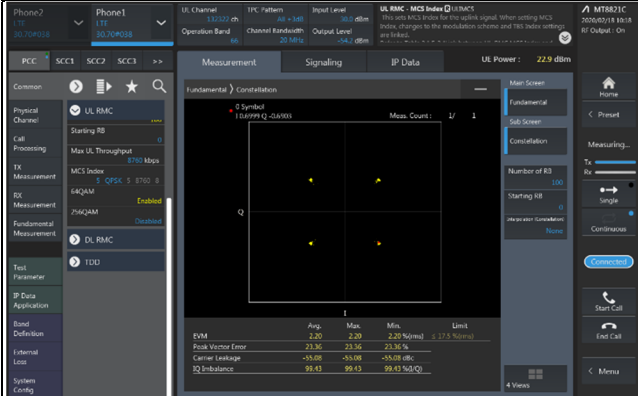


LTE Band 66

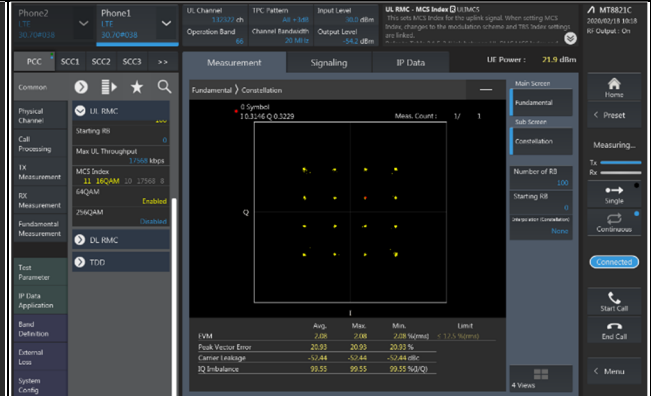
Spectrum Plot of Measurement Value

Channel: 132322 / Frequency (MHz): 1745.0 MHz

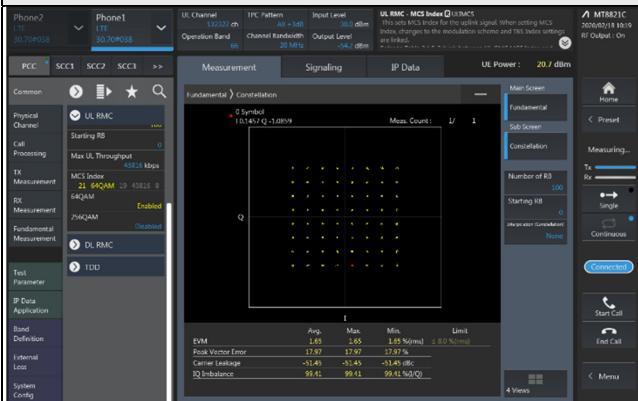
QPSK



16QAM



64QAM

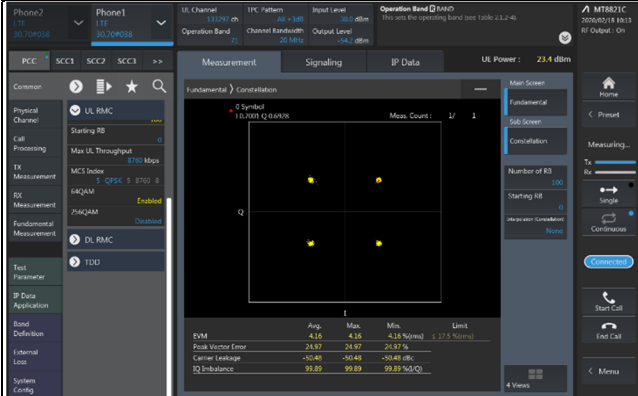


LTE Band 71

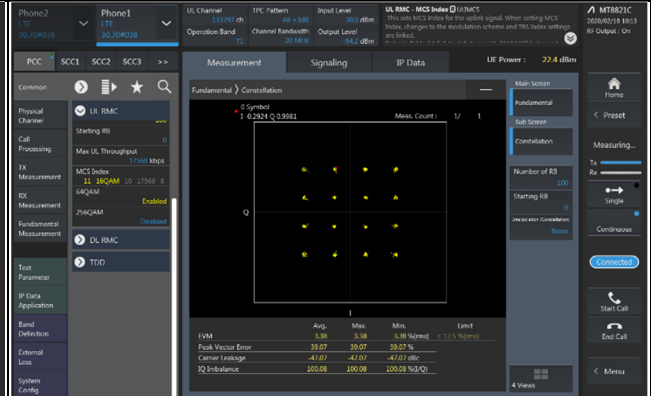
Spectrum Plot of Measurement Value

Channel: 133297 / Frequency (MHz): 680.5 MHz

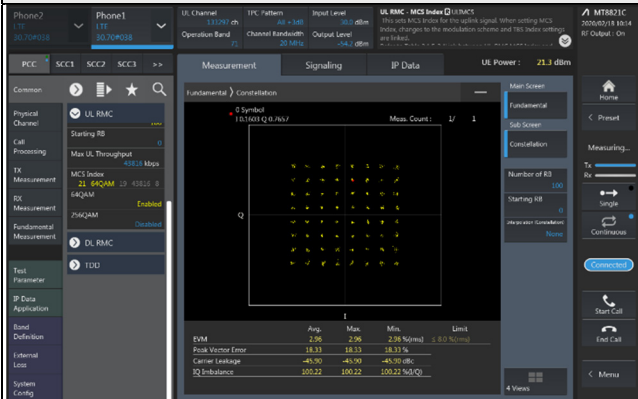
QPSK



16QAM



64QAM



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

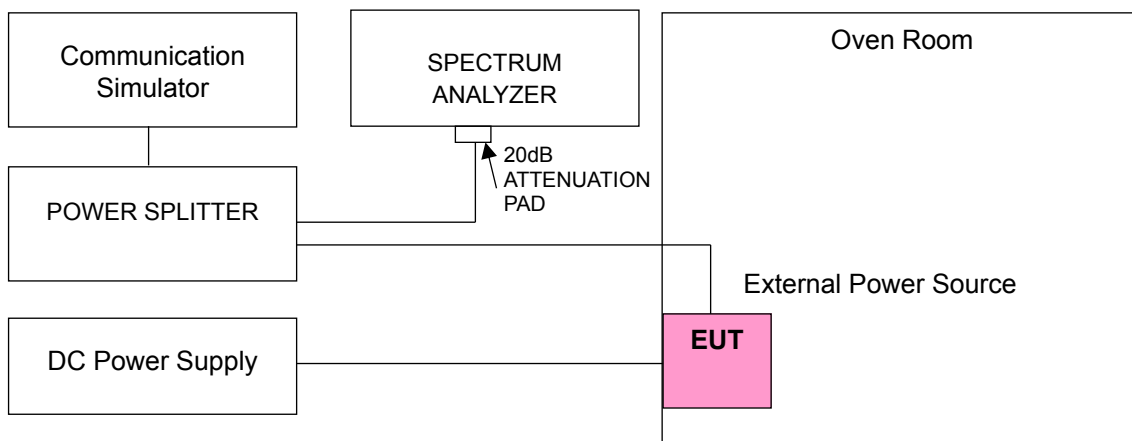
According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that "The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with specification of EUT $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$.

4.3.2 Test Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA Band 4			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1712.400003	0.002	1752.600004	0.002
5	1712.400003	0.002	1752.600002	0.001
5.75	1712.400004	0.002	1752.600003	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	WCDMA Band 4			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1712.400004	0.002	1752.600003	0.002
-20	1712.400002	0.001	1752.600002	0.001
-10	1712.400002	0.001	1752.600001	0.001
0	1712.400004	0.002	1752.600004	0.002
10	1712.400001	0.001	1752.600003	0.002
20	1712.399999	-0.001	1752.599997	-0.002
30	1712.399999	-0.001	1752.599997	-0.002
40	1712.399998	-0.001	1752.599996	-0.002
50	1712.399998	-0.001	1752.599998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1710.700003	0.002	1754.300004	0.002
5	1710.700004	0.002	1754.300002	0.001
5.75	1710.700001	0.001	1754.300003	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1710.700003	0.002	1754.300004	0.002
-20	1710.700003	0.002	1754.300001	0.001
-10	1710.700001	0.001	1754.300002	0.001
0	1710.700004	0.002	1754.300004	0.002
10	1710.700002	0.001	1754.300002	0.001
20	1710.699998	-0.001	1754.299998	-0.001
30	1710.699996	-0.002	1754.299998	-0.001
40	1710.699997	-0.002	1754.299996	-0.002
50	1710.699999	-0.001	1754.299998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1711.500003	0.002	1753.500004	0.002
5	1711.500003	0.002	1753.500002	0.001
5.75	1711.500004	0.002	1753.500004	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1711.500001	0.001	1753.500004	0.002
-20	1711.500001	0.001	1753.500002	0.001
-10	1711.500003	0.002	1753.500003	0.002
0	1711.500002	0.001	1753.500002	0.001
10	1711.500001	0.001	1753.500003	0.002
20	1711.499996	-0.002	1753.499998	-0.001
30	1711.499998	-0.001	1753.499999	-0.001
40	1711.499996	-0.002	1753.499998	-0.001
50	1711.499998	-0.001	1753.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1712.500004	0.002	1752.500004	0.002
5	1712.500003	0.002	1752.500003	0.001
5.75	1712.500001	0.001	1752.500002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1712.500002	0.001	1752.500003	0.002
-20	1712.500004	0.002	1752.500001	0.001
-10	1712.500001	0.001	1752.500002	0.001
0	1712.500001	0.001	1752.500002	0.001
10	1712.500001	0.001	1752.500003	0.002
20	1712.499997	-0.002	1752.499999	-0.001
30	1712.499997	-0.002	1752.499998	-0.001
40	1712.499997	-0.002	1752.499997	-0.002
50	1712.499998	-0.001	1752.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1715.000002	0.001	1750.000002	0.001
5	1715.000002	0.001	1750.000002	0.001
5.75	1715.000004	0.002	1750.000001	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1715.000003	0.002	1750.000003	0.002
-20	1715.000003	0.002	1750.000001	0.001
-10	1715.000001	0.001	1750.000002	0.001
0	1715.000002	0.001	1750.000002	0.001
10	1715.000002	0.001	1750.000003	0.002
20	1714.999997	-0.002	1749.999996	-0.002
30	1714.999997	-0.002	1749.999998	-0.001
40	1714.999997	-0.002	1749.999997	-0.002
50	1714.999998	-0.001	1749.999999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1717.500003	0.001	1747.500004	0.002
5	1717.500003	0.002	1747.500002	0.001
5.75	1717.500002	0.001	1747.500004	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1717.500001	0.001	1747.500003	0.002
-20	1717.500002	0.001	1747.500002	0.001
-10	1717.500002	0.001	1747.500004	0.002
0	1717.500003	0.002	1747.500002	0.001
10	1717.500002	0.001	1747.500003	0.002
20	1717.499998	-0.001	1747.499999	-0.001
30	1717.499998	-0.001	1747.499998	-0.001
40	1717.499999	-0.001	1747.499998	-0.001
50	1717.499997	-0.002	1747.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1720.000004	0.002	1745.000003	0.002
5	1720.000002	0.001	1745.000003	0.002
5.75	1720.000004	0.002	1745.000002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1720.000001	0.001	1745.000001	0.001
-20	1720.000004	0.002	1745.000003	0.002
-10	1720.000003	0.002	1745.000004	0.002
0	1720.000003	0.002	1745.000003	0.002
10	1720.000004	0.002	1745.000003	0.002
20	1719.999996	-0.002	1744.999999	-0.001
30	1719.999997	-0.002	1744.999998	-0.001
40	1719.999997	-0.002	1744.999999	-0.001
50	1719.999999	-0.001	1744.999998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2502.500002	0.001	2567.500004	0.002
5	2502.500003	0.001	2567.500003	0.001
5.75	2502.500001	0.001	2567.500003	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2502.500004	0.001	2567.500002	0.001
-20	2502.500001	0.001	2567.500003	0.001
-10	2502.500002	0.001	2567.500002	0.001
0	2502.500003	0.001	2567.500004	0.002
10	2502.500003	0.001	2567.500002	0.001
20	2502.499999	-0.001	2567.499999	0.000
30	2502.499999	-0.001	2567.499998	-0.001
40	2502.499999	0.000	2567.499999	0.000
50	2502.499997	-0.001	2567.499997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2505.000004	0.001	2565.000002	0.001
5	2505.000004	0.001	2565.000004	0.001
5.75	2505.000001	0.001	2565.000003	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2505.000003	0.001	2565.000001	0.000
-20	2505.000001	0.001	2565.000003	0.001
-10	2505.000001	0.000	2565.000002	0.001
0	2505.000003	0.001	2565.000004	0.001
10	2505.000002	0.001	2565.000004	0.002
20	2504.999999	0.000	2564.999997	-0.001
30	2504.999999	-0.001	2564.999997	-0.001
40	2504.999998	-0.001	2564.999997	-0.001
50	2504.999999	-0.001	2564.999997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2507.500002	0.001	2562.500002	0.001
5	2507.500001	0.000	2562.500003	0.001
5.75	2507.500001	0.000	2562.500002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2507.500004	0.001	2562.500002	0.001
-20	2507.500003	0.001	2562.500004	0.001
-10	2507.500002	0.001	2562.500004	0.001
0	2507.500004	0.001	2562.500001	0.000
10	2507.500002	0.001	2562.500002	0.001
20	2507.499997	-0.001	2562.499999	-0.001
30	2507.499999	-0.001	2562.499999	0.000
40	2507.499998	-0.001	2562.499999	-0.001
50	2507.499997	-0.001	2562.499997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2510.000004	0.001	2560.000003	0.001
5	2510.000003	0.001	2560.000001	0.000
5.75	2510.000003	0.001	2560.000003	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2510.000002	0.001	2560.000003	0.001
-20	2510.000004	0.001	2560.000003	0.001
-10	2510.000004	0.001	2560.000002	0.001
0	2510.000003	0.001	2560.000002	0.001
10	2510.000002	0.001	2560.000002	0.001
20	2509.999997	-0.001	2559.999996	-0.001
30	2509.999998	-0.001	2559.999997	-0.001
40	2509.999998	-0.001	2559.999996	-0.001
50	2509.999997	-0.001	2559.999999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	699.700004	0.005	715.300002	0.003
5	699.700001	0.002	715.300003	0.004
5.75	699.700003	0.004	715.300002	0.003

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	699.700001	0.002	715.300004	0.006
-20	699.700003	0.005	715.300001	0.001
-10	699.700003	0.004	715.300003	0.004
0	699.700003	0.004	715.300002	0.002
10	699.700004	0.005	715.300004	0.005
20	699.699997	-0.005	715.299997	-0.005
30	699.699996	-0.006	715.299996	-0.005
40	699.699998	-0.003	715.299997	-0.004
50	699.699997	-0.004	715.299997	-0.004

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	700.500003	0.005	714.500003	0.004
5	700.500003	0.004	714.500003	0.004
5.75	700.500002	0.002	714.500002	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	700.500003	0.005	714.500003	0.004
-20	700.500002	0.003	714.500002	0.003
-10	700.500004	0.006	714.500003	0.005
0	700.500001	0.001	714.500003	0.004
10	700.500001	0.002	714.500002	0.002
20	700.499997	-0.005	714.499996	-0.006
30	700.499998	-0.003	714.499997	-0.005
40	700.499998	-0.003	714.499997	-0.004
50	700.499997	-0.005	714.499998	-0.003

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	701.500001	0.001	713.500002	0.002
5	701.500002	0.002	713.500001	0.002
5.75	701.500001	0.002	713.500003	0.004

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	701.500003	0.004	713.500002	0.002
-20	701.500003	0.004	713.500003	0.005
-10	701.500004	0.006	713.500001	0.002
0	701.500002	0.003	713.500003	0.004
10	701.500004	0.005	713.500003	0.004
20	701.499998	-0.003	713.499997	-0.004
30	701.499999	-0.002	713.499999	-0.002
40	701.499998	-0.003	713.499997	-0.005
50	701.499996	-0.005	713.499996	-0.005

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	704.000002	0.003	711.000002	0.003
5	704.000002	0.003	711.000003	0.004
5.75	704.000001	0.001	711.000003	0.005

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	704.000002	0.002	711.000002	0.003
-20	704.000002	0.003	711.000001	0.002
-10	704.000003	0.004	711.000001	0.002
0	704.000003	0.005	711.000002	0.003
10	704.000004	0.005	711.000003	0.004
20	703.999996	-0.006	710.999999	-0.002
30	703.999998	-0.004	710.999996	-0.005
40	703.999997	-0.004	710.999996	-0.005
50	703.999998	-0.003	710.999996	-0.005

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	779.500003	0.003	784.500004	0.005
5	779.500001	0.001	784.500001	0.002
5.75	779.500002	0.002	784.500003	0.004

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 13			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	779.500002	0.002	784.500002	0.002
-20	779.500002	0.003	784.500004	0.005
-10	779.500004	0.005	784.500001	0.002
0	779.500004	0.005	784.500004	0.005
10	779.500003	0.003	784.500002	0.002
20	779.499997	-0.004	784.499999	-0.002
30	779.499996	-0.005	784.499998	-0.002
40	779.499998	-0.002	784.499997	-0.004
50	779.499996	-0.005	784.499997	-0.004

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
4.25	782.000004	0.005
5	782.000003	0.004
5.75	782.000001	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 13	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
-30	782.000004	0.005
-20	782.000003	0.003
-10	782.000003	0.004
0	782.000004	0.004
10	782.000002	0.002
20	781.999999	-0.001
30	781.999998	-0.003
40	781.999999	-0.001
50	781.999999	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	706.500002	0.003	713.500001	0.002
5	706.500002	0.002	713.500002	0.002
5.75	706.500003	0.004	713.500001	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 17			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	706.500001	0.002	713.500004	0.005
-20	706.500003	0.004	713.500003	0.004
-10	706.500002	0.003	713.500003	0.005
0	706.500003	0.004	713.500002	0.002
10	706.500003	0.005	713.500003	0.004
20	706.499997	-0.004	713.499997	-0.004
30	706.499998	-0.003	713.499997	-0.005
40	706.499996	-0.006	713.499997	-0.005
50	706.499998	-0.002	713.499996	-0.005

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	709.000002	0.003	711.000002	0.002
5	709.000002	0.002	711.000002	0.003
5.75	709.000001	0.002	711.000001	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 17			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	709.000003	0.004	711.000001	0.002
-20	709.000004	0.005	711.000004	0.006
-10	709.000001	0.002	711.000001	0.001
0	709.000003	0.004	711.000001	0.002
10	709.000004	0.005	711.000003	0.004
20	708.999999	-0.002	710.999997	-0.005
30	708.999998	-0.002	710.999997	-0.004
40	708.999996	-0.005	710.999998	-0.003
50	708.999997	-0.005	710.999997	-0.005

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 30			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2307.500001	0.000	2312.500001	0.001
5	2307.500003	0.001	2312.500002	0.001
5.75	2307.500004	0.002	2312.500001	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 30			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2307.500002	0.001	2312.500002	0.001
-20	2307.500003	0.001	2312.500002	0.001
-10	2307.500002	0.001	2312.500001	0.000
0	2307.500003	0.001	2312.500001	0.000
10	2307.500004	0.002	2312.500002	0.001
20	2307.499998	-0.001	2312.499998	-0.001
30	2307.499998	-0.001	2312.499998	-0.001
40	2307.499997	-0.001	2312.499998	-0.001
50	2307.499998	-0.001	2312.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 30	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
4.25	2310.000003	0.001
5	2310.000004	0.002
5.75	2310.000001	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 30	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
-30	2310.000003	0.001
-20	2310.000003	0.001
-10	2310.000003	0.001
0	2310.000003	0.001
10	2310.000003	0.001
20	2309.999997	-0.001
30	2309.999999	-0.001
40	2309.999999	-0.001
50	2309.999998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 38			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2572.500003	0.001	2617.500001	0.000
5	2572.500002	0.001	2617.500003	0.001
5.75	2572.500003	0.001	2617.500002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 38			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2572.500002	0.001	2617.500002	0.001
-20	2572.500002	0.001	2617.500002	0.001
-10	2572.500004	0.001	2617.500002	0.001
0	2572.500002	0.001	2617.500004	0.001
10	2572.500003	0.001	2617.500002	0.001
20	2572.499997	-0.001	2617.499998	-0.001
30	2572.499997	-0.001	2617.499999	0.000
40	2572.499998	-0.001	2617.499997	-0.001
50	2572.499997	-0.001	2617.499997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 38			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2575.000003	0.001	2615.000001	0.000
5	2575.000003	0.001	2615.000001	0.000
5.75	2575.000003	0.001	2615.000004	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 38			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2575.000001	0.000	2615.000003	0.001
-20	2575.000004	0.001	2615.000003	0.001
-10	2575.000003	0.001	2615.000002	0.001
0	2575.000002	0.001	2615.000001	0.000
10	2575.000004	0.001	2615.000003	0.001
20	2574.999998	-0.001	2614.999998	-0.001
30	2574.999998	-0.001	2614.999998	-0.001
40	2574.999999	0.000	2614.999997	-0.001
50	2574.999999	0.000	2614.999997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 38			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2577.500002	0.001	2612.500003	0.001
5	2577.500003	0.001	2612.500002	0.001
5.75	2577.500001	0.000	2612.500002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 38			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2577.500003	0.001	2612.500002	0.001
-20	2577.500004	0.002	2612.500002	0.001
-10	2577.500002	0.001	2612.500002	0.001
0	2577.500001	0.001	2612.500003	0.001
10	2577.500001	0.000	2612.500004	0.001
20	2577.499996	-0.001	2612.499996	-0.001
30	2577.499998	-0.001	2612.499998	-0.001
40	2577.499998	-0.001	2612.499998	-0.001
50	2577.499997	-0.001	2612.499997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 38			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2580.000003	0.001	2610.000002	0.001
5	2580.000003	0.001	2610.000004	0.001
5.75	2580.000002	0.001	2610.000000	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 38			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2580.000002	0.001	2610.000001	0.000
-20	2580.000002	0.001	2610.000002	0.001
-10	2580.000003	0.001	2610.000002	0.001
0	2580.000002	0.001	2610.000003	0.001
10	2580.000002	0.001	2610.000002	0.001
20	2579.999997	-0.001	2609.999998	-0.001
30	2579.999997	-0.001	2609.999997	-0.001
40	2579.999996	-0.001	2609.999998	-0.001
50	2579.999998	-0.001	2609.999998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2498.500001	0.001	2687.500001	0.000
5	2498.500003	0.001	2687.500002	0.001
5.75	2498.500002	0.001	2687.500003	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 41			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2498.500003	0.001	2687.500004	0.001
-20	2498.500003	0.001	2687.500003	0.001
-10	2498.500004	0.002	2687.500003	0.001
0	2498.500002	0.001	2687.500001	0.000
10	2498.500004	0.001	2687.500002	0.001
20	2498.499998	-0.001	2687.499999	0.000
30	2498.499999	-0.001	2687.499997	-0.001
40	2498.499997	-0.001	2687.499998	-0.001
50	2498.499998	-0.001	2687.499999	0.000

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2501.000004	0.002	2685.000003	0.001
5	2501.000003	0.001	2685.000002	0.001
5.75	2501.000003	0.001	2685.000002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 41			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2501.000004	0.002	2685.000003	0.001
-20	2501.000002	0.001	2685.000003	0.001
-10	2501.000001	0.001	2685.000002	0.001
0	2501.000002	0.001	2685.000002	0.001
10	2501.000002	0.001	2685.000001	0.000
20	2500.999999	0.000	2684.999997	-0.001
30	2500.999997	-0.001	2684.999998	-0.001
40	2500.999999	0.000	2684.999997	-0.001
50	2500.999997	-0.001	2684.999996	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2503.500003	0.001	2682.500001	0.000
5	2503.500002	0.001	2682.500004	0.001
5.75	2503.500001	0.000	2682.500003	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 41			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2503.500003	0.001	2682.500004	0.001
-20	2503.500004	0.002	2682.500004	0.001
-10	2503.500003	0.001	2682.500003	0.001
0	2503.500003	0.001	2682.500002	0.001
10	2503.500001	0.000	2682.500003	0.001
20	2503.499999	-0.001	2682.499997	-0.001
30	2503.499997	-0.001	2682.499999	0.000
40	2503.499998	-0.001	2682.499998	-0.001
50	2503.499998	-0.001	2682.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	2506.000004	0.001	2680.000004	0.001
5	2506.000001	0.000	2680.000003	0.001
5.75	2506.000002	0.001	2680.000002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 41			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2506.000004	0.001	2680.000001	0.000
-20	2506.000002	0.001	2680.000002	0.001
-10	2506.000001	0.001	2680.000004	0.001
0	2506.000003	0.001	2680.000001	0.000
10	2506.000003	0.001	2680.000004	0.001
20	2505.999998	-0.001	2679.999998	-0.001
30	2505.999998	-0.001	2679.999998	-0.001
40	2505.999997	-0.001	2679.999996	-0.001
50	2505.999998	-0.001	2679.999996	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1710.700002	0.001	1779.300004	0.002
5	1710.700002	0.001	1779.300003	0.002
5.75	1710.700001	0.001	1779.300003	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1710.700002	0.001	1779.300003	0.002
-20	1710.700003	0.002	1779.300003	0.002
-10	1710.700002	0.001	1779.300001	0.001
0	1710.700004	0.002	1779.300002	0.001
10	1710.700003	0.002	1779.300003	0.001
20	1710.699999	-0.001	1779.299998	-0.001
30	1710.699998	-0.001	1779.299997	-0.002
40	1710.699997	-0.002	1779.299998	-0.001
50	1710.699996	-0.002	1779.299997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1711.500004	0.002	1778.500003	0.002
5	1711.500003	0.002	1778.500003	0.001
5.75	1711.500004	0.002	1778.500003	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1711.500001	0.001	1778.500003	0.002
-20	1711.500001	0.001	1778.500003	0.001
-10	1711.500002	0.001	1778.500003	0.001
0	1711.500003	0.001	1778.500003	0.002
10	1711.500004	0.002	1778.500002	0.001
20	1711.499997	-0.002	1778.499998	-0.001
30	1711.499998	-0.001	1778.499996	-0.002
40	1711.499997	-0.002	1778.499998	-0.001
50	1711.499998	-0.001	1778.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1712.500002	0.001	1777.500004	0.002
5	1712.500002	0.001	1777.500003	0.002
5.75	1712.500002	0.001	1777.500004	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1712.500001	0.001	1777.500004	0.002
-20	1712.500002	0.001	1777.500003	0.002
-10	1712.500002	0.001	1777.500003	0.002
0	1712.500003	0.002	1777.500001	0.001
10	1712.500001	0.001	1777.500001	0.001
20	1712.499998	-0.001	1777.499996	-0.002
30	1712.499998	-0.001	1777.499998	-0.001
40	1712.499996	-0.002	1777.499999	-0.001
50	1712.499998	-0.001	1777.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1715.000003	0.002	1775.000004	0.002
5	1715.000002	0.001	1775.000002	0.001
5.75	1715.000002	0.001	1775.000003	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1715.000001	0.001	1775.000003	0.002
-20	1715.000002	0.001	1775.000003	0.002
-10	1715.000002	0.001	1775.000003	0.001
0	1715.000002	0.001	1775.000002	0.001
10	1715.000004	0.002	1775.000002	0.001
20	1714.999996	-0.002	1774.999998	-0.001
30	1714.999999	-0.001	1774.999999	-0.001
40	1714.999998	-0.001	1774.999998	-0.001
50	1714.999997	-0.002	1774.999997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1717.500001	0.001	1772.500002	0.001
5	1717.500002	0.001	1772.500003	0.001
5.75	1717.500003	0.002	1772.500002	0.001

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1717.500003	0.001	1772.500003	0.002
-20	1717.500004	0.002	1772.500002	0.001
-10	1717.500004	0.002	1772.500003	0.002
0	1717.500003	0.002	1772.500001	0.001
10	1717.500003	0.002	1772.500003	0.002
20	1717.499998	-0.001	1772.499999	-0.001
30	1717.499996	-0.002	1772.499996	-0.002
40	1717.499997	-0.002	1772.499999	-0.001
50	1717.499998	-0.001	1772.499999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1720.000002	0.001	1770.000003	0.002
5	1720.000002	0.001	1770.000001	0.001
5.75	1720.000004	0.002	1770.000003	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1720.000003	0.002	1770.000004	0.002
-20	1720.000004	0.002	1770.000002	0.001
-10	1720.000003	0.002	1770.000002	0.001
0	1720.000001	0.001	1770.000004	0.002
10	1720.000004	0.002	1770.000002	0.001
20	1719.999999	-0.001	1769.999999	-0.001
30	1719.999997	-0.002	1769.999996	-0.002
40	1719.999997	-0.002	1769.999997	-0.002
50	1719.999999	-0.001	1769.999998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 71			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	665.500004	0.006	695.500001	0.002
5	665.500001	0.002	695.500001	0.002
5.75	665.500003	0.005	695.500001	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 71			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	665.500001	0.002	695.500004	0.005
-20	665.500002	0.003	695.500004	0.005
-10	665.500003	0.004	695.500001	0.002
0	665.500003	0.005	695.500003	0.005
10	665.500004	0.006	695.500002	0.002
20	665.499999	-0.002	695.499998	-0.002
30	665.499998	-0.004	695.499997	-0.004
40	665.499998	-0.003	695.499996	-0.005
50	665.499998	-0.002	695.499999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 71			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	668.000001	0.002	693.000002	0.003
5	668.000003	0.005	693.000002	0.003
5.75	668.000002	0.003	693.000003	0.004

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 71			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	668.000003	0.004	693.000004	0.006
-20	668.000001	0.002	693.000004	0.005
-10	668.000002	0.002	693.000002	0.003
0	668.000001	0.002	693.000002	0.003
10	668.000003	0.004	693.000004	0.005
20	667.999998	-0.003	692.999999	-0.002
30	667.999996	-0.006	692.999997	-0.005
40	667.999996	-0.006	692.999999	-0.002
50	667.999997	-0.004	692.999999	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 71			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	670.500004	0.006	690.500003	0.005
5	670.500001	0.002	690.500001	0.002
5.75	670.500003	0.004	690.500002	0.003

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 71			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	670.500002	0.003	690.500003	0.004
-20	670.500002	0.002	690.500004	0.006
-10	670.500003	0.004	690.500003	0.004
0	670.500003	0.004	690.500003	0.004
10	670.500004	0.005	690.500003	0.004
20	670.499998	-0.003	690.499996	-0.005
30	670.499996	-0.005	690.499996	-0.006
40	670.499999	-0.002	690.499998	-0.003
50	670.499998	-0.002	690.499998	-0.003

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 71			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	673.000001	0.001	688.000003	0.004
5	673.000003	0.005	688.000003	0.005
5.75	673.000003	0.005	688.000001	0.002

Note: The applicant defined the normal working voltage is from 4.25Vdc to 5.75Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 71			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	673.000002	0.002	688.000003	0.005
-20	673.000004	0.006	688.000002	0.002
-10	673.000003	0.004	688.000002	0.003
0	673.000004	0.006	688.000003	0.004
10	673.000002	0.002	688.000002	0.003
20	672.999999	-0.002	687.999998	-0.004
30	672.999996	-0.006	687.999999	-0.002
40	672.999997	-0.005	687.999997	-0.005
50	672.999997	-0.005	687.999999	-0.002

4.4 Occupied Bandwidth Measurement

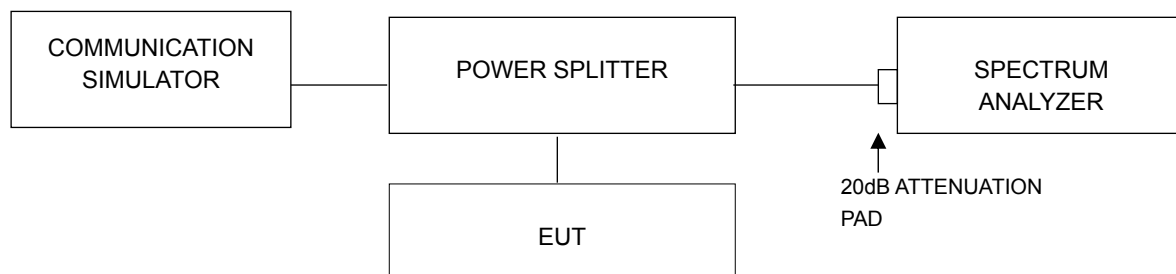
4.4.1 Limits of Occupied Bandwidth Measurement

The occupied bandwidth (OBW), 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 % of the total mean power radiated by a given emission.

4.4.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 51kHz and VBW = 150kHz for WCDMA; with RBW = 30kHz and VBW = 100kHz (Channel Bandwidth: 1.4MHz), RBW = 62kHz and VBW = 200kHz (Channel Bandwidth: 3MHz), RBW = 100kHz and VBW = 300kHz (Channel Bandwidth: 5MHz), RBW = 200kHz and VBW = 1MHz (Channel Bandwidth: 10MHz), RBW = 300kHz and VBW = 1MHz (Channel Bandwidth: 15MHz) and RBW = 430kHz and VBW = 1.3MHz (Channel Bandwidth: 20MHz). The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

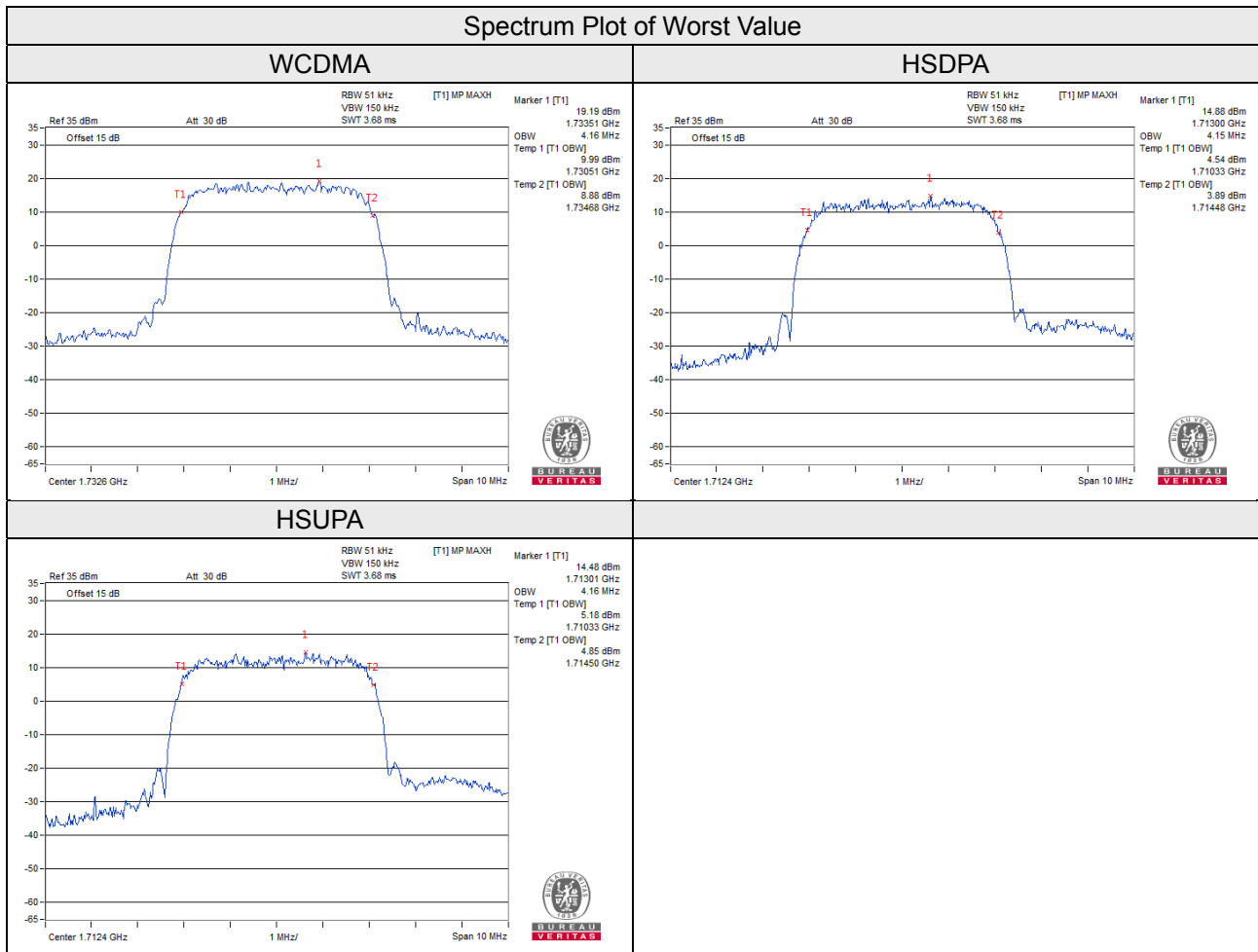
4.4.3 Test Setup



4.4.4 Test Result

Occupied Bandwidth WCDMA Band 4

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		WCDMA	HSDPA	HSUPA
1312	1712.4	4.15	4.15	4.16
1413	1732.6	4.16	4.15	4.16
1513	1752.6	4.15	4.15	4.13



LTE Band 4

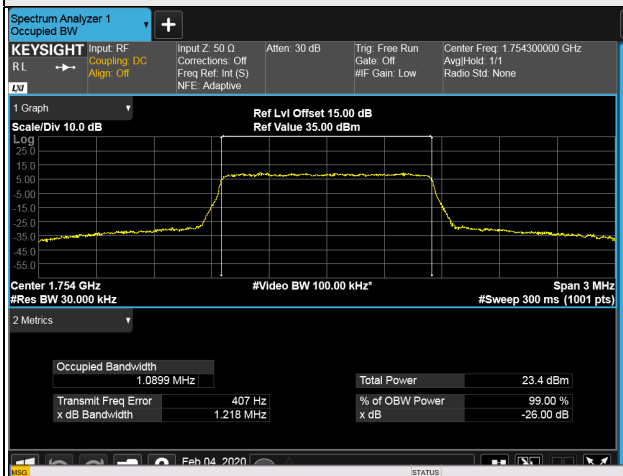
LTE Band 4, Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19957	1710.7	1.09	1.09	1.09
20175	1732.5	1.09	1.09	1.09
20393	1754.3	1.09	1.09	1.09
LTE Band 4, Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19965	1711.5	2.70	2.70	2.70
20175	1732.5	2.70	2.69	2.70
20385	1753.5	2.70	2.70	2.70
LTE Band 4, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19975	1712.5	4.49	4.49	4.49
20175	1732.5	4.49	4.49	4.49
20375	1752.5	4.49	4.49	4.49
LTE Band 4, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20000	1715.0	8.96	8.97	8.96
20175	1732.5	8.96	8.96	8.95
20350	1750.0	8.95	8.96	8.95
LTE Band 4, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20025	1717.5	13.46	13.44	13.44
20175	1732.5	13.46	13.45	13.44
20325	1747.5	13.46	13.45	13.44

LTE Band 4, Channel Bandwidth 20MHz

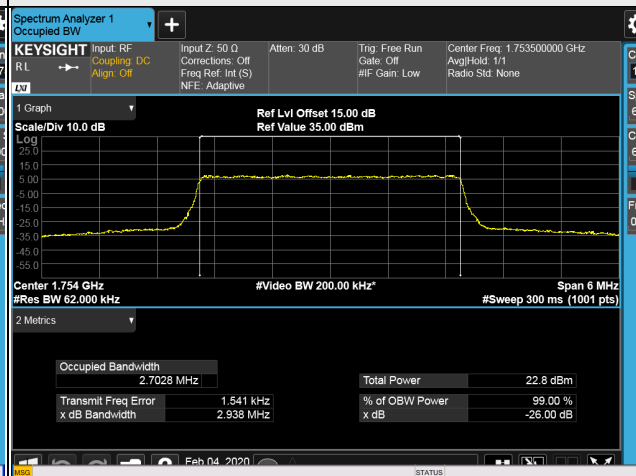
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20050	1720.0	17.91	17.92	17.91
20175	1732.5	17.93	17.95	17.95
20300	1745.0	17.93	17.97	17.96

Spectrum Plot of Worst Value

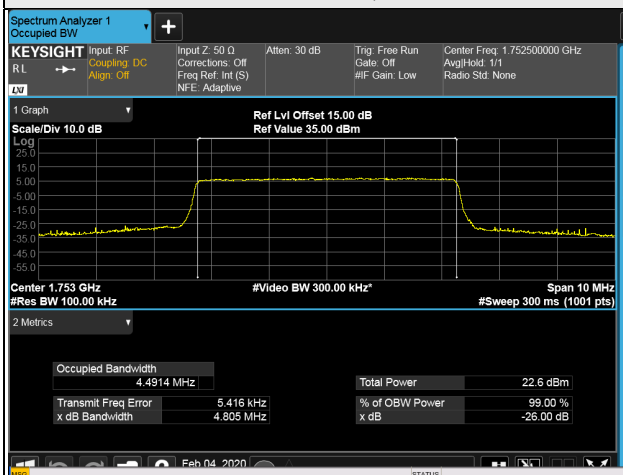
1.4MHz / 16QAM



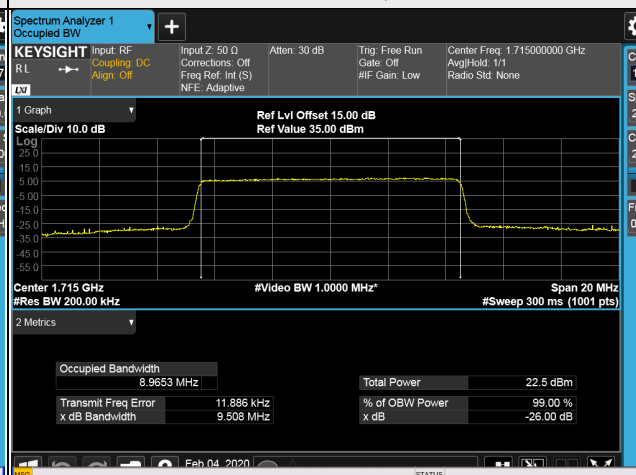
3MHz / 64QAM



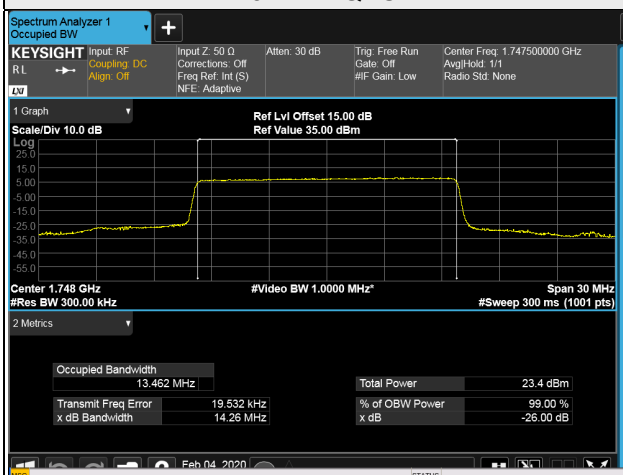
5MHz / 64QAM



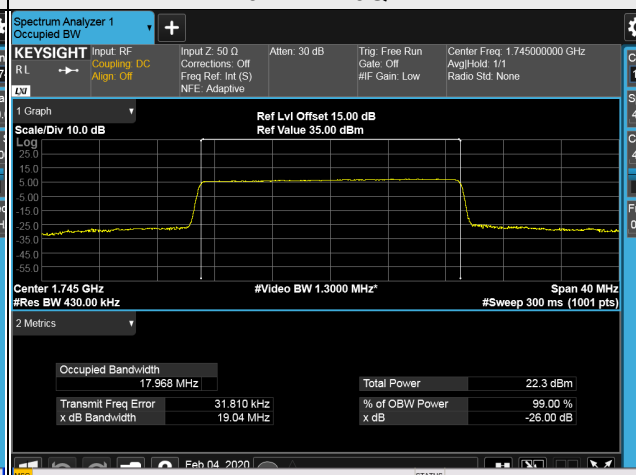
10MHz / 16QAM



15MHz / QPSK



20MHz / 16QAM

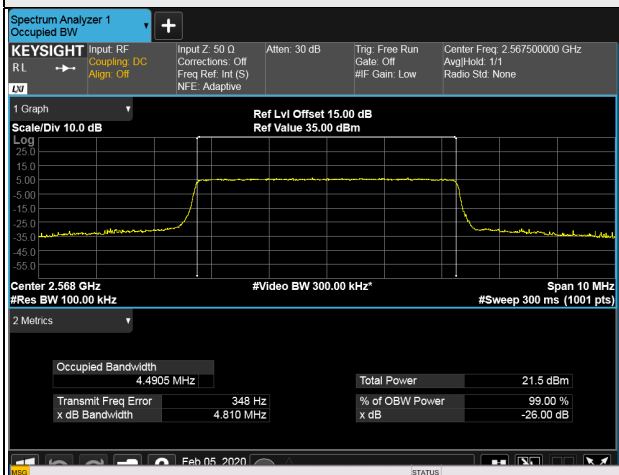


LTE Band 7

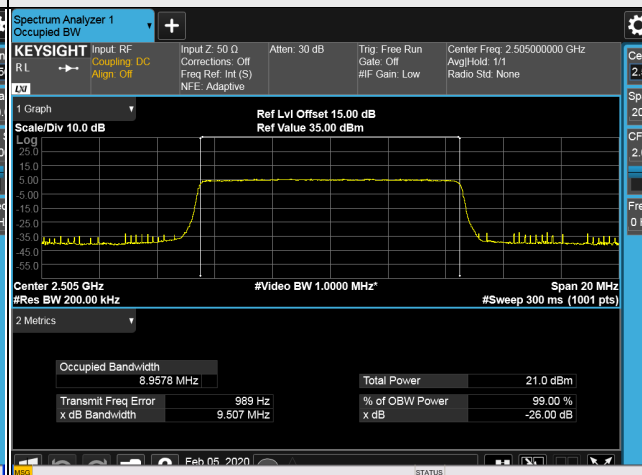
LTE Band 7, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20775	2502.5	4.49	4.49	4.49
21100	2535.0	4.49	4.49	4.49
21425	2567.5	4.49	4.49	4.49
LTE Band 7, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20800	2505.0	8.95	8.96	8.95
21100	2535.0	8.96	8.96	8.95
21400	2565.0	8.96	8.95	8.95
LTE Band 7, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20825	2507.5	13.45	13.44	13.43
21100	2535.0	13.45	13.44	13.44
21375	2562.5	13.45	13.44	13.43
LTE Band 7, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20850	2510.0	17.90	17.91	17.91
21100	2535.0	17.92	17.93	17.94
21350	2560.0	17.91	17.92	17.93

Spectrum Plot of Worst Value

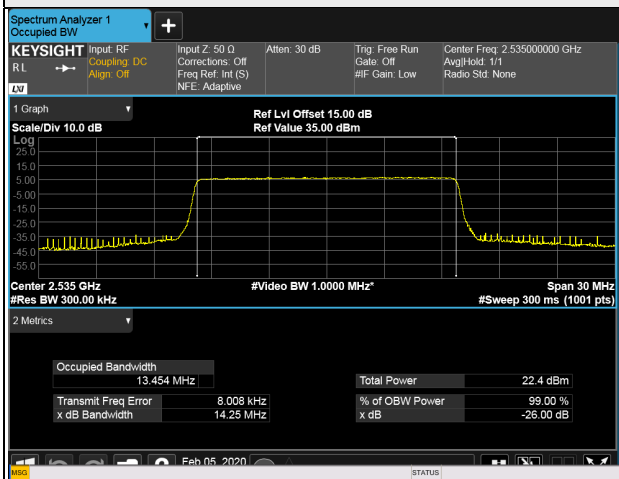
5MHz / 64QAM



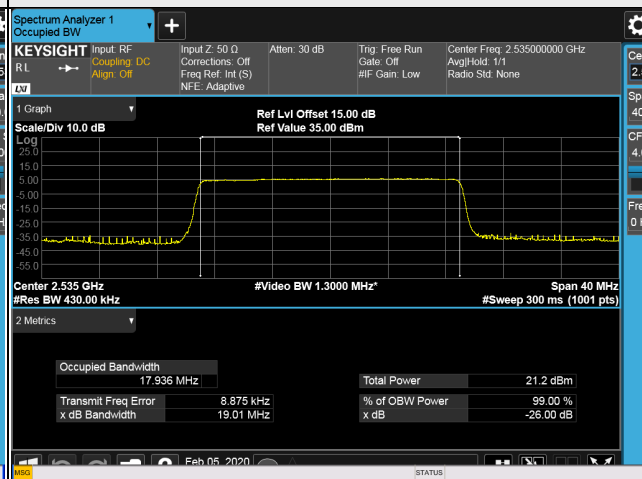
10MHz / 16QAM



15MHz / QPSK



20MHz / 64QAM

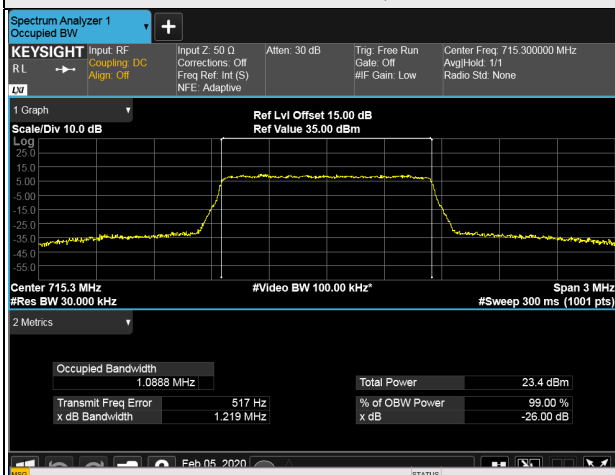


LTE Band 12

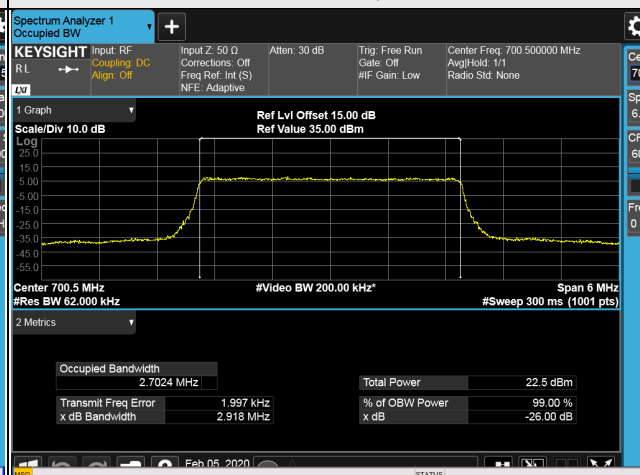
LTE Band 12, Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23017	699.7	1.09	1.09	1.09
23095	707.5	1.09	1.09	1.09
23173	715.3	1.08	1.09	1.09
LTE Band 12, Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23025	700.5	2.70	2.69	2.70
23095	707.5	2.70	2.69	2.70
23165	714.5	2.70	2.69	2.70
LTE Band 12, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23035	701.5	4.49	4.49	4.49
23095	707.5	4.48	4.48	4.48
23155	713.5	4.49	4.49	4.49
LTE Band 12, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23060	704.0	8.96	8.96	8.95
23095	707.5	8.95	8.95	8.94
23130	711.0	8.94	8.95	8.94

Spectrum Plot of Worst Value

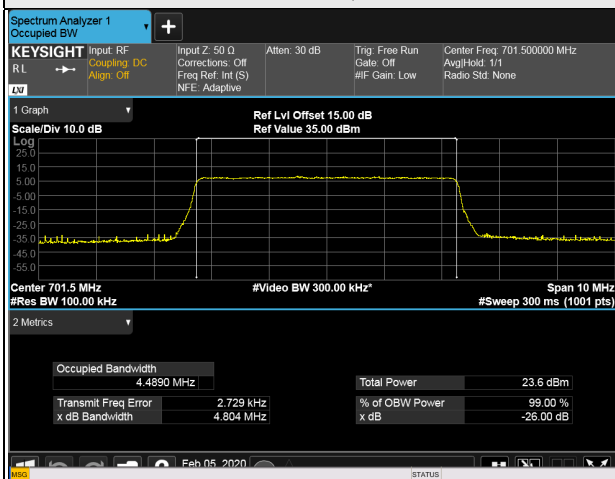
1.4MHz / 16QAM



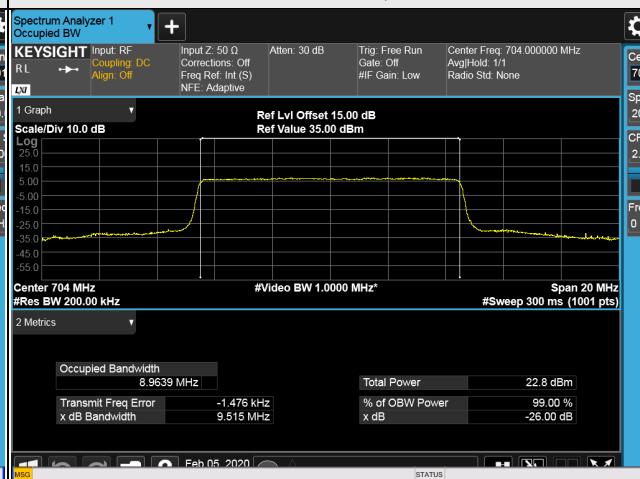
3MHz / 64QAM



5MHz / QPSK

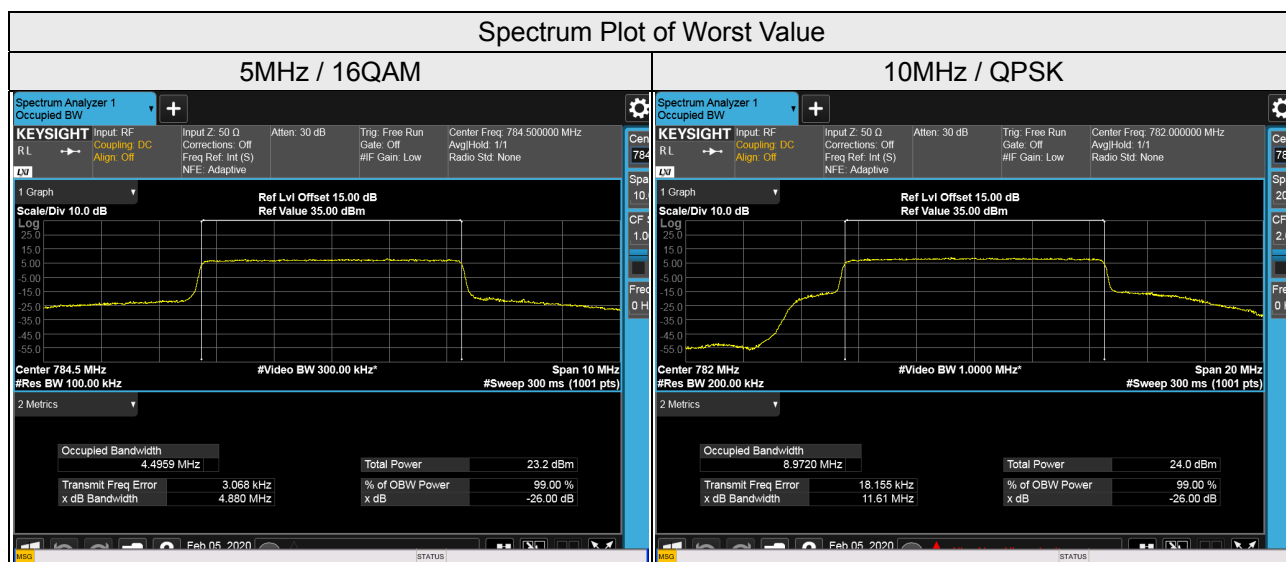


10MHz / 16QAM



LTE Band 13

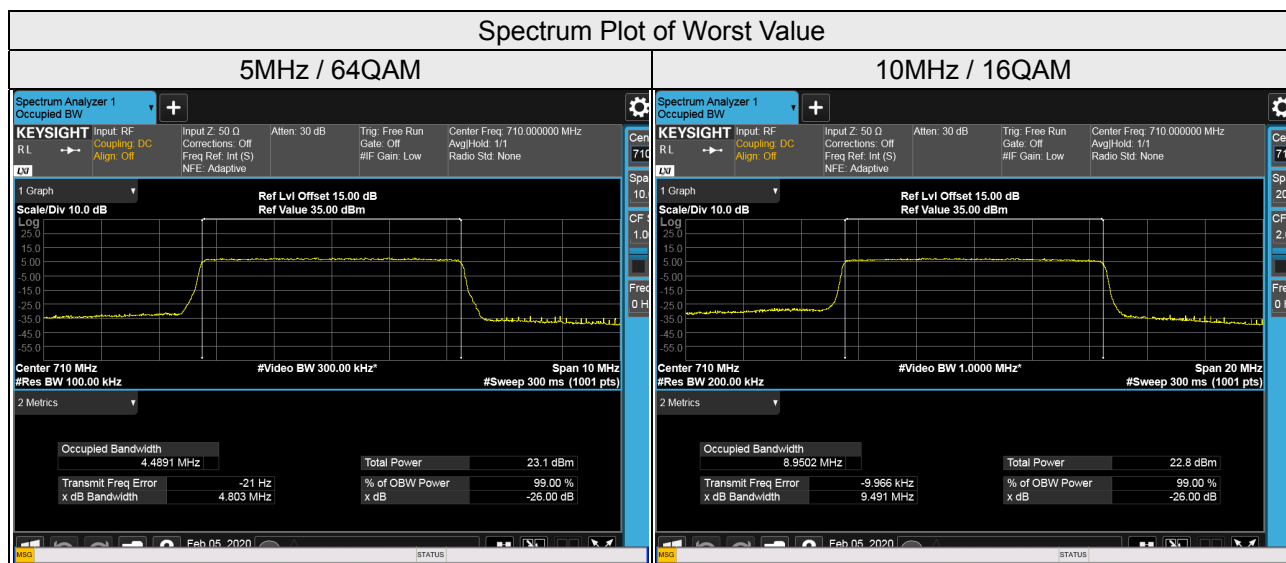
LTE Band 13, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23205	779.5	4.48	4.48	4.48
23230	782.0	4.49	4.49	4.49
23255	784.5	4.49	4.50	4.50
LTE Band 13, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23230	782.0	8.97	8.94	8.94



LTE Band 17

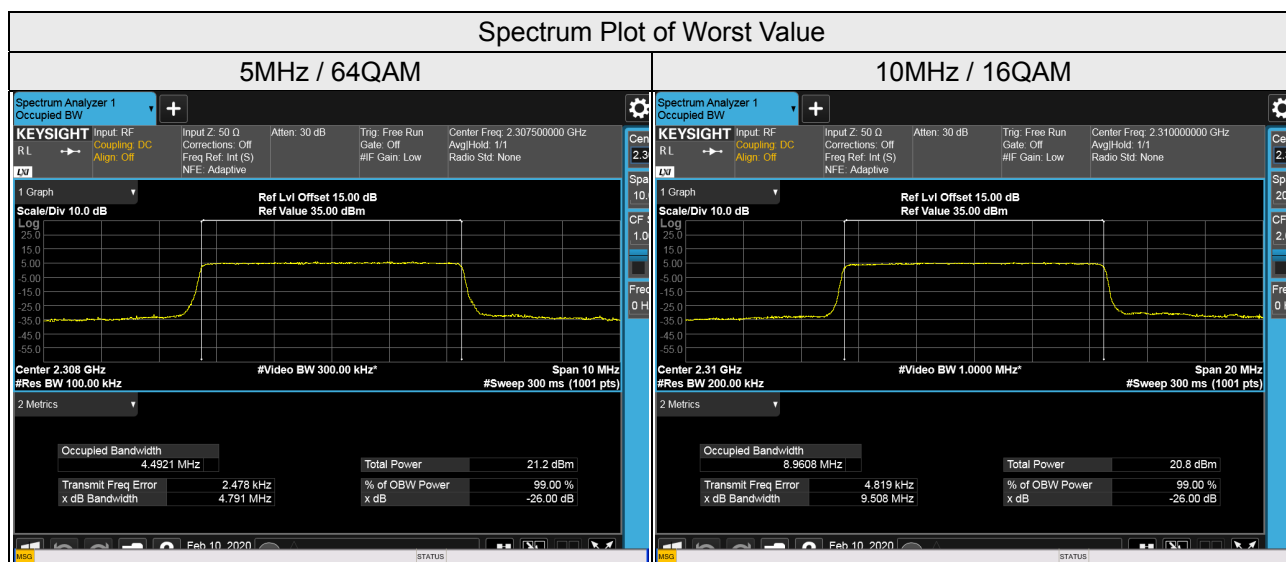
LTE Band 17, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23755	706.5	4.48	4.48	4.49
23790	710.0	4.49	4.49	4.49
23825	713.5	4.48	4.48	4.49

LTE Band 17, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23780	709.0	8.94	8.94	8.94
23790	710.0	8.95	8.95	8.94
23800	711.0	8.94	8.94	8.94



LTE Band 30

LTE Band 30, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
27685	2307.5	4.49	4.49	4.49
27710	2310	4.49	4.49	4.49
27735	2312.5	4.49	4.49	4.49
LTE Band 30, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
27710	2310	8.96	8.96	8.95

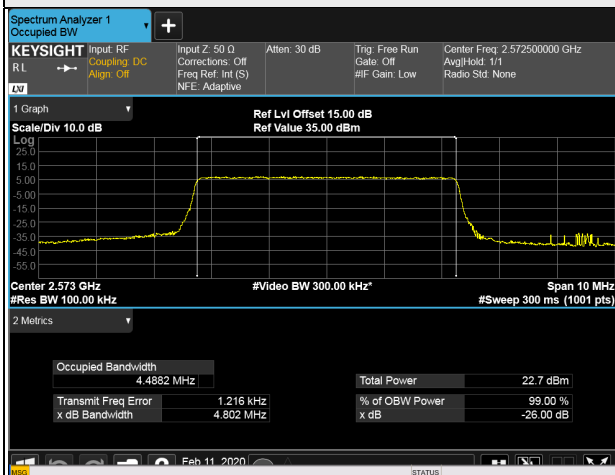


LTE Band 38

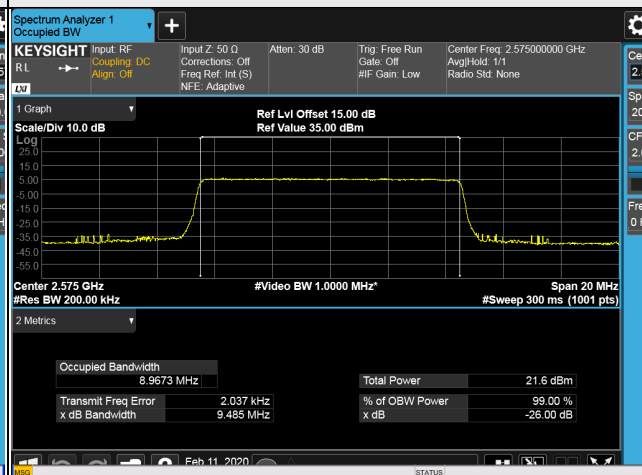
LTE Band 38, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
37775	2572.5	4.49	4.49	4.49
38000	2595.0	4.49	4.49	4.48
38225	2617.5	4.48	4.48	4.48
LTE Band 38, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
37800	2575.0	8.96	8.96	8.97
38000	2595.0	8.95	8.96	8.96
38200	2615.0	8.95	8.96	8.96
LTE Band 38, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
37825	2577.5	13.45	13.44	13.44
38000	2595.0	13.45	13.44	13.44
38175	2612.5	13.46	13.44	13.43
LTE Band 38, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
37850	2580.0	17.90	17.90	17.90
38000	2595.0	17.90	17.89	17.90
38150	2610.0	17.90	17.88	17.90

Spectrum Plot of Worst Value

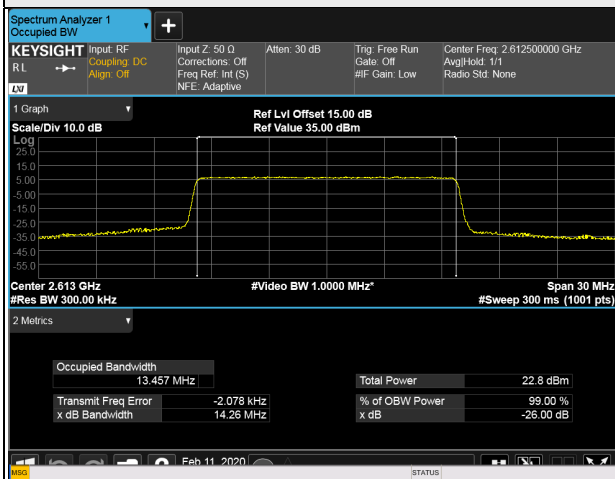
5MHz / QPSK



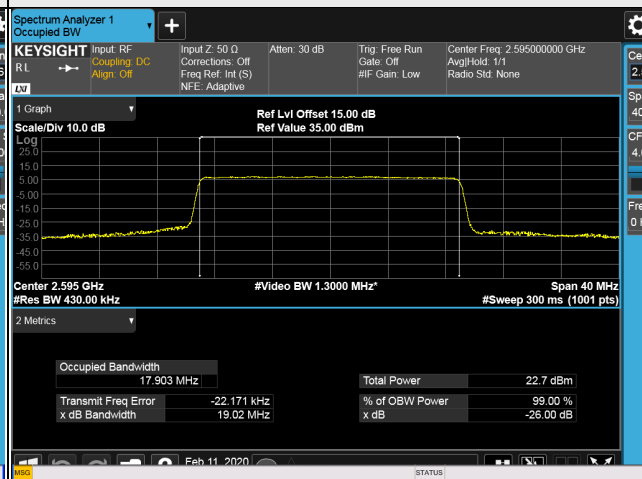
10MHz / 64QAM



15MHz / QPSK



20MHz / QPSK

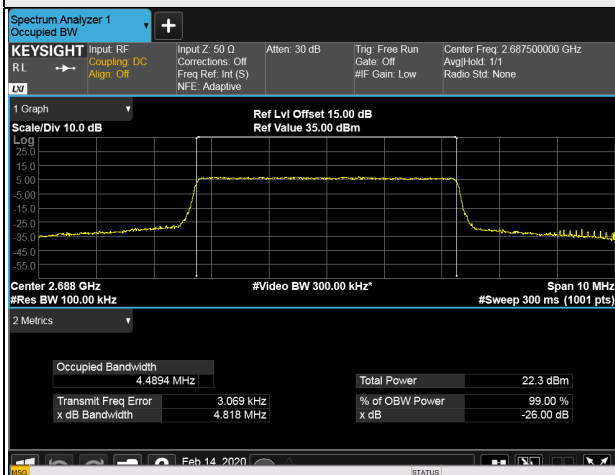


LTE Band 41

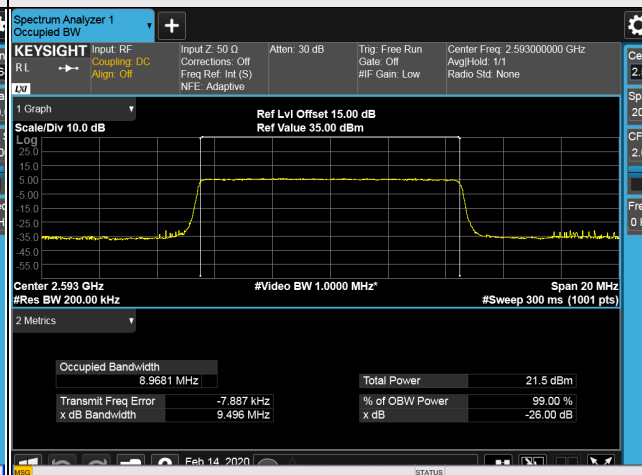
LTE Band 41, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39675	2498.5	4.49	4.49	4.48
40620	2593	4.49	4.49	4.49
41565	2687.5	4.49	4.49	4.49
LTE Band 41, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39700	2501	8.95	8.96	8.96
40620	2593	8.96	8.97	8.96
41540	2685	8.96	8.97	8.96
LTE Band 41, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39725	2503.5	13.45	13.44	13.43
40620	2593	13.45	13.44	13.44
41515	2682.5	13.45	13.43	13.43
LTE Band 41, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39750	2506	17.90	17.89	17.90
40620	2593	17.90	17.90	17.91
41490	2680	17.89	17.88	17.90

Spectrum Plot of Worst Value

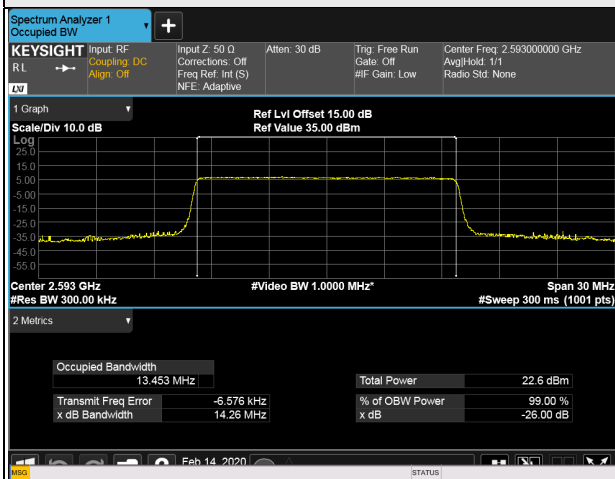
5MHz / QPSK



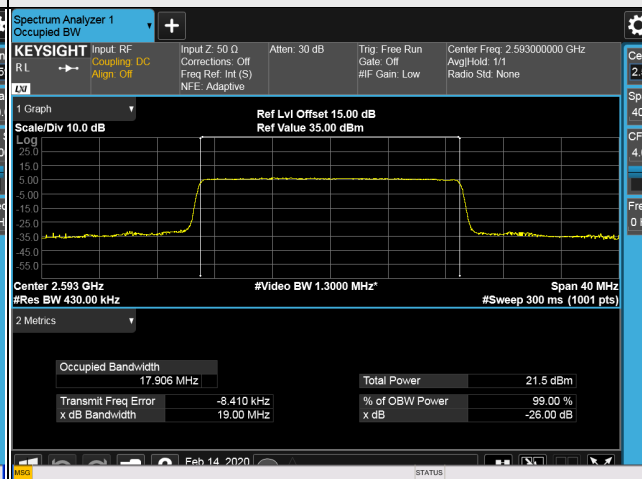
10MHz / 16QAM



15MHz / QPSK



20MHz / 64QAM



LTE Band 66

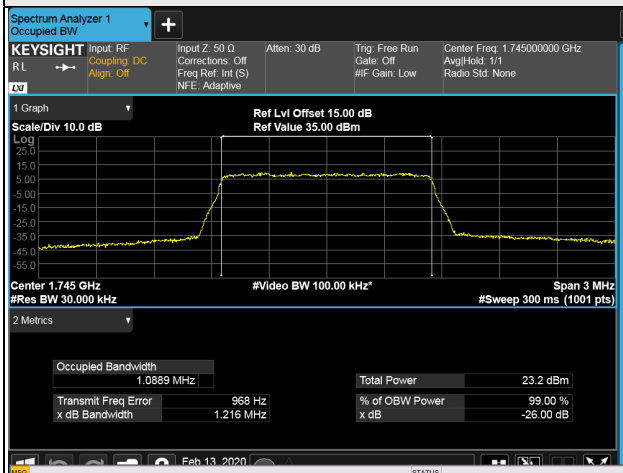
LTE Band 66, Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
131979	1710.7	1.09	1.09	1.09
132322	1745.0	1.09	1.09	1.09
132665	1779.3	1.09	1.09	1.09
LTE Band 66, Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
131987	1711.5	2.70	2.70	2.70
132322	1745.0	2.70	2.69	2.70
132657	1778.5	2.70	2.69	2.70
LTE Band 66, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
131997	1712.5	4.49	4.49	4.49
132322	1745.0	4.49	4.49	4.49
132647	1777.5	4.48	4.49	4.49
LTE Band 66, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
132022	1715.0	8.96	8.96	8.95
132322	1745.0	8.96	8.96	8.95
132622	1775.0	8.95	8.96	8.95
LTE Band 66, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
132047	1717.5	13.46	13.44	13.43
132322	1745.0	13.47	13.45	13.44
132597	1772.5	13.47	13.46	13.46

LTE Band 66, Channel Bandwidth 20MHz

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
132072	1720.0	17.90	17.91	17.91
132322	1745.0	17.94	17.96	17.95
132572	1770.0	17.97	17.99	17.99

Spectrum Plot of Worst Value

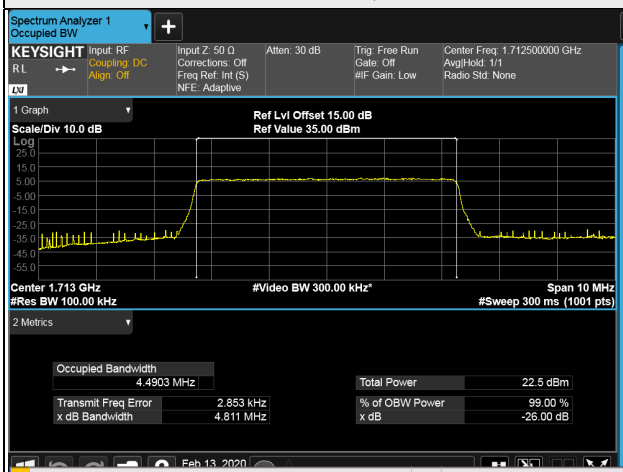
1.4MHz / QPSK



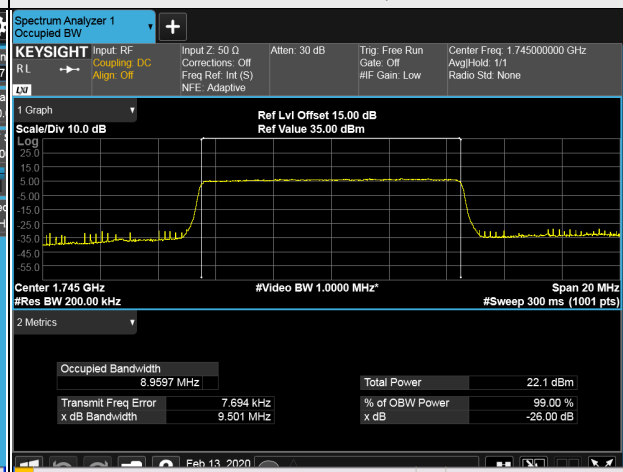
3MHz / 64QAM



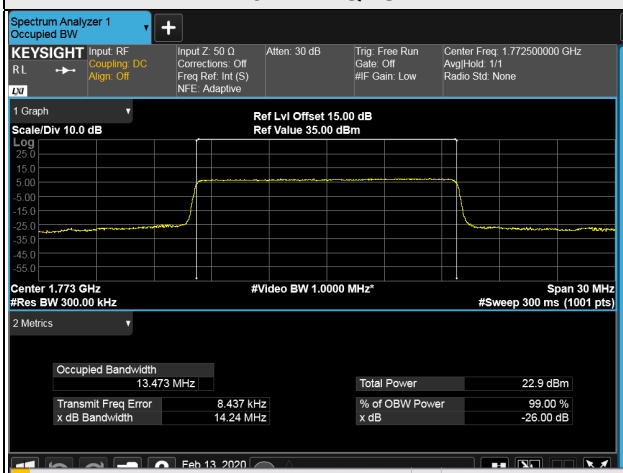
5MHz / 64QAM



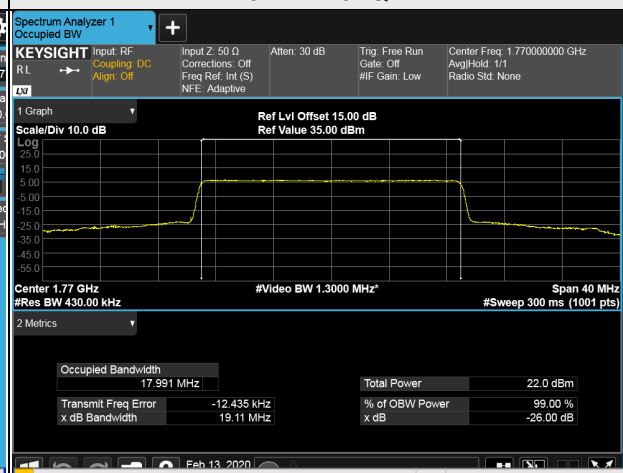
10MHz / 16QAM



15MHz / QPSK



20MHz / 64QAM

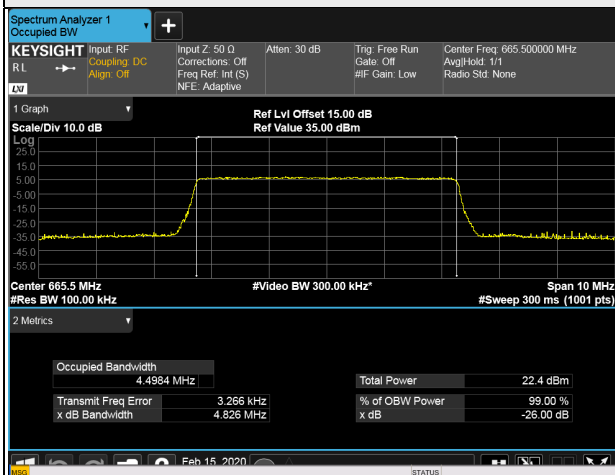


LTE Band 71

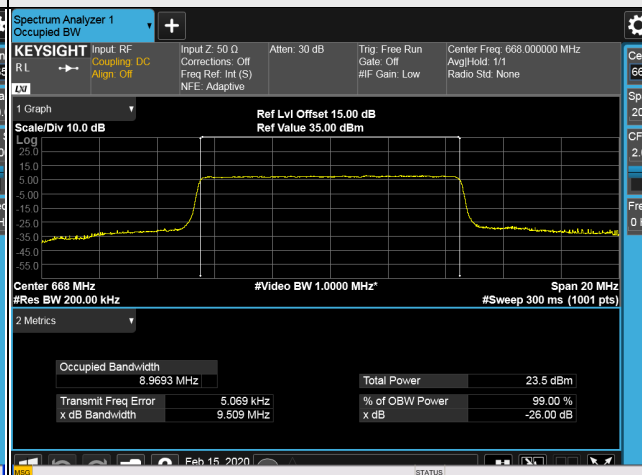
LTE Band 71, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
133147	665.5	4.49	4.49	4.50
133297	680.5	4.49	4.49	4.49
133447	695.5	4.49	4.49	4.50
LTE Band 71, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
133172	668	8.97	8.97	8.97
133297	680.5	8.96	8.96	8.97
133422	693	8.95	8.95	8.96
LTE Band 71, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
133197	670.5	13.46	13.45	13.44
133297	680.5	13.46	13.45	13.44
133397	690.5	13.44	13.43	13.43
LTE Band 71, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
133222	673	17.91	17.92	17.91
133297	680.5	17.94	17.93	17.93
133372	688	17.91	17.92	17.92

Spectrum Plot of Worst Value

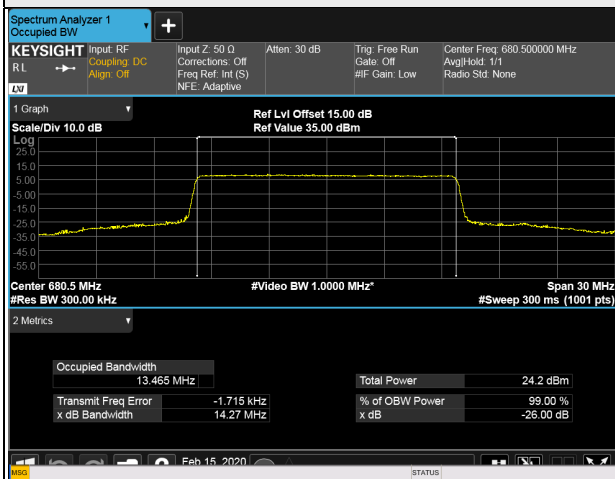
5MHz / 64QAM



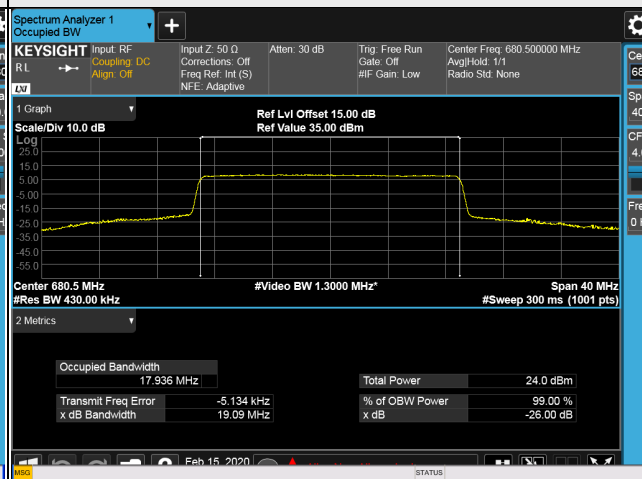
10MHz / QPSK



15MHz / QPSK



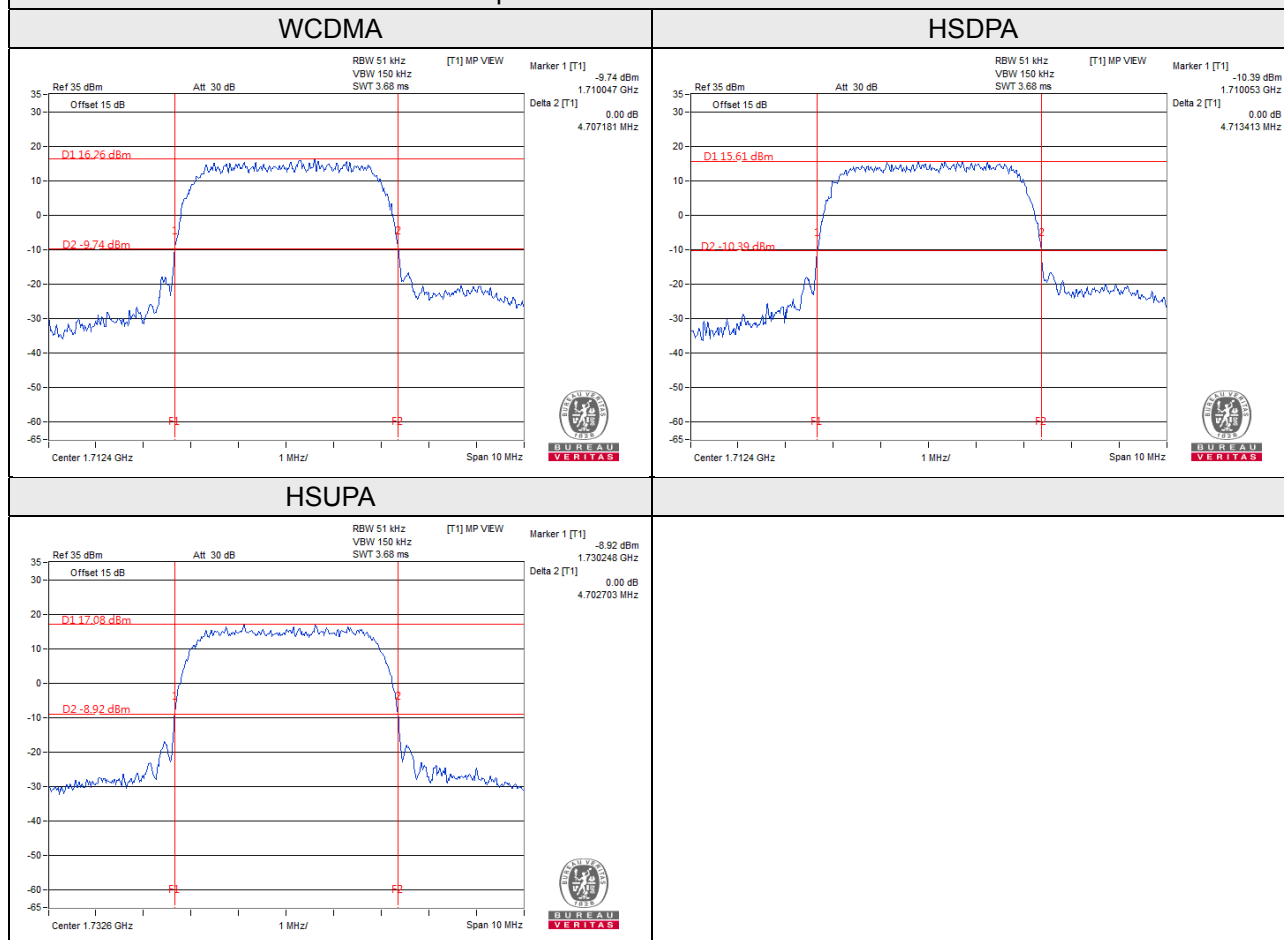
20MHz / QPSK



26dB Bandwidth
WCDMA Band 4

Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		WCDMA	HSDPA	HSUPA
1312	1712.4	4.70	4.71	4.69
1413	1732.6	4.69	4.70	4.70
1513	1752.6	4.69	4.71	4.70

Spectrum Plot of Worst Value



LTE Band 4

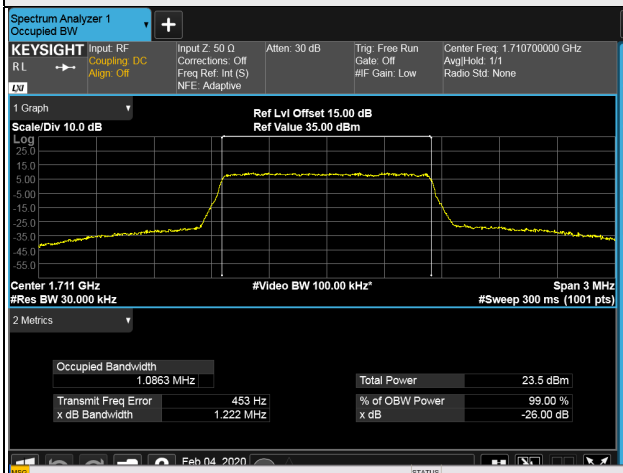
LTE Band 4, Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19957	1710.7	1.22	1.22	1.22
20175	1732.5	1.21	1.21	1.21
20393	1754.3	1.22	1.22	1.22
LTE Band 4, Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19965	1711.5	2.91	2.93	2.92
20175	1732.5	2.92	2.92	2.91
20385	1753.5	2.91	2.93	2.94
LTE Band 4, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19975	1712.5	4.82	4.80	4.81
20175	1732.5	4.79	4.80	4.81
20375	1752.5	4.81	4.81	4.81
LTE Band 4, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20000	1715.0	9.50	9.51	9.49
20175	1732.5	9.51	9.51	9.52
20350	1750.0	9.48	9.52	9.49
LTE Band 4, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20025	1717.5	14.24	14.24	14.25
20175	1732.5	14.24	14.23	14.23
20325	1747.5	14.26	14.24	14.23

LTE Band 4, Channel Bandwidth 20MHz

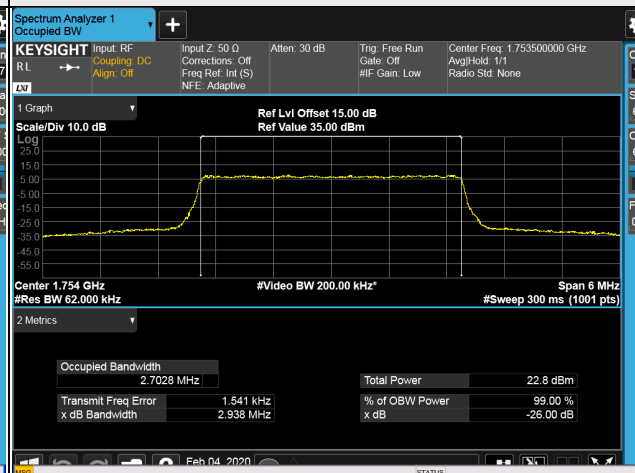
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20050	1720.0	19.05	19.03	19.03
20175	1732.5	19.05	19.04	19.03
20300	1745.0	19.03	19.04	19.04

Spectrum Plot of Worst Value

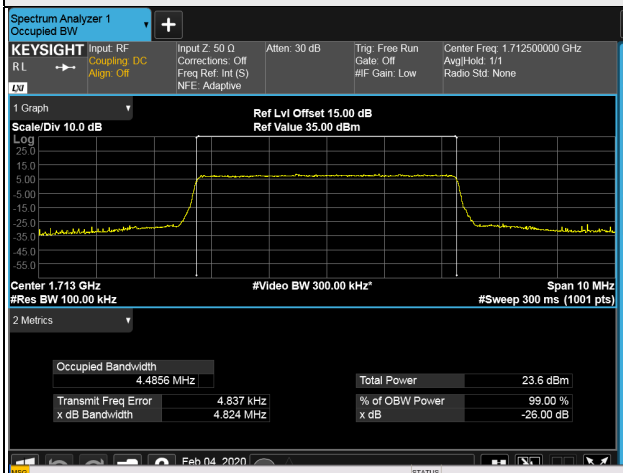
1.4MHz / 64QAM



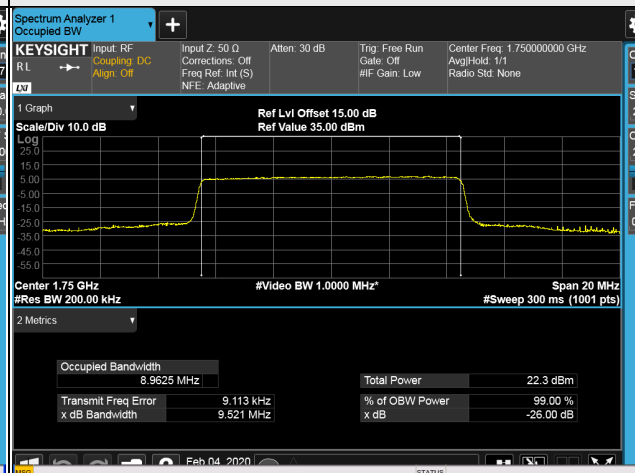
3MHz / 64QAM



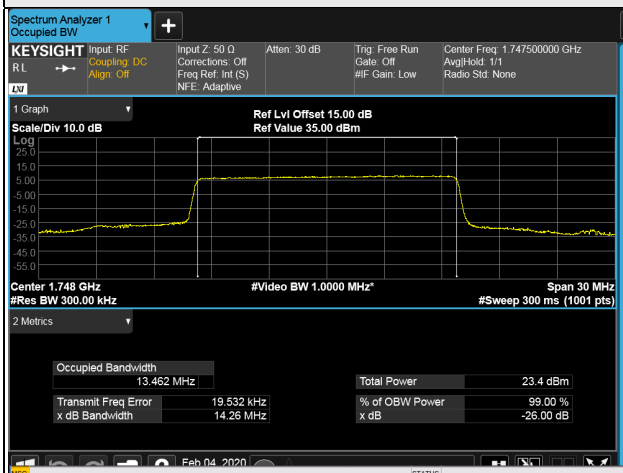
5MHz / QPSK



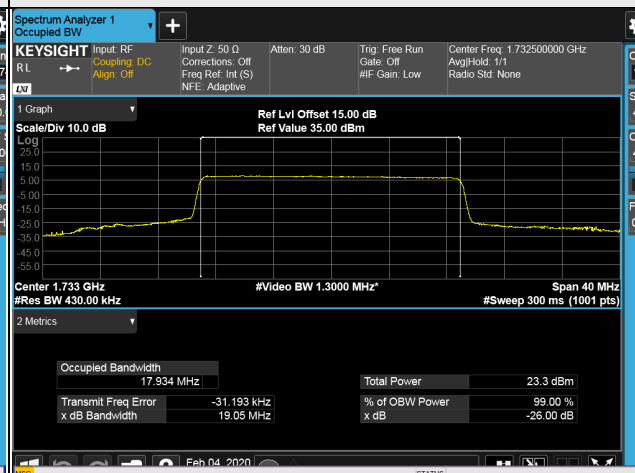
10MHz / 16QAM



15MHz / QPSK



20MHz / QPSK

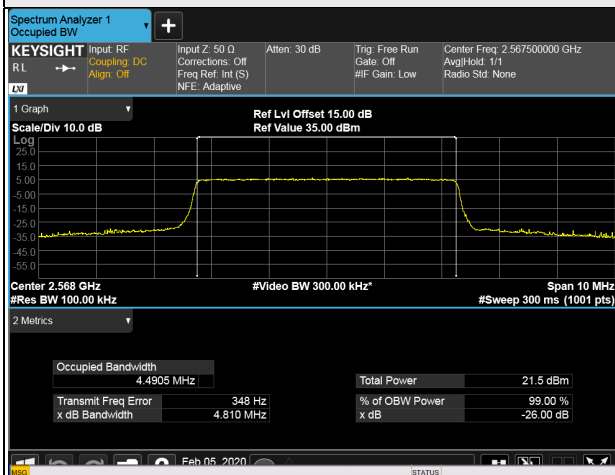


LTE Band 7

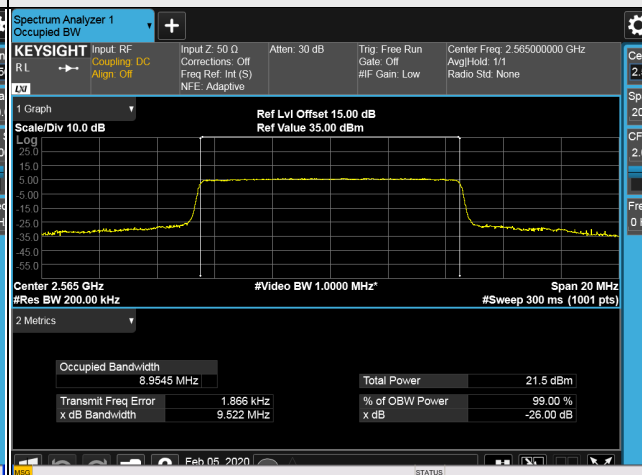
LTE Band 7, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20775	2502.5	4.79	4.80	4.80
21100	2535.0	4.80	4.80	4.80
21425	2567.5	4.79	4.80	4.81
LTE Band 7, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20800	2505.0	9.50	9.51	9.51
21100	2535.0	9.49	9.50	9.50
21400	2565.0	9.51	9.52	9.51
LTE Band 7, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20825	2507.5	14.25	14.23	14.23
21100	2535.0	14.25	14.24	14.23
21375	2562.5	14.26	14.25	14.26
LTE Band 7, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20850	2510.0	19.01	19.01	19.04
21100	2535.0	19.01	19.02	19.01
21350	2560.0	19.02	19.04	19.05

Spectrum Plot of Worst Value

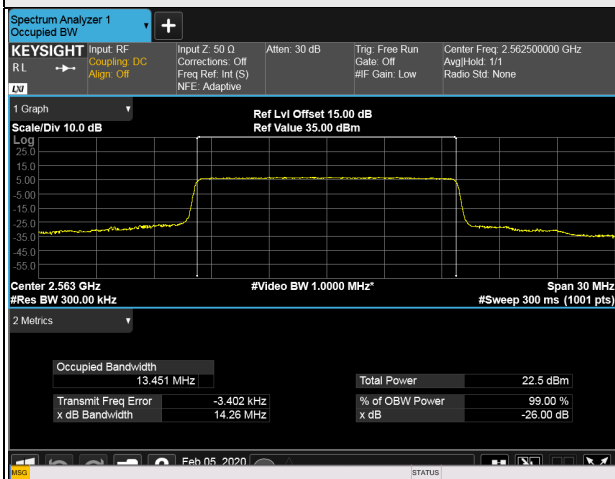
5MHz / 64QAM



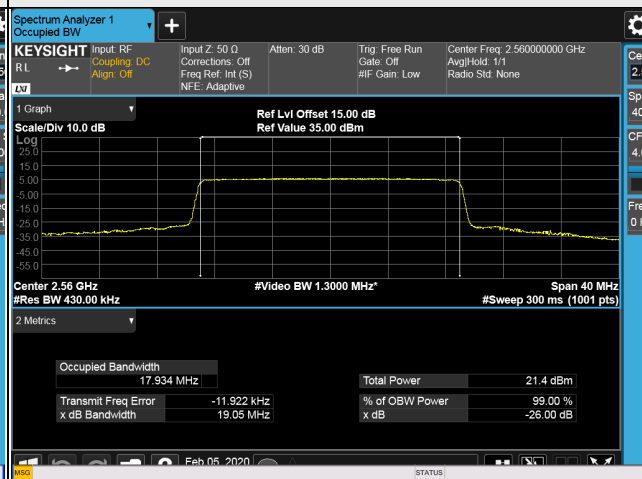
10MHz / 16QAM



15MHz / QPSK



20MHz / 64QAM

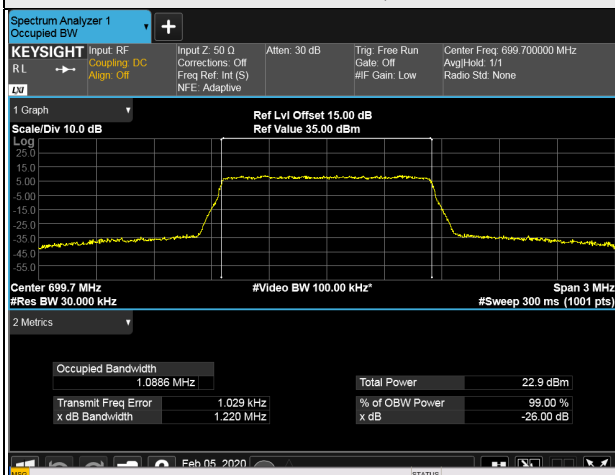


LTE Band 12

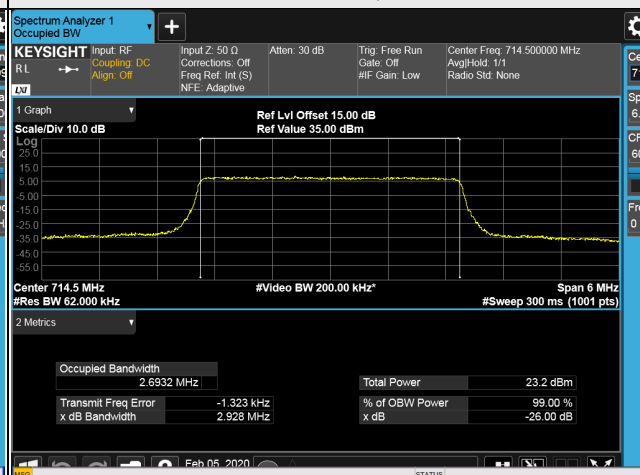
LTE Band 12, Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23017	699.7	1.22	1.22	1.21
23095	707.5	1.21	1.22	1.22
23173	715.3	1.21	1.22	1.21
LTE Band 12, Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23025	700.5	2.91	2.92	2.92
23095	707.5	2.91	2.92	2.91
23165	714.5	2.91	2.93	2.91
LTE Band 12, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23035	701.5	4.80	4.80	4.80
23095	707.5	4.78	4.80	4.78
23155	713.5	4.81	4.81	4.80
LTE Band 12, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23060	704.0	9.51	9.52	9.50
23095	707.5	9.49	9.49	9.48
23130	711.0	9.50	9.51	9.49

Spectrum Plot of Worst Value

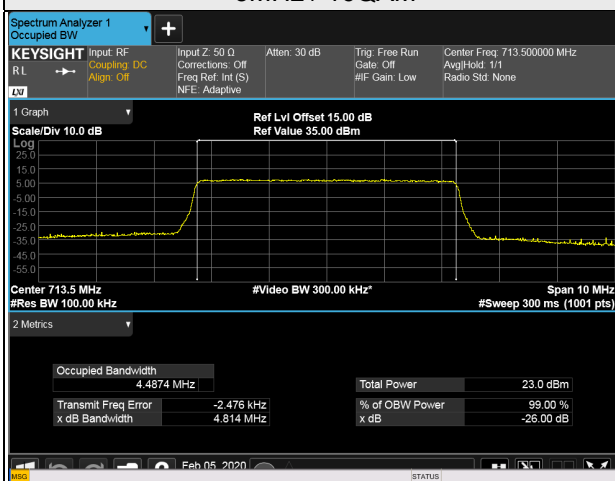
1.4MHz / 16QAM



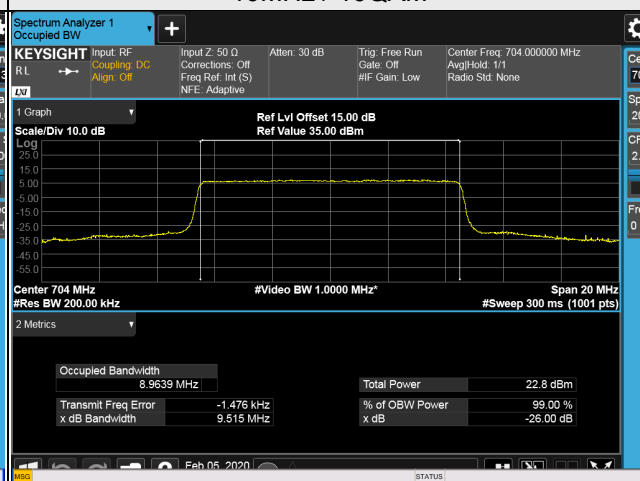
3MHz / 16QAM



5MHz / 16QAM

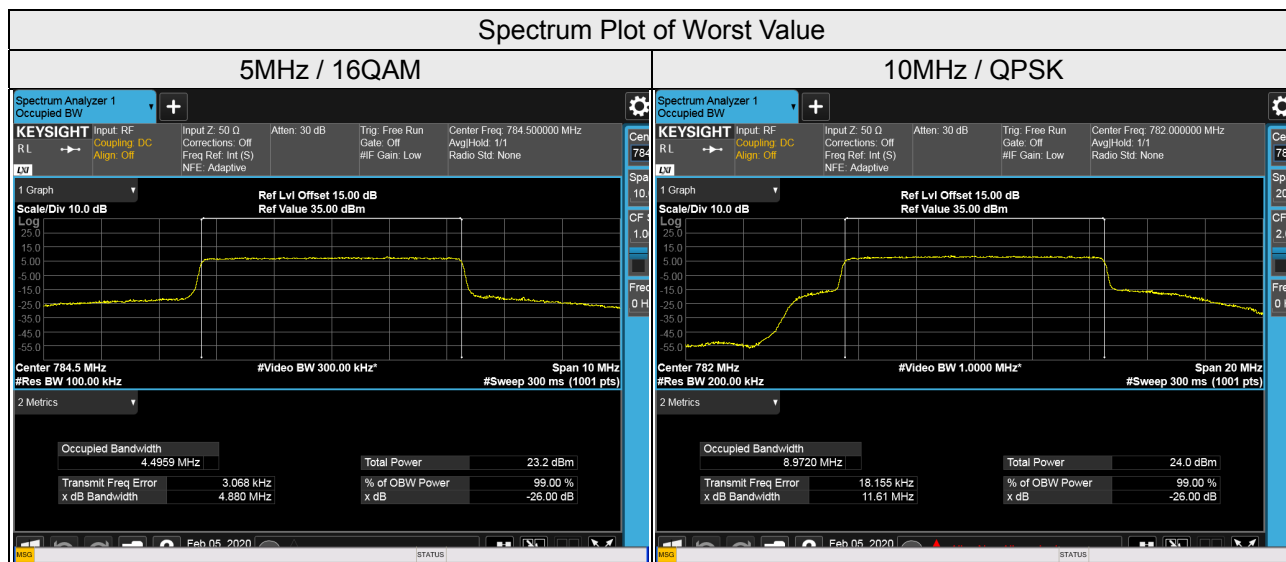


10MHz / 16QAM



LTE Band 13

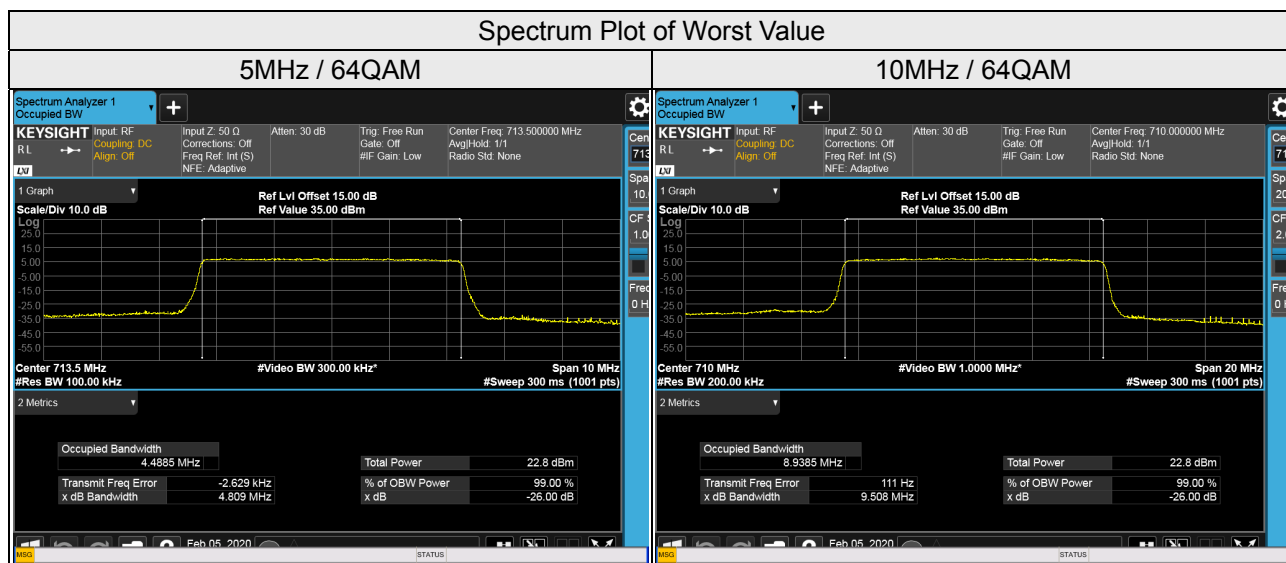
LTE Band 13, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23205	779.5	4.78	4.78	4.80
23230	782.0	4.78	4.81	4.81
23255	784.5	4.86	4.88	4.87
LTE Band 13, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23230	782.0	11.61	9.51	9.50



LTE Band 17

LTE Band 17, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23755	706.5	4.78	4.79	4.79
23790	710.0	4.79	4.80	4.80
23825	713.5	4.80	4.79	4.81

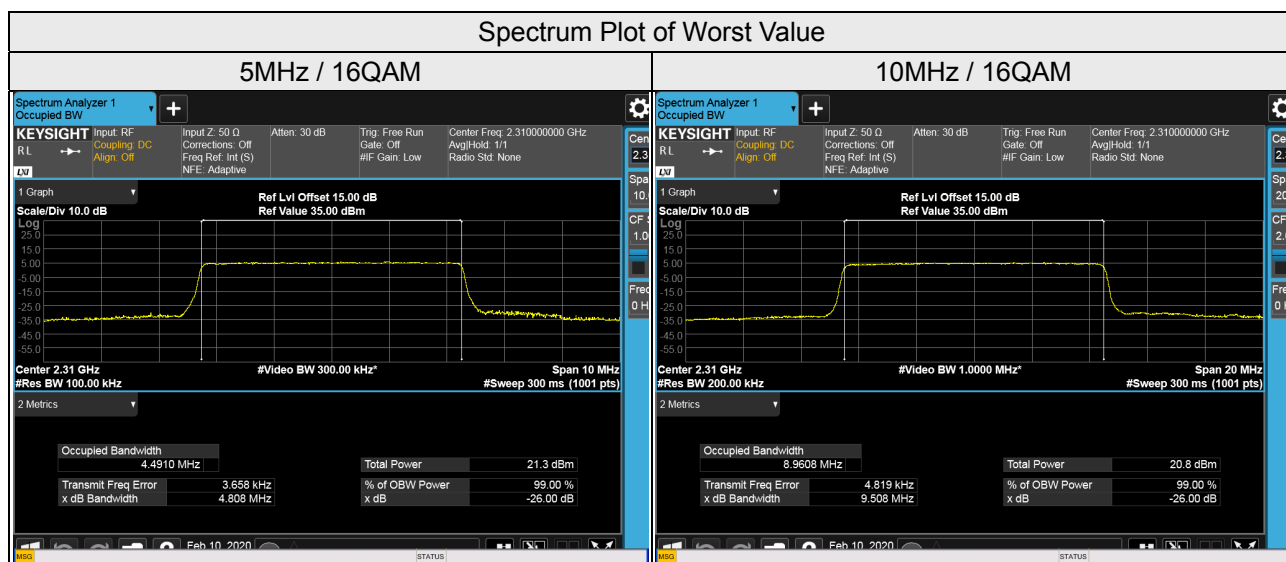
LTE Band 17, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
23780	709.0	9.48	9.49	9.50
23790	710.0	9.50	9.49	9.51
23800	711.0	9.49	9.49	9.50



LTE Band 30

LTE Band 30, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
27685	2307.5	4.80	4.80	4.79
27710	2310	4.80	4.81	4.80
27735	2312.5	4.79	4.80	4.80

LTE Band 30, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
27710	2310	9.49	9.51	9.49

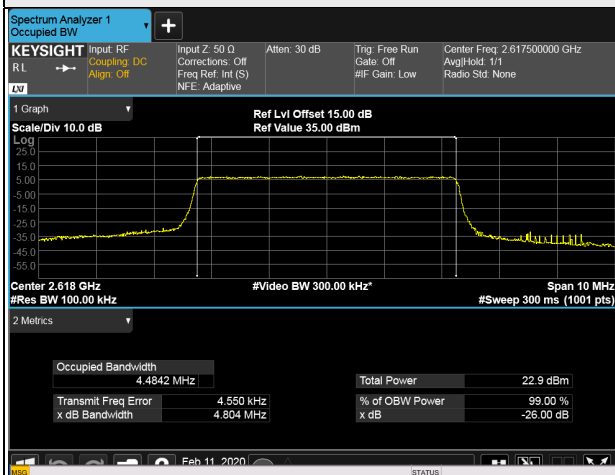


LTE Band 38

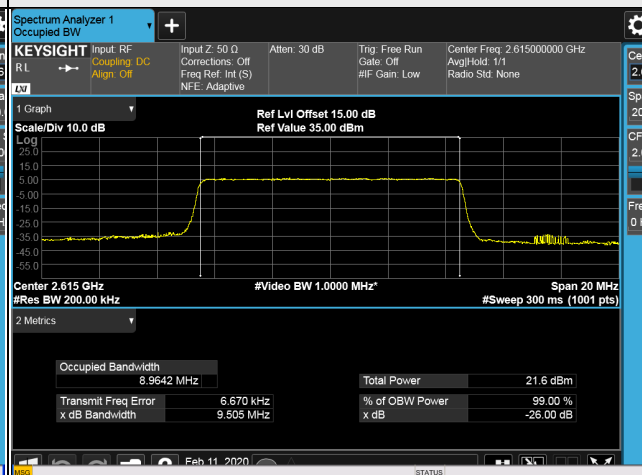
LTE Band 38, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
37775	2572.5	4.80	4.78	4.79
38000	2595.0	4.79	4.79	4.78
38225	2617.5	4.80	4.79	4.79
LTE Band 38, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
37800	2575.0	9.48	9.49	9.49
38000	2595.0	9.49	9.50	9.50
38200	2615.0	9.48	9.50	9.51
LTE Band 38, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
37825	2577.5	14.27	14.22	14.22
38000	2595.0	14.25	14.24	14.23
38175	2612.5	14.26	14.24	14.24
LTE Band 38, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
37850	2580.0	19.01	18.99	18.99
38000	2595.0	19.02	18.99	19.00
38150	2610.0	19.01	19.00	19.01

Spectrum Plot of Worst Value

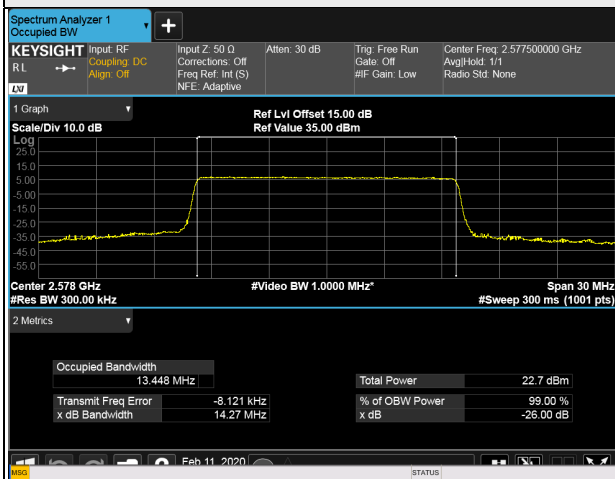
5MHz / QPSK



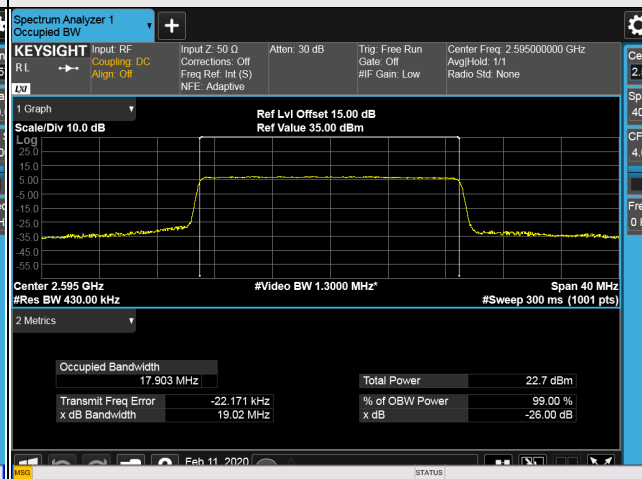
10MHz / 64QAM



15MHz / QPSK



20MHz / QPSK

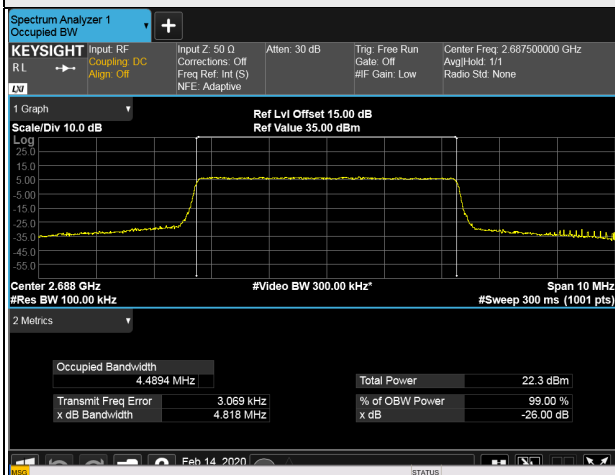


LTE Band 41

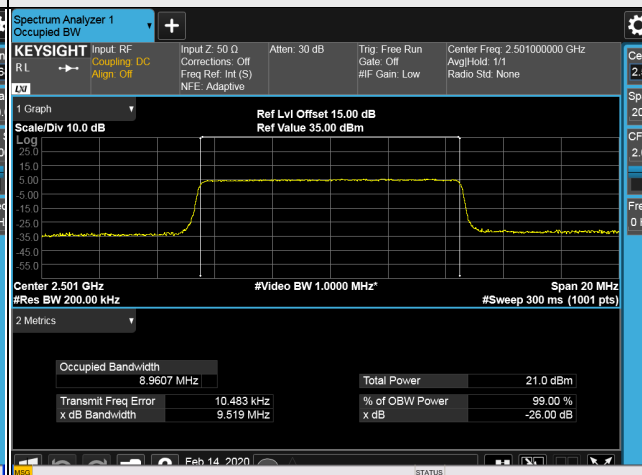
LTE Band 41, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39675	2498.5	4.80	4.78	4.79
40620	2593	4.78	4.79	4.79
41565	2687.5	4.82	4.79	4.79
LTE Band 41, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39700	2501	9.48	9.49	9.52
40620	2593	9.48	9.50	9.51
41540	2685	9.48	9.49	9.51
LTE Band 41, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39725	2503.5	14.24	14.24	14.25
40620	2593	14.26	14.25	14.22
41515	2682.5	14.23	14.24	14.23
LTE Band 41, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39750	2506	19.01	19.01	18.99
40620	2593	19.01	19.00	19.00
41490	2680	19.00	18.99	19.01

Spectrum Plot of Worst Value

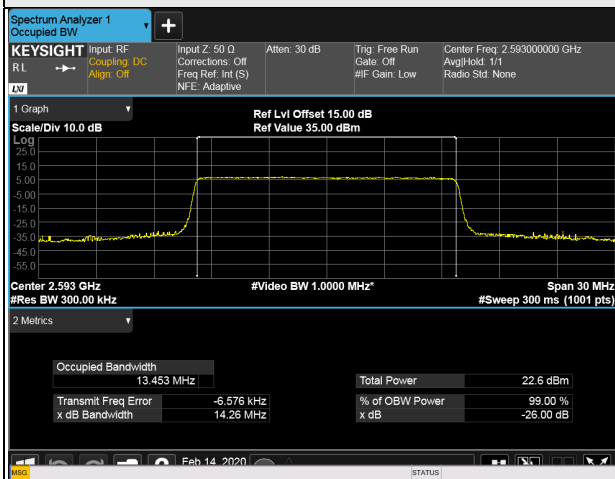
5MHz / QPSK



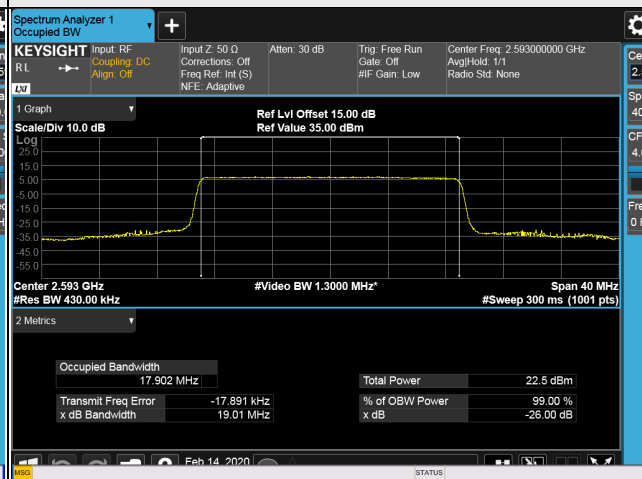
10MHz / 64QAM



15MHz / QPSK



20MHz / QPSK



LTE Band 66

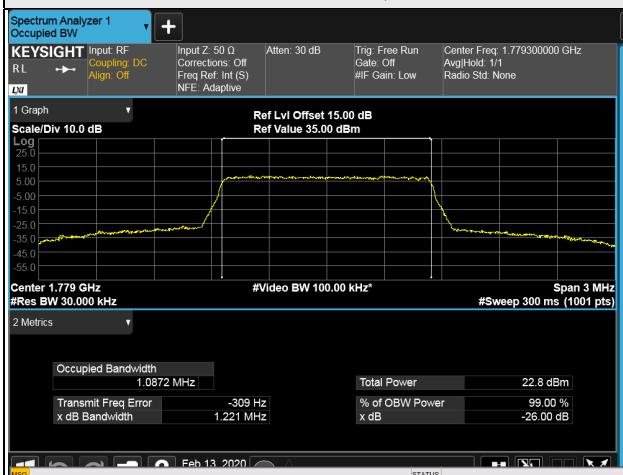
LTE Band 66, Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
131979	1710.7	1.21	1.22	1.22
132322	1745.0	1.21	1.22	1.22
132665	1779.3	1.21	1.22	1.22
LTE Band 66, Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
131987	1711.5	2.91	2.93	2.91
132322	1745.0	2.93	2.93	2.92
132657	1778.5	2.92	2.93	2.93
LTE Band 66, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
131997	1712.5	4.81	4.81	4.81
132322	1745.0	4.80	4.79	4.80
132647	1777.5	4.82	4.79	4.82
LTE Band 66, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
132022	1715.0	9.51	9.50	9.51
132322	1745.0	9.49	9.50	9.50
132622	1775.0	9.49	9.51	9.50
LTE Band 66, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
132047	1717.5	14.26	14.23	14.21
132322	1745.0	14.27	14.24	14.22
132597	1772.5	14.24	14.27	14.25

LTE Band 66, Channel Bandwidth 20MHz

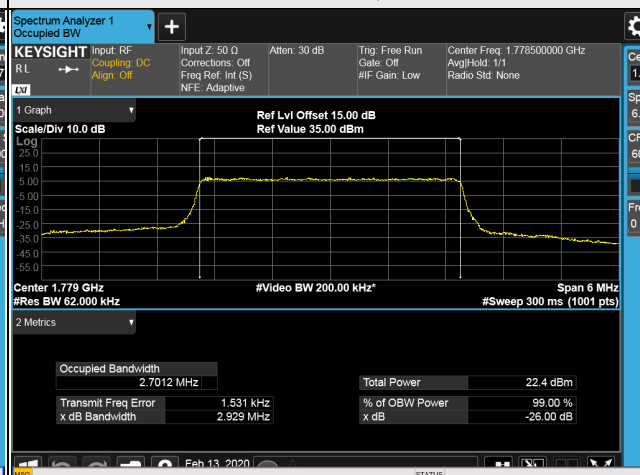
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
132072	1720.0	19.04	19.03	19.04
132322	1745.0	19.03	19.01	19.03
132572	1770.0	19.09	19.09	19.11

Spectrum Plot of Worst Value

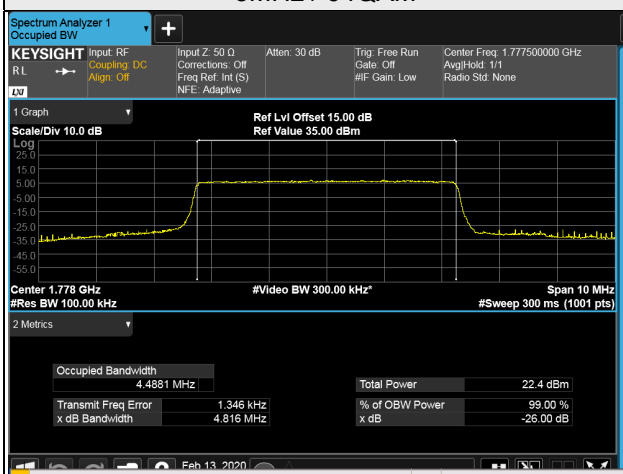
1.4MHz / 64QAM



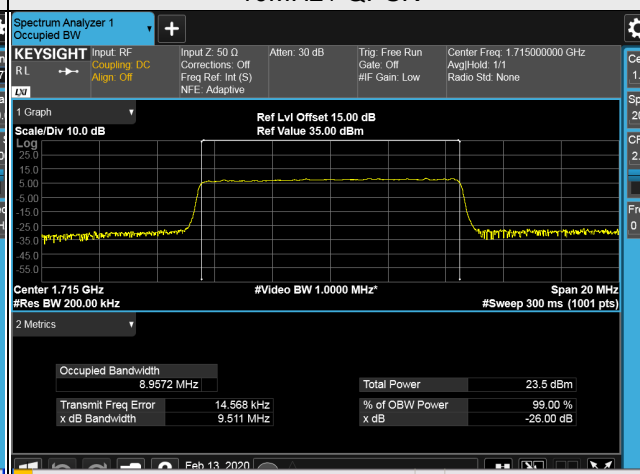
3MHz / 64QAM



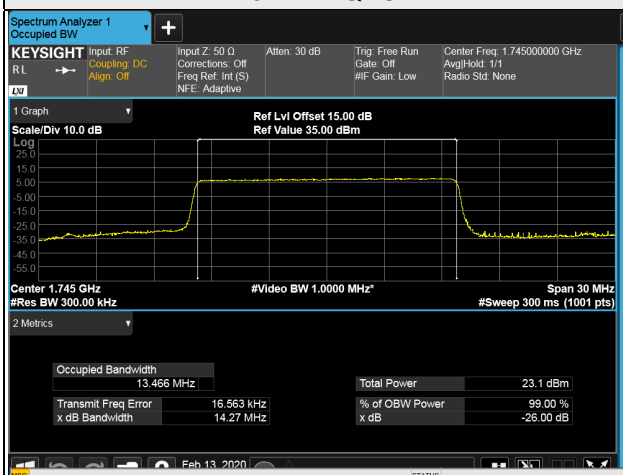
5MHz / 64QAM



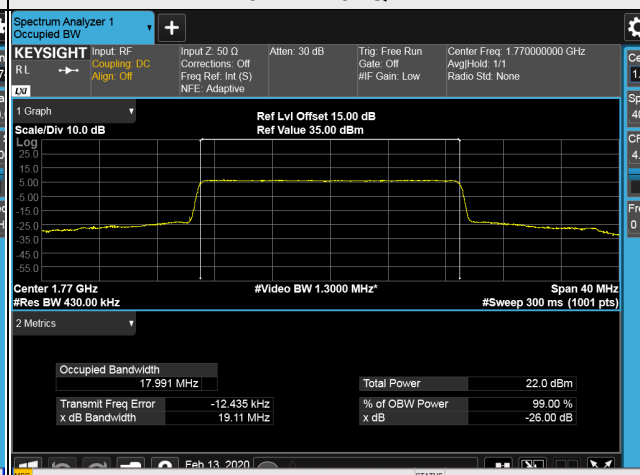
10MHz / QPSK



15MHz / QPSK



20MHz / 64QAM

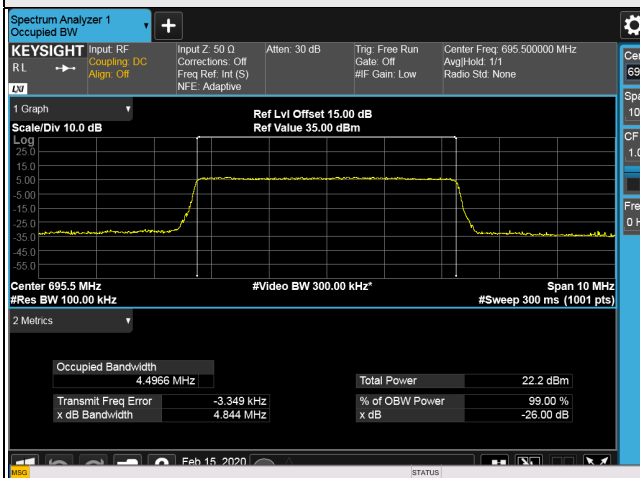


LTE Band 71

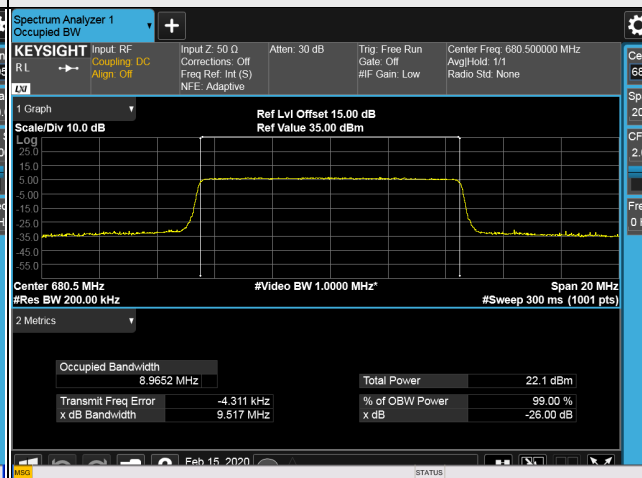
LTE Band 71, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
133147	665.5	4.79	4.80	4.83
133297	680.5	4.81	4.80	4.82
133447	695.5	4.81	4.79	4.84
LTE Band 71, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
133172	668	9.51	9.51	9.51
133297	680.5	9.51	9.51	9.52
133422	693	9.51	9.50	9.52
LTE Band 71, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
133197	670.5	14.27	14.24	14.23
133297	680.5	14.27	14.24	14.25
133397	690.5	14.24	14.24	14.24
LTE Band 71, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
133222	673	19.02	19.01	19.00
133297	680.5	19.09	19.03	19.04
133372	688	19.01	19.02	19.01

Spectrum Plot of Worst Value

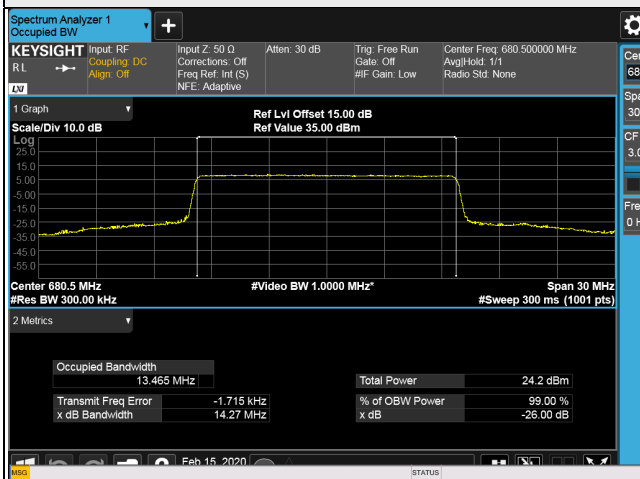
5MHz / 64QAM



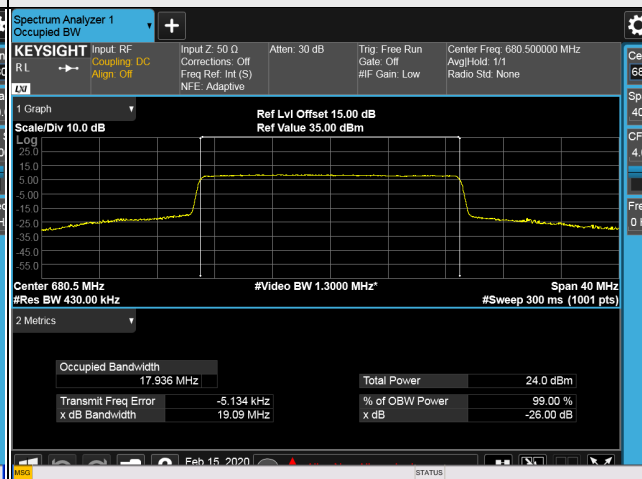
10MHz / 64QAM



15MHz / QPSK



20MHz / QPSK



4.5 Channel Edge Measurement

4.5.1 Limits of Band Edge Measurement

For WCDMA Band 4, LTE Band 4, 66

According to FCC 27.53(h) for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log (P)$ dB.

For LTE Band 7, 38, 41

According to FCC 27.53(m)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

For LTE Band 12, 71

According to FCC 27.53(g) for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

For LTE Band 13

According to FCC 27.53(c)(2) for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB.

According to 27.53(c)(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations

For LTE Band 17

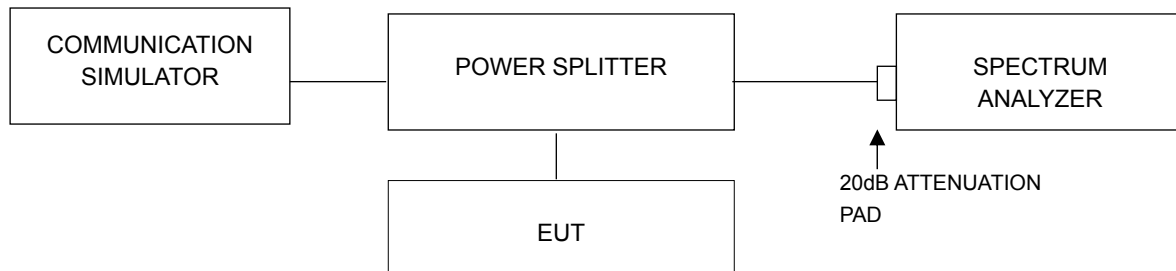
According to FCC 27.53(g) for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

For LTE Band 30

According to FCC 27.53(a) (4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

- (i) By a factor of not less than: $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz;
- (ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz;
- (iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log (P)$ dB above 2365 MHz.

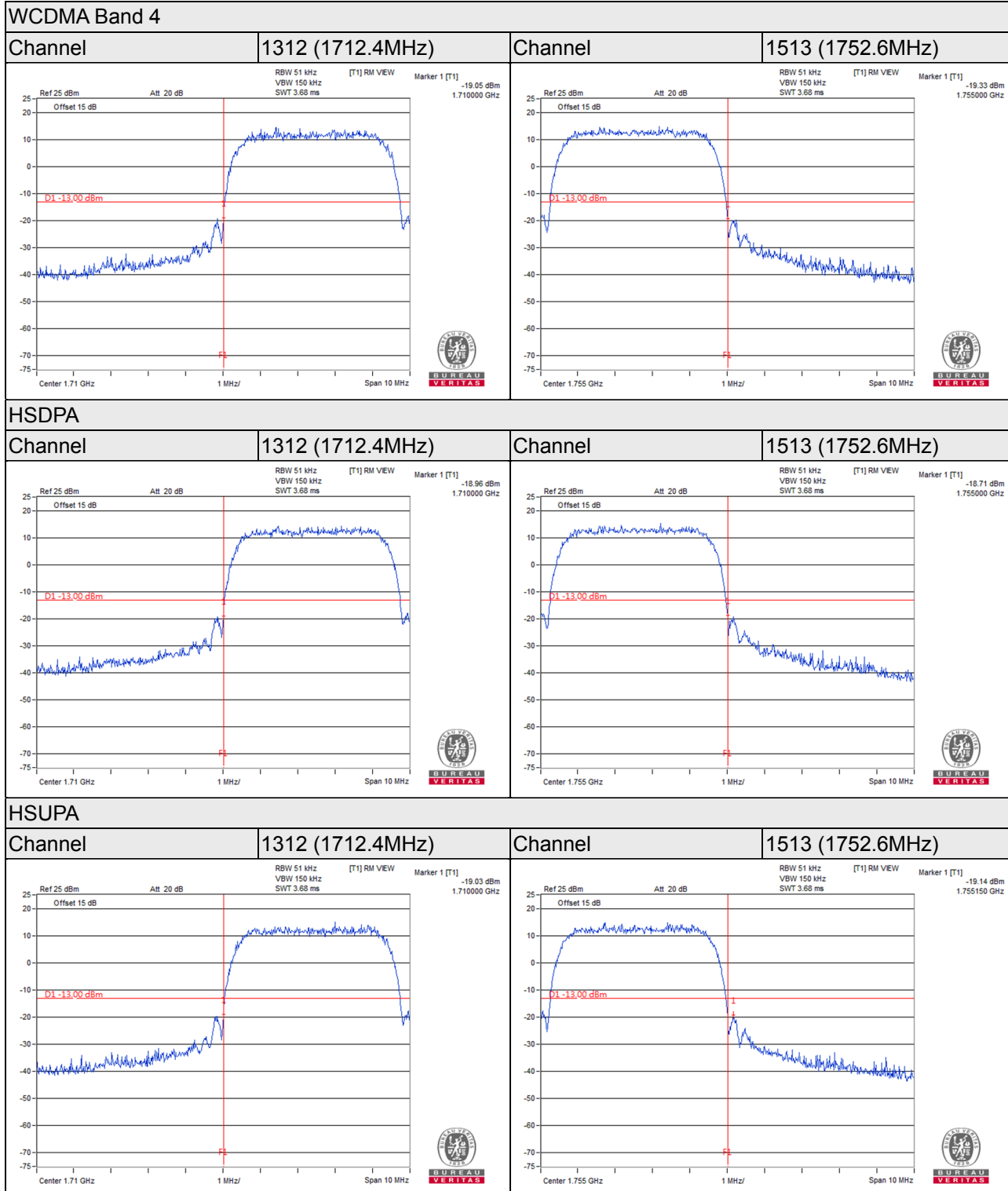
4.5.2 Test Setup



4.5.3 Test Procedures

- a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. Band edge measurements were done at 2 channels: low, middle and high operational frequency range. Emission mask measurements were done at 3 channels: low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 51kHz and VB of the spectrum is 150kHz (WCDMA / HSDPA / HSUPA).
- c. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 15kHz and VB of the spectrum is 51kHz (LTE Channel Bandwidth 1.4MHz).
- d. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Channel Bandwidth 3MHz).
- e. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (LTE Channel Bandwidth 5MHz).
- f. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).
- g. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Channel Bandwidth 15MHz).
- h. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz (LTE Channel Bandwidth 20MHz).
- i. Except LTE Band 12 and LTE Band 17 measurement procedure refer 27.53(g)(m)(6).
- j. LTE Band 7, Band 38 and Band 41 operations in the 5 MHz and 10 MHz channel BW mode, extend the 1% range from 1M to 2M above and below the channel edge and then reduce the limit further by 10 log $(1000/100)=10\text{dB}$ (i.e. total $-10 + -10 = -20\text{dB}$) to compensate for the integration from 100k to 1M.
- k. Record the max trace plot into the test report.

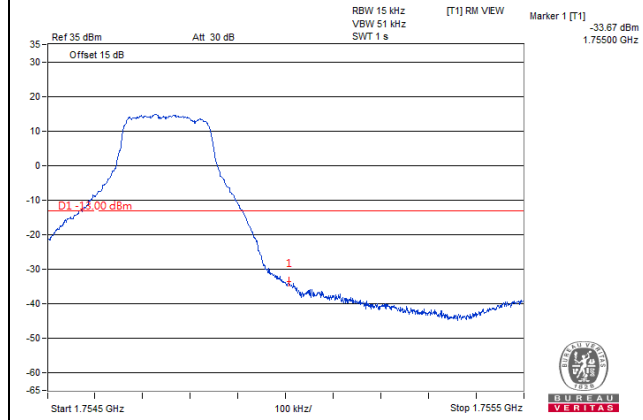
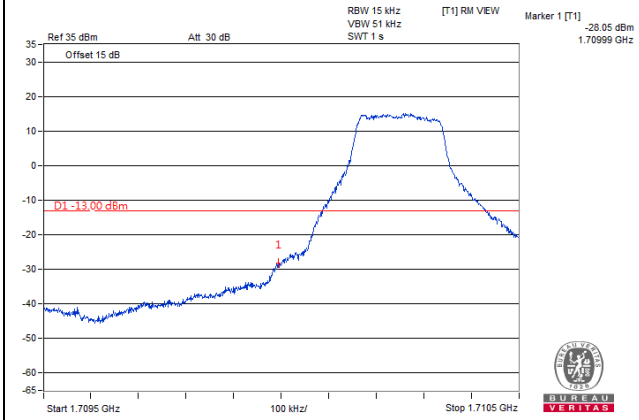
4.5.4 Test Results



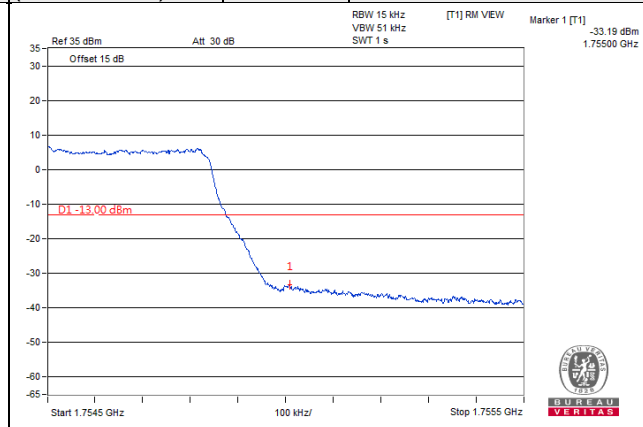
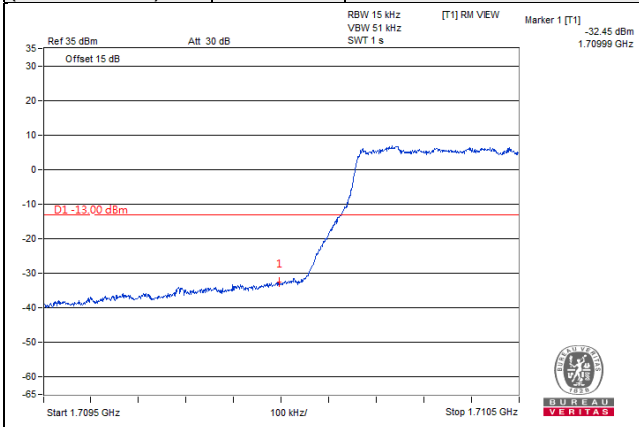
LTE Band 4

Channel Bandwidth: 1.4MHz

Channel 19957 (1710.7MHz)	QPSK	1 RB / 0 RB Offset	Channel 20393 (1754.3MHz)	QPSK	1 RB / 5 RB Offset
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Channel 19957 (1710.7MHz)	QPSK	6 RB / 0 RB Offset	Channel 20393 (1754.3MHz)	QPSK	6 RB / 0 RB Offset
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Channel Bandwidth: 3MHz

Channel 19965
(1711.5MHz)

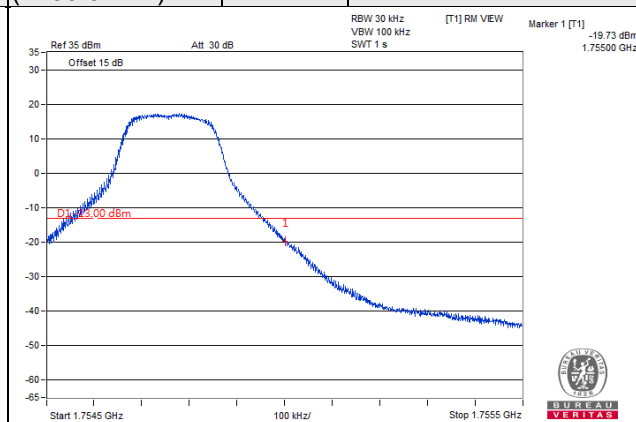
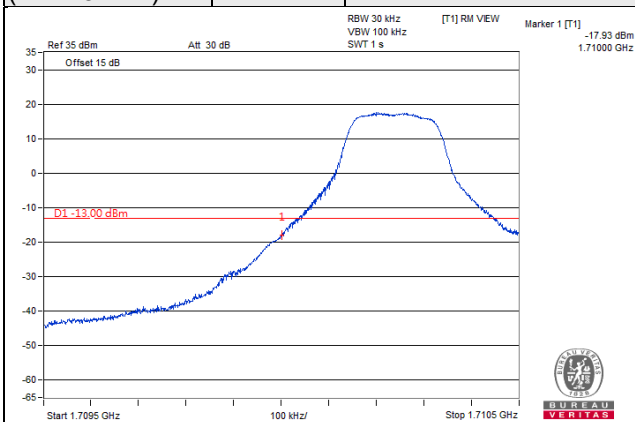
QPSK

1 RB / 0 RB Offset

Channel 20385
(1753.5MHz)

QPSK

1 RB / 14 RB Offset



Channel 19965
(1711.5MHz)

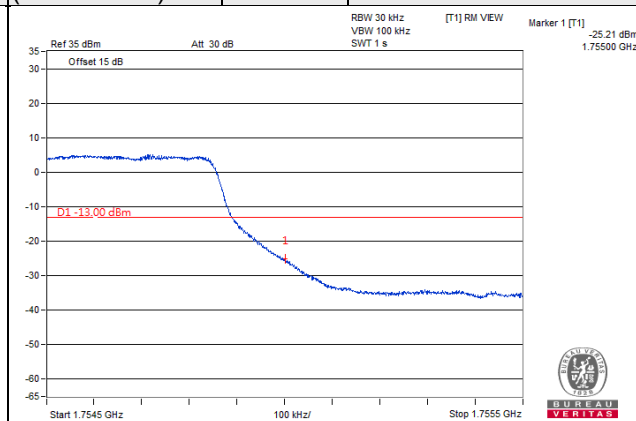
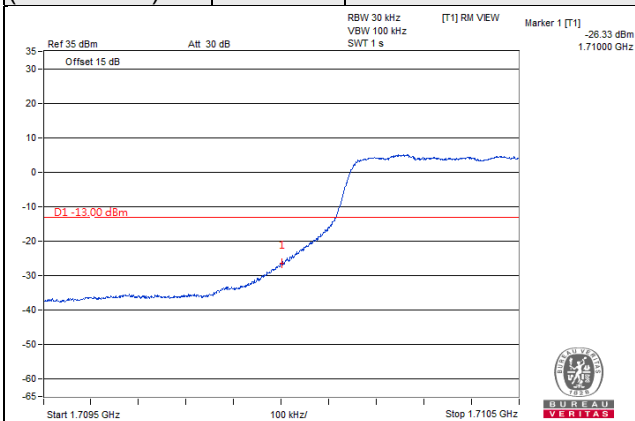
QPSK

15 RB / 0 RB Offset

Channel 20385
(1753.5MHz)

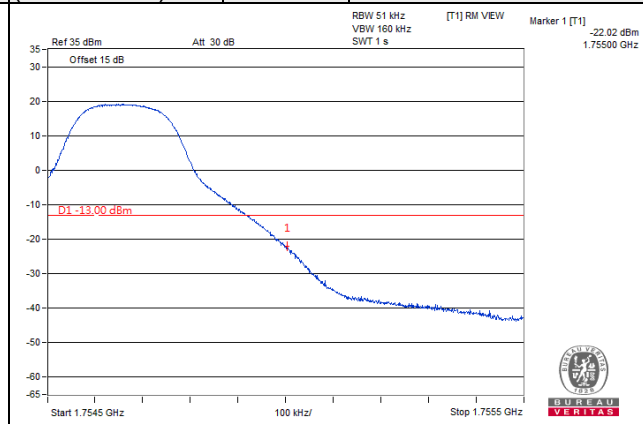
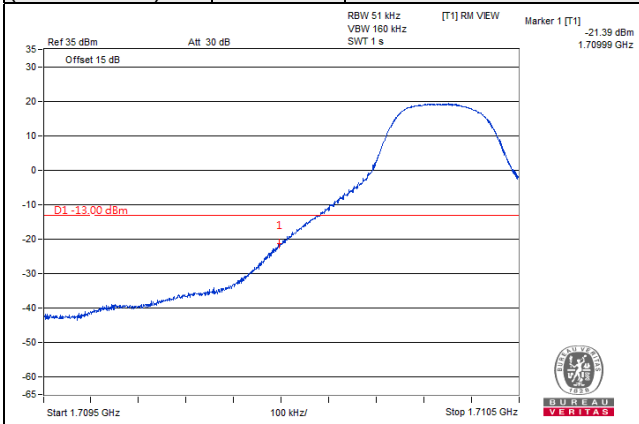
QPSK

15 RB / 0 RB Offset

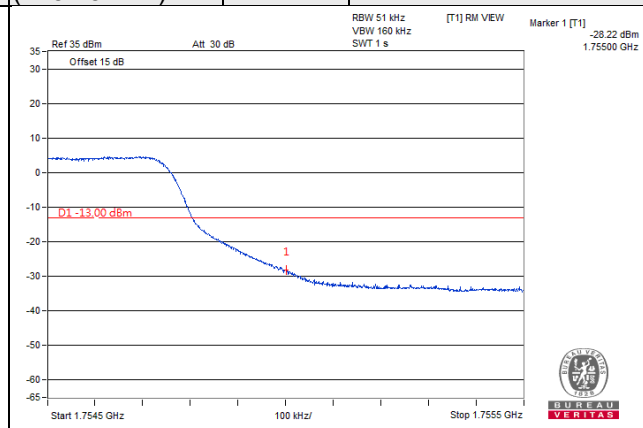
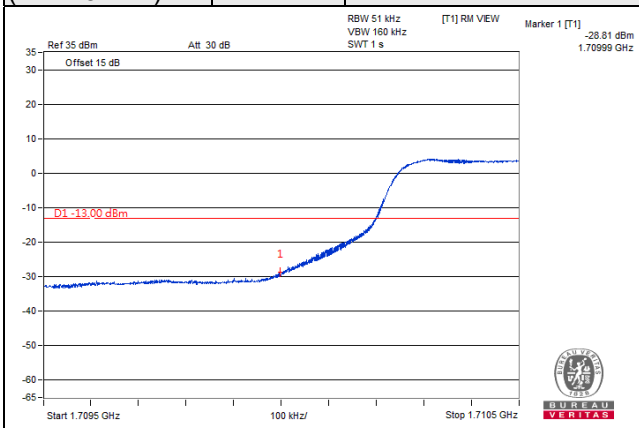


Channel Bandwidth: 5MHz

Channel 19975 (1712.5MHz)	QPSK	1 RB / 0 RB Offset	Channel 20375 (1752.5MHz)	QPSK	1 RB / 24 RB Offset
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Channel 19975 (1712.5MHz)	QPSK	25 RB / 0 RB Offset	Channel 20375 (1752.5MHz)	QPSK	25 RB / 0 RB Offset
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Channel Bandwidth: 10MHz

Channel 20000
(1715.0MHz)

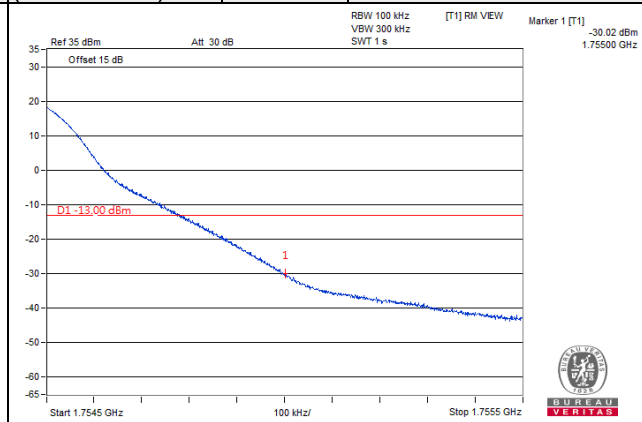
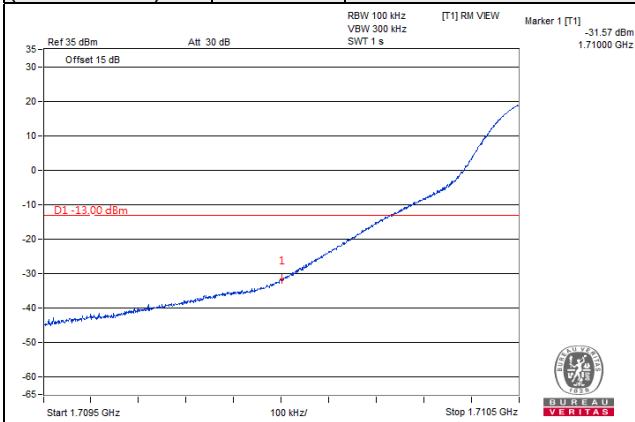
QPSK

1 RB / 0 RB Offset

Channel 20350
(1750.0MHz)

QPSK

1 RB / 49 RB Offset



Channel 20000
(1715.0MHz)

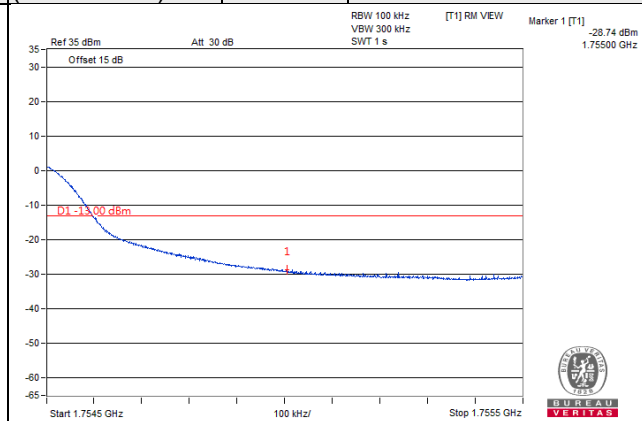
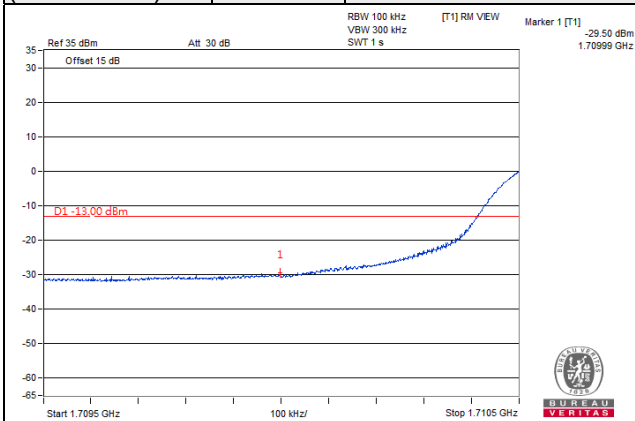
QPSK

50 RB / 0 RB Offset

Channel 20350
(1750.0MHz)

QPSK

50 RB / 0 RB Offset



Channel Bandwidth: 15MHz

Channel 20025
(1717.5MHz)

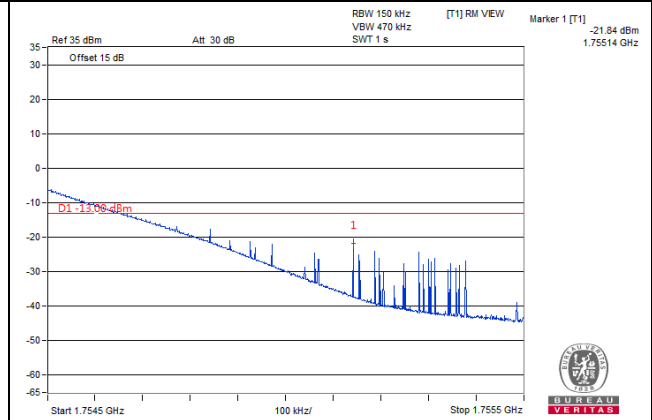
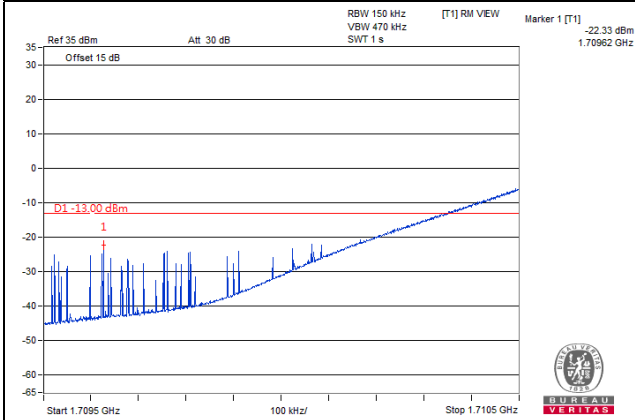
QPSK

1 RB / 0 RB Offset

Channel 20325
(1747.5MHz)

QPSK

1 RB / 74 RB Offset



Channel 20025
(1717.5MHz)

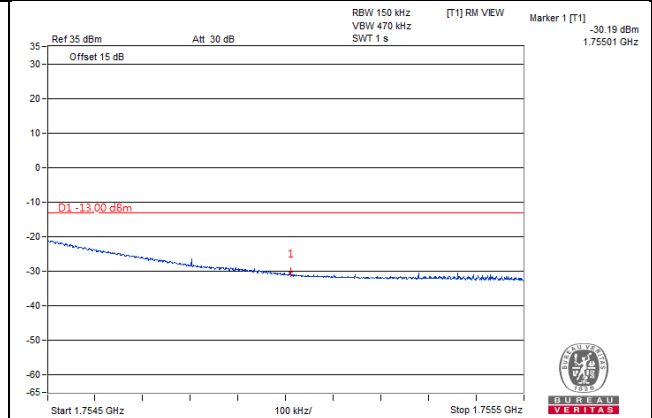
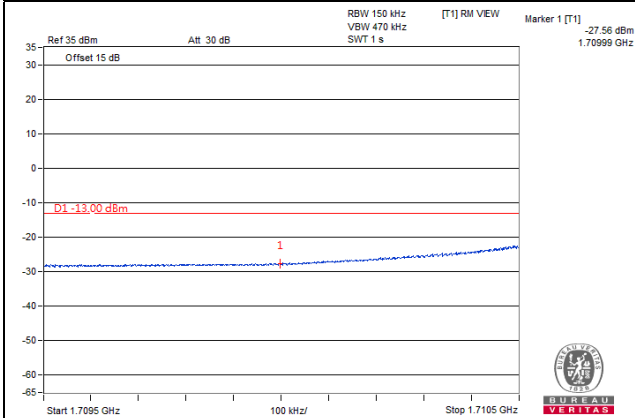
QPSK

75 RB / 0 RB Offset

Channel 20325
(1747.5MHz)

QPSK

75 RB / 0 RB Offset





BUREAU VERITAS

Channel Bandwidth: 20MHz

Channel 20050
(1720.0MHz)

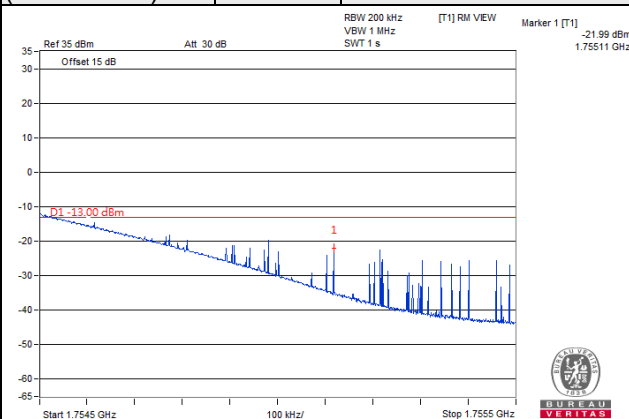
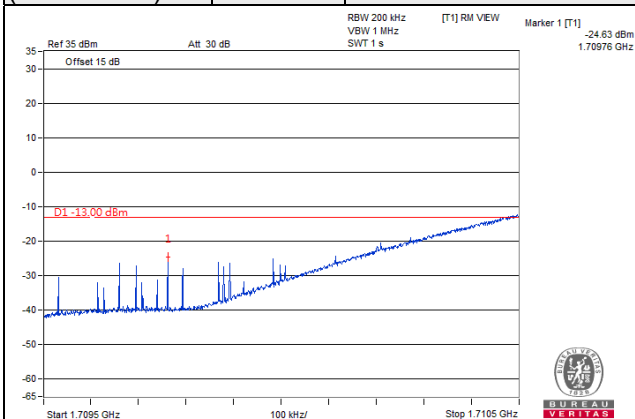
QPSK

1 RB / 0 RB Offset

Channel 20300
(1745.0MHz)

QPSK

1 RB / 99 RB Offset



Channel 20050
(1720.0MHz)

QPSK

100 RB / 0 RB Offset

Channel 20300
(1745.0MHz)

QPSK

100 RB / 0 RB Offset

