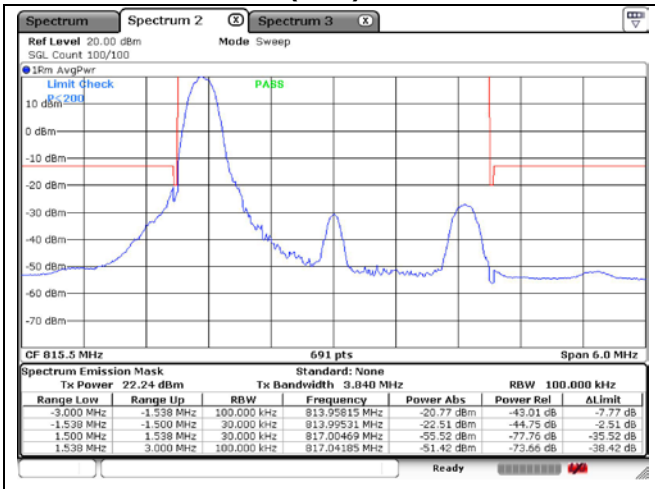
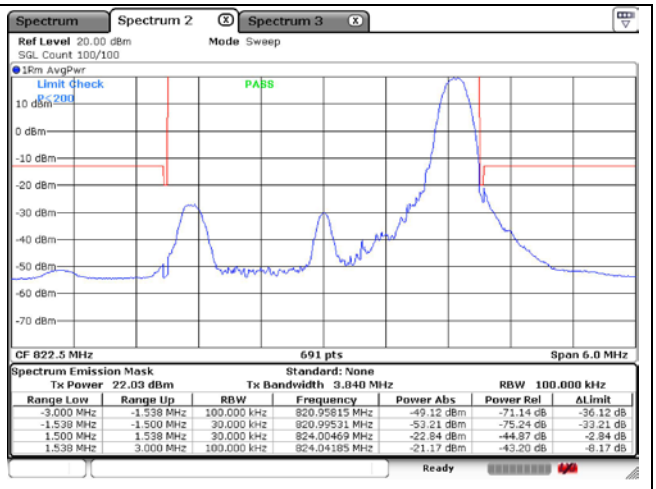
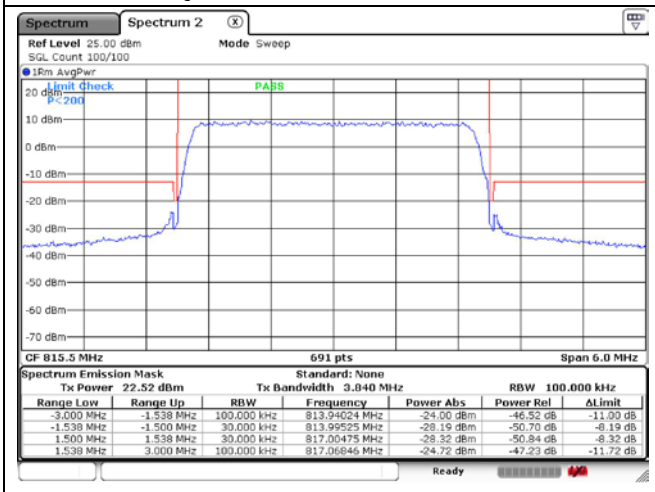
LTE band 26_Part 90 (3 ㎒)



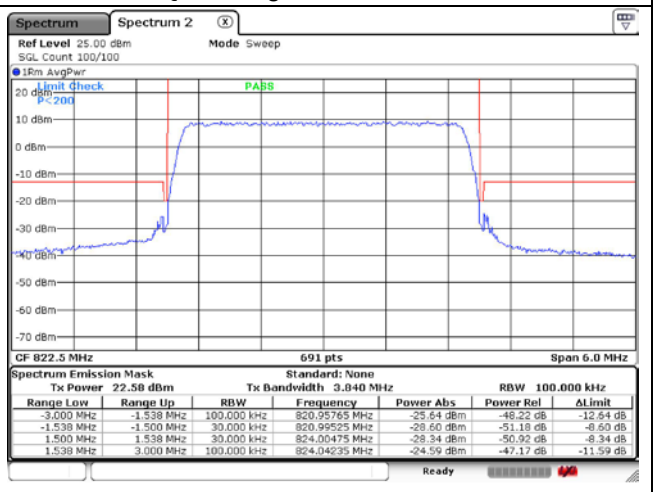
QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB

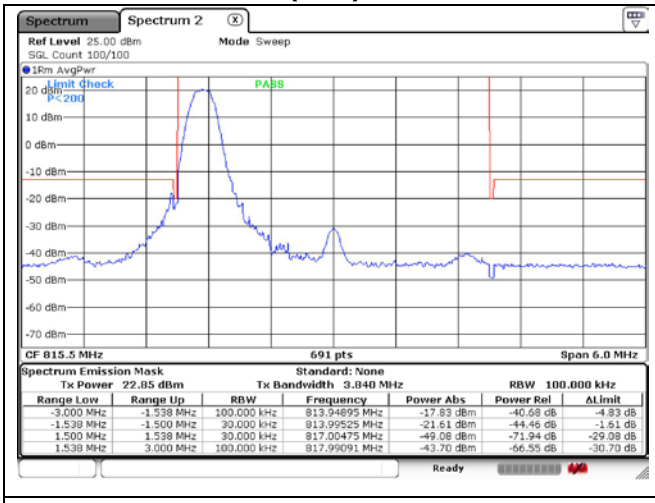


QPSK Low Channel - Full RB

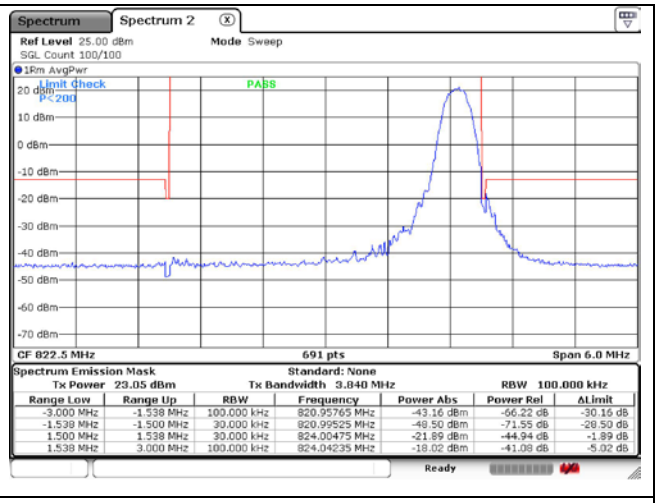


QPSK High Channel - Full RB

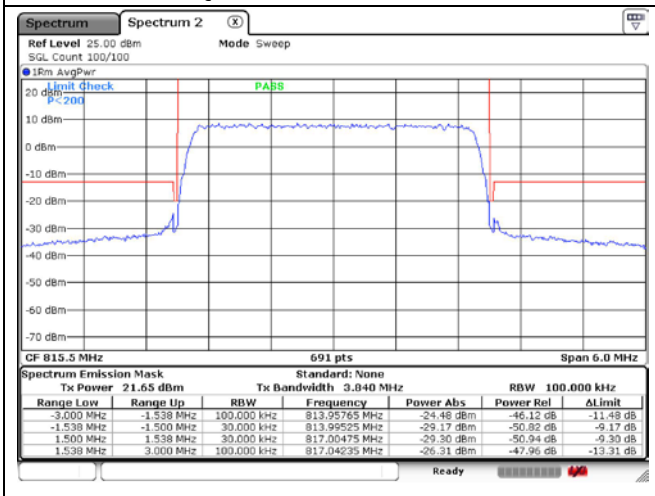
LTE band 26_Part 90 (3 ㎒)



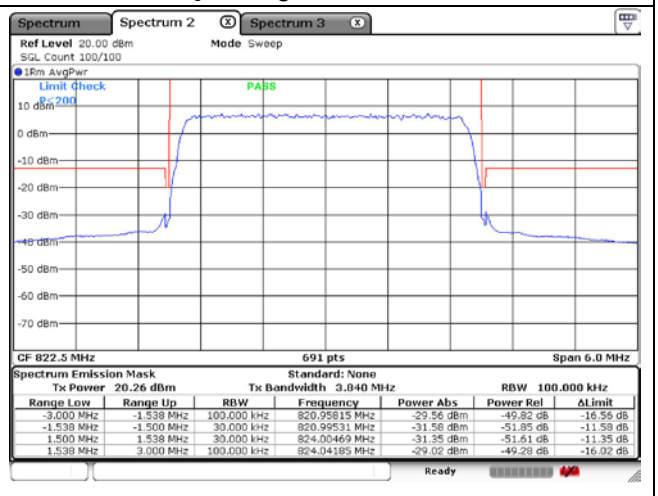
16QAM Low Channel - 1 RB



16QAM High Channel - 1 RB

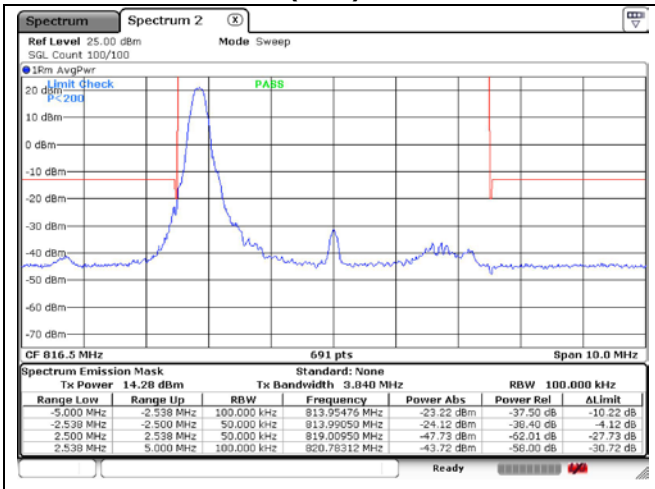


16QAM Low Channel - Full RB

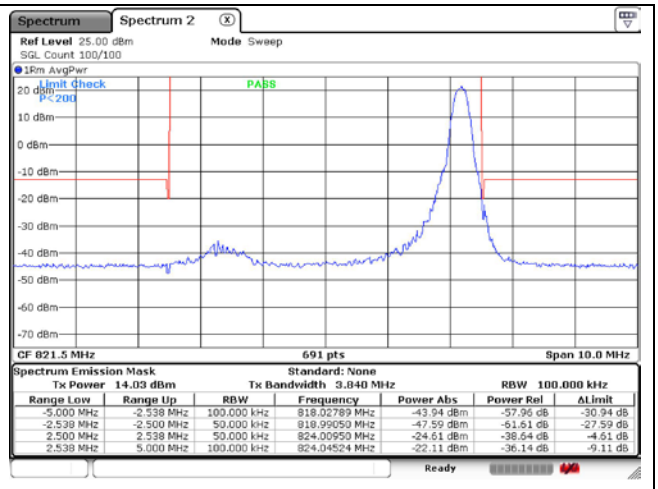


16QAM High Channel - Full RB

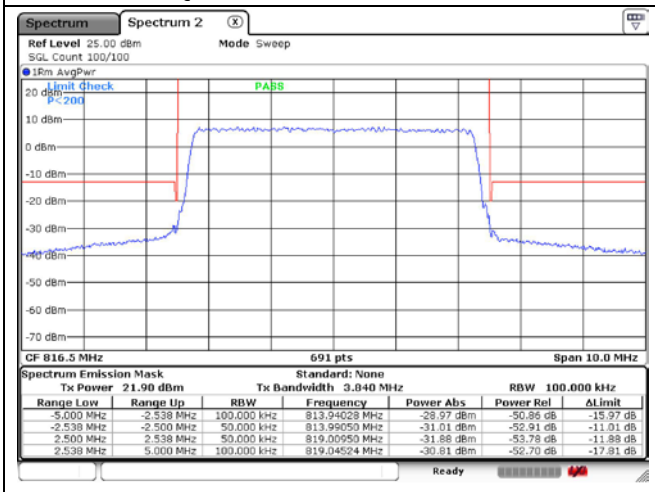
LTE band 26_Part 90 (5 ㎒)



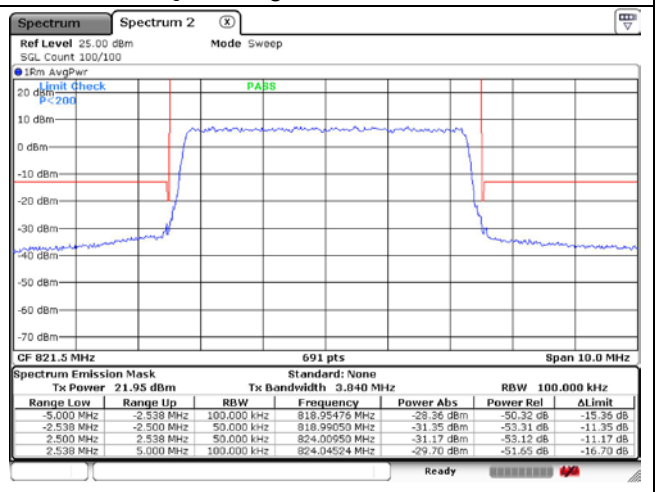
QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB

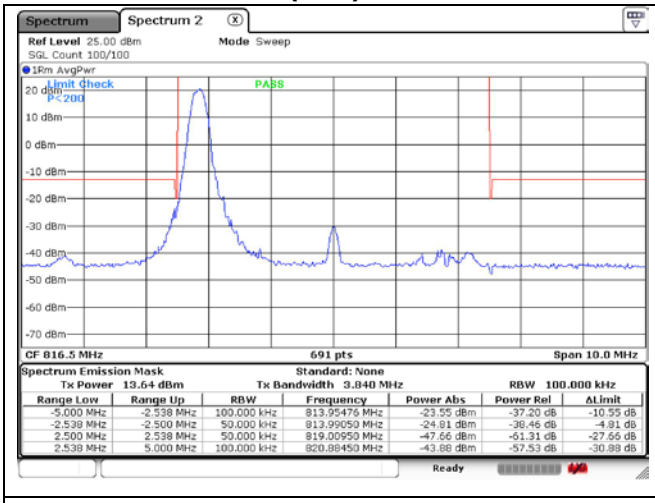


QPSK Low Channel - Full RB

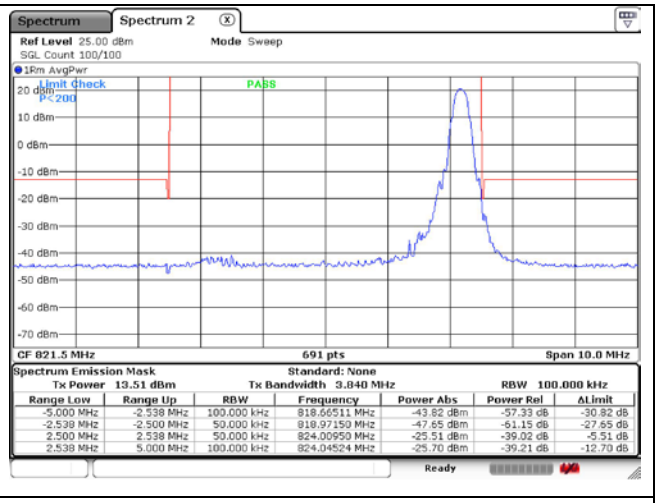


QPSK High Channel - Full RB

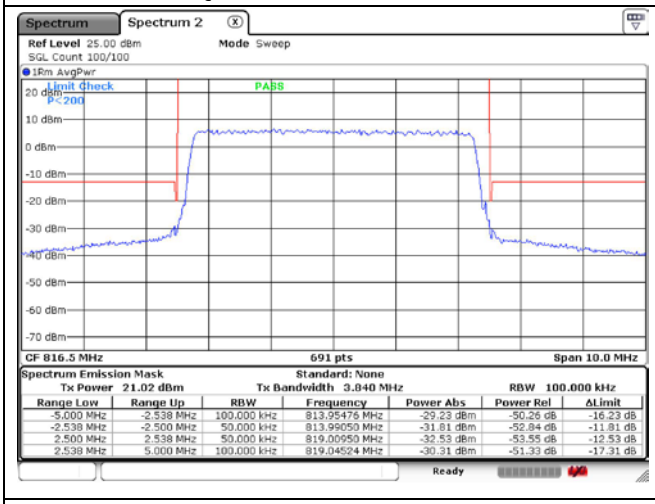
LTE band 26_Part 90 (5 ㎒)



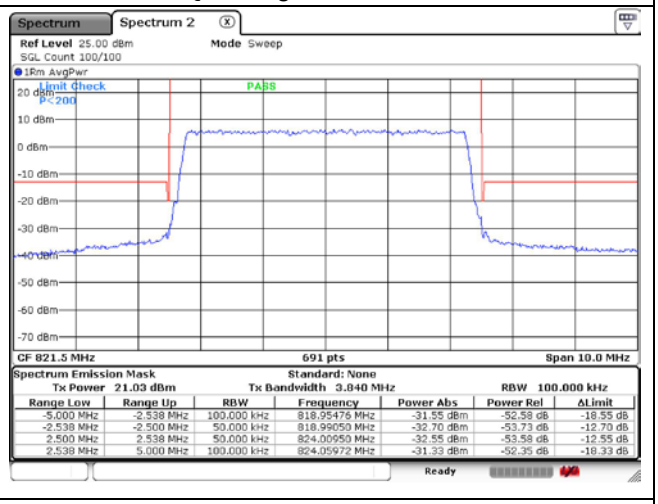
16QAM Low Channel - 1 RB



16QAM High Channel - 1 RB

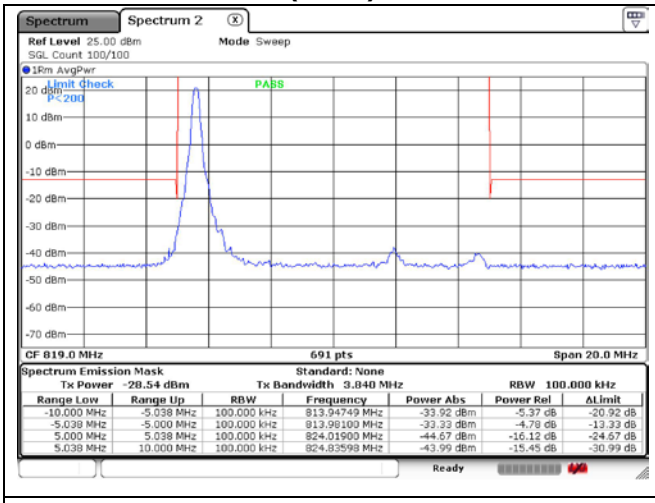


16QAM Low Channel - Full RB

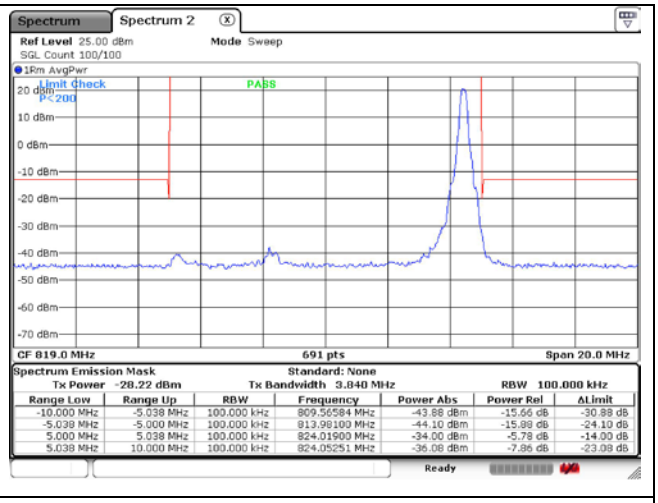


16QAM High Channel - Full RB

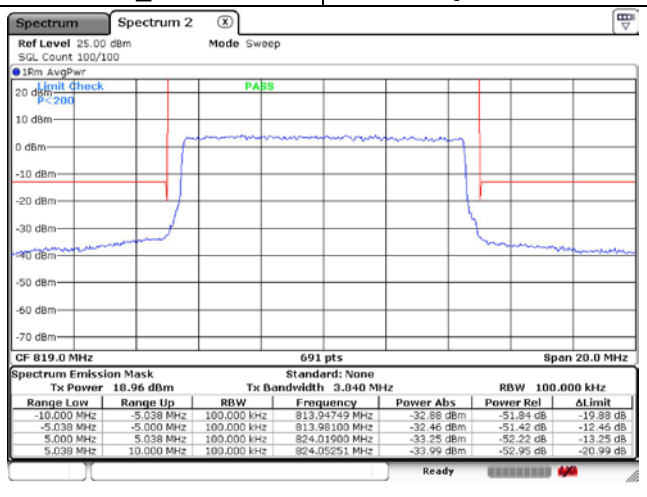
LTE band 26_Part 90 (10 ㎒)



QPSK Middle Channel - 1 RB_Low

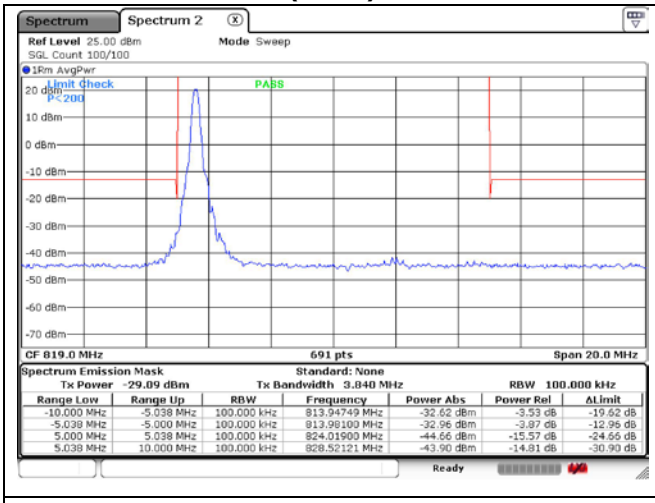


QPSK Middle Channel - 1 RB_High

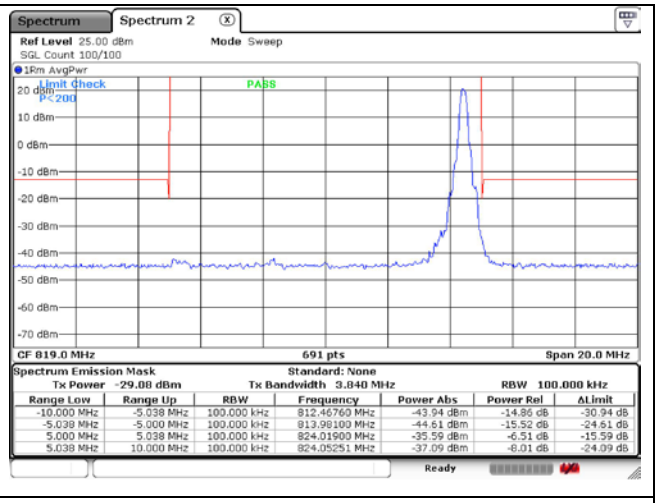


QPSK Middle Channel - Full RB

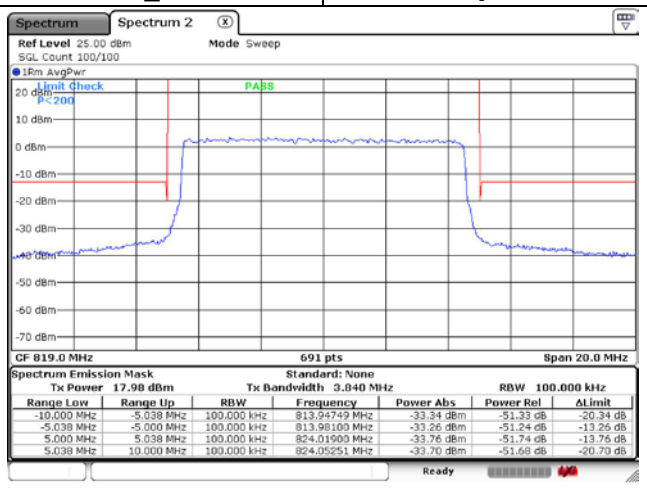
LTE band 26_Part 90 (10 ㎒)



16QAM Middle Channel - 1 RB_Low

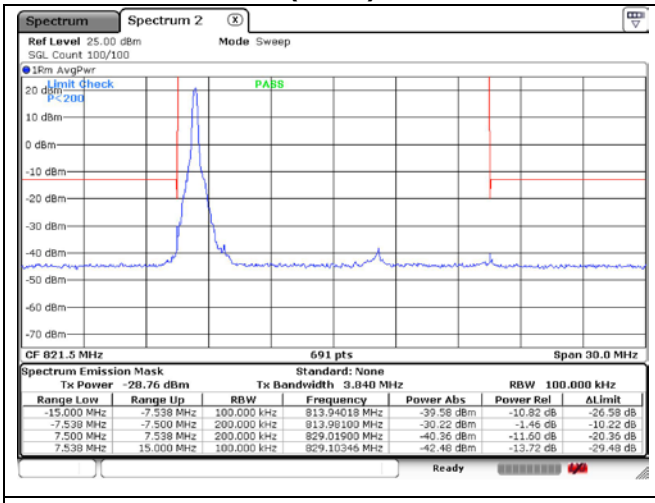


16QAM Middle Channel - 1 RB High

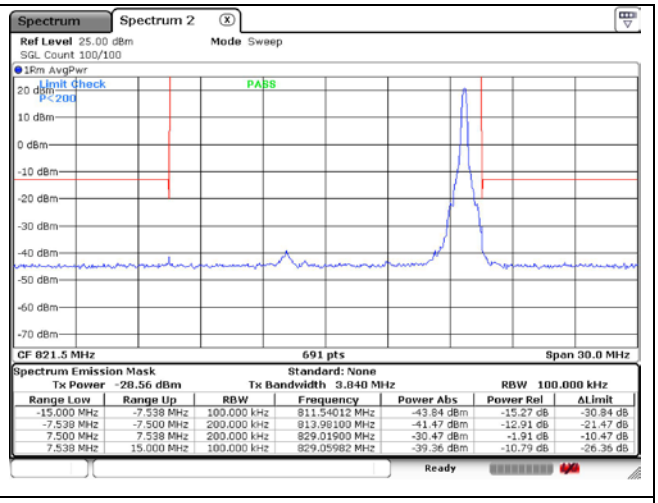


16QAM Middle Channel - Full RB

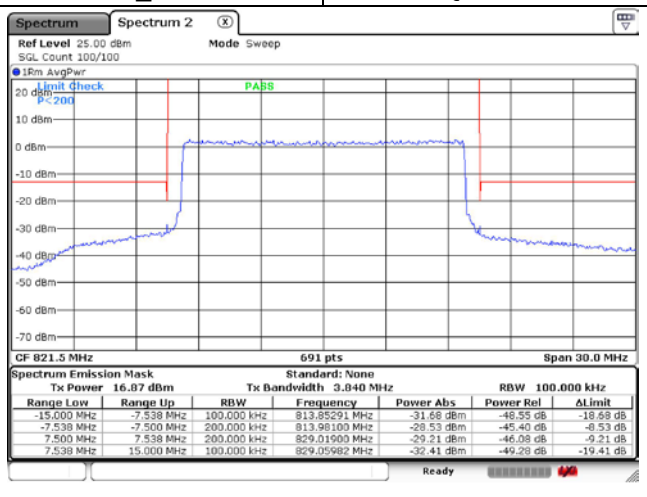
LTE band 26_Part 90 (15 ㎒)



QPSK Middle Channel - 1 RB_Low

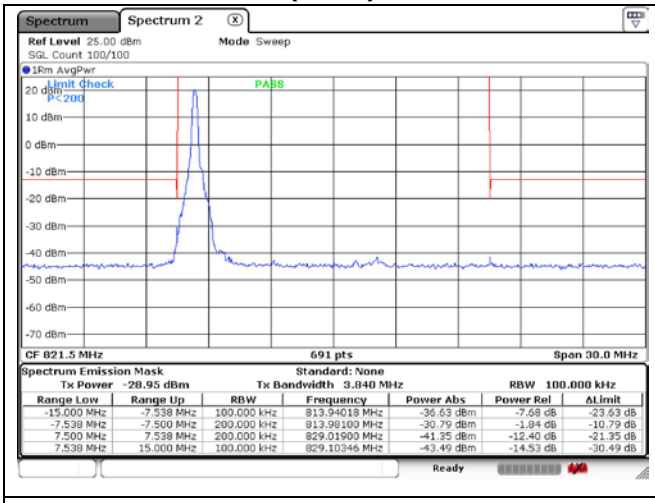


QPSK Middle Channel - 1 RB_High

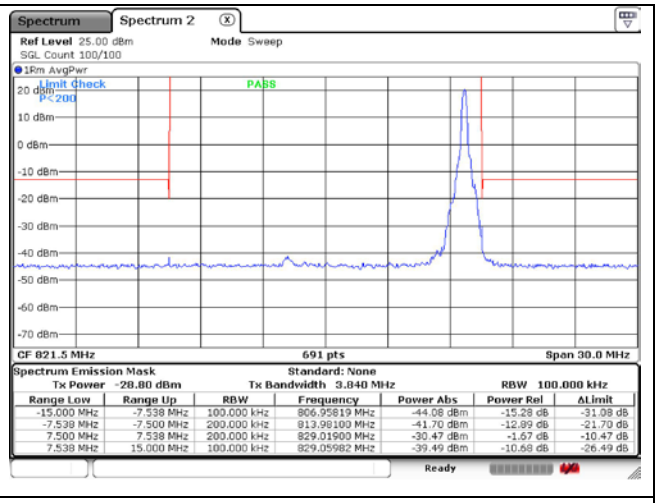


QPSK Middle Channel - Full RB

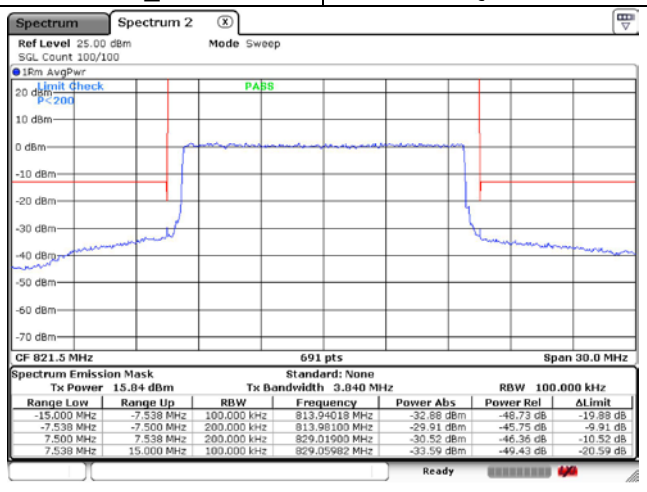
LTE band 26_Part 90 (15 ㎒)



16QAM Middle Channel - 1 RB_Low

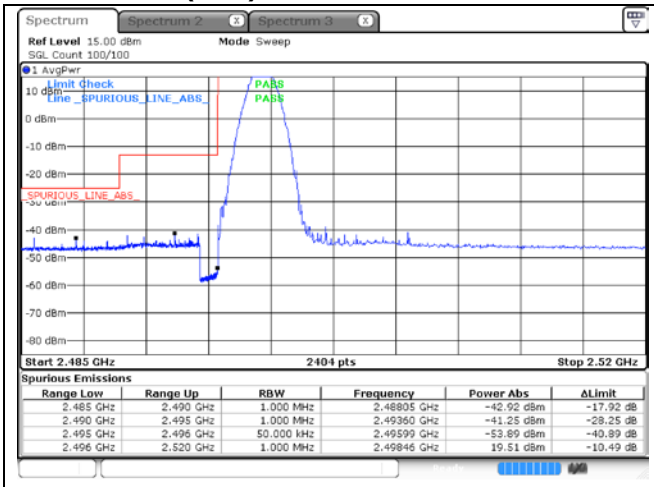


16QAM Middle Channel - 1 RB High

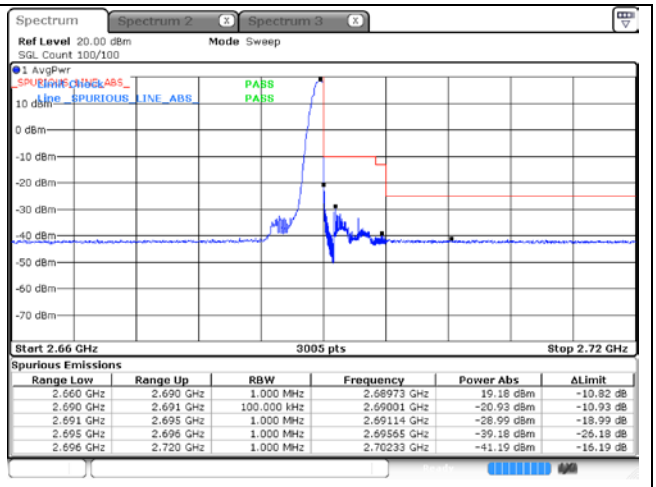


16QAM Middle Channel - Full RB

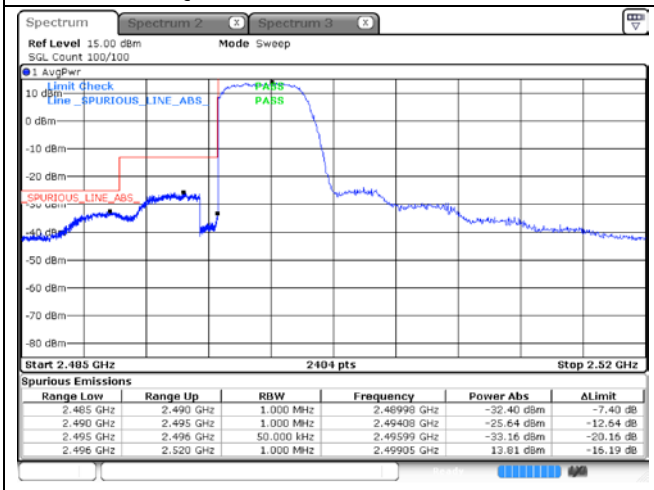
LTE band 41 (5 ㎒)



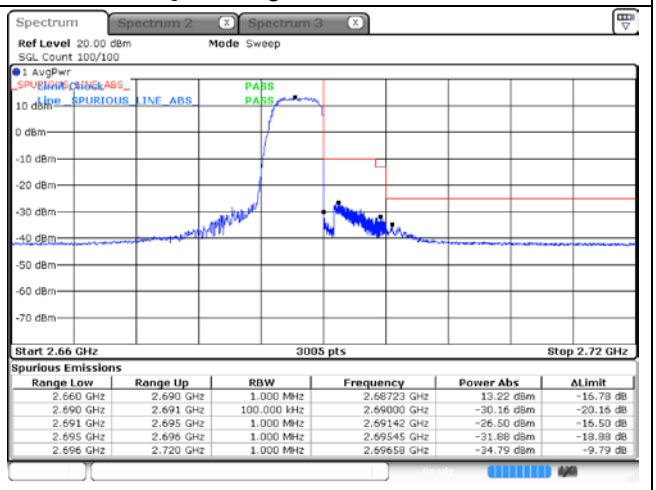
QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB

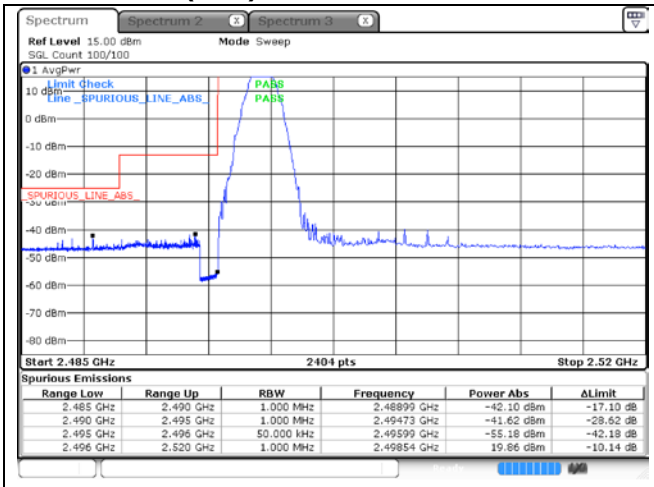


QPSK Low Channel - Full RB

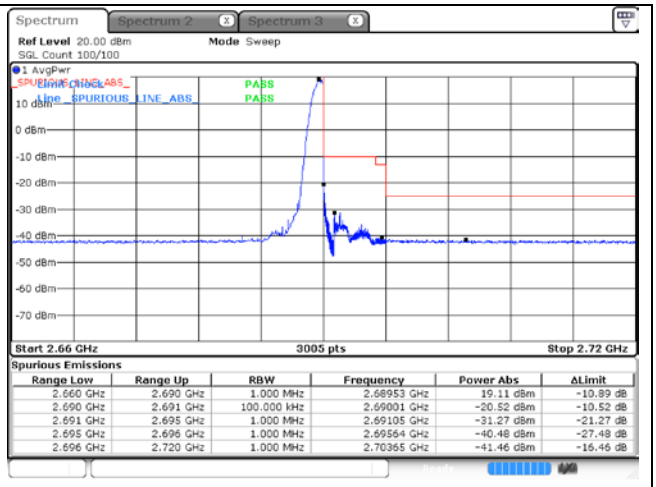


QPSK High Channel - Full RB

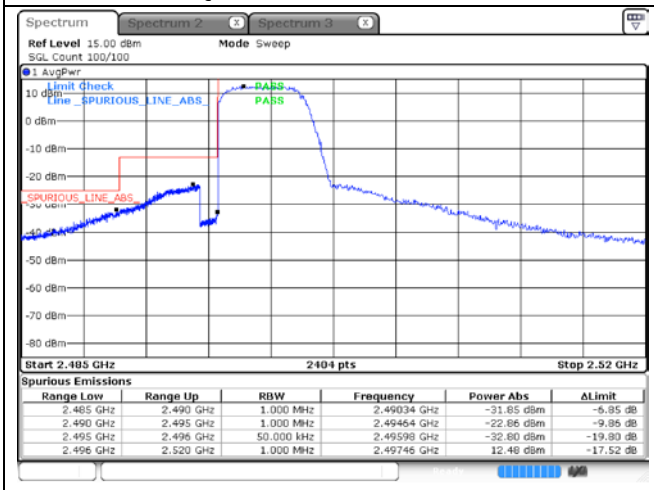
LTE band 41 (5 ㎒)



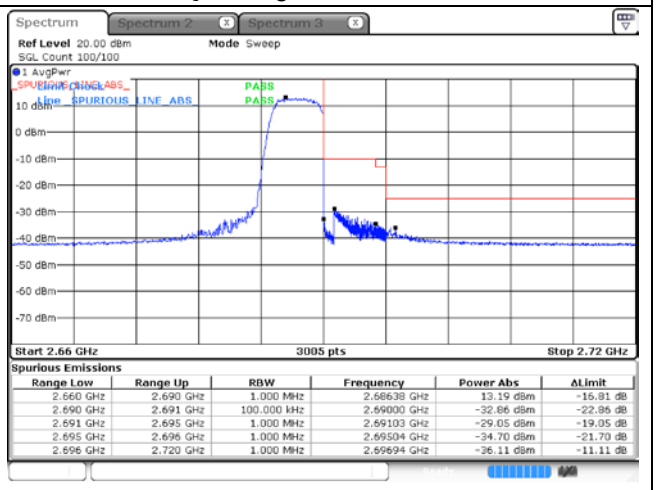
16QAM Low Channel - 1 RB



16QAM High Channel - 1 RB

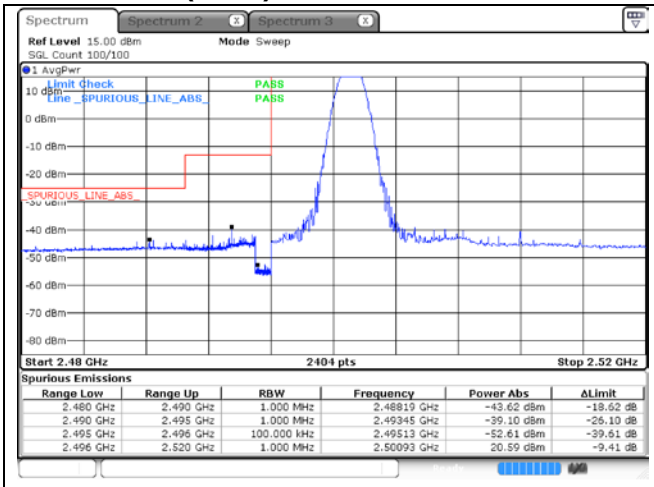


16QAM Low Channel - Full RB

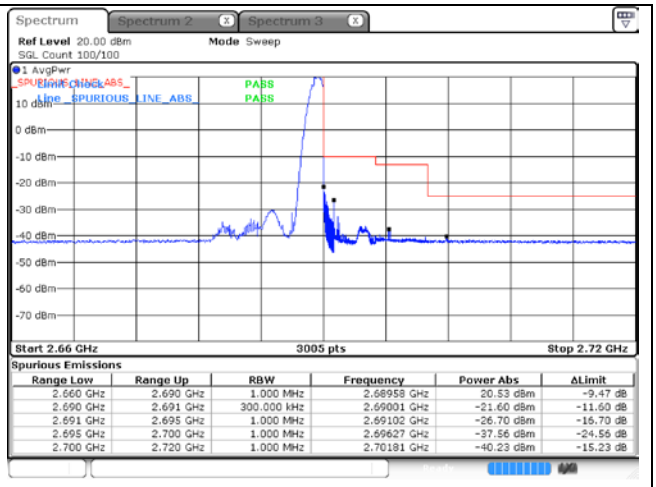


16QAM High Channel - Full RB

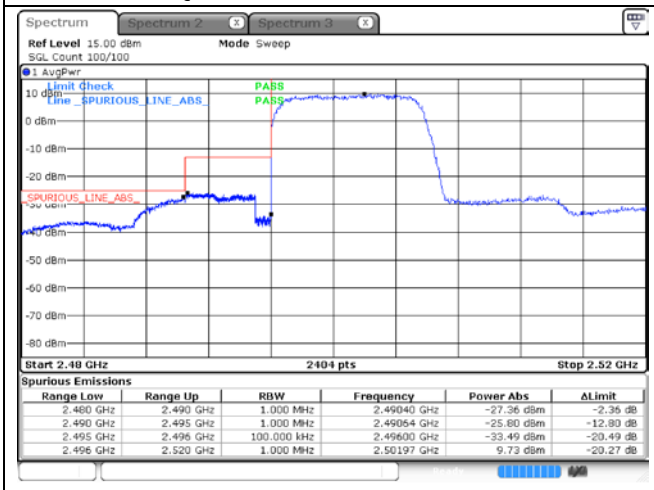
LTE band 41 (10 ㎒)



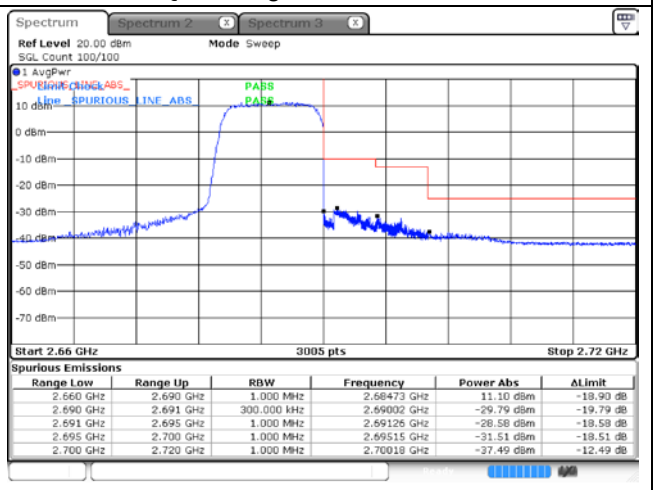
QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB

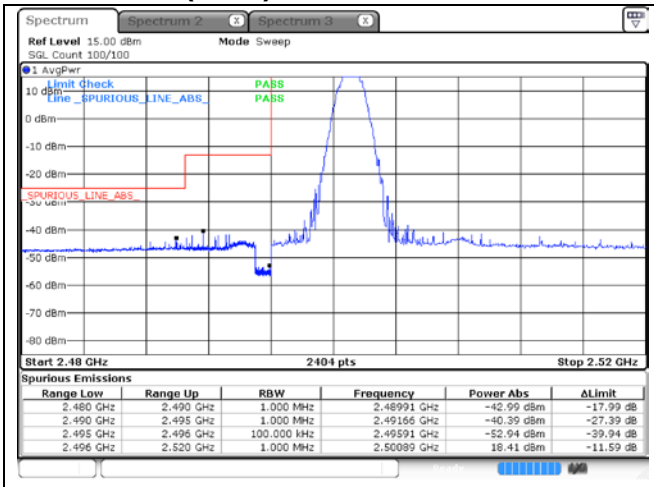


QPSK Low Channel - Full RB

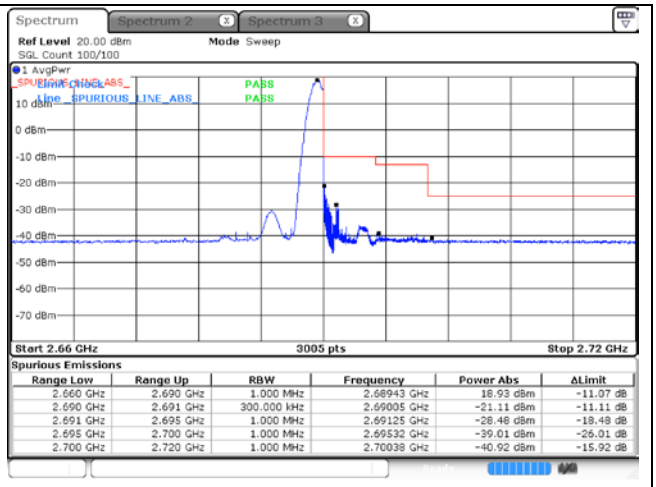


QPSK High Channel - Full RB

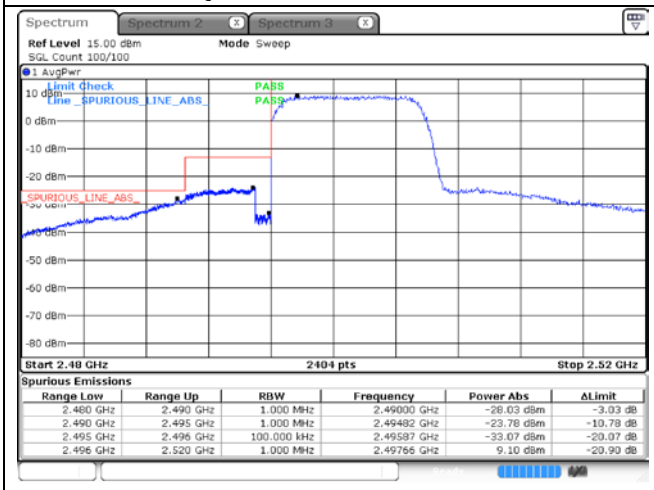
LTE band 41 (10 ㎒)



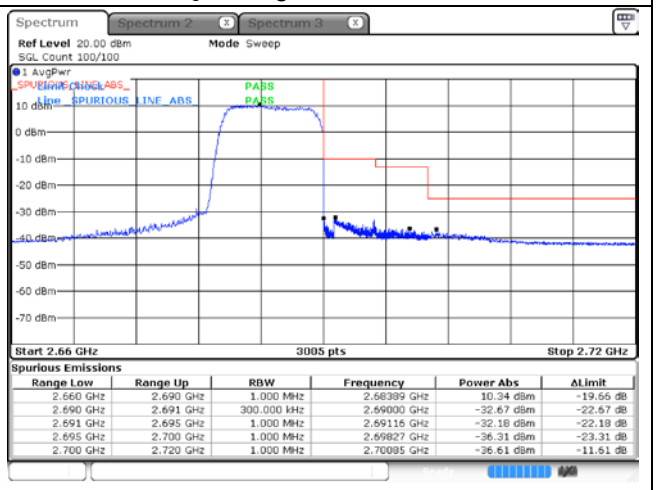
16QAM Low Channel - 1 RB



16QAM High Channel - 1 RB

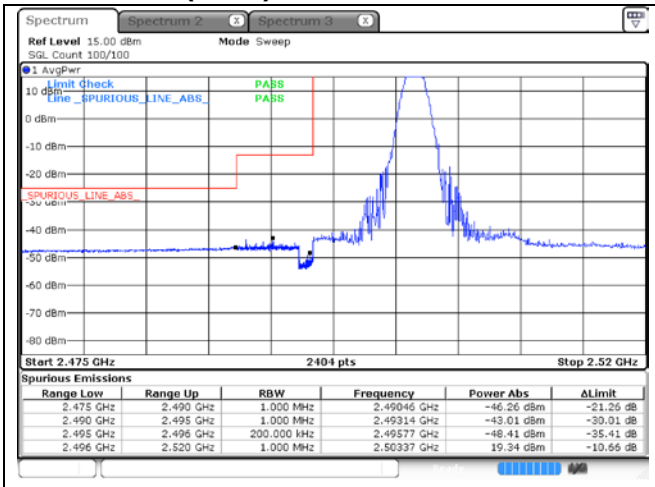


16QAM Low Channel - Full RB

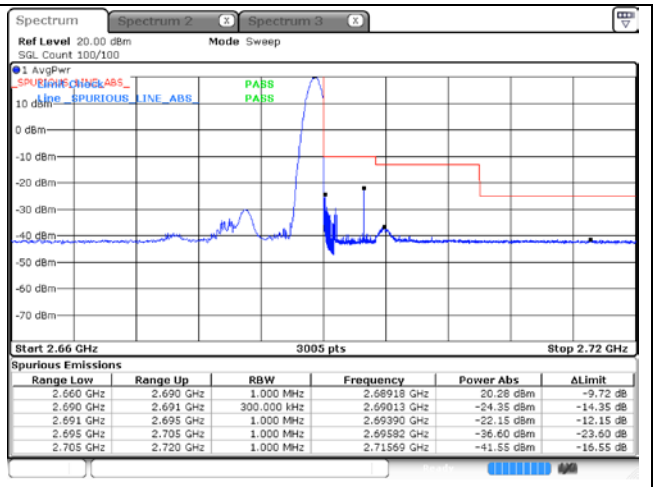


16QAM High Channel - Full RB

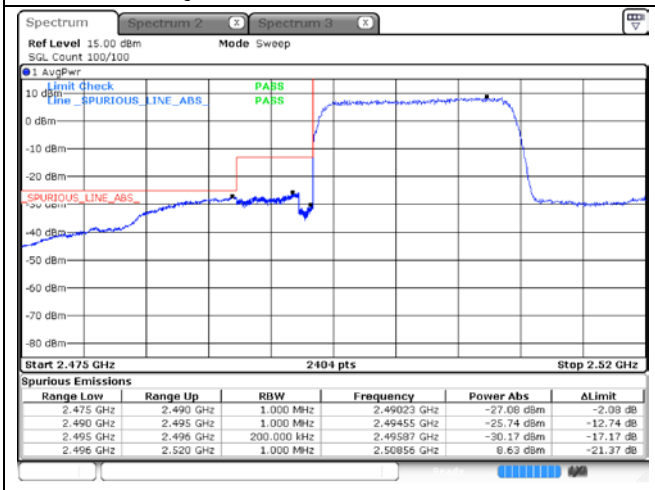
LTE band 41 (15 ㎒)



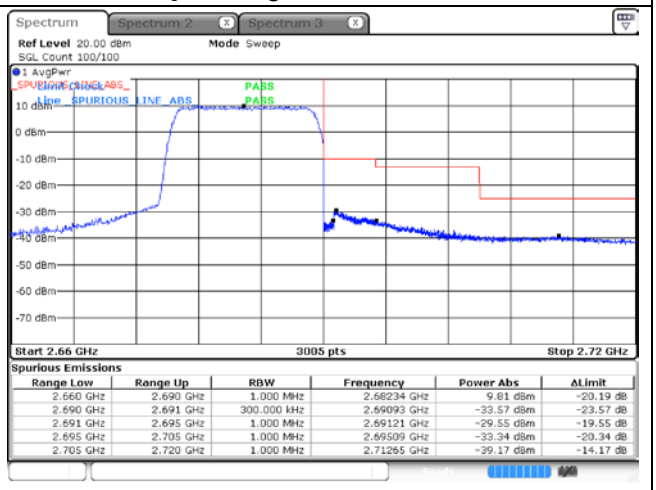
QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB

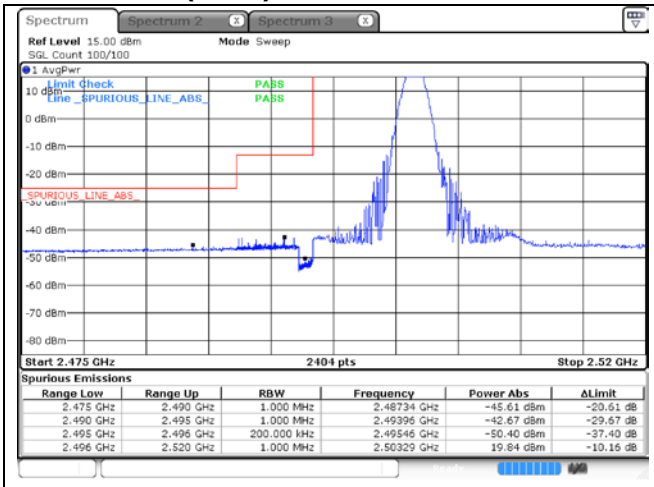


QPSK Low Channel - Full RB

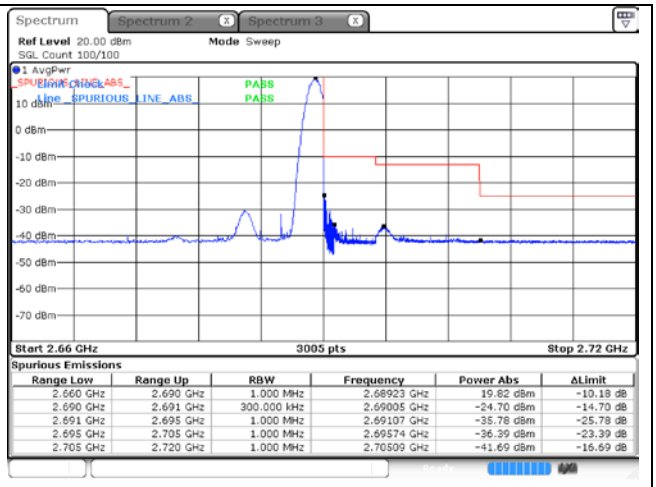


QPSK High Channel - Full RB

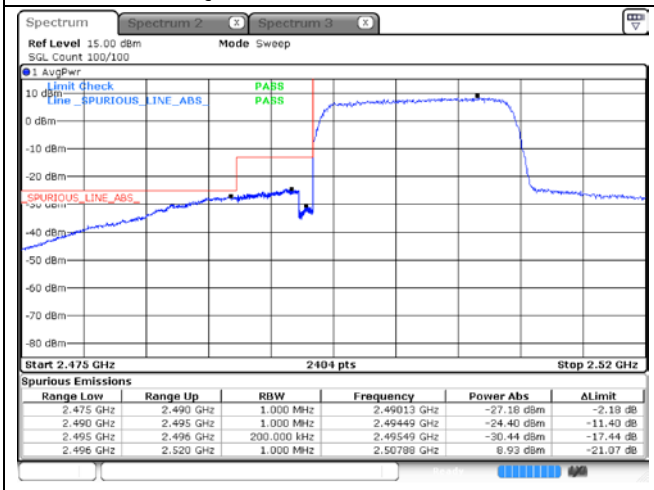
LTE band 41 (15 ㎒)



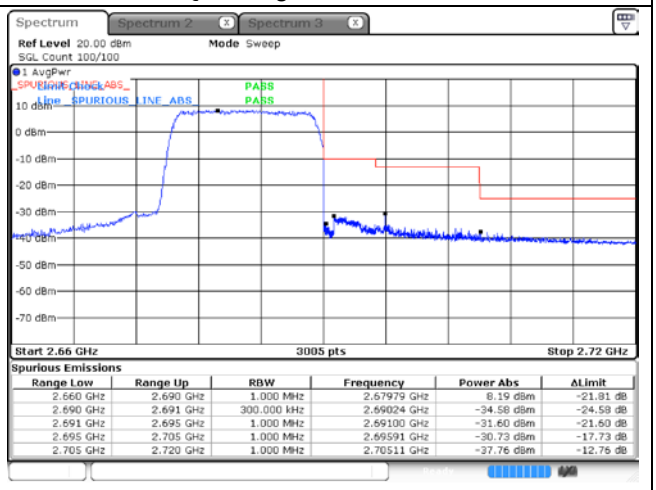
16QAM Low Channel - 1 RB



16QAM High Channel - 1 RB

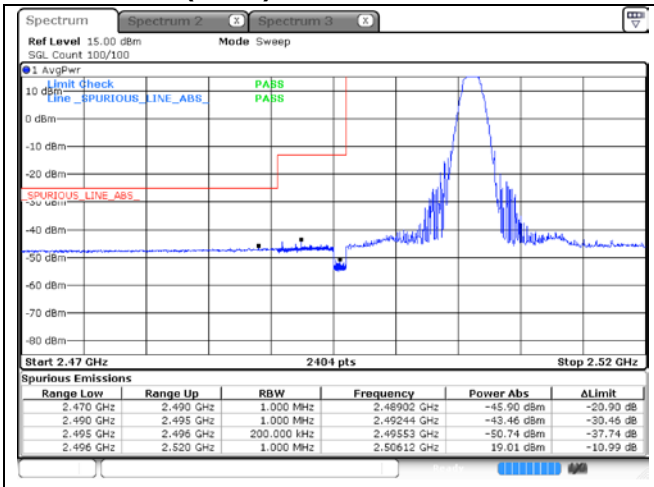


16QAM Low Channel - Full RB

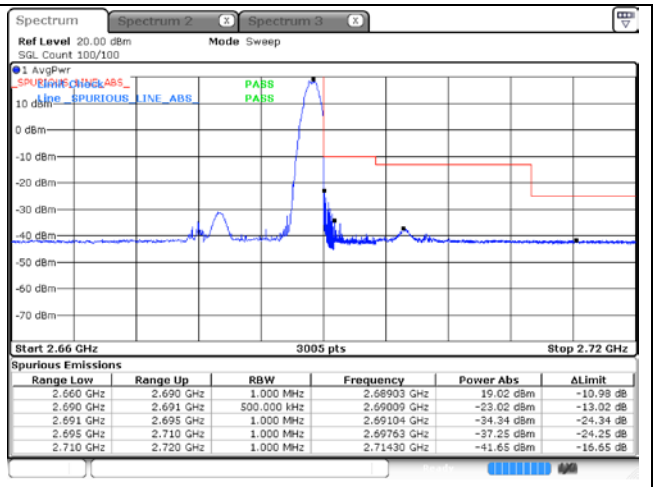


16QAM High Channel - Full RB

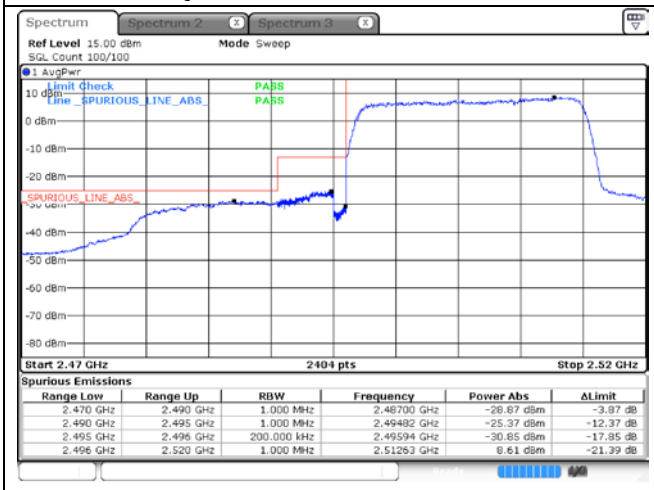
LTE band 41 (20 ㎒)



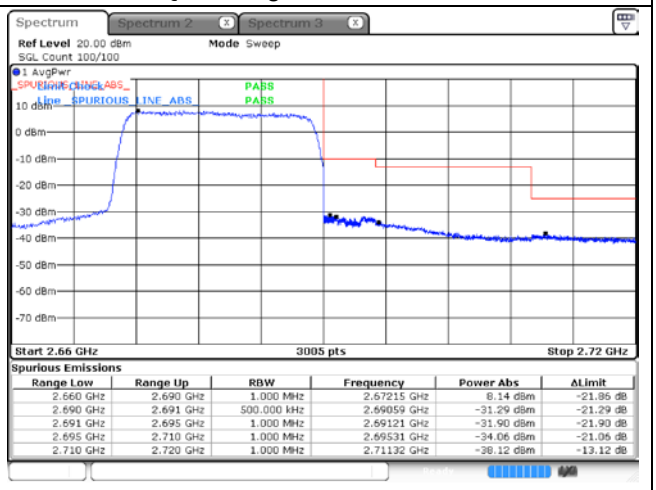
QPSK Low Channel - 1 RB



QPSK High Channel - 1 RB

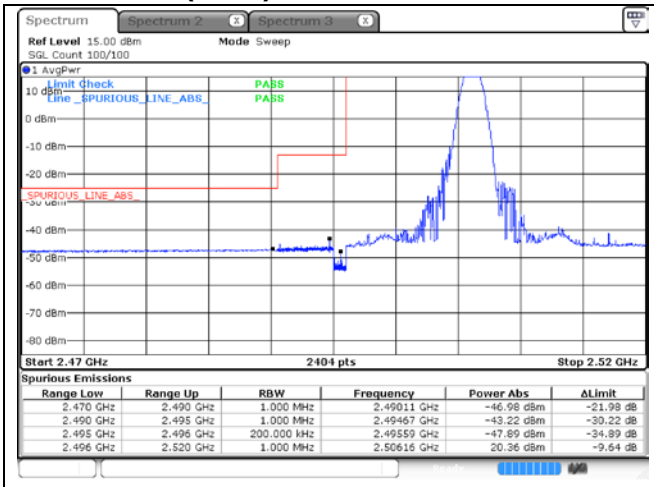


QPSK Low Channel - Full RB

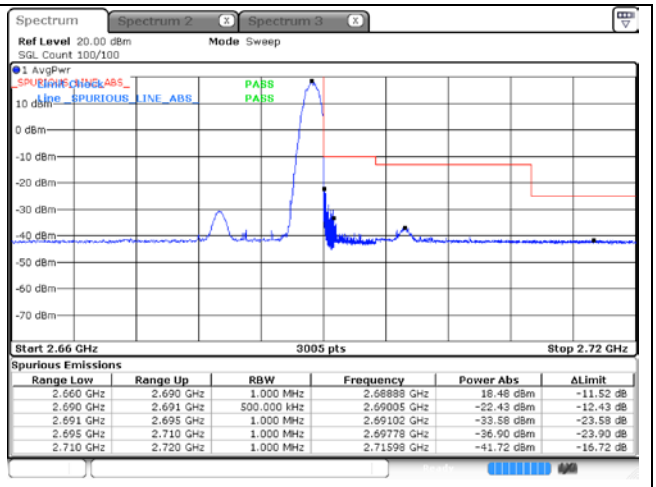


QPSK High Channel - Full RB

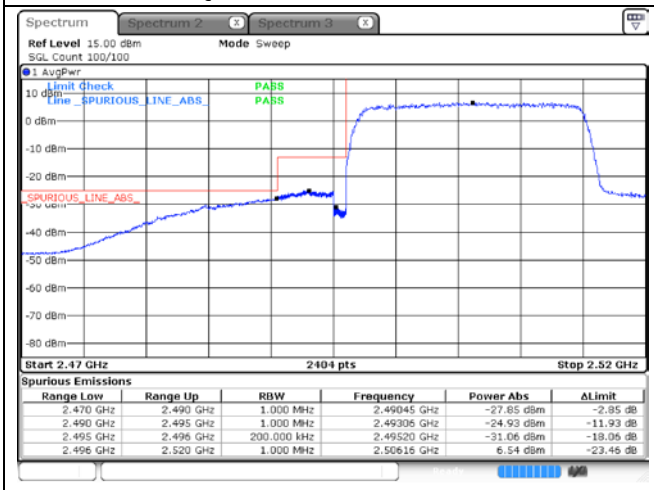
LTE band 41 (20 ㎒)



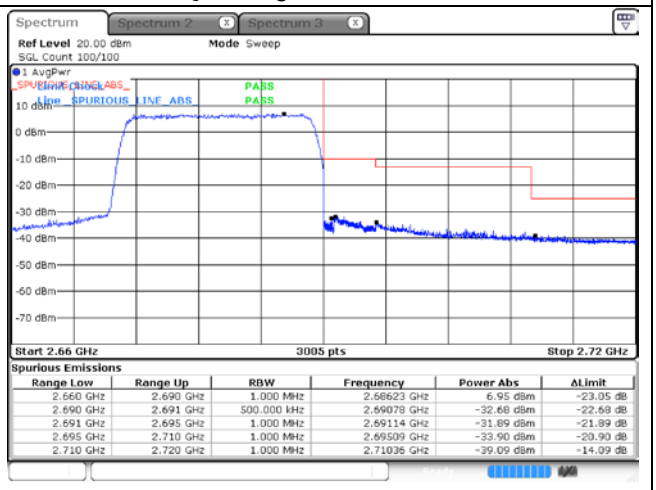
16QAM Low Channel - 1 RB



16QAM High Channel - 1 RB



16QAM Low Channel - Full RB



16QAM High Channel - Full RB

8. Frequency Stability

8.1. Limit

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

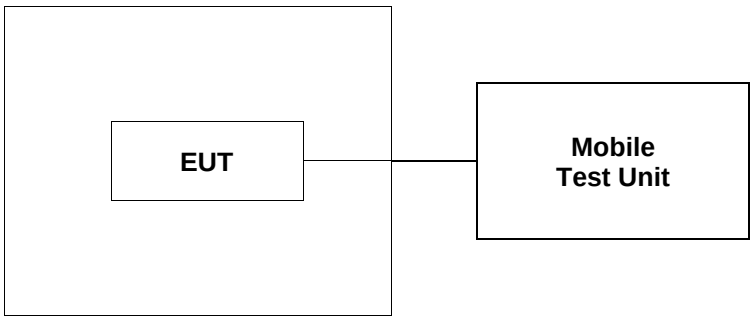
- §24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

- §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 ㎒ band at a power level 2 Watts or less, the limit specified in Table is +/- 2.5 ppm.

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.



Temperature Chamber

8.3. Test Results

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

SIM 1
LTE band 2 at middle channel

Reference Frequency: 1 880.0 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	-3.19	-0.005 59
40		-15.55	-0.012 16
30		-18.08	-0.013 51
20(Ref.)		7.32	-
10		-8.64	-0.008 49
0		-15.40	-0.012 09
-10		10.88	0.001 89
-20		-12.41	-0.010 49
-30		13.90	0.003 50
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	7.38	0.000 03
	14.38 (115%)	-7.35	-0.007 80

LTE band 4 at middle channel

Reference Frequency: 1 732.5 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	-6.56	-0.001 61
40		4.03	0.004 50
30		-19.19	-0.008 90
20(Ref.)		-3.77	-
10		17.86	0.012 48
0		1.44	0.003 01
-10		10.37	0.008 16
-20		13.42	0.009 92
-30		-0.14	0.002 10
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	-2.98	0.000 46
	14.38 (115%)	-10.53	-0.003 90

LTE band 7 at middle channel

Reference Frequency: 2 535.0 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	10.39	-0.000 79
40		15.07	0.001 05
30		-19.51	-0.012 59
20(Ref.)		12.40	-
10		2.55	-0.003 89
0		13.17	0.000 30
-10		-8.42	-0.008 21
-20		-10.33	-0.008 97
-30		1.72	-0.004 21
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	6.11	-0.002 48
	14.38 (115%)	2.07	-0.004 07

LTE band 12/17 at middle channel

Reference Frequency: 707.5 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	12.15	0.041 53
40		-6.52	0.015 14
30		3.17	0.028 83
20(Ref.)		-17.23	-
10		-16.37	0.001 22
0		15.94	0.046 88
-10		-0.66	0.023 42
-20		6.25	0.033 19
-30		14.07	0.044 24
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	-18.52	-0.001 82
	14.38 (115%)	3.22	0.028 90

LTE band 26/5 Part 22 at middle channel

Reference Frequency: 836.5 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	7.51	0.027 09
40		18.60	0.040 35
30		3.40	0.022 18
20(Ref.)		-15.15	-
10		7.47	0.027 04
0		3.23	0.021 97
-10		3.89	0.022 76
-20		-1.79	0.015 97
-30		8.26	0.027 99
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	17.05	0.038 49
	14.38 (115%)	3.77	0.022 62

LTE band 26 Part 90 at middle channel

Reference Frequency: 819 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	10.24	0.036 39
40		-17.95	0.001 97
30		8.53	0.034 30
20(Ref.)		-19.56	-
10		-7.23	0.015 05
0		11.85	0.038 35
-10		-5.61	0.017 03
-20		18.01	0.045 87
-30		2.57	0.027 02
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	17.97	0.045 82
	14.38 (115%)	18.01	0.045 87

LTE band 41 at middle channel

Reference Frequency: 2 593.0 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	-12.81	-0.010 94
40		4.22	-0.004 38
30		19.74	0.001 61
20(Ref.)		15.57	-
10		19.63	0.001 57
0		14.32	-0.000 48
-10		-14.67	-0.011 66
-20		6.06	-0.003 67
-30		-8.44	-0.009 26
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	10.10	-0.002 11
	14.38 (115%)	15.42	-0.000 06

SIM 2
LTE band 2 at middle channel

Reference Frequency: 1 880.0 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	8.24	0.013 03
40		9.26	0.013 57
30		-16.59	-0.000 18
20(Ref.)		-16.26	-
10		9.78	0.013 85
0		-6.33	0.005 28
-10		-12.89	0.001 79
-20		4.85	0.011 23
-30		17.64	0.018 03
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	8.13	0.012 97
	14.38 (115%)	13.37	0.015 76

LTE band 4 at middle channel

Reference Frequency: 1 732.5 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	-7.41	-0.000 64
40		-10.17	-0.002 23
30		14.37	0.011 93
20(Ref.)		-6.30	-
10		-1.22	0.002 93
0		11.64	0.010 35
-10		-2.88	0.001 97
-20		10.34	0.009 60
-30		-11.33	-0.002 90
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	5.97	0.007 08
	14.38 (115%)	-3.47	0.001 63

LTE band 7 at middle channel

Reference Frequency: 2 535.0 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	0.69	-0.000 58
40		-5.13	-0.002 88
30		8.59	0.002 53
20(Ref.)		2.17	-
10		-9.00	-0.004 41
0		5.66	0.001 38
-10		4.80	0.001 04
-20		-10.78	-0.005 11
-30		-9.83	-0.004 73
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	19.14	0.006 69
	14.38 (115%)	9.15	0.002 75

LTE band 26/5 Part 22 at middle channel

Reference Frequency: 836.5 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	-10.96	-0.021 09
40		-11.31	-0.021 51
30		-4.13	-0.012 92
20(Ref.)		6.68	-
10		0.72	-0.007 12
0		14.53	0.009 38
-10		-9.99	-0.019 93
-20		-14.85	-0.025 74
-30		15.73	0.010 82
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	4.80	-0.002 25
	14.38 (115%)	-19.75	-0.031 60

LTE band 26 Part 90 at middle channel

Reference Frequency: 819 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	4.47	0.002 36
40		-16.32	-0.023 03
30		-14.50	-0.020 81
20(Ref.)		2.54	-
10		17.95	0.018 82
0		13.72	0.013 65
-10		-18.45	-0.025 63
-20		-4.49	-0.008 58
-30		10.85	0.010 15
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	4.03	0.001 82
	14.38 (115%)	-1.02	-0.004 35

LTE band 41 at middle channel

Reference Frequency: 2 593.0 ㎒			
Frequency Stability versus Temperature			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
50	12.5	7.87	0.009 75
40		11.28	0.011 07
30		10.05	0.010 59
20(Ref.)		-17.42	-
10		1.29	0.007 22
0		1.01	0.007 11
-10		-0.23	0.006 63
-20		1.01	0.007 11
-30		1.65	0.007 35
Frequency Stability versus Power Supply			
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**	
		Frequency Error (㎐)	**ppm**
20	10.63 (85%)	-7.93	0.003 66
	14.38 (115%)	-8.57	0.003 41

- End of the Test Report -