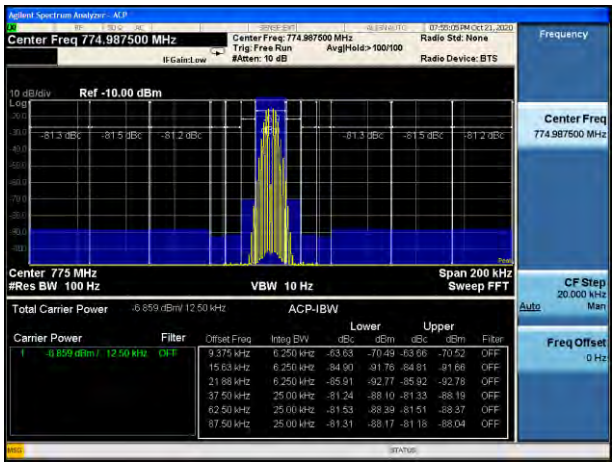
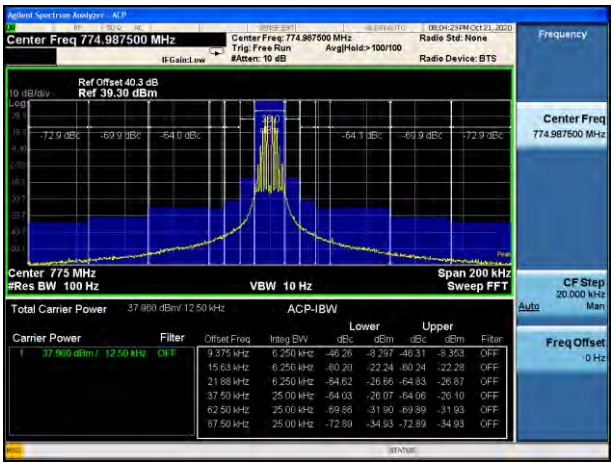
1.3.5 Pre-AGC_ Highest frequency

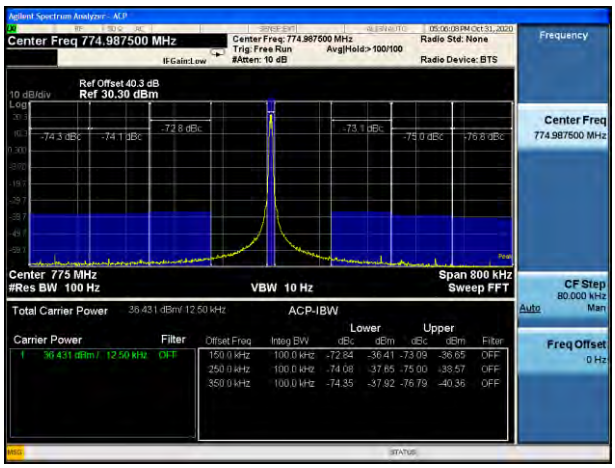
Input



Output

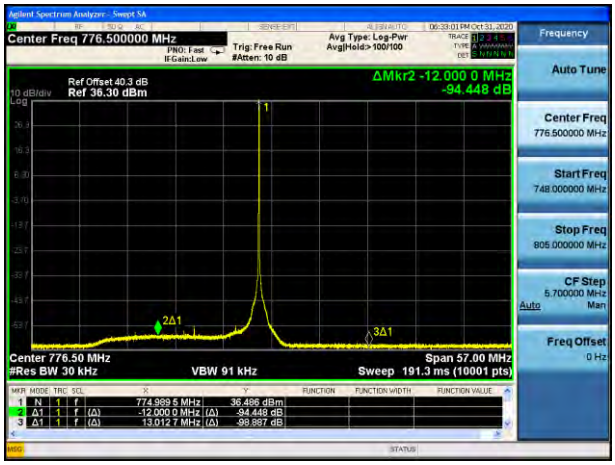


Output



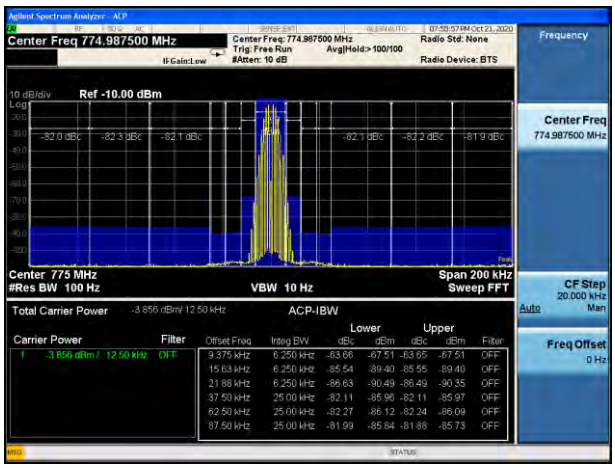
Output

Output

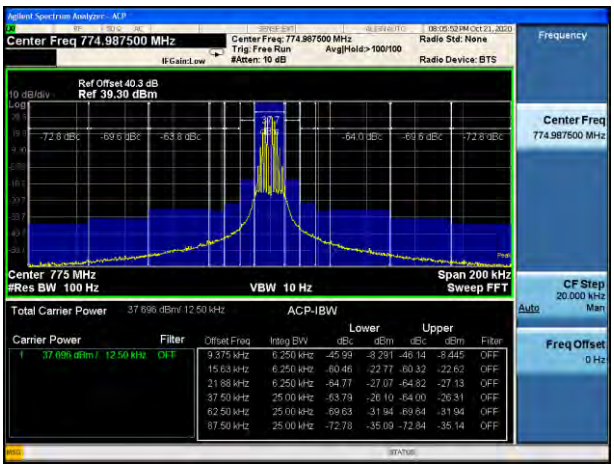


1.3.6 3dB above AGC_ Highest frequency

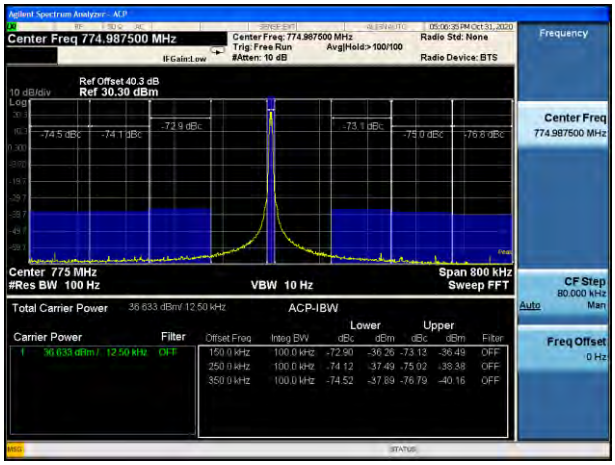
Input



Output

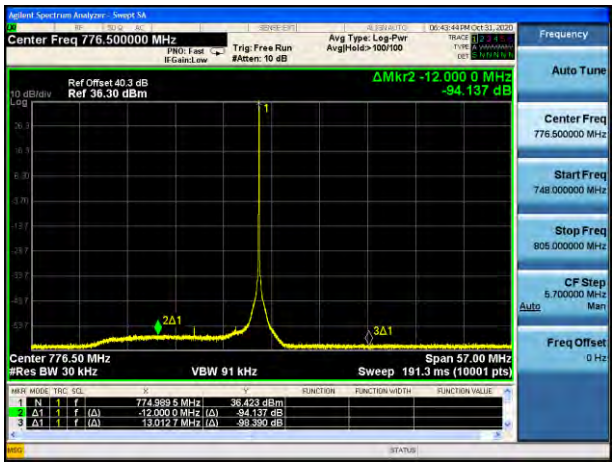


Output



Output

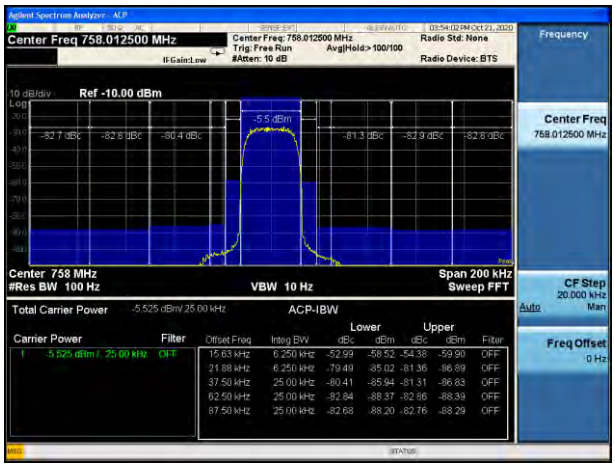
Output



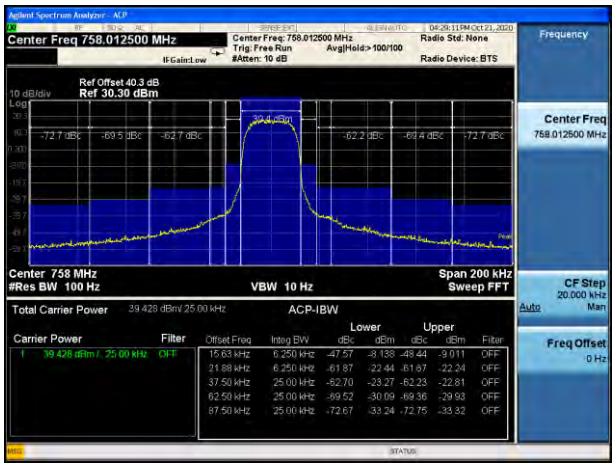
1.3 Adjacent Channel Power (25kHz TETRA)

1.3.1 Pre-AGC_ Lowest frequency

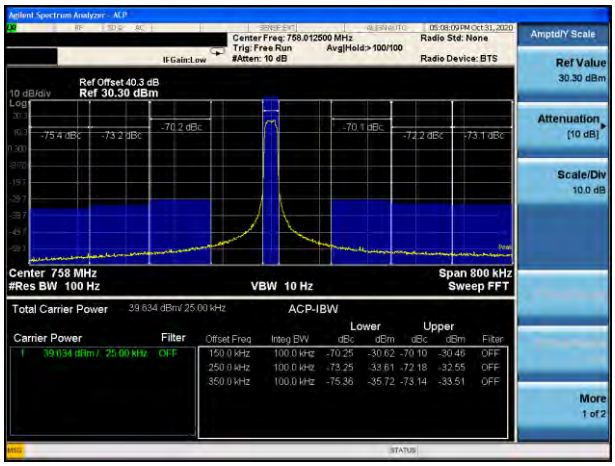
Input



Output

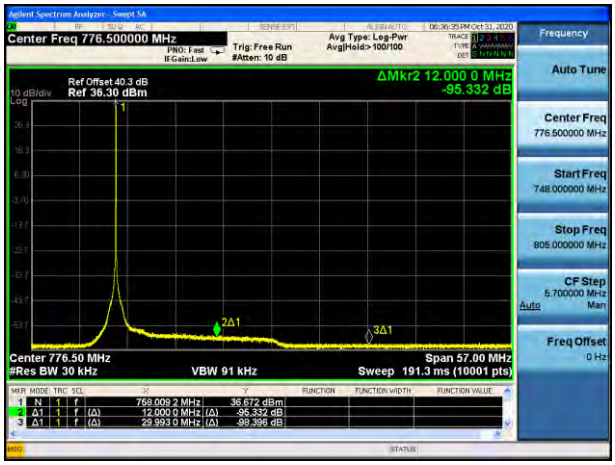


Output



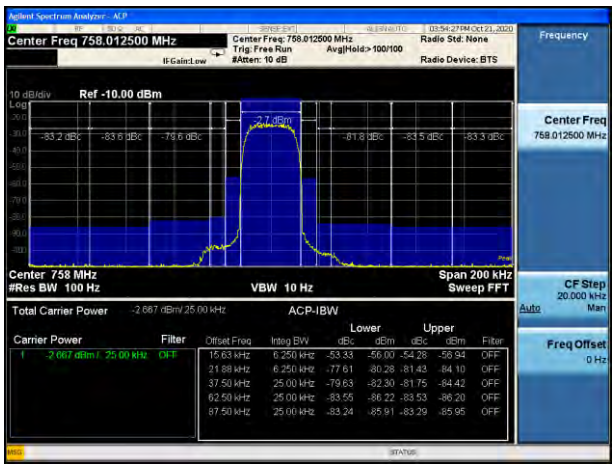
Output

Output

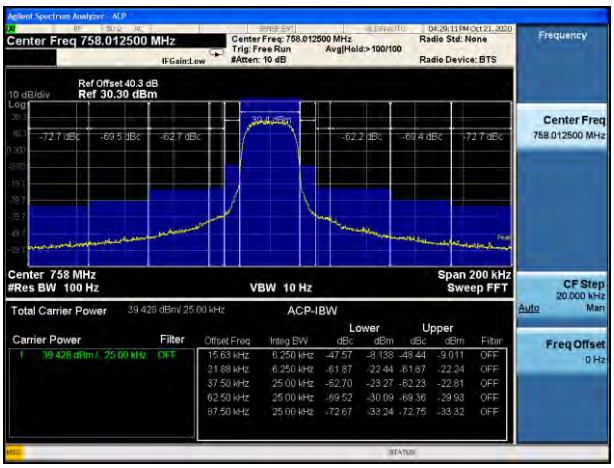


1.3.2 3dB above AGC_ Lowest frequency

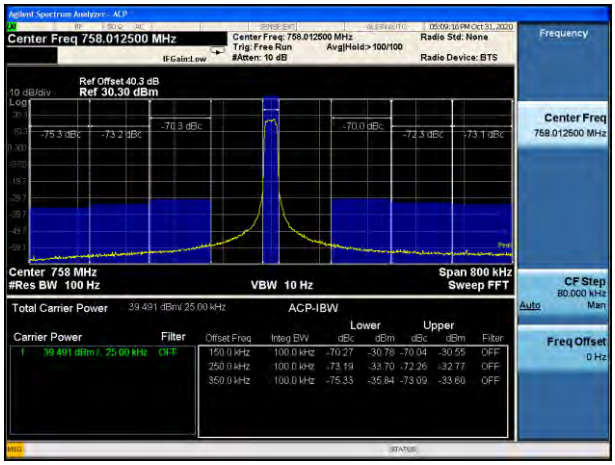
Input



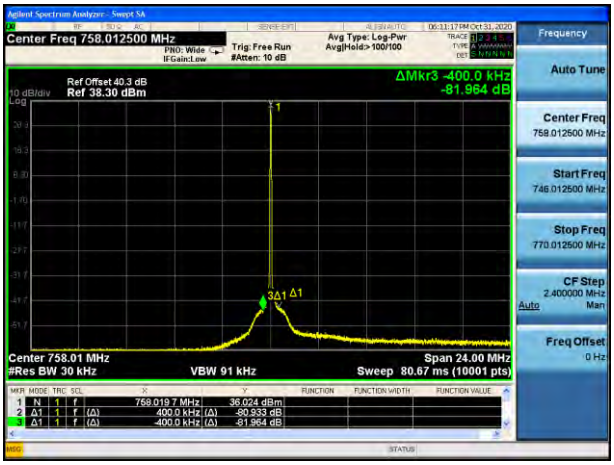
Output



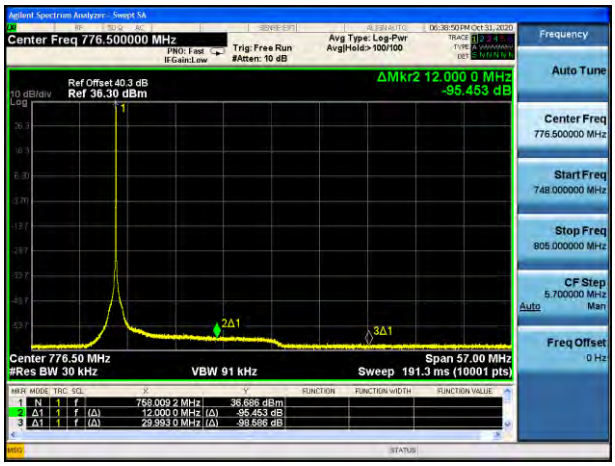
Output



Output

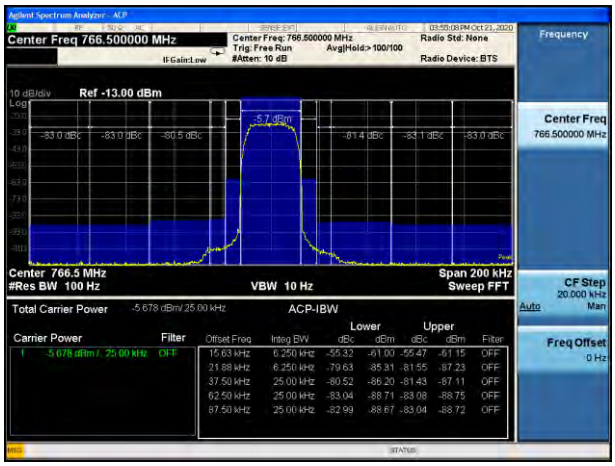


Output

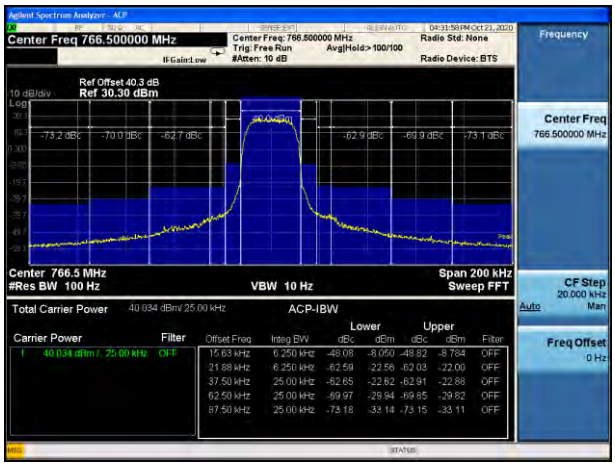


1.3.3 Pre-AGC_ Middle frequency

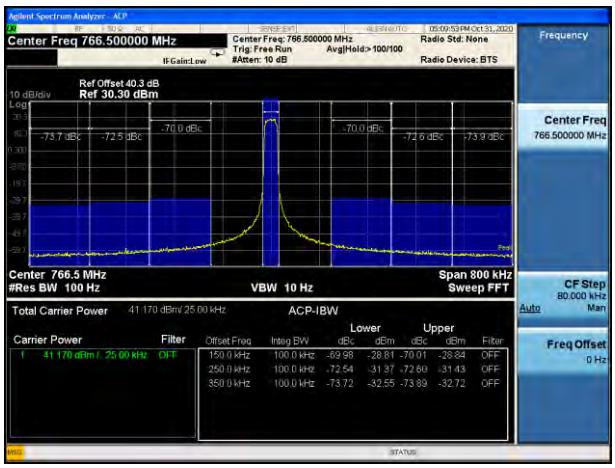
Input



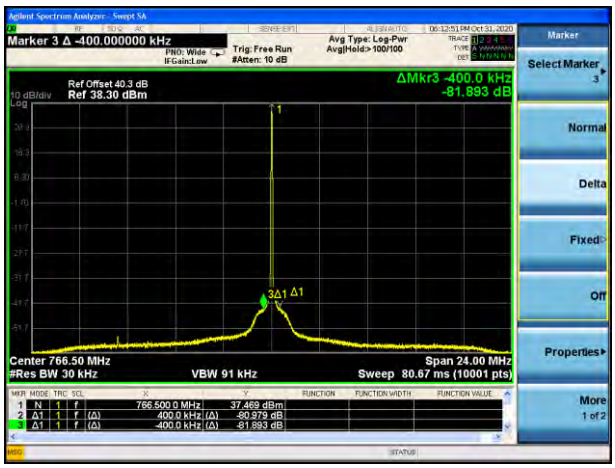
Output



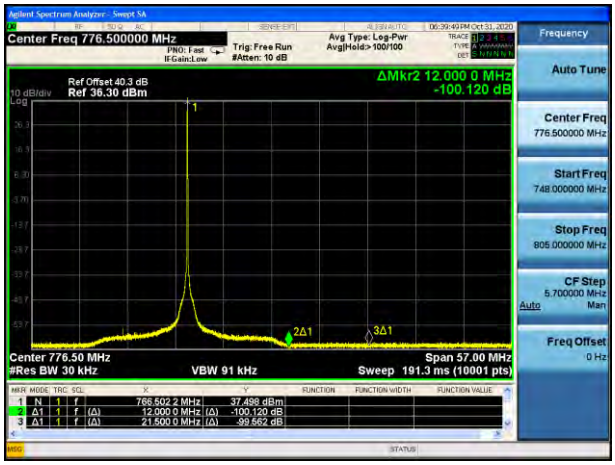
Output



Output

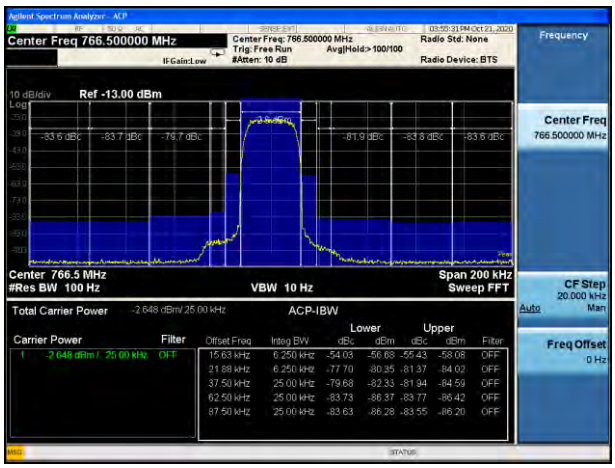


Output

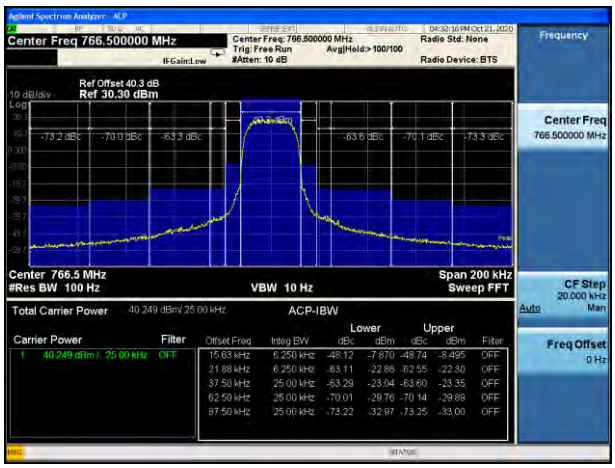


1.3.4 3dB above AGC_ Middle frequency

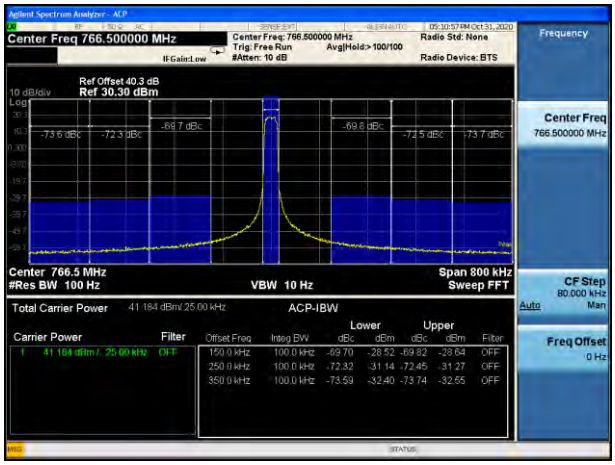
Input



Output

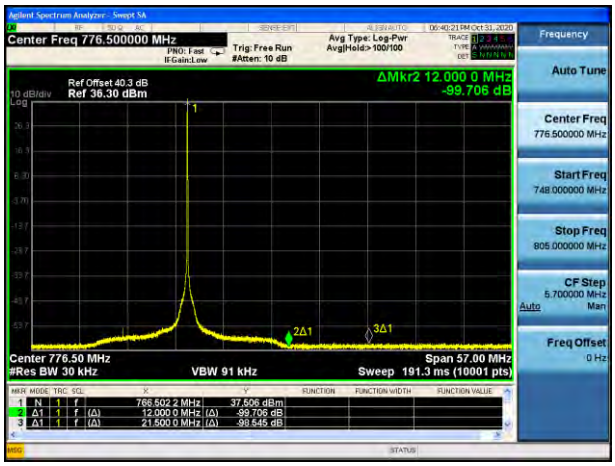


Output



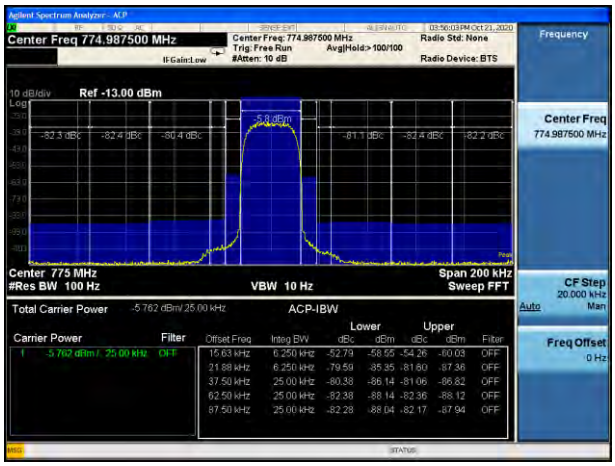
Output

Output

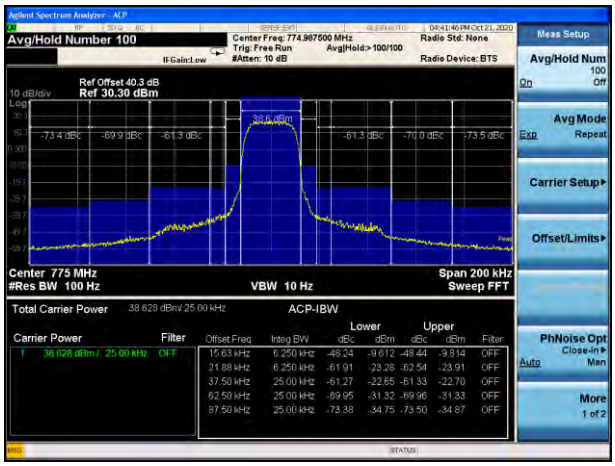


1.3.5 Pre-AGC_ Highest frequency

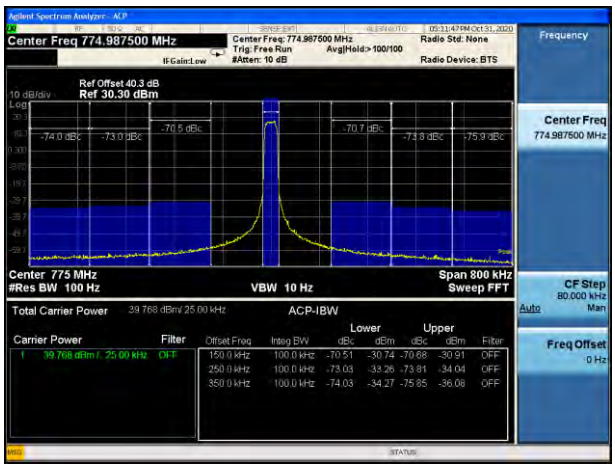
Input



Output

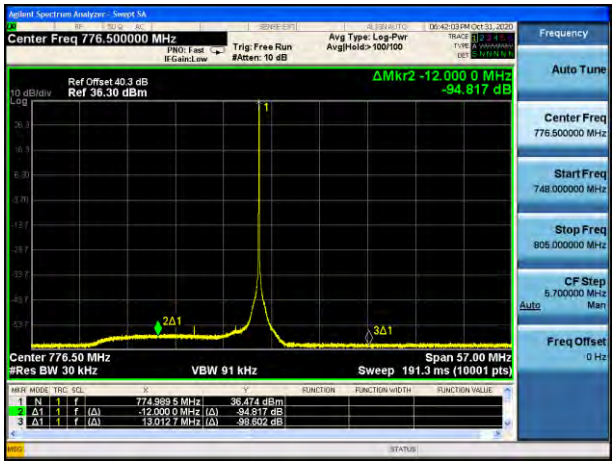


Output



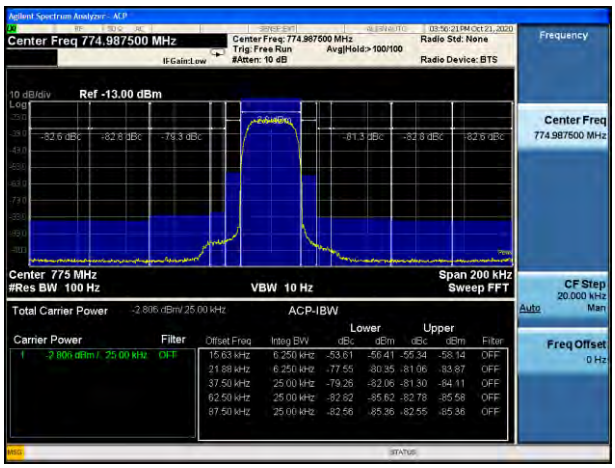
Output

Output

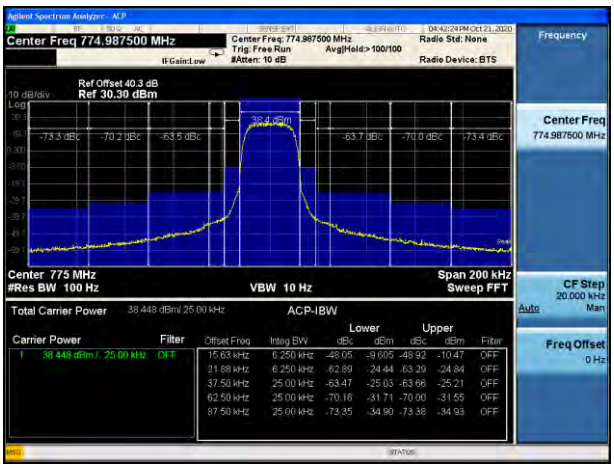


1.3.6 3dB above AGC_ Highest frequency

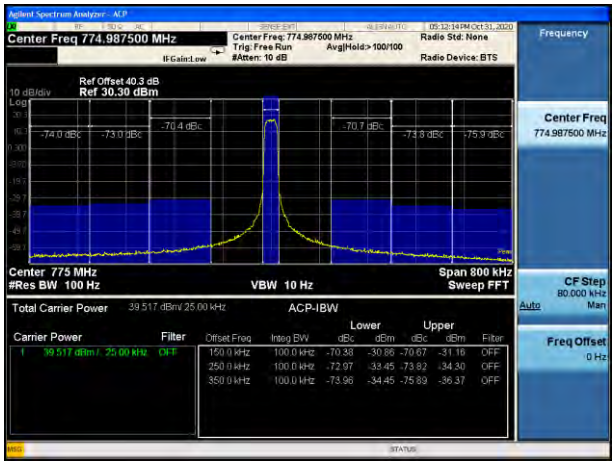
Input



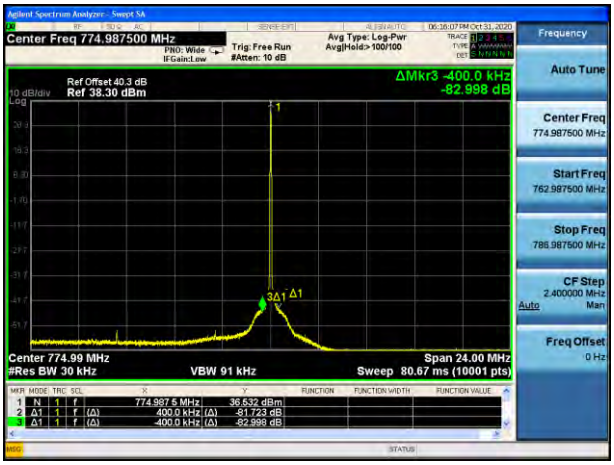
Output



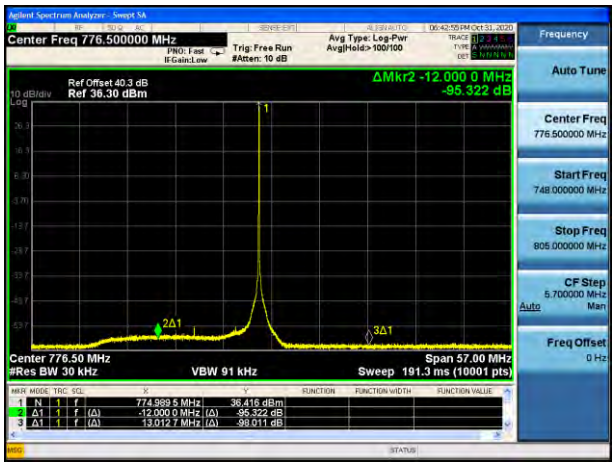
Output



Output



Output



2.Downlink: 851MHz to 869MHz

2.1 Occupied Bandwidth

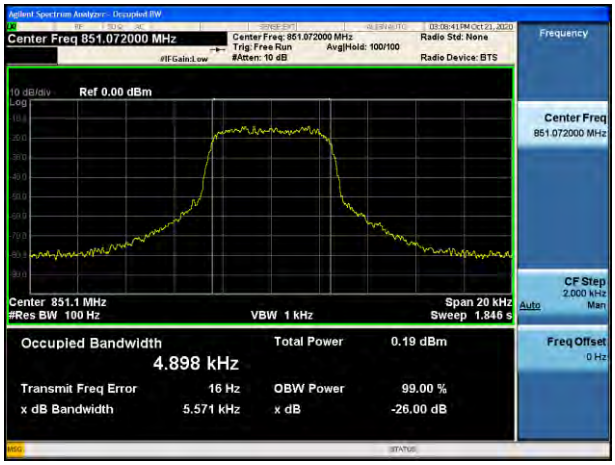
2.1.1 6.25kHz CQPSK Pre-AGC

Input

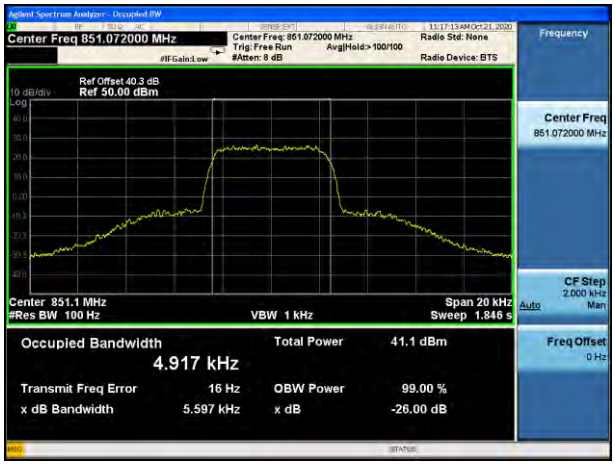
Output

2.1.2 6.25kHz CQPSK 3dB above AGC

Input

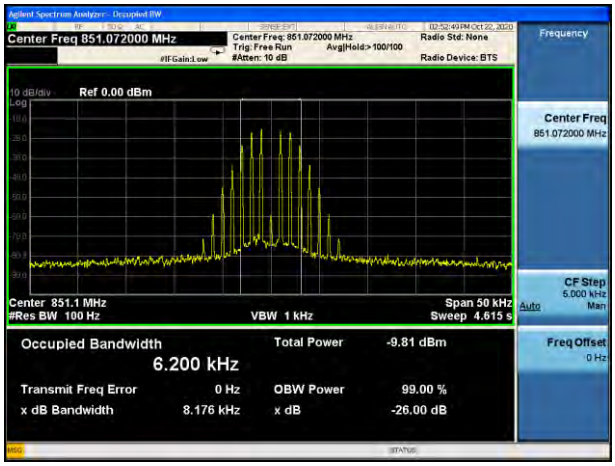


Output

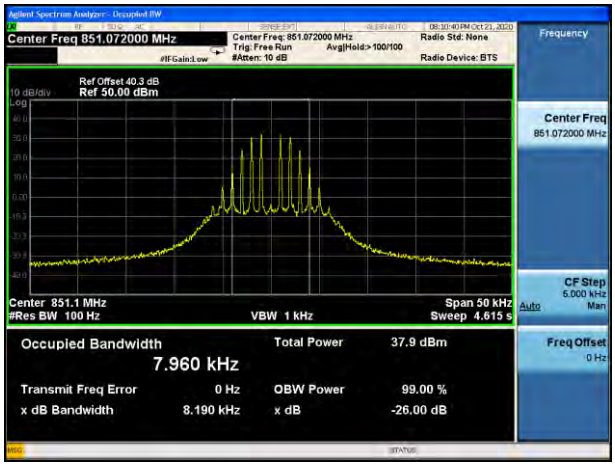


2.1.2 12.5kHz FM Pre-AGC

Input

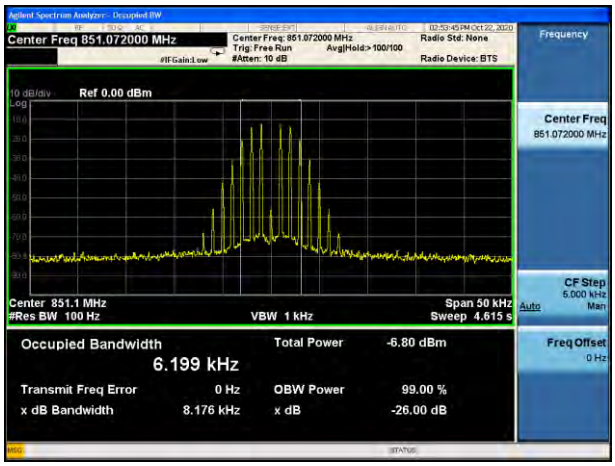


Output

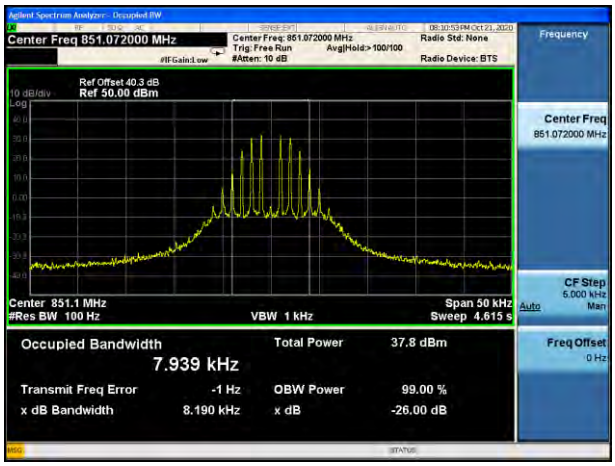


2.1.2 12.5kHz FM 3dB above AGC

Input

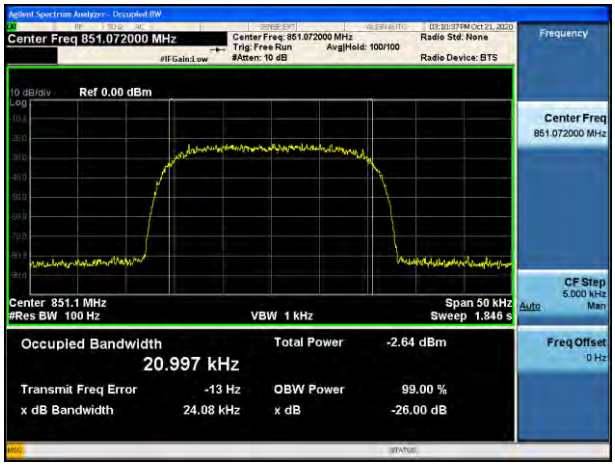


Output

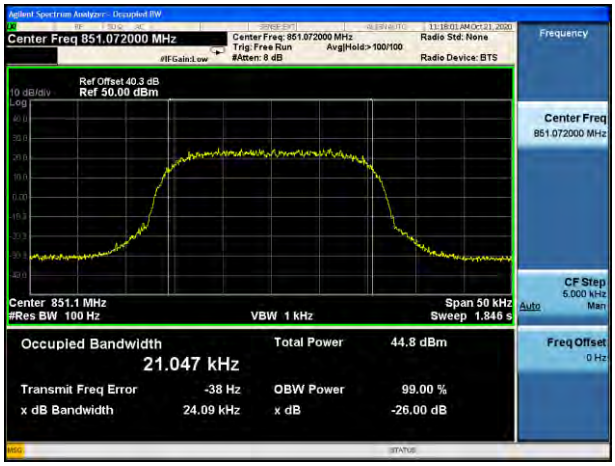


2.1.3 25kHz TETRA Pre-AGC

Input

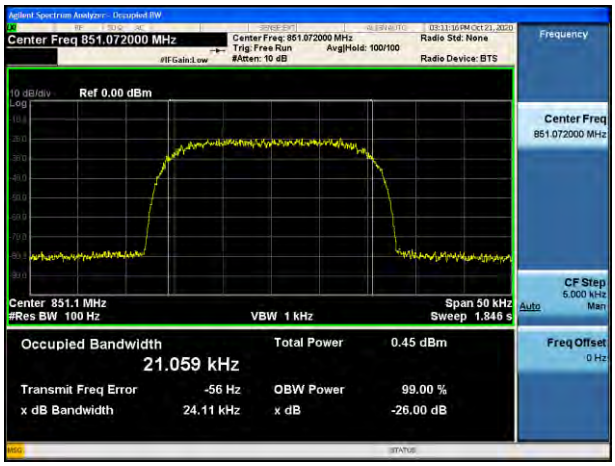


Output

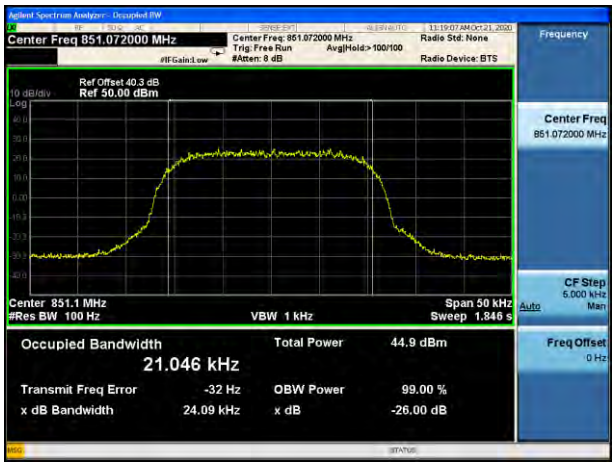


2.1.3 25kHz TETRA 3dB above AGC

Input



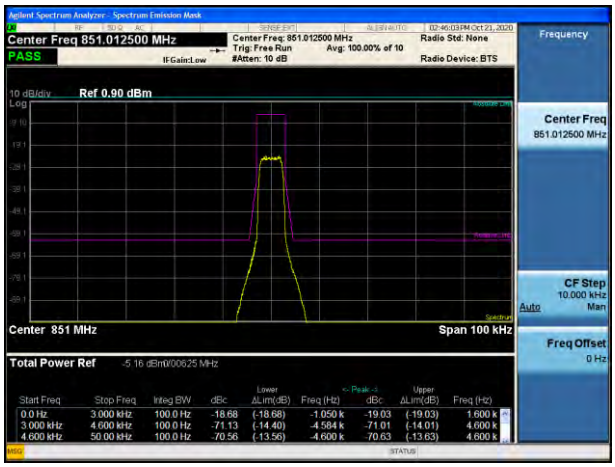
Output



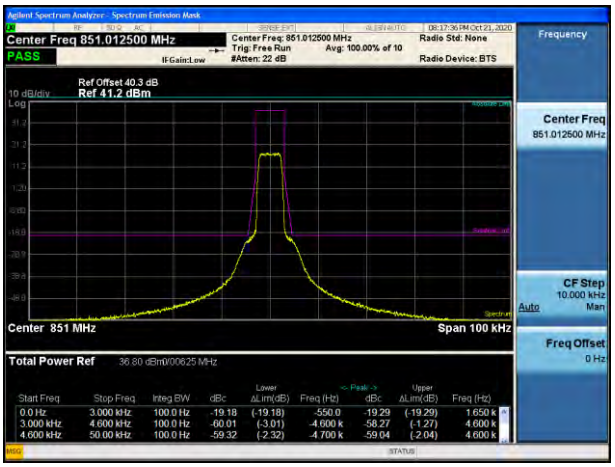
2.2 Emission masks (6.25kHz CQPSK MASK E)

2.2.1 Pre-AGC_ Lowest frequency

Input



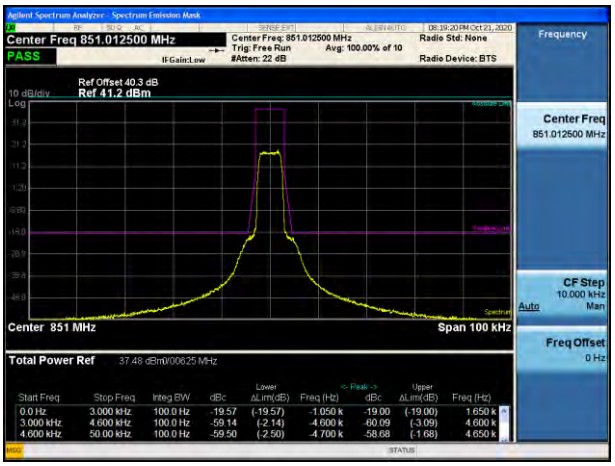
Output



2.2.2 3dB above AGC_ Lowest frequency

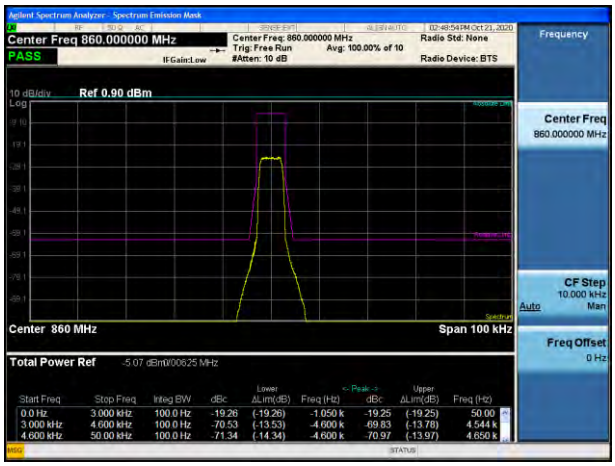
Input

Output

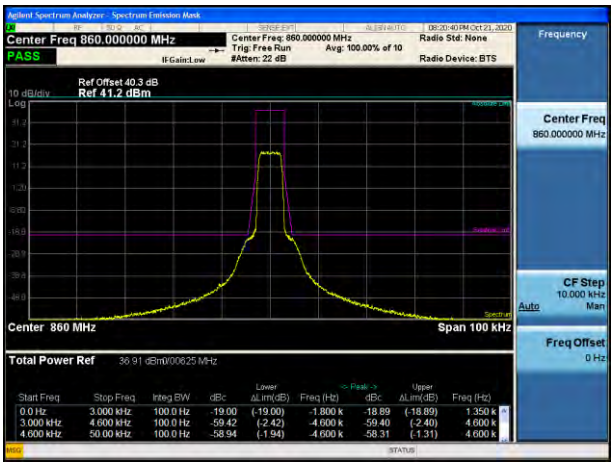


2.2.3 Pre-AGC_ Middle frequency

Input

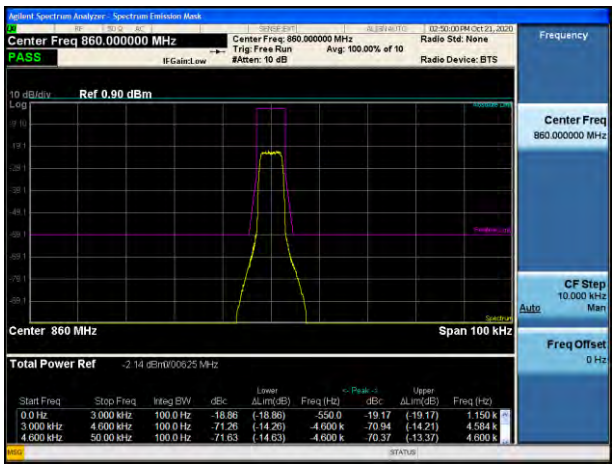


Output

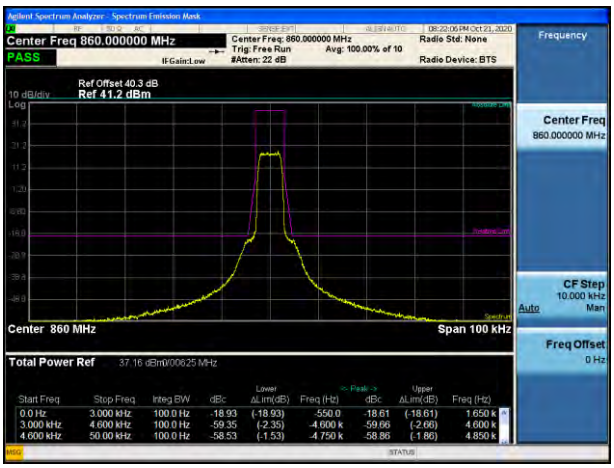


2.2.4 3dB above AGC_ Middle frequency

Input

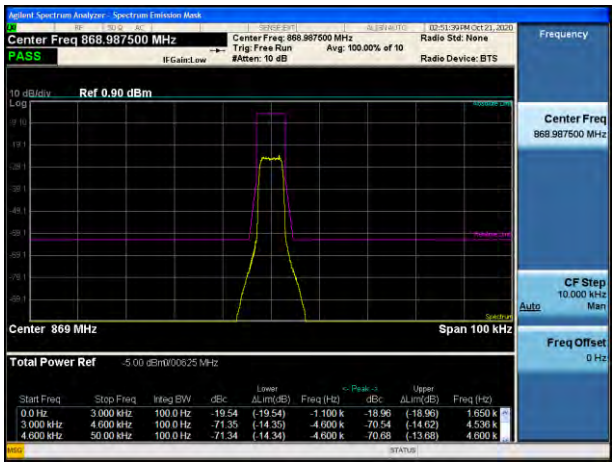


Output

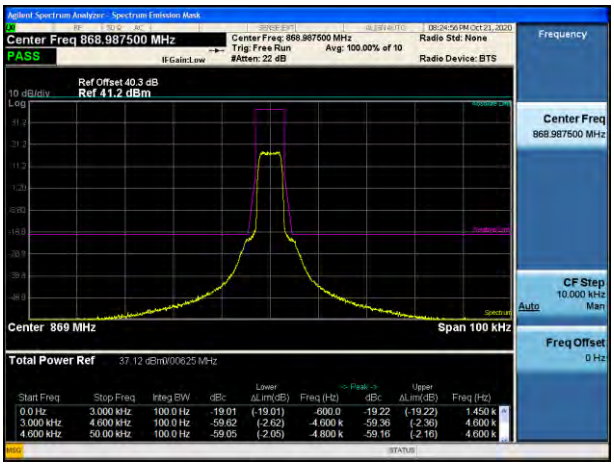


2.2.5 Pre-AGC_ Highest frequency

Input

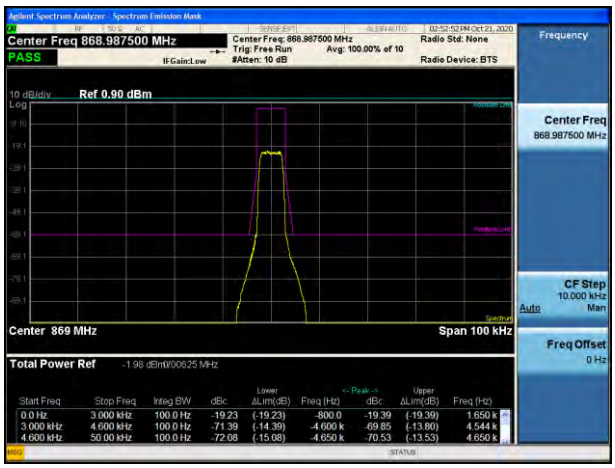


Output

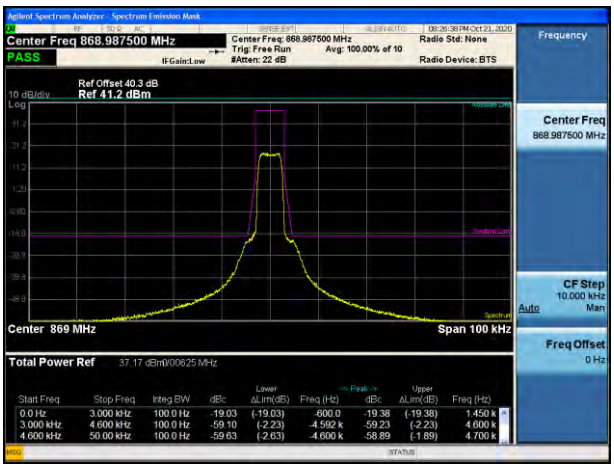


2.2.6 3dB above AGC_ Highest frequency

Input



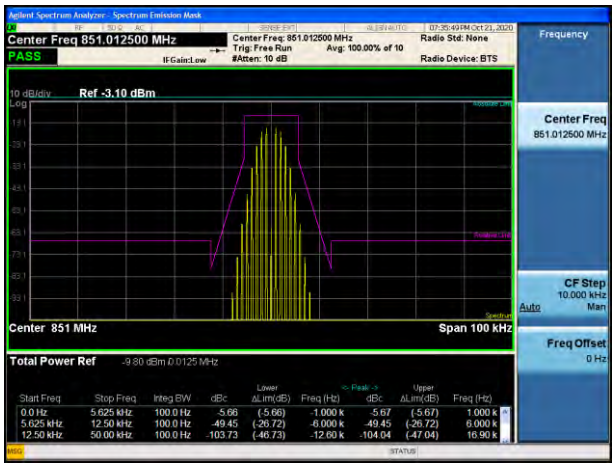
Output



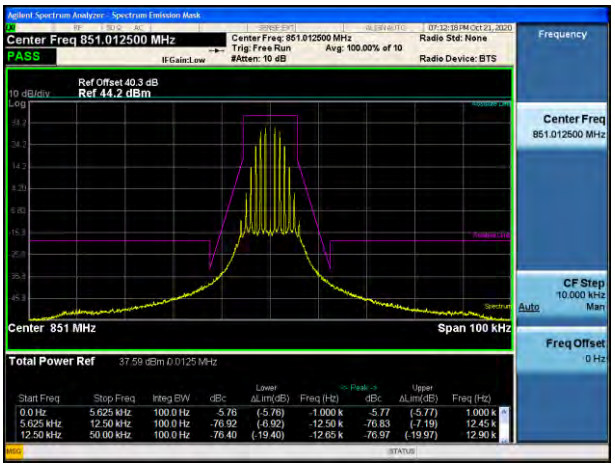
2.3 Emission masks (12.5kHz FM MASK D)

2.3.1 Pre-AGC_ Lowest frequency

Input

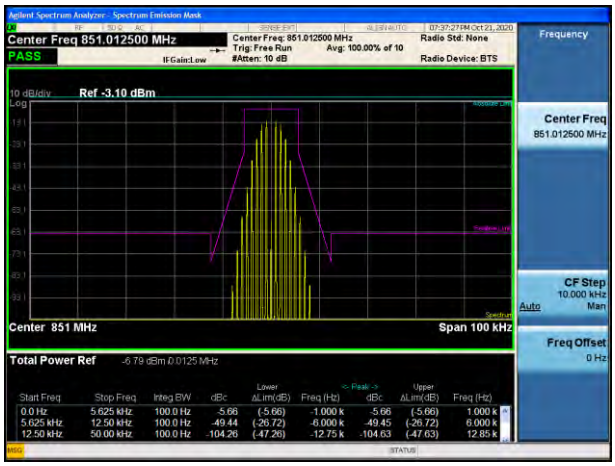


Output

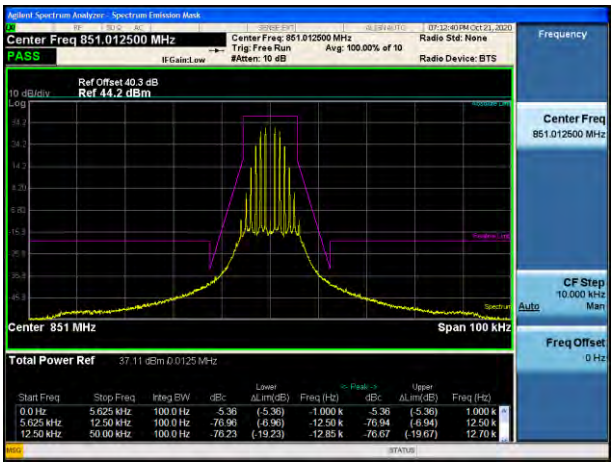


2.3.2 3dB above AGC_ Lowest frequency

Input

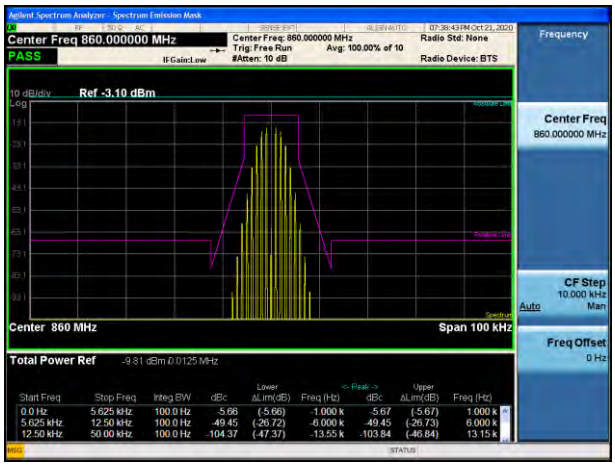


Output

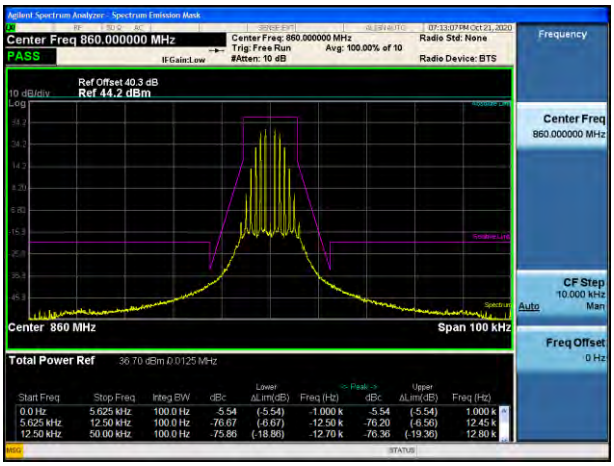


2.3.3 Pre-AGC_ Middle frequency

Input

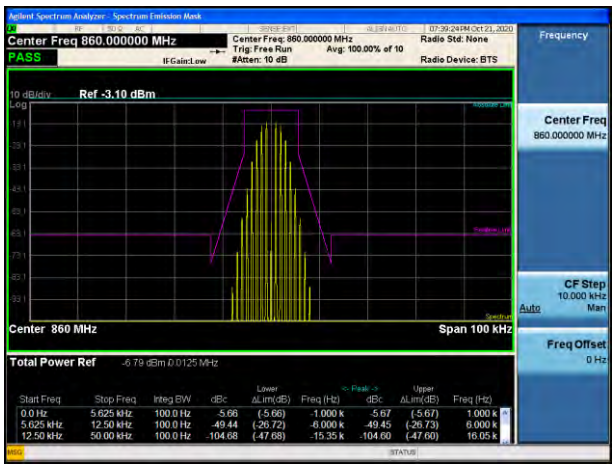


Output

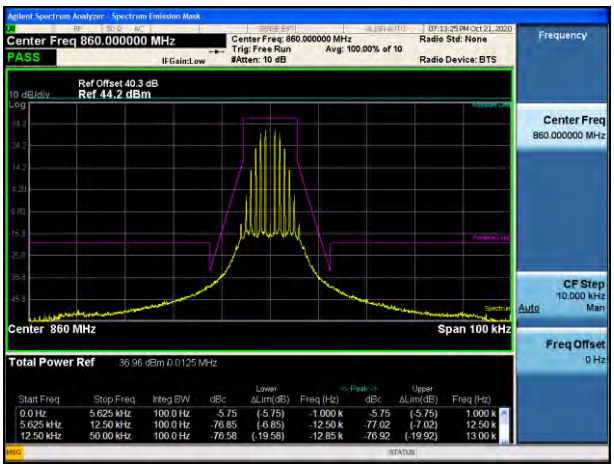


2.3.4 3dB above AGC_ Middle frequency

Input

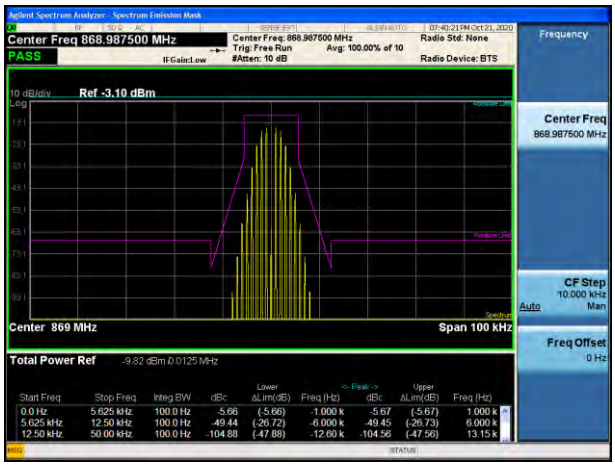


Output

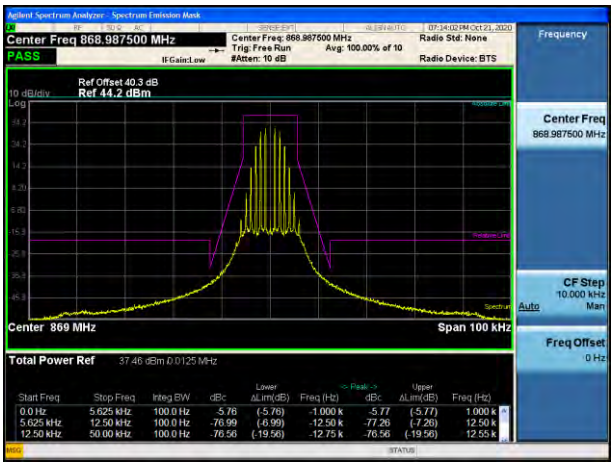


2.3.5 Pre-AGC_ Highest frequency

Input

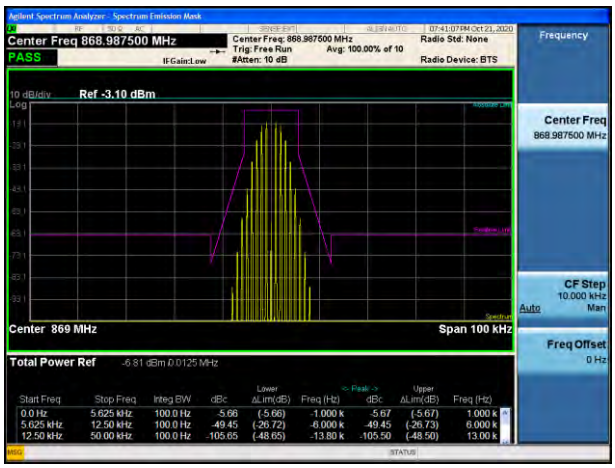


Output

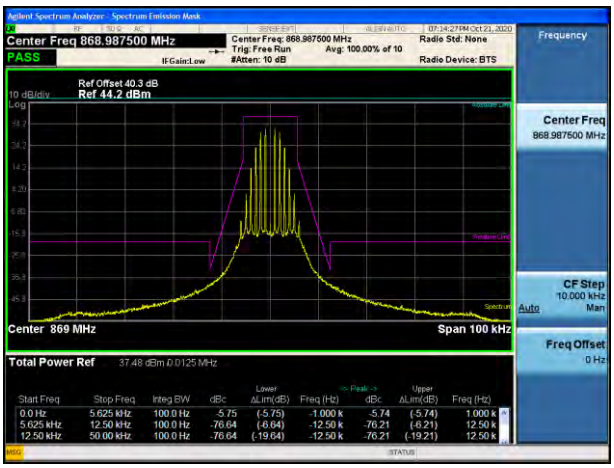


2.3.6 3dB above AGC_ Highest frequency

Input



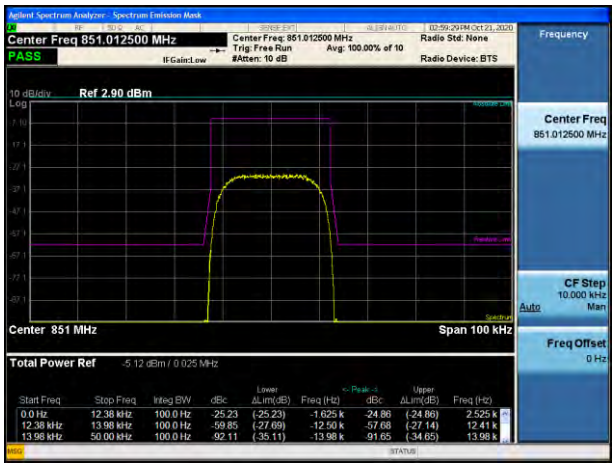
Output



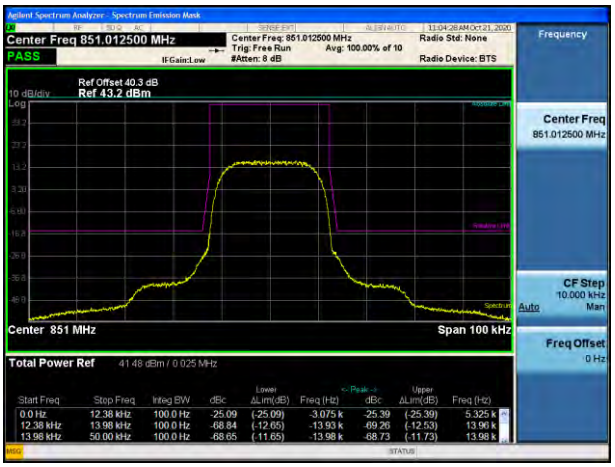
2.3 Emission masks (25kHz TETRA MASK Y)

2.3.1 Pre-AGC_ Lowest frequency

Input

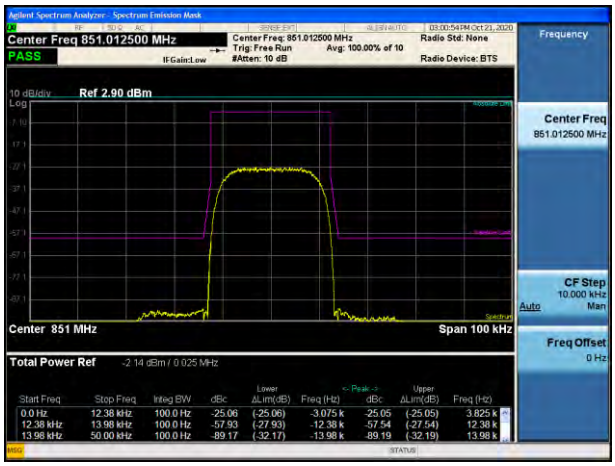


Output

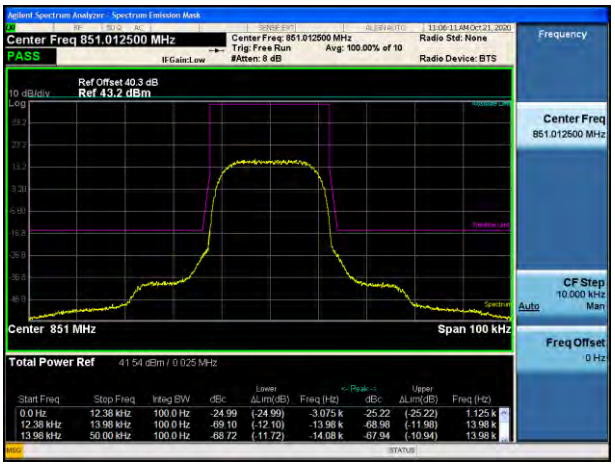


2.3.2 3dB above AGC_ Lowest frequency

Input

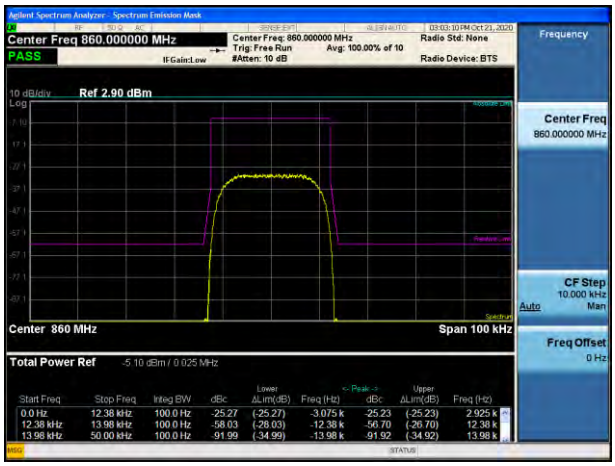


Output

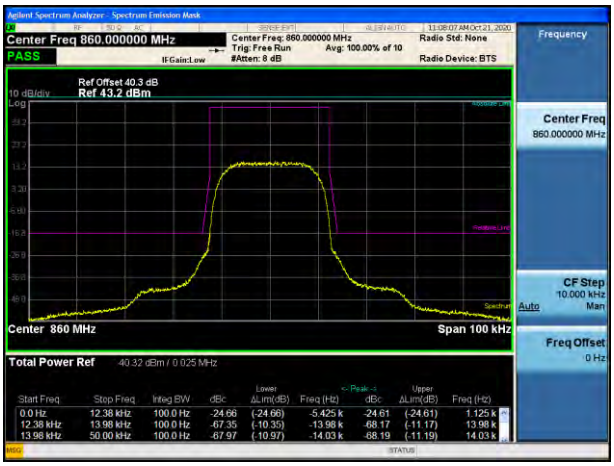


2.3.3 Pre-AGC_ Middle frequency

Input

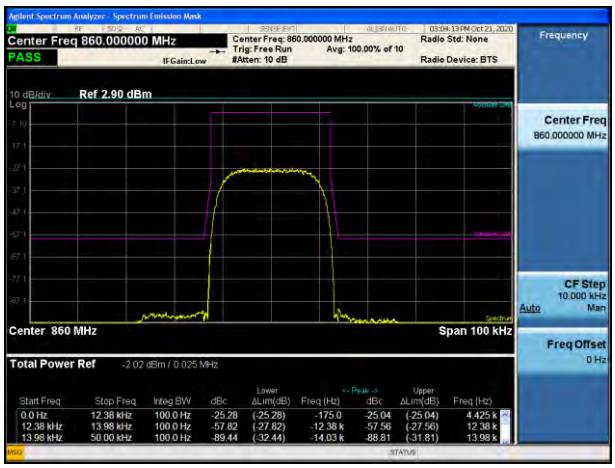


Output

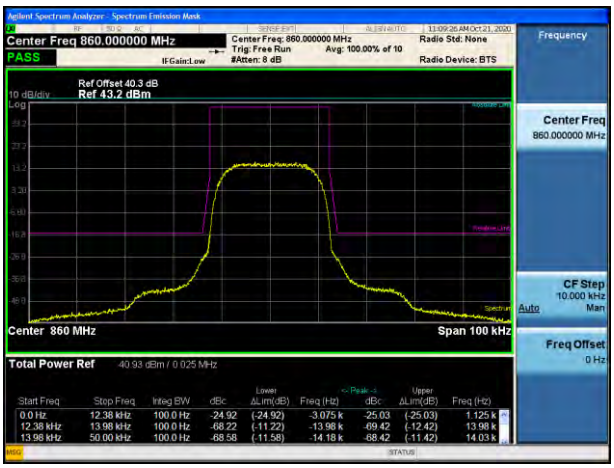


2.3.4 3dB above AGC_ Middle frequency

Input

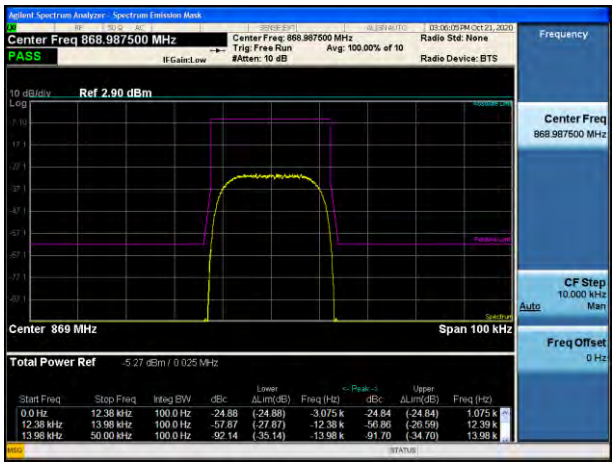


Output

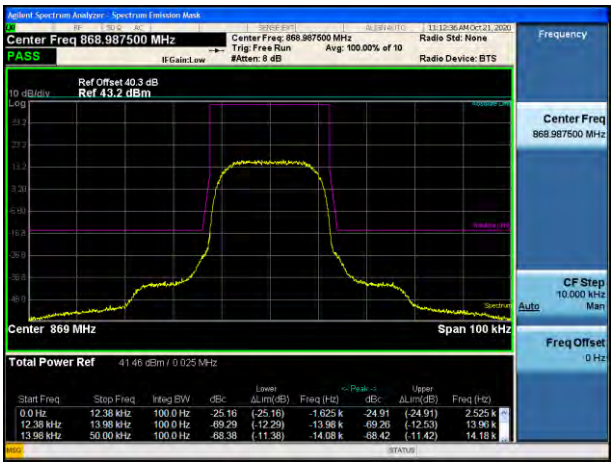


2.3.5 Pre-AGC_ Highest frequency

Input

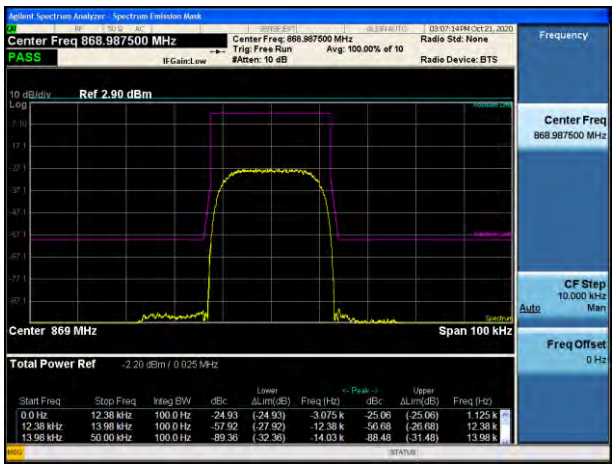


Output

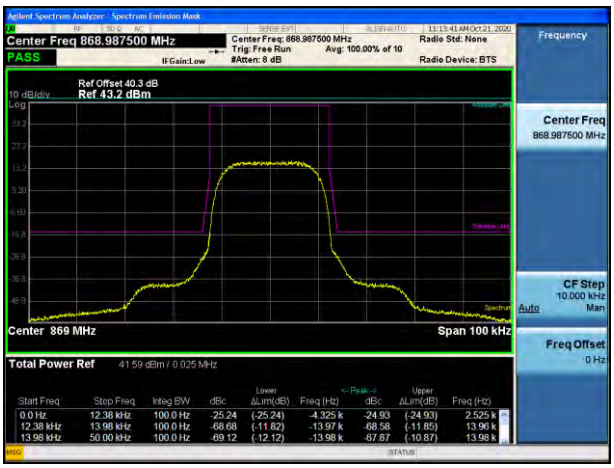


2.3.6 3dB above AGC_ Highest frequency

Input



Output



7.2.6 Out of Band Rejection

Test Requirement: /

Test Method: KDB 935210 D05 Indus Booster Basic Meas v01r04

Limit: Shall within the passband

EUT Operation:

Status: Drive the EUT to maximum output power. .

Conditions: Normal conditions

Application: RF output ports

Test Configuration:

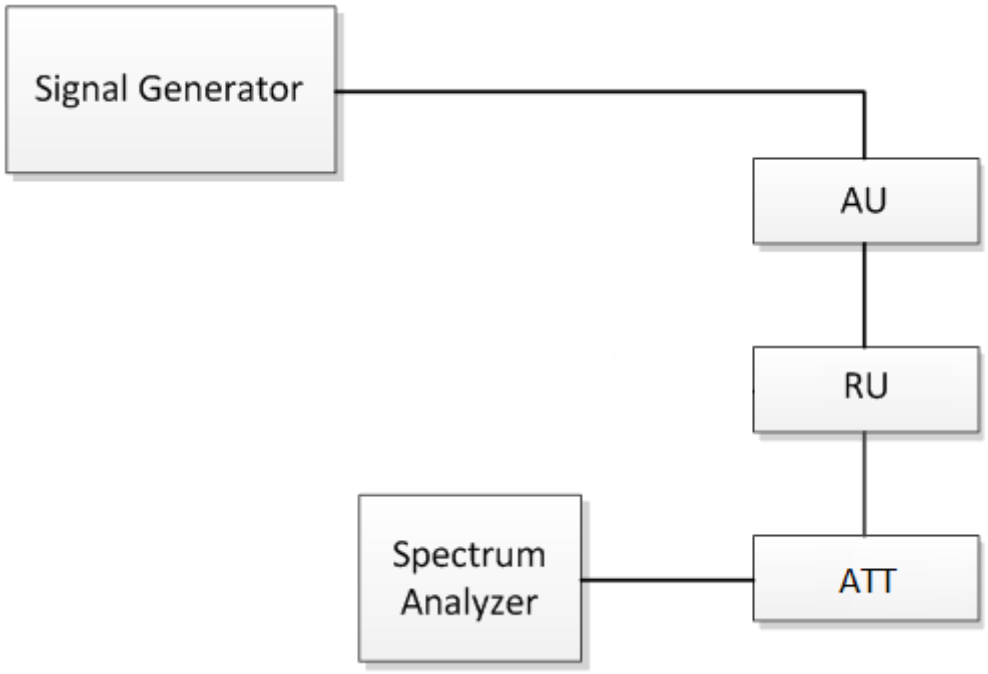


Fig.5. Out of Band rejection test configuration

Test Procedure:

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

b) Configure a swept CW signal with the following parameters:

1) Frequency range = ± 250 % of the manufacturer's specified pass band.

2) The CW amplitude shall be 3 dB below the AGC threshold (see 4.2), and shall not activate the AGC threshold throughout the test.

3) Dwell time = approximately 10 ms.

4) Frequency step = 50 kHz.

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

d) Set the RBW of the spectrum analyzer to between 1 % and 5 % of the manufacturer's rated passband, and VBW = 3 × RBW.

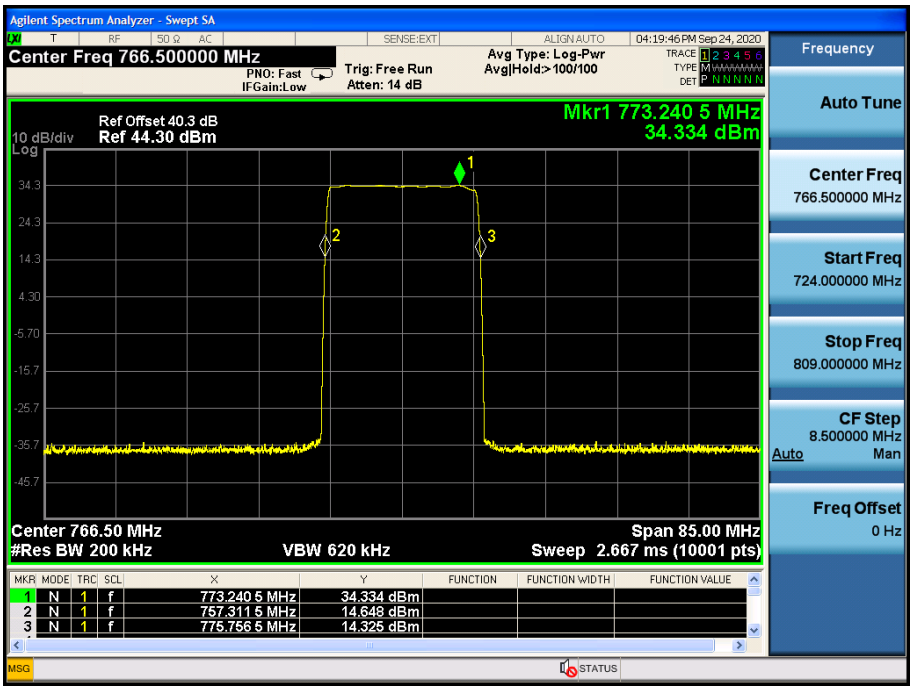
e) Set the detector to Peak and the trace to Max-Hold.

f) After the trace is completely filled, place a marker at the peak amplitude, which is designated as f0, and with two additional markers (use the marker-delta method) at the 20 dB bandwidth (i.e., at the points where the level has fallen by 20 dB).

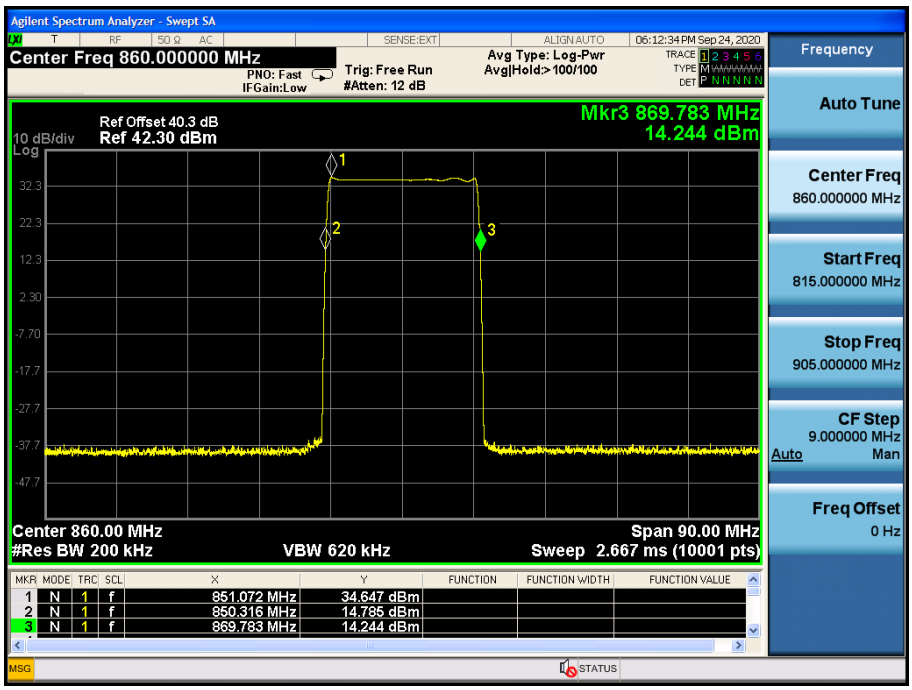
g) Capture the frequency response plot for inclusion in the test report.

7.2.6.1 Measurement Record:

1. **Downlink: 758MHz to 775MHz**



2. **Downlink: 851MHz to 869MHz**



7.2.7 Frequency Stability

Test Requirement:	For 758-775MHz: 47 CFR Part 90.539
	For 851-869MHz: 47 CFR Part 90.213
Test Method:	KDB 935210 D05 Indus Booster Basic Meas v01r04
Limit:	For band 700M BW=6.25kHz/12.5kHz/25kHz: +/- 0.1ppm
	For band 800M BW=6.25kHz: +/- 0.1ppm
	BW=12.5kHz: +/- 1.0ppm
	BW=25kHz: +/- 1.5ppm
Status:	Drive the EUT to maximum output power.
Conditions:	Temperature conditions, voltage conditions
Application:	Cellular Band RF output ports
Test Procedure:	1. Temperature conditions:

a) The RF output port of the EUT was connected to Frequency Meter;
b) Set the working Frequency in the middle channel;
c) record the 20°C and norminal voltage frequency value as reference point;
d) vary the temperature from -40°C to 50℃ with step 10°C
e) when reach a temperature point, keep the temperature banlance at least 1 hour to make the product working in this status;
f) read the frequency at the relative temperature.

2. Voltage conditions:

a) record the 20°C and norminal voltage frequency value as reference point;
b) vary the voltage from -15% norminal voltage to +15% voltage;
c) read the frequency at the relative voltage.

7.2.7.1 Measurement Record:

Frequency Stability vs temperature:

1. Test for Downlink: 758MHz to 775MHz (middle channel=766.5MHz)

Channel Bandwidth (kHz)	Temperature(°C)	Frequency Error (Hz)	Limit(ppm)	Results(ppm)
6.25kHz	50	1.3	0.1	0.002
	40	1.3	0.1	0.002
	30	1.3	0.1	0.002
	20	1.3	0.1	0.002
	10	1.3	0.1	0.002
	0	1.3	0.1	0.002
	-10	1.3	0.1	0.002
	-20	1.3	0.1	0.002
	-30	1.3	0.1	0.002
	-40	1.3	0.1	0.002
12.5kHz	50	1.3	0.1	0.002
	40	1.3	0.1	0.002
	30	1.3	0.1	0.002
	20	1.3	0.1	0.002
	10	1.3	0.1	0.002
	0	1.3	0.1	0.002
	-10	1.3	0.1	0.002
	-20	1.3	0.1	0.002
	-30	1.3	0.1	0.002
	-40	1.3	0.1	0.002
25kHz	50	1.3	0.1	0.002
	40	1.3	0.1	0.002
	30	1.3	0.1	0.002
	20	1.3	0.1	0.002
	10	1.3	0.1	0.002
	0	1.3	0.1	0.002
	-10	1.3	0.1	0.002
	-20	1.3	0.1	0.002
	-30	1.3	0.1	0.002
	-40	1.3	0.1	0.002

2.Test for Downlink: 851MHz to 869MHz (middle channel=860MHz)

Channel Bandwidth (kHz)	Temperature(°C)	Frequency Error (Hz)	Limit(ppm)	Results(ppm)
6.25kHz	50	1.1	0.1	0.001
	40	1.1	0.1	0.001
	30	1.1	0.1	0.001
	20	1.1	0.1	0.001
	10	1.1	0.1	0.001
	0	1.1	0.1	0.001
	-10	1.1	0.1	0.001
	-20	1.1	0.1	0.001
	-30	1.1	0.1	0.001
	-40	1.1	0.1	0.001
12.5kHz	50	1.1	1.0	0.001
	40	1.1	1.0	0.001
	30	1.1	1.0	0.001
	20	1.1	1.0	0.001
	10	1.1	1.0	0.001
	0	1.1	1.0	0.001
	-10	1.1	1.0	0.001
	-20	1.1	1.0	0.001
	-30	1.1	1.0	0.001
	-40	1.1	1.0	0.001
25kHz	50	1.1	1.5	0.001
	40	1.1	1.5	0.001
	30	1.1	1.5	0.001
	20	1.1	1.5	0.001
	10	1.1	1.5	0.001
	0	1.1	1.5	0.001
	-10	1.1	1.5	0.001
	-20	1.1	1.5	0.001
	-30	1.1	1.5	0.001
	-40	1.1	1.5	0.001

Frequency Stability vs voltage:
1.Test for Downlink: 758MHz to 775MHz (middle channel=766.5MHz)

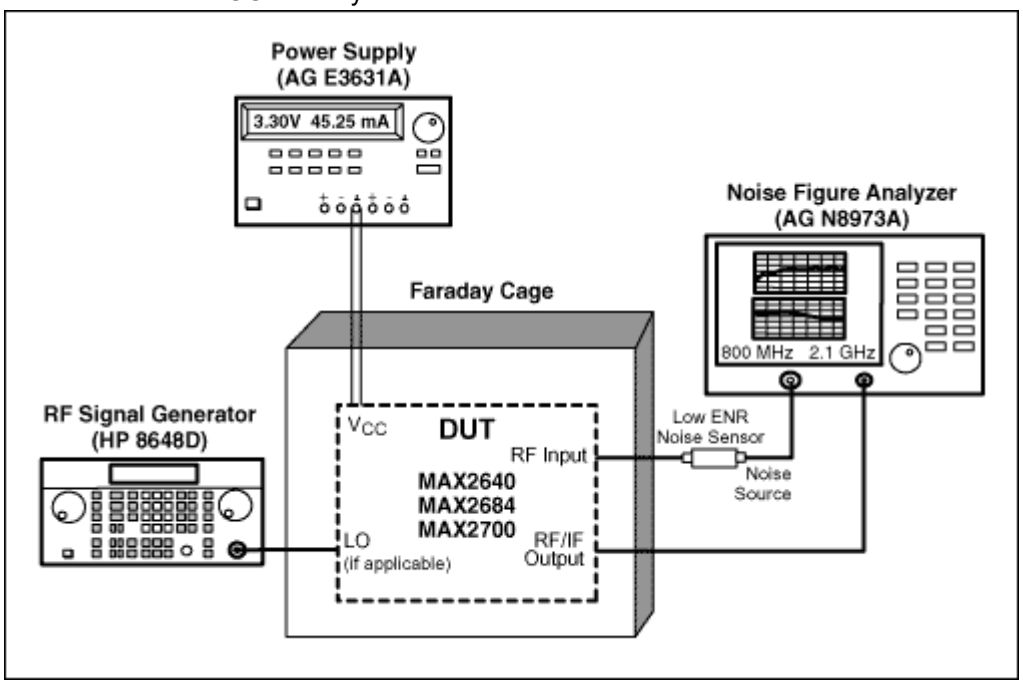
Channel Bandwidth (kHz)	Voltage(V ac)	Frequency Error (Hz)	Limit(ppm)	Results(ppm)
6.25kHz	102	1.1	0.1	0.001
	120	1.1	0.1	0.001
	138	1.1	0.1	0.001
12.5kHz	102	1.1	0.1	0.001
	120	1.1	0.1	0.001
	138	1.1	0.1	0.001
25kHz	102	1.1	0.1	0.001
	120	1.1	0.1	0.001
	138	1.1	0.1	0.001

2.Test for Downlink: 851MHz to 869MHz (middle channel=860MHz)

Channel Bandwidth (kHz)	Voltage(V ac)	Frequency Error (Hz)	Limit(ppm)	Results(ppm)
6.25kHz	102	0.9	0.1	0.001
	120	0.9	0.1	0.001
	138	0.9	0.1	0.001
12.5kHz	102	0.9	1.0	0.001
	120	0.9	1.0	0.001
	138	0.9	1.0	0.001
25kHz	102	0.9	1.5	0.001
	120	0.9	1.5	0.001
	138	0.9	1.5	0.001

7.2.8 Noise

Test Requirement:	For 758-775MHz: 47 CFR Part 2.1051, 47 CFR Part 90.219(d)(6) For 851-869MHz: /
Test Method:	KDB 935210 D05 Indus Booster Basic Meas v01r04
Limit:	The ERP of noise within the passband should not exceed −43 dBm in a 10 kHz measurement bandwidth. The ERP of noise in spectrum more than 1 MHz outside of the passband should not exceed −70 dBm in a 10 kHz measurement bandwidth. The noise figure of a zone enhancer shall not exceed 9 dB in either direction.
Status:	Drive the EUT to maximum output power.
Conditions:	Temperature conditions, voltage conditions
Application:	RF output ports
Test Procedure:	Several widely recognized methods for performing noise figure measurements are available. Some require the use of specialized equipment, such as a noise figure analyzer and/or an excess noise ratio (ENR) calibrated noise source, while others involve the use of conventional measurement instrumentation such as a spectrum analyzer. Methods that require use of a noise figure analyzer are generally accepted as producing the most accurate results, and are considered to be the reference method within this document, while others are considered to be acceptable alternative methods. Consult the relevant instrumentation application notes for detailed guidance regarding the selection and application of an appropriate methodology for performing noise figure measurements. Note also that noise figure measurements require that any AGC circuitry be disabled over the duration of the measurement.



7.2.8.1 Measurement Record:

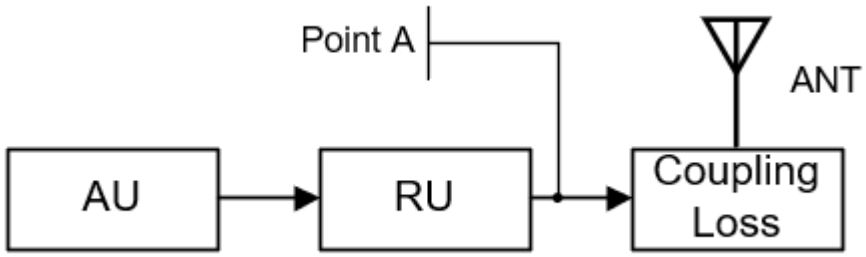
1. Noise

Frequency range(MHz)	ERP noise in passband	The ERP noise more than 1MHz outside of passband
758MHz to 775MHz	-45.78dBm	-72.94dBm
851MHz to 869MHz	-43.22dBm	-70.54dBm

ERP noise = Test results at point A + Coupling Loss + Antenna Gain

Remark:

The noise test results in the table are measured from point A. The test results plus the coupling loss and antenna gain will meet the noise radiation requirements of the signal booster, which is that the ERP of noise should not exceed −43 dBm in 10 kHz within passband and −70 dBm in 10 kHz more than 1 MHz outside of passband. Therefore, the coupling loss in engineering practice must be greater than 20dB to eliminate the interference.



Setting details were declared by manufacture and stated in the user manual.
The test screenshots below are only to record the case without engineering practice for reference.

2.Noise Figure:
788MHz to 805MHz

806MHz to 824MHz

8 Photographs

8.1.1 Test Setup

Please refer to setup photos.

8.1.2 EUT Constructional Details

Please Refer to external and internal photos for details.

--The End of Report--