



Appendix B

Test Data for SZEM161201074805RG



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1 Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	ERP[dB]	Limit[dBm]	Verdict
GSM 850	GSM/TM1	LCH	33.24	33.35	38.45	PASS
		MCH	33.27	33.38	38.45	PASS
		HCH	33.05	33.16	38.45	PASS
	GSM/TM2	LCH	26.64	26.75	38.45	PASS
		MCH	26.88	26.99	38.45	PASS
		HCH	27.24	27.35	38.45	PASS

Note:

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

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

b: SGP=Signal Generator Level

c: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS

Test Band	Test Mode	Test Channel	Measured[dB]	EIRP[dB]	Limit[dBm]	Verdict
GSM 1900	GSM/TM1	LCH	30.33	32.56	33	PASS
		MCH	30.36	32.59	33	PASS
		HCH	30.35	32.58	33	PASS
	GSM/TM2	LCH	26.49	28.72	33	PASS
		MCH	26.57	28.80	33	PASS
		HCH	26.85	29.08	33	PASS

Note:

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

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b: SGP=Signal Generator Level

c: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS



2 Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM 850	GSM/TM1	LCH	6.43	13	PASS
		MCH	6.38	13	PASS
		HCH	6.38	13	PASS
	GSM/TM2	LCH	9.68	13	PASS
		MCH	9.36	13	PASS
		HCH	9.04	13	PASS
GSM 1900	GSM/TM1	LCH	6.41	13	PASS
		MCH	6.41	13	PASS
		HCH	6.43	13	PASS
	GSM/TM2	LCH	10.41	13	PASS
		MCH	9.19	13	PASS
		HCH	9.19	13	PASS



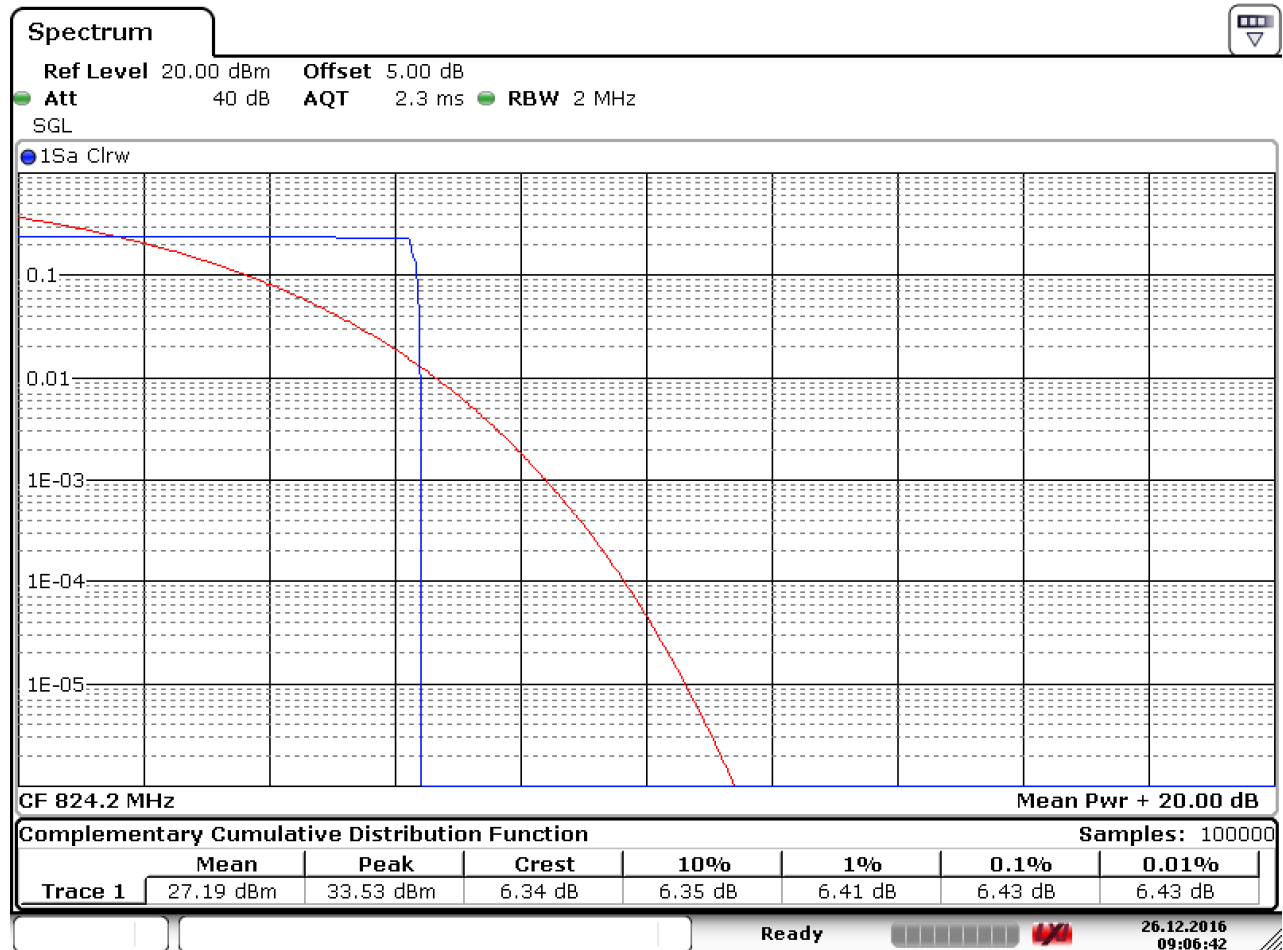
Part II - Test Plots

2.1 For GSM

2.1.1 Test Band = GSM 850

2.1.1.1 Test Mode = GSM/TM1

2.1.1.1.1 Test Channel = LCH

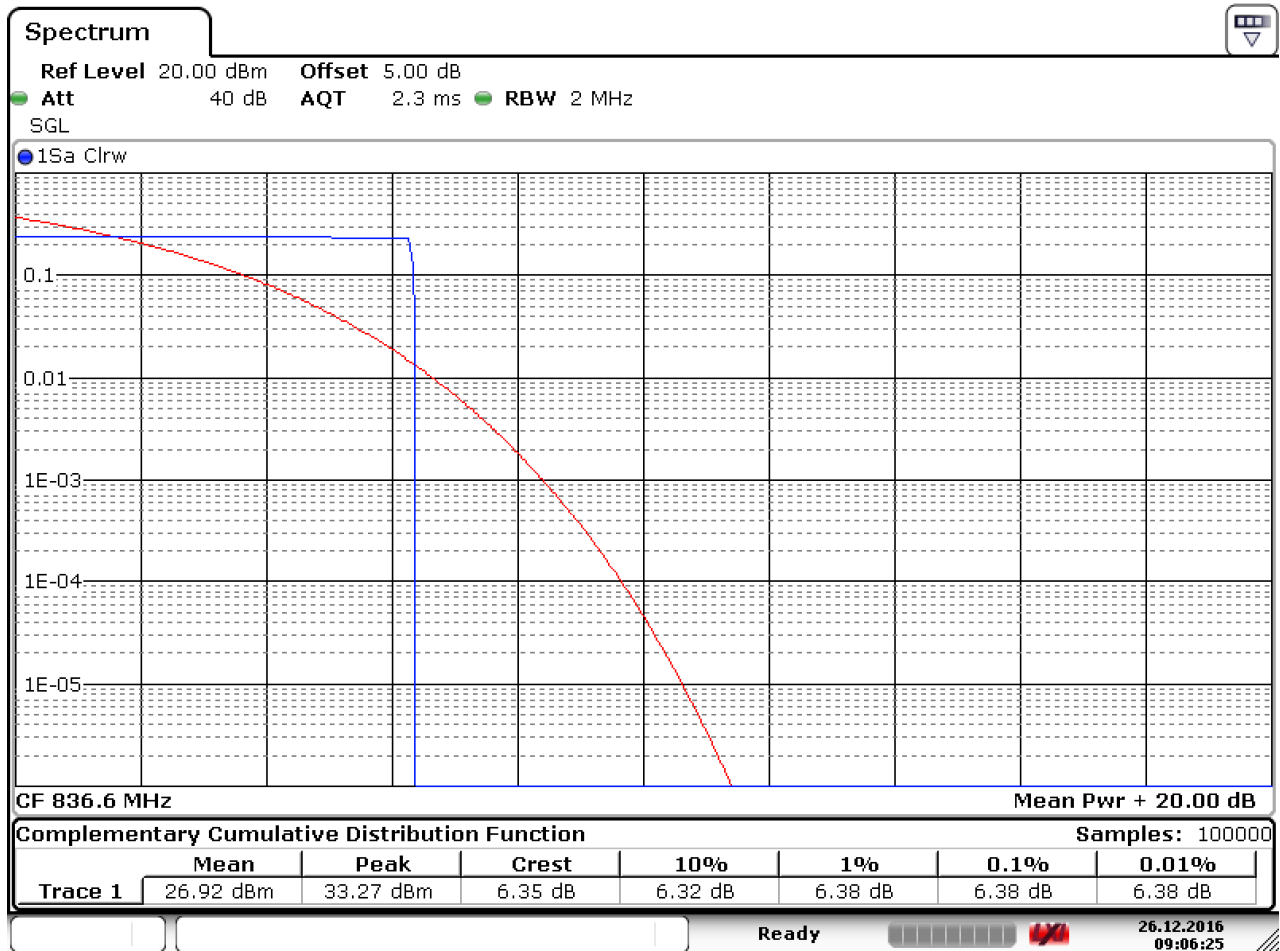


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2.1.1.1.2 Test Channel = MCH

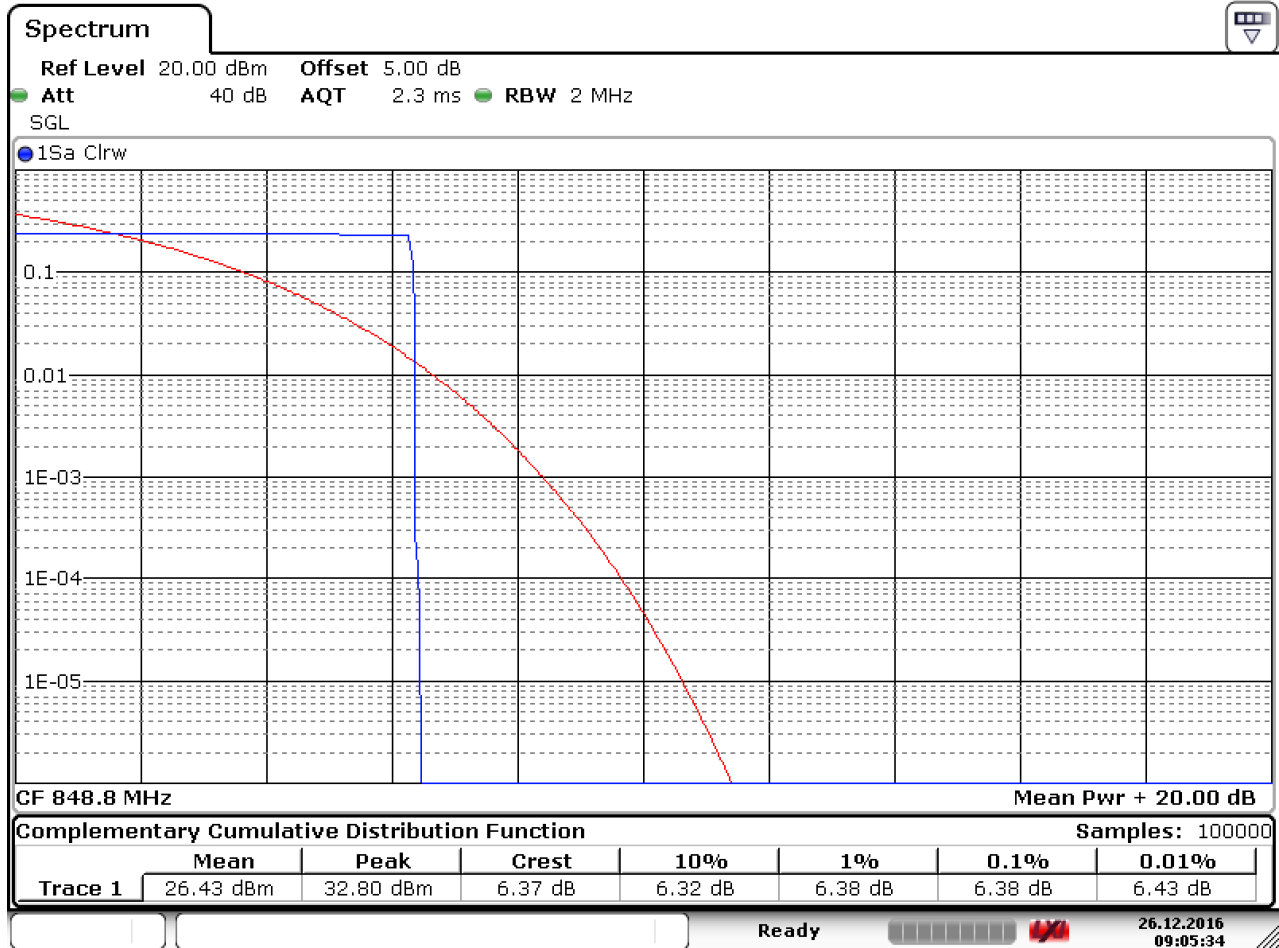


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2.1.1.1.3 Test Channel = HCH



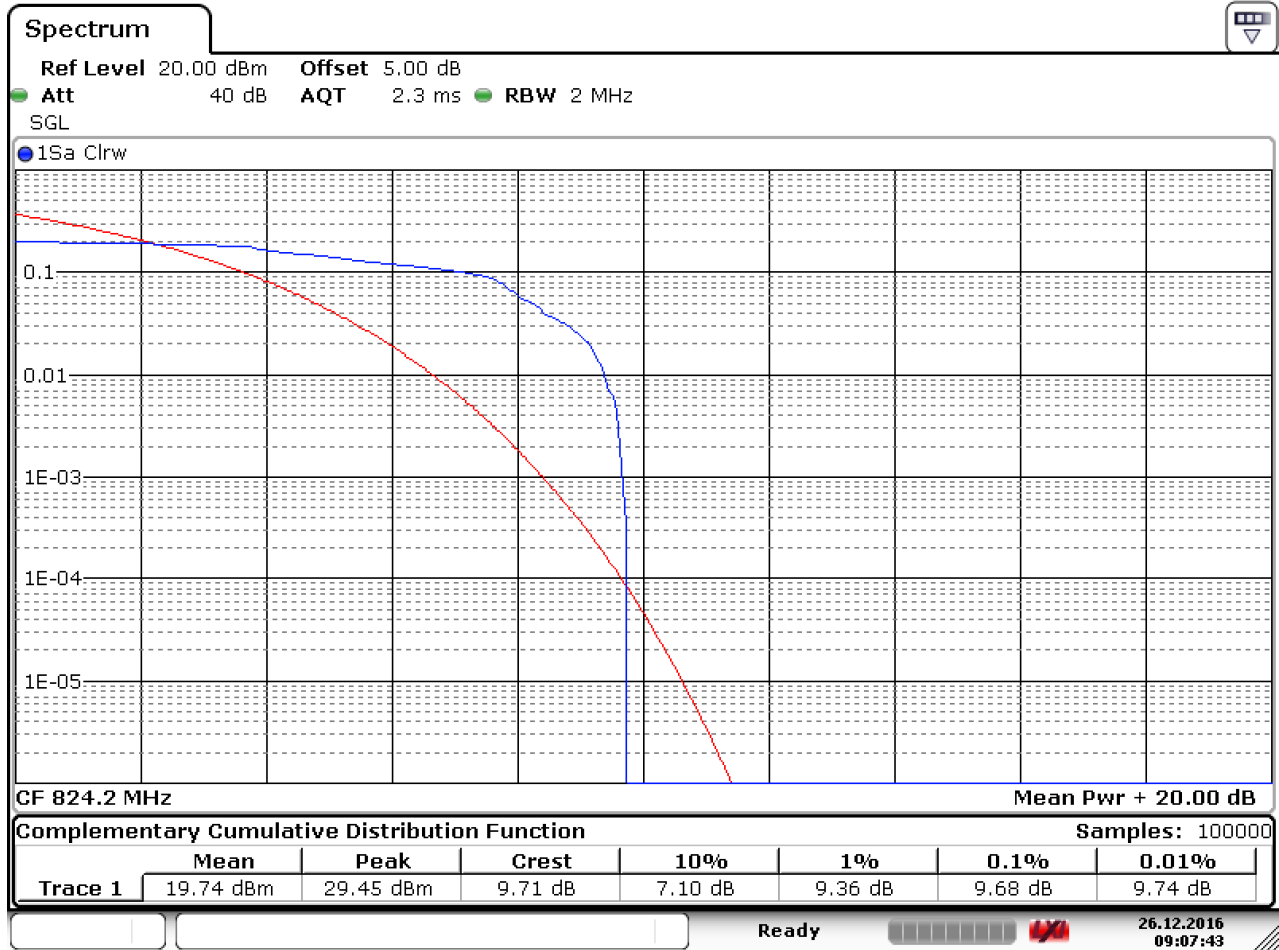
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2.1.1.2 Test Mode = GSM/TM2

2.1.1.2.1 Test Channel = LCH

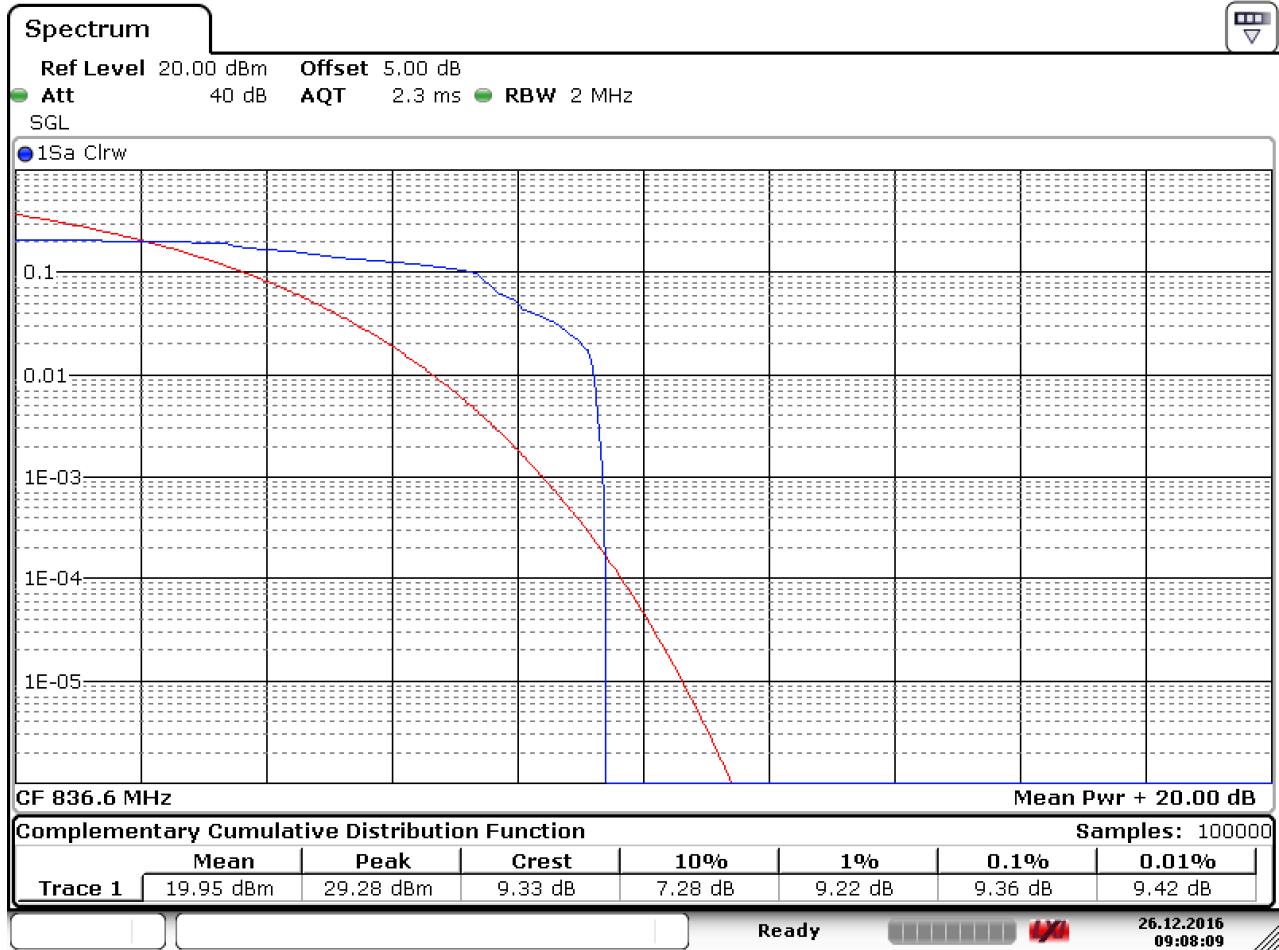


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2.1.1.2.2 Test Channel = MCH

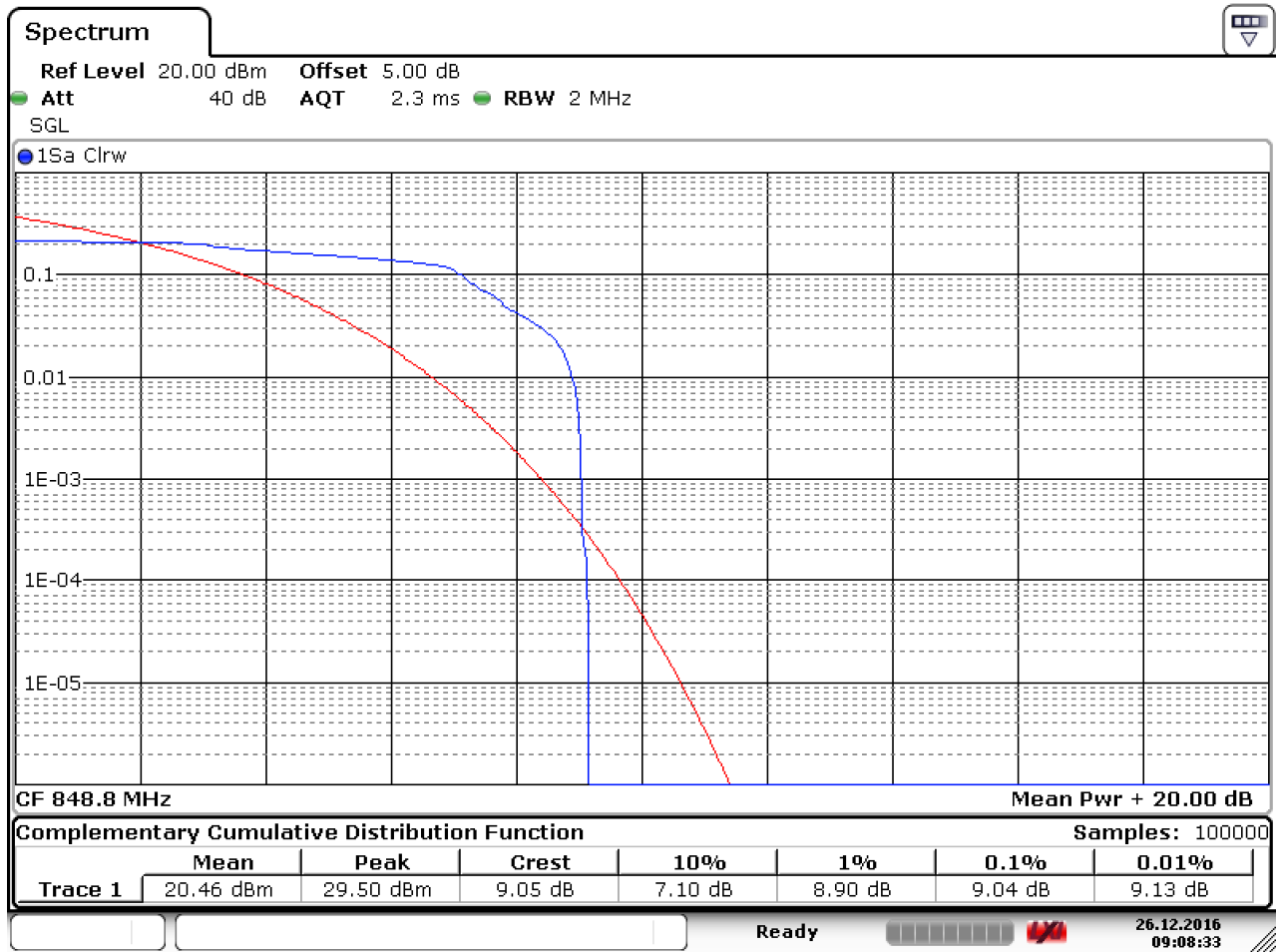


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2.1.1.2.3 Test Channel = HCH



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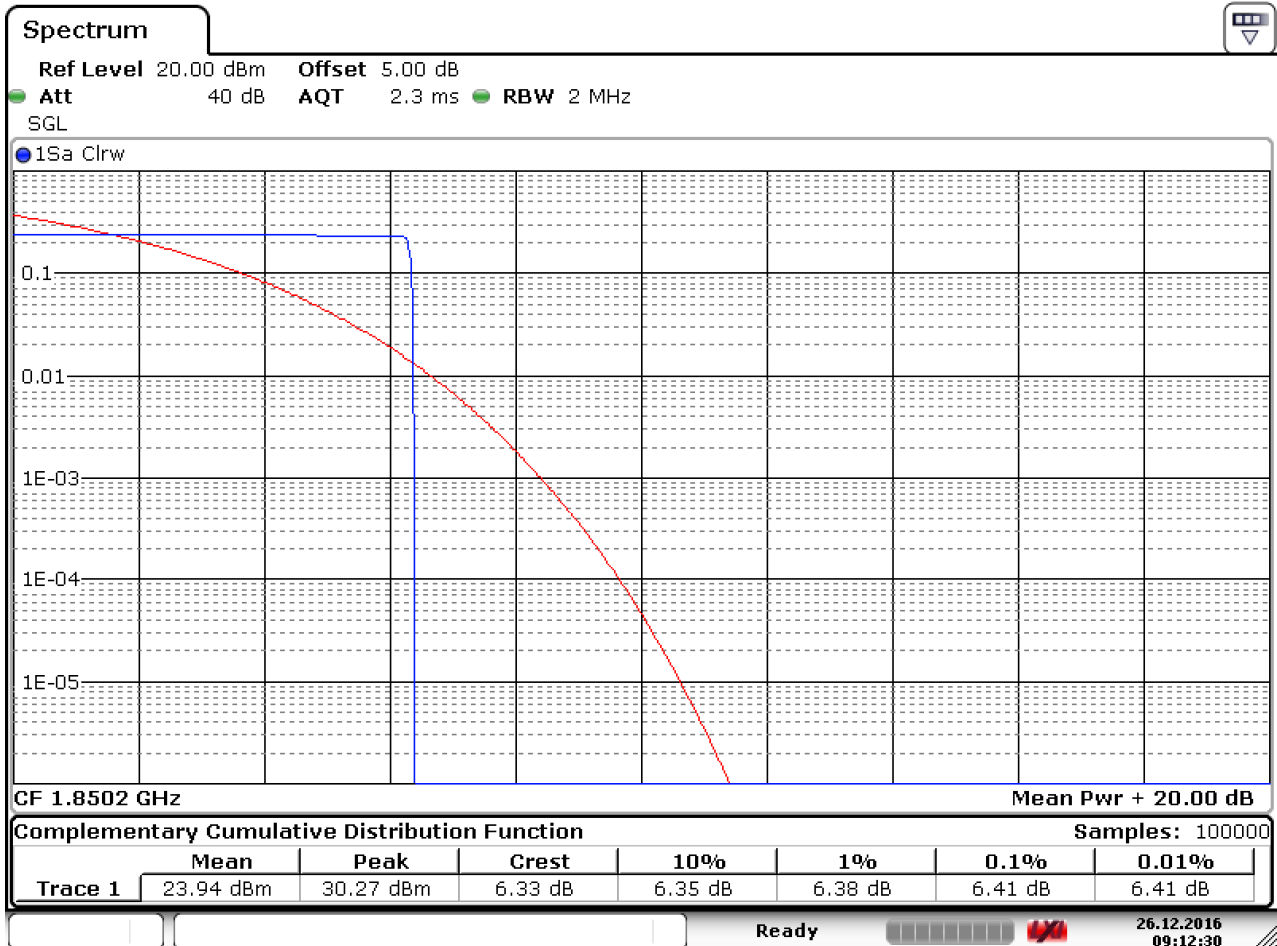
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2.1.2 Test Band = GSM 1900

2.1.2.1 Test Mode = GSM/TM1

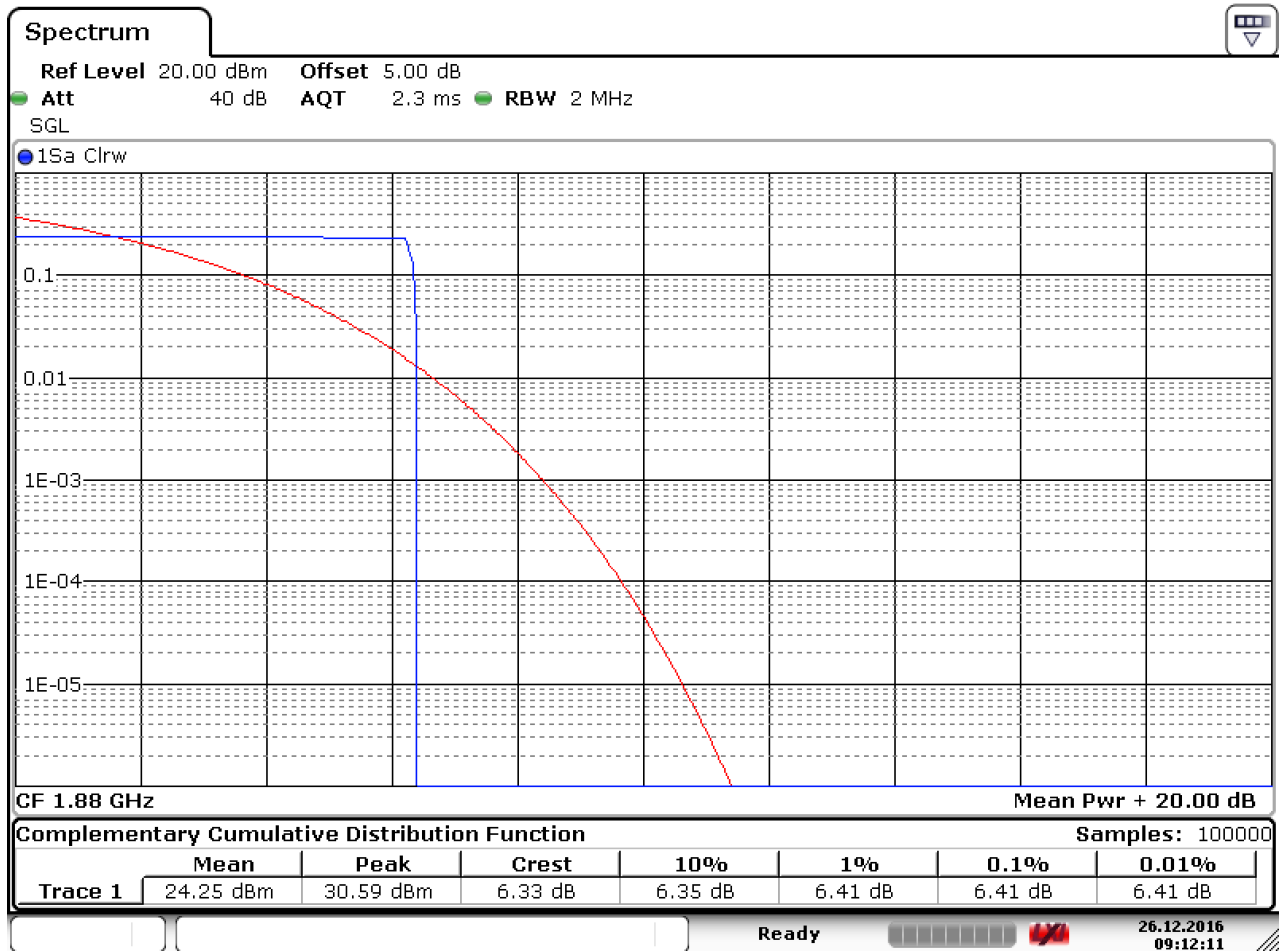
2.1.2.1.1 Test Channel = LCH



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2.1.2.1.2 Test Channel = MCH

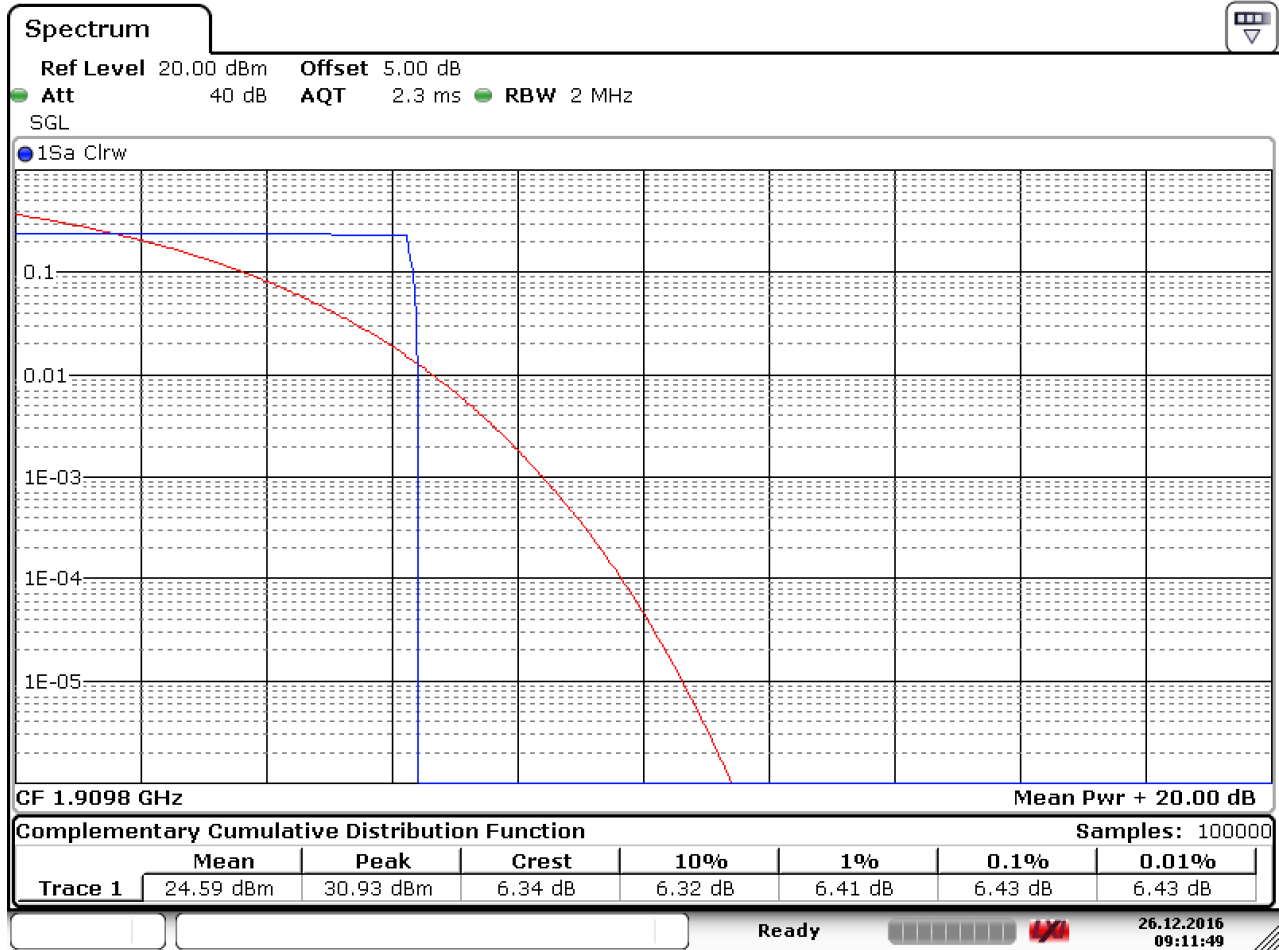


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2.1.2.1.3 Test Channel = HCH



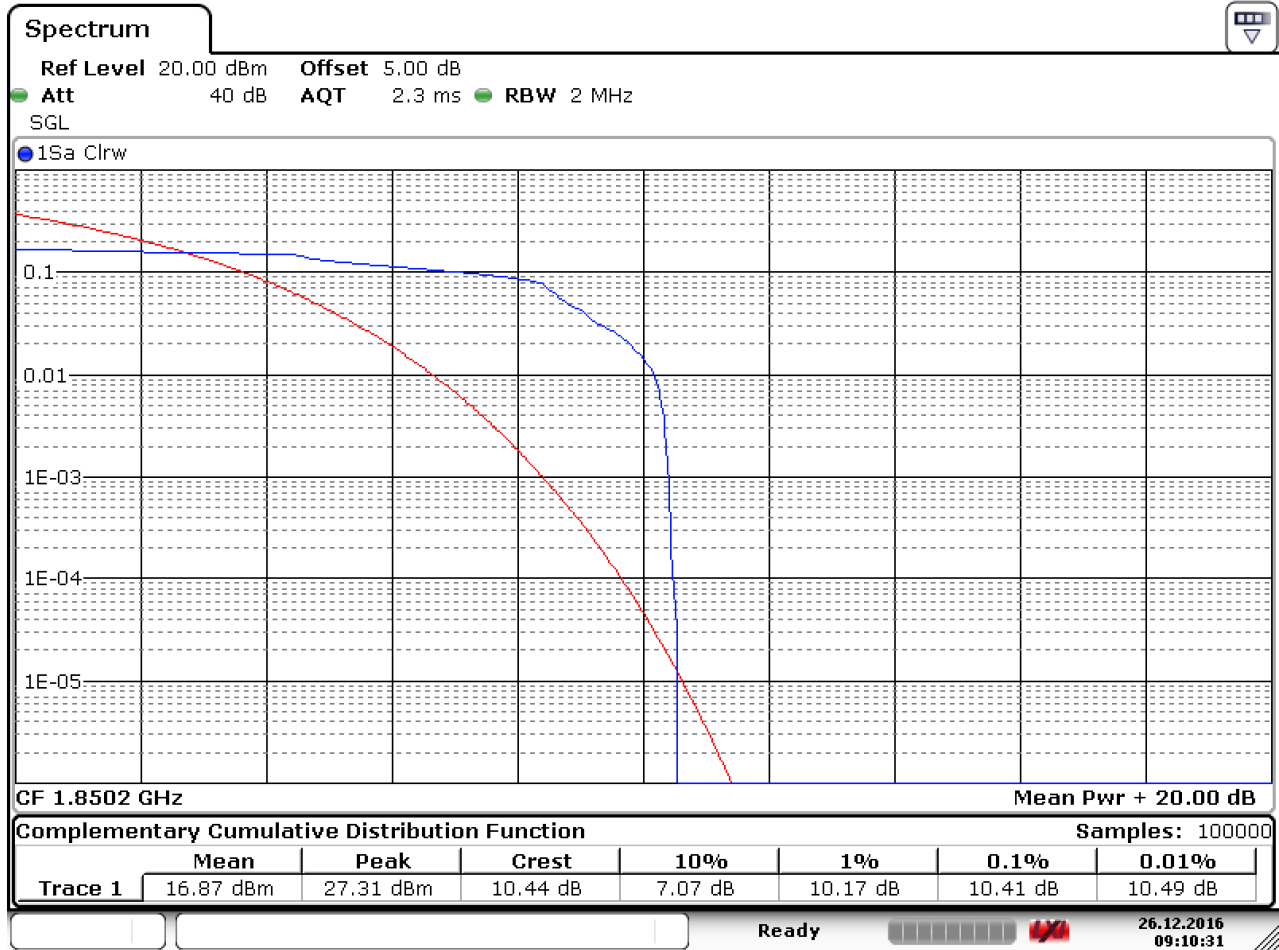
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2.1.2.2 Test Mode = GSM/TM2

2.1.2.2.1 Test Channel = LCH

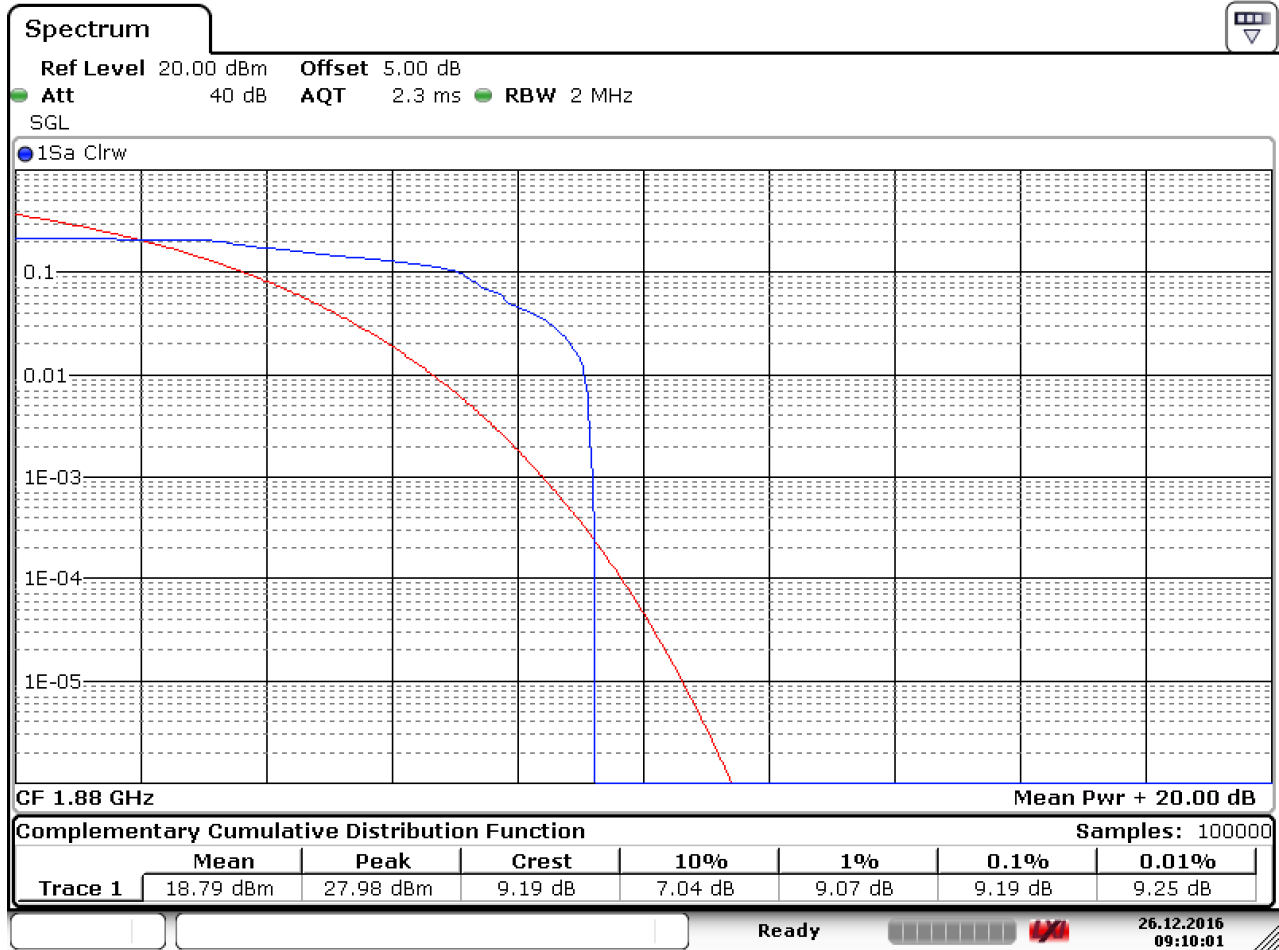


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2.1.2.2.2 Test Channel = MCH

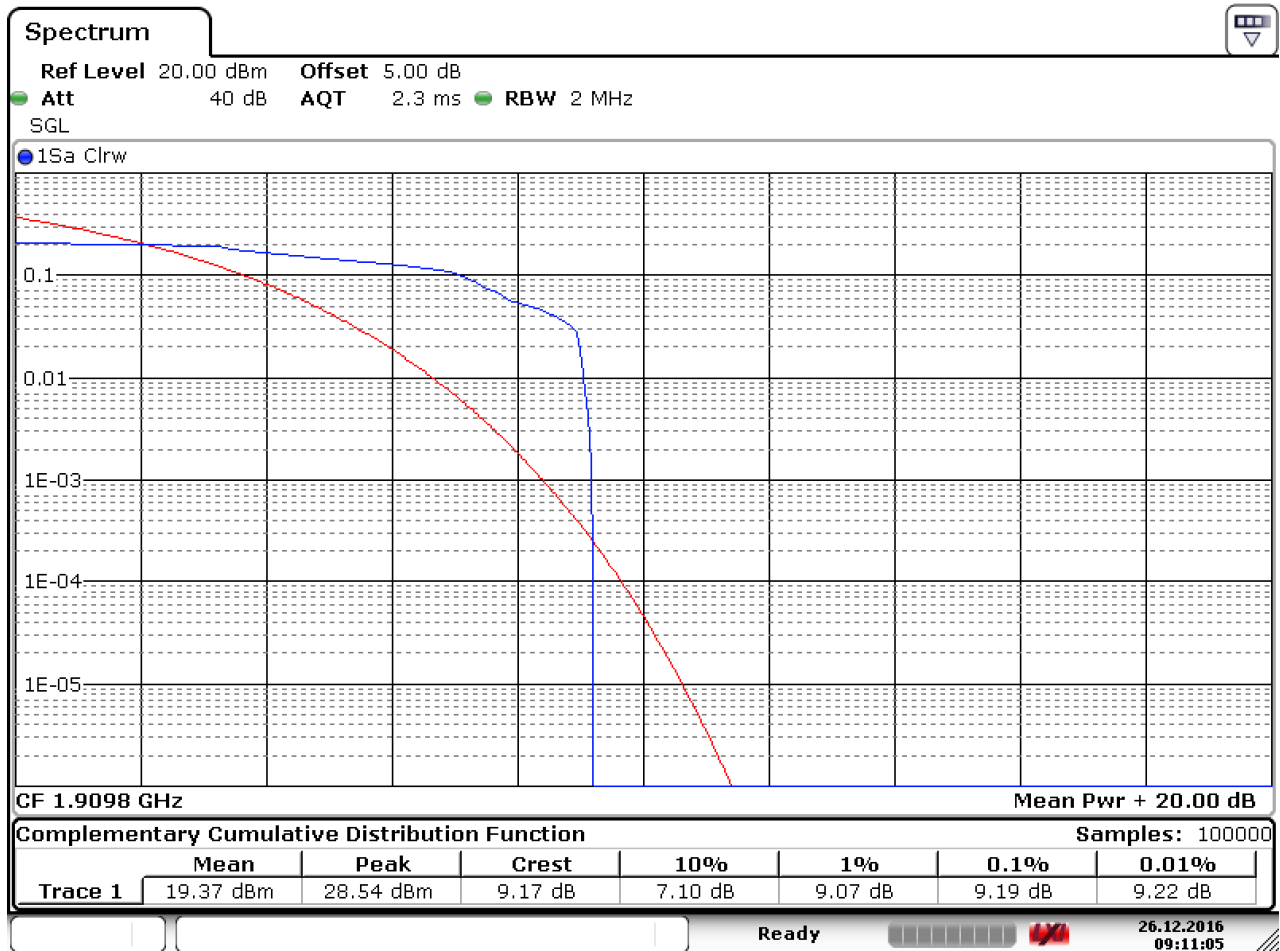


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2.1.2.2.3 Test Channel = HCH



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3 Modulation Characteristics

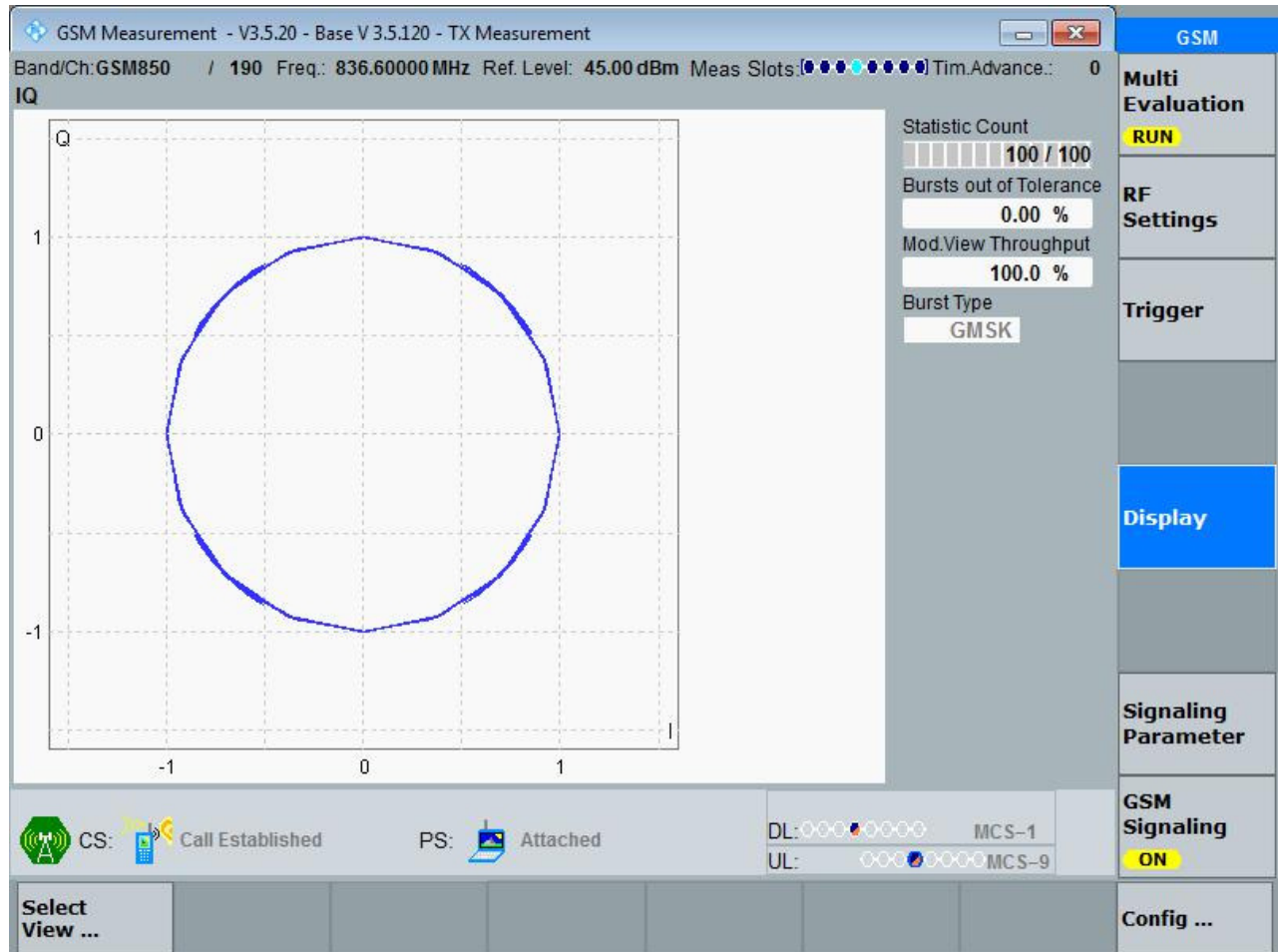
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM 850

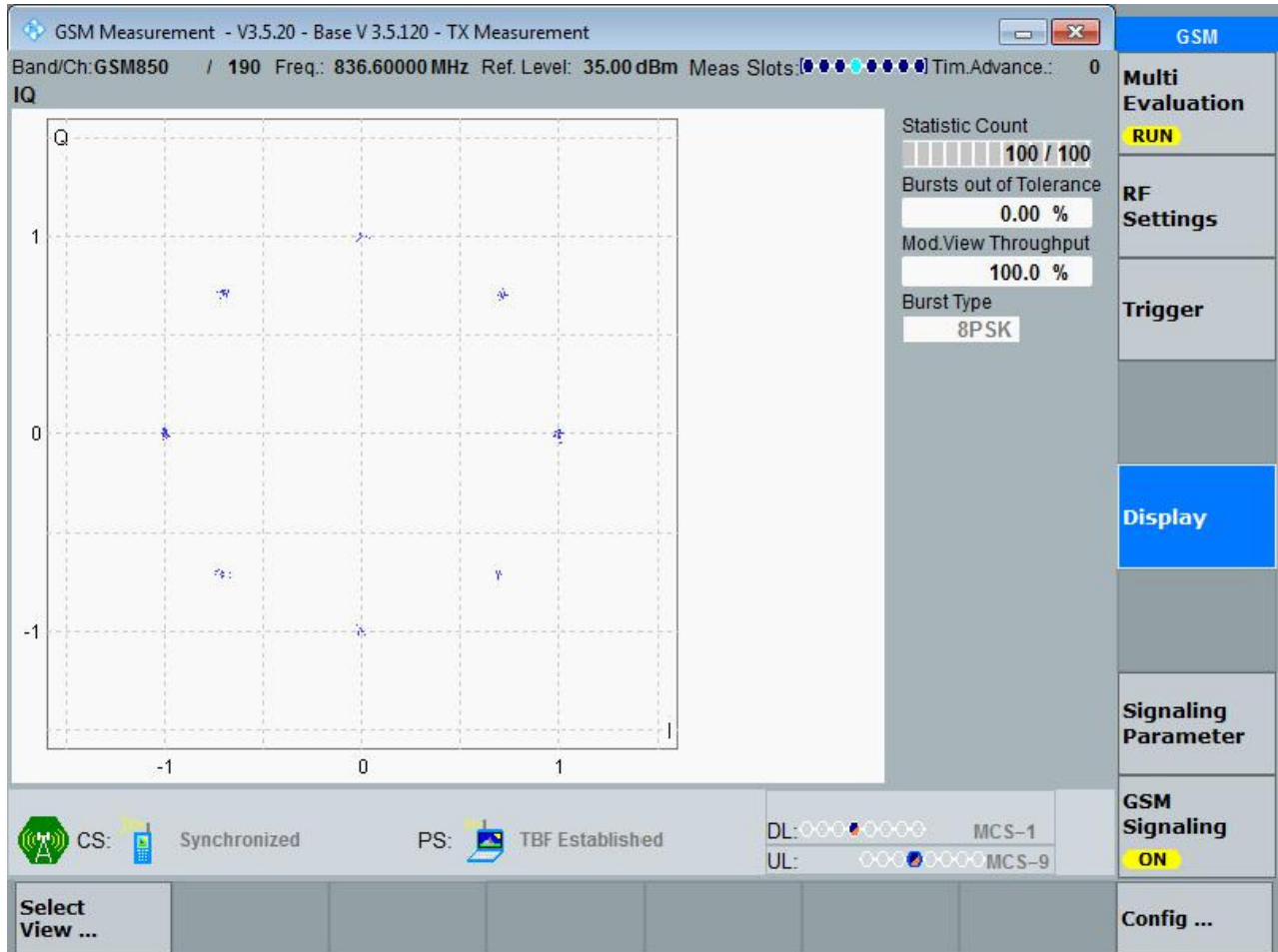
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH





3.1.1.2 Test Mode = GSM/TM2
3.1.1.2.1 Test Channel = MCH

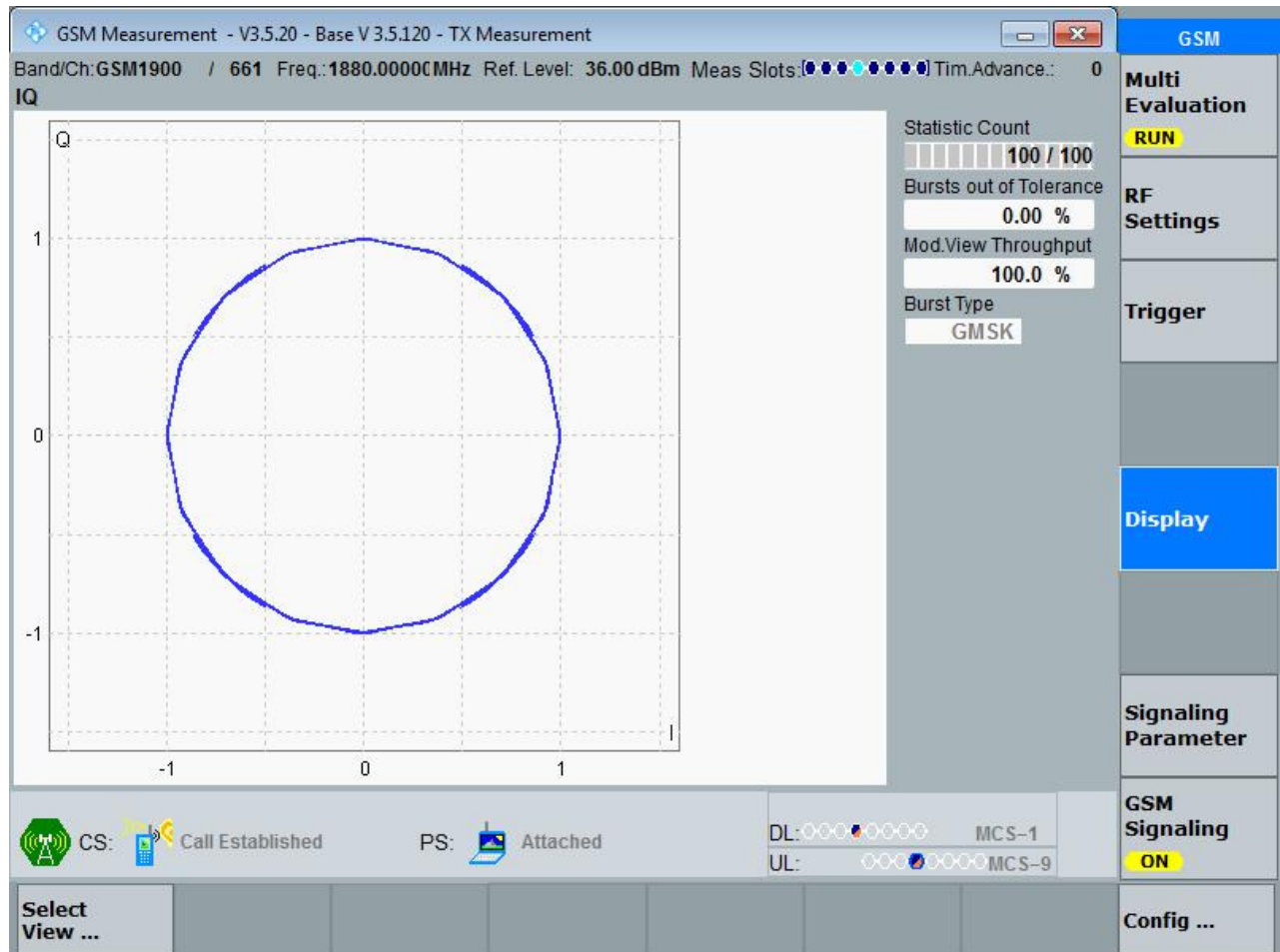




3.1.2 Test Band = GSM 1900

3.1.2.1 Test Mode = GSM/TM1

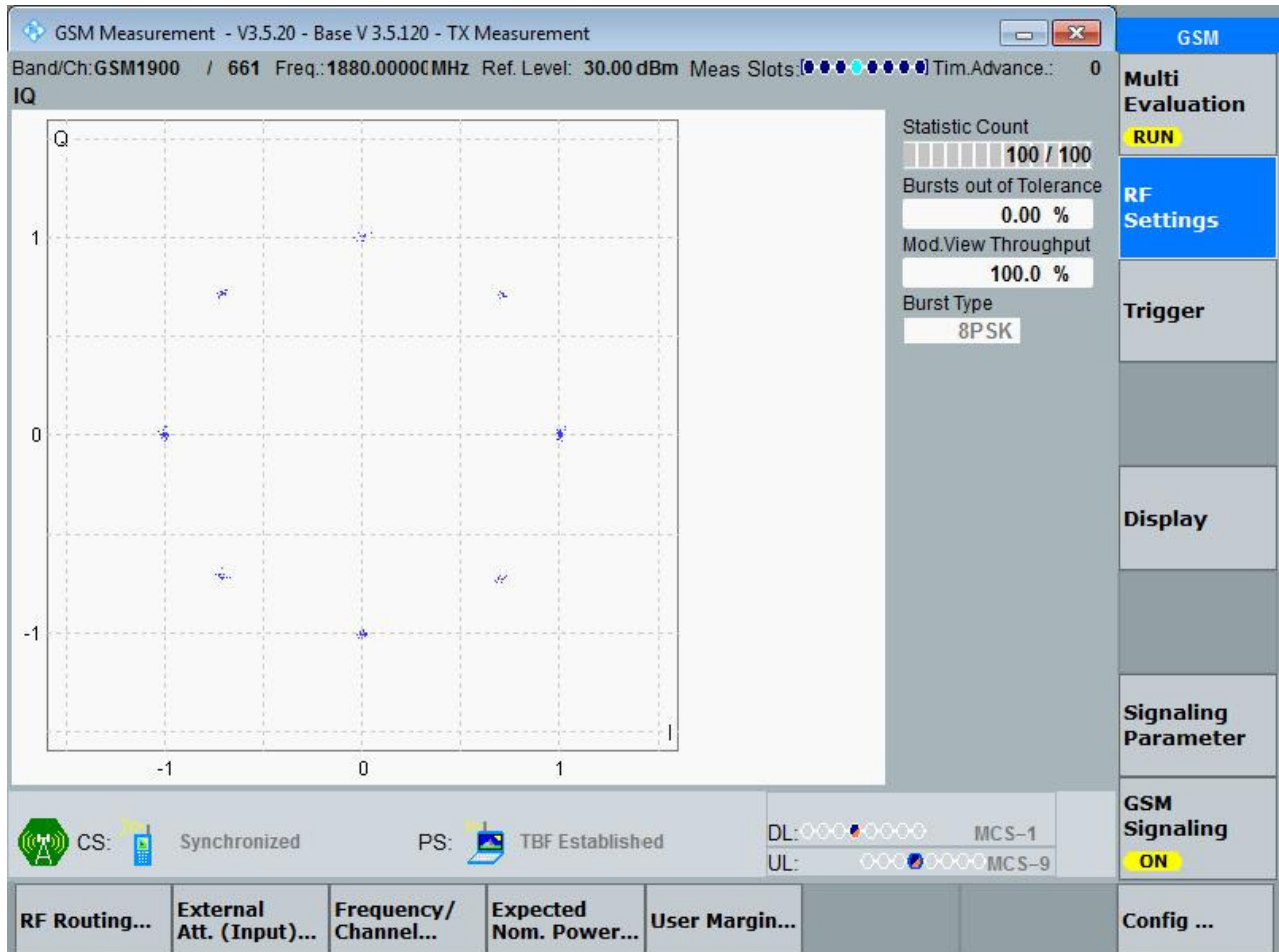
3.1.2.1.1 Test Channel = MCH





3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH



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4 Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM 850	GSM/TM1	LCH	244.76	317.7	PASS
		MCH	244.76	317.7	PASS
		HCH	243.76	319.7	PASS
	GSM/TM2	LCH	243.76	317.7	PASS
		MCH	245.75	317.7	PASS
		HCH	244.76	316.7	PASS
GSM 1900	GSM/TM1	LCH	243.76	319.7	PASS
		MCH	243.76	319.7	PASS
		HCH	243.76	318.7	PASS
	GSM/TM2	LCH	245.75	314.7	PASS
		MCH	246.75	314.7	PASS
		HCH	247.75	318.7	PASS

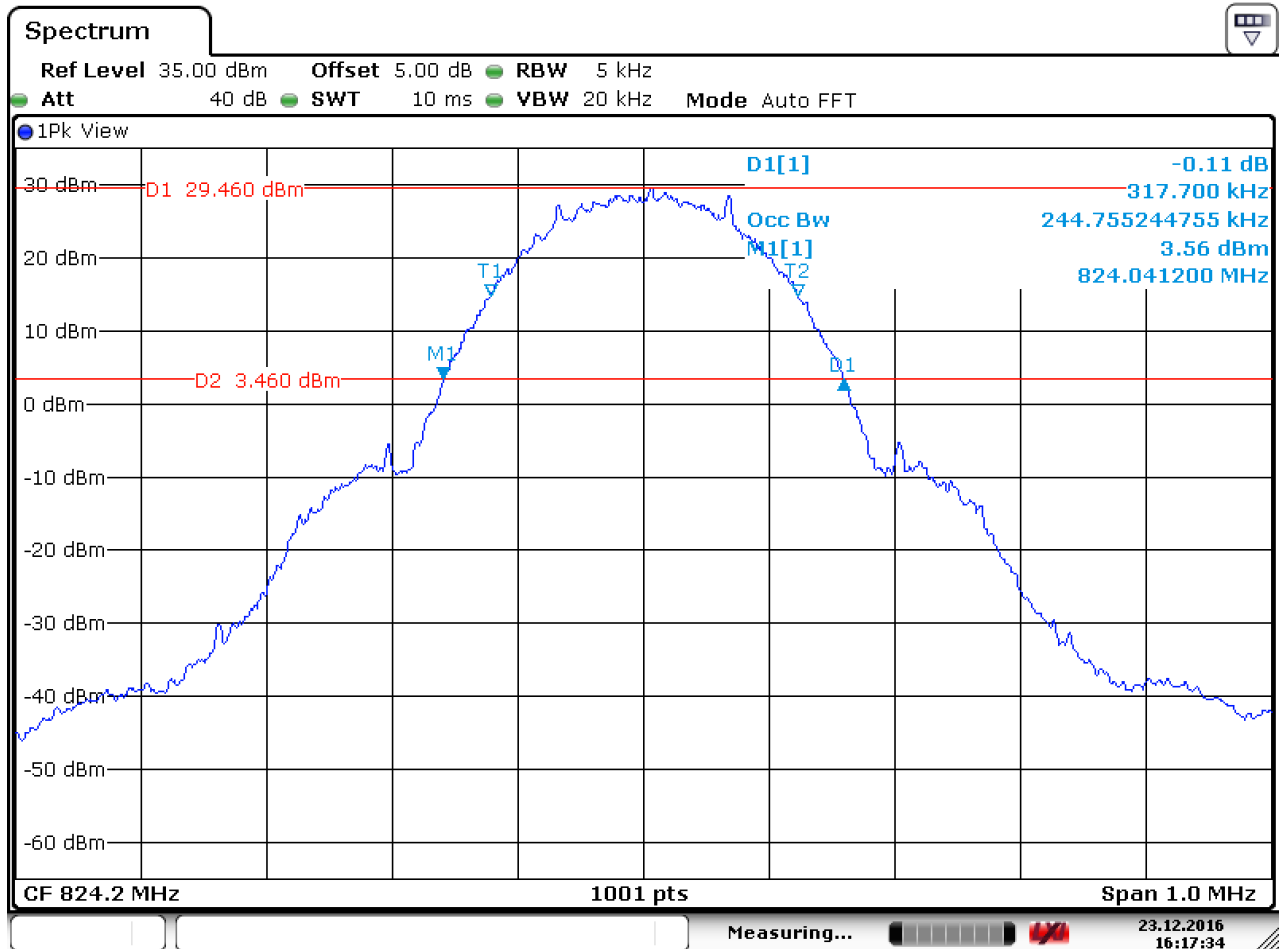


4.1 For GSM

4.1.1 Test Band = GSM 850

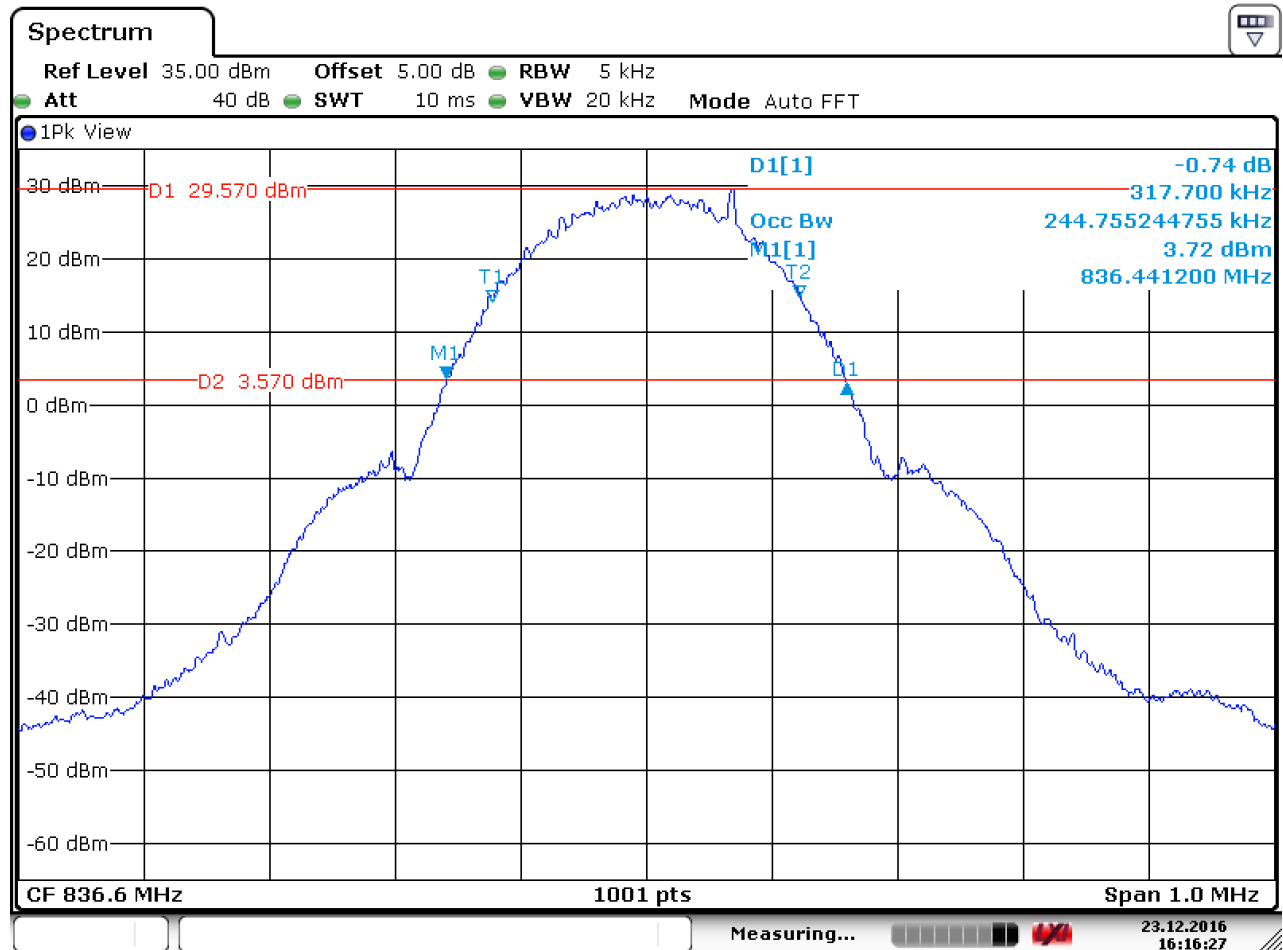
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



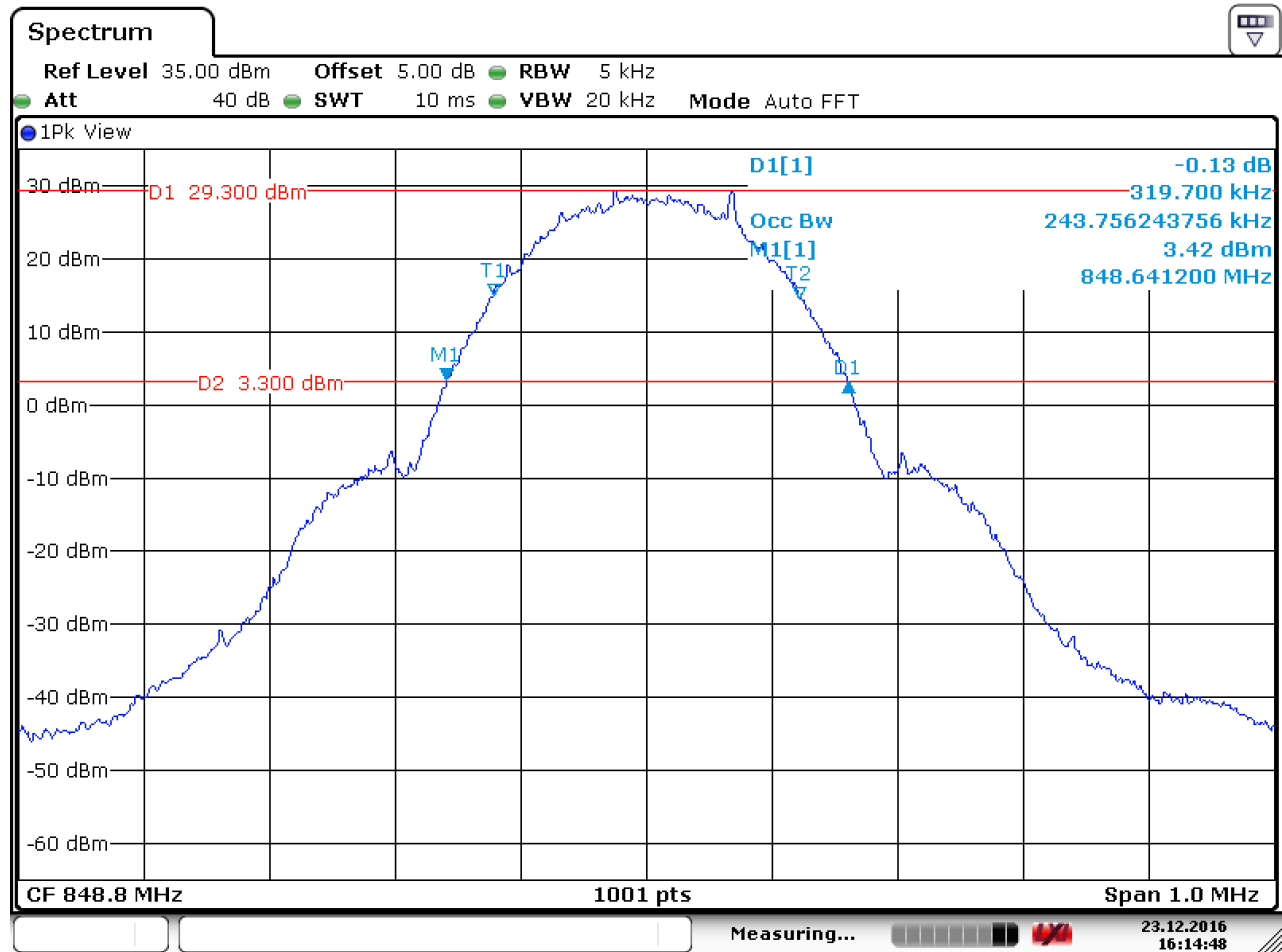
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4.1.1.1.2 Test Channel = MCH



Date: 23.DEC.2016 16:16:26

4.1.1.1.3 Test Channel = HCH



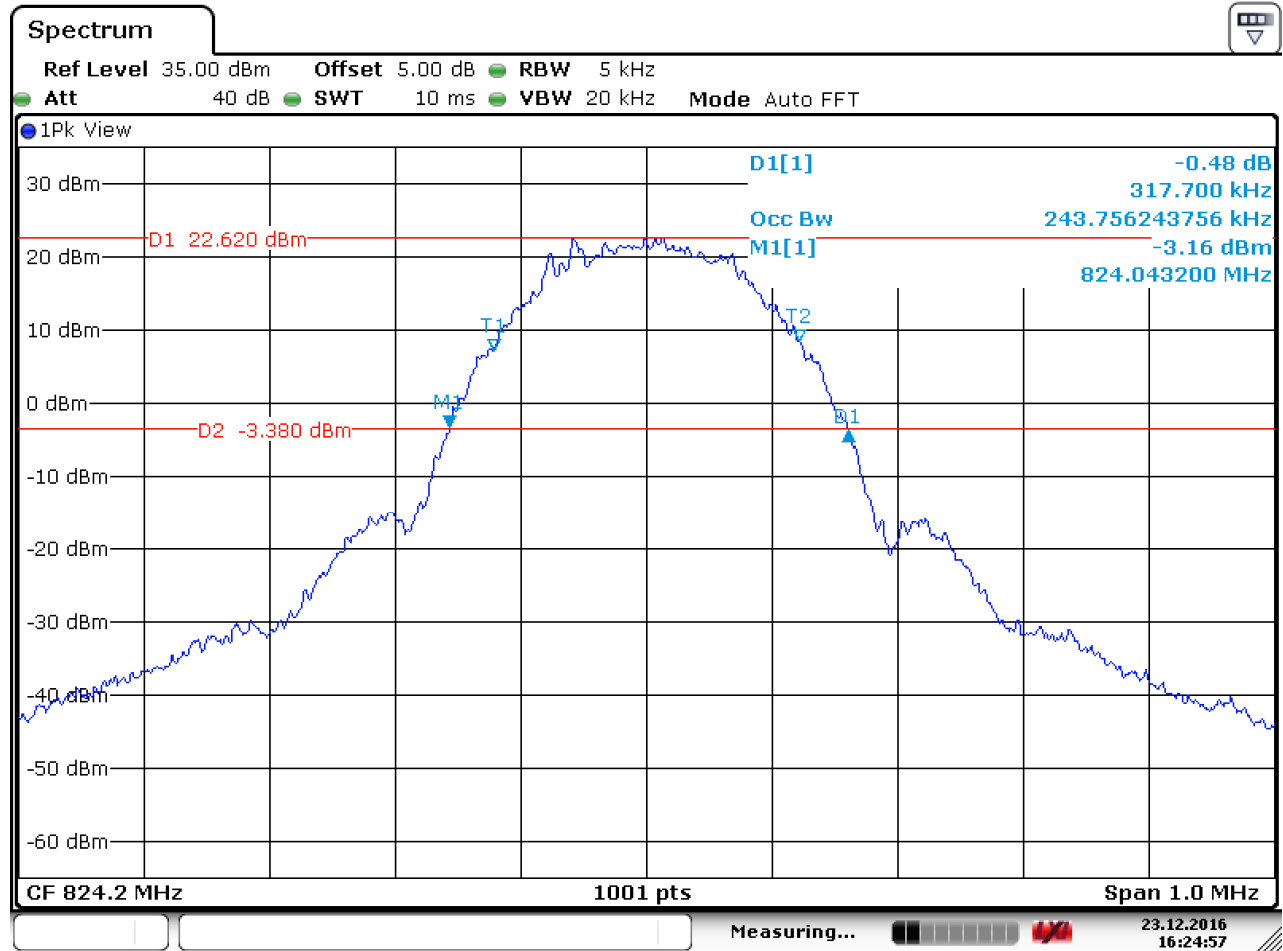
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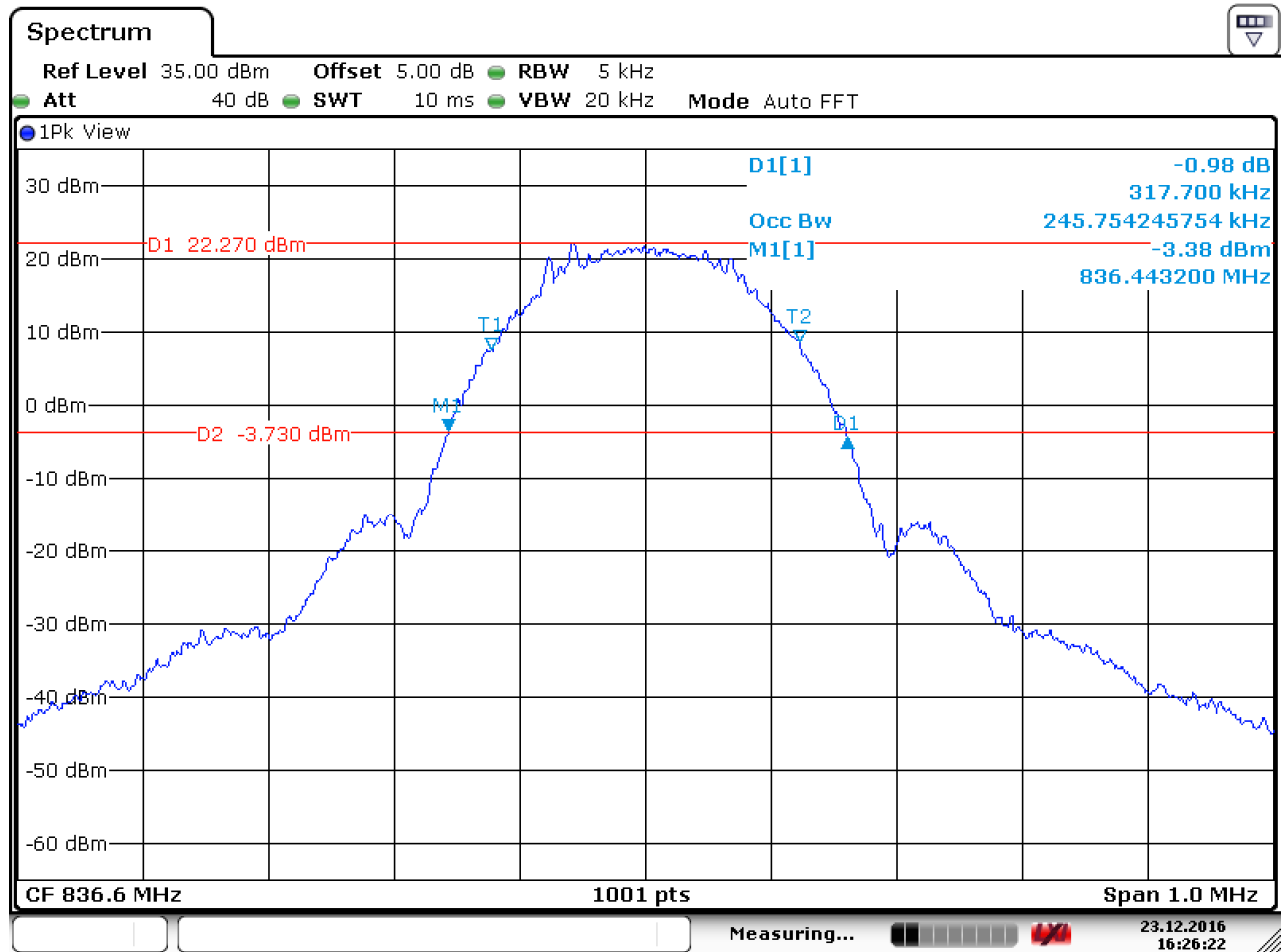
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4.1.1.2.1 Test Channel = LCH



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4.1.1.2.2 Test Channel = MCH

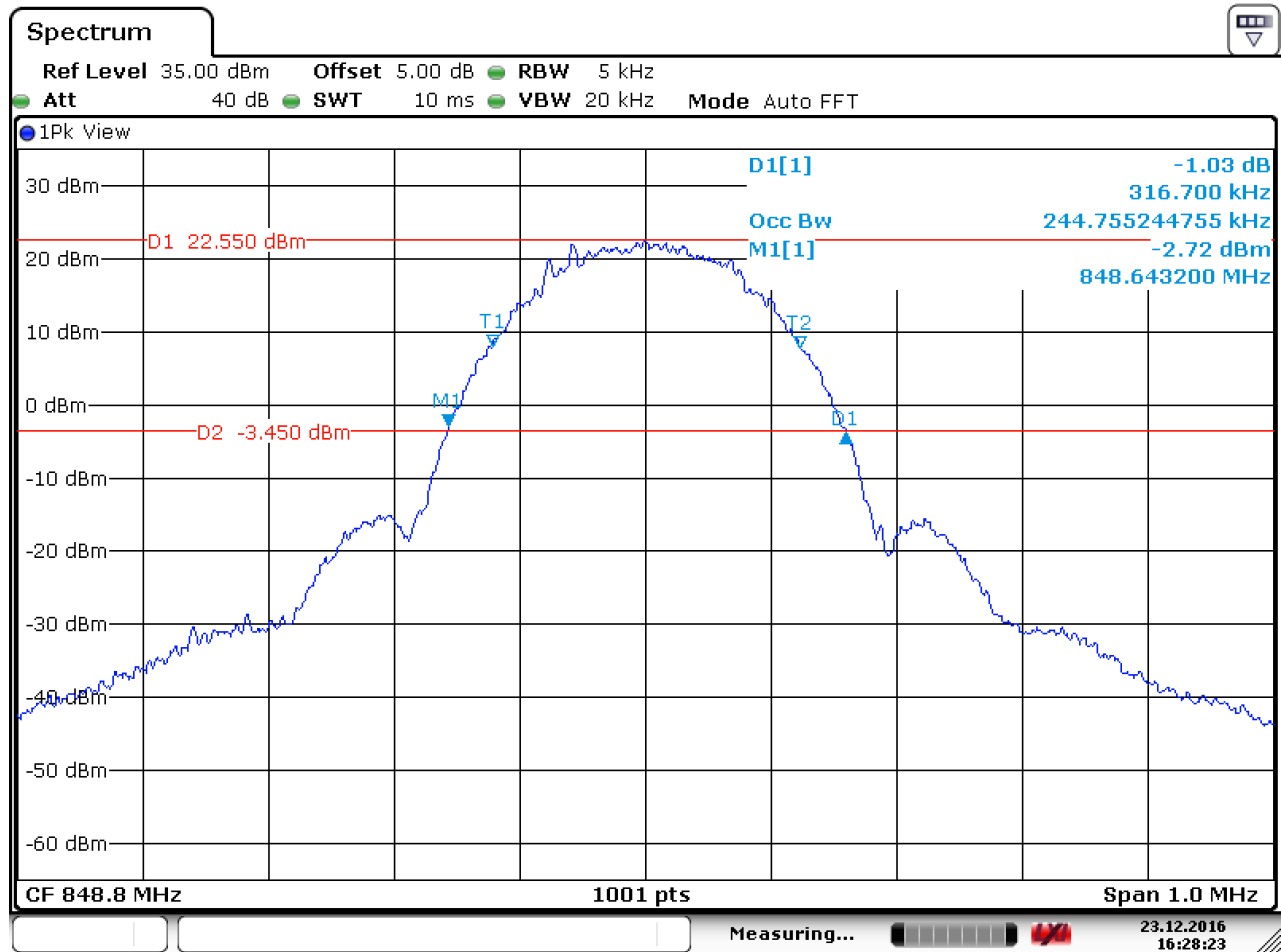


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4.1.1.2.3 Test Channel = HCH



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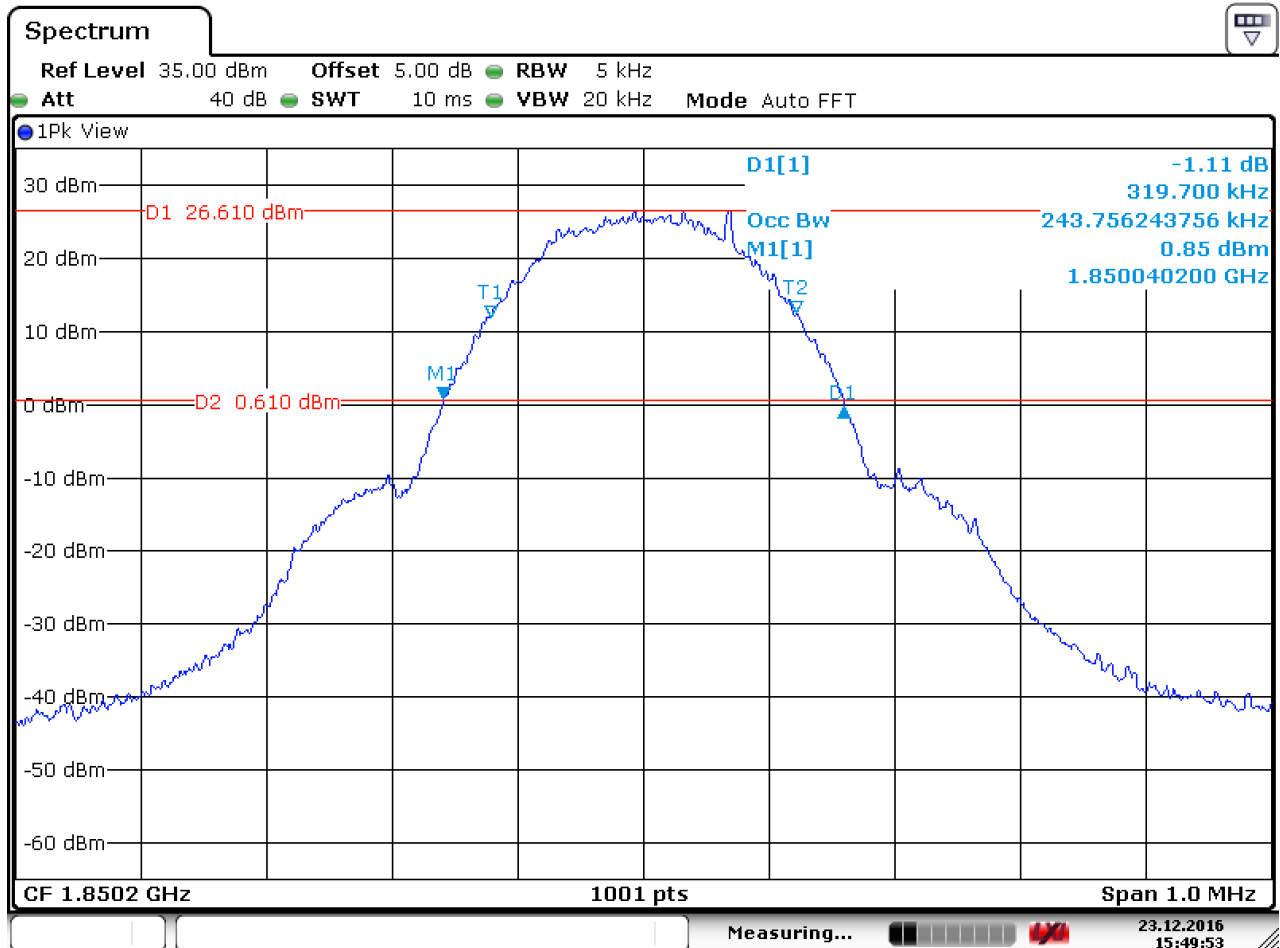
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4.1.2 Test Band = GSM 1900

4.1.2.1 Test Mode = GSM/TM1

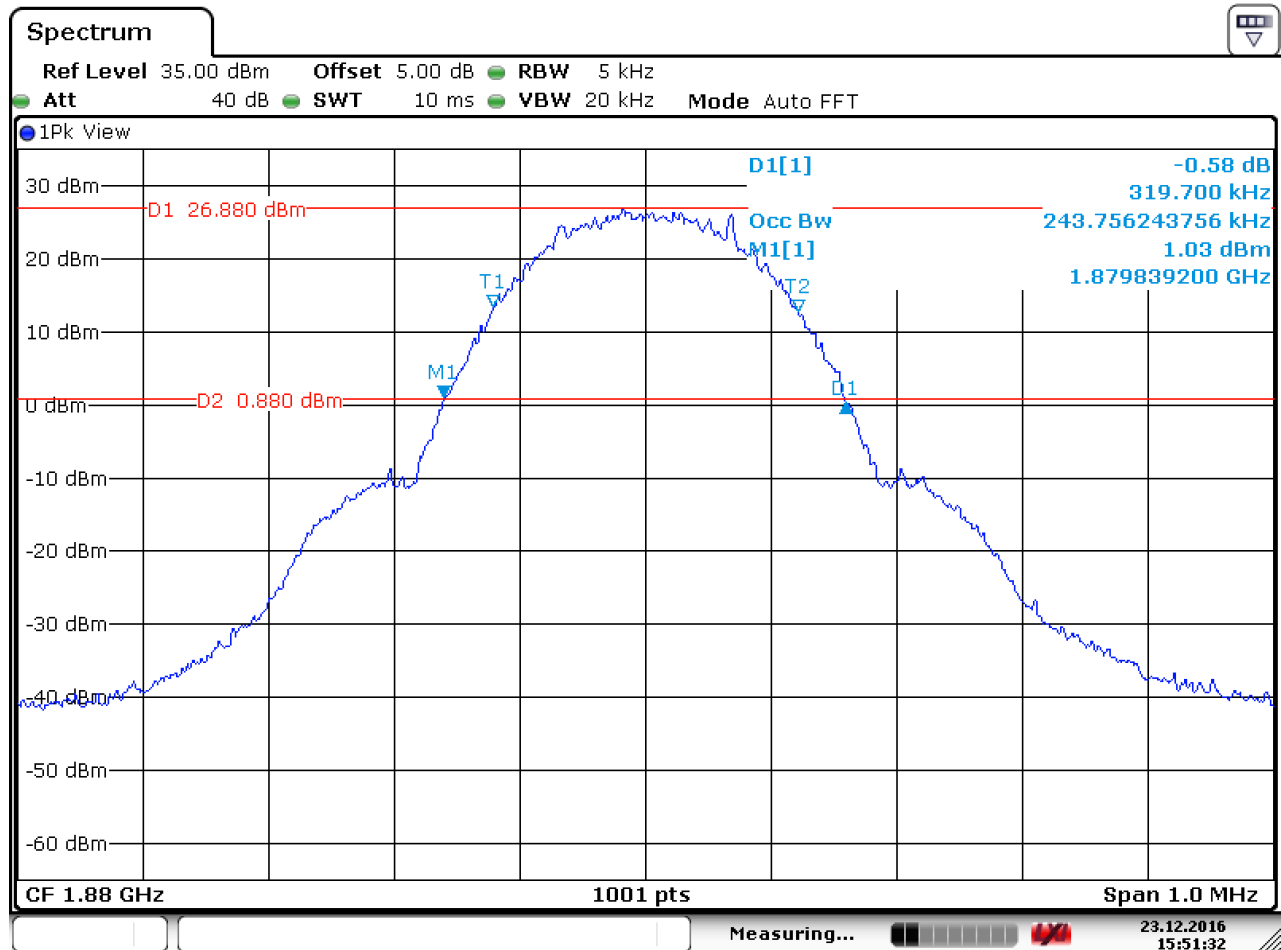
4.1.2.1.1 Test Channel = LCH



Date: 23.DEC.2016 15:49:54

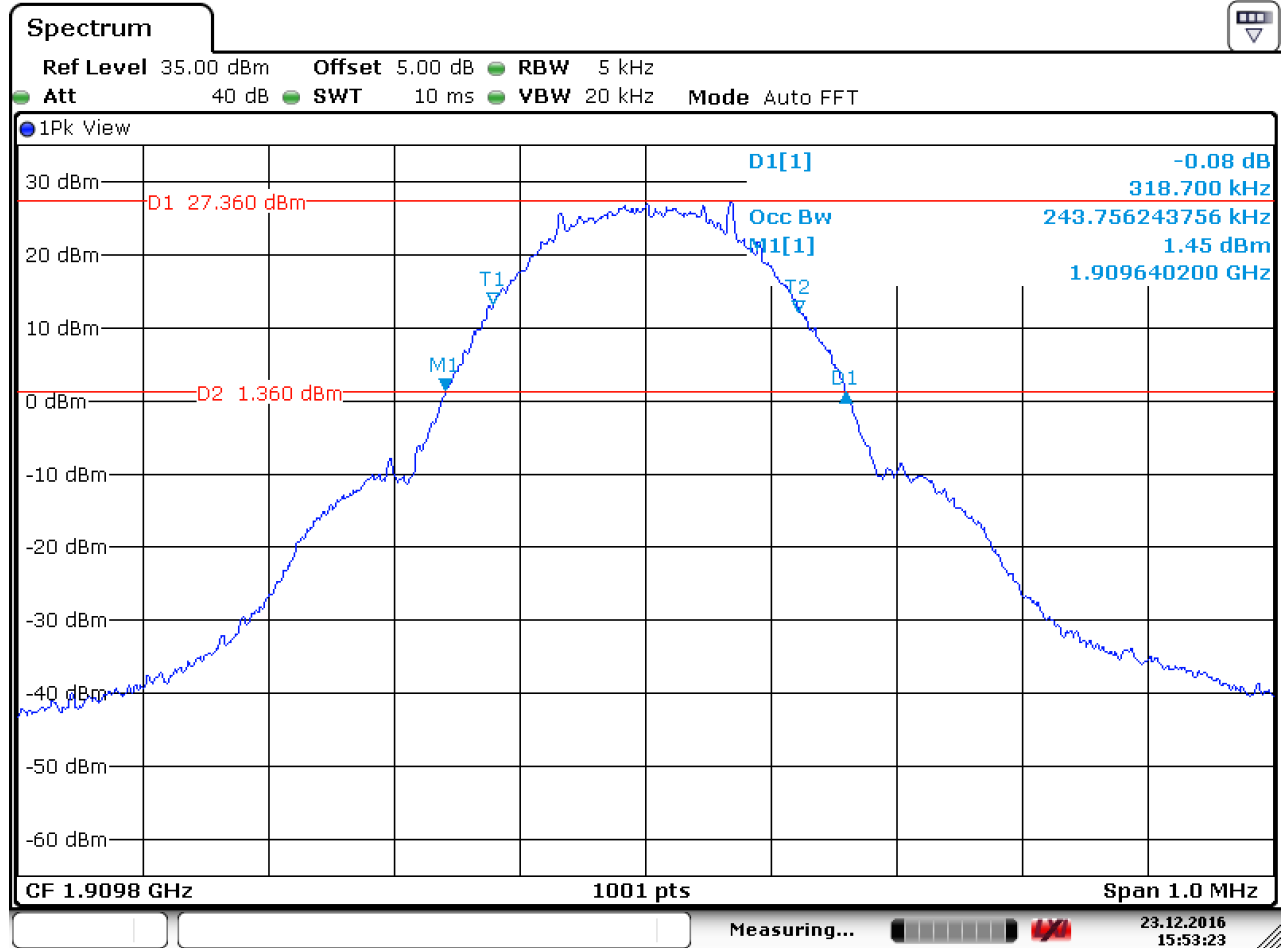
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4.1.2.1.2 Test Channel = MCH



Date: 23.DEC.2016 15:51:32

4.1.2.1.3 Test Channel = HCH

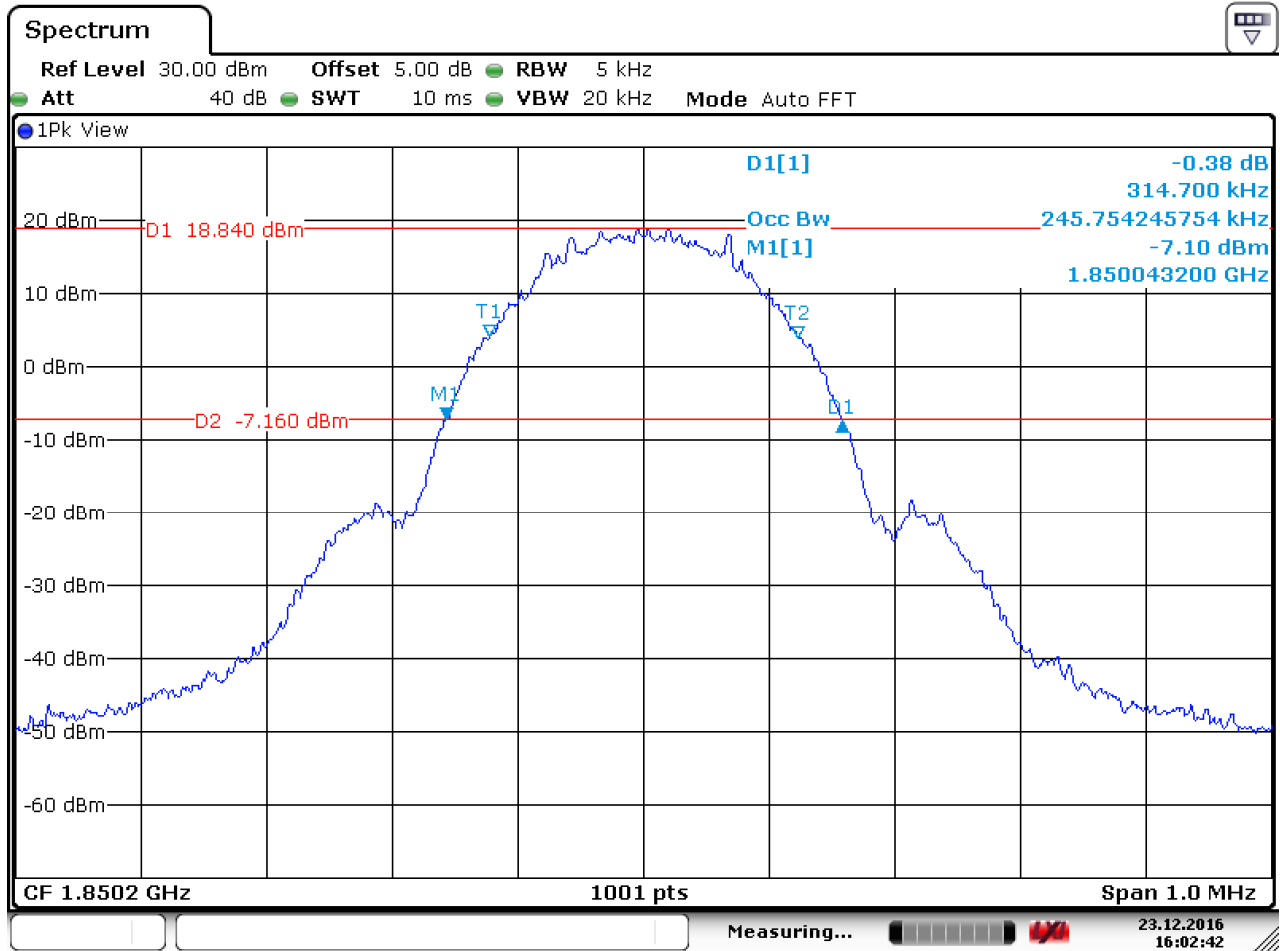


Date: 23.DEC.2016 15:53:24



4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH

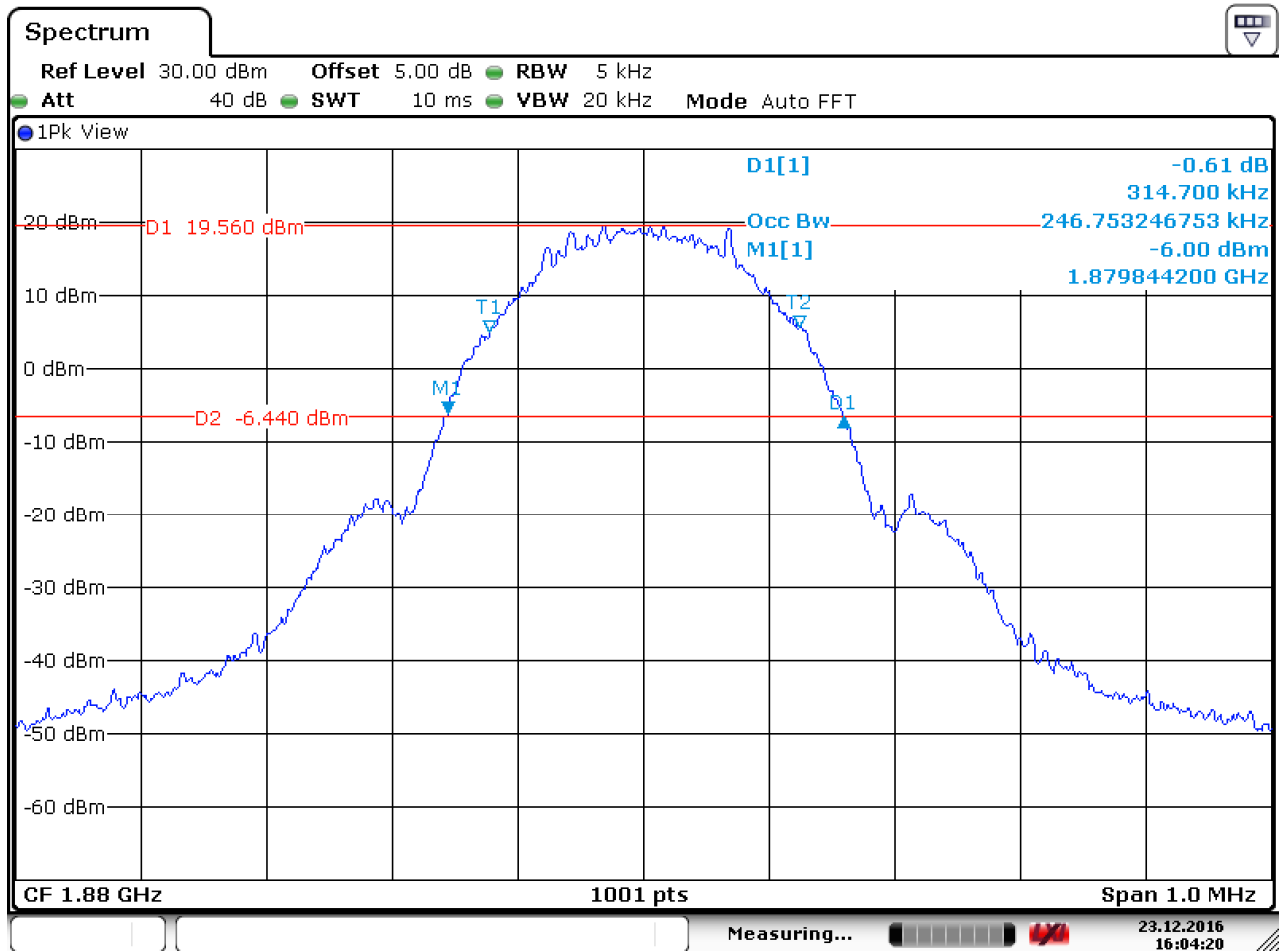


Date: 23.DEC.2016 16:02:43

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4.1.2.2.2 Test Channel = MCH

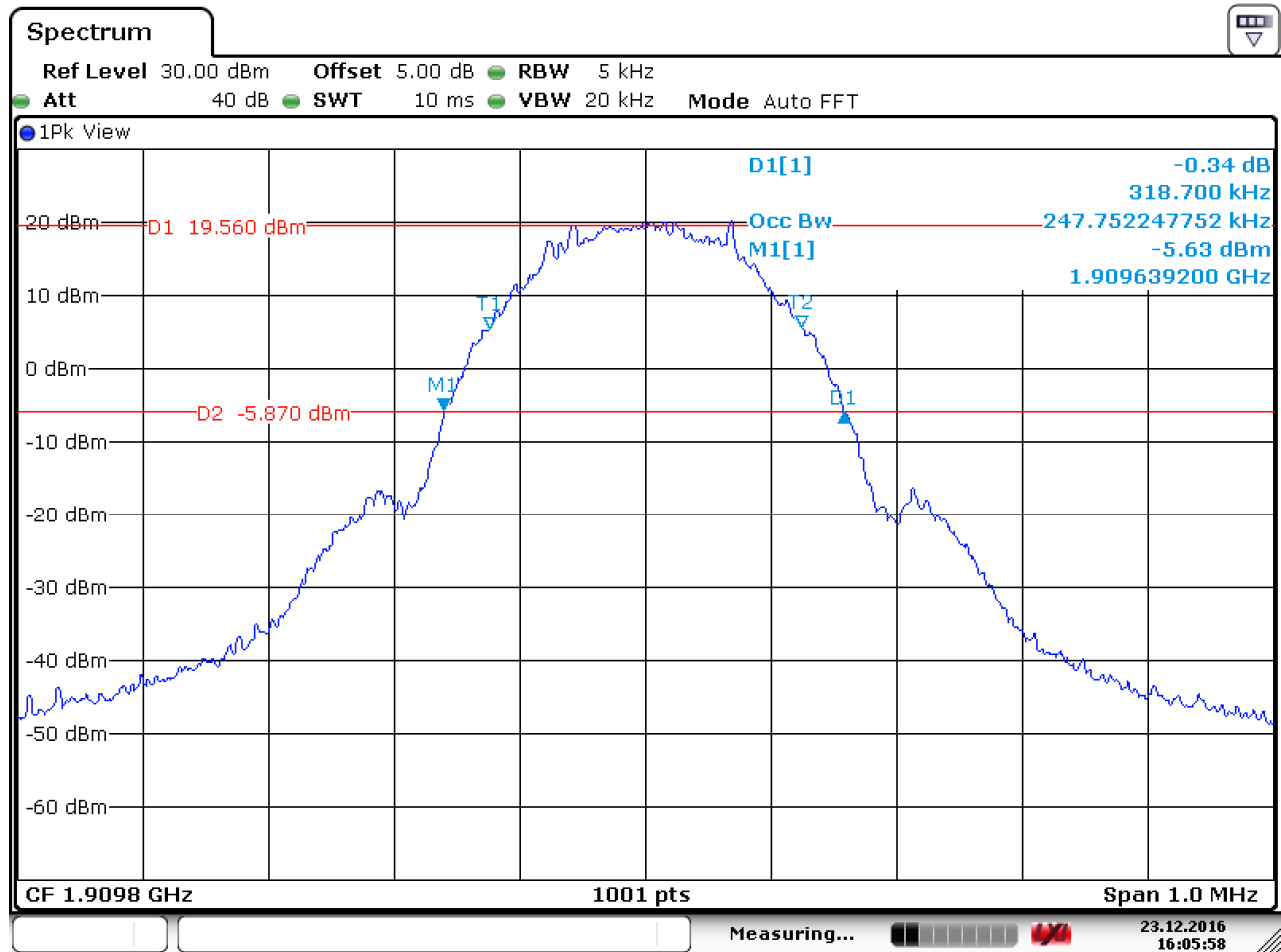


Date: 23.DEC.2016 16:04:21

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4.1.2.2.3 Test Channel = HCH



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5 Band Edges Compliance

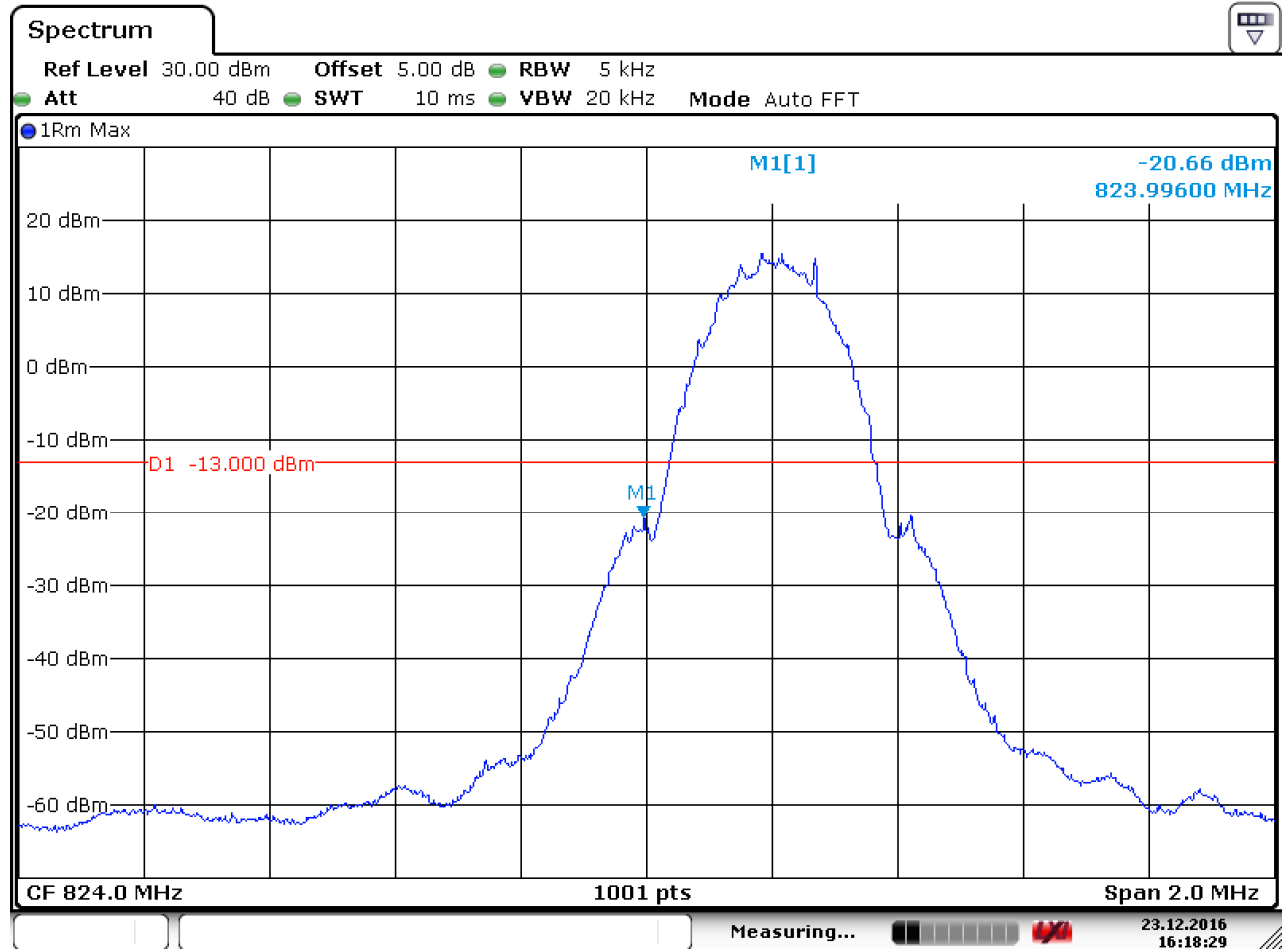
Part I - Test Plots

5.1 For GSM

5.1.1 Test Band = GSM 850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

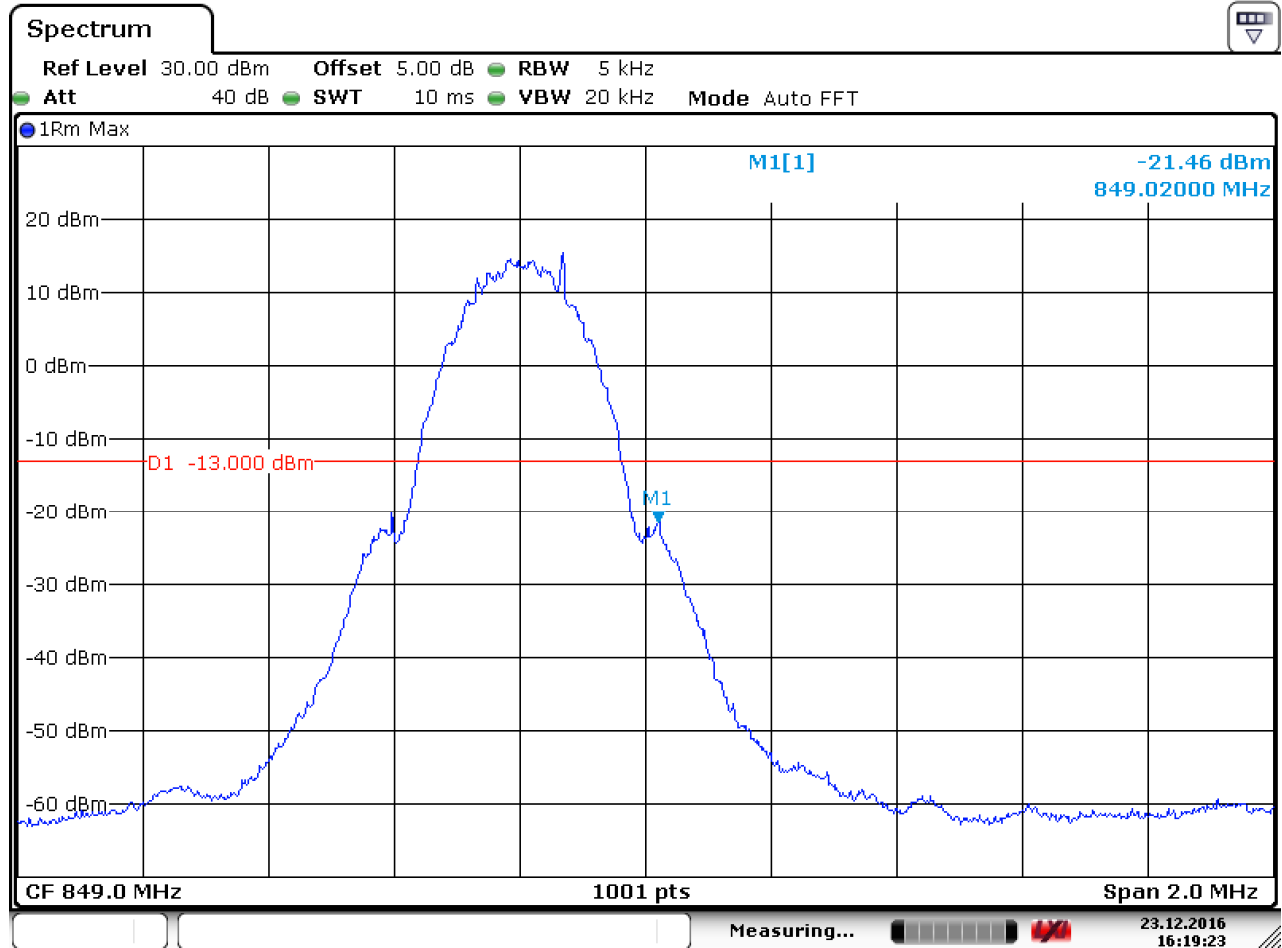


Date: 23.DEC.2016 16:18:30

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5.1.1.1.2 Test Channel = HCH



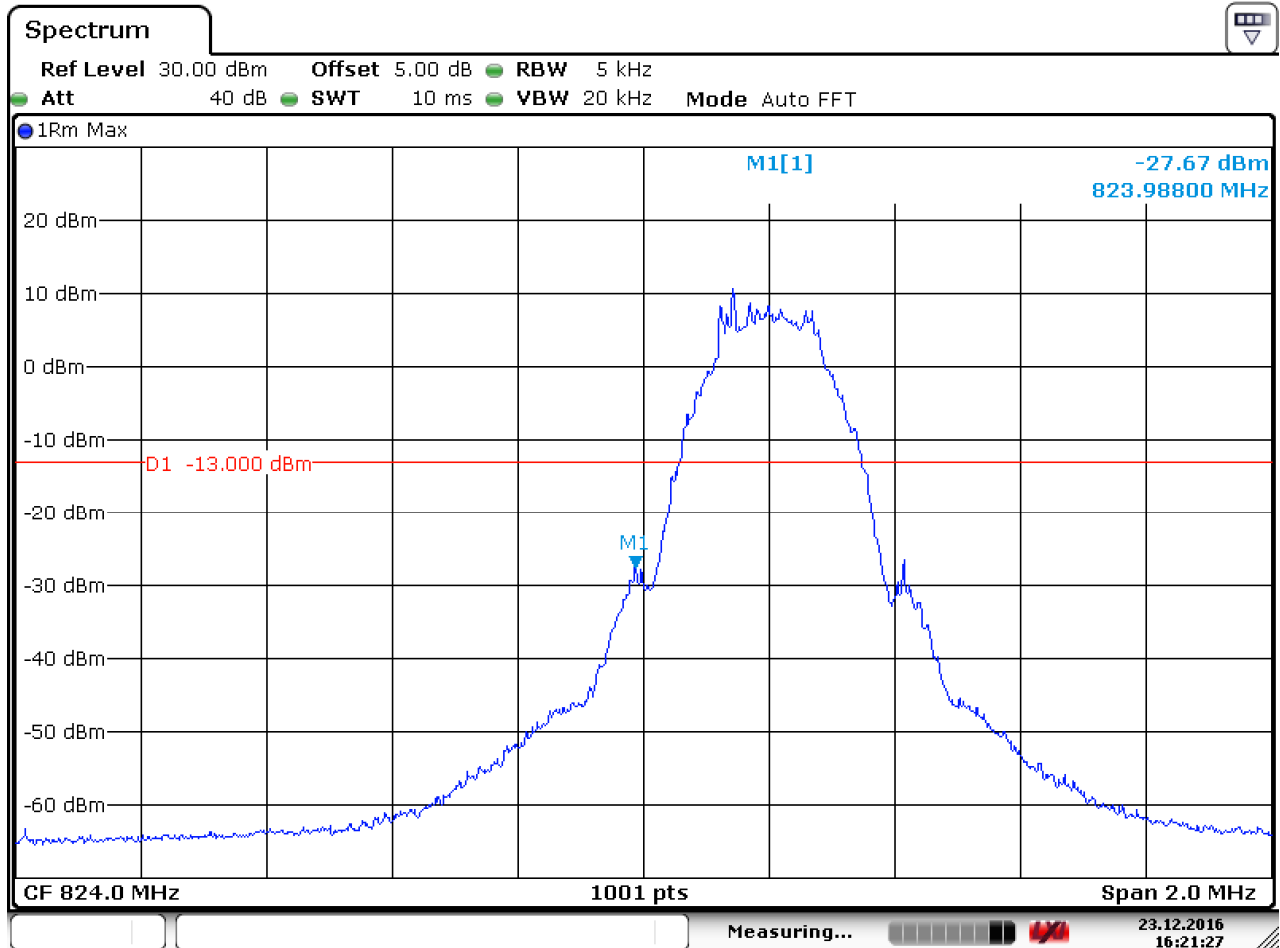
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5.1.1.2 Test Mode = GSM/TM2

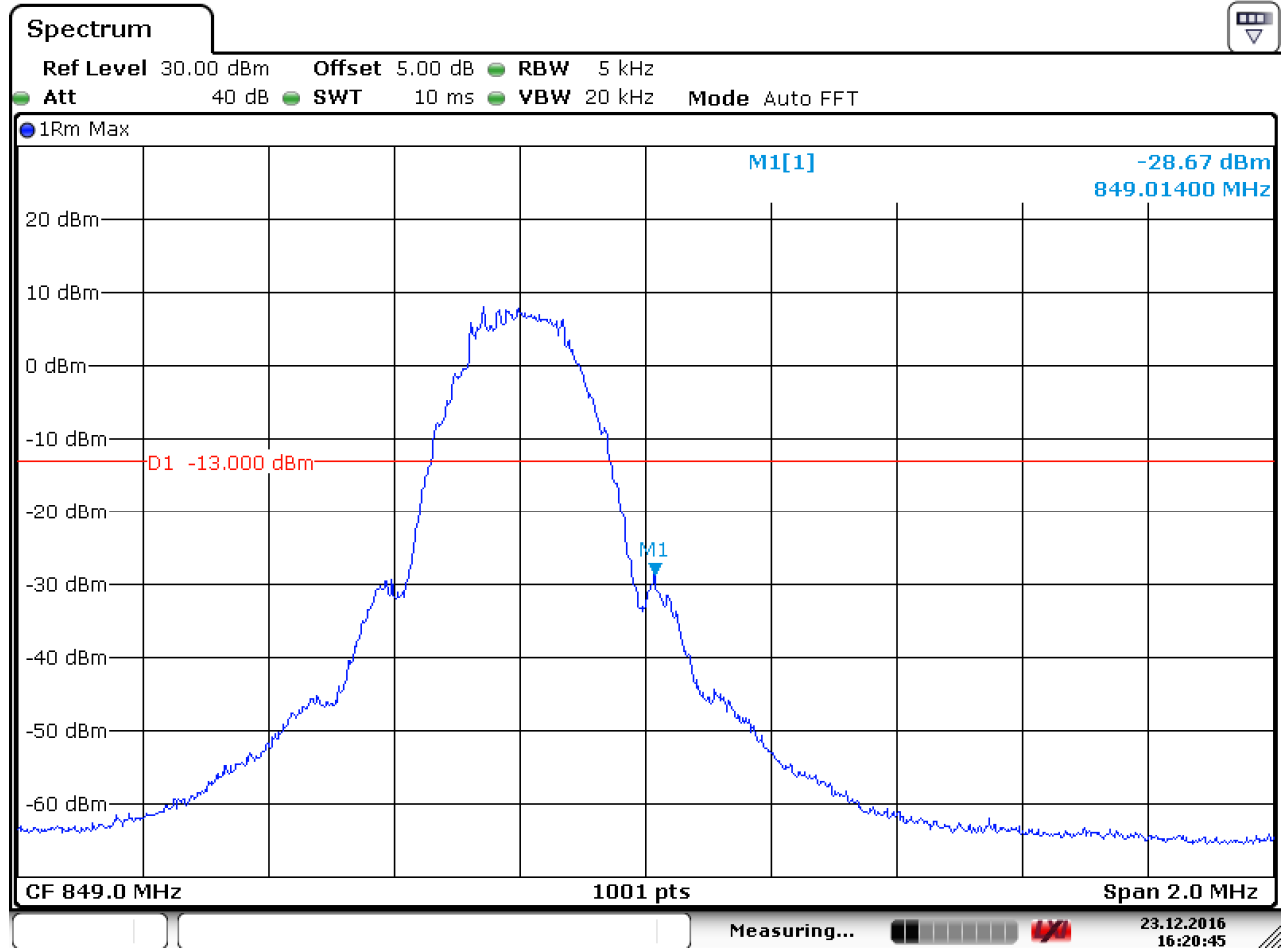
5.1.1.2.1 Test Channel = LCH



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5.1.1.2.2 Test Channel = HCH



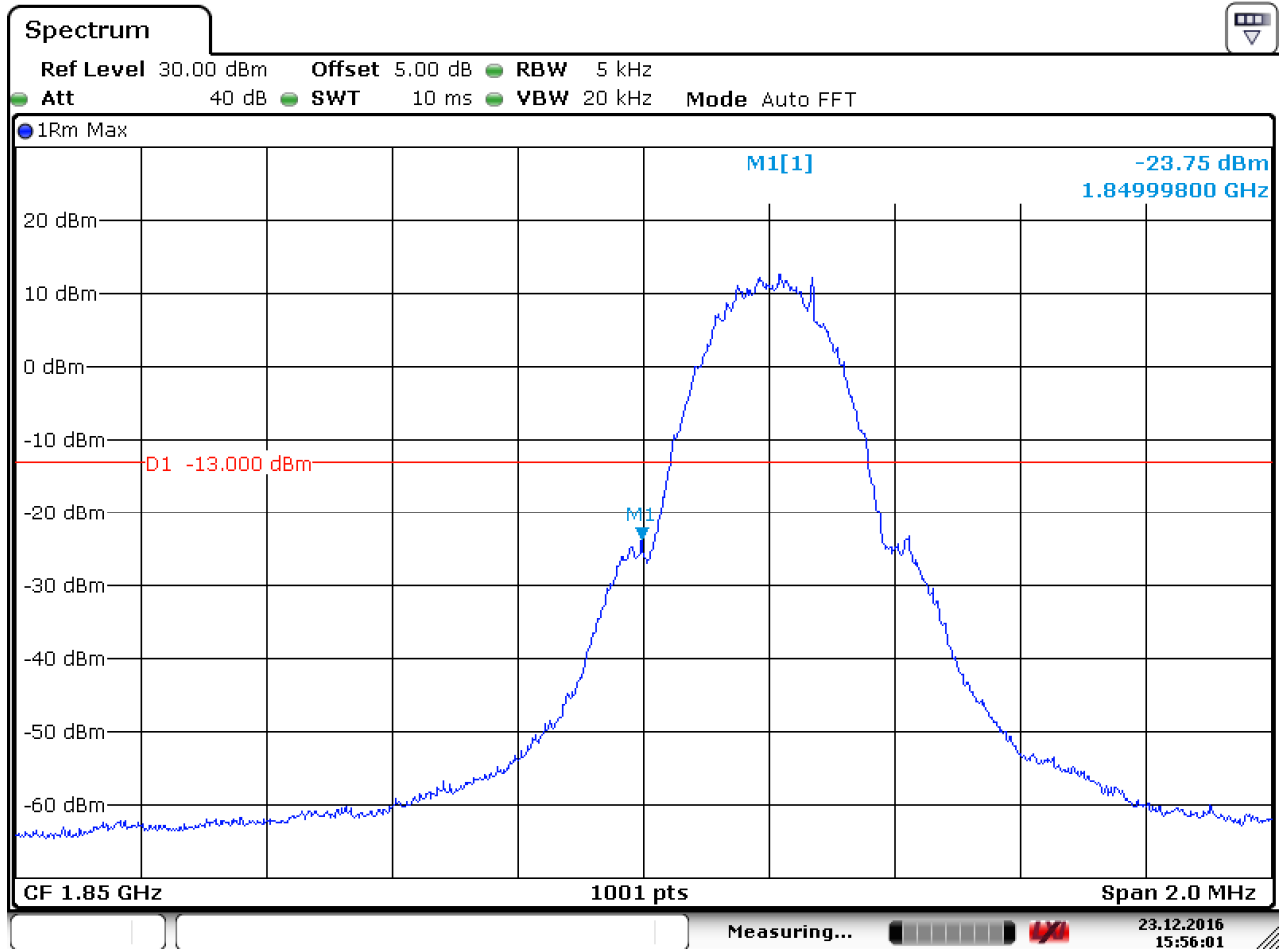
Date: 23.DEC.2016 16:20:45



5.1.2 Test Band = GSM 1900

5.1.2.1 Test Mode = GSM/TM1

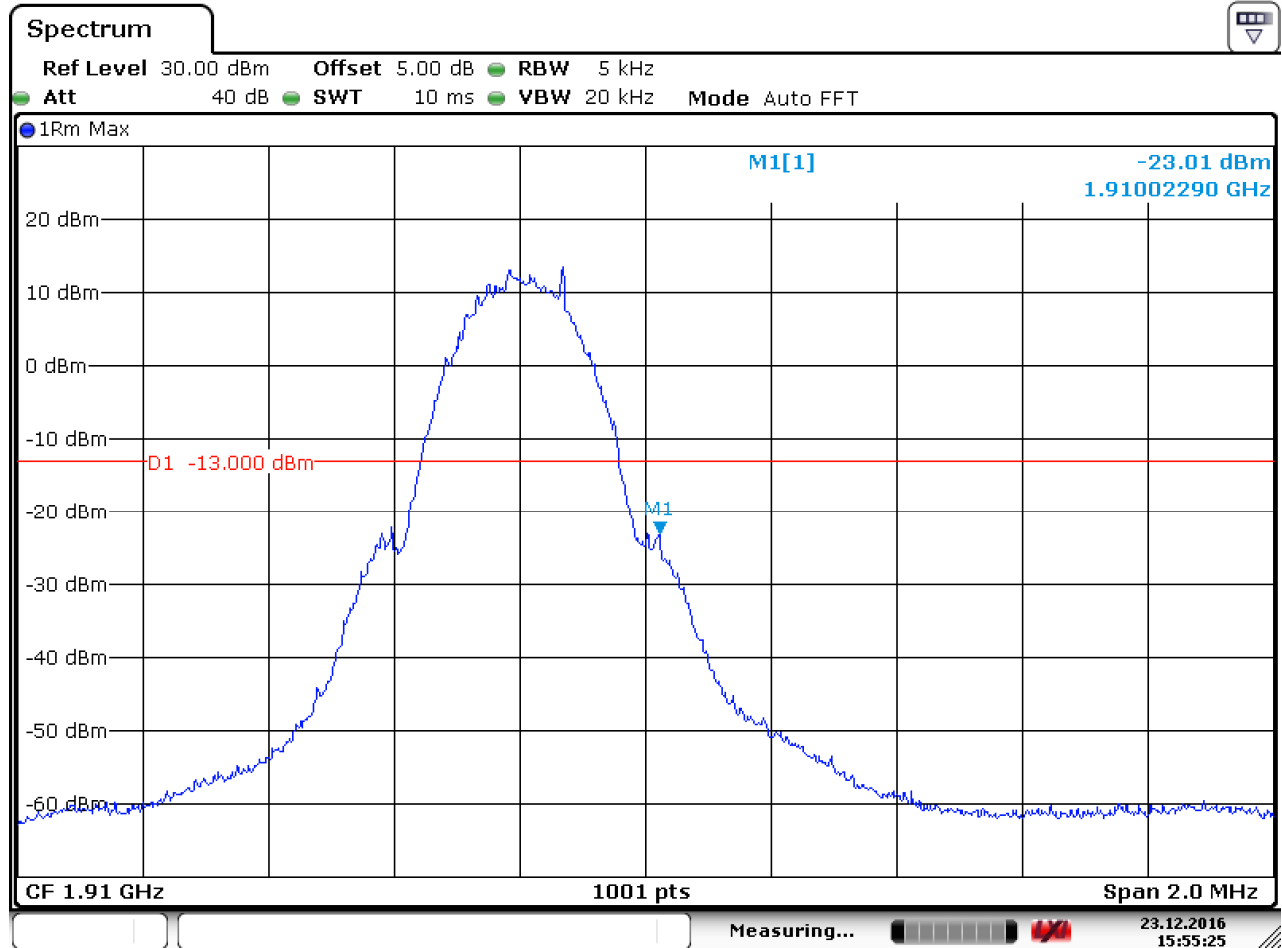
5.1.2.1.1 Test Channel = LCH



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5.1.2.1.2 Test Channel = HCH

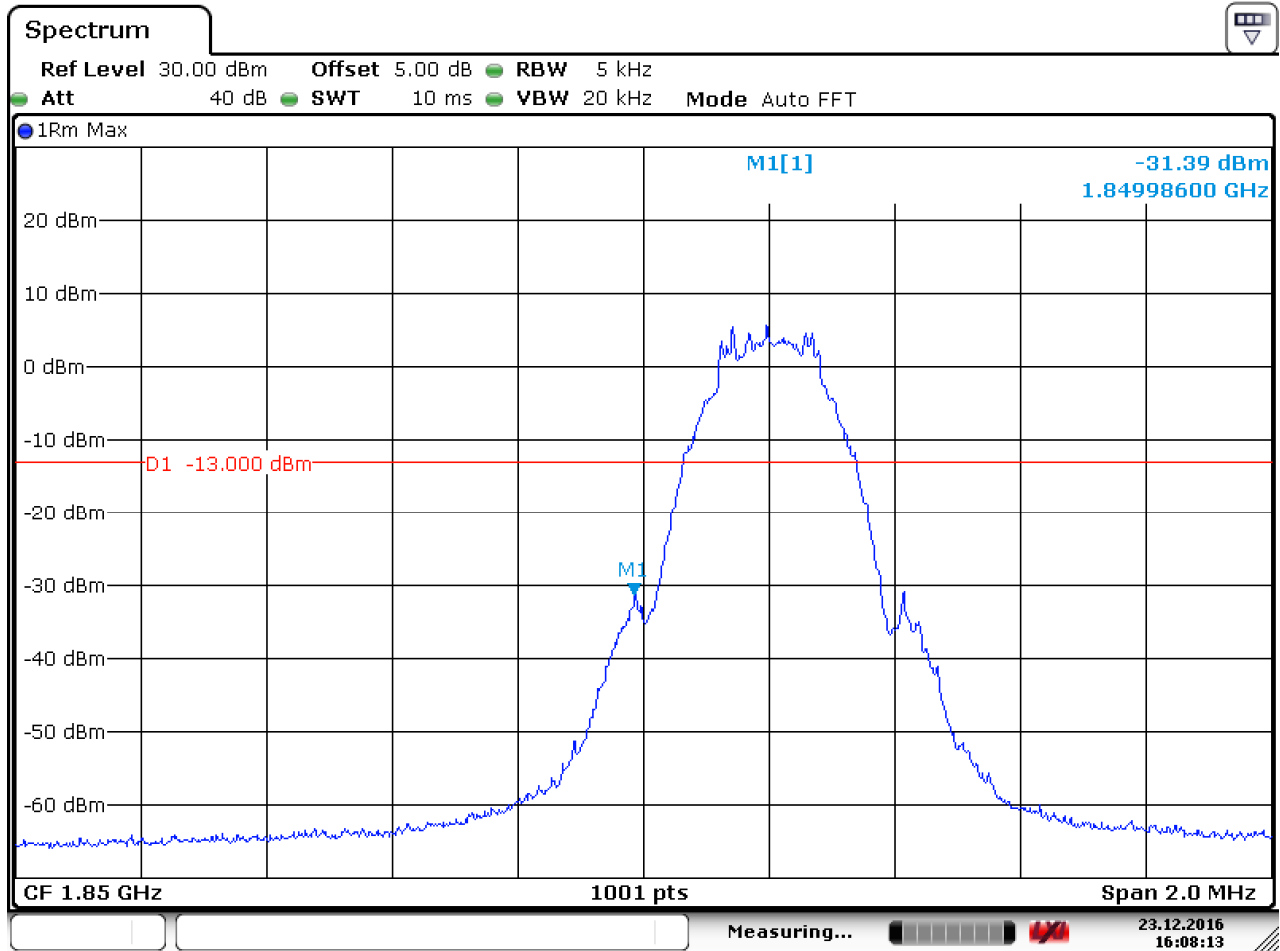


Date: 23.DEC.2016 15:55:25



5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH

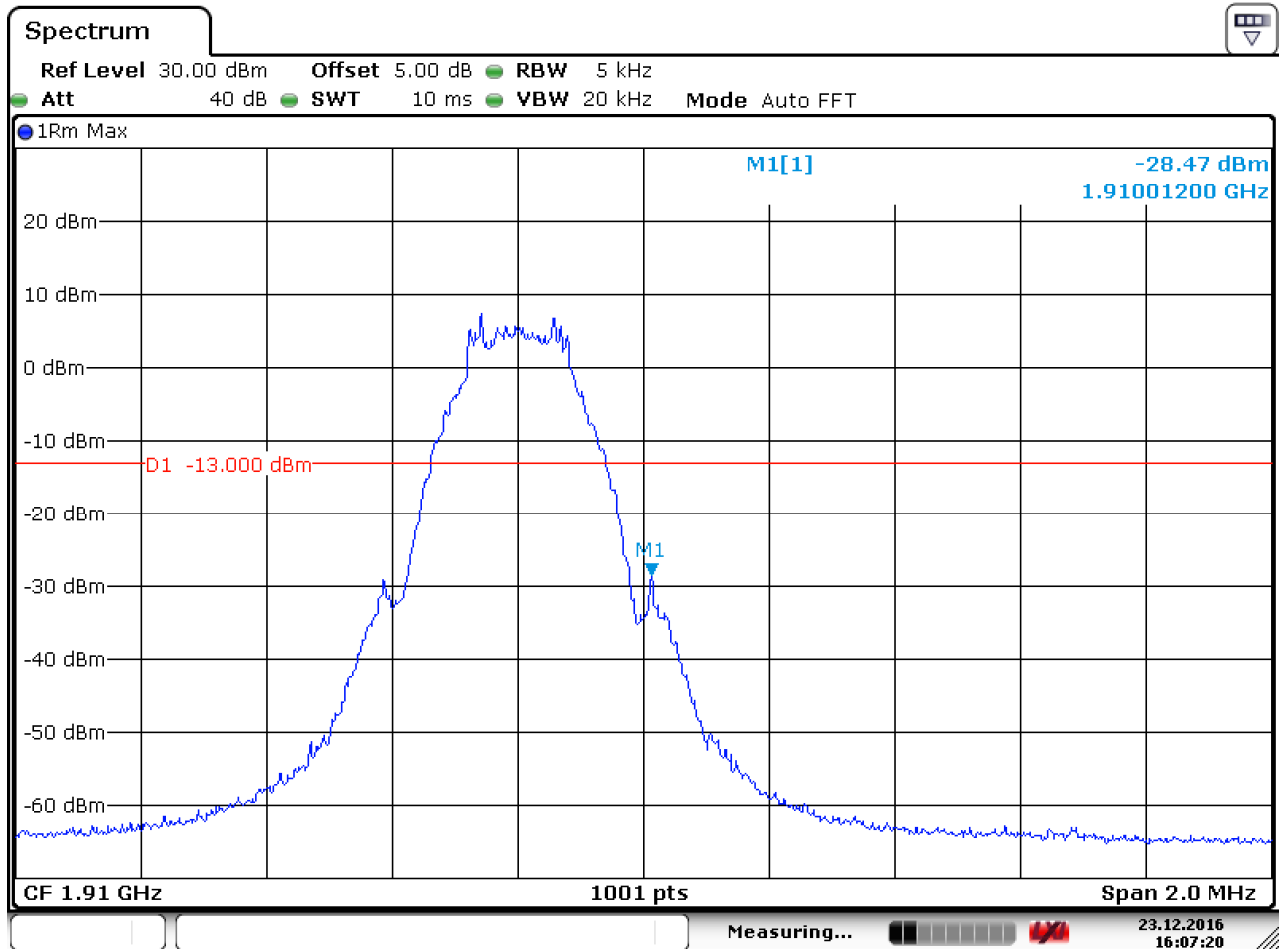


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5.1.2.2.2 Test Channel = HCH



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6 Spurious Emission at Antenna Terminal

NOTE: 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.

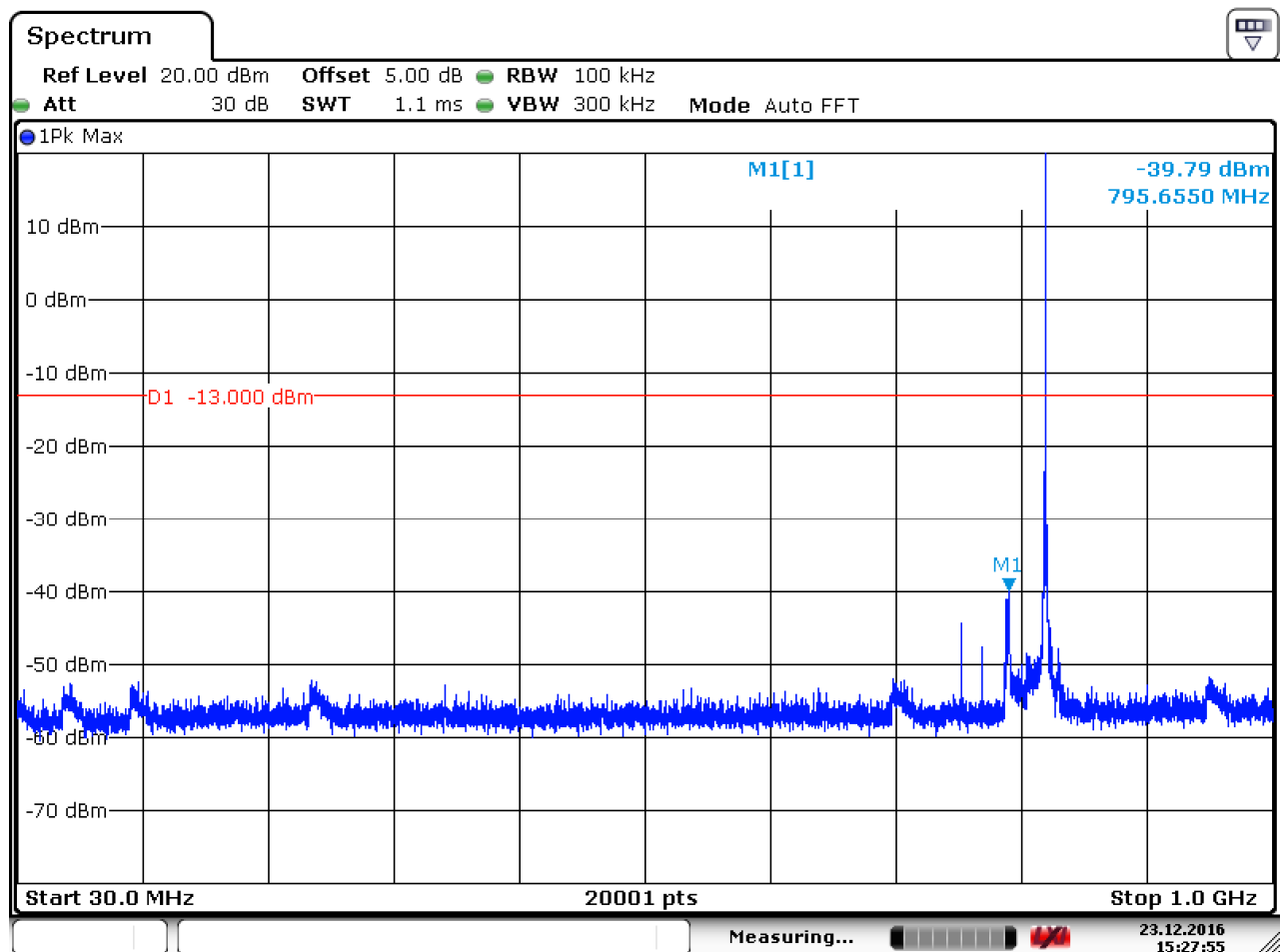
Part I - Test Plots

6.1 For GSM

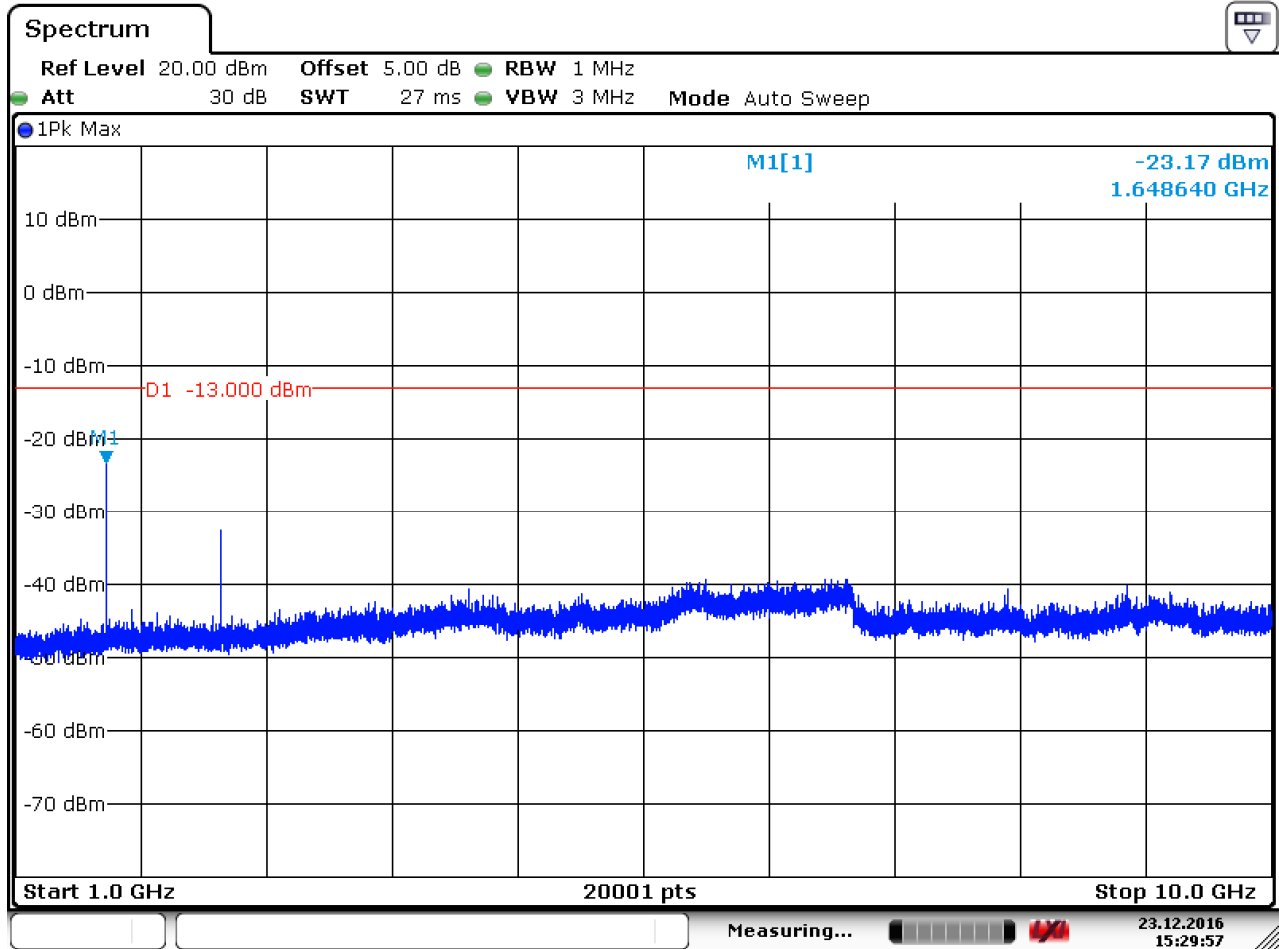
6.1.1 Test Band = GSM 850

6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



Date: 23.DEC.2016 15:27:56

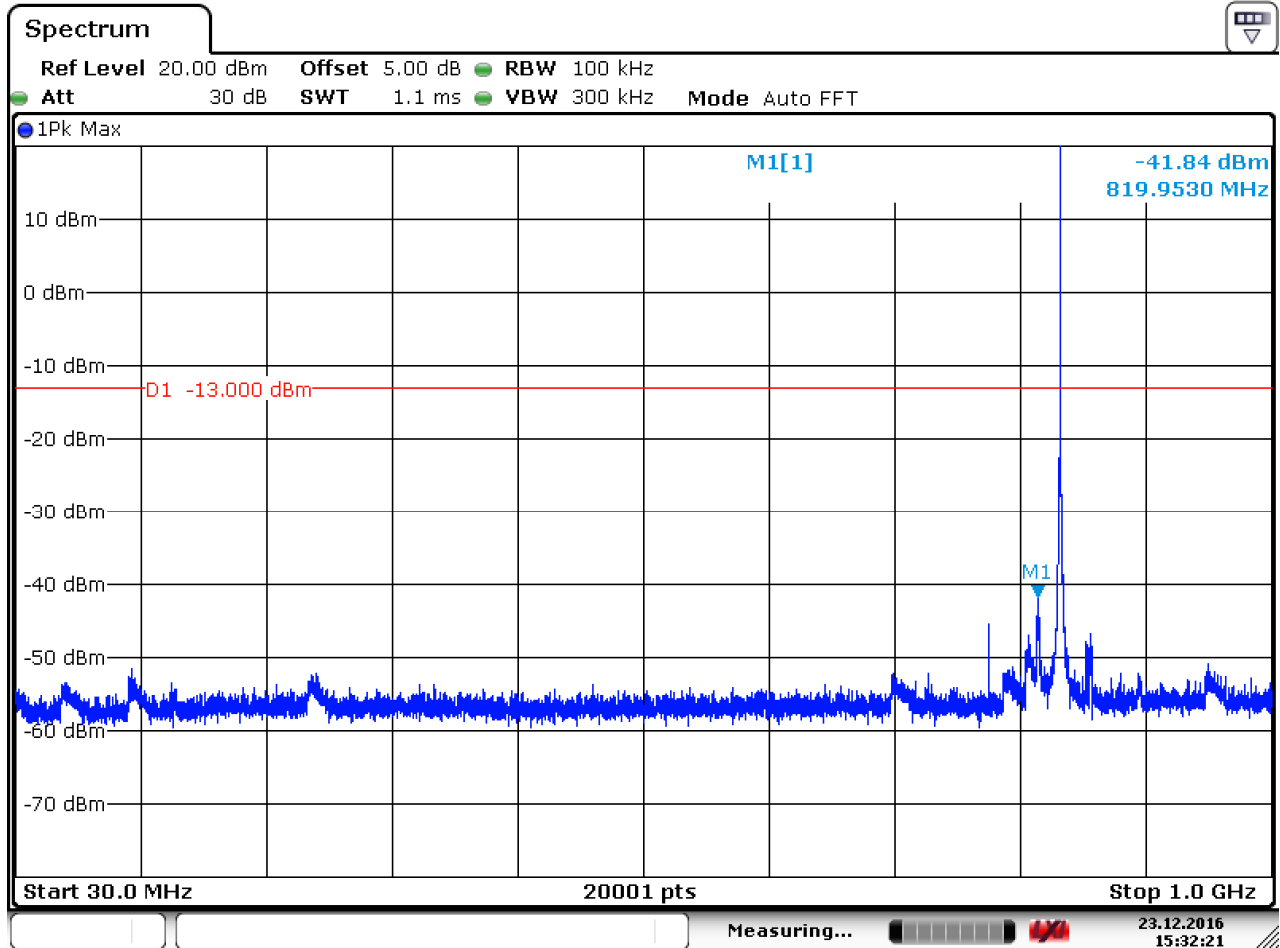


Date: 23.DEC.2016 15:29:57

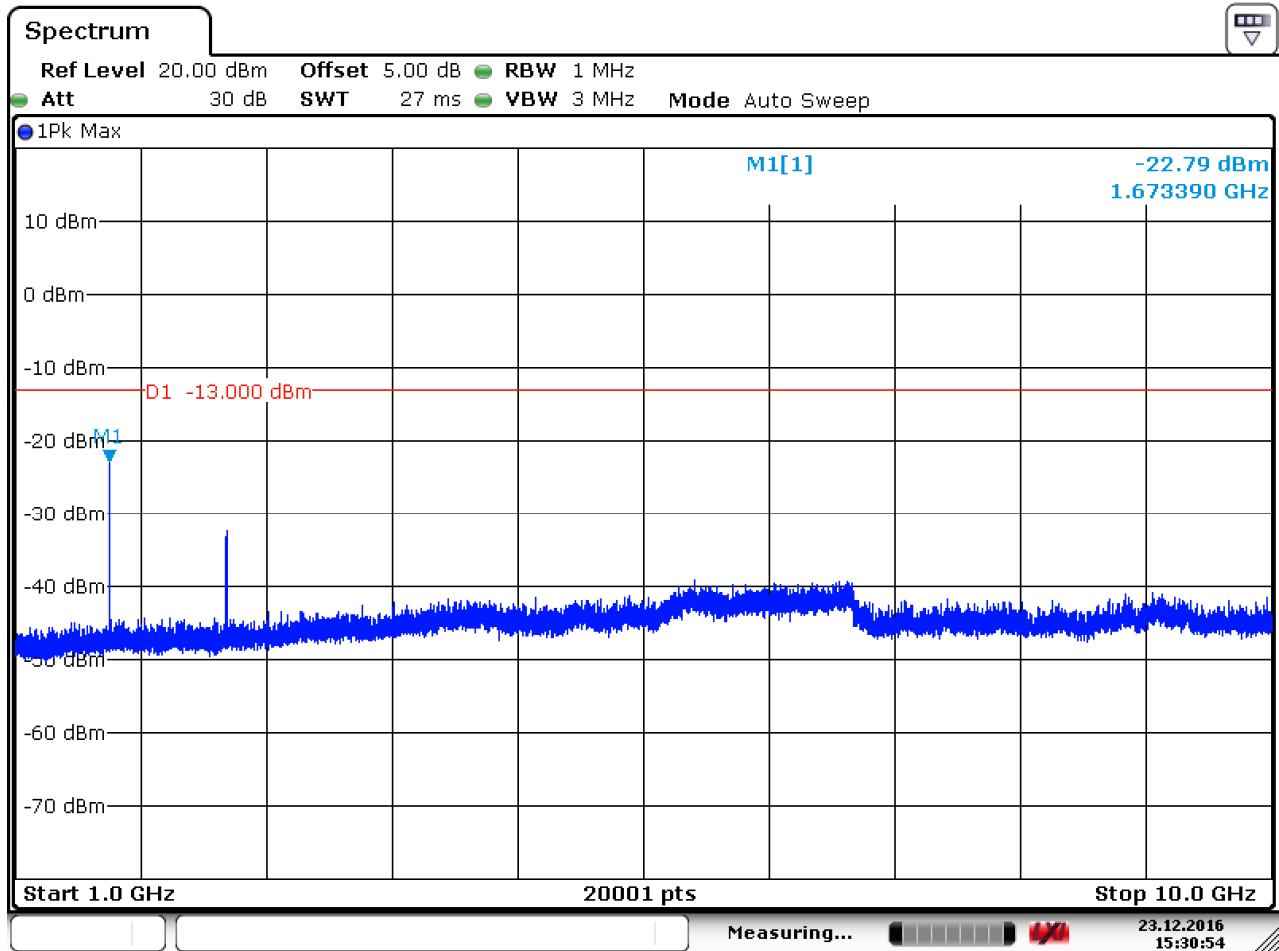
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6.1.1.1.2 Test Channel = MCH



Date: 23.DEC.2016 15:32:22

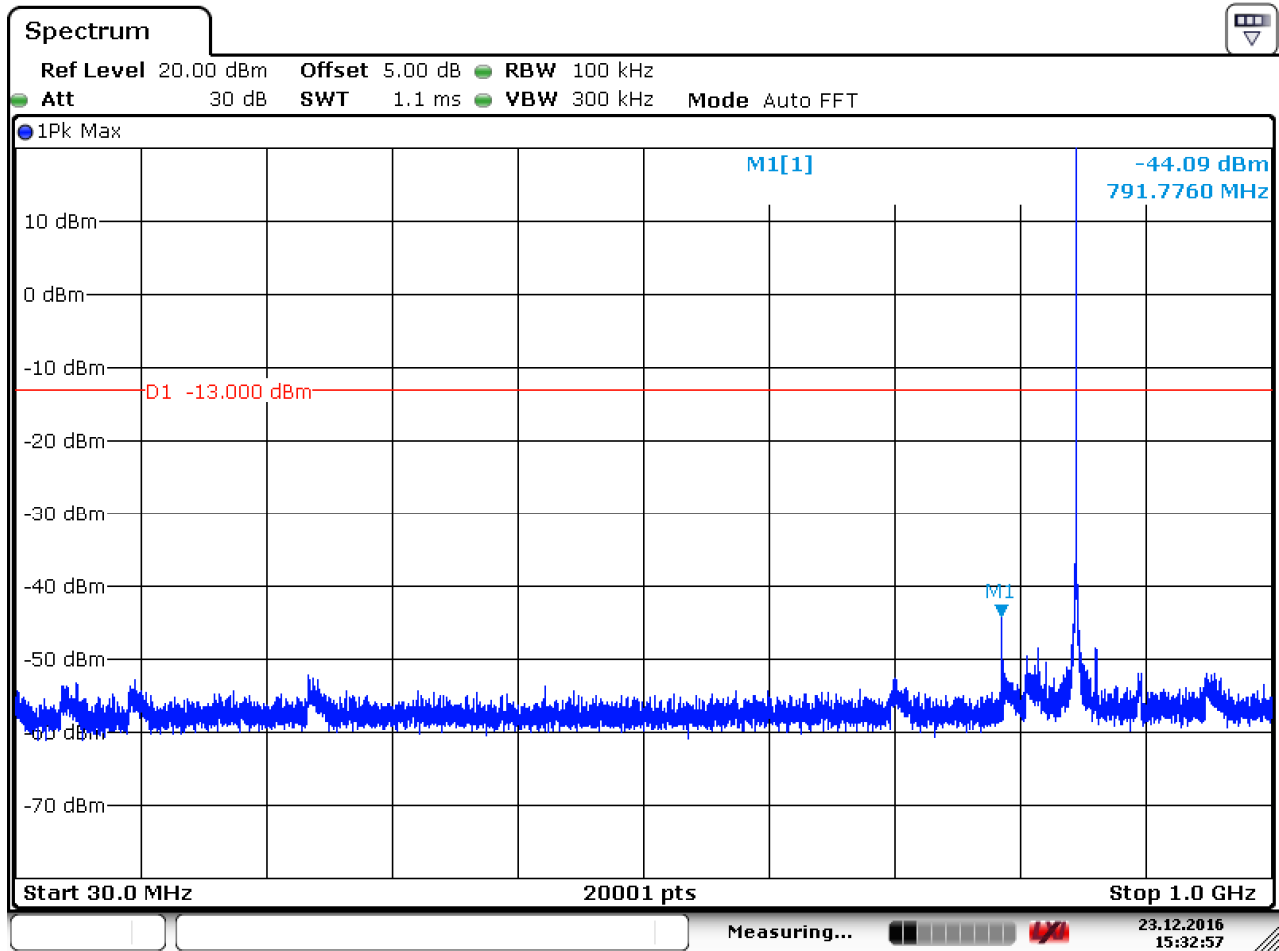


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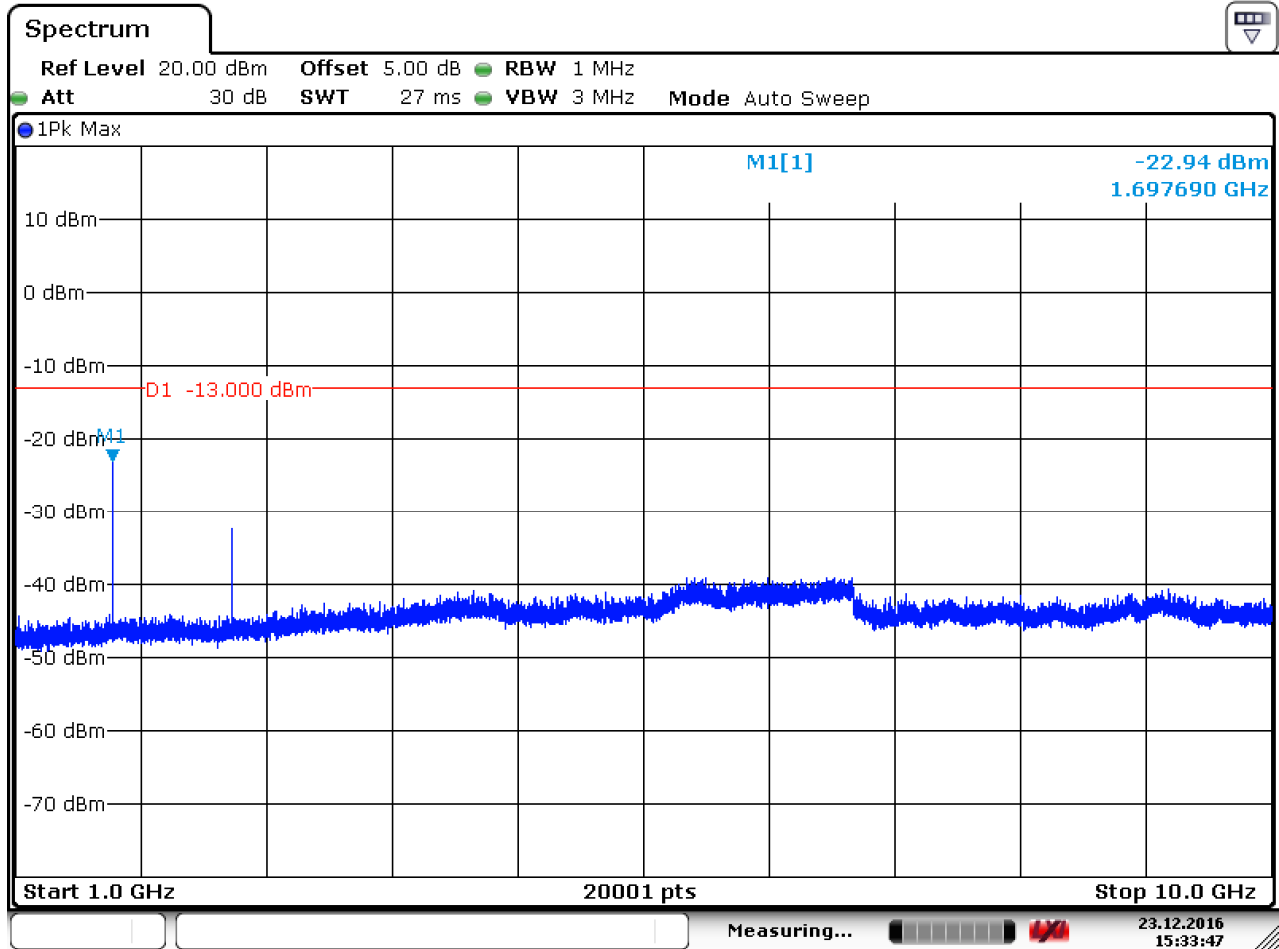


6.1.1.1.3 Test Channel = HCH



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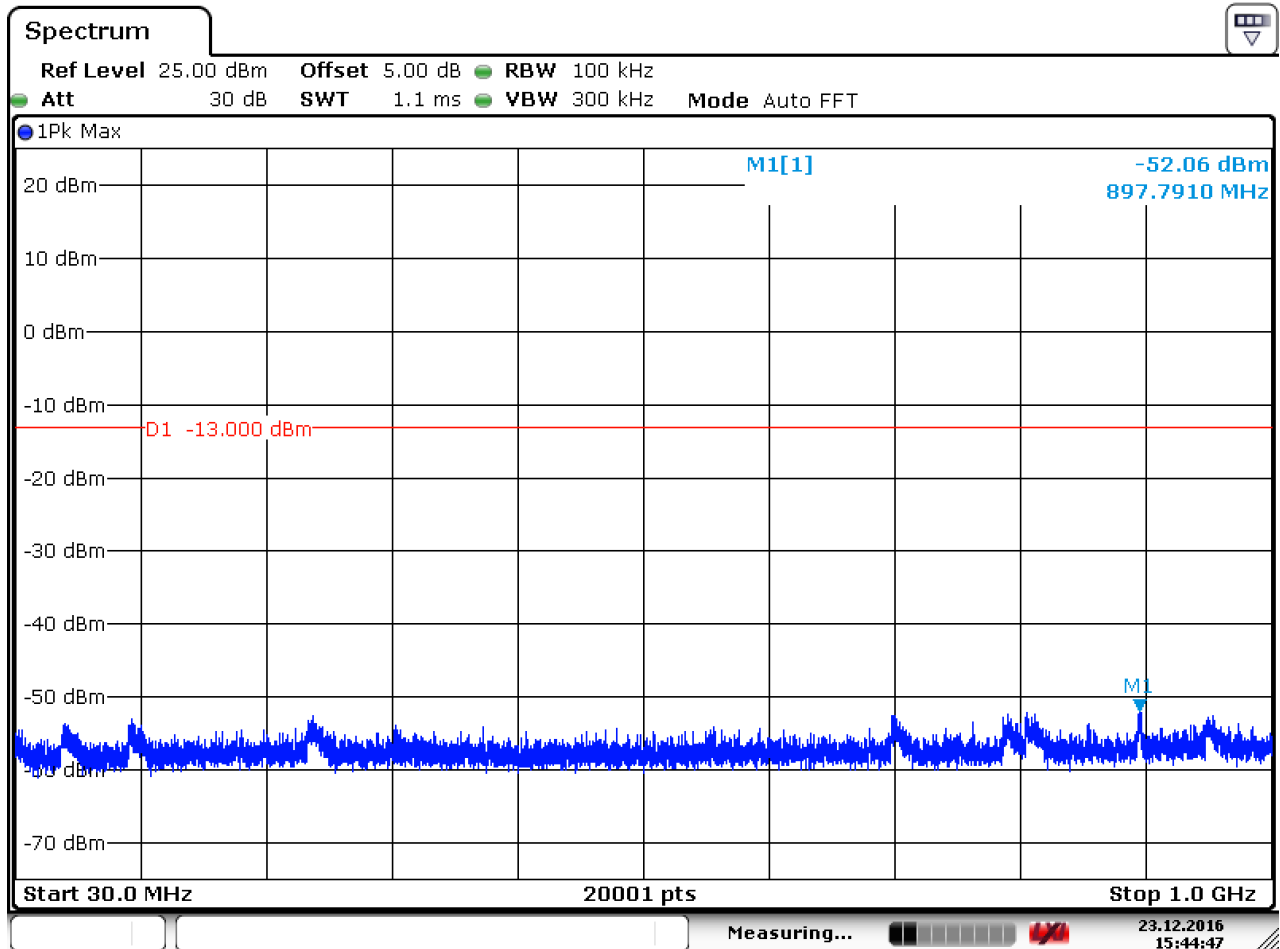
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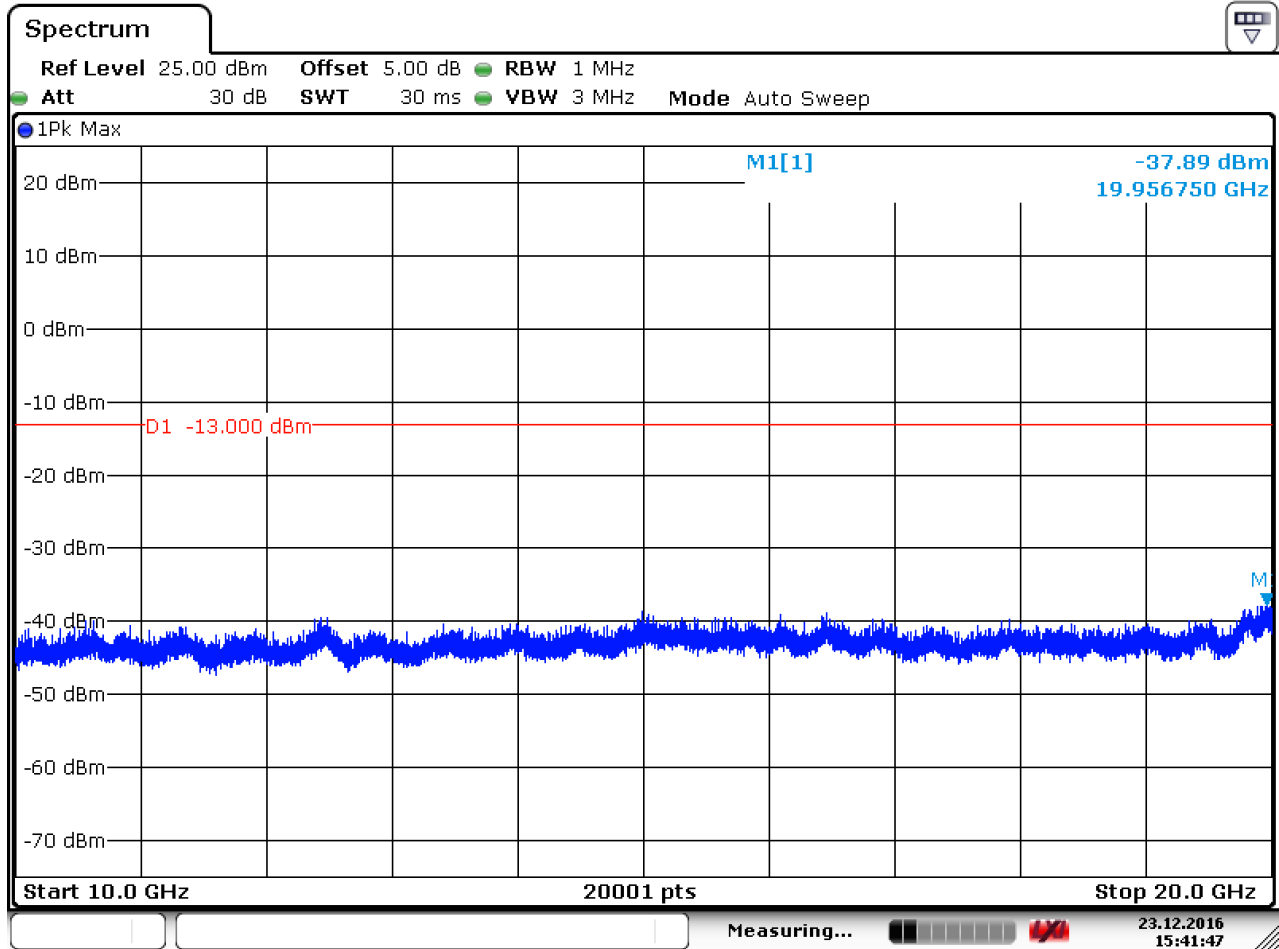
6.1.2 Test Band = GSM 1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH



Date: 23.DEC.2016 15:44:47

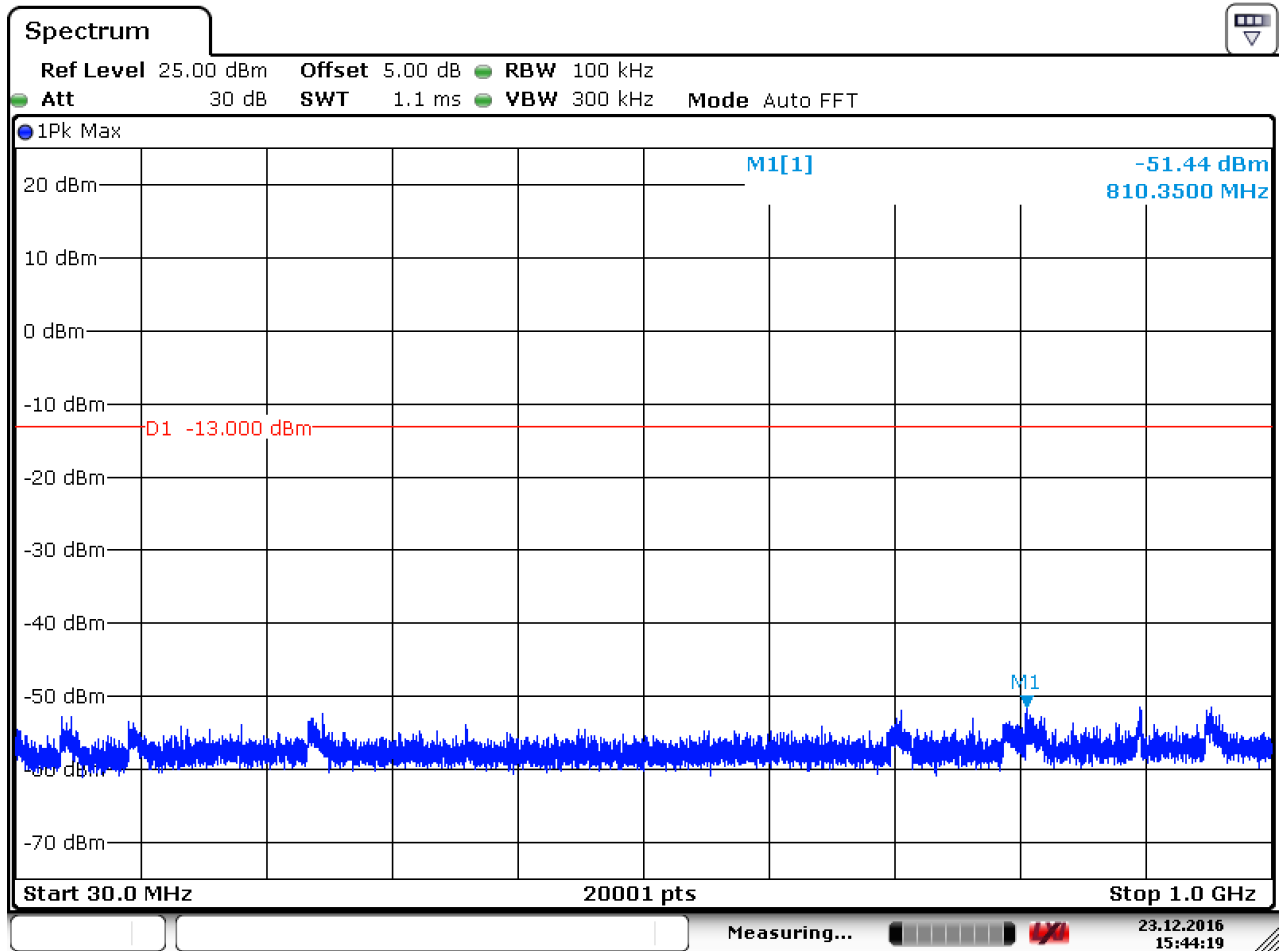


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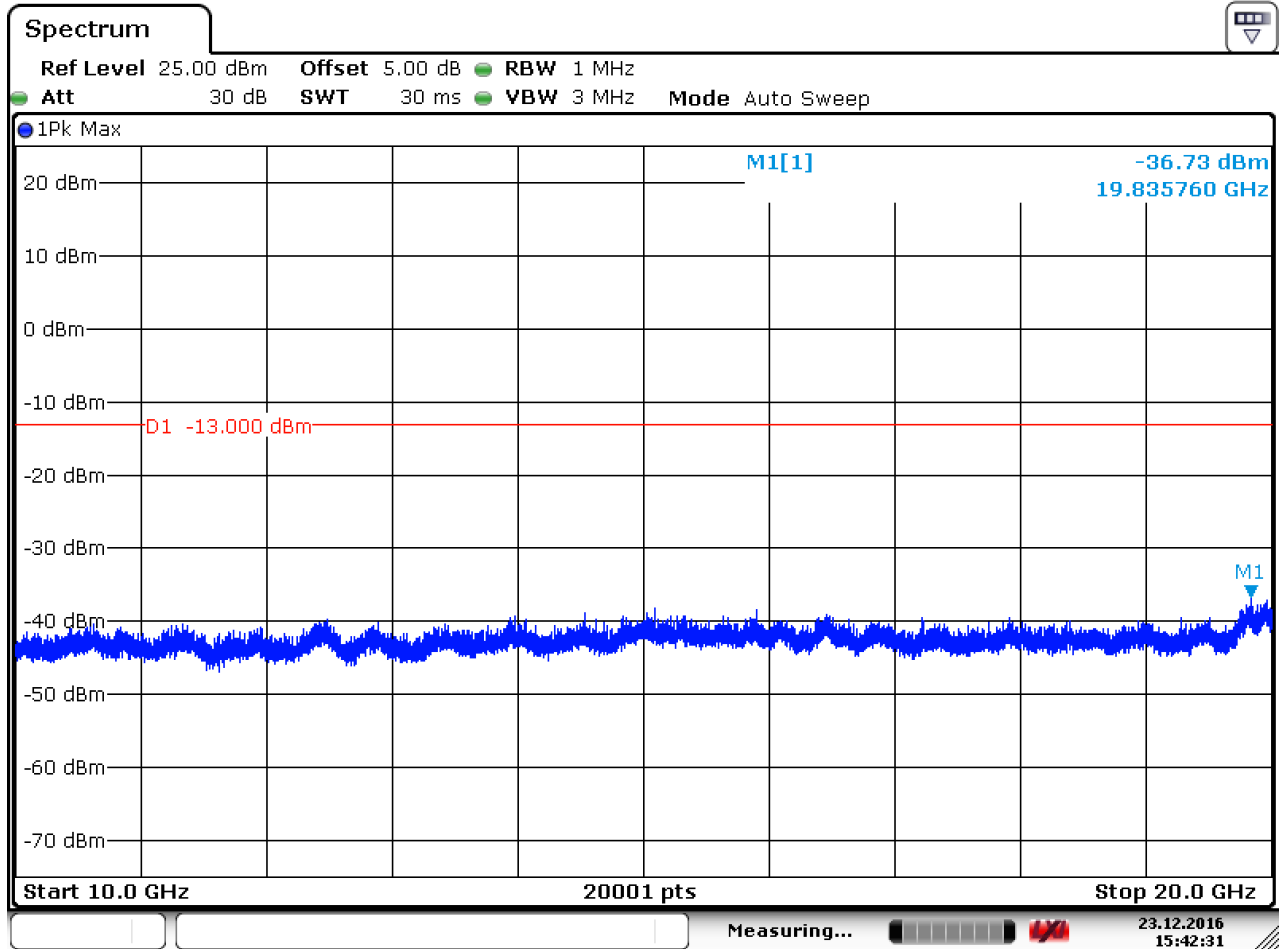


6.1.2.1.2 Test Channel = MCH



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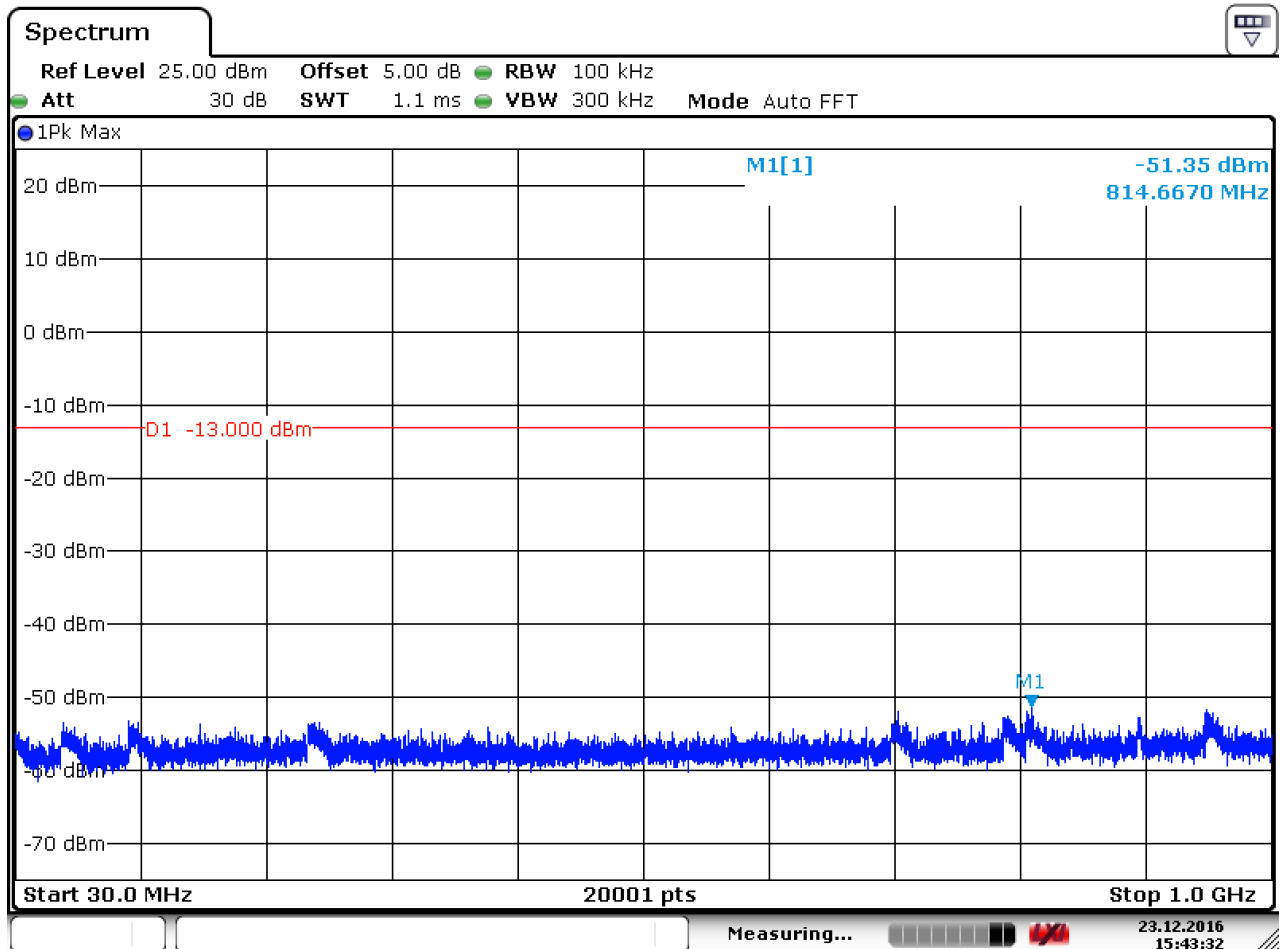


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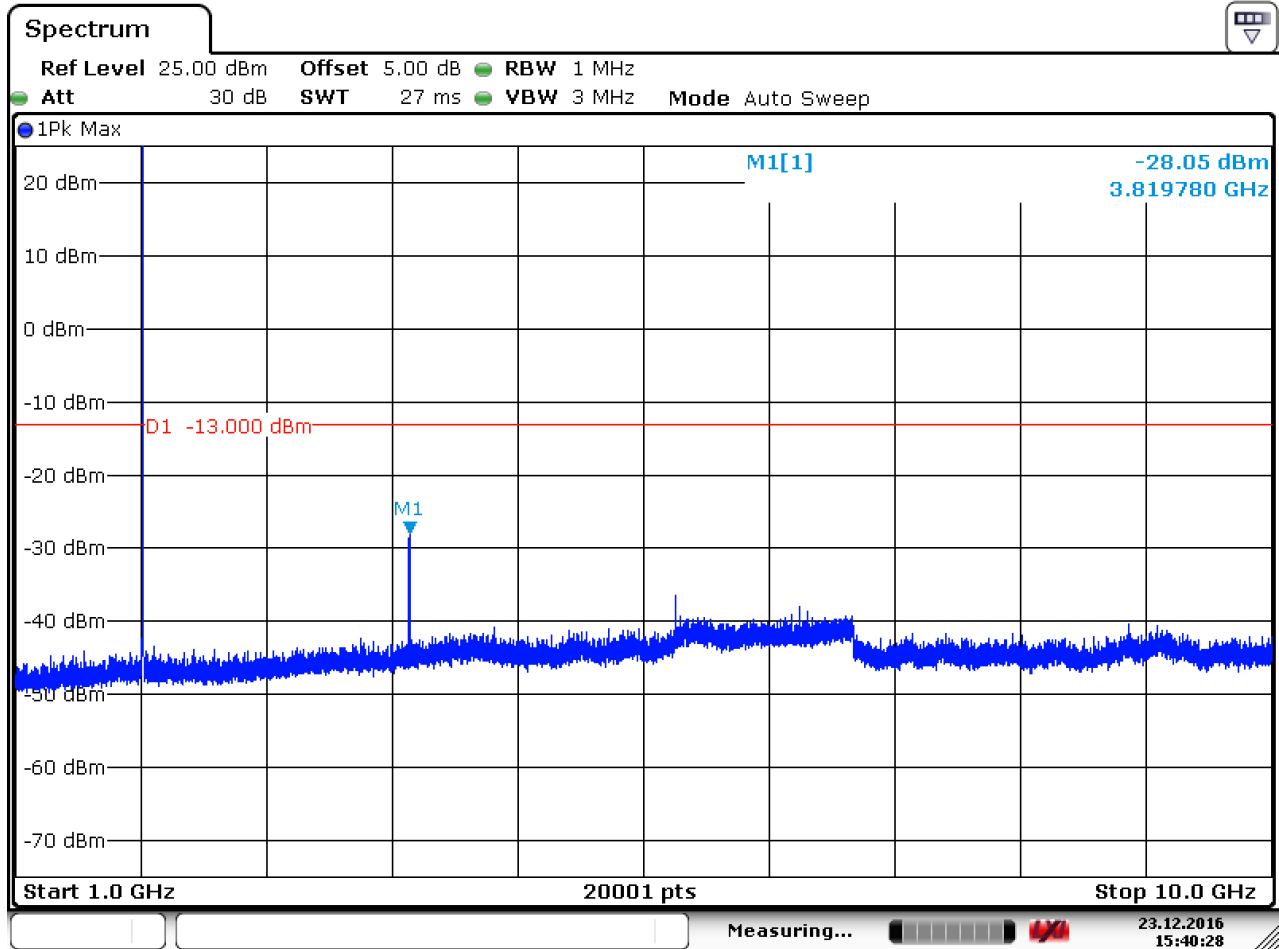


6.1.2.1.3 Test Channel = HCH



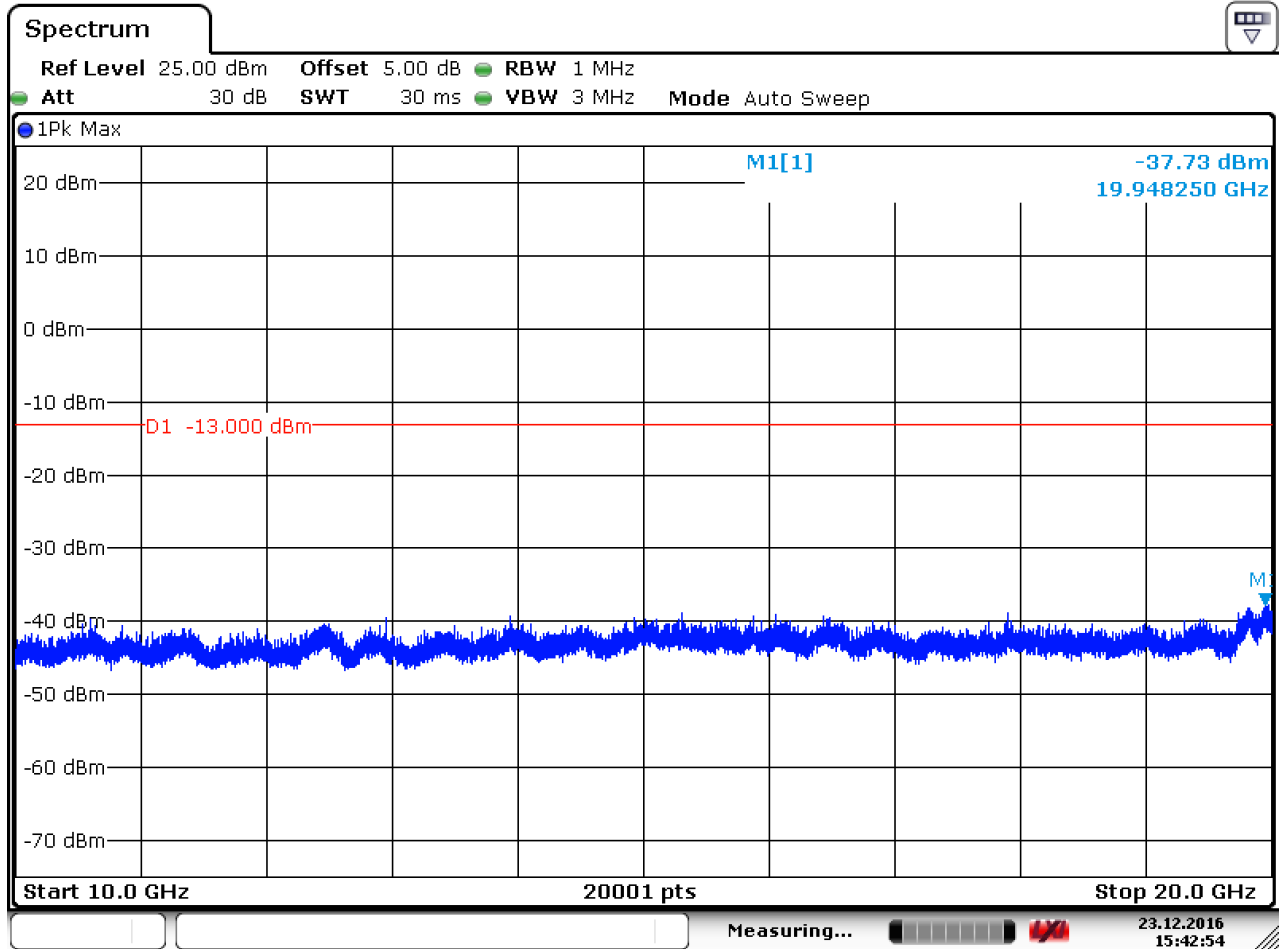
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7 Field Strength of Spurious Radiation

Part I - Test Plots

7.1 For GSM

7.1.1 Test Band = GSM 850

7.1.1.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1648.275	-40.18	-13.00	27.18	Vertical
2472.600	-42.53	-13.00	29.53	Vertical
8654.950	-52.49	-13.00	39.49	Vertical
1648.650	-44.50	-13.00	31.50	Horizontal
2472.600	-34.54	-13.00	21.54	Horizontal
7417.350	-52.30	-13.00	39.30	Horizontal

7.1.1.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1673.550	-42.43	-13.00	29.43	Vertical
2510.025	-38.07	-13.00	25.07	Vertical
4183.350	-51.56	-13.00	38.56	Vertical
1656.600	-43.98	-13.00	30.98	Horizontal
2509.650	-35.03	-13.00	22.03	Horizontal
9225.100	-51.93	-13.00	38.93	Horizontal

7.1.1.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1697.175	-43.35	-13.00	30.35	Vertical
2546.250	-41.10	-13.00	28.10	Vertical
9246.100	-52.48	-13.00	39.48	Vertical
1697.625	-47.31	-13.00	34.31	Horizontal
2546.625	-39.32	-13.00	26.32	Horizontal
4244.250	-53.20	-13.00	40.20	Horizontal



7.1.2 Test Band = GSM 1900

7.1.2.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
3699.125	-45.87	-13.00	32.87	Vertical
5549.750	-41.69	-13.00	28.69	Vertical
9251.875	-46.34	-13.00	33.34	Vertical
3700.000	-38.12	-13.00	25.12	Horizontal
5550.625	-40.02	-13.00	27.02	Horizontal
9251.875	-46.25	-13.00	33.25	Horizontal

7.1.2.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
3759.500	-43.74	-13.00	30.74	Vertical
5640.750	-43.95	-13.00	30.95	Vertical
9268.500	-47.96	-13.00	34.96	Vertical
3760.375	-42.37	-13.00	29.37	Horizontal
5639.875	-39.22	-13.00	26.22	Horizontal
7521.125	-47.03	-13.00	34.03	Horizontal

7.1.2.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
3819.000	-44.37	-13.00	31.37	Vertical
5729.125	-40.95	-13.00	27.95	Vertical
7639.250	-46.56	-13.00	33.56	Vertical
3819.875	-43.08	-13.00	30.08	Horizontal
5730.875	-38.33	-13.00	25.33	Horizontal
7638.375	-45.88	-13.00	32.88	Horizontal

NOTE:

- 1) All modes are tested, but the data presented above is the worst case. 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.



8 Frequency Stability

8.1 Frequency Error VS. Voltage

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM 850	GSM/TM1	LCH	TN	VL	2.60	0.00315	PASS
				VN	1.41	0.00171	PASS
				VH	-3.38	-0.00410	PASS
		MCH	TN	VL	-2.73	-0.00326	PASS
				VN	-1.82	-0.00218	PASS
				VH	-4.45	-0.00532	PASS
		HCH	TN	VL	3.02	0.00356	PASS
				VN	-1.92	-0.00226	PASS
				VH	-2.98	-0.00351	PASS
	GSM/TM2	LCH	TN	VL	-3.56	-0.00432	PASS
				VN	1.57	0.00190	PASS
				VH	-2.18	-0.00264	PASS
		MCH	TN	VL	3.03	0.00362	PASS
				VN	2.00	0.00239	PASS
				VH	-4.30	-0.00514	PASS
		HCH	TN	VL	0.40	0.00047	PASS
				VN	-3.39	-0.00399	PASS
				VH	2.73	0.00322	PASS



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Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM 1900	GSM/TM1	LCH	TN	VL	-4.33	-0.00234	PASS
				VN	2.14	0.00116	PASS
				VH	1.42	0.00077	PASS
		MCH	TN	VL	1.39	0.00074	PASS
				VN	-2.50	-0.00133	PASS
				VH	5.30	0.00282	PASS
		HCH	TN	VL	-2.58	-0.00135	PASS
				VN	2.47	0.00129	PASS
				VH	-4.60	-0.00241	PASS
	GSM/TM2	LCH	TN	VL	1.20	0.00065	PASS
				VN	-3.30	-0.00178	PASS
				VH	2.90	0.00157	PASS
		MCH	TN	VL	-4.22	-0.00224	PASS
				VN	1.49	0.00079	PASS
				VH	0.54	0.00029	PASS
		HCH	TN	VL	-2.43	-0.00127	PASS
				VN	3.50	0.00183	PASS
				VH	-4.33	-0.00227	PASS

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8.2 Frequency Error VS. Temperature

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM 850	GSM/TM1	LCH	VN	-30	-4.72	-0.00573	PASS
				-20	1.80	0.00218	PASS
				-10	1.02	0.00124	PASS
				0	-2.60	-0.00315	PASS
				10	0.49	0.00059	PASS
				20	-4.33	-0.00525	PASS
				30	1.79	0.00217	PASS
				40	-0.05	-0.00006	PASS
				50	-6.20	-0.00752	PASS
		MCH	VN	-30	-2.98	-0.00356	PASS
				-20	-5.00	-0.00598	PASS
				-10	-0.40	-0.00048	PASS
				0	-3.53	-0.00422	PASS
				10	1.32	0.00158	PASS
				20	2.80	0.00335	PASS
				30	1.58	0.00189	PASS
				40	0.67	0.00080	PASS
				50	-4.32	-0.00516	PASS
		HCH	VN	-30	-0.54	-0.00064	PASS
				-20	3.77	0.00444	PASS
				-10	3.19	0.00376	PASS
				0	-5.52	-0.00650	PASS
				10	1.57	0.00185	PASS
				20	-2.87	-0.00338	PASS
				30	3.78	0.00445	PASS
				40	-0.66	-0.00078	PASS
				50	-4.50	-0.00530	PASS



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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM 850	GSM/TM2	LCH	VN	-30	-2.62	-0.00318	PASS
				-20	2.01	0.00244	PASS
				-10	-5.10	-0.00619	PASS
				0	1.52	0.00184	PASS
				10	-5.34	-0.00648	PASS
				20	-4.10	-0.00497	PASS
				30	-4.22	-0.00512	PASS
				40	-5.63	-0.00683	PASS
				50	-2.75	-0.00334	PASS
		MCH	VN	-30	-2.99	-0.00357	PASS
				-20	3.07	0.00367	PASS
				-10	-4.23	-0.00506	PASS
				0	1.90	0.00227	PASS
				10	-5.11	-0.00611	PASS
				20	-3.56	-0.00426	PASS
				30	-2.09	-0.00250	PASS
				40	-3.12	-0.00373	PASS
				50	-5.59	-0.00668	PASS
		HCH	VN	-30	-3.07	-0.00362	PASS
				-20	-5.72	-0.00674	PASS
				-10	-2.71	-0.00319	PASS
				0	-5.32	-0.00627	PASS
				10	1.05	0.00124	PASS
				20	-4.33	-0.00510	PASS
				30	-3.55	-0.00418	PASS
				40	-2.85	-0.00336	PASS
				50	-5.08	-0.00598	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM 1900	GSM/TM1	LCH	VN	-30	-3.42	-0.00185	PASS
				-20	-4.89	-0.00264	PASS
				-10	2.00	0.00108	PASS
				0	-3.55	-0.00192	PASS
				10	-0.59	-0.00032	PASS
				20	1.35	0.00073	PASS
				30	-3.90	-0.00211	PASS
				40	-5.01	-0.00271	PASS
				50	-3.44	-0.00186	PASS
		MCH	VN	-30	-4.90	-0.00261	PASS
				-20	1.29	0.00069	PASS
				-10	-2.42	-0.00129	PASS
				0	4.55	0.00242	PASS
				10	-3.27	-0.00174	PASS
				20	-6.30	-0.00335	PASS
				30	-3.33	-0.00177	PASS
				40	-8.10	-0.00431	PASS
				50	-5.20	-0.00277	PASS
		HCH	VN	-30	-3.99	-0.00209	PASS
				-20	3.66	0.00192	PASS
				-10	1.89	0.00099	PASS
				0	-0.30	-0.00016	PASS
				10	-3.28	-0.00172	PASS
				20	-4.19	-0.00219	PASS
				30	1.30	0.00068	PASS
				40	-3.09	-0.00162	PASS
				50	-4.24	-0.00222	PASS

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Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM 1900	GSM/TM2	LCH	VN	-30	-2.23	-0.00121	PASS
				-20	-4.30	-0.00232	PASS
				-10	1.50	0.00081	PASS
				0	-2.49	-0.00135	PASS
				10	-2.99	-0.00162	PASS
				20	-4.56	-0.00246	PASS
				30	1.20	0.00065	PASS
				40	-3.33	-0.00180	PASS
		MCH	VN	50	-6.11	-0.00330	PASS
				-30	-5.56	-0.00296	PASS
				-20	-2.46	-0.00131	PASS
				-10	-4.50	-0.00239	PASS
				0	1.70	0.00090	PASS
				10	-5.37	-0.00286	PASS
				20	-2.74	-0.00146	PASS
				30	-3.58	-0.00190	PASS
		HCH	VN	40	0.57	0.00030	PASS
				50	-5.30	-0.00282	PASS
				-30	-3.08	-0.00161	PASS
				-20	2.77	0.00145	PASS
				-10	1.34	0.00070	PASS
				0	-5.29	-0.00277	PASS
				10	-6.23	-0.00326	PASS
				20	-3.99	-0.00209	PASS
30	-2.40	-0.00126	PASS				
40	-2.29	-0.00120	PASS				
50	-5.88	-0.00308	PASS				

The End

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