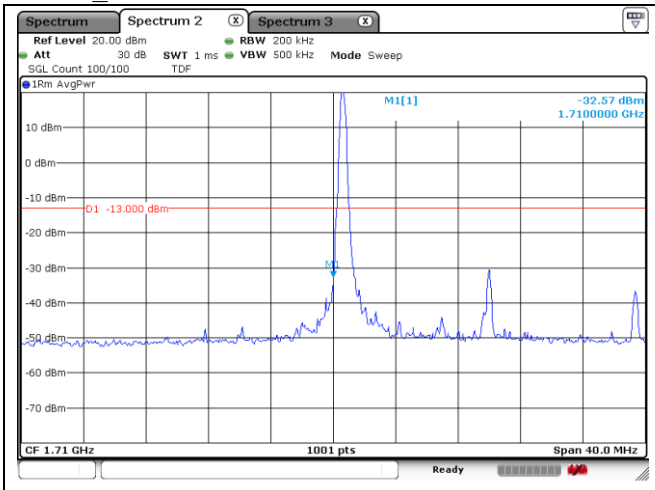
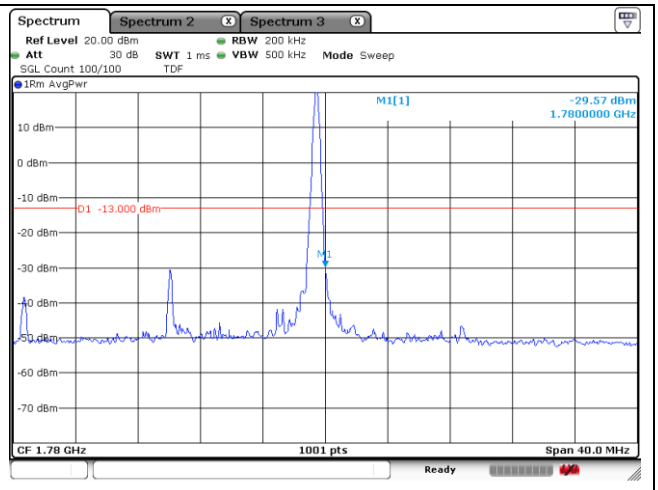
ULCA_66B



PCC 10 ㎒ + SCC 10 ㎒_16QAM-Low Channel – 1 RB



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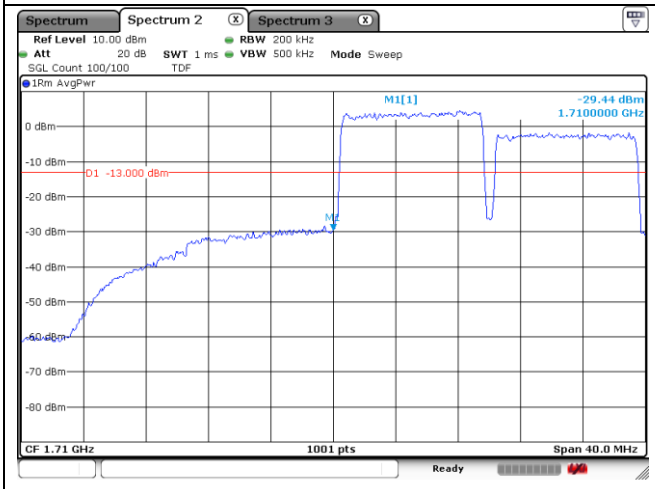

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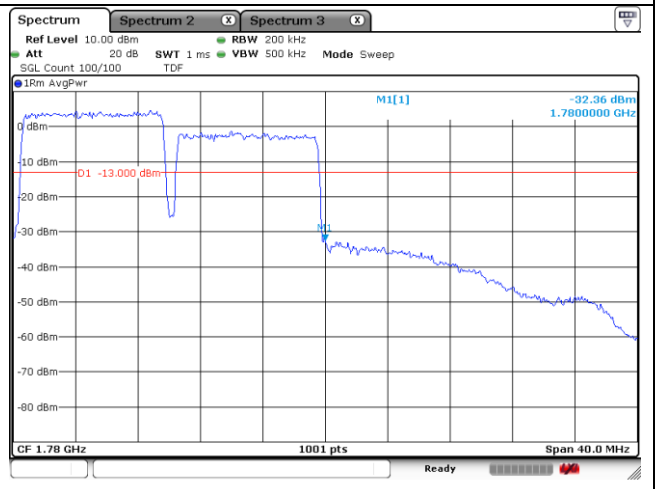

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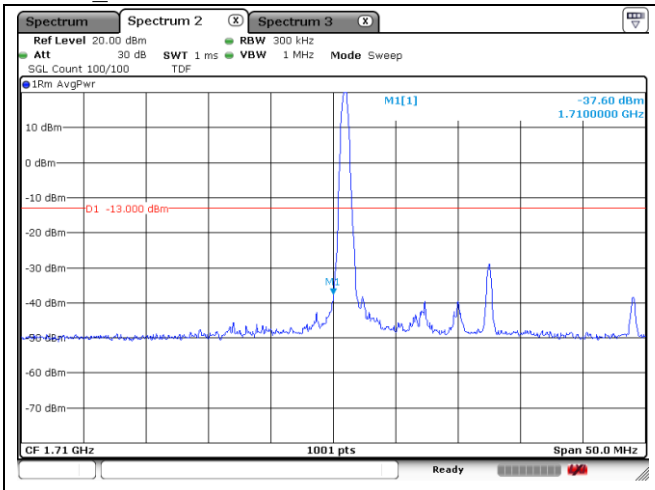
ULCA_66C



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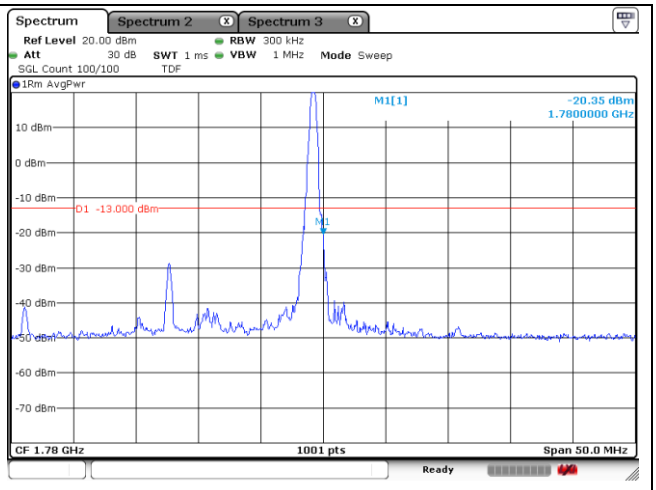

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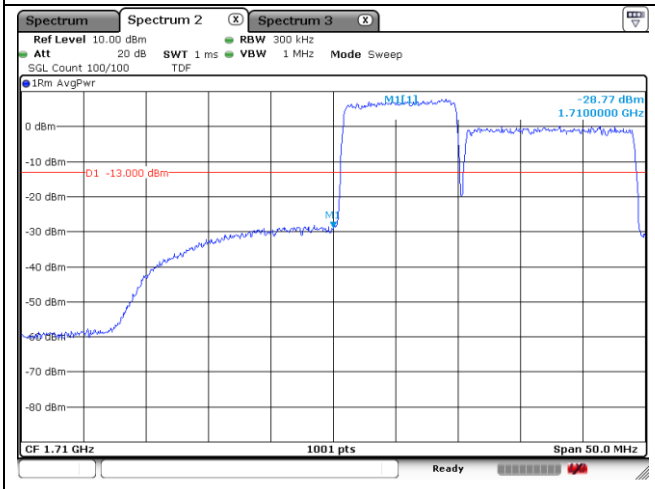

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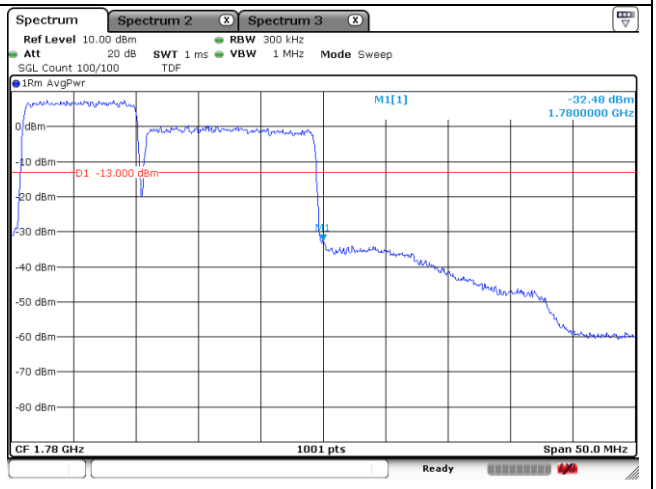

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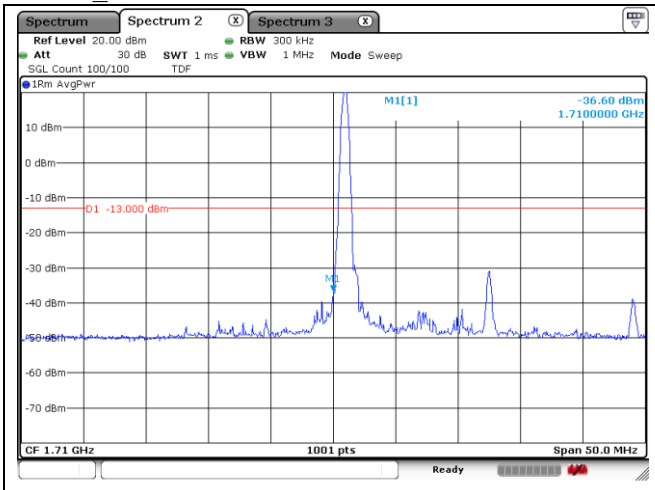
ULCA_66C



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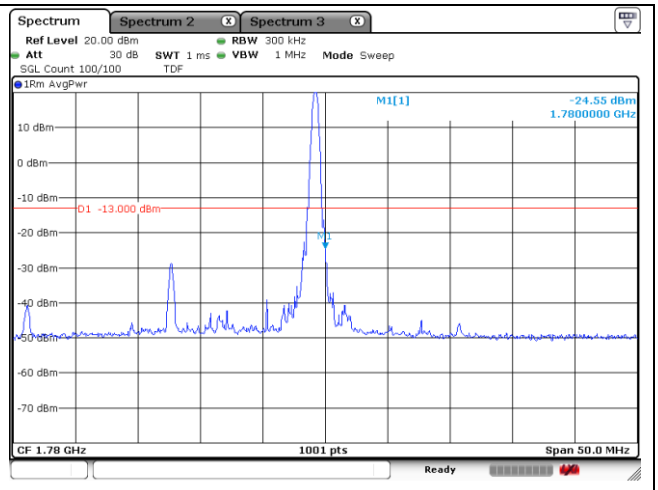

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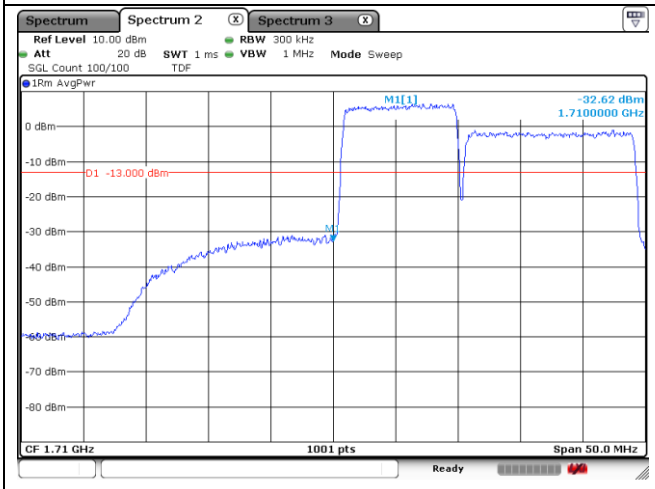

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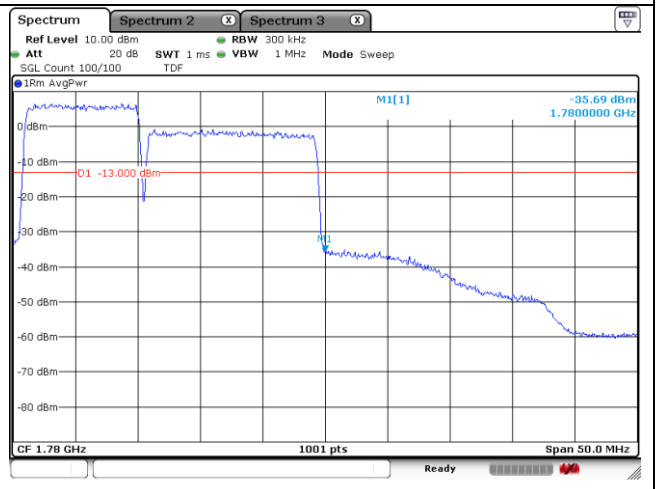

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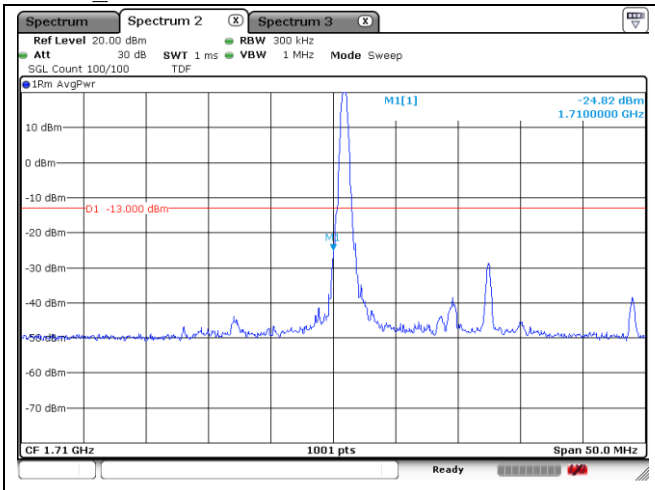
ULCA_66C



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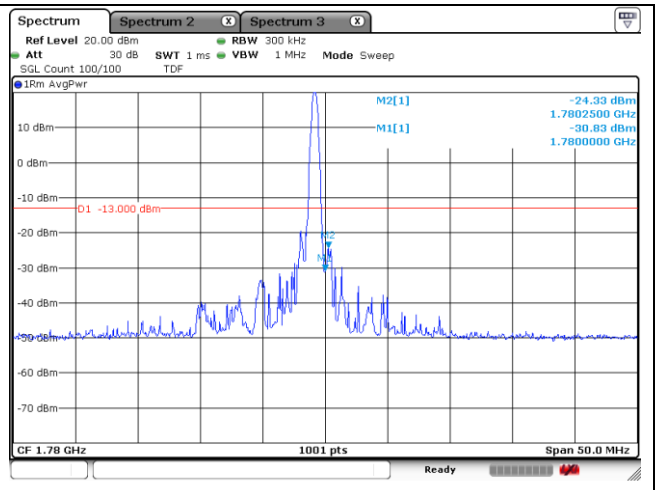

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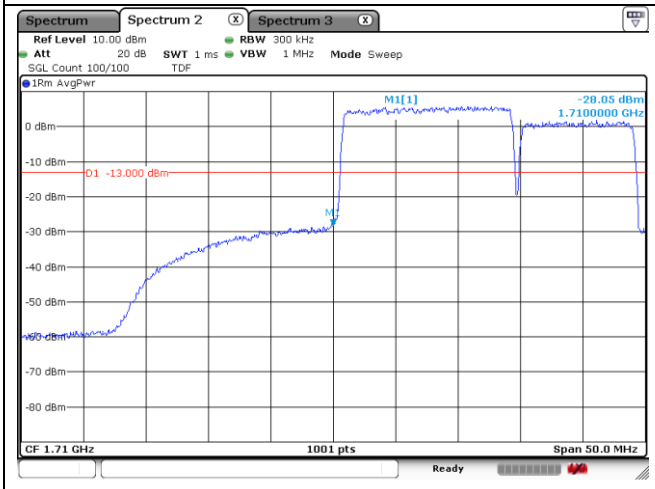

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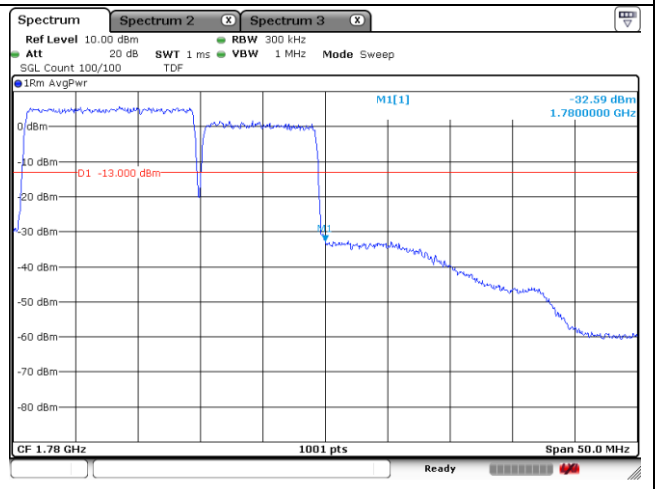

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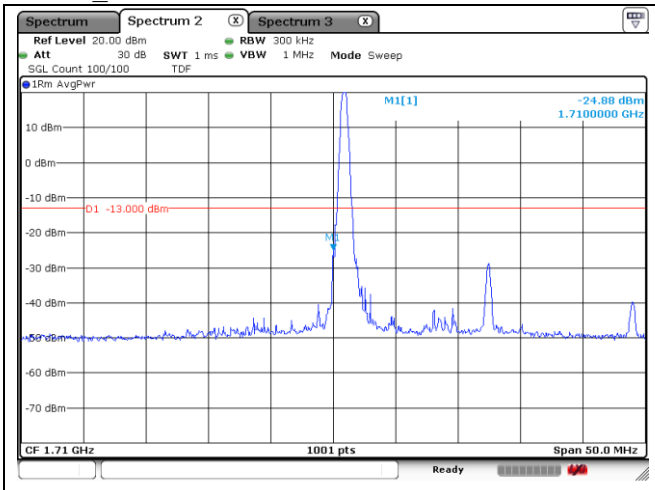
ULCA_66C



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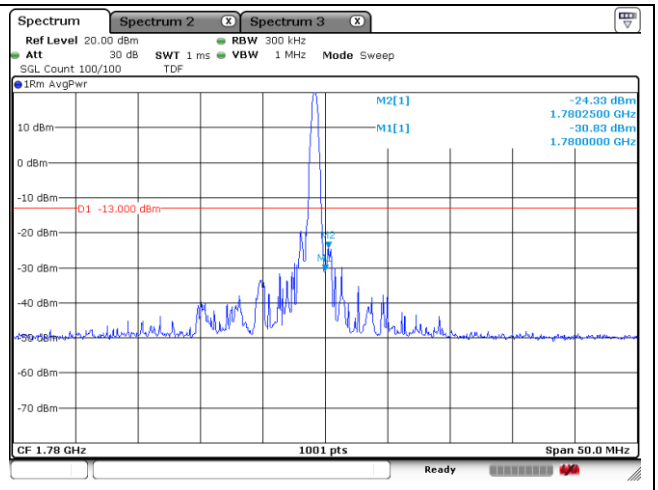

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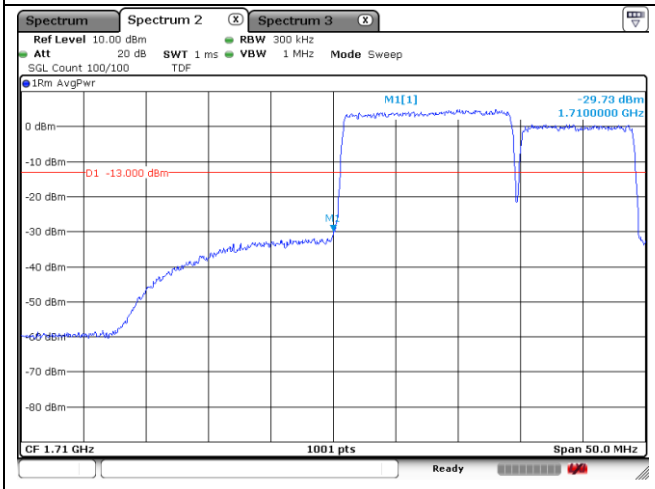

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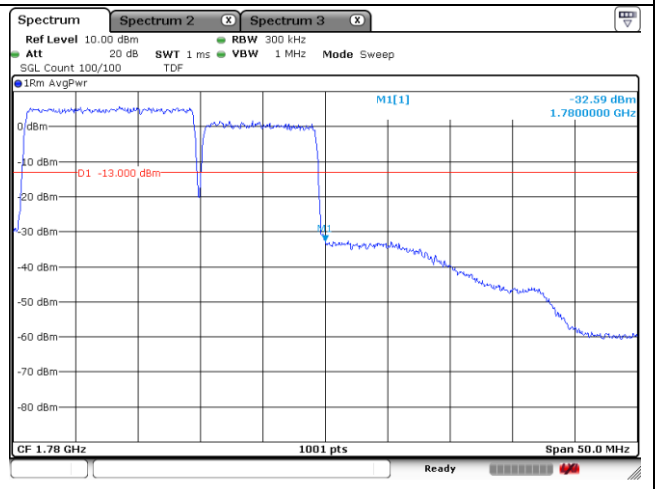

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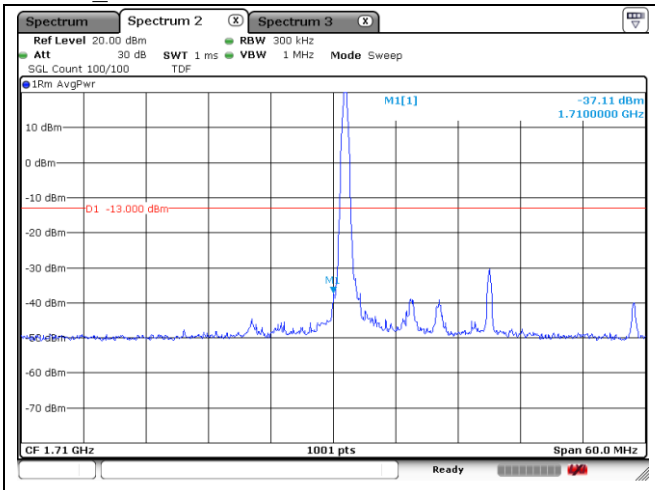
ULCA_66C



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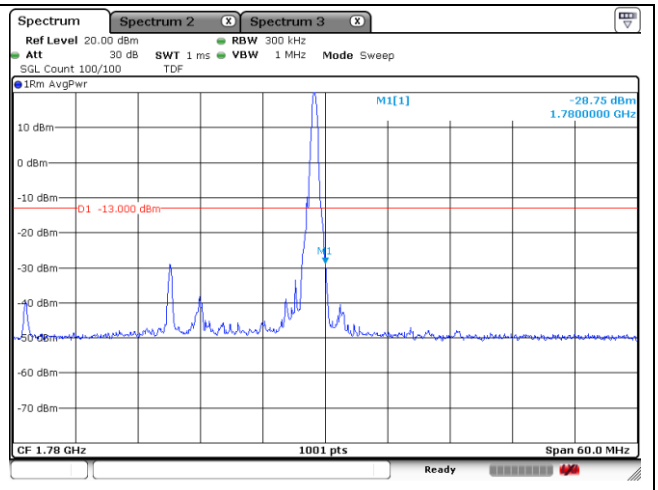

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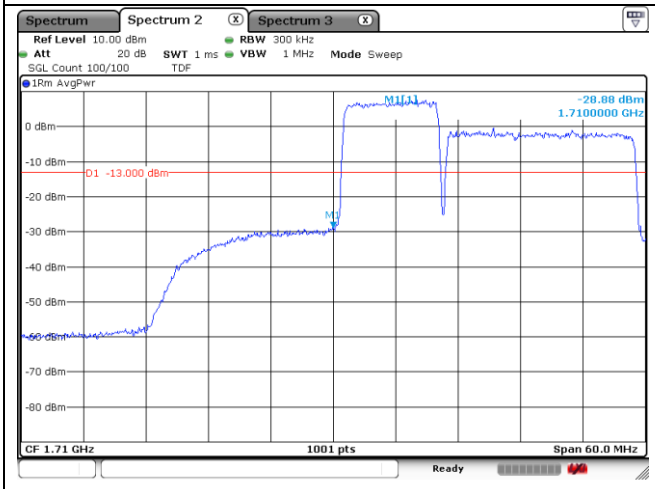

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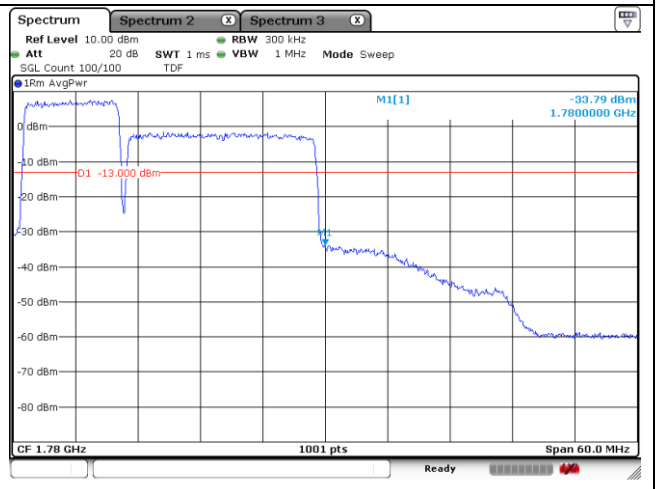

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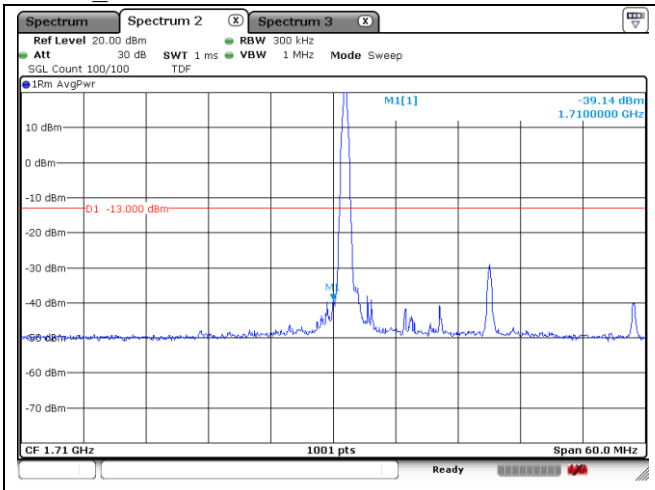
ULCA_66C



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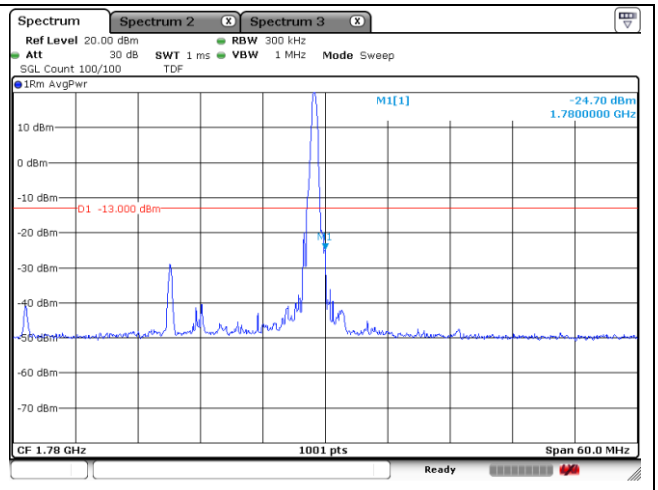

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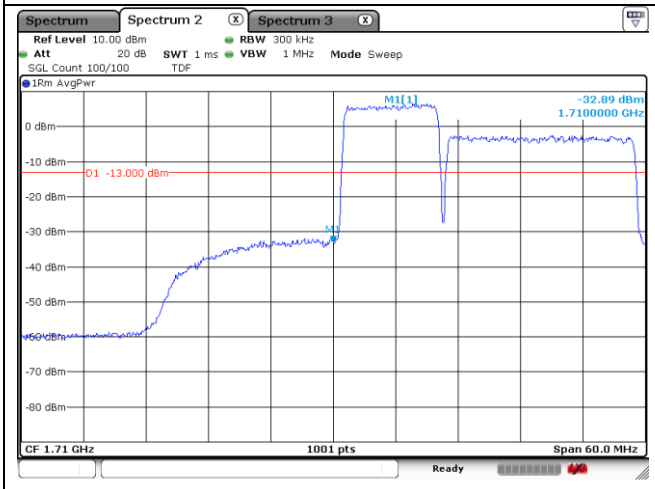

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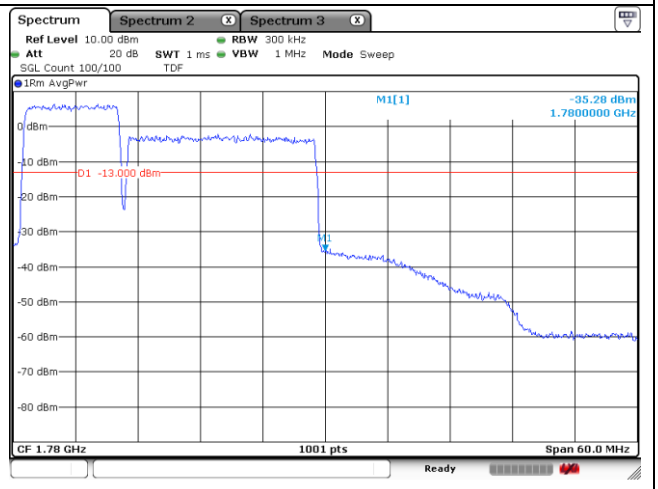

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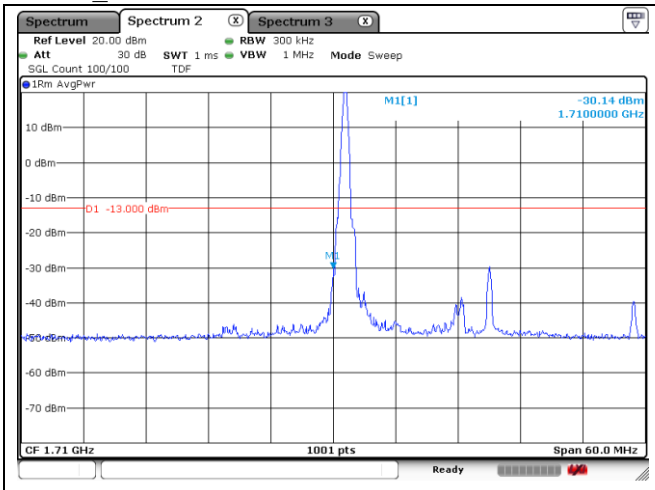

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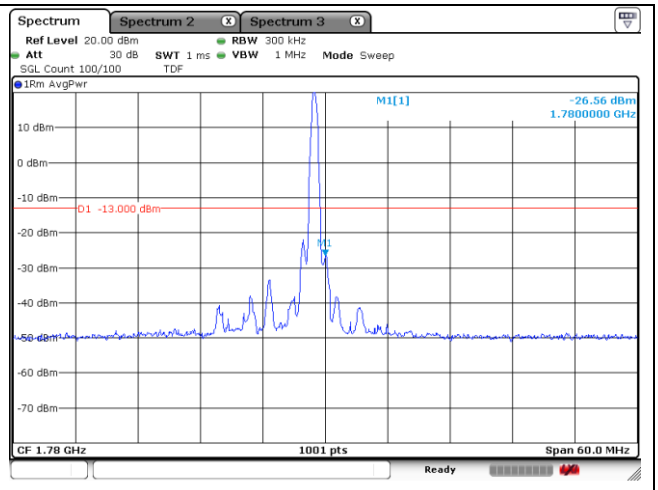

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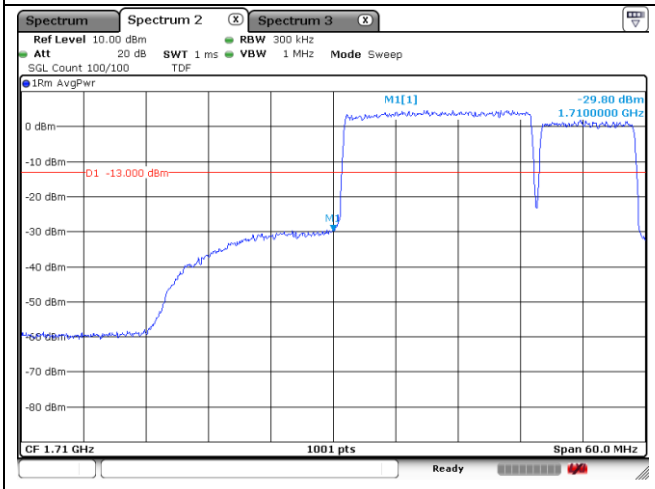

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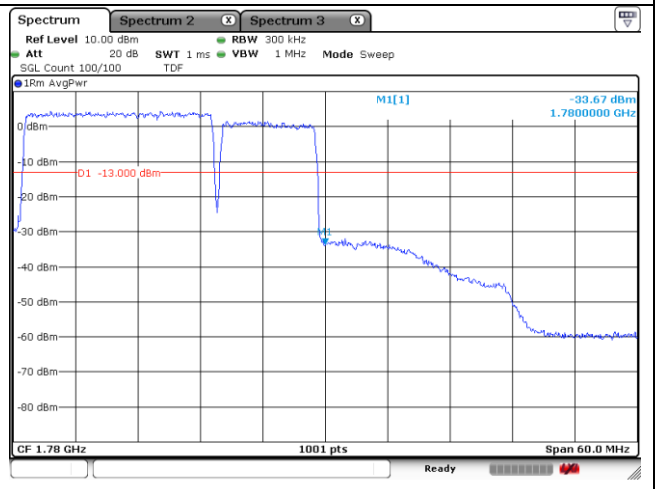

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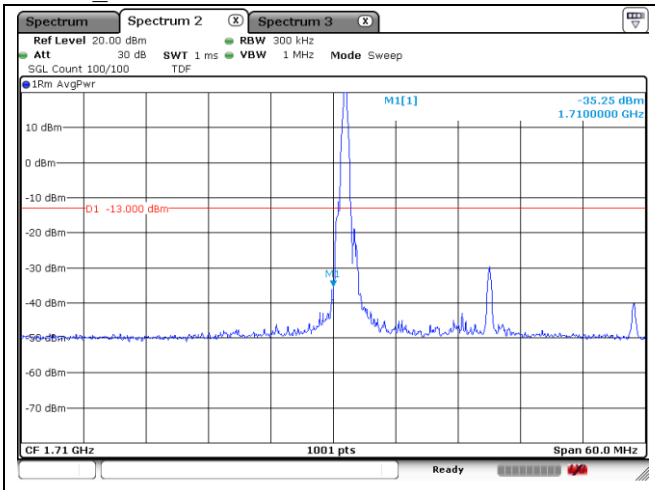
ULCA_66C



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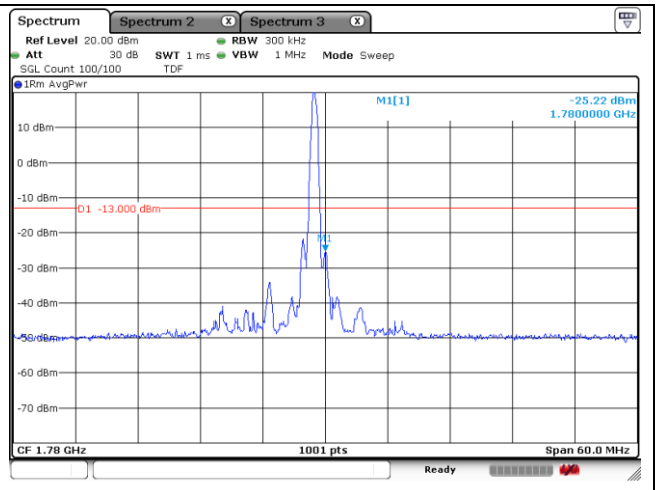

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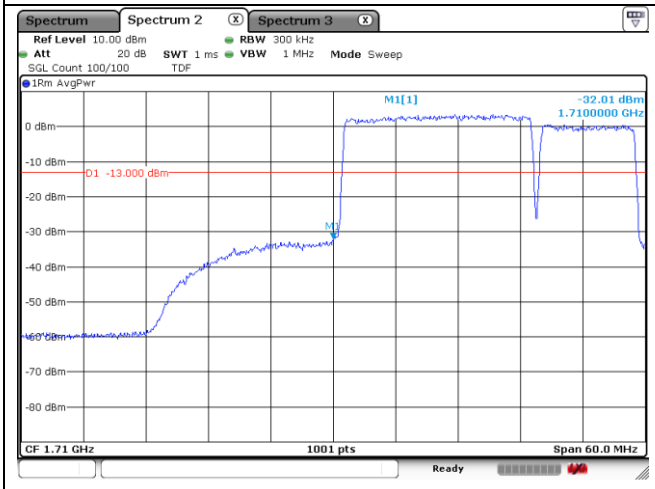

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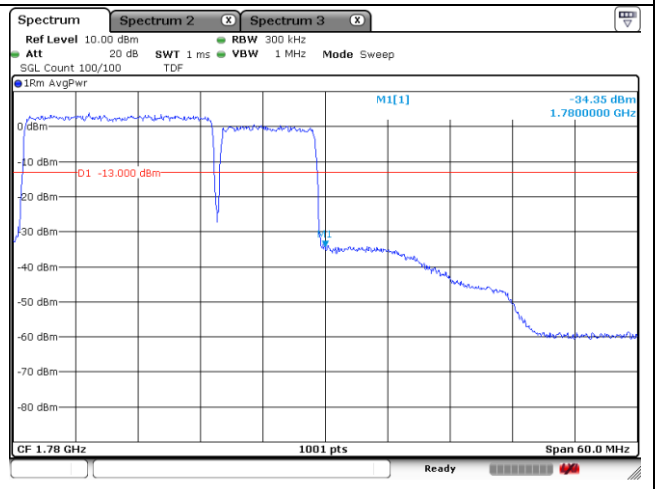

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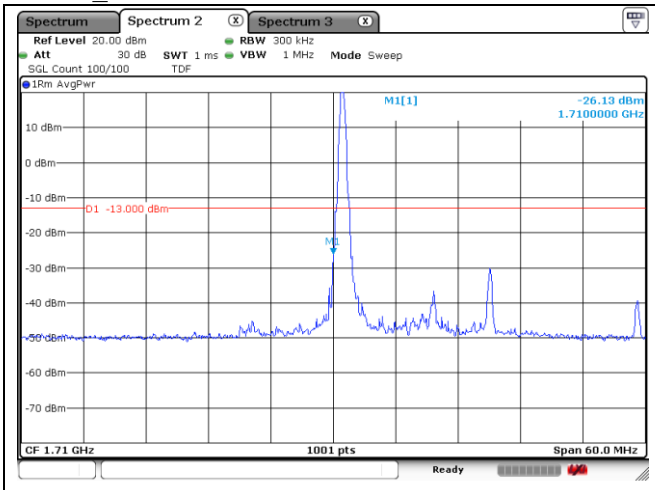
ULCA_66C



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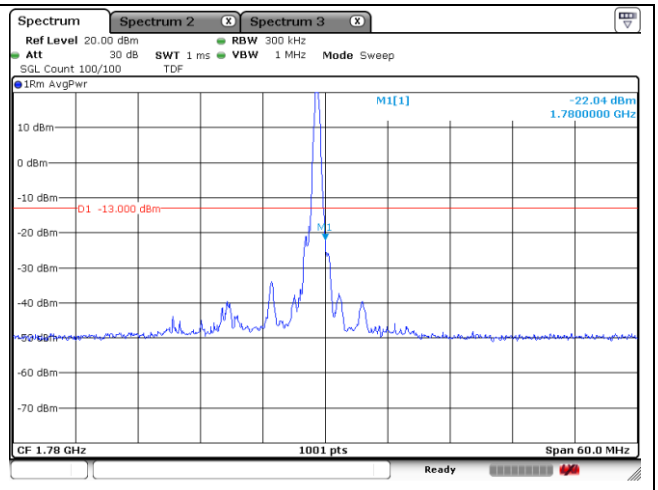

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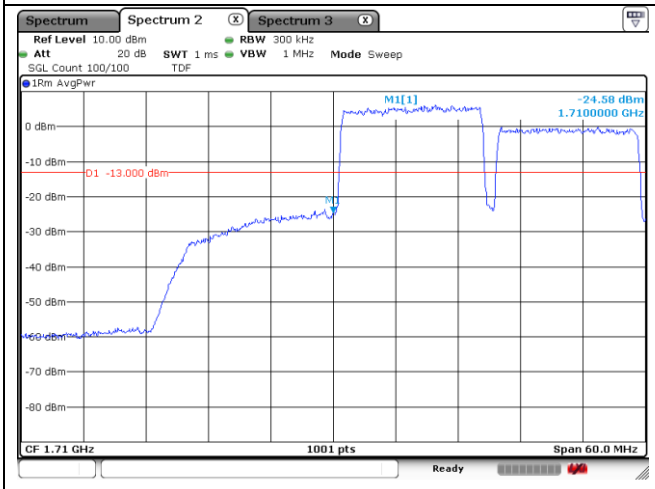

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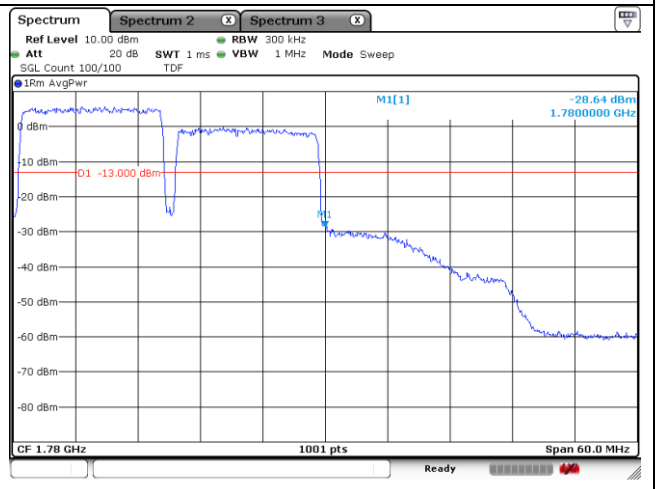

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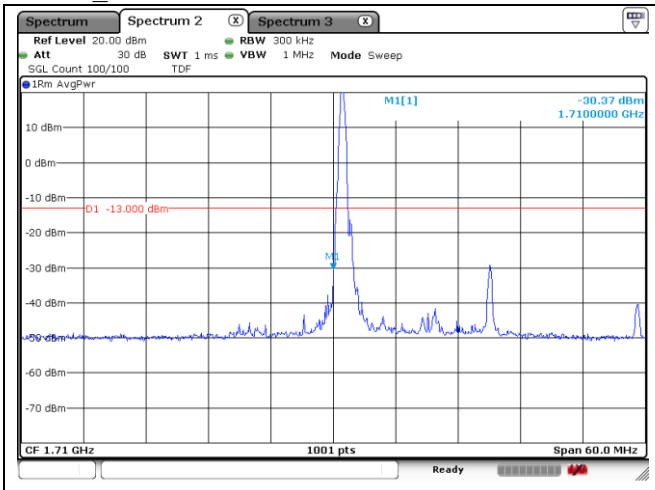
ULCA_66C



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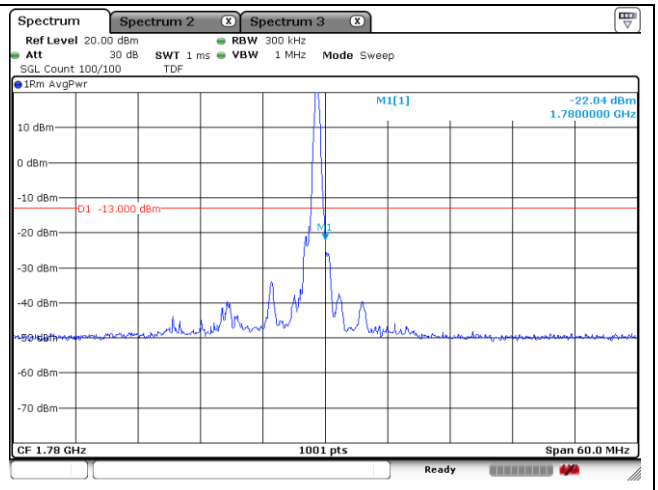

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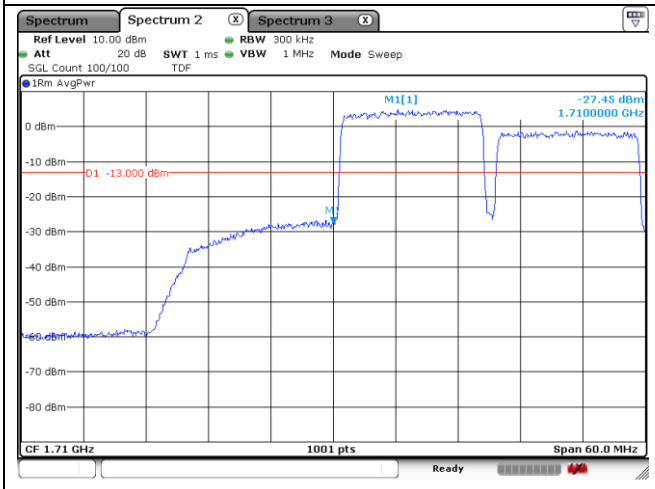

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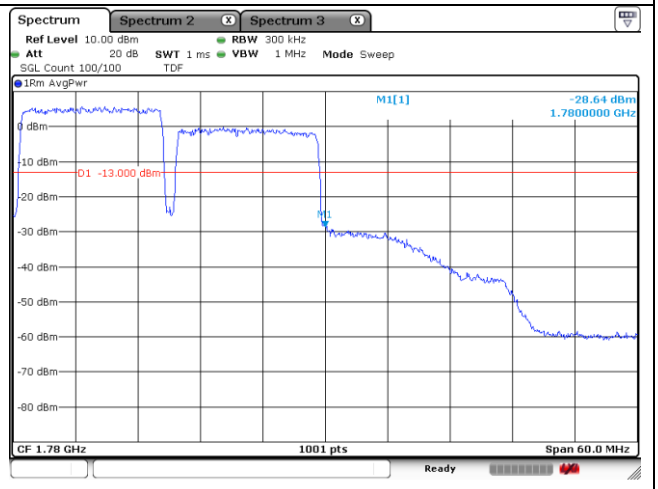

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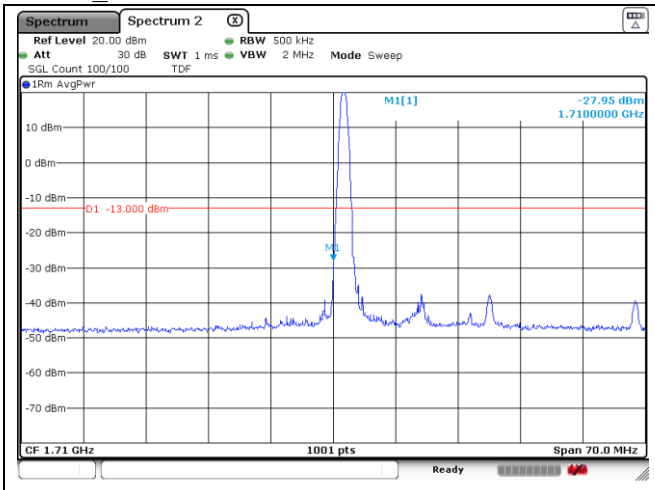
ULCA_66C



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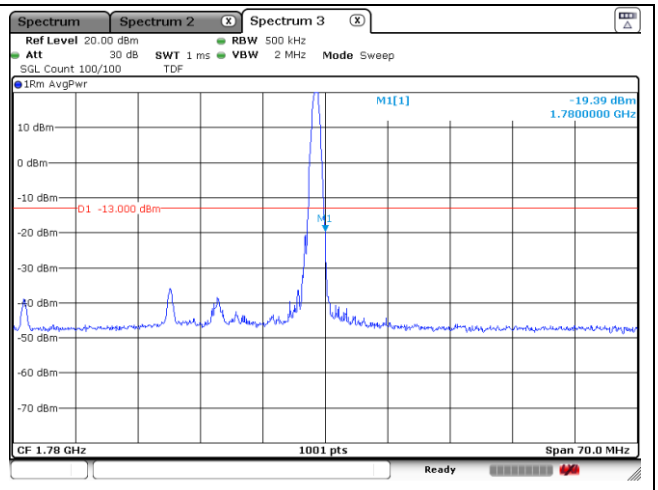

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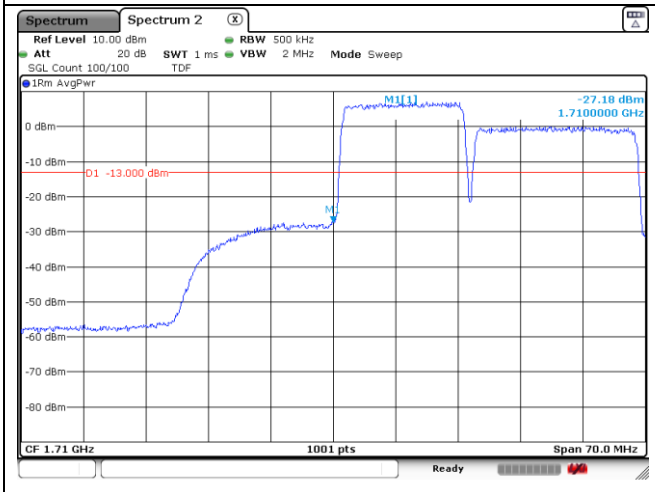

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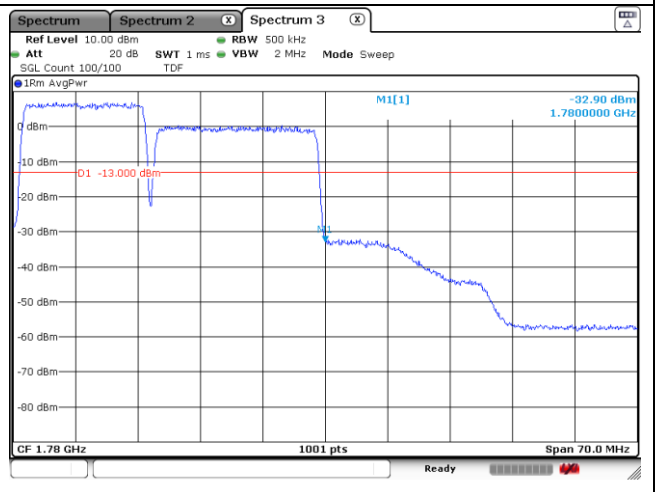

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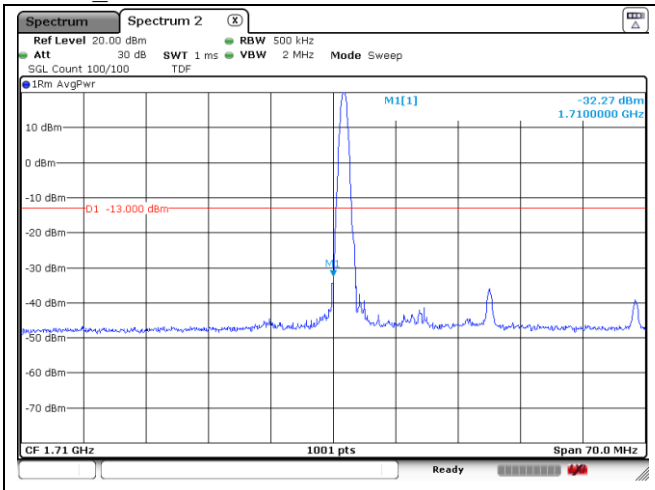
ULCA_66C



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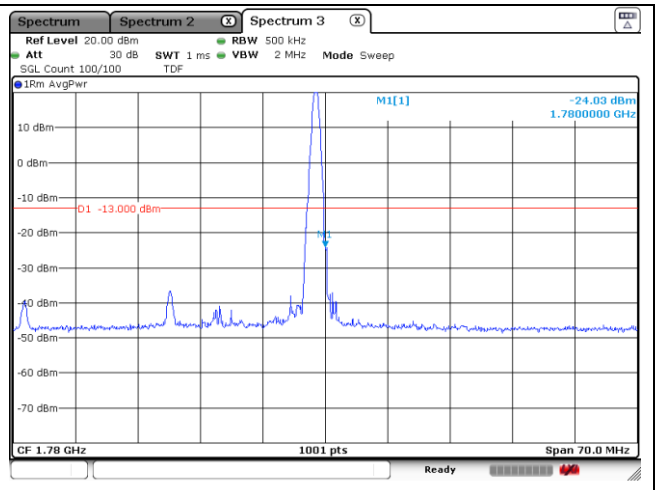

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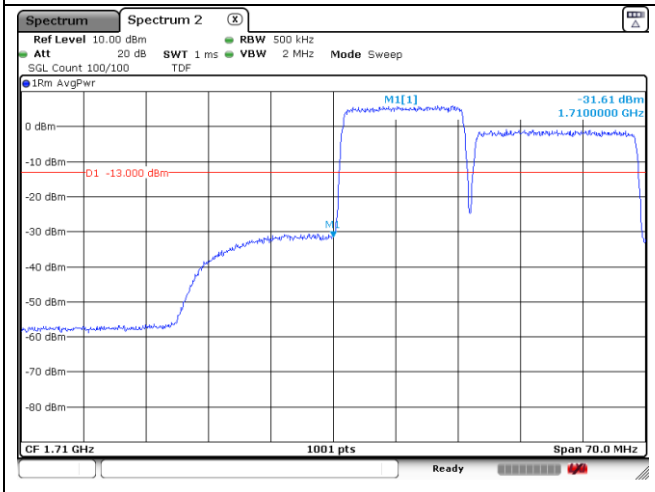

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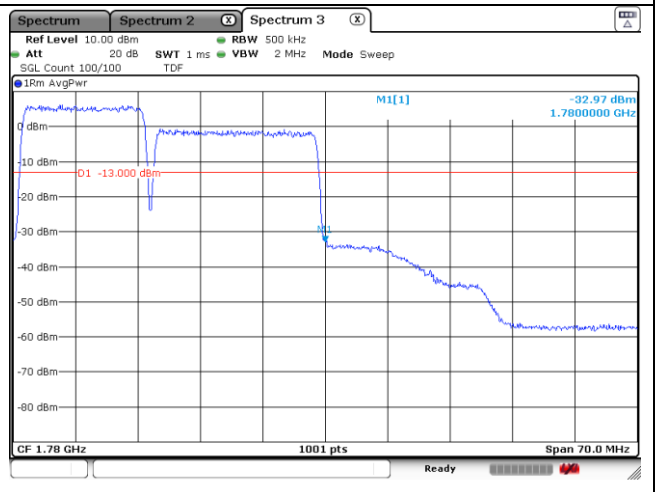
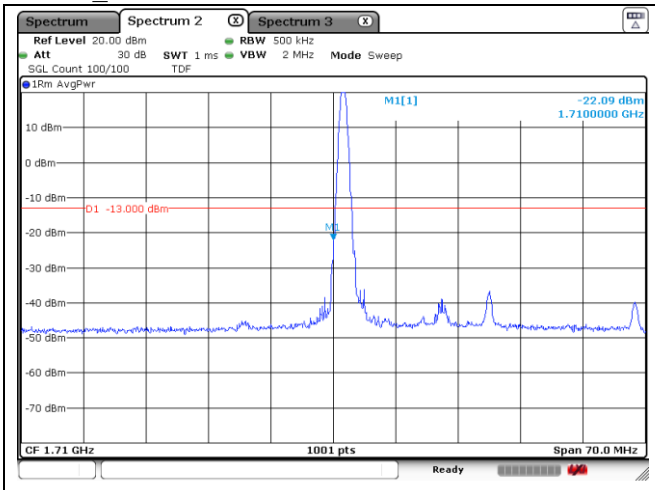
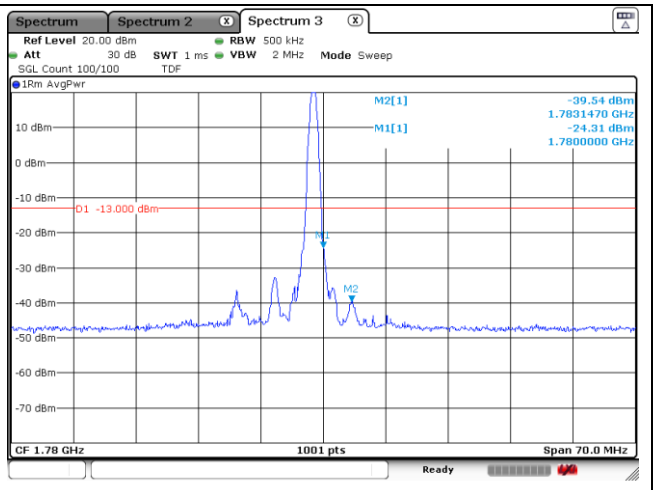


PCC 15 ㎒ + SCC 20 ㎒_16QAM-High Channel – Full RB

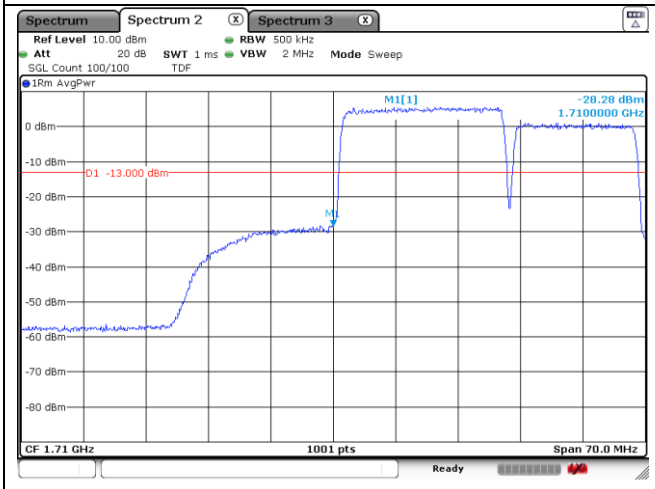
ULCA_66C



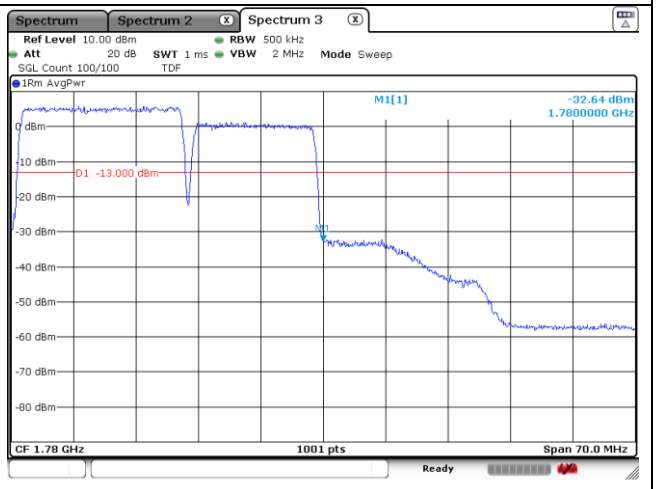
PCC 20 ㎒ + SCC 15 ㎒_QPSK-Low Channel – 1 RB



PCC 20 ㎒ + SCC 15 ㎒_QPSK-High Channel – 1 RB

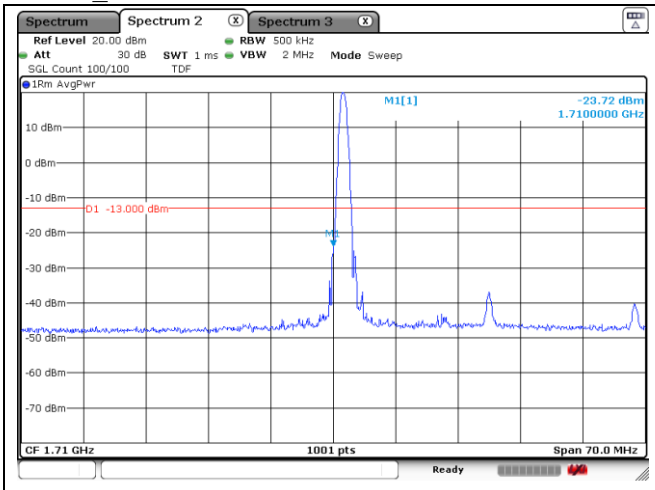


PCC 20 ㎒ + SCC 15 ㎒_QPSK-Low Channel – Full RB



PCC 20 ㎒ + SCC 15 ㎒_QPSK-High Channel – Full RB

ULCA_66C



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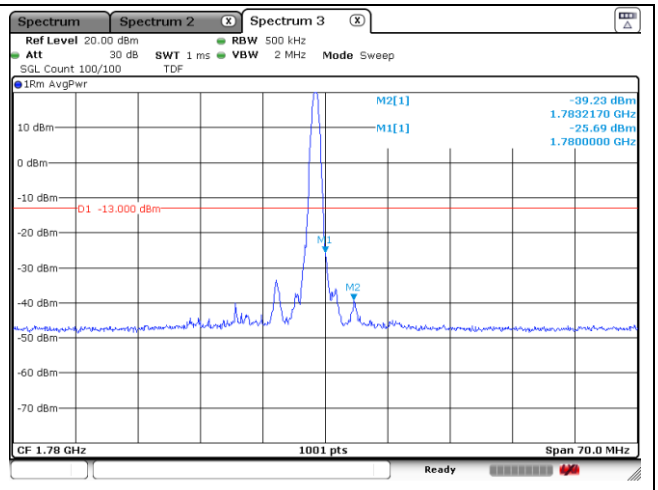

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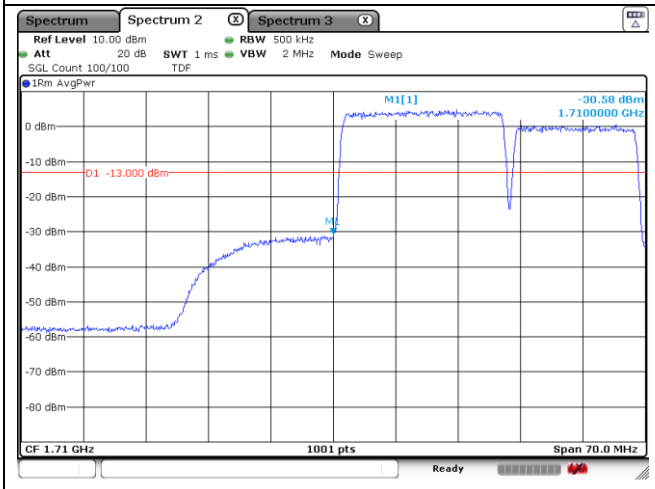
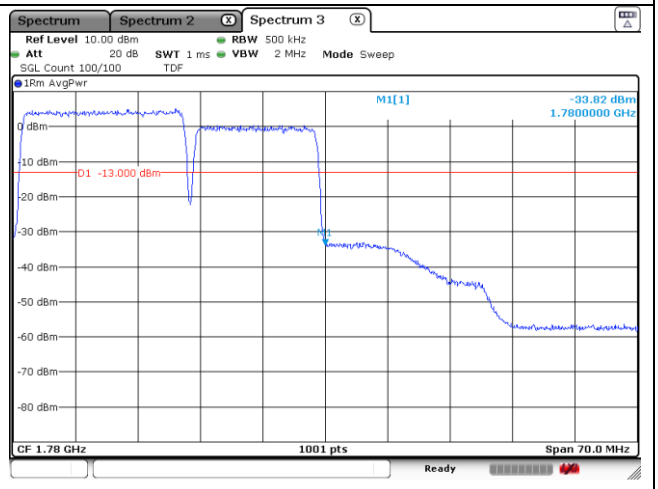
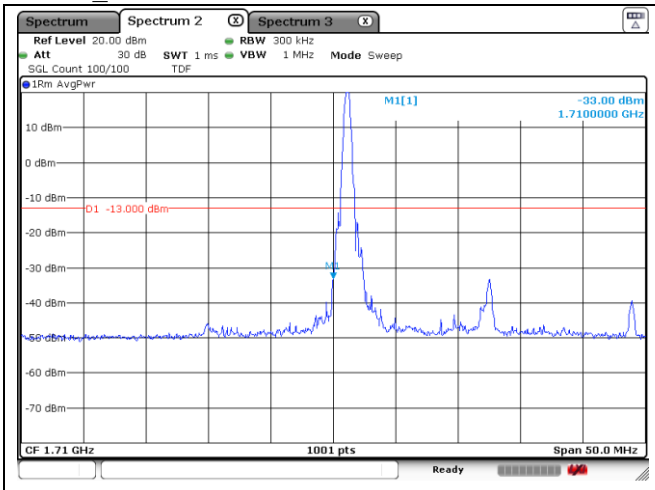


PCC 20 ㎒ + SCC 15 ㎒_16QAM-Low Channel – Full RB

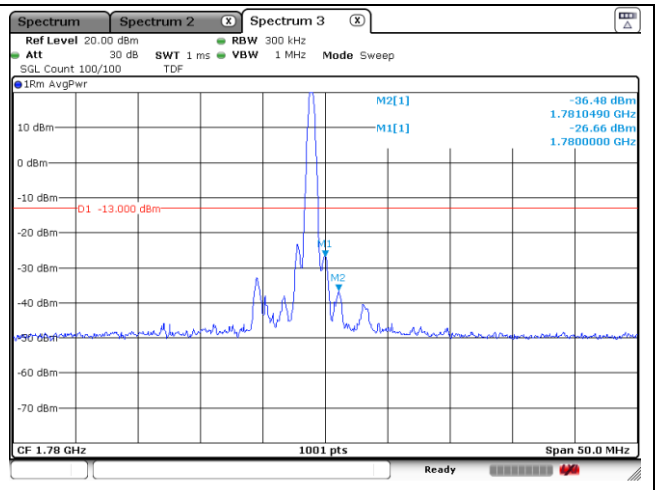


PCC 20 ㎒ + SCC 15 ㎒_16QAM-High Channel – Full RB

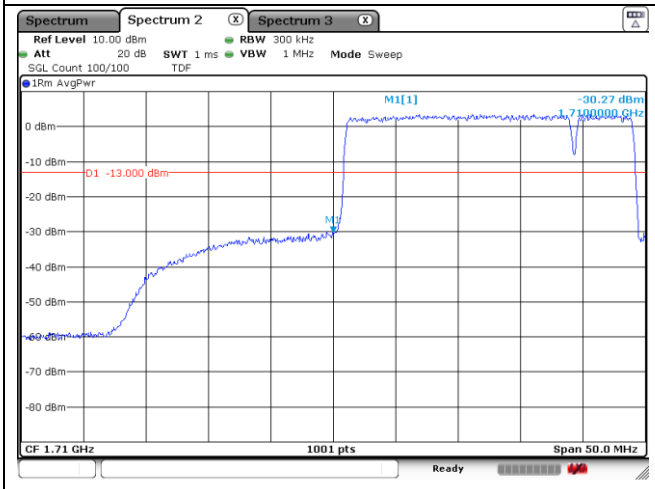
ULCA_66C



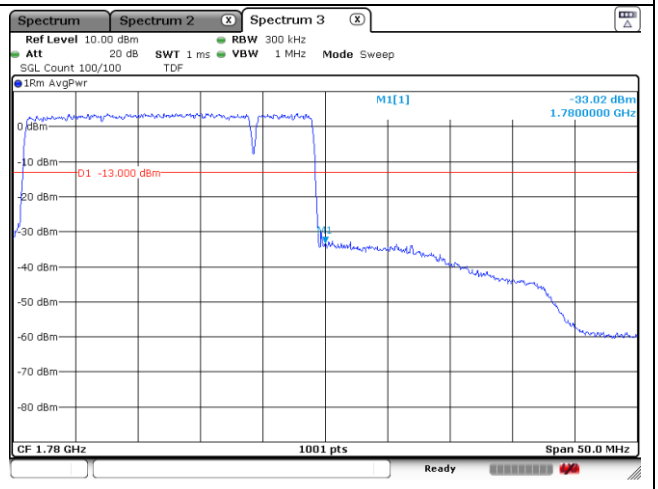
PCC 20 ㎒ + SCC 5 ㎒_QPSK-Low Channel – 1 RB



PCC 20 ㎒ + SCC 5 ㎒_QPSK-High Channel – 1 RB



PCC 20 ㎒ + SCC 5 ㎒_QPSK-Low Channel – Full RB



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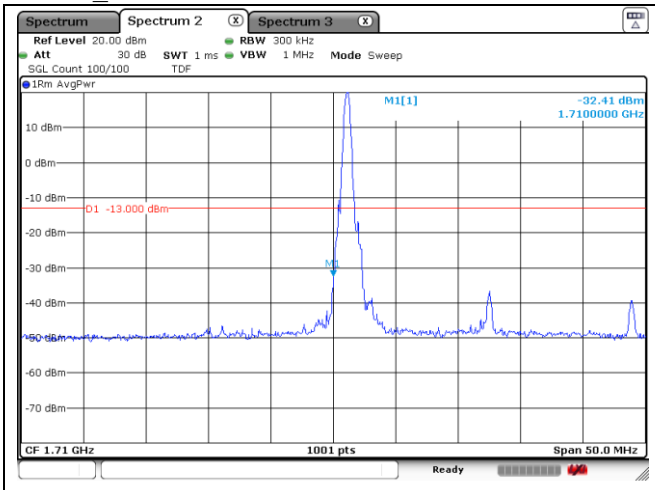
ULCA_66C



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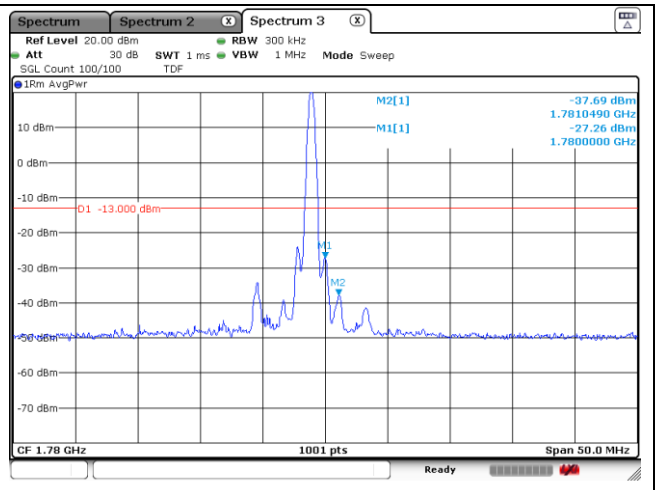

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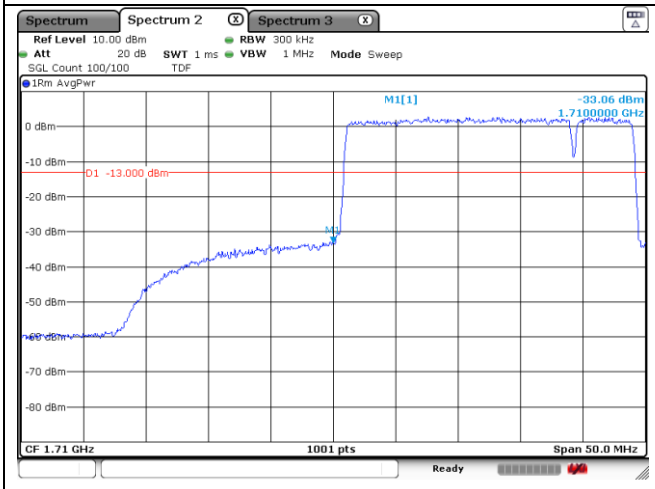
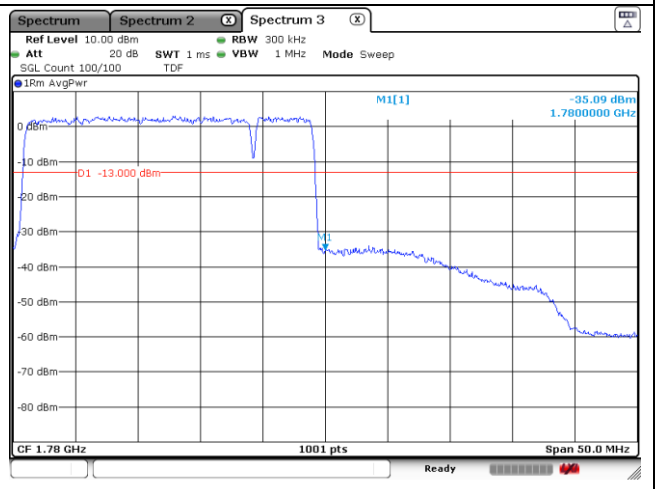
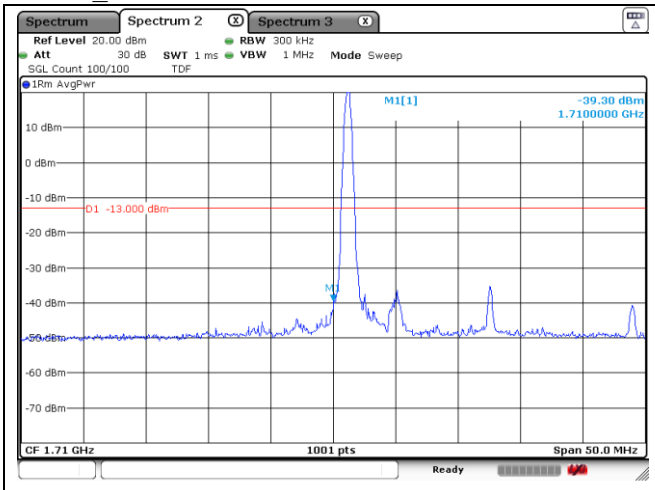


PCC 20 ㎒ + SCC 5 ㎒_16QAM-Low Channel – Full RB



PCC 20 ㎒ + SCC 5 ㎒_16QAM-High Channel – Full RB

ULCA_66C



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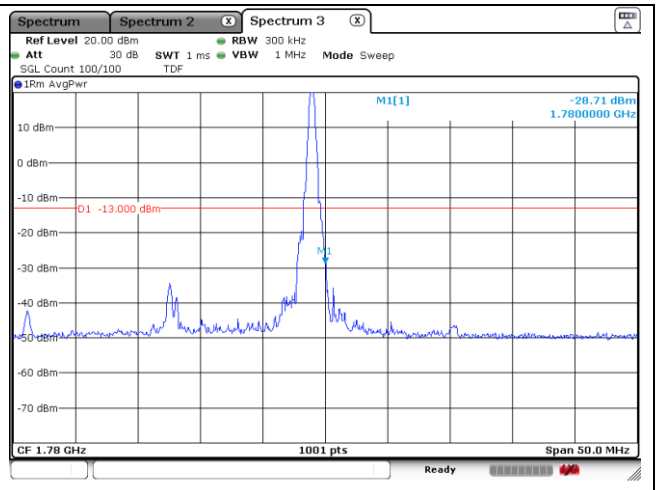
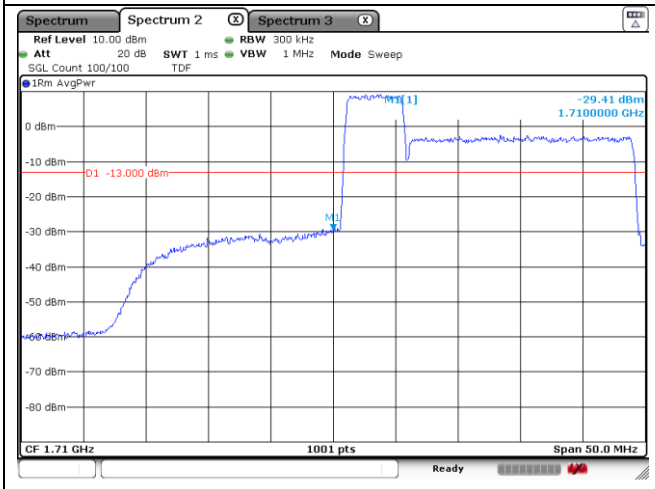
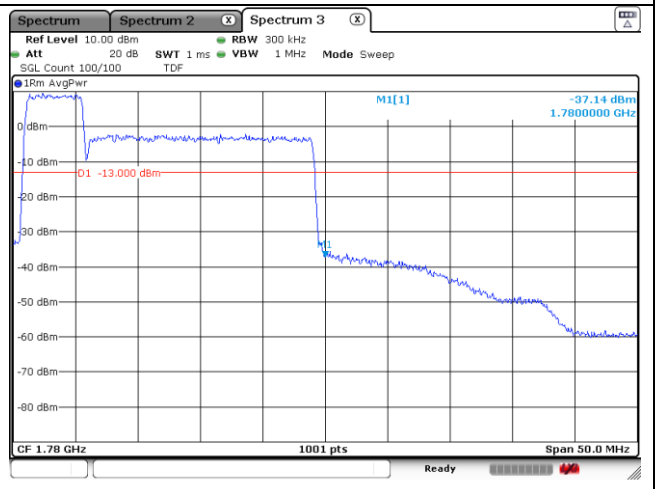


PCC 5 ㎒ + SCC 20 ㎒_QPSK-High Channel – 1 RB

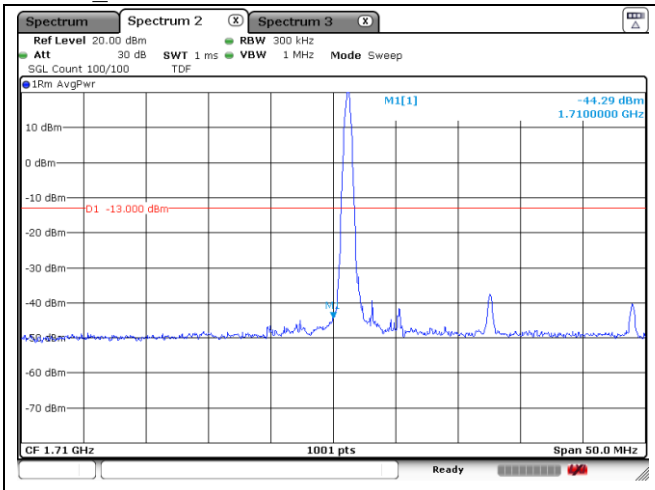


PCC 5 ㎒ + SCC 20 ㎒_QPSK-Low Channel – Full RB



PCC 5 ㎒ + SCC 20 ㎒_QPSK-High Channel – Full RB

ULCA_66C



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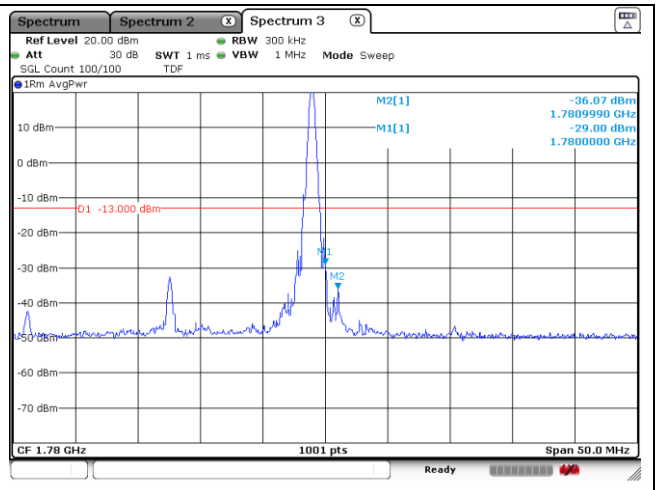

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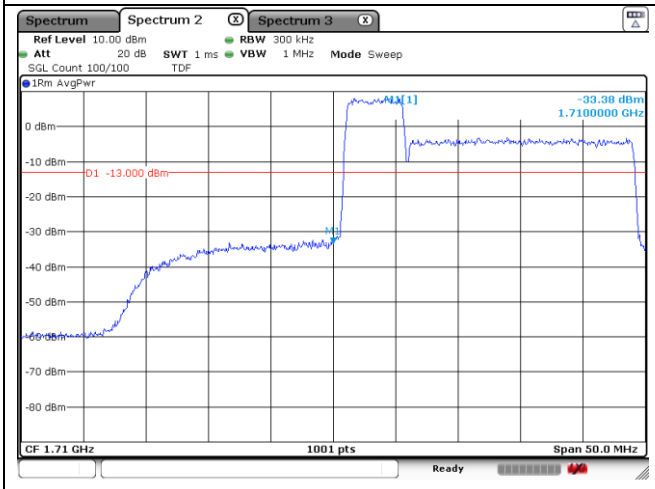
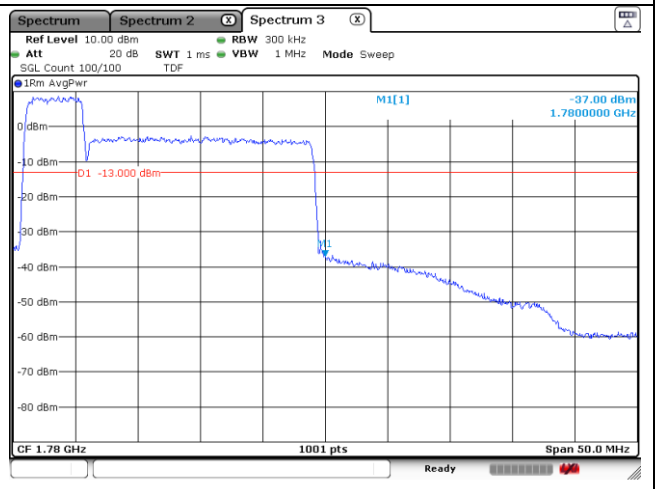
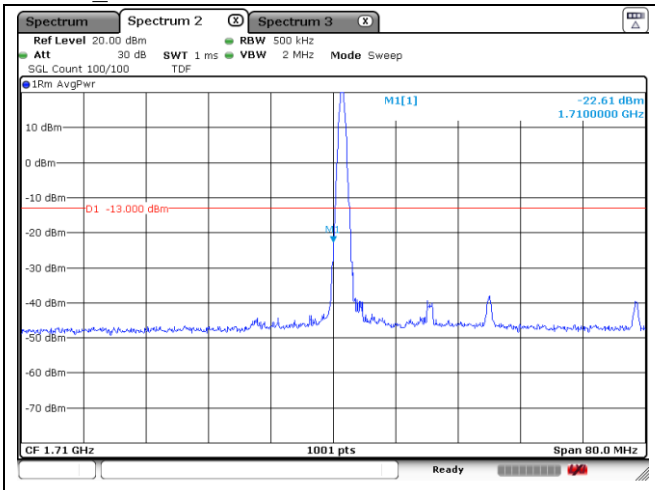


PCC 5 ㎒ + SCC 20 ㎒_16QAM-Low Channel – Full RB



PCC 5 ㎒ + SCC 20 ㎒_16QAM-High Channel – Full RB

ULCA_66C



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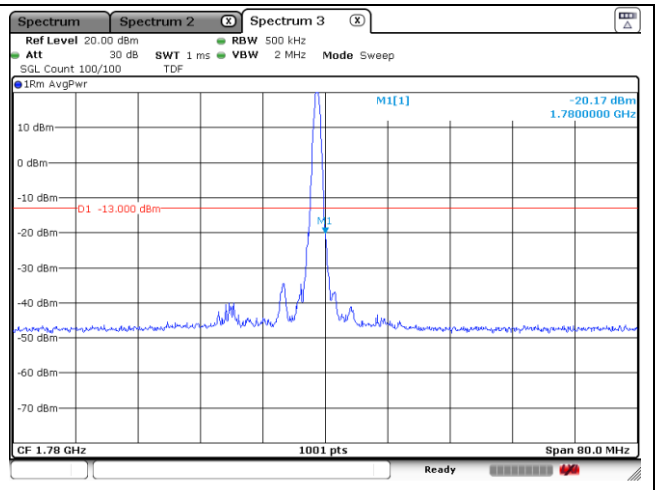

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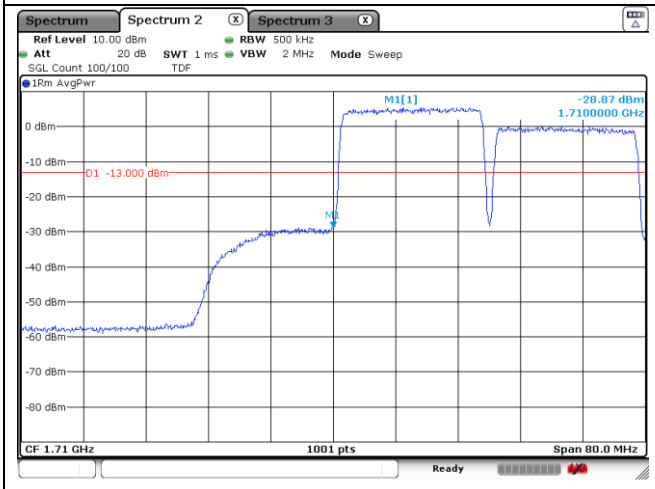
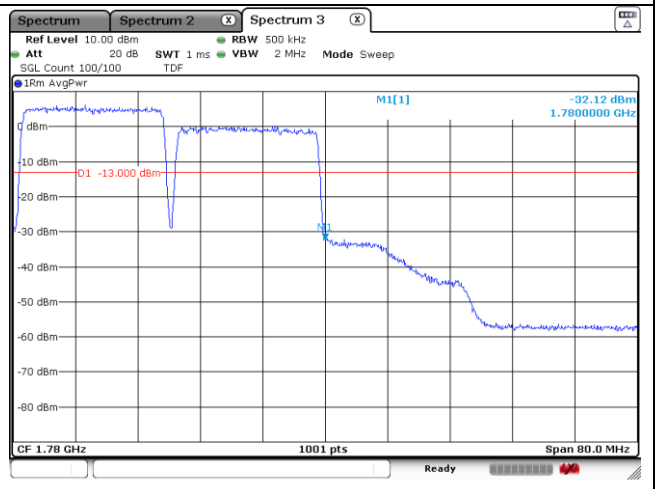
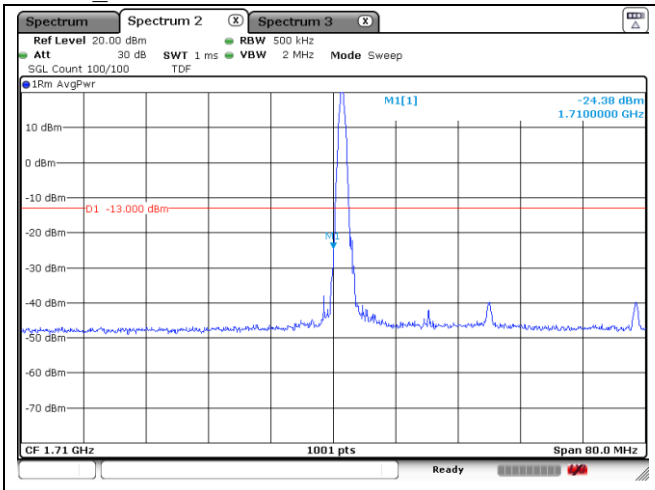


PCC 20 ㎒ + SCC 20 ㎒_QPSK-Low Channel – Full RB

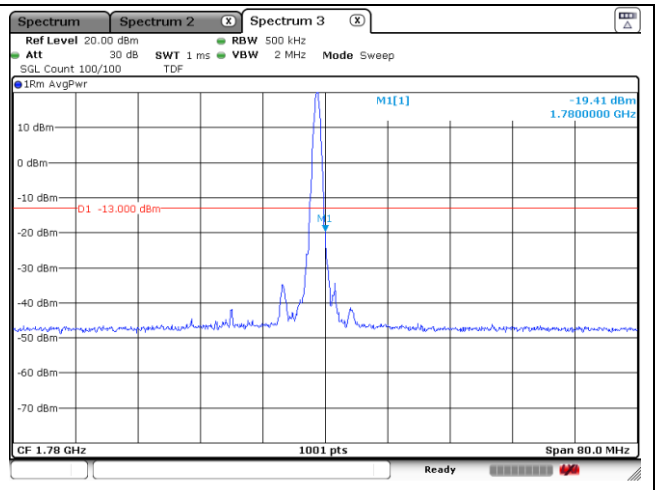


PCC 20 ㎒ + SCC 20 ㎒_QPSK-High Channel – Full RB

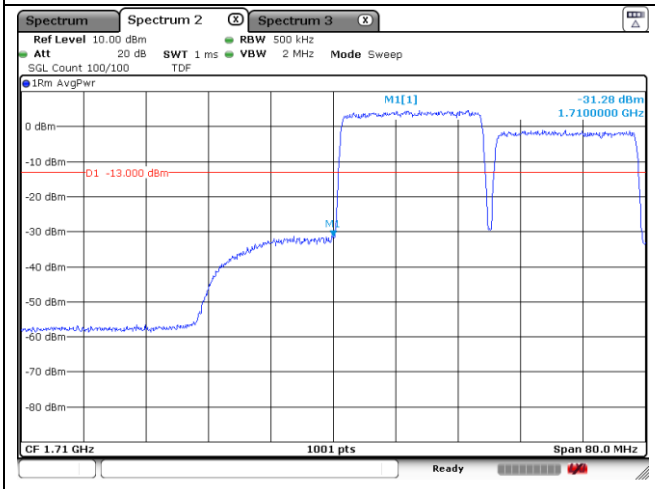
ULCA_66C



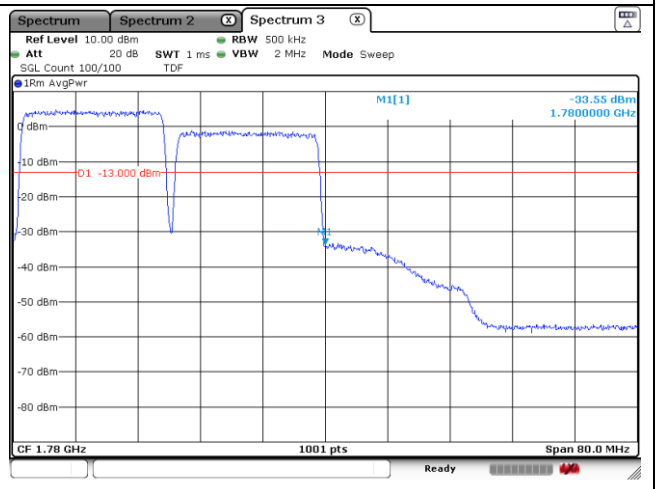
PCC 20 ㎒ + SCC 20 ㎒_16QAM-Low Channel – 1 RB



PCC 20 ㎒ + SCC 20 ㎒_16QAM-High Channel – 1 RB



PCC 20 ㎒ + SCC 20 ㎒_16QAM-Low Channel – Full RB



PCC 20 ㎒ + SCC 20 ㎒_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 ㎒ band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 ppm.

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

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-132 Issue 3
5.3, the carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and ±1.5 ppm for base stations.

- RSS-139 Issue 4
5.4, the frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

- RSS-199 Issue 3
4.3, the transmitter frequency stability limit shall be determined as follows:

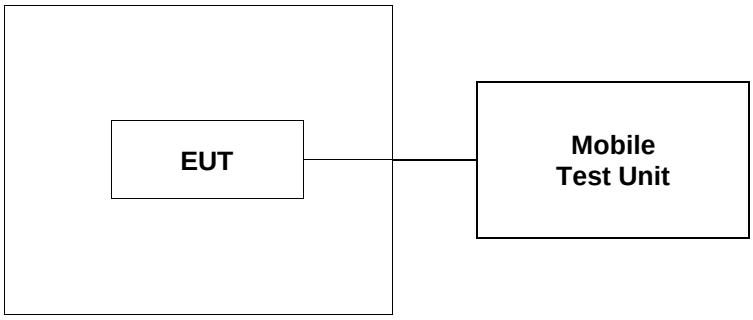
(a) the frequency offset shall be measured according to the procedure described in RSS-Gen and recorded.

(b) using a resolution bandwidth equal to that permitted within the 1 ㎒ band immediately outside the channel edge, as found in section 4.5, reference points will be selected at the unwanted emission limits, which comply with the attenuation specified in section 4.5 for the type of device under test, on the emission mask of the lowest and highest channels. The frequency at these points shall be recorded as f_L and f_H respectively.

The applicant shall ensure compliance with frequency stability requirements by showing that f_L minus the frequency offset and f_H plus the frequency offset is within the frequency range in which the equipment is designed to operate.

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.

ULCA 5B at middle channel

Reference Frequency: PCC 834.1 ㎒ / SCC 838 ㎒					
Frequency Stability versus Temperature					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**ppm**	
		PCC	**SCC**	**PCC**	**SCC**
50	12.7	-11.20	2.40	-0.013 91	0.003 94
40		-8.80	4.10	-0.011 03	0.005 97
30		-9.70	-2.30	-0.012 11	-0.001 67
20(Ref.)		0.40	-0.90	-	-
10		-2.20	3.20	-0.003 12	0.004 89
0		-3.40	-5.30	-0.004 56	-0.005 25
-10		1.00	-2.40	0.000 72	-0.001 79
-20		-7.00	-8.20	-0.008 87	-0.008 71
-30		5.50	2.00	0.006 11	0.003 46
Frequency Stability versus Power Supply					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**Ppm**	
		PCC	**SCC**	**PCC**	**SCC**
20	10.80 (85%)	6.00	0.50	0.006 71	0.001 67
	14.61 (115%)	10.50	4.80	0.012 11	0.006 80

ULCA 7C at middle channel

Reference Frequency: PCC 2 525.6 ㎒ / SCC 2 540 ㎒					
Frequency Stability versus Temperature					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**ppm**	
		PCC	**SCC**	**PCC**	**SCC**
50	12.7	1.70	11.00	-0.001 03	0.002 09
40		9.70	9.70	0.002 14	0.001 57
30		-8.20	4.60	-0.004 95	-0.000 43
20(Ref.)		4.30	5.70	-	-
10		6.20	-0.30	0.000 75	-0.002 36
0		5.30	-2.10	0.000 40	-0.003 07
-10		0.90	10.30	-0.001 35	0.001 81
-20		1.90	-3.90	-0.000 95	-0.003 78
-30		-5.00	-11.50	-0.003 68	-0.006 77
Frequency Stability versus Power Supply					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**ppm**	
		PCC	**SCC**	**PCC**	**SCC**
20	10.80 (85%)	-1.20	10.70	-0.002 18	0.001 97
	14.61 (115%)	6.00	10.20	0.000 67	0.001 77

ULCA 66B at middle channel

Reference Frequency: PCC 1 752.6 ㎒ / SCC 1 757.4 ㎒					
Frequency Stability versus Temperature					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**ppm**	
		PCC	**SCC**	**PCC**	**SCC**
50	12.7	-8.80	9.00	-0.003 71	0.002 56
40		-4.80	8.50	-0.001 43	0.002 28
30		6.10	4.10	0.004 79	-0.000 23
20(Ref.)		-2.30	4.50	-	-
10		-0.70	5.90	0.000 91	0.000 80
0		-9.40	-2.70	-0.004 05	-0.004 10
-10		3.10	5.20	0.003 08	0.000 40
-20		-8.80	1.20	-0.003 71	-0.001 88
-30		-4.00	10.40	-0.000 97	0.003 36
Frequency Stability versus Power Supply					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**ppm**	
		PCC	**SCC**	**PCC**	**SCC**
20	10.80 (85%)	-6.10	5.50	-0.002 17	0.000 57
	14.61 (115%)	-8.60	0.40	-0.003 59	-0.002 33

ULCA 66C at middle channel

Reference Frequency: PCC 1 747.9 ㎒ / SCC 1 759.9 ㎒					
Frequency Stability versus Temperature					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**ppm**	
		PCC	**SCC**	**PCC**	**SCC**
50	12.7	-9.20	7.70	-0.003 32	0.000 28
40		3.30	-6.50	0.003 83	-0.007 78
30		1.50	-3.50	0.002 80	-0.006 08
20(Ref.)		-3.40	7.20	-	-
10		3.60	-6.30	0.004 00	-0.007 67
0		-6.30	6.40	-0.001 66	-0.000 45
-10		5.30	11.20	0.004 98	0.002 27
-20		-3.30	-8.10	0.000 06	-0.008 69
-30		-3.00	3.80	0.000 23	-0.001 93
Frequency Stability versus Power Supply					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**ppm**	
		PCC	**SCC**	**PCC**	**SCC**
20	10.80 (85%)	4.40	0.50	0.004 46	-0.003 81
	14.61 (115%)	-9.40	8.40	-0.003 43	0.000 68

- End of the Test Report -