HCT CO.,LTD.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 FAX: +82-31-645-6401

FCC / ISED REPORT

Certification

Applicant Name:
SOLiD, Inc.

Address:
10, 9th Floor, SOLiD Space, Pangyoyeok-ro 220, Bundang-gu, Seongnam-si, Gyeonggi-do, 463-400, South Korea

Date of Issue:
August 18, 2017
Location:
HCT CO., LTD.,
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
Report No.: HCT-R-1707-F007-1
ISED Registration Number: 5944A-5

FCC ID:	**W6USRDR7080A**
IC:	**9354A-SRDR7080A**
APPLICANT:	**SOLiD, Inc.**

Model: SRDR-33-7080-A

EUT Type: SOLiD Responder

Frequency Ranges :

	Downlink	Uplink
PS 700	769 ~ 775 MHz (for FCC) (768 ~ 769 MHz Guard band) 768 ~ 775 MHz (for ISED)	799 ~ 805 MHz (for FCC) (798 ~ 799 MHz Guard band) 798 ~ 805 MHz (for ISED)
PS 800	851 ~ 861 MHz	806 ~ 816 MHz

Conducted Output Power:

	Downlink	Uplink
PS 700	33 dBm (2 W)	27 dBm (0.5 W)
PS 800	33 dBm (2 W)	27 dBm (0.5 W)

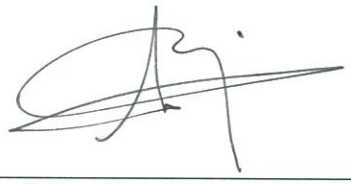
Date of Test: May 11, 2017 ~ June 12, 2017

FCC Rule Part(s): CFR 47 Part 2, Part 90

IC Rules: RSS-Gen (Issue 4, November 2014), RSS-131 (Issue 3, May 2017)

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC / IC Rules under normal use and maintenance.

Report prepared by : Kwon Jeong
Engineer of Telecommunication testing center



Approved by : Jong Seok Lee
Manager of Telecommunication testing center

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1707-F008	July 13, 2017	- First Approval Report
HCT-R-1707-F007-1	August 18, 2017	- Updated to the lastest version of test items, standards and test procedures. - Revised the title of uplink input each plot. - Added the ACP test results.

Table of Contents

1. CLIENT INFORMATION

The EUT has been tested by request of

Company	SOLiD, Inc. 10, 9th Floor, SOLiD Space, Pangyoyeok-ro 220, Bundang-gu, Seongnam-si, Gyeonggi-do, 463-400, South Korea

FCC ID: W6USRDR7080A

IC: 9354A-SRDR7080A

EUT Type: SOLiD Responder

Model: SRDR-33-7080-A

Power Supply: AC 120 V, AC 220 V, DC -48 V

Frequency Ranges :

	Downlink	Uplink
PS 700	769 ~ 775 MHz (for FCC) (768 ~ 769 MHz Guard band) 768 ~ 775 MHz (for ISED)	799 ~ 805 MHz (for FCC) (798 ~ 799 MHz Guard band) 798 ~ 805 MHz (for ISED)
PS 800	851 ~ 861 MHz	806 ~ 816 MHz

Conducted Output Power:

	Downlink	Uplink
PS 700	33 dBm (2 W)	27 dBm (0.5 W)
PS 800	33 dBm (2 W)	27 dBm (0.5 W)

Antenna Gain(s): Manufacturer does not provide an antenna.

Measurement standard(s): ANSI/TIA-603-D-2010, KDB 971168 D01 v02r02, KDB 935210 D05 v01r01, RSS-GEN, RSS-119, RSS-131

FCC Rule Part(s): CFR 47 Part 2, Part 90

IC Rules: RSS-Gen (Issue 4, November 2014), RSS-131 (Issue 3, May 2017)

Place of Tests: HCT CO., LTD.,
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
(ISED Registration Number : 5944A-5)

2. FACILITIES AND ACCREDITATIONS

2.1. FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 07, 2015 (Registration Number: 90661).

2.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.
Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

3. TEST SPECIFICATIONS

3.1. STANDARDS

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 2, Part 90, RSS-Gen, RSS-119, RSS-131.

Description	Reference (FCC)	Reference (IC)	Results
Conducted RF Output Power	§2.1046, §90.541, §90.542, §90.635	RSS-119, Section 5.4 RSS-131, Section 6.2	Compliant
Occupied Bandwidth	§2.1049	RSS-Gen, Sectin 6.6	Compliant
Out of Band Rejection	KDB 935210 D05 v01r01	-	Compliant
Noise Figure	§90.219(e)(2)	RSS-131, Section 6.4	Compliant
Emission Masks	§90.210	RSS-119, Section 5.5 RSS-119, Section 5.8	Compliant
Spurious Emissions at Antenna Terminals	§2.1051, §90.219(e)(3), §90.543	RSS-119, Section 5.8 RSS-131, Section 6.5	Compliant
Radiated Spurious Emissions	§2.1053	RSS-Gen, Section 7.1.2	Compliant
Frequency Stability	§2.1055; §90.213. §90.539	RSS-119, Section 5.3 RSS-131, Section 6.6	Compliant

3.2. MODE OF OPERATION DURING THE TEST

The EUT was operated in a manner representative of the typical usage of the equipment.

During all testing, system components were manipulated within the confines of typical usage to maximize each emission.

All modulation modes were tested. Test results are only attached worst cases.

The device does not supply antenna(s) with the system, so the dummy loads were connected to the RF output ports for radiated spurious emission testing.

	Downlink Freq.	Uplink Freq.	Modulation
PS700	769 ~ 775 MHz (768 ~ 769 MHz Guard band) 768 ~ 775 MHz (for ISED)	799 ~805 MHz (798 ~ 799 MHz Guard band) 798 ~ 805 MHz (for ISED)	P25 (12.5 kHz) Analog FM (25 kHz)
PS 800	851 ~ 861 MHz	806 ~ 816 MHz	

* Note: This EUT is supported power supply both of AC and DC. Test results are only attached worst cases.

* The tests results in plots are already including the actual value of loss for the attenuator and cable combination. Please check correction factors below table.

▣ Correction Factor

Freq(MHz)	Factor(dB)
30	30.504
100	29.246
200	29.578
300	29.551
400	29.859
500	29.924
600	29.983
700	29.946
800	30.056
900	30.200
1000	30.263
2000	30.864
3000	32.243
4000	32.456
5000	30.504
6000	29.246
7000	33.210

8000	33.429
9000	34.210
10000	34.597
11000	35.485
12000	36.128
13000	37.014
14000	37.524
15000	38.070
16000	41.191
17000	41.070
18000	42.726
19000	41.312
20000	41.964
21000	42.616
22000	43.268
23000	43.920
24000	44.572
25000	45.225

3.3. MAXIMUM MEASUREMENT UNCERTAINTY

The value of the measurement uncertainty for the measurement of each parameter.

Coverage factor *k* = 2, Confidence levels of 95 %

Description	Condition	Uncertainty
Conducted RF Output Power	-	± 0.72 dB
Occupied Bandwidth	OBW ≤ 20 MHz	± 52 kHz
Out of Band Rejection	Gain 20 dB bandwidth	± 0.89 dB ± 0.58 MHz
Spurious Emissions at Antenna Terminals	-	± 1.08 dB
Noise Figure, Emission Masks	-	± 0.89 dB
Radiated Spurious Emissions	f ≤ 1 GHz f > 1 GHz	± 4.80 dB ± 6.07 dB

4. STANDARDS ENVIRONMENTAL TEST CONDITIONS

Temperature :	**+ 15 ℃ to + 35 ℃**
Relative humidity:	**30 % to 60 %**
Air pressure	**860 mbar to 1 060 mbar**

5. TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Agilent	E4438C /Signal Generator	12/21/2016	Annual	MY42082646
Agilent	E4438C /Signal Generator	01/24/2017	Annual	US41460432
Agilent	N5182A /Signal Generator	03/29/2017	Annual	MY50141649
Agilent	N5182A /Signal Generator	01/23/2017	Annual	MY47070406
Agilent	N9020A / Signal Analyzer	07/04/2016	Annual	MY49100925
Weinschel	67-30-33 / Fixed Attenuator	02/09/2017	Annual	CC7264
Weinschel	2-10 / 10 dB Attenuator	02/22/2017	Annual	BR0554
Agilent	11636A / Power Divider	08/12/2016	Annual	09109
DEAYOUNG ENT	DFSS60 / AC Power Supply	04/05/2017	Annual	1003030-1
NANGYEUL CO., LTD.	NY-THR18750 / Temperature and Humidity Chamber	10/21/2016	Annual	NY-2009012201A
Innco system	MA4000-EP / Antenna Position Tower	N/A	N/A	N/A
Innco system	CT0800 / Turn Table	N/A	N/A	N/A
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
ETS	2090 / Controller(Turn table)	N/A	N/A	1646
Rohde & Schwarz	Loop Antenna	04/19/2017	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	12/11/2015	Biennial	9120D-1191
Rohde & Schwarz	FSP / Spectrum Analyzer	09/29/2016	Annual	836650/016
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/23/2016	Annual	101068-SZ
Wainwright Instruments	WHK1.2/15G-10EF / Highpass Filter	04/10/2017	Annual	4
Wainwright Instruments	WHKX10-2700-3000-18000-40SS / High Pass Filter	08/11/2016	Annual	4
CERNEX	CBLU1183540 / Power Amplifier	01/25/2017	Annual	24614
CERNEX	CBL06185030 / Power Amplifier	01/25/2017	Annual	24615
CERNEX	CBL18265035 / Power Amplifier	01/23/2017	Annual	22966

6. RF OUTPUT POWER

FCC Rules

Test Requirements:

§ 2.1046 Measurements required: RF power output:

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8).The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

(b) For single sideband, independent sideband, and single channel, controlled carrier radio telephone transmitters, the procedure specified in paragraph (a) of this section shall be employed and, in addition, the transmitter shall be modulated during the test as specified and as applicable in § 2.1046 (b) (1-5). In all tests, the input level of the modulating signal shall be such as to develop rated peak envelope power or carrier power, as appropriate, for the transmitter.

(c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

§ 90.541 Transmitting power and antenna height limits.

The transmitting power and antenna height of base, mobile, portable and control stations operating in the 769-775 MHz and 799-805 MHz frequency bands must not exceed the maximum limits in this section. Power limits are listed in effective radiated power (ERP).

(a) The transmitting power and antenna height of base stations must not exceed the limits given in paragraph (a) of §90.635.

§ 90.542 Broadband transmitting power limits.

(a) The following power limits apply to the 758-768/788-798 MHz band:

(1) Fixed and base stations transmitting a signal in the 758-768 MHz band with an emission bandwidth of 1 MHz or less must not exceed an ERP of 1000 watts and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts ERP in accordance with Table 1 of this section.

(2) Fixed and base stations located in a county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, and transmitting a signal in the 758-768 MHz band with an emission bandwidth of 1 MHz or less must not exceed an ERP of 2000 watts and an antenna height of 305 m HAAT,

except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 2000 watts ERP in accordance with Table 2 of this section.

(3) Fixed and base stations transmitting a signal in the 758-768 MHz band with an emission bandwidth greater than 1 MHz must not exceed an ERP of 1000 watts/MHz and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts/MHz ERP accordance with Table 3 of this section.

(4) Fixed and base stations located in a county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, and transmitting a signal in the 758-768 MHz band with an emission bandwidth greater than 1 MHz must not exceed an ERP of 2000 watts/MHz and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 2000 watts/MHz ERP in accordance with Table 4 of this section.

(5) Licensees of fixed or base stations transmitting a signal in the 758-768 MHz band at an ERP greater than 1000 watts must comply with the provisions set forth in paragraph (b) of this section.

(6) Control stations and mobile stations transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 30 watts ERP.

(7) Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

(8) For transmissions in the 758-768 MHz and 788-798 MHz bands, licensees may employ equipment operating in compliance with either of the following measurement techniques:

(i) The maximum composite transmit power shall be measured over any interval of continuous transmission using instrumentation calibrated in terms of RMS-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, etc., so as to obtain a true maximum composite measurement for the emission in question over the full bandwidth of the channel.

(ii) A Commission-approved average power technique.

Table 1 to §90.542(a)—Permissible Power and Antenna Heights for Base and Fixed Stations in the 758-768 MHz Band Transmitting a Signal With an Emission Bandwidth of 1 MHz or Less

Antenna height (AAT) in meters (feet)	Effective radiated power (ERP) (watts)
Above 1372 (4500)	65
Above 1220 (4000) To 1372 (4500)	70
Above 1067 (3500) To 1220 (4000)	75
Above 915 (3000) To 1067 (3500)	100
Above 763 (2500) To 915 (3000)	140

Above 610 (2000) To 763 (2500)	200
Above 458 (1500) To 610 (2000)	350
Above 305 (1000) To 458 (1500)	600
Up to 305 (1000)	1000

Table 2 to §90.542(a)—Permissible Power and Antenna Heights for Base and Fixed Stations in the 758-768 MHz Band Transmitting a Signal With an Emission Bandwidth of 1 MHz or Less

Antenna height (AAT) in meters (feet)	Effective radiated power (ERP) (watts)
Above 1372 (4500)	130
Above 1220 (4000) To 1372 (4500)	140
Above 1067 (3500) To 1220 (4000)	150
Above 915 (3000) To 1067 (3500)	200
Above 763 (2500) To 915 (3000)	280
Above 610 (2000) To 763 (2500)	400
Above 458 (1500) To 610 (2000)	700
Above 305 (1000) To 458 (1500)	1200
Up to 305 (1000)	2000

Table 3 to §90.542(a)—Permissible Power and Antenna Heights for Base and Fixed Stations in the 758-768 MHz Band Transmitting a Signal With an Emission Bandwidth Greater Than 1 MHz

Antenna height (AAT) in meters (feet)	Effective radiated power (ERP) per MHz (watts/MHz)
Above 1372 (4500)	65
Above 1220 (4000) To 1372 (4500)	70
Above 1067 (3500) To 1220 (4000)	75
Above 915 (3000) To 1067 (3500)	100
Above 763 (2500) To 915 (3000)	140
Above 610 (2000) To 763 (2500)	200
Above 458 (1500) To 610 (2000)	350
Above 305 (1000) To 458 (1500)	600
Up to 305 (1000)	1000

Table 4 to §90.542(a)—Permissible Power and Antenna Heights for Base and Fixed Stations in the 758-768 MHz Band Transmitting a Signal With an Emission Bandwidth Greater Than 1 MHz

Antenna height (AAT) in meters (feet)	Effective radiated power (ERP) per MHz (watts/MHz)

Above 1372 (4500)	130
Above 1220 (4000) To 1372 (4500)	140
Above 1067 (3500) To 1220 (4000)	150
Above 915 (3000) To 1067 (3500)	200
Above 763 (2500) To 915 (3000)	280
Above 610 (2000) To 763 (2500)	400
Above 458 (1500) To 610 (2000)	700
Above 305 (1000) To 458 (1500)	1200
Up to 305 (1000)	2000

(b) For base and fixed stations operating in the 758-768 MHz band in accordance with the provisions of paragraph (a)(5) of this section, the power flux density that would be produced by such stations through a combination of antenna height and vertical gain pattern must not exceed 3000 microwatts per square meter on the ground over the area extending to 1 km from the base of the antenna mounting structure.

§ 90.635 Limitations on power and antenna height.

(a) The effective radiated power and antenna height for base stations may not exceed 1 kilowatt (30 dBw) and 304 m. (1,000 ft.) above average terrain (AAT), respectively, or the equivalent thereof as determined from the Table. These are maximum values, and applicants will be required to justify power levels and antenna heights requested.

Table—Equivalent Power and Antenna Heights for Base Stations in the 851-869 MHz and 935-940 MHz Bands Which Have a Requirement for a 32 km (20 mi) Service Area Radius

Antenna height (ATT) meters (feet)	Effective radiated power (watts)
Above 1,372 (4,500)	65
Above 1,220 (4,000) to 1,372 (4,500)	70
Above 1,067 (3,500) to 1,220 (4,000)	75
Above 915 (3,000) to 1,067 (3,500)	100
Above 763 (2,500) to 915 (3,000)	140
Above 610 (2,000) to 763 (2,500)	200
Above 458 (1,500) to 610 (2,000)	350
Above 305 (1,000) to 458 (1,500)	600
Up to 305 (1,000)	1,000

§ 90.219 Use of signal boosters.

(e) *Device Specifications.* In addition to the general rules for equipment certification in

§90.203(a)(2) and part 2, subpart J of this chapter, a signal booster must also meet the rules in this paragraph.

(1) The output power capability of a signal booster must be designed for deployments providing a radiated power not exceeding 5 Watts ERP for each retransmitted channel.

IC Rules

Test Requirements:

RSS-119

5. Transmitter and Receiver Specifications

5.4 Transmitter Output Power

The output power shall be within ±1 dB of the manufacturer's rated power listed in the equipment specifications.

The transmitter output power limits set forth in Table 2 will come into force upon the publication of Issue 12 of this standard and will apply to newly certified equipment.

Table 2 —Transmitter Output Power

Frequency Bands (MHz)	Transmitter Output Power (W)	
	Base/Fixed Equipment	Mobile Equipment
27.41-28 and 29.7-50	300	30
72-76	No limit	1
138-174	110	60
217-218 and 219-220	110	30
220-222	See SRSP-512 for ERP limit	50
406.1-430 and 450-470	110	60
768-776 and 798-806	See SRSP-511 for ERP limit	30 3 W ERP for portable equipment
806-821/851-866 and 821-824/866-869	110	30
896-901/935-940	110	60
929-930/931-932	110	30
928-929/952-953 and 932-932.5/941-941.5	110	30
932.5-935/941.5-944	110	30

RSS-131

6. Equipment standard specifications for zone enhancers working with equipment certified under RSS-119

6.2 Output power

The output power of the zone enhancer shall comply with the transmitter output power of the equipment with which it is to be used (as specified in RSS-119) and shall be within ± 1.0 dB of the zone enhancer manufacturer's rated output power.

Test Procedures:

Measurements were in accordance with the test methods section 3.5.2 of KDB 935210 D05 v01r01.

a) Connect a signal generator to the input of the EUT.

b) Configure to generate the AWGN (broadband) test signal.

c) The frequency of the signal generator shall be set to the frequency f0 as determined from 3.3

d) Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation as necessary

e) Set the signal generator output power to a level that produces an EUT output level that is just below the AGC threshold (see 3.2), but not more than 0.5 dB below.

f) Measure and record the output power of the EUT; use 3.5.3 or 3.5.4 for power measurement.

g) Remove the EUT from the measurement setup. Using the same signal generator settings, repeat the power measurement at the signal generator port, which was used as the input signal to the EUT, and record as the input power. EUT gain may be calculated as described in 3.5.5

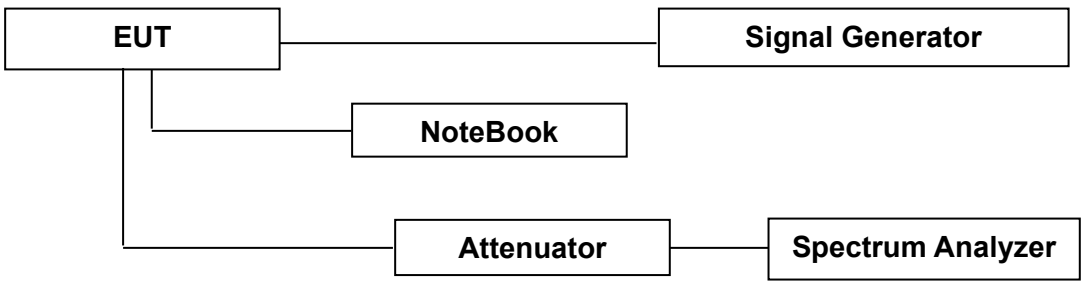
h) Repeat steps f) and g) with input signal amplitude set to 3 dB above the AGC threshold level.

i) Repeat steps e) to h) with the narrowband test signal.

j) Repeat steps e) to i) for all frequency bands authorized for use by the EUT.

Power measurement Method :

Guidance for performing input/output power measurements using a spectrum or signal analyzer is provided in 5.2 of KDB Publication 971168.



Block Diagram 1. RF Power Output Test Setup

Test Results:

Input Signal	Input Level (dBm)		Maximum Amp Gain	
	DL	UL	DL	UL
PS 700	-62	-68	95	95
PS 800	-62	-68	95	95

Single channel Enhancer

* Due to EUT's ALC function (Auto Level Control), even if input signal is increased,

The same output power is transmit.

[Downlink]

	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
PS 700 P25 (12.5 kHz)_ AGC threshold	Low	769.00625	33.46	2.218
	Middle	772.00000	33.20	2.089
	High	774.99375	32.97	1.982
PS 700 P25 (12.5 kHz)_ +3dB above AGC threshold	Low	769.00625	32.75	1.884
	Middle	772.00000	32.62	1.828
	High	774.99375	32.94	1.968
PS 700 Analog FM (25 kHz)_ AGC threshold	Low	769.01250	33.04	2.014
	Middle	772.00000	33.04	2.014
	High	774.98750	33.01	2.000
PS 700 Analog FM (25 kHz)_ +3dB above AGC threshold	Low	769.01250	33.07	2.028
	Middle	772.00000	33.01	2.000
	High	774.98750	32.97	1.982

	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
PS 800 P25 (12.5 kHz)_ AGC threshold	Low	851.00625	33.14	2.061
	Middle	856.00000	33.03	2.009
	High	860.99375	33.37	2.173
PS 800 P25 (12.5 kHz)_ +3dB above AGC threshold	Low	851.00625	33.03	2.009
	Middle	856.00000	33.03	2.009
	High	860.99375	33.08	2.032
PS 800 Analog FM (25 kHz)_ AGC threshold	Low	851.0125	33.22	2.099
	Middle	856.0000	33.02	2.004
	High	860.9875	32.93	1.963
PS 800 Analog FM (25 kHz)_ +3dB above AGC threshold	Low	851.0125	33.15	2.065
	Middle	856.0000	33.01	2.000
	High	860.9875	32.65	1.841

[Uplink]

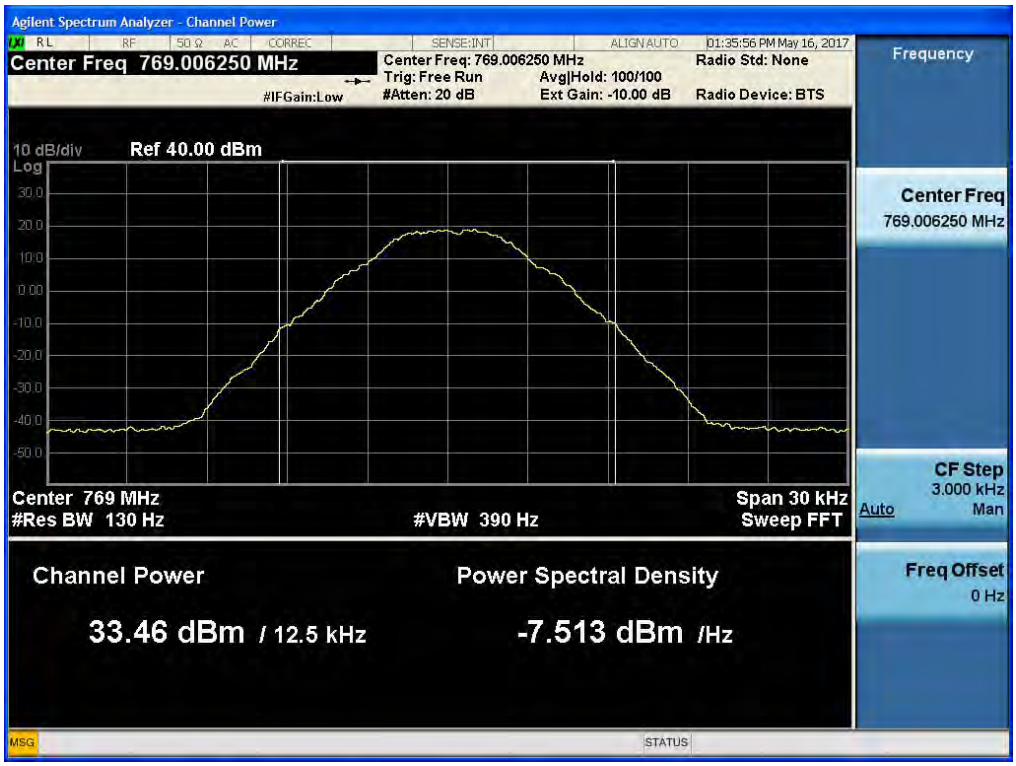
	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
PS 700 P25 (12.5 kHz)_ AGC threshold	Low	799.01	27.02	0.500
	Middle	802.00	27.10	0.513
	High	804.99	27.01	0.502
PS 700 P25 (12.5 kHz)_ +3dB above AGC threshold	Low	799.01	27.07	0.509
	Middle	802.00	27.21	0.526
	High	804.99	27.18	0.522
PS 700 Analog FM (25 kHz)_ AGC threshold	Low	799.0125	27.10	0.513
	Middle	802.0000	27.21	0.526
	High	804.9875	27.02	0.504
PS 700 Analog FM (25 kHz)_ +3dB above AGC threshold	Low	799.0125	27.14	0.518
	Middle	802.0000	27.19	0.524
	High	804.9875	27.02	0.504

	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
PS 800 P25 (12.5 kHz)_ AGC threshold	Low	806.00625	27.01	0.502
	Middle	811.00000	27.01	0.502
	High	815.99375	27.00	0.501
PS 800 P25 (12.5 kHz)_ +3dB above AGC threshold	Low	806.00625	27.00	0.501
	Middle	811.00000	27.01	0.502
	High	815.99375	27.04	0.506
PS 800 Analog FM (25 kHz)_ AGC threshold	Low	806.0125	27.02	0.504
	Middle	811.0000	27.09	0.512
	High	815.9875	27.10	0.513
PS 800 Analog FM (25 kHz)_ +3dB above AGC threshold	Low	806.0125	27.45	0.556
	Middle	811.0000	27.06	0.508
	High	815.9875	27.15	0.519

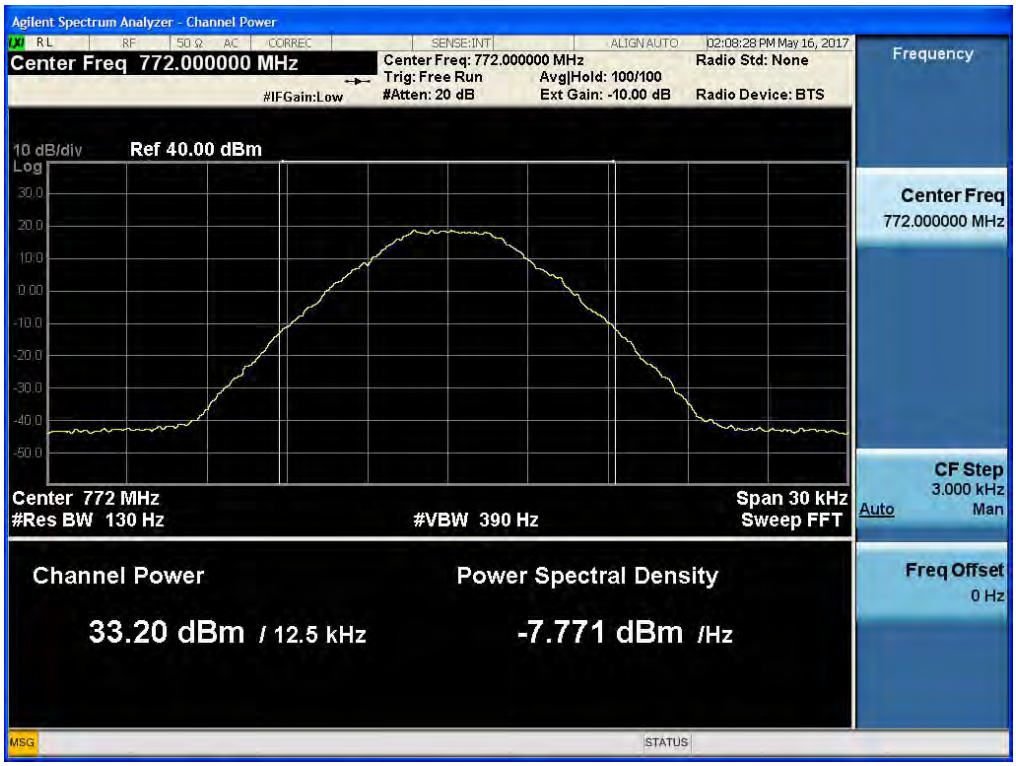
Single channel Enhancer Plots of RF Output Power

PS 700 P25_12.5 kHz (769 – 775 MHz)_DL

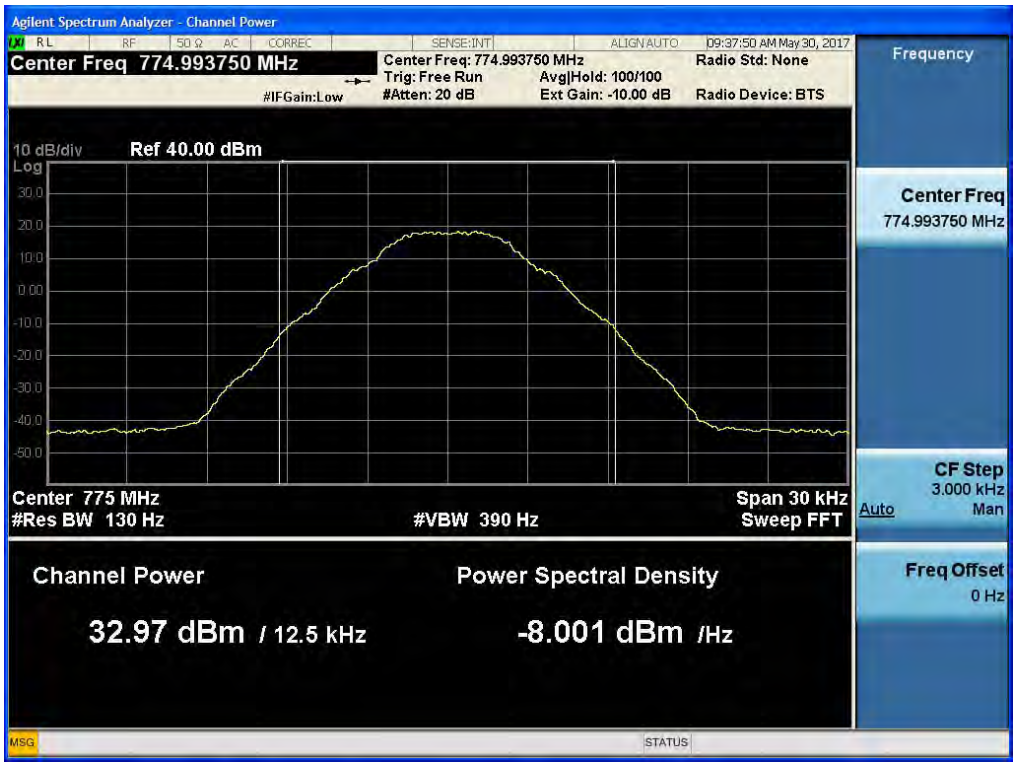
[AGC threshold Downlink - Low]



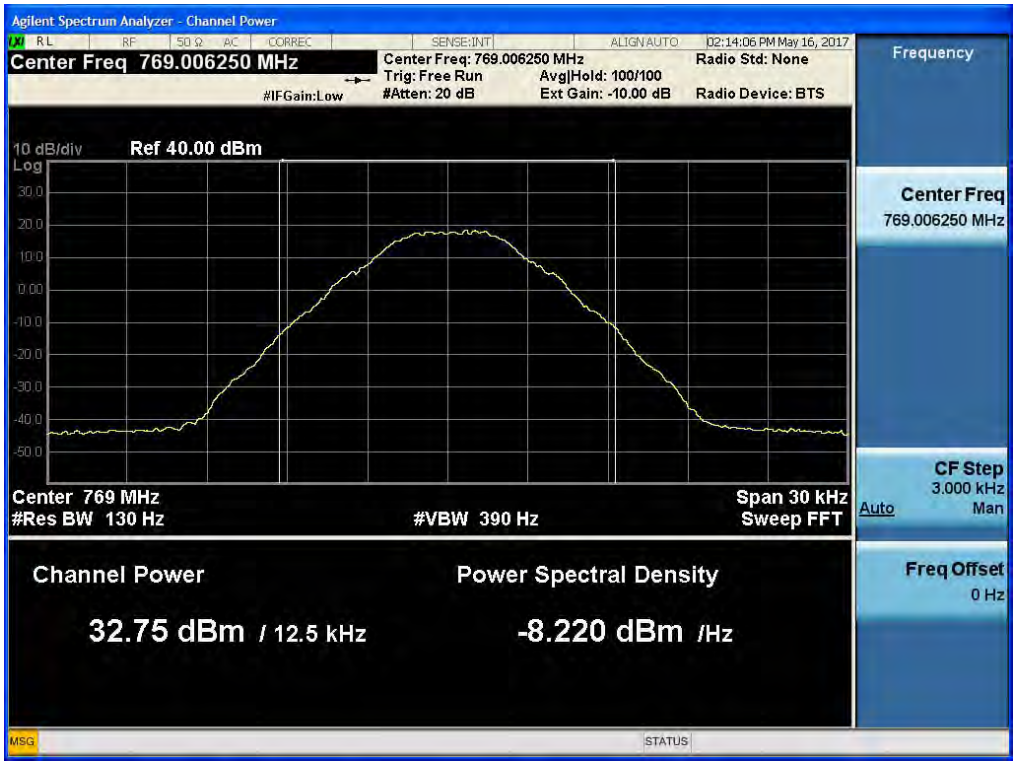
[AGC threshold Downlink - Middle]



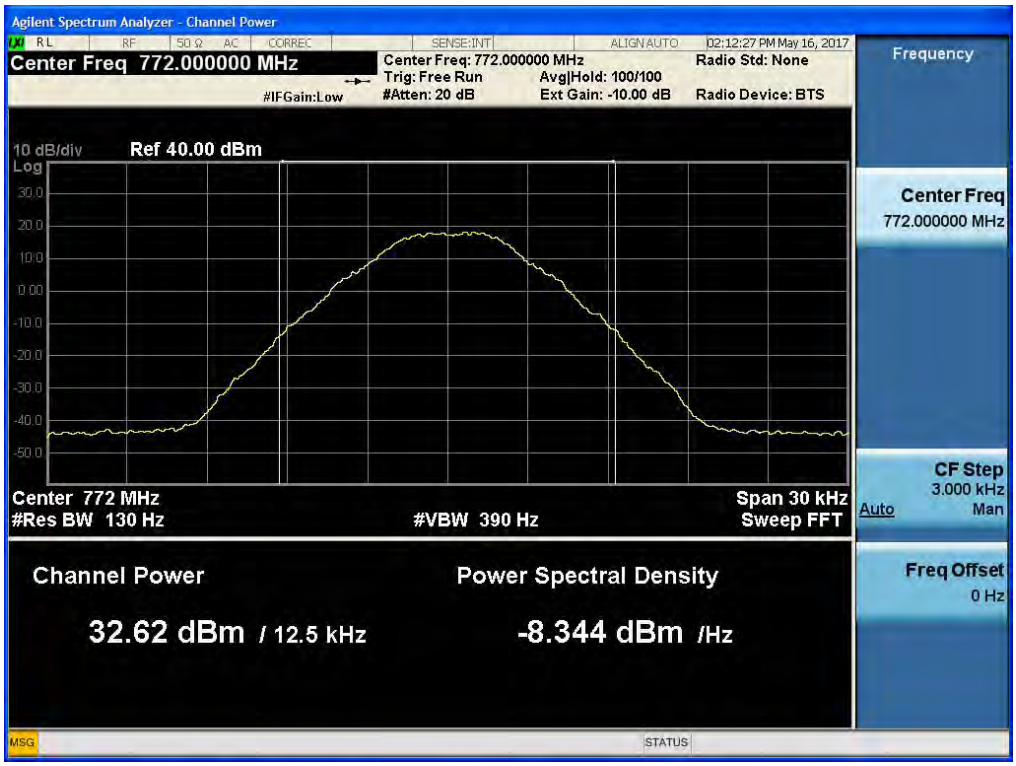
[AGC threshold Downlink - High]



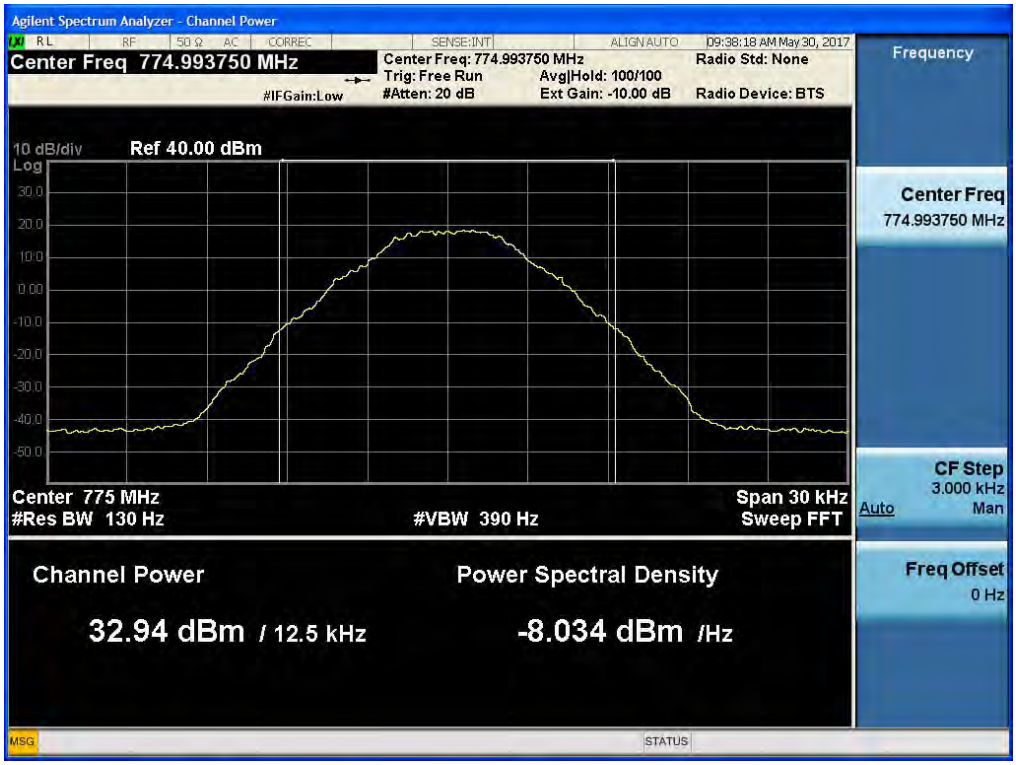
[+3dBm above AGC threshold Downlink Low]



[+3dBm above AGC threshold Downlink Middle]

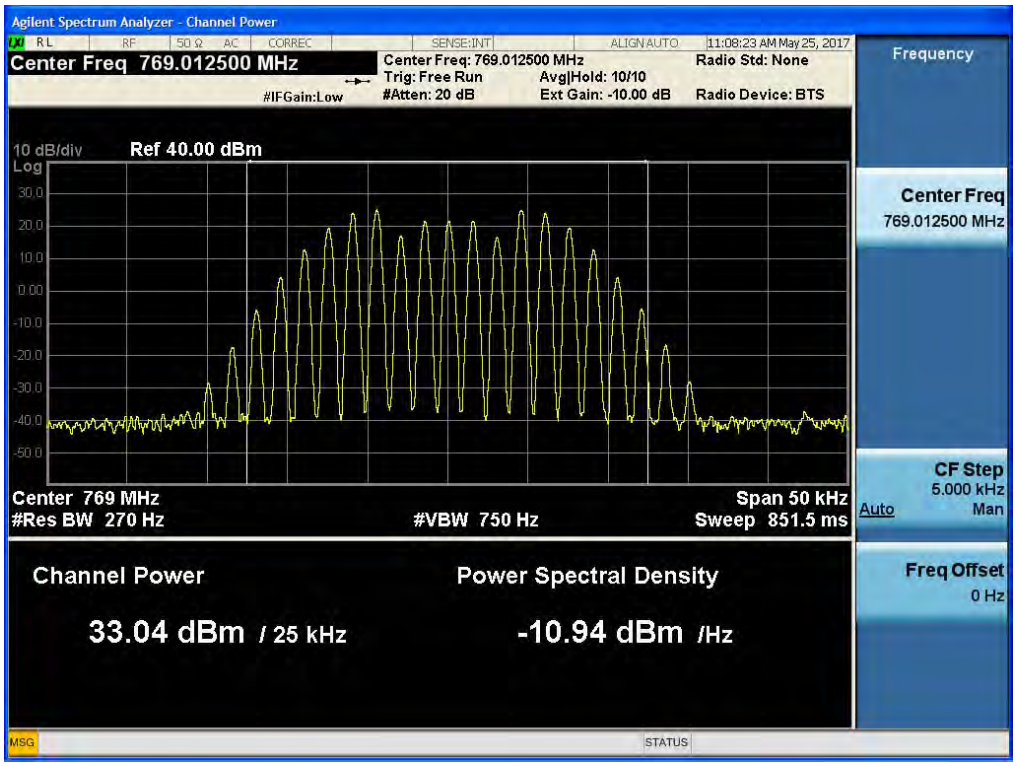


[+3dBm above AGC threshold Downlink High]

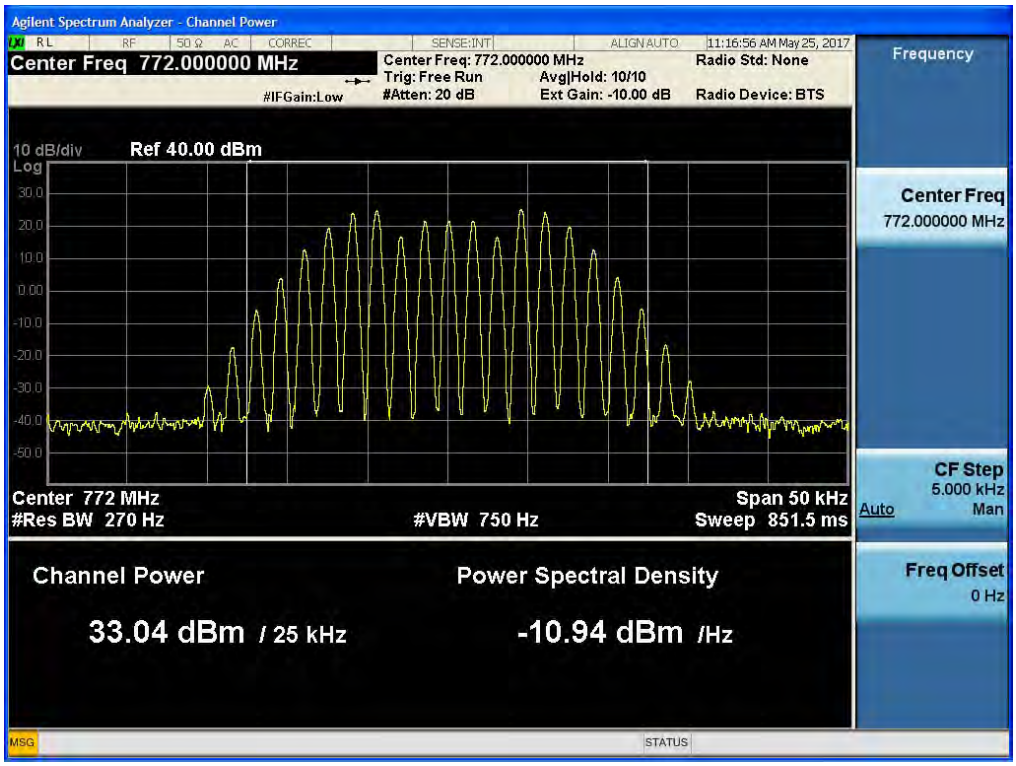


PS 700 Analog FM_25 kHz (769 – 775 MHz)_DL

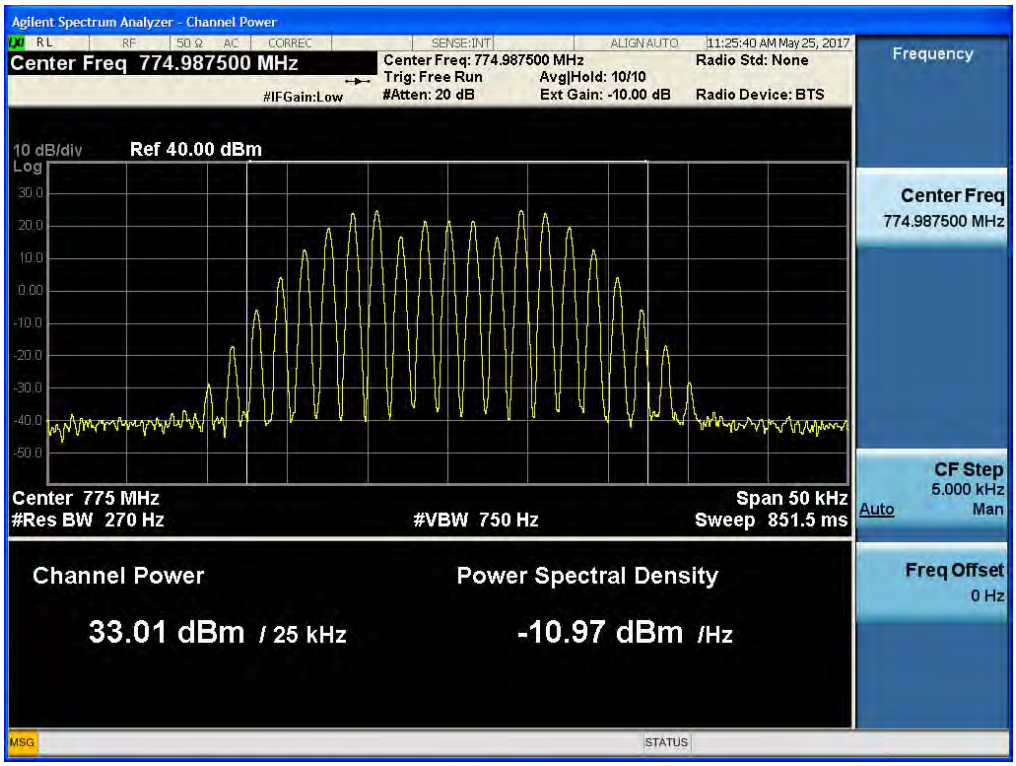
[AGC threshold Downlink - Low]



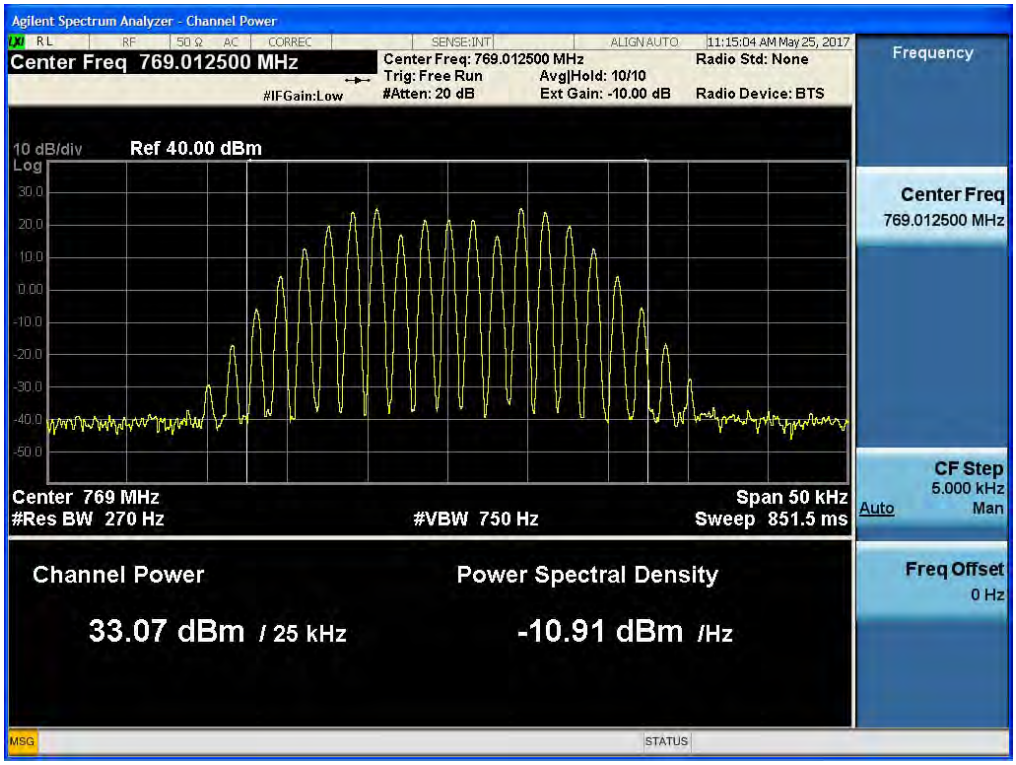
[AGC threshold Downlink - Middle]



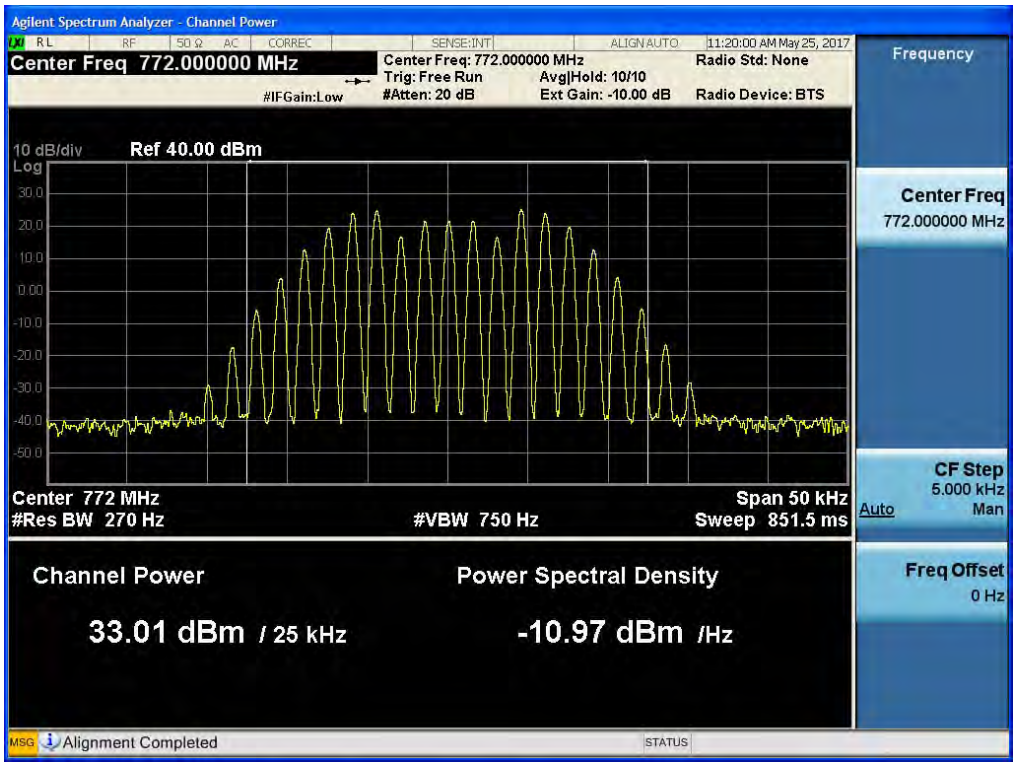
[AGC threshold Downlink - High]



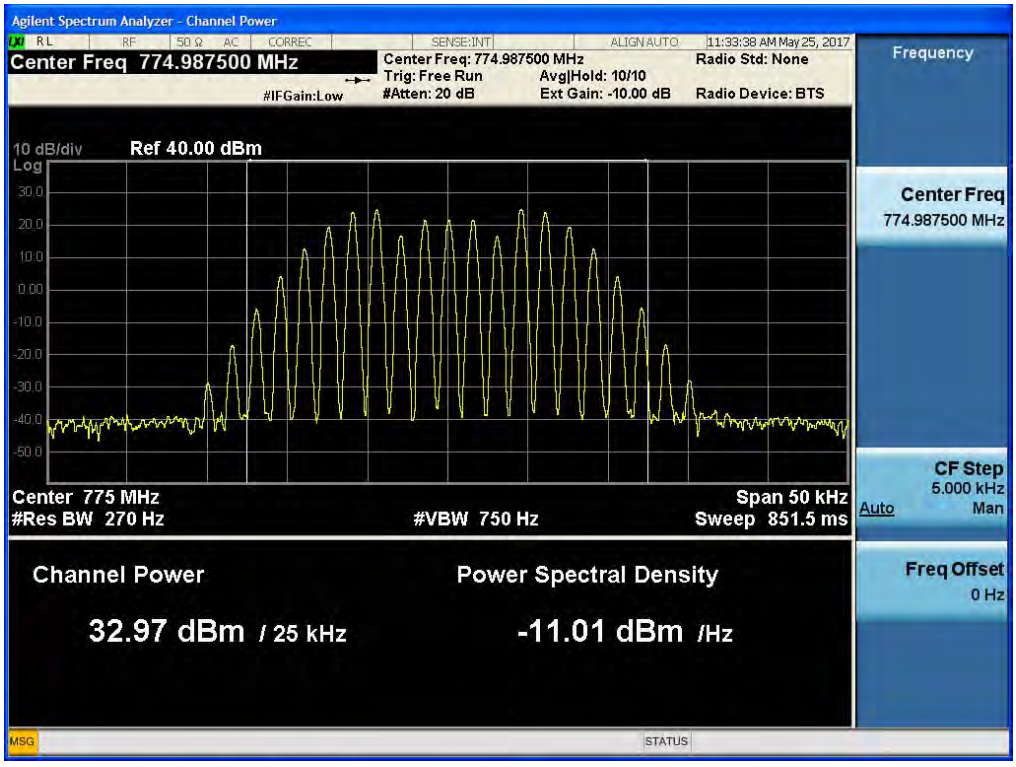
[+3dBm above AGC threshold Downlink Low]



[+3dBm above AGC threshold Downlink Middle]

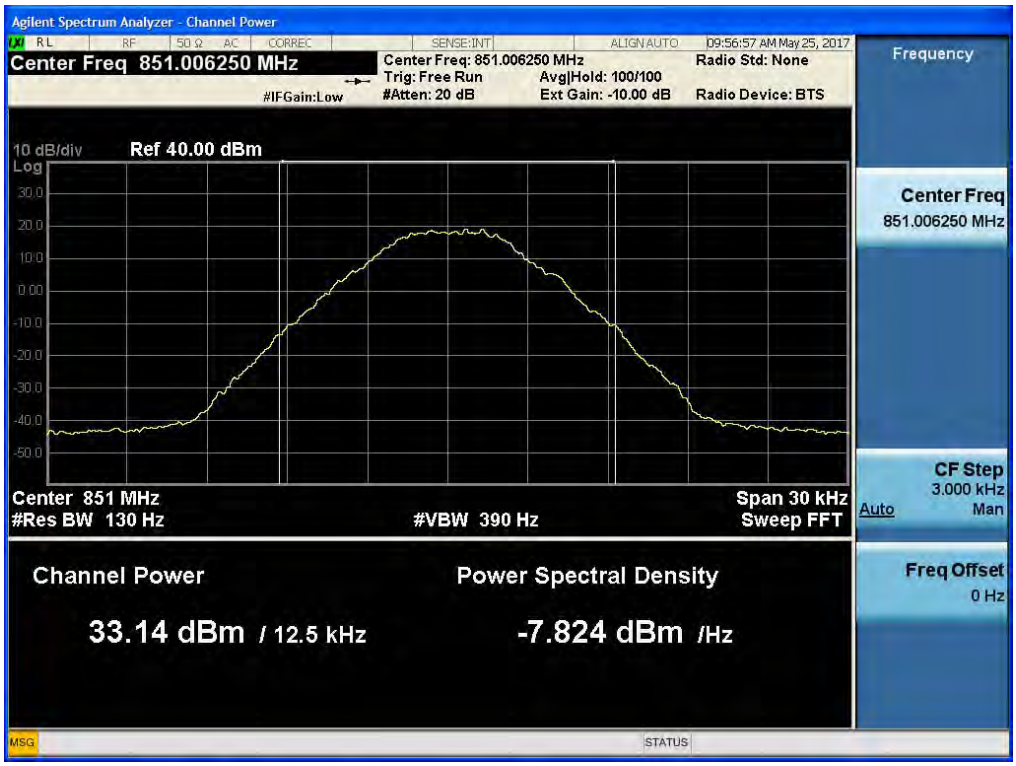


[+3dBm above AGC threshold Downlink High]



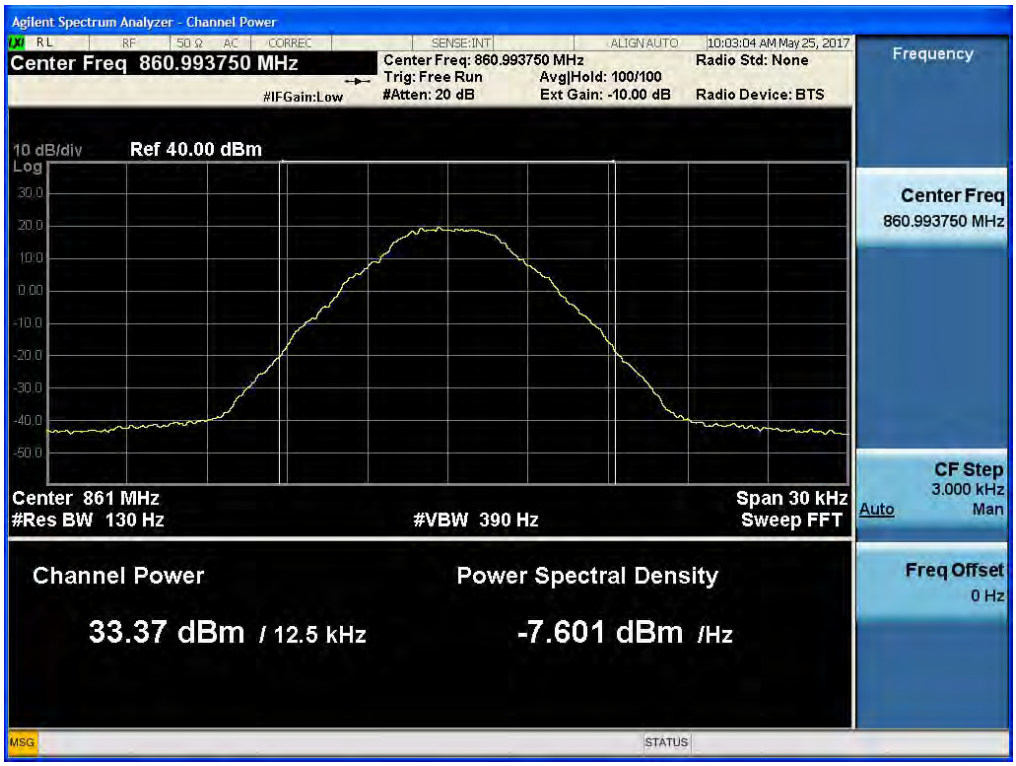
PS 800 P25_12.5 kHz (851 – 861 MHz)_DL

[AGC threshold Downlink - Low]

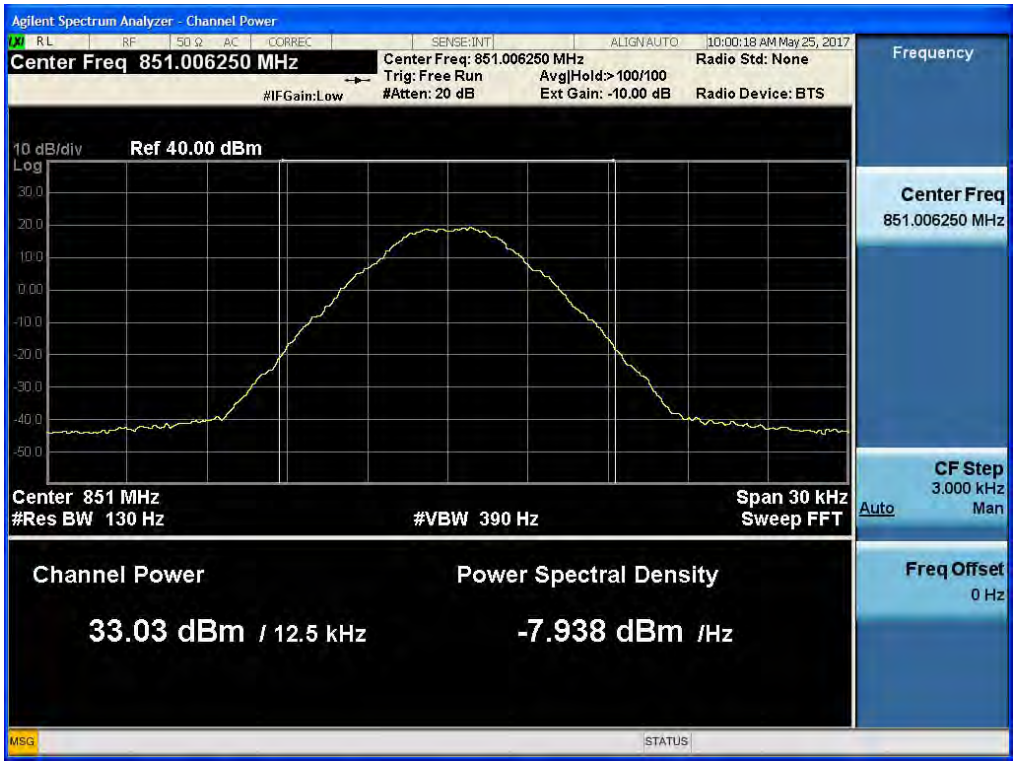


[AGC threshold Downlink - Middle]

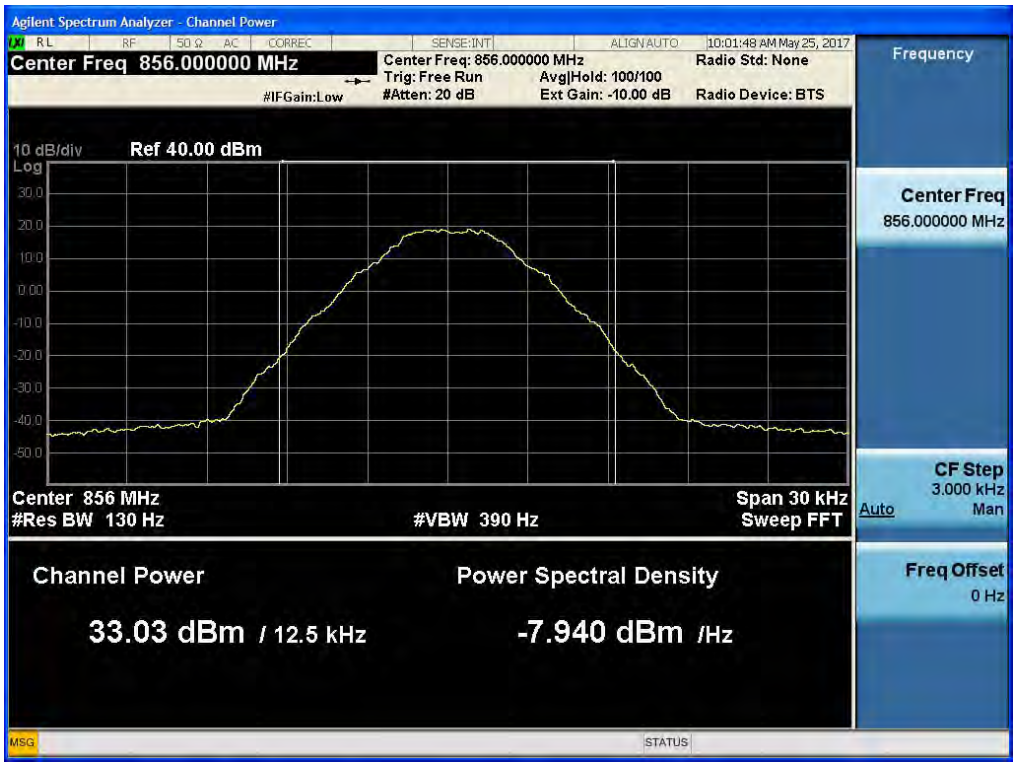
[AGC threshold Downlink - High]



[+3dBm above AGC threshold Downlink Low]



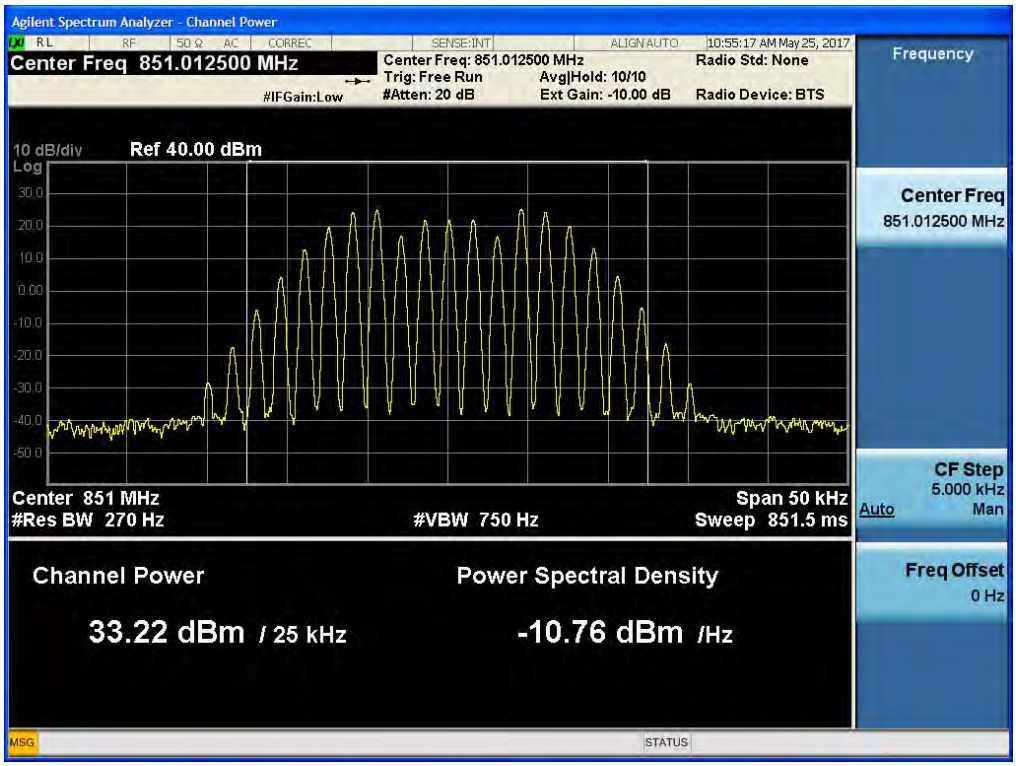
[+3dBm above AGC threshold Downlink Middle]



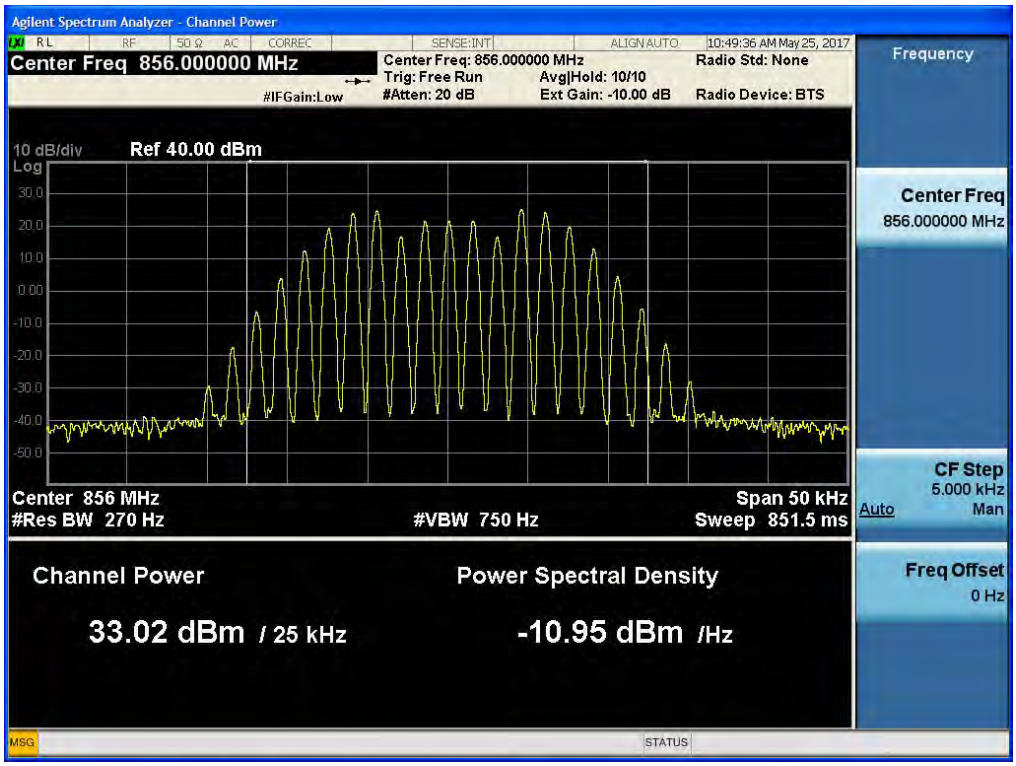
[+3dBm above AGC threshold Downlink High]

PS 800 Analog FM_25 kHz (851 – 861 MHz)_DL

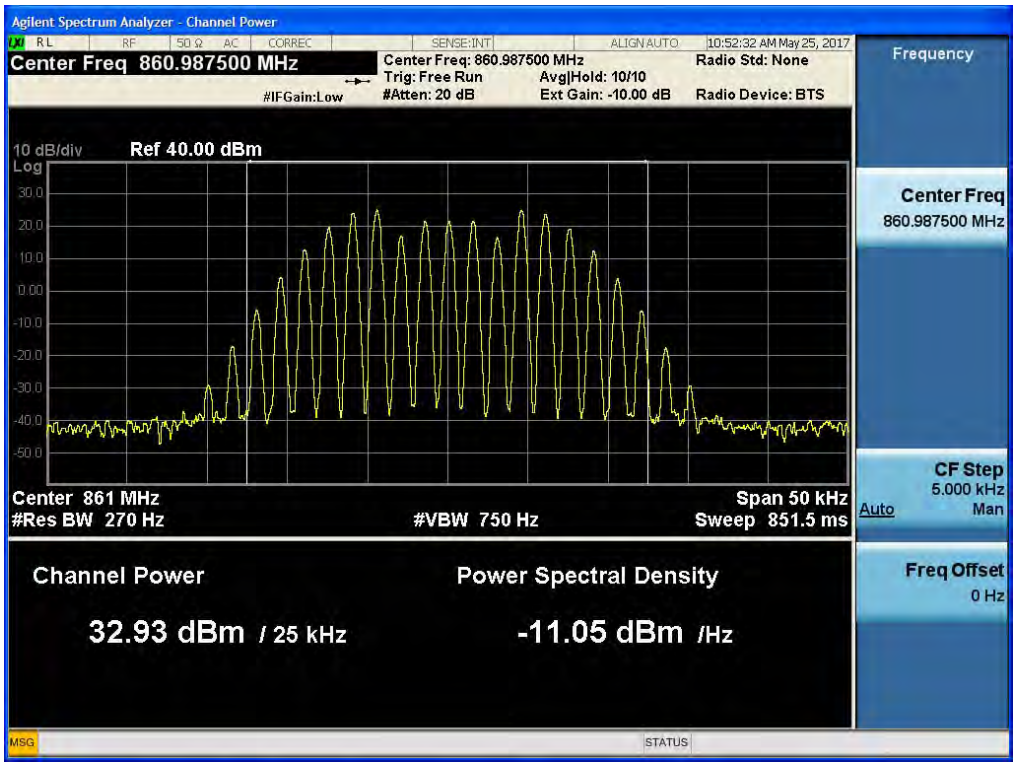
[AGC threshold Downlink - Low]



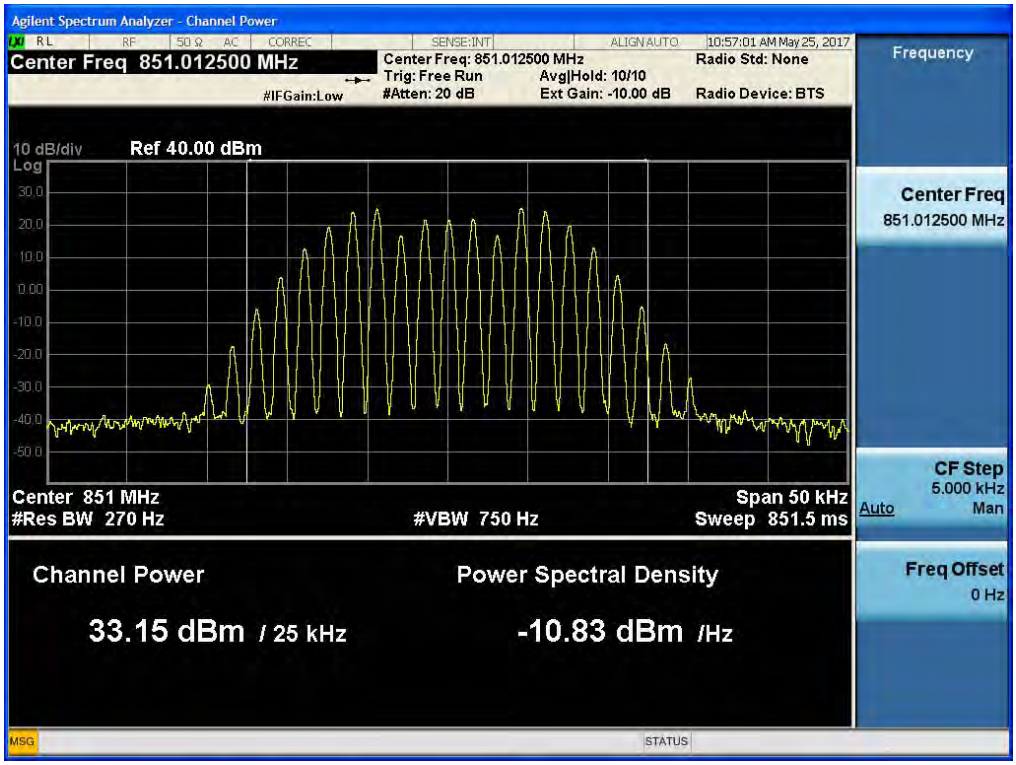
[AGC threshold Downlink - Middle]



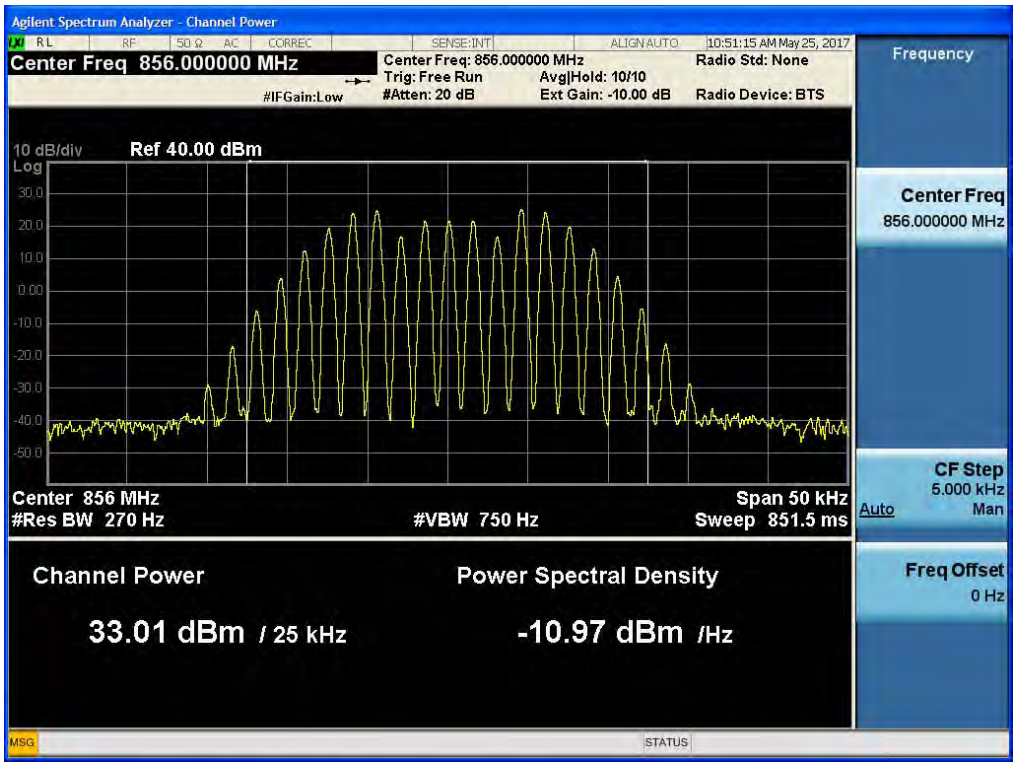
[AGC threshold Downlink - High]



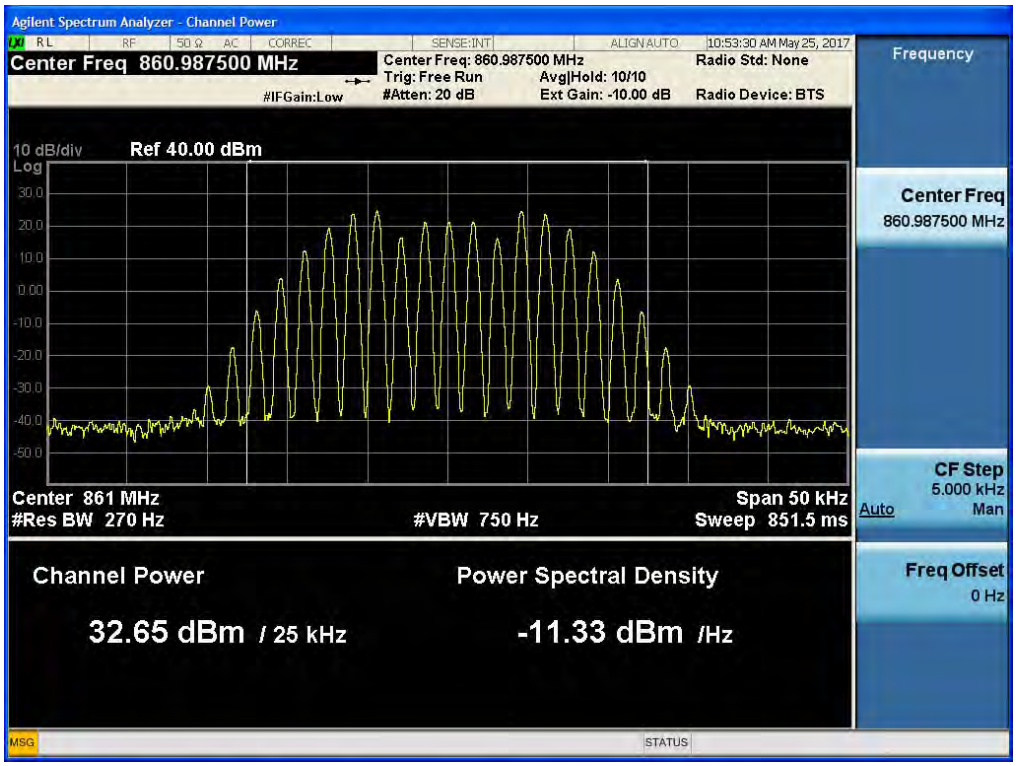
[+3dBm above AGC threshold Downlink Low]



[+3dBm above AGC threshold Downlink Middle]

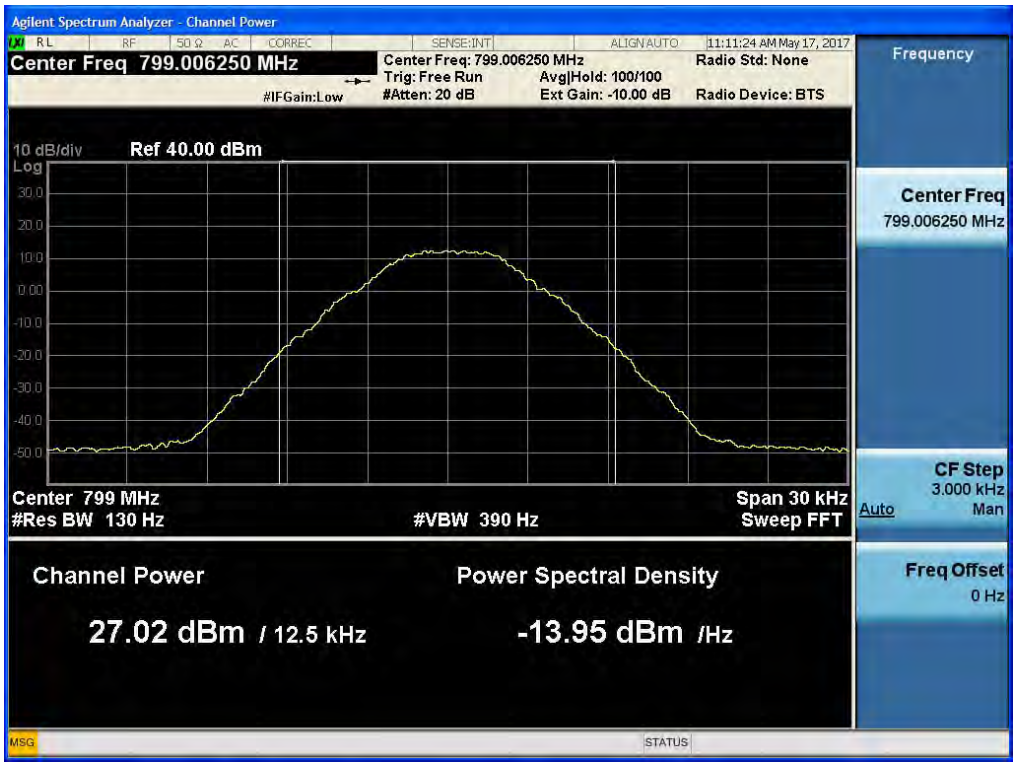


[+3dBm above AGC threshold Downlink High]

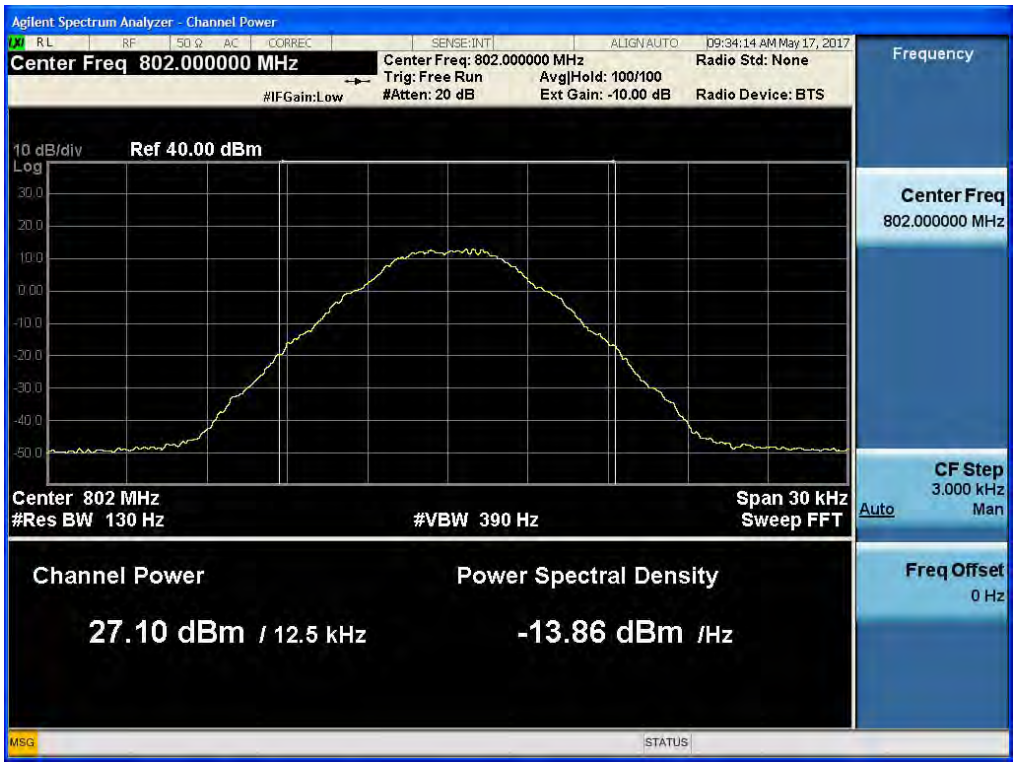


PS 700 P25_12.5 kHz (799 – 805 MHz)_UL

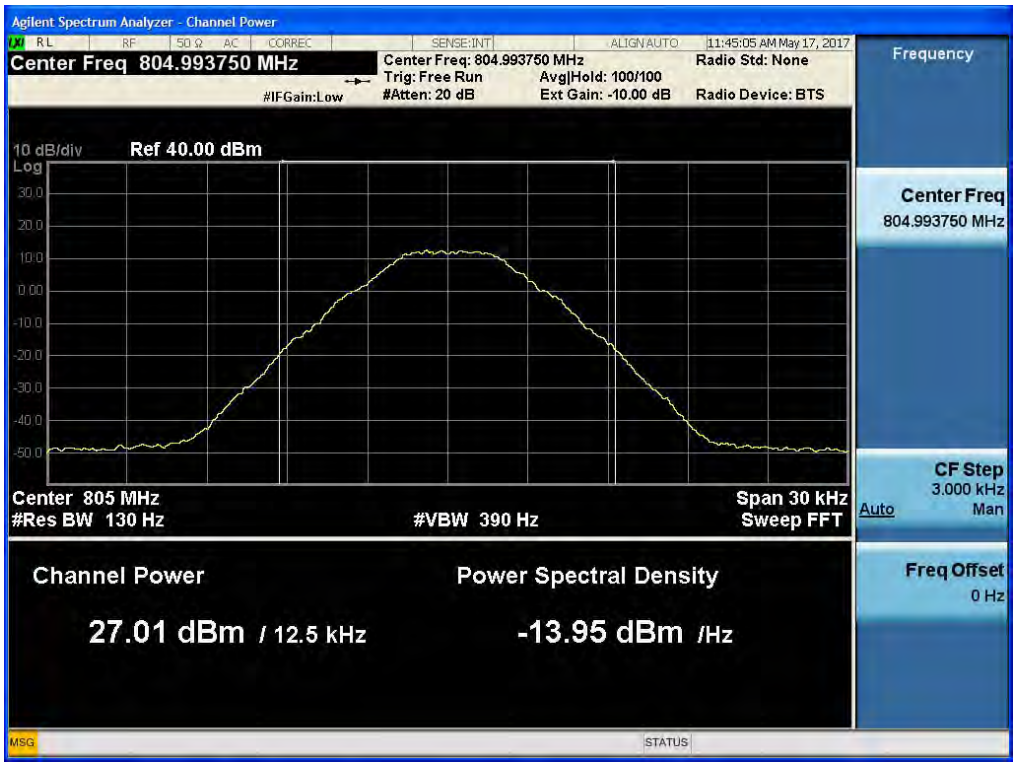
[AGC threshold Uplink - Low]



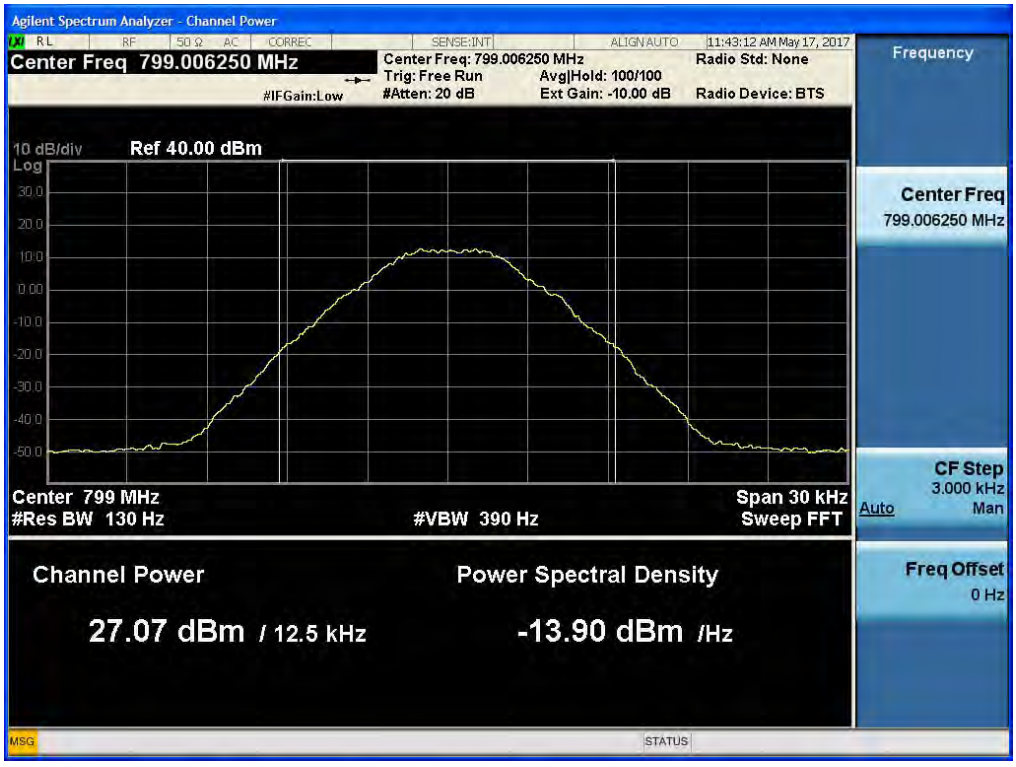
[AGC threshold Uplink - Middle]



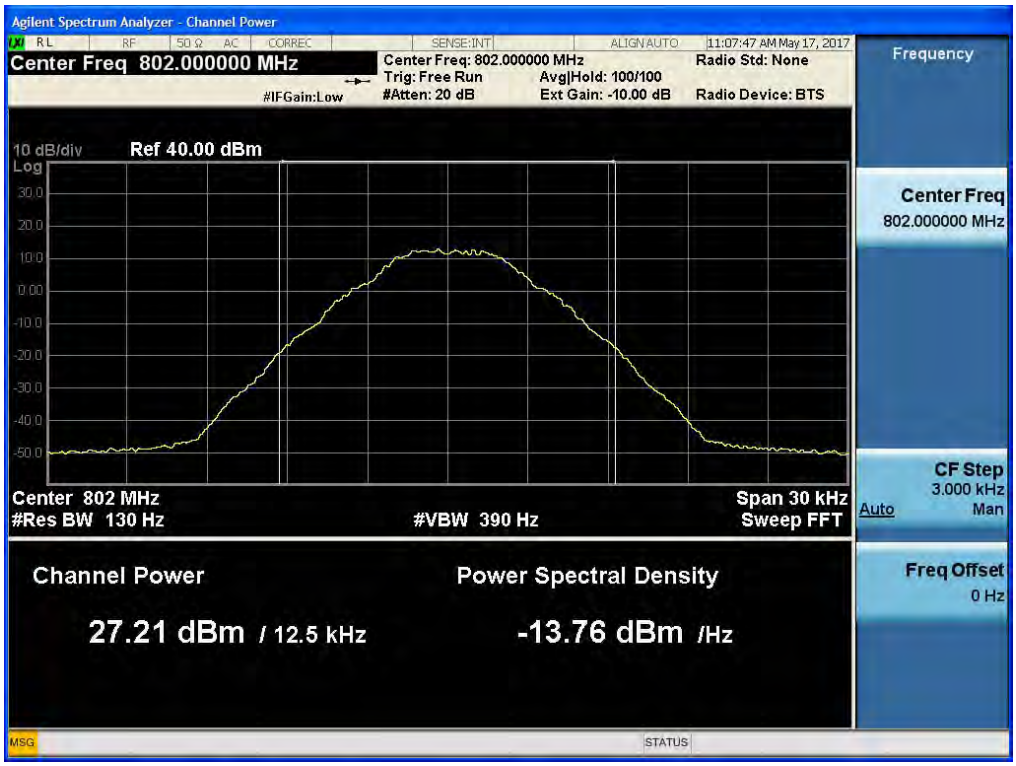
[AGC threshold Uplink - High]



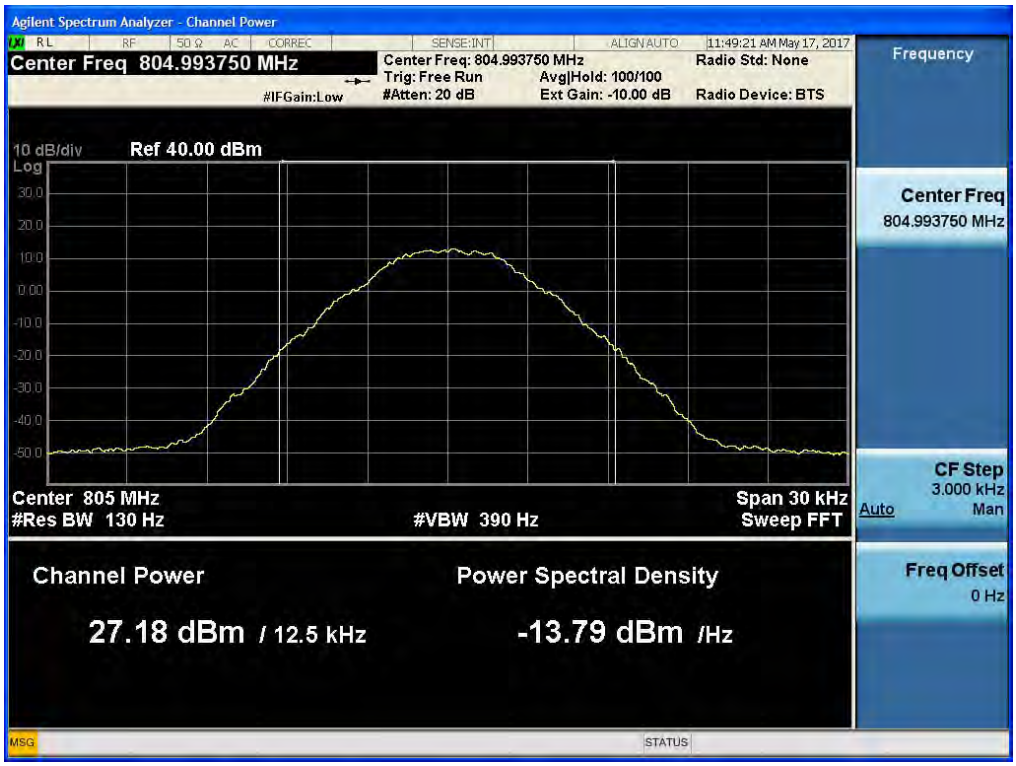
[+3dBm above AGC threshold Uplink - Low]



[+3dBm above AGC threshold Uplink - Middle]

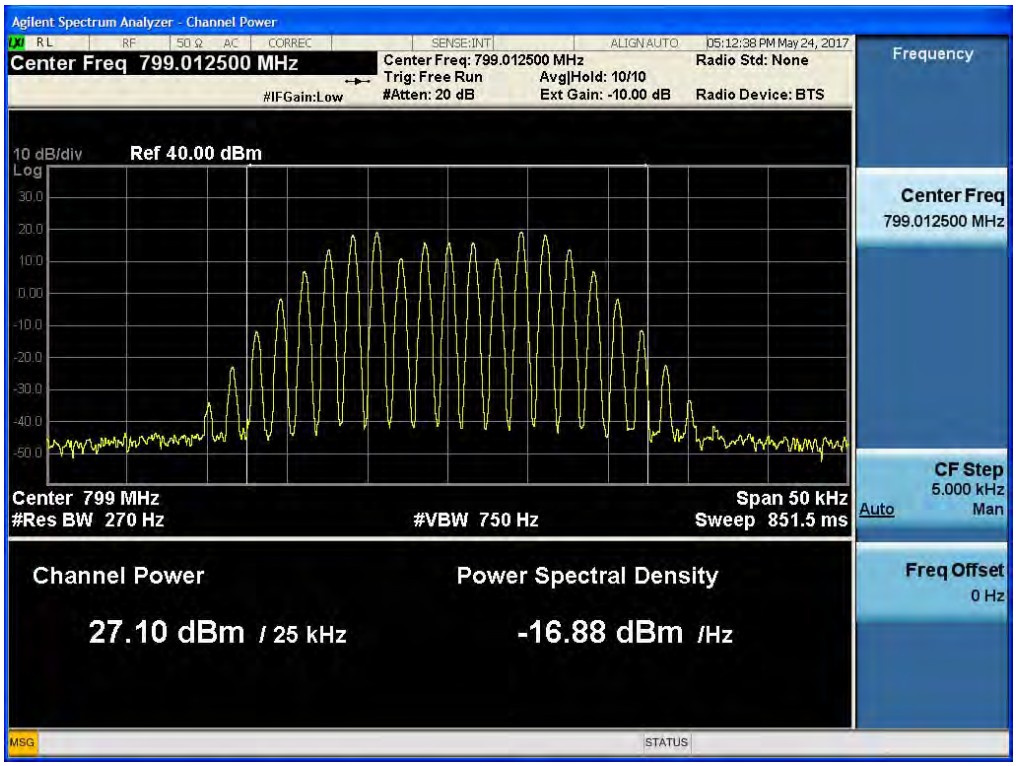


[+3dBm above AGC threshold Uplink - High]



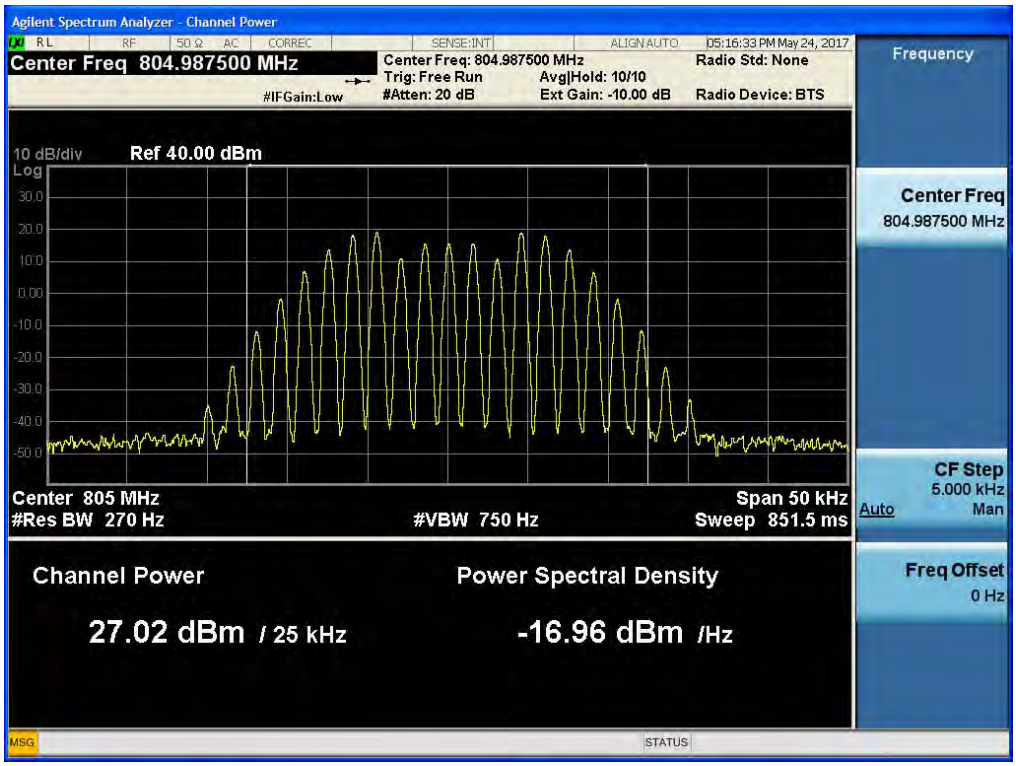
PS 700 Analog FM_25 kHz (799 – 805 MHz)_UL

[AGC threshold Uplink - Low]

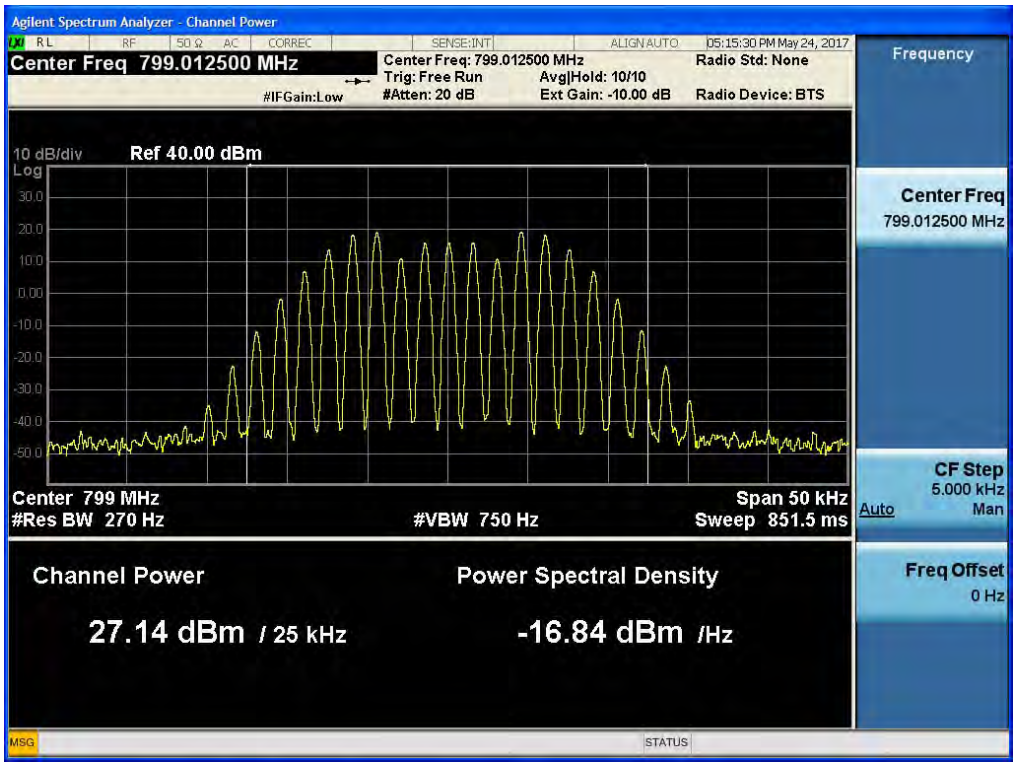


[AGC threshold Uplink - Middle]

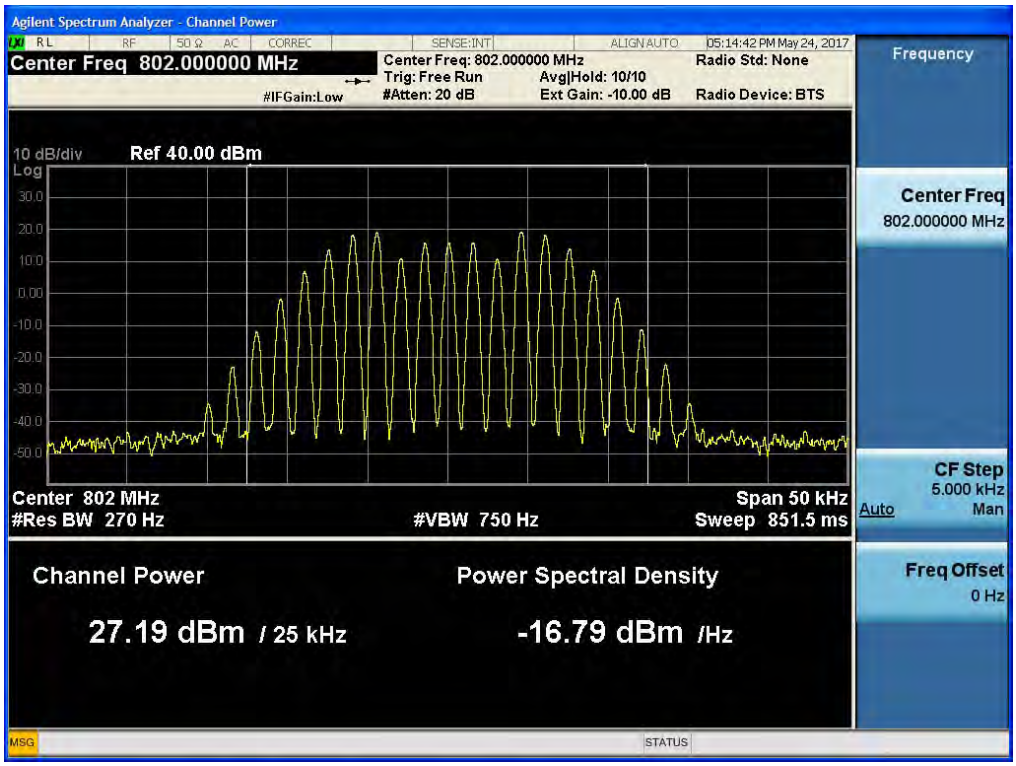
[AGC threshold Uplink - High]



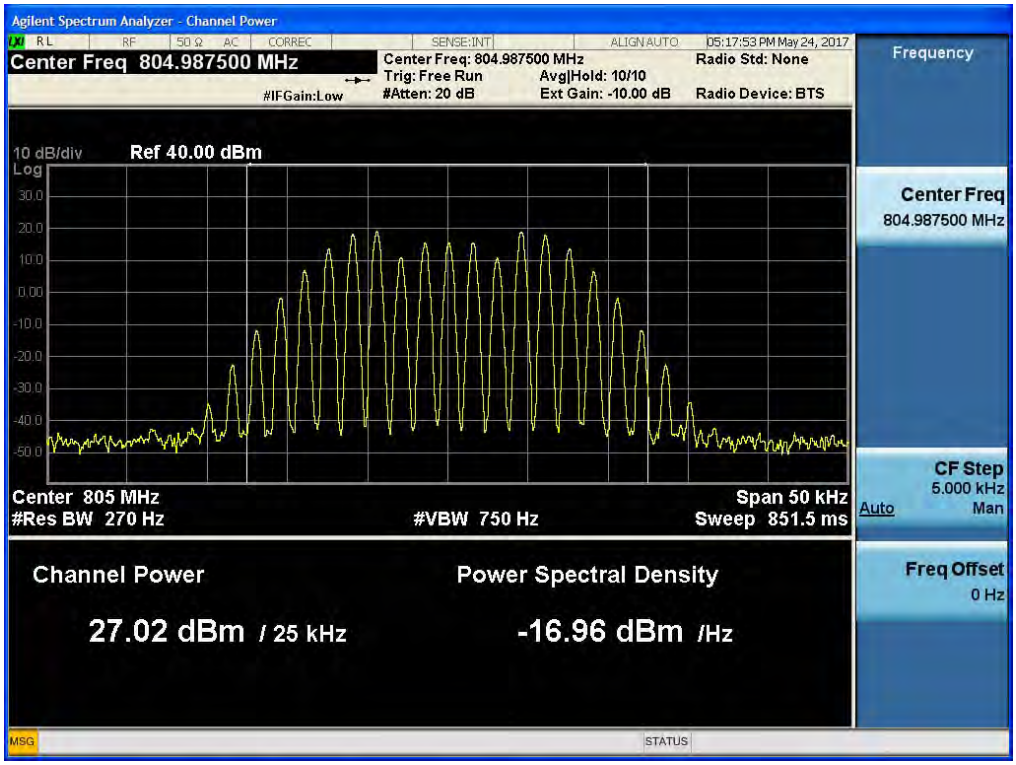
[+3dBm above AGC threshold Uplink - Low]



[+3dBm above AGC threshold Uplink - Middle]

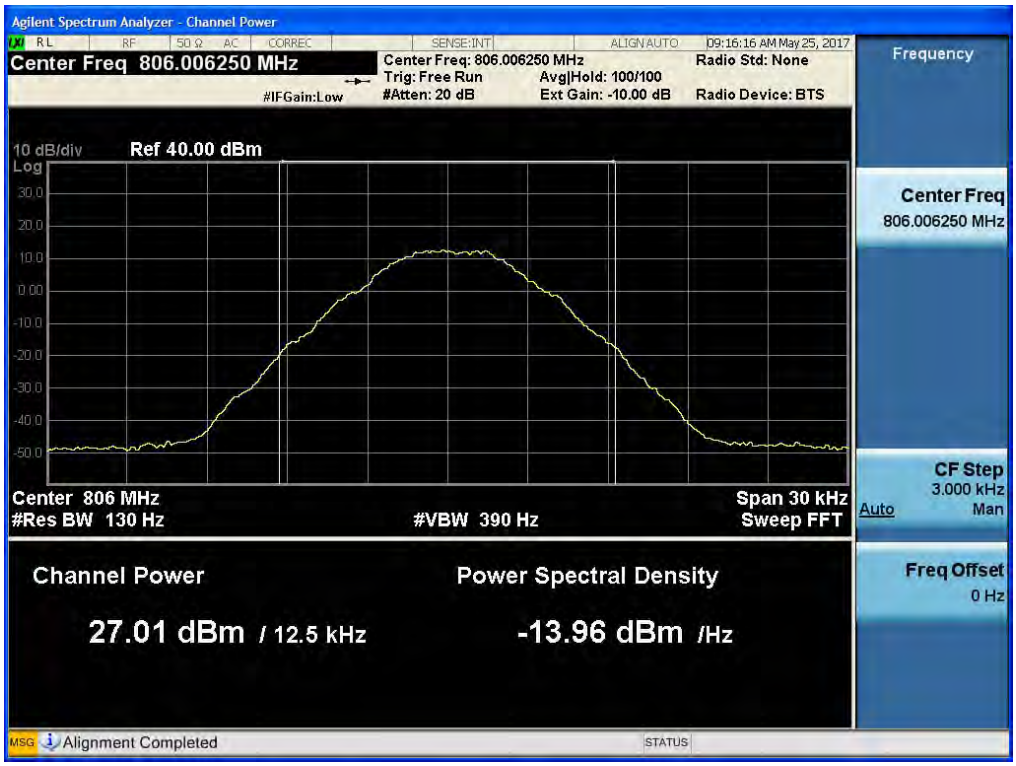


[+3dBm above AGC threshold Uplink - High]

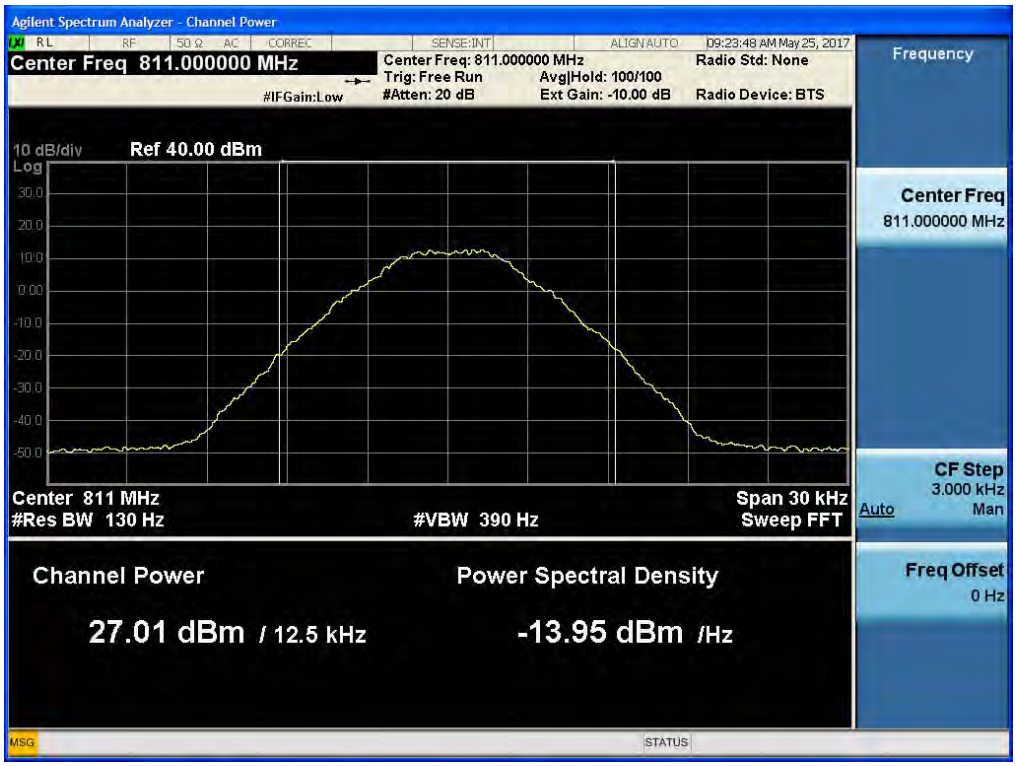


PS 800 P25_12.5 kHz (806 – 816 MHz)_UL

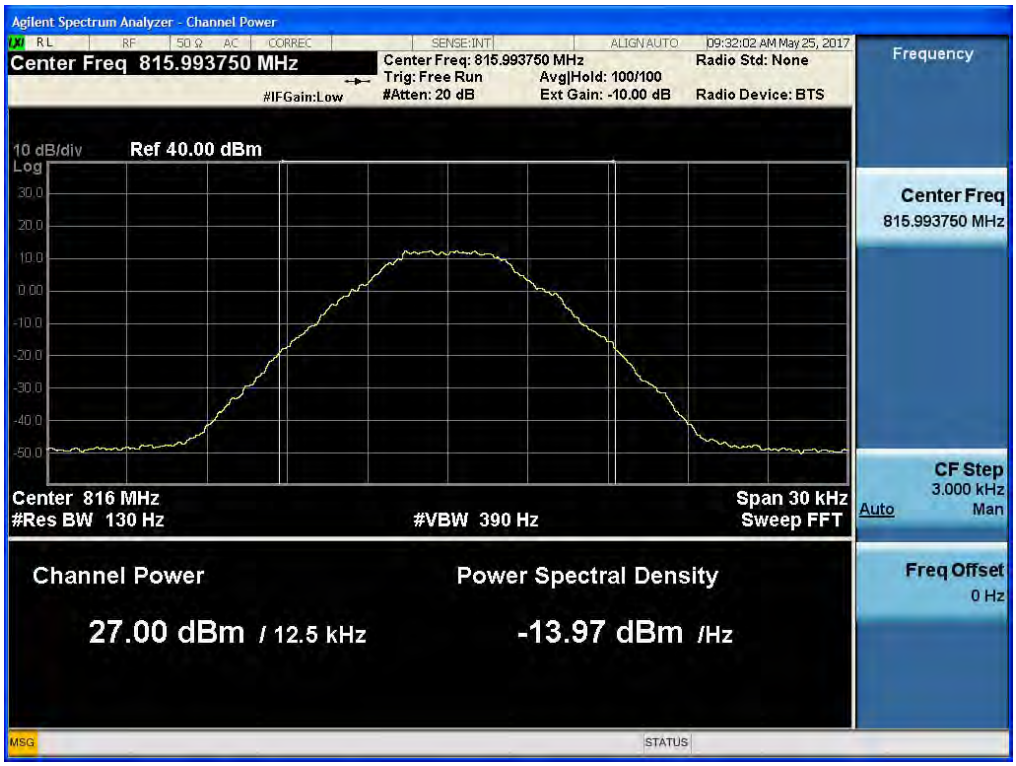
[AGC threshold Uplink - Low]



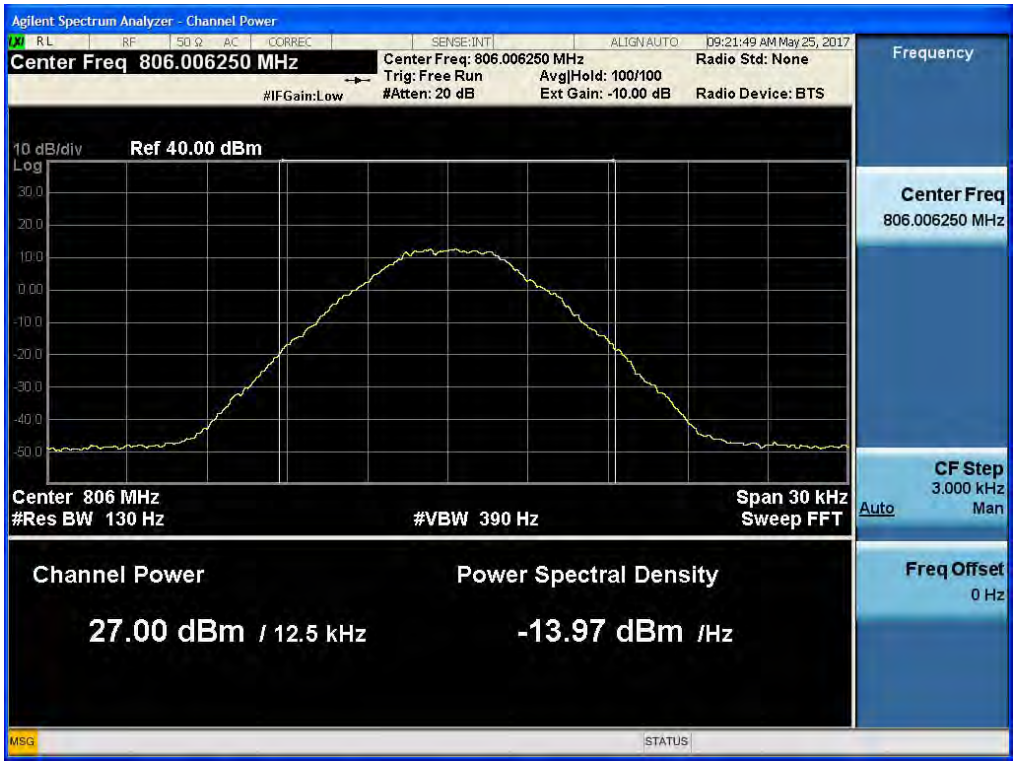
[AGC threshold Uplink - Middle]



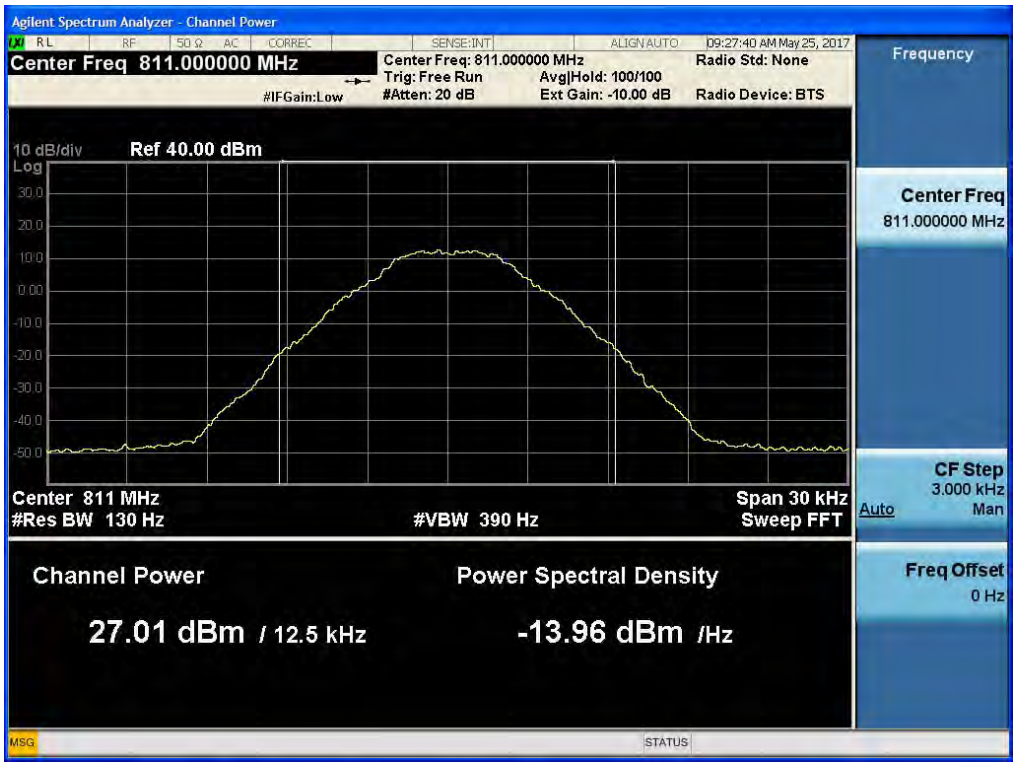
[AGC threshold Uplink - High]



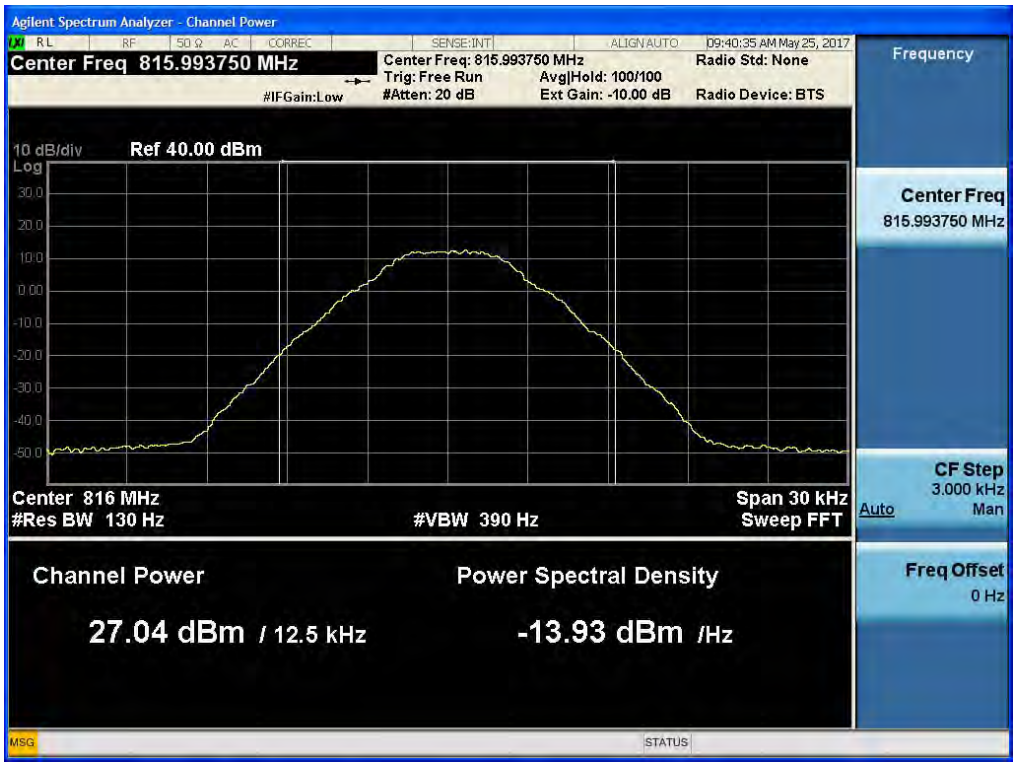
[+3dBm above AGC threshold Uplink - Low]



[+3dBm above AGC threshold Uplink - Middle]

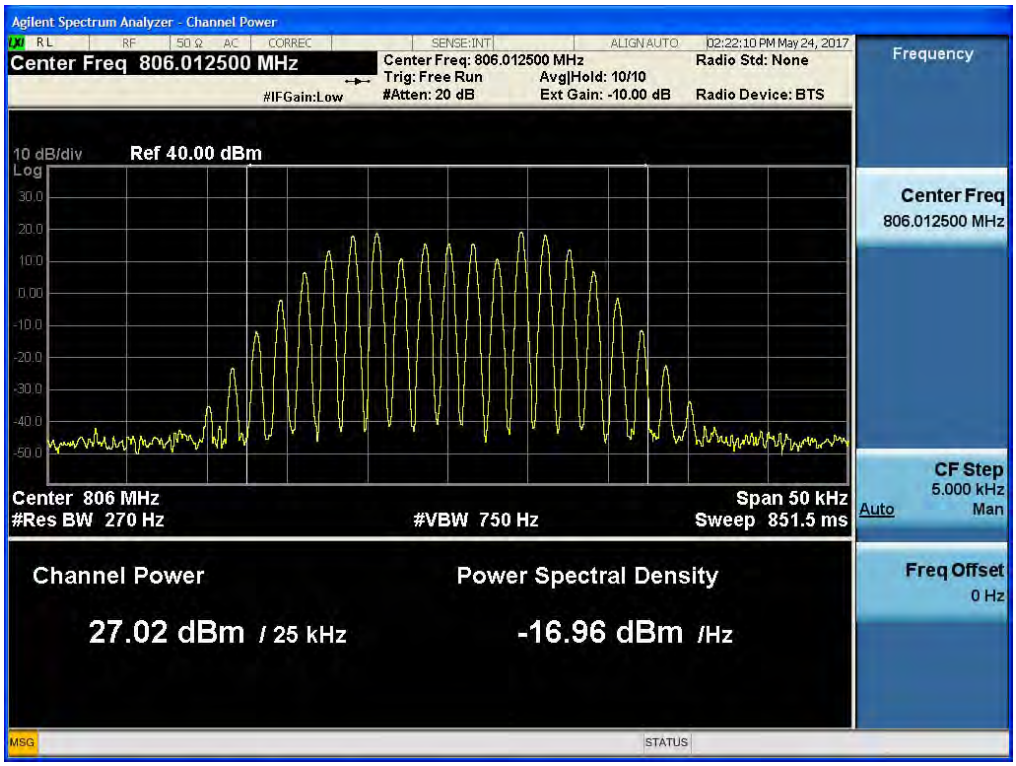


[+3dBm above AGC threshold Uplink - High]

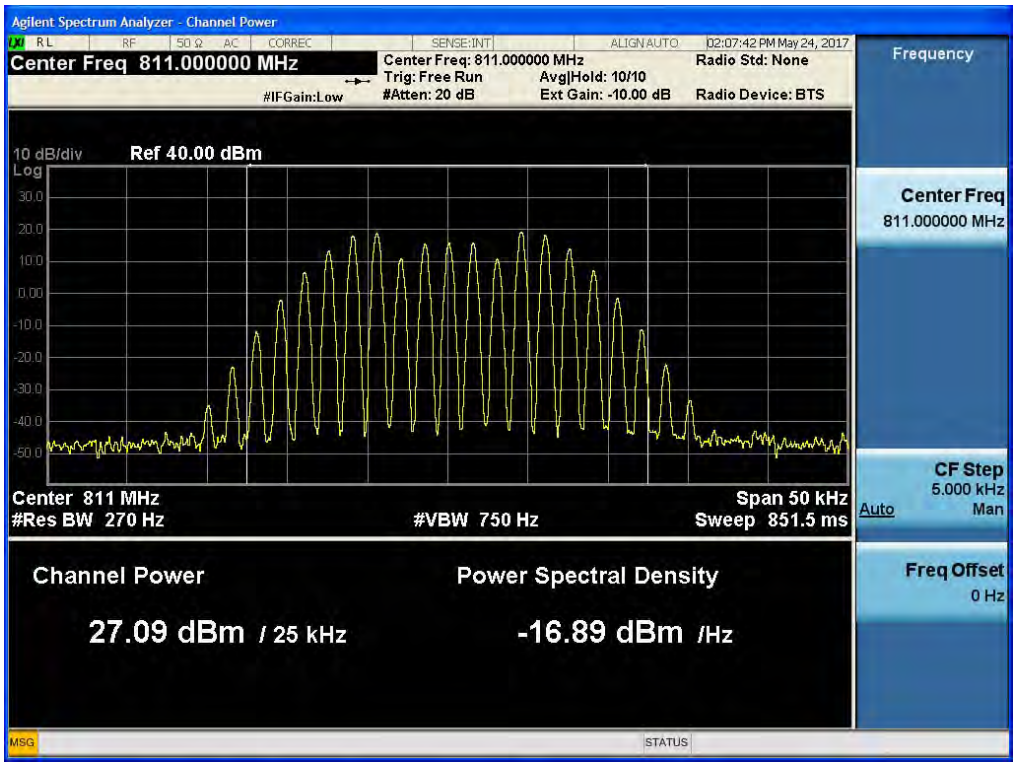


PS 800 Analog FM_25 kHz (806 – 816 MHz)_UL

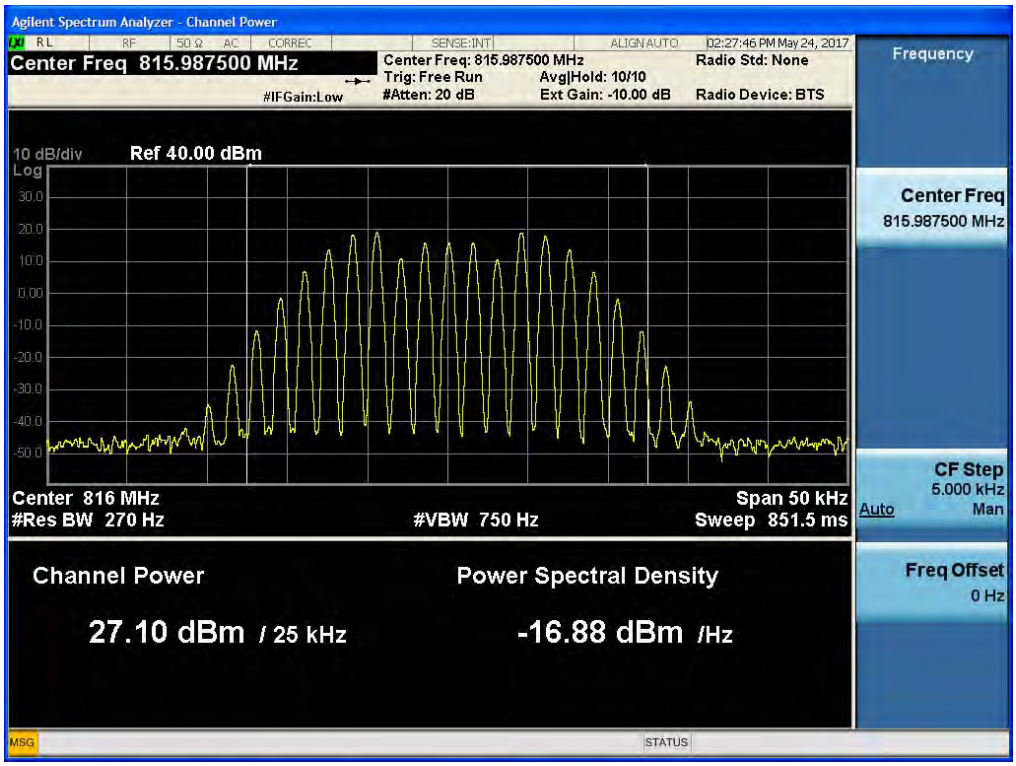
[AGC threshold Uplink - Low]



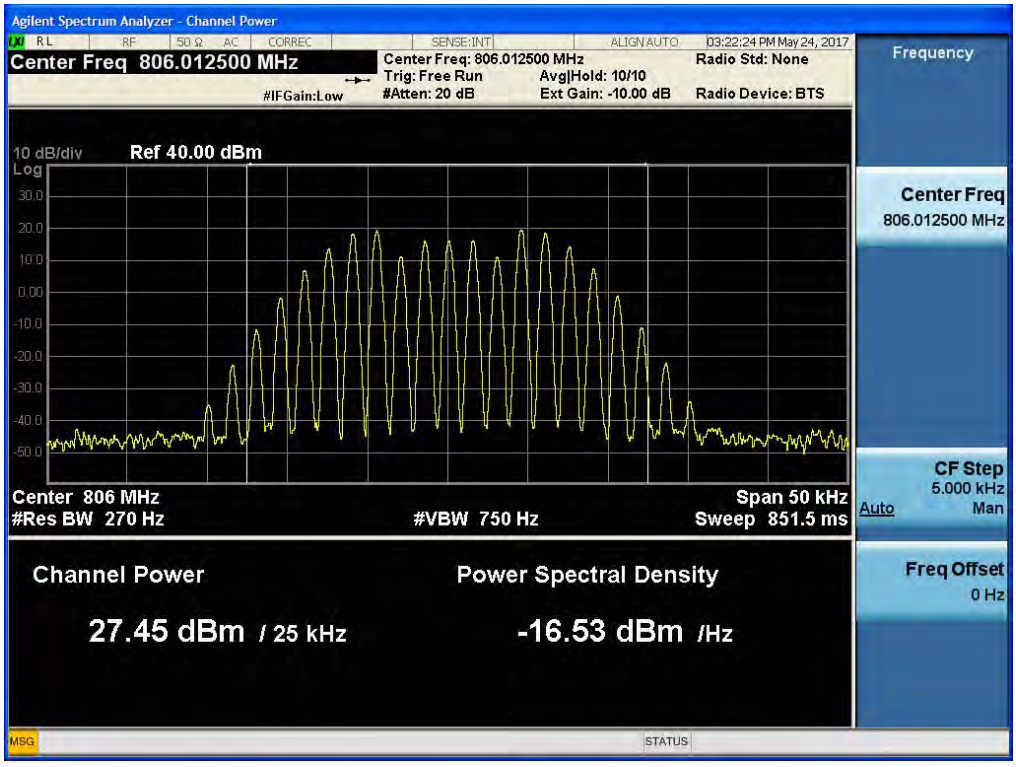
[AGC threshold Uplink - Middle]



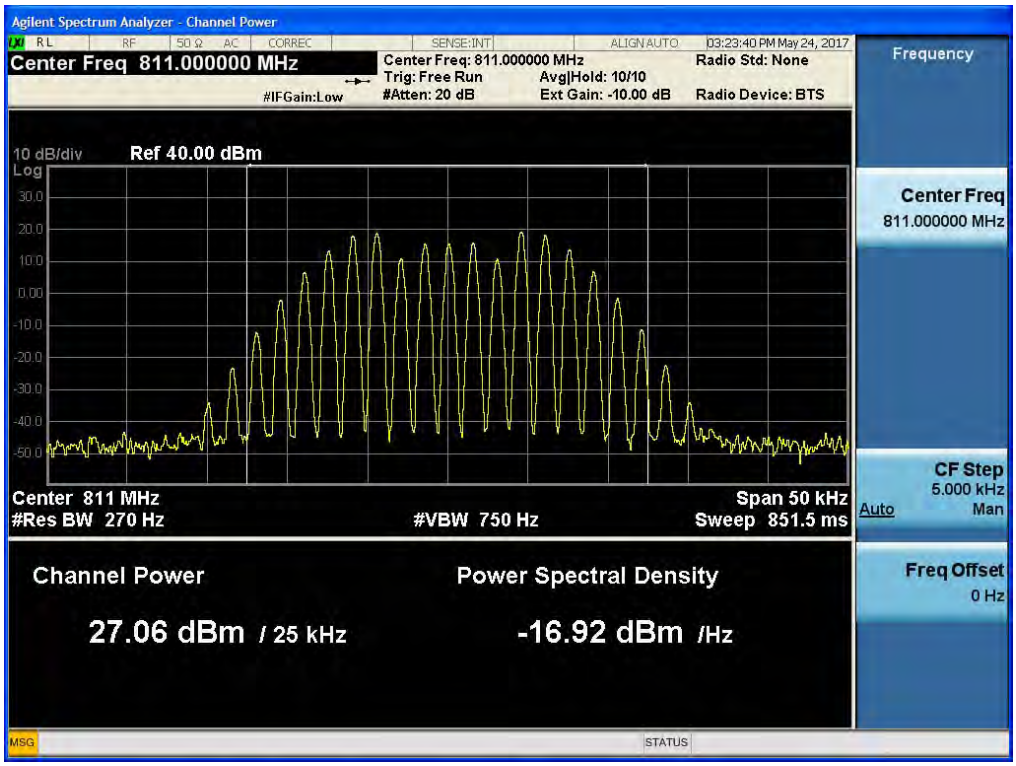
[AGC threshold Uplink - High]



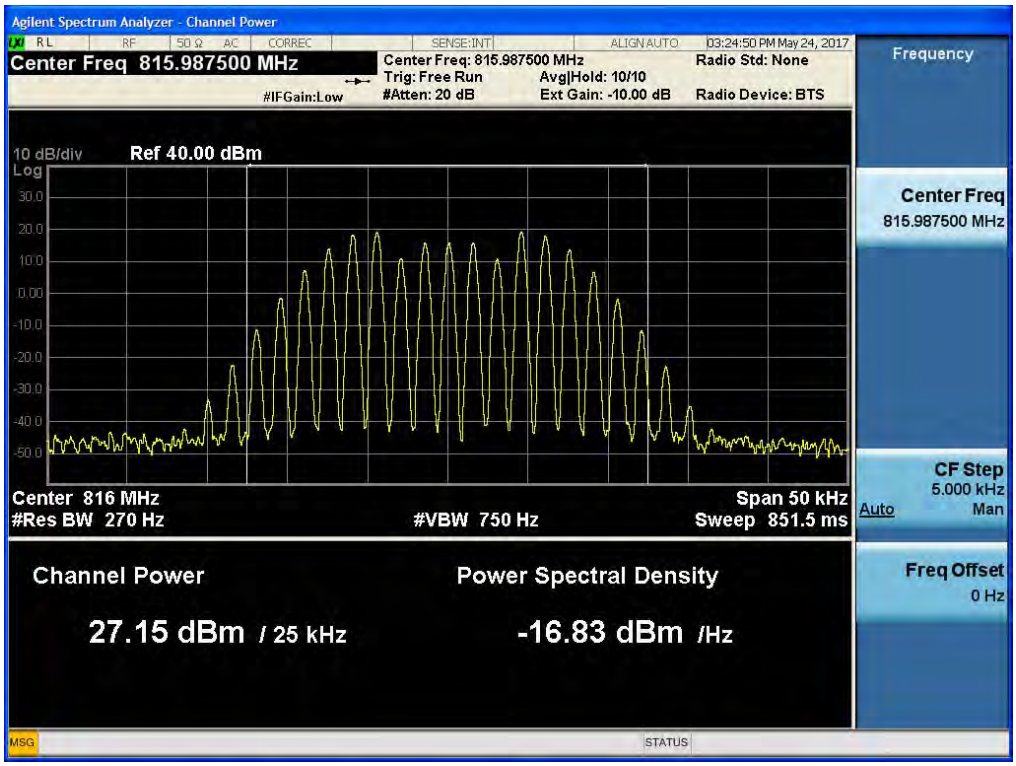
[+3dBm above AGC threshold Uplink - Low]



[+3dBm above AGC threshold Uplink - Middle]



[+3dBm above AGC threshold Uplink - High]



7. OCCUPIED BANDWIDTH

FCC Rules

Test Requirements:

§ 2.1049 Measurements required: Occupied bandwidth:

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to
0.5 percent of the total mean power radiated by a given emission shall be measured
under the specified conditions of § 2.1049 (a) through (i) as applicable.

IC Rules

Test Requirements:

RSS-Gen

6 Technical Requirements

6.6 Occupied Bandwidth

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99 % emission bandwidth, as calculated or measured.

Test Procedures:

Measurements were in accordance with the test methods section 3.4 of KDB 935210 D05 v01r01 and section 4.2 of KDB 971168 D01 v02r02.
Test is 99% OBW measured and used.

3.4 of KDB 935210 D05 v01r01

a) Connect a signal generator to the input of the EUT.

b) Configure the signal generator to transmit the AWGN signal.

c) Configure the signal amplitude to be just below the AGC threshold level (see 3.2), but not more than 0.5 dB below.

d) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation.

e) Set the spectrum analyzer center frequency to the center frequency of the operational band under test. The span range of the spectrum analyzer shall be between 2 times to 5 times the emission bandwidth (EBW) or alternatively, the OBW.

f) The nominal RBW shall be in the range of 1 % to 5 % of the anticipated OBW, and the VBW shall be ≥ 3 × RBW.

g) Set the reference level of the instrument as required to preclude the signal from exceeding the maximum spectrum analyzer input mixer level for linear operation. In general, the peak of the spectral envelope must be more than [10 log (OBW / RBW)] below the reference level. Steps f) and g) may require iteration to enable adjustments within the specified tolerances.

h) The noise floor of the spectrum analyzer at the selected RBW shall be at least 36 dB below

the reference level.

i) Set spectrum analyzer detection function to positive peak.

j) Set the trace mode to max hold.

k) Determine the reference value: Allow the trace to stabilize. Set the spectrum analyzer marker to the highest amplitude level of the displayed trace (this is the reference value) and record the associated frequency as f0.

l) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the −26 dB down amplitude. The 26 dB EBW (alternatively OBW) is the positive frequency difference between the two markers. If the spectral envelope crosses the −26 dB down amplitude at multiple points, the lowest or highest frequency shall be selected as the frequencies that are the furthest removed from the center frequency at which the spectral envelope crosses the −26 dB down amplitude point. m) Repeat steps e) to l) with the input signal connected directly to the spectrum analyzer (i.e., input signal measurement).

n) Compare the spectral plot of the input signal (determined from step m) to the output signal (determined from step l) to affirm that they are similar (in passband and rolloff characteristic features and relative spectral locations), and include plot(s) and descriptions in test report.

(o) Repeat the procedure [steps e) to n)] with the input signal amplitude set to 3 dB above the AGC threshold.

p) Repeat steps e) to o) with the signal generator set to the narrowband signal.

q) Repeat steps e) to p) for all frequency bands authorized for use by the EUT.

4.2 of KDB 971168 D01 v02r02

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.

c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

d) NOTE—Steps a) through c) may require iteration to adjust within the specified tolerances.

e) Set the detection mode to peak, and the trace mode to max hold..

f) Use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.

g) If the instrument does not have a 99 % power bandwidth function, the trace data points are to be recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the

total is reached; that frequency is recorded as the upper frequency. The 99 % power bandwidth is the difference between these two frequencies.

h) The OBW shall be reported by providing plot(s) of the measuring instrument display. The frequency and amplitude axes and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

[Downlink Output]

	Channel	Frequency (MHz)	OBW (kHz)
PS 700 P25 (12.5 kHz)_ AGC threshold	Low	769.00625	8.251
	Middle	772.00000	8.154
	High	774.99375	8.309
PS 700 P25 (12.5 kHz)_ +3dB above AGC threshold	Low	769.00625	8.213
	Middle	772.00000	8.511
	High	774.99375	8.209
PS 700 Analog FM (25 kHz)_ AGC threshold	Low	769.01250	18.117
	Middle	772.00000	18.117
	High	774.98750	18.119
PS 700 Analog FM (25 kHz)_ +3dB above AGC threshold	Low	769.01250	18.117
	Middle	772.00000	18.119
	High	774.98750	18.120

	Channel	Frequency (MHz)	OBW (kHz)
PS 800 P25 (12.5 kHz)_ AGC threshold	Low	851.00625	8.140
	Middle	856.00000	7.460
	High	860.99375	7.555
PS 800 P25 (12.5 kHz)_ +3dB above AGC threshold	Low	851.00625	7.393
	Middle	856.00000	7.366
	High	860.99375	7.475
PS 800 Analog FM (25 kHz)_ AGC threshold	Low	851.0125	18.119
	Middle	856.0000	18.117
	High	860.9875	18.113
PS 800 Analog FM (25 kHz)_ +3dB above AGC threshold	Low	851.0125	18.119
	Middle	856.0000	18.118
	High	860.9875	18.111

[Downlink Input]

	Channel	Frequency (MHz)	OBW (kHz)
PS 700 P25 (12.5 kHz)_ AGC threshold	Low	769.00625	8.119
	Middle	772.00000	8.130
	High	774.99375	8.001
PS 700 Analog FM (25 kHz)_ AGC threshold	Low	769.01250	18.101
	Middle	772.00000	18.102
	High	774.98750	18.104
PS 800 P25 (12.5 kHz)_ AGC threshold	Low	851.00625	8.110
	Middle	856.00000	7.954
	High	860.99375	8.033
PS 800 Analog FM (25 kHz)_ AGC threshold	Low	851.0125	18.104
	Middle	856.0000	18.102
	High	860.9875	18.100

[Uplink Output]

	Channel	Frequency (MHz)	OBW (kHz)
PS 700 P25 (12.5 kHz)_ AGC threshold	Low	799.01	8.213
	Middle	802.00	8.179
	High	804.99	8.301
PS 700 P25 (12.5 kHz)_ +3dB above AGC threshold	Low	799.01	8.320
	Middle	802.00	8.202
	High	804.99	8.334
PS 700 Analog FM (25 kHz)_ AGC threshold	Low	799.0125	18.116
	Middle	802.0000	18.118
	High	804.9875	18.117
PS 700 Analog FM (25 kHz)_ +3dB above AGC threshold	Low	799.0125	18.117
	Middle	802.0000	18.118
	High	804.9875	18.116

	Channel	Frequency (MHz)	OBW (kHz)
PS 800 P25 (12.5 kHz)_ AGC threshold	Low	806.00625	8.271
	Middle	811.00000	8.292
	High	815.99375	8.348
PS 800 P25 (12.5 kHz)_ +3dB above AGC threshold	Low	806.00625	8.329
	Middle	811.00000	8.456
	High	815.99375	8.272
PS 800 Analog FM (25 kHz)_ AGC threshold	Low	806.0125	18.117
	Middle	811.0000	18.118
	High	815.9875	18.119
PS 800 Analog FM (25 kHz)_ +3dB above AGC threshold	Low	806.0125	18.115
	Middle	811.0000	18.118
	High	815.9875	18.119

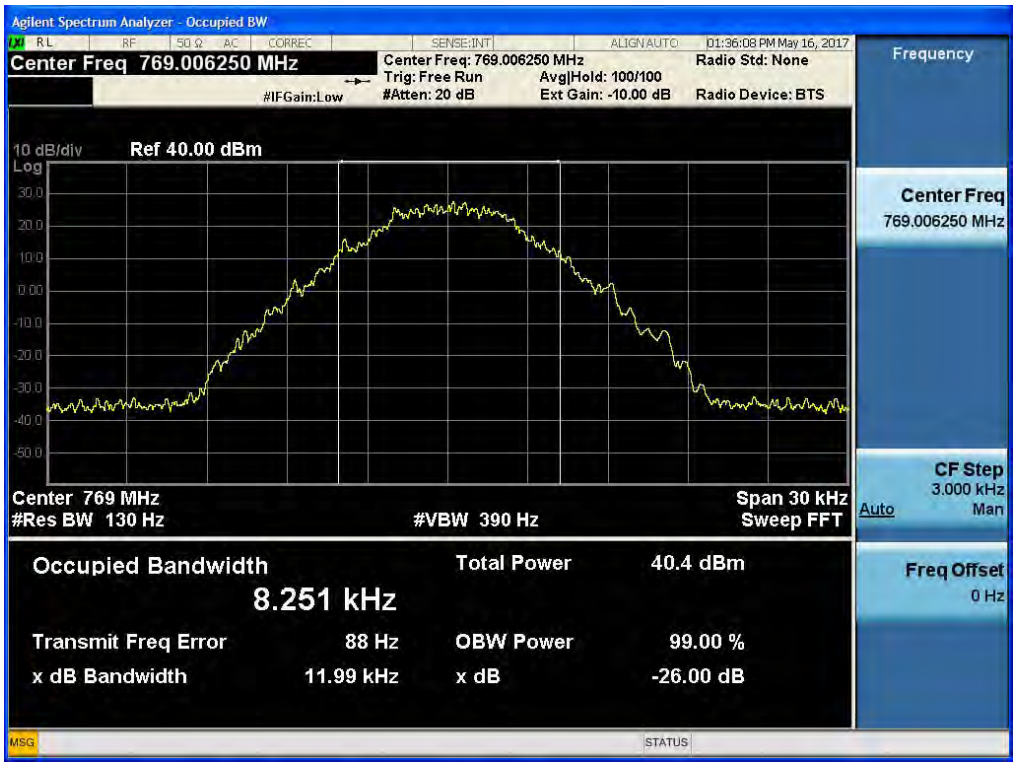
[Uplink Input]

	Channel	Frequency (MHz)	OBW (kHz)
PS 700 P25 (12.5 kHz)_ AGC threshold	Low	799.01	8.000
	Middle	802.00	8.133
	High	804.99	8.017
PS 700 Analog FM (25 kHz)_ AGC threshold	Low	799.0125	18.102
	Middle	802.0000	18.102
	High	804.9875	18.101
PS 800 P25 (12.5 kHz)_ AGC threshold	Low	806.00625	8.046
	Middle	811.00000	8.171
	High	815.99375	8.081
PS 800 Analog FM (25 kHz)_ AGC threshold	Low	806.0125	18.102
	Middle	811.0000	18.103
	High	815.9875	18.103

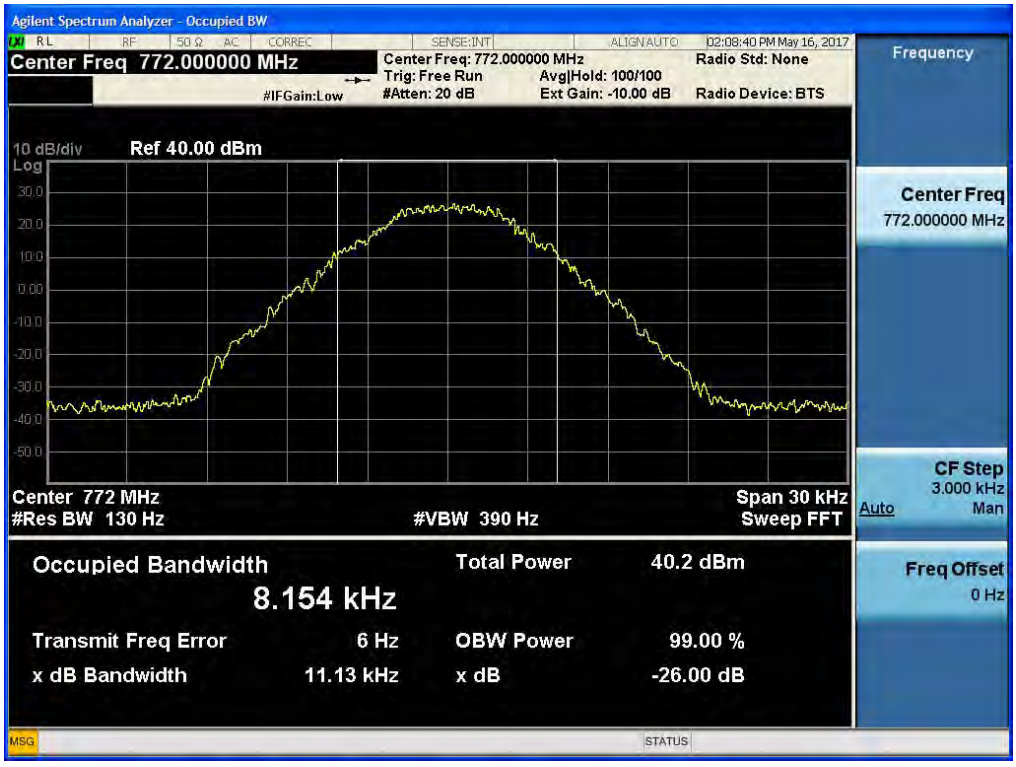
Plots of Occupied Bandwidth for Downlink Output

PS 700 P25_12.5 kHz (769 – 775 MHz)_DL

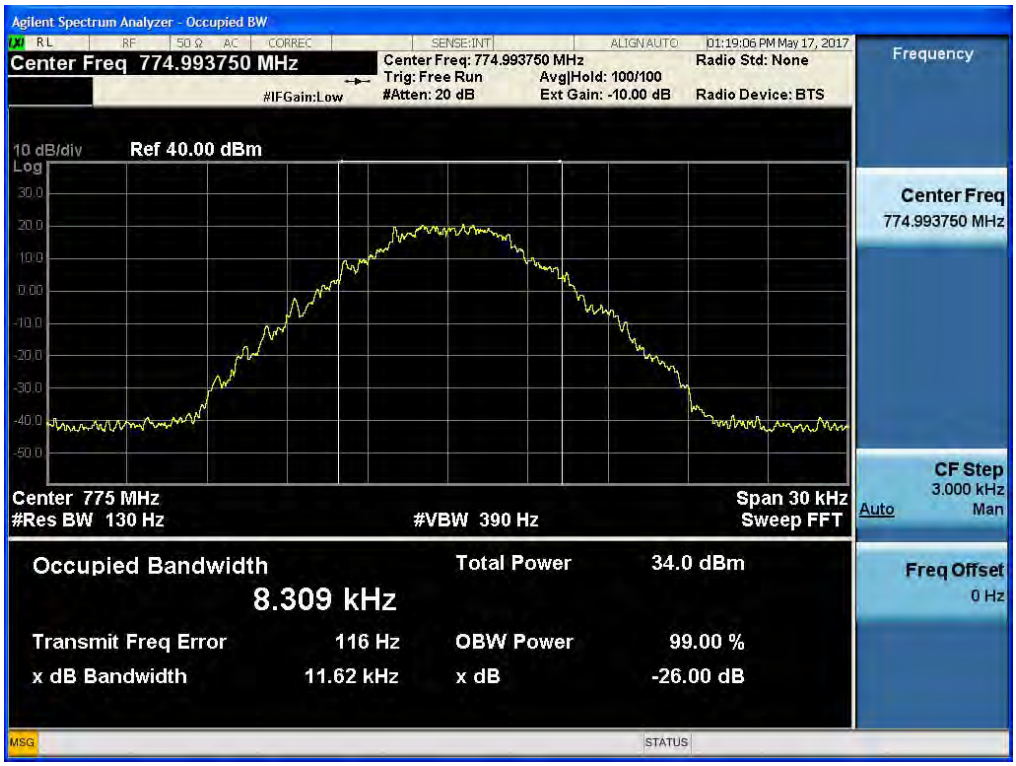
[AGC threshold Downlink - Low]



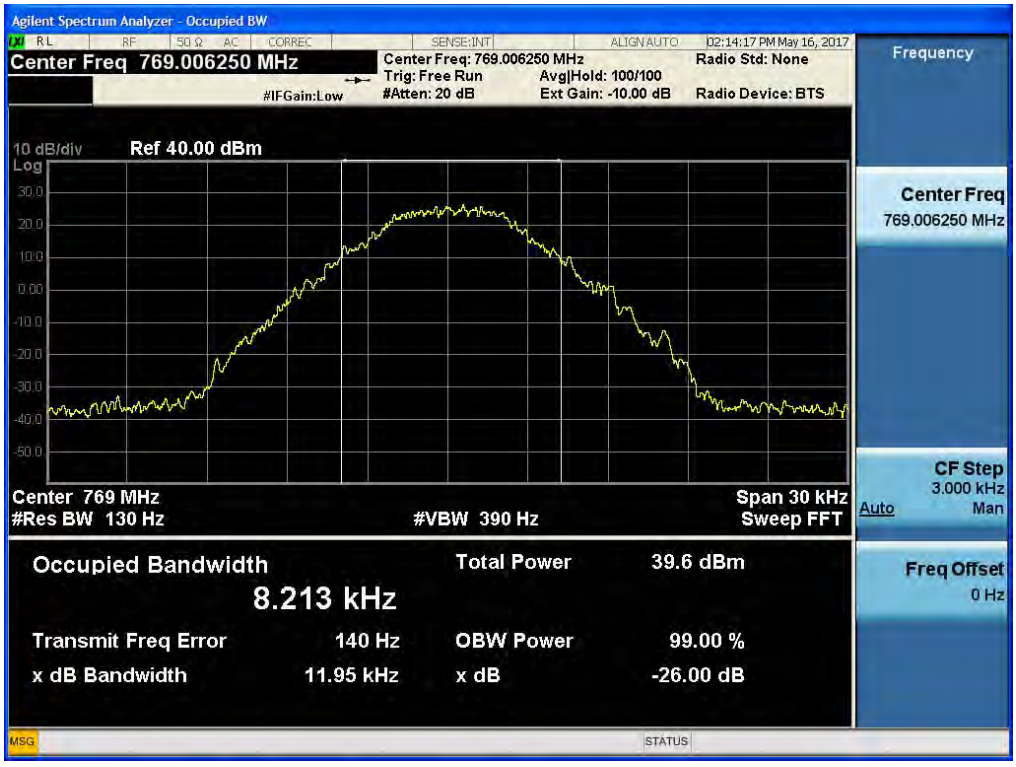
[AGC threshold Downlink - Middle]



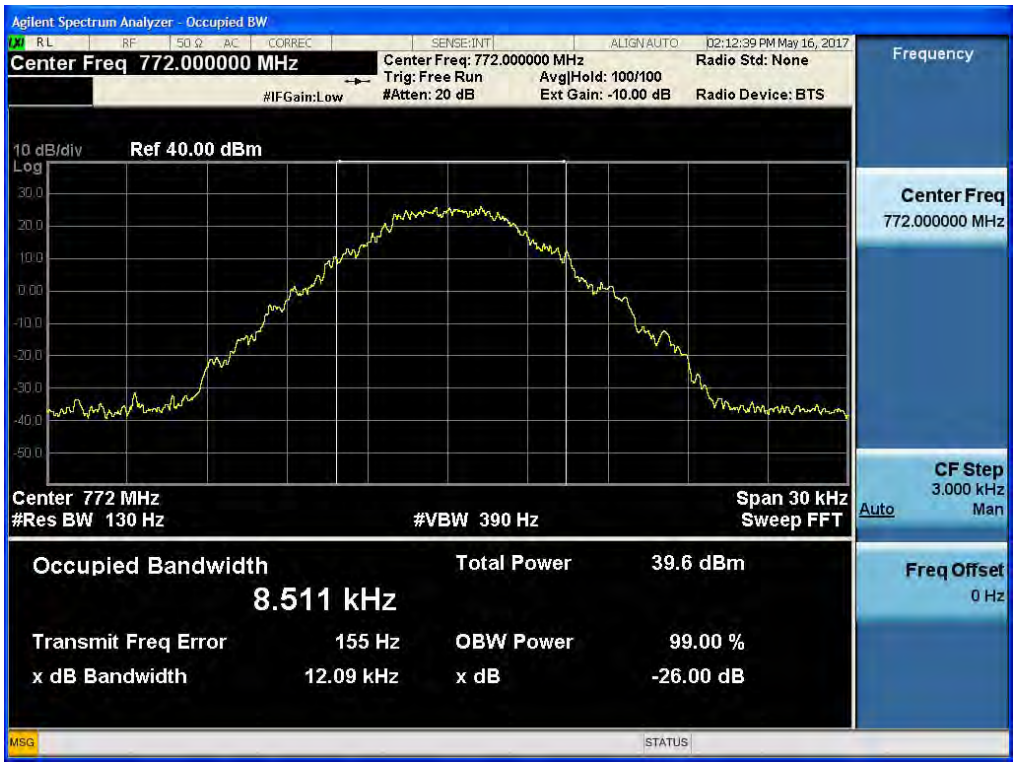
[AGC threshold Downlink - High]



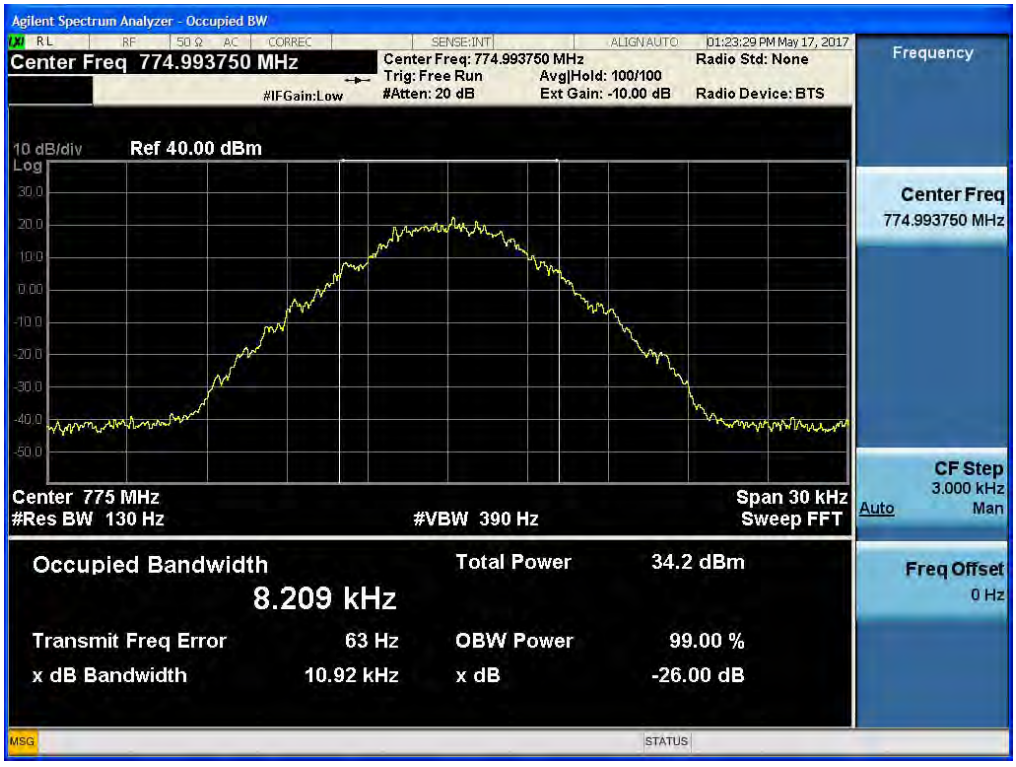
[+3dBm above AGC threshold Downlink Low]



[+3dBm above AGC threshold Downlink Middle]

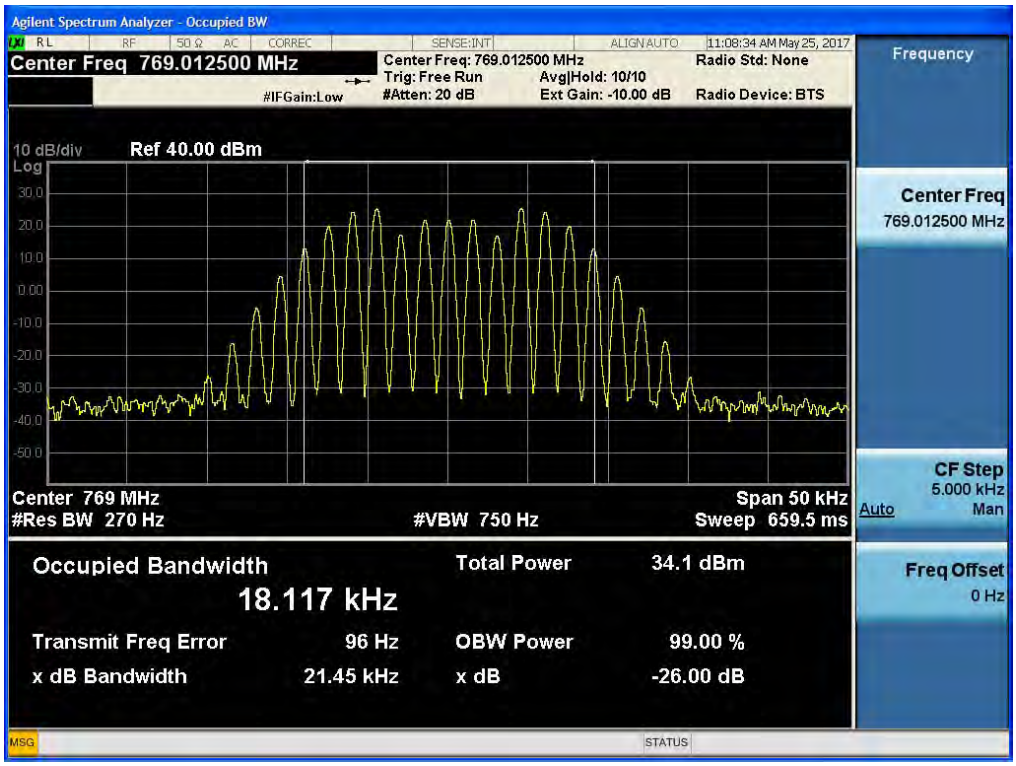


[+3dBm above AGC threshold Downlink High]

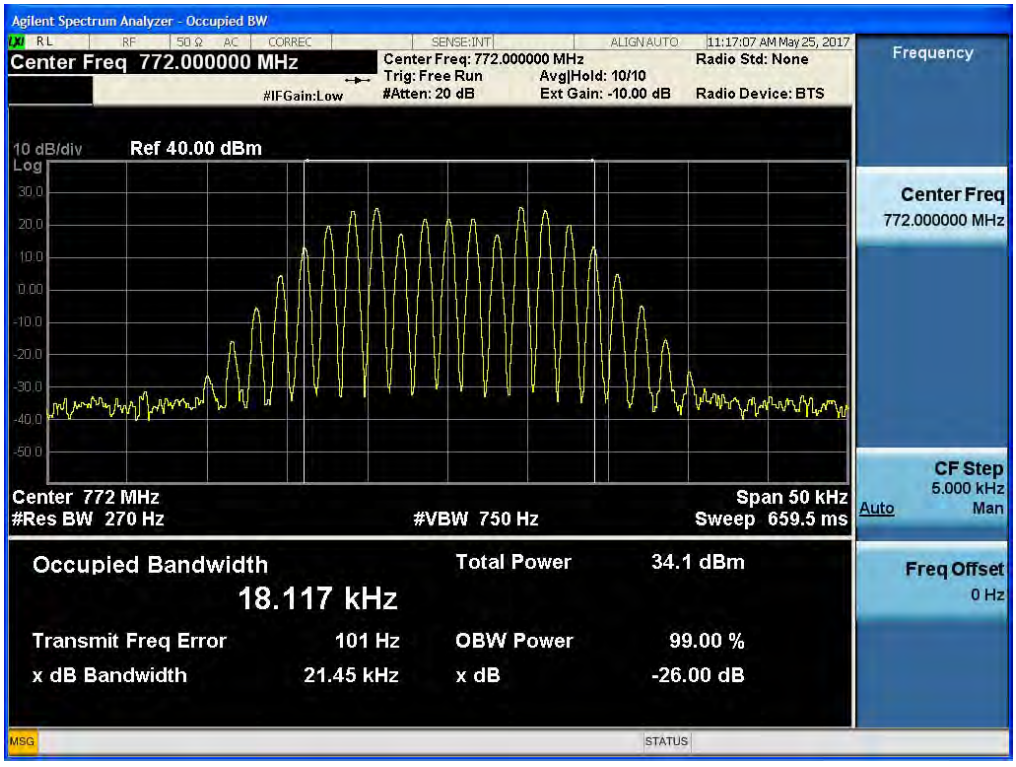


PS 700 Analog FM_25 kHz (769 – 775 MHz)_DL

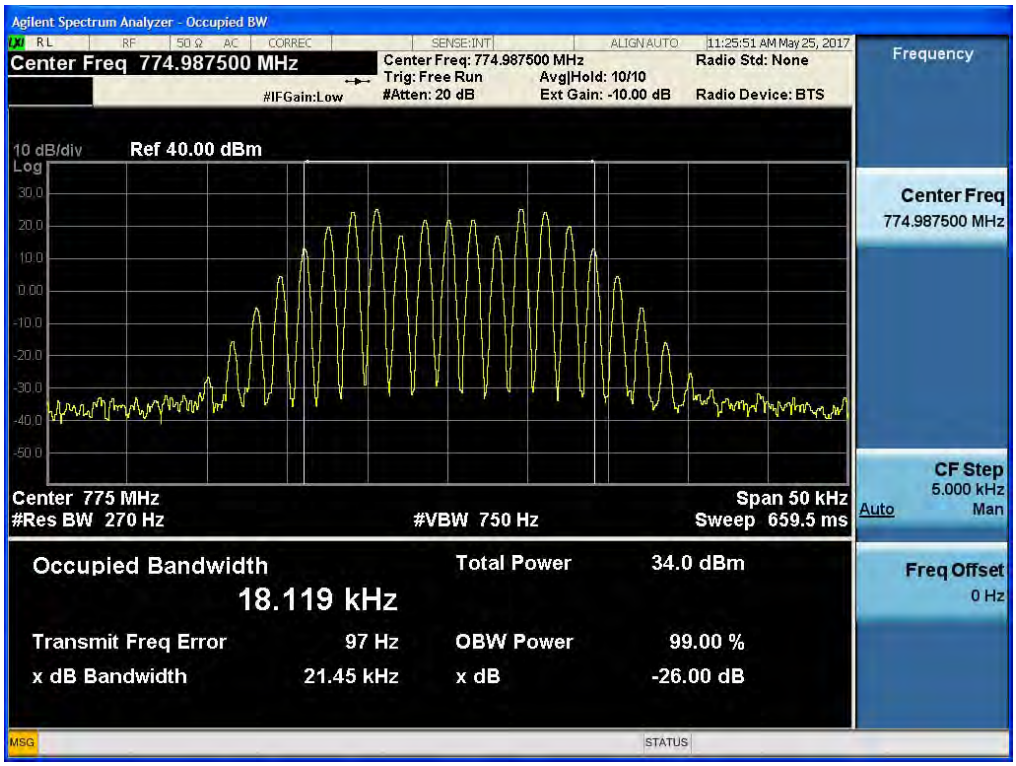
[AGC threshold Downlink - Low]



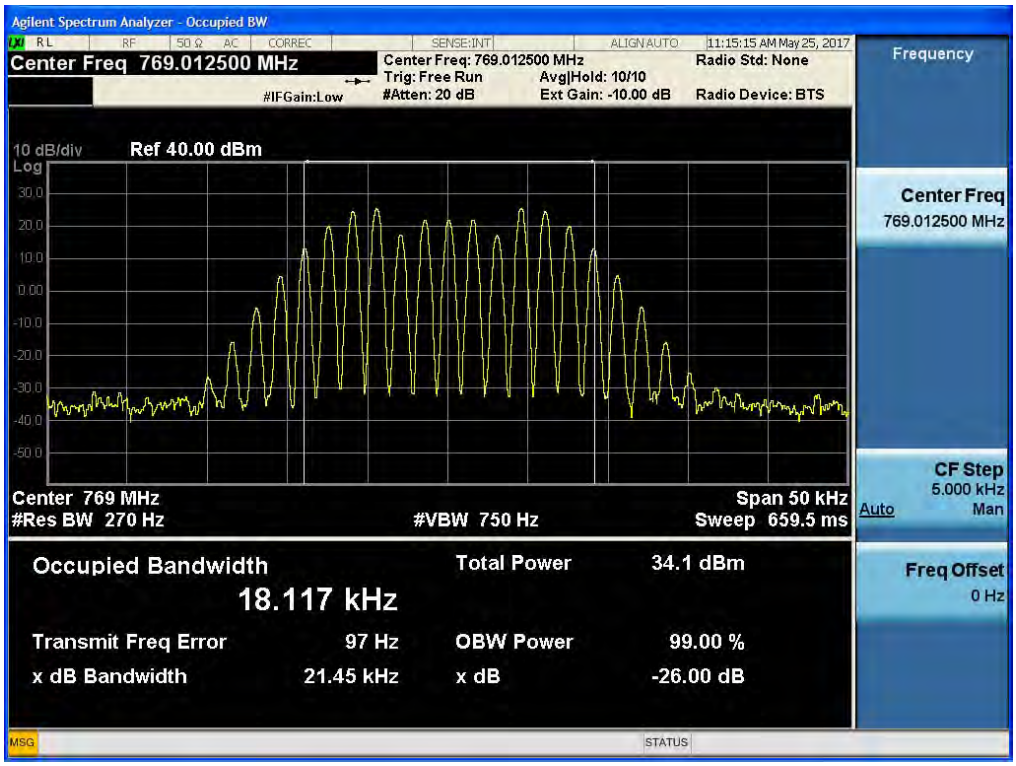
[AGC threshold Downlink - Middle]



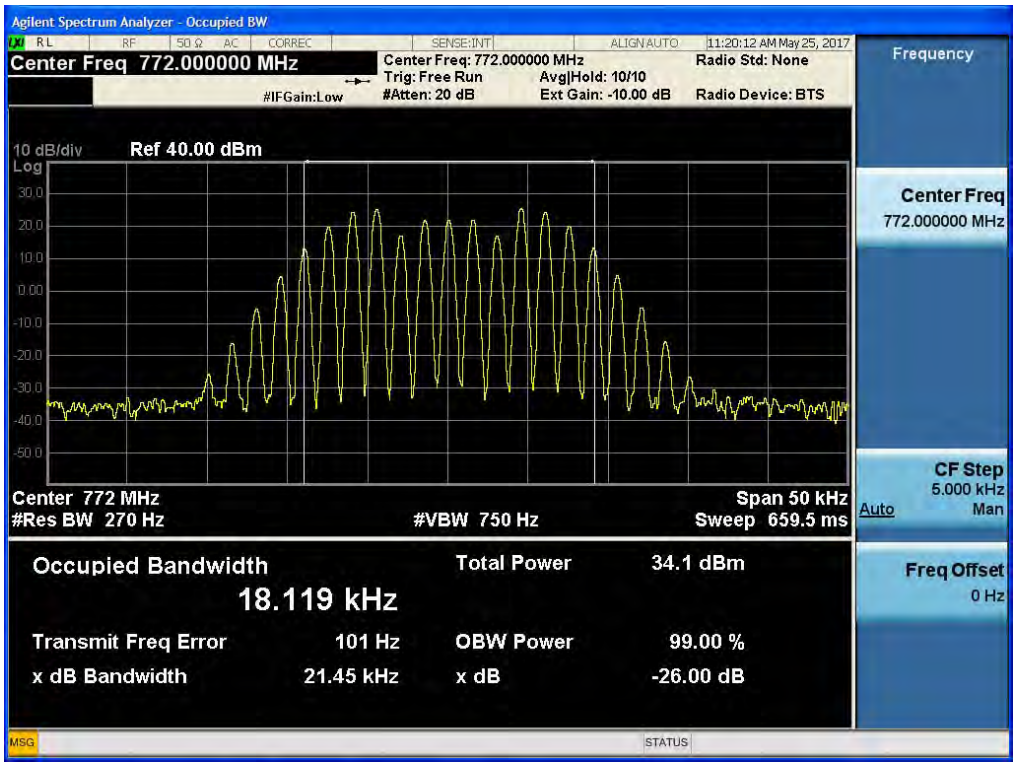
[AGC threshold Downlink - High]



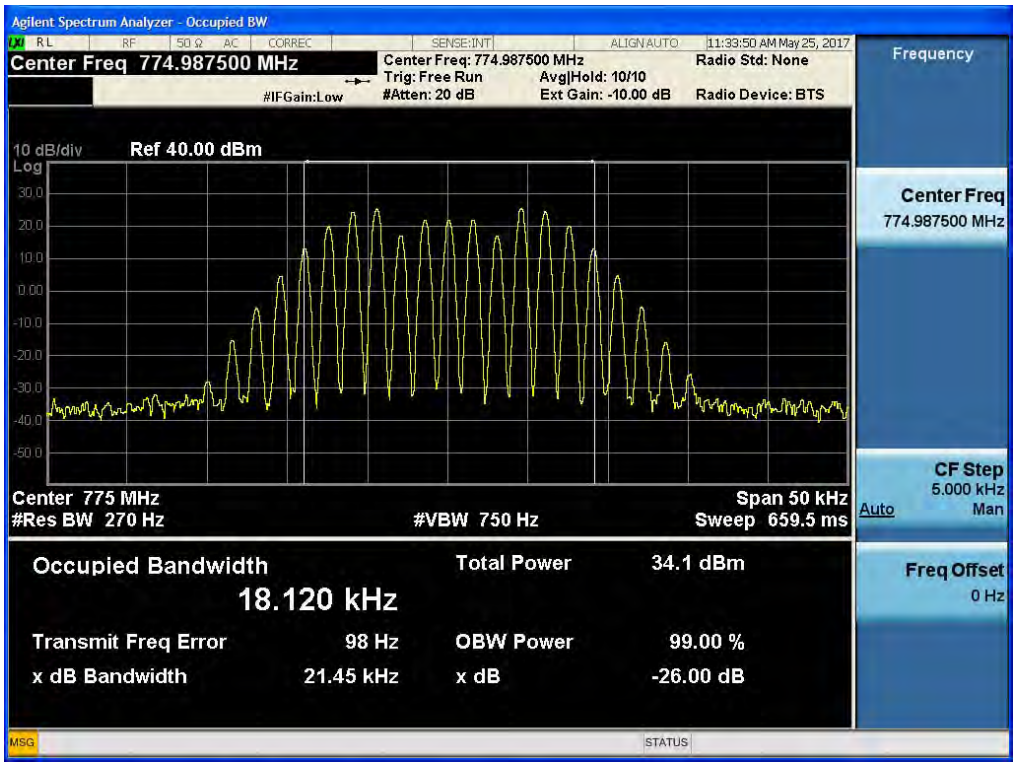
[+3dBm above AGC threshold Downlink Low]



[+3dBm above AGC threshold Downlink Middle]

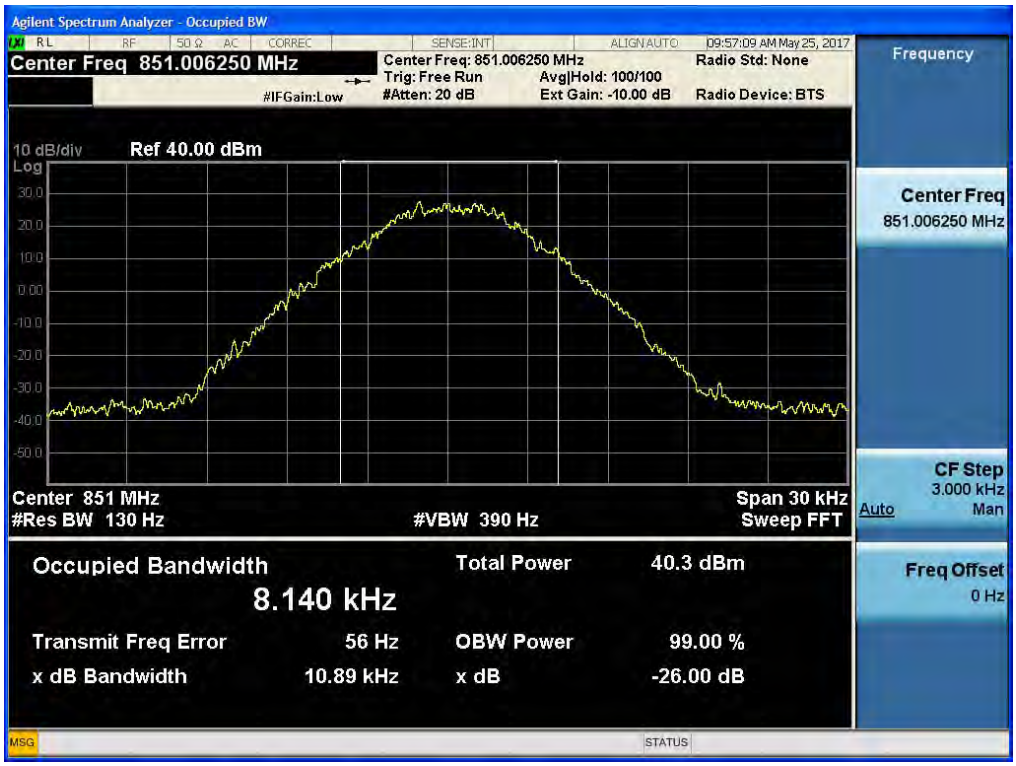


[+3dBm above AGC threshold Downlink High]

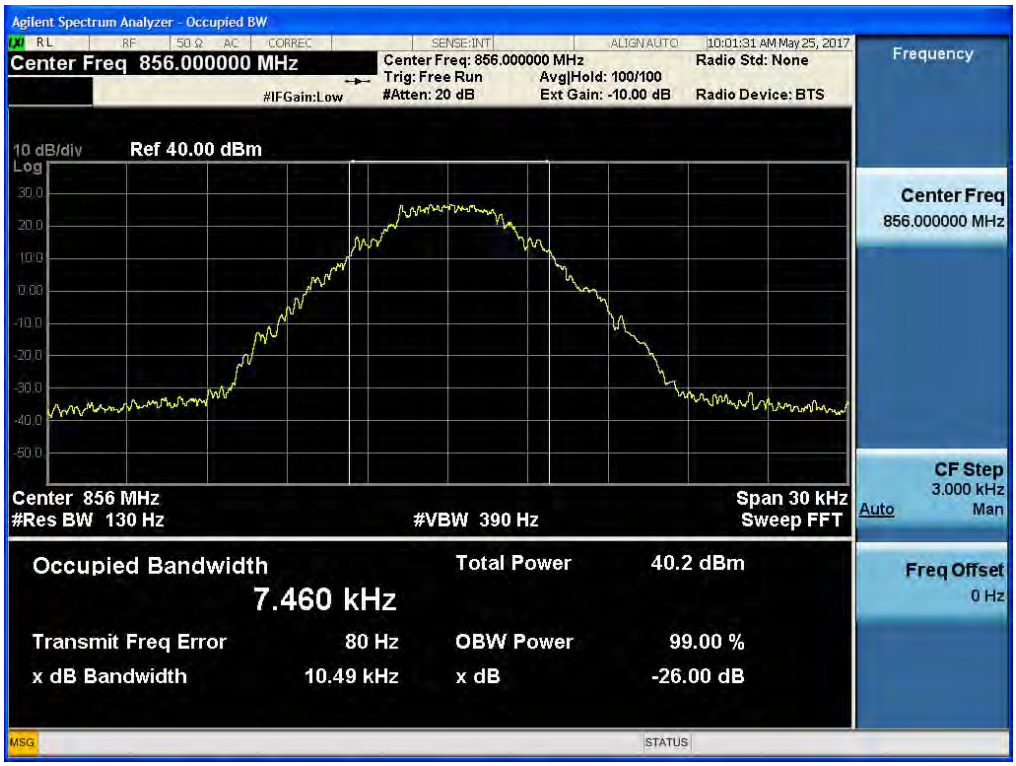


PS 800 P25_12.5 kHz (851 – 861 MHz)_DL

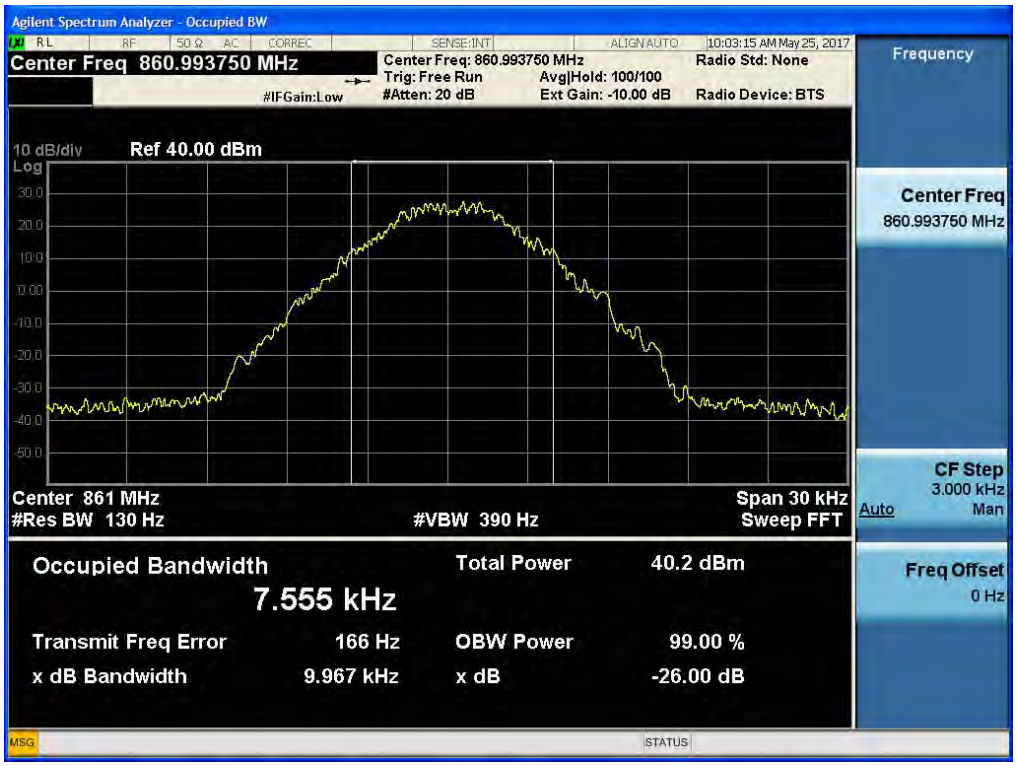
[AGC threshold Downlink - Low]



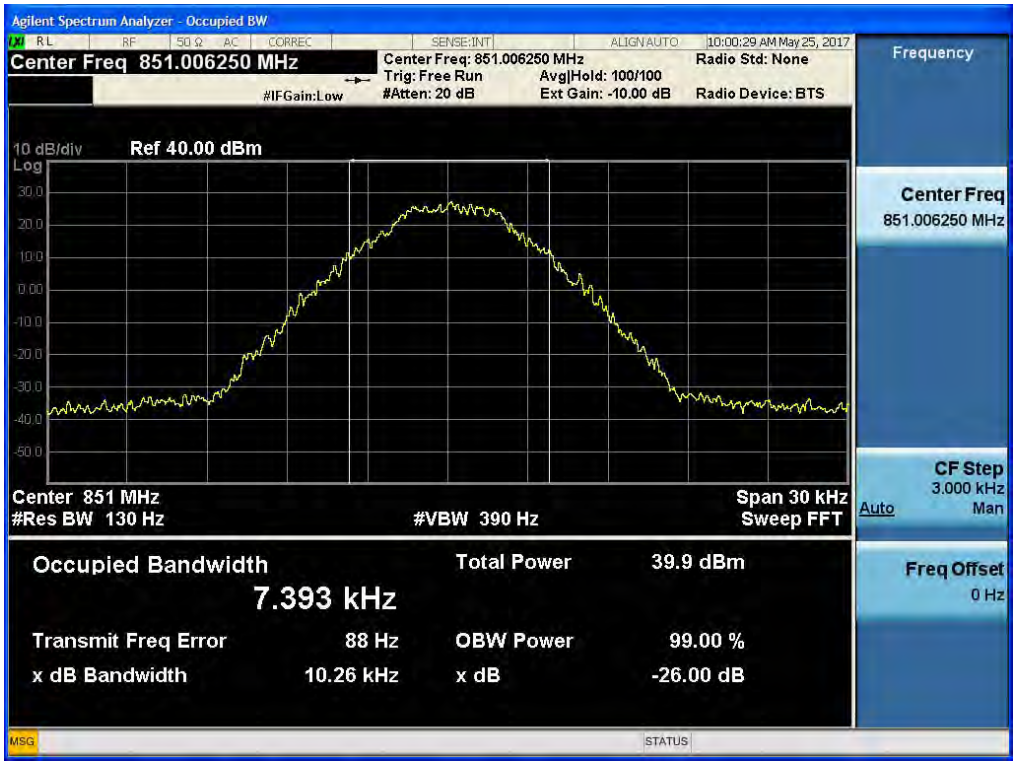
[AGC threshold Downlink - Middle]



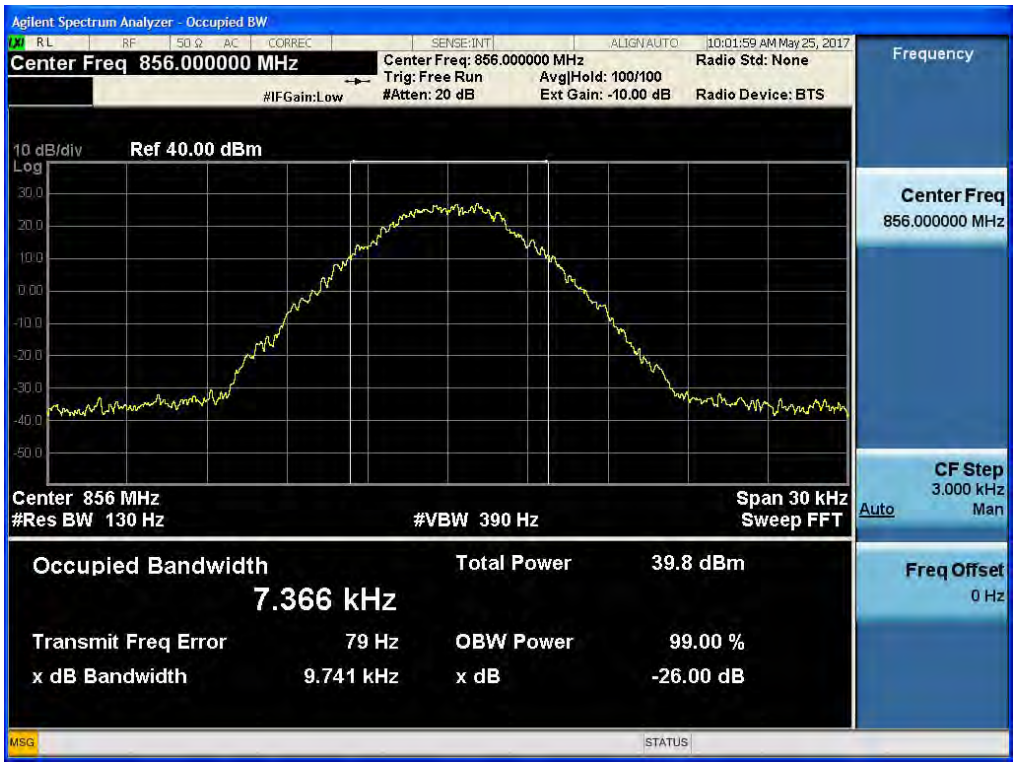
[AGC threshold Downlink - High]



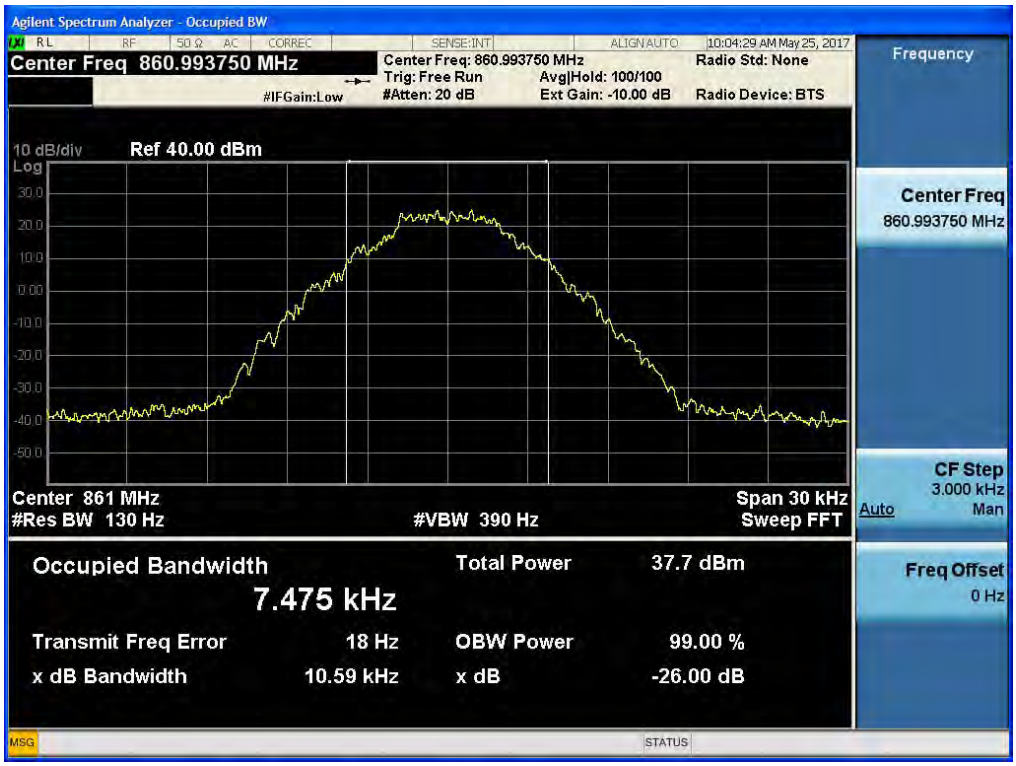
[+3dBm above AGC threshold Downlink Low]



[+3dBm above AGC threshold Downlink Middle]

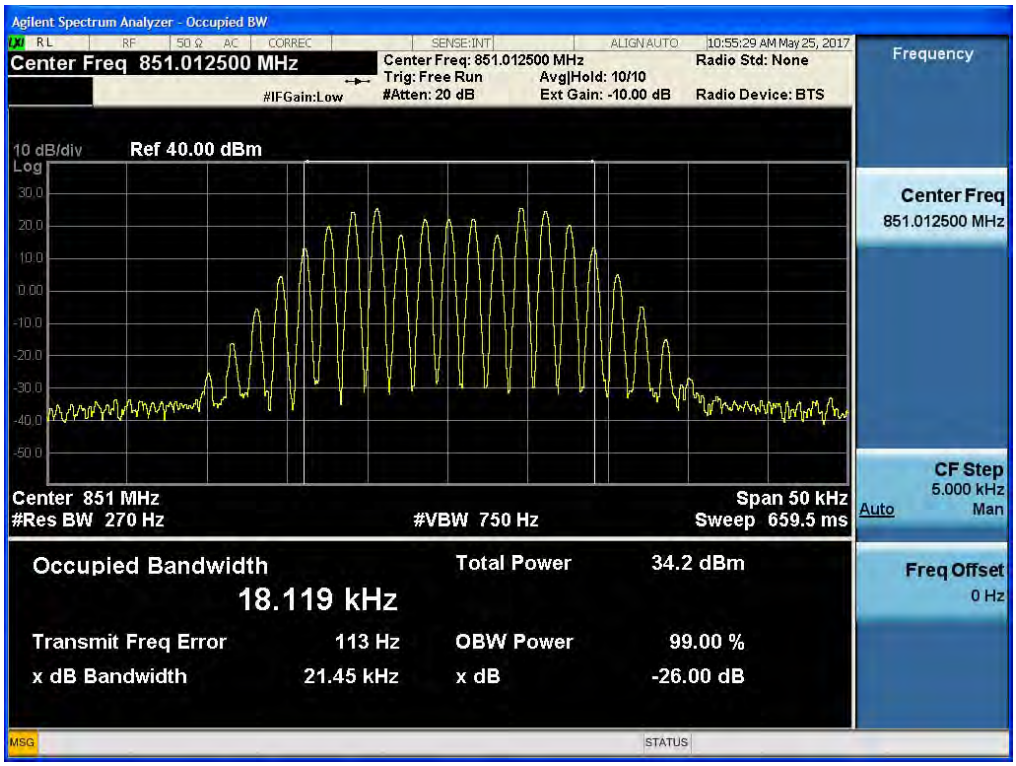


[+3dBm above AGC threshold Downlink High]

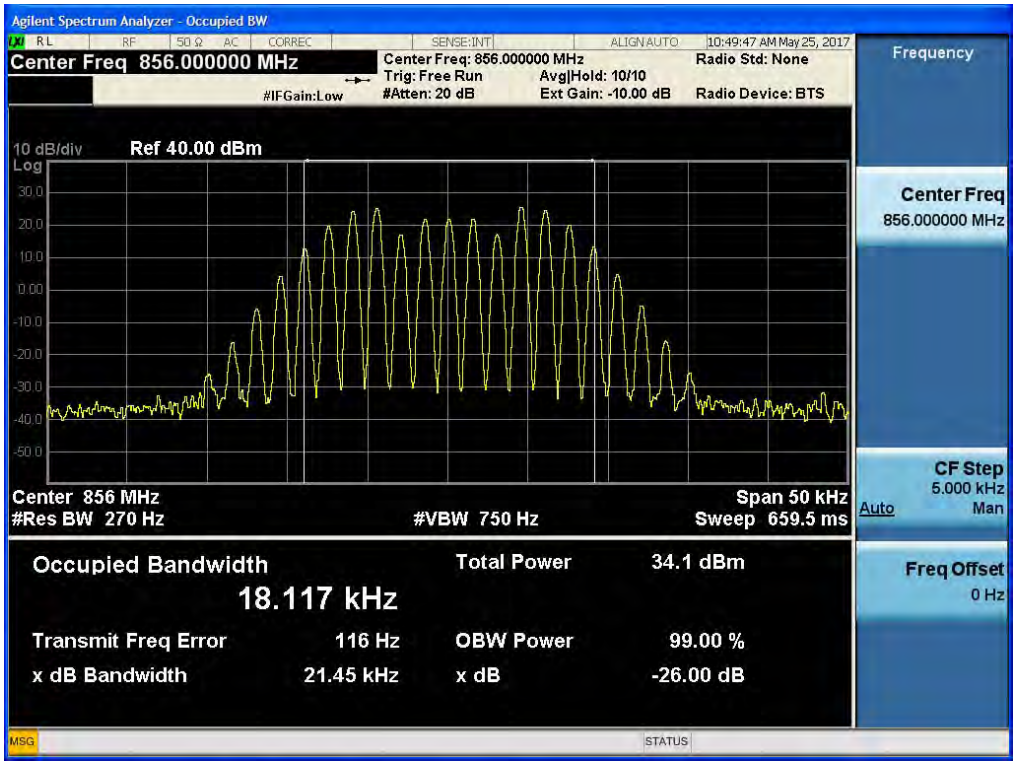


PS 800 Analog FM_25 kHz (851 – 861 MHz)_DL

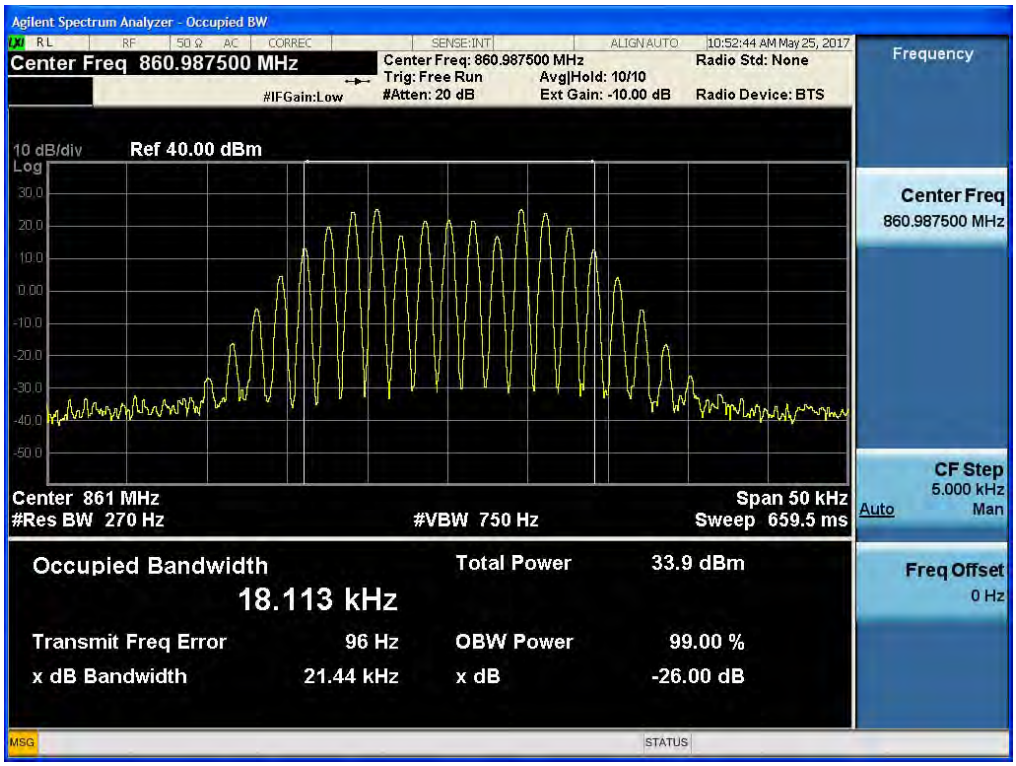
[AGC threshold Downlink - Low]



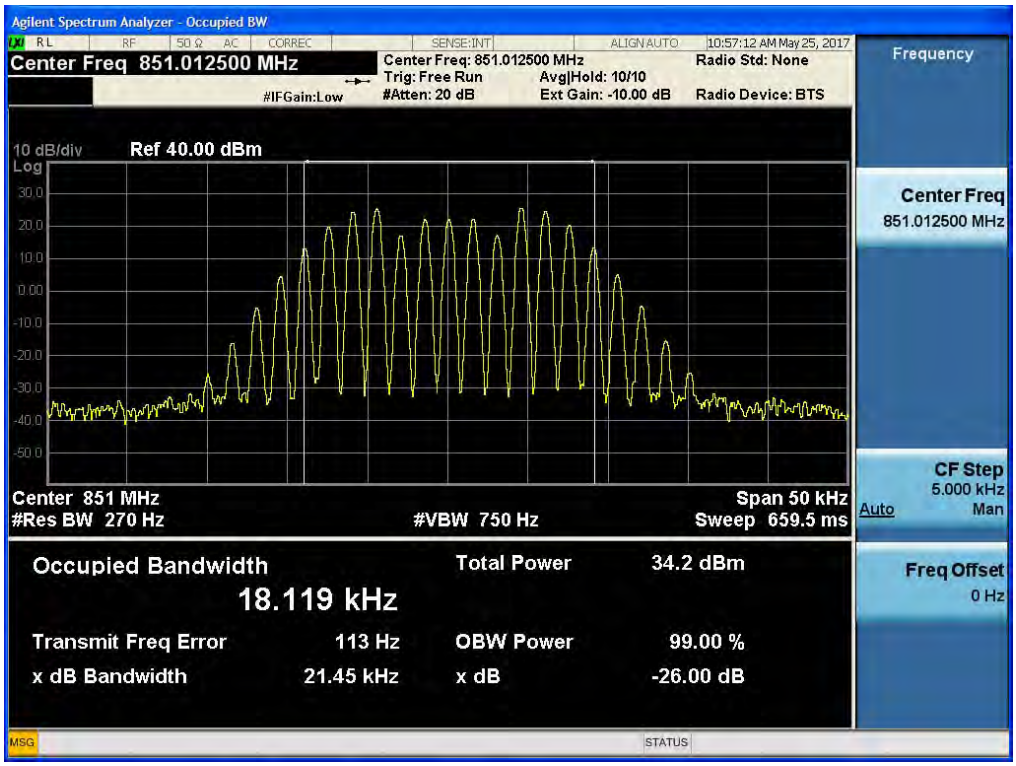
[AGC threshold Downlink - Middle]



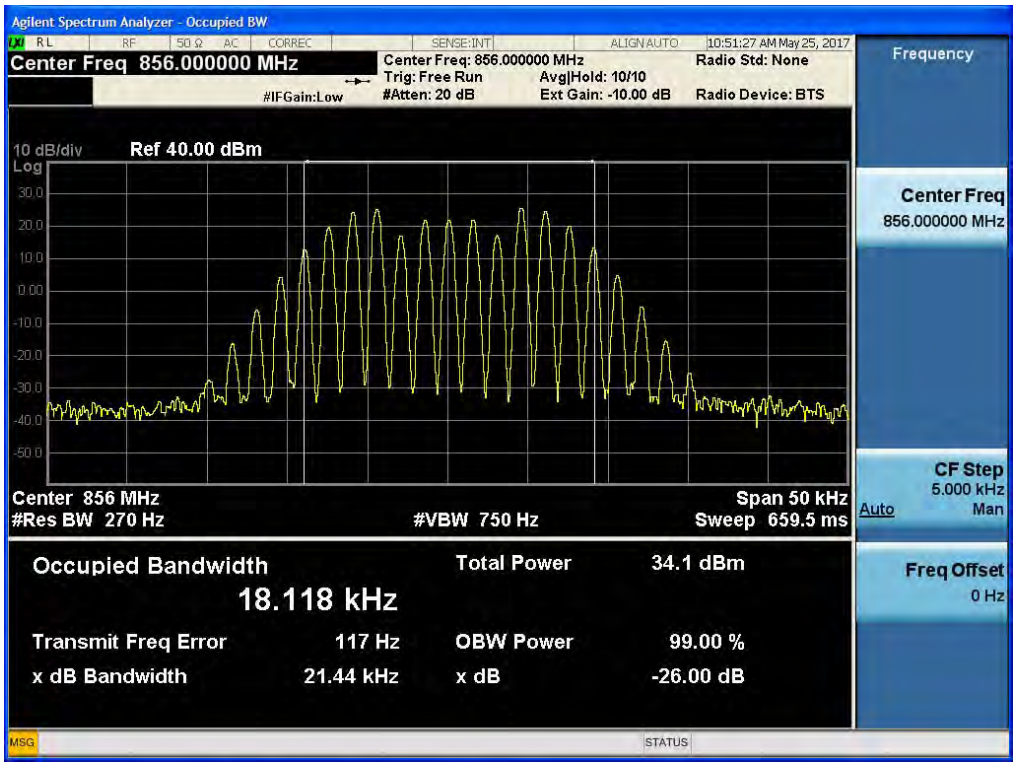
[AGC threshold Downlink - High]



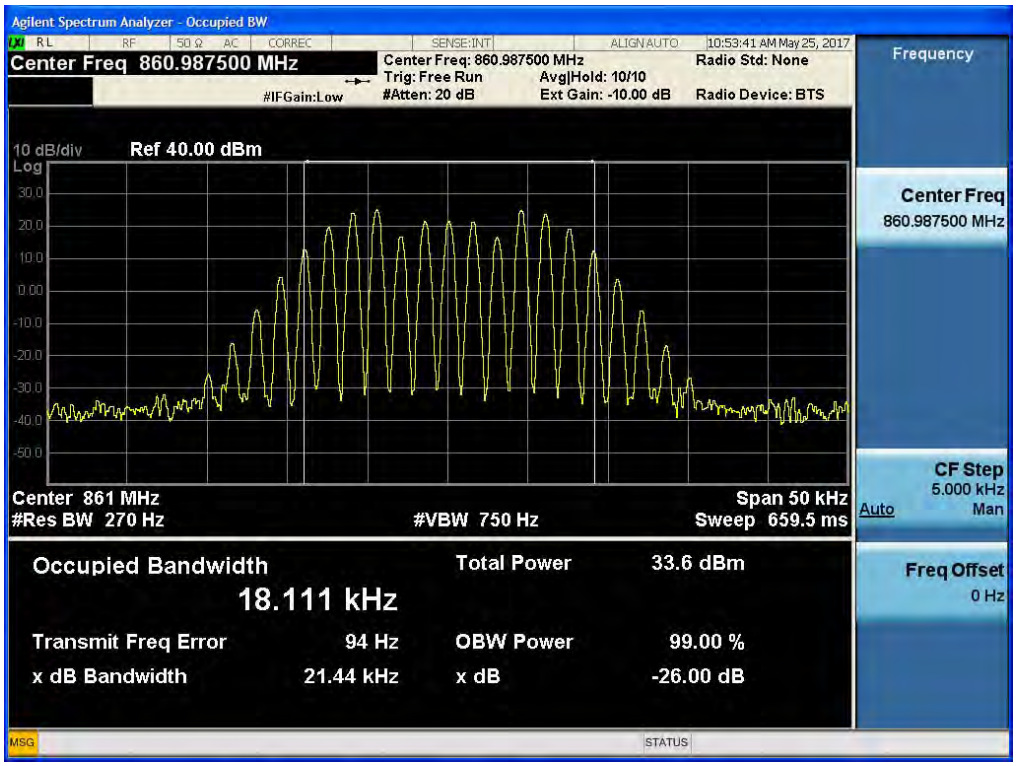
[+3dBm above AGC threshold Downlink Low]



[+3dBm above AGC threshold Downlink Middle]



[+3dBm above AGC threshold Downlink High]

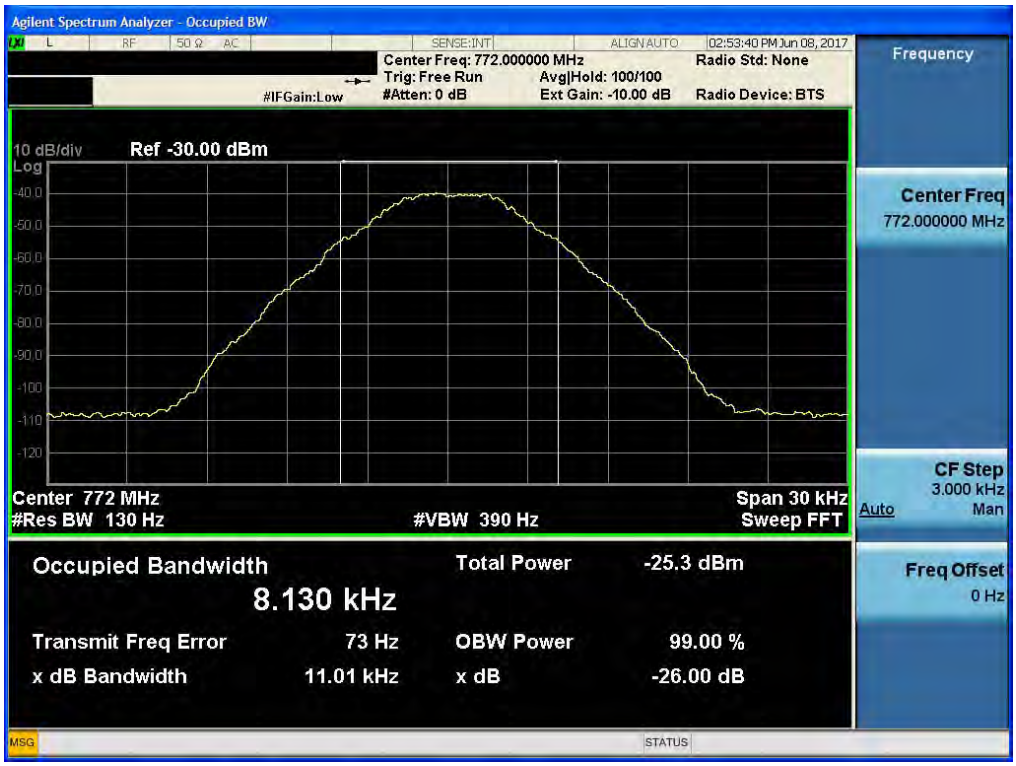


Plots of Occupied Bandwidth for Downlink Input

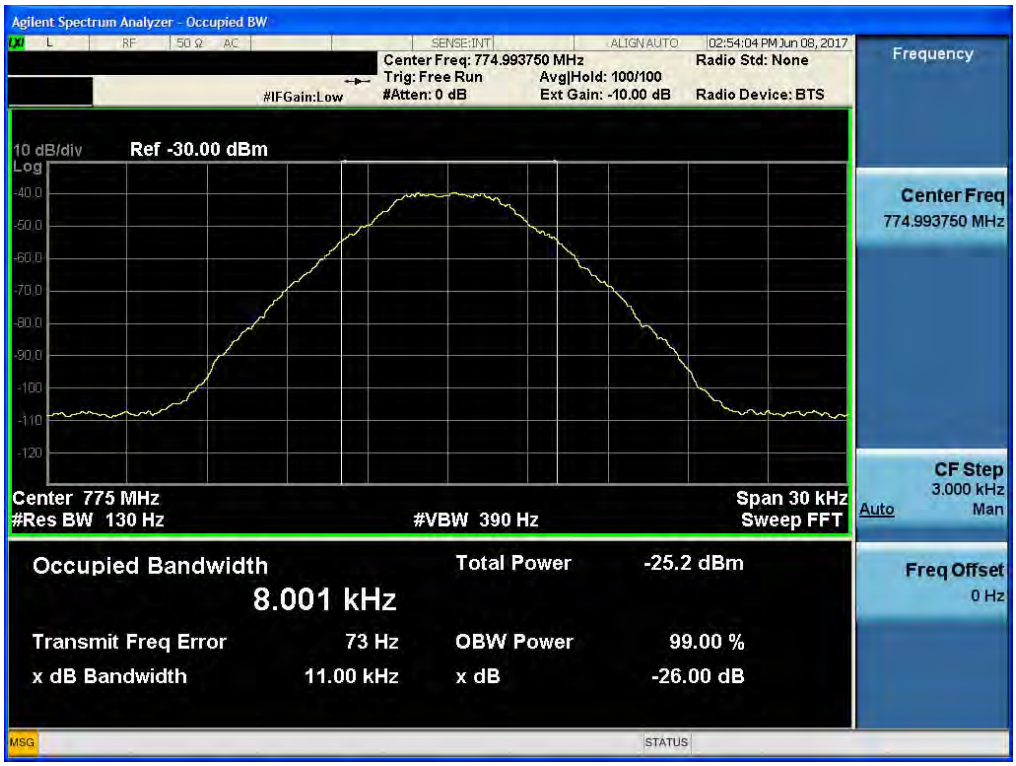
PS 700 P25_12.5 kHz (769 – 775 MHz)_DL

[AGC threshold Downlink - Low]

[AGC threshold Downlink - Middle]

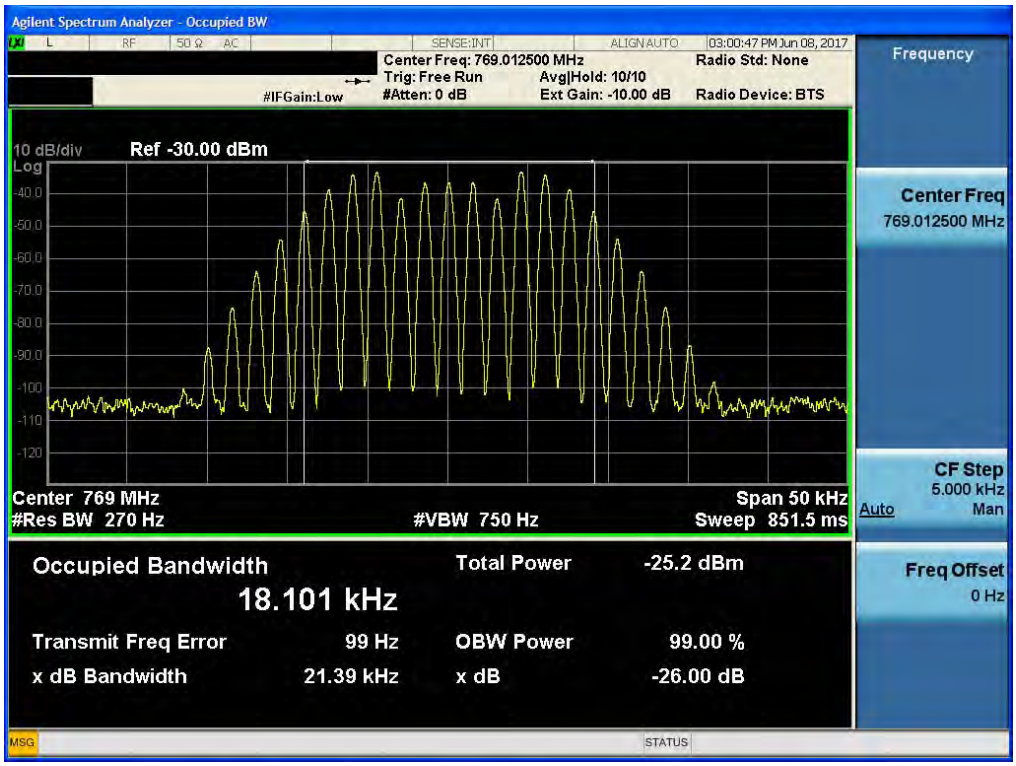


[AGC threshold Downlink - High]

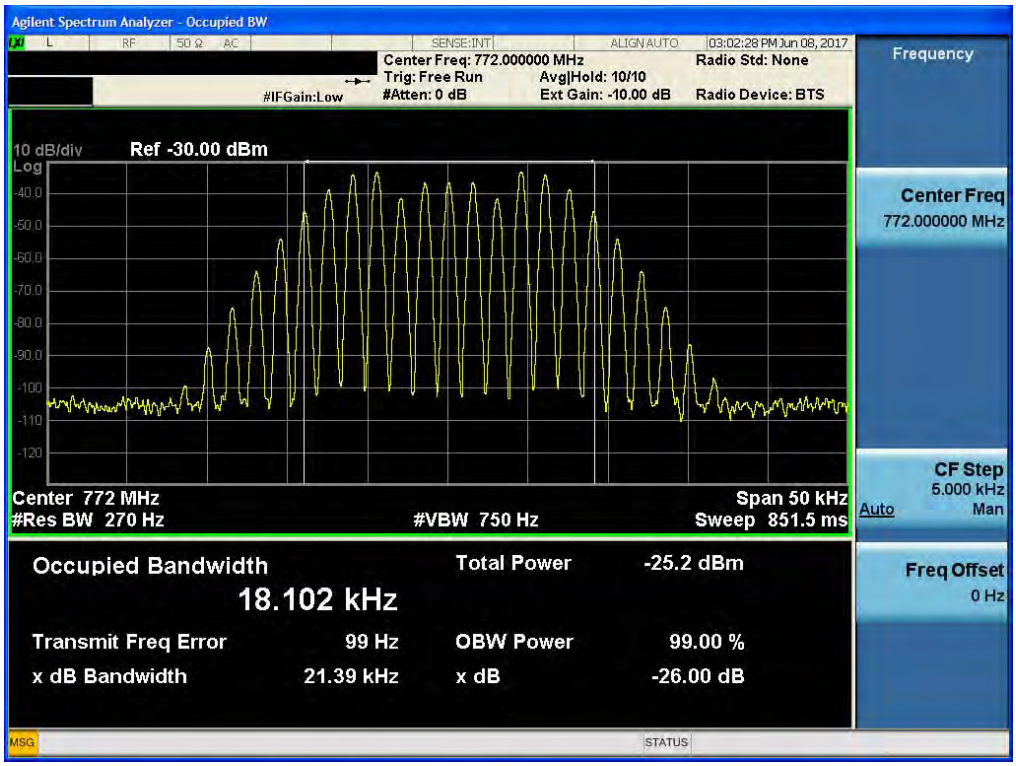


PS 700 Analog FM_25 kHz (769 – 775 MHz)_DL

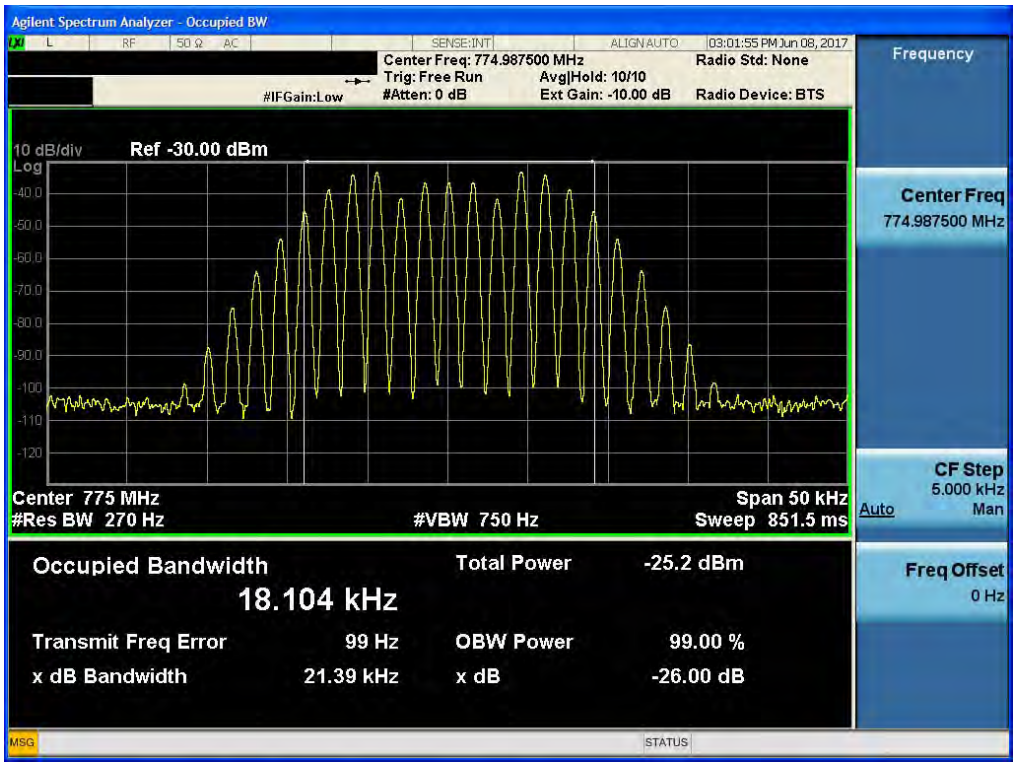
[AGC threshold Downlink - Low]



[AGC threshold Downlink - Middle]

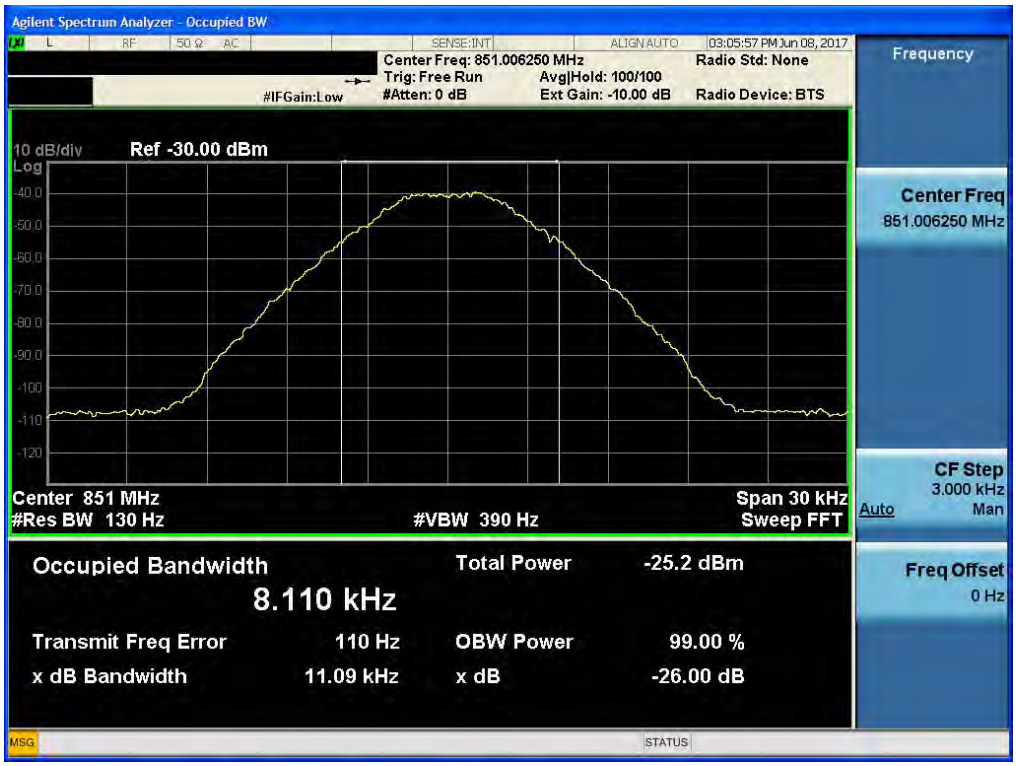


[AGC threshold Downlink - High]



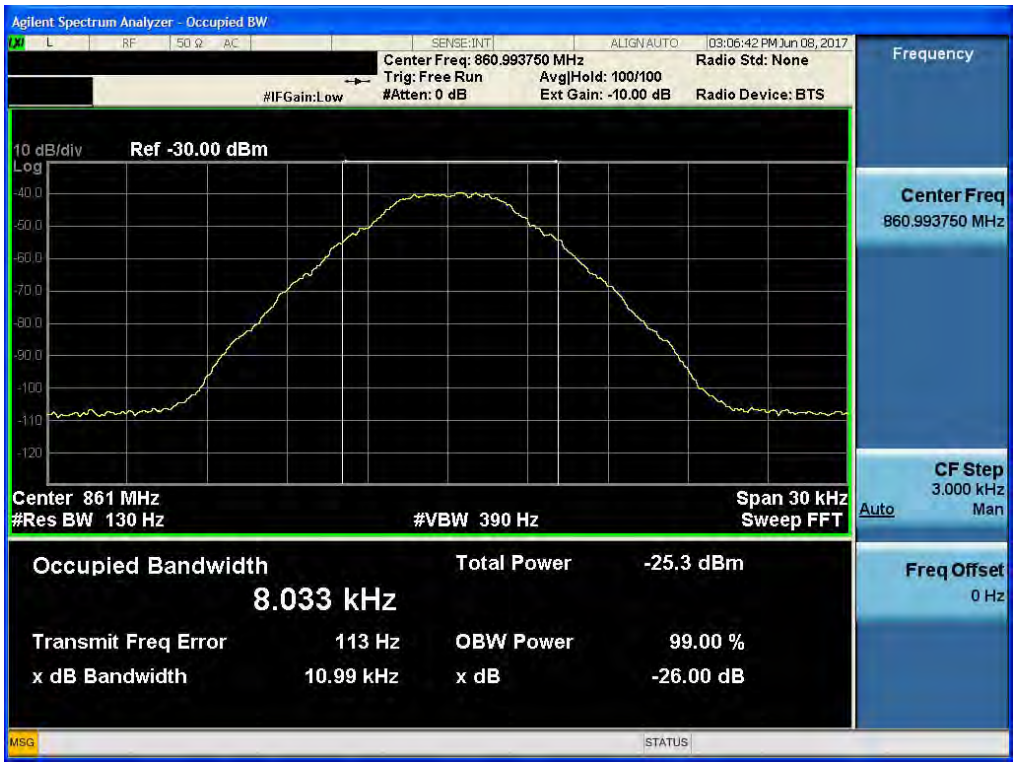
PS 800 P25_12.5 kHz (851 – 861 MHz)_DL

[AGC threshold Downlink - Low]



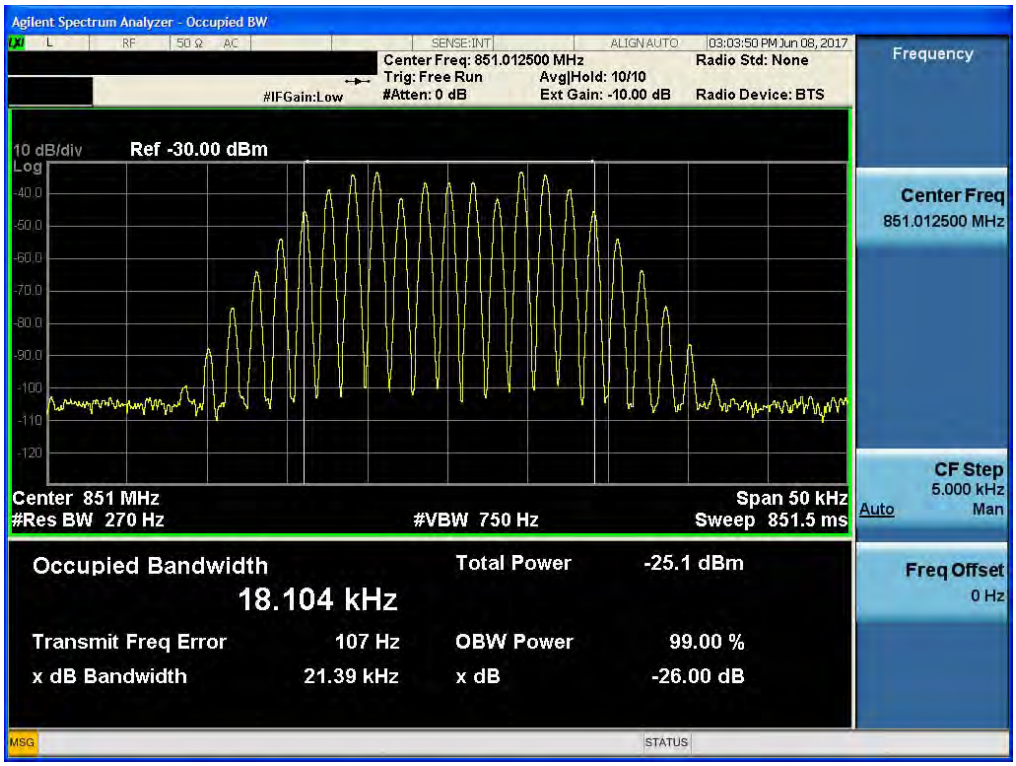
[AGC threshold Downlink - Middle]

[AGC threshold Downlink - High]

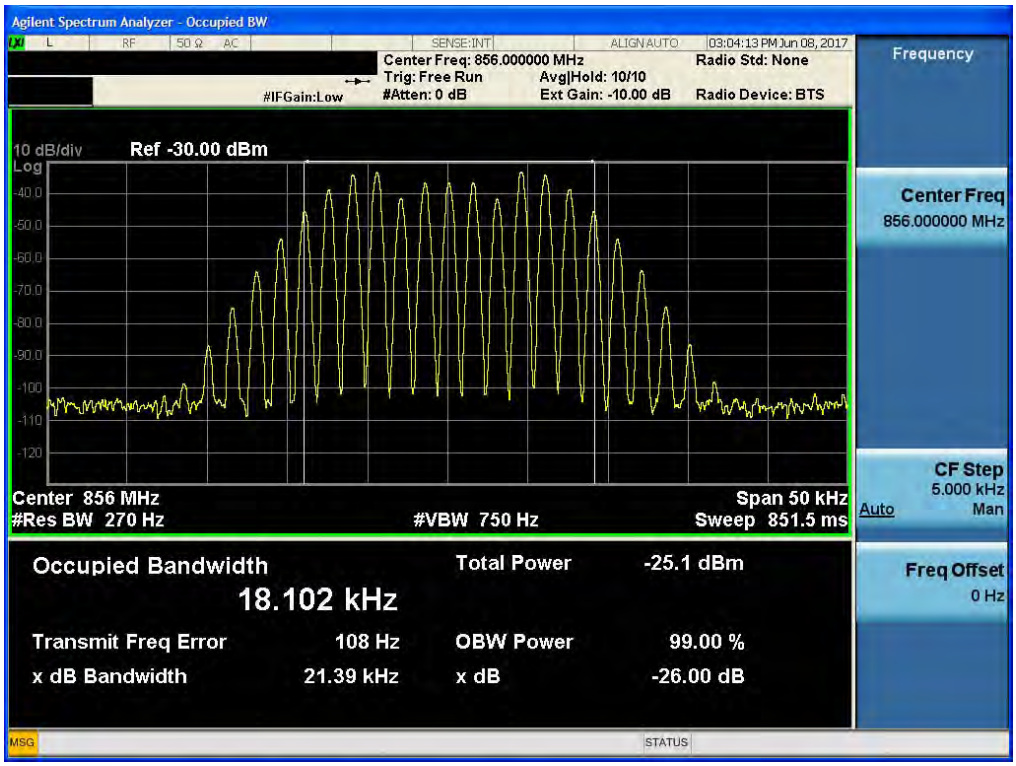


PS 800 Analog FM_25 kHz (851 – 861 MHz)_DL

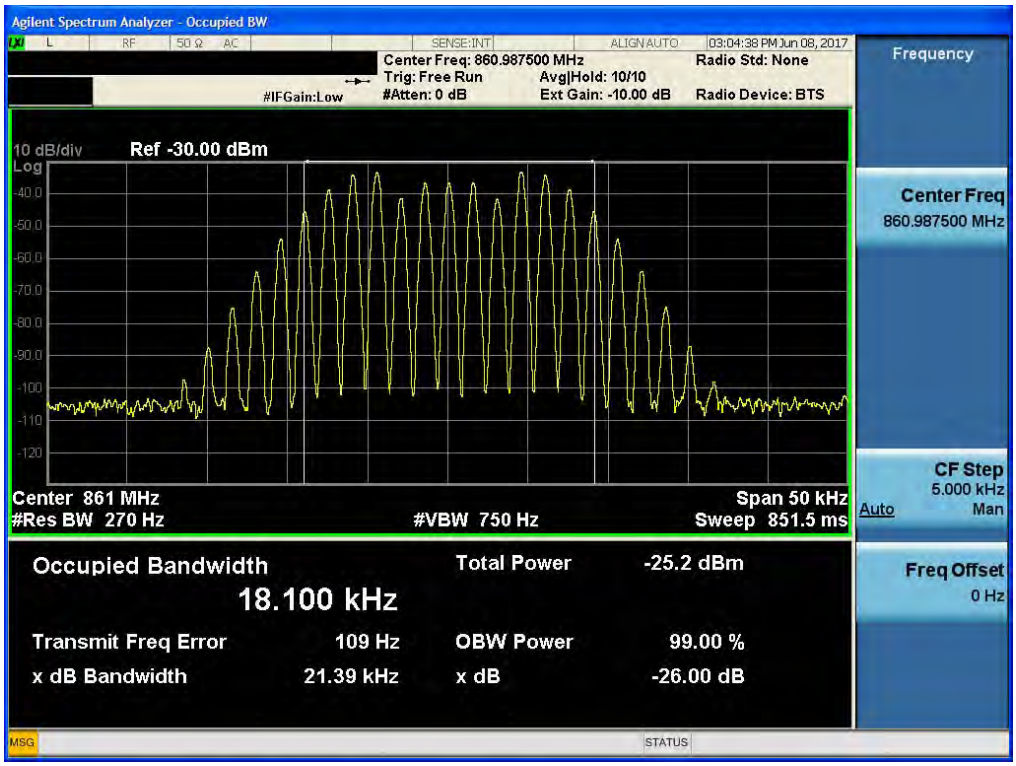
[AGC threshold Downlink - Low]



[AGC threshold Downlink - Middle]



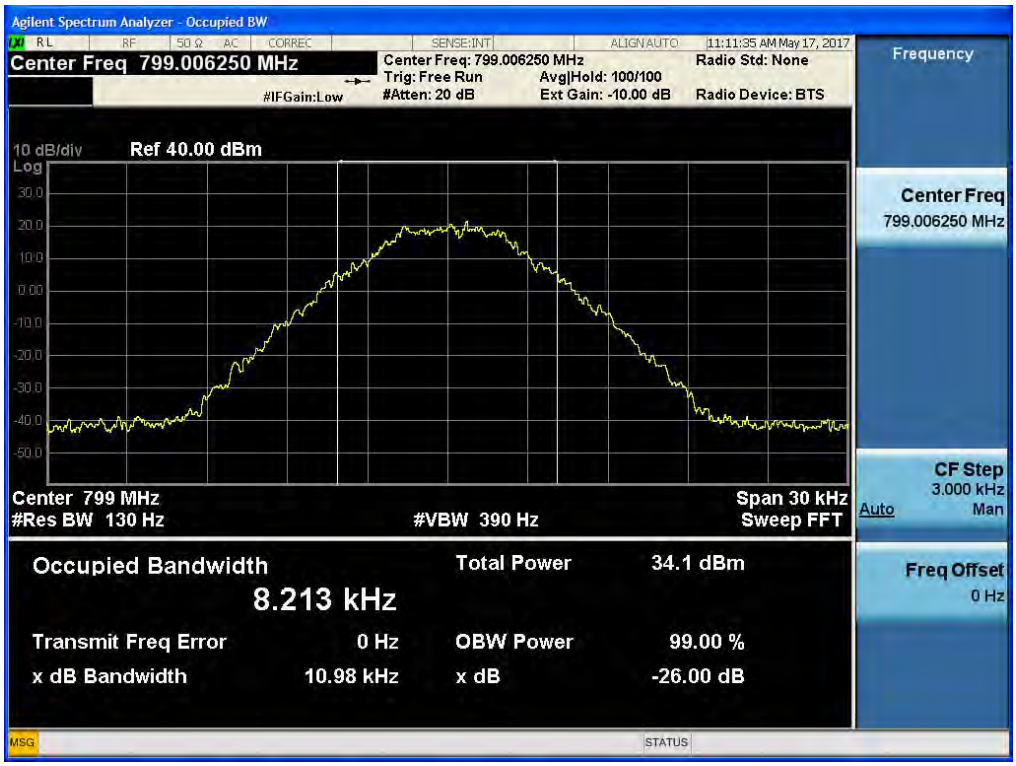
[AGC threshold Downlink - High]



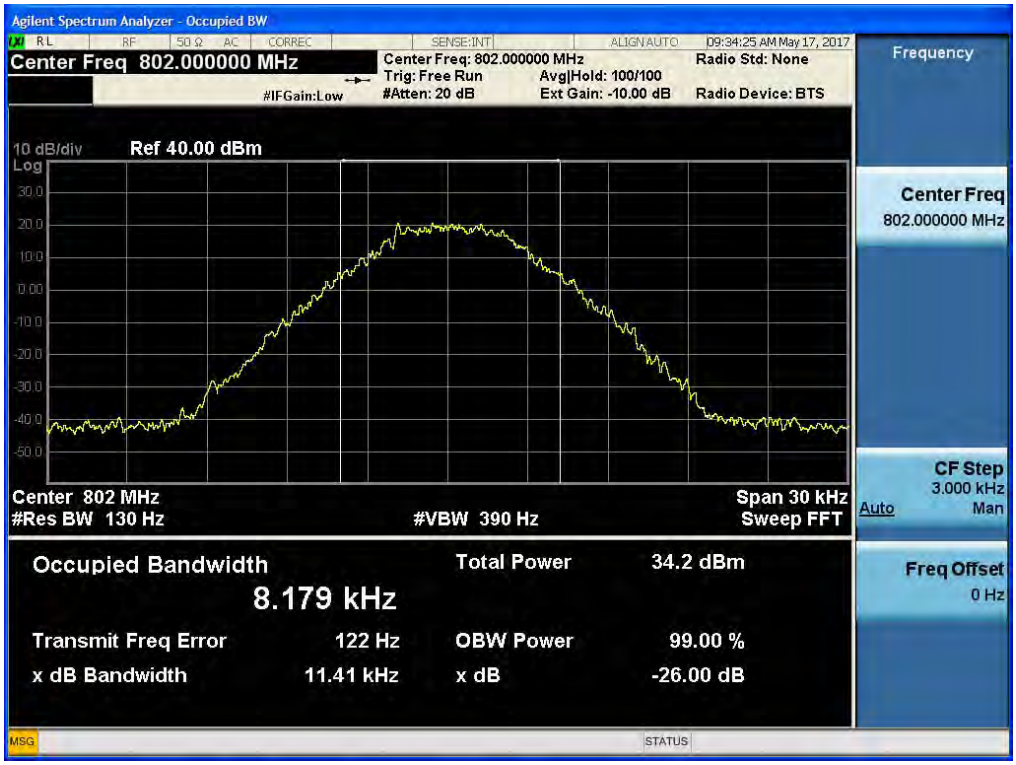
Plots of Occupied Bandwidth for Uplink Output

PS 700 P25_12.5 kHz (799 – 805 MHz)_UL

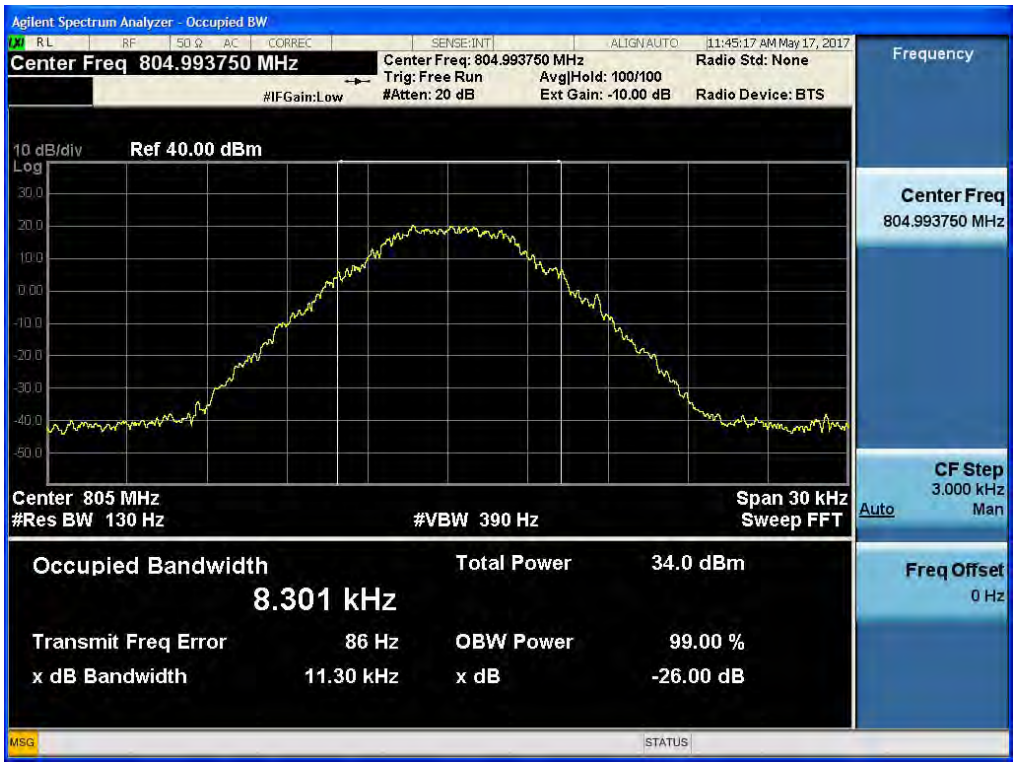
[AGC threshold Uplink - Low]



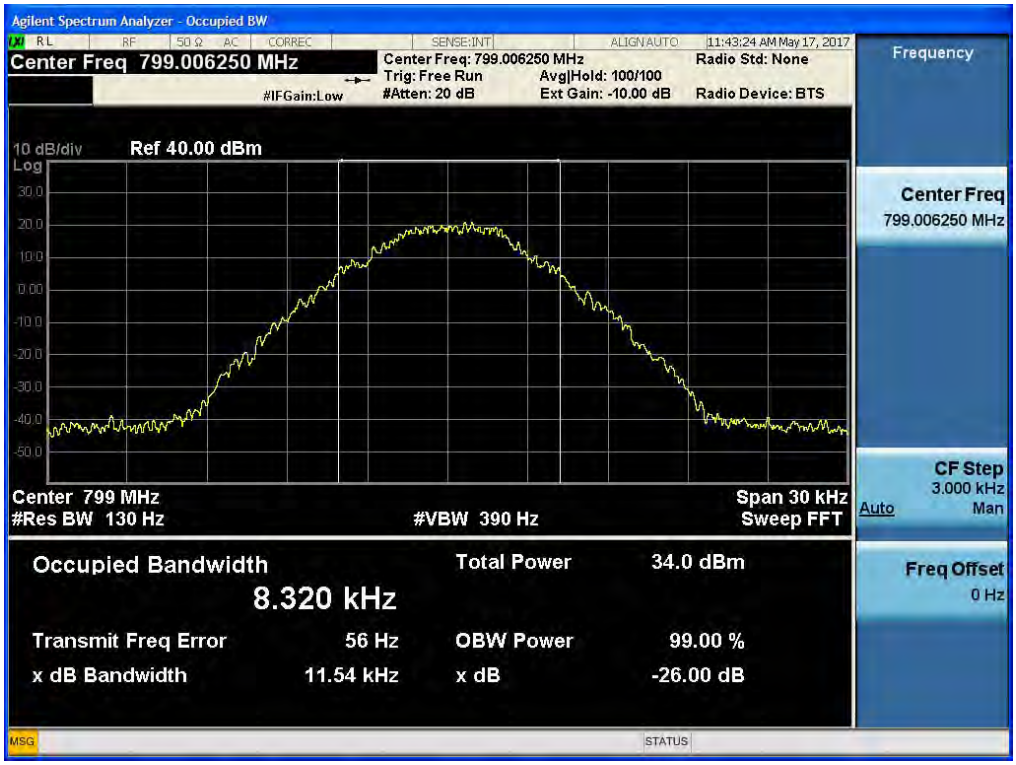
[AGC threshold Uplink - Middle]



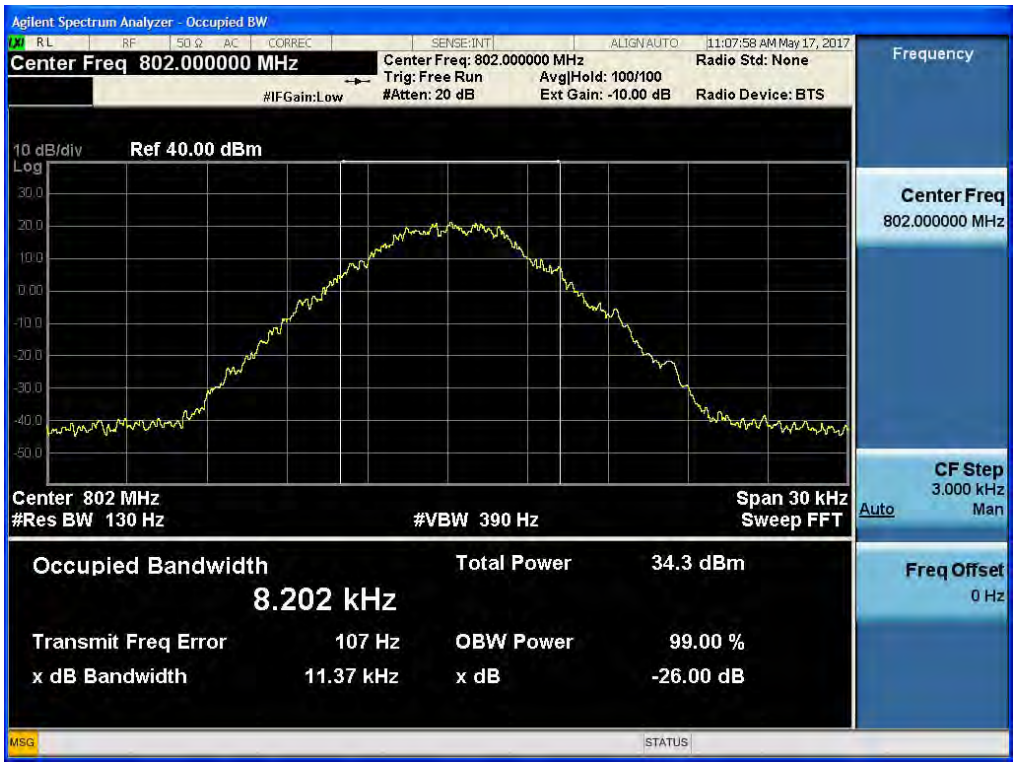
[AGC threshold Uplink - High]



[+3dBm above AGC threshold Uplink - Low]



[+3dBm above AGC threshold Uplink - Middle]



[+3dBm above AGC threshold Uplink - High]