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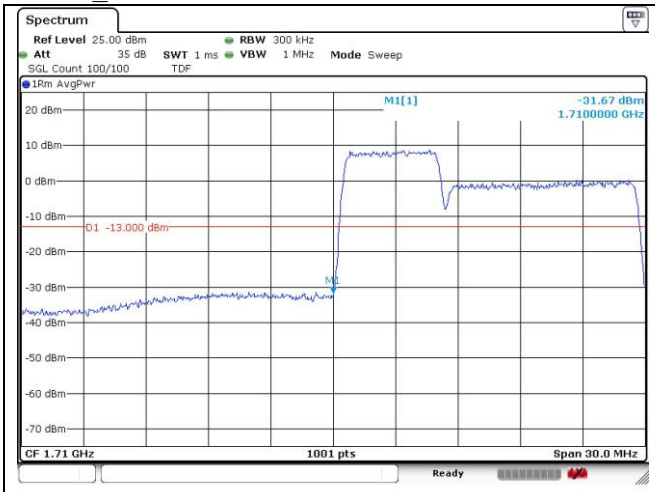
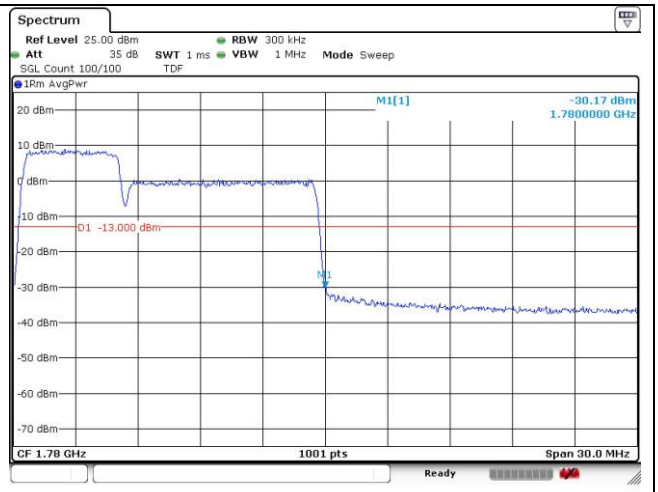


PCC 5 ㎒ + SCC 10 ㎒_QPSK-Low Channel



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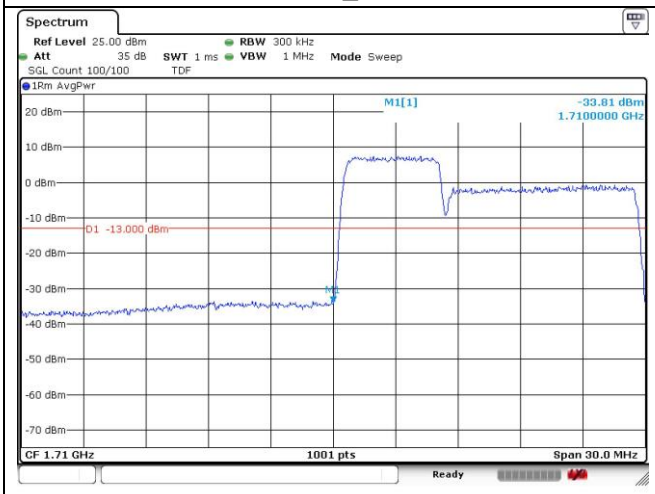

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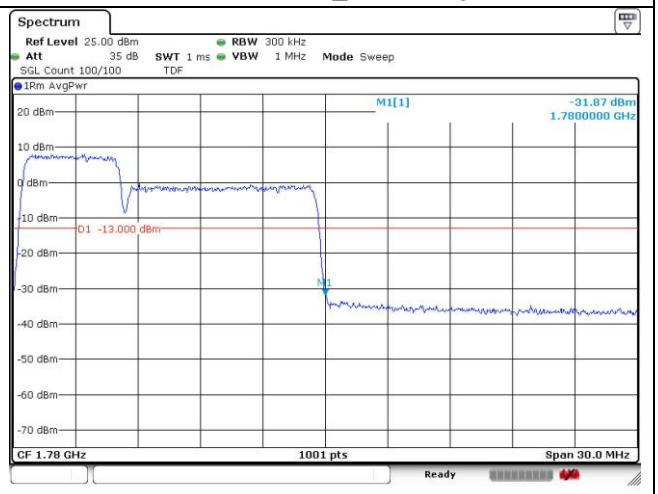

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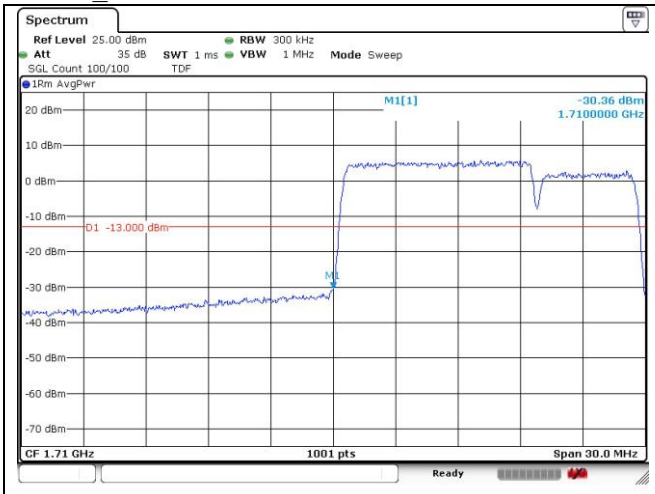

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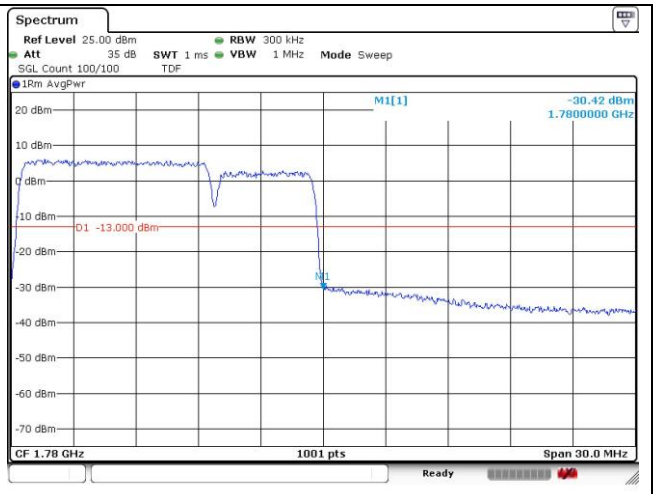

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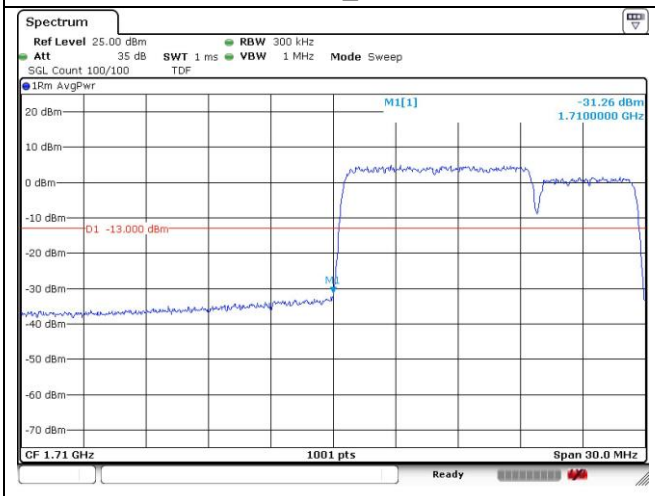

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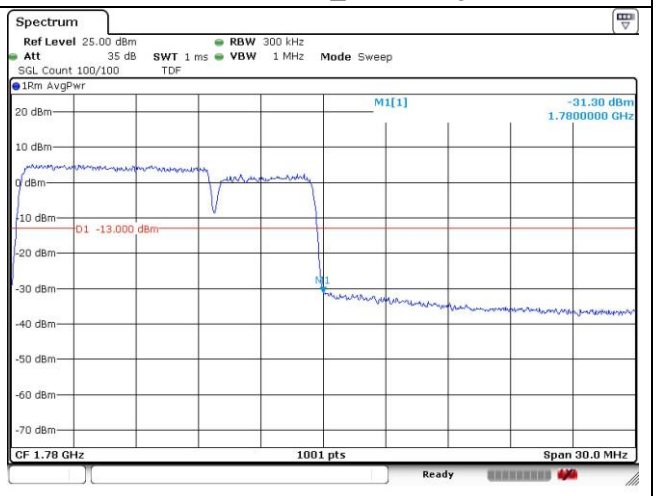

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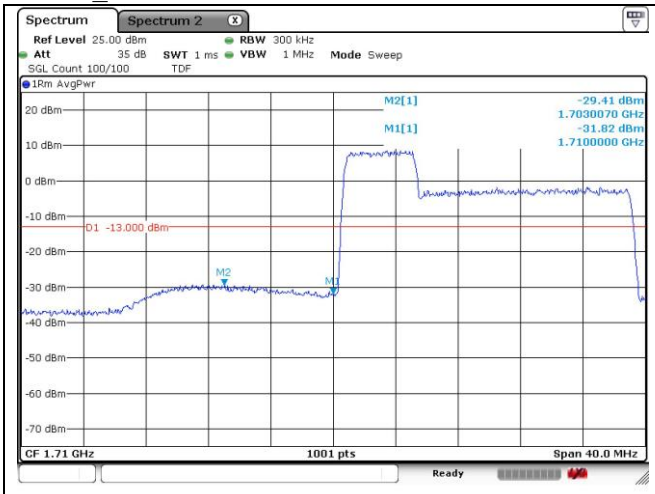

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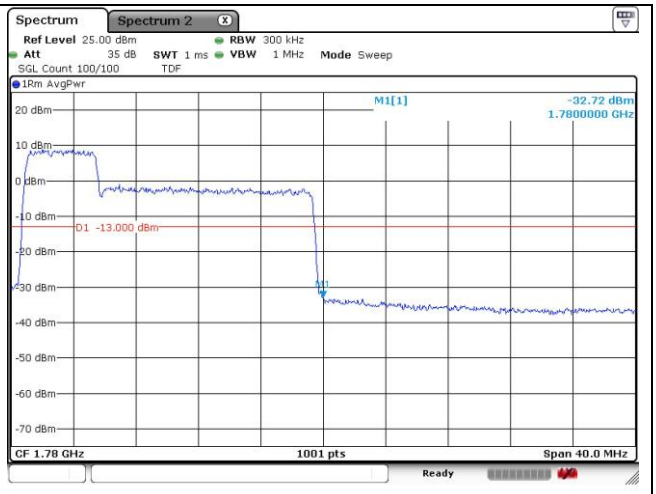

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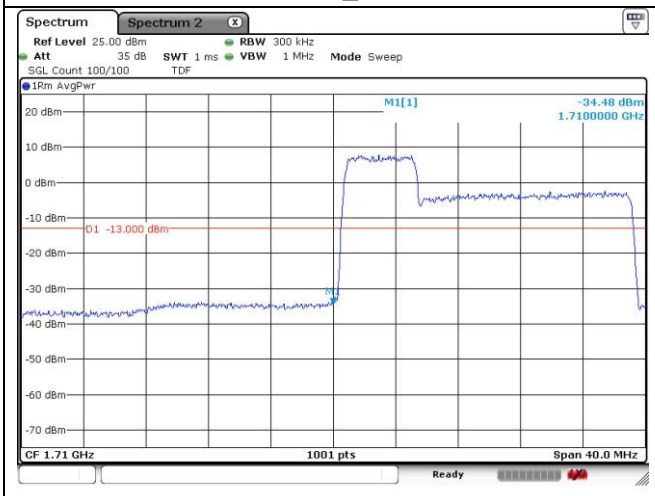

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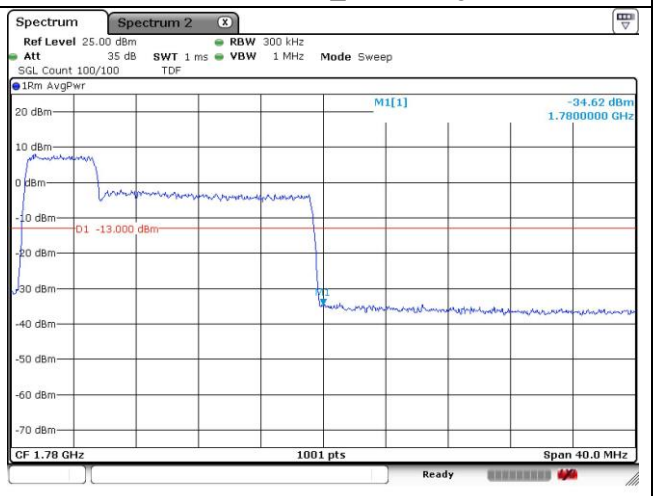

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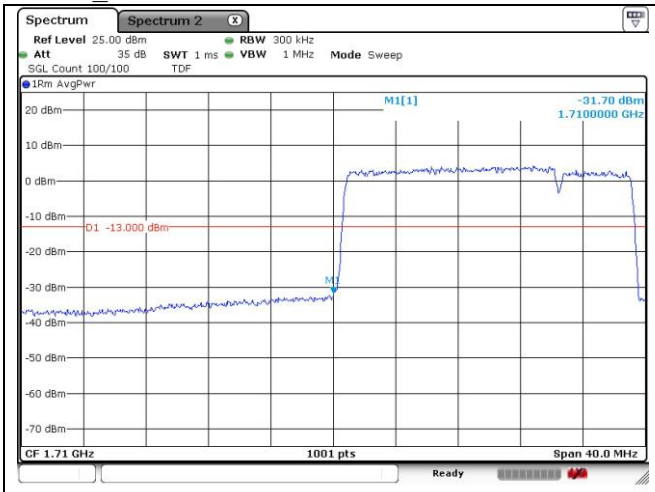

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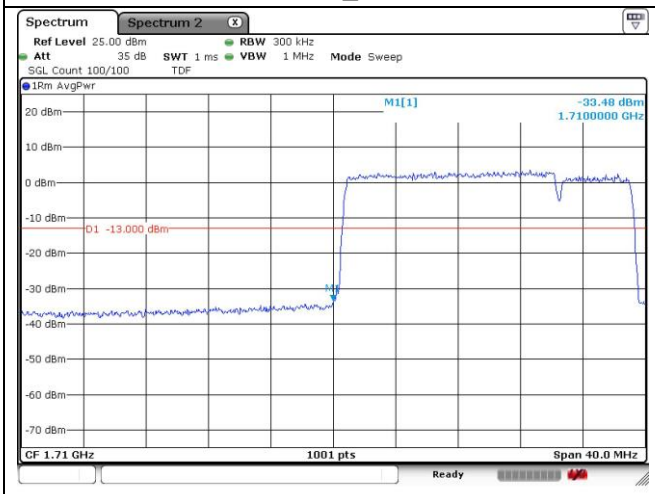

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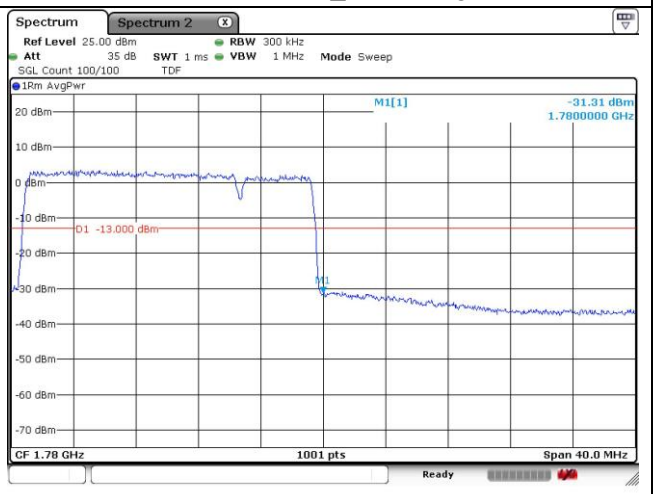

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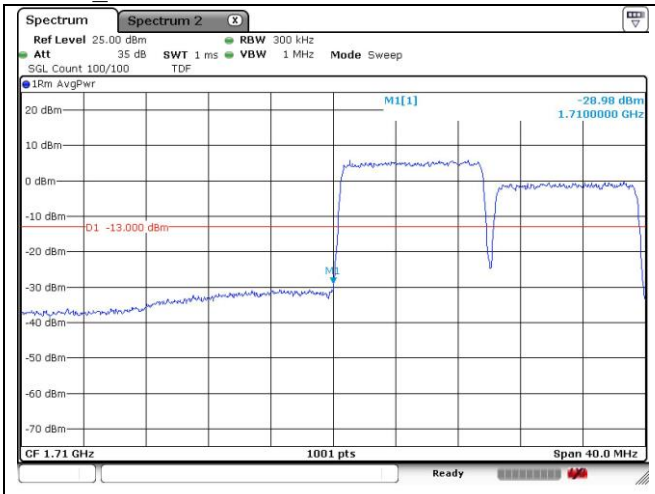

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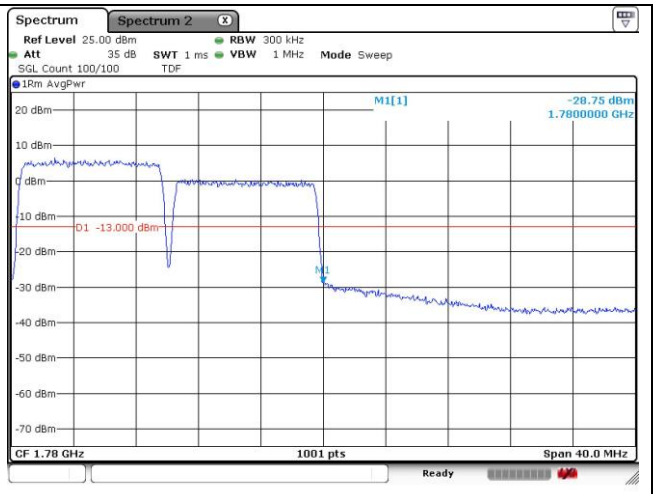

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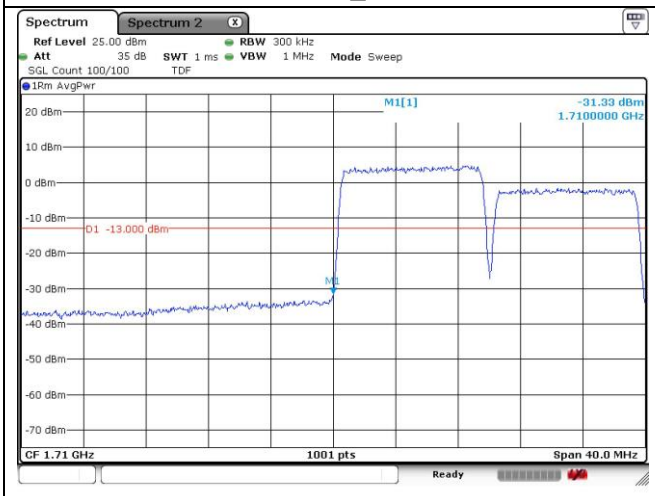

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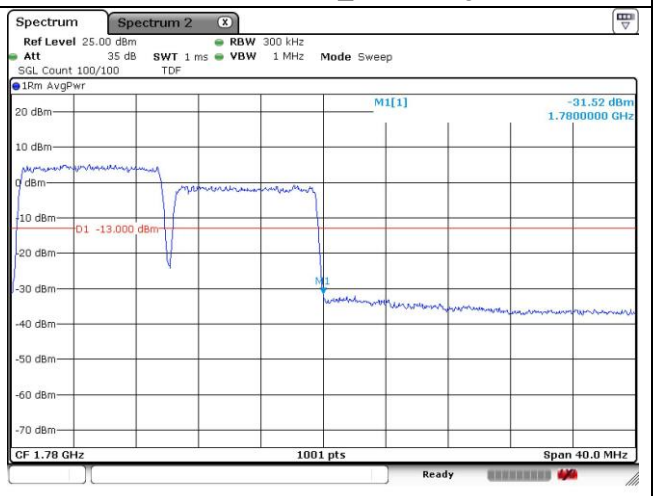

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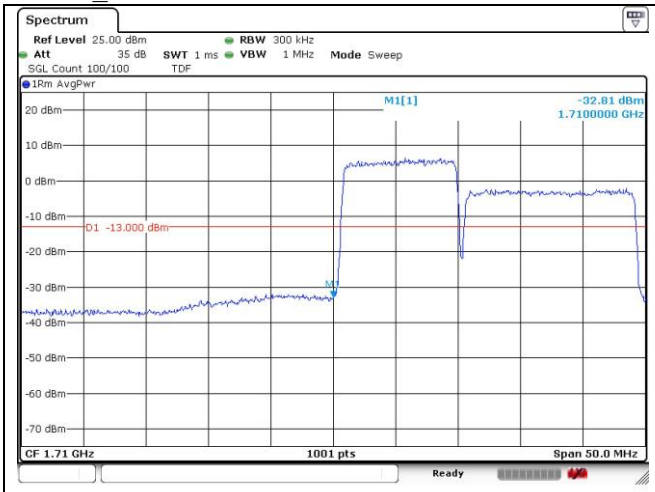
ULCA_66C



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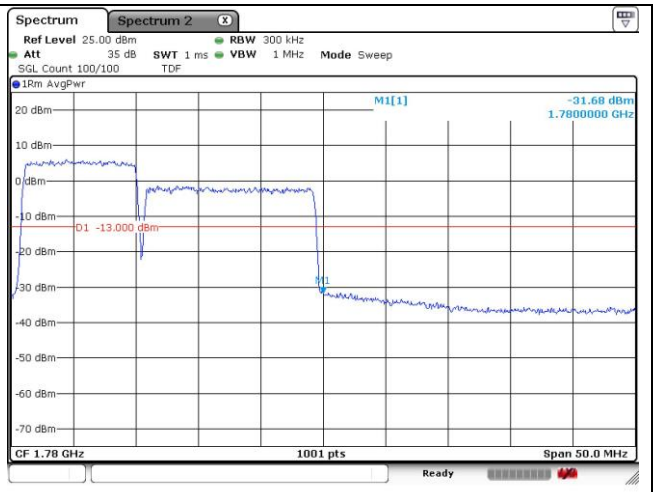

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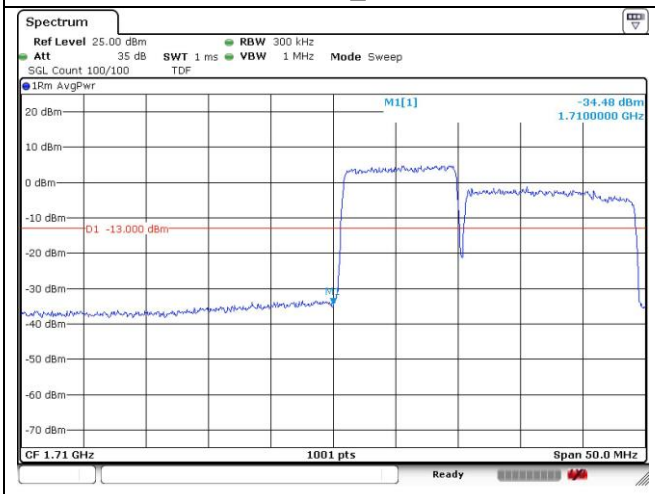

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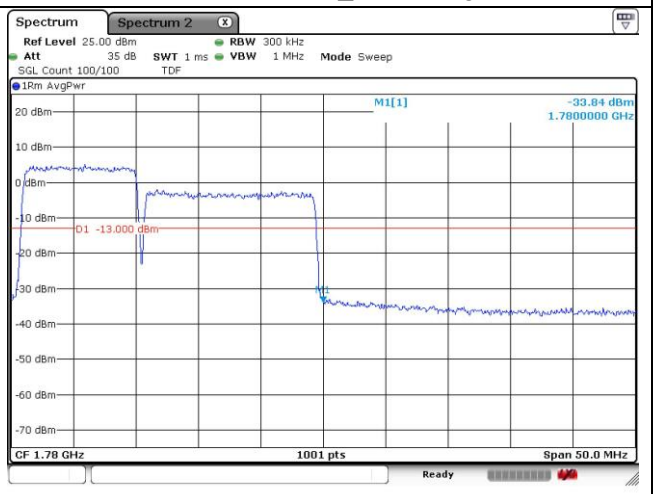

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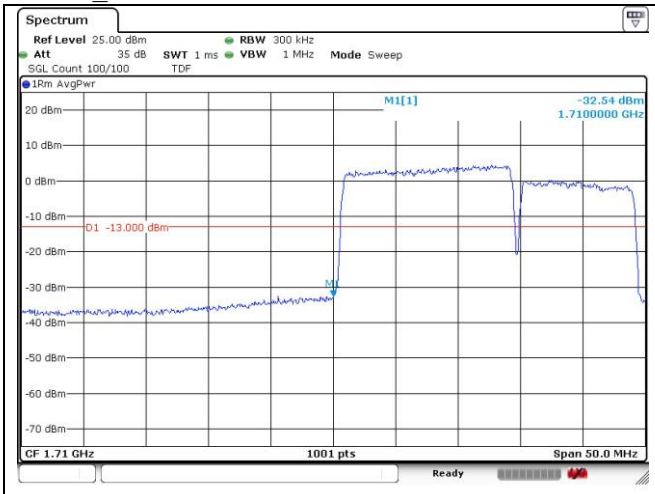
ULCA_66C



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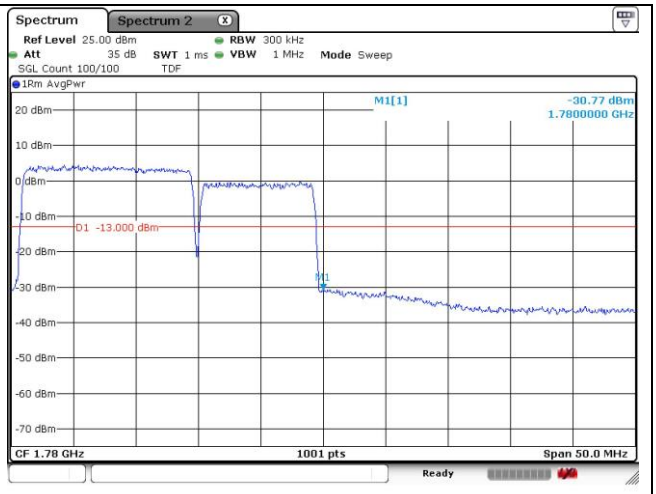

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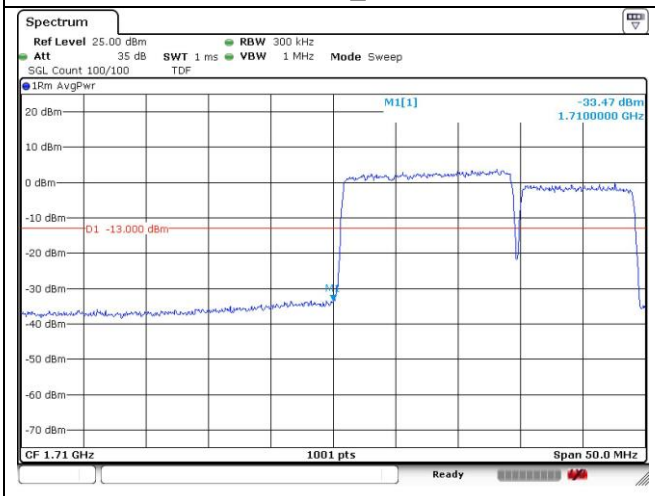

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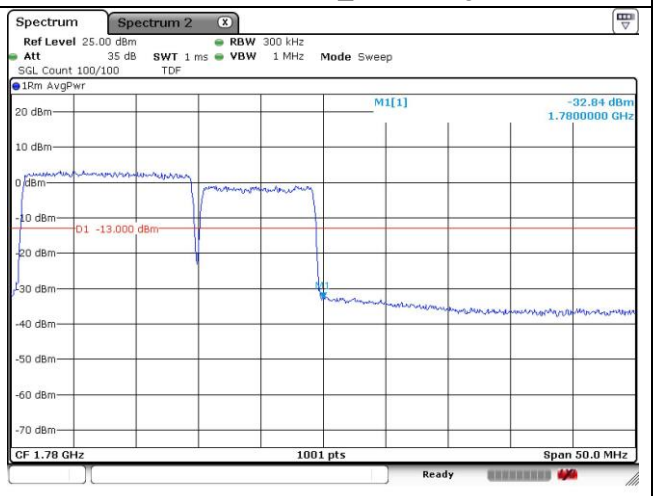

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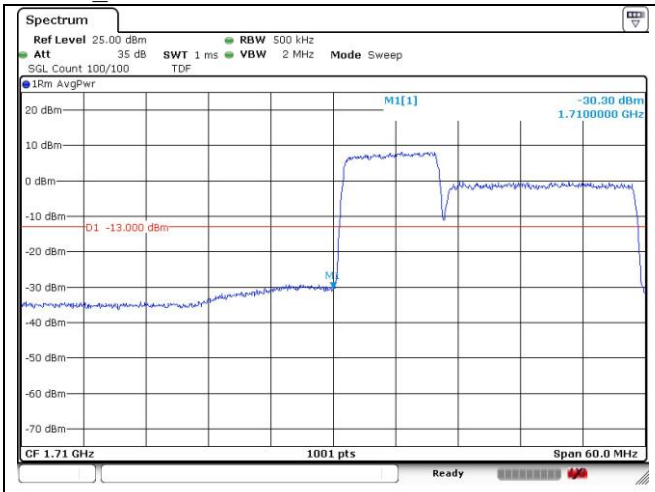

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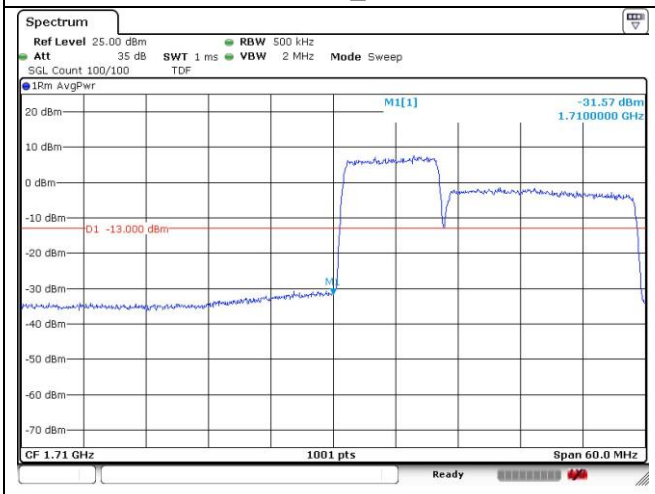

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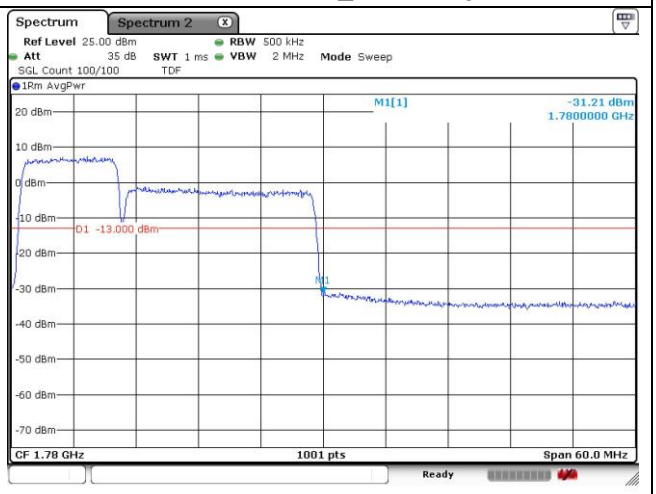

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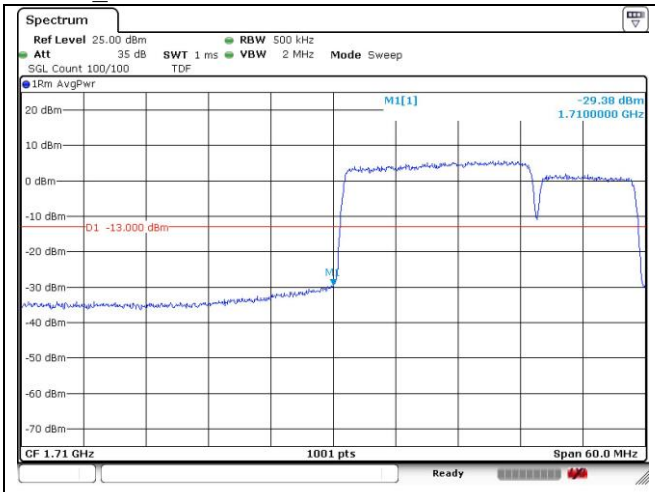

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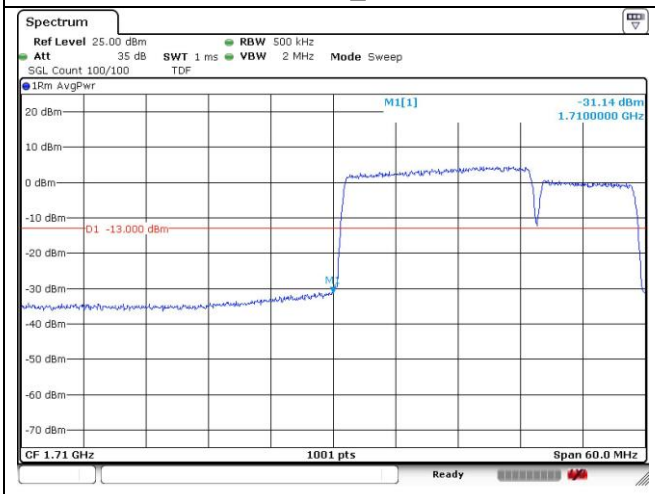

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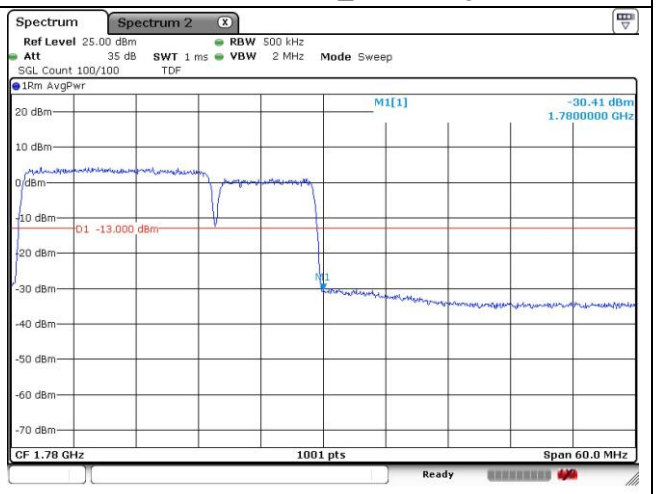

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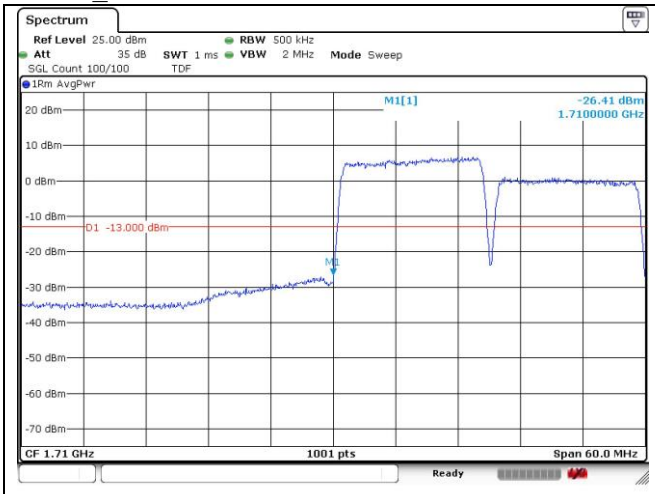
ULCA_66C



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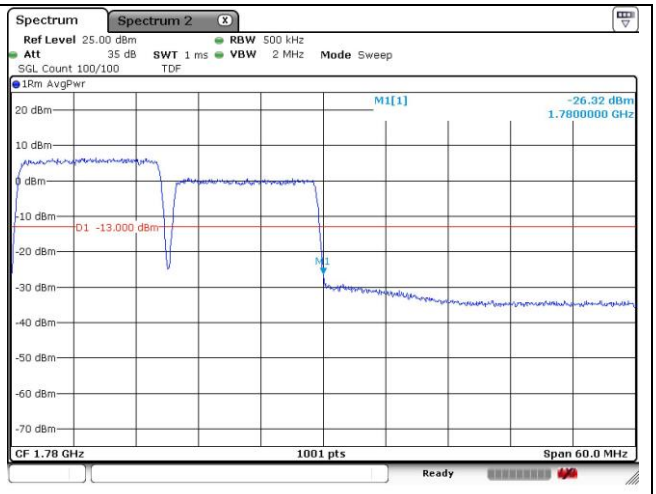

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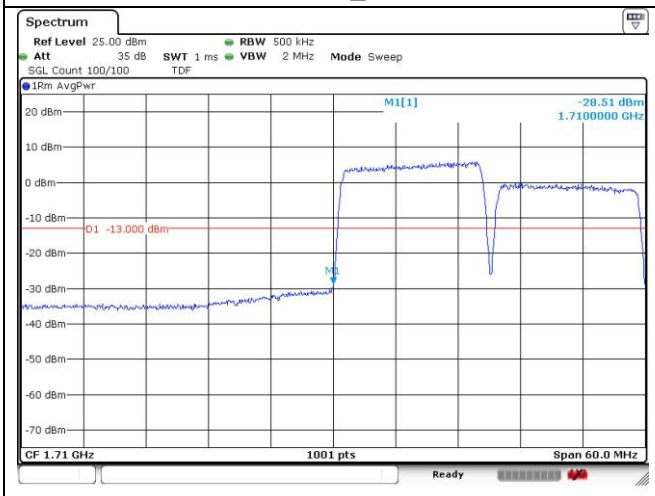

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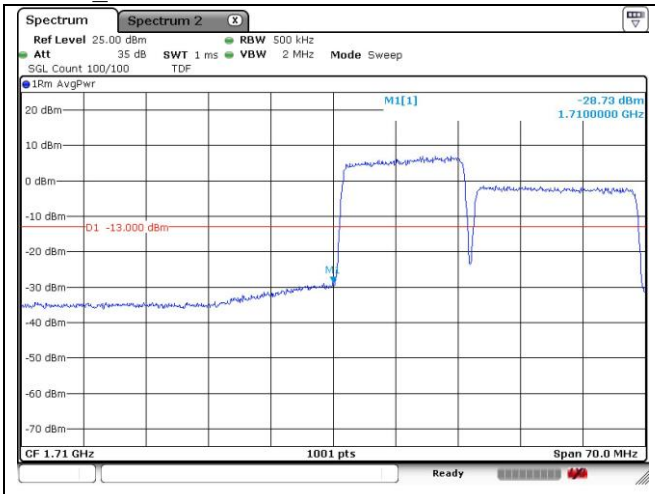

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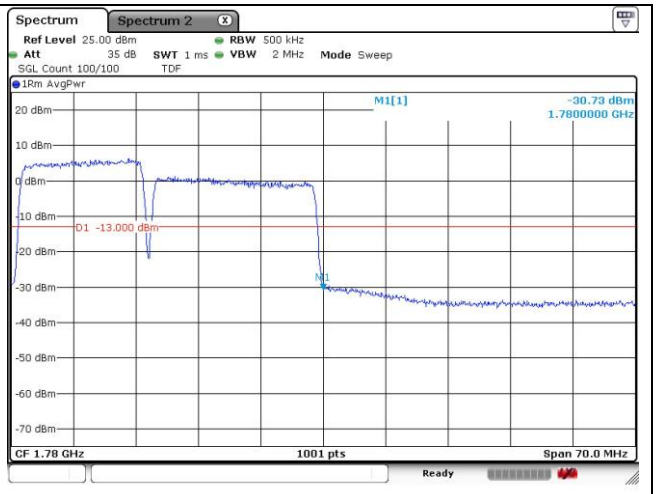

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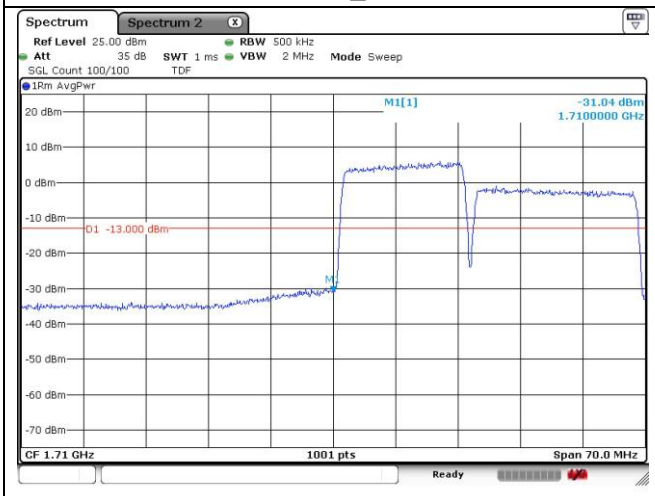

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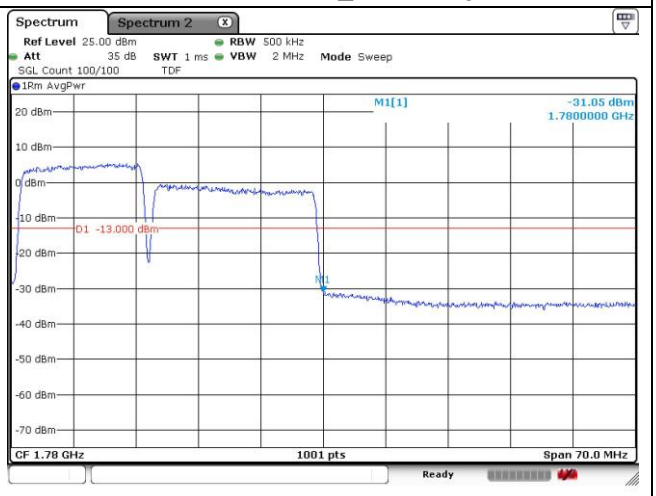

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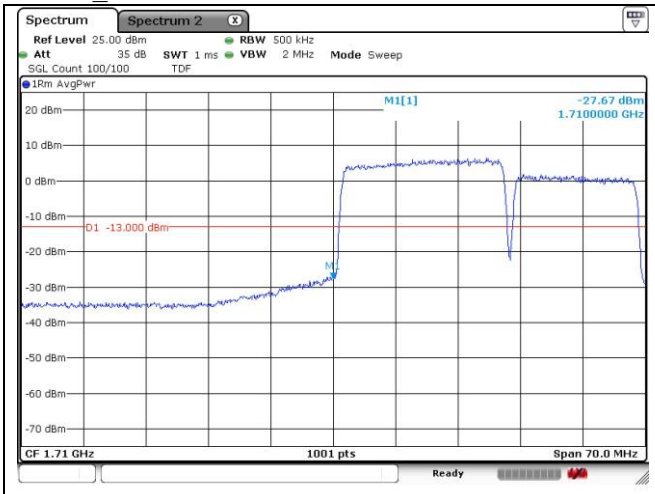

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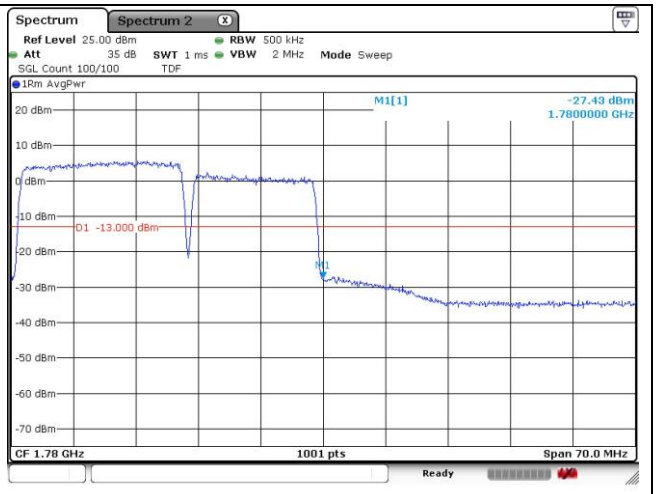

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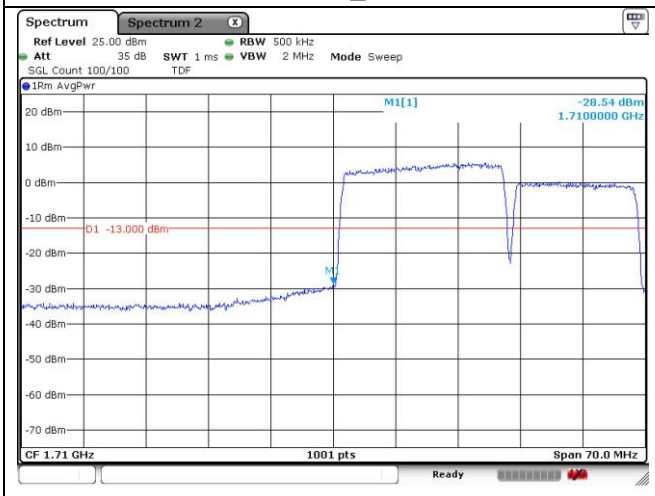

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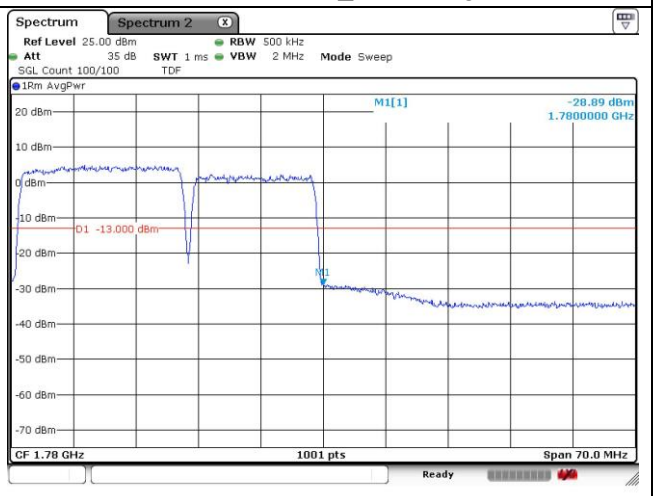

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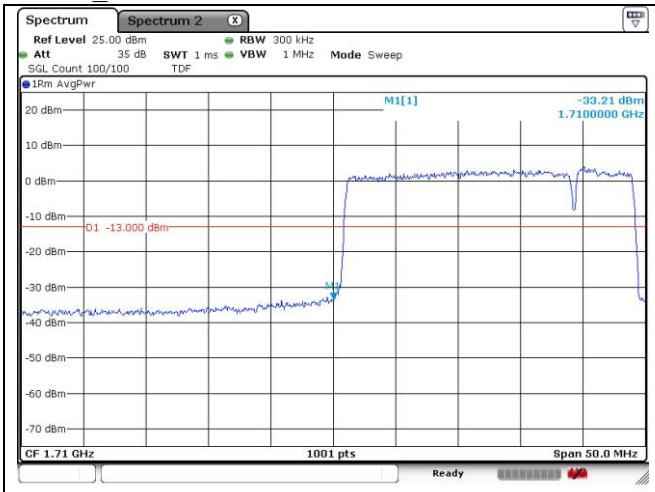

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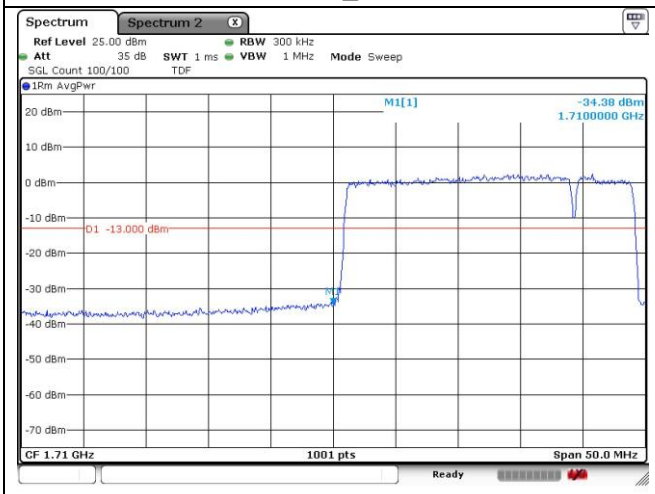

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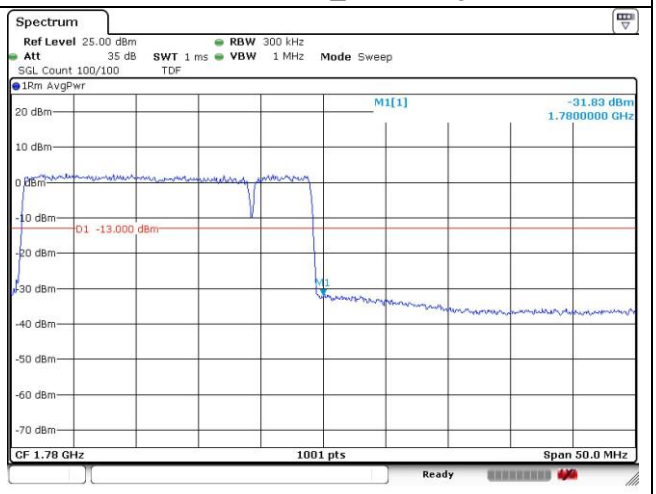

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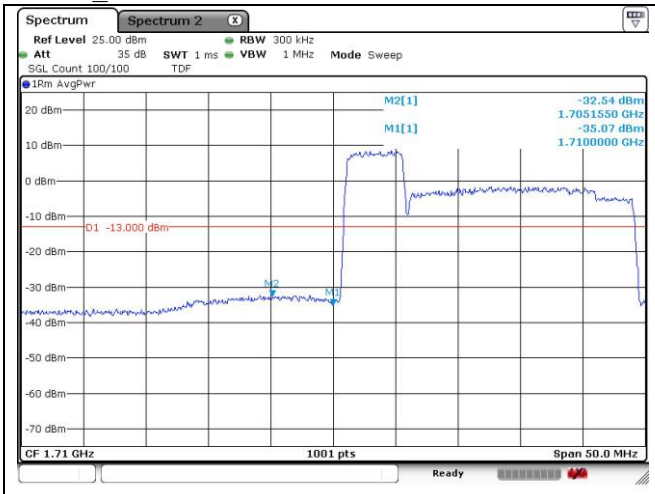

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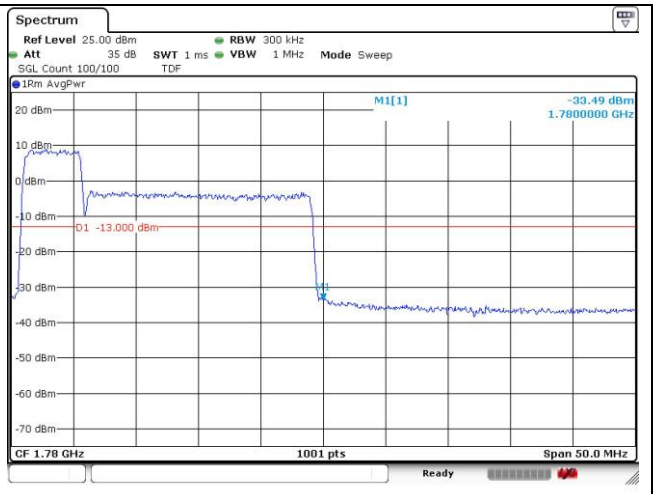

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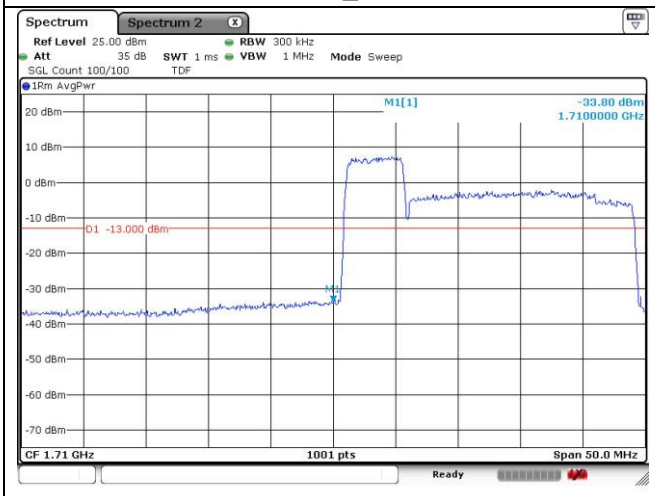

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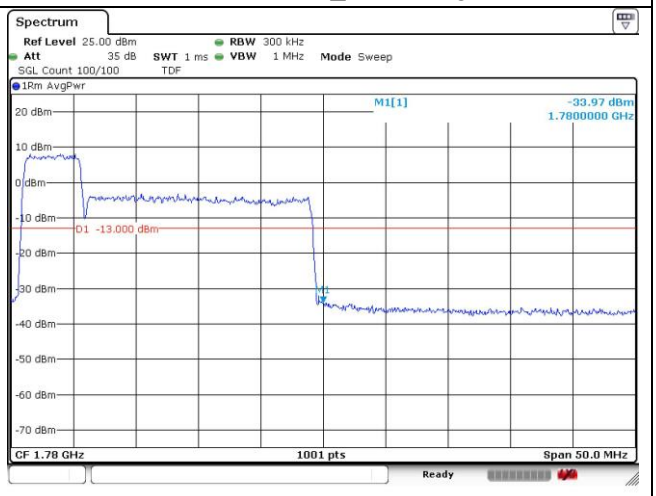

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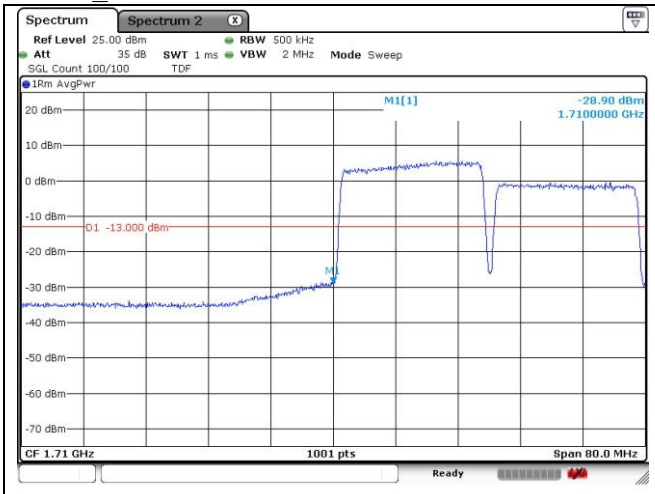
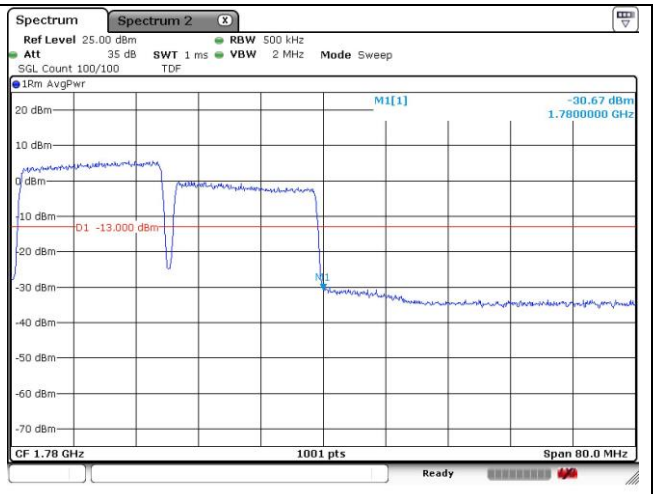
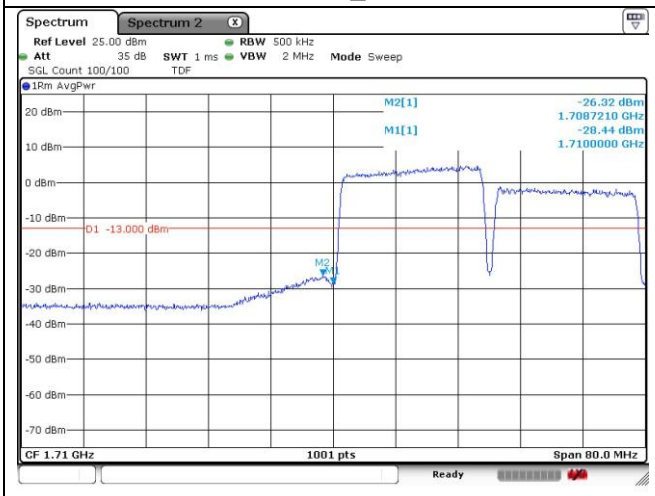
ULCA_66C



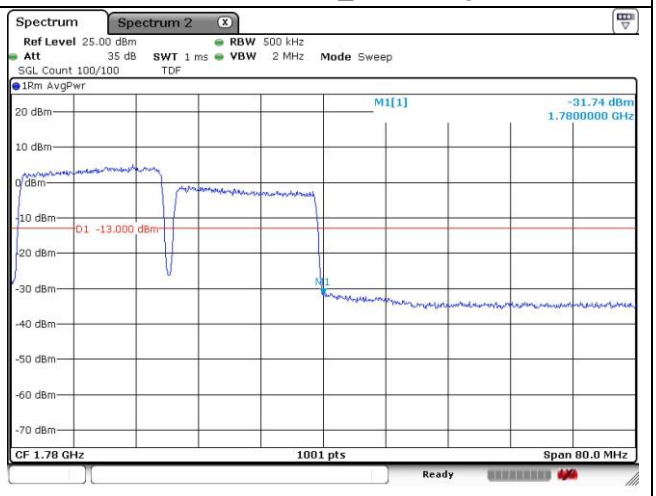
PCC 20 ㎒ + SCC 20 ㎒_QPSK-Low Channel



PCC 20 ㎒ + SCC 20 ㎒_QPSK-High Channel



PCC 20 ㎒ + SCC 20 ㎒_16QAM-Low Channel



PCC 20 ㎒ + SCC 20 ㎒_16QAM-High Channel

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.
In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the occupied bandwidth stays within each of the sub-bands (see Section 5.1) when tested to the temperature and supply voltage variations specified in RSS-Gen.

- RSS-139 Issue 3
6.4, 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:

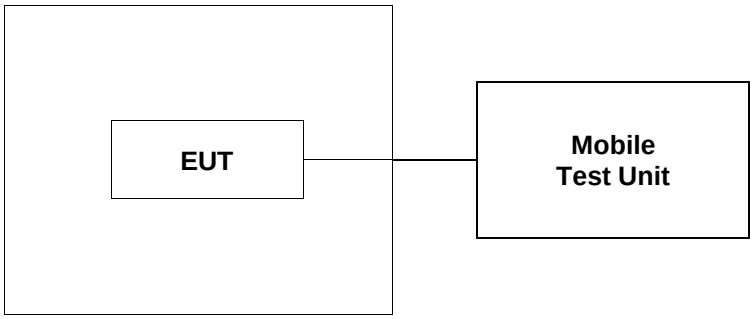
(a) the frequency offset shall be measured according to the procedure described in RSS-Gen and recorded.

(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	13.50	19.30	-18.00	0.026 98	-0.030 67
40		5.50	-3.50	0.010 43	-0.013 37
30		4.50	-3.60	0.009 23	-0.013 48
20(Ref.)		-3.20	7.70	-	-
10		-4.20	19.50	-0.001 20	0.014 08
0		-2.30	20.20	0.001 08	0.014 92
-10		-5.90	-12.00	-0.003 24	-0.023 51
-20		-4.40	-20.20	-0.001 44	-0.033 29
-30		5.50	-3.60	0.010 43	-0.013 48
Frequency Stability versus Power Supply					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**Ppm**	
		PCC	**SCC**	**PCC**	**SCC**
20	11.475 (85%)	-5.80	11.80	-0.003 12	0.004 89
	15.525 (115%)	-1.50	7.40	0.002 04	-0.000 36

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	13.50	17.80	-22.00	0.012 35	-0.011 97
40		26.40	-4.30	0.015 76	-0.005 00
30		7.00	-2.30	0.008 08	-0.004 21
20(Ref.)		-13.40	8.40	-	-
10		-37.20	25.70	-0.009 42	0.006 81
0		-38.10	26.30	-0.009 78	0.007 05
-10		-21.50	24.70	-0.003 21	0.006 42
-20		-26.80	25.70	-0.005 31	0.006 81
-30		-21.50	18.40	-0.003 21	0.003 94
Frequency Stability versus Power Supply					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**ppm**	
		PCC	**SCC**	**PCC**	**SCC**
20	11.475 (85%)	-19.20	10.70	-0.002 30	0.000 91
	15.525 (115%)	-13.60	14.90	-0.000 08	0.002 56

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	13.50	21.10	-17.30	0.009 07	-0.014 45
40		10.30	1.60	0.002 91	-0.003 70
30		4.50	2.10	-0.000 40	-0.003 41
20(Ref.)		5.20	8.10	-	-
10		-20.20	16.00	-0.014 49	0.004 50
0		-14.10	22.10	-0.011 01	0.007 97
-10		-12.50	20.60	-0.010 10	0.007 11
-20		-14.10	20.60	-0.011 01	0.007 11
-30		-20.20	18.80	-0.014 49	0.006 09
Frequency Stability versus Power Supply					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**ppm**	
		PCC	**SCC**	**PCC**	**SCC**
20	11.475 (85%)	-12.40	-2.80	-0.010 04	-0.006 20
	15.525 (115%)	-14.50	-3.90	-0.011 24	-0.006 83

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	13.50	21.10	-17.50	0.023 51	-0.014 43
40		21.90	-1.70	0.023 97	-0.005 45
30		10.90	1.20	0.017 68	-0.003 81
20(Ref.)		-20.00	7.90	-	-
10		-26.40	31.10	-0.003 66	0.013 18
0		-35.30	24.70	-0.008 75	0.009 55
-10		-23.00	16.90	-0.001 72	0.005 11
-20		-35.30	24.70	-0.008 75	0.009 55
-30		-30.20	18.80	-0.005 84	0.006 19
Frequency Stability versus Power Supply					
Environment Temperature (℃)	**Power Supplied (V)**	**Frequency Measure with Time Elapse**			
		Frequency Error (㎐)		**ppm**	
		PCC	**SCC**	**PCC**	**SCC**
20	11.475 (85%)	-11.40	17.90	0.004 92	0.005 68
	15.525 (115%)	-4.20	15.10	0.009 04	0.004 09

- End of the Test Report -