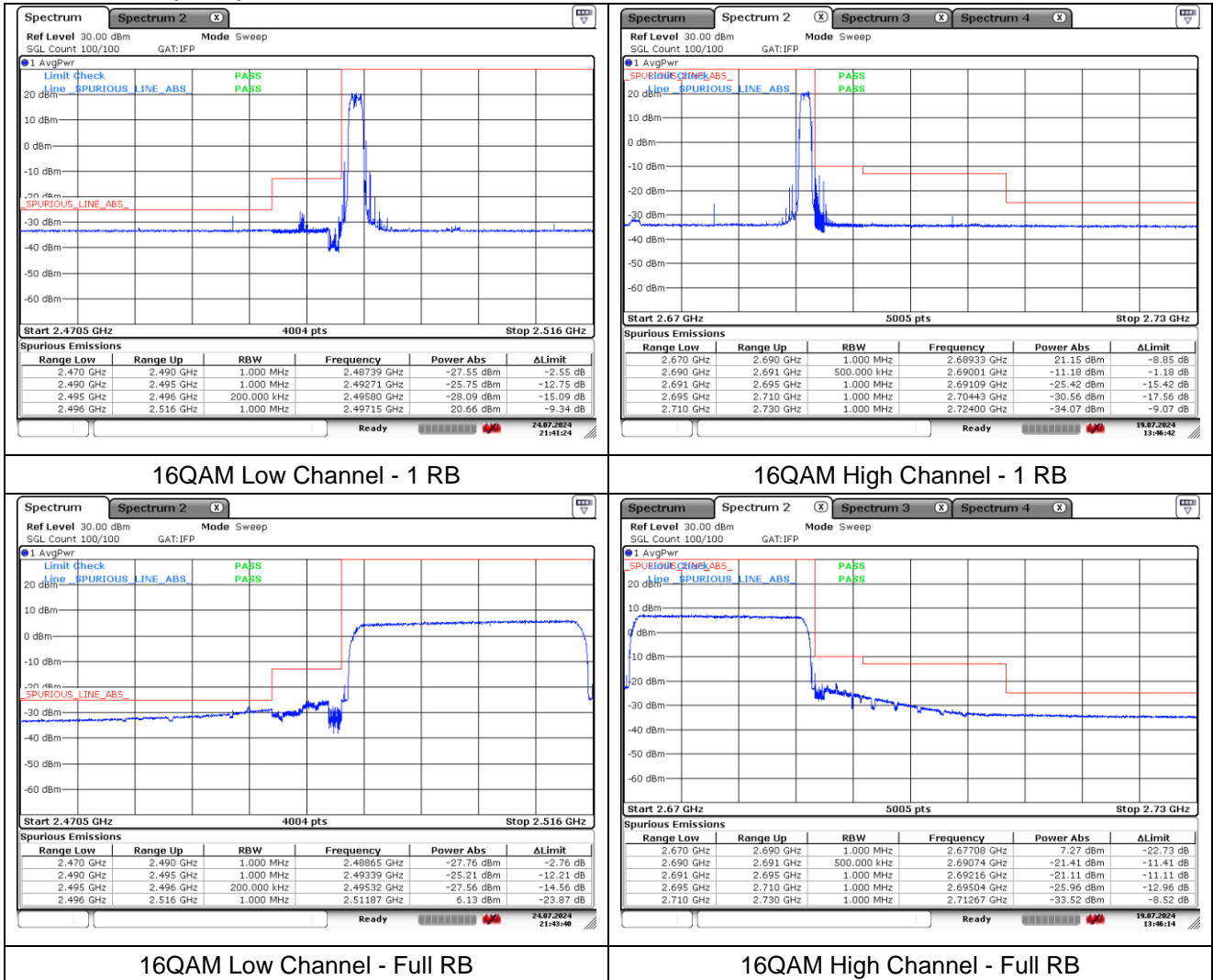
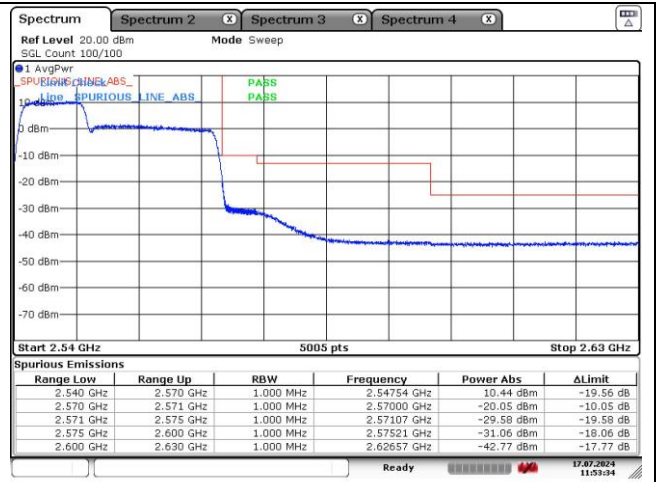
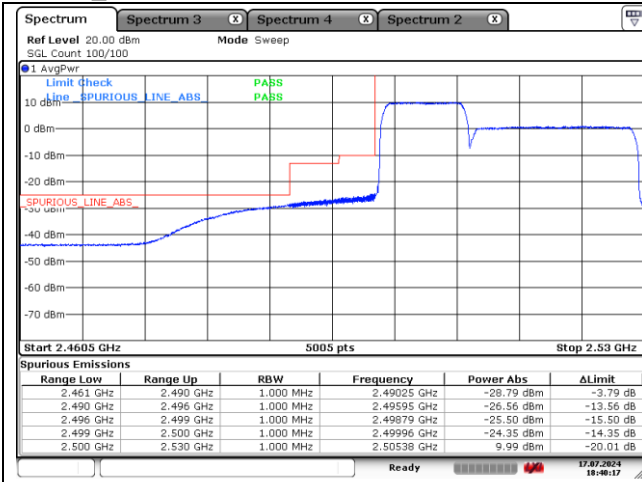


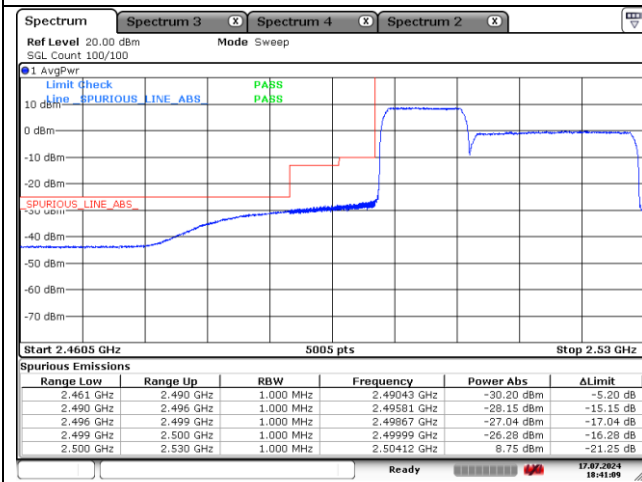
LTE band 41 (20 MHz)



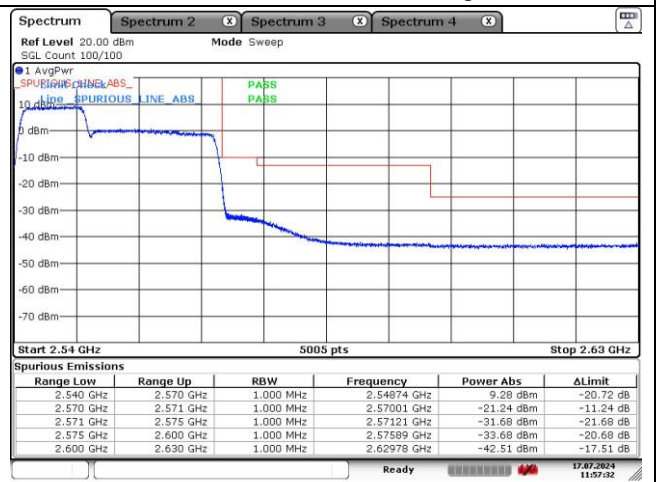
ULCA_7C



PCC 10 MHz + SCC 20 MHz_QPSK-Low Channel



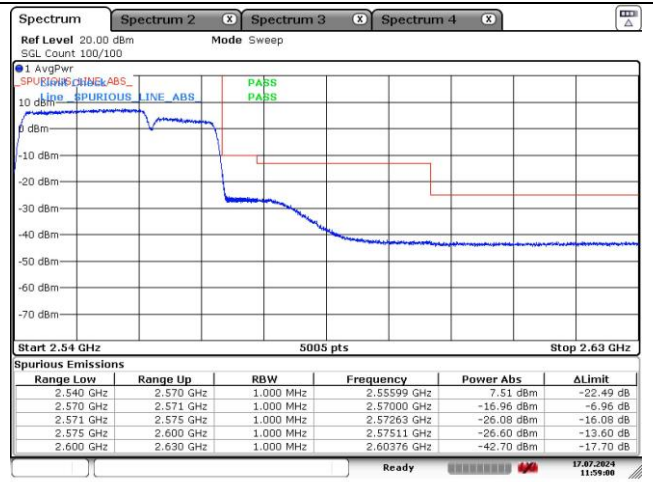
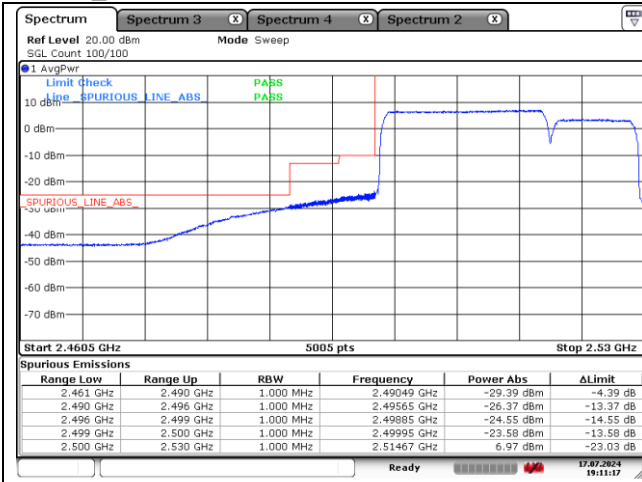
PCC 10 MHz + SCC 20 MHz_QPSK-High Channel



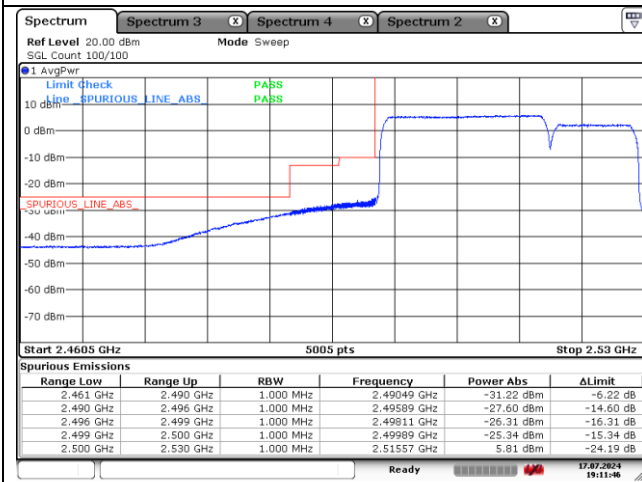
PCC 10 MHz + SCC 20 MHz_16QAM-Low Channel

PCC 10 MHz + SCC 20 MHz_16QAM-High Channel

ULCA_7C



PCC 20 MHz + SCC 10 MHz_QPSK-Low Channel



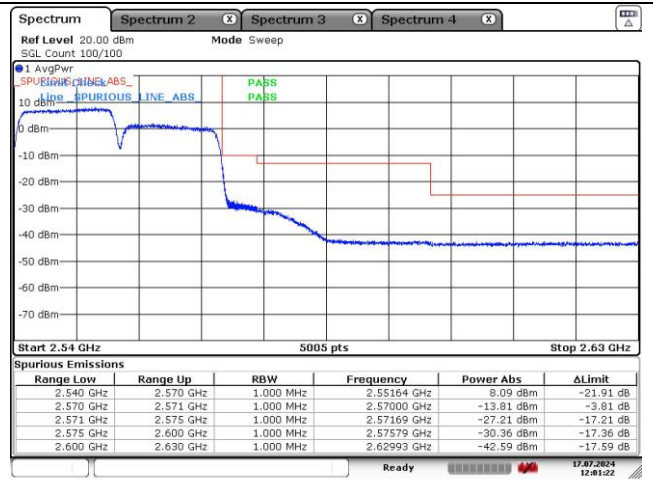
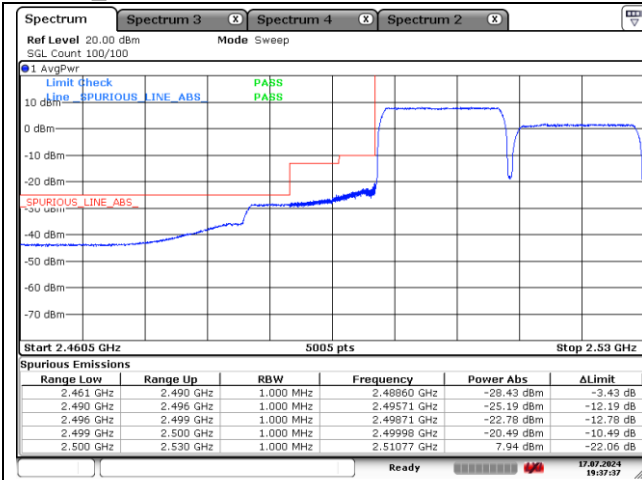
PCC 20 MHz + SCC 10 MHz_QPSK-High Channel



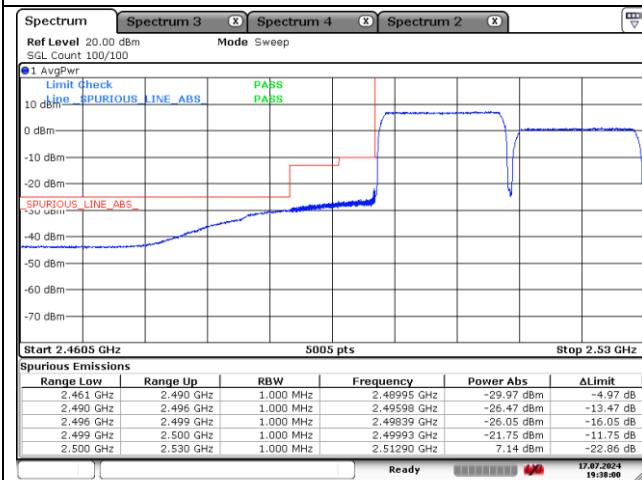
PCC 20 MHz + SCC 10 MHz_16QAM-Low Channel

PCC 20 MHz + SCC 10 MHz_16QAM-High Channel

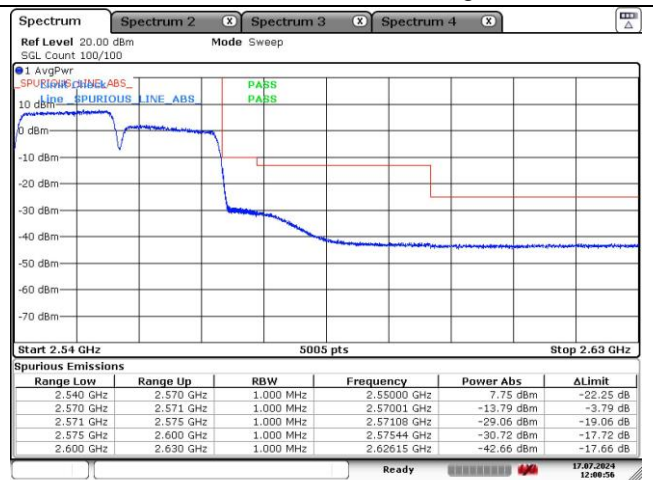
ULCA_7C



PCC 15 MHz + SCC 15 MHz_QPSK-Low Channel



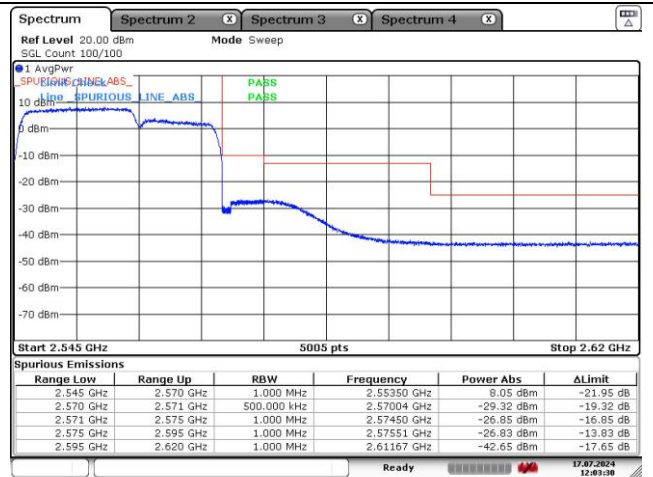
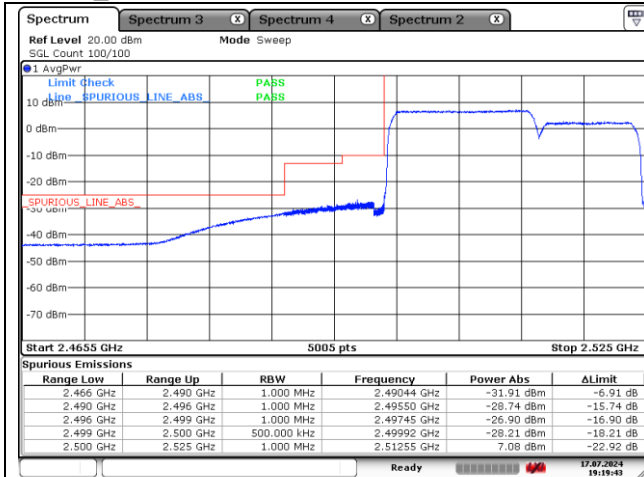
PCC 15 MHz + SCC 15 MHz_QPSK-High Channel



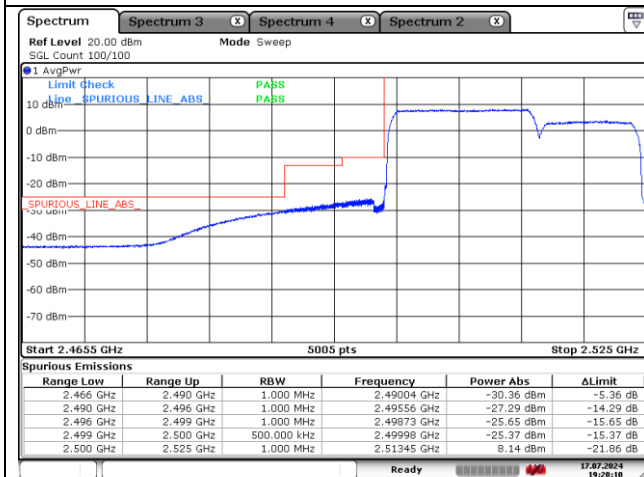
PCC 15 MHz + SCC 15 MHz_16QAM-Low Channel

PCC 15 MHz + SCC 15 MHz_16QAM-High Channel

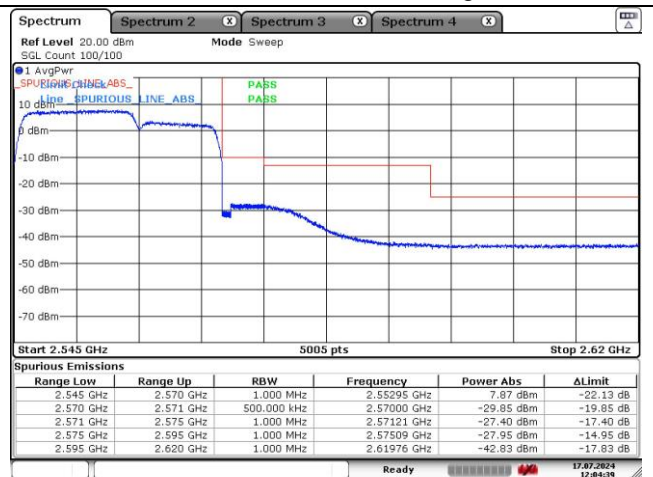
ULCA_7C



PCC 15 MHz + SCC 10 MHz_QPSK-Low Channel



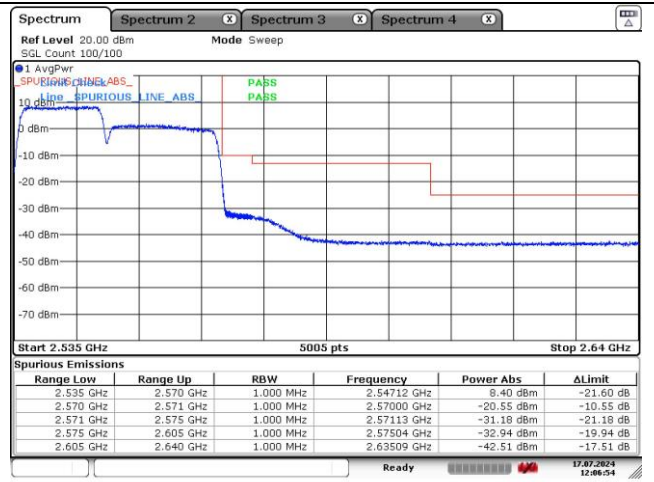
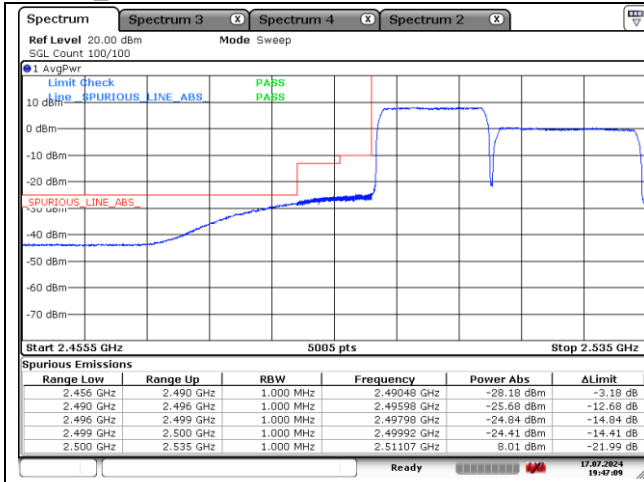
PCC 15 MHz + SCC 10 MHz_QPSK-High Channel



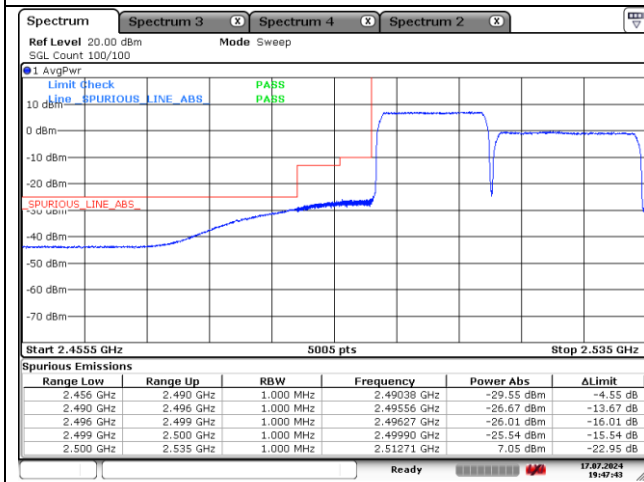
PCC 15 MHz + SCC 10 MHz_16QAM-Low Channel

PCC 15 MHz + SCC 10 MHz_16QAM-High Channel

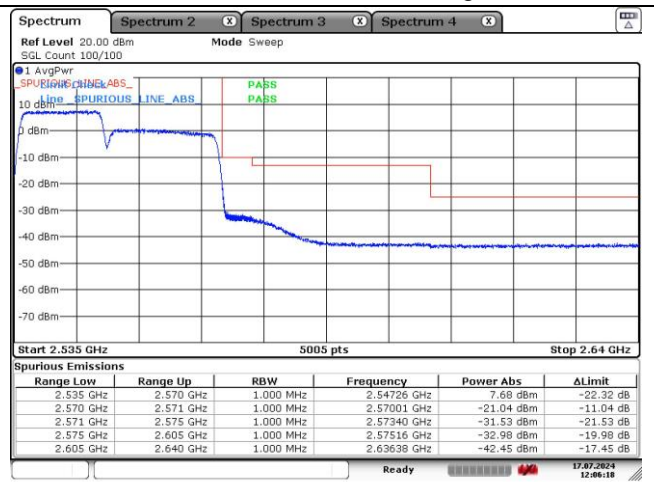
ULCA_7C



PCC 15 MHz + SCC 20 MHz_QPSK-Low Channel



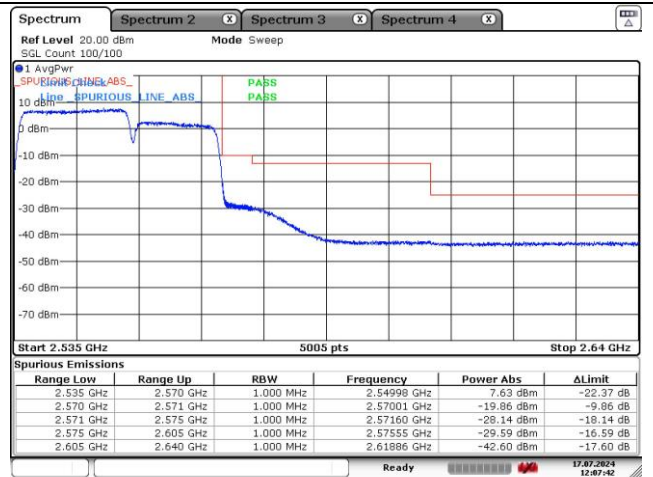
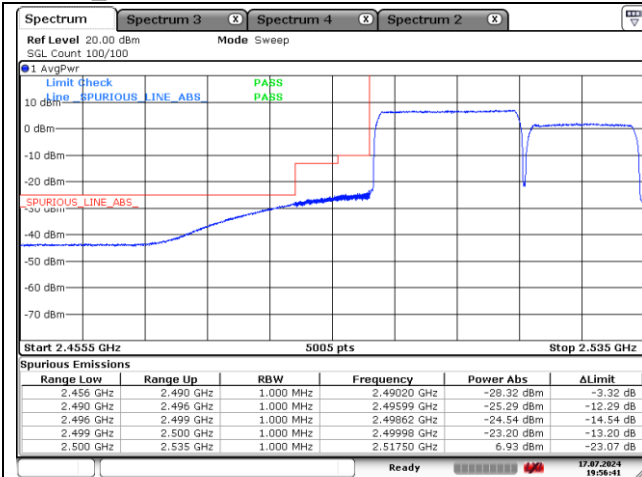
PCC 15 MHz + SCC 20 MHz_QPSK-High Channel



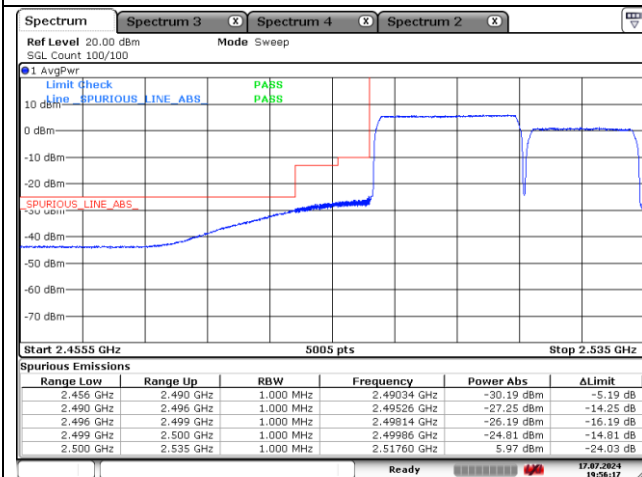
PCC 15 MHz + SCC 20 MHz_16QAM-Low Channel

PCC 15 MHz + SCC 20 MHz_16QAM-High Channel

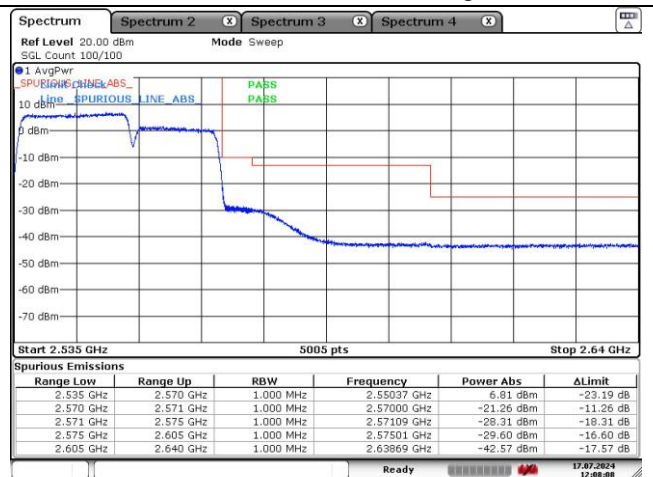
ULCA_7C



PCC 20 MHz + SCC 15 MHz_QPSK-Low Channel



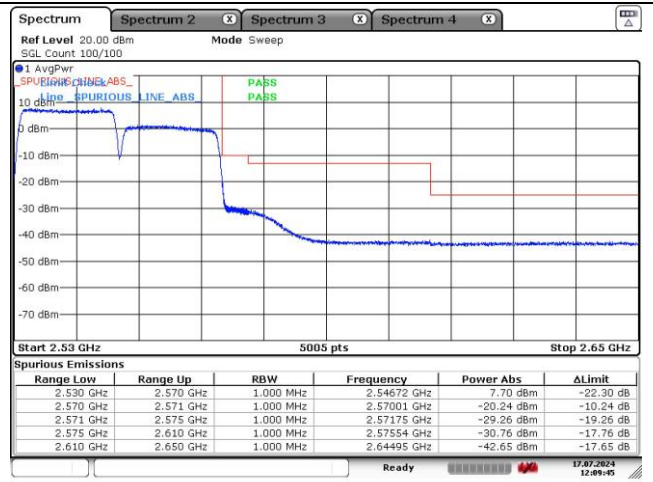
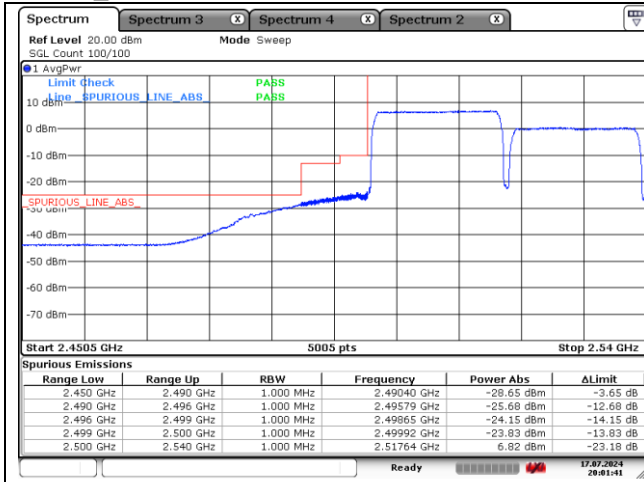
PCC 20 MHz + SCC 15 MHz_QPSK-High Channel



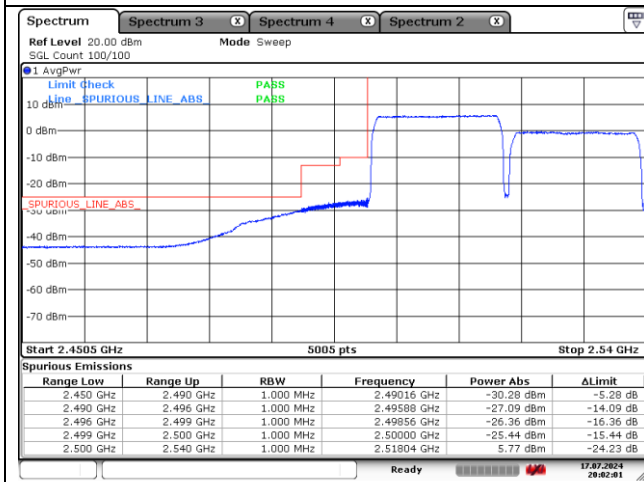
PCC 20 MHz + SCC 15 MHz_16QAM-Low Channel

PCC 20 MHz + SCC 15 MHz_16QAM-High Channel

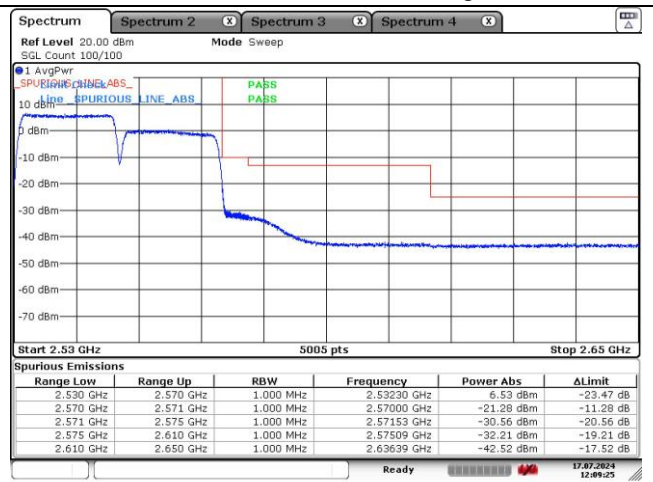
ULCA_7C



PCC 20 MHz + SCC 20 MHz_QPSK-Low Channel



PCC 20 MHz + SCC 20 MHz_QPSK-High Channel



PCC 20 MHz + SCC 20 MHz_16QAM-Low Channel

PCC 20 MHz + SCC 20 MHz_16QAM-High Channel

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 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.

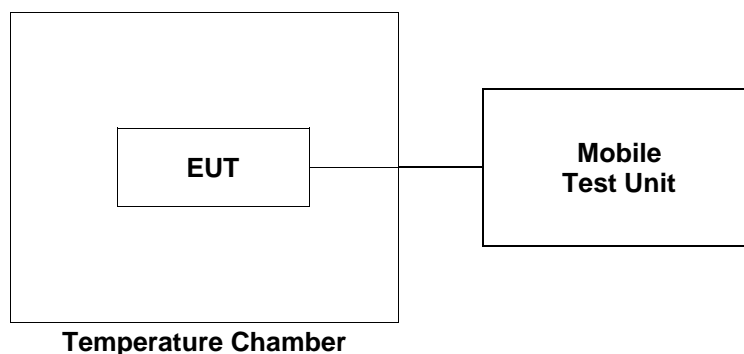
- §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

- §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.

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 % R.H.

LTE band 4 at middle channel

Reference Frequency: 1 732.5 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.10	-2.10	-0.002 42
40		-1.90	-0.002 31
30		-2.50	-0.002 66
20(Ref.)		2.10	-
10		3.20	0.000 63
0		2.60	0.000 29
-10		3.70	0.000 92
-20		2.50	0.000 23
-30		2.80	0.000 40
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.49 (85%)	2.00	-0.000 06
	4.72 (115%)	2.00	0.000 46

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	4.10	-2.50	-0.000 43
40		-3.40	-0.000 79
30		-1.80	-0.000 16
20(Ref.)		-1.40	-
10		-0.90	0.000 20
0		-1.70	-0.000 12
-10		-2.10	-0.000 28
-20		-1.80	-0.000 16
-30		-1.80	-0.000 16
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.49 (85%)	-2.10	-0.000 28
	4.72 (115%)	-1.00	0.000 16

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	4.10	1.70	-0.001 41
40		2.30	-0.000 57
30		1.90	-0.001 13
20(Ref.)		2.70	-
10		3.20	0.000 71
0		2.60	-0.000 14
-10		2.80	0.000 14
-20		4.30	0.002 26
-30		4.10	0.001 98
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.49 (85%)	3.30	0.000 85
	4.72 (115%)	2.00	-0.000 99

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	4.10	-3.80	-0.002 66
40		-2.50	-0.001 97
30		-2.40	-0.001 91
20(Ref.)		1.20	-
10		-1.70	-0.001 54
0		-2.40	-0.001 91
-10		1.70	0.000 27
-20		3.90	0.001 43
-30		-2.40	-0.001 91
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.49 (85%)	0.90	-0.000 16
	4.72 (115%)	-1.10	-0.001 22

LTE band 26/5 Part 22 at middle channel

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	4.10	1.80	-0.002 27
40		2.20	-0.001 79
30		1.10	-0.003 11
20(Ref.)		3.70	-
10		2.60	-0.001 32
0		2.10	-0.001 91
-10		2.50	-0.001 43
-20		2.30	-0.001 67
-30		2.40	-0.001 55
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.49 (85%)	1.60	-0.002 51
	4.72 (115%)	1.20	-0.002 99

LTE band 26_Part 90 at middle channel

Reference Frequency: 819 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.10	1.80	0.000 12
40		2.40	0.000 85
30		1.50	-0.000 24
20(Ref.)		1.70	-
10		2.50	0.000 98
0		2.90	0.001 47
-10		2.70	0.001 22
-20		2.00	0.000 37
-30		2.60	0.001 10
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.49 (85%)	2.10	0.000 49
	4.72 (115%)	1.40	-0.000 37

LTE band 41/38 at middle channel

Reference Frequency: 2 593.0 MHz			
Frequency Stability versus Temperature			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
50	4.10	-2.20	-0.000 15
40		-2.60	-0.000 31
30		2.90	0.001 81
20(Ref.)		-1.80	-
10		2.70	0.001 74
0		-1.50	0.000 12
-10		2.90	0.001 81
-20		3.30	0.001 97
-30		3.40	0.002 01
Frequency Stability versus Power Supply			
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
20	3.49 (85%)	1.10	0.001 12
	4.72 (115%)	1.50	0.001 27

ULCA 7C at middle channel

Reference Frequency: PCC 2 525.6 MHz / SCC 2 540 MHz					
Frequency Stability versus Temperature					
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse			
		Frequency Error (Hz)		ppm	
		PCC	SCC	PCC	SCC
50	4.10	135.22	86.75	0.003 80	0.001 19
40		131.48	88.23	0.002 32	0.001 78
30		127.51	86.47	0.000 74	0.001 08
20(Ref.)		125.63	83.72	-	-
10		126.38	88.37	0.000 30	0.001 83
0		133.26	86.63	0.003 02	0.001 15
-10		132.76	85.79	0.002 82	0.000 81
-20		138.87	89.33	0.005 24	0.002 21
-30		126.38	88.37	0.000 30	0.001 83
Frequency Stability versus Power Supply					
Environment Temperature (°C)	Power Supplied (V)	Frequency Measure with Time Elapse			
		Frequency Error (Hz)		Ppm	
		PCC	SCC	PCC	SCC
20	3.49 (85%)	128.25	84.32	0.001 04	0.000 24
	4.72 (115%)	124.36	86.71	-0.000 50	0.001 18

- End of the Test Report -