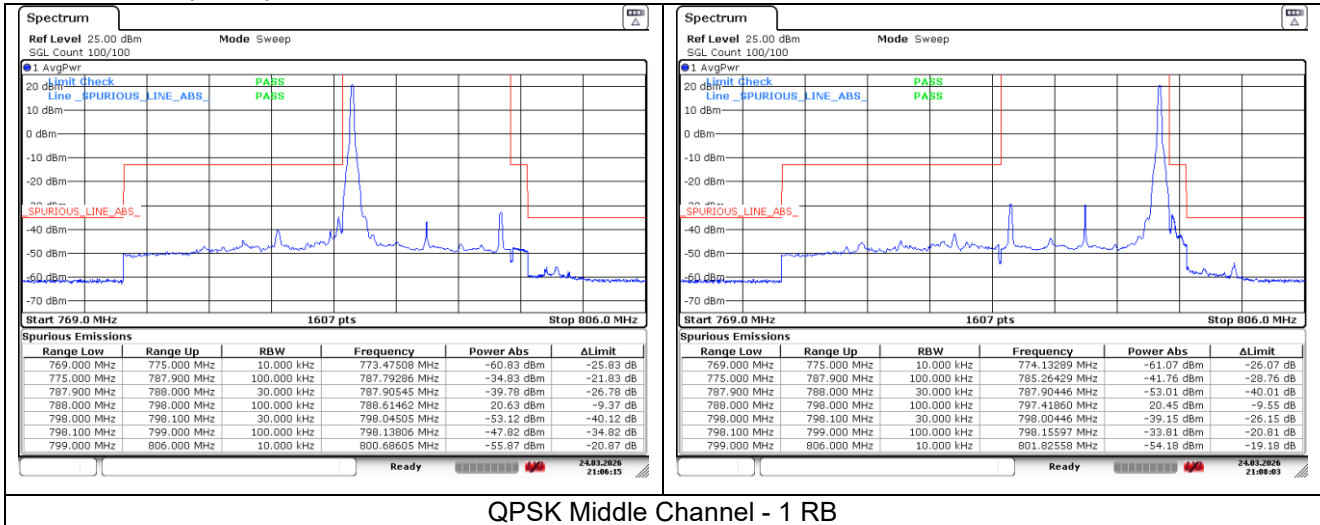
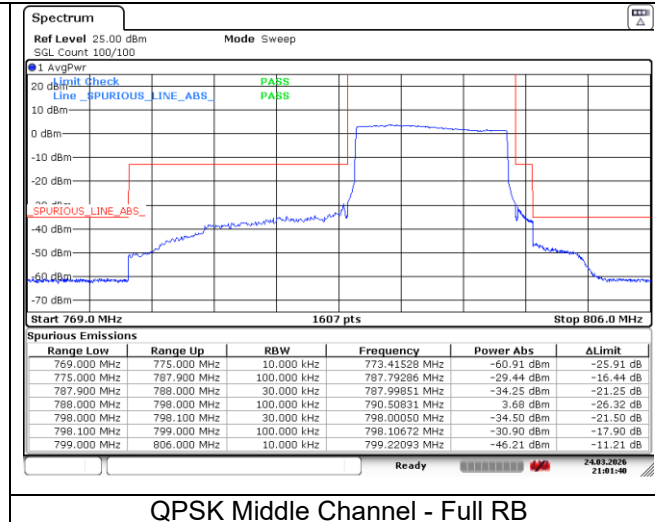


LTE band 14 (10 MHz)

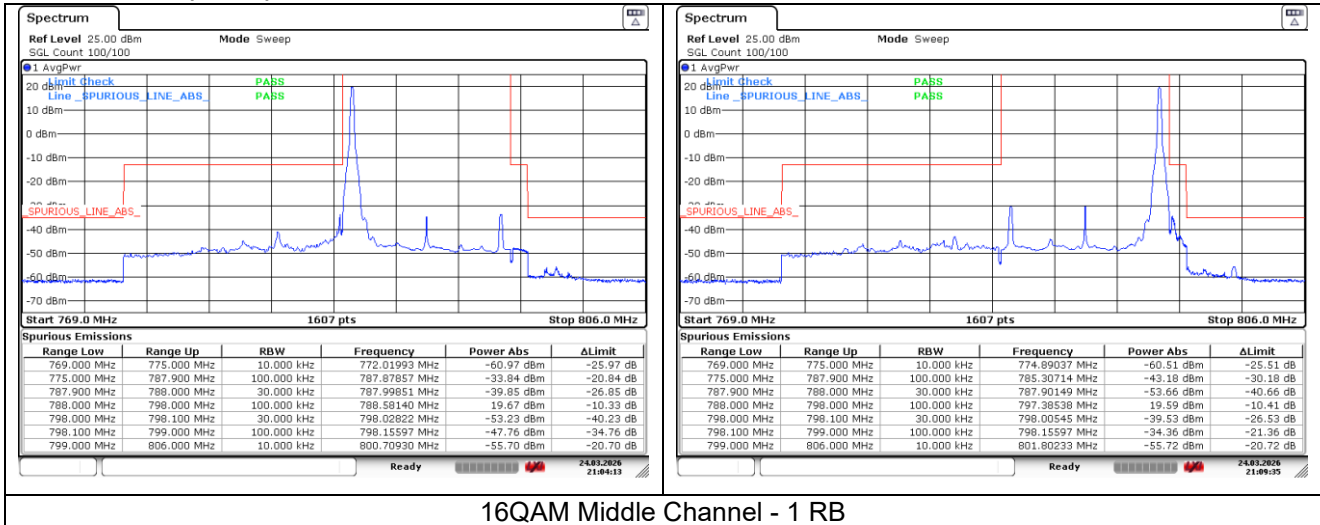


QPSK Middle Channel - 1 RB

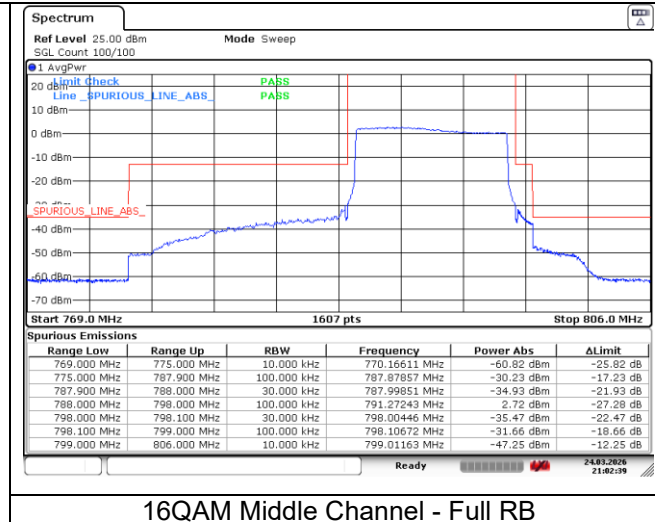


QPSK Middle Channel - Full RB

LTE band 14 (10 MHz)

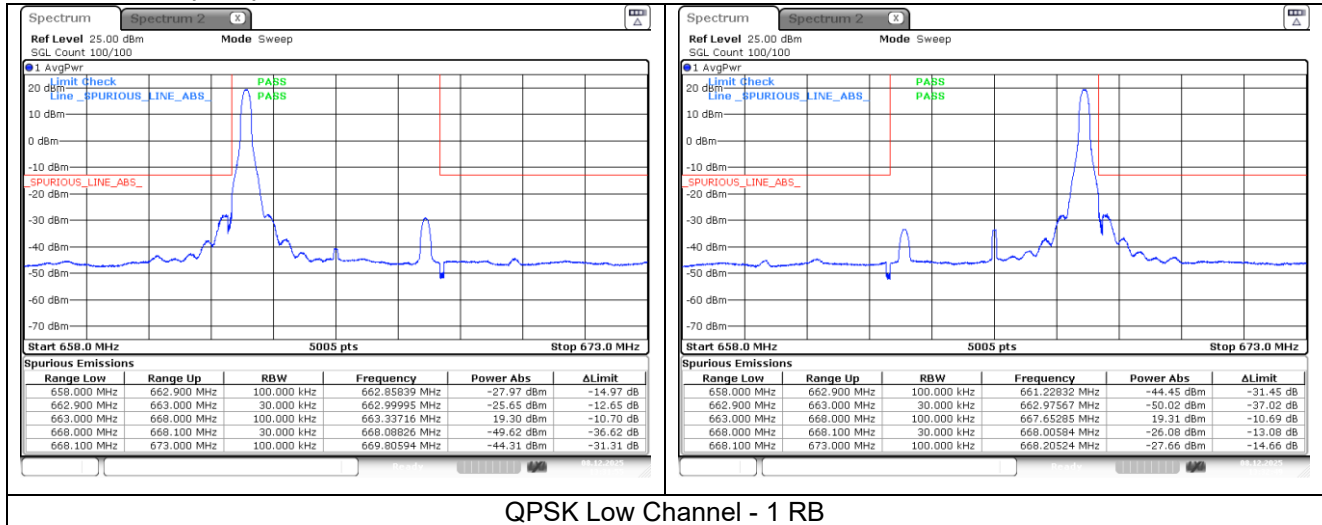


16QAM Middle Channel - 1 RB

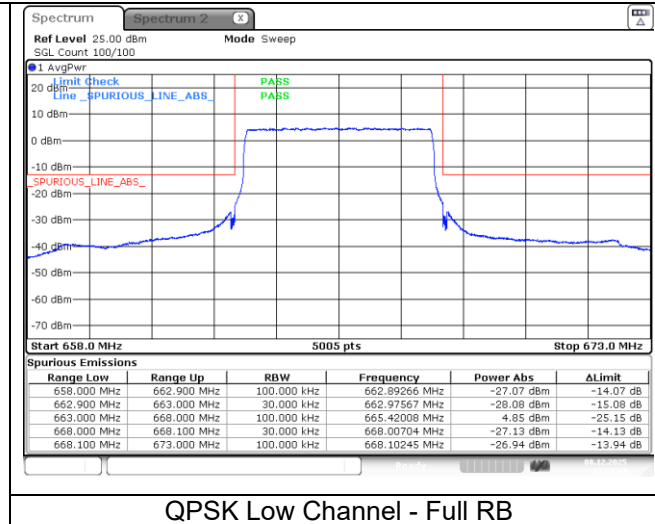


16QAM Middle Channel - Full RB

LTE band 71 (5 MHz)

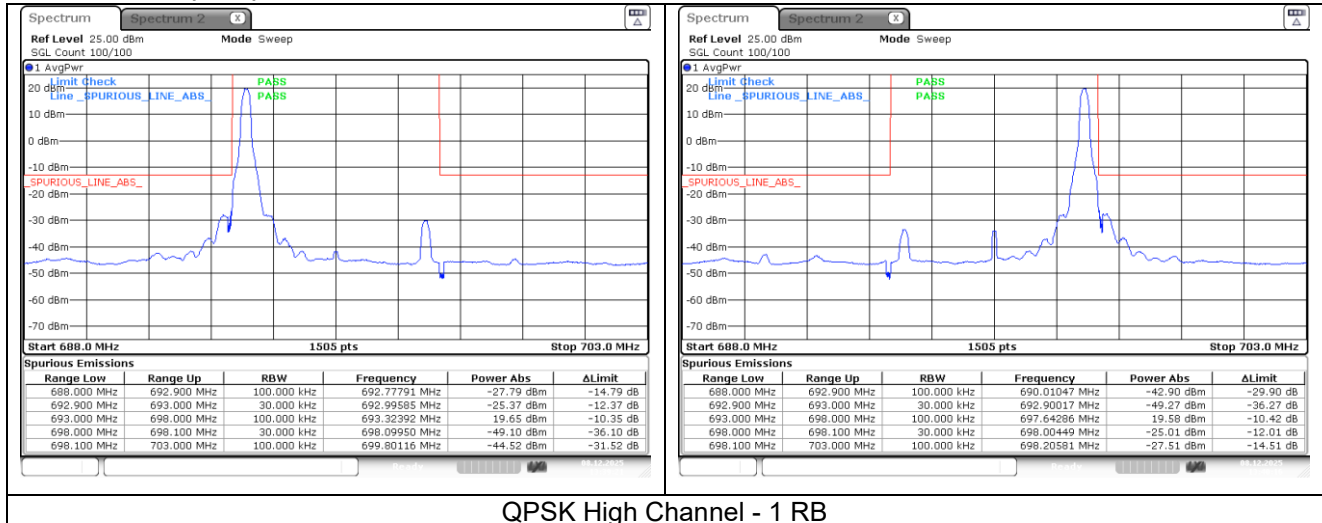


QPSK Low Channel - 1 RB

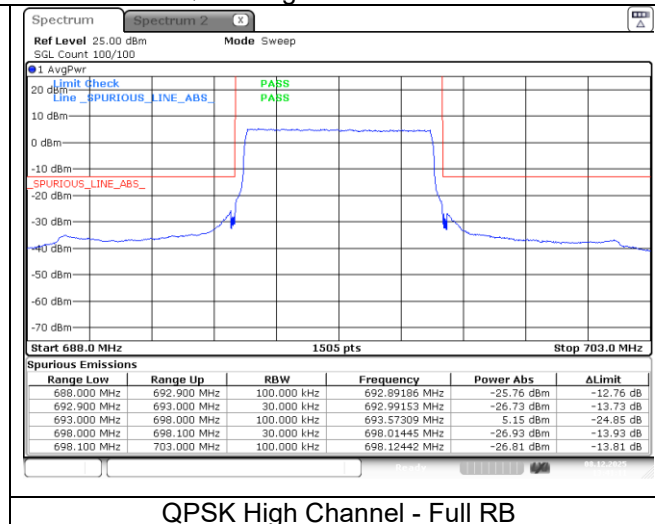


QPSK Low Channel - Full RB

LTE band 71 (5 MHz)

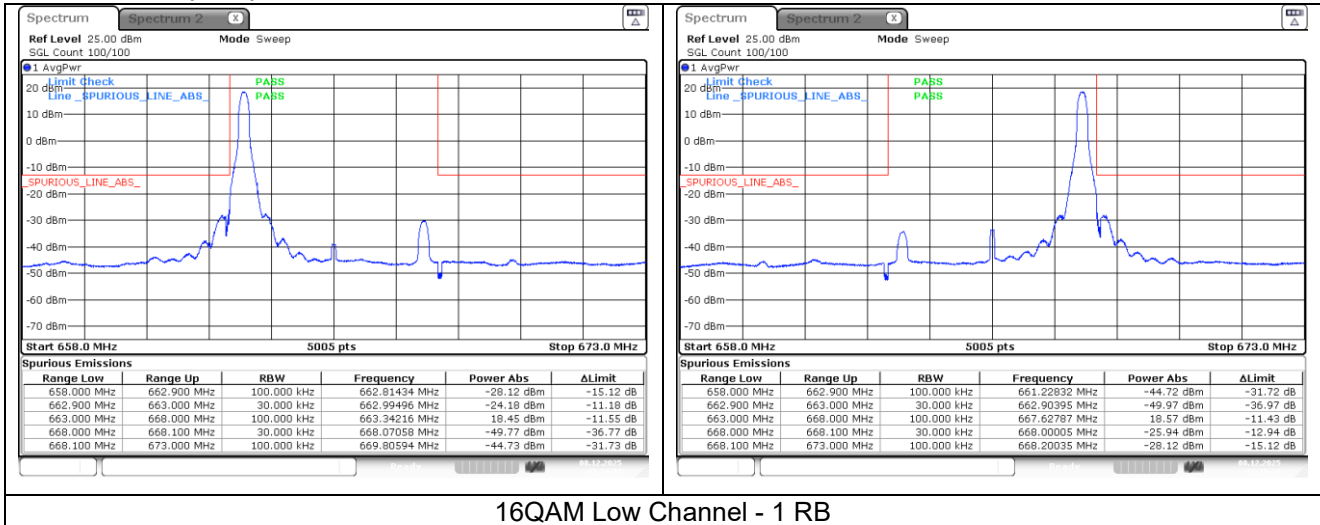


QPSK High Channel - 1 RB

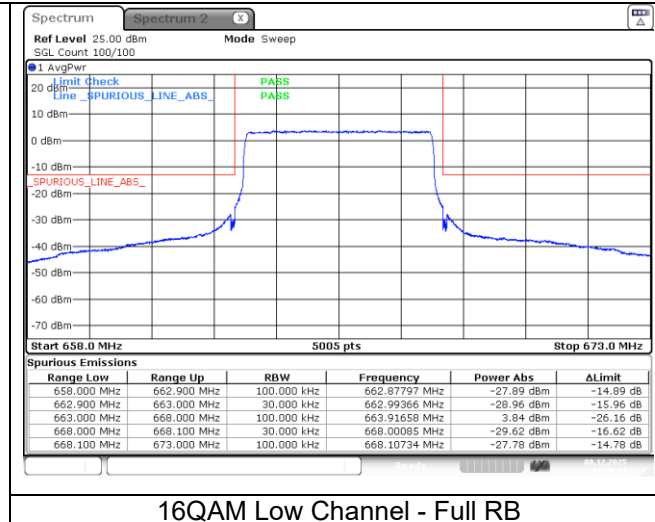


QPSK High Channel - Full RB

LTE band 71 (5 MHz)

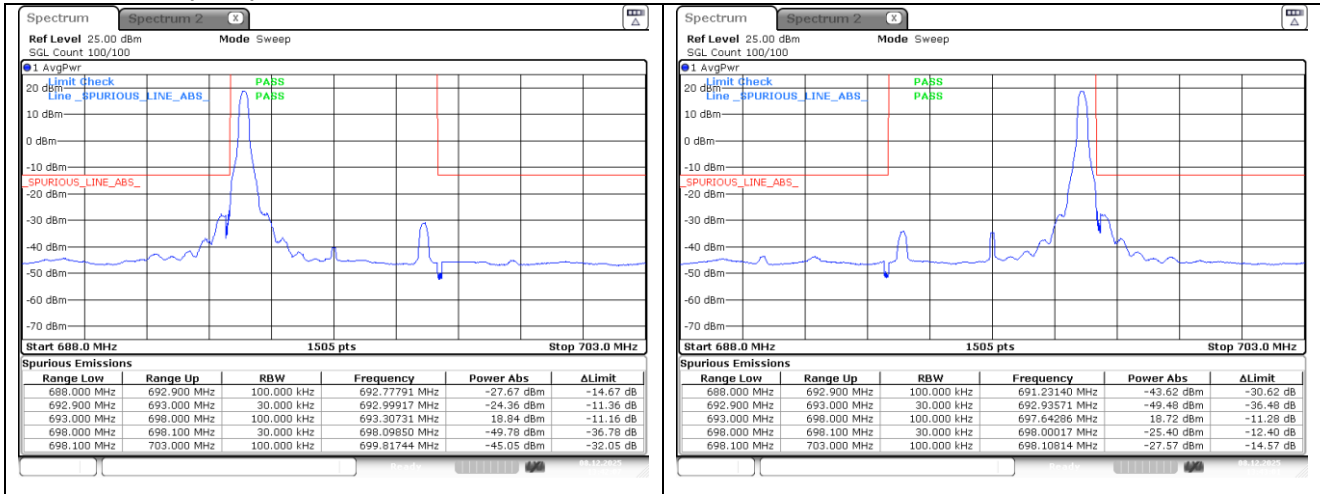


16QAM Low Channel - 1 RB

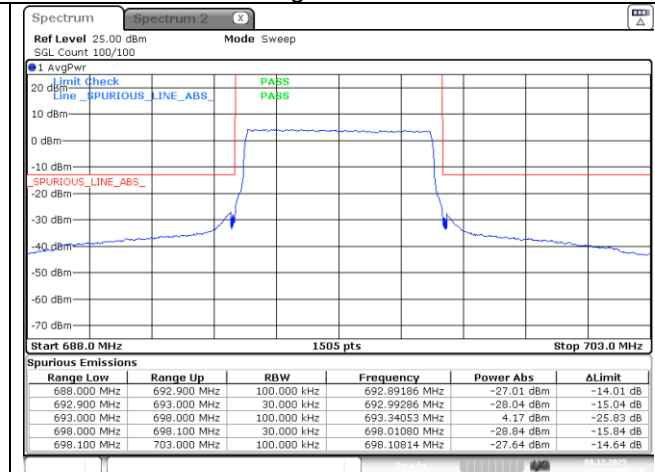


16QAM Low Channel - Full RB

LTE band 71 (5 MHz)

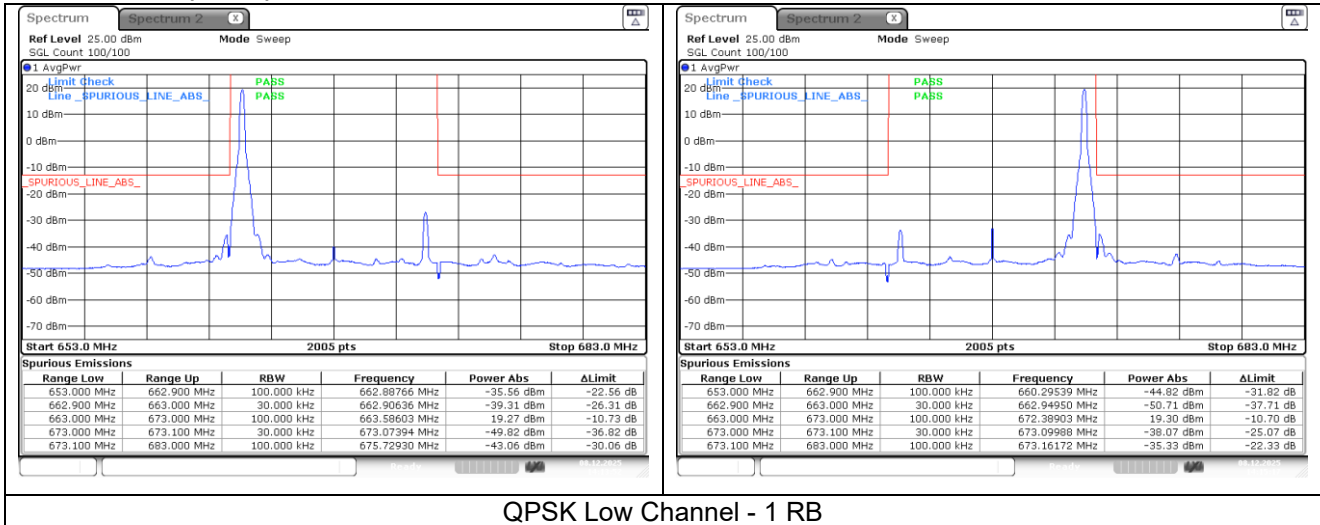


16QAM High Channel - 1 RB

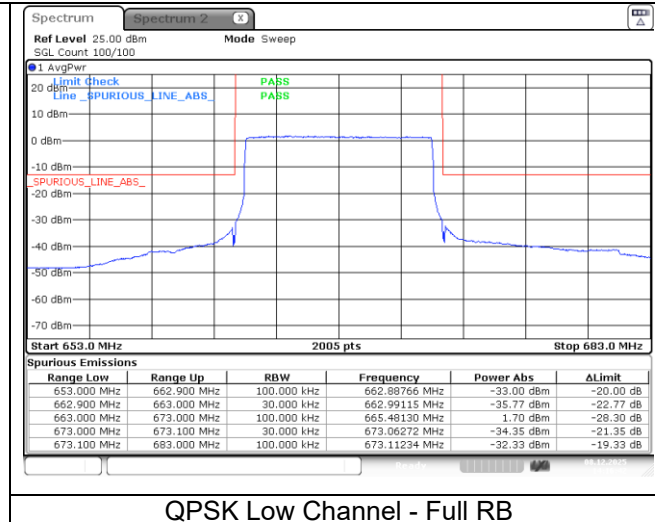


16QAM High Channel - Full RB

LTE band 71 (10 MHz)

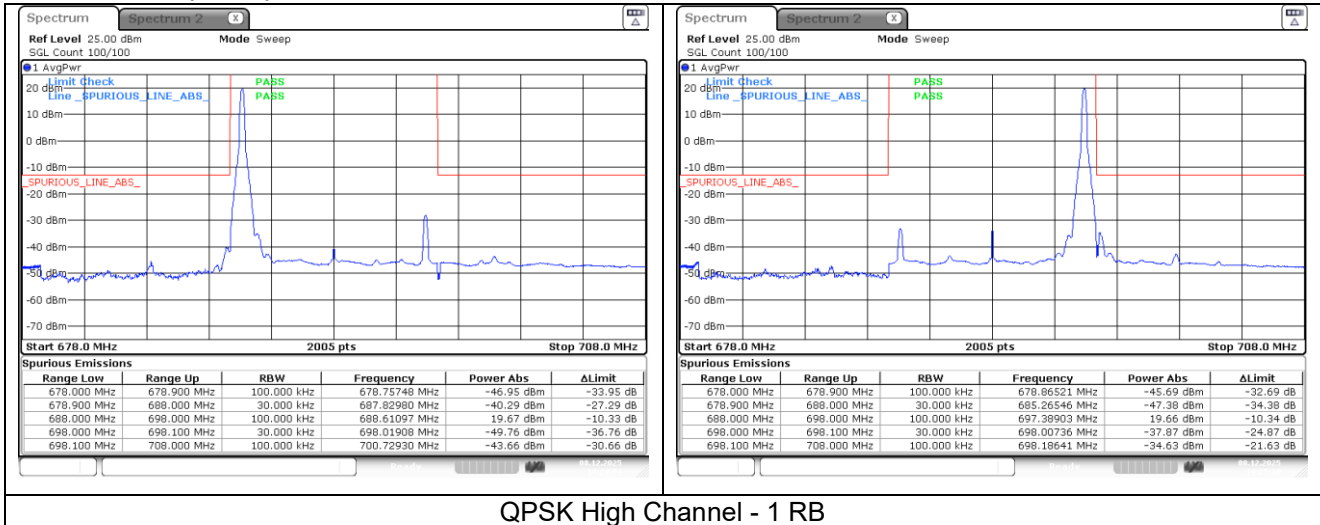


QPSK Low Channel - 1 RB

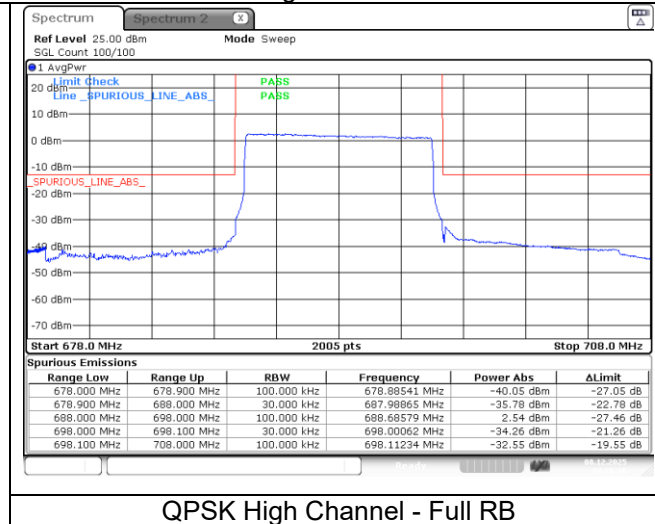


QPSK Low Channel - Full RB

LTE band 71 (10 MHz)

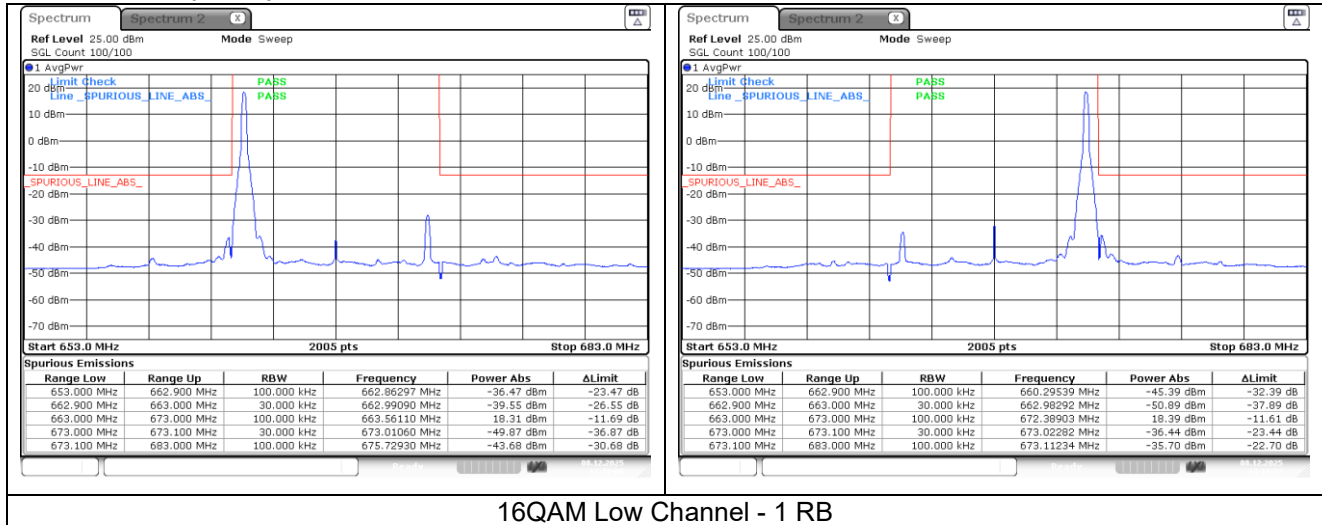


QPSK High Channel - 1 RB

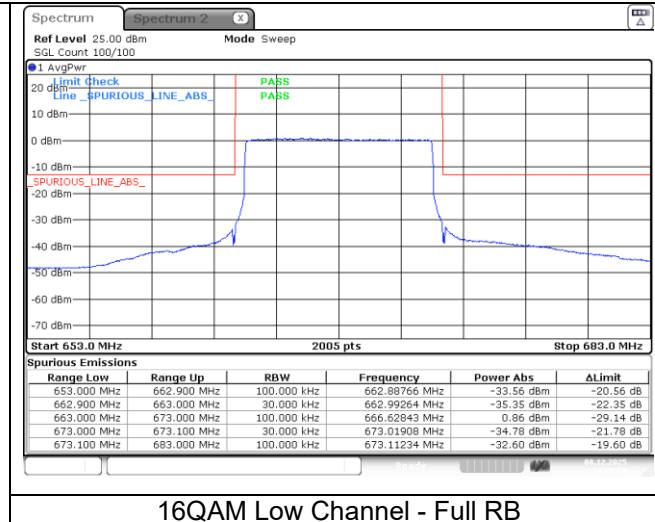


QPSK High Channel - Full RB

LTE band 71 (10 MHz)

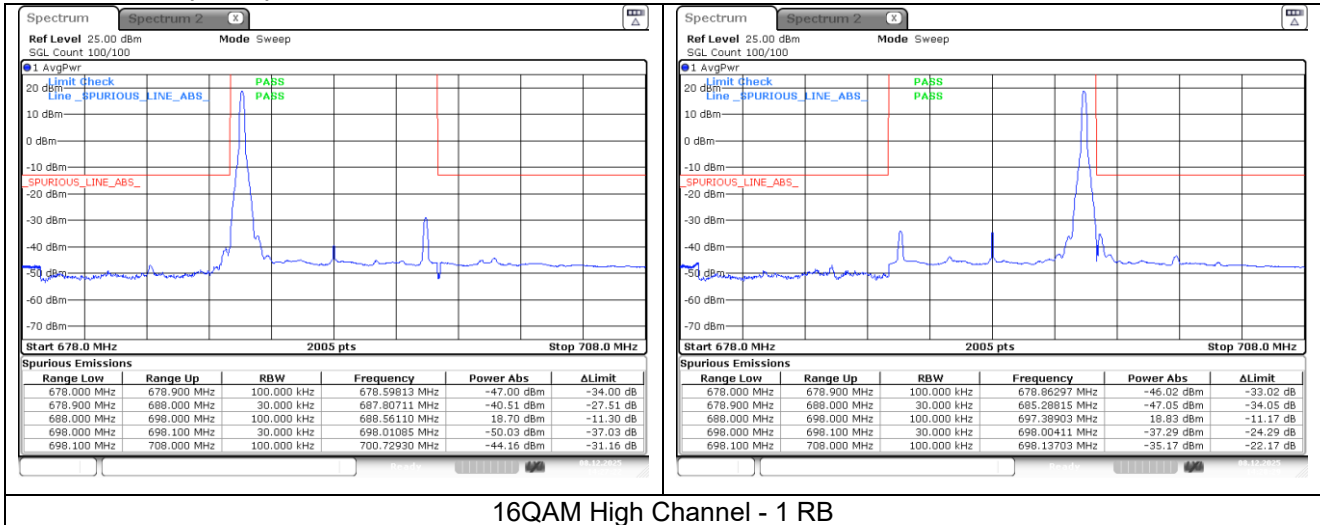


16QAM Low Channel - 1 RB

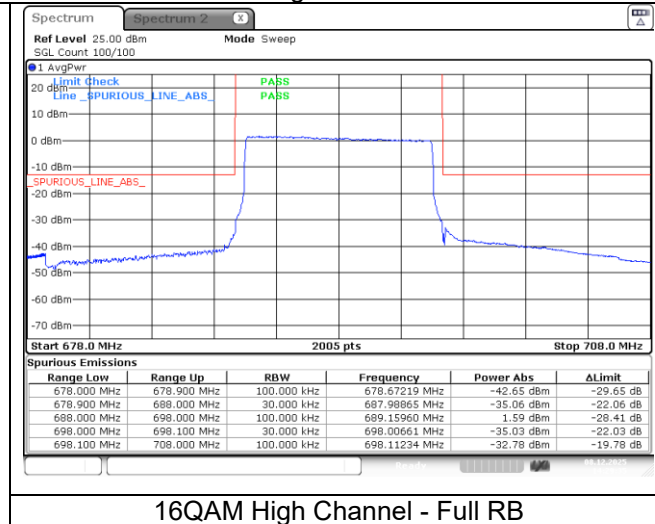


16QAM Low Channel - Full RB

LTE band 71 (10 MHz)

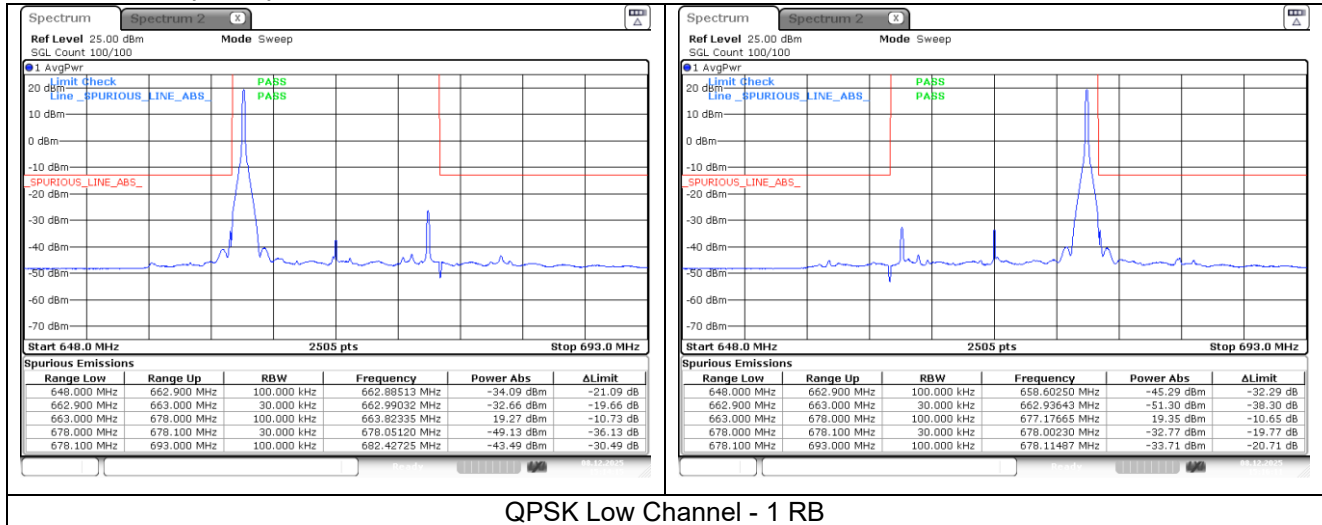


16QAM High Channel - 1 RB

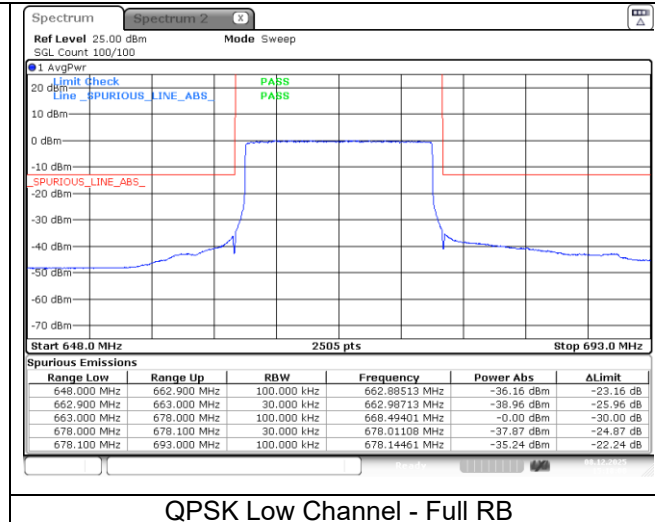


16QAM High Channel - Full RB

LTE band 71 (15 MHz)

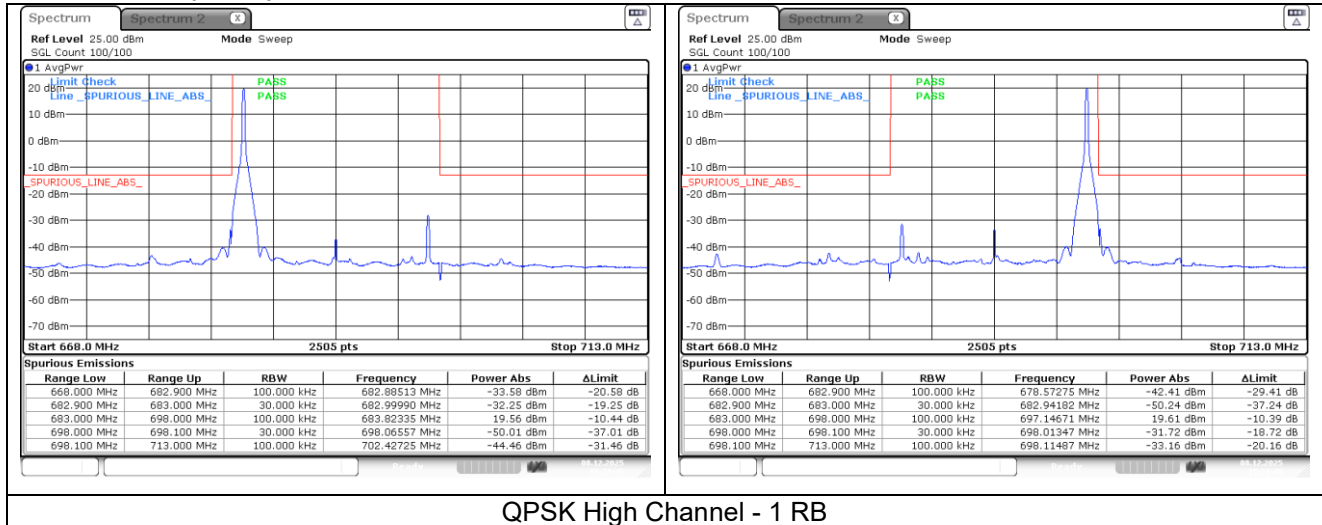


QPSK Low Channel - 1 RB

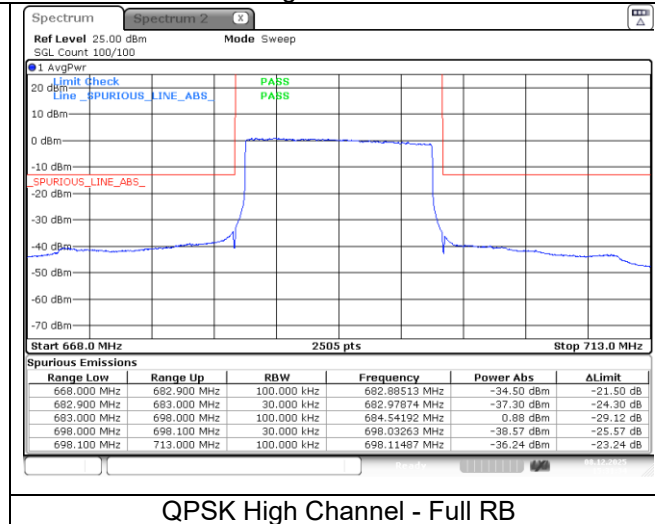


QPSK Low Channel - Full RB

LTE band 71 (15 MHz)

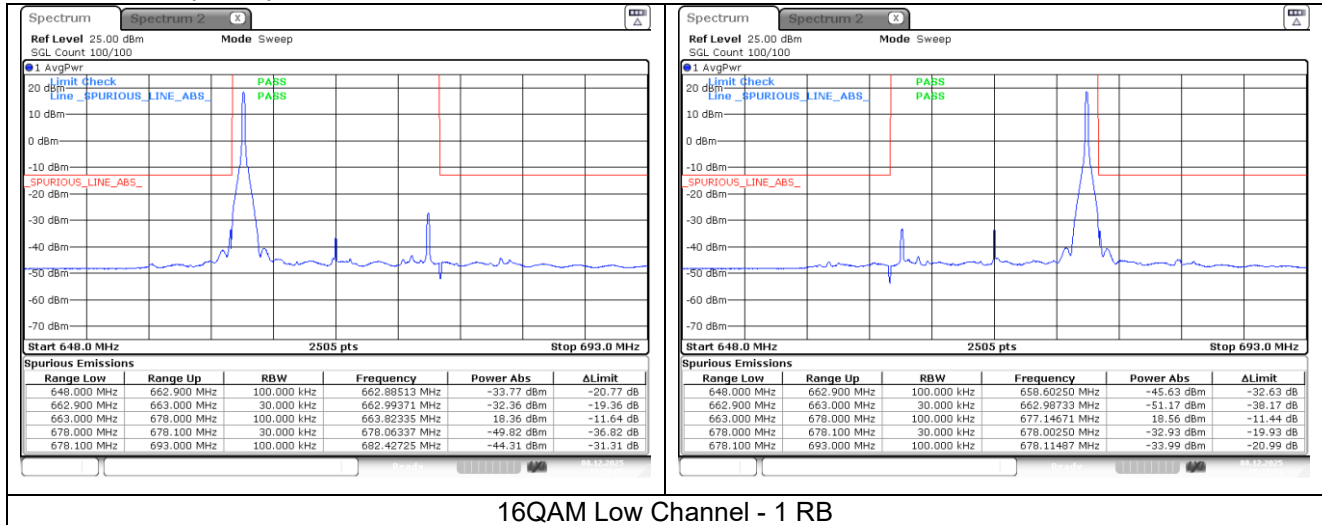


QPSK High Channel - 1 RB

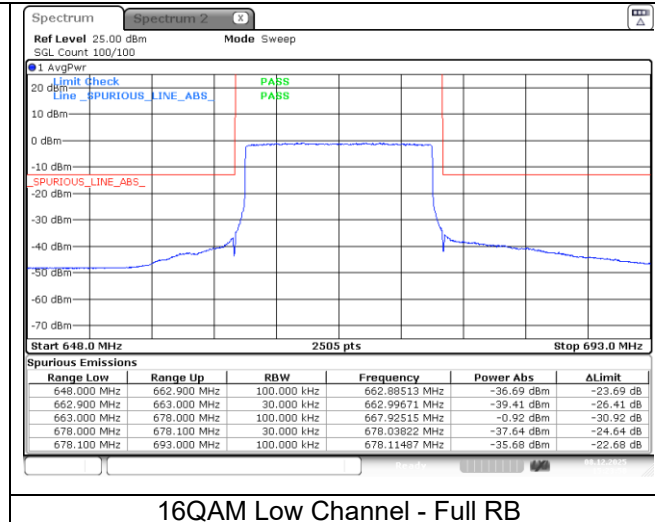


QPSK High Channel - Full RB

LTE band 71 (15 MHz)

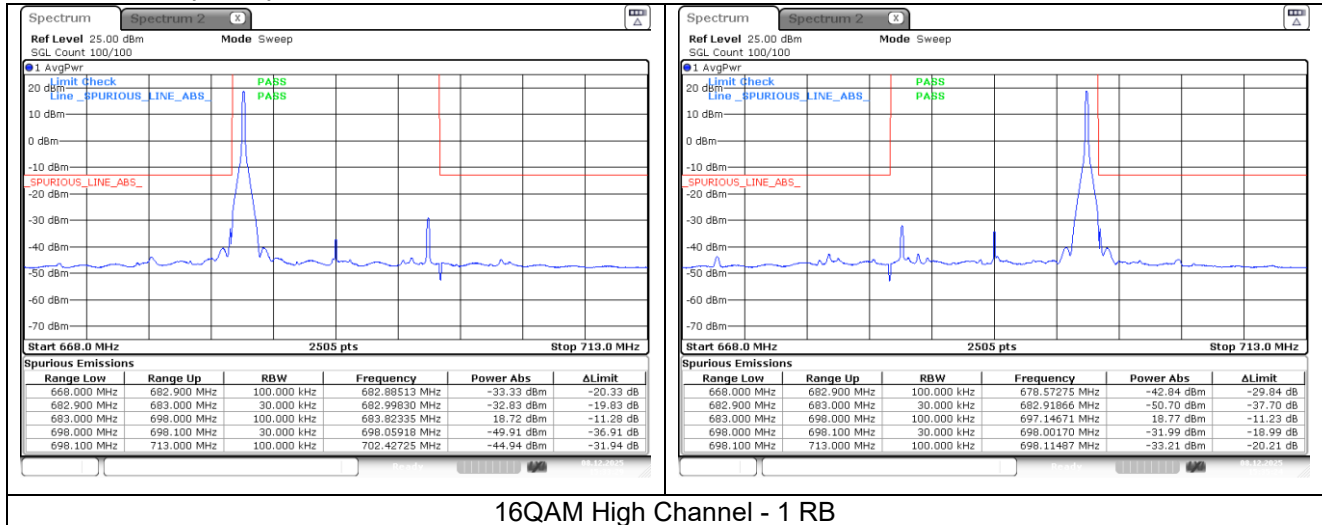


16QAM Low Channel - 1 RB

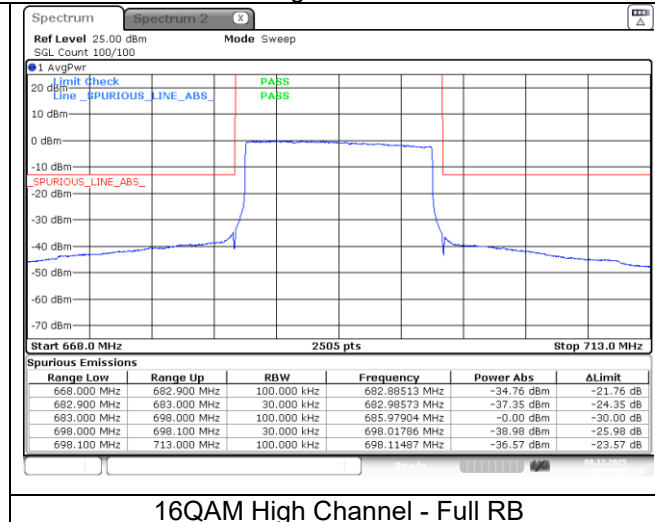


16QAM Low Channel - Full RB

LTE band 71 (15 MHz)

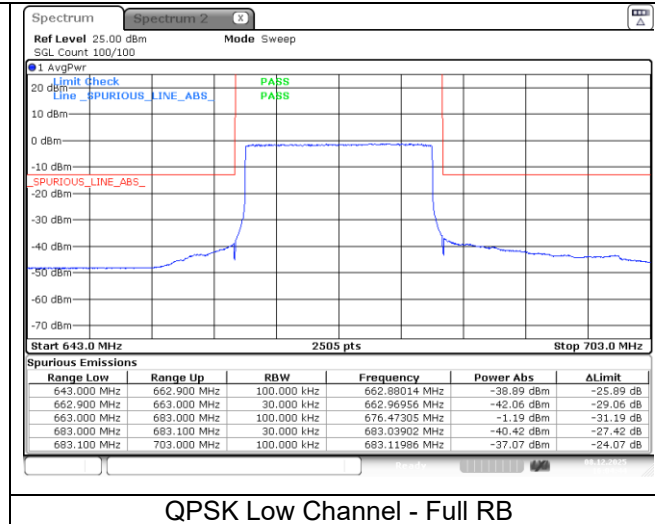
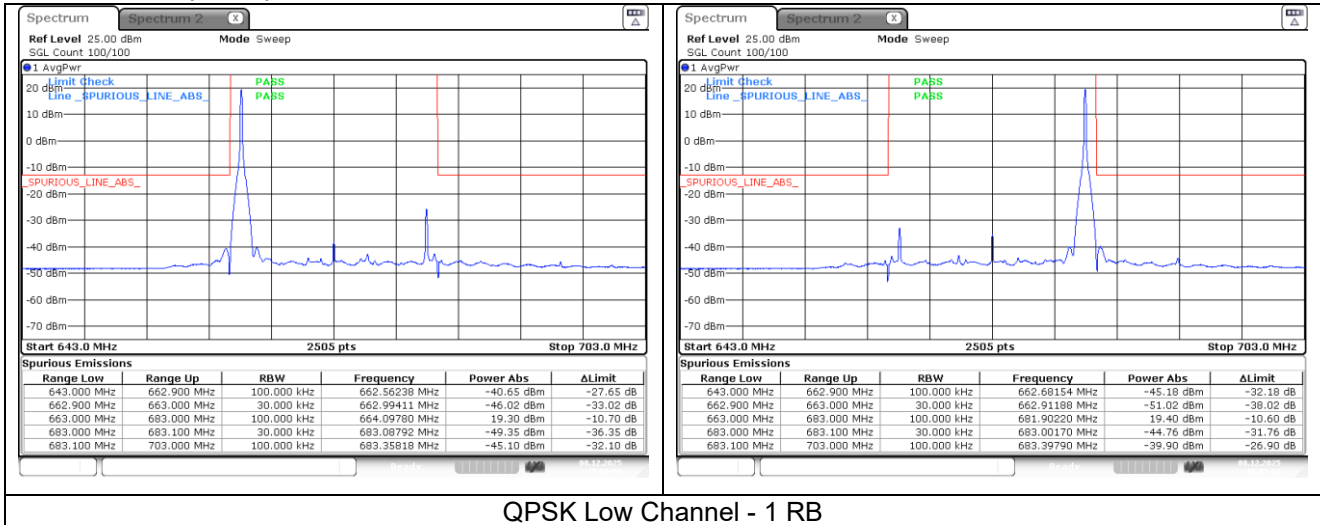


16QAM High Channel - 1 RB

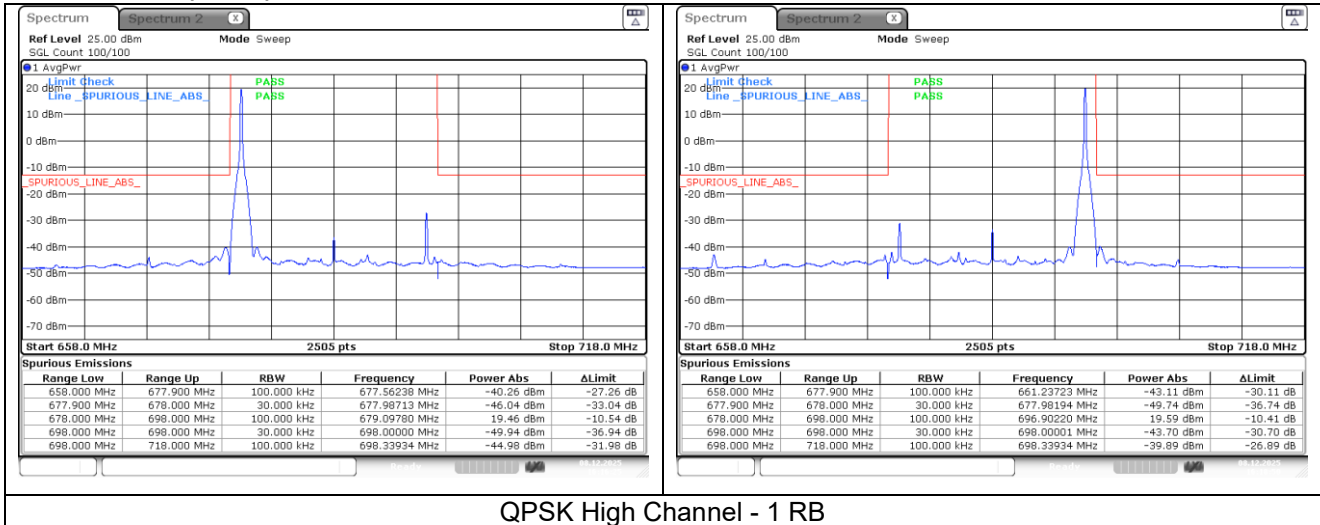


16QAM High Channel - Full RB

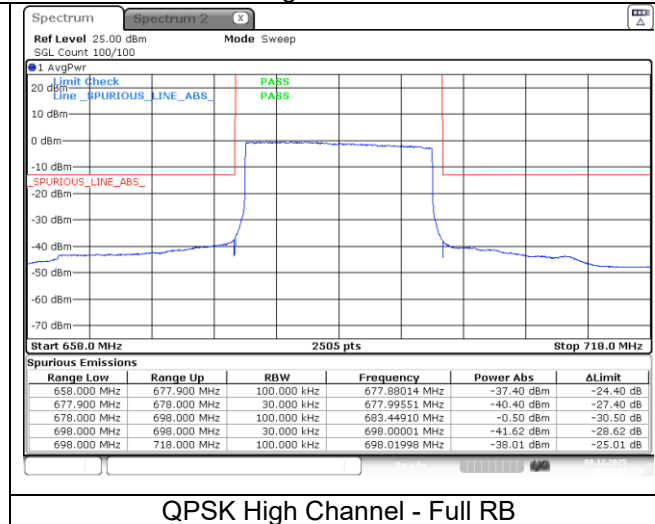
LTE band 71 (20 MHz)



LTE band 71 (20 MHz)

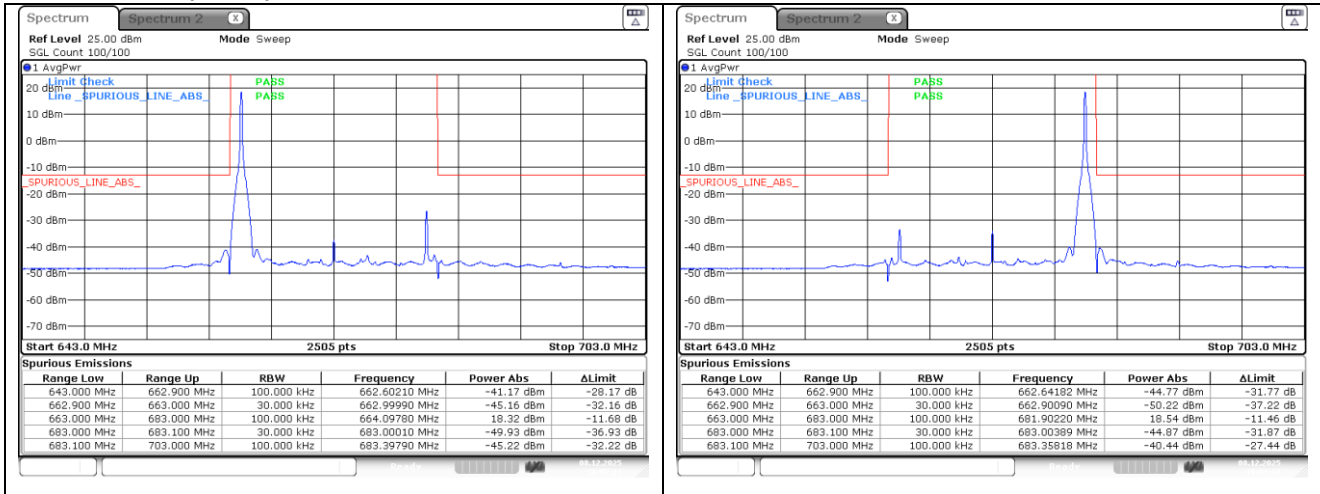


QPSK High Channel - 1 RB

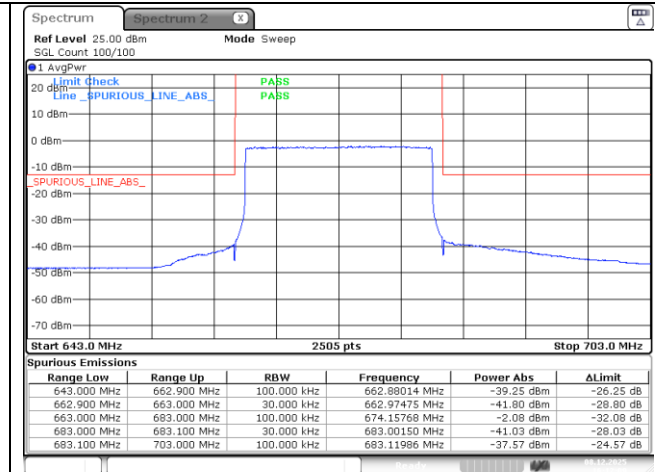


QPSK High Channel - Full RB

LTE band 71 (20 MHz)

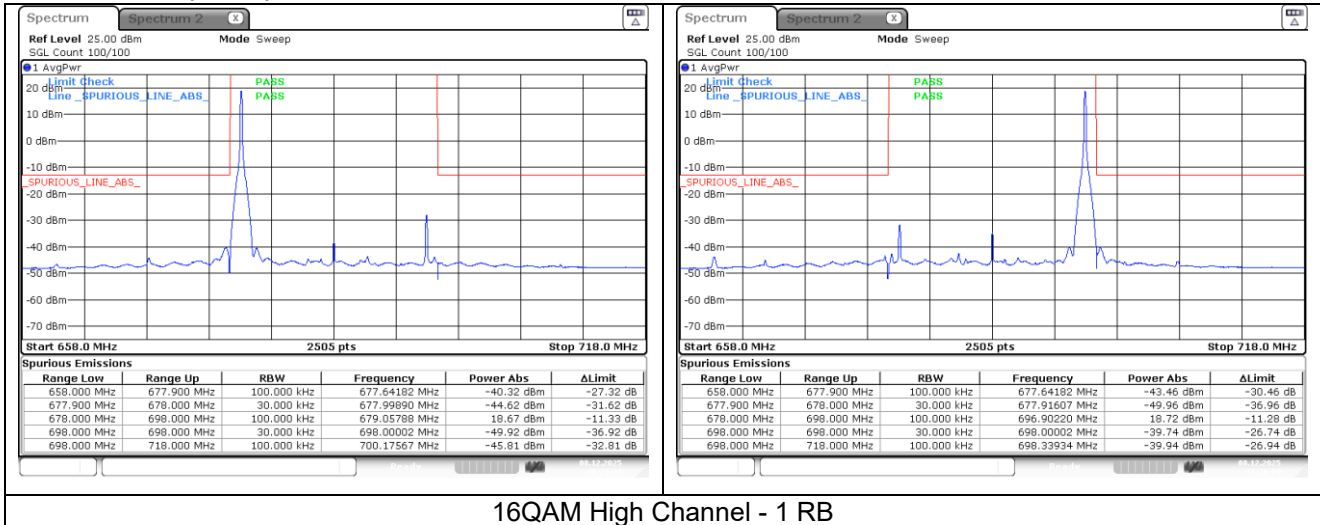


16QAM Low Channel - 1 RB

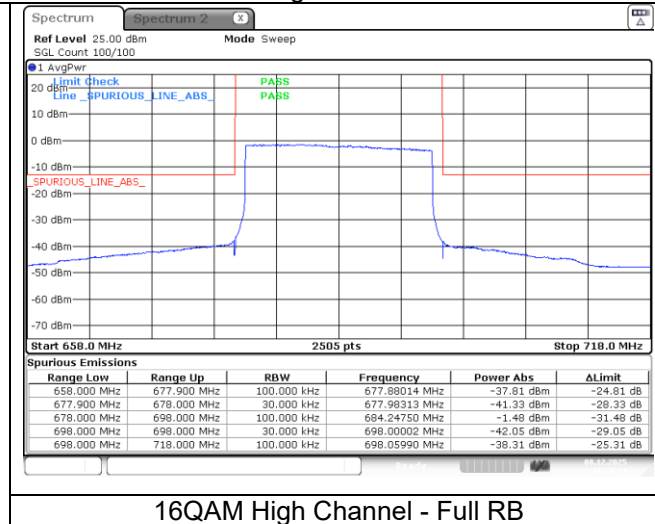


16QAM Low Channel - Full RB

LTE band 71 (20 MHz)



16QAM High Channel - 1 RB



16QAM High Channel - Full RB

8. Frequency Stability

8.1. Limit

FCC

- § 2.1055 (a), § 2.1055 (d) & following:

- §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table of this section.

For Mobile devices operating in the 824 to 849 MHz band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 ppm.

- §24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

- §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

- §90.213, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table.

For Mobile devices operating in the 809 to 824 MHz band at a power level 2 Watts or less, the limit specified in Table is +/- 2.5 ppm.

IC**- RSS-Gen Issue 5**

6.11, for licensed devices, the following measurement conditions apply:

a. at the temperatures of -30°C (-22°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer's rated supply voltage

- RSS-130 Issue 2

4.5, the transmitter frequency stability limit shall be determined as follows:

For equipment that is capable of transmitting numerous channels simultaneously for different applications (e.g. LTE and narrowband – internet of things (IoT)), the occupied bandwidth shall be the bandwidth representing the sum of the occupied bandwidths of these channels.

The frequency stability shall be sufficient to ensure that the occupied bandwidth remains within each frequency block range when tested at the temperature and supply voltage variations specified in RSS-Gen.

- RSS-132 Issue 4

5.3, the frequency stability shall be sufficient to ensure that the occupied bandwidth stays within each of the sub-bands when tested at the temperature and supply voltage variations specified in RSS-Gen.

- RSS-133 Issue 7

5.4, the frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested to the temperature and supply voltage variations specified in RSS-Gen.

- RSS-139 Issue 4

5.4, the frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested to the temperature and supply voltage variations specified in RSS-Gen.

- RSS-140 Issue 1

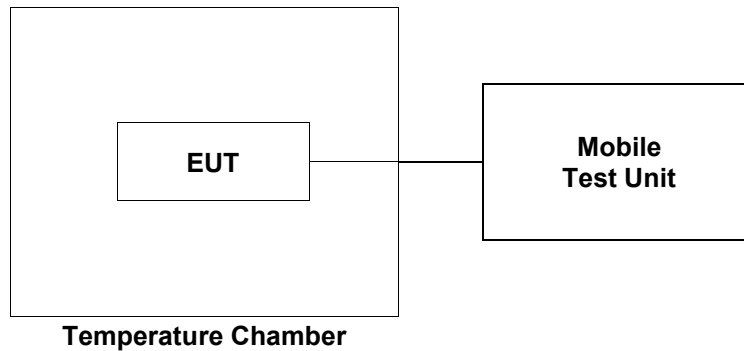
4.2, the frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested at the temperature and supply voltage variations specified in RSS-Gen.

- RSS-199 Issue 4

5.4, the frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested to the temperature and supply voltage variations specified in RSS-Gen.

8.2. Test Procedure

1. Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a Mobile Test Unit via feed-through attenuators.
2. The EUT was placed inside the temperature chamber.
3. After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from Mobile Test Unit.



8.3. Test Results

Ambient temperature : (23 ± 1) °C
Relative humidity : 47 %

WCDMA II mode at middle channel

Reference Frequency: 1 880.0 MHz			
Frequency Stability versus Temperature			
Environment Temperature (℃)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	5.1	0.001 65
40		3.4	0.000 74
30		-1.2	-0.001 70
20(Ref.)		2.0	-
10		4.1	0.001 12
0		3.2	0.000 64
-10		2.5	0.000 27
-20		-3.6	-0.002 98
-30		6.5	0.002 39
Frequency Stability versus Power Supply			
Environment Temperature (℃)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	3.1	0.000 60
	4.6 (115%)	-2.5	-0.002 41

WCDMA IV mode at middle channel

Reference Frequency: 1 732.6 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	4.6	0.000 29
40		6.3	0.001 27
30		2.3	-0.001 04
20(Ref.)		4.1	-
10		-1.9	-0.003 46
0		2.9	-0.000 69
-10		-6.1	-0.005 89
-20		5.4	0.000 75
-30		6.3	0.001 27
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	3.2	-0.000 52
	4.6 (115%)	4.3	0.000 12

WCDMA V mode at middle channel

Reference Frequency: 836.6 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	-4.8	-0.003 23
40		4.6	0.008 01
30		3.5	0.006 69
20(Ref.)		-2.1	-
10		1.1	0.003 83
0		-3.5	-0.001 67
-10		4.7	0.008 13
-20		5.6	0.009 21
-30		6.1	0.009 80
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	-1.5	0.000 72
	4.6 (115%)	3.4	0.006 58

LTE band 7 at middle channel

Reference Frequency: 2 535.0 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	6.7	0.003 43
40		9.3	0.004 46
30		4.6	0.002 60
20(Ref.)		-2.0	-
10		3.4	0.002 13
0		-7.2	-0.002 05
-10		4.1	0.002 41
-20		-6.3	-0.001 70
-30		-10.3	-0.003 27
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	3.1	0.002 01
	4.6 (115%)	-2.3	-0.000 12

LTE band 12/17 at middle channel

Reference Frequency: 707.5 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	6.5	0.004 52
40		-8.5	-0.016 68
30		4.1	0.001 13
20(Ref.)		3.3	-
10		-8.5	-0.016 68
0		-6.5	-0.013 85
-10		8.1	0.006 78
-20		6.3	0.004 24
-30		9.8	0.009 19
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	-2.6	-0.008 34
	4.6 (115%)	-1.1	-0.006 22

LTE band 13 at middle channel

Reference Frequency: 782 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	3.2	-0.002 05
40		6.9	0.002 69
30		-2.6	-0.009 46
20(Ref.)		4.8	-
10		4.3	-0.000 64
0		6.8	0.002 56
-10		-7.1	-0.015 22
-20		11.3	0.008 31
-30		5.6	0.001 02
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	3.5	-0.001 66
	4.6 (115%)	-2.4	-0.009 21

LTE band 14 at middle channel

Reference Frequency: 793 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	8.6	0.009 21
40		-4.5	-0.007 31
30		3.5	0.002 77
20(Ref.)		1.3	-
10		-7.5	-0.011 10
0		3.5	0.002 77
-10		6.6	0.006 68
-20		5.8	0.005 67
-30		-9.1	-0.013 11
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	-4.2	-0.006 94
	4.6 (115%)	2.7	0.001 77

LTE band 25/2 at middle channel

Reference Frequency: 1 882.5 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	6.3	0.005 90
40		3.1	0.004 20
30		4.1	0.004 73
20(Ref.)		-4.8	-
10		-5.7	-0.000 48
0		-11.3	-0.003 45
-10		8.1	0.006 85
-20		7.4	0.006 48
-30		6.7	0.006 11
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	3.2	0.004 25
	4.6 (115%)	5.1	0.005 26

LTE band 26/5 at middle channel_Part 22

Reference Frequency: 836.5 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	8.8	0.002 51
40		5.7	-0.001 20
30		-4.6	-0.013 51
20(Ref.)		6.7	-
10		-9.2	-0.019 01
0		7.3	0.000 72
-10		-8.5	-0.018 17
-20		6.3	-0.000 48
-30		9.1	0.002 87
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	5.4	-0.001 55
	4.6 (115%)	-4.7	-0.013 63

LTE band 26 at middle channel_Part 90

Reference Frequency: 819 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	8.1	0.012 82
40		3.7	0.007 45
30		5.4	0.009 52
20(Ref.)		-2.4	-
10		3.7	0.007 45
0		-8.3	-0.007 20
-10		6.1	0.010 38
-20		6.8	0.011 23
-30		-9.5	-0.008 67
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	3.3	0.006 96
	4.6 (115%)	1.8	0.005 13

LTE band 66/4 at middle channel

Reference Frequency: 1 745.0 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	6.4	0.002 69
40		-9.3	-0.006 30
30		-5.7	-0.004 24
20(Ref.)		1.7	-
10		3.7	0.001 15
0		8.1	0.003 67
-10		-3.6	-0.003 04
-20		7.5	0.003 32
-30		13.6	0.006 82
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	5.3	0.002 06
	4.6 (115%)	-3.4	-0.002 92

LTE band 71 at middle channel

Reference Frequency: 680.5 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.0	8.5	0.019 10
40		7.1	0.017 05
30		6.8	0.016 61
20(Ref.)		-4.5	-
10		3.7	0.012 05
0		6.5	0.016 16
-10		5.4	0.014 55
-20		-11.2	-0.009 85
-30		6.1	0.015 58
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.4 (85%)	4.6	0.013 37
	4.6 (115%)	5.2	0.014 25

- End of the Test Report -