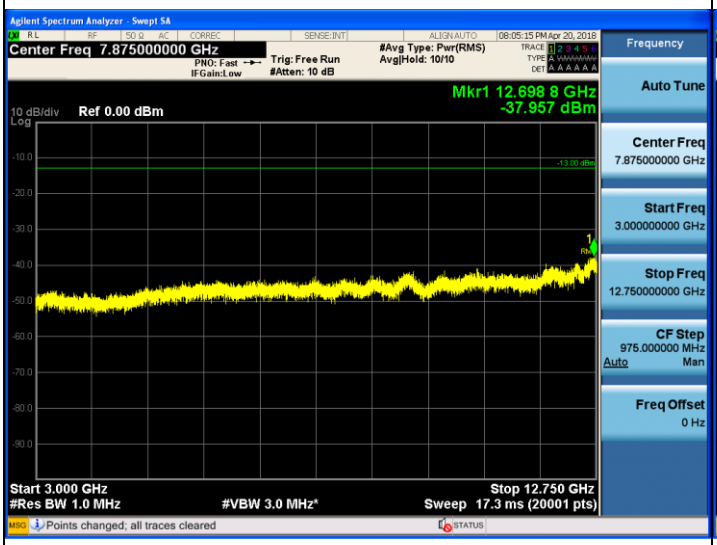
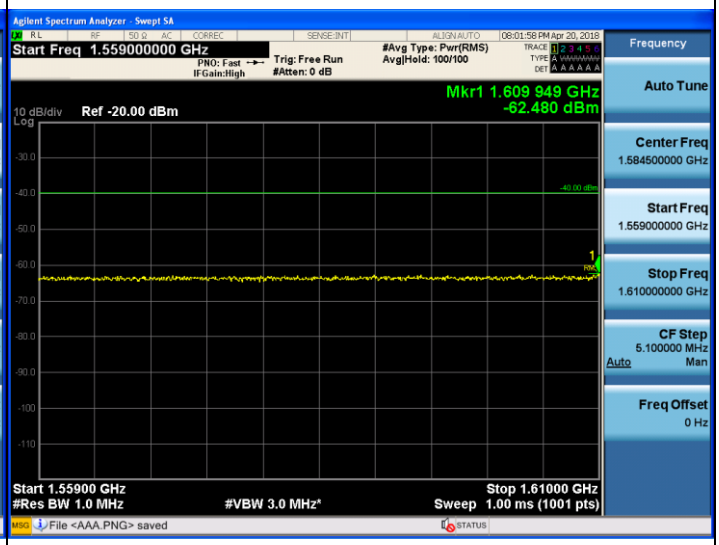
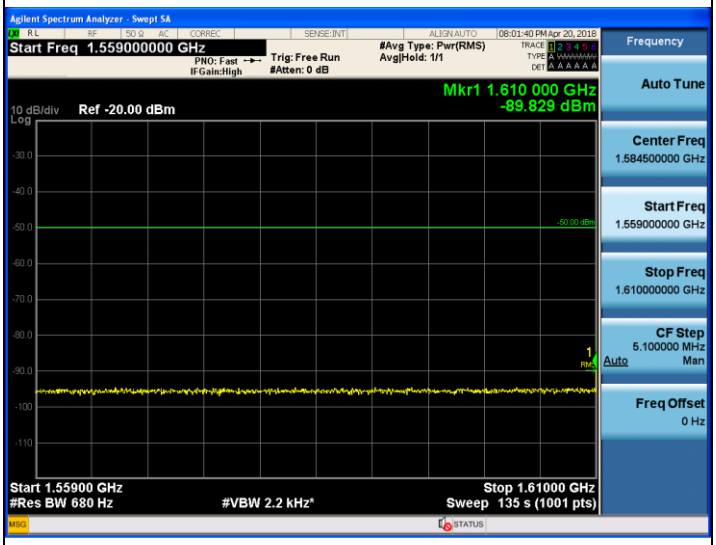
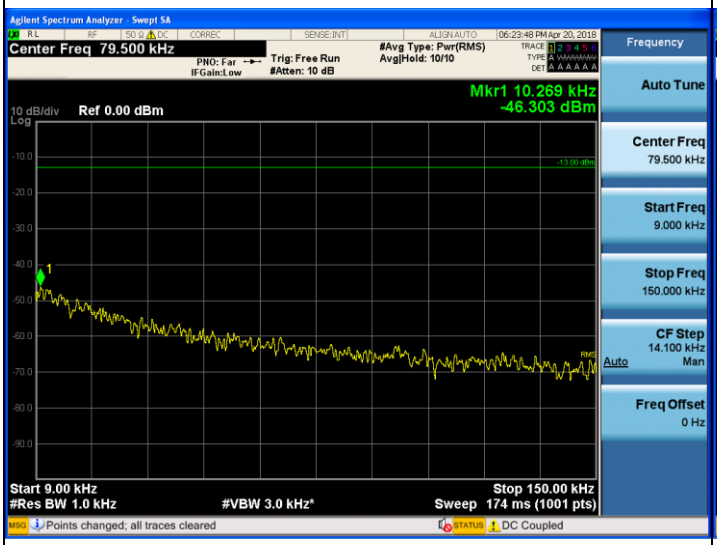
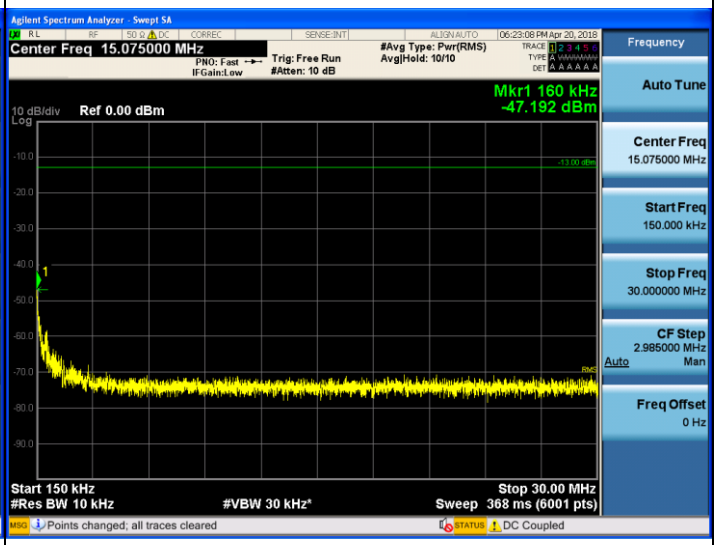
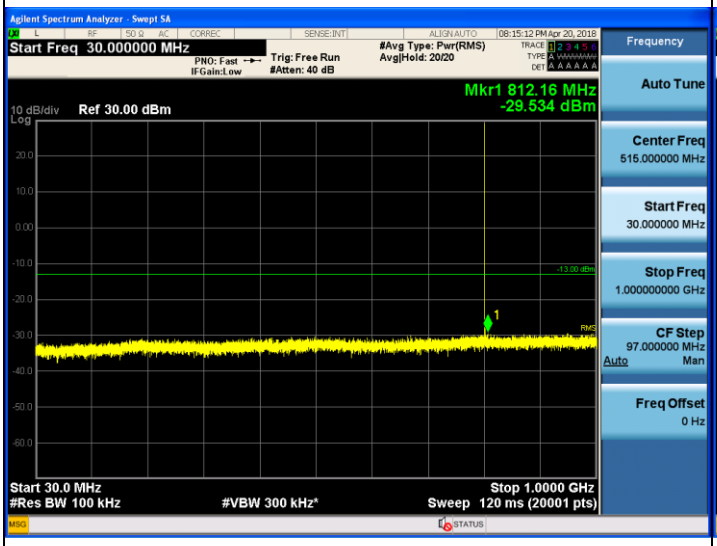
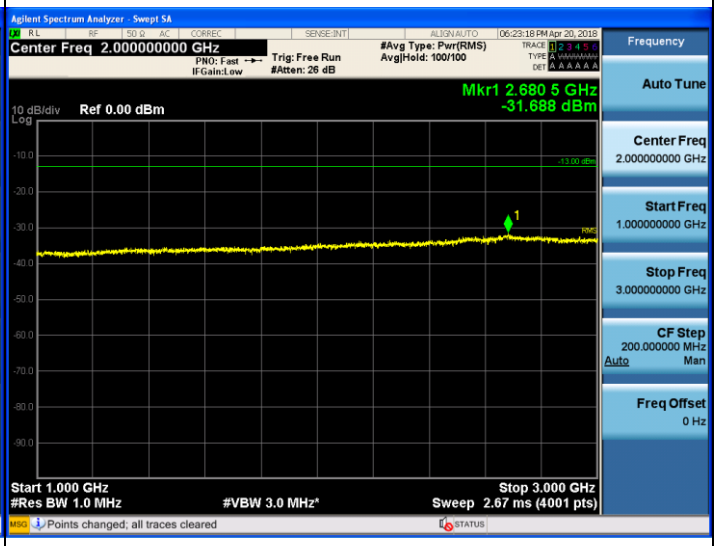
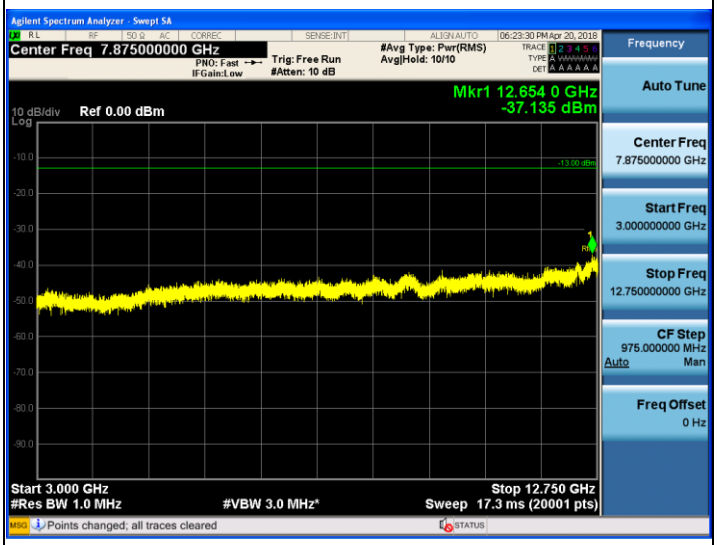
3 GHz ~ 12.75 GHz	1.559 GHz ~ 1.610 GHz
	
1.559 GHz ~ 1.610 GHz (700 Hz)	
	

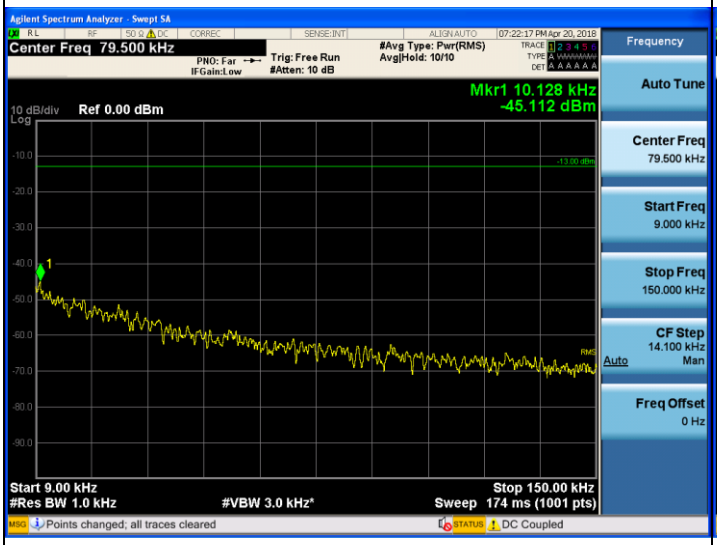
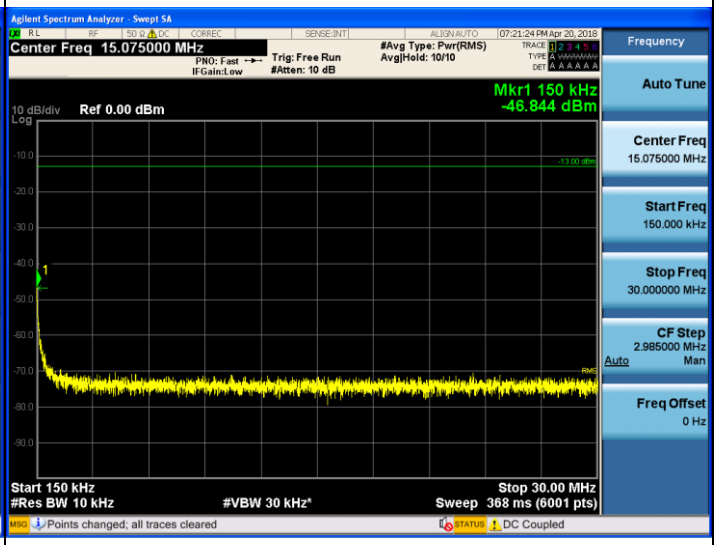
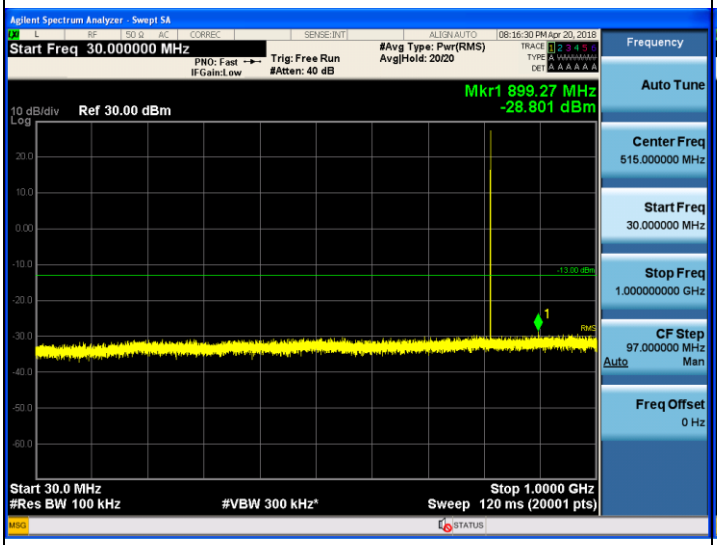
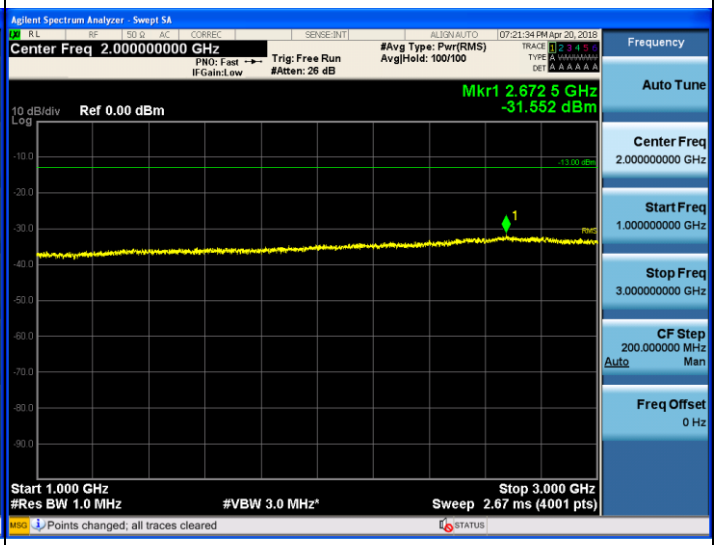
Plot of Uplink Unwanted Conducted Emissions for PS 800 Band

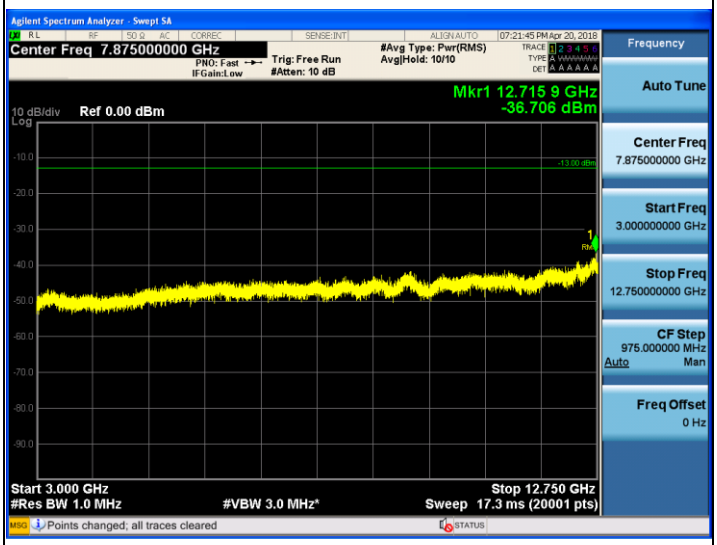
- Low Channel (P25 6.25 kHz)

9 kHz ~ 150 kHz	150 kHz ~ 30 MHz
	
30 MHz ~ 1 GHz	**1 GHz ~ 3 GHz**
	

3 GHz ~ 12.75 GHz


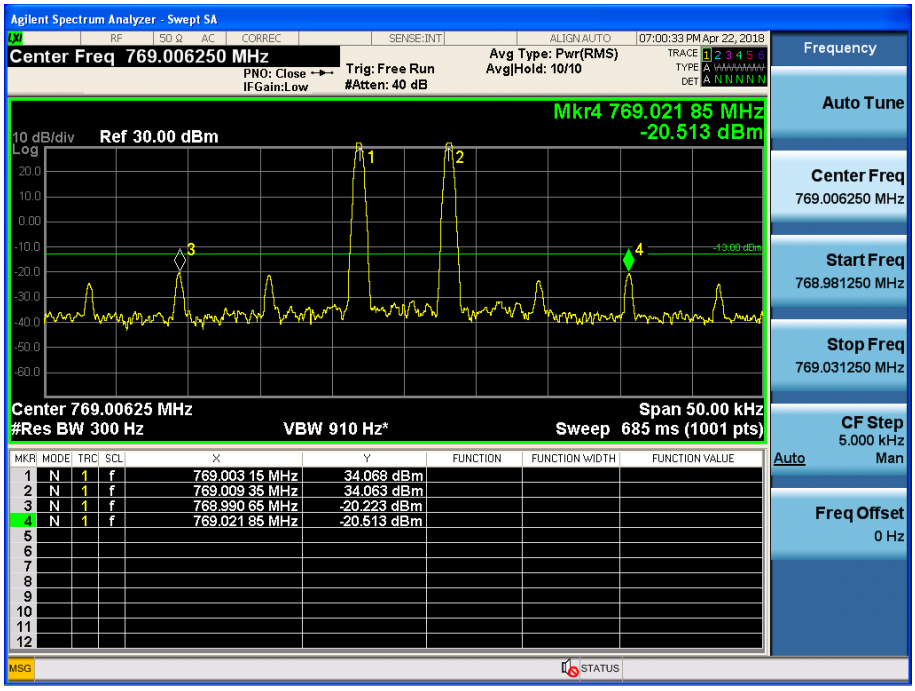
- High Channel (P25 6.25 kHz)

9 kHz ~ 150 kHz	150 kHz ~ 30 MHz
	
30 MHz ~ 1 GHz	**1 GHz ~ 3 GHz**
	

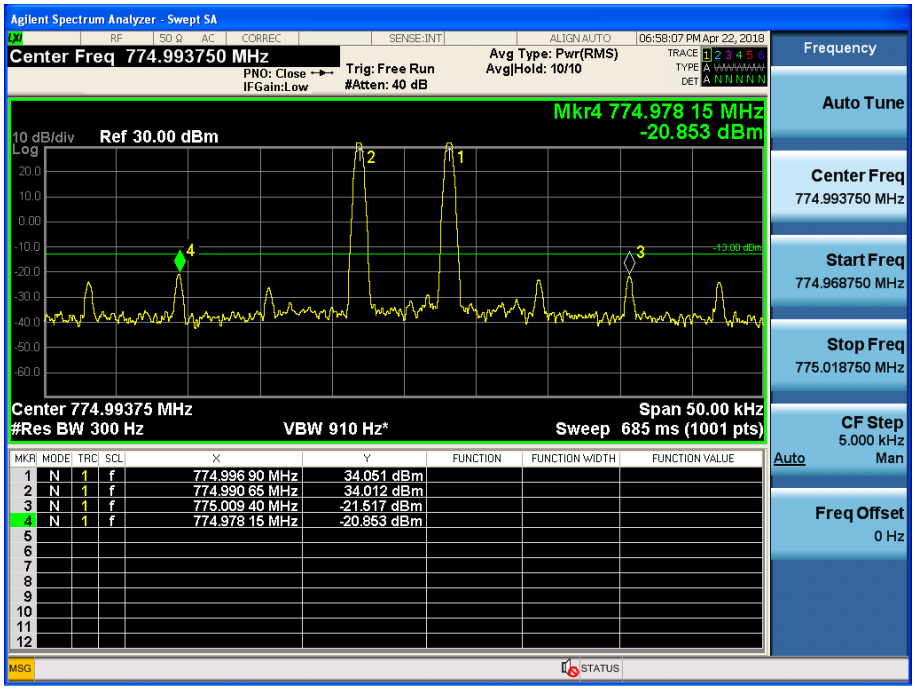
3 GHz ~ 12.75 GHz


Plot of Downlink Intermodulation Spurious Emissions for PS 700

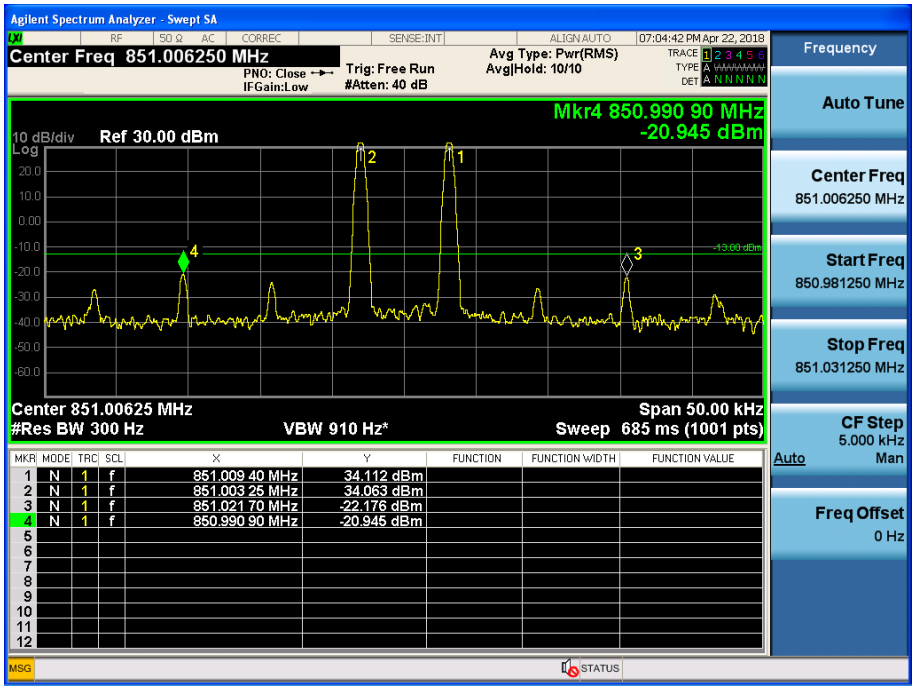
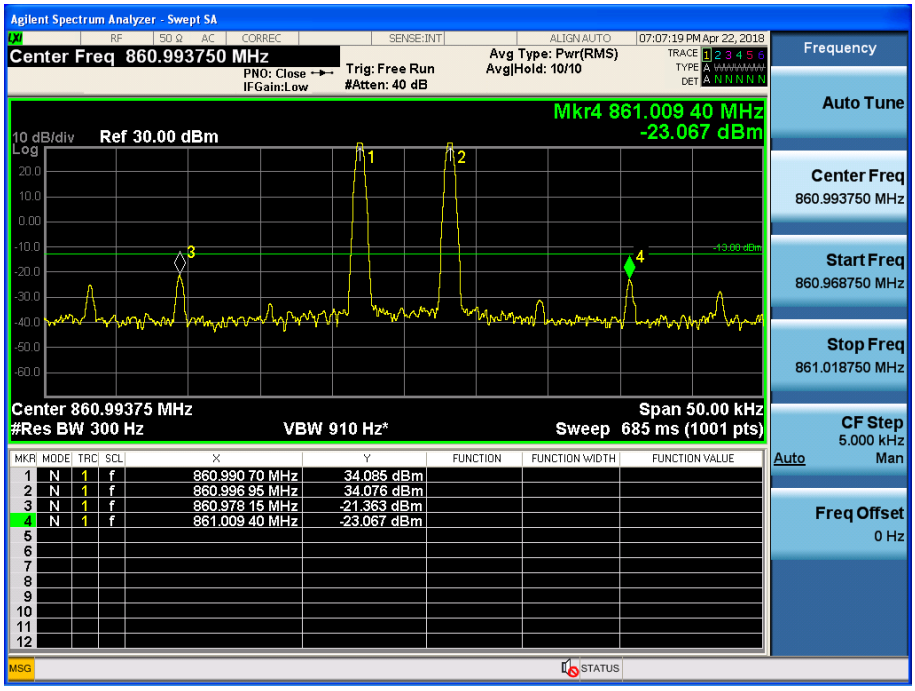
Low Channel



High Channel

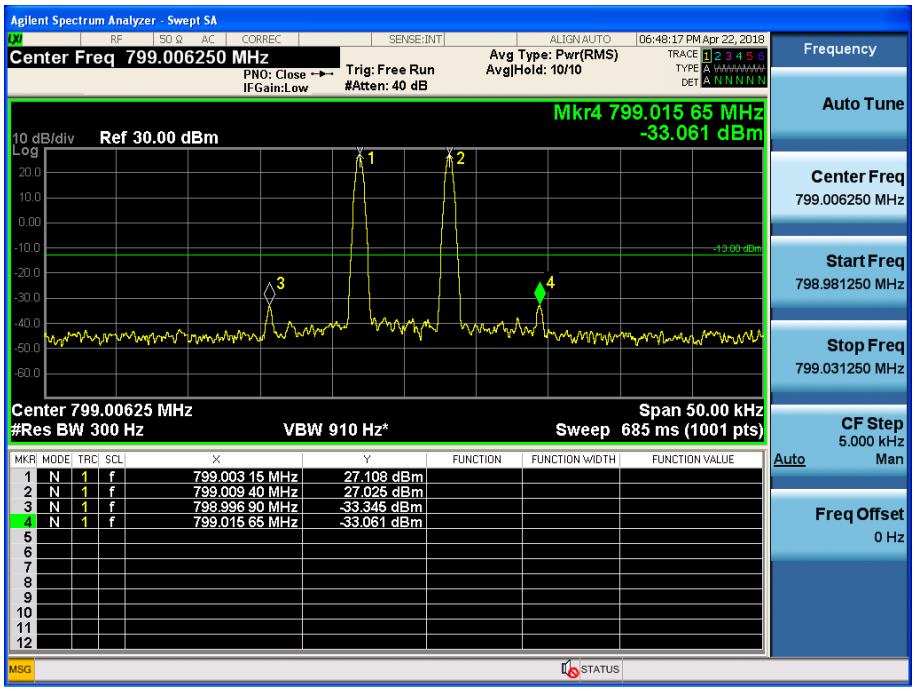


Plot of Downlink Intermodulation Spurious Emissions for PS 800

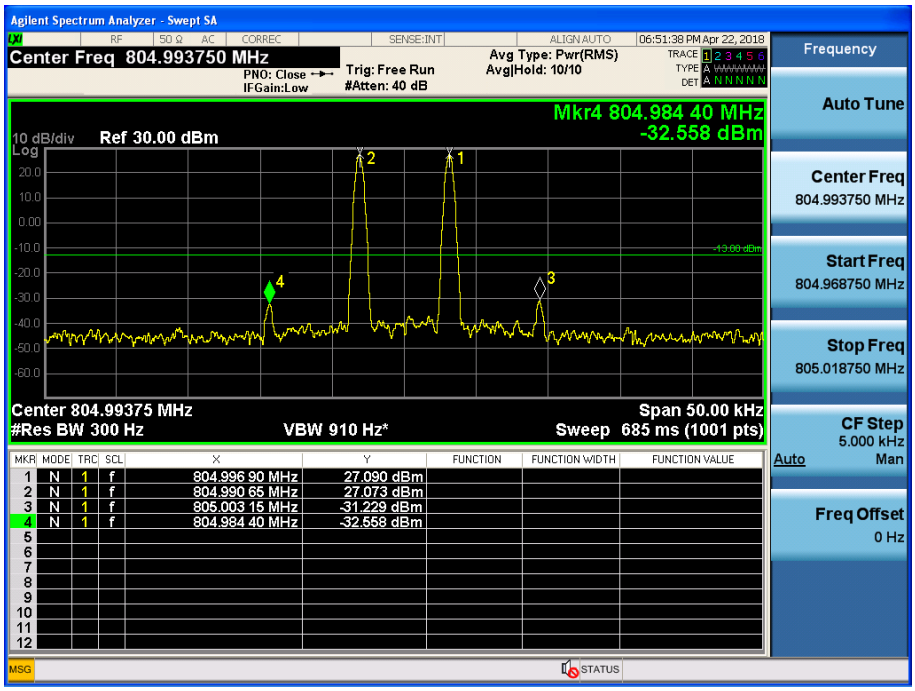
Low Channel

High Channel


Plot of Uplink Intermodulation Spurious Emissions for PS 700

Low Channel

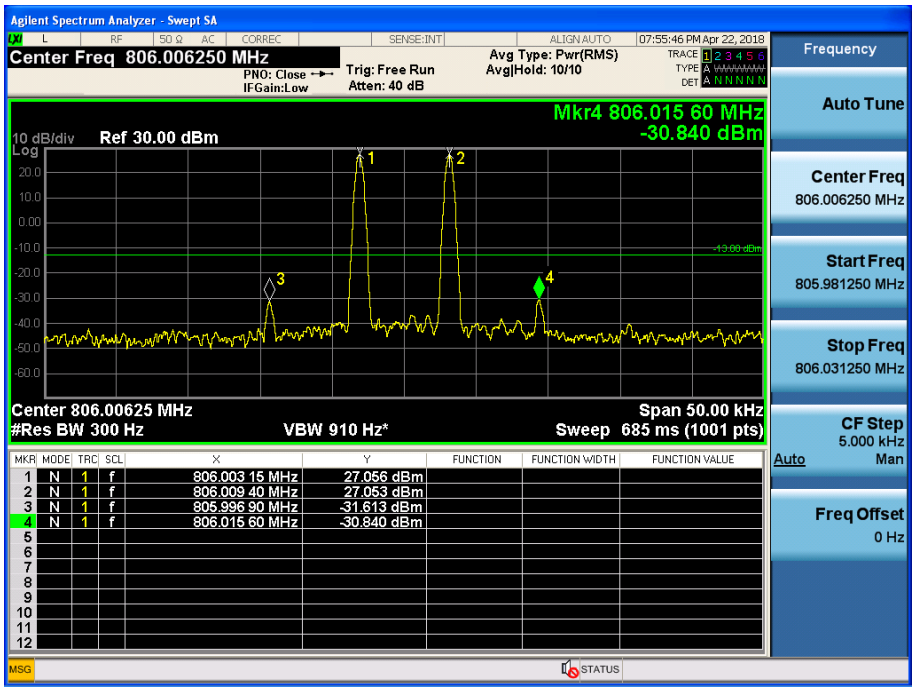


High Channel

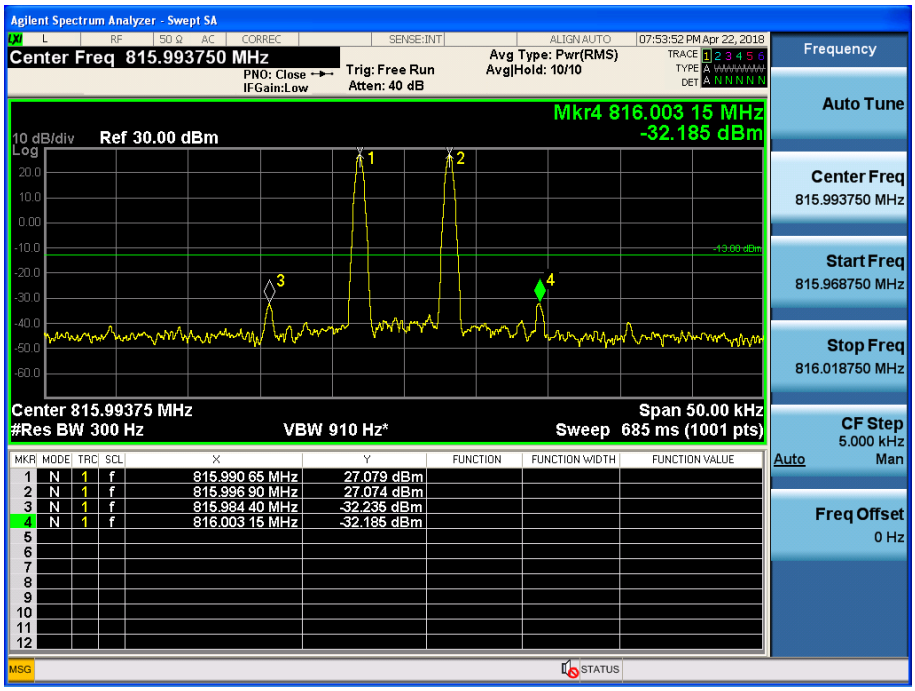


Plot of Uplink Intermodulation Spurious Emissions for PS 800

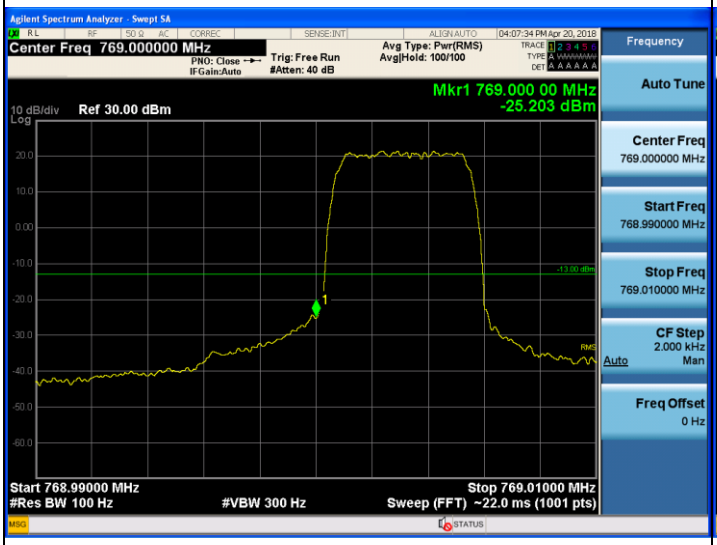
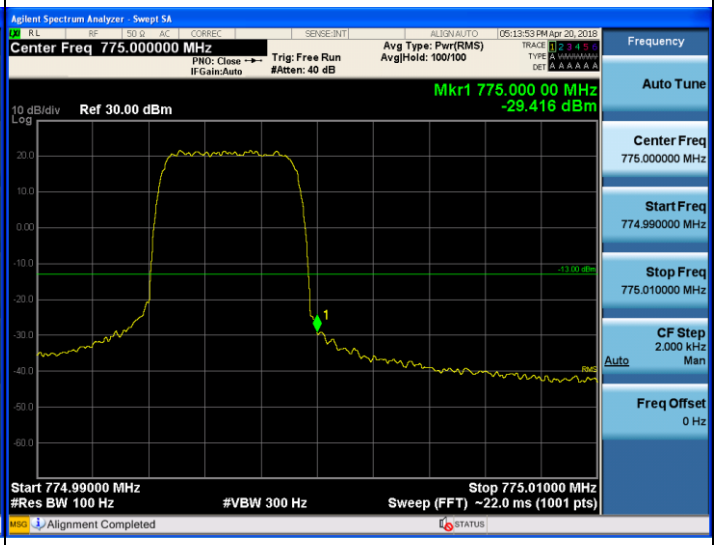
Low Channel



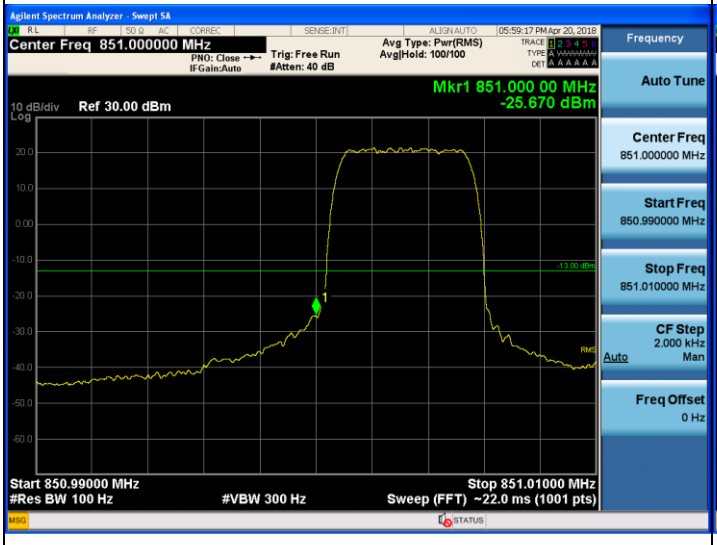
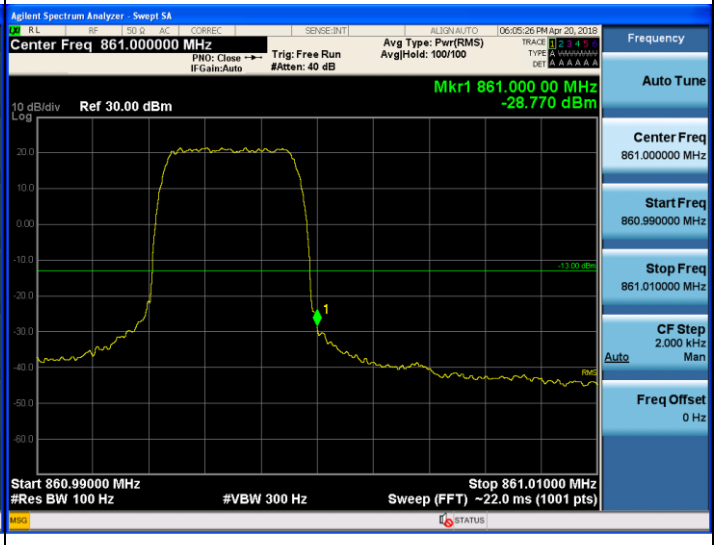
High Channel



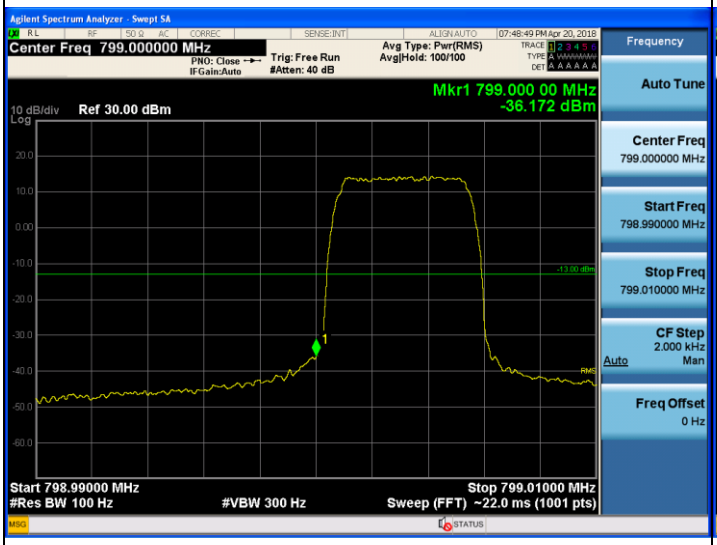
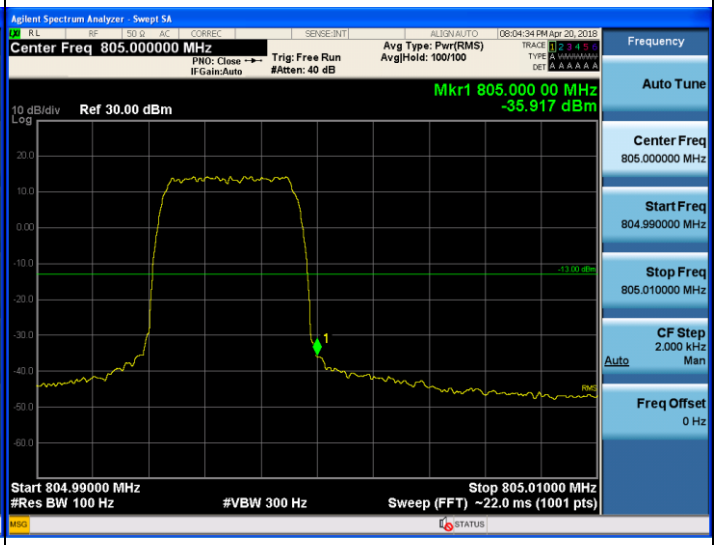
Plot of Downlink Band Edge for PS 700

Band Left	Band Right
	

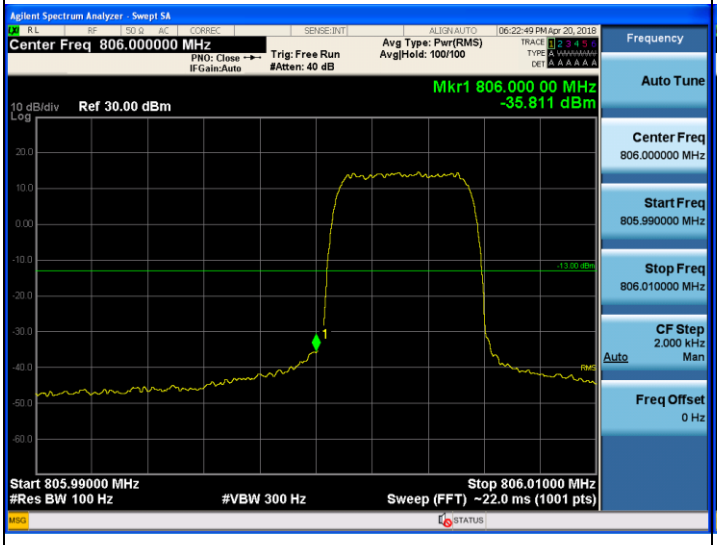
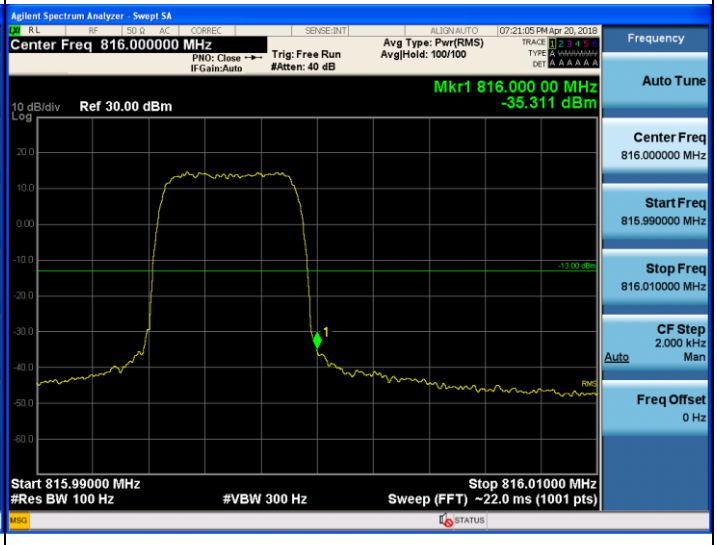
Plot of Downlink Band Edge for PS 800

Band Left	Band Right
	

Plot of Uplink Band Edge for PS 700

Band Left	Band Right
	

Plot of Uplink Band Edge for PS 800

Band Left	Band Right
	

11. RADIATED 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.

§ 90.543 Emission limitations.

Transmitters designed to operate in 769-775 MHz and 799-805 MHz frequency bands must meet the emission limitations in paragraphs (a) through (d) of this section. Class A and Class B signal boosters retransmitting signals in the 769-775 MHz and 799-805 MHz frequency bands are exempt from the limits listed in paragraph (a) of this section when simultaneously retransmitting multiple signals and instead shall be subject to the limit listed in paragraph (c) of this section when operating in this manner. Transmitters operating in 758-768 MHz and 788-798 MHz bands must meet the emission limitations in (e) of this section.

(c) *Out-of-band emission limit.* On any frequency outside of the frequency ranges covered by the

ACP tables in this section, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

(d) *Authorized bandwidth.* Provided that the ACP requirements of this section are met, applicants may request any authorized bandwidth that does not exceed the channel size.

(f) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

IC Rules

Test Requirements:

RSS-Gen

7. Receiver Emissions Limits

7.3 Receiver Radiated Emissions Limits

Radiated emission measurements shall be performed with the receiver antenna connected to the receiver antenna ports. The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is higher, to at least five times the highest tunable or local oscillator frequency, whichever is higher, without exceeding 40 GHz.

Spurious emissions from receivers shall not exceed the radiated emissions limits shown in table 3.

Table 3 – Receiver radiated emissions limits

Frequency (MHz)	Field Strength (μv/m at 3 metres)*
30-88	100
88-216	150
216-960	200
Above 960	500

Note 1: Measurements for compliance with the limits in table 3 may be performed at distances other than 3 metres, in accordance with section 6.6.

Test Procedures:

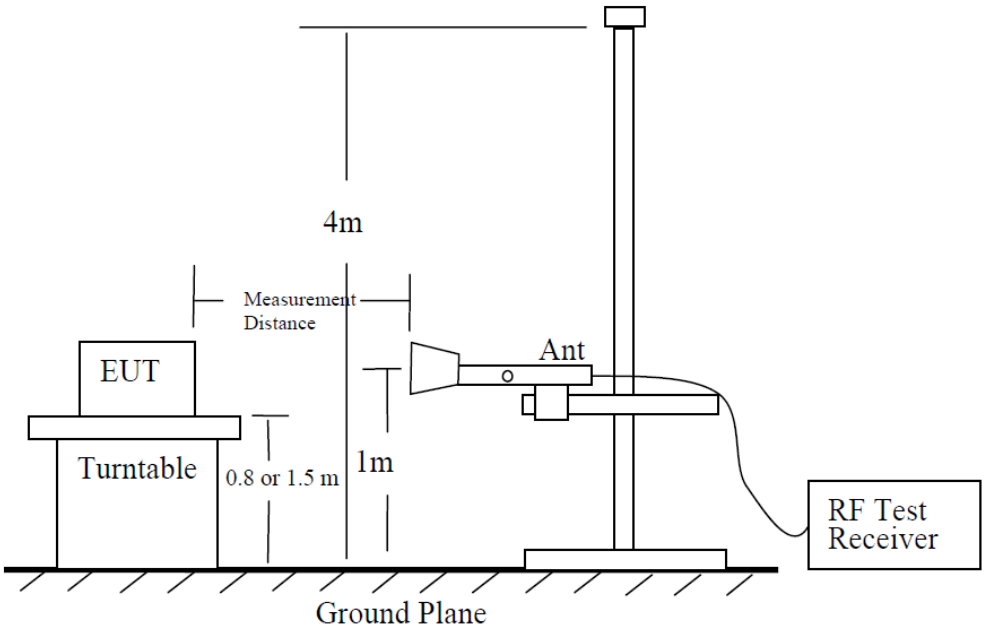
As required by 47 CFR 2.1053, *field strength of radiated spurious measurements* were made in accordance with the procedures of ANSI/TIA-603-E-2016 "Land Mobile FM or PM Communications

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.

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)
3) Position of EUT for testing below 1 GHz test is 80 cm, and above 1 GHz is 1.5 m

Receiver Spurious Emissions Test Result:

ISED Rule(s):	**RSS-GEN**
Test Requirements:	**Blow the table**
Operating conditions:	**Under normal test conditions**
Method of testing:	**Radiated**
S/A. Settings:	**F < 1 GHz: RBW: 120 kHz, VBW: 300 kHz (Quasi Peak)** **F > 1 GHz: RBW: 1 MHz, VBW: 1 MHz (Peak)**
Mode of operation:	**Receive**

Frequency (MHz)	**Field Strength (microvolts/m at 3 meters)**
30 – 88	100
88 - 216	150
216 – 960	200
Above 960	500

Data of Receiver Spurious Emissions

30 MHz ~ 1 GHz

Frequency (MHz)	Reading (dBuV)	Ant. factor (dB/m)	Cable loss (dB)	Ant. POL (H/V)	Total (dBuV/m)	Limit (dBuV/m)	Margin (dB)
No critical peaks found							

Above 1 GHz

Frequency (MHz)	Reading (dBuV)	Ant. factor (dB/m)	Cable loss (dB)	Ant. POL (H/V)	Total (dBuV/m)	Limit (dBuV/m)	Margin (dB)
No critical peaks found							

Test Result:

PS 700 Downlink

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

* C.L.: Cable Loss / A.G.: Ant. Gain / D.F.: Distance Factor (3.75 m)

PS 700 Uplink

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

* C.L.: Cable Loss / A.G.: Ant. Gain / D.F.: Distance Factor (3.75 m)

PS 800 Downlink

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

* C.L.: Cable Loss / A.G.: Ant. Gain / D.F.: Distance Factor (3.75 m)

PS 800 Uplink

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

* C.L.: Cable Loss / A.G.: Ant. Gain / D.F.: Distance Factor (3.75 m)

12. FREQUENCY STABILITY

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.

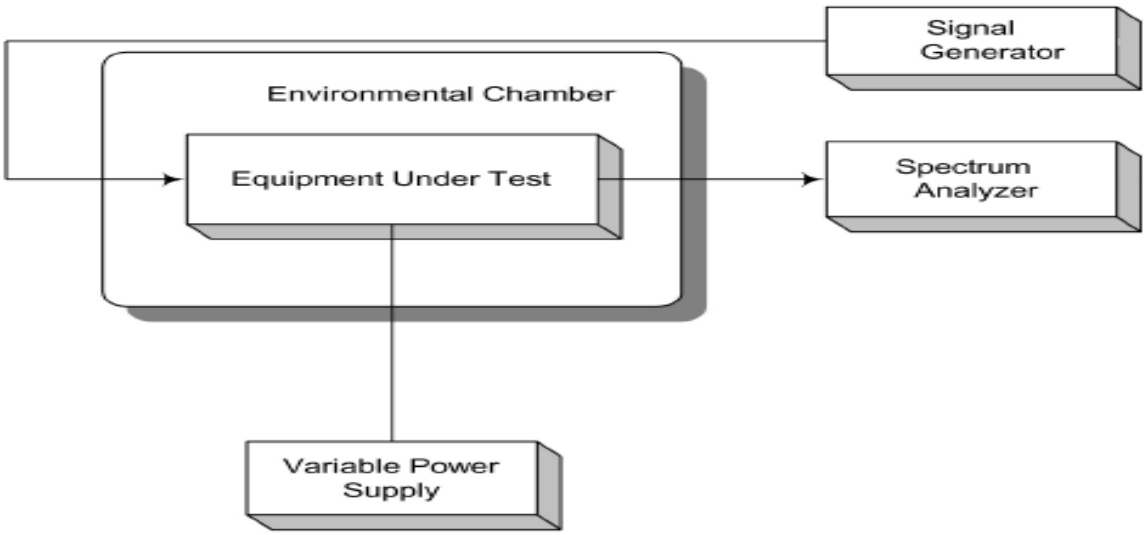
A CW signal was injected into the EUT at the appropriate RF level. The frequency counter option on the Spectrum Analyzer was used to measure frequency deviations.

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

Test Setup:



Note:

1) The results of the frequency stability test shown above the frequency deviation measured values are very small and similar trend for each port, so we are attached only the worst case data.

Test Results:

Data for PS700 Downlink

Reference: voltage = -48 Vdc at 20°C, frequency = 772 MHz

Voltage (%)	Temp.(℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	772 000 000	0.102	0.000	0.00000
	-30	772 000 001	0.666	0.565	0.00073
	-20	772 000 001	0.966	0.864	0.00112
	-10	772 000 000	-0.328	-0.430	-0.00056
	0	772 000 001	0.907	0.805	0.00104
	+10	772 000 000	0.466	0.364	0.00047
	+30	772 000 001	0.834	0.732	0.00095
	+40	772 000 000	-0.198	-0.300	-0.00039
	+50	772 000 000	0.340	0.238	0.00031
115%	+20	772 000 000	-0.147	-0.248	-0.00032
85%	+20	771 999 999	-0.972	-1.073	-0.00139

Data for PS700 Uplink

Reference: voltage = -48 Vdc at 20°C, frequency = 802 MHz

Voltage (%)	Temp.(℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	801 999 999	-0.741	0.000	0.00000
	-30	802 000 000	0.367	1.108	0.00138
	-20	802 000 001	0.669	1.410	0.00176
	-10	802 000 001	0.907	1.648	0.00205
	0	801 999 999	-0.979	-0.237	-0.00030
	+10	802 000 000	0.391	1.132	0.00141
	+30	802 000 000	0.240	0.982	0.00122
	+40	801 999 999	-0.746	-0.005	-0.00001
	+50	801 999 999	-0.967	-0.226	-0.00028
115%	+20	802 000 001	0.737	1.478	0.00184
85%	+20	801 999 999	-0.539	0.203	0.00025

Data for PS800 Downlink

Reference: voltage = -48 Vdc at 20°C, frequency = 856 MHz

Voltage (%)	Temp.(℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	856 000 001	0.999	0.000	0.00000
	-30	856 000 000	-0.374	-1.373	-0.00160
	-20	856 000 001	0.878	-0.121	-0.00014
	-10	856 000 001	0.764	-0.235	-0.00027
	0	856 000 000	0.162	-0.837	-0.00098
	+10	855 999 999	-0.670	-1.669	-0.00195
	+30	856 000 000	-0.334	-1.333	-0.00156
	+40	855 999 999	-0.990	-1.989	-0.00232
	+50	856 000 000	0.072	-0.927	-0.00108
115%	+20	856 000 000	0.217	-0.782	-0.00091
85%	+20	856 000 001	0.941	-0.058	-0.00007

Data for PS800 Uplink

Reference: voltage = -48 Vdc at 20°C, frequency = 811 MHz

Voltage (%)	Temp.(℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	811 000 000	0.476	0.000	0.00000
	-30	811 000 000	0.243	-0.233	-0.00029
	-20	810 999 999	-0.949	-1.425	-0.00176
	-10	810 999 999	-0.778	-1.254	-0.00155
	0	810 999 999	-0.925	-1.401	-0.00173
	+10	810 999 999	-0.663	-1.139	-0.00140
	+30	811 000 000	0.307	-0.169	-0.00021
	+40	810 999 999	-0.537	-1.013	-0.00125
	+50	811 000 000	-0.368	-0.844	-0.00104
115%	+20	811 000 000	0.008	-0.468	-0.00058
85%	+20	810 999 999	-0.536	-1.012	-0.00125