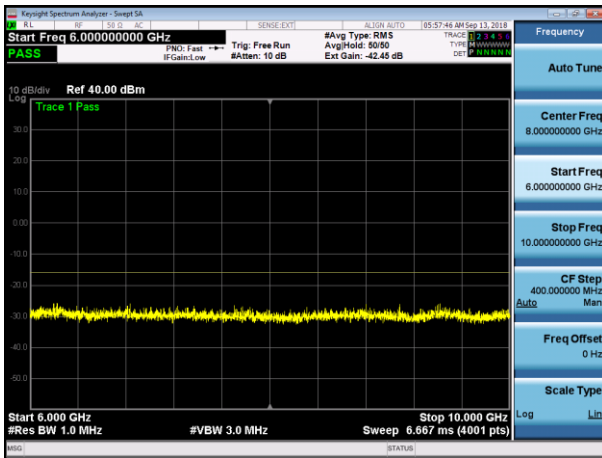
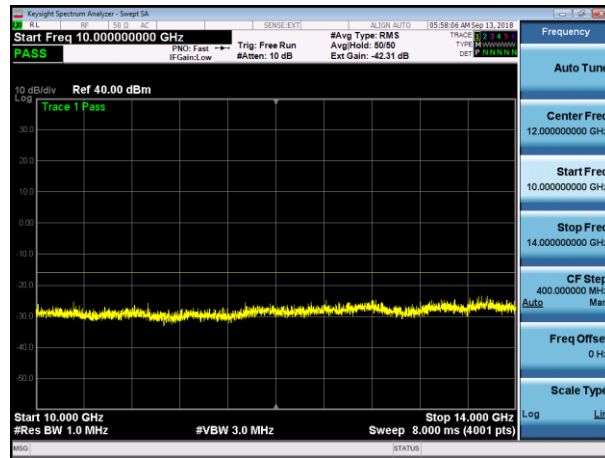




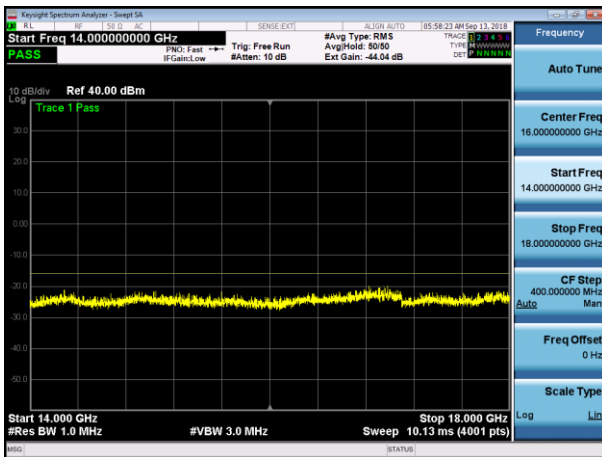
LTE15 Top+NB IoT GB (Upper) 6000MHz-10000MHz



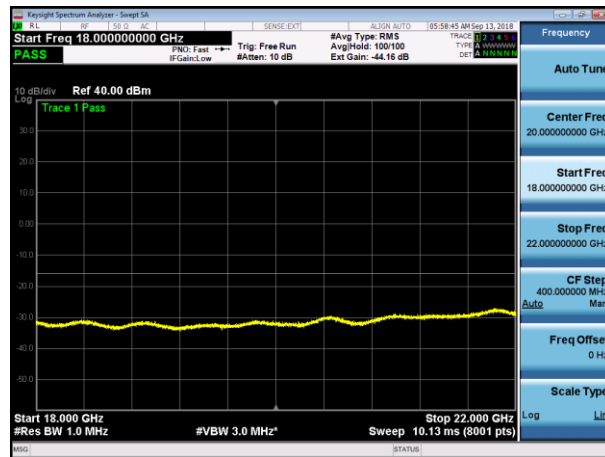
LTE15 Top+NB IoT GB (Upper) 10000MHz-14000MHz



LTE15 Top+NB IoT GB (Upper) 14000MHz-18000MHz

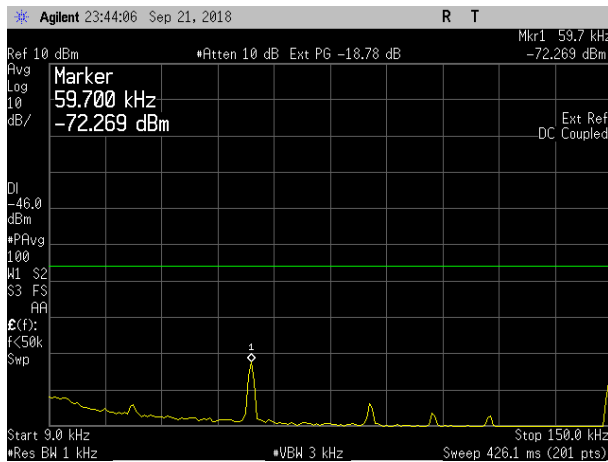


LTE15 Top+NB IoT GB (Upper) 18000MHz-22000MHz

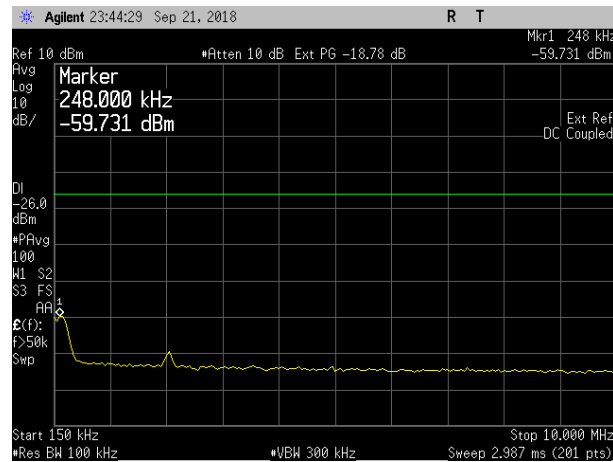


**20MHz Bottom Channel (2120MHz) NB IoT at lower Guard Band**

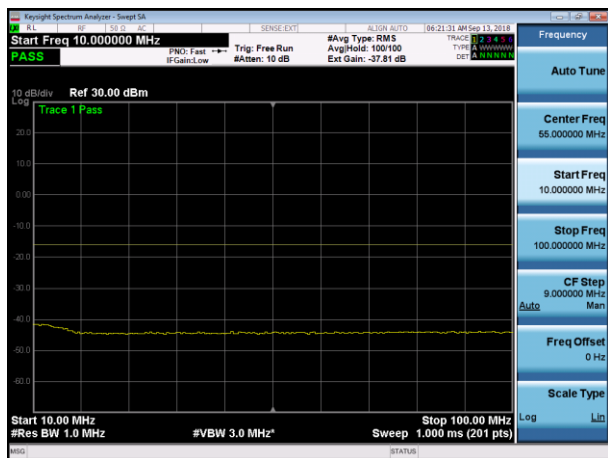
LTE20 Bottom+NB IoT GB (Upper) 0.009-0.15Mhz



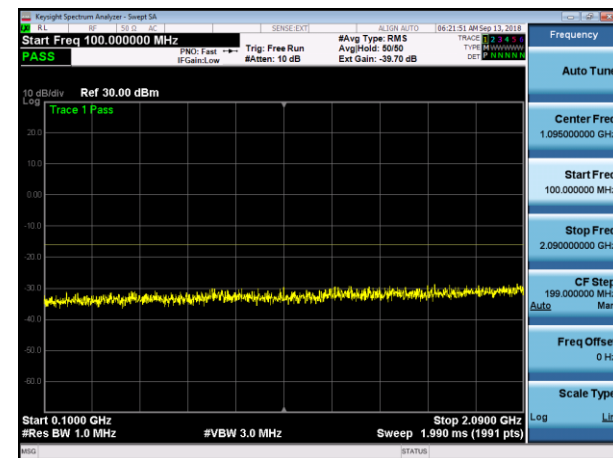
LTE20 Bottom+NB IoT GB (Upper) 0.15MHz – 10MHz



LTE20 Bottom+NB IoT GB (Upper) 10-100Mhz



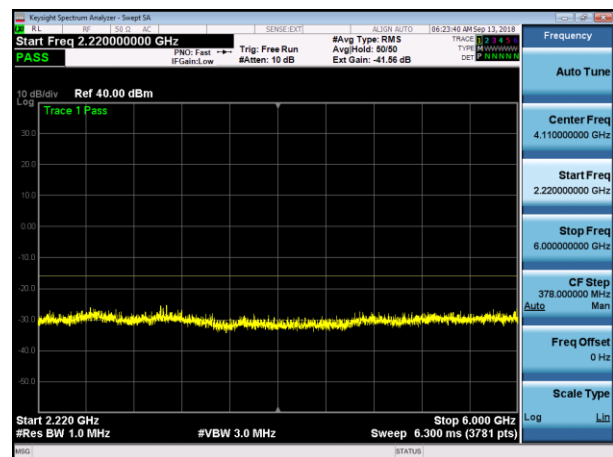
LTE20 Bottom+NB IoT GB (Upper) 100MHz – 2090MHz



LTE20 BOTTOM+NB IoT GB (Upper) 2090MHz – 2220MHz

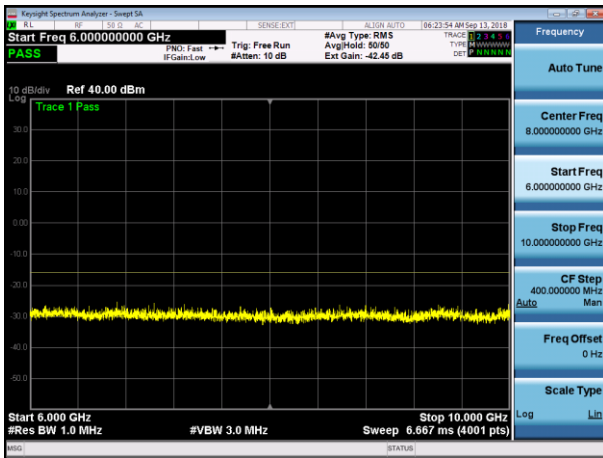


LTE20 BOTTOM+NB IoT GB (Upper) 2220MHz-6000Mhz

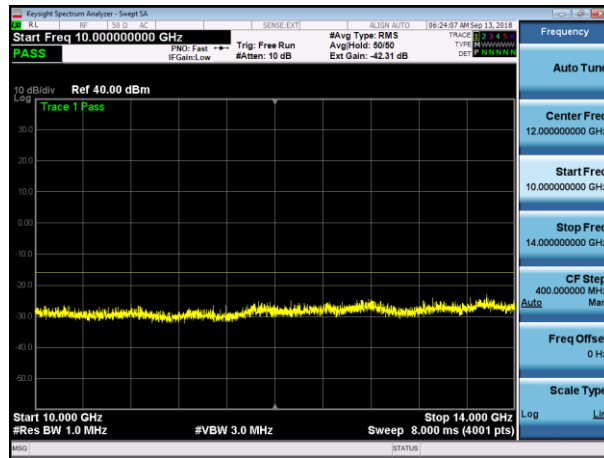




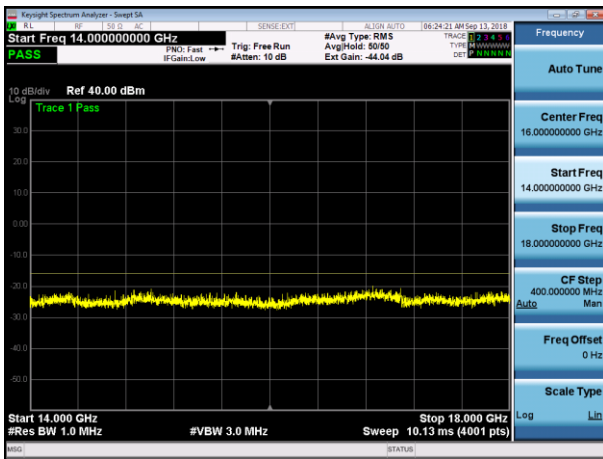
LTE20 BOTTOM+NB IoT GB (Upper) 6000MHz-10000MHz



LTE20 BOTTOM+NB IoT GB (Upper) 10000-14000MHz



LTE20 BOTTOM+NB IoT GB (Upper) 14000MHz – 18000MHz

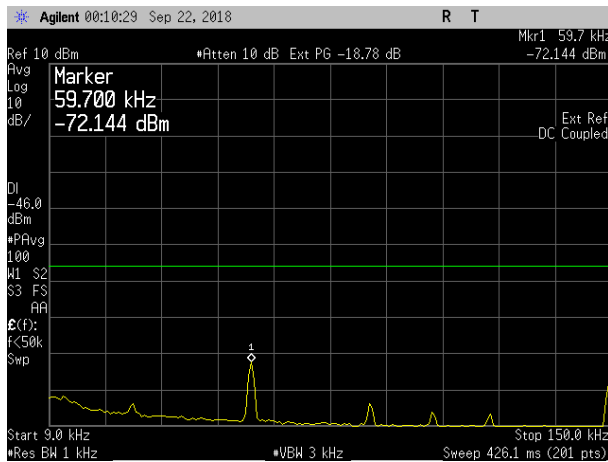


LTE20 BOTTOM+NB IoT GB (Upper) 18000MHz – 22000MHz

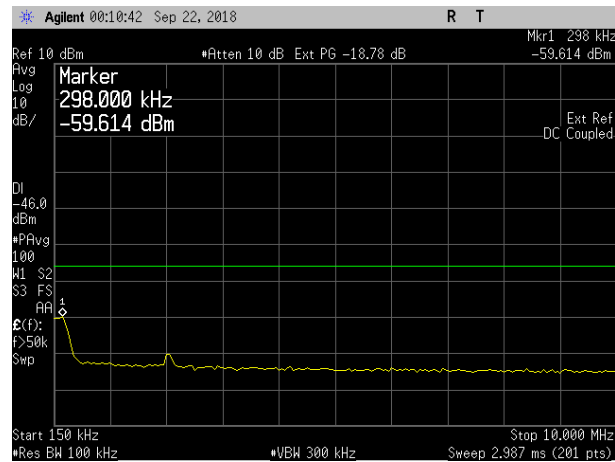


**20MHz Middle Channel (2132.5MHz) NB IoT at lower Guard Band**

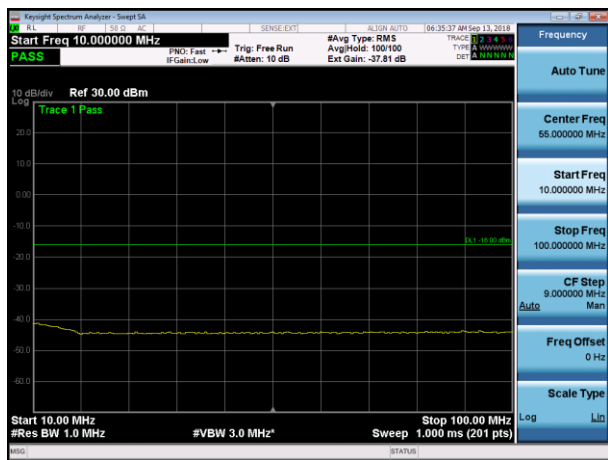
LTE20 Mid+NB IoT GB (Upper) 0.009-0.15MHz



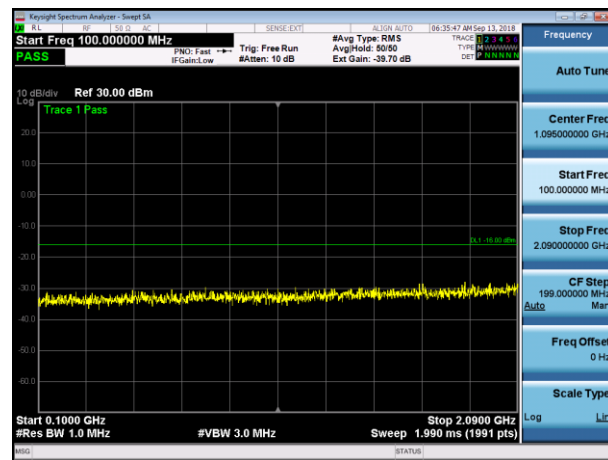
LTE20 Mid+NB IoT GB (Upper) 0.15MHz – 10MHz



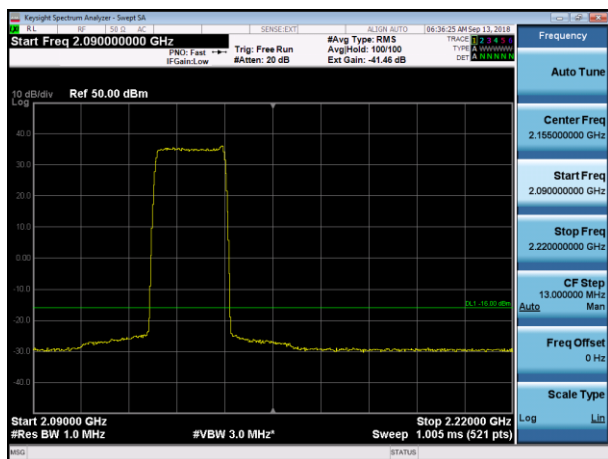
LTE20 Mid+NB IoT GB (Upper) 10MHz-100MHz



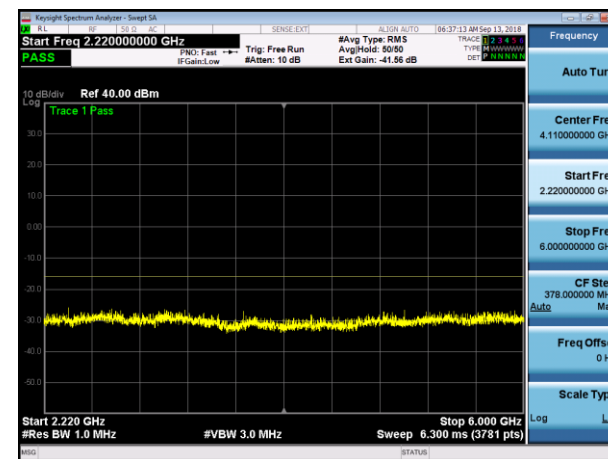
LTE20 Mid+NB IoT GB (Upper) 100MHz-2090MHz



LTE20 Mid+NB IoT GB (Upper) 2090MHz-2220MHz

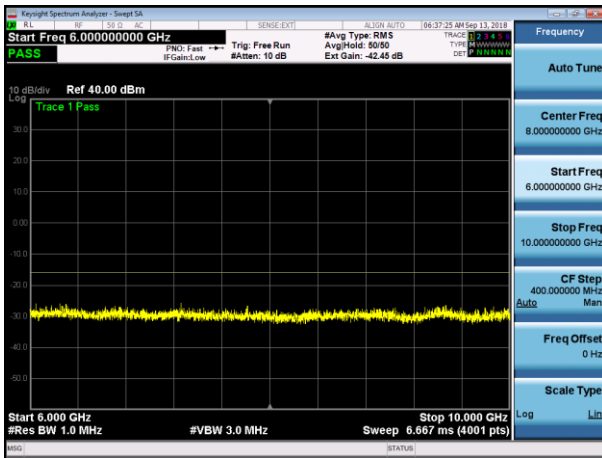


LTE20 Mid+NB IoT GB (Upper) 2220MHz-6000MHz

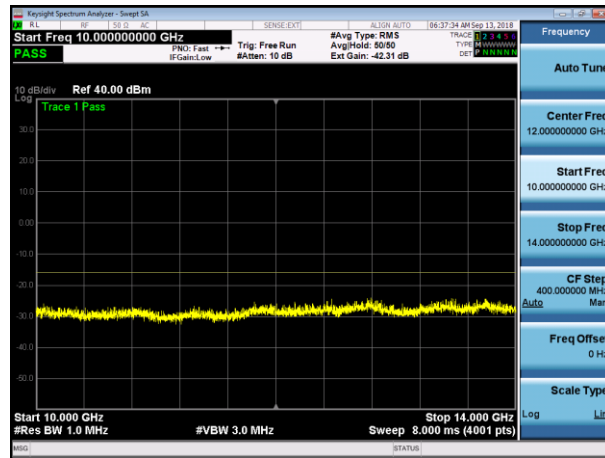




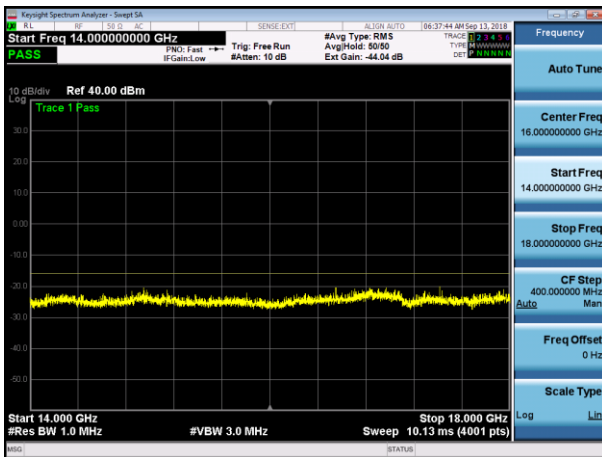
LTE20 Mid+NB IoT GB (Upper) 6000MHz-10000MHz



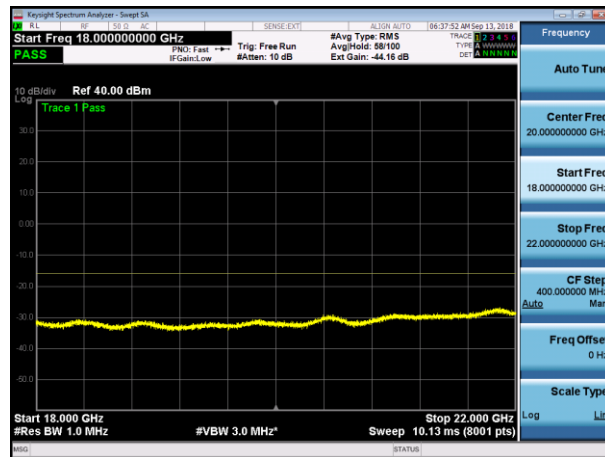
LTE20 Mid+NB IoT GB (Upper) 10000MHz-14000MHz



LTE20 Mid+NB IoT GB (Upper) 14000MHz-18000MHz

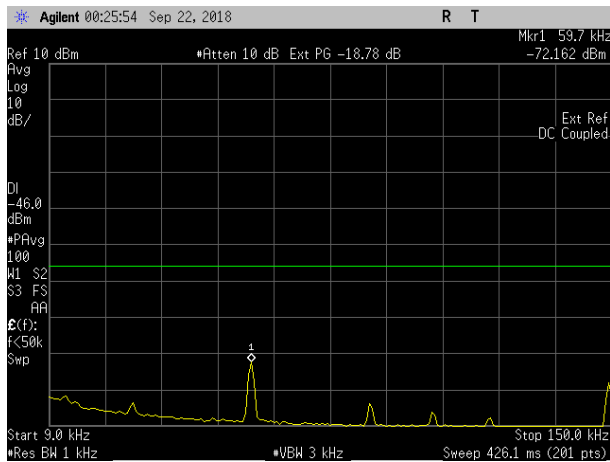


LTE20 Mid+NB IoT GB (Upper) 18000MHz-22000MHz

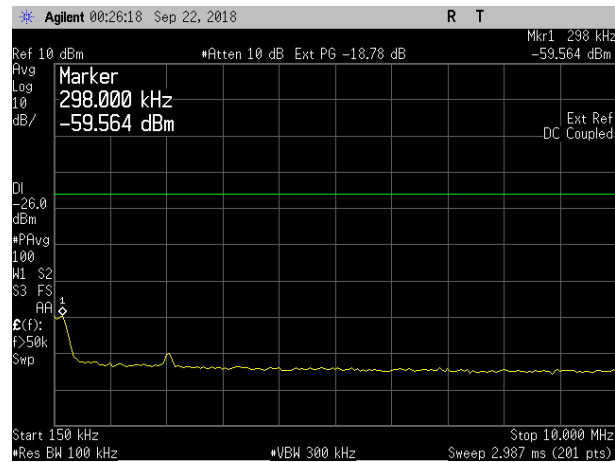


**20MHz Top Channel (2145MHz) NB IoT at lower Guard Band**

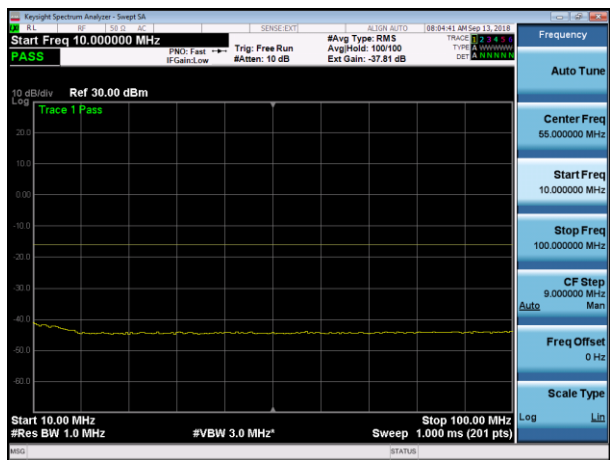
LTE20 Top+NB IoT GB (Upper) 0.009-0.15Mhz



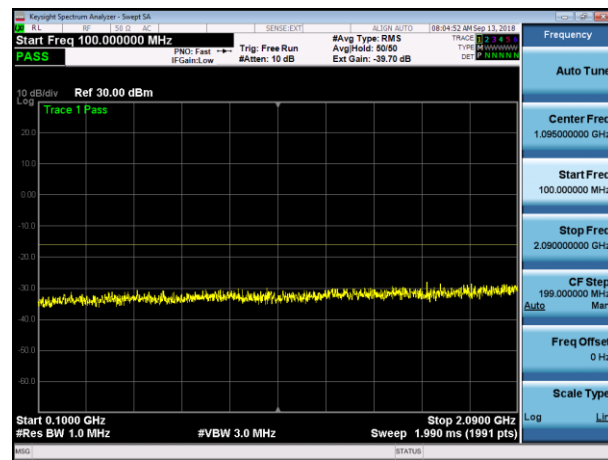
LTE20 Top+NB IoT GB (Upper) 0.15MHz – 10MHz



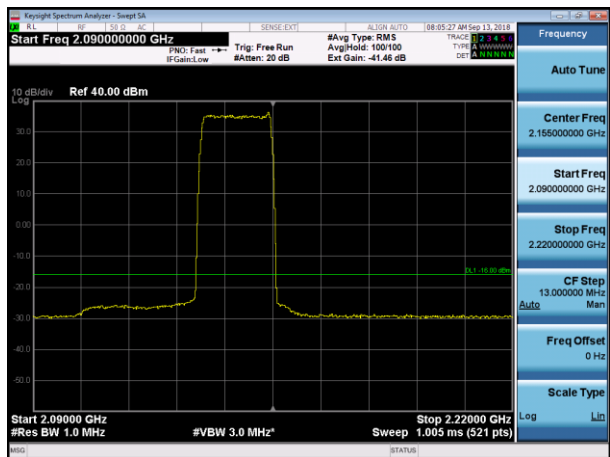
LTE20 Top+NB IoT GB (Upper) 10MHz-100MHz



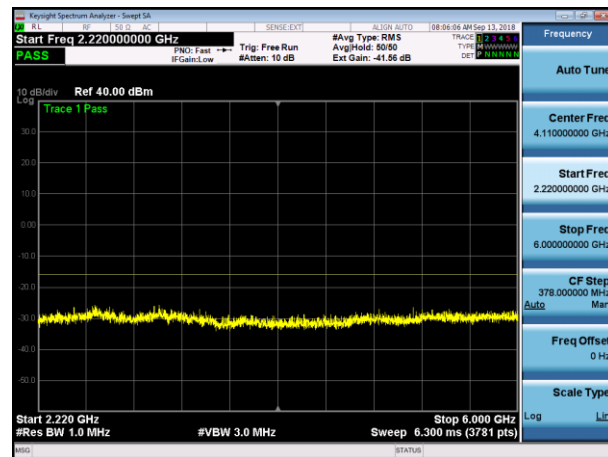
LTE20 Top+NB IoT GB (Upper) 100MHz-2090MHz



LTE20 Top+NB IoT GB (Upper) 2090MHz-2220MHz

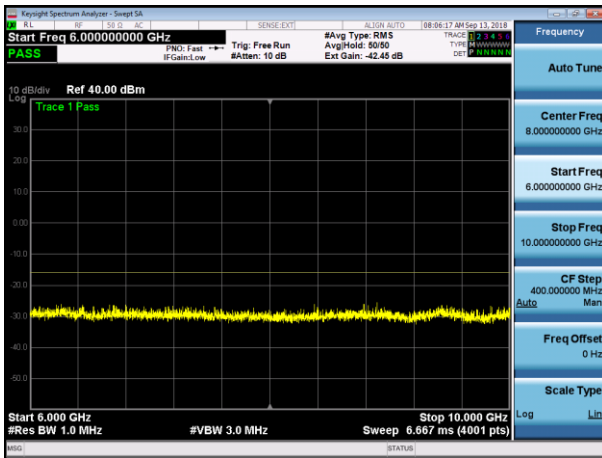


LTE20 Top+NB IoT GB (Upper) 2220MHz-6000MHz

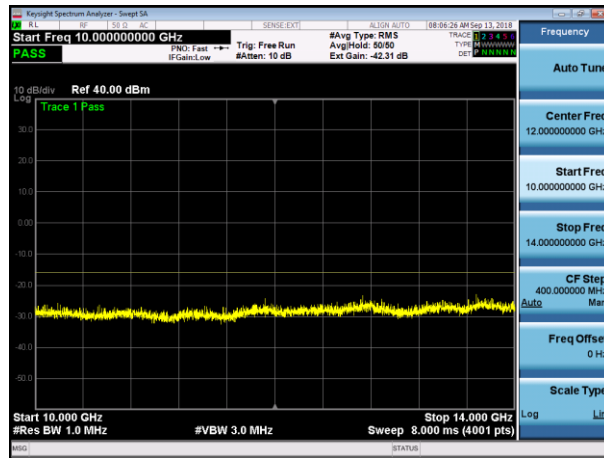




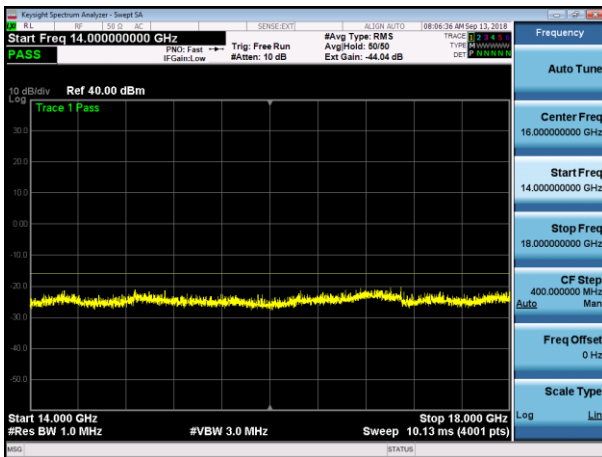
LTE20 Top+NB IoT GB (Upper) 6000MHz-10000MHz



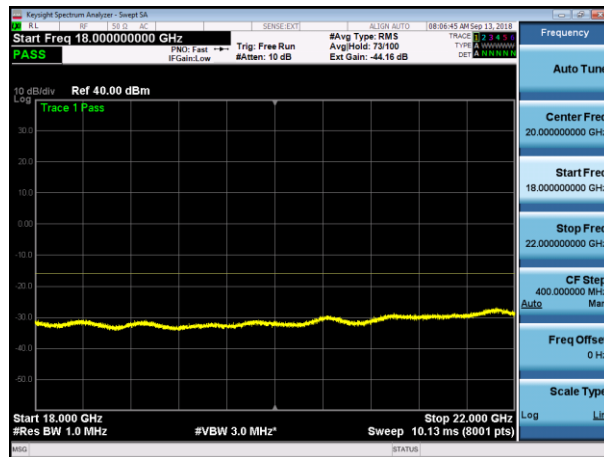
LTE20 Top+NB IoT GB (Upper) 10000MHz-14000MHz



LTE20 Top+NB IoT GB (Upper) 14000MHz-18000MHz

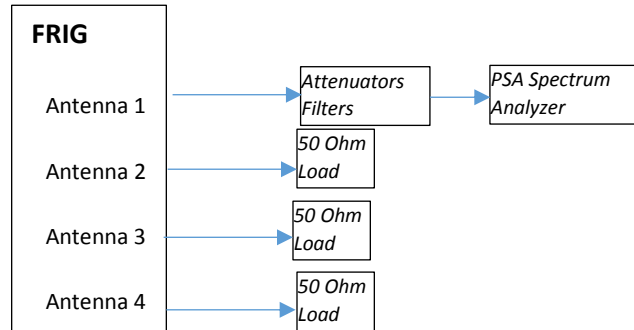


LTE20 Top+NB IoT GB (Upper) 18000MHz-22000MHz



12. TEST DATA FOR FRIG 4X30W CONFIGURATION

All conducted RF measurements for this test effort in this section were made at FRIG antenna port 1 (the highest power 60W port). The general test setup used is provided below. See Test Setup Photographs and Auxillary Equipment for details.



General Test Setup Used for Conducted RF Measurements on FRIG for 4x30W Configuration

12.1. RF Output Power

Peak and RMS Average RF output power was measured at the FRIG RRH antenna port. Measurements were made on the bottom, middle and top channels placing the NB IoT Guard Band carrier at the lower end of the carrier and then the upper end of the carrier for the LTE bandwidths of 10MHz, 15MHz, and 20MHz. Peak to average power ratio (PAPR) has been calculated as described in section 5.7.2 of KDB971168 D01 v03r01. The results of the power measurements and PAPR calculations are provided in the table below.

NB IoT Guard Band Carrier in Lower Guard Band

FRIG Ant 1 Port	LTE Bandwidth	LTE - Aggregate w/NB IoT GB		
		Peak (dBm)	Average (dBm)	PAPR (dB)
Bottom Channel	10M	52.20	44.22	7.98
	15M	52.23	44.25	7.98
	20M	51.48	43.55	7.93
Middle Channel	10M	52.48	44.46	8.02
	15M	52.44	44.47	7.97
	20M	51.71	43.72	7.99
Top channel	10M	52.28	44.42	7.86
	15M	52.30	44.38	7.92
	20M	52.38	44.39	7.99

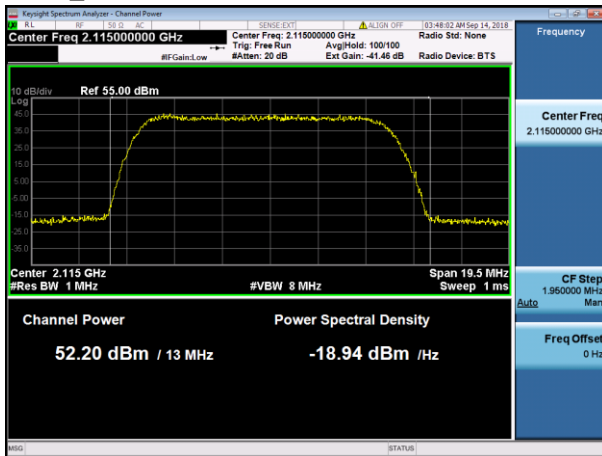
NB IoT Guard Band Carrier in Upper Guard Band

FRIG Ant 1 Port	LTE Bandwidth	LTE - Aggregate w/NB IoT GB		
		Peak (dBm)	Average (dBm)	PAPR (dB)
Bottom Channel	10M	51.90	44.08	7.82
	15M	52.30	44.24	8.06
	20M	52.20	44.24	7.96
Middle Channel	10M	52.08	44.21	7.87
	15M	52.35	44.45	7.9
	20M	52.43	44.37	8.06
Top channel	10M	52.23	44.31	7.92
	15M	52.35	44.37	7.98
	20M	52.36	44.35	8.01

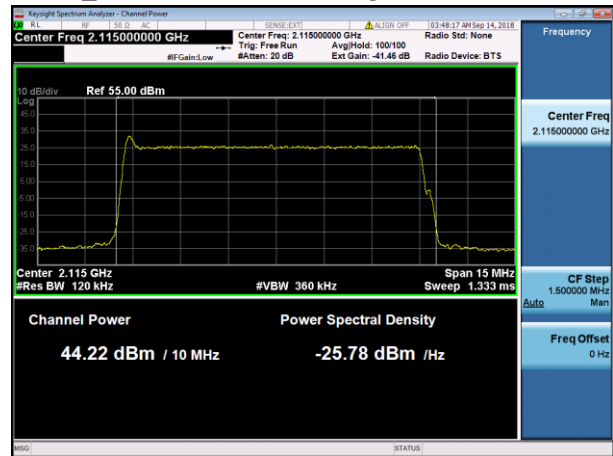
All measurement results are provided in the following pages. The total measurement RF path loss of the test setup (attenuator and test cables) was 41.46 dB and is accounted for by the spectrum analyzer reference level offset.

Channel Power Plots, NB IoT Guard Band Carrier in Lower Guard Band (10MHz):

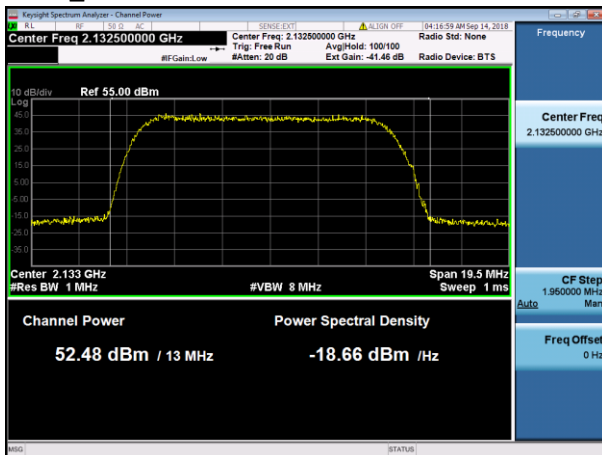
LTE10_Bottom Channel Peak



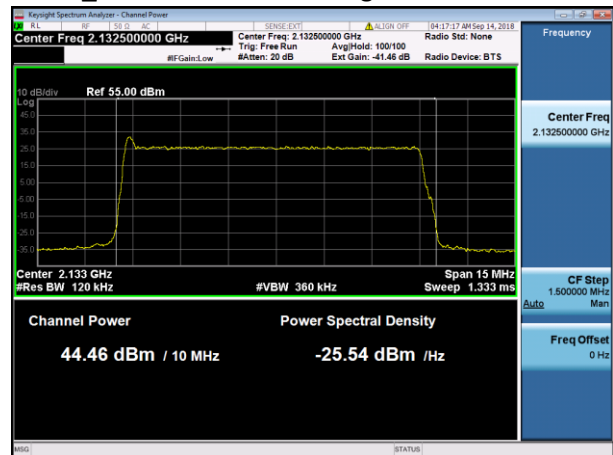
LTE10_Bottom Channel Average



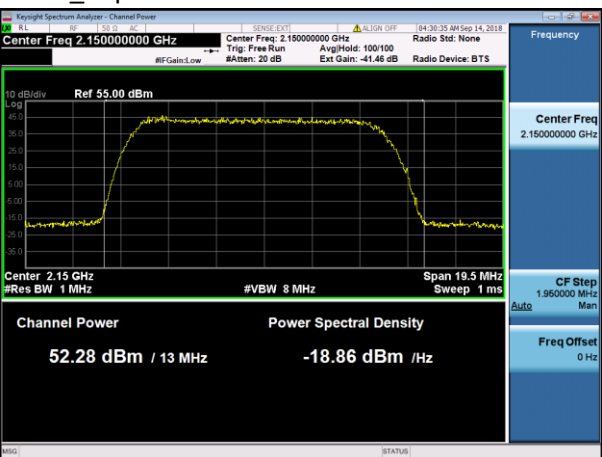
LTE10_Middle Channel Peak



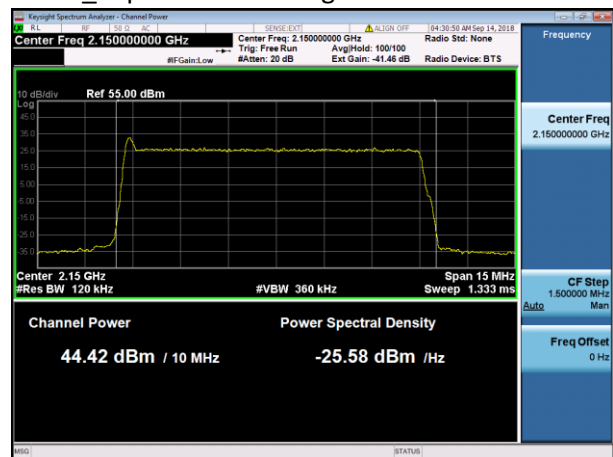
LTE10_Middle Channel Average



LTE10_Top Channel Peak

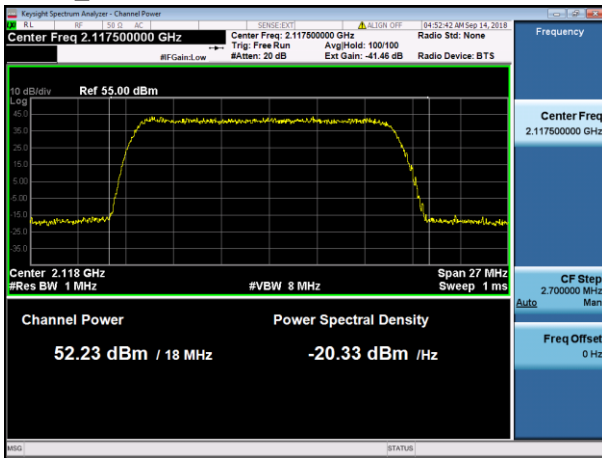


LTE10_Top Channel Average

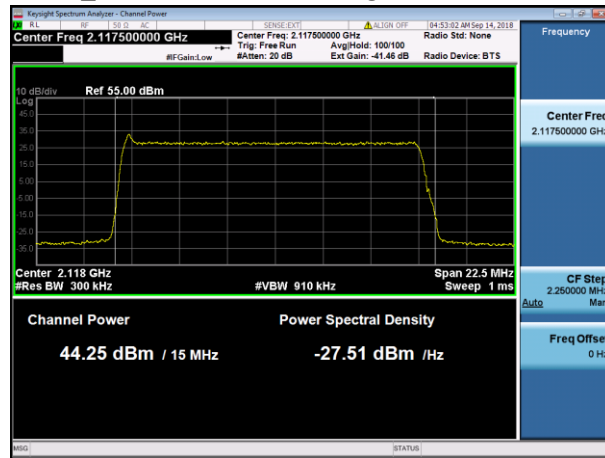


Channel Power Plots, NB IoT Guard Band Carrier in Lower Guard Band (15MHz):

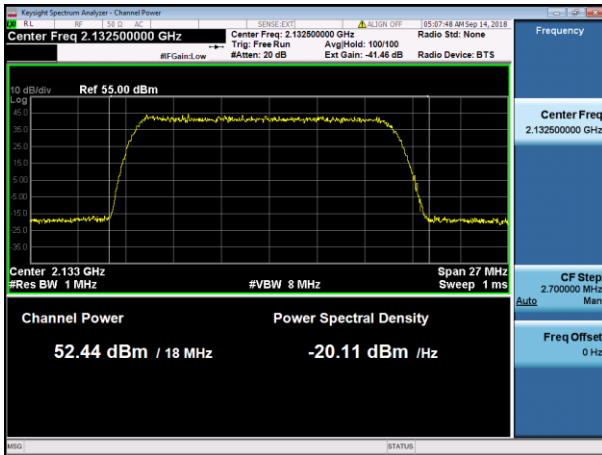
LTE15_Bottom Channel Peak



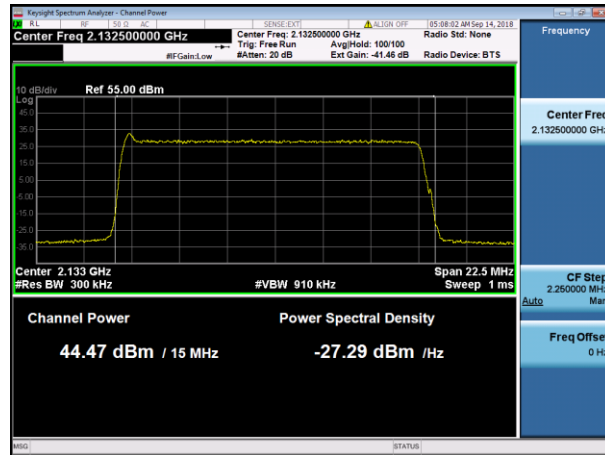
LTE15_Bottom Channel Average



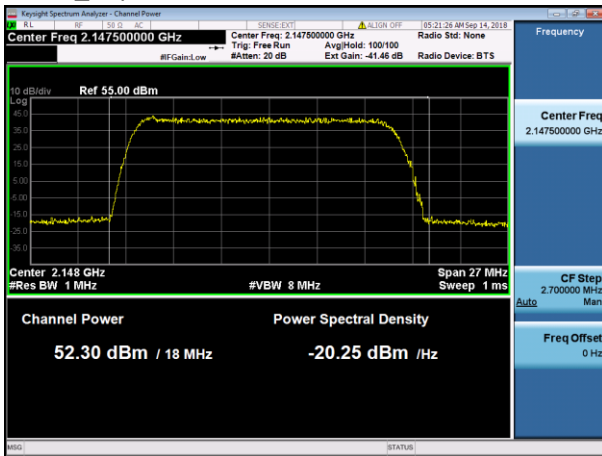
LTE15_Middle Channel Peak



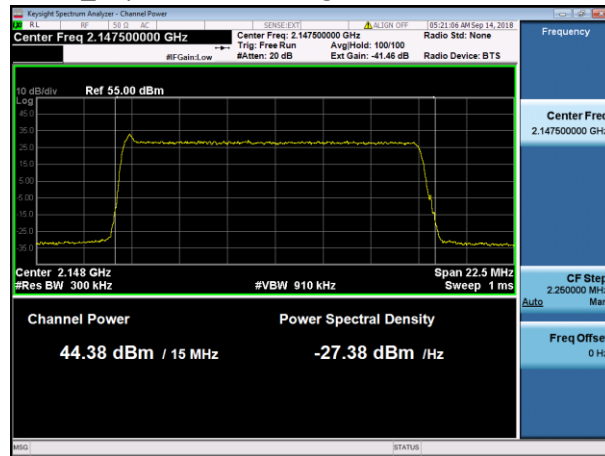
LTE15_Middle Channel Average



LTE15_Top Channel Peak



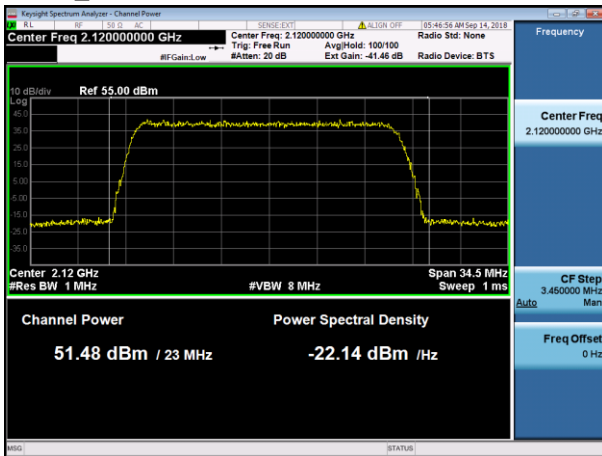
LTE15_Top Channel Average



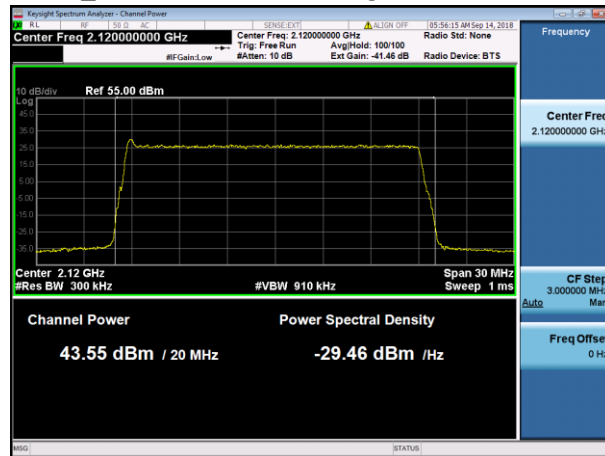


Channel Power Plots, NB IoT Guard Band Carrier in Lower Guard Band (20MHz):

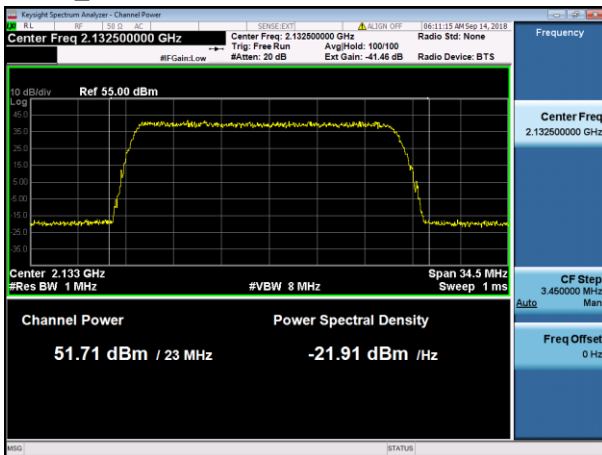
LTE20_Bottom Channel Peak



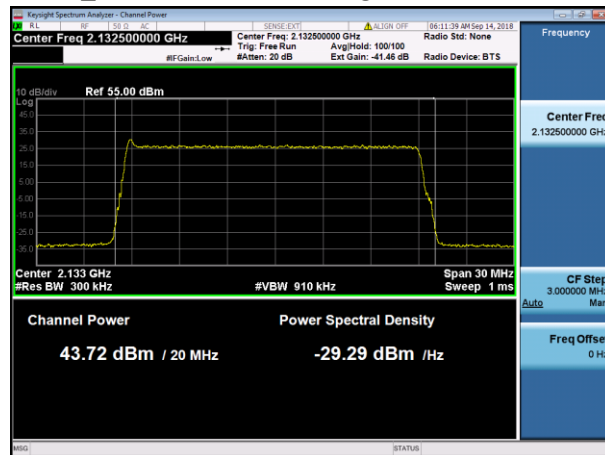
LTE20_Bottom Channel Average



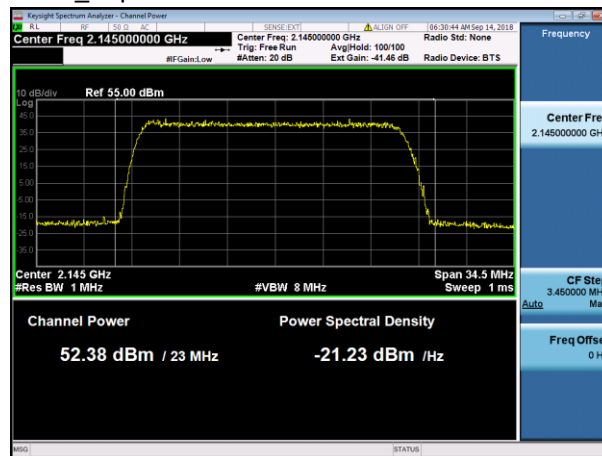
LTE20_Middle Channel Peak



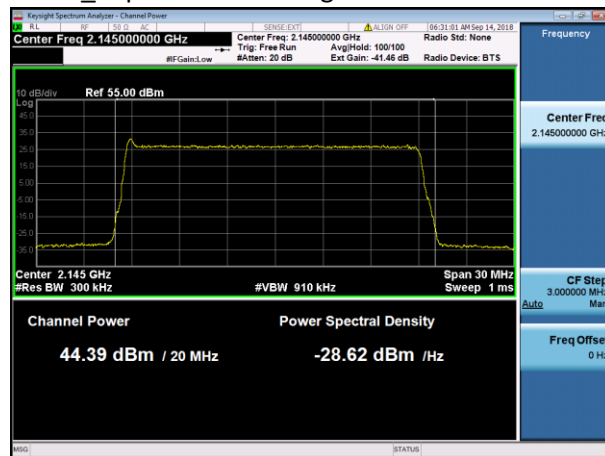
LTE20_Middle Channel Average



LTE20_Top Channel Peak



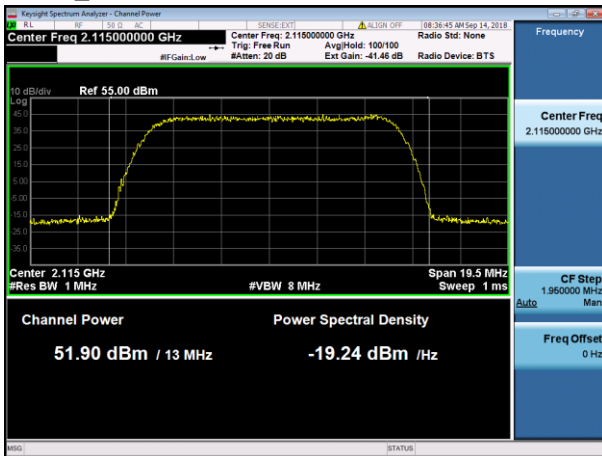
LTE20_Top Channel Average



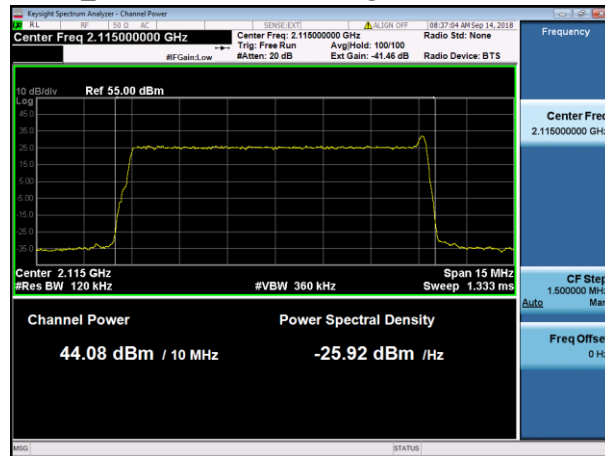


Channel Power Plots, NB IoT Guard Band Carrier in Upper Guard Band (10MHz):

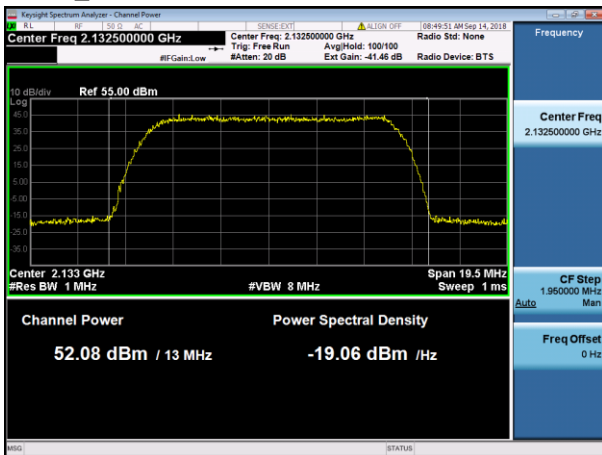
LTE10_Bottom Channel Peak



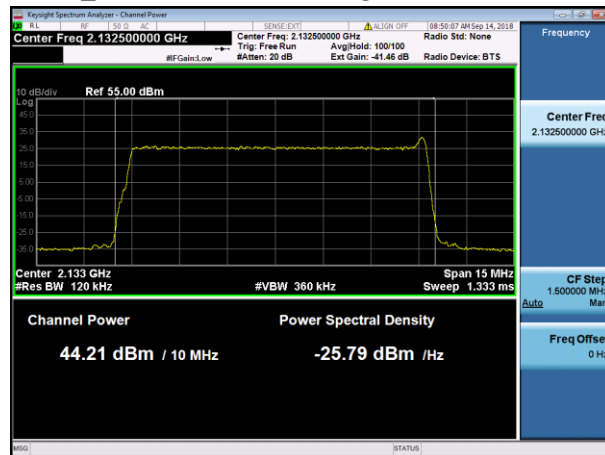
LTE10_Bottom Channel Average



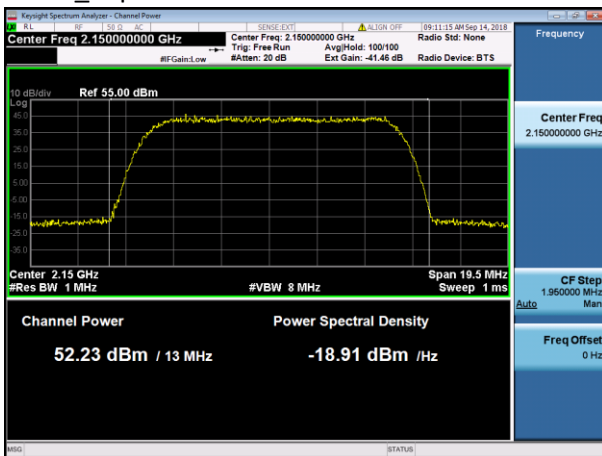
LTE10_Middle Channel Peak



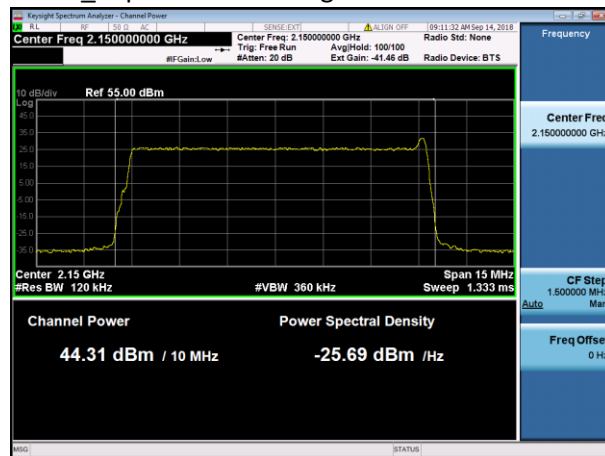
LTE10_Middle Channel Average



LTE10_Top Channel Peak

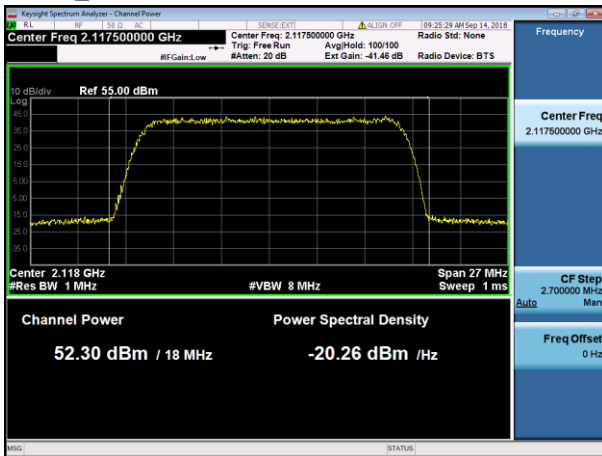


LTE10_Top Channel Average

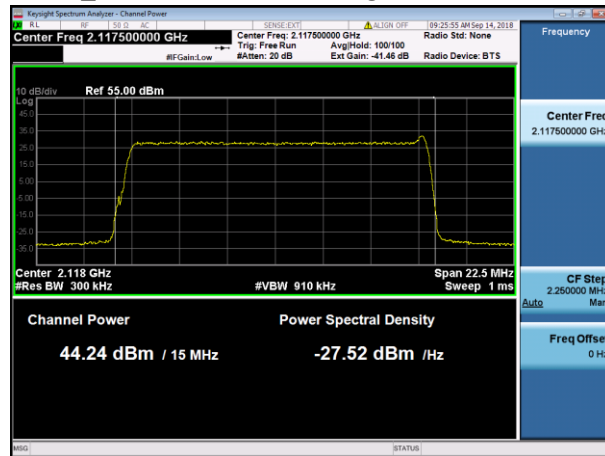


Channel Power Plots, NB IoT Guard Band Carrier in Upper Guard Band (15MHz):

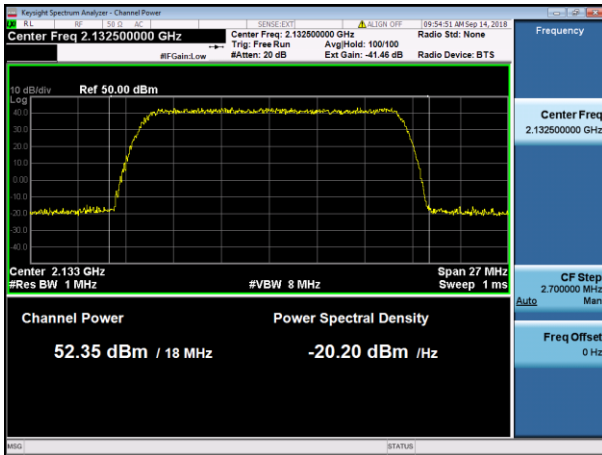
LTE15_Bottom Channel Peak



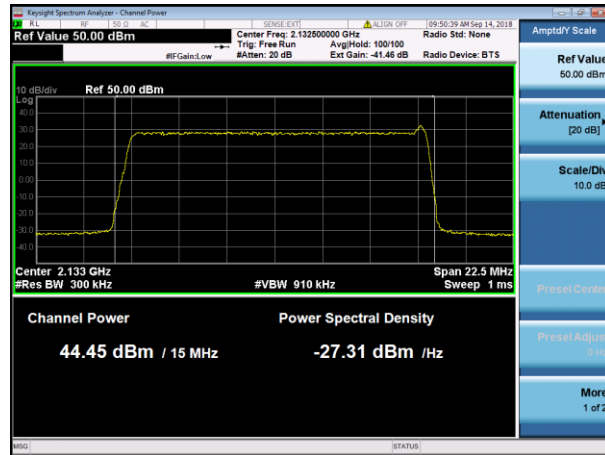
LTE15_Bottom Channel Average



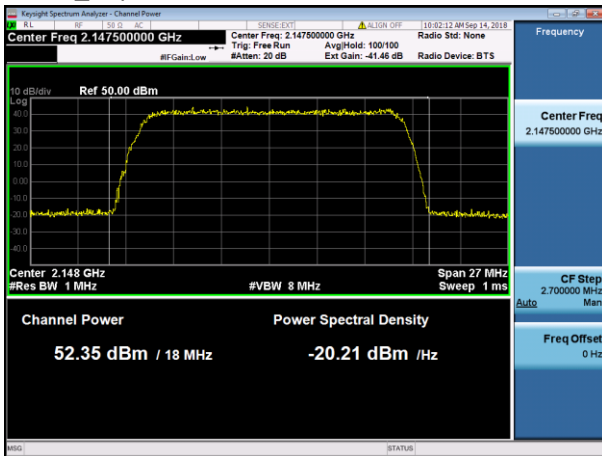
LTE15_Middle Channel Peak



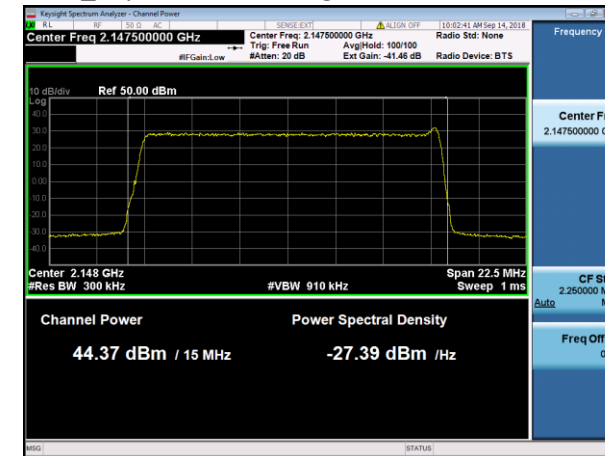
LTE15_Middle Channel Average



LTE15_Top Channel Peak

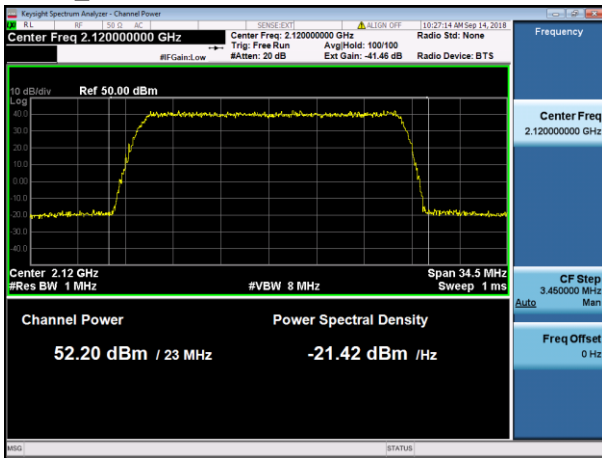


LTE15_Top Channel Average

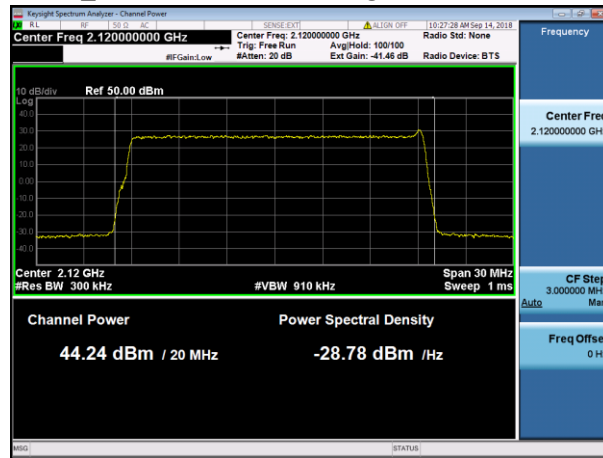


Channel Power Plots, NB IoT Guard Band Carrier in Upper Guard Band (20MHz):

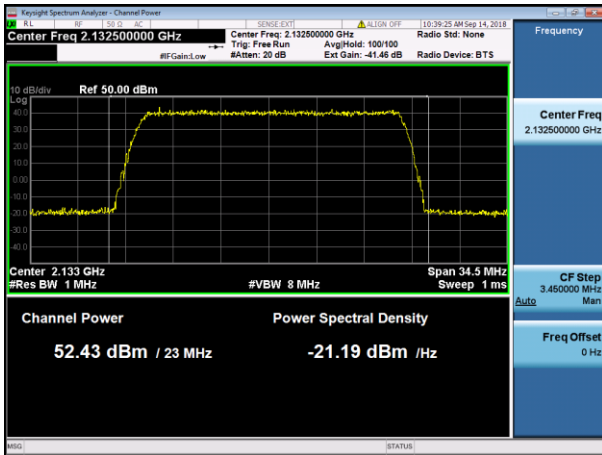
LTE20_Bottom Channel Peak



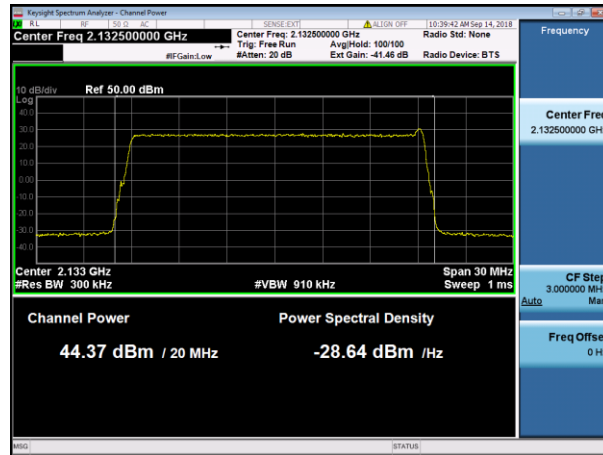
LTE20_Bottom Channel Average



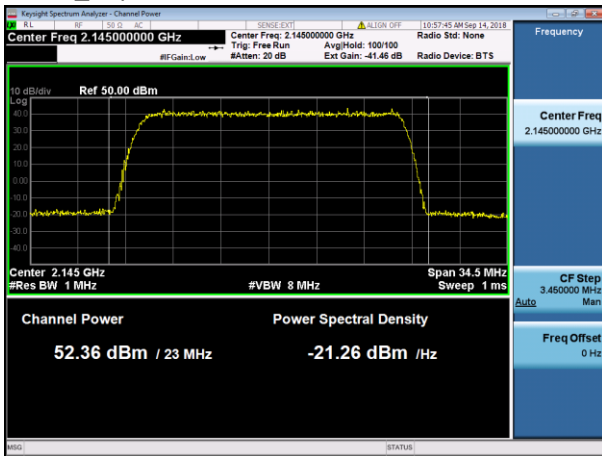
LTE20_Middle Channel Peak



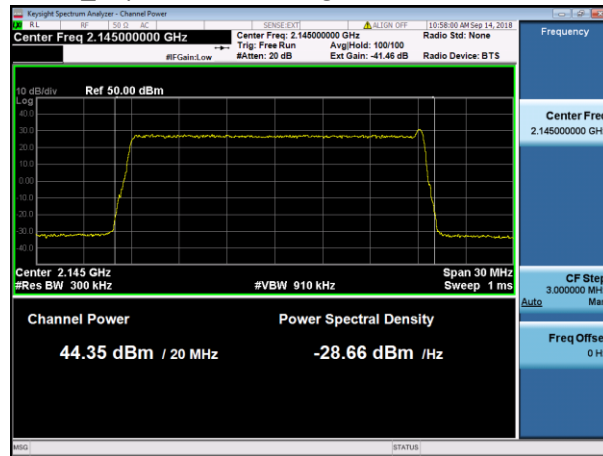
LTE20_Middle Channel Average



LTE20_Top Channel Peak



LTE20_Top Channel Average



12.2. Emission Bandwidth (26 dB down and 99%)

Emission bandwidth measurements were made at FRIG antenna port 1 for NB IoT GB. Measurements were made on the bottom, middle and top channels for LTE bandwidths of 10MHz, 15MHz, and 20MHz. The results are provided in the following table.

LTE Bandwidth	NB IoT Guard band (Lower)					
	Bottom Channel		Middle Channel		Top Channel	
	26dB(MHz)	99% (MHz)	26dB(MHz)	99% (MHz)	26dB(MHz)	99% (MHz)
10M	9.67	9.23	9.66	9.24	9.66	9.25
15M	14.44	13.81	14.44	13.8	14.48	13.81
20M	19.21	18.29	19.23	18.3	19.2	18.29

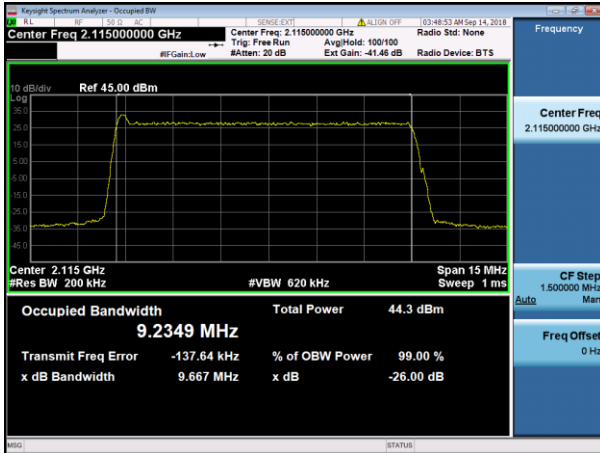
LTE Bandwidth	NB IoT Guard band (upper)					
	Bottom Channel		Middle Channel		Top Channel	
	26dB(MHz)	99% (MHz)	26dB(MHz)	99% (MHz)	26dB(MHz)	99% (MHz)
10M	9.65	9.24	9.66	9.25	9.51	9.19
15M	14.45	13.81	14.47	13.81	14.44	13.83
20M	19.21	18.30	19.19	18.29	19.23	18.29

Emission bandwidth measurement data are provided in the following pages.

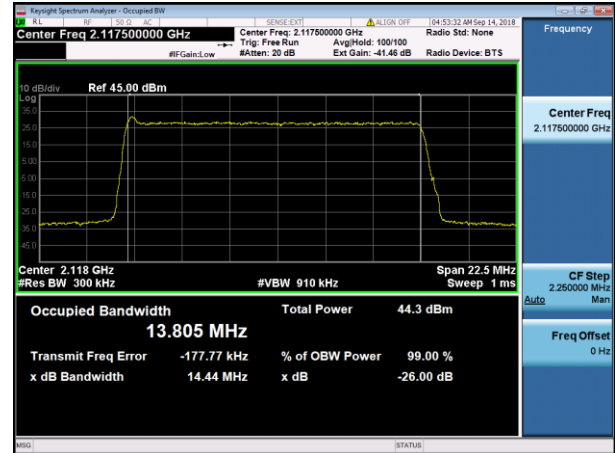


LTE10 and LTE15 plus NB IoT Guard Band Carrier in lower Guard Band (Lower) Bandwidth Plots:

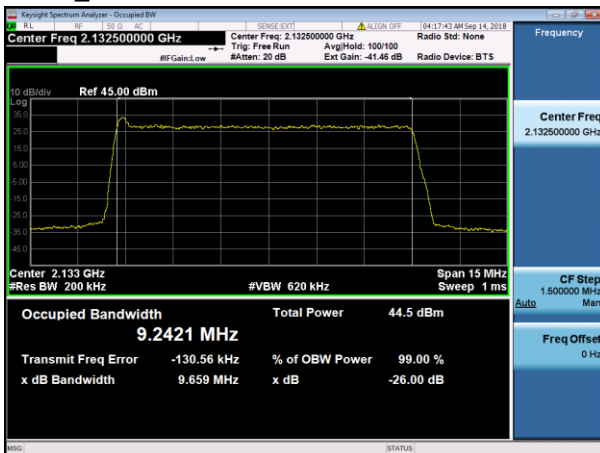
LTE10_Bottom Channel



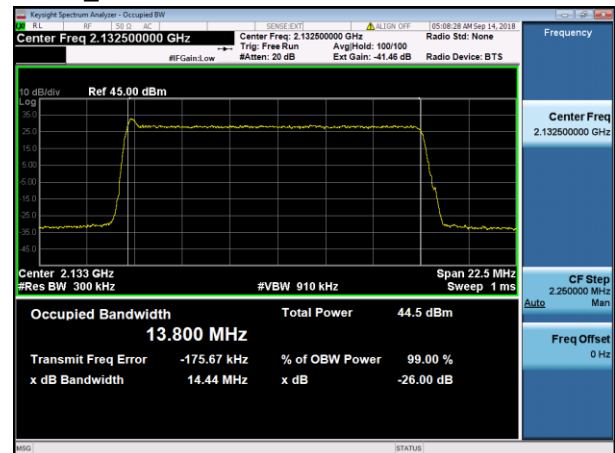
LTE15_Bottom Channel



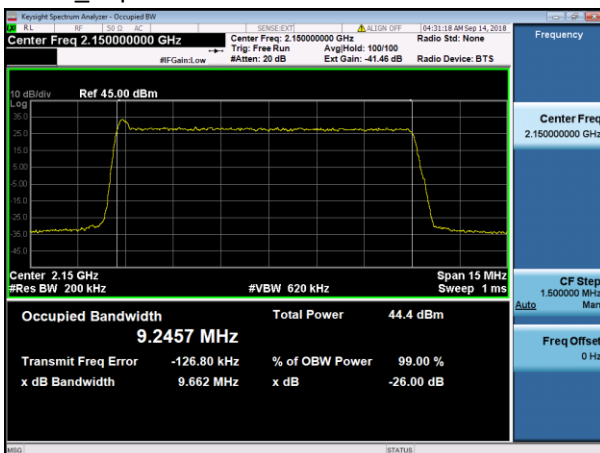
LTE10_Middle Channel



LTE15_Middle Channel



LTE10_Top Channel



LTE15_Top Channel

