

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

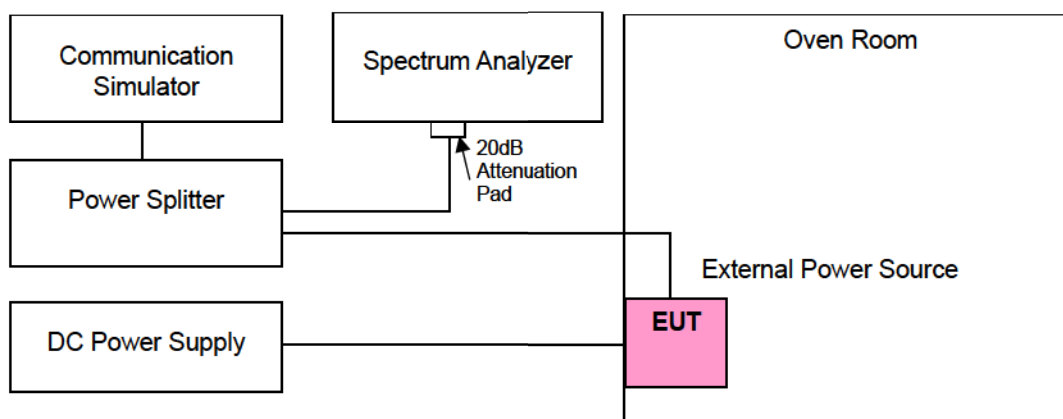
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

4.3.2 Test Procedure

- a. 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.
- b. 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.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °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 Conducted Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Vdc)	GPRS			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1850.200003	0.002	1909.800001	0.001
3.4	1850.200001	0.001	1909.800001	0.001
4.6	1850.200001	0.001	1909.800004	0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	GPRS			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1850.200003	0.002	1909.800002	0.001
-30	1850.200001	0.001	1909.800003	0.002
-20	1850.200004	0.002	1909.800004	0.002
-10	1850.200001	0.001	1909.800002	0.001
0	1850.200004	0.002	1909.800001	0.001
10	1850.200002	0.001	1909.800002	0.001
20	1850.200004	0.002	1909.800004	0.002
30	1850.200002	0.001	1909.800004	0.002
40	1850.200003	0.002	1909.800004	0.002
50	1850.199996	-0.002	1909.799997	-0.002
60	1850.199996	-0.002	1909.799996	-0.002
70	1850.199997	-0.002	1909.799996	-0.002
80	1850.199997	-0.002	1909.799997	-0.002
85	1850.199998	-0.001	1909.799998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	EDGE			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1850.200005	0.003	1909.799997	-0.002
3.4	1850.199997	-0.002	1909.800005	0.003
4.6	1850.199996	-0.002	1909.799999	-0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	EDGE			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1850.199999	-0.001	1909.799996	-0.002
-30	1850.200001	0.001	1909.800001	0.001
-20	1850.199996	-0.002	1909.799998	-0.001
-10	1850.200002	0.001	1909.799997	-0.002
0	1850.199998	-0.001	1909.800004	0.002
10	1850.200003	0.002	1909.800003	0.002
20	1850.199997	-0.002	1909.799996	-0.002
30	1850.200004	0.002	1909.800002	0.001
40	1850.200003	0.002	1909.800003	0.002
50	1850.199997	-0.002	1909.799998	-0.001
60	1850.199996	-0.002	1909.800004	0.002
70	1850.199999	-0.001	1909.799998	-0.001
80	1850.199998	-0.001	1909.800002	0.001
85	1850.200003	0.002	1909.800002	0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1850.699998	-0.001	1909.300000	-0.002
3.4	1850.700004	0.002	1909.300002	0.001
4.6	1850.700001	0.001	1909.299999	-0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1850.699999	-0.001	1909.300003	0.002
-30	1850.699998	-0.001	1909.300001	0.001
-20	1850.700003	0.002	1909.300005	0.003
-10	1850.699996	-0.002	1909.299999	-0.001
0	1850.699995	-0.003	1909.299995	-0.003
10	1850.699999	-0.001	1909.299999	-0.001
20	1850.700001	0.001	1909.299998	-0.001
30	1850.700004	0.002	1909.300001	0.001
40	1850.699998	-0.001	1909.300005	0.003
50	1850.700002	0.001	1909.300001	0.001
60	1850.700002	0.001	1909.300001	0.001
70	1850.700002	0.001	1909.299998	-0.001
80	1850.700005	0.003	1909.300003	0.002
85	1850.699997	-0.002	1909.300003	0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1851.500003	0.002	1908.500002	0.001
3.4	1851.499999	-0.001	1908.500002	0.001
4.6	1851.500003	0.002	1908.500005	0.003

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1851.500002	0.001	1908.500001	0.001
-30	1851.500001	0.001	1908.499997	-0.002
-20	1851.499998	-0.001	1908.499995	-0.003
-10	1851.500003	0.002	1908.499998	-0.001
0	1851.499997	-0.002	1908.500005	0.003
10	1851.500005	0.003	1908.499999	-0.001
20	1851.499995	-0.003	1908.500004	0.002
30	1851.500004	0.002	1908.499996	-0.002
40	1851.500002	0.001	1908.499999	-0.001
50	1851.499997	-0.002	1908.499995	-0.003
60	1851.500002	0.001	1908.499998	-0.001
70	1851.500005	0.003	1908.500003	0.002
80	1851.499999	-0.001	1908.500003	0.002
85	1851.499999	-0.001	1908.499995	-0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1852.499997	-0.002	1907.499996	-0.002
3.4	1852.500002	0.001	1907.500004	0.002
4.6	1852.499996	-0.002	1907.499995	-0.003

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1852.500003	0.002	1907.500003	0.002
-30	1852.499995	-0.003	1907.499997	-0.002
-20	1852.500005	0.003	1907.500001	0.001
-10	1852.499995	-0.003	1907.499995	-0.003
0	1852.499999	-0.001	1907.500003	0.002
10	1852.499998	-0.001	1907.500001	0.001
20	1852.500003	0.002	1907.500002	0.001
30	1852.500003	0.002	1907.500004	0.002
40	1852.500004	0.002	1907.500005	0.003
50	1852.500005	0.003	1907.500003	0.002
60	1852.499998	-0.001	1907.500004	0.002
70	1852.500004	0.002	1907.500003	0.002
80	1852.499995	-0.003	1907.500004	0.002
85	1852.499998	-0.001	1907.499995	-0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1854.999998	-0.001	1905.000001	0.001
3.4	1854.999999	-0.001	1904.999997	-0.002
4.6	1855.000001	0.001	1905.000001	0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1854.999999	-0.001	1905.000005	0.003
-30	1854.999997	-0.002	1905.000005	0.003
-20	1855.000002	0.001	1905.000003	0.002
-10	1855.000004	0.002	1905.000005	0.003
0	1854.999997	-0.002	1904.999997	-0.002
10	1854.999996	-0.002	1905.000002	0.001
20	1855.000003	0.002	1904.999998	-0.001
30	1854.999997	-0.002	1905.000005	0.003
40	1855.000005	0.003	1904.999995	-0.003
50	1855.000002	0.001	1905.000003	0.002
60	1855.000003	0.002	1904.999997	-0.002
70	1855.000004	0.002	1905.000003	0.002
80	1855.000003	0.002	1905.000002	0.001
85	1855.000003	0.002	1904.999997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1857.500002	0.001	1902.499996	-0.002
3.4	1857.499997	-0.002	1902.499995	-0.003
4.6	1857.499998	-0.001	1902.500003	0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1857.499999	-0.001	1902.499999	-0.001
-30	1857.500005	0.003	1902.499999	-0.001
-20	1857.499998	-0.001	1902.500002	0.001
-10	1857.499999	-0.001	1902.499997	-0.002
0	1857.500003	0.002	1902.500002	0.001
10	1857.499996	-0.002	1902.500002	0.001
20	1857.499999	-0.001	1902.500005	0.003
30	1857.500003	0.002	1902.499999	-0.001
40	1857.499995	-0.003	1902.500002	0.001
50	1857.499997	-0.002	1902.499996	-0.002
60	1857.499997	-0.002	1902.499995	-0.003
70	1857.500004	0.002	1902.500003	0.002
80	1857.500004	0.002	1902.499999	-0.001
85	1857.499995	-0.003	1902.499998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1859.999998	-0.001	1900.000002	0.001
3.4	1860.000003	0.002	1900.000001	0.001
4.6	1859.999999	-0.001	1899.999995	-0.003

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1860.000004	0.002	1900.000001	0.001
-30	1859.999998	-0.001	1900.000005	0.003
-20	1860.000004	0.002	1900.000001	0.001
-10	1859.999998	-0.001	1899.999997	-0.002
0	1859.999998	-0.001	1899.999997	-0.002
10	1860.000004	0.002	1899.999997	-0.002
20	1859.999997	-0.002	1899.999999	-0.001
30	1859.999998	-0.001	1900.000003	0.002
40	1859.999996	-0.002	1899.999997	-0.002
50	1860.000005	0.003	1900.000005	0.003
60	1859.999996	-0.002	1900.000002	0.001
70	1859.999995	-0.003	1899.999998	-0.001
80	1860.000001	0.001	1899.999995	-0.003
85	1859.999996	-0.002	1900.000005	0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1850.700003	0.002	1914.299997	-0.002
3.4	1850.700002	0.001	1914.300004	0.002
4.6	1850.699995	-0.003	1914.300004	0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1850.699995	-0.003	1914.299995	-0.003
-30	1850.700005	0.003	1914.299996	-0.002
-20	1850.699999	-0.001	1914.300005	0.003
-10	1850.699998	-0.001	1914.299996	-0.002
0	1850.699998	-0.001	1914.299996	-0.002
10	1850.700001	0.001	1914.299999	-0.001
20	1850.700001	0.001	1914.299998	-0.001
30	1850.699999	-0.001	1914.300001	0.001
40	1850.700003	0.002	1914.300004	0.002
50	1850.699999	-0.001	1914.300002	0.001
60	1850.700004	0.002	1914.299997	-0.002
70	1850.700005	0.003	1914.300005	0.003
80	1850.700005	0.003	1914.300004	0.002
85	1850.700003	0.002	1914.300005	0.003

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1851.500004	0.002	1913.499998	-0.001
3.4	1851.499995	-0.003	1913.499996	-0.002
4.6	1851.499995	-0.003	1913.500004	0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1851.500001	0.001	1913.499995	-0.003
-30	1851.499998	-0.001	1913.499996	-0.002
-20	1851.500005	0.003	1913.500002	0.001
-10	1851.500003	0.002	1913.499995	-0.003
0	1851.500001	0.001	1913.499996	-0.002
10	1851.500001	0.001	1913.499998	-0.001
20	1851.499998	-0.001	1913.499998	-0.001
30	1851.500002	0.001	1913.500001	0.001
40	1851.500003	0.002	1913.500005	0.003
50	1851.500002	0.001	1913.500004	0.002
60	1851.500003	0.002	1913.500004	0.002
70	1851.500003	0.002	1913.499999	-0.001
80	1851.500001	0.001	1913.500002	0.001
85	1851.499997	-0.002	1913.500002	0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1852.500002	0.001	1912.500004	0.002
3.4	1852.499995	-0.003	1912.499998	-0.001
4.6	1852.500001	0.001	1912.500002	0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1852.500004	0.002	1912.499998	-0.001
-30	1852.500005	0.003	1912.500005	0.003
-20	1852.500003	0.002	1912.499997	-0.002
-10	1852.499999	-0.001	1912.499999	-0.001
0	1852.499999	-0.001	1912.499999	-0.001
10	1852.499995	-0.003	1912.499999	-0.001
20	1852.500004	0.002	1912.500004	0.002
30	1852.500001	0.001	1912.499995	-0.003
40	1852.500001	0.001	1912.499998	-0.001
50	1852.500001	0.001	1912.500004	0.002
60	1852.500004	0.002	1912.499996	-0.002
70	1852.500005	0.003	1912.500004	0.002
80	1852.500001	0.001	1912.499996	-0.002
85	1852.499997	-0.002	1912.499996	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1854.999998	-0.001	1910.000005	0.003
3.4	1854.999995	-0.003	1909.999995	-0.003
4.6	1854.999996	-0.002	1910.000003	0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1854.999996	-0.002	1909.999997	-0.002
-30	1854.999999	-0.001	1910.000005	0.003
-20	1855.000005	0.003	1910.000001	0.001
-10	1854.999997	-0.002	1909.999999	-0.001
0	1855.000004	0.002	1910.000003	0.002
10	1855.000004	0.002	1909.999996	-0.002
20	1854.999995	-0.003	1909.999998	-0.001
30	1855.000001	0.001	1909.999995	-0.003
40	1854.999995	-0.003	1909.999996	-0.002
50	1854.999996	-0.002	1910.000001	0.001
60	1854.999997	-0.002	1909.999995	-0.003
70	1855.000002	0.001	1910.000005	0.003
80	1855.000005	0.003	1910.000002	0.001
85	1854.999999	-0.001	1909.999998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1857.500001	0.001	1907.499998	-0.001
3.4	1857.499998	-0.001	1907.500002	0.001
4.6	1857.500002	0.001	1907.499999	-0.001

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1857.499998	-0.001	1907.500002	0.001
-30	1857.500005	0.003	1907.500005	0.003
-20	1857.500002	0.001	1907.500002	0.001
-10	1857.499995	-0.003	1907.499998	-0.001
0	1857.500001	0.001	1907.500004	0.002
10	1857.499997	-0.002	1907.499995	-0.003
20	1857.500005	0.003	1907.499996	-0.002
30	1857.500004	0.002	1907.499998	-0.001
40	1857.499998	-0.001	1907.500005	0.003
50	1857.499999	-0.001	1907.500004	0.002
60	1857.499996	-0.002	1907.500004	0.002
70	1857.500002	0.001	1907.499999	-0.001
80	1857.500001	0.001	1907.500002	0.001
85	1857.499998	-0.001	1907.500003	0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.0	1860.000005	0.003	1904.999999	-0.001
3.4	1859.999997	-0.002	1905.000002	0.001
4.6	1860.000002	0.001	1904.999996	-0.002

Note: The applicant defined the normal working voltage is from 3.4Vdc to 4.6Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	1859.999998	-0.001	1904.999999	-0.001
-30	1859.999996	-0.002	1904.999995	-0.003
-20	1860.000001	0.001	1905.000002	0.001
-10	1860.000003	0.002	1904.999997	-0.002
0	1860.000004	0.002	1905.000004	0.002
10	1860.000003	0.002	1905.000005	0.003
20	1860.000005	0.003	1904.999998	-0.001
30	1859.999999	-0.001	1904.999995	-0.003
40	1859.999997	-0.002	1905.000001	0.001
50	1859.999998	-0.001	1904.999999	-0.001
60	1860.000001	0.001	1905.000001	0.001
70	1860.000001	0.001	1905.000005	0.003
80	1859.999995	-0.003	1905.000005	0.003
85	1859.999999	-0.001	1905.000003	0.002

4.4 Occupied Bandwidth Measurement

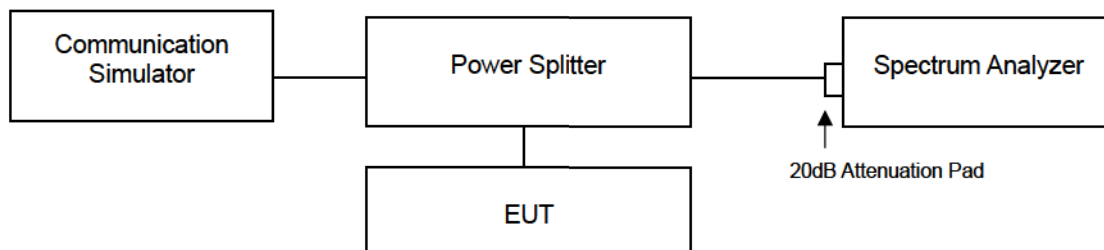
4.4.1 Test Procedure

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

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- b) The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times$ RBW.
- c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- d) The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- e) Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- f) Determine the following reference values: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
- g) Determine the “-X dB amplitude” as equal to (Reference Value - X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
- h) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB amplitude” determined in step f). If a marker is below this “-X dB amplitude” value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers.
- i) The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

For the occupied bandwidth measurement method, please refer to section 5.4.4 of ANSI C63.26.

4.4.2 Test Setup

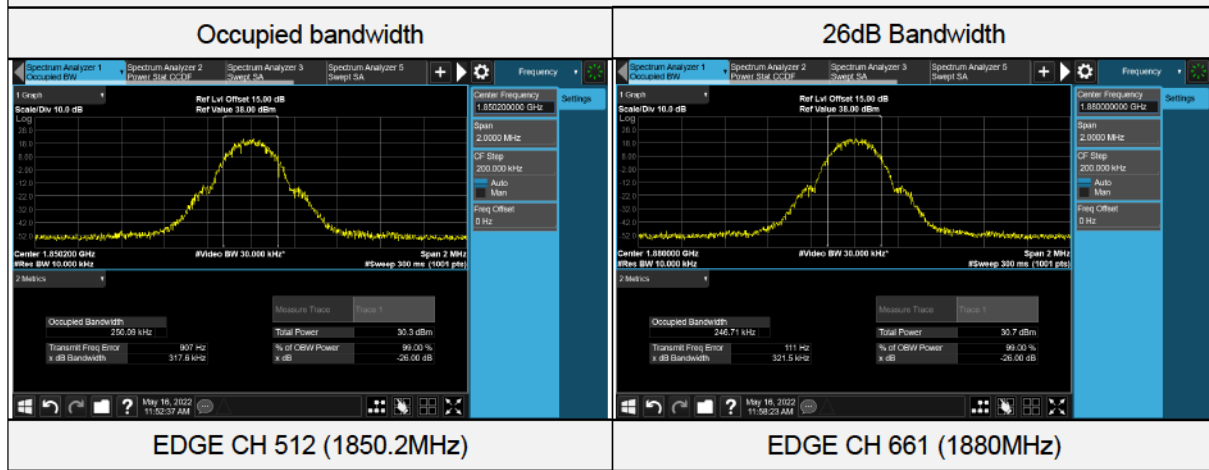


4.4.3 Test Result

GPRS, EDGE

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (kHz)	26dB Bandwidth (kHz)
GPRS	512	1850.2	247.09	319.50
GPRS	661	1880	248.07	311.30
GPRS	810	1909.8	248.40	321.50
EDGE	512	1850.2	250.09	317.60
EDGE	661	1880	246.71	321.50
EDGE	810	1909.8	244.12	321.30

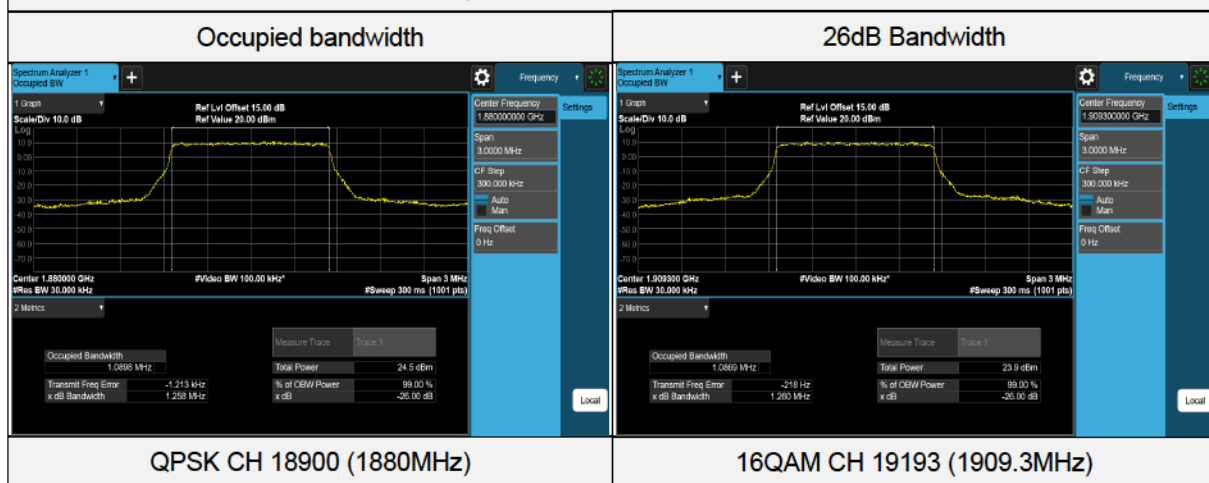
Spectrum Plot of Worst Value



LTE Band 2 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18607	1850.7	1.0876	1.247
QPSK	18900	1880	1.0898	1.258
QPSK	19193	1909.3	1.0888	1.259
16QAM	18607	1850.7	1.0866	1.254
16QAM	18900	1880	1.0876	1.251
16QAM	19193	1909.3	1.0869	1.260
64QAM	18607	1850.7	1.0883	1.253
64QAM	18900	1880	1.0876	1.256
64QAM	19193	1909.3	1.0883	1.252

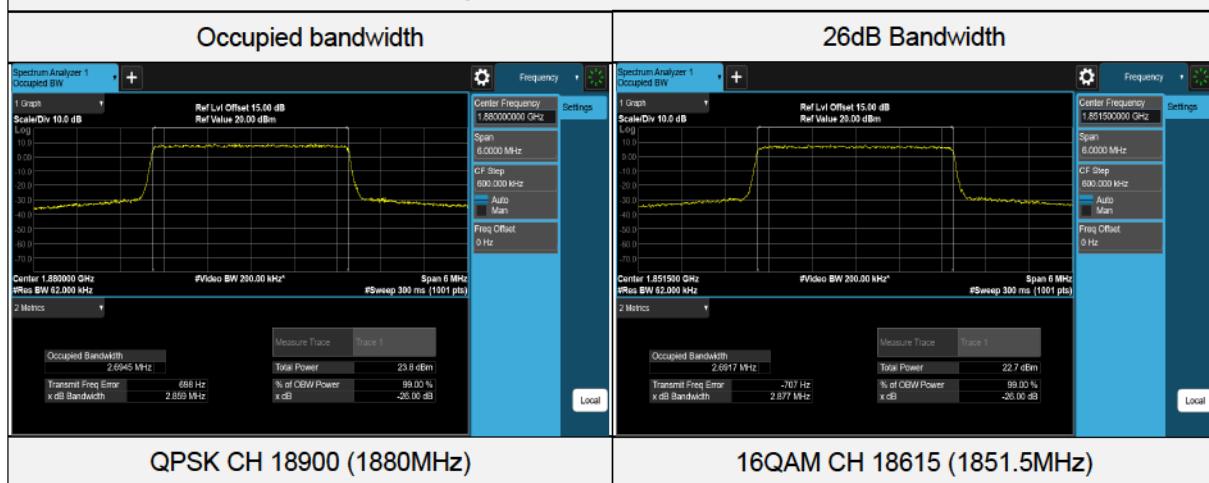
Spectrum Plot of Worst Value



LTE Band 2 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18615	1851.5	2.6893	2.862
QPSK	18900	1880	2.6945	2.859
QPSK	19185	1908.5	2.6920	2.868
16QAM	18615	1851.5	2.6917	2.877
16QAM	18900	1880	2.6921	2.863
16QAM	19185	1908.5	2.6902	2.877
64QAM	18615	1851.5	2.6905	2.865
64QAM	18900	1880	2.6906	2.854
64QAM	19185	1908.5	2.6891	2.861

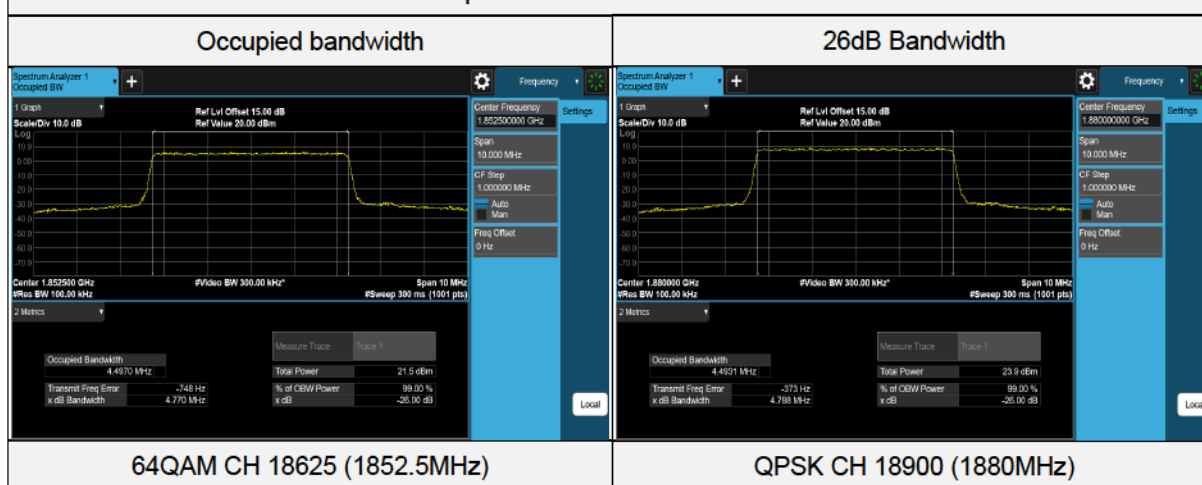
Spectrum Plot of Worst Value



LTE Band 2 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18625	1852.5	4.4955	4.786
QPSK	18900	1880	4.4931	4.788
QPSK	19175	1907.5	4.4935	4.777
16QAM	18625	1852.5	4.4889	4.767
16QAM	18900	1880	4.4909	4.773
16QAM	19175	1907.5	4.4905	4.774
64QAM	18625	1852.5	4.4970	4.770
64QAM	18900	1880	4.4930	4.773
64QAM	19175	1907.5	4.4959	4.775

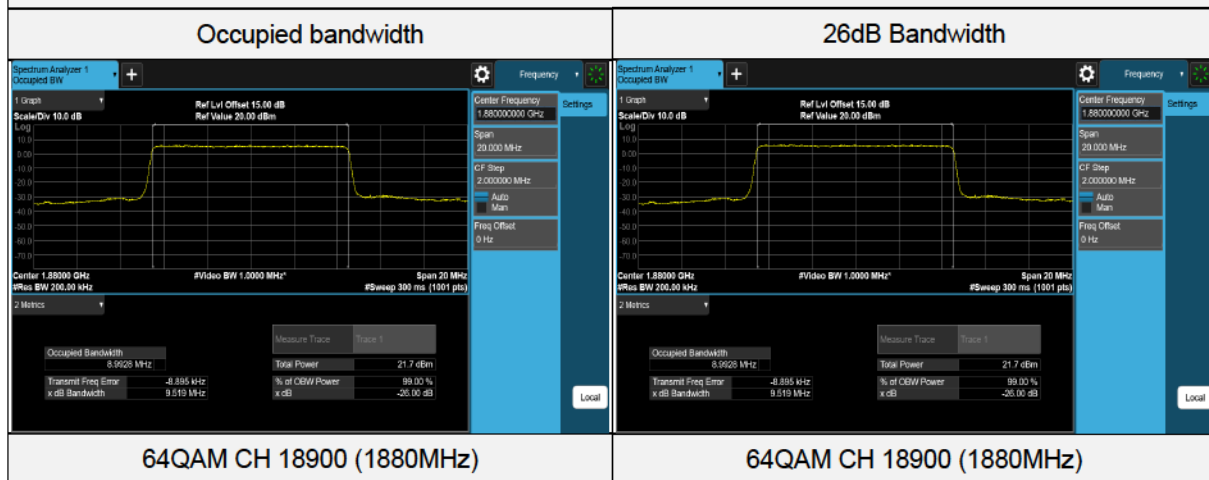
Spectrum Plot of Worst Value



LTE Band 2 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18650	1855	8.9839	9.500
QPSK	18900	1880	8.9823	9.515
QPSK	19150	1905	8.9862	9.513
16QAM	18650	1855	8.9832	9.501
16QAM	18900	1880	8.9856	9.497
16QAM	19150	1905	8.9801	9.504
64QAM	18650	1855	8.9892	9.510
64QAM	18900	1880	8.9928	9.519
64QAM	19150	1905	8.9841	9.517

Spectrum Plot of Worst Value



LTE Band 2 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18675	1857.5	13.475	14.22
QPSK	18900	1880	13.477	14.23
QPSK	19125	1902.5	13.484	14.21
16QAM	18675	1857.5	13.465	14.24
16QAM	18900	1880	13.466	14.24
16QAM	19125	1902.5	13.470	14.22
64QAM	18675	1857.5	13.457	14.22
64QAM	18900	1880	13.466	14.23
64QAM	19125	1902.5	13.463	14.23

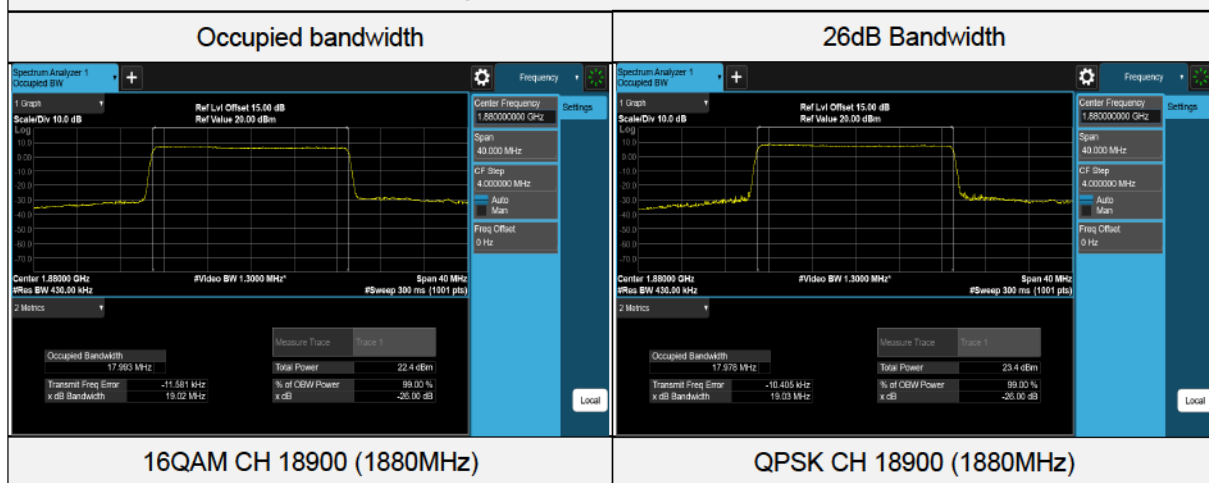
Spectrum Plot of Worst Value



LTE Band 2 (Channel Bandwidth 20MHz)

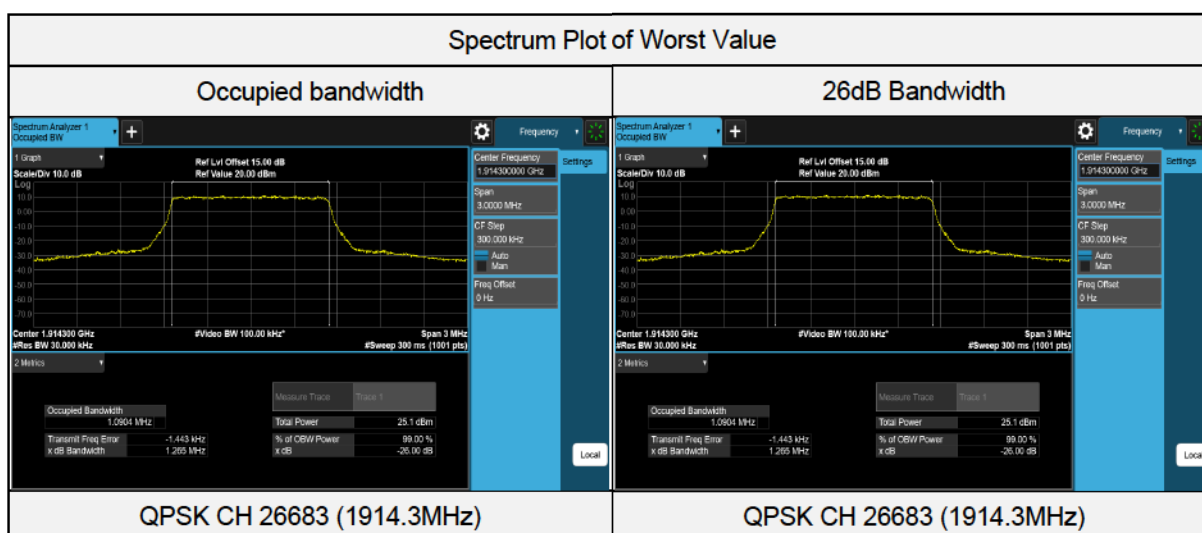
Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18700	1860	17.946	19.01
QPSK	18900	1880	17.979	19.03
QPSK	19100	1900	17.949	19.02
16QAM	18700	1860	17.962	19.01
16QAM	18900	1880	17.993	19.02
16QAM	19100	1900	17.956	19.03
64QAM	18700	1860	17.953	19.01
64QAM	18900	1880	17.976	19.03
64QAM	19100	1900	17.955	19.02

Spectrum Plot of Worst Value



LTE Band 25 (Channel Bandwidth 1.4MHz)

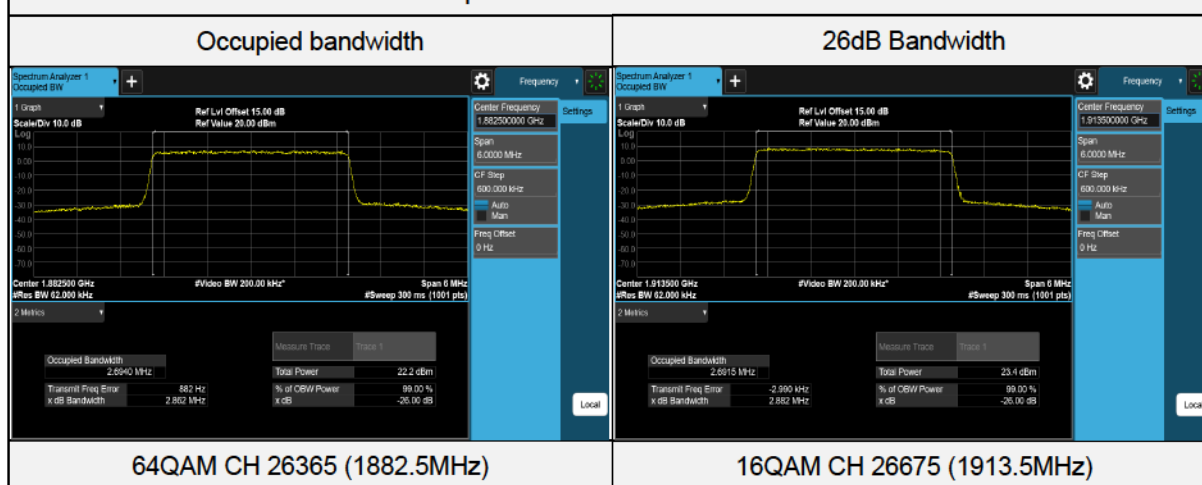
Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26047	1850.7	1.0864	1.247
QPSK	26365	1882.5	1.0898	1.254
QPSK	26683	1914.3	1.0904	1.265
16QAM	26047	1850.7	1.0876	1.254
16QAM	26365	1882.5	1.0868	1.258
16QAM	26683	1914.3	1.0867	1.250
64QAM	26047	1850.7	1.0874	1.256
64QAM	26365	1882.5	1.0872	1.258
64QAM	26683	1914.3	1.0881	1.261



LTE Band 25 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26055	1851.5	2.6925	2.869
QPSK	26365	1882.5	2.6923	2.863
QPSK	26675	1913.5	2.6889	2.863
16QAM	26055	1851.5	2.6885	2.874
16QAM	26365	1882.5	2.6900	2.874
16QAM	26675	1913.5	2.6915	2.882
64QAM	26055	1851.5	2.6925	2.865
64QAM	26365	1882.5	2.6940	2.862
64QAM	26675	1913.5	2.6895	2.864

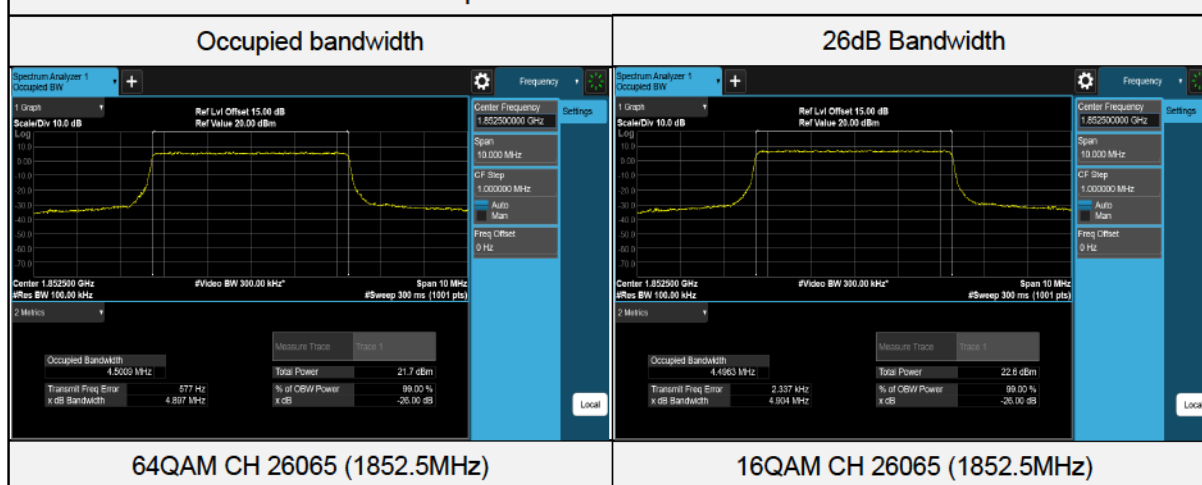
Spectrum Plot of Worst Value



LTE Band 25 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26065	1852.5	4.4976	4.893
QPSK	26365	1882.5	4.4996	4.867
QPSK	26665	1912.5	4.4948	4.880
16QAM	26065	1852.5	4.4963	4.904
16QAM	26365	1882.5	4.4966	4.877
16QAM	26665	1912.5	4.4903	4.855
64QAM	26065	1852.5	4.5009	4.897
64QAM	26365	1882.5	4.4992	4.871
64QAM	26665	1912.5	4.4936	4.821

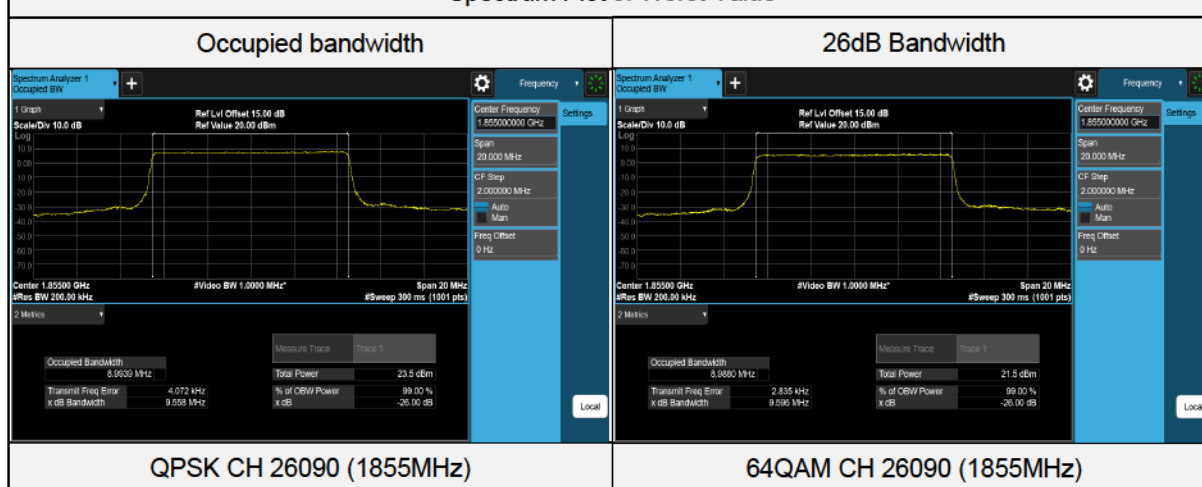
Spectrum Plot of Worst Value



LTE Band 25 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26090	1855	8.9939	9.558
QPSK	26365	1882.5	8.9879	9.563
QPSK	26640	1910	8.9752	9.574
16QAM	26090	1855	8.9890	9.543
16QAM	26365	1882.5	8.9875	9.546
16QAM	26640	1910	8.9735	9.536
64QAM	26090	1855	8.9880	9.596
64QAM	26365	1882.5	8.9900	9.573
64QAM	26640	1910	8.9776	9.555

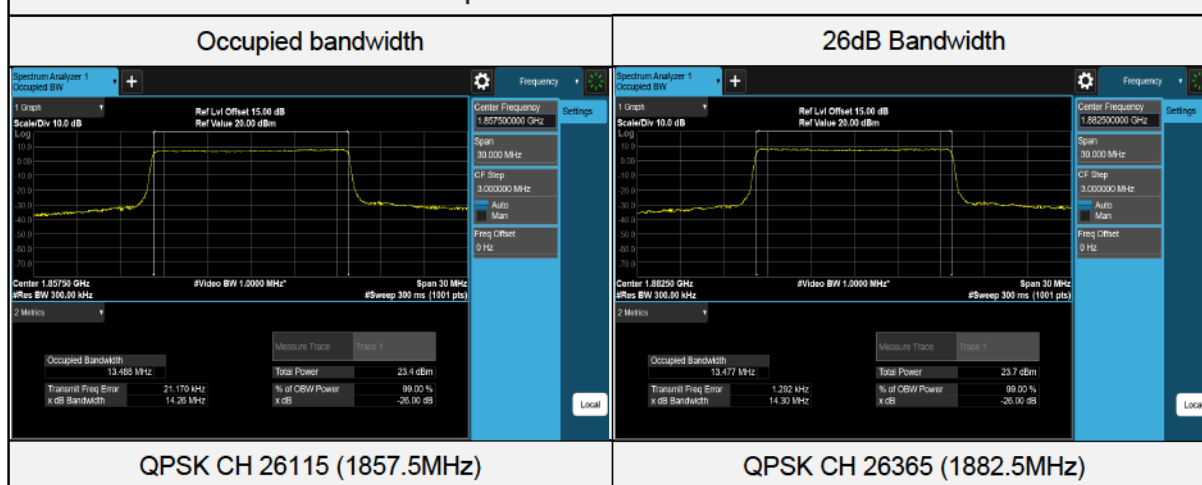
Spectrum Plot of Worst Value



LTE Band 25 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26115	1857.5	13.488	14.26
QPSK	26365	1882.5	13.477	14.30
QPSK	26615	1907.5	13.464	14.27
16QAM	26115	1857.5	13.468	14.25
16QAM	26365	1882.5	13.477	14.29
16QAM	26615	1907.5	13.463	14.28
64QAM	26115	1857.5	13.465	14.29
64QAM	26365	1882.5	13.473	14.29
64QAM	26615	1907.5	13.457	14.29

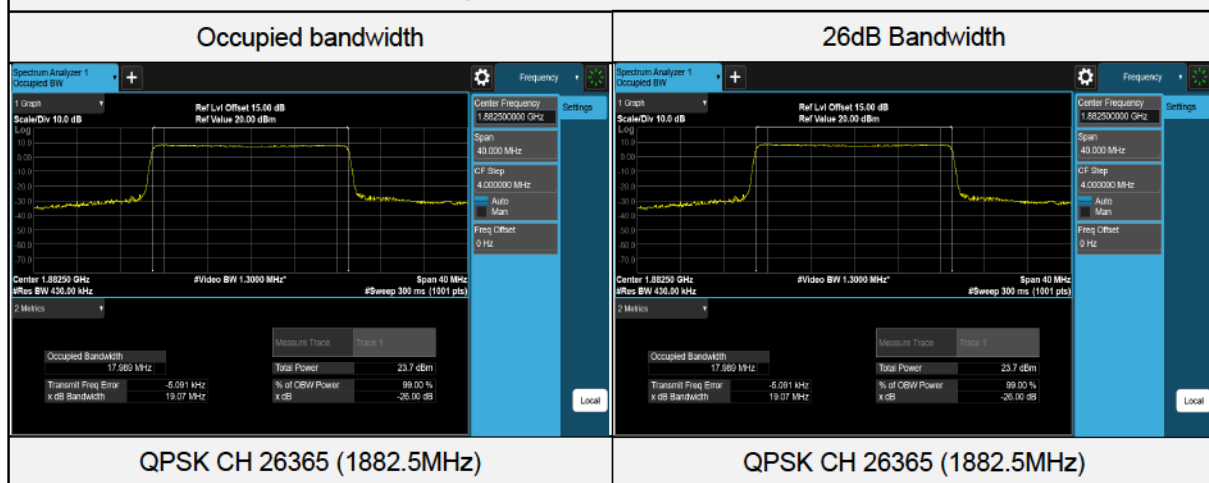
Spectrum Plot of Worst Value



LTE Band 25 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26140	1860	17.950	19.04
QPSK	26365	1882.5	17.989	19.07
QPSK	26590	1905	17.966	19.04
16QAM	26140	1860	17.966	19.03
16QAM	26365	1882.5	17.989	19.05
16QAM	26590	1905	17.973	19.04
64QAM	26140	1860	17.956	19.05
64QAM	26365	1882.5	17.985	19.07
64QAM	26590	1905	17.966	19.05

Spectrum Plot of Worst Value

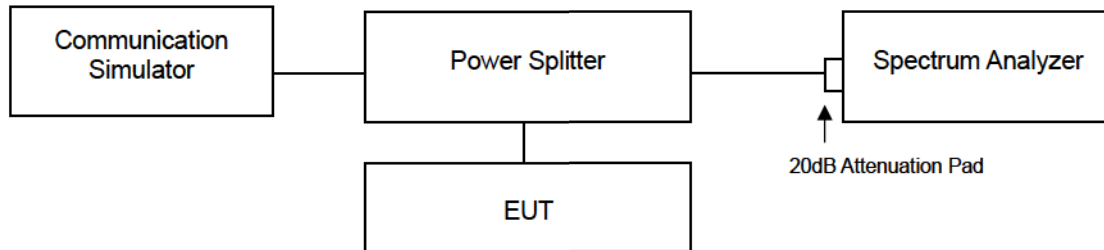


4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4.5.2 Test Setup



4.5.3 Test Procedures

- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 10kHz and VB of the spectrum is 30kHz (GPRS / EDGE).
- 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. Record the max trace plot into the test report.