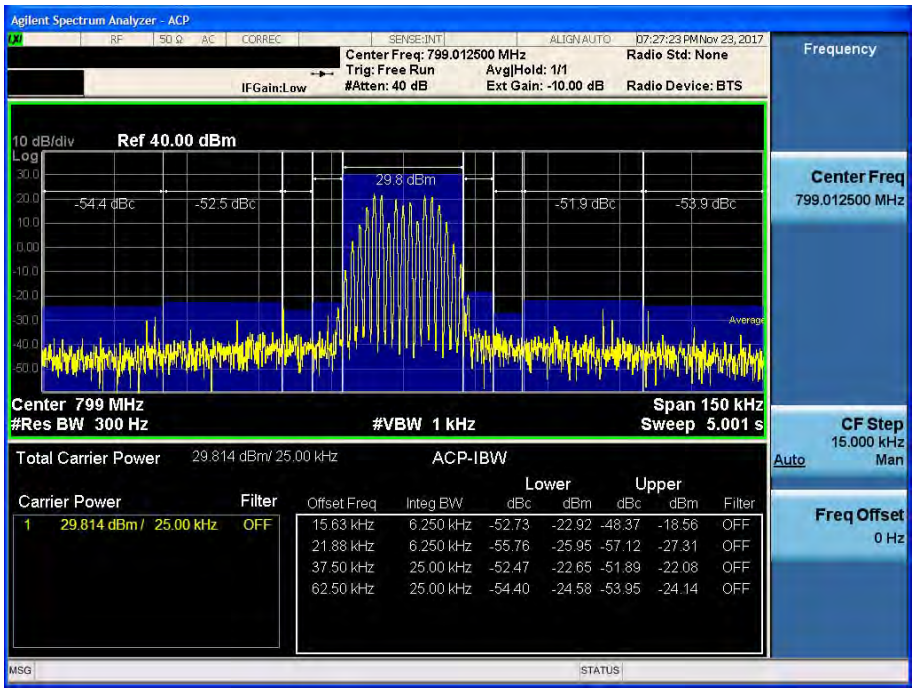
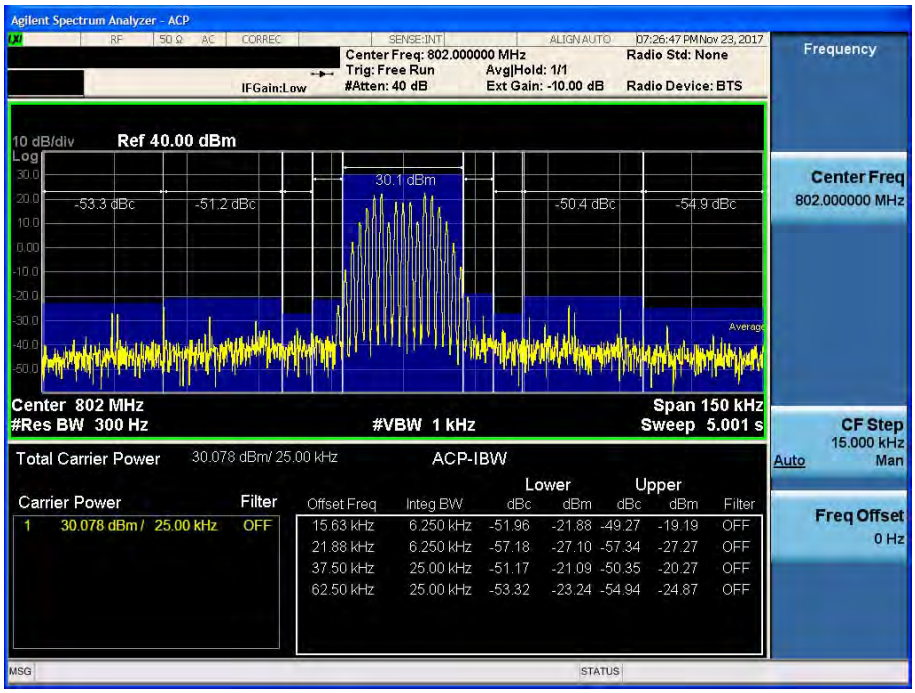
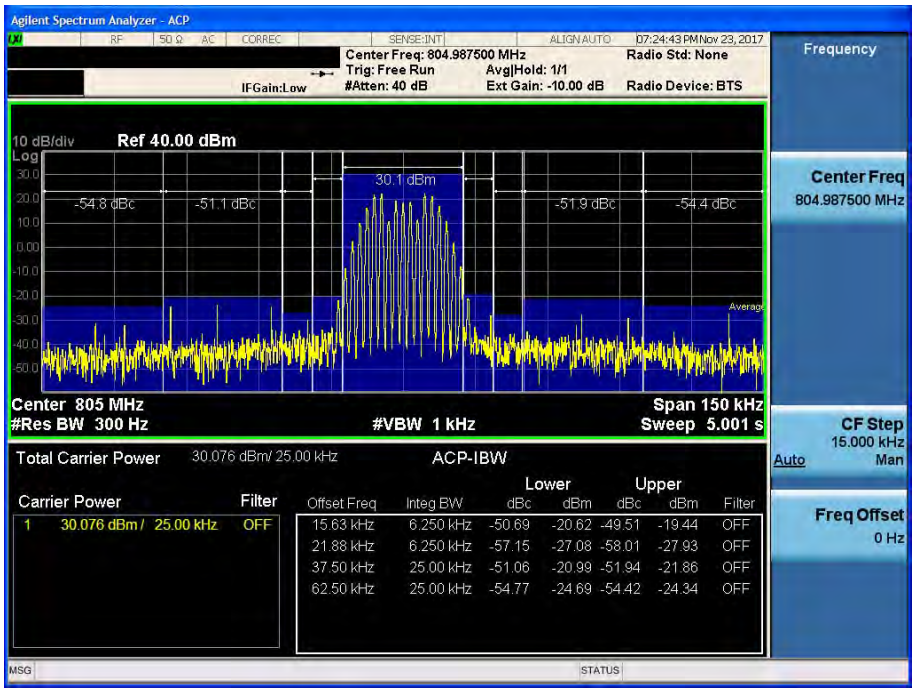
[Uplink – Low, 25 kHz (15.625kHz - 62.5kHz)]



[Uplink – Middle, 25 kHz (15.625kHz - 62.5kHz)]

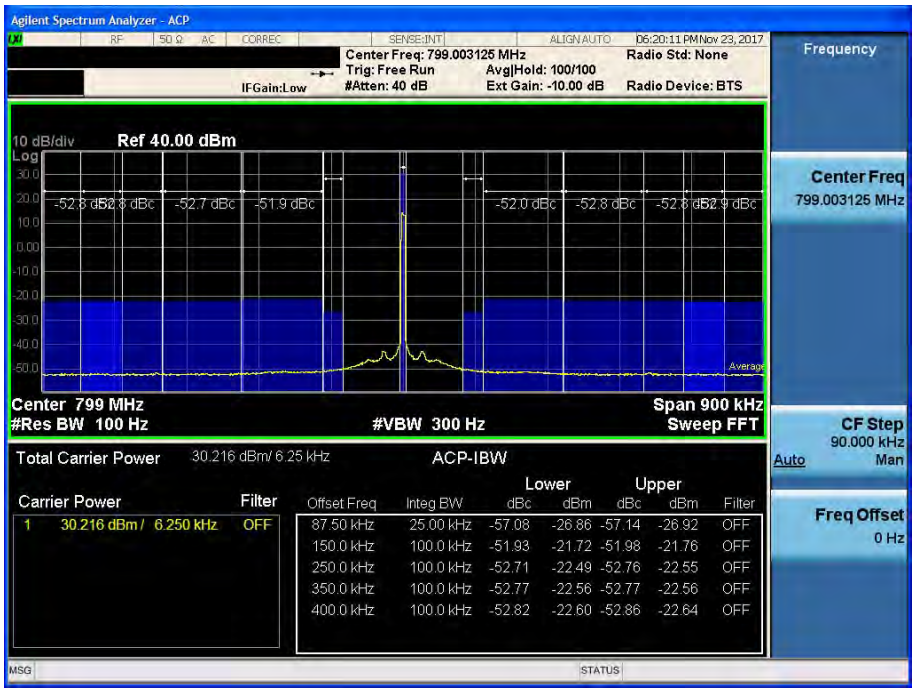


[Uplink – High, 25 kHz (15.625kHz - 62.5kHz)]

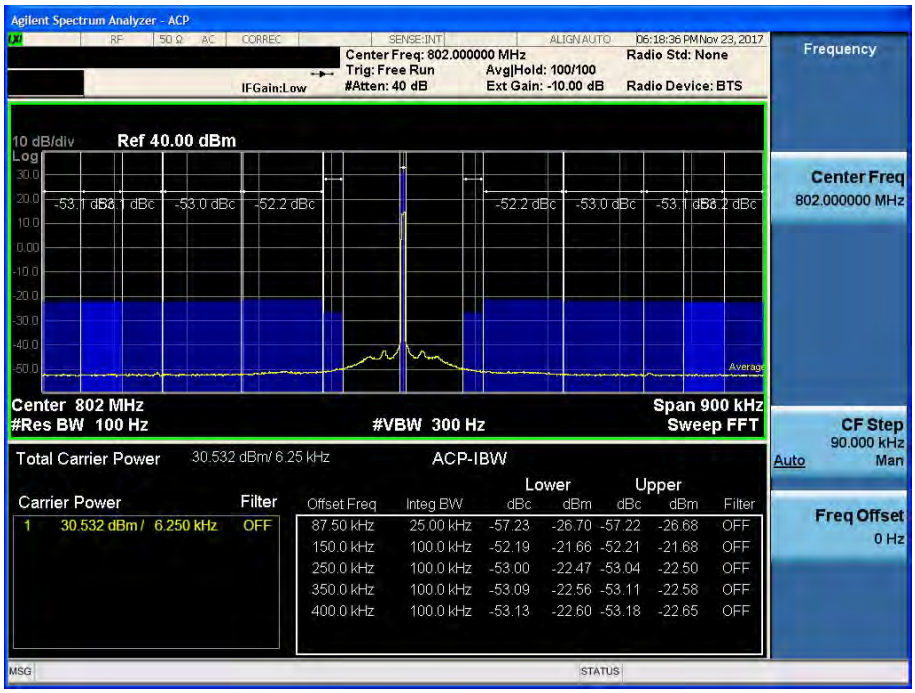


700 APCO 25_Uplink

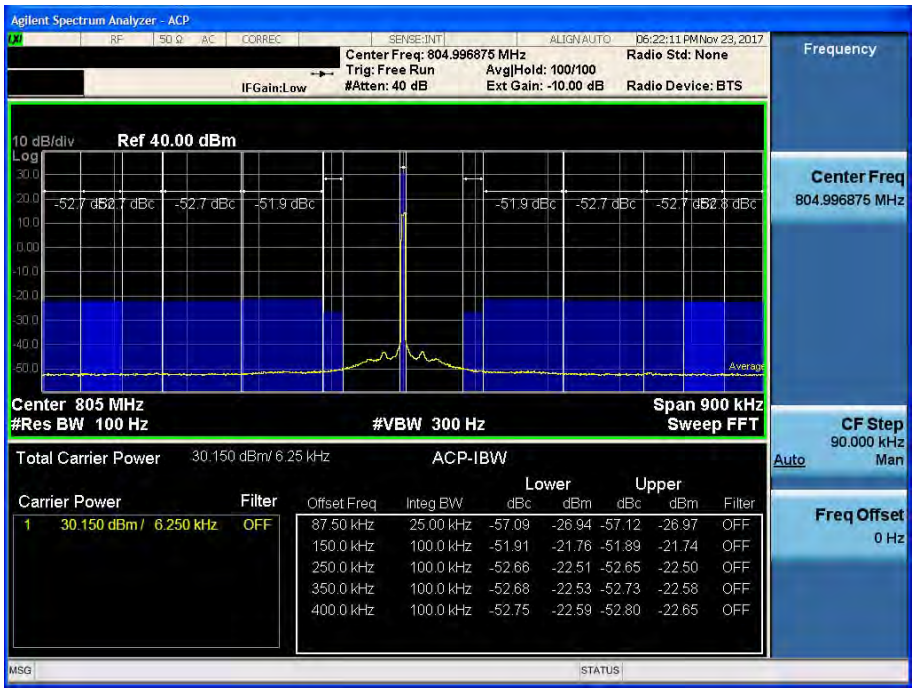
[Uplink – Low, 6.25 kHz (87.5kHz-400kHz)]



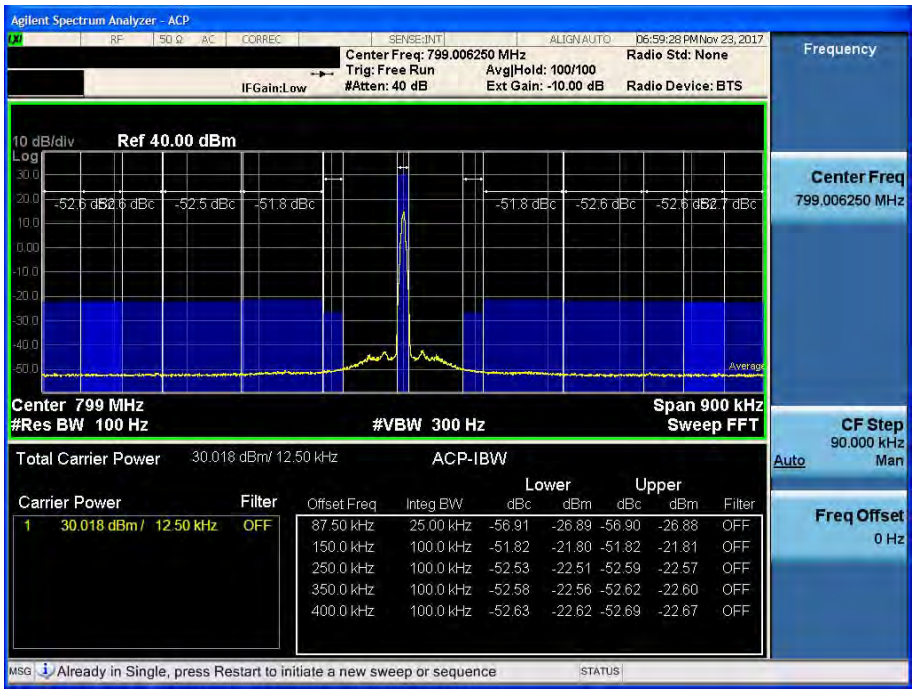
[Uplink – Middle, 6.25 kHz(87.5kHz-400kHz)]



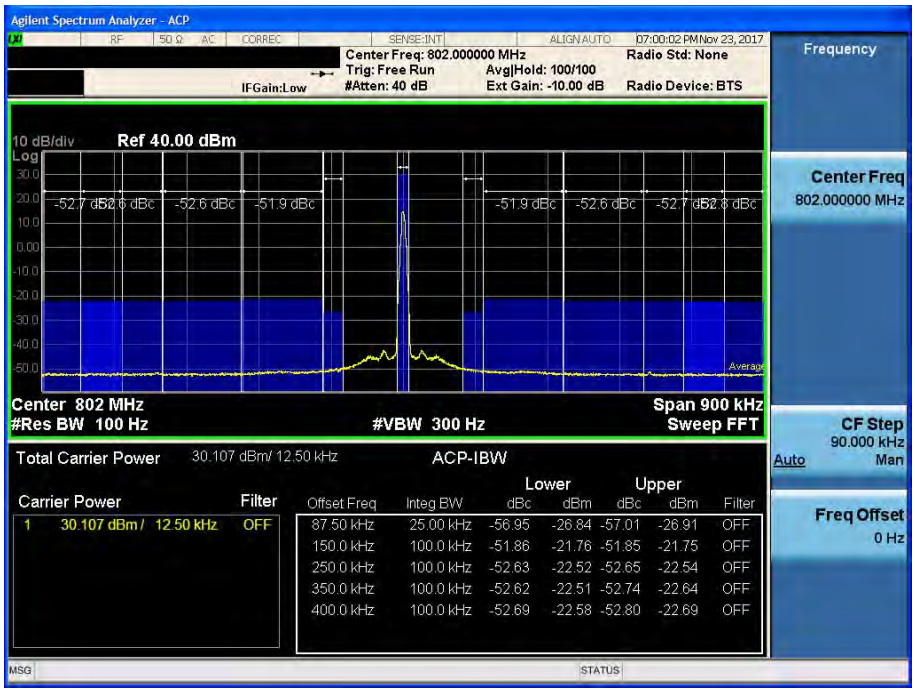
[Uplink – High, 6.25 kHz(87.5kHz-400kHz)]



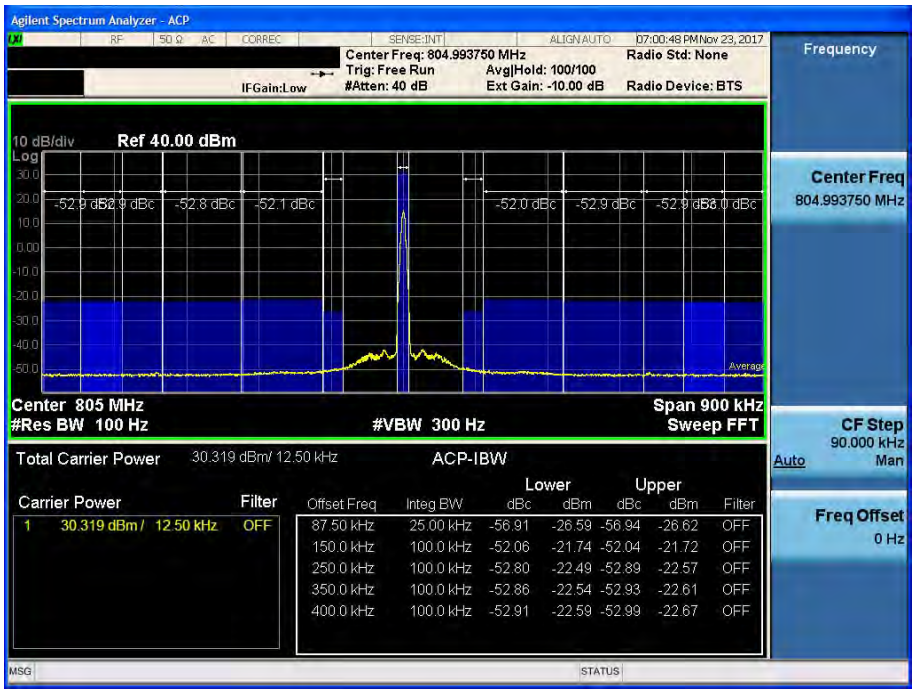
[Uplink – Low, 12.5 kHz (87.5kHz - 400kHz)]



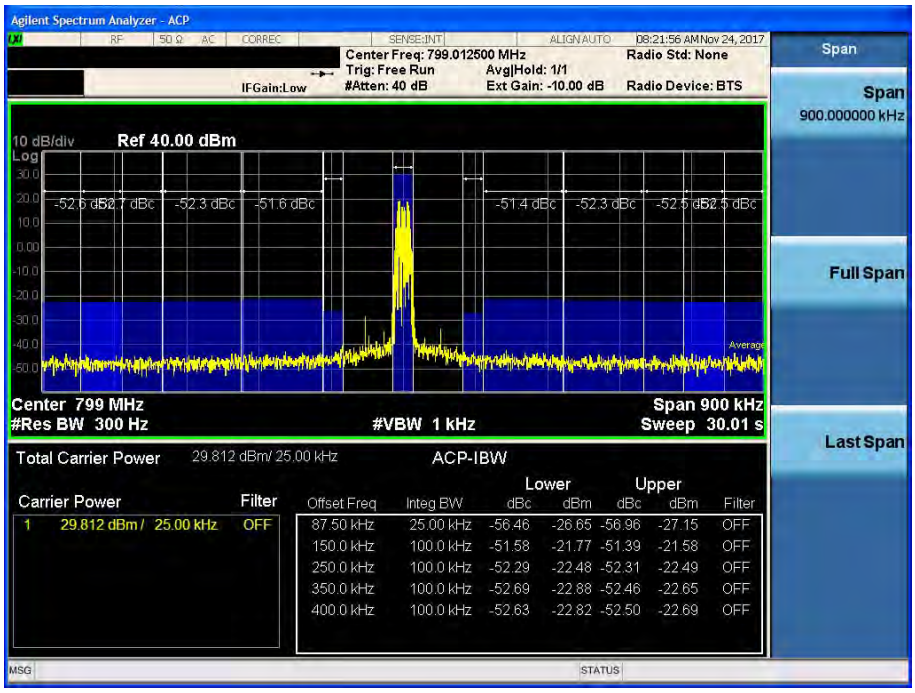
[Uplink – Middle, 12.5 kHz(87.5kHz - 400kHz)]



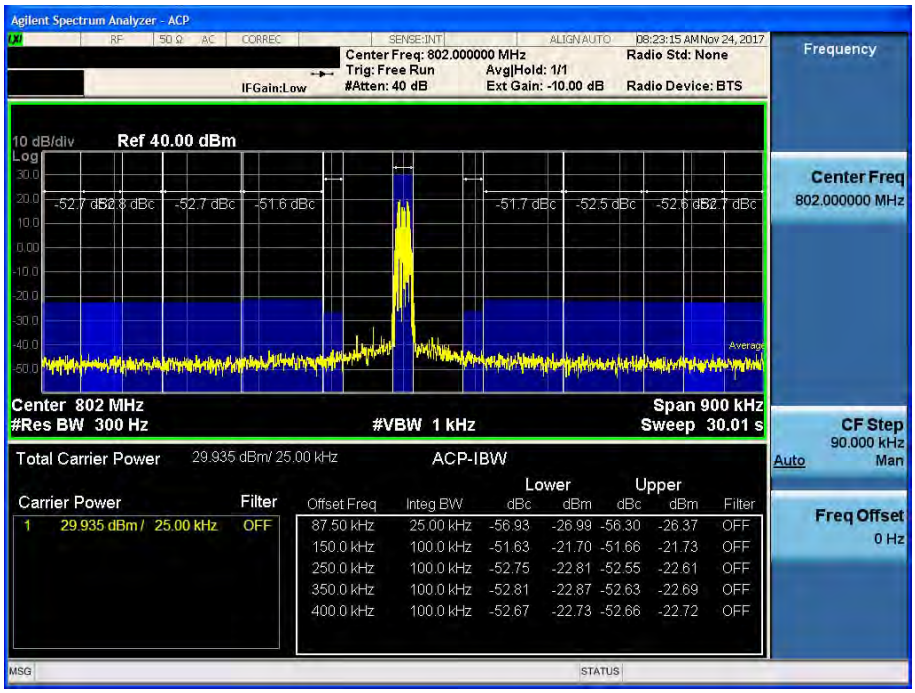
[Uplink – High, 12.5 kHz(87.5kHz - 400kHz)]



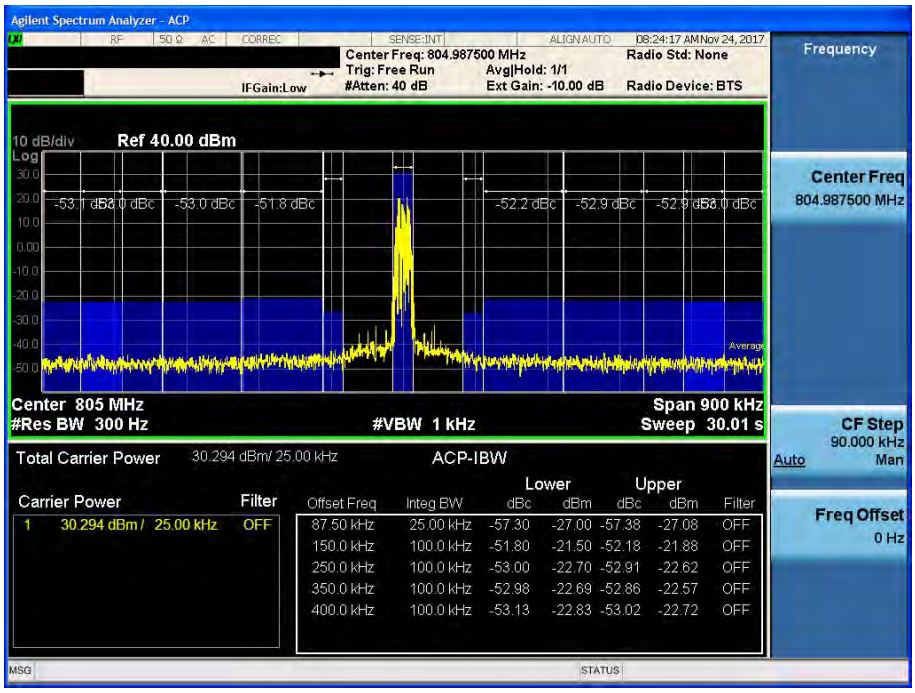
[Uplink – Low, 25 kHz (87.5kHz - 400kHz)]



[Uplink – Middle, 25 kHz(87.5kHz - 400kHz)]



[Uplink – High, 25 kHz] (87.5kHz - 400kHz)]



12. RADIATED SPURIOUS EMISSIONS

FCC Rules

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:

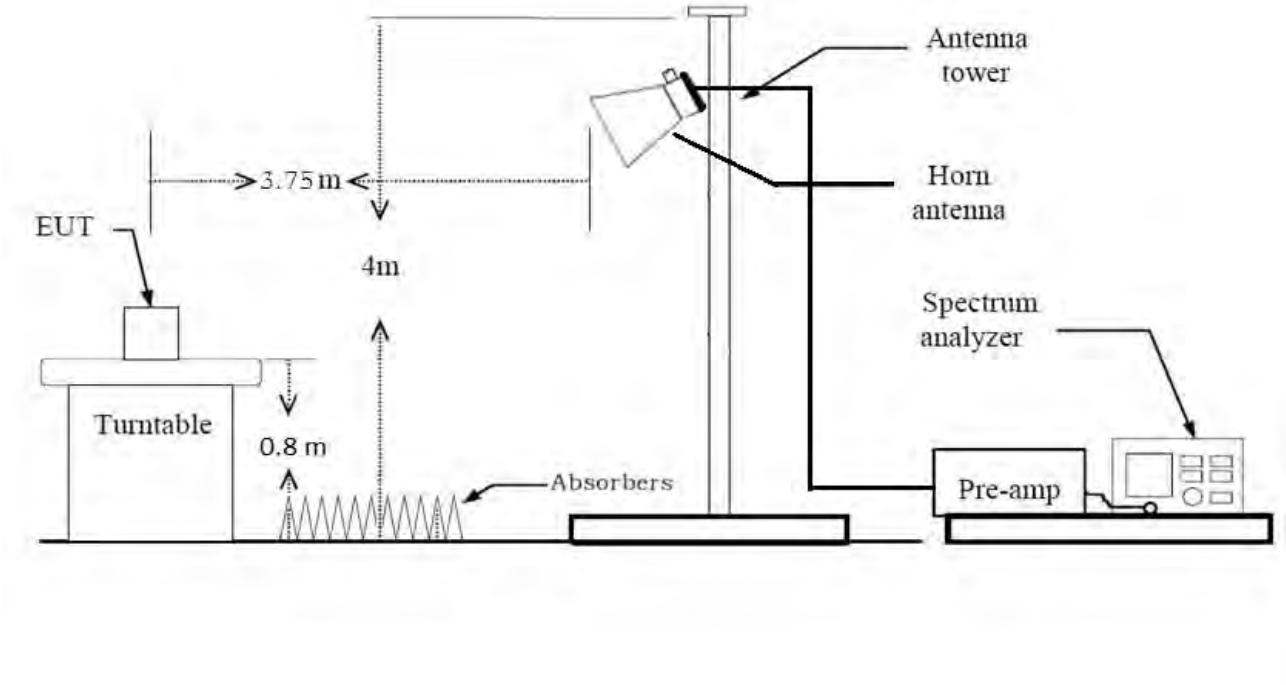
As required by 47 CFR 2.1053, *field strength of radiated spurious measurements* were made in accordance with the procedures of ANSI/TIA-603-C-2004 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards".

Radiated emission measurements were performed inside a 3 meter 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 360and the receiving antenna scanned from 1-3m 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)

Radiated Spurious Emissions Test Result:

FirstNet + PS 700

[Downlink]

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.: Ant. Gain / H.P.F.: High Pass Filter / D.F.: Distance Factor (3.75 m)

[Uplink]

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.: Ant. Gain / H.P.F.: High Pass Filter / D.F.: Distance Factor (3.75 m)

PS 800 APCO25

[Downlink]

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.: Ant. Gain / H.P.F.: High Pass Filter / D.F.: Distance Factor (3.75 m)

[Uplink]

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.: Ant. Gain / H.P.F.: High Pass Filter / D.F.: Distance Factor (3.75 m)

13. FREQUENCY STABILITY OVER TEMPERATURE AND VOLTAGE VARIATIONS

FCC Rules

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.

§ 90.213 Frequency stability.

(a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table.

Minimum Frequency Stability [Parts per million (ppm)]

Frequency range (MHz)	Fixed and base stations	Mobile stations	
		Over 2 watts output	2 watts or less output
Below 25	100	100	200
25-50	20	20	50
72-76	5		50
150-174	5	5	[4]50
216-220	1.0		1.0
220-222[12]	0.1	1.5	1.5
421-512	2.5	5	5
806-809	1.0	1.5	1.5
809-824	1.5	2.5	2.5
851-854	1.0	1.5	1.5
854-869	1.5	2.5	2.5
896-901	0.1	1.5	1.5
902-928	2.5	2.5	2.5
902-928[13]	2.5	2.5	2.5
929-930	1.5		
935-940	0.1	1.5	1.5
1427-1435	300	300	300
Above 2450			

(b) For the purpose of determining the frequency stability limits, the power of a transmitter is considered to be the maximum rated output power as specified by the manufacturer.

§ 90.539 Frequency stability.

Transmitters designed to operate in 769-775 MHz and 799-805 MHz frequency bands must meet the frequency stability requirements in this section.

(a) Mobile, portable and control transmitters must normally use automatic frequency control (AFC) to lock on to the base station signal.

(b) The frequency stability of base transmitters operating in the narrowband segment must be 100 parts per billion or better.

(c) The frequency stability of mobile, portable, and control transmitters operating in the narrowband segment must be 400 parts per billion or better when AFC is locked to the base station. When AFC is not locked to the base station, the frequency stability must be at least 1.0 ppm for 6.25 kHz, 1.5 ppm for 12.5 kHz (2 channel aggregate), and 2.5 ppm for 25 kHz (4 channel aggregate).

(d) The frequency stability of base transmitters operating in the wideband segment must be 1 part per million or better.

(e) The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked.

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

Frequency Stability and Voltage Test Results

FistNet + PS 700

[Downlink]

Reference: 120 Vac at 20°C **Freq.** = 763 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	763 000 001	0.976	0.000	0.00000
	-30	763 000 000	0.411	-0.566	-0.00027
	-20	763 000 000	-0.273	-1.249	-0.00059
	-10	763 000 001	0.920	-0.057	-0.00003
	0	763 000 000	0.381	-0.595	-0.00028
	+10	762 999 999	-0.852	-1.828	-0.00086
	+30	763 000 000	0.495	-0.482	-0.00023
	+40	763 000 001	0.745	-0.231	-0.00011
	+50	763 000 000	0.268	-0.708	-0.00033
High	+20	762 999 999	-0.745	-1.722	-0.00081
Low	+20	763 000 000	0.242	-0.734	-0.00034

Reference: 120 Vac at 20°C **Freq.** = 772 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	772 000 000	0.403	0.000	0.00000
	-30	772 000 001	0.888	0.486	0.00023
	-20	771 999 999	-0.945	-1.347	-0.00063
	-10	772 000 001	0.513	0.110	0.00005
	0	772 000 001	0.878	0.476	0.00022
	+10	772 000 000	-0.489	-0.892	-0.00042
	+30	772 000 001	0.899	0.497	0.00023
	+40	772 000 000	0.099	-0.303	-0.00014
	+50	772 000 000	0.019	-0.384	-0.00018
High	+20	772 000 000	-0.296	-0.699	-0.00033
Low	+20	772 000 000	0.457	0.054	0.00003

[Uplink]

Reference: 120 Vac at 20°C **Freq.** = 793 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	793 000 001	0.908	0.000	0.00000
	-30	793 000 000	0.318	-0.590	-0.00028
	-20	792 999 999	-0.944	-1.852	-0.00087
	-10	793 000 000	0.018	-0.889	-0.00042
	0	793 000 000	0.078	-0.830	-0.00039
	+10	792 999 999	-0.951	-1.859	-0.00087
	+30	793 000 001	0.992	0.084	0.00004
	+40	793 000 001	0.729	-0.179	-0.00008
	+50	793 000 001	0.804	-0.103	-0.00005
High	+20	793 000 000	-0.056	-0.963	-0.00045
Low	+20	793 000 000	0.085	-0.823	-0.00039

Reference: 120 Vac at 20°C **Freq.** = 802 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	802 000 001	0.514	0.000	0.00000
	-30	802 000 000	0.400	-0.114	-0.00005
	-20	801 999 999	-0.776	-1.291	-0.00061
	-10	802 000 000	0.416	-0.099	-0.00005
	0	802 000 000	0.454	-0.061	-0.00003
	+10	801 999 999	-0.537	-1.051	-0.00049
	+30	802 000 001	0.767	0.253	0.00012
	+40	802 000 001	0.910	0.396	0.00019
	+50	802 000 001	0.747	0.233	0.00011
High	+20	802 000 000	-0.454	-0.969	-0.00045
Low	+20	802 000 000	0.231	-0.283	-0.00013

PS 800

[Downlink]

Reference: 110 Vac at 20°C **Freq.** = 856.0 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	856 000 000	0.335	0.000	0.00000
	-30	856 000 001	0.555	0.220	0.00010
	-20	855 999 999	-0.869	-1.204	-0.00056
	-10	856 000 001	0.781	0.446	0.00021
	0	856 000 000	0.217	-0.118	-0.00006
	+10	855 999 999	-0.708	-1.042	-0.00049
	+30	856 000 000	0.257	-0.078	-0.00004
	+40	856 000 001	0.537	0.203	0.00010
	+50	856 000 001	0.591	0.256	0.00012
High	+20	855 999 999	-0.744	-1.079	-0.00051
Low	+20	856 000 000	0.037	-0.298	-0.00014

[Uplink]

Reference: 110 Vac at 20°C **Freq.** = 811.0 MHz

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	811 000 001	0.979	0.000	0.00000
	-30	811 000 001	0.517	-0.462	-0.00022
	-20	811 000 000	-0.269	-1.248	-0.00059
	-10	811 000 000	0.291	-0.689	-0.00032
	0	811 000 000	0.411	-0.569	-0.00027
	+10	810 999 999	-0.710	-1.689	-0.00079
	+30	811 000 001	0.653	-0.327	-0.00015
	+40	811 000 000	0.191	-0.789	-0.00037
	+50	811 000 001	0.819	-0.161	-0.00008
High	+20	810 999 999	-0.641	-1.621	-0.00076
Low	+20	811 000 001	0.946	-0.033	-0.00002