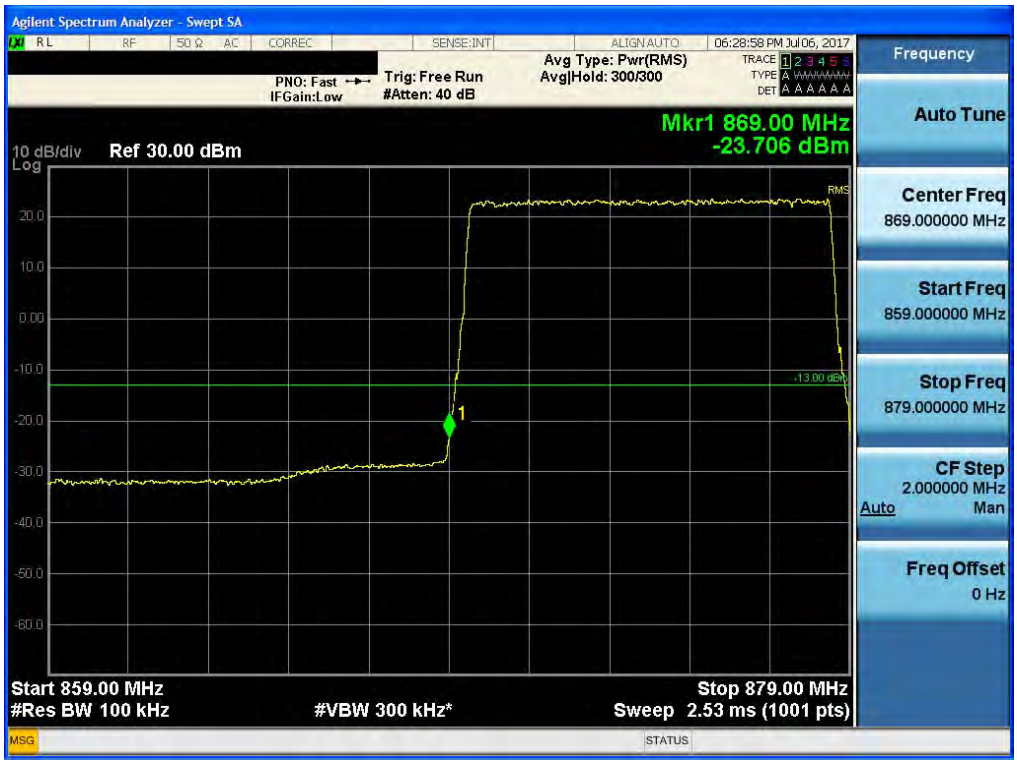
(QPSK High)

(16QAM Low)

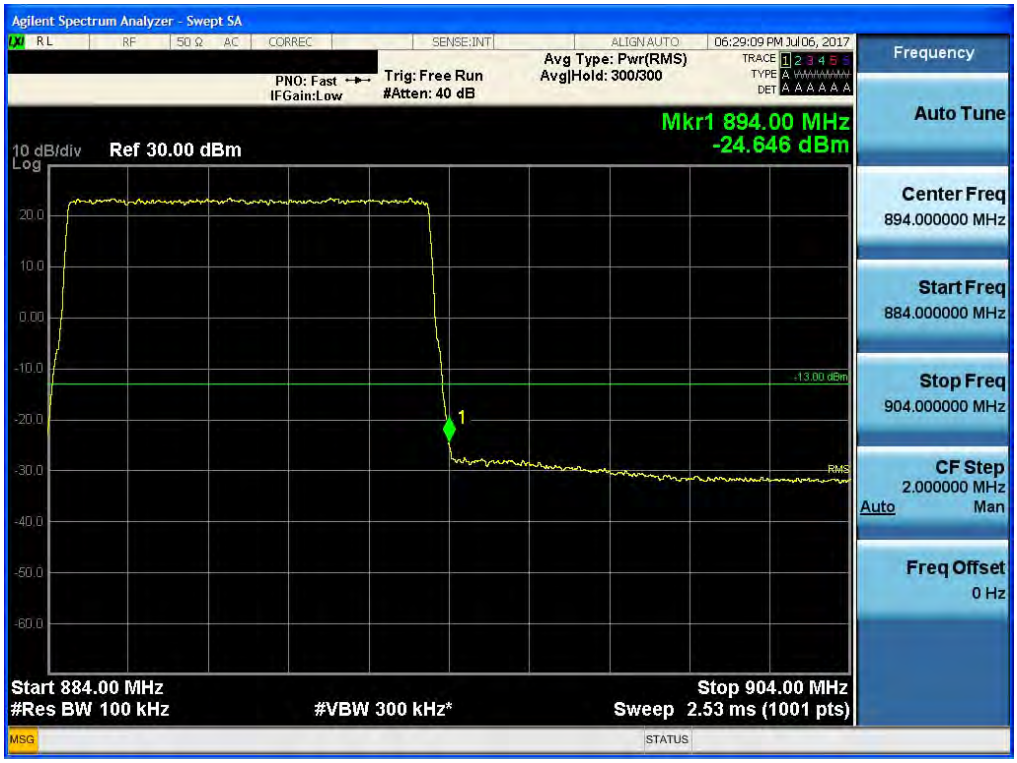
(16QAM High)



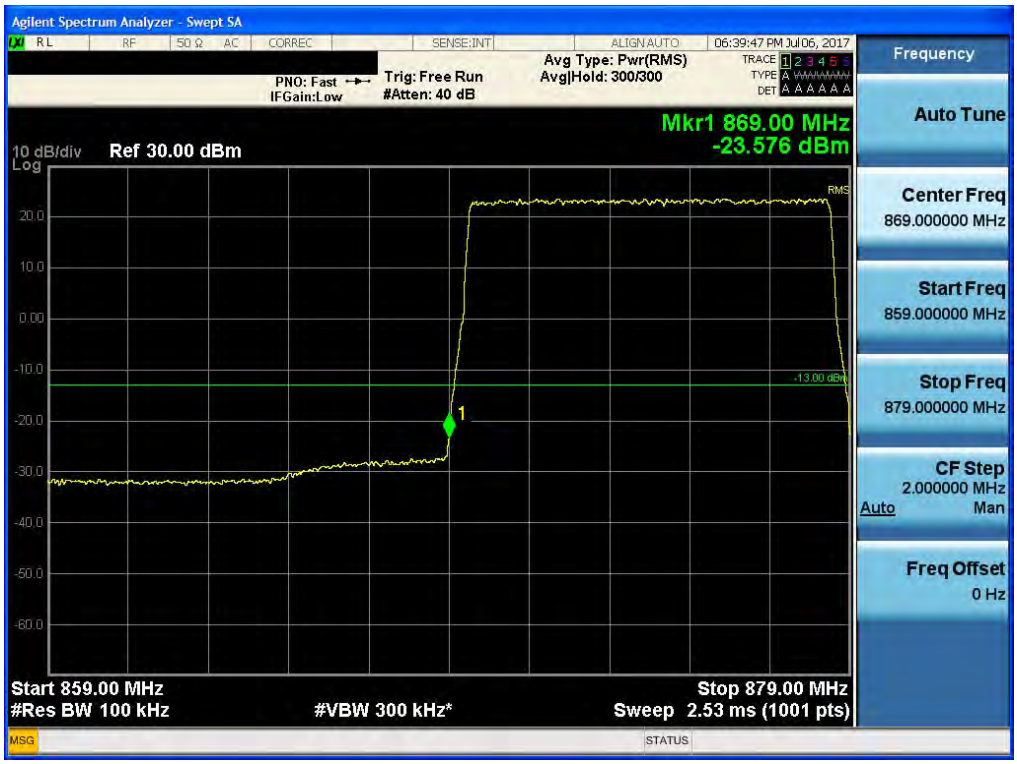
(64QAM Low)



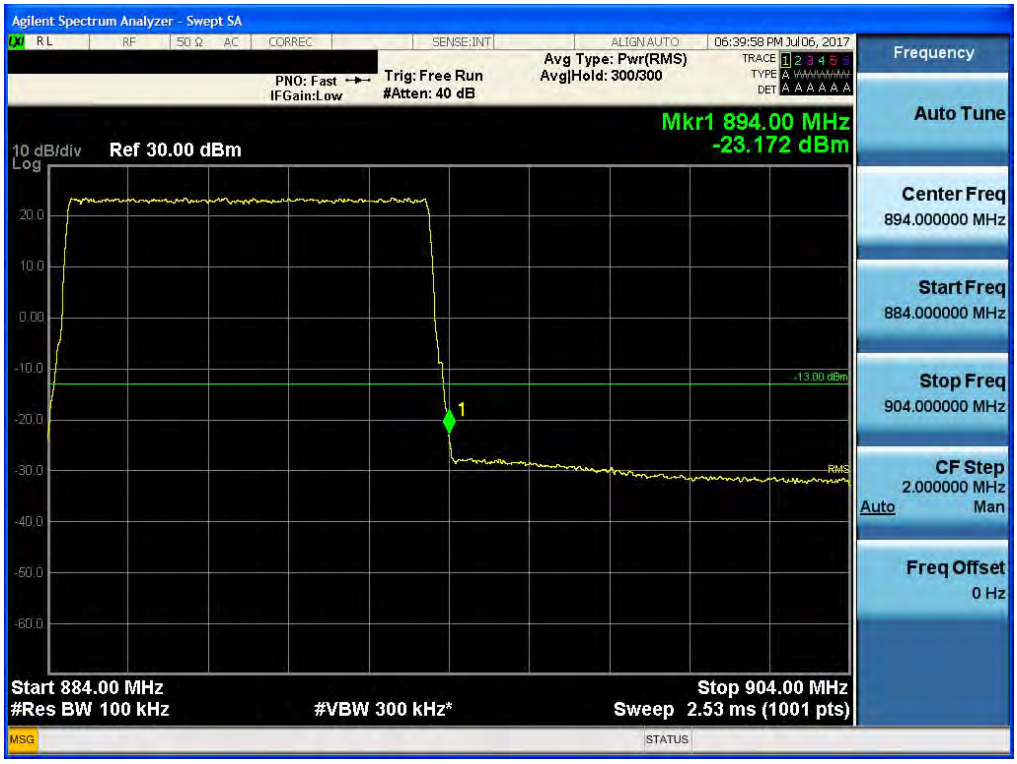
(64QAM High)



(256QAM Low)



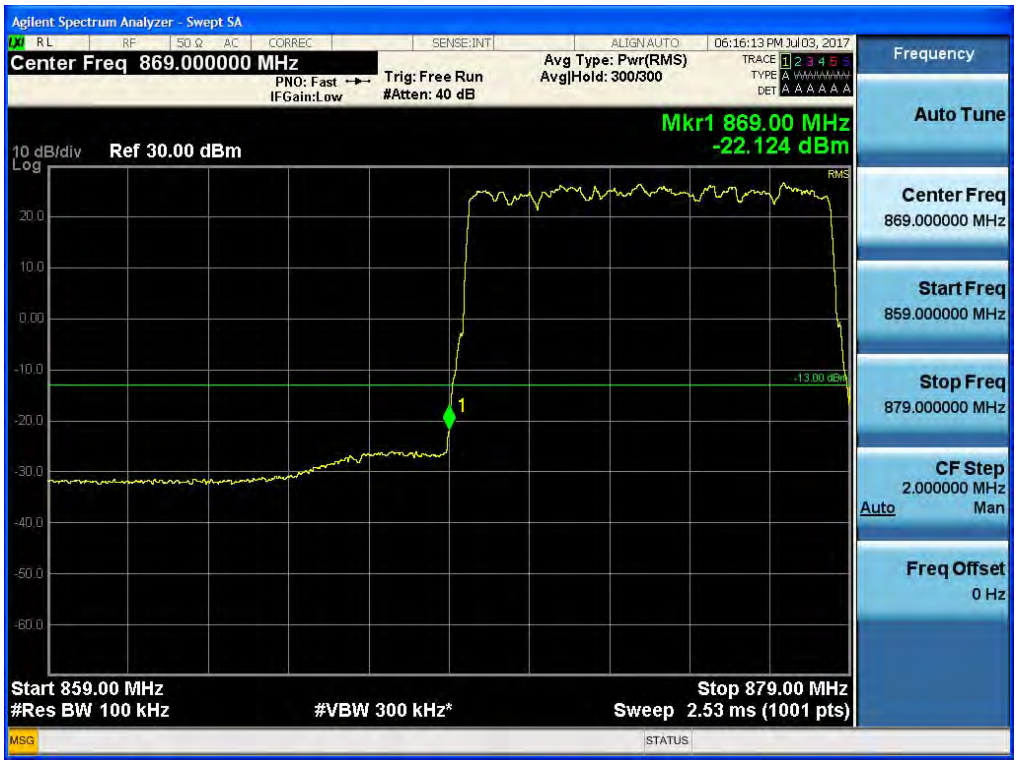
(256QAM High)



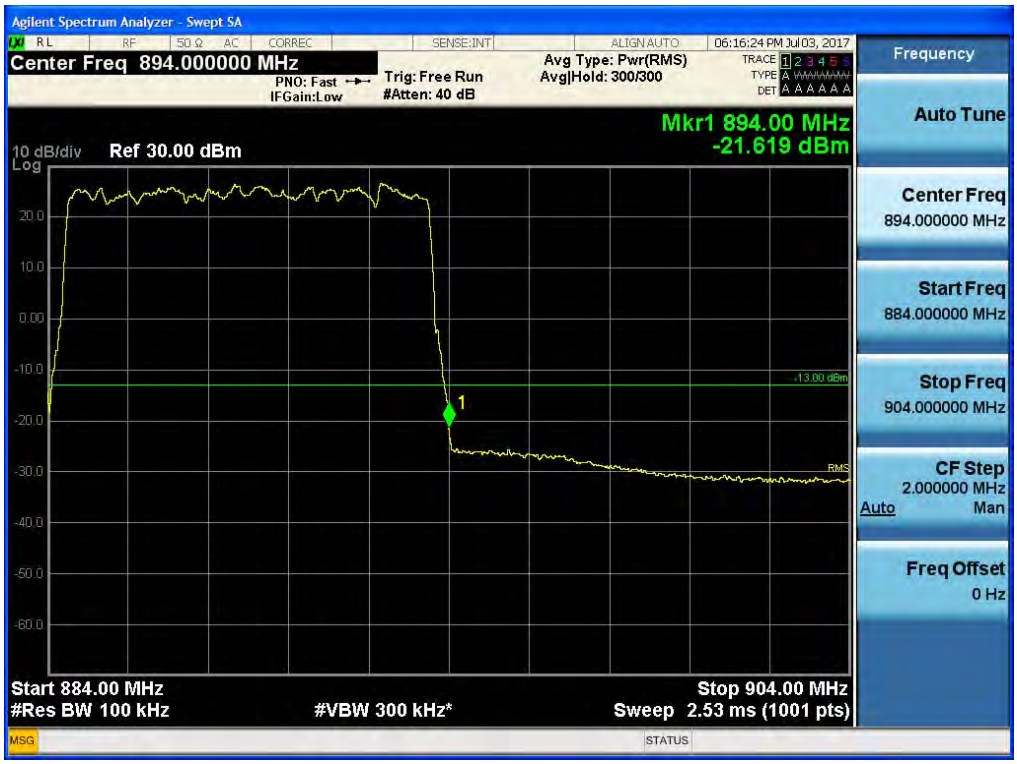
LTE Band 5_3 Carrier

Test Data at Output Port 1 (2 paths)

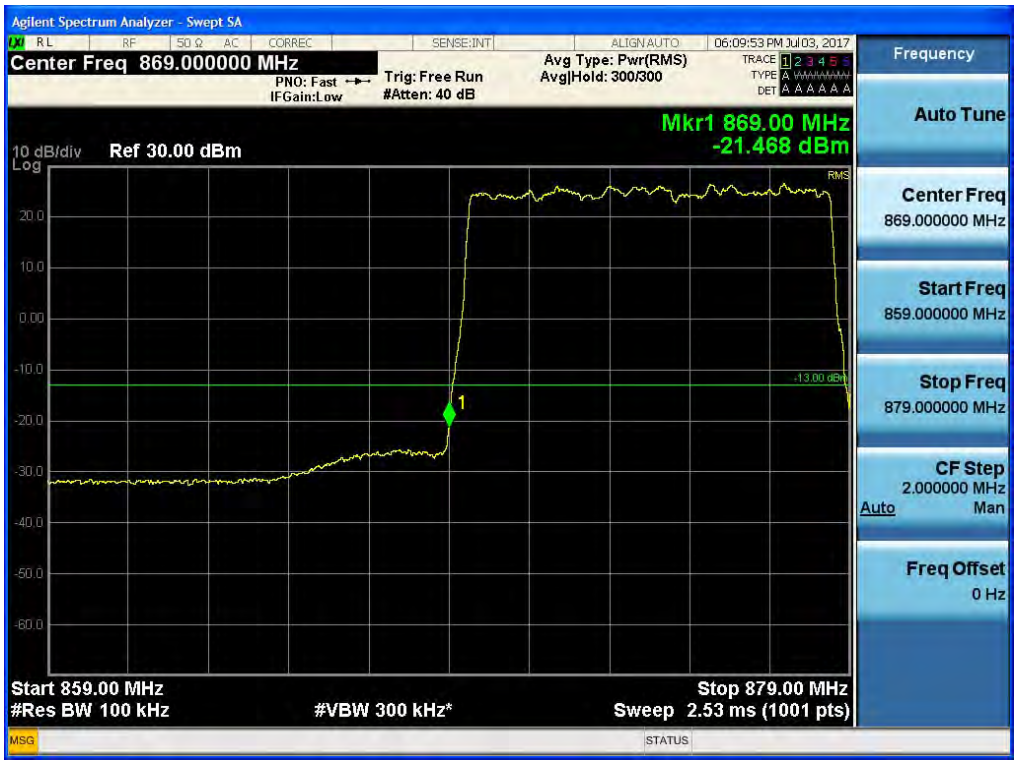
(QPSK Low)



(QPSK High)

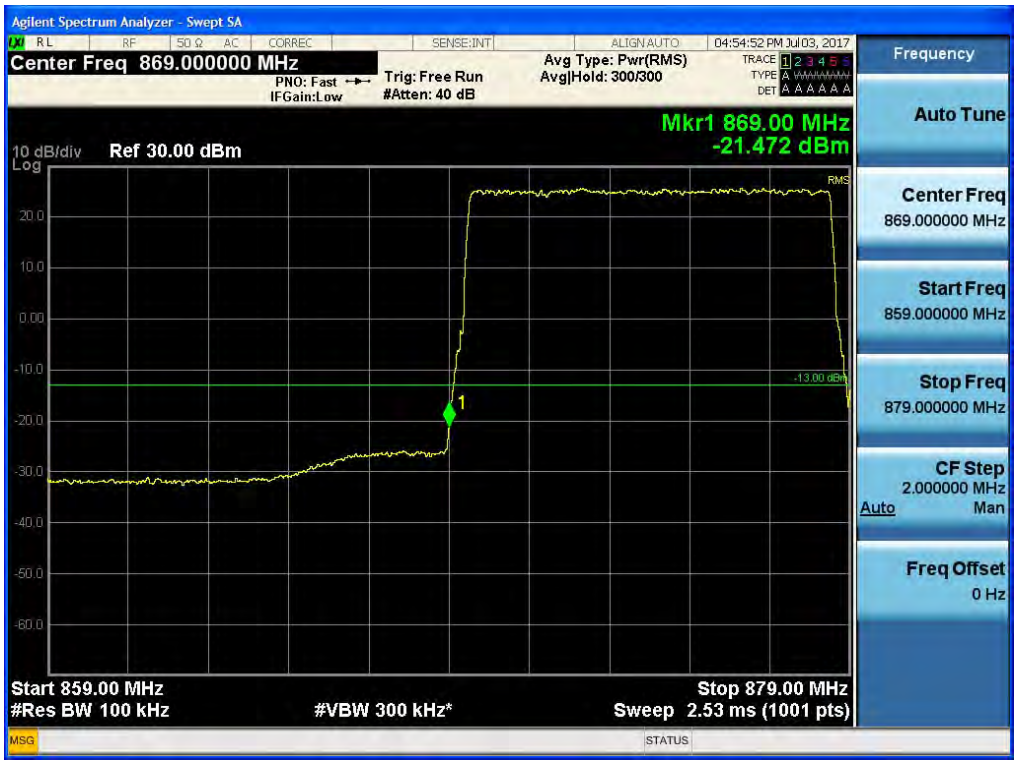


(16QAM Low)

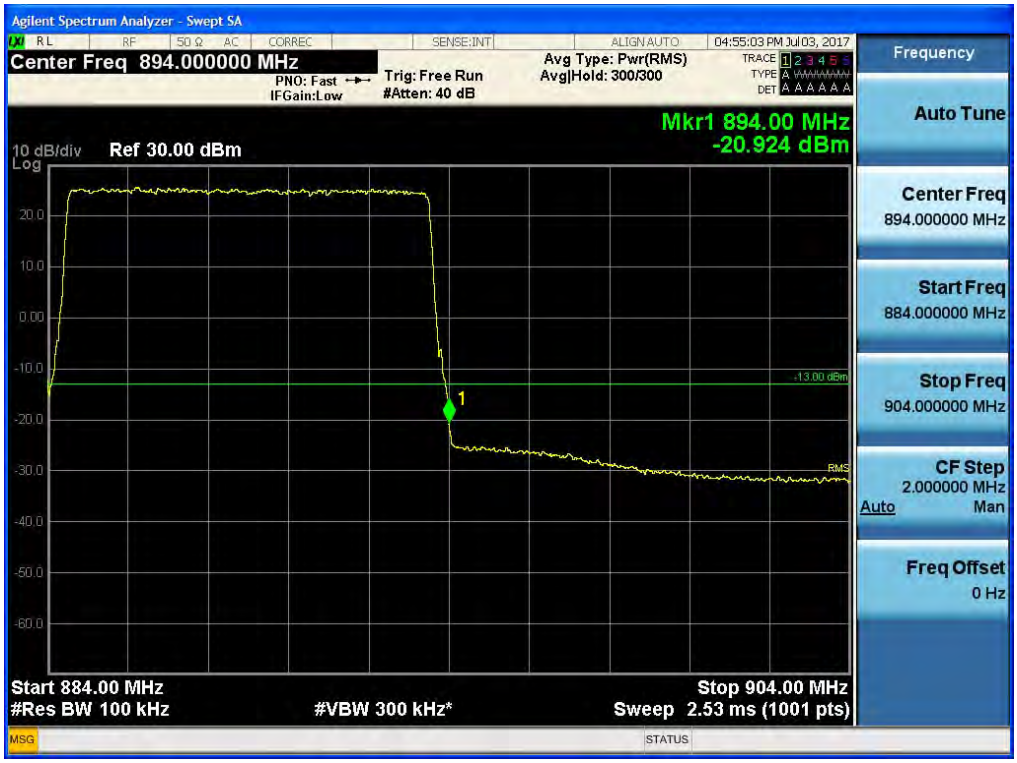


(16QAM High)

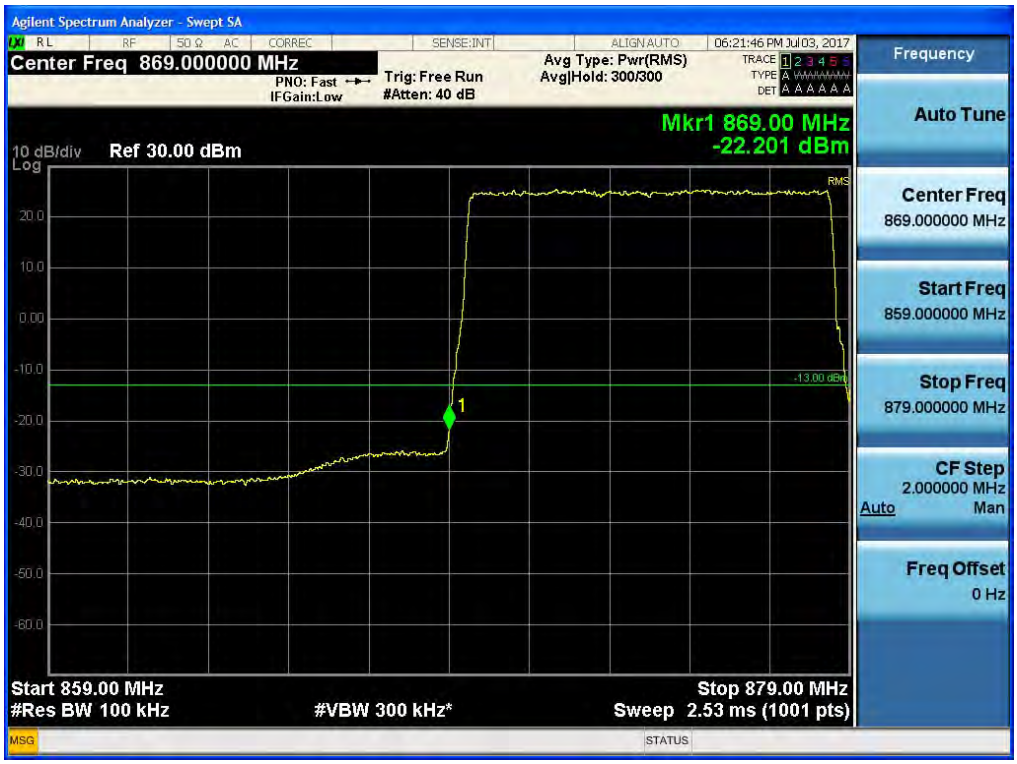
(64QAM Low)



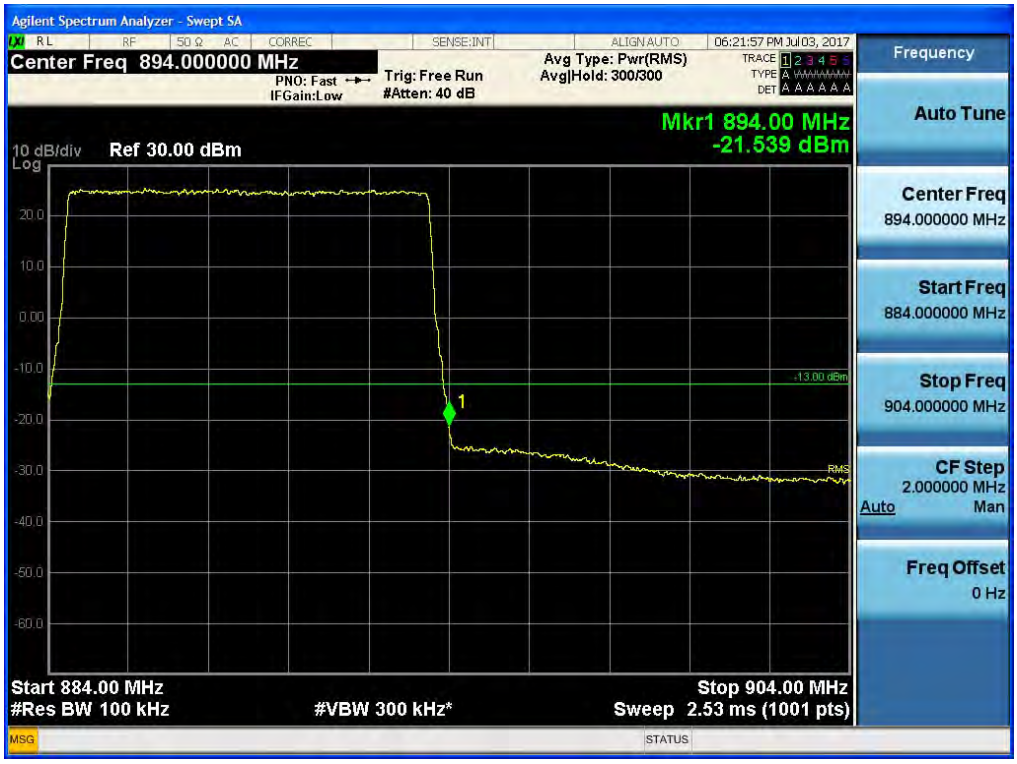
(64QAM High)



(256QAM Low)

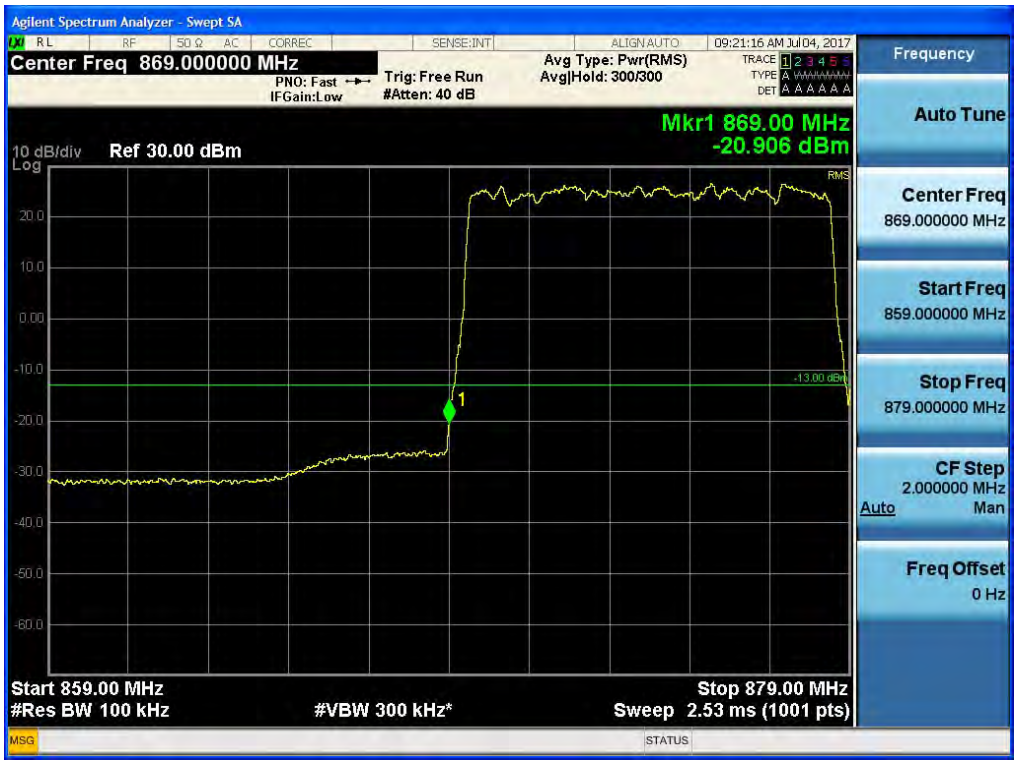


(256QAM High)

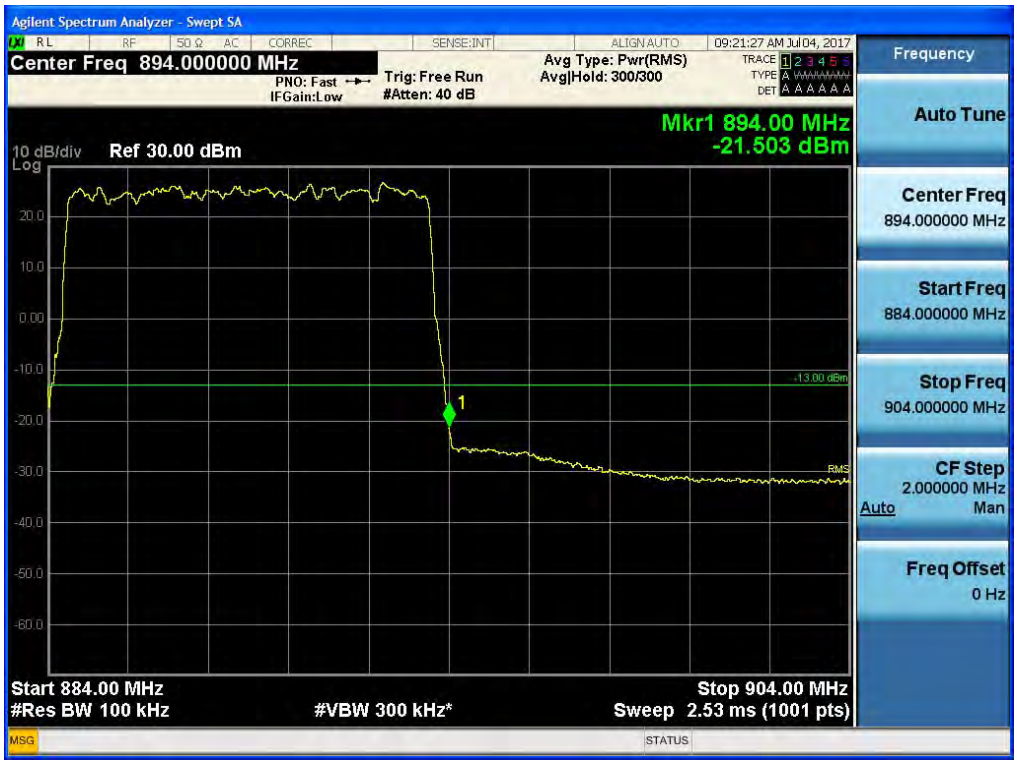


Test Data at Output Port 2 (2 paths)

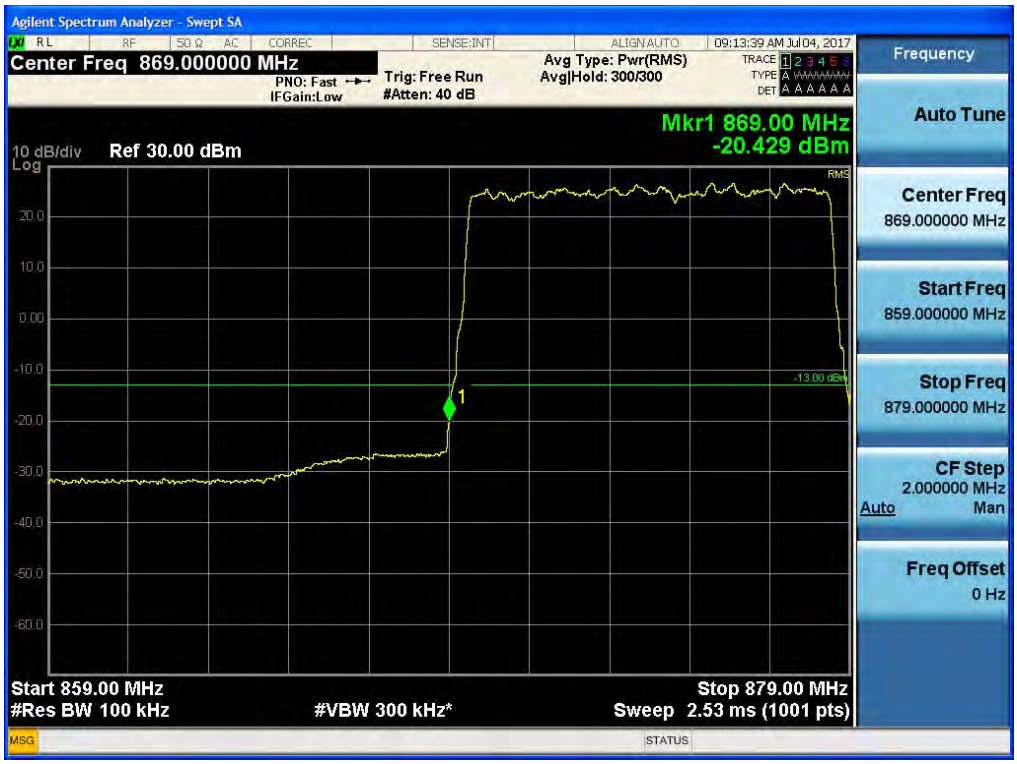
(QPSK Low)



(QPSK High)

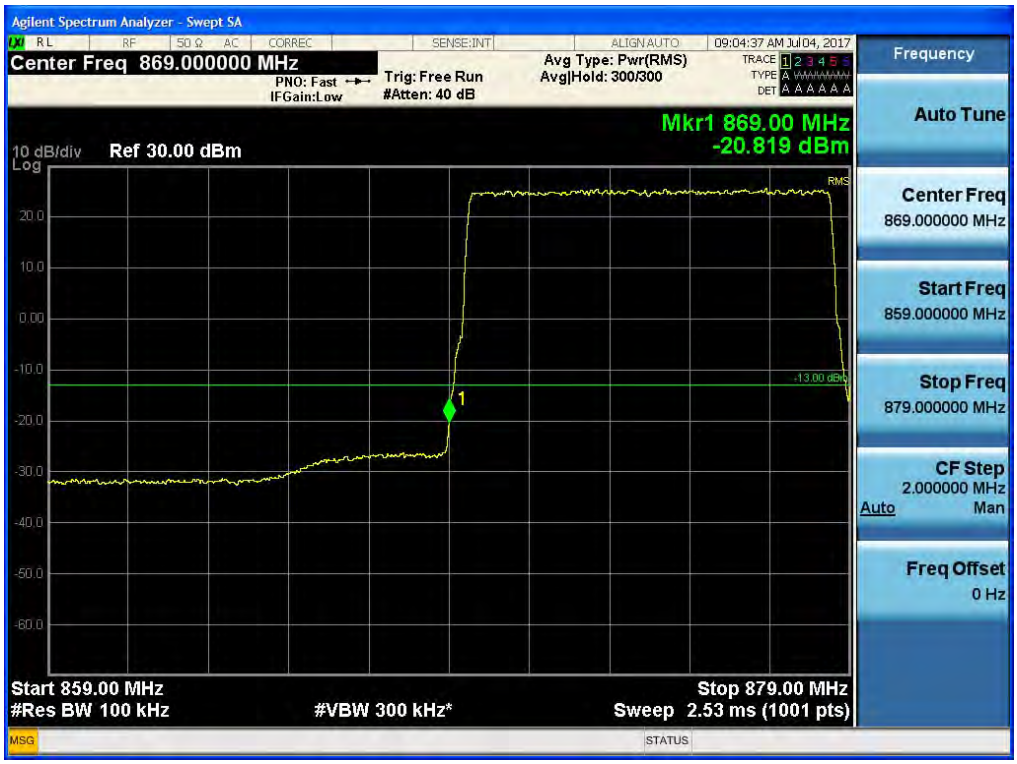


(16QAM Low)

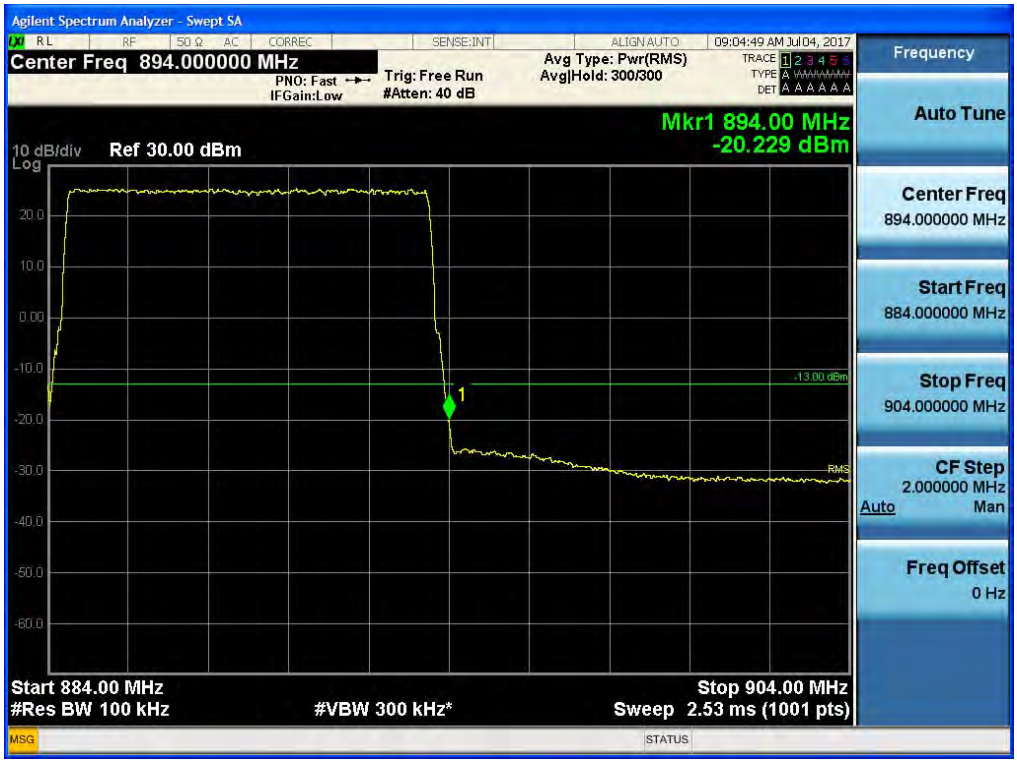


(16QAM High)

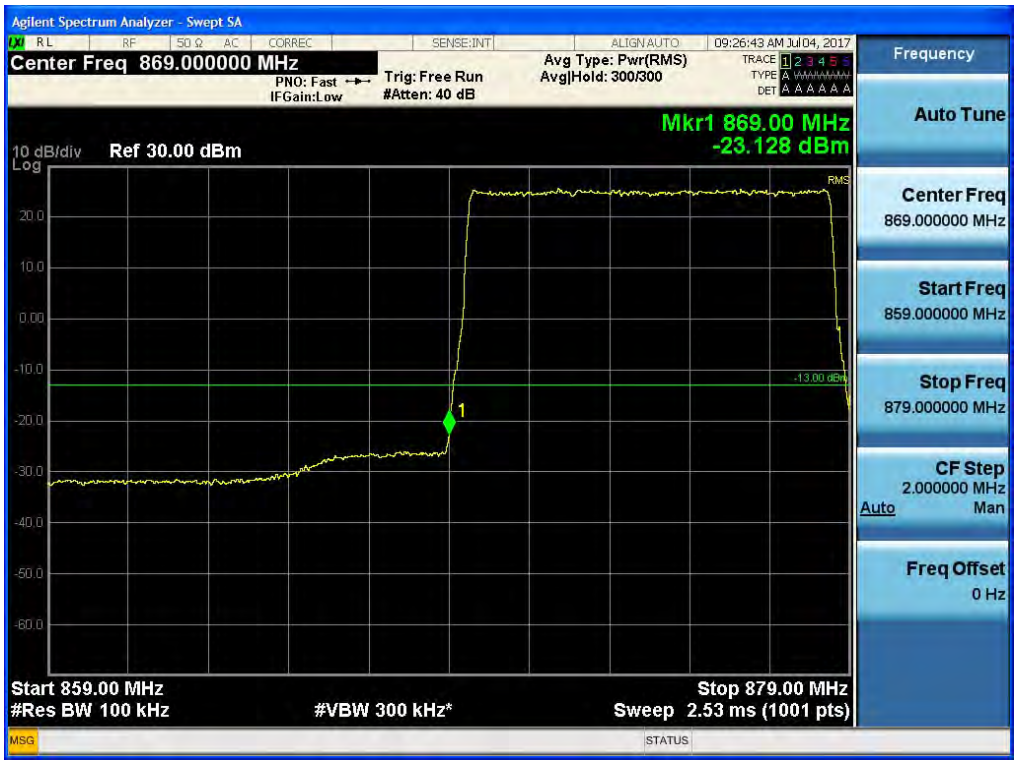
(64QAM Low)



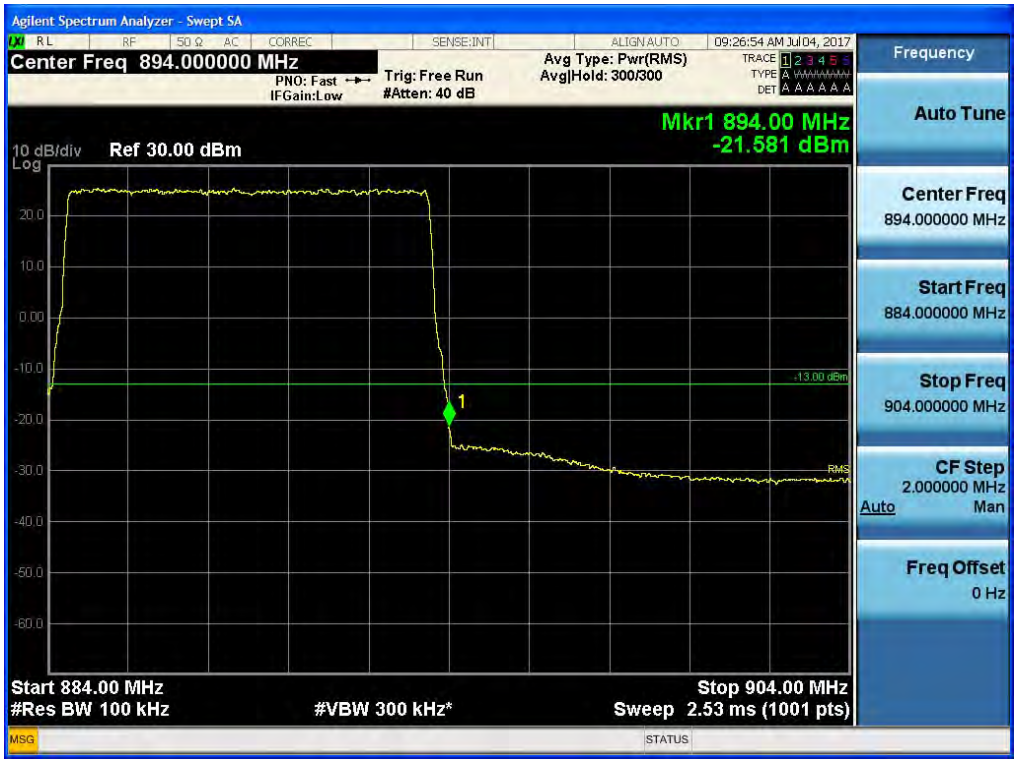
(64QAM High)



(256QAM Low)



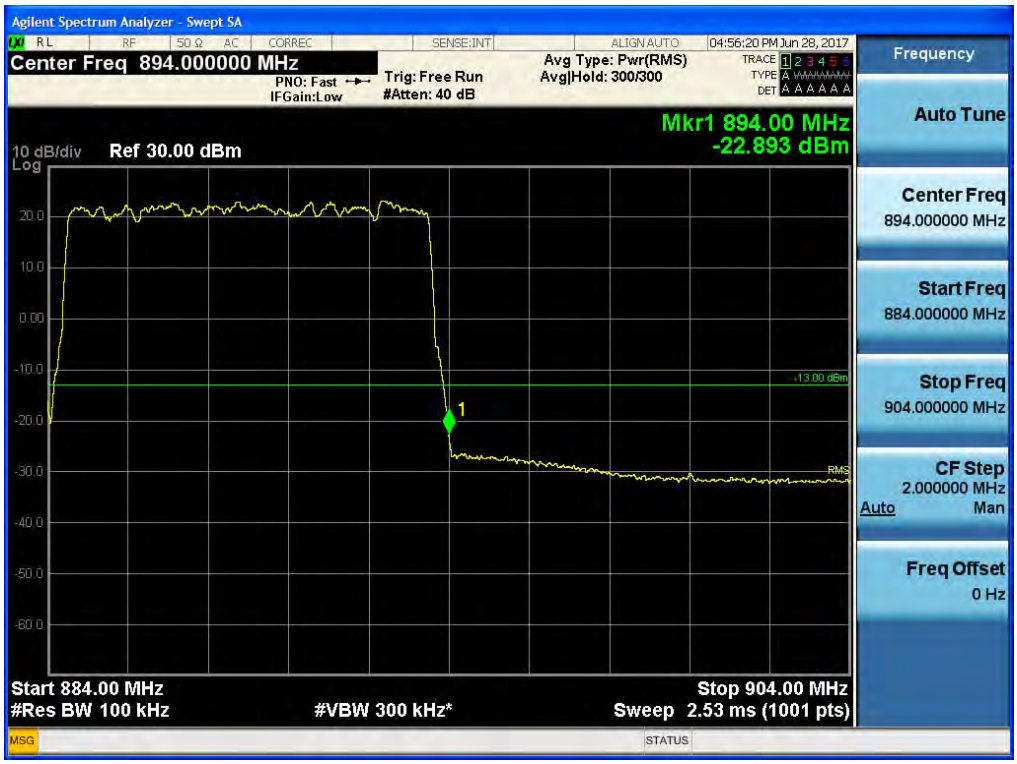
(256QAM High)



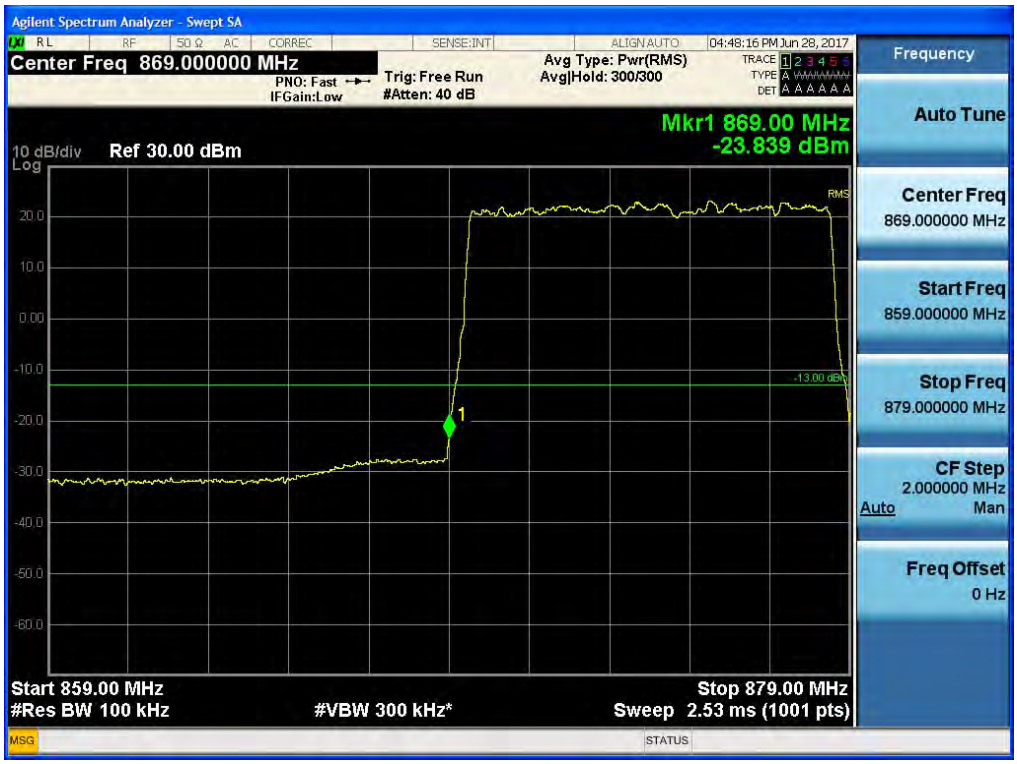
Test Data at Output Port 3 (4 paths)

(QPSK Low)

(QPSK High)

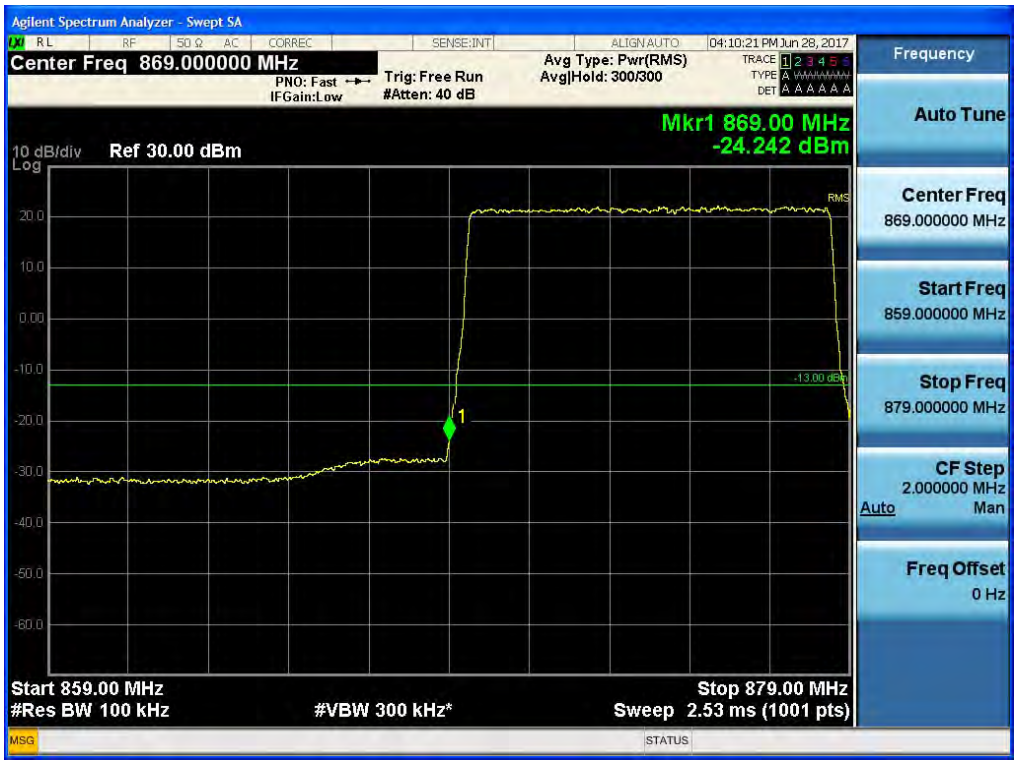


(16QAM Low)

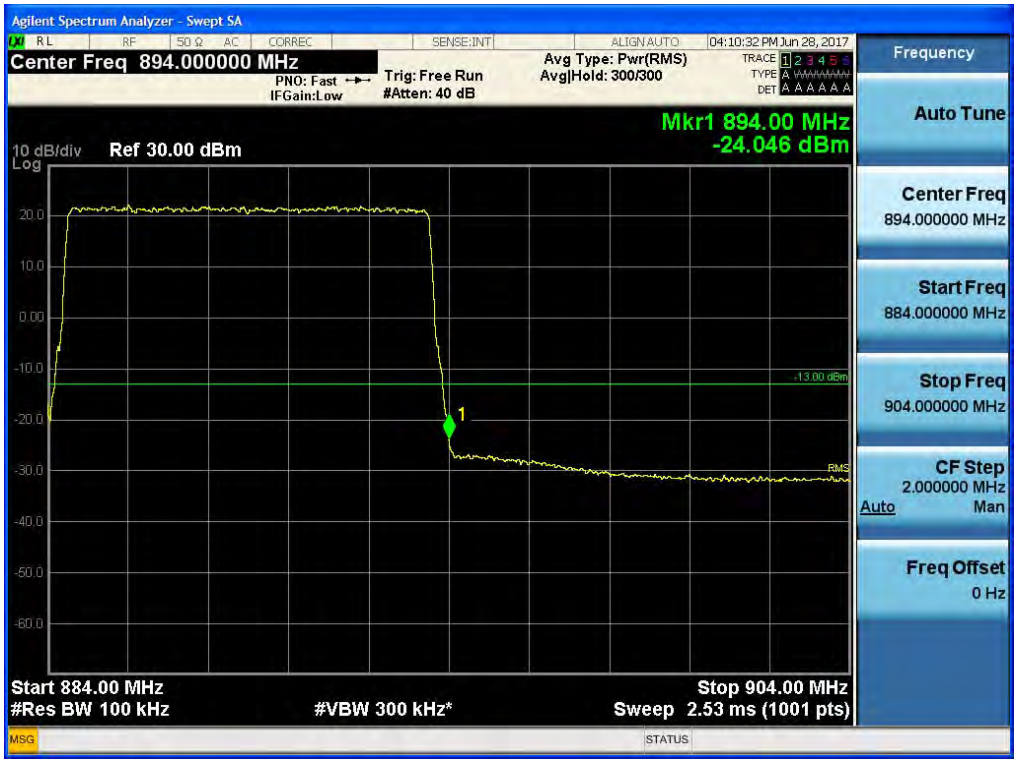


(16QAM High)

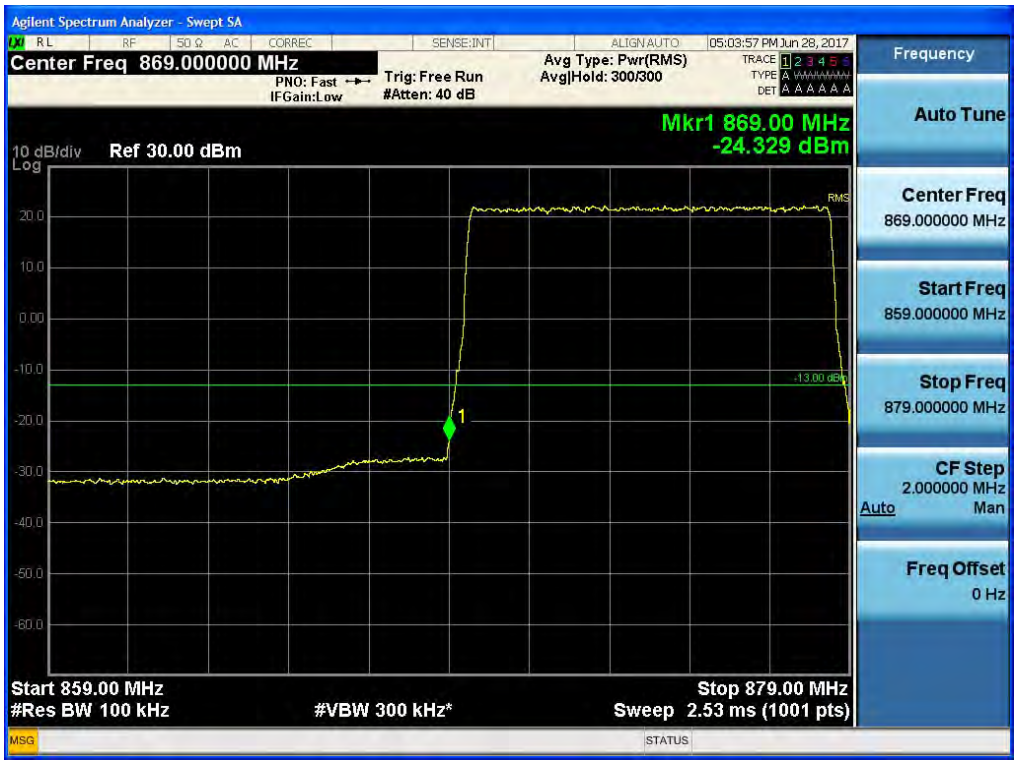
(64QAM Low)



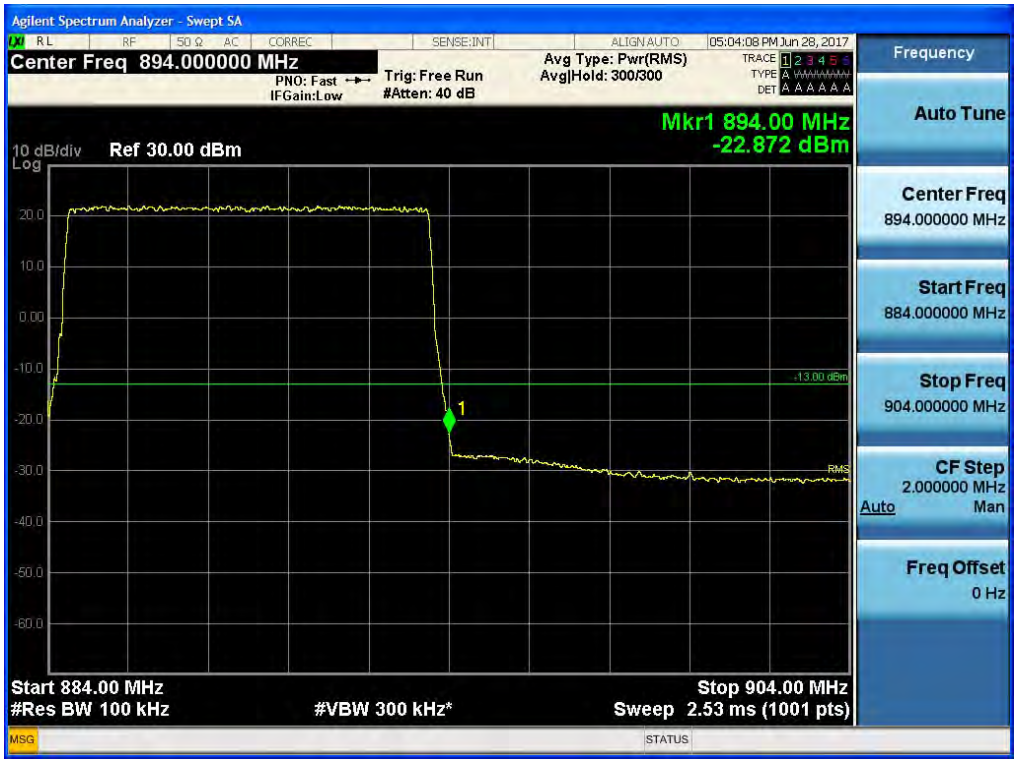
(64QAM High)



(256QAM Low)



(256QAM High)

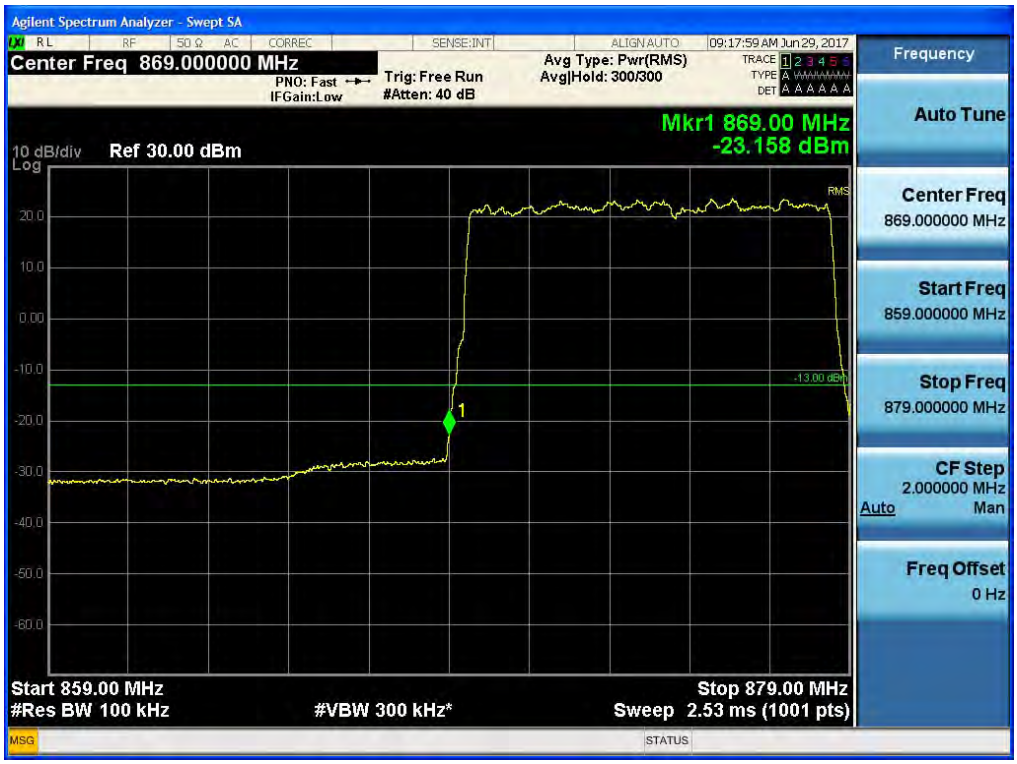


Test Data at Output Port 4 (4 paths)

(QPSK Low)

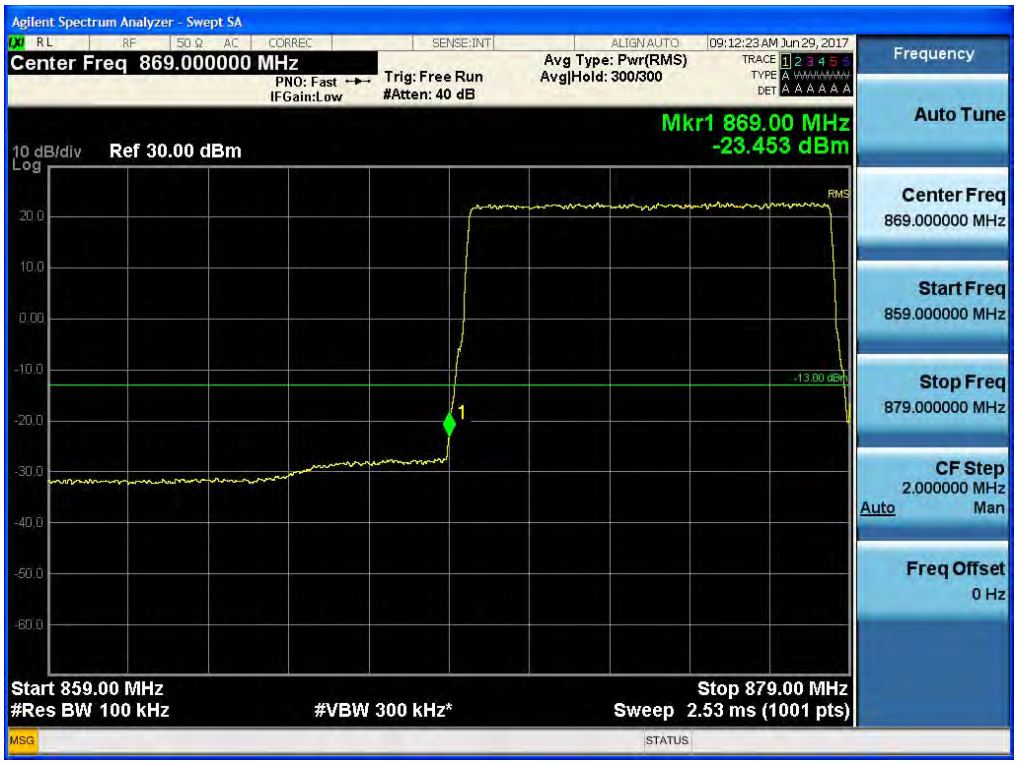
(QPSK High)

(16QAM Low)

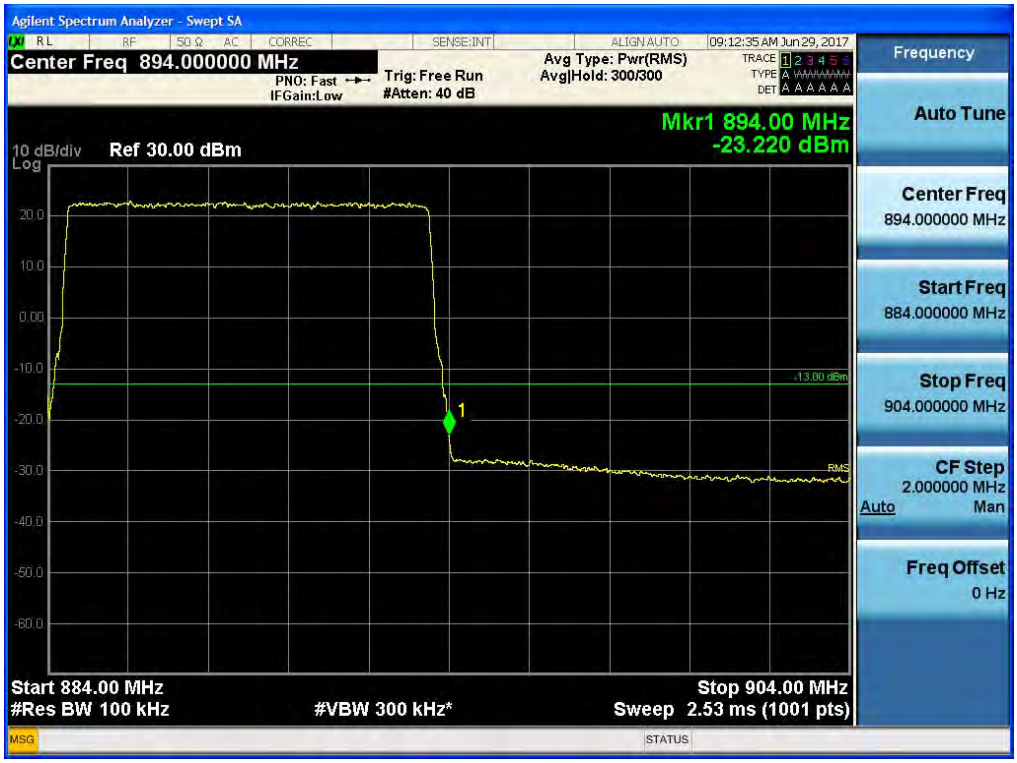


(16QAM High)

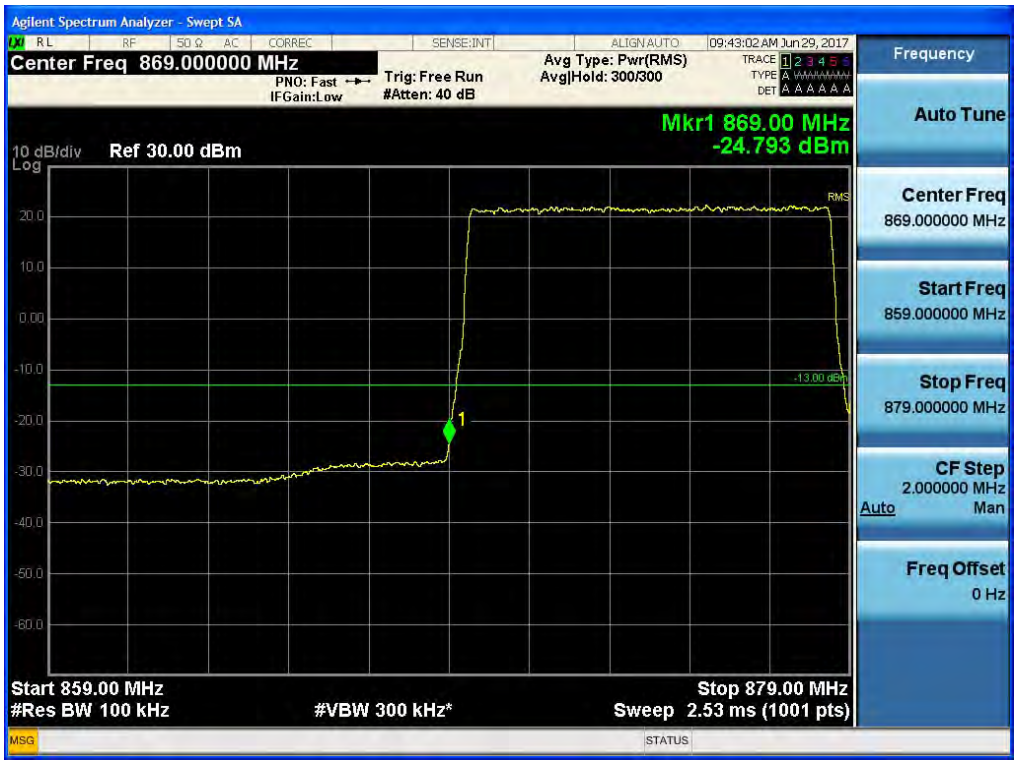
(64QAM Low)



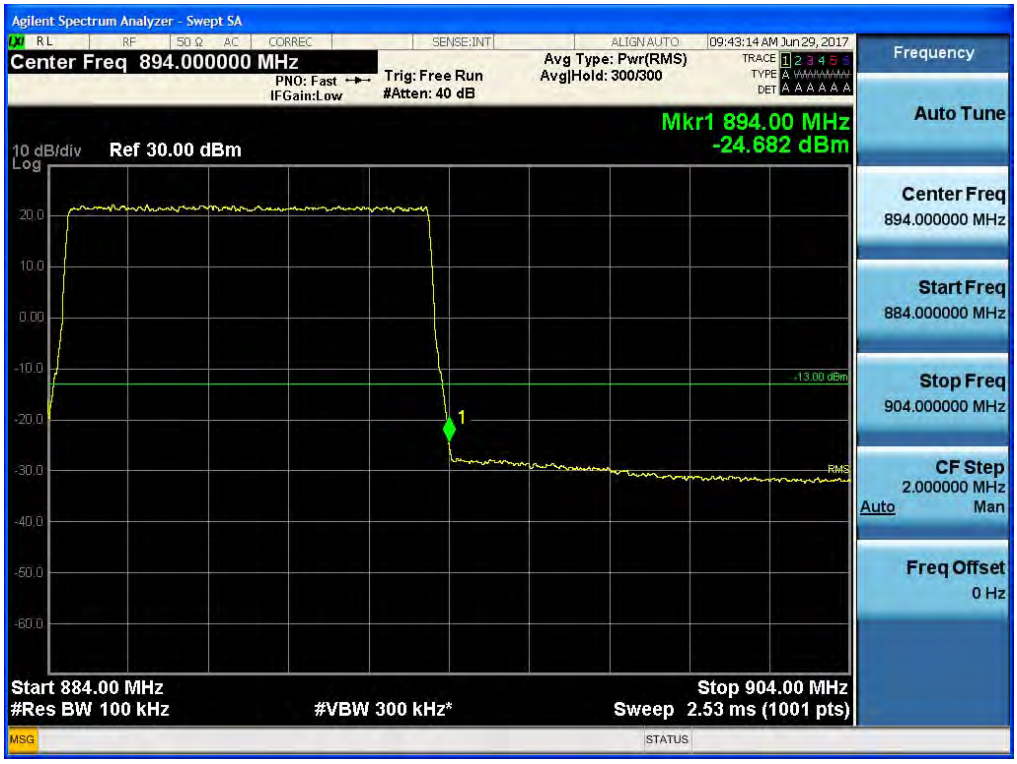
(64QAM High)



(256QAM Low)



(256QAM High)



8. RADIATED SPURIOUS EMISSION

Test Requirements:

§ 2.1053 Measurements required: Field strength of spurious radiation.

(a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.

(b) The measurements specified in paragraph (a) of this section shall be made for the following equipment:

(1) Those in which the spurious emissions are required to be 60 dB or more below the mean power of the transmitter.

(2) All equipment operating on frequencies higher than 25 MHz.

(3) All equipment where the antenna is an integral part of, and attached directly to the transmitter.

(4) Other types of equipment as required, when deemed necessary by the Commission.

Test Procedures:

Radiated emission measurements were performed at an semi-anechoic chamber.

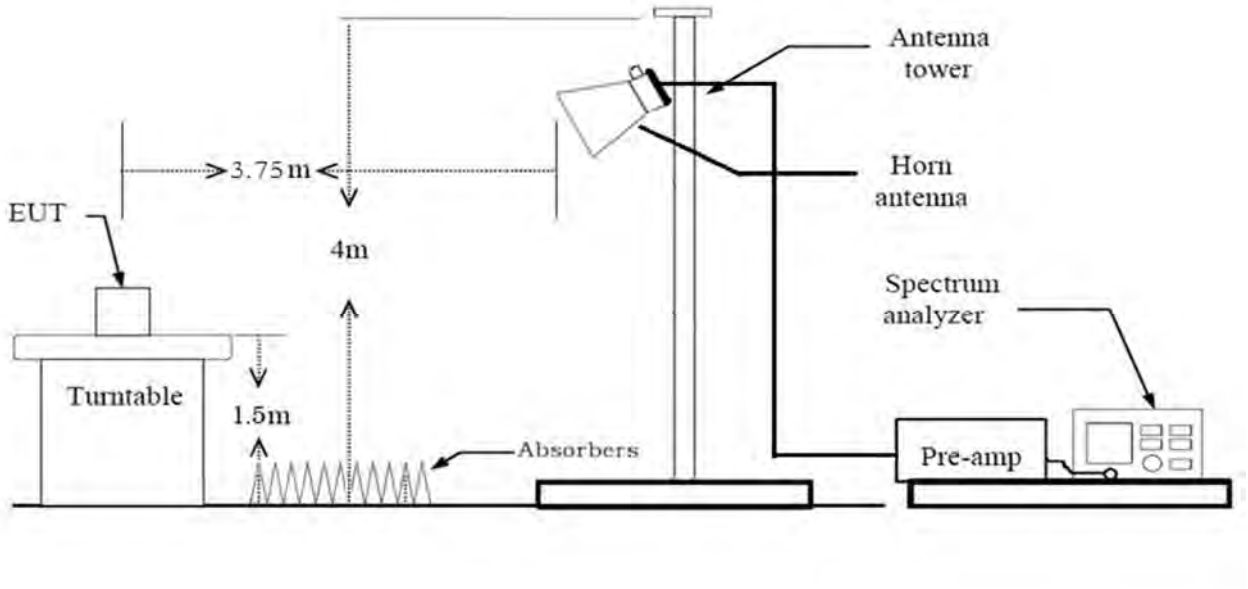
The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360^0 and the receiving antenna scanned from 1-4m in order to capture the maximum emission.

A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated.

The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in

both vertical and horizontal polarization. Harmonic emissions up to the 10th or 40GHz, whichever was the lesser, were investigated.

Radiated Spurious Emissions Test Setup



Note :

1. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
2. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Test Results:

[LTE Band 13]

Ch.	Freq.(MHz)	Measured Level [dBuV/m]	Measured Power [dBm]	Ant. Factor [dB/m]	C.L [dB]	A.G. [dB]	H.P.F.. [dB]	D.F. [dB]	Pol.	Result [dBm]
No Critical Peaks Found										

* C.L.: Cable Loss / A.G.: Amp Gain / H.P.F.: High Pass Filter / D.F.: Distance Factor (3.75 m)

Notes:

1. We have done all test case.

2. We have done horizontal and vertical polarization in detecting antenna.

[LTE Band 5]

Ch.	Freq.(MHz)	Measured Level [dBuV/m]	Measured Power [dBm]	Ant. Factor [dB/m]	C.L [dB]	A.G. [dB]	H.P.F.. [dB]	D.F. [dB]	Pol.	Result [dBm]
No Critical Peaks Found										

* C.L.: Cable Loss / A.G.: Amp Gain / H.P.F.: High Pass Filter / D.F.: Distance Factor (3.75 m)

Notes:

1. We have done all test case.

2. We have done horizontal and vertical polarization in detecting antenna.

9. FREQUECNY STABILITY

Test Requirements:

§2.1055 Measurements required: Frequency stability.

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From −30° to + 50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

§ 22.355 Frequency tolerance.

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1—Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

§27.54 Frequency stability.

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Test Procedures:

As required by 47 CFR 2.1055, *Frequency Stability measurements* were made at the RF output terminals using a Spectrum Analyzer.

The EUT was placed in the Environmental Chamber.

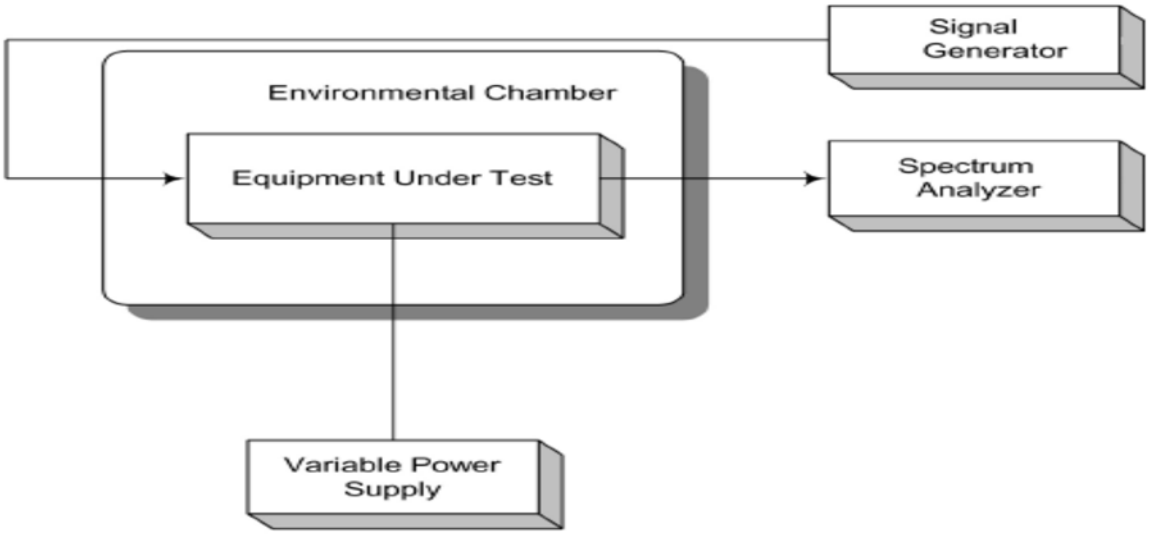
A CW signal was injected into the EUT at the appropriate RF level. The frequency counter option on the Spectrum Analyzer was used to measure frequency deviations.

The frequency drift was investigated for every 10 °C increment until the unit is stabilized then recorded the reading in tabular format with the temperature range of -30 to 50 °C.

Voltage supplied to EUT is 110 Vac reference temperature was done at 20°C.

The voltage was varied by ± 15 % of nominal

Test Setup:


Signal Generator
Environmental Chamber
Equipment Under Test
Spectrum Analyzer
Variable Power Supply

Test Results:

Band 13

Reference: - 48 Vdc at 20°c **Freq.** = 751,000,000 Hz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	750 999 998	-1.511	0.000	0.00000
	-30	751 000 002	1.865	1.865	0.00212
	-20	751 000 001	1.252	1.252	0.00142
	-10	750 999 997	-3.214	-3.214	-0.00365
	0	750 999 998	-1.898	-1.898	-0.00215
	+10	751 000 001	0.924	0.924	0.00105
	+30	751 000 001	1.228	1.228	0.00139
	+40	750 999 999	-0.572	-0.572	-0.00065
	+50	751 000 001	1.358	1.358	0.00154
115%	+20	751 000 001	1.024	1.024	0.00116
85%	+20	751 000 000	0.208	0.208	0.00024

Band 5

Reference: - 48 Vdc at 20°c **Freq.** = 881,500,000 Hz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	881 500 001	1.353	0.000	0.00000
	-30	881 500 001	1.465	1.465	0.00166
	-20	881 499 999	-0.884	-0.884	-0.00100
	-10	881 500 002	1.682	1.682	0.00191
	0	881 500 000	0.250	0.250	0.00028
	+10	881 499 998	-2.323	-2.323	-0.00264
	+30	881 499 998	-1.542	-1.542	-0.00175
	+40	881 500 002	1.588	1.588	0.00180
	+50	881 500 001	1.143	1.143	0.00130
115%	+20	881 500 001	0.854	0.854	0.00097
85%	+20	881 500 001	1.226	1.226	0.00139

Note:

The results of the frequency stability test shown above the frequency deviation measured values are very small and similer trend for each port, so attached datas were only the worst case.

10. PHOTOGRAPHS OF THE EUT

Photographs is described in Appendix A. Please refer to Appendix A.

Note:

Appendix A File No. : A3LRFV01U-D2A-EUT-RF-Rev.0

11. SETUP PHOTO

Setup photos is described in Appendix B. Please refer to Appendix B.

Note:

Appendix B File No. : A3LRFV01U-D2A-SP-RF-Rev.0