

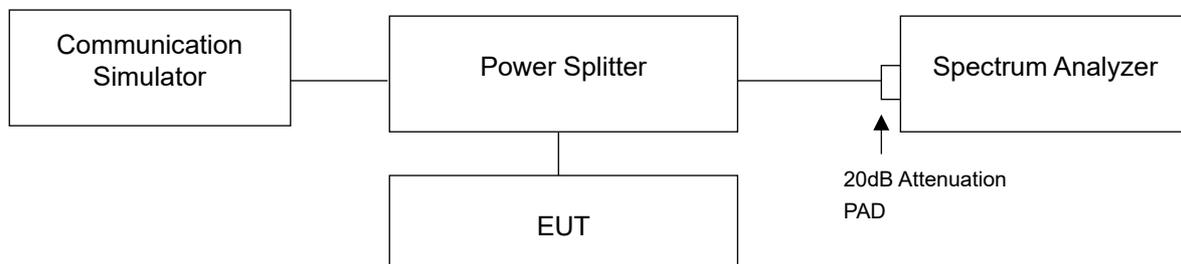
## 4.4 Occupied Bandwidth Measurement

### 4.4.1 Test Procedure

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Measurement method, please refer to section 5.4.4 of ANSI C63.26. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

For the 26dBc bandwidth measurement method, please refer to section 5.4.3 of ANSI C63.26.

### 4.4.2 Test Setup



#### 4.4.3 Test Result

##### Occupied Bandwidth

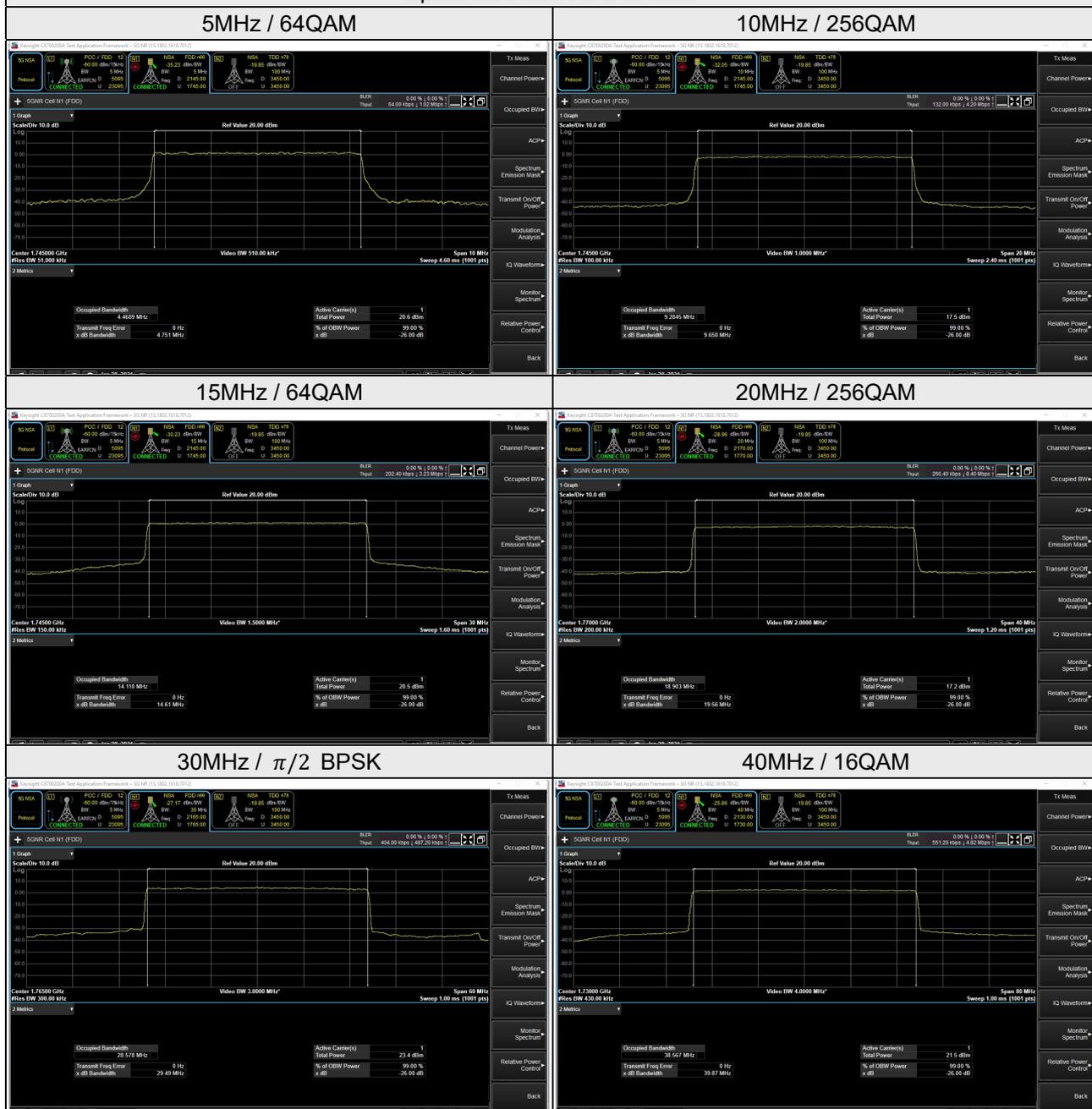
n66

n66, Channel Bandwidth 5MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
342500	1712.5	4.463	4.467	4.465	4.468	4.466
349000	1745.0	4.466	4.468	4.466	4.469	4.466
355500	1777.5	4.466	4.468	4.466	4.468	4.466
n66, Channel Bandwidth 10MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
343000	1715.0	9.166	9.281	9.257	9.260	9.281
349000	1745.0	9.165	9.283	9.260	9.281	9.285
355000	1775.0	9.174	9.284	9.259	9.282	9.283
n66, Channel Bandwidth 15MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
343500	1717.5	13.990	14.106	14.103	14.108	14.105
349000	1745.0	13.986	14.103	14.101	14.110	14.106
354500	1772.5	13.995	14.106	14.102	14.107	14.105
n66, Channel Bandwidth 20MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
344000	1720.0	18.722	18.900	18.899	18.903	18.902
349000	1745.0	18.669	18.899	18.897	18.901	18.903
354000	1770.0	18.730	18.900	18.896	18.901	18.903
n66, Channel Bandwidth 30MHz						
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
345000	1725	28.571	28.564	28.573	28.493	28.500
349000	1745	28.570	28.494	28.561	28.484	28.488
353000	1765	28.578	28.560	28.575	28.493	28.498

n66, Channel Bandwidth 40MHz

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
346000	1730	38.443	38.480	38.567	38.476	38.473
349000	1745	38.449	38.464	38.471	38.458	38.455
352000	1760	38.442	38.462	38.469	38.460	38.449

Spectrum Plot of Worst Value



LTE Band 2

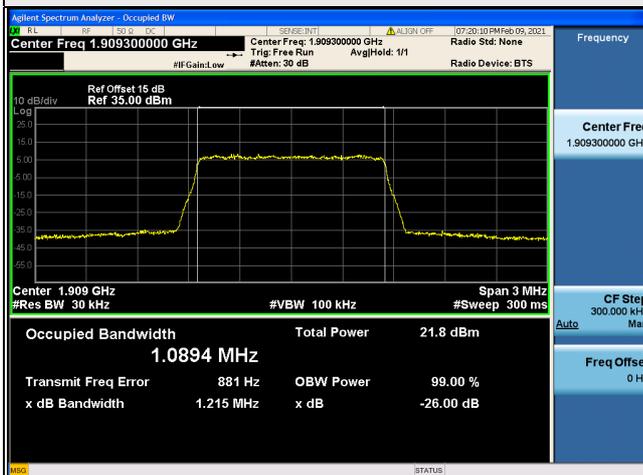
LTE Band 2, Channel Bandwidth 1.4MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18607	1850.7	1.087	1.088	1.088	1.086
18900	1880.0	1.087	1.089	1.088	1.085
19193	1909.3	1.088	1.089	1.087	1.086
LTE Band 2, Channel Bandwidth 3MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18615	1851.5	2.699	2.694	2.695	2.697
18900	1880.0	2.697	2.694	2.695	2.696
19185	1908.5	2.700	2.694	2.695	2.696
LTE Band 2, Channel Bandwidth 5MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18625	1852.5	4.484	4.488	4.496	4.485
18900	1880.0	4.483	4.487	4.497	4.485
19175	1907.5	4.484	4.486	4.491	4.485
LTE Band 2, Channel Bandwidth 10MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18650	1855.0	8.951	8.951	8.957	8.950
18900	1880.0	8.955	8.961	8.959	8.952
19150	1905.0	8.949	8.951	8.954	8.946
LTE Band 2, Channel Bandwidth 15MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18675	1857.5	13.449	13.435	13.429	13.442
18900	1880.0	13.460	13.443	13.439	13.448
19125	1902.5	13.446	13.437	13.432	13.434

LTE Band 2, Channel Bandwidth 20MHz

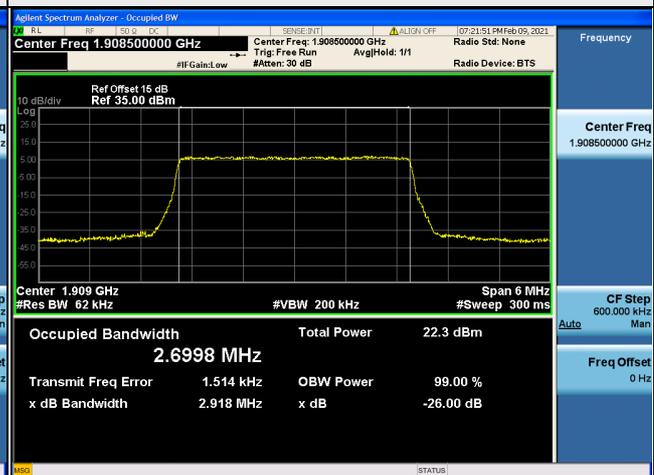
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18700	1860.0	17.904	17.922	17.915	17.916
18900	1880.0	17.921	17.935	17.931	17.928
19100	1900.0	17.899	17.910	17.911	17.917

### Spectrum Plot of Worst Value

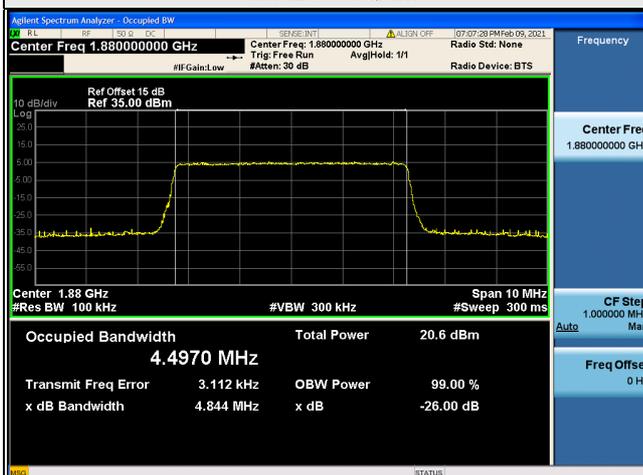
#### 1.4MHz / 16QAM



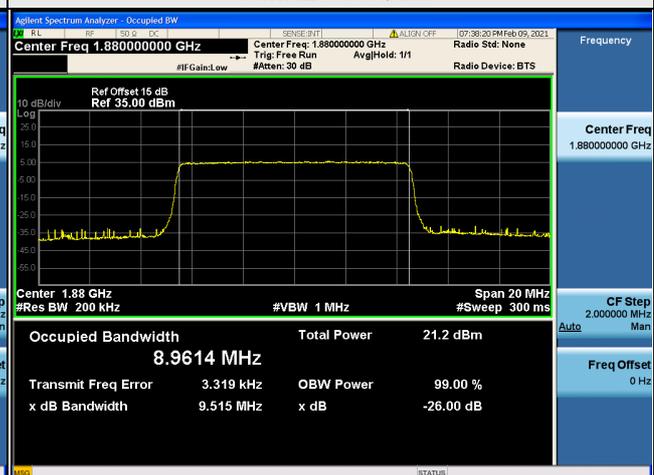
#### 3MHz / QPSK



#### 5MHz / 64QAM



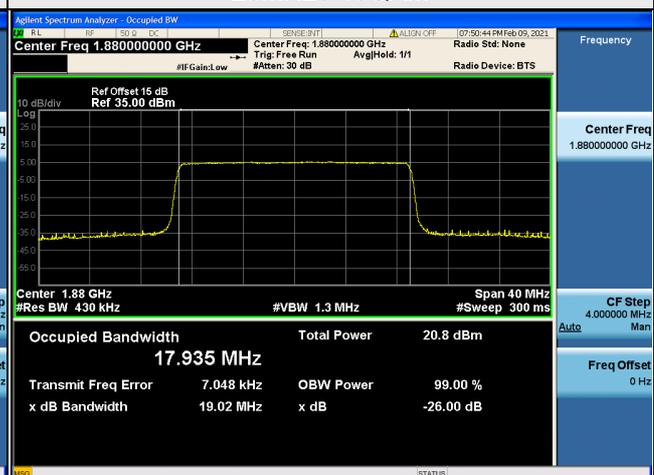
#### 10MHz / 16QAM



#### 15MHz / QPSK



#### 20MHz / 16QAM

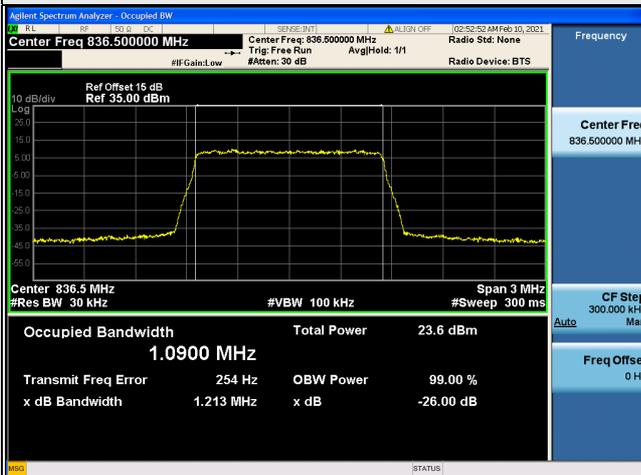


LTE Band 5

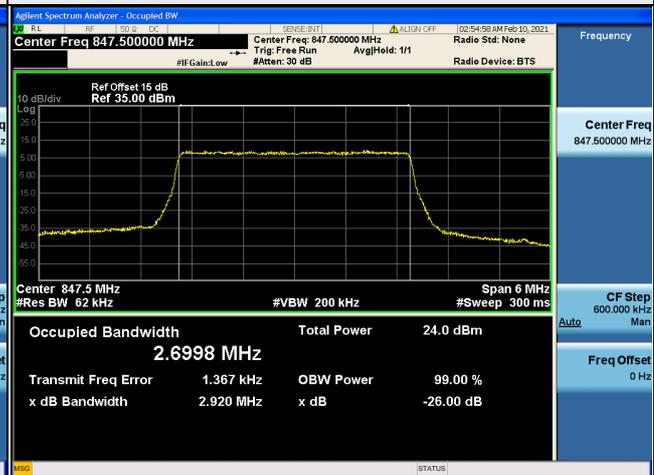
LTE Band 5, Channel Bandwidth 1.4MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20407	824.7	1.086	1.088	1.087	1.085
20525	836.5	1.086	1.090	1.087	1.085
20643	848.3	1.086	1.090	1.087	1.085
LTE Band 5, Channel Bandwidth 3MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20415	825.5	2.698	2.694	2.695	2.694
20525	836.5	2.698	2.694	2.695	2.697
20635	847.5	2.700	2.697	2.696	2.697
LTE Band 5, Channel Bandwidth 5MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20425	826.5	4.488	4.486	4.497	4.484
20525	836.5	4.488	4.489	4.495	4.485
20625	846.5	4.487	4.489	4.494	4.485
LTE Band 5, Channel Bandwidth 10MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20450	829.0	8.949	8.952	8.953	8.949
20525	836.5	8.952	8.950	8.958	8.949
20600	844.0	8.947	8.948	8.946	8.944

### Spectrum Plot of Worst Value

#### 1.4MHz / 16QAM



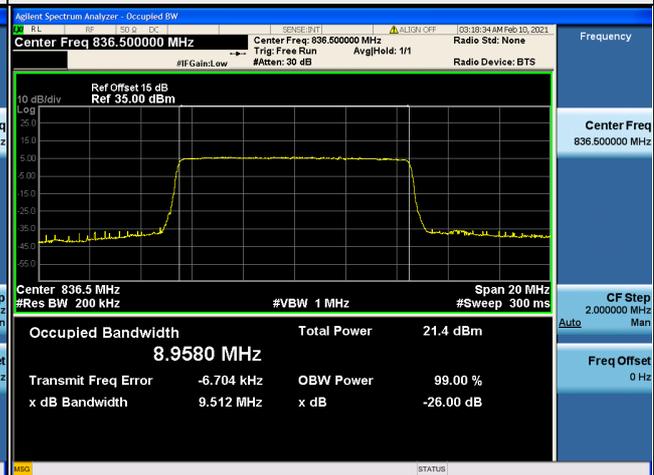
#### 3MHz / QPSK



#### 5MHz / 64QAM



#### 10MHz / 64QAM

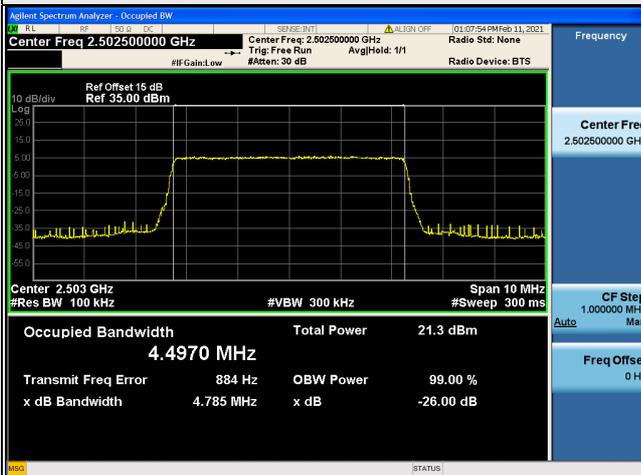


LTE Band 7

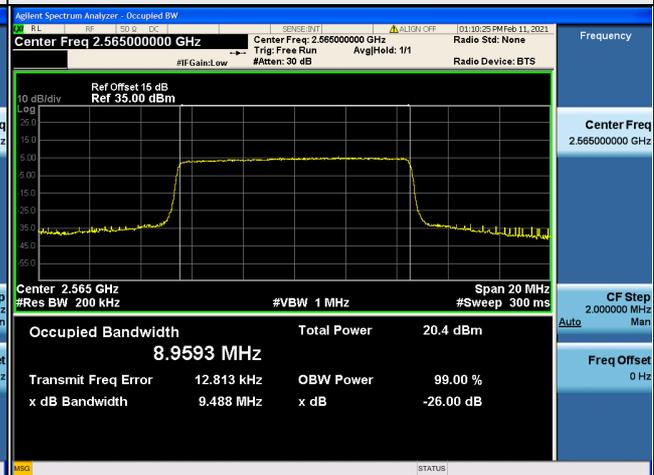
LTE Band 7, Channel Bandwidth 5MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20775	2502.5	4.487	4.486	4.497	4.483
21100	2535.0	4.485	4.485	4.494	4.486
21425	2567.5	4.487	4.485	4.496	4.486
LTE Band 7, Channel Bandwidth 10MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20800	2505.0	8.950	8.951	8.956	8.953
21100	2535.0	8.951	8.956	8.955	8.948
21400	2565.0	8.948	8.954	8.959	8.952
LTE Band 7, Channel Bandwidth 15MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20825	2507.5	13.446	13.431	13.431	13.433
21100	2535.0	13.453	13.433	13.433	13.440
21375	2562.5	13.456	13.446	13.441	13.450
LTE Band 7, Channel Bandwidth 20MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20850	2510.0	17.897	17.925	17.905	17.913
21100	2535.0	17.900	17.926	17.917	17.921
21350	2560.0	17.928	17.951	17.947	17.948

### Spectrum Plot of Worst Value

5MHz / 64QAM



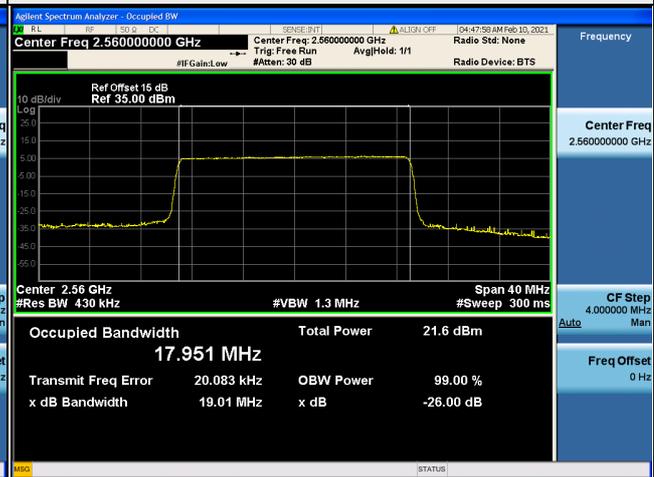
10MHz / 64QAM



15MHz / QPSK



20MHz / 16QAM

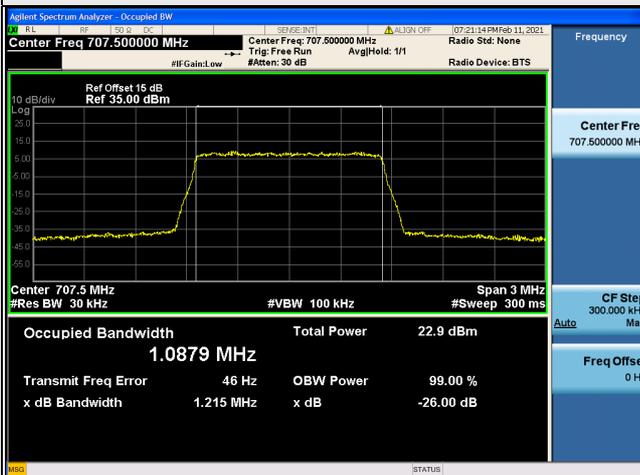


LTE Band 12

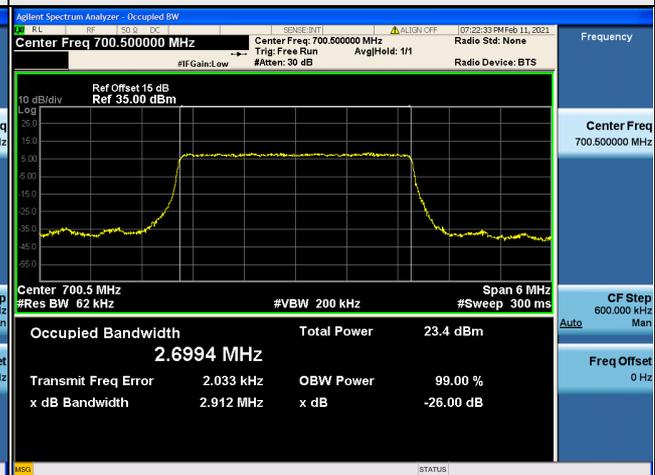
LTE Band 12, Channel Bandwidth 1.4MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
23017	699.7	1.086	1.088	1.087	1.084
23095	707.5	1.087	1.088	1.087	1.084
23173	715.3	1.084	1.088	1.087	1.085
LTE Band 12, Channel Bandwidth 3MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
23025	700.5	2.699	2.694	2.695	2.694
23095	707.5	2.698	2.694	2.694	2.696
23165	714.5	2.696	2.693	2.694	2.695
LTE Band 12, Channel Bandwidth 5MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
23035	701.5	4.484	4.485	4.491	4.483
23095	707.5	4.486	4.487	4.494	4.485
23155	713.5	4.484	4.483	4.491	4.481
LTE Band 12, Channel Bandwidth 10MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
23060	704.0	8.951	8.949	8.956	8.948
23095	707.5	8.963	8.963	8.968	8.957
23130	711.0	8.957	8.953	8.959	8.953

### Spectrum Plot of Worst Value

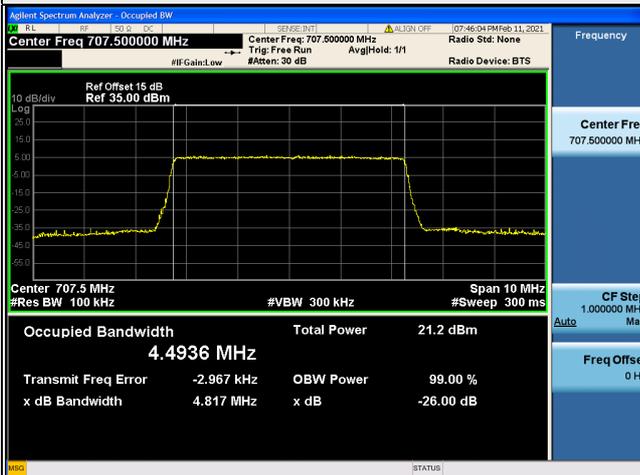
#### 1.4MHz / 16QAM



#### 3MHz / QPSK



#### 5MHz / 64QAM



#### 10MHz / 64QAM

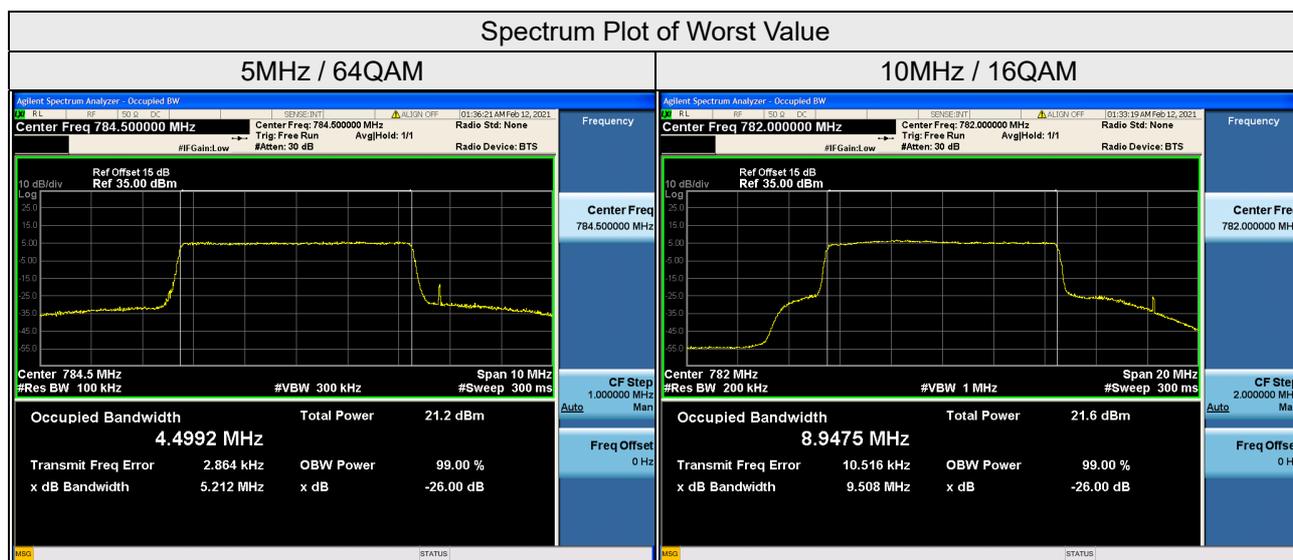


LTE Band 13

LTE Band 13, Channel Bandwidth 5MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
23205	779.5	4.476	4.476	4.486	4.475
23230	782.0	4.490	4.491	4.499	4.486
23255	784.5	4.493	4.494	4.499	4.492

LTE Band 13, Channel Bandwidth 10MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
23230	782.0	8.940	8.948	8.942	8.935



## 26dB Bandwidth

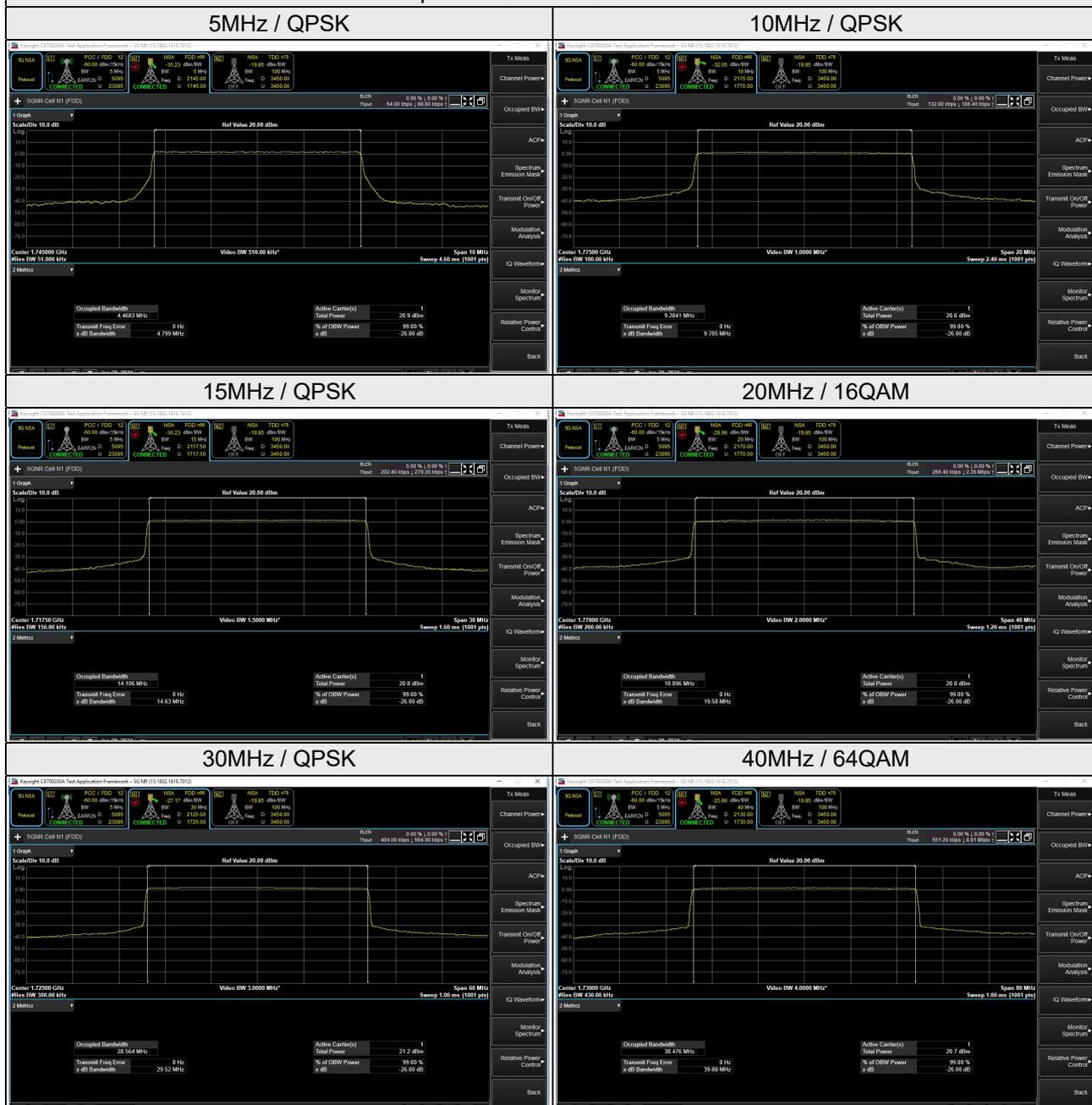
n66

n66, Channel Bandwidth 5MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
342500	1712.5	4.761	4.769	4.750	4.732	4.699
349000	1745.0	4.749	4.799	4.773	4.751	4.693
355500	1777.5	4.747	4.773	4.759	4.733	4.690
n66, Channel Bandwidth 10MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
343000	1715.0	9.258	9.691	9.602	9.599	9.604
349000	1745.0	9.284	9.664	9.656	9.648	9.650
355000	1775.0	9.283	9.705	9.629	9.637	9.630
n66, Channel Bandwidth 15MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
343500	1717.5	13.880	14.630	14.620	14.610	14.590
349000	1745.0	13.870	14.610	14.610	14.610	14.590
354500	1772.5	13.870	14.610	14.610	14.610	14.590
n66, Channel Bandwidth 20MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
344000	1720.0	18.470	19.580	19.570	19.550	19.550
349000	1745.0	18.470	19.570	19.570	19.540	19.550
354000	1770.0	18.480	19.580	19.580	19.550	19.560
n66, Channel Bandwidth 30MHz						
Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
345000	1725	29.490	29.520	29.510	29.490	29.490
349000	1745	29.490	29.510	29.500	29.490	29.480
353000	1765	29.490	29.510	29.510	29.490	29.490

n66, Channel Bandwidth 40MHz

Channel	Frequency (MHz)	26dB Bandwidth (MHz)				
		$\pi/2$ BPSK	QPSK	16QAM	64QAM	256QAM
346000	1730	39.840	39.880	39.870	39.880	39.850
349000	1745	39.830	39.840	39.840	39.850	39.830
352000	1760	39.830	39.850	39.850	39.860	39.840

Spectrum Plot of Worst Value



LTE Band 2

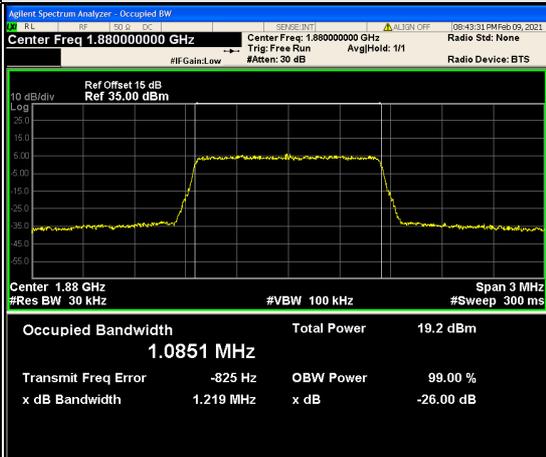
LTE Band 2, Channel Bandwidth 1.4MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18607	1850.7	1.210	1.215	1.214	1.212
18900	1880.0	1.211	1.212	1.214	1.219
19193	1909.3	1.210	1.215	1.211	1.208
LTE Band 2, Channel Bandwidth 3MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18615	1851.5	2.905	2.929	2.904	2.926
18900	1880.0	2.916	2.914	2.903	2.926
19185	1908.5	2.918	2.910	2.907	2.917
LTE Band 2, Channel Bandwidth 5MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18625	1852.5	4.788	4.786	4.830	4.814
18900	1880.0	4.792	4.793	4.844	4.797
19175	1907.5	4.805	4.797	4.819	4.814
LTE Band 2, Channel Bandwidth 10MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18650	1855.0	9.496	9.488	9.517	9.496
18900	1880.0	9.482	9.515	9.508	9.499
19150	1905.0	9.481	9.498	9.508	9.502
LTE Band 2, Channel Bandwidth 15MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18675	1857.5	14.220	14.250	14.250	14.230
18900	1880.0	14.260	14.250	14.250	14.250
19125	1902.5	14.240	14.260	14.230	14.240

LTE Band 2, Channel Bandwidth 20MHz

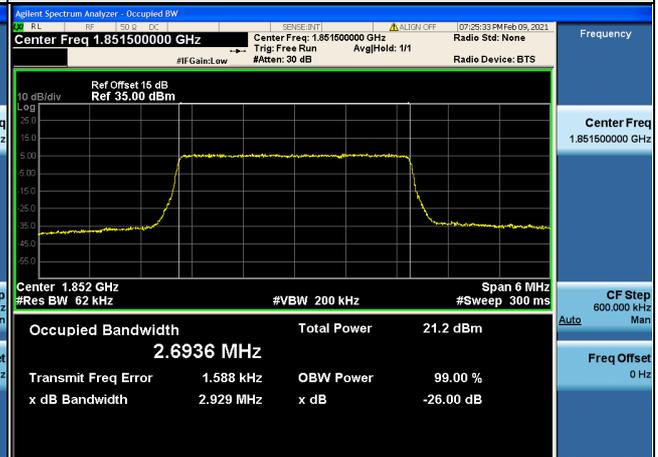
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
18700	1860.0	19.010	19.030	19.010	19.010
18900	1880.0	19.010	19.020	19.020	19.010
19100	1900.0	19.000	18.990	19.010	19.010

### Spectrum Plot of Worst Value

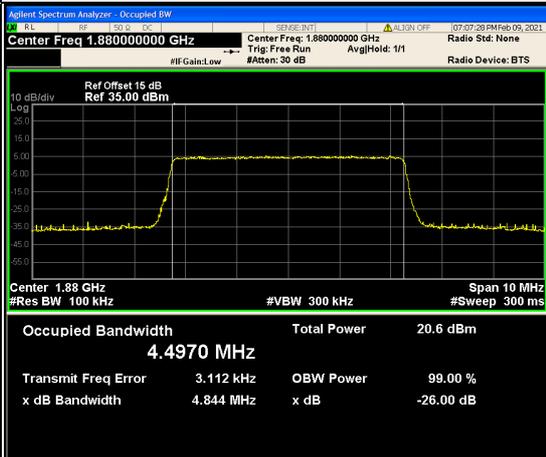
#### 1.4MHz / 256QAM



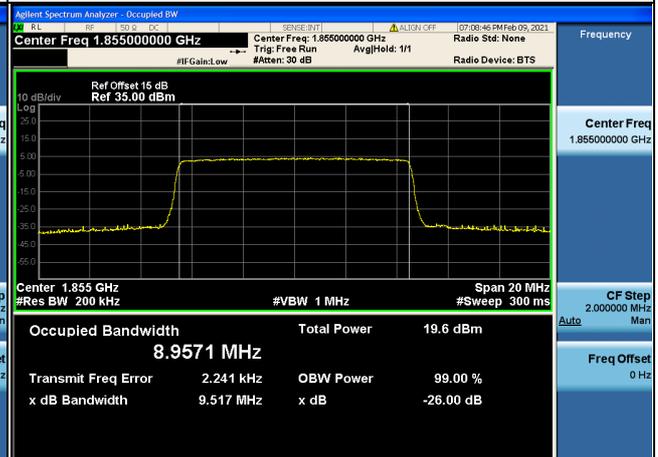
#### 3MHz / 16QAM



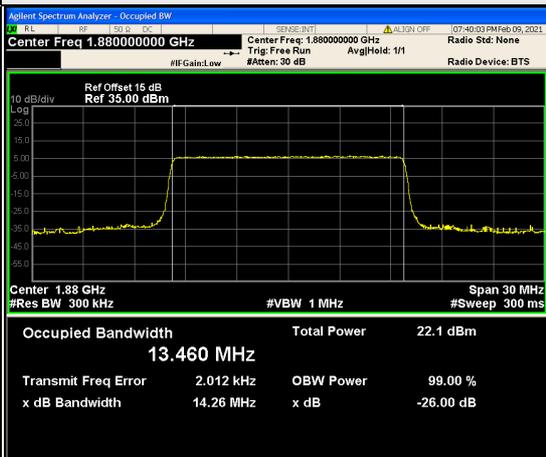
#### 5MHz / 64QAM



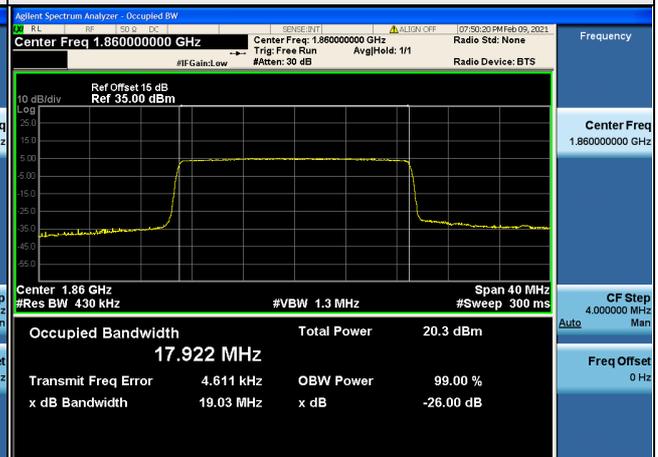
#### 10MHz / 64QAM



#### 15MHz / QPSK



#### 20MHz / 16QAM

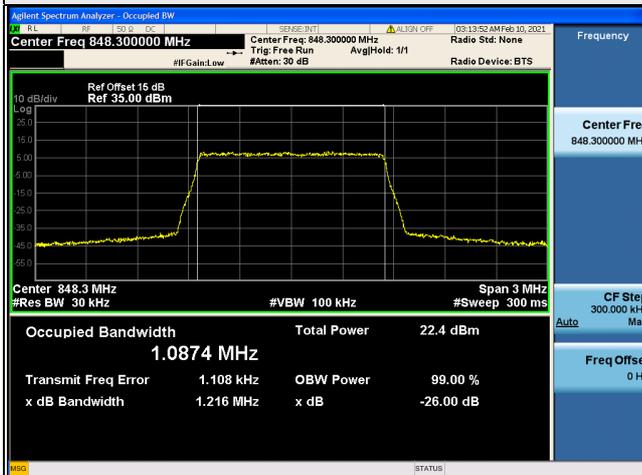


LTE Band 5

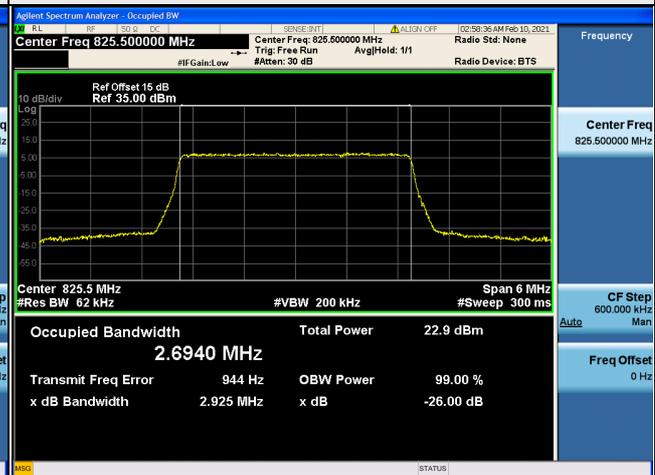
LTE Band 5, Channel Bandwidth 1.4MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20407	824.7	1.206	1.215	1.213	1.211
20525	836.5	1.216	1.213	1.212	1.209
20643	848.3	1.211	1.211	1.216	1.210
LTE Band 5, Channel Bandwidth 3MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20415	825.5	2.911	2.925	2.905	2.911
20525	836.5	2.914	2.923	2.904	2.915
20635	847.5	2.920	2.922	2.910	2.915
LTE Band 5, Channel Bandwidth 5MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20425	826.5	4.789	4.805	4.827	4.799
20525	836.5	4.795	4.812	4.831	4.787
20625	846.5	4.806	4.797	4.812	4.800
LTE Band 5, Channel Bandwidth 10MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20450	829.0	9.486	9.497	9.506	9.498
20525	836.5	9.500	9.505	9.512	9.498
20600	844.0	9.480	9.490	9.497	9.492

### Spectrum Plot of Worst Value

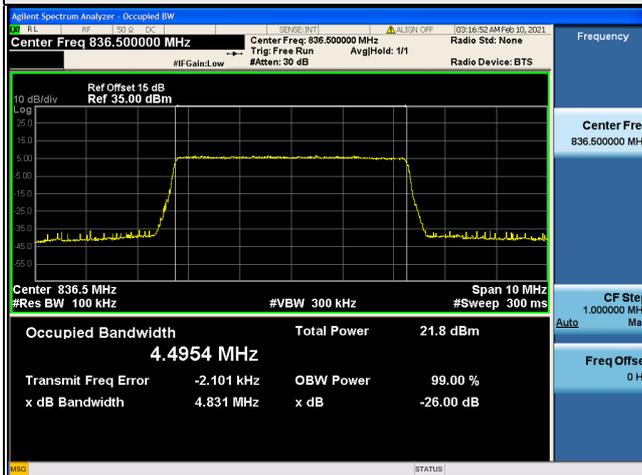
1.4MHz / 64QAM



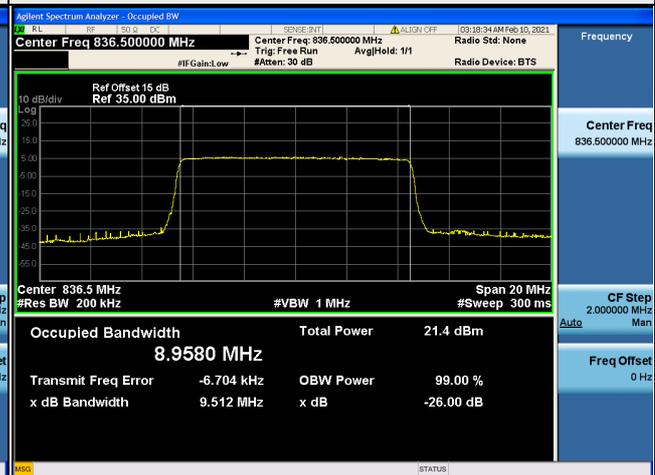
3MHz / 16QAM



5MHz / 64QAM



10MHz / 64QAM

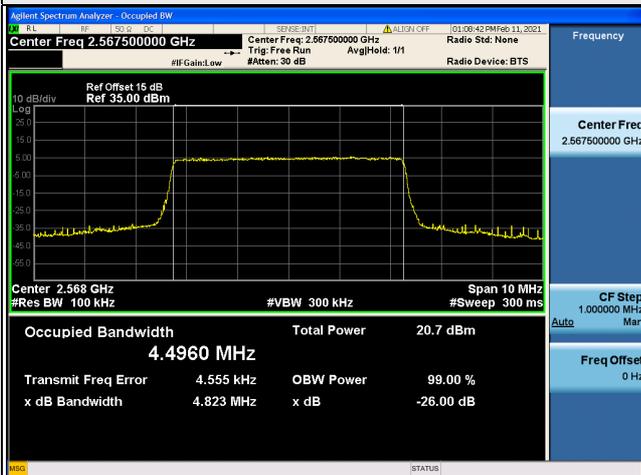


LTE Band 7

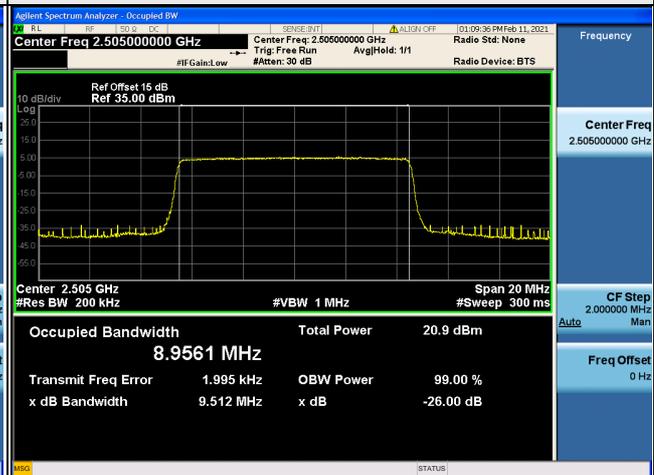
LTE Band 7, Channel Bandwidth 5MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20775	2502.5	4.802	4.798	4.785	4.814
21100	2535.0	4.798	4.796	4.814	4.788
21425	2567.5	4.807	4.797	4.823	4.791
LTE Band 7, Channel Bandwidth 10MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20800	2505.0	9.504	9.496	9.512	9.500
21100	2535.0	9.490	9.502	9.506	9.498
21400	2565.0	9.488	9.503	9.488	9.495
LTE Band 7, Channel Bandwidth 15MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20825	2507.5	14.250	14.220	14.220	14.250
21100	2535.0	14.260	14.240	14.230	14.220
21375	2562.5	14.230	14.230	14.220	14.240
LTE Band 7, Channel Bandwidth 20MHz					
Channel	Frequency (MHz)	26dB Bandwidth (MHz)			
		QPSK	16QAM	64QAM	256QAM
20850	2510.0	19.000	19.010	19.000	19.000
21100	2535.0	19.010	19.000	19.020	19.000
21350	2560.0	19.020	19.010	19.020	19.020

### Spectrum Plot of Worst Value

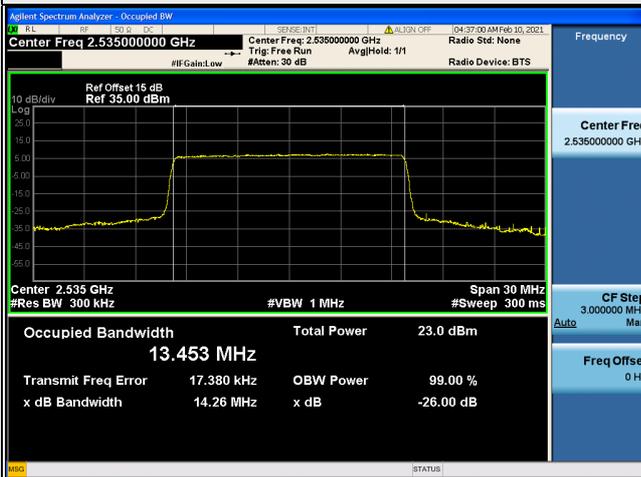
#### 5MHz / 64QAM



#### 10MHz / 64QAM



#### 15MHz / QPSK



#### 20MHz / 64QAM

