



Appendix B

LTE-CatM1 Band 12



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1 Effective Radiated Power Output Data

Effective Radiated Power of Transmitter (ERP) for LTE-CatM1 Band 12

Test Band	Test Mode	Test Bandwidth	Test channel	Test RB	Conducted Power (dBm)	ERP (dBm)	limit (dBm)	Verdict
CatM1 Band 12	QPSK	1.4M	LCH	1RB#0	21.02	17.47	34.77	PASS
CatM1 Band 12	QPSK	1.4M	LCH	5RB#0	20.22	16.67	34.77	PASS
CatM1 Band 12	QPSK	1.4M	LCH	6RB#0	19.14	15.59	34.77	PASS
CatM1 Band 12	QPSK	1.4M	MCH	1RB#0	20.83	17.28	34.77	PASS
CatM1 Band 12	QPSK	1.4M	MCH	5RB#0	19.88	16.33	34.77	PASS
CatM1 Band 12	QPSK	1.4M	MCH	6RB#0	18.77	15.22	34.77	PASS
CatM1 Band 12	QPSK	1.4M	HCH	1RB#0	21.01	17.46	34.77	PASS
CatM1 Band 12	QPSK	1.4M	HCH	5RB#0	20.12	16.57	34.77	PASS
CatM1 Band 12	QPSK	1.4M	HCH	6RB#0	18.89	15.34	34.77	PASS
CatM1 Band 12	16QAM	1.4M	LCH	1RB#0	20.05	16.50	34.77	PASS
CatM1 Band 12	16QAM	1.4M	LCH	5RB#0	19.17	15.62	34.77	PASS
CatM1 Band 12	16QAM	1.4M	MCH	1RB#0	19.83	16.28	34.77	PASS
CatM1 Band 12	16QAM	1.4M	MCH	5RB#0	18.99	15.44	34.77	PASS
CatM1 Band 12	16QAM	1.4M	HCH	1RB#0	19.91	16.36	34.77	PASS
CatM1 Band 12	16QAM	1.4M	HCH	5RB#0	19.11	15.56	34.77	PASS
CatM1 Band 12	QPSK	3M	LCH	1RB#0	20.96	17.41	34.77	PASS
CatM1 Band 12	QPSK	3M	LCH	5RB#0	19.93	16.38	34.77	PASS
CatM1 Band 12	QPSK	3M	LCH	6RB#0	18.81	15.26	34.77	PASS
CatM1 Band 12	QPSK	3M	MCH	1RB#0	20.89	17.34	34.77	PASS
CatM1 Band 12	QPSK	3M	MCH	5RB#0	19.88	16.33	34.77	PASS
CatM1 Band 12	QPSK	3M	MCH	6RB#0	18.78	15.23	34.77	PASS
CatM1 Band 12	QPSK	3M	HCH	1RB#0	20.91	17.36	34.77	PASS
CatM1 Band 12	QPSK	3M	HCH	5RB#0	19.87	16.32	34.77	PASS
CatM1 Band 12	QPSK	3M	HCH	6RB#0	18.83	15.28	34.77	PASS
CatM1 Band 12	16QAM	3M	LCH	1RB#0	19.78	16.23	34.77	PASS
CatM1 Band 12	16QAM	3M	LCH	5RB#0	18.74	15.19	34.77	PASS
CatM1 Band 12	16QAM	3M	MCH	1RB#0	19.79	16.24	34.77	PASS
CatM1 Band 12	16QAM	3M	MCH	5RB#0	18.78	15.23	34.77	PASS
CatM1 Band 12	16QAM	3M	HCH	1RB#0	19.85	16.30	34.77	PASS
CatM1 Band 12	16QAM	3M	HCH	5RB#0	18.82	15.27	34.77	PASS
CatM1 Band 12	QPSK	5M	LCH	1RB#0	21.21	17.66	34.77	PASS
CatM1 Band 12	QPSK	5M	LCH	5RB#0	20.09	16.54	34.77	PASS
CatM1 Band 12	QPSK	5M	LCH	6RB#0	20.03	16.48	34.77	PASS
CatM1 Band 12	QPSK	5M	MCH	1RB#0	21.14	17.59	34.77	PASS
CatM1 Band 12	QPSK	5M	MCH	5RB#0	20.01	16.46	34.77	PASS
CatM1 Band 12	QPSK	5M	MCH	6RB#0	19.99	16.44	34.77	PASS
CatM1 Band 12	QPSK	5M	HCH	1RB#0	21.05	17.50	34.77	PASS
CatM1 Band 12	QPSK	5M	HCH	5RB#0	19.97	16.42	34.77	PASS
CatM1 Band 12	QPSK	5M	HCH	6RB#0	19.95	16.40	34.77	PASS



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CatM1 Band 12	16QAM	5M	LCH	1RB#0	20.83	17.28	34.77	PASS
CatM1 Band 12	16QAM	5M	LCH	5RB#0	19.97	16.42	34.77	PASS
CatM1 Band 12	16QAM	5M	MCH	1RB#0	20.74	17.19	34.77	PASS
CatM1 Band 12	16QAM	5M	MCH	5RB#0	19.82	16.27	34.77	PASS
CatM1 Band 12	16QAM	5M	HCH	1RB#0	20.71	17.16	34.77	PASS
CatM1 Band 12	16QAM	5M	HCH	5RB#0	19.97	16.42	34.77	PASS
CatM1 Band 12	QPSK	10M	LCH	1RB#0	21.09	17.54	34.77	PASS
CatM1 Band 12	QPSK	10M	LCH	5RB#0	21.04	17.49	34.77	PASS
CatM1 Band 12	QPSK	10M	LCH	6RB#0	19.92	16.37	34.77	PASS
CatM1 Band 12	QPSK	10M	MCH	1RB#0	20.96	17.41	34.77	PASS
CatM1 Band 12	QPSK	10M	MCH	5RB#0	21.12	17.57	34.77	PASS
CatM1 Band 12	QPSK	10M	MCH	6RB#0	20.09	16.54	34.77	PASS
CatM1 Band 12	QPSK	10M	HCH	1RB#0	21.12	17.57	34.77	PASS
CatM1 Band 12	QPSK	10M	HCH	5RB#0	21.02	17.47	34.77	PASS
CatM1 Band 12	QPSK	10M	HCH	6RB#0	19.88	16.33	34.77	PASS
CatM1 Band 12	16QAM	10M	LCH	1RB#0	20.86	17.31	34.77	PASS
CatM1 Band 12	16QAM	10M	LCH	5RB#0	20.83	17.28	34.77	PASS
CatM1 Band 12	16QAM	10M	MCH	1RB#0	20.93	17.38	34.77	PASS
CatM1 Band 12	16QAM	10M	MCH	5RB#0	20.91	17.36	34.77	PASS
CatM1 Band 12	16QAM	10M	HCH	1RB#0	20.71	17.16	34.77	PASS
CatM1 Band 12	16QAM	10M	HCH	5RB#0	20.79	17.24	34.77	PASS

Note:

a: For getting the EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$EIRP [dBm] = \text{Conducted Power} [dBm] + \text{Gain} [dBi]$

$ERP [dBm] = \text{Conducted Power} [dBm] + \text{Gain} [dBi] - 2.15$



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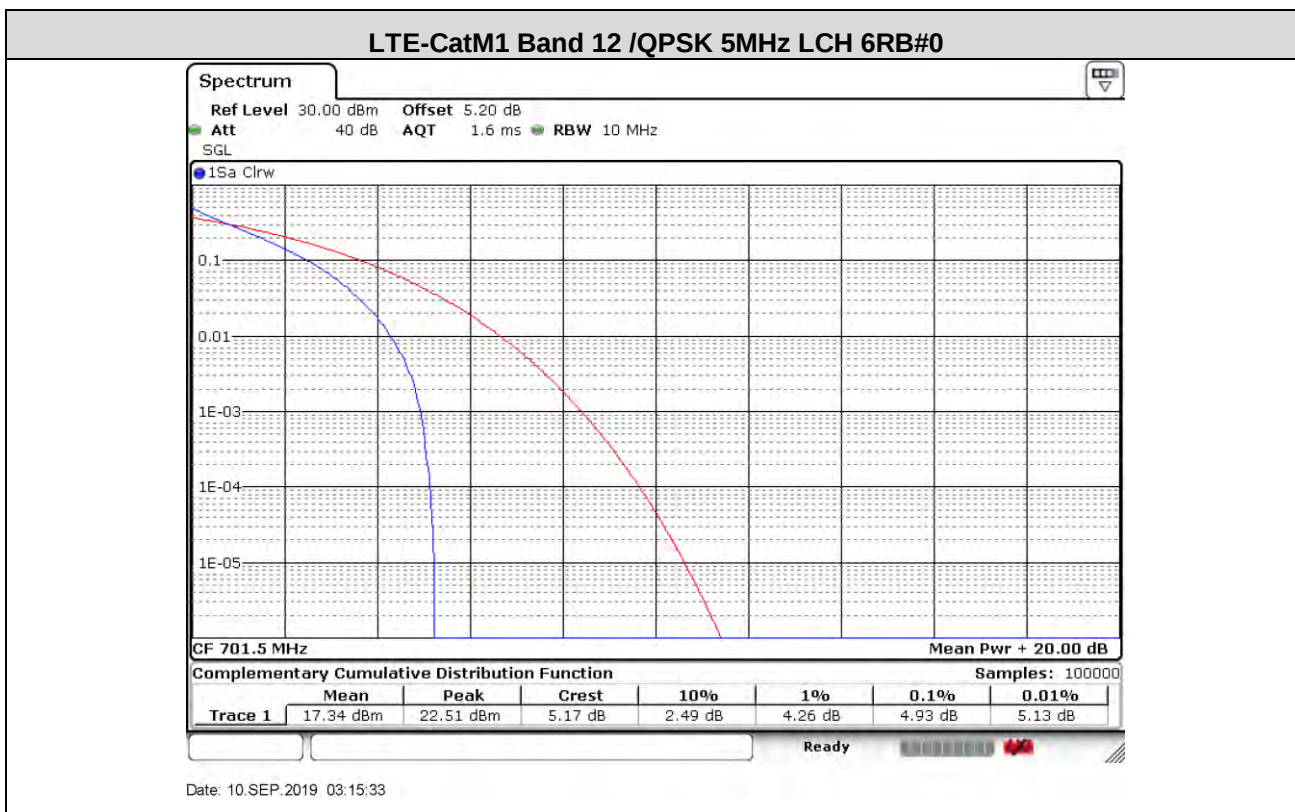


2 Peak-to-Average Ratio

2.1 Test Results

Test Band	Test Mode	RB Config	Test Channel	Measured [dB]	Limit [dB]	Verdict
CatM1 Band 12	QPSK/5M	6RB#0	LCH	4.93	13	PASS
CatM1 Band 12	QPSK/5M	6RB#0	MCH	4.72	13	PASS
CatM1 Band 12	QPSK/5M	6RB#0	HCH	3.97	13	PASS
CatM1 Band 12	16QAM/5M	5RB#0	LCH	3.88	13	PASS
CatM1 Band 12	16QAM/5M	5RB#0	MCH	4.35	13	PASS
CatM1 Band 12	16QAM/5M	5RB#0	HCH	5.59	13	PASS

2.2 Test Plots



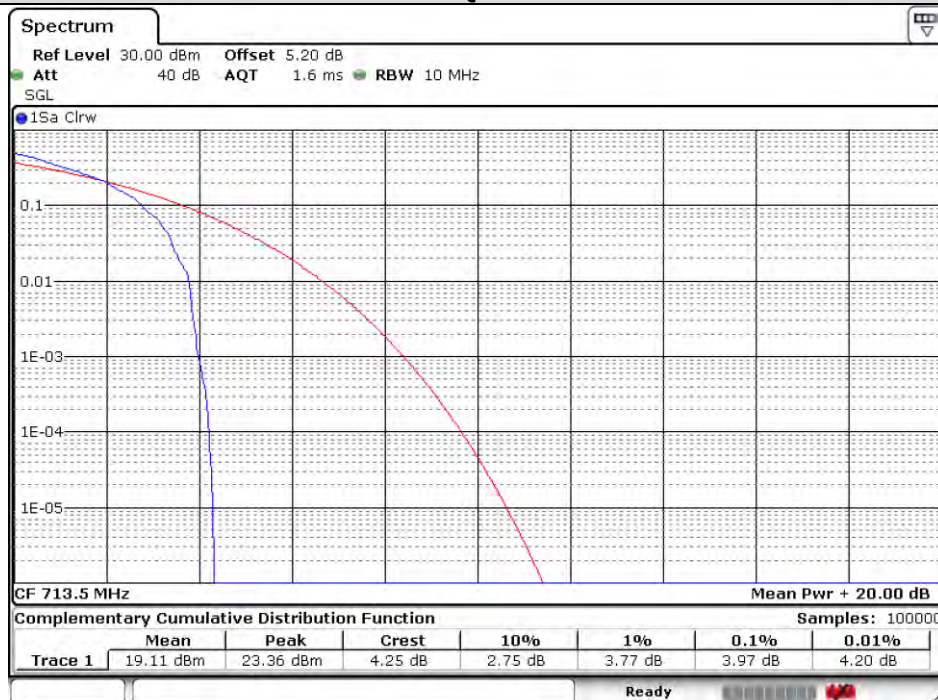


LTE-CatM1 Band 12 /QPSK 5MHz MCH 6RB#0



Date: 10.SEP.2019 03:16:45

LTE-CatM1 Band 12 /QPSK 5MHz HCH 6RB#0



Date: 10.SEP.2019 03:17:56



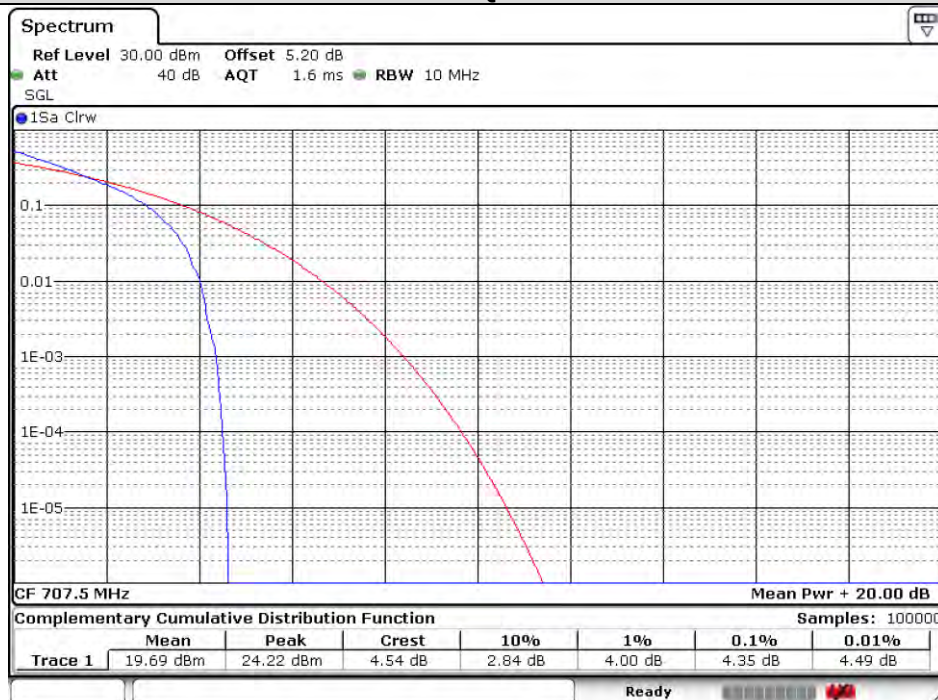


LTE-CatM1 Band 12 /16QAM 5MHz LCH 5RB#0



Date: 18.SEP.2019 16:46:53

LTE-CatM1 Band 12 /16QAM 5MHz MCH 5RB#0



Date: 18.SEP.2019 16:46:17

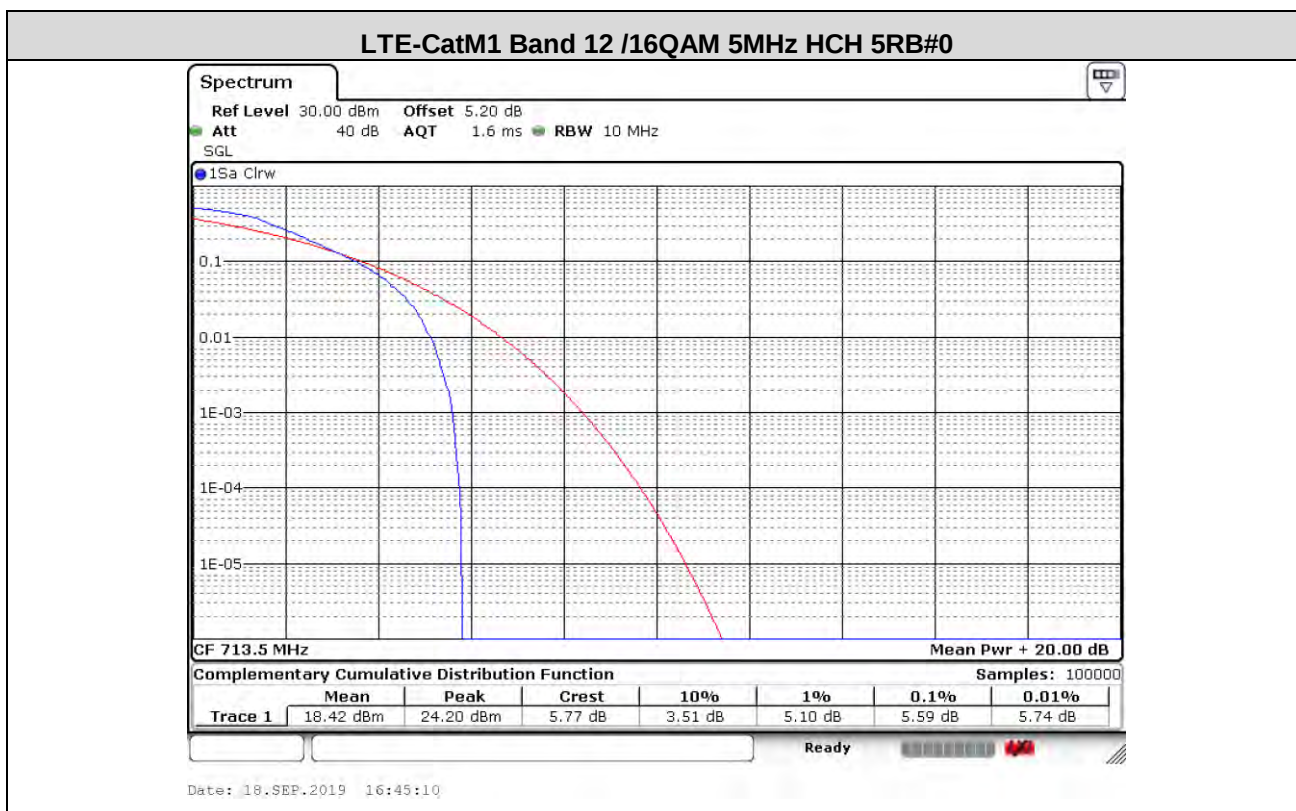


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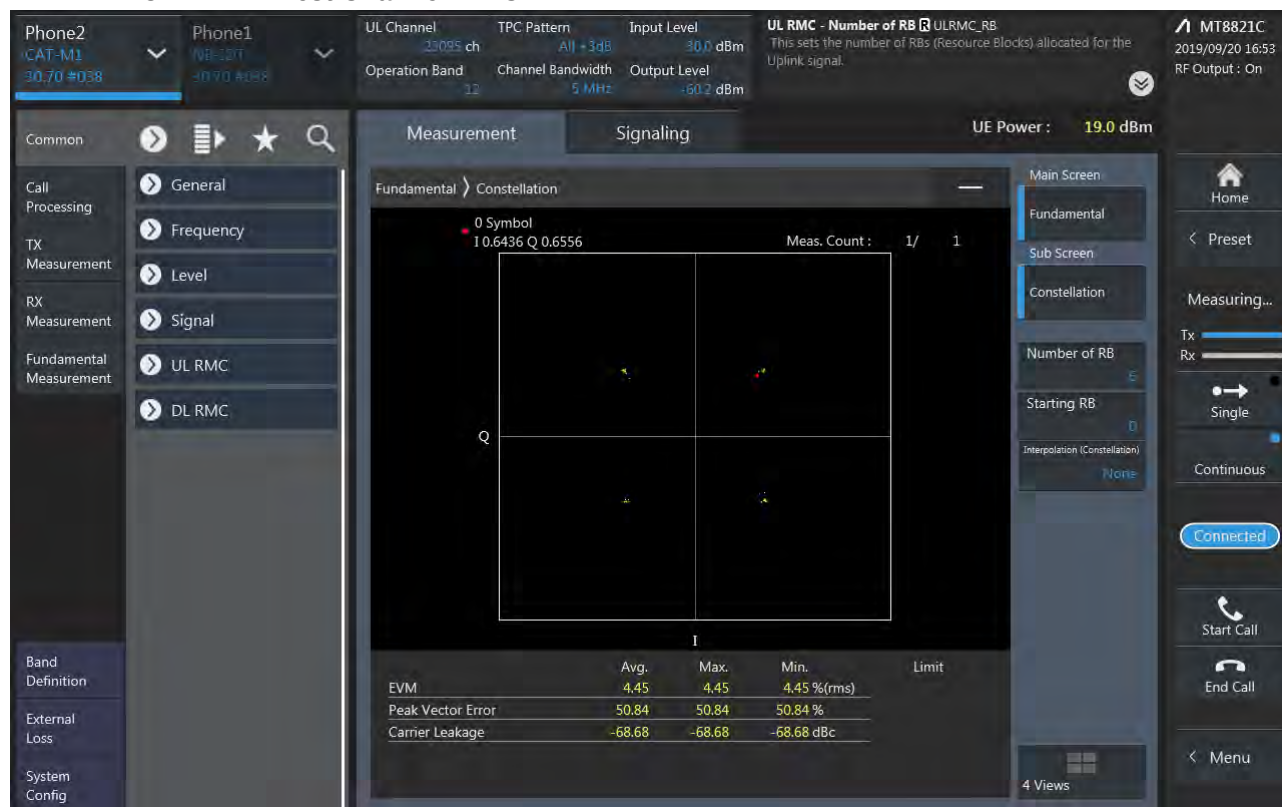
3 Modulation Characteristics

3.1 For LTE-CatM1

3.1.1 Test Band = LTE-CatM1 Band 12

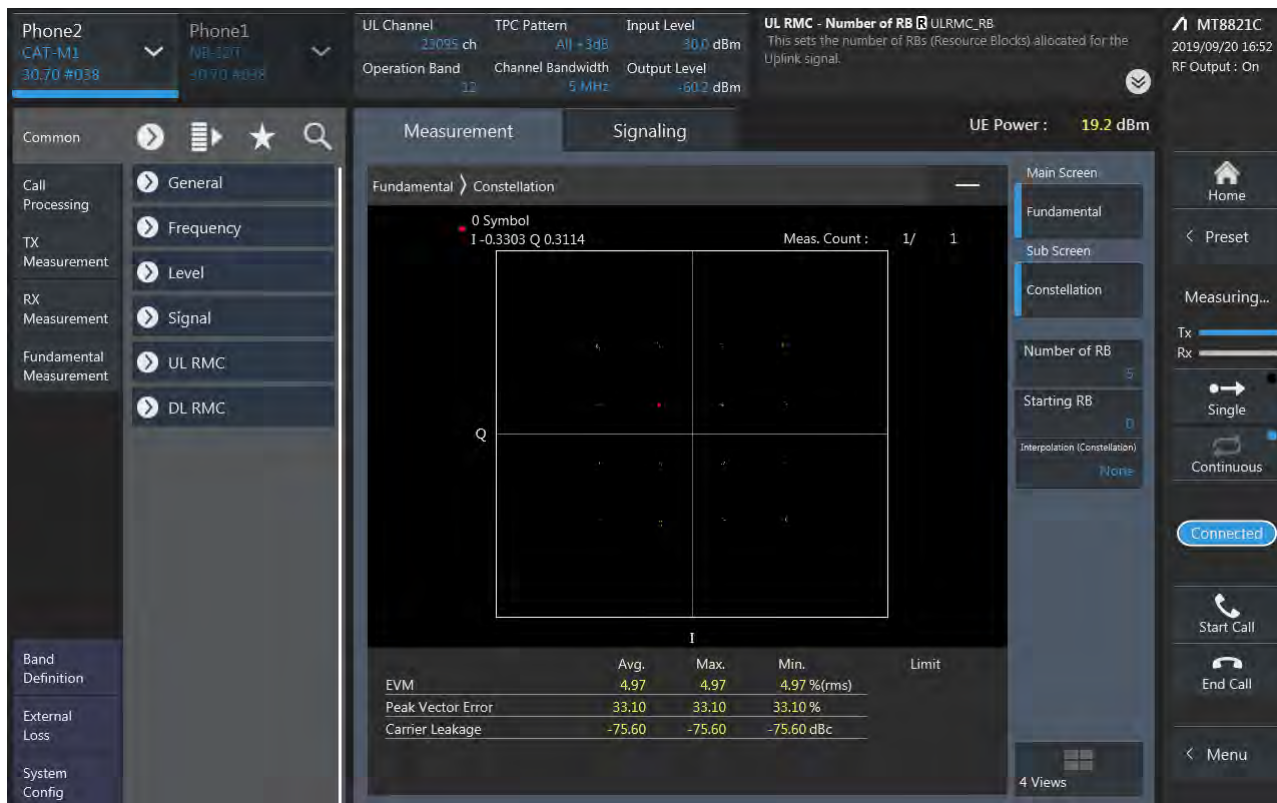
3.1.1.1 Test Mode = LTE-CatM1 /QPSK 5MHz

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = LTE-CatM1 /16QAM 5MHz

3.1.1.2.1 Test Channel = MCH



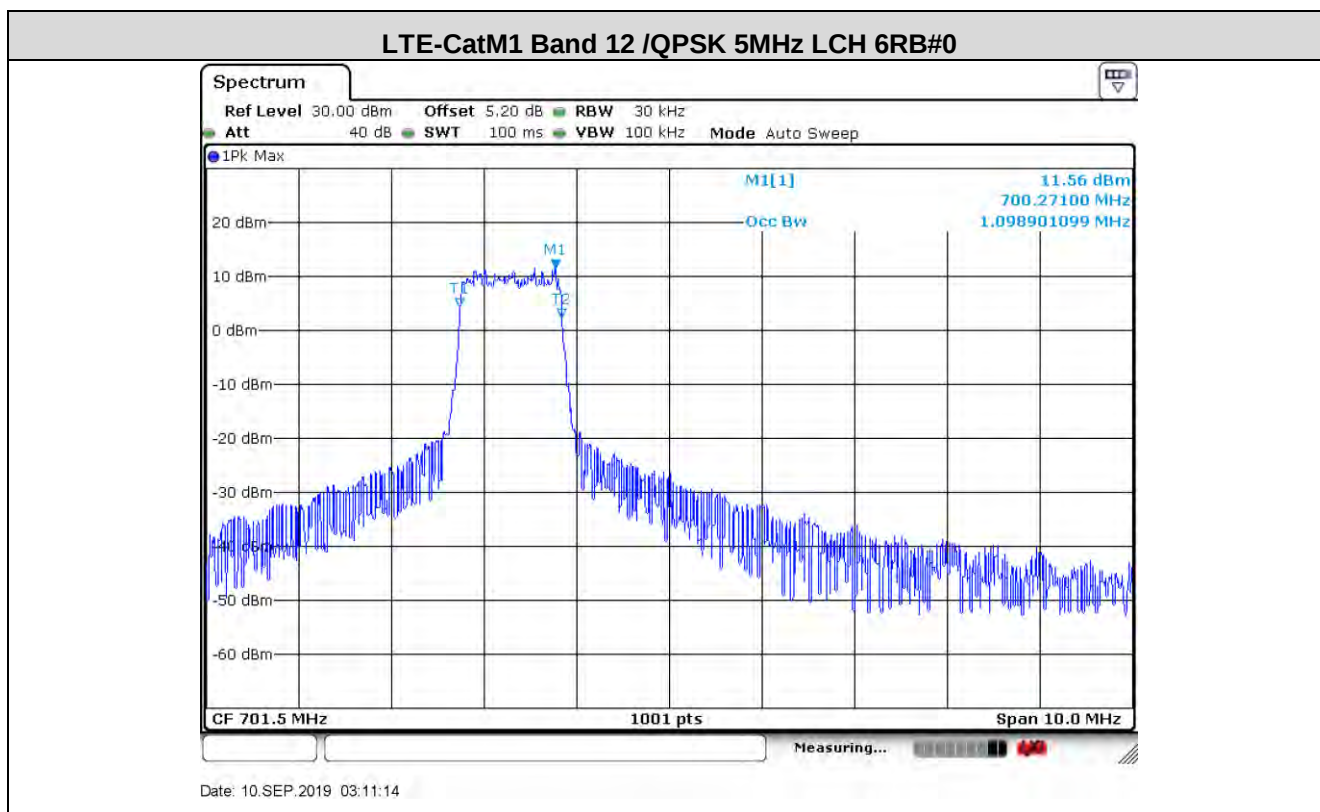


4 26dB Bandwidth and Occupied Bandwidth

4.1 Test Results

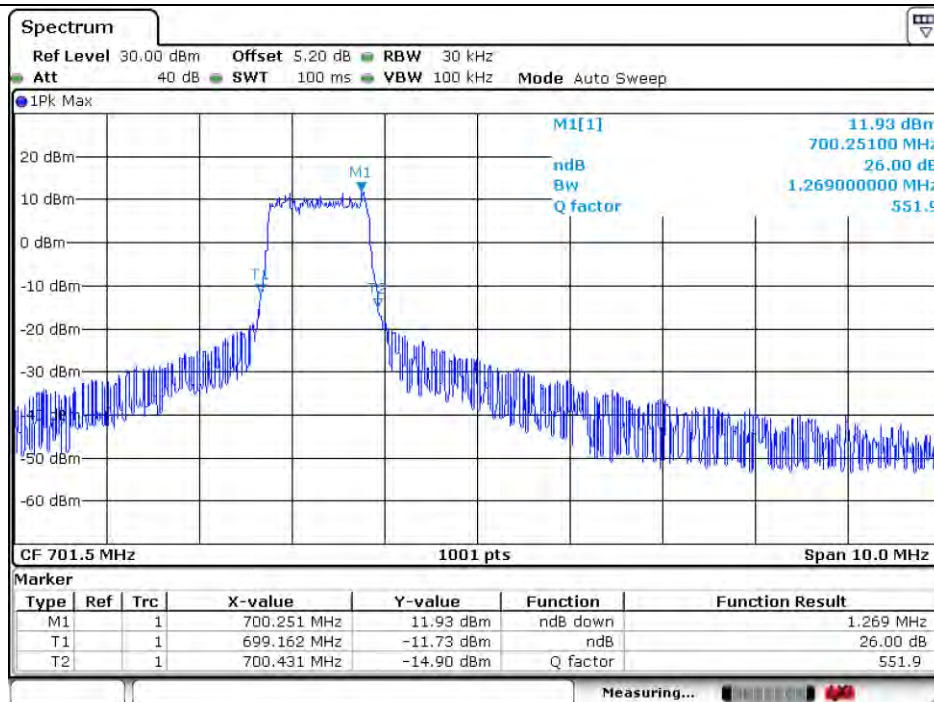
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	26dB Emission Bandwidth [MHz]	Verdict
CatM1 Band 12	QPSK/ 5MHz	LCH	1.10	1.27	PASS
CatM1 Band 12	QPSK/ 5MHz	MCH	1.09	1.29	PASS
CatM1 Band 12	QPSK/ 5MHz	HCH	1.10	1.28	PASS
CatM1 Band 12	16QAM/ 5MHz	LCH	0.92	1.12	PASS
CatM1 Band 12	16QAM/ 5MHz	MCH	0.93	1.10	PASS
CatM1 Band 12	16QAM/ 5MHz	HCH	0.92	1.11	PASS

4.2 Test Plots



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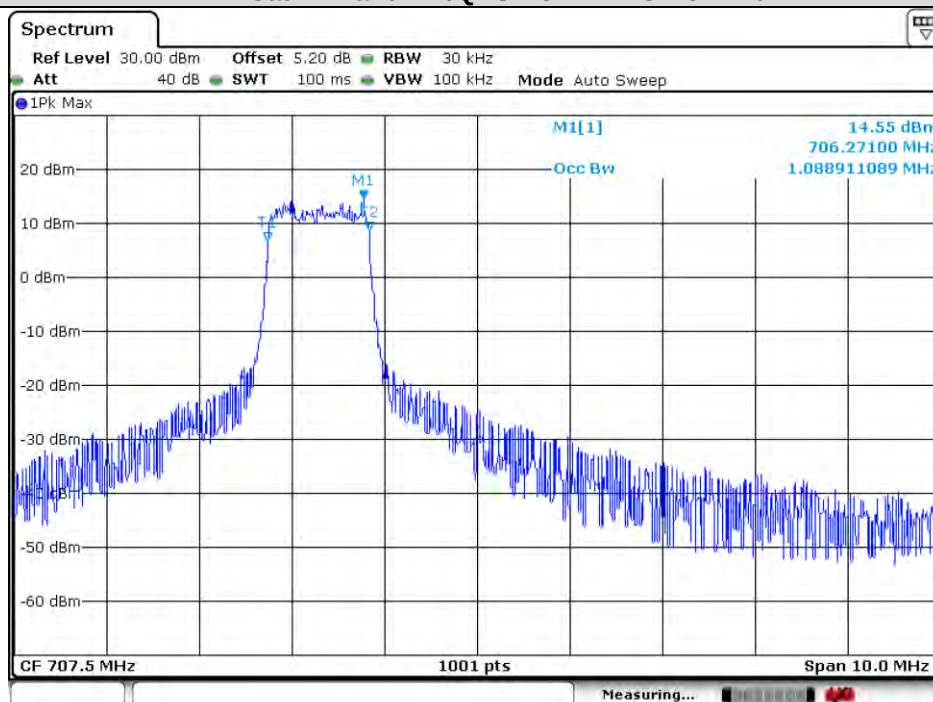
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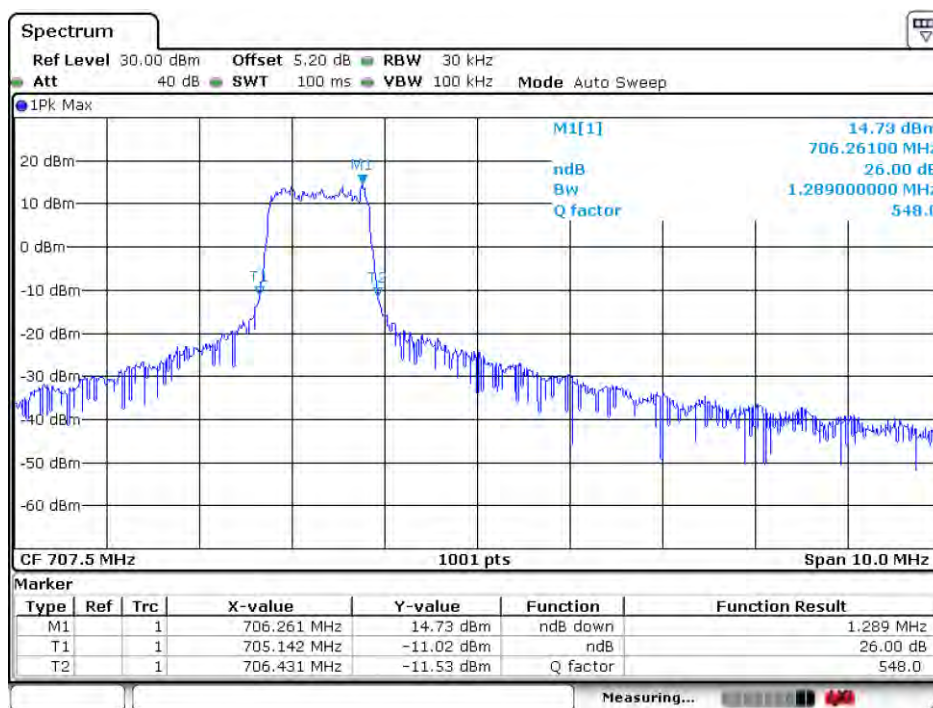
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LTE-CatM1 Band 12 /QPSK 5MHz MCH 6RB#0



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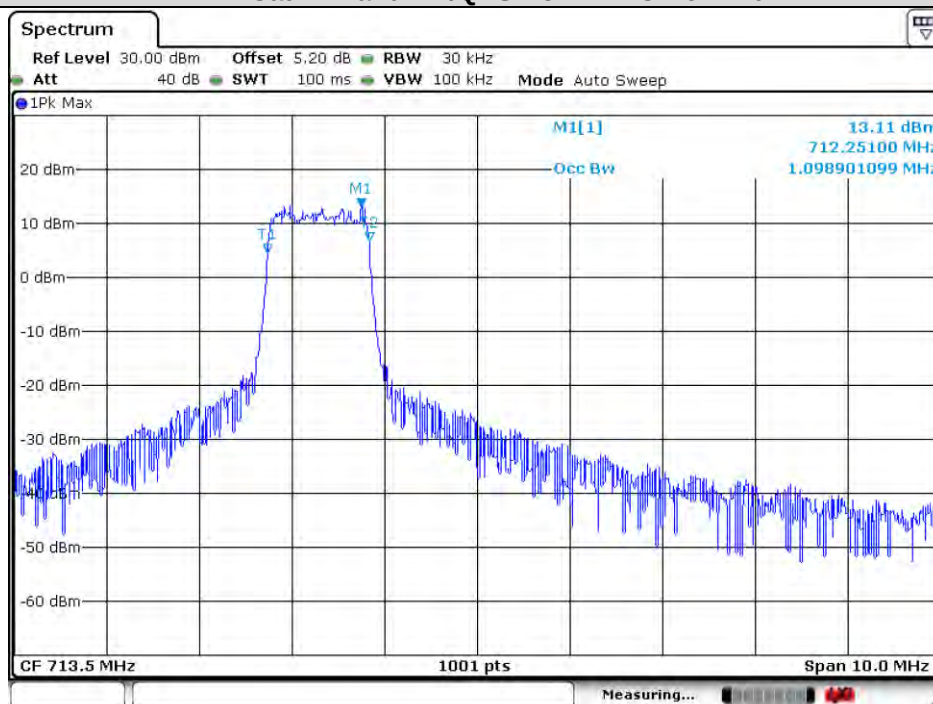
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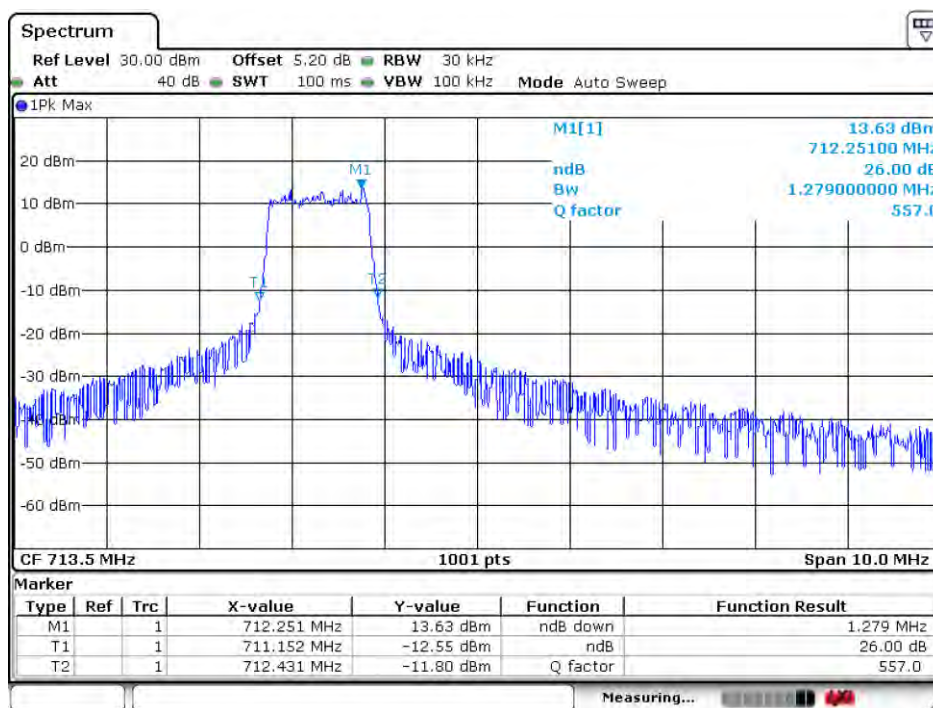
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Date: 10.SEP.2019 02:56:20



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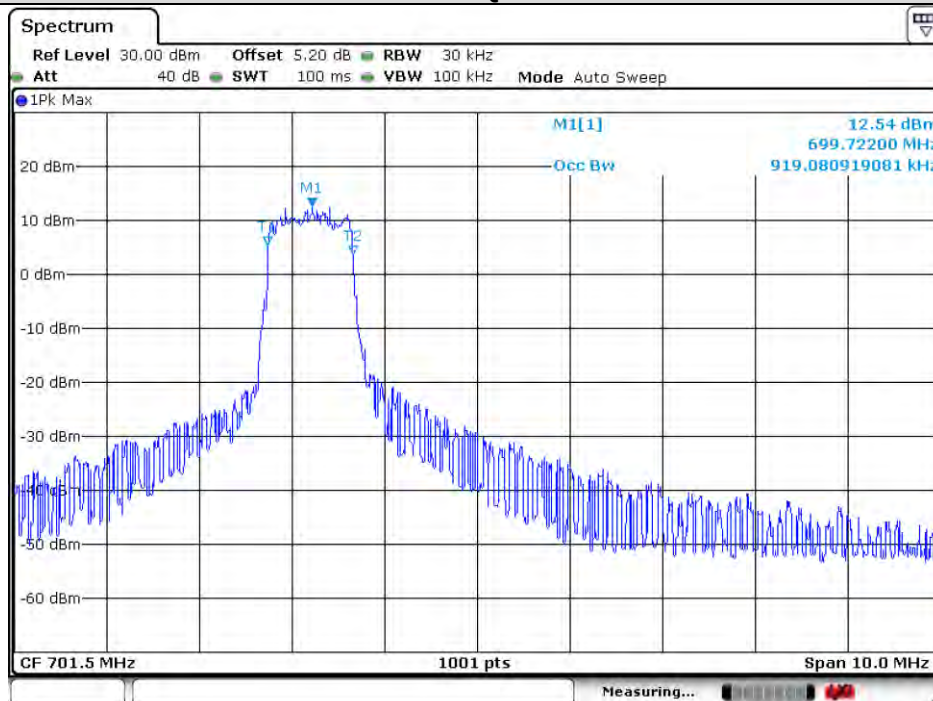
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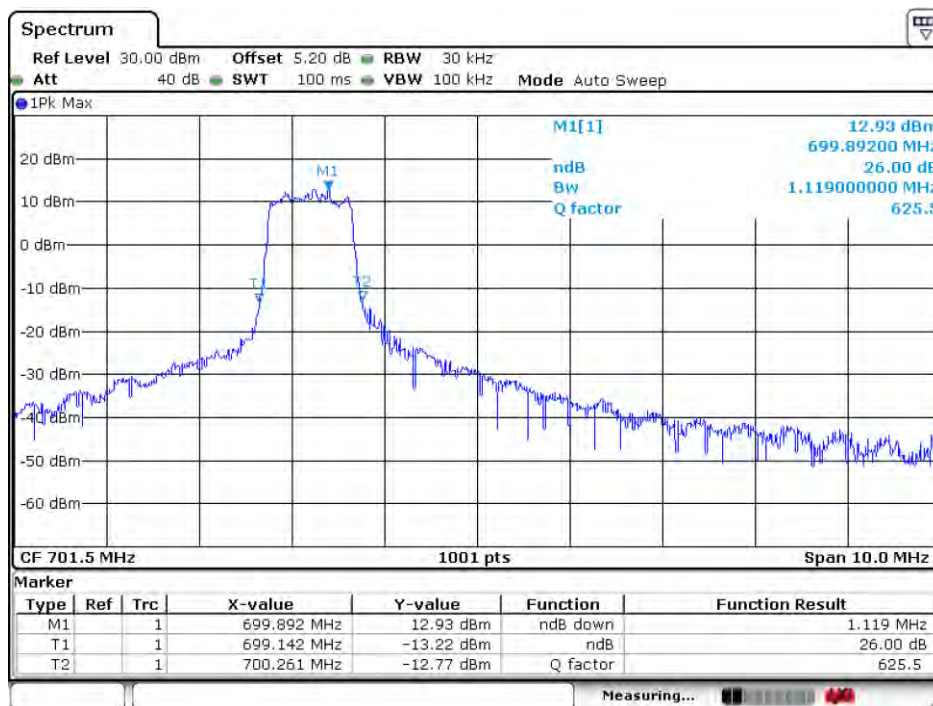
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Date: 10.SEP.2019 03:12:36



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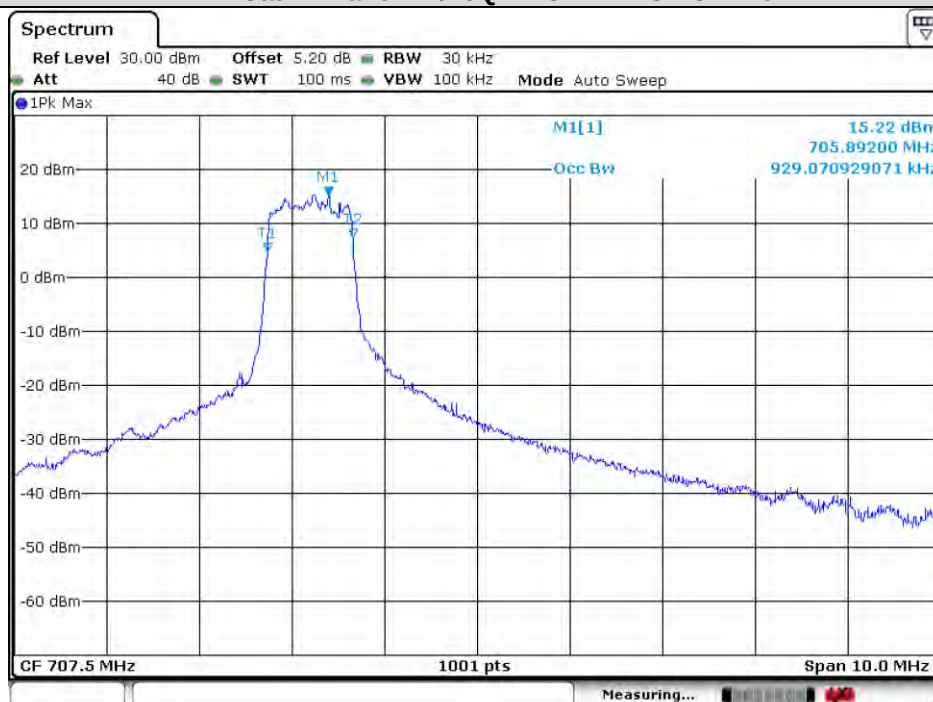
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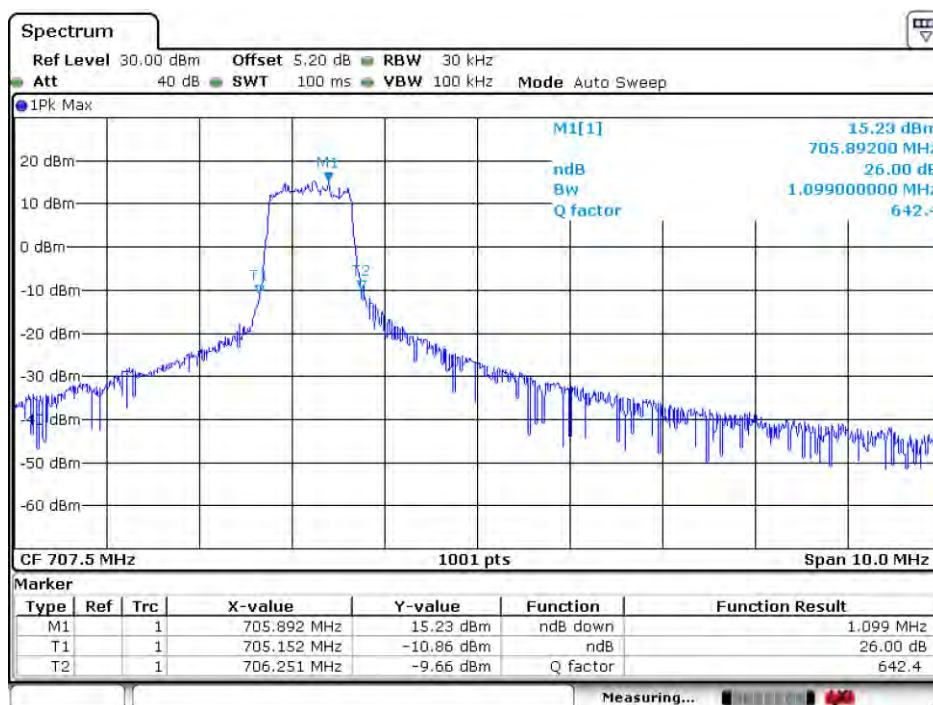
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Date: 10.SEP.2019 03:04:31



Date: 10.SEP.2019 03:05:29



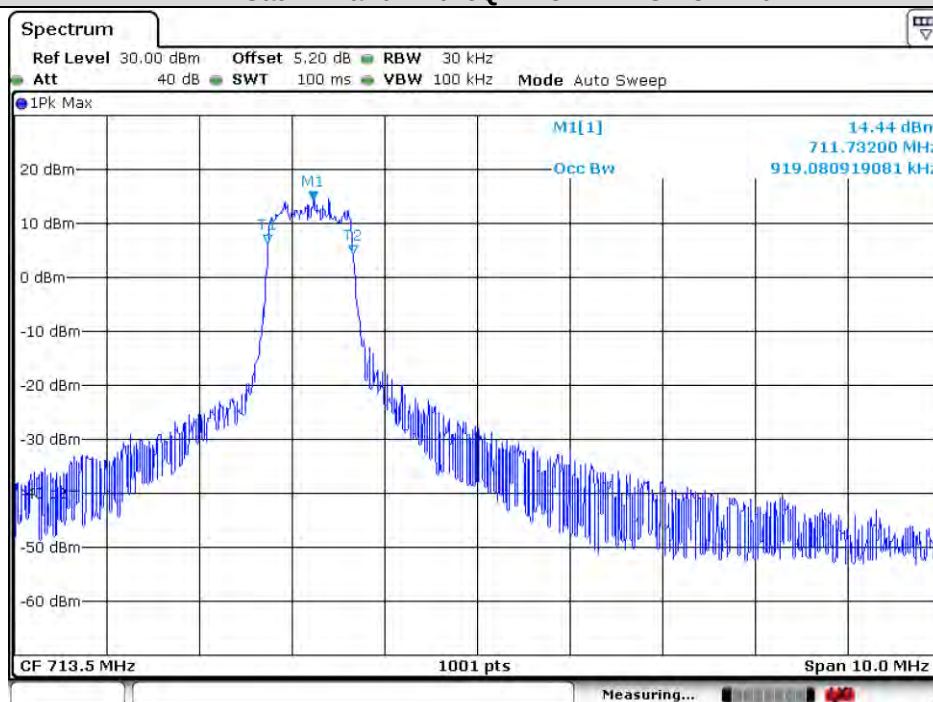
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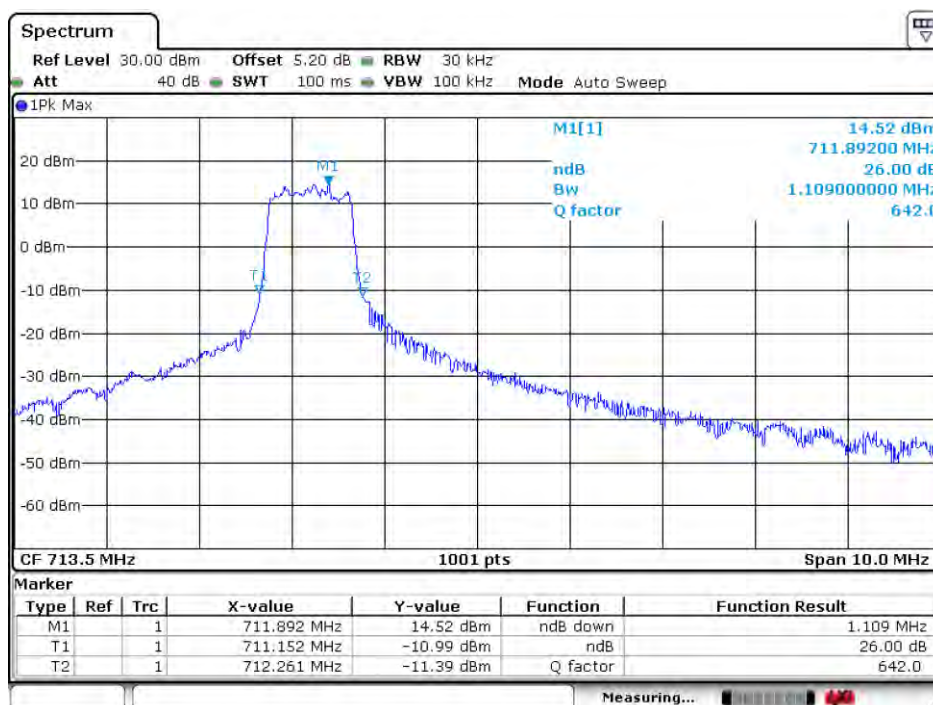
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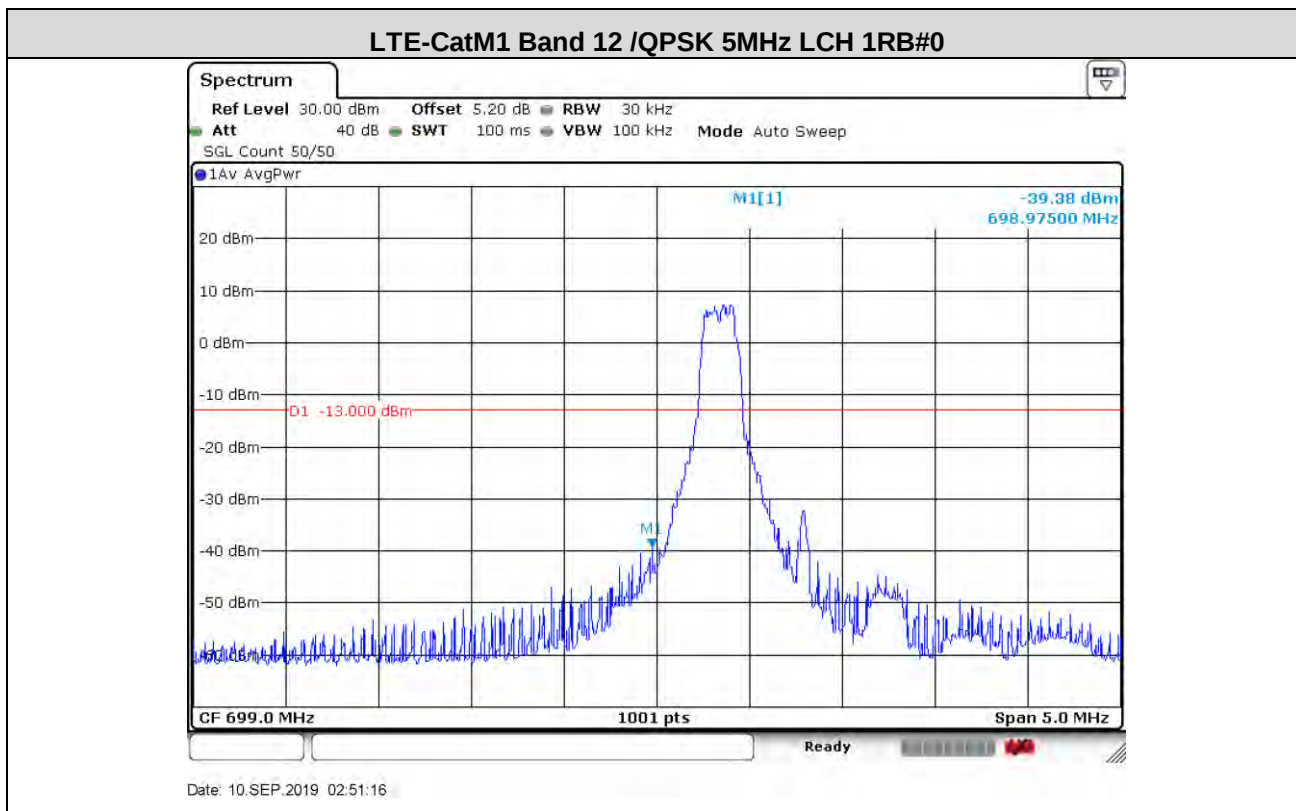
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5 Band Edges Compliance

5.1 Test Plots



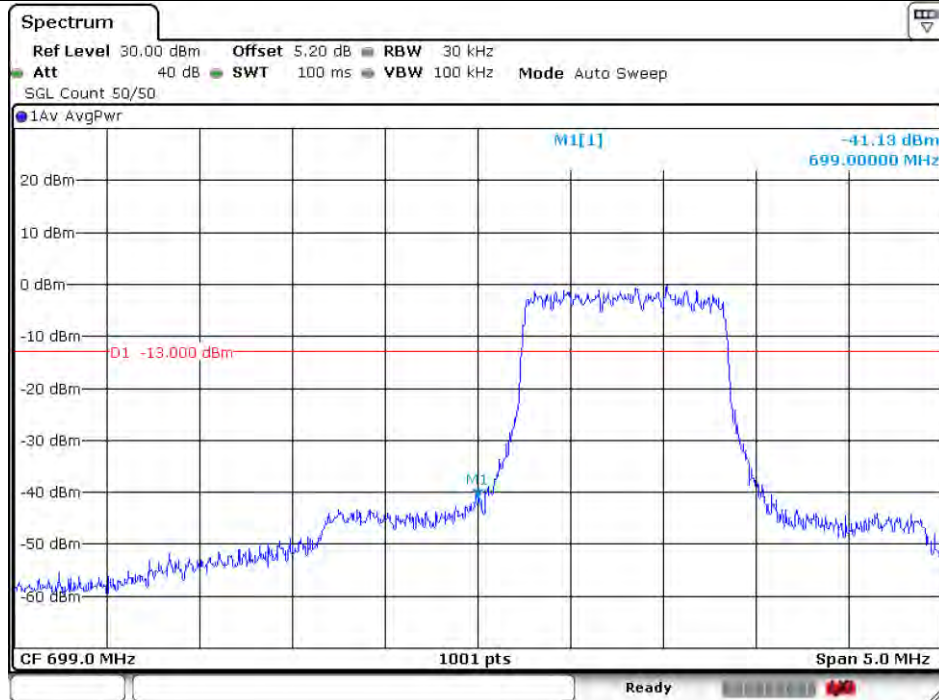
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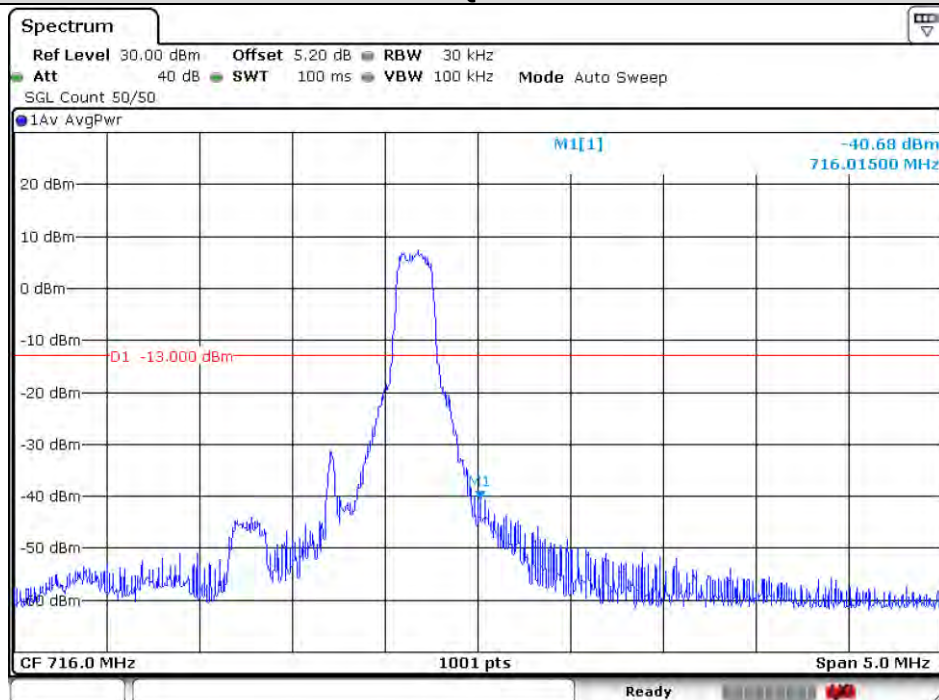
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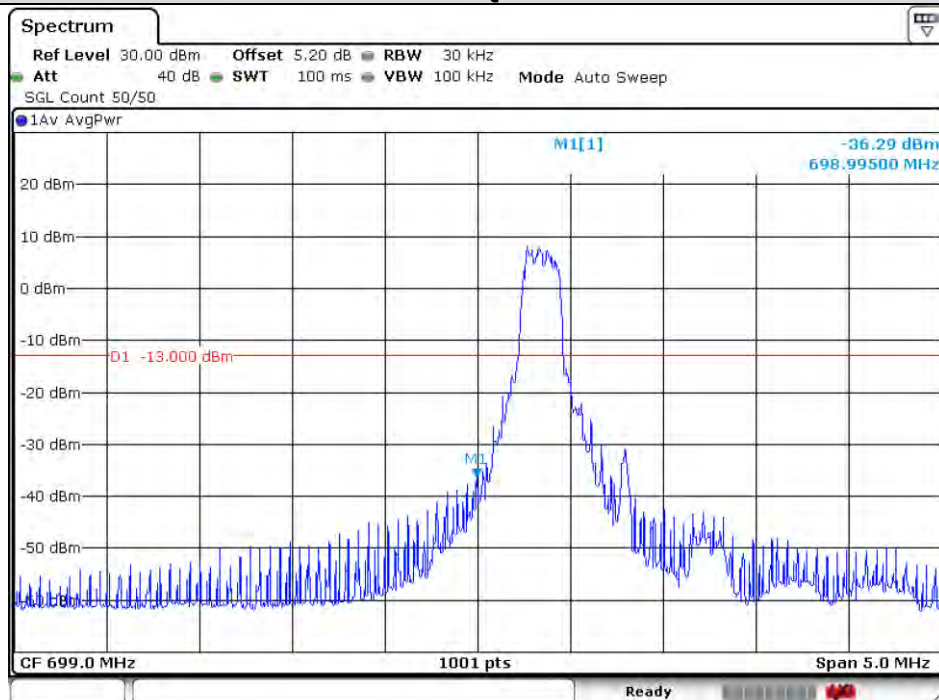
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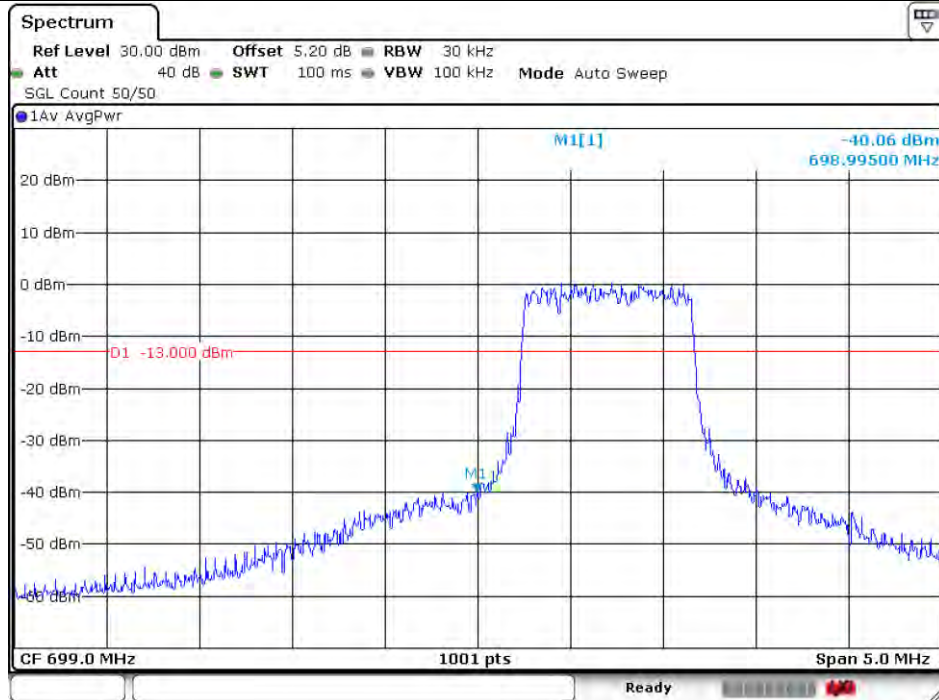
LTE-CatM1 Band 12 /16QAM 5MHz LCH 1RB#0



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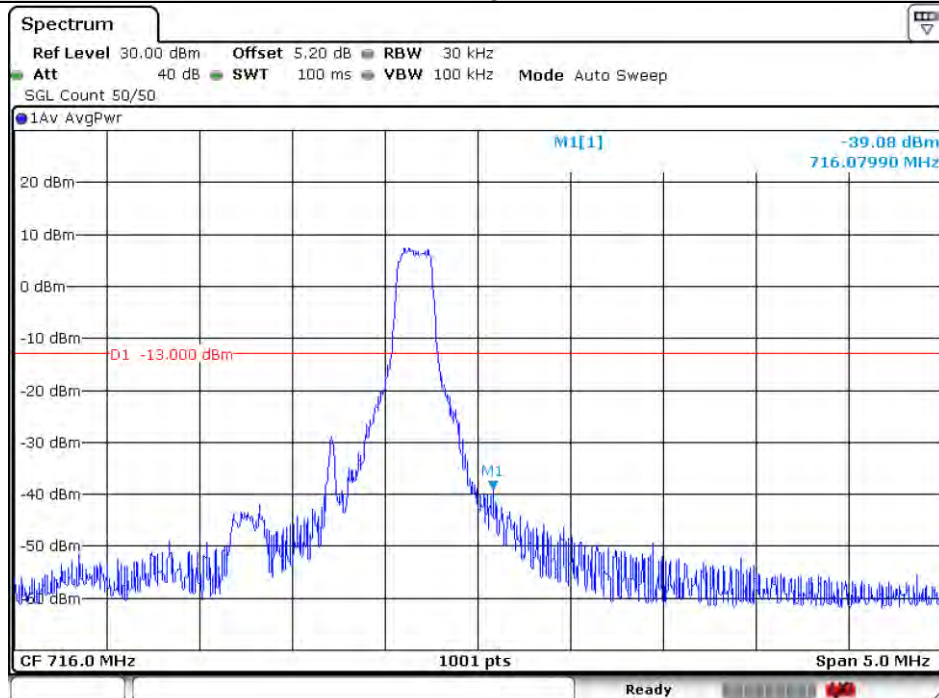


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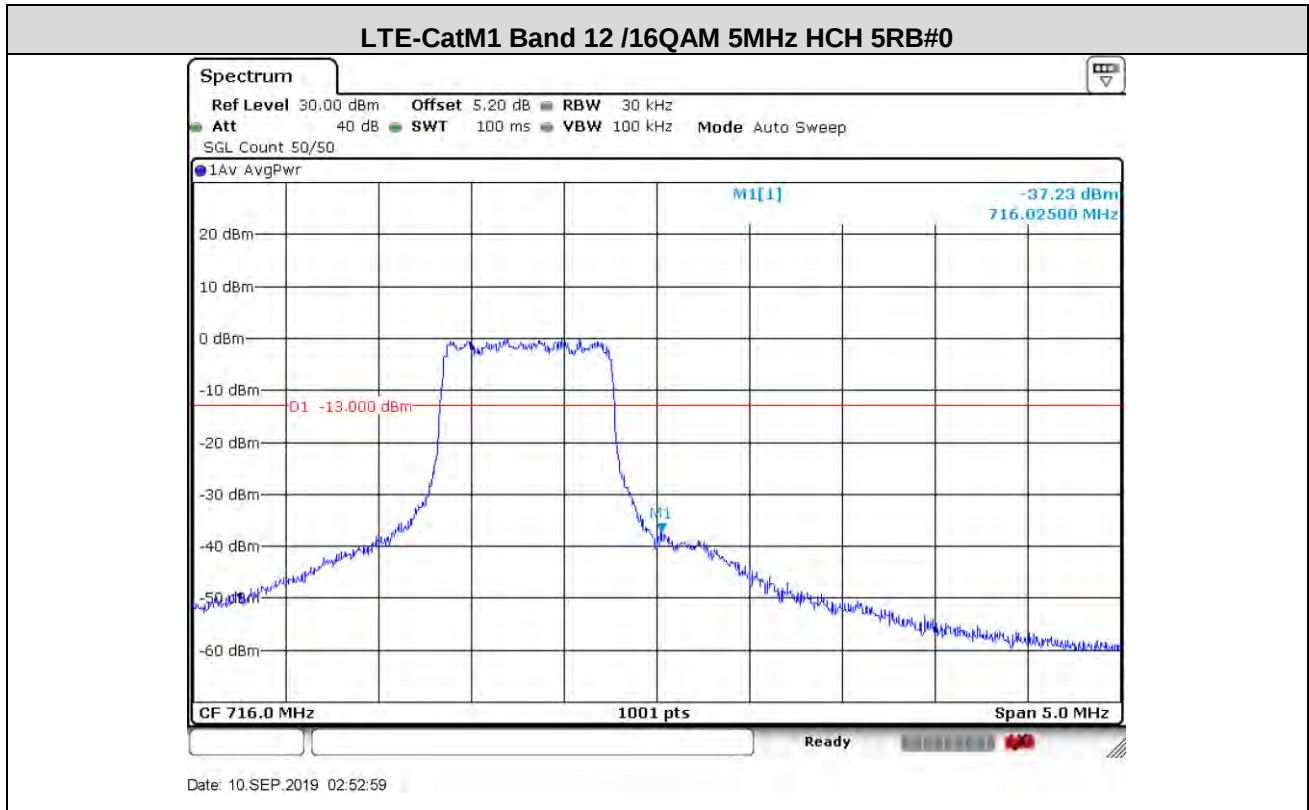


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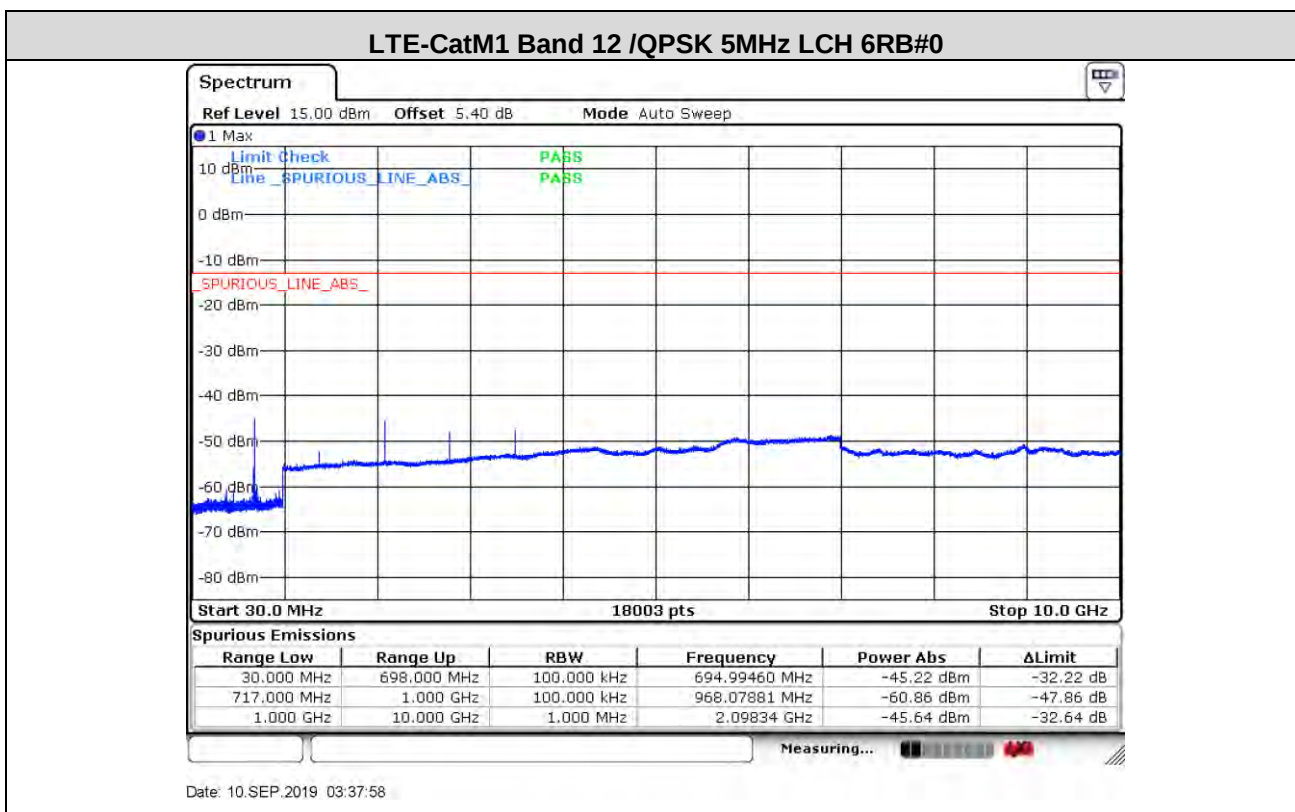


6 Spurious Emission at Antenna Terminal

NOTE1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

Part I - Test Plots

6.1 Test Plots



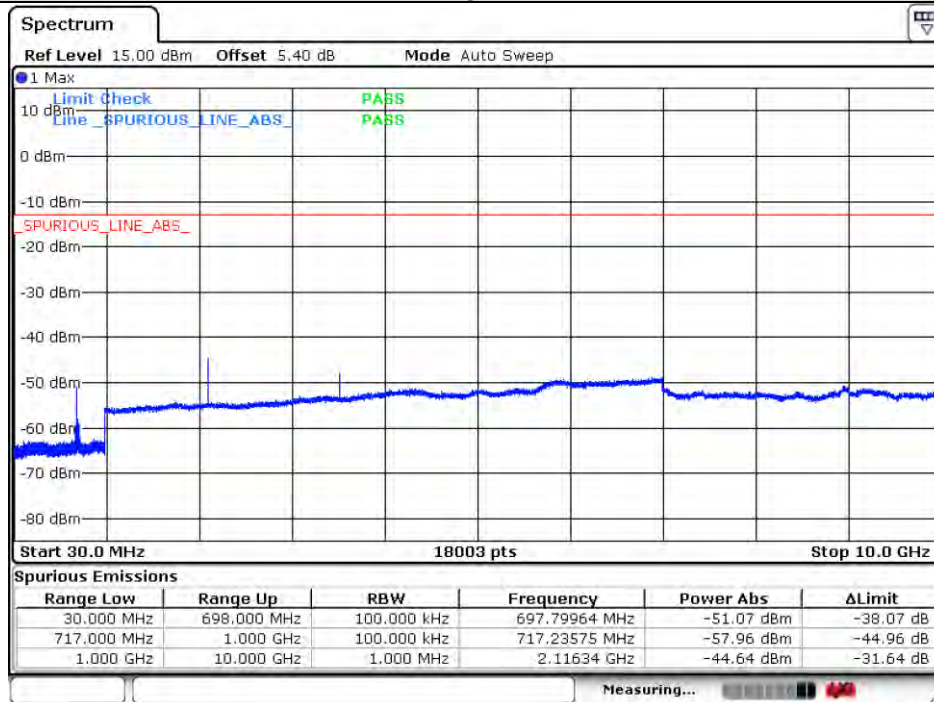
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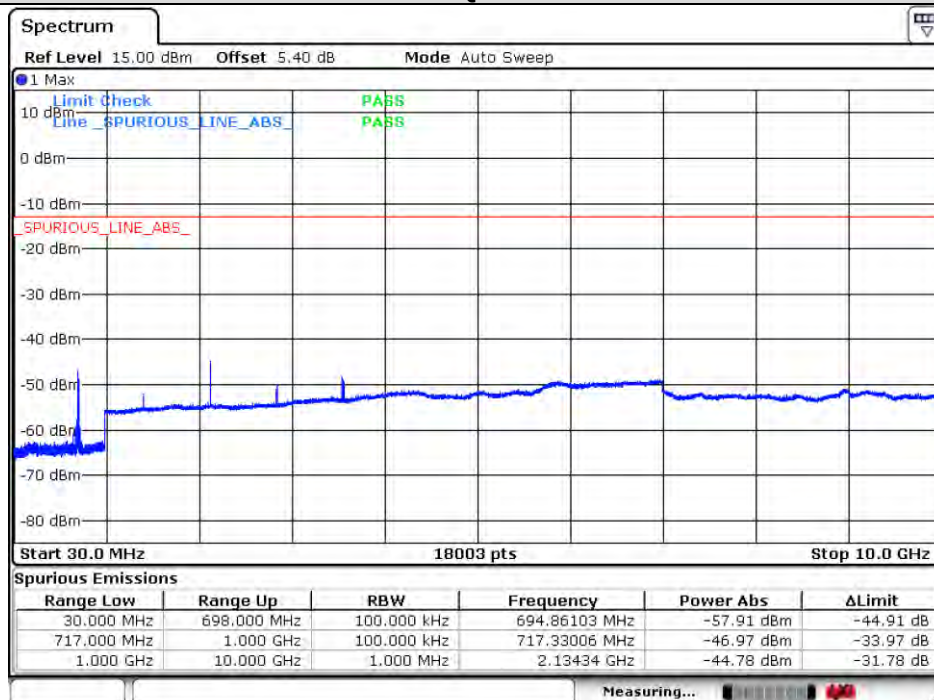
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LTE-CatM1 Band 12 /QPSK 5MHz MCH 6RB#0



Date: 10.SEP.2019 03:36:47

LTE-CatM1 Band 12 /QPSK 5MHz HCH 6RB#0



Date: 10.SEP.2019 03:19:02



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7 Field Strength of Spurious Radiation

7.1 For LTE-CatM1

7.1.1 Test Band = LTE-CatM1 Band 12

7.1.1.1 Test Mode =LTE-CatM1/QPSK

7.1.1.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
111.0476	-63.68	-13.00	50.68	Vertical
598.0119	-64.60	-13.00	51.60	Vertical
1398.4797	-57.24	-13.00	44.24	Vertical
1941.7884	-38.99	-13.00	25.99	Vertical
2410.2821	-33.79	-13.00	20.79	Vertical
17998.1999	-34.96	-13.00	21.96	Vertical
40.6220	-64.02	-13.00	51.02	Horizontal
232.0611	-68.14	-13.00	55.14	Horizontal
1398.4797	-53.93	-13.00	40.93	Horizontal
2465.4931	-38.76	-13.00	25.76	Horizontal
3496.8199	-53.07	-13.00	40.07	Horizontal
17979.5992	-38.83	-13.00	25.83	Horizontal

7.1.1.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
109.6410	-65.30	-13.00	52.30	Vertical
557.3669	-66.59	-13.00	53.59	Vertical
2116.2232	-53.00	-13.00	40.00	Vertical
2821.5643	-55.73	-13.00	42.73	Vertical
14707.0683	-43.10	-13.00	30.10	Vertical
17994.5998	-33.55	-13.00	20.55	Vertical
40.2825	-64.01	-13.00	51.01	Horizontal
1410.4821	-54.25	-13.00	41.25	Horizontal
2116.2232	-41.31	-13.00	28.31	Horizontal
2821.5643	-48.19	-13.00	35.19	Horizontal
3526.8211	-51.96	-13.00	38.96	Horizontal
17991.5997	-38.33	-13.00	25.33	Horizontal



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7.1.1.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
110.0290	-65.44	-13.00	52.44	Vertical
575.0218	-65.98	-13.00	52.98	Vertical
1422.4845	-55.40	-13.00	42.40	Vertical
2465.4931	-43.13	-13.00	30.13	Vertical
16916.3567	-40.89	-13.00	27.89	Vertical
17957.9983	-34.58	-13.00	21.58	Vertical
43.2897	-64.32	-13.00	51.32	Horizontal
243.5077	-68.48	-13.00	55.48	Horizontal
1422.4845	-50.94	-13.00	37.94	Horizontal
2134.2268	-50.54	-13.00	37.54	Horizontal
2465.4931	-42.25	-13.00	29.25	Horizontal
16904.9562	-39.11	-13.00	26.11	Horizontal

NOTE:

- 1) The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 2) only the worst case data presented in this report.



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8 Frequency Stability

8.1 Frequency Error VS. Voltage

Test Band	Test Mode	Test Channel	RB Config	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Limit (ppm)	Verdict
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	TN	VL	-14.53	-0.020708	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	TN	VN	13.85	0.019740	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	TN	VH	10.50	0.014972	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	TN	VL	-4.85	-0.006862	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	TN	VN	7.41	0.010473	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	TN	VH	13.13	0.018560	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	TN	VL	0.56	0.000788	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	TN	VN	-6.70	-0.009384	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	TN	VH	7.34	0.010289	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	TN	VL	14.84	0.021157	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	TN	VN	-1.70	-0.002427	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	TN	VH	-12.14	-0.017313	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	TN	VL	-11.75	-0.016606	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	TN	VN	14.91	0.021080	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	TN	VH	-6.69	-0.009453	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	TN	VL	-12.46	-0.017457	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	TN	VN	5.46	0.007650	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	TN	VH	9.33	0.013072	±2.5	PASS



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8.2 Frequency Error VS. Temperature

Test Band	Test Mode	Test Channel	RB Config	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Limit (ppm)	Verdict
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	VN	-30	-0.59	-0.000838	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	VN	-20	-5.82	-0.008301	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	VN	-10	-9.68	-0.013796	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	VN	0	0.33	0.000467	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	VN	10	3.44	0.004903	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	VN	20	13.19	0.018804	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	VN	30	-3.36	-0.004794	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	VN	40	-4.57	-0.006522	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	LCH	6RB#0	VN	50	-10.53	-0.015004	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	VN	-30	-0.70	-0.000992	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	VN	-20	-13.55	-0.019150	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	VN	-10	8.98	0.012692	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	VN	0	14.95	0.021129	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	VN	10	-6.72	-0.009500	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	VN	20	14.12	0.019956	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	VN	30	-5.62	-0.007945	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	VN	40	1.37	0.001938	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	MCH	6RB#0	VN	50	-6.41	-0.009058	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	VN	-30	-12.25	-0.017168	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	VN	-20	-5.14	-0.007202	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	VN	-10	9.91	0.013894	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	VN	0	4.09	0.005730	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	VN	10	-4.80	-0.006725	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	VN	20	-10.60	-0.014863	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	VN	30	13.65	0.019136	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	VN	40	-14.43	-0.020228	±2.5	PASS
CatM1 Band 12	QPSK 5MHz	HCH	6RB#0	VN	50	-8.87	-0.012433	±2.5	PASS



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Test Band	Test Mode	Test Channel	RB Config	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Limit (ppm)	Verdict
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	VN	-30	-2.25	-0.003209	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	VN	-20	-3.15	-0.004492	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	VN	-10	-5.78	-0.008236	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	VN	0	-3.70	-0.005270	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	VN	10	0.17	0.000243	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	VN	20	8.84	0.012603	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	VN	30	-3.36	-0.004794	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	VN	40	-14.80	-0.021101	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	LCH	5RB#0	VN	50	-4.04	-0.005755	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	VN	-30	-10.81	-0.015273	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	VN	-20	6.44	0.009099	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	VN	-10	-5.37	-0.007585	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	VN	0	-7.69	-0.010862	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	VN	10	-14.71	-0.020796	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	VN	20	-4.42	-0.006254	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	VN	30	5.34	0.007551	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	VN	40	10.86	0.015347	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	MCH	5RB#0	VN	50	0.09	0.000131	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	VN	-30	10.16	0.014235	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	VN	-20	-10.72	-0.015024	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	VN	-10	3.14	0.004407	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	VN	0	10.43	0.014618	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	VN	10	-9.83	-0.013770	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	VN	20	-7.27	-0.010183	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	VN	30	13.53	0.018964	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	VN	40	12.19	0.017085	±2.5	PASS
CatM1 Band 12	16QAM 5MHz	HCH	5RB#0	VN	50	3.53	0.004949	±2.5	PASS

The End



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Appendix B

LTE-CatM1 Band 13



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1 Effective Radiated Power Output Data

Effective Radiated Power of Transmitter (ERP) for LTE-CatM1 Band 13

Test Band	Test Mode	Test Bandwidth	Test channel	Test RB	Conducted Power (dBm)	ERP (dBm)	limit (dBm)	Verdict
CatM1 Band 13	QPSK	5M	LCH	1RB#0	20.60	19.56	34.77	PASS
CatM1 Band 13	QPSK	5M	LCH	5RB#0	19.20	18.16	34.77	PASS
CatM1 Band 13	QPSK	5M	LCH	6RB#0	19.18	18.14	34.77	PASS
CatM1 Band 13	QPSK	5M	MCH	1RB#0	20.70	19.66	34.77	PASS
CatM1 Band 13	QPSK	5M	MCH	5RB#0	19.29	18.25	34.77	PASS
CatM1 Band 13	QPSK	5M	MCH	6RB#0	19.28	18.24	34.77	PASS
CatM1 Band 13	QPSK	5M	HCH	1RB#0	20.71	19.67	34.77	PASS
CatM1 Band 13	QPSK	5M	HCH	5RB#0	19.24	18.20	34.77	PASS
CatM1 Band 13	QPSK	5M	HCH	6RB#0	19.22	18.18	34.77	PASS
CatM1 Band 13	16QAM	5M	LCH	1RB#0	20.48	19.44	34.77	PASS
CatM1 Band 13	16QAM	5M	LCH	5RB#0	19.26	18.22	34.77	PASS
CatM1 Band 13	16QAM	5M	MCH	1RB#0	20.27	19.23	34.77	PASS
CatM1 Band 13	16QAM	5M	MCH	5RB#0	19.31	18.27	34.77	PASS
CatM1 Band 13	16QAM	5M	HCH	1RB#0	20.31	19.27	34.77	PASS
CatM1 Band 13	16QAM	5M	HCH	5RB#0	19.34	18.30	34.77	PASS
CatM1 Band 13	QPSK	10M	MCH	1RB#0	20.92	19.88	34.77	PASS
CatM1 Band 13	QPSK	10M	MCH	5RB#0	20.62	19.58	34.77	PASS
CatM1 Band 13	QPSK	10M	MCH	6RB#0	19.39	18.35	34.77	PASS
CatM1 Band 13	16QAM	10M	MCH	1RB#0	20.44	19.40	34.77	PASS
CatM1 Band 13	16QAM	10M	MCH	5RB#0	20.59	19.55	34.77	PASS

Note:

a: For getting the EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$EIRP [dBm] = \text{Conducted Power} [dBm] + \text{Gain} [dBi]$

$ERP [dBm] = \text{Conducted Power} [dBm] + \text{Gain} [dBi] - 2.15$



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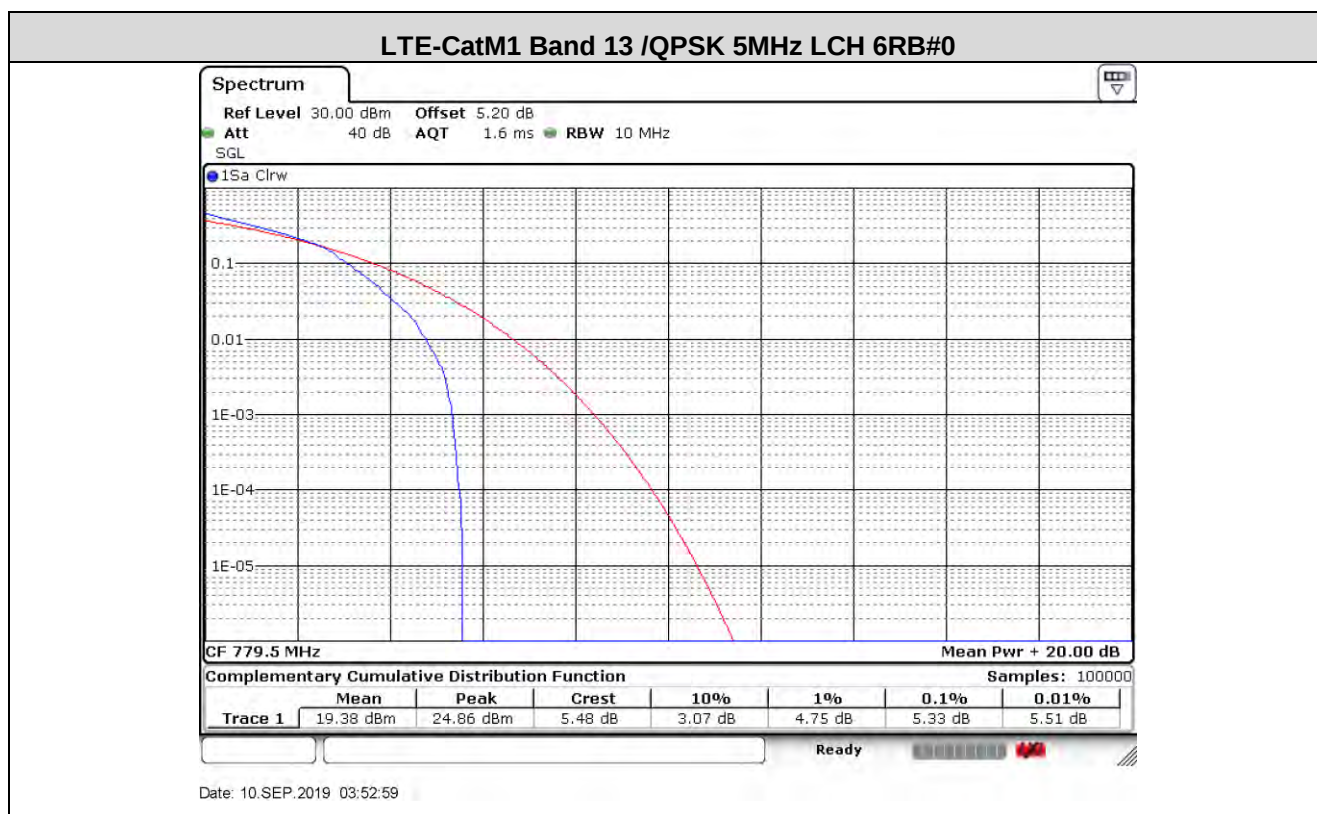


2 Peak-to-Average Ratio

2.1 Test Results

Test Band	Test Mode	RB Config	Test Channel	Measured [dB]	Limit [dB]	Verdict
CatM1 Band 13	QPSK/5M	6RB#0	LCH	5.33	13	PASS
CatM1 Band 13	QPSK/5M	6RB#0	MCH	4.87	13	PASS
CatM1 Band 13	QPSK/5M	6RB#0	HCH	4.06	13	PASS
CatM1 Band 13	16QAM/5M	5RB#0	LCH	4.41	13	PASS
CatM1 Band 13	16QAM/5M	5RB#0	MCH	3.74	13	PASS
CatM1 Band 13	16QAM/5M	5RB#0	HCH	3.88	13	PASS

2.2 Test Plots



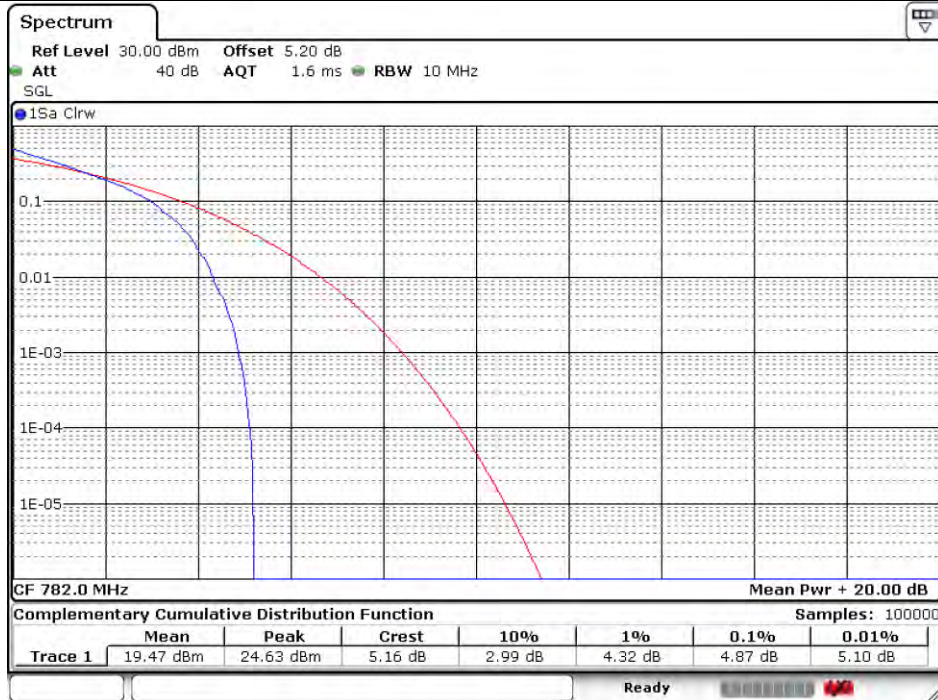
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LTE-CatM1 Band 13 /QPSK 5MHz MCH 6RB#0



Date: 10.SEP.2019 03:53:52

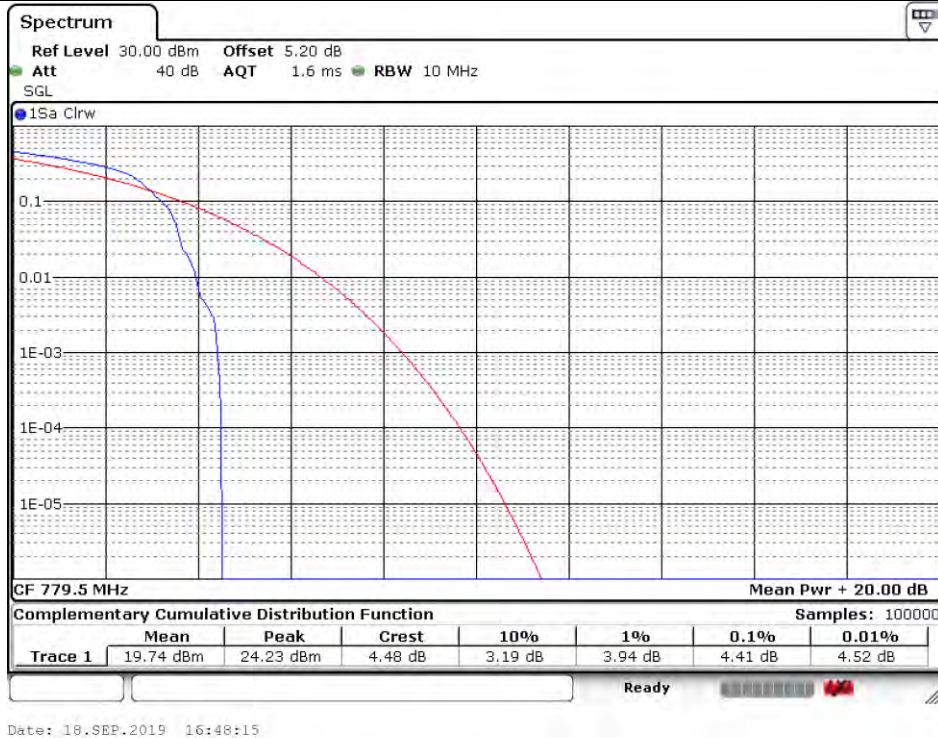
LTE-CatM1 Band 13 /QPSK 5MHz HCH 6RB#0



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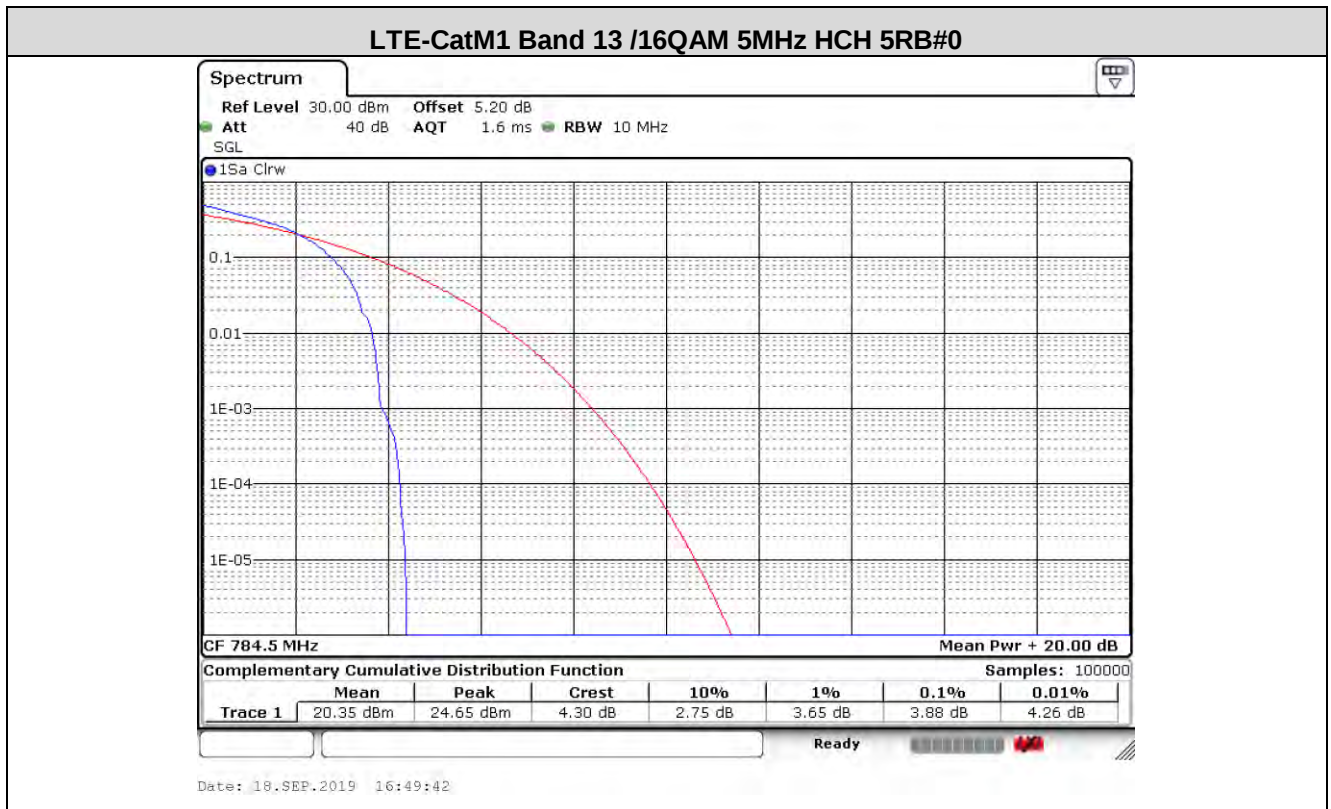


LTE-CatM1 Band 13 /16QAM 5MHz LCH 5RB#0



LTE-CatM1 Band 13 /16QAM 5MHz MCH 5RB#0





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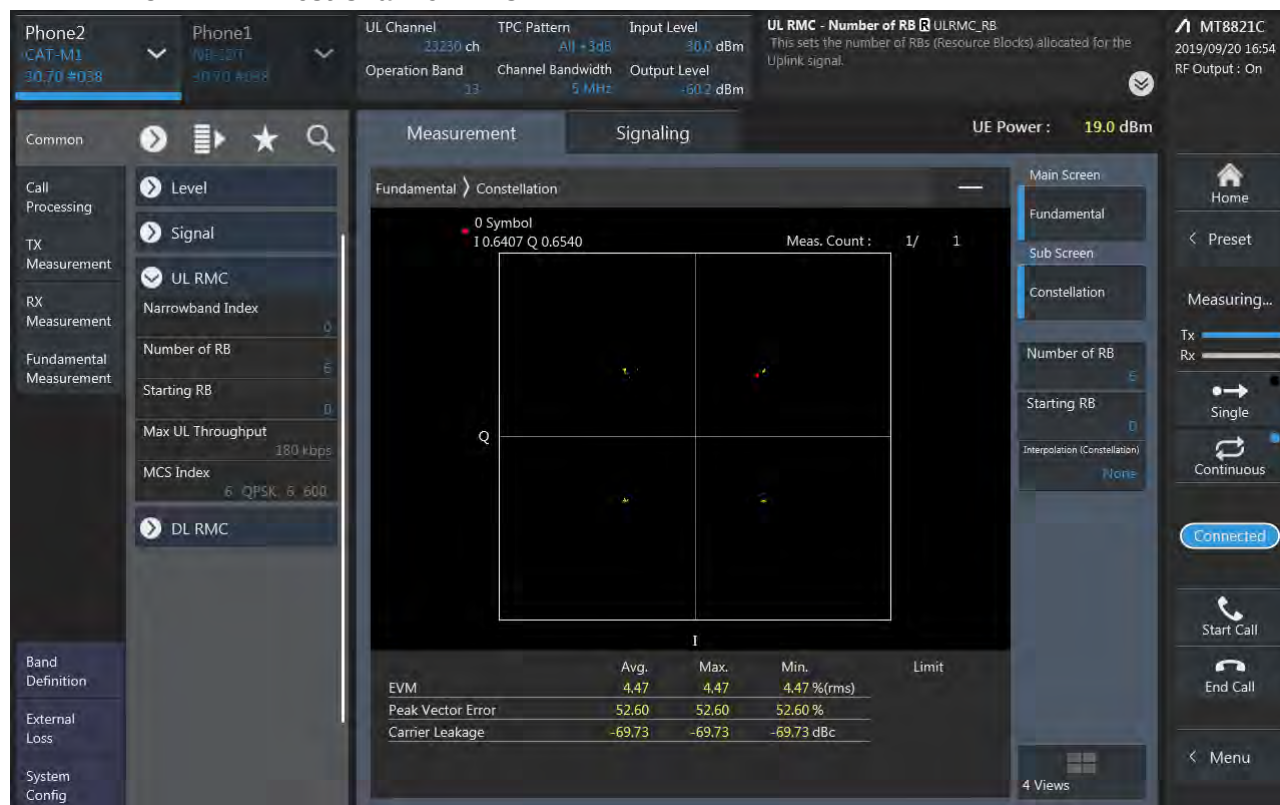
3 Modulation Characteristics

3.1 For LTE-CatM1

3.1.1 Test Band = LTE-CatM1 Band 13

3.1.1.1 Test Mode = LTE-CatM1 /QPSK 5MHz

3.1.1.1.1 Test Channel = MCH



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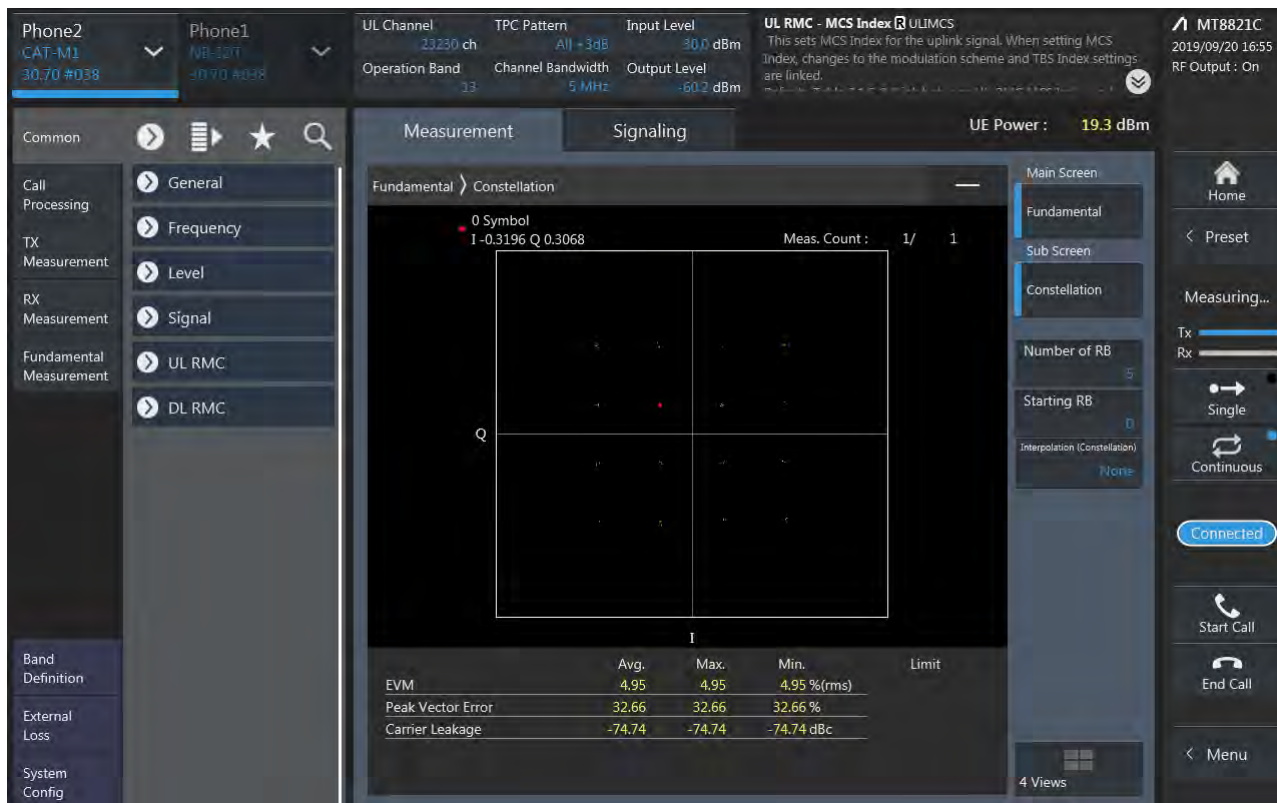
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3.1.1.2 Test Mode = LTE-CatM1 /16QAM 5MHz

3.1.1.2.1 Test Channel = MCH



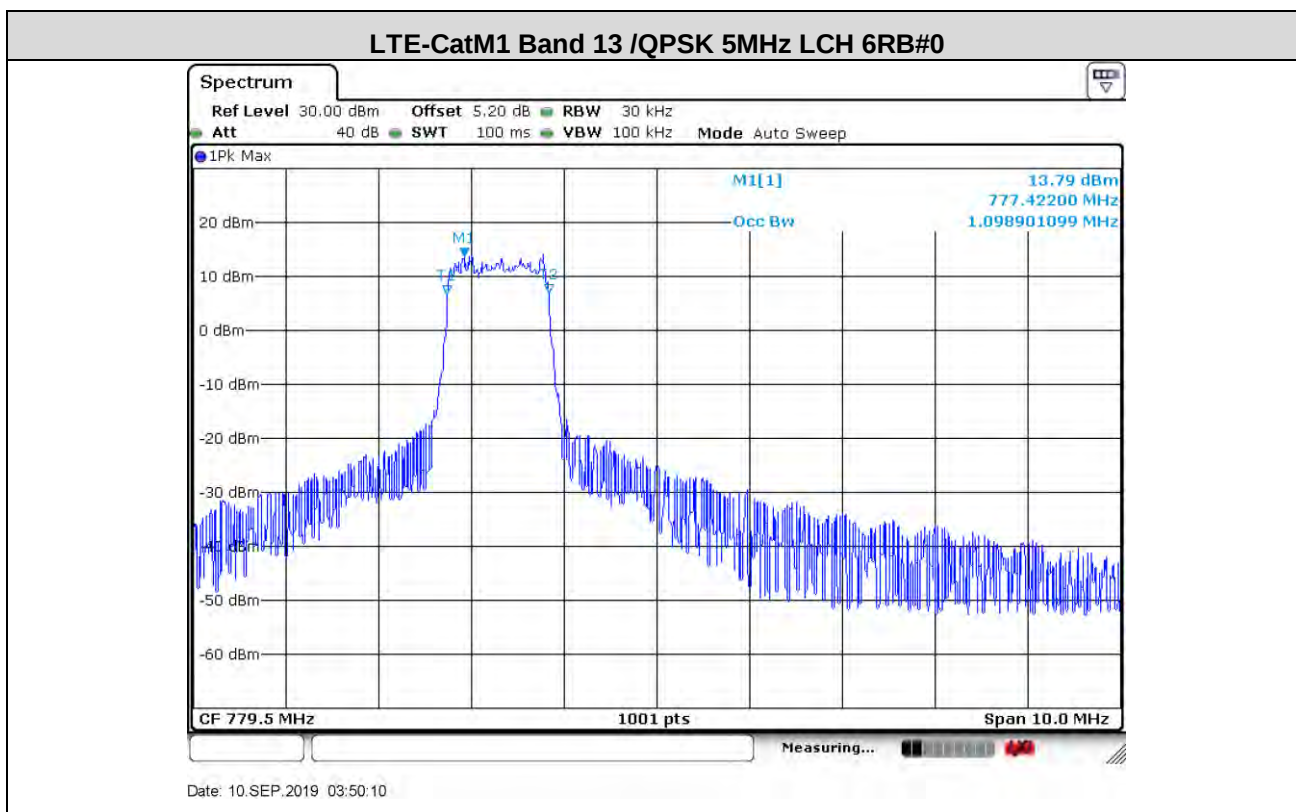


4 26dB Bandwidth and Occupied Bandwidth

4.1 Test Results

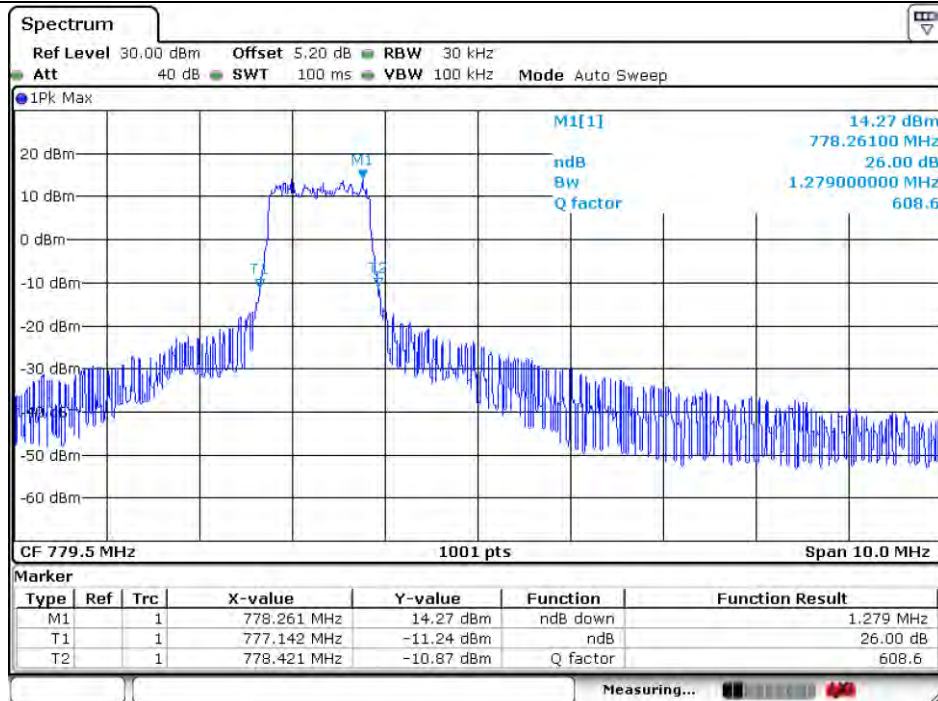
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	26dB Emission Bandwidth [MHz]	Verdict
CatM1 Band 13	QPSK/ 5MHz	LCH	1.10	1.28	PASS
CatM1 Band 13	QPSK/ 5MHz	MCH	1.10	1.26	PASS
CatM1 Band 13	QPSK/ 5MHz	HCH	1.11	1.30	PASS
CatM1 Band 13	16QAM/ 5MHz	LCH	0.91	1.08	PASS
CatM1 Band 13	16QAM/ 5MHz	MCH	0.92	1.09	PASS
CatM1 Band 13	16QAM/ 5MHz	HCH	0.91	1.09	PASS

4.2 Test Plots



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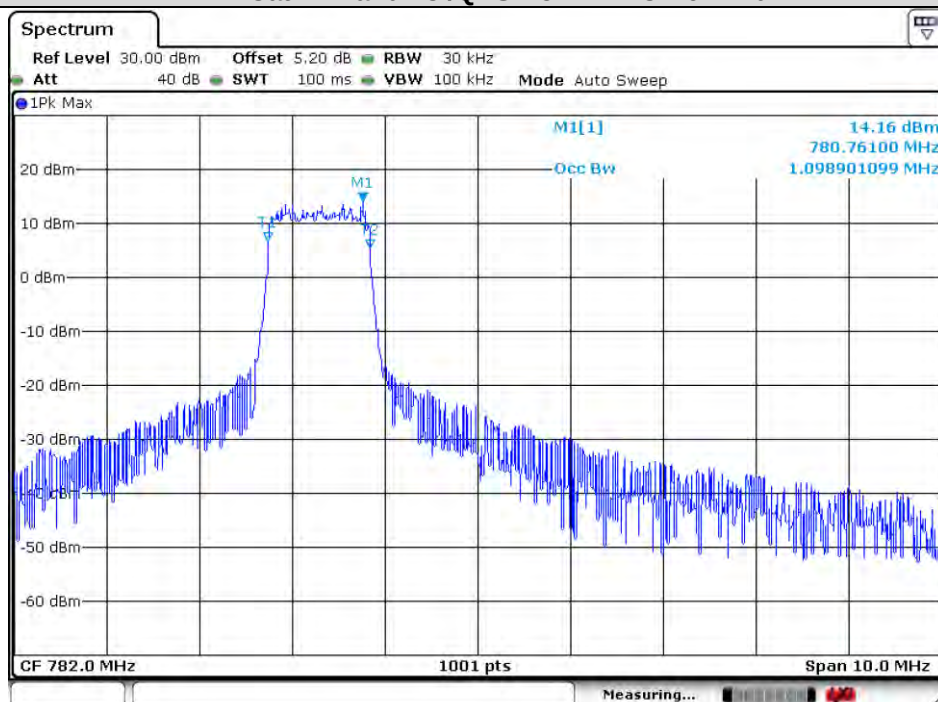


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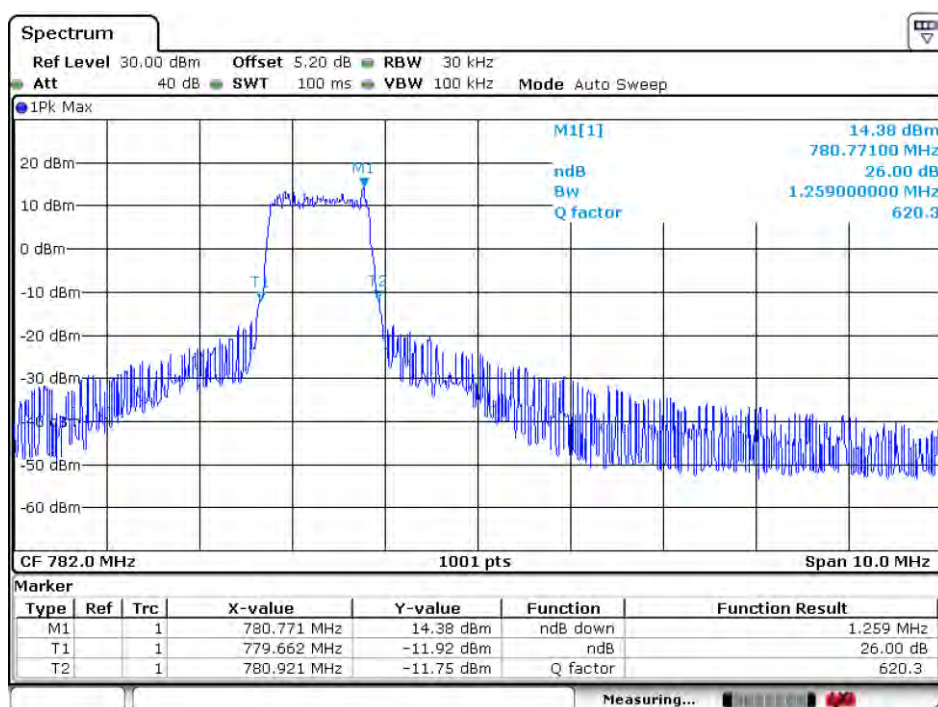




LTE-CatM1 Band 13 /QPSK 5MHz MCH 6RB#0



Date: 10.SEP.2019 03:48:44



Date: 10.SEP.2019 03:48:25



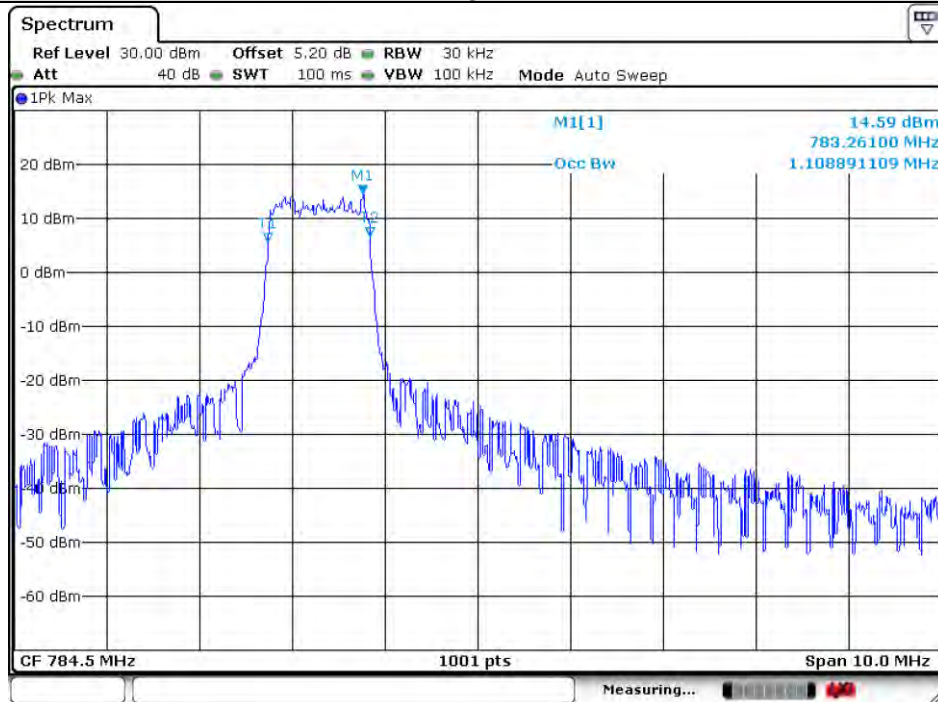
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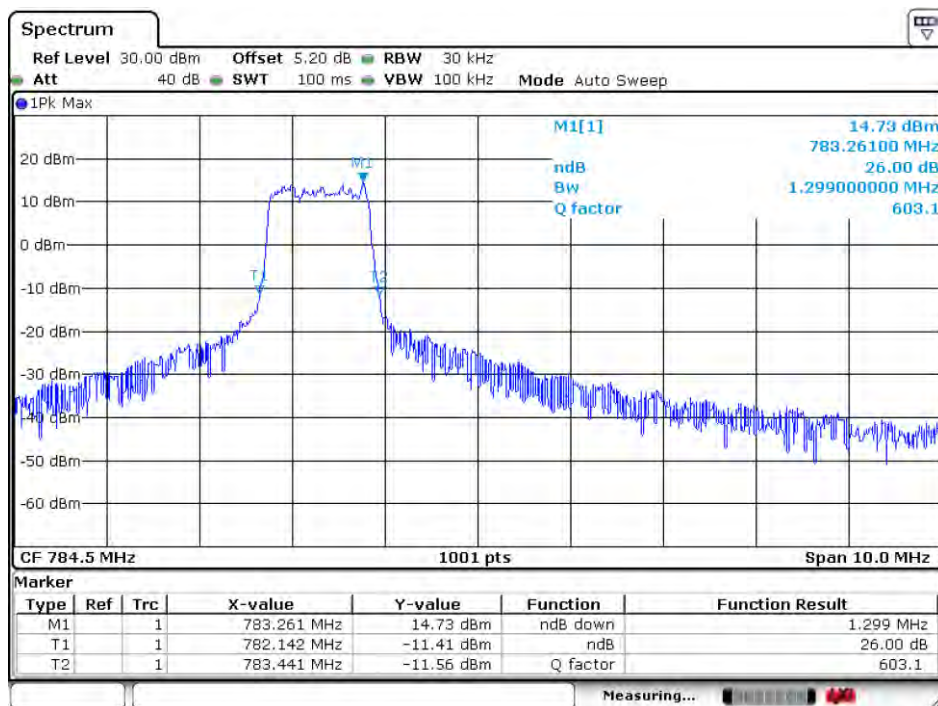
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LTE-CatM1 Band 13 /QPSK 5MHz HCH 6RB#0



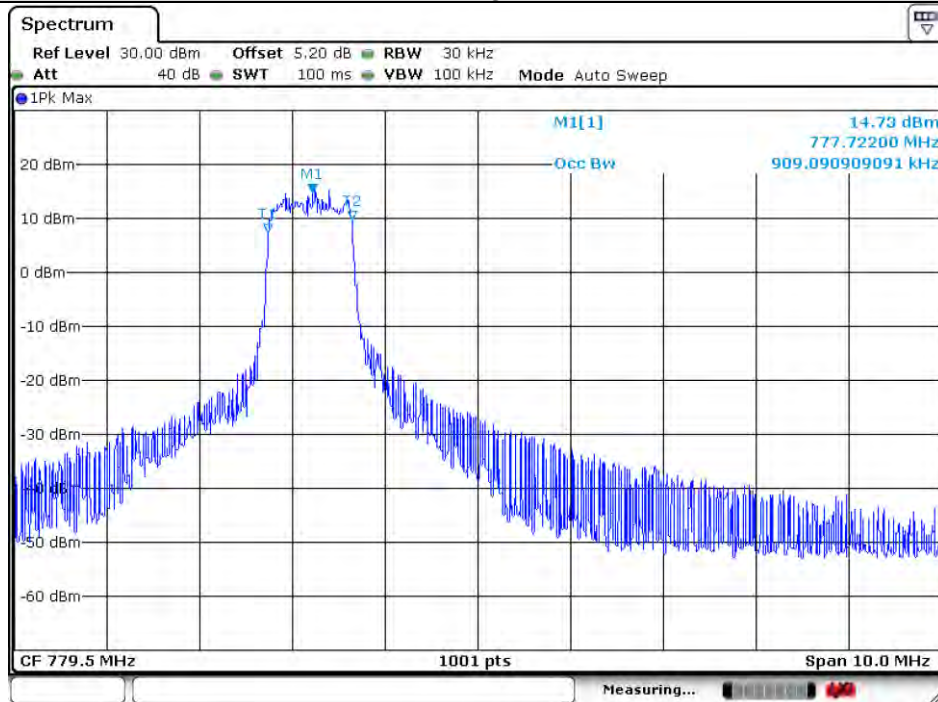
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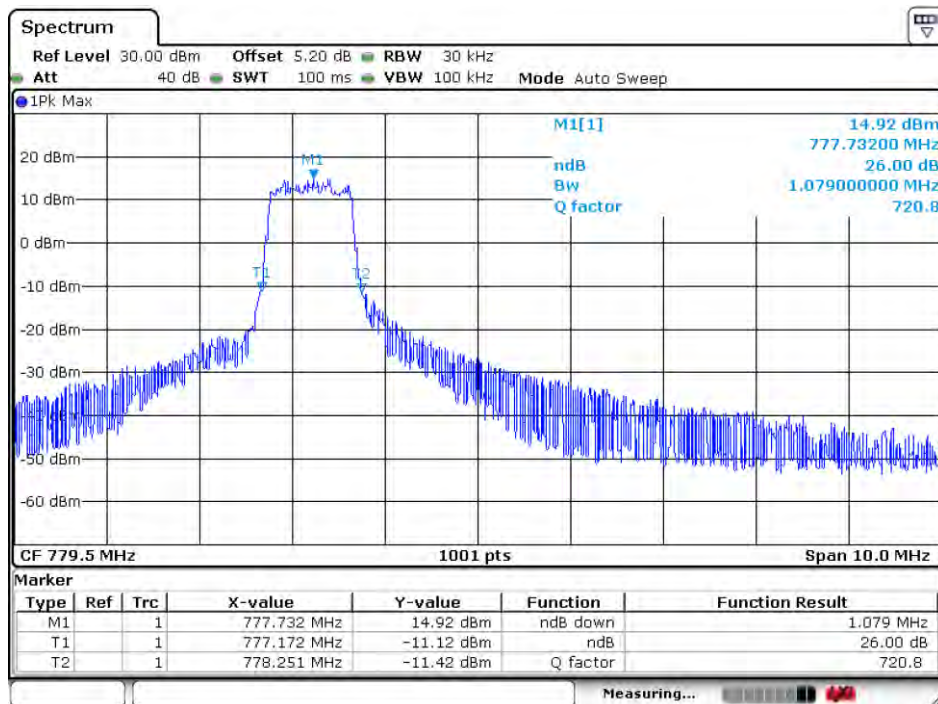
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LTE-CatM1 Band 13 /16QAM 5MHz LCH 5RB#0



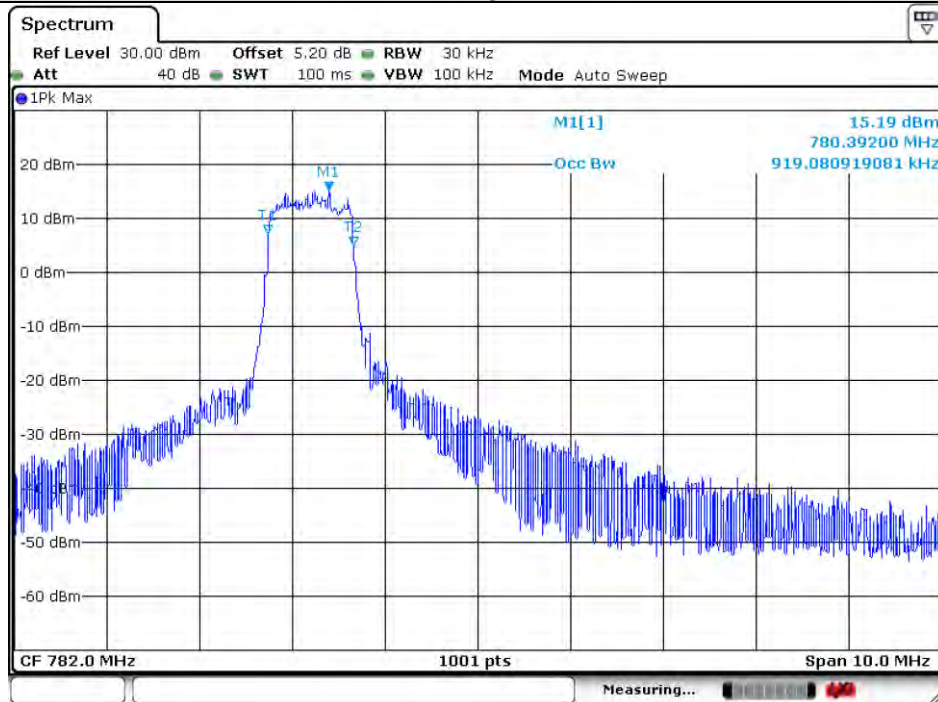
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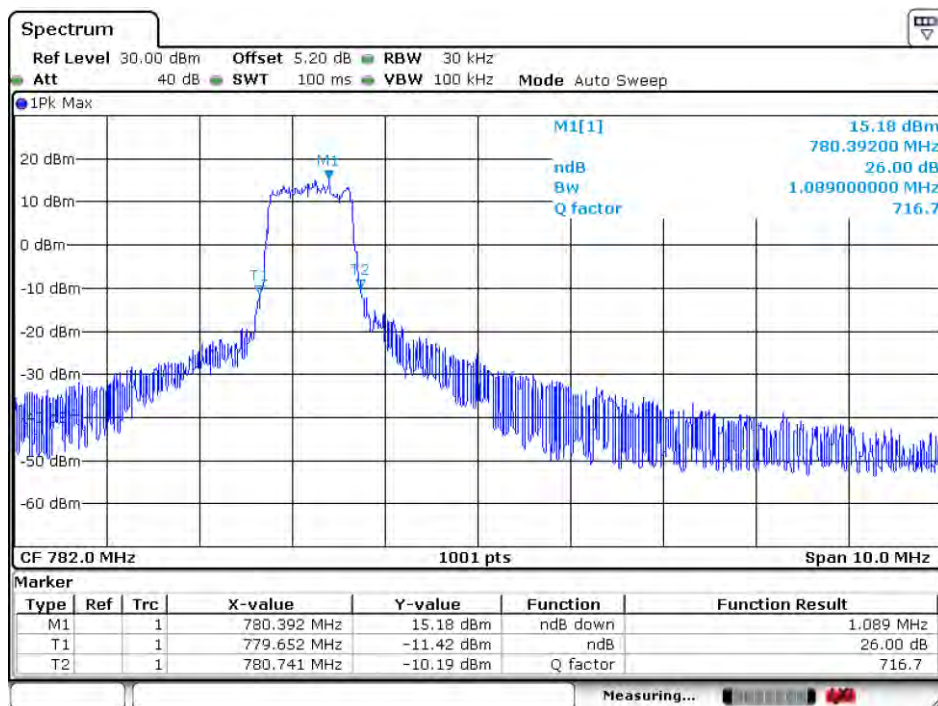
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LTE-CatM1 Band 13 /16QAM 5MHz MCH 5RB#0



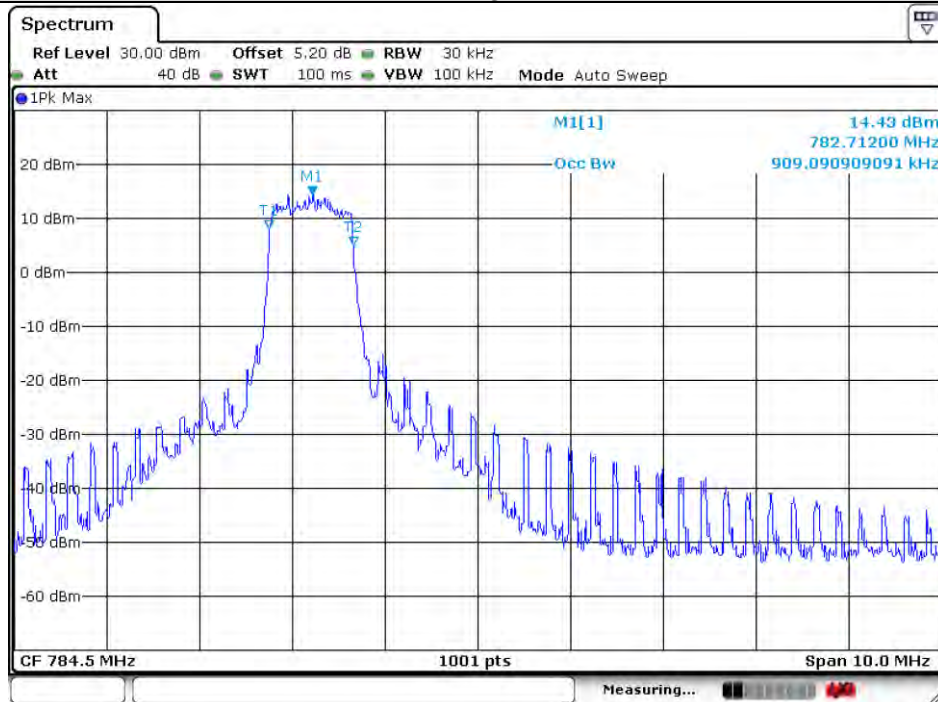
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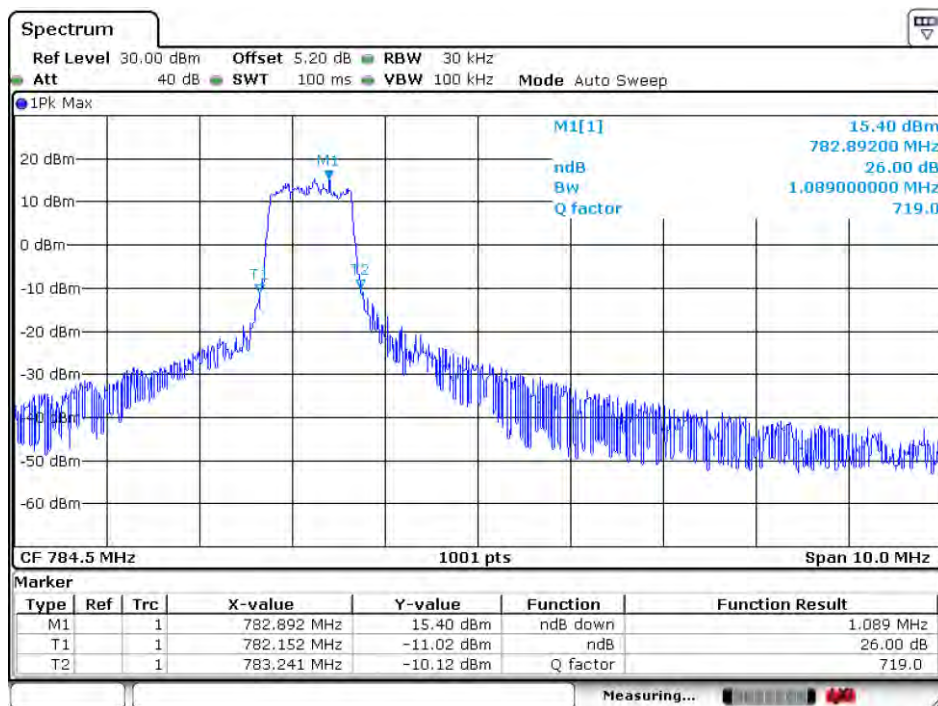
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LTE-CatM1 Band 13 /16QAM 5MHz HCH 5RB#0



Date: 10.SEP.2019 03:46:37



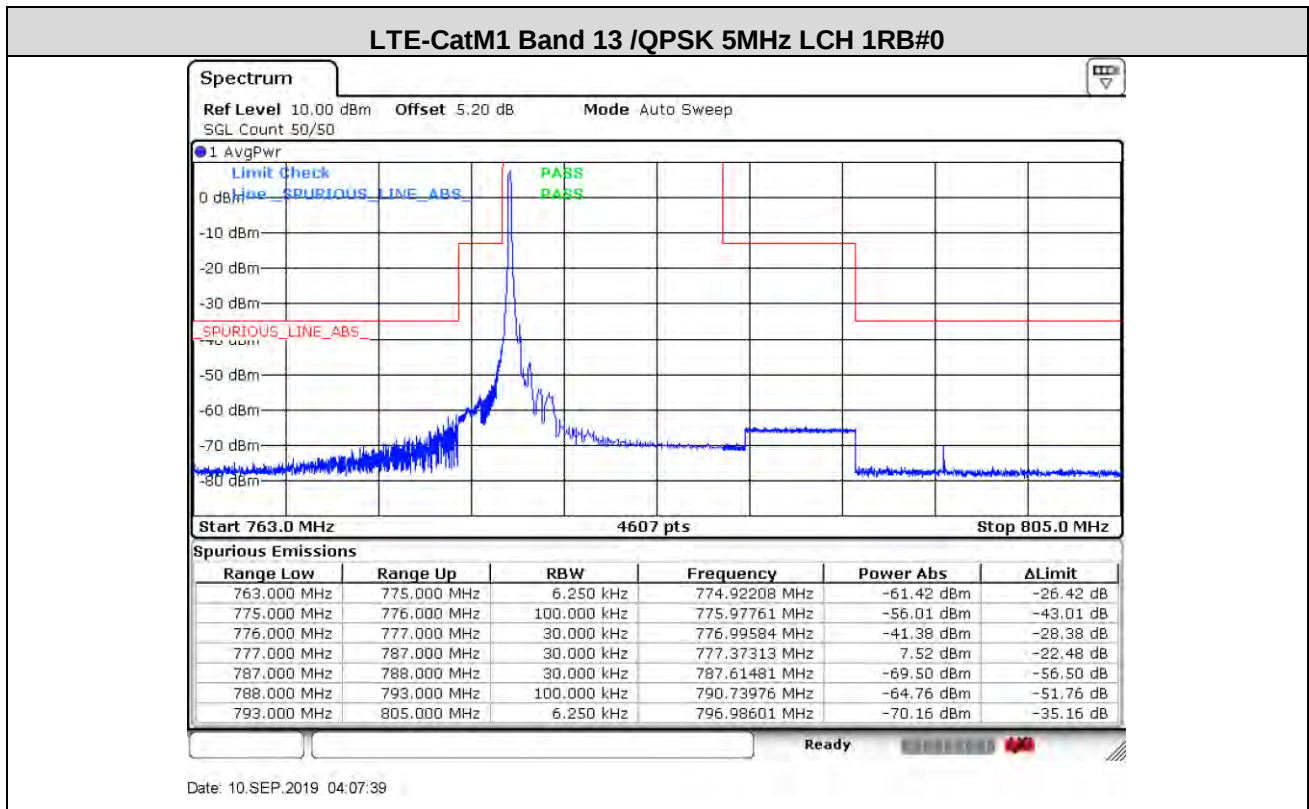
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5 Band Edges Compliance

5.1 Test Plots

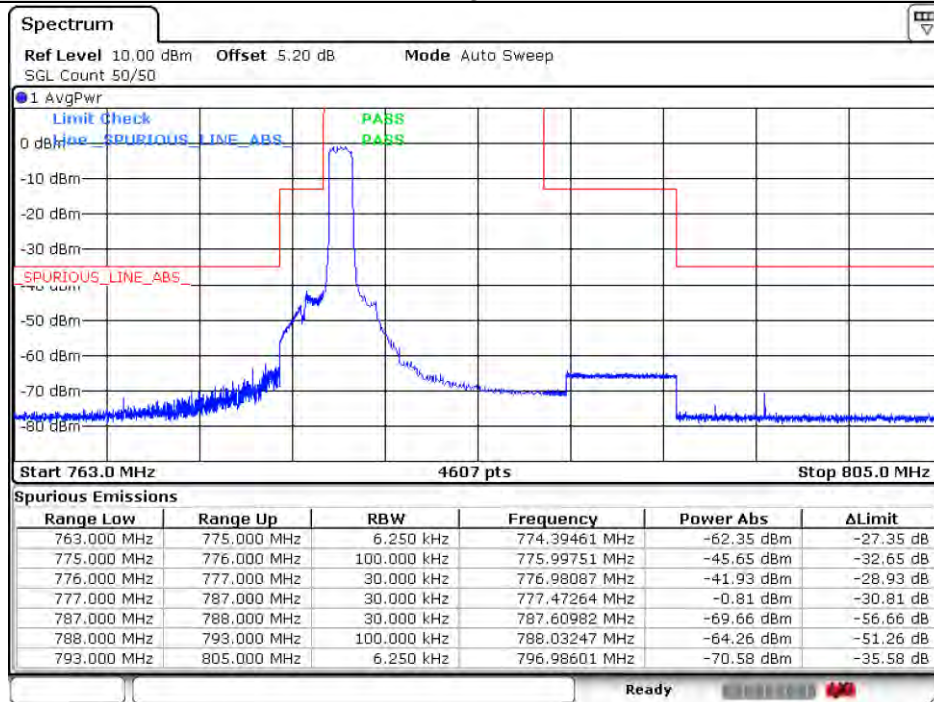


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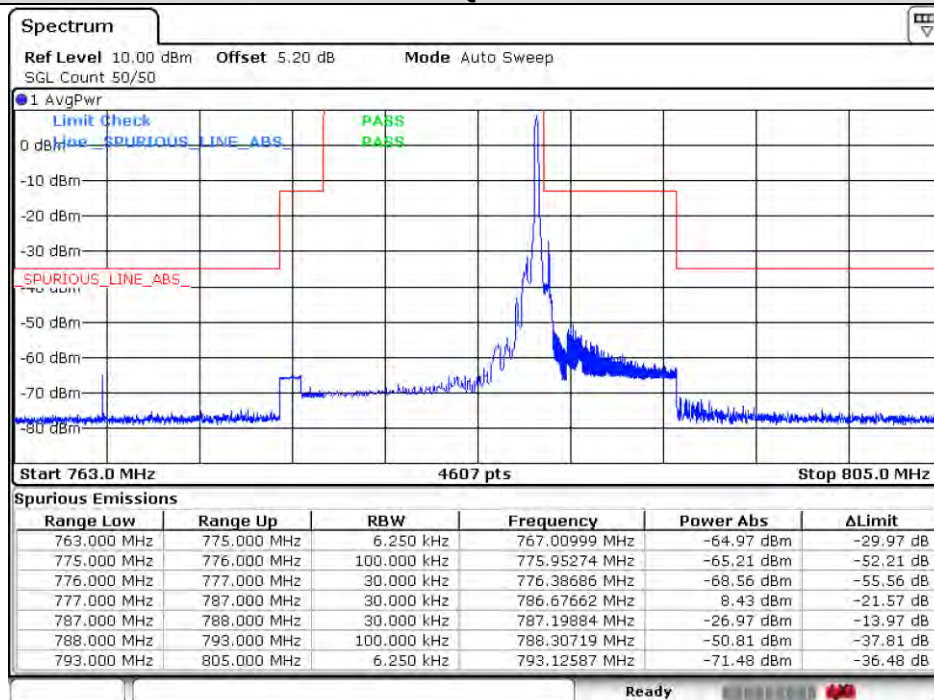
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LTE-CatM1 Band 13 /QPSK 5MHz LCH 6RB#0



Date: 10.SEP.2019 04:08:42

LTE-CatM1 Band 13 /QPSK 5MHz HCH 1RB#0



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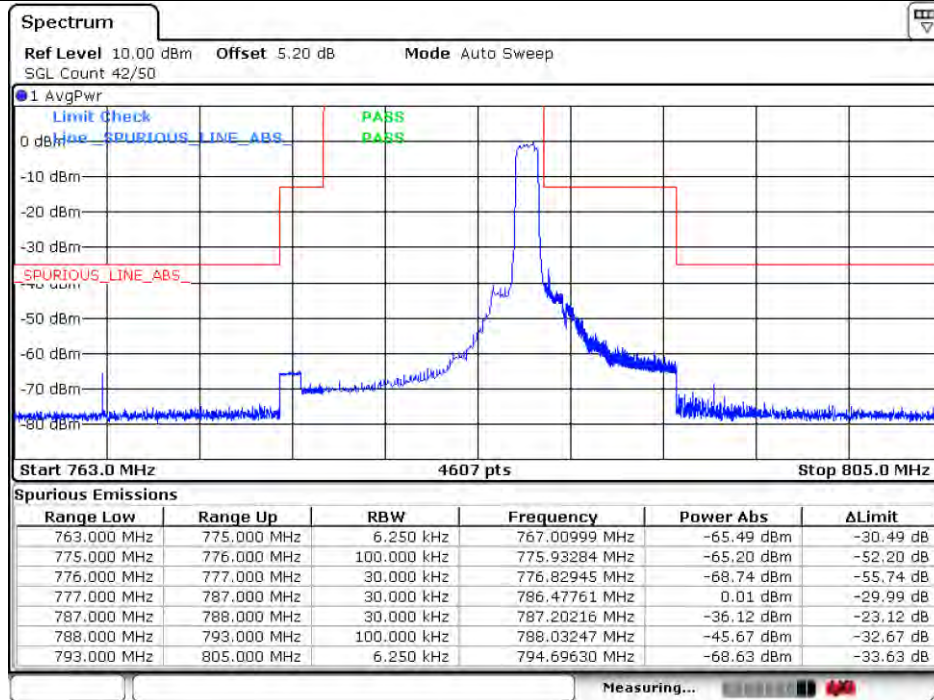
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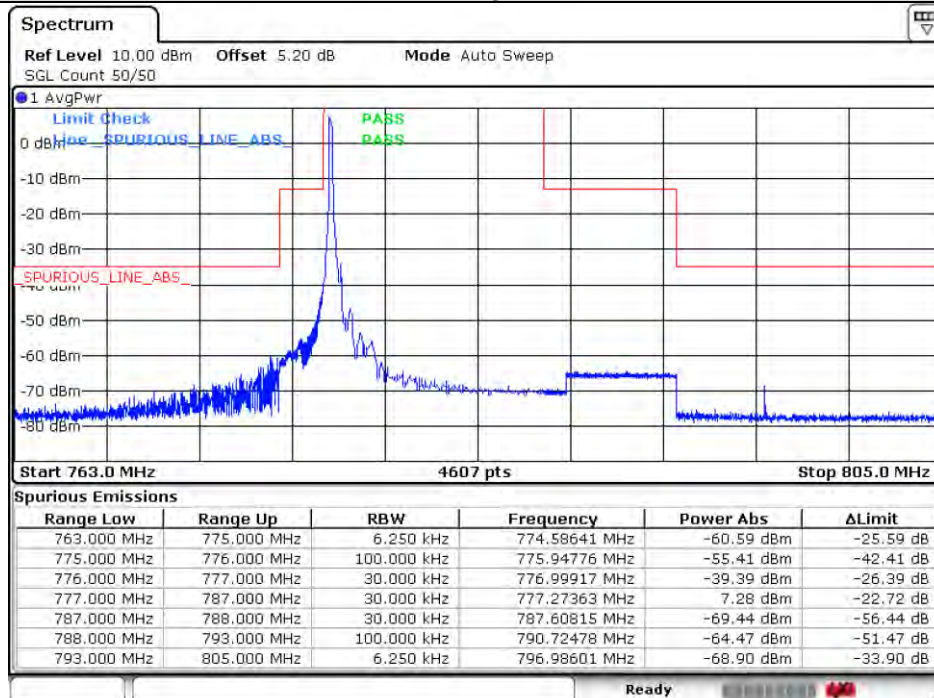
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LTE-CatM1 Band 13 /QPSK 5MHz HCH 6RB#0



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LTE-CatM1 Band 13 /16QAM 5MHz LCH 1RB#0



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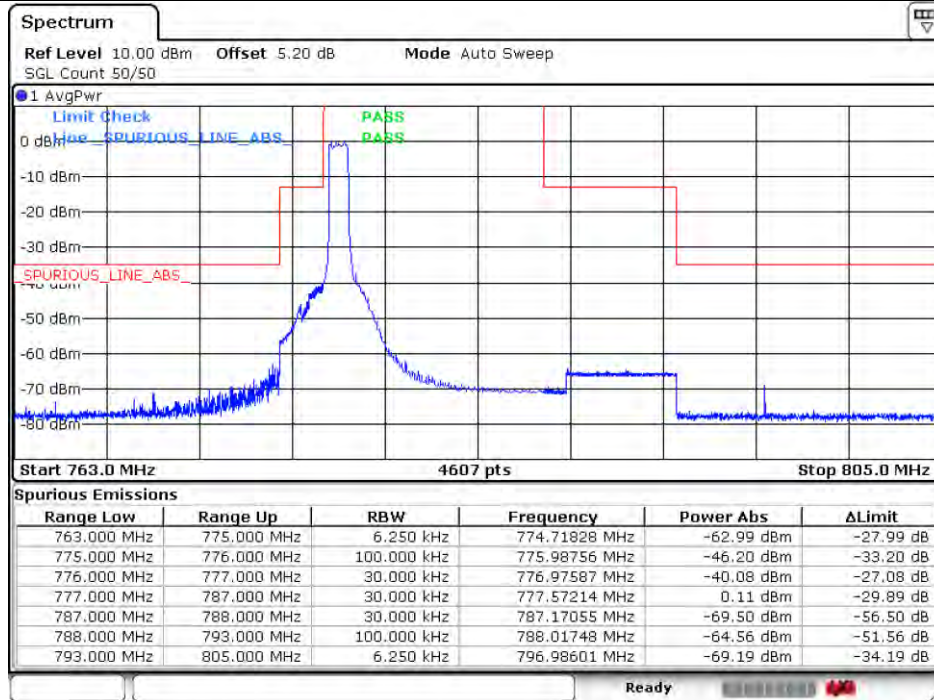
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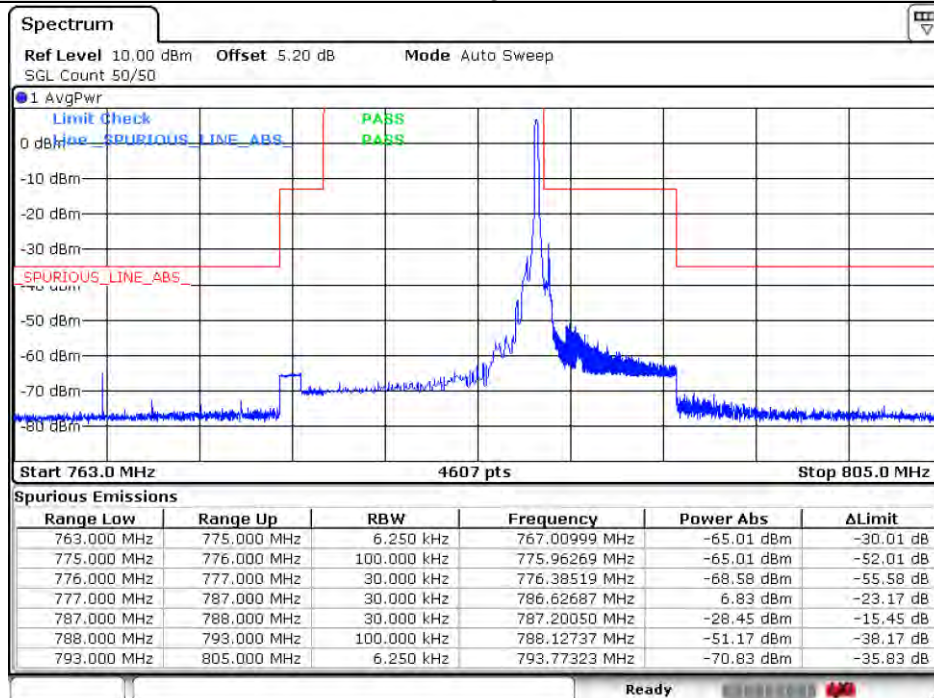
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LTE-CatM1 Band 13 /16QAM 5MHz LCH 5RB#0



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LTE-CatM1 Band 13 /16QAM 5MHz HCH 1RB#0



Date: 10.SEP.2019 04:13:55



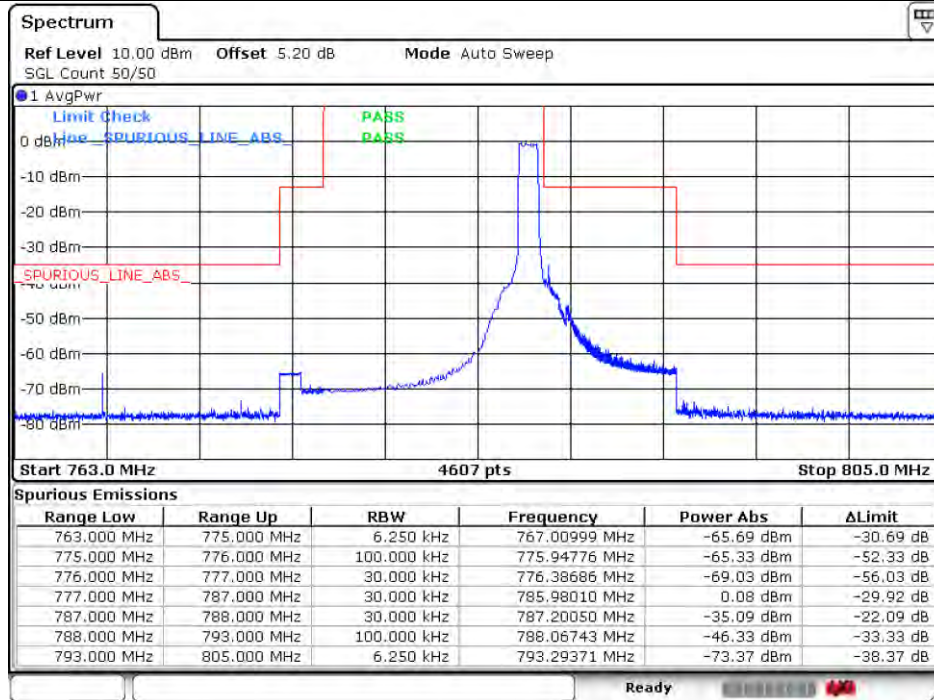
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LTE-CatM1 Band 13 /16QAM 5MHz HCH 5RB#0



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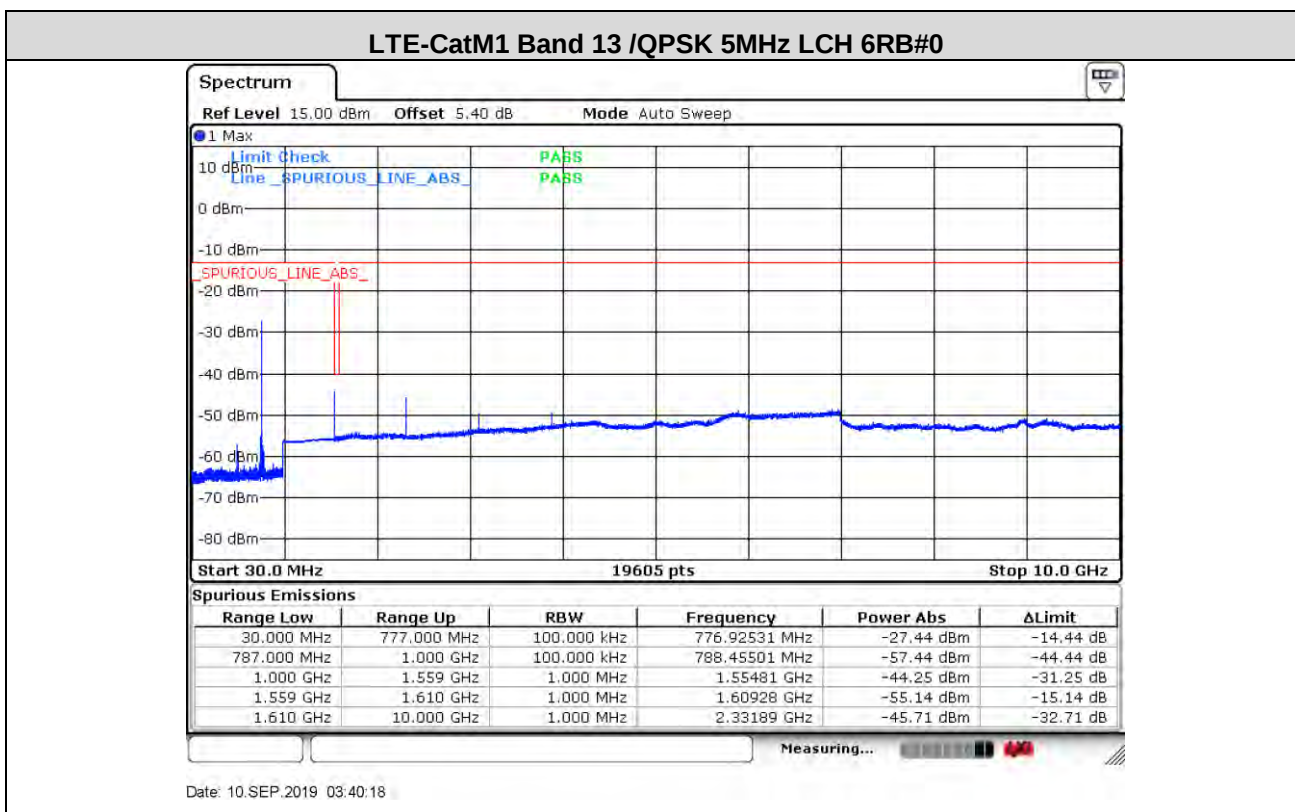


6 Spurious Emission at Antenna Terminal

NOTE1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

Part I - Test Plots

6.1 Test Plots



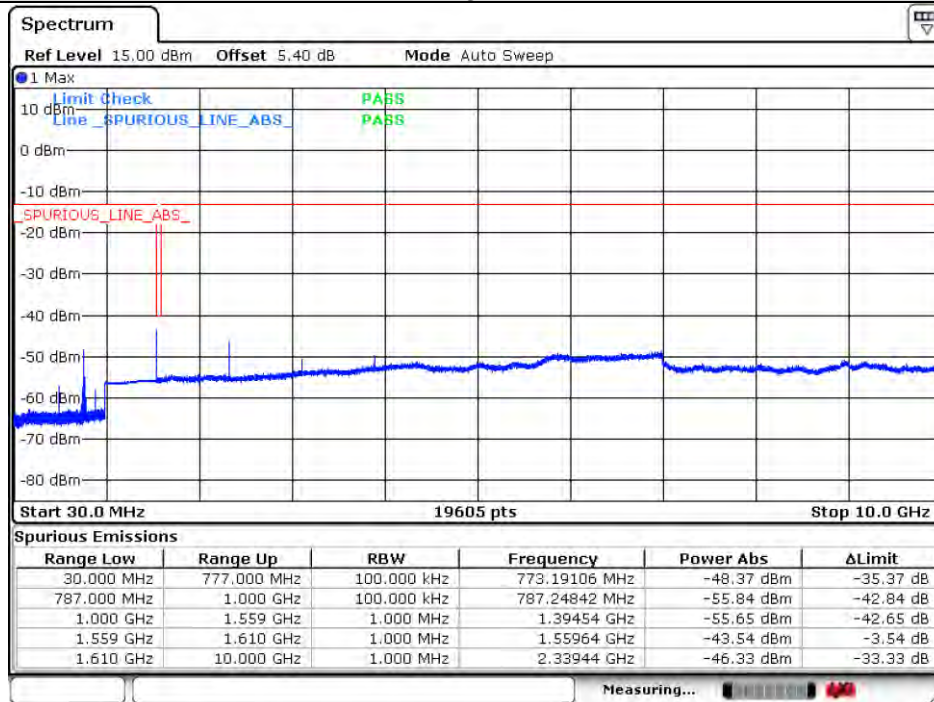
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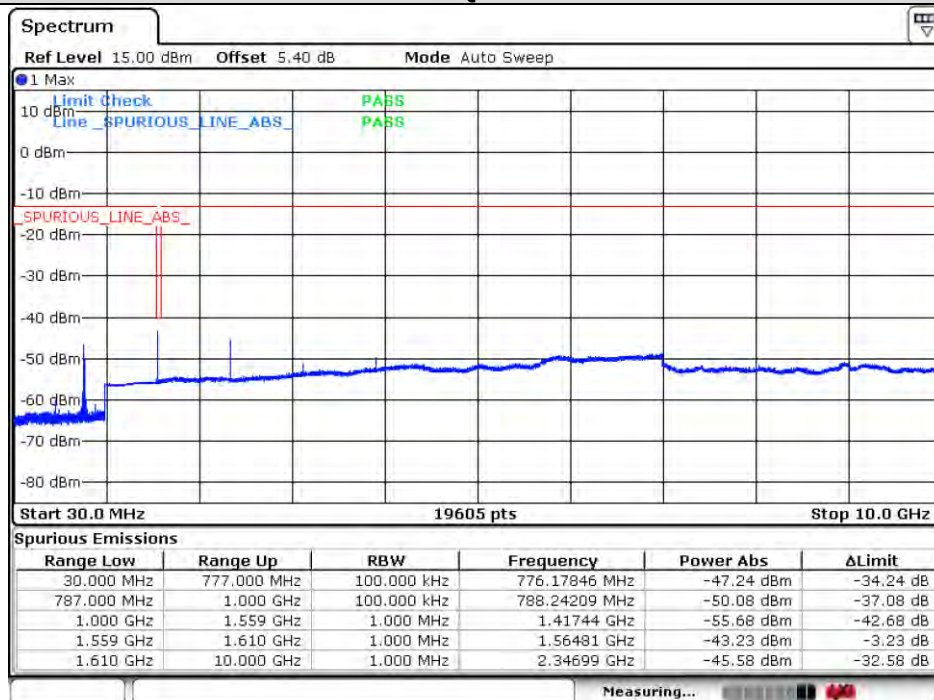
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LTE-CatM1 Band 13 /QPSK 5MHz MCH 6RB#0



Date: 10.SEP.2019 03:41:38

LTE-CatM1 Band 13 /QPSK 5MHz HCH 6RB#0



Date: 10.SEP.2019 03:42:49



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7 Field Strength of Spurious Radiation

7.1 For LTE-CatM1

7.1.1 Test Band = LTE-CatM1 Band 13

7.1.1.1 Test Mode =LTE-CatM1/QPSK

7.1.1.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
108.5739	-66.15	-13.00	53.15	Vertical
604.6567	-64.44	-13.00	51.44	Vertical
1559.5109	-58.84	-40.00	18.84	Vertical
2465.8932	-42.25	-13.00	29.25	Vertical
16855.1542	-41.55	-13.00	28.55	Vertical
17996.9999	-34.37	-13.00	21.37	Vertical
43.2897	-65.10	-13.00	52.10	Horizontal
590.5425	-64.18	-13.00	51.18	Horizontal
1559.5109	-53.32	-40.00	13.32	Horizontal
2465.8932	-41.17	-13.00	28.17	Horizontal
3109.2044	-52.56	-13.00	39.56	Horizontal
16994.9598	-38.76	-13.00	25.76	Horizontal

7.1.1.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
113.9577	-65.02	-13.00	52.02	Vertical
577.9319	-65.33	-13.00	52.33	Vertical
1605.4931	-53.64	-40.00	13.64	Vertical
10088.0835	-48.95	-13.00	35.95	Vertical
14669.8668	-43.08	-13.00	30.08	Vertical
17997.5999	-33.36	-13.00	20.36	Vertical
43.7747	-63.94	-13.00	50.94	Horizontal
1559.7119	-55.69	-40.00	15.69	Horizontal
2339.4679	-43.22	-13.00	30.22	Horizontal
2459.4919	-32.68	-13.00	19.68	Horizontal
16393.1357	-38.77	-13.00	25.77	Horizontal
17996.3999	-38.51	-13.00	25.51	Horizontal



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7.1.1.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
106.7308	-64.97	-13.00	51.97	Vertical
599.9035	-64.43	-13.00	51.43	Vertical
1564.5129	-55.97	-40.00	15.97	Vertical
2465.8932	-44.69	-13.00	31.69	Vertical
16912.1565	-40.95	-13.00	27.95	Vertical
17998.1999	-34.89	-13.00	21.89	Vertical
41.8831	-64.96	-13.00	51.96	Horizontal
237.0569	-68.40	-13.00	55.40	Horizontal
1564.5129	-52.27	-40.00	12.27	Horizontal
2465.8932	-42.37	-13.00	29.37	Horizontal
3129.6052	-50.59	-13.00	37.59	Horizontal
16993.1597	-39.45	-13.00	26.45	Horizontal

NOTE:

- 1) The disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 2) only the worst case data presented in this report.



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8 Frequency Stability

8.1 Frequency Error VS. Voltage

Test Band	Test Mode	Test Channel	RB Config	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Limit (ppm)	Verdict
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	TN	VL	-9.02	-0.011566	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	TN	VN	-11.72	-0.015037	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	TN	VH	-4.31	-0.005528	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	TN	VL	6.56	0.008383	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	TN	VN	-0.09	-0.000109	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	TN	VH	8.04	0.010285	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	TN	VL	-1.50	-0.001909	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	TN	VN	-12.45	-0.015867	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	TN	VH	4.54	0.005792	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	TN	VL	2.40	0.003081	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	TN	VN	7.70	0.009876	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	TN	VH	-0.03	-0.000043	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	TN	VL	-4.13	-0.005284	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	TN	VN	-4.34	-0.005544	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	TN	VH	-5.50	-0.007035	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	TN	VL	7.97	0.010164	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	TN	VN	7.57	0.009648	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	TN	VH	13.58	0.017312	±2.5	PASS



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8.2 Frequency Error VS. Temperature

Test Band	Test Mode	Test Channel	RB Config	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Limit (ppm)	Verdict
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	VN	-30	13.65	0.017508	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	VN	-20	-9.78	-0.012547	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	VN	-10	-10.92	-0.014003	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	VN	0	4.82	0.006187	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	VN	10	5.42	0.006955	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	VN	20	-13.02	-0.016698	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	VN	30	9.28	0.011909	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	VN	40	0.95	0.001220	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	LCH	6RB#0	VN	50	6.18	0.007929	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	VN	-30	12.96	0.016568	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	VN	-20	12.86	0.016446	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	VN	-10	1.88	0.002400	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	VN	0	12.52	0.016012	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	VN	10	11.87	0.015179	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	VN	20	-12.21	-0.015610	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	VN	30	-1.28	-0.001632	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	VN	40	10.09	0.012904	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	MCH	6RB#0	VN	50	-2.97	-0.003795	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	VN	-30	2.48	0.003163	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	VN	-20	-4.84	-0.006167	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	VN	-10	1.29	0.001641	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	VN	0	10.03	0.012780	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	VN	10	-7.39	-0.009422	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	VN	20	-1.55	-0.001980	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	VN	30	-11.26	-0.014349	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	VN	40	11.65	0.014852	±2.5	PASS
CatM1 Band 13	QPSK 5MHz	HCH	6RB#0	VN	50	-5.21	-0.006637	±2.5	PASS



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Test Band	Test Mode	Test Channel	RB Config	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Limit (ppm)	Verdict
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	VN	-30	2.80	0.003594	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	VN	-20	1.87	0.002393	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	VN	-10	-2.38	-0.003052	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	VN	0	0.43	0.000549	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	VN	10	-4.93	-0.006326	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	VN	20	-9.83	-0.012607	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	VN	30	-2.75	-0.003524	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	VN	40	9.05	0.011604	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	LCH	5RB#0	VN	50	14.10	0.018083	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	VN	-30	12.88	0.016472	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	VN	-20	-13.21	-0.016890	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	VN	-10	-5.33	-0.006811	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	VN	0	-13.07	-0.016711	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	VN	10	-9.93	-0.012702	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	VN	20	6.97	0.008911	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	VN	30	-1.26	-0.001607	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	VN	40	-12.24	-0.015650	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	MCH	5RB#0	VN	50	-14.70	-0.018798	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	VN	-30	-6.32	-0.008062	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	VN	-20	-4.61	-0.005881	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	VN	-10	-5.06	-0.006449	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	VN	0	-9.83	-0.012527	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	VN	10	-10.24	-0.013053	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	VN	20	6.78	0.008646	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	VN	30	1.19	0.001522	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	VN	40	-2.87	-0.003656	±2.5	PASS
CatM1 Band 13	16QAM 5MHz	HCH	5RB#0	VN	50	-1.40	-0.001781	±2.5	PASS

The End



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Appendix B

LTE-CatM1 Band 14



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1 Effective Radiated Power Output Data

Effective Radiated Power of Transmitter (ERP) for LTE-CatM1 Band 14

Test Band	Test Mode	Test Bandwidth	Test channel	Test RB	Conducted Power (dBm)	ERP (dBm)	limit (dBm)	Verdict
CatM1 Band 14	QPSK	5M	LCH	1RB#0	20.68	17.83	34.77	PASS
CatM1 Band 14	QPSK	5M	LCH	5RB#0	19.48	16.63	34.77	PASS
CatM1 Band 14	QPSK	5M	LCH	6RB#0	19.39	16.54	34.77	PASS
CatM1 Band 14	QPSK	5M	MCH	1RB#0	20.67	17.82	34.77	PASS
CatM1 Band 14	QPSK	5M	MCH	5RB#0	19.48	16.63	34.77	PASS
CatM1 Band 14	QPSK	5M	MCH	6RB#0	19.45	16.60	34.77	PASS
CatM1 Band 14	QPSK	5M	HCH	1RB#0	20.71	17.86	34.77	PASS
CatM1 Band 14	QPSK	5M	HCH	5RB#0	19.52	16.67	34.77	PASS
CatM1 Band 14	QPSK	5M	HCH	6RB#0	19.37	16.52	34.77	PASS
CatM1 Band 14	16QAM	5M	LCH	1RB#0	20.19	17.34	34.77	PASS
CatM1 Band 14	16QAM	5M	LCH	5RB#0	18.05	15.20	34.77	PASS
CatM1 Band 14	16QAM	5M	MCH	1RB#0	20.24	17.39	34.77	PASS
CatM1 Band 14	16QAM	5M	MCH	5RB#0	18.18	15.33	34.77	PASS
CatM1 Band 14	16QAM	5M	HCH	1RB#0	20.21	17.36	34.77	PASS
CatM1 Band 14	16QAM	5M	HCH	5RB#0	18.13	15.28	34.77	PASS
CatM1 Band 14	QPSK	10M	MCH	1RB#0	20.71	17.86	34.77	PASS
CatM1 Band 14	QPSK	10M	MCH	5RB#0	19.56	16.71	34.77	PASS
CatM1 Band 14	QPSK	10M	MCH	6RB#0	19.44	16.59	34.77	PASS
CatM1 Band 14	16QAM	10M	MCH	1RB#0	20.18	17.33	34.77	PASS
CatM1 Band 14	16QAM	10M	MCH	5RB#0	19.49	16.64	34.77	PASS

Note:

a: For getting the EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$EIRP [dBm] = \text{Conducted Power} [dBm] + \text{Gain} [dBi]$

$ERP [dBm] = \text{Conducted Power} [dBm] + \text{Gain} [dBi] - 2.15$



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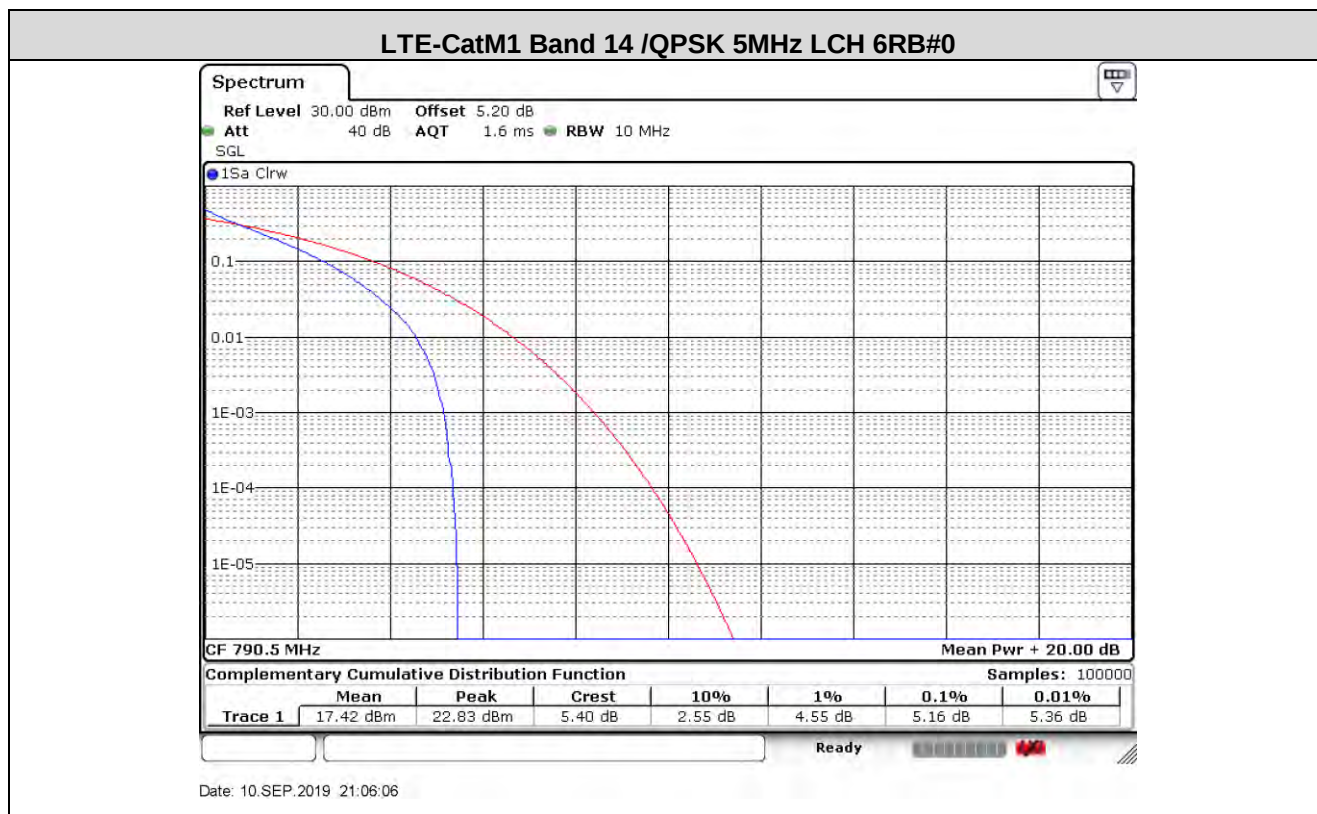


2 Peak-to-Average Ratio

2.1 Test Results

Test Band	Test Mode	RB Config	Test Channel	Measured [dB]	Limit [dB]	Verdict
CatM1 Band 14	QPSK/5M	6RB#0	LCH	5.16	13	PASS
CatM1 Band 14	QPSK/5M	6RB#0	MCH	4.81	13	PASS
CatM1 Band 14	QPSK/5M	6RB#0	HCH	5.01	13	PASS
CatM1 Band 14	16QAM/5M	5RB#0	LCH	3.54	13	PASS
CatM1 Band 14	16QAM/5M	5RB#0	MCH	3.77	13	PASS
CatM1 Band 14	16QAM/5M	5RB#0	HCH	3.45	13	PASS

2.2 Test Plots



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LTE-CatM1 Band 14 /QPSK 5MHz MCH 6RB#0



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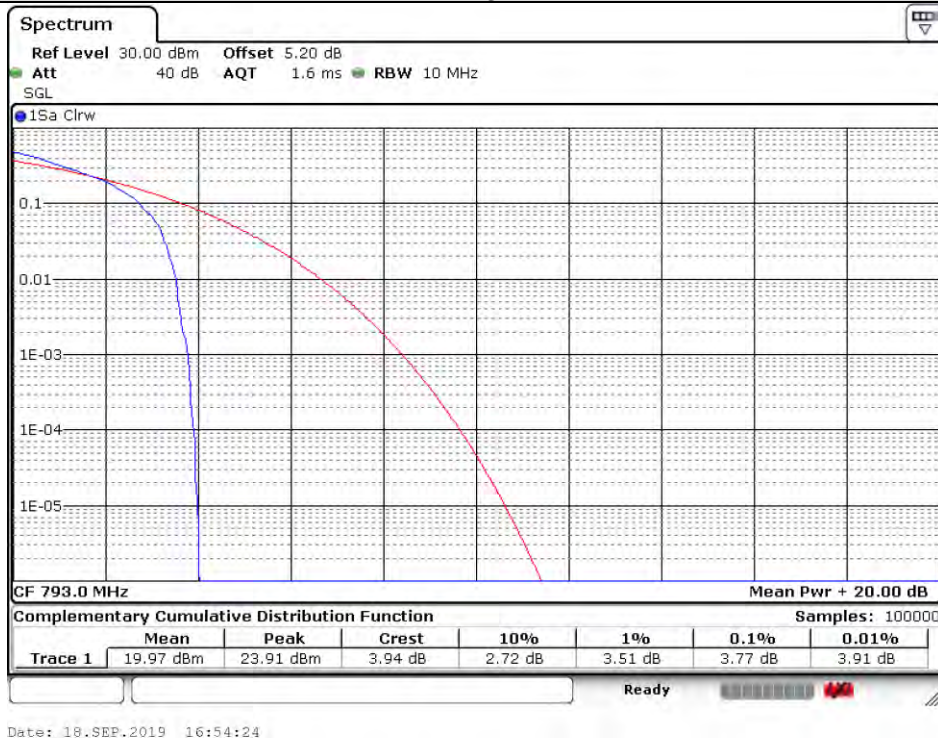
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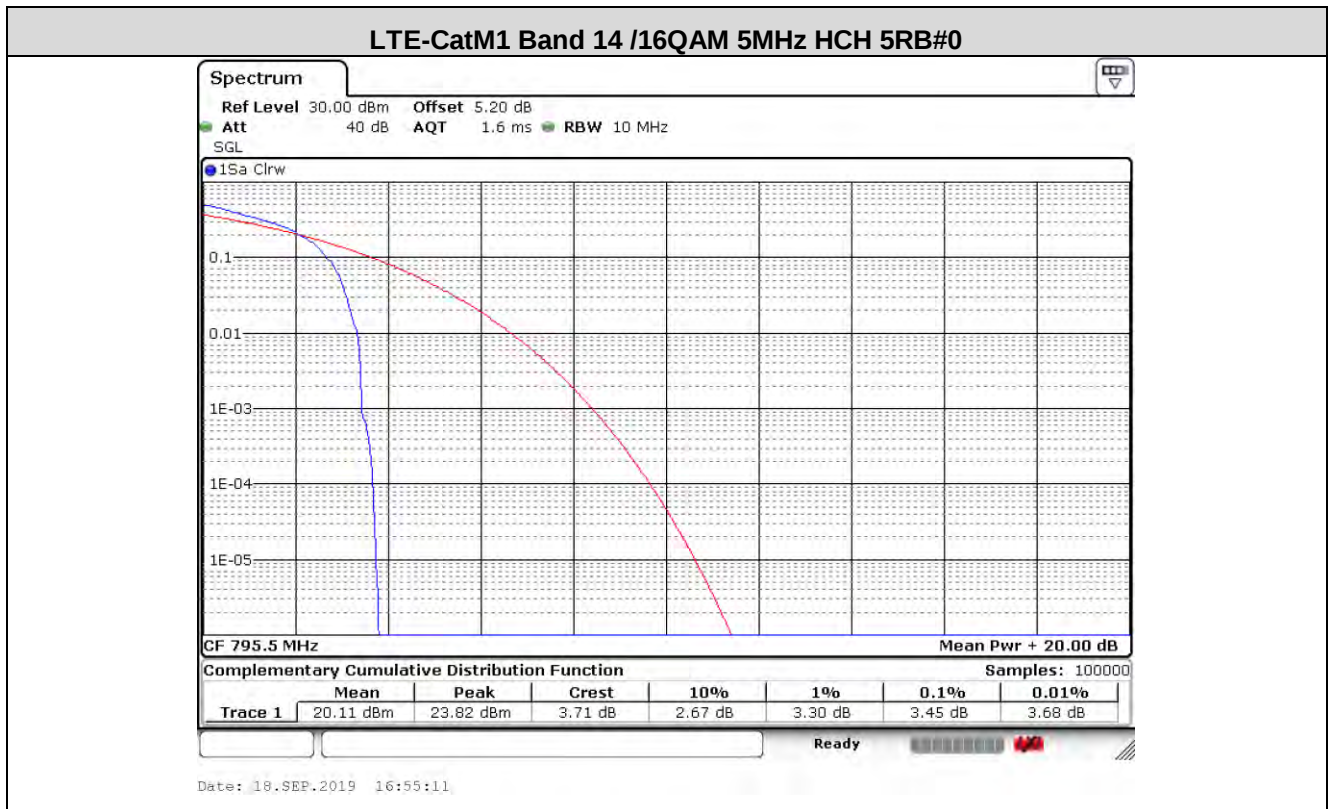


LTE-CatM1 Band 14 /16QAM 5MHz LCH 5RB#0



LTE-CatM1 Band 14 /16QAM 5MHz MCH 5RB#0





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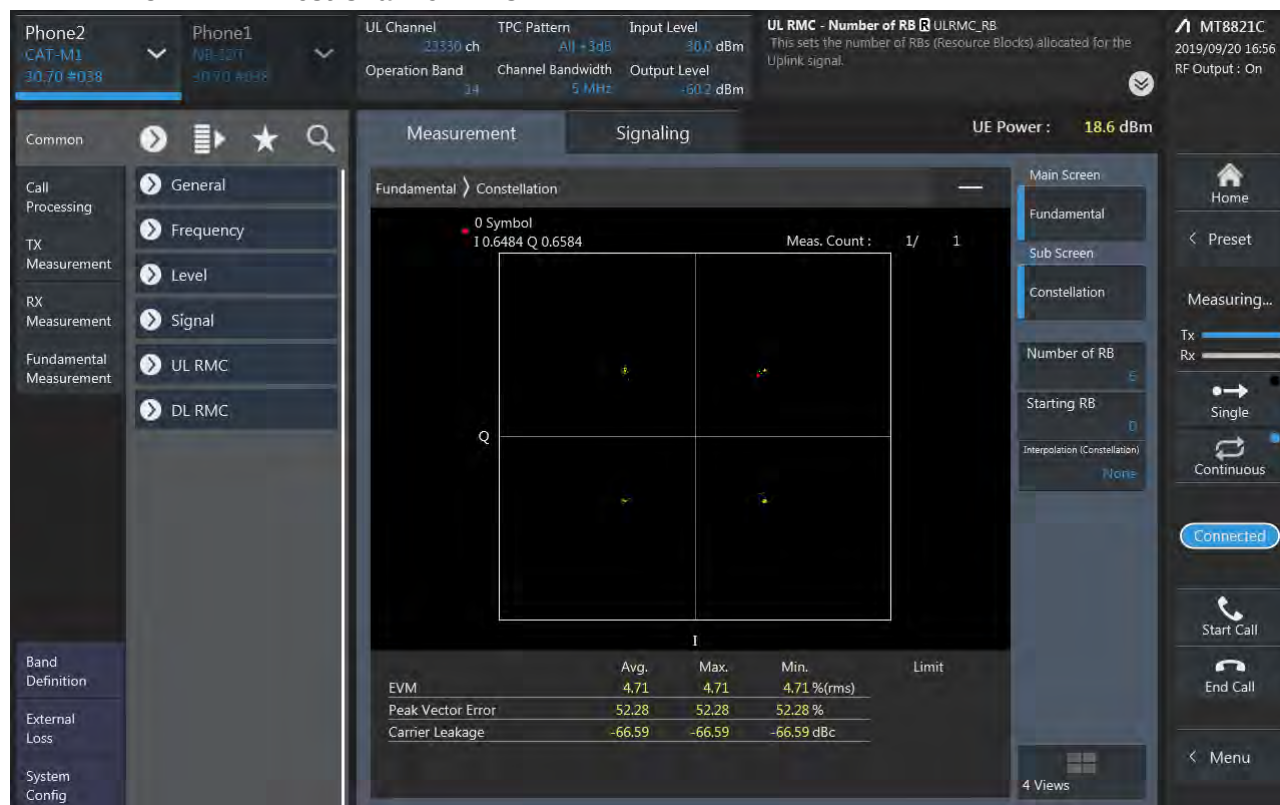
3 Modulation Characteristics

3.1 For LTE-CatM1

3.1.1 Test Band = LTE-CatM1 Band 14

3.1.1.1 Test Mode = LTE-CatM1 /QPSK 5MHz

3.1.1.1.1 Test Channel = MCH



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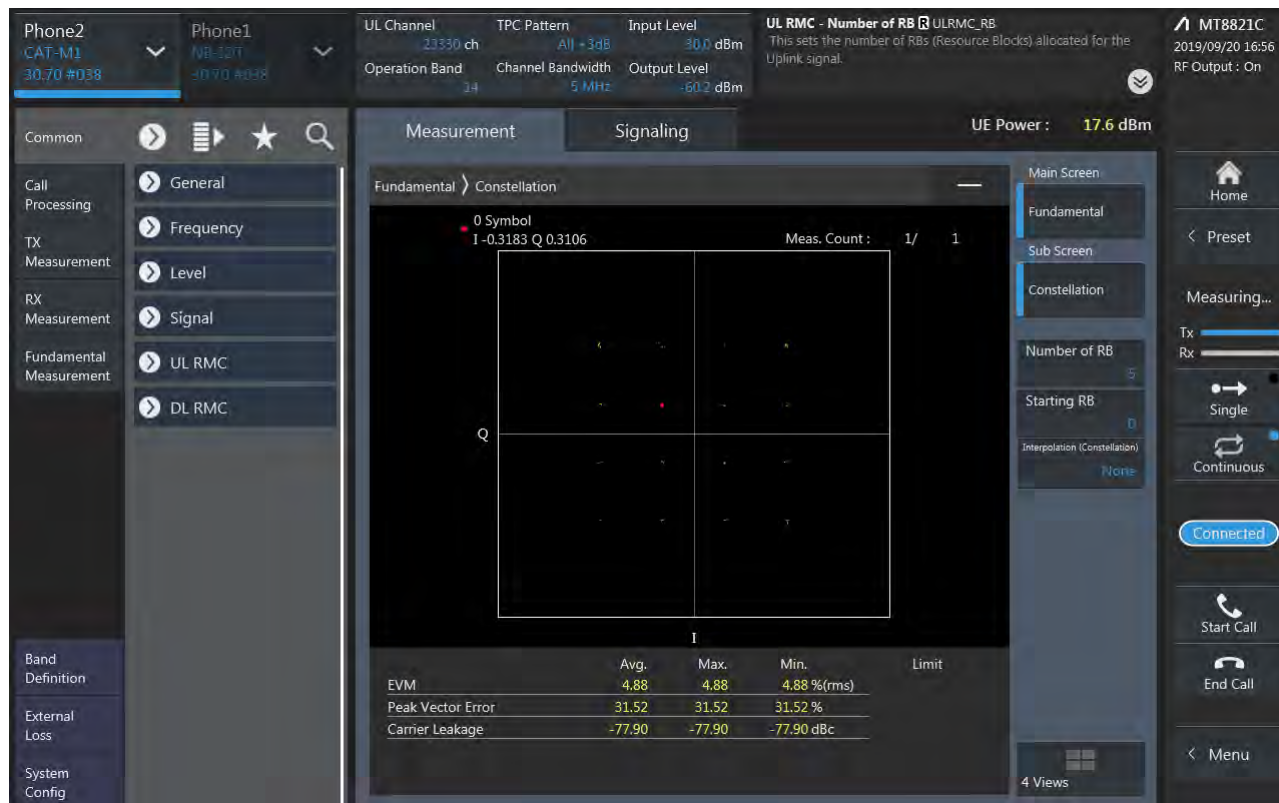
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3.1.1.2 Test Mode = LTE-CatM1 /16QAM 5MHz

3.1.1.2.1 Test Channel = MCH



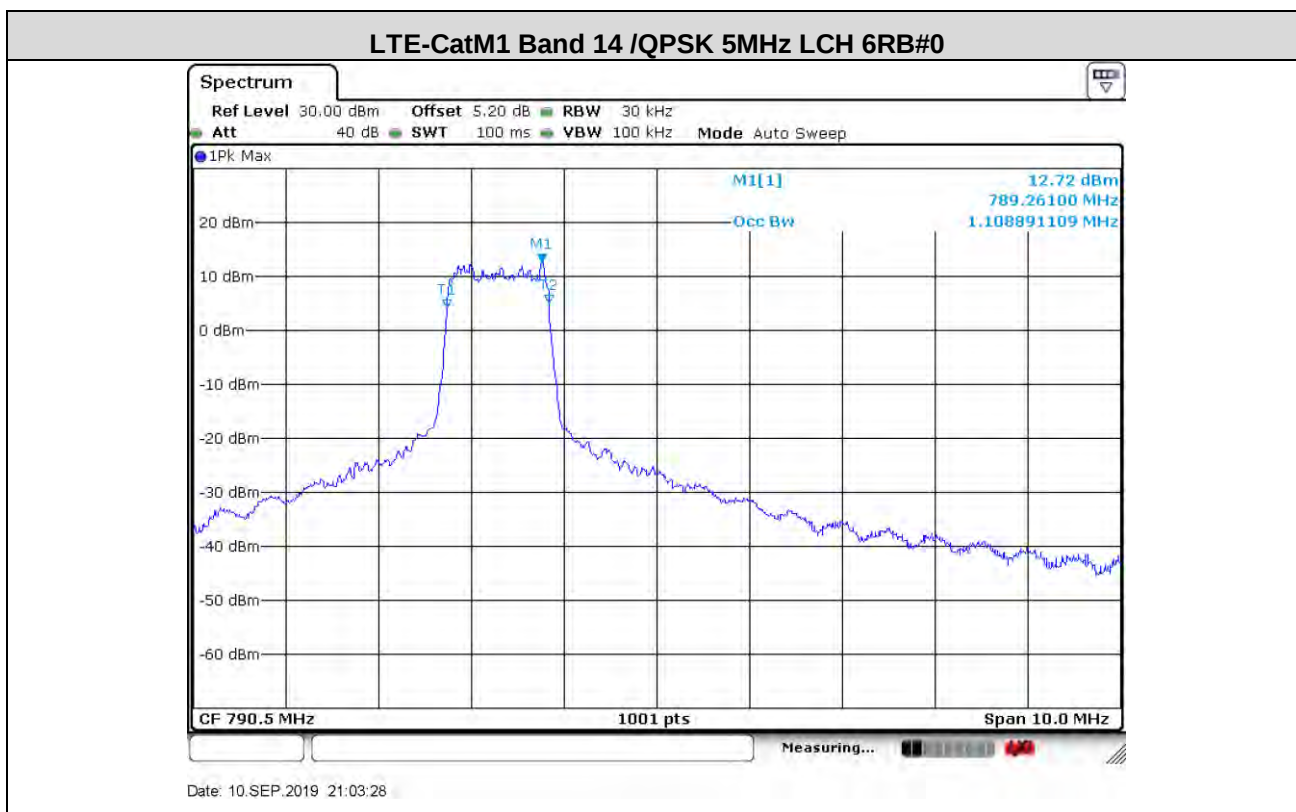


4 26dB Bandwidth and Occupied Bandwidth

4.1 Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	26dB Emission Bandwidth [MHz]	Verdict
CatM1 Band 14	QPSK/ 5MHz	LCH	1.11	1.29	PASS
CatM1 Band 14	QPSK/ 5MHz	MCH	1.11	1.28	PASS
CatM1 Band 14	QPSK/ 5MHz	HCH	1.11	1.30	PASS
CatM1 Band 14	16QAM/ 5MHz	LCH	0.92	1.09	PASS
CatM1 Band 14	16QAM/ 5MHz	MCH	0.93	1.09	PASS
CatM1 Band 14	16QAM/ 5MHz	HCH	0.91	1.07	PASS

4.2 Test Plots

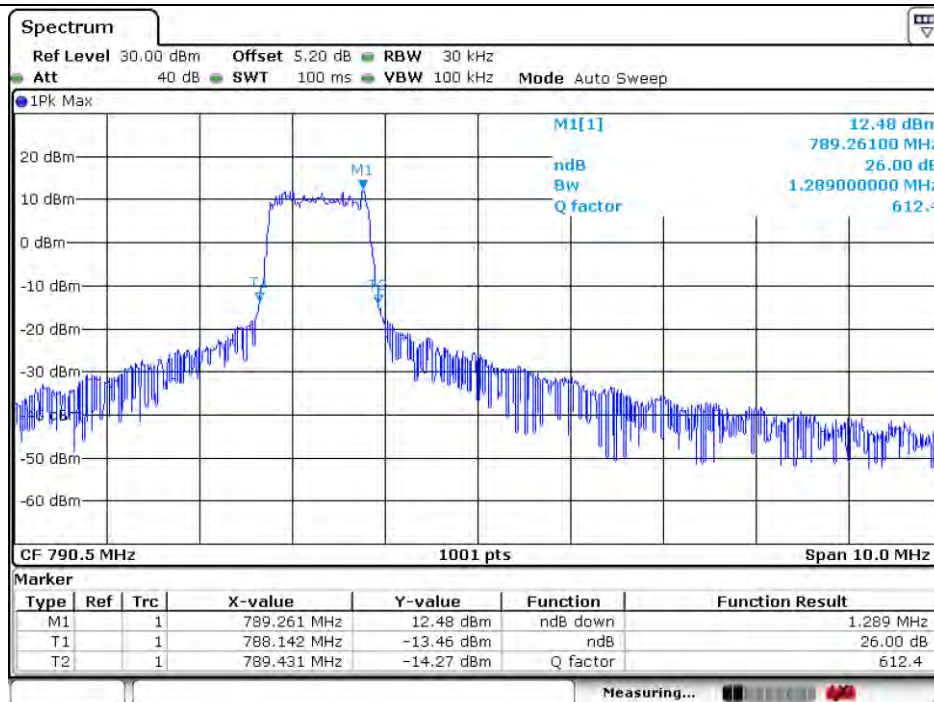


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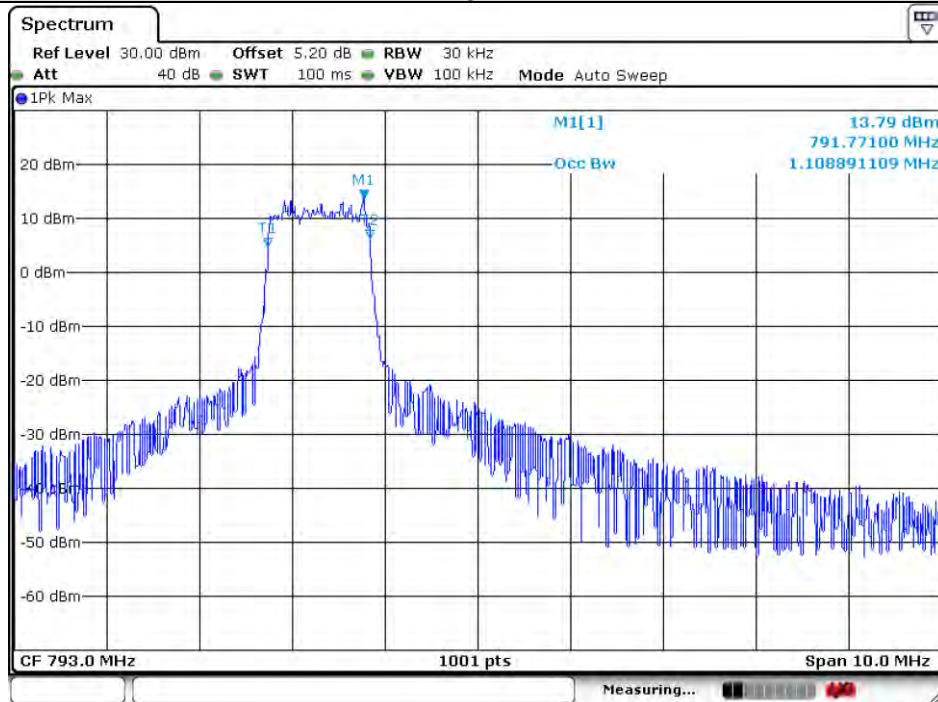
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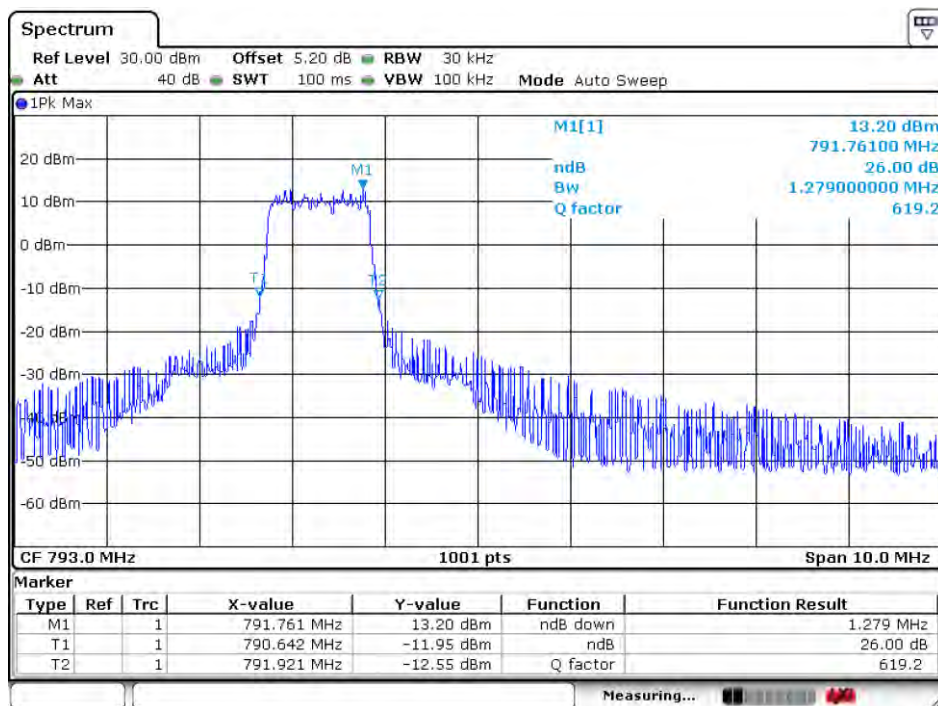
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LTE-CatM1 Band 14 /QPSK 5MHz MCH 6RB#0



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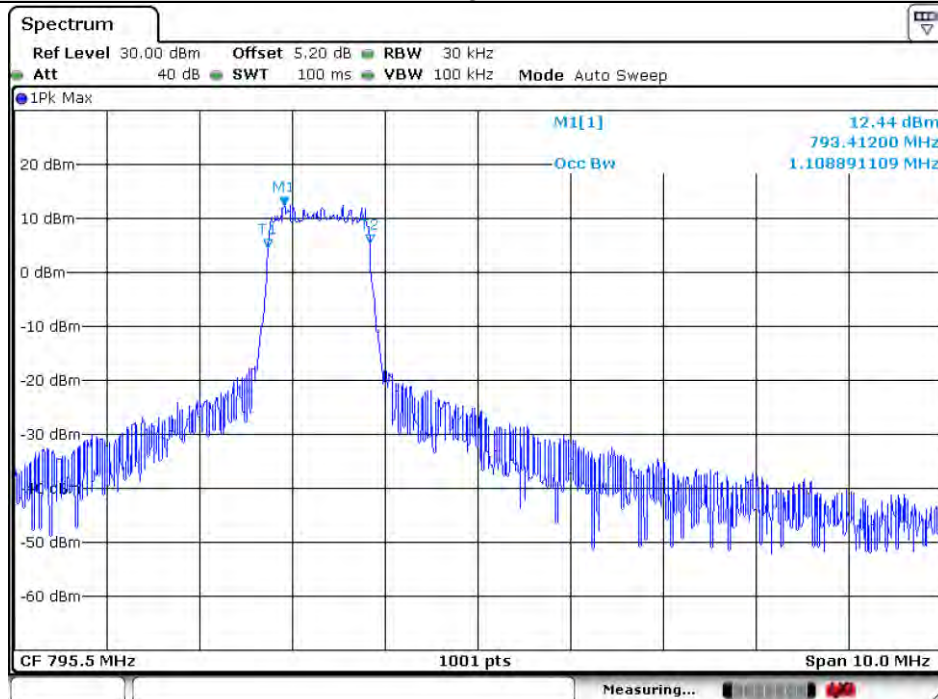
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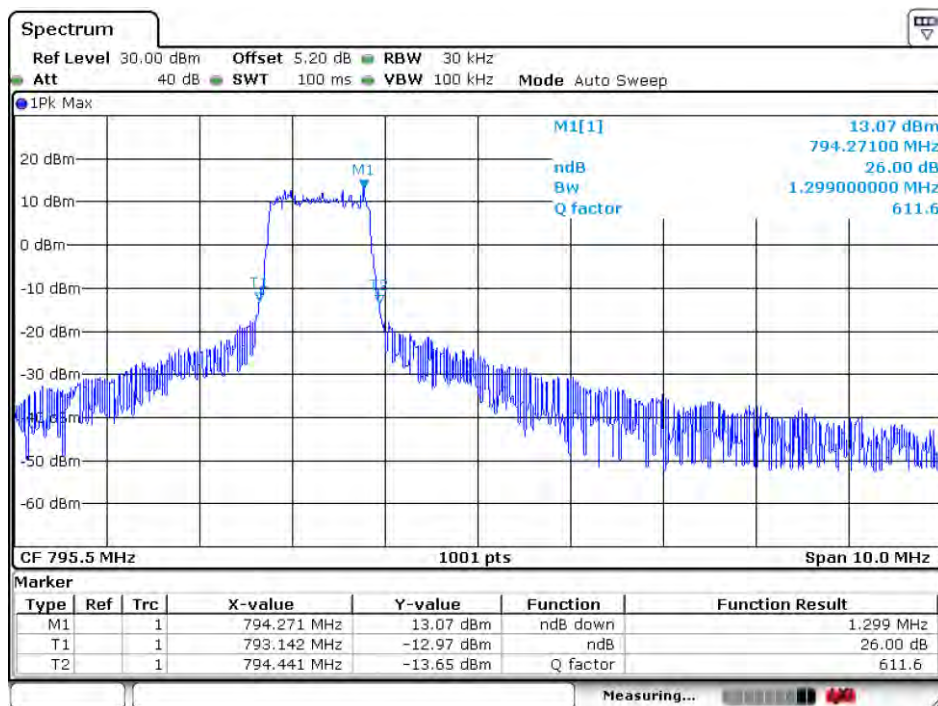
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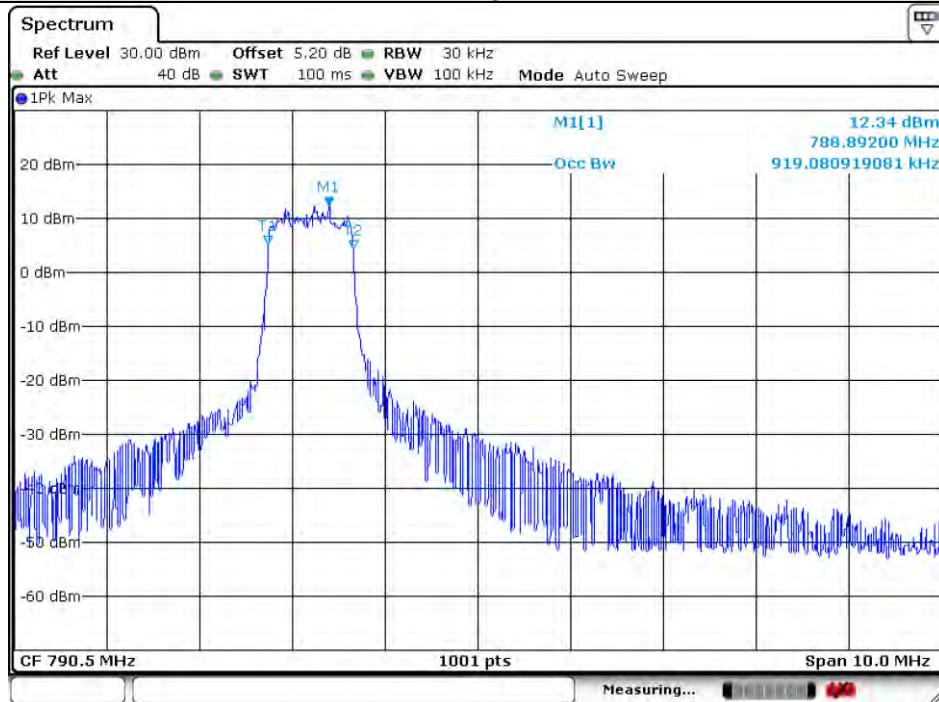
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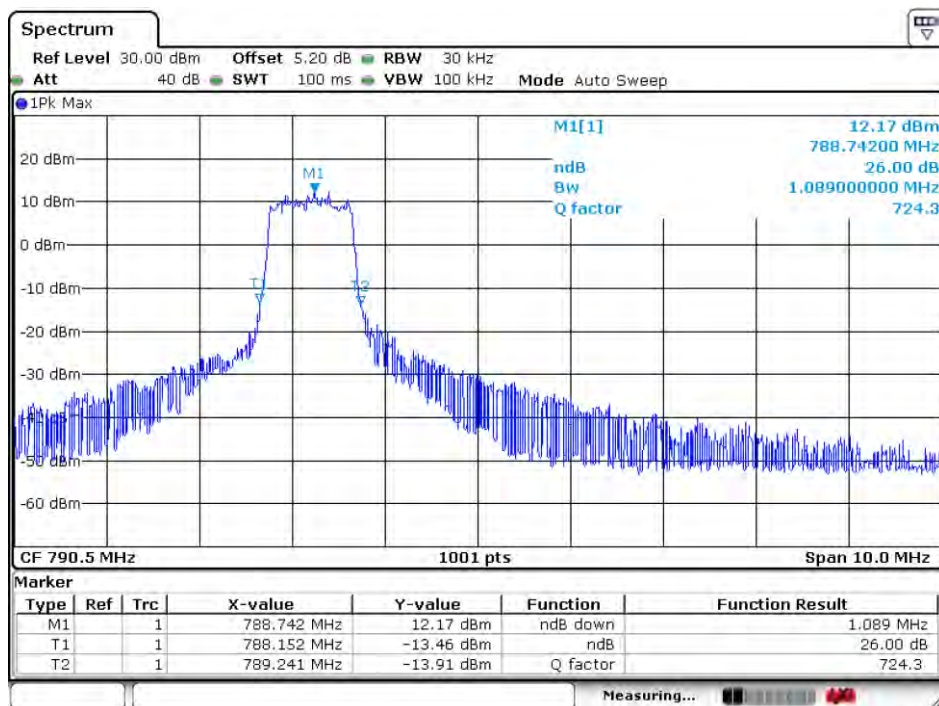
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LTE-CatM1 Band 14 /16QAM 5MHz LCH 5RB#0



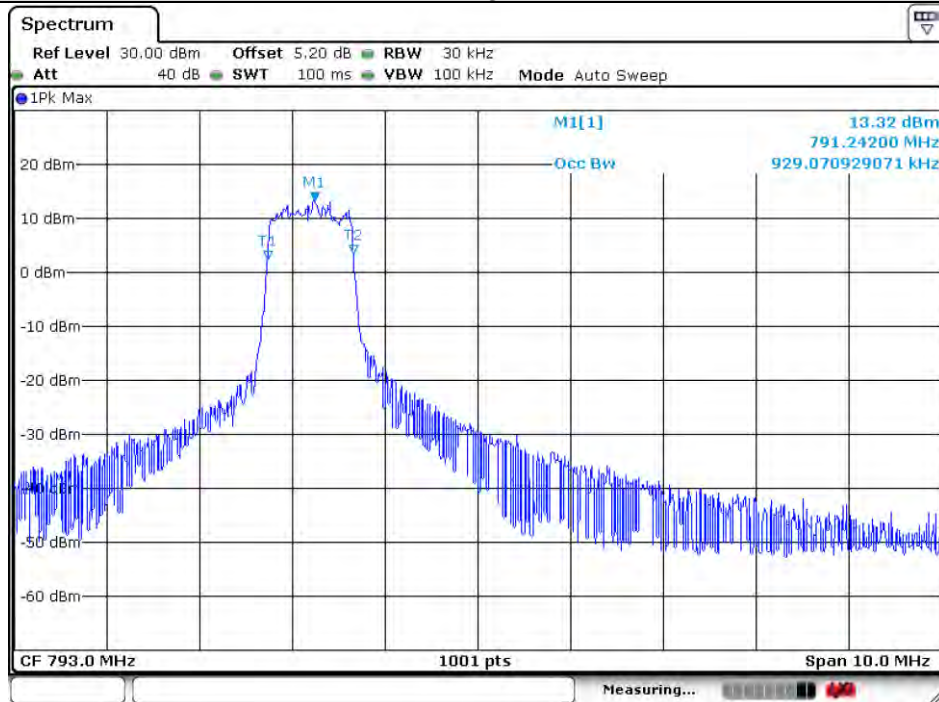
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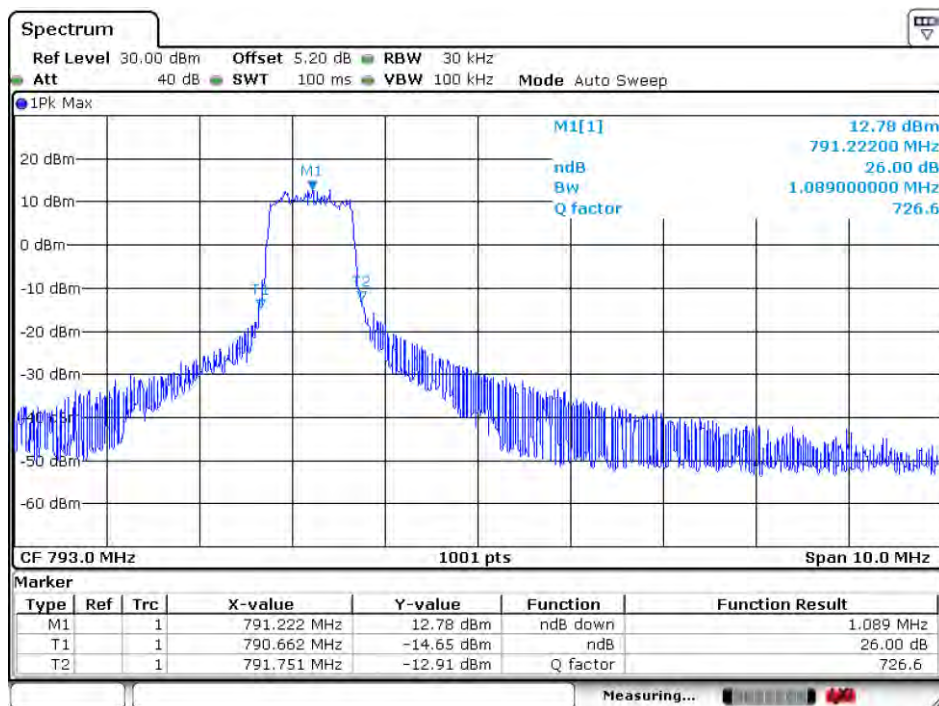
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LTE-CatM1 Band 14 /16QAM 5MHz MCH 5RB#0



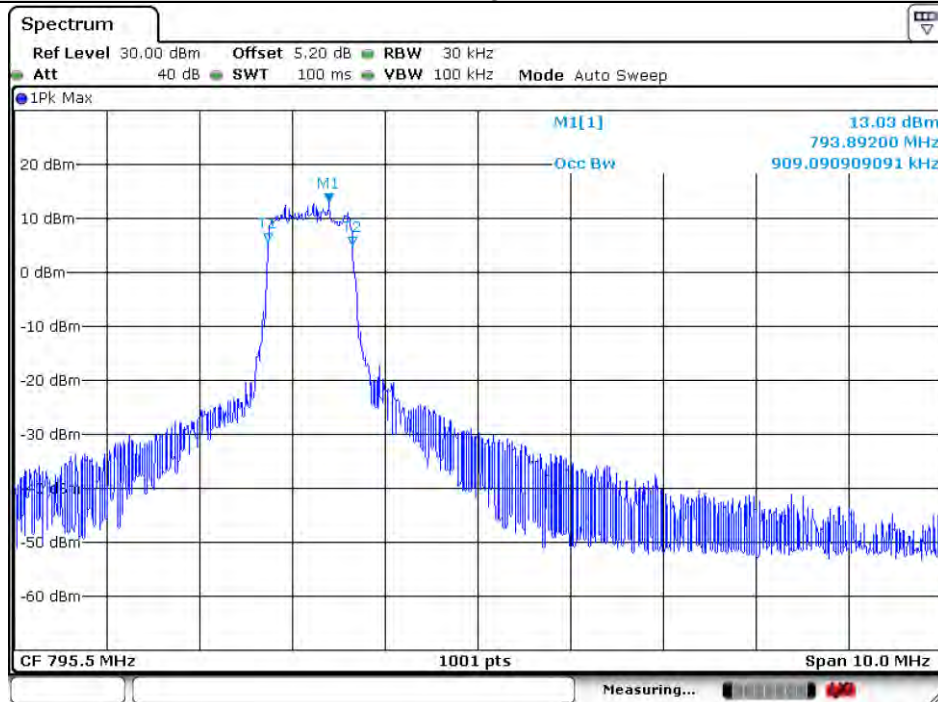
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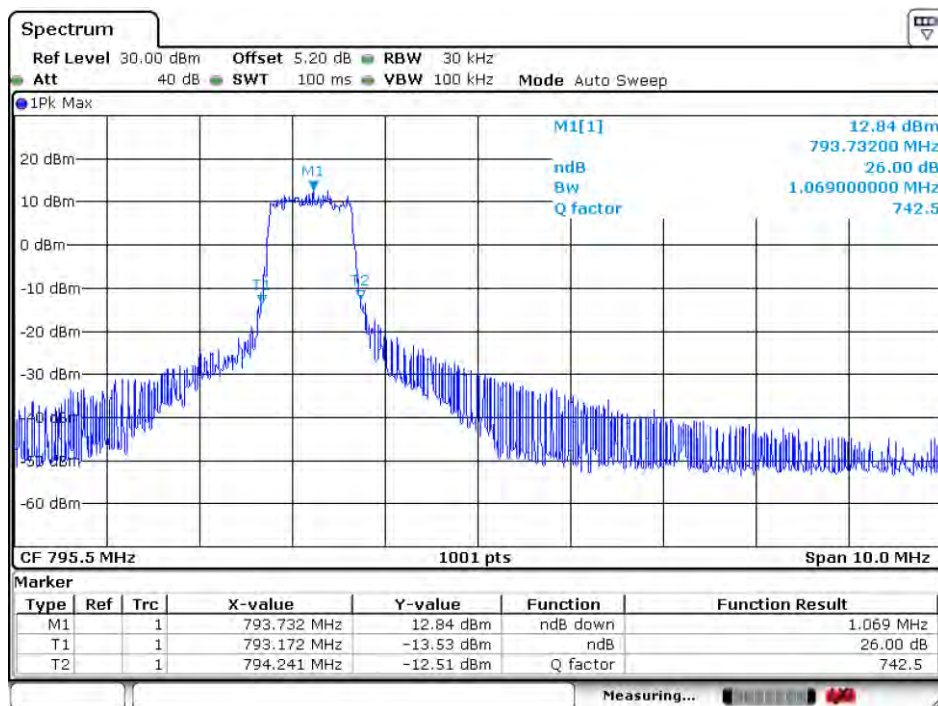
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LTE-CatM1 Band 14 /16QAM 5MHz HCH 5RB#0



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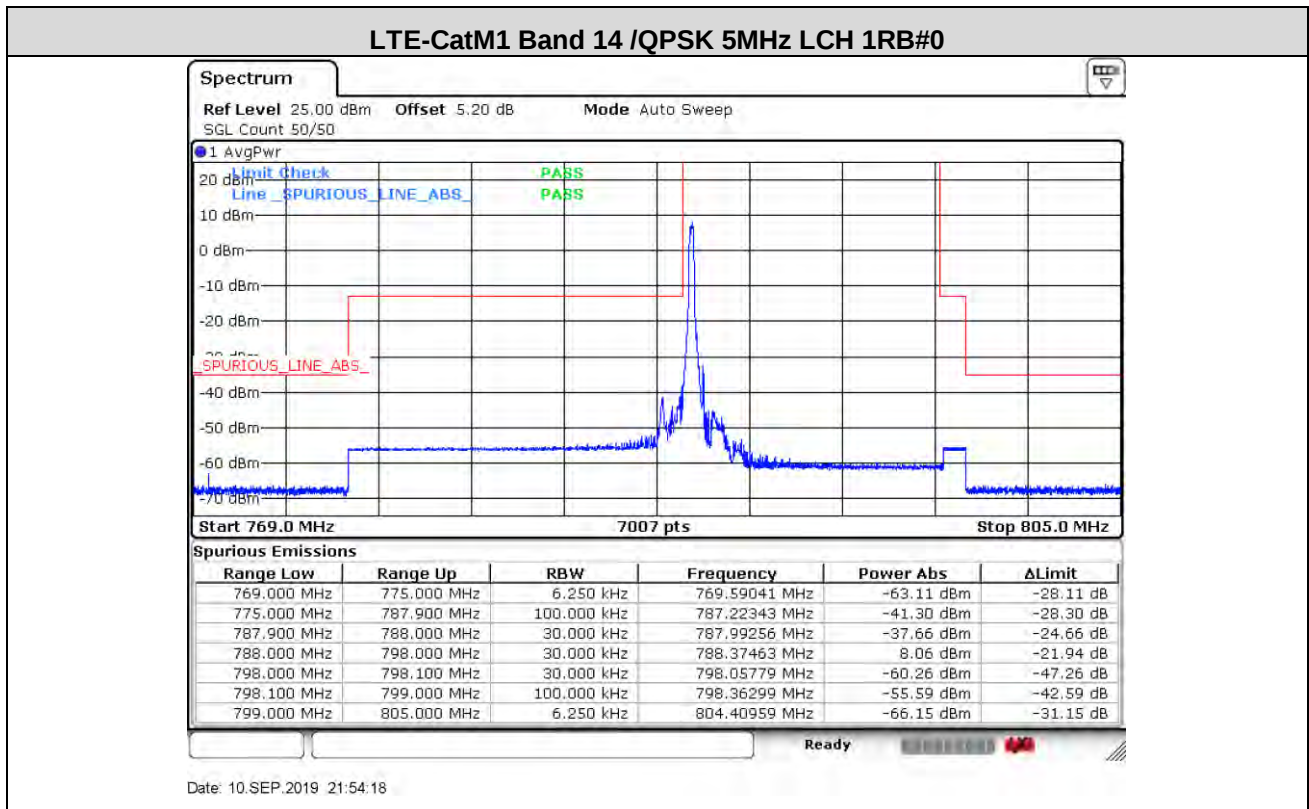
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5 Band Edges Compliance

5.1 Test Plots



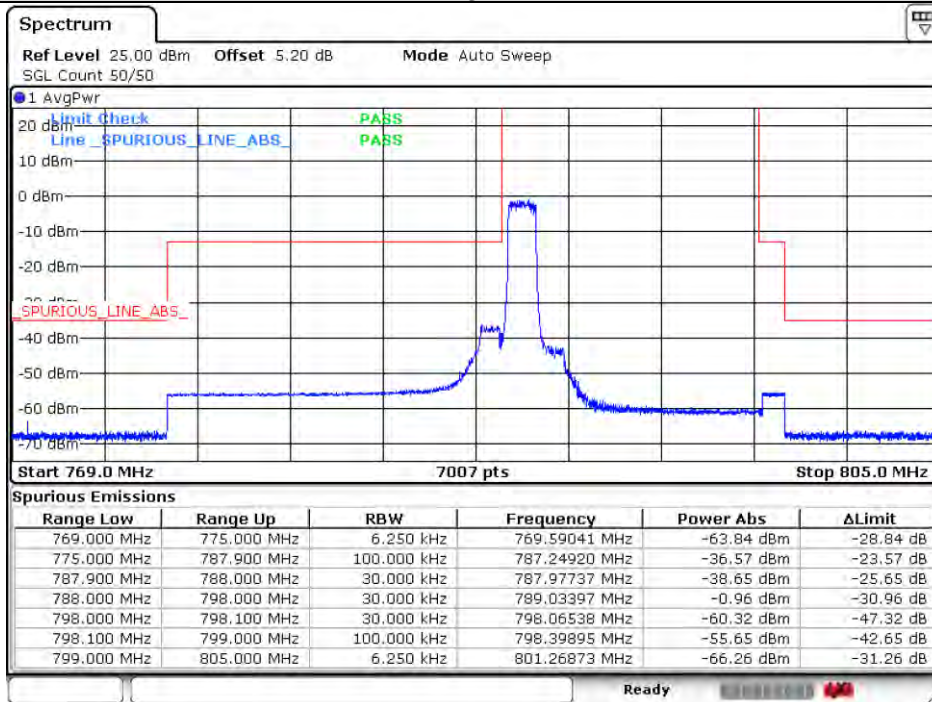
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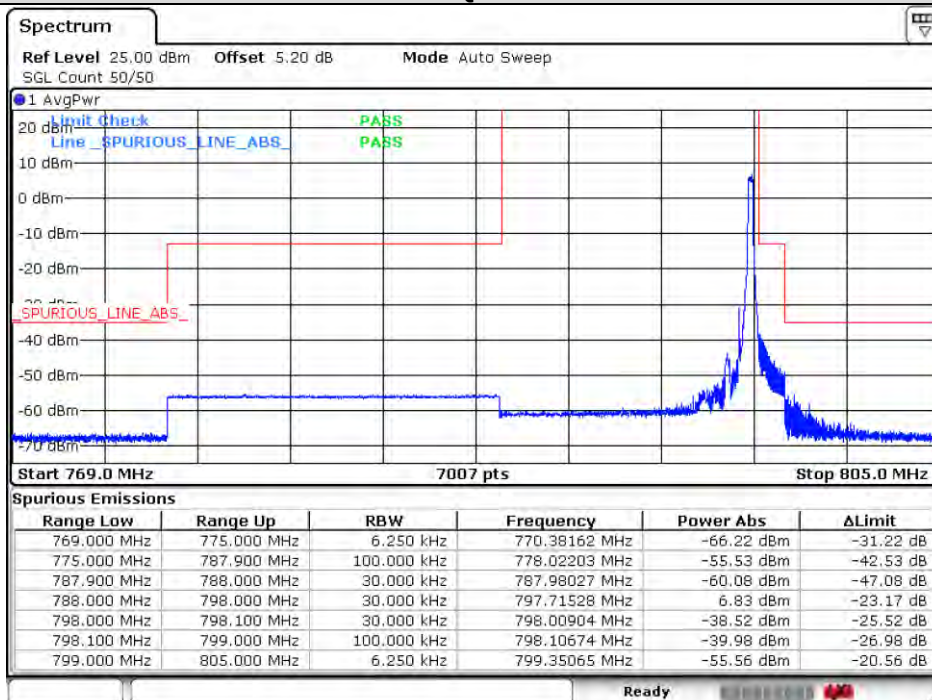
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LTE-CatM1 Band 14 /QPSK 5MHz LCH 6RB#0



Date: 10.SEP.2019 21:58:16

LTE-CatM1 Band 14 /QPSK 5MHz HCH 1RB#0



Date: 10.SEP.2019 21:47:08



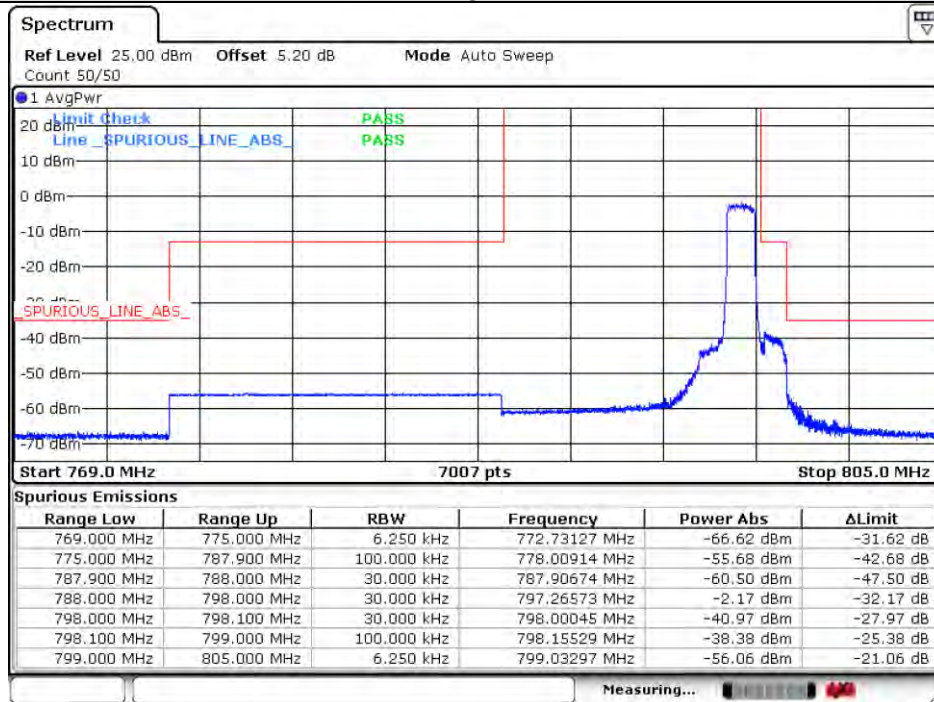
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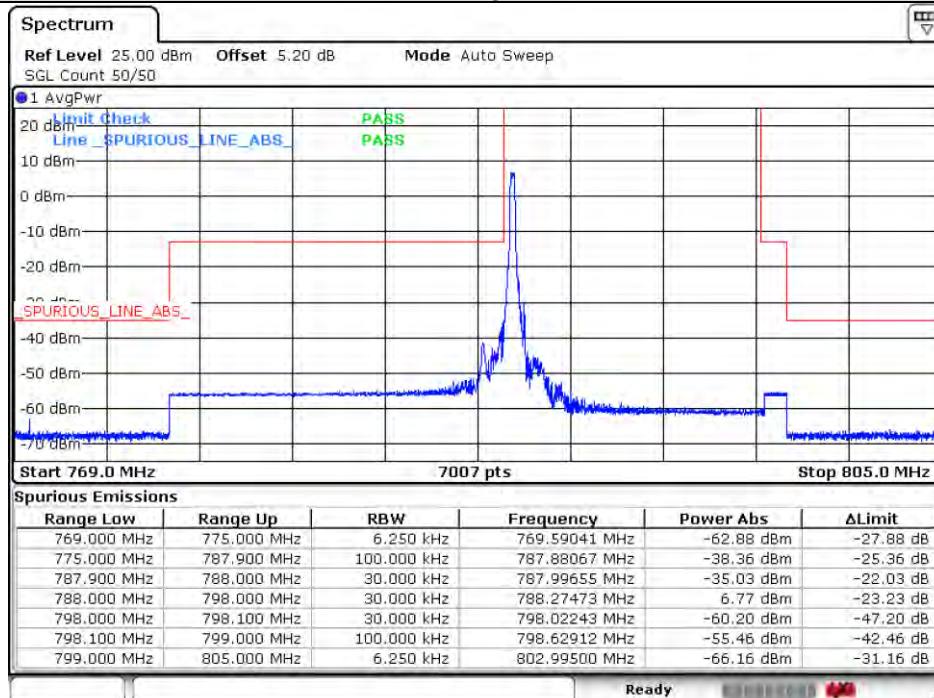
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LTE-CatM1 Band 14 /QPSK 5MHz HCH 6RB#0



Date: 10.SEP.2019 21:45:55

LTE-CatM1 Band 14 /16QAM 5MHz LCH 1RB#0



Date: 10.SEP.2019 21:52:14



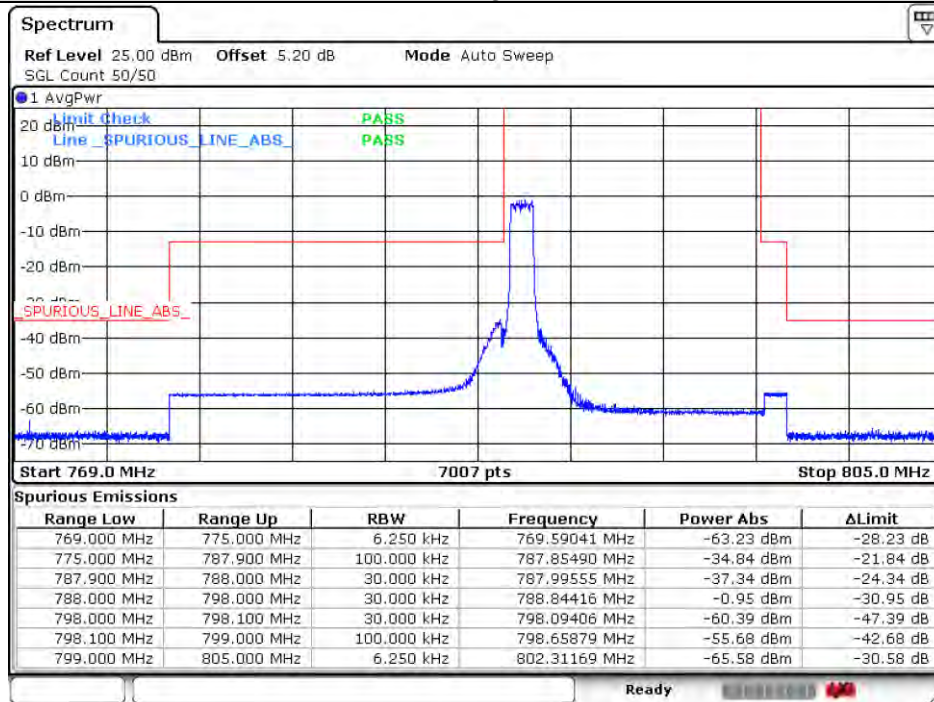
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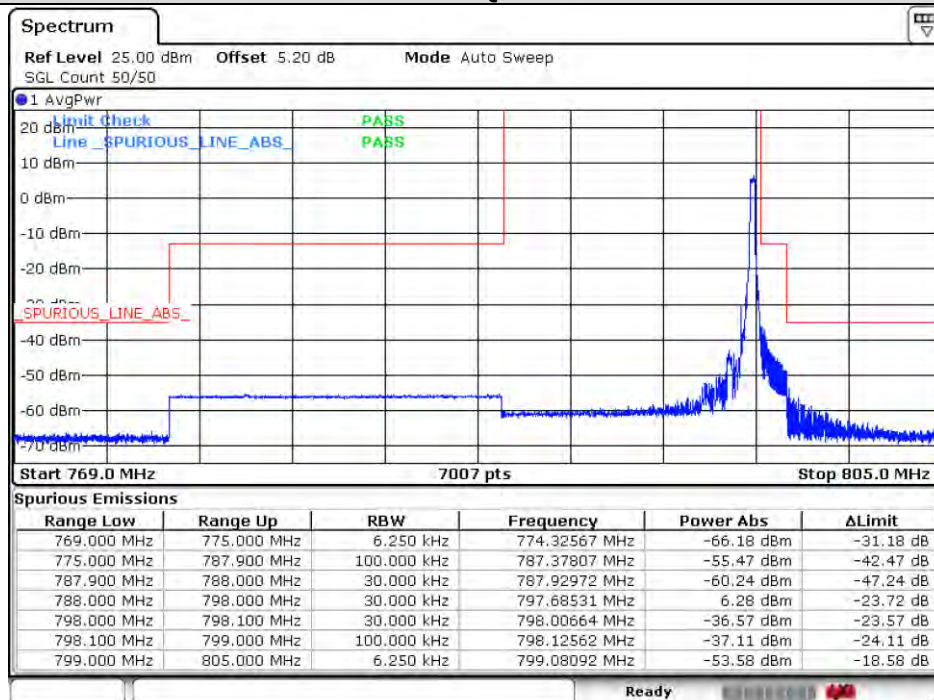
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LTE-CatM1 Band 14 /16QAM 5MHz LCH 5RB#0



Date: 10.SEP.2019 21:50:53

LTE-CatM1 Band 14 /16QAM 5MHz HCH 1RB#0



Date: 10.SEP.2019 21:48:05



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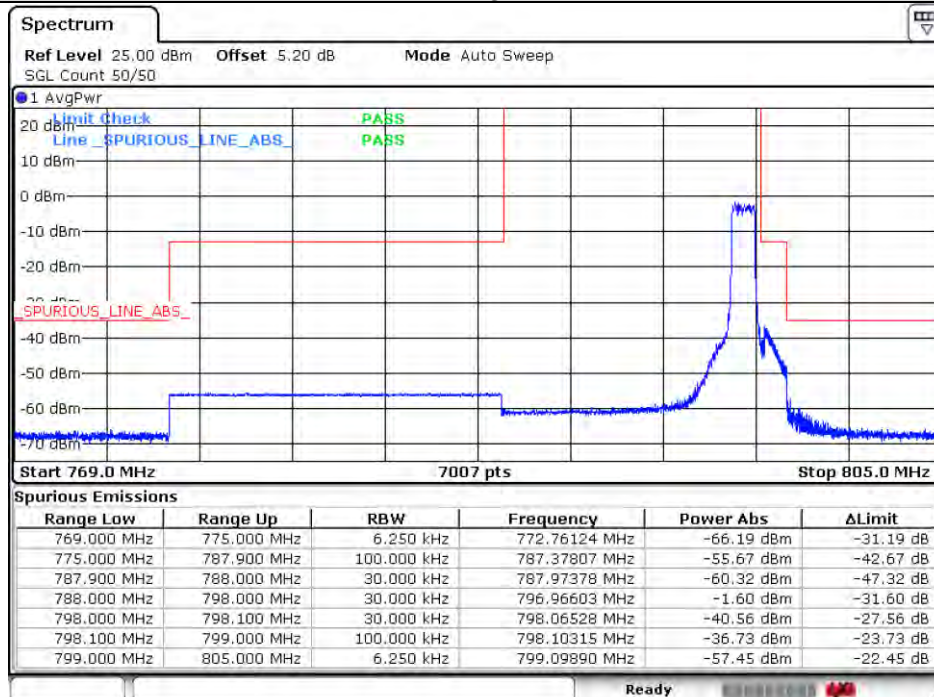
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LTE-CatM1 Band 14 /16QAM 5MHz HCH 5RB#0



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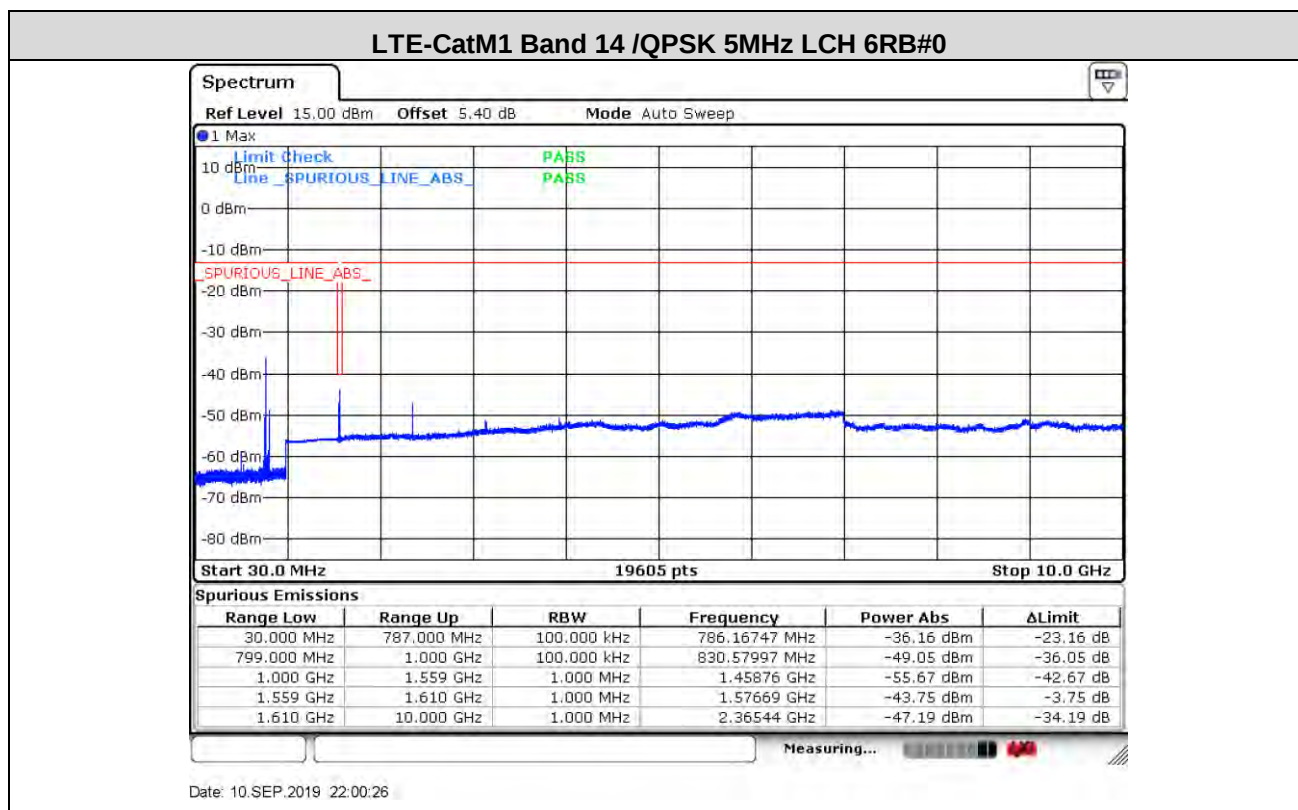


6 Spurious Emission at Antenna Terminal

NOTE1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

Part I - Test Plots

6.1 Test Plots



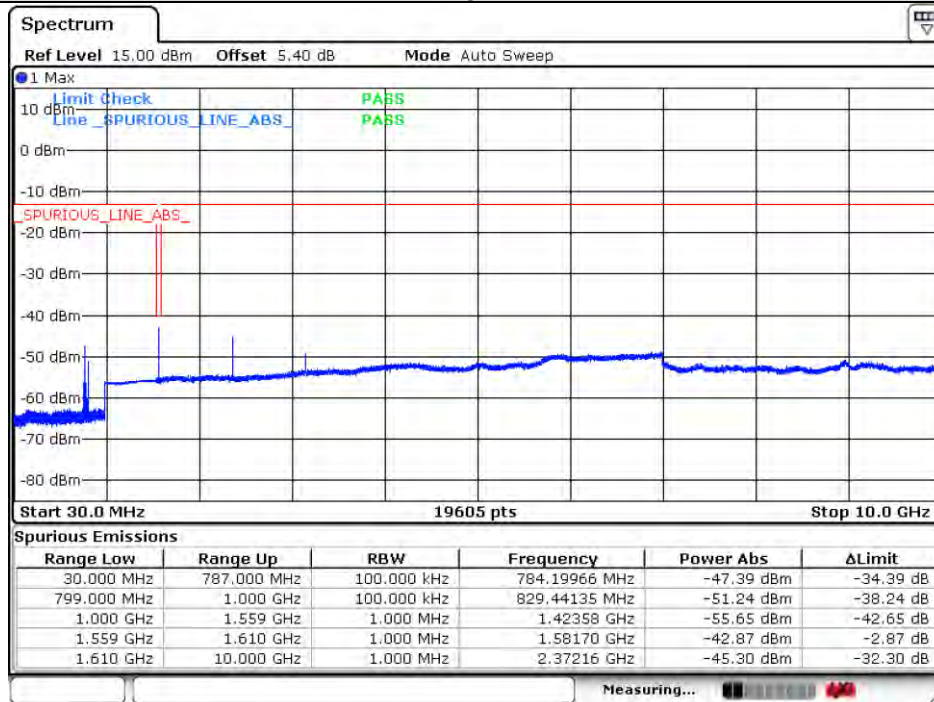
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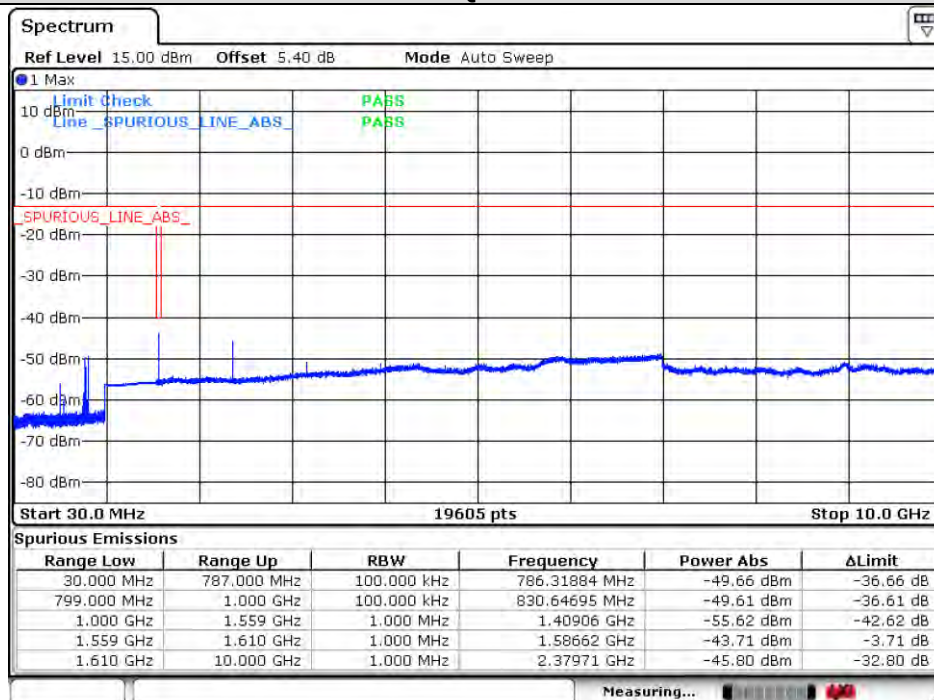
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LTE-CatM1 Band 14 /QPSK 5MHz MCH 6RB#0



Date: 10.SEP.2019 22:02:10

LTE-CatM1 Band 14 /QPSK 5MHz HCH 6RB#0



Date: 10.SEP.2019 22:03:18



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7 Field Strength of Spurious Radiation

7.1 For LTE-CatM1

7.1.1 Test Band = LTE-CatM1 Band 14

7.1.1.1 Test Mode =LTE-CatM1/QPSK

7.1.1.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
112.5996	-64.32	-13.00	51.32	Vertical
608.9249	-63.81	-13.00	50.81	Vertical
1586.5173	-57.27	-40.00	17.27	Vertical
2465.8932	-41.21	-13.00	28.21	Vertical
14551.6621	-42.95	-13.00	29.95	Vertical
17977.1991	-35.15	-13.00	22.15	Vertical
41.2041	-65.34	-13.00	52.34	Horizontal
233.3222	-68.73	-13.00	55.73	Horizontal
1586.5173	-53.36	-40.00	13.36	Horizontal
2465.8932	-42.16	-13.00	29.16	Horizontal
3172.8069	-51.22	-13.00	38.22	Horizontal
17989.7996	-39.39	-13.00	26.39	Horizontal

7.1.1.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
109.8835	-64.54	-13.00	51.54	Vertical
997.1384	-55.43	-13.00	42.43	Vertical
1603.4927	-59.98	-40.00	19.98	Vertical
7306.3723	-53.91	-13.00	40.91	Vertical
14537.2615	-43.41	-13.00	30.41	Vertical
17813.3925	-37.48	-13.00	24.48	Vertical
43.2897	-64.01	-13.00	51.01	Horizontal
249.3280	-68.92	-13.00	55.92	Horizontal
1581.7163	-50.89	-40.00	10.89	Horizontal
2457.8916	-24.03	-13.00	11.03	Horizontal
3163.2065	-52.13	-13.00	39.13	Horizontal
17995.7998	-38.32	-13.00	25.32	Horizontal



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7.1.1.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
105.5668	-66.06	-13.00	53.06	Vertical
563.8662	-66.12	-13.00	53.12	Vertical
1576.5153	-55.30	-40.00	15.30	Vertical
2365.0730	-54.89	-13.00	41.89	Vertical
16900.7560	-40.80	-13.00	27.80	Vertical
17994.5998	-34.61	-13.00	21.61	Vertical
42.6106	-64.33	-13.00	51.33	Horizontal
233.0797	-68.73	-13.00	55.73	Horizontal
1576.5153	-52.51	-40.00	12.51	Horizontal
2468.2937	-21.94	-13.00	8.94	Horizontal
3153.0061	-50.21	-13.00	37.21	Horizontal
16994.9598	-39.49	-13.00	26.49	Horizontal

NOTE:

- 1) The disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 2) only the worst case data presented in this report.



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8 Frequency Stability

8.1 Frequency Error VS. Voltage

Test Band	Test Mode	Test Channel	RB Config	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Limit (ppm)	Verdict
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	TN	VL	-6.25	-0.00791	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	TN	VN	-1.80	-0.00227	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	TN	VH	4.42	0.00559	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	TN	VL	-3.04	-0.00383	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	TN	VN	-0.12	-0.00016	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	TN	VH	-4.00	-0.00505	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	TN	VL	6.58	0.00827	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	TN	VN	-8.20	-0.01030	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	TN	VH	6.35	0.00799	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	TN	VL	8.20	0.01037	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	TN	VN	-6.69	-0.00846	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	TN	VH	6.68	0.00845	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	TN	VL	-1.51	-0.00190	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	TN	VN	5.14	0.00648	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	TN	VH	2.27	0.00286	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	TN	VL	1.91	0.00241	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	TN	VN	-4.86	-0.00611	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	TN	VH	-8.92	-0.01121	±2.5	PASS



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8.2 Frequency Error VS. Temperature

Test Band	Test Mode	Test Channel	RB Config	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Limit (ppm)	Verdict
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	VN	-8.86	-0.01121	0.017508	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	VN	-9.36	-0.01184	-0.012547	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	VN	-8.53	-0.01078	-0.014003	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	VN	6.03	0.00763	0.006187	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	VN	5.76	0.00729	0.006955	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	VN	-6.49	-0.00821	-0.016698	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	VN	-1.05	-0.00133	0.011909	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	VN	-2.35	-0.00298	0.001220	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	LCH	6RB#0	VN	-3.56	-0.00451	0.007929	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	VN	-3.71	-0.00467	0.016568	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	VN	0.34	0.00043	0.016446	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	VN	-7.20	-0.00909	0.002400	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	VN	-2.83	-0.00357	0.016012	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	VN	1.24	0.00157	0.015179	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	VN	-7.81	-0.00985	-0.015610	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	VN	7.15	0.00902	-0.001632	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	VN	9.66	0.01218	0.012904	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	MCH	6RB#0	VN	-8.05	-0.01015	-0.003795	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	VN	6.21	0.00780	0.003163	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	VN	-5.43	-0.00682	-0.006167	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	VN	-8.51	-0.01070	0.001641	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	VN	1.56	0.00196	0.012780	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	VN	9.11	0.01145	-0.009422	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	VN	-4.43	-0.00557	-0.001980	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	VN	4.59	0.00577	-0.014349	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	VN	-7.17	-0.00901	0.014852	±2.5	PASS
CatM1 Band 14	QPSK 5MHz	HCH	6RB#0	VN	-7.32	-0.00921	-0.006637	±2.5	PASS



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SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch Technical Services Laboratory

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn
中国·深圳·科技园中区M-10栋一号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com



Test Band	Test Mode	Test Channel	RB Config	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Limit (ppm)	Verdict
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	VN	4.58	0.00579	0.003594	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	VN	-4.13	-0.00523	0.002393	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	VN	-4.77	-0.00604	-0.003052	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	VN	-3.93	-0.00498	0.000549	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	VN	-1.54	-0.00194	-0.006326	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	VN	-2.84	-0.00359	-0.012607	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	VN	8.01	0.01013	-0.003524	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	VN	2.84	0.00359	0.011604	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	LCH	5RB#0	VN	-1.57	-0.00199	0.018083	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	VN	0.75	0.00095	0.016472	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	VN	7.00	0.00883	-0.016890	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	VN	6.98	0.00880	-0.006811	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	VN	-6.72	-0.00848	-0.016711	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	VN	2.92	0.00368	-0.012702	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	VN	-7.07	-0.00891	0.008911	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	VN	-4.85	-0.00612	-0.001607	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	VN	0.35	0.00045	-0.015650	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	MCH	5RB#0	VN	2.16	0.00272	-0.018798	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	VN	9.89	0.01243	-0.008062	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	VN	-3.15	-0.00396	-0.005881	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	VN	0.07	0.00008	-0.006449	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	VN	-3.08	-0.00387	-0.012527	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	VN	-5.83	-0.00733	-0.013053	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	VN	-0.31	-0.00039	0.008646	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	VN	-5.23	-0.00657	0.001522	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	VN	-1.31	-0.00164	-0.003656	±2.5	PASS
CatM1 Band 14	16QAM 5MHz	HCH	5RB#0	VN	-0.83	-0.00104	-0.001781	±2.5	PASS

The End



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