

Appendix B

WCDMA Band 2&5

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1 Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	EIRP[dB]	Limit[dBm]	Verdict
WCDMA1900	UMTS/WCDMA	LCH	22.40	23.60	33	PASS
		MCH	22.45	23.65	33	PASS
		HCH	22.50	23.70	33	PASS
	UMTS/HSUPA	LCH	20.00	21.20	33	PASS
		MCH	20.18	21.38	33	PASS
		HCH	19.98	21.18	33	PASS
	UMTS/HSDPA	LCH	20.78	21.98	33	PASS
		MCH	20.95	22.15	33	PASS
		HCH	20.75	21.95	33	PASS

Test Band	Test Mode	Test Channel	Measured[dB]	ERP[dB]	Limit[dBm]	Verdict
WCDMA850	UMTS/WCDMA	LCH	22.96	24.76	38.45	PASS
		MCH	22.74	24.54	38.45	PASS
		HCH	22.84	24.64	38.45	PASS
	UMTS/HSUPA	LCH	20.24	22.04	38.45	PASS
		MCH	20.16	21.96	38.45	PASS
		HCH	20.14	21.94	38.45	PASS
	UMTS/HSDPA	LCH	21.18	22.98	38.45	PASS
		MCH	21.18	22.98	38.45	PASS
		HCH	21.1	22.9	38.45	PASS

Note:

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

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

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

b: SGP=Signal Generator Level

2 Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA1900	UMTS/TM1	LCH	2.55	13	PASS
		MCH	2.61	13	PASS
		HCH	2.38	13	PASS
WCDMA850	UMTS/TM1	LCH	3.33	13	PASS
		MCH	3.36	13	PASS
		HCH	3.33	13	PASS

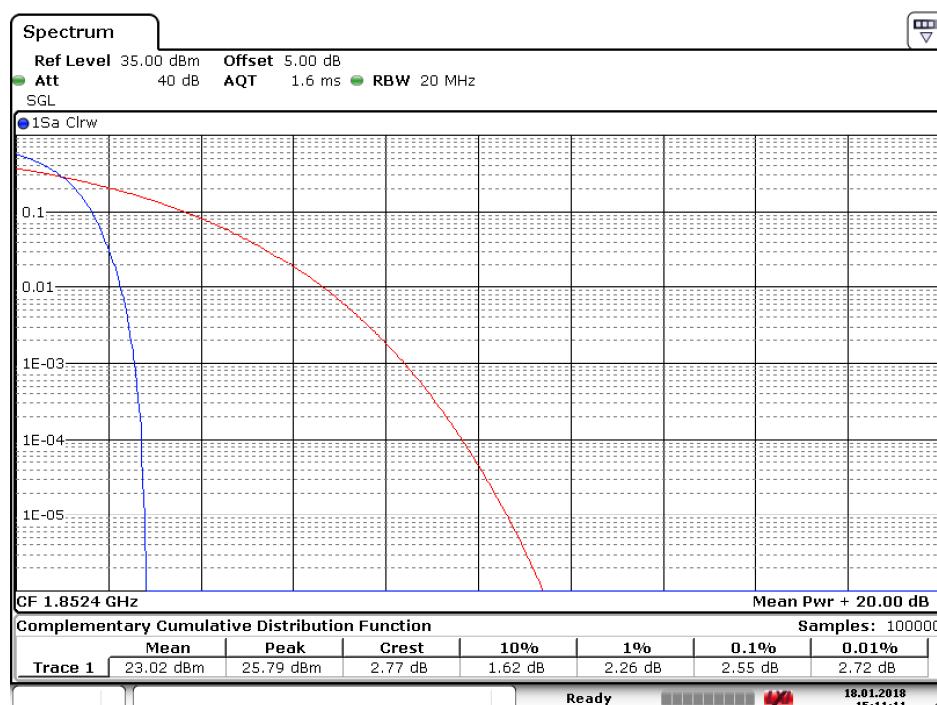
Part II - Test Plots

2.1 For WCDMA

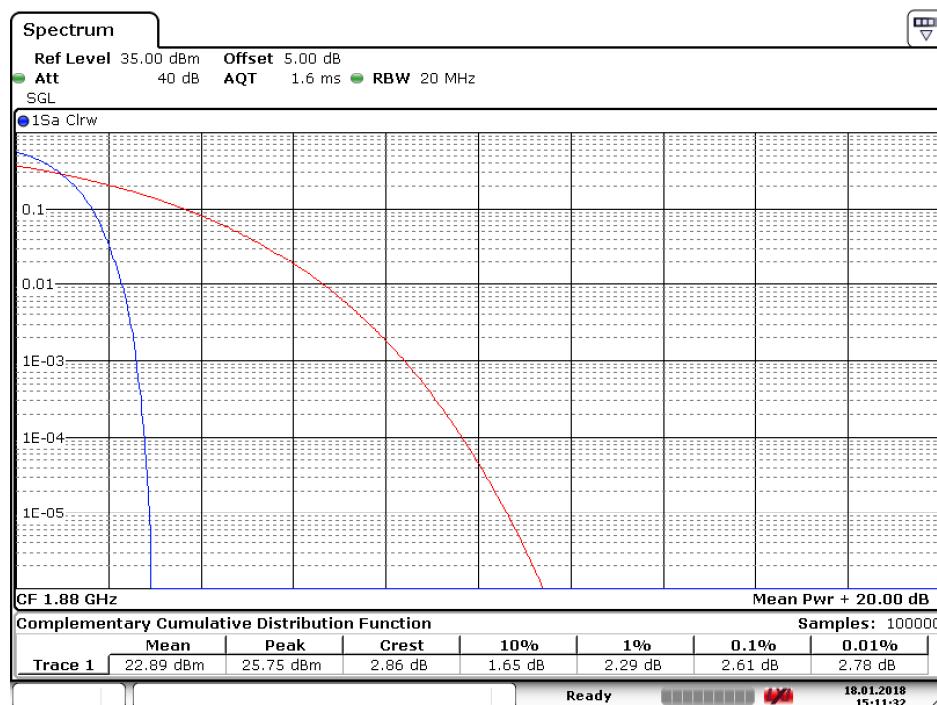
2.1.1 Test Band = WCDMA 1900

2.1.1.1 Test Mode = UMTS/TM1

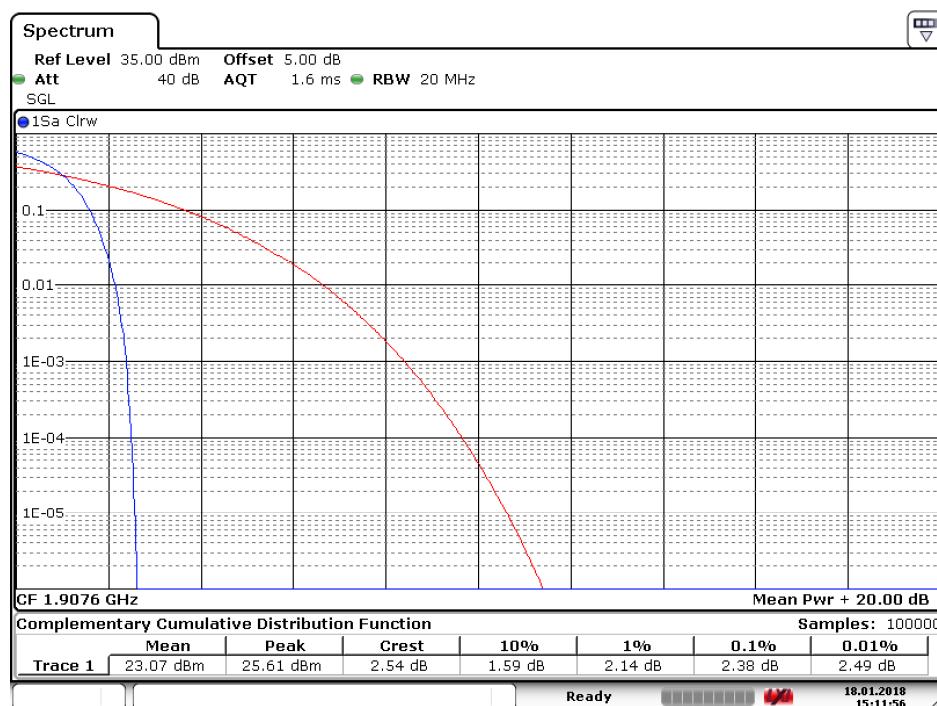
2.1.1.1.1 Test Channel = LCH



Date: 18.JAN.2018 15:11:12

2.1.1.1.2 Test Channel = MCH


Date: 18.JAN.2018 15:11:32

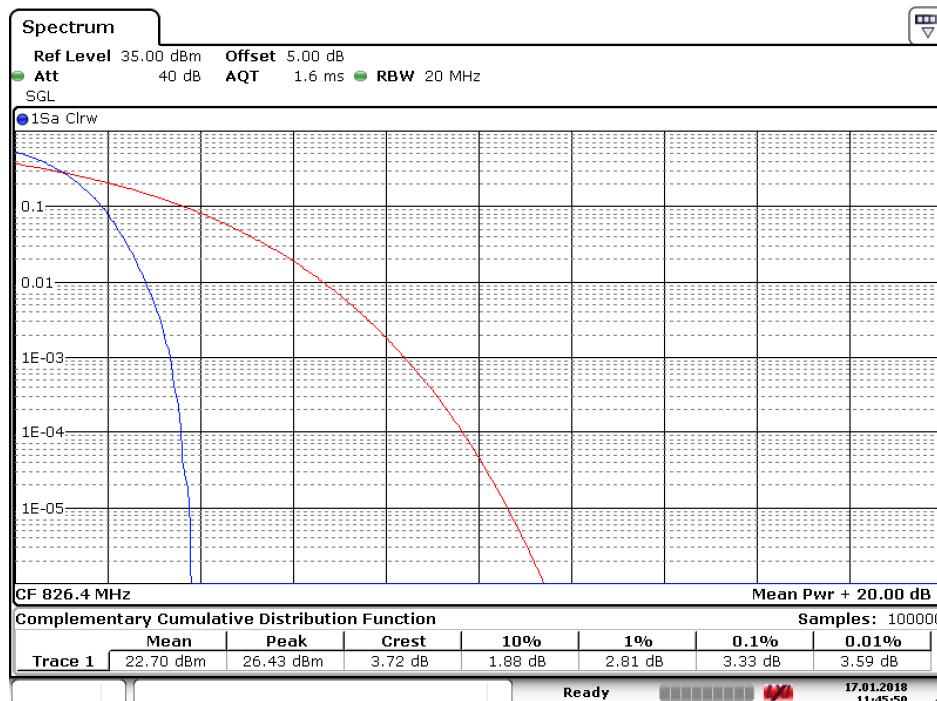
2.1.1.1.3 Test Channel = HCH


Date: 18.JAN.2018 15:11:56

2.1.2 Test Band = WCDMA 850

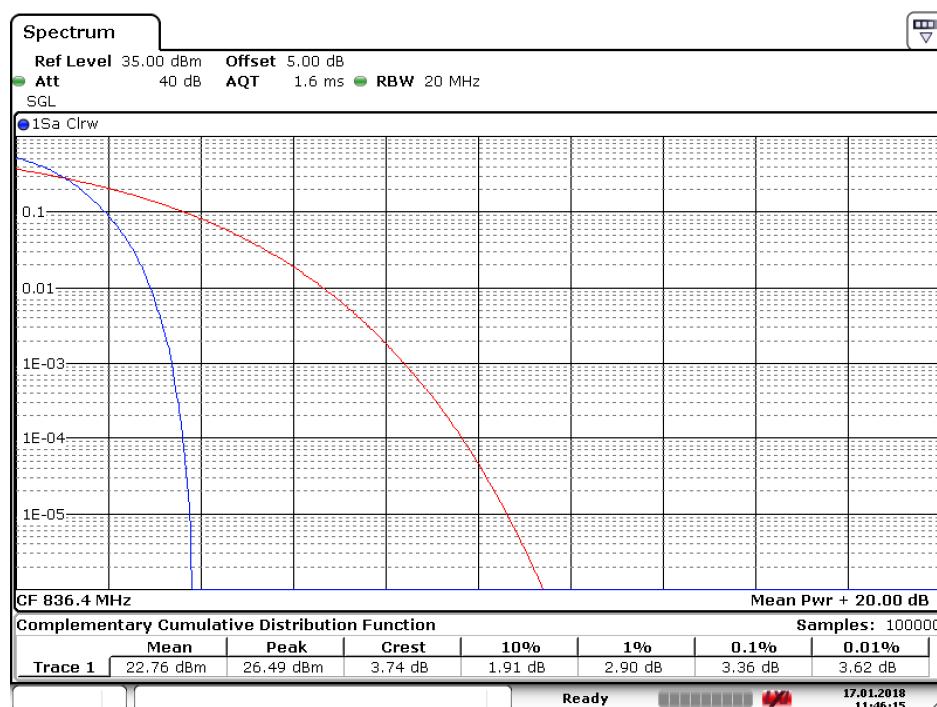
2.1.2.1 Test Mode = UMTS/TM1

2.1.2.1.1 Test Channel = LCH



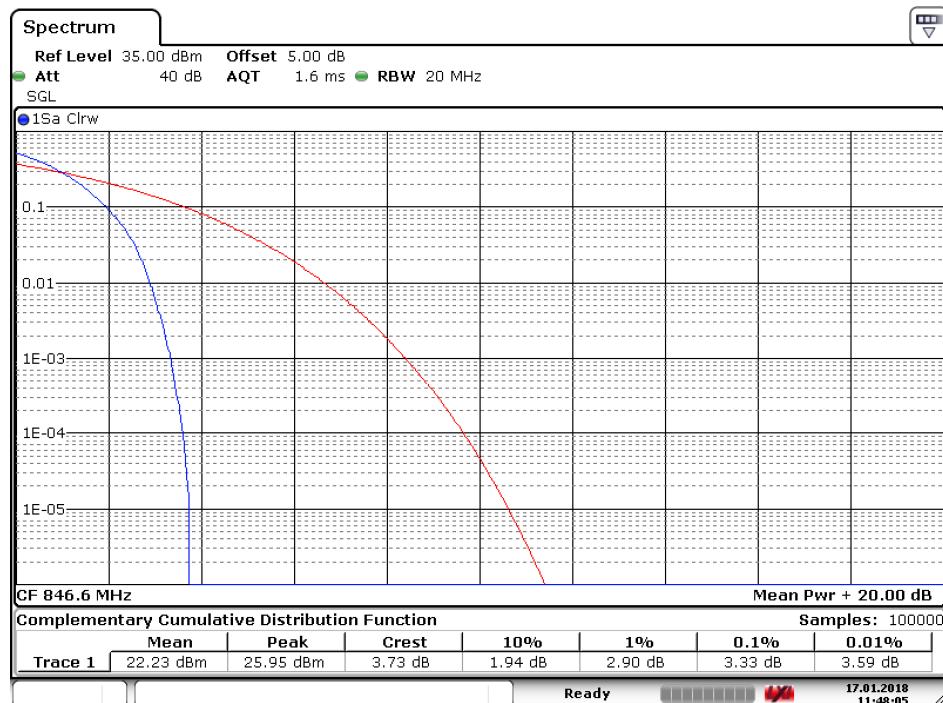
Date: 17.JAN.2018 11:45:50

2.1.2.1.2 Test Channel = MCH



Date: 17.JAN.2018 11:46:15

2.1.2.1.3 Test Channel = HCH



Date: 17.JAN.2018 11:48:04

3 Modulation Characteristics

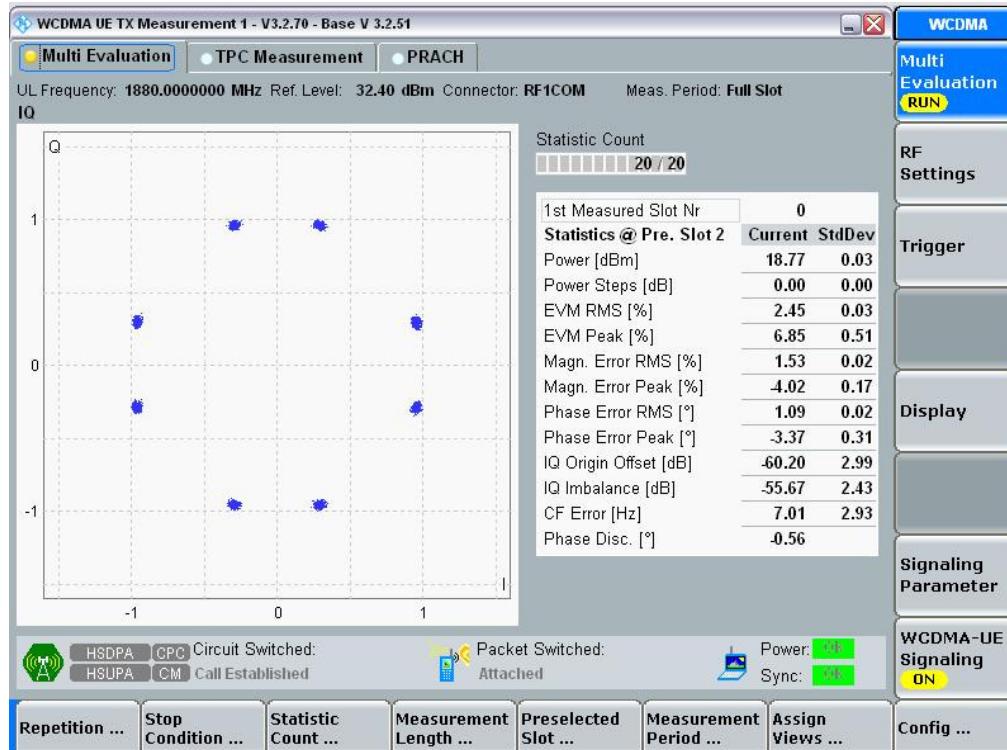
Part I - Test Plots

3.1 For WCDMA

3.1.1 Test Band = WCDMA 1900

3.1.1.1 Test Mode = UMTS/TM1

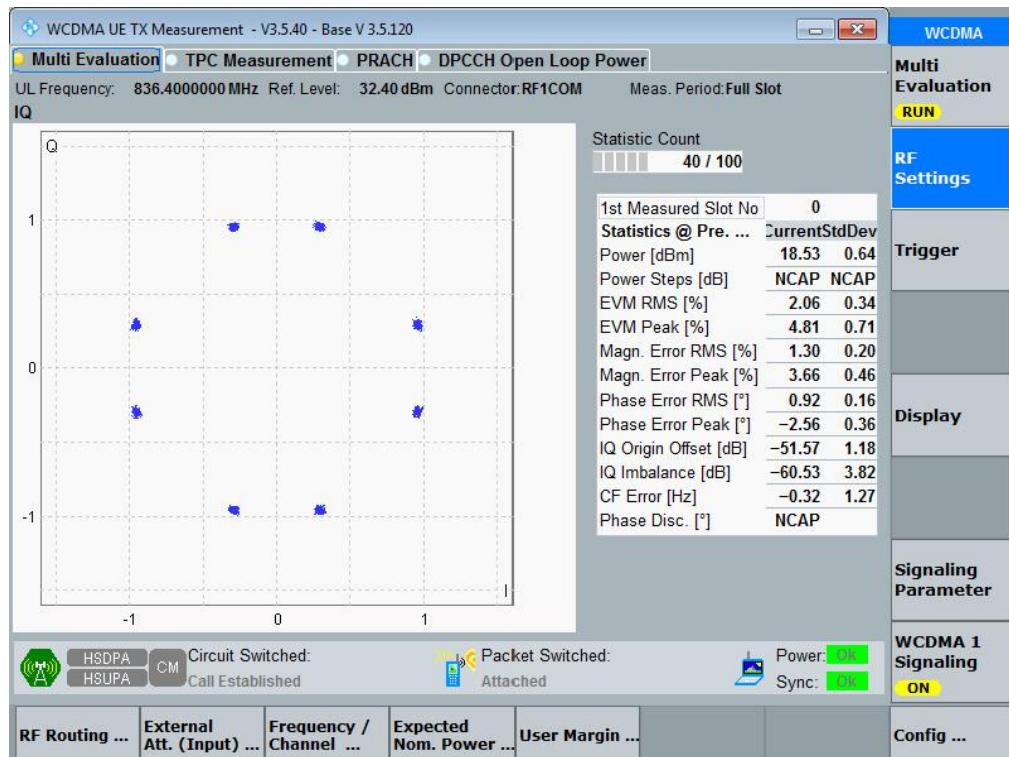
3.1.1.1.1 Test Channel = MCH



3.1.2 Test Band = WCDMA 850

3.1.2.1 Test Mode = UMTS /TM1

3.1.2.1.1 Test Channel = MCH



4 Bandwidth

Part I - Test Results

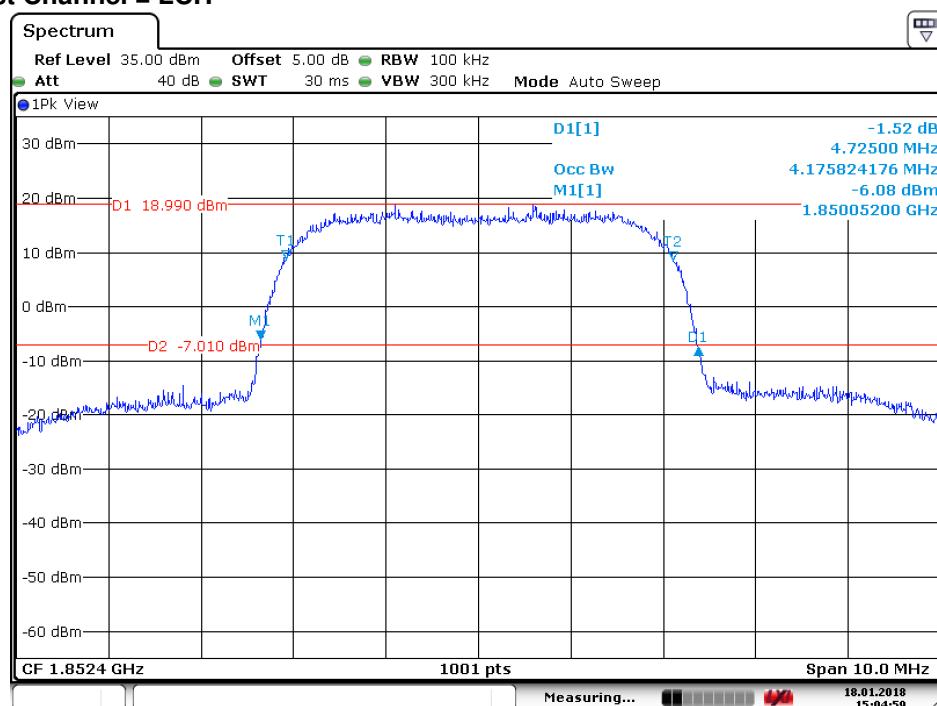
Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA1900	UMTS/TM1	LCH	4.18	4.73	PASS
		MCH	4.16	4.70	PASS
		HCH	4.16	4.70	PASS
WCDMA850	UMTS/TM1	LCH	4.15	4.66	PASS
		MCH	4.16	4.67	PASS
		HCH	4.10	4.65	PASS

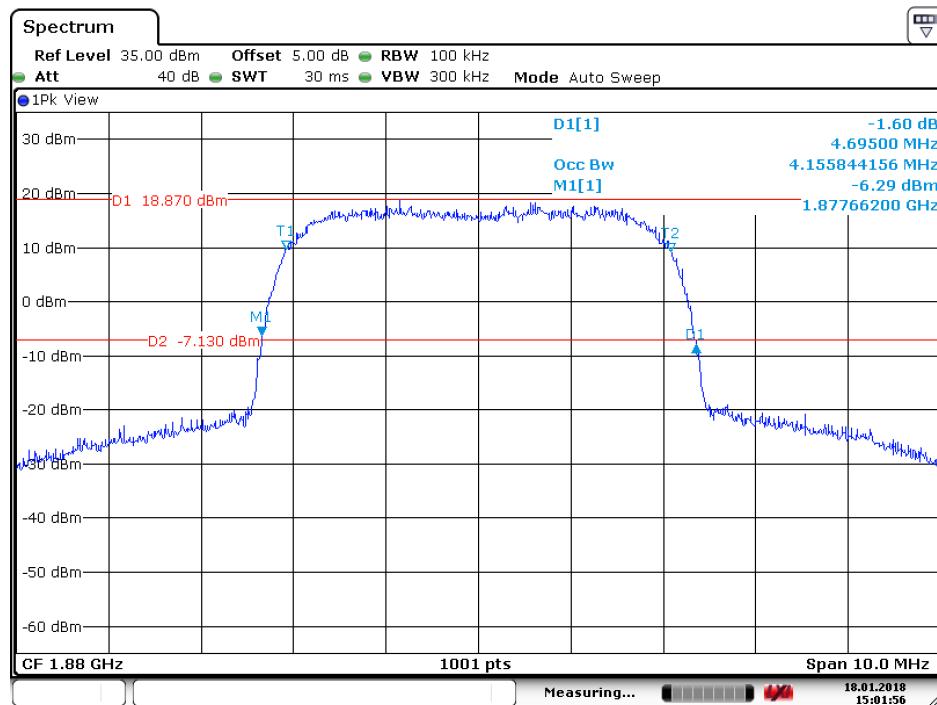
4.1 For WCDMA

4.1.1 Test Band = WCDMA 1900

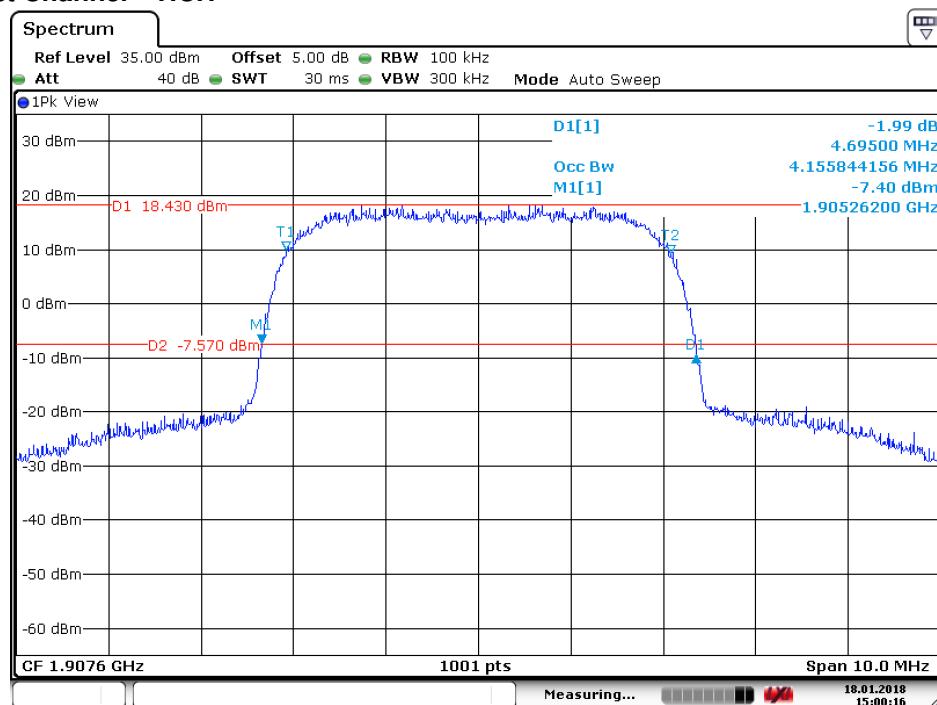
4.1.1.1 Test Mode = UMTS/TM1

4.1.1.1.1 Test Channel = LCH



4.1.1.1.2 Test Channel = MCH


Date: 18.JAN.2018 15:01:56

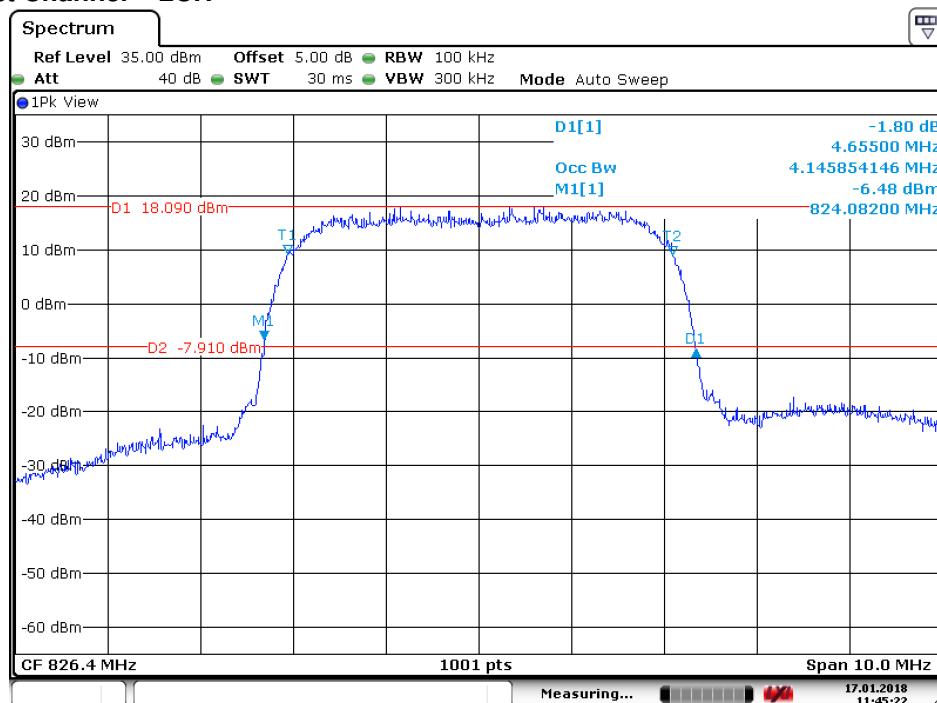
4.1.1.1.3 Test Channel = HCH


Date: 18.JAN.2018 15:00:17

4.1.2 Test Band = WCDMA 850

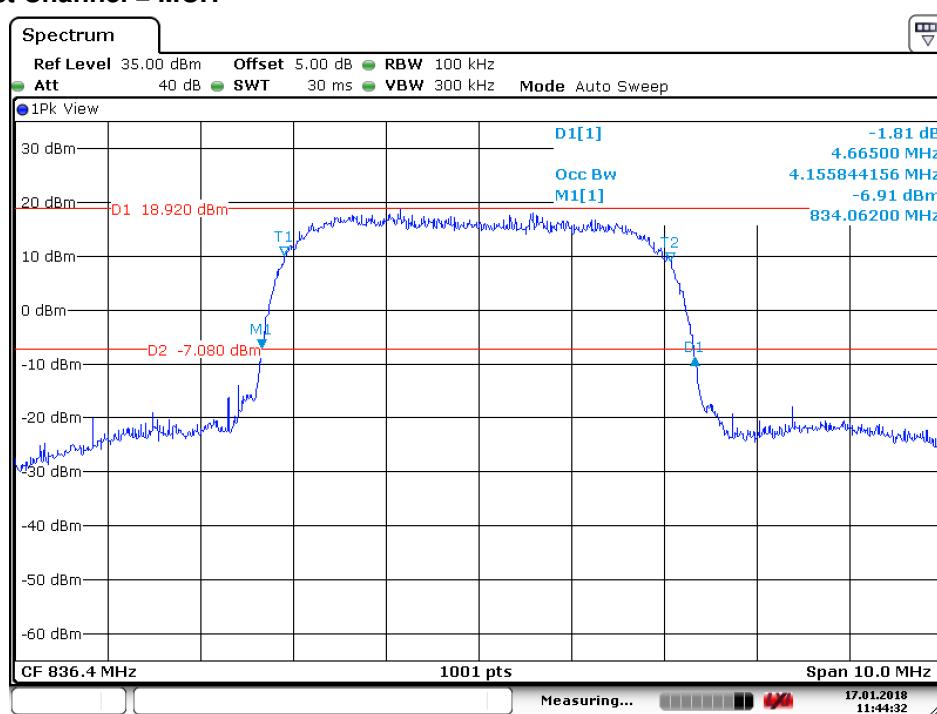
4.1.2.1 Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH



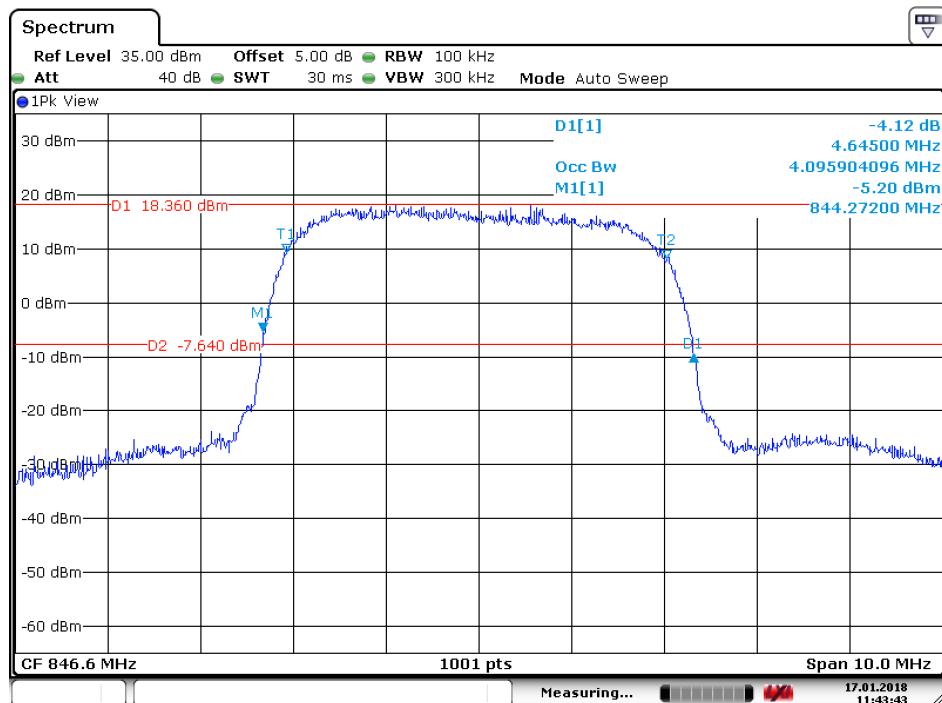
Date: 17.JAN.2018 11:45:23

4.1.2.1.2 Test Channel = MCH



Date: 17.JAN.2018 11:44:32

4.1.2.1.3 Test Channel = HCH



Date: 17.JAN.2018 11:43:44

5 Band Edges Compliance

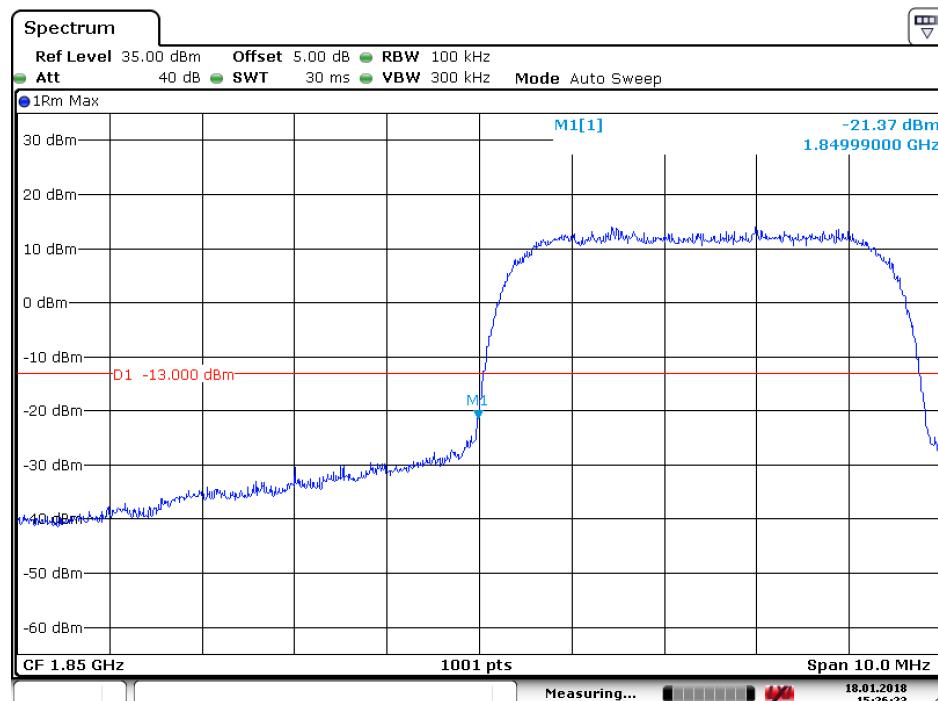
Part I - Test Plots

5.1 For WCDMA

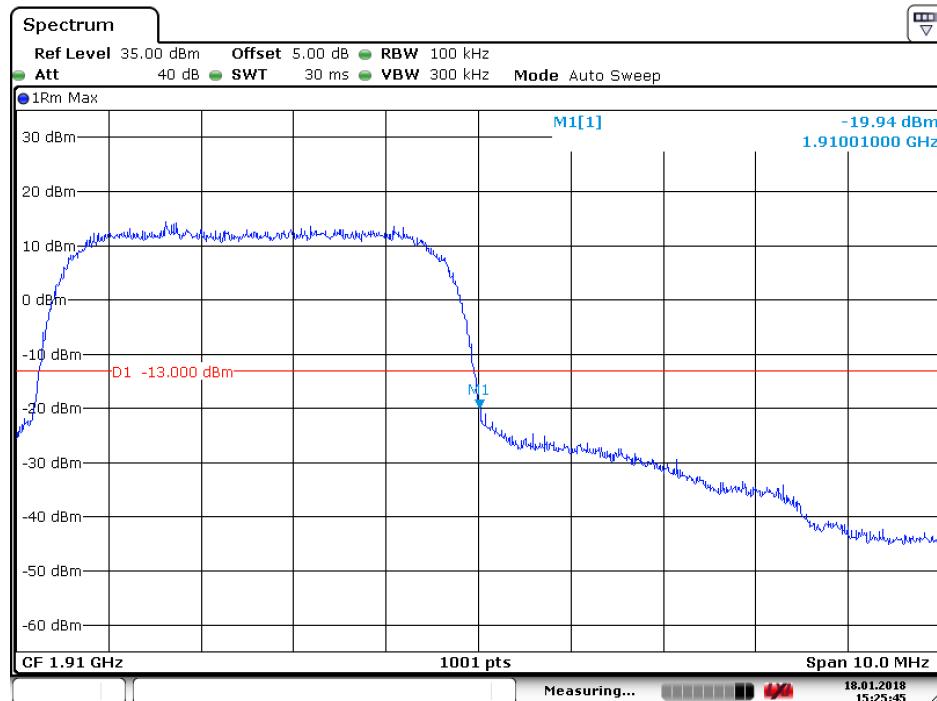
5.1.1 Test Band = WCDMA 1900

5.1.1.1 Test Mode = UMTS/TM1

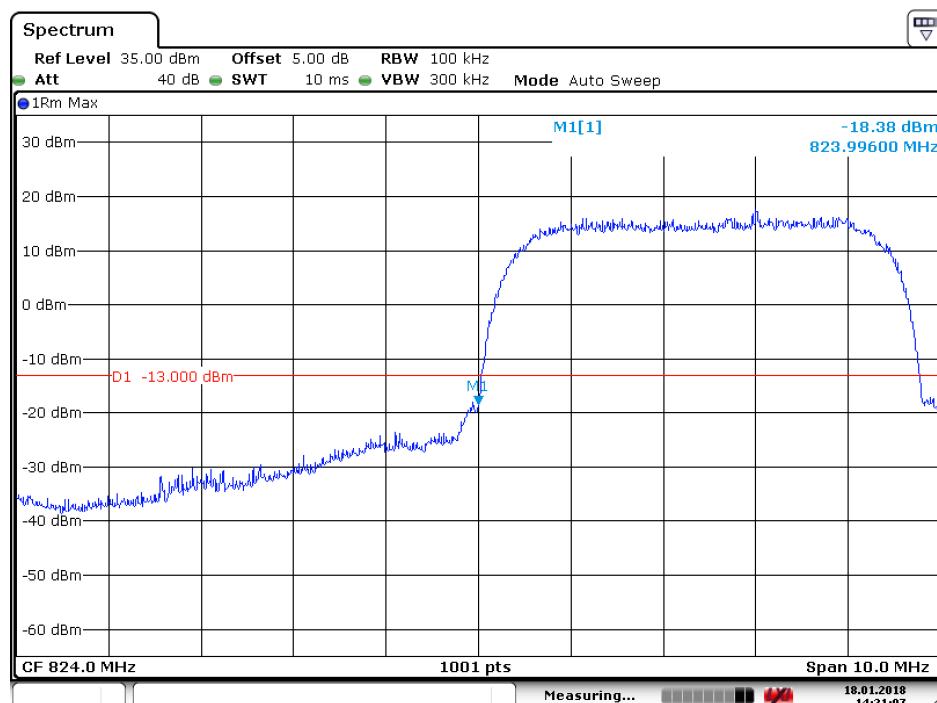
5.1.1.1.1 Test Channel = LCH



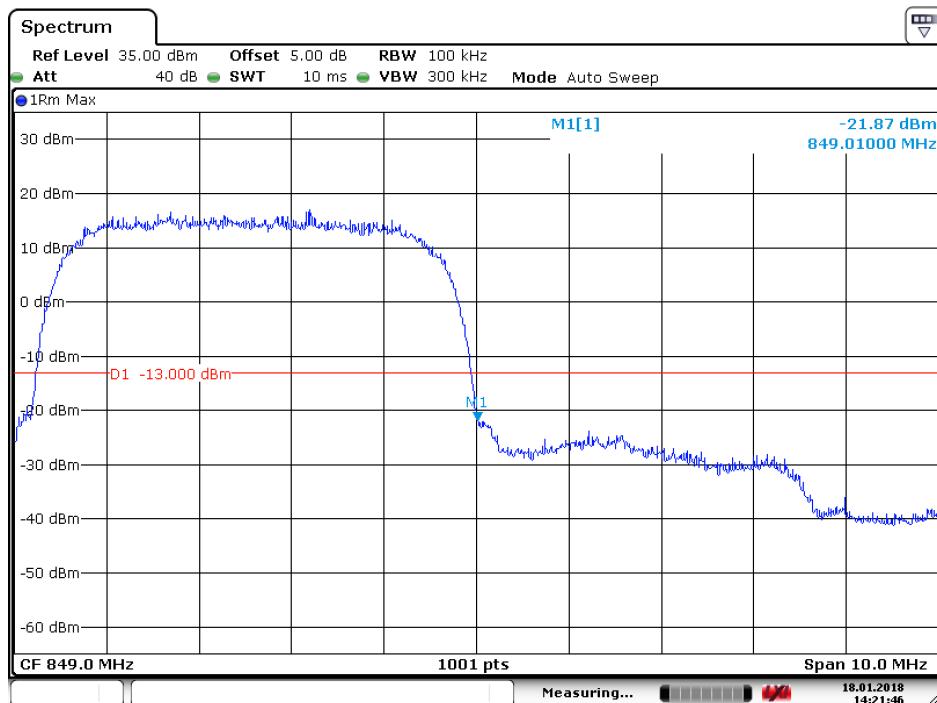
Date: 18.JAN.2018 15:26:23

5.1.1.1.2 Test Channel = HCH


Date: 18.JAN.2018 15:25:46

5.1.2 Test Band = WCDMA 850
5.1.2.1 Test Mode = UMTS/TM1
5.1.2.1.1 Test Channel = LCH


Date: 18.JAN.2018 14:21:07

5.1.2.1.2 Test Channel = HCH

Date: 18.JAN.2018 14:21:47

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 $< \text{RBW}/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (\text{Span} / \text{RBW})$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

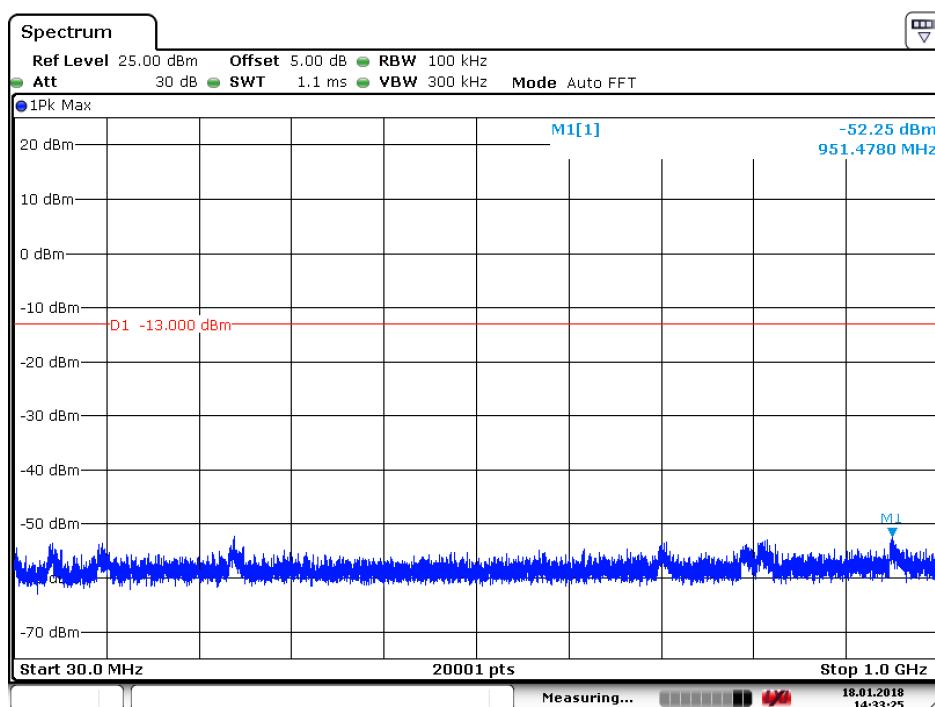
Part I - Test Plots

6.1 For WCDMA

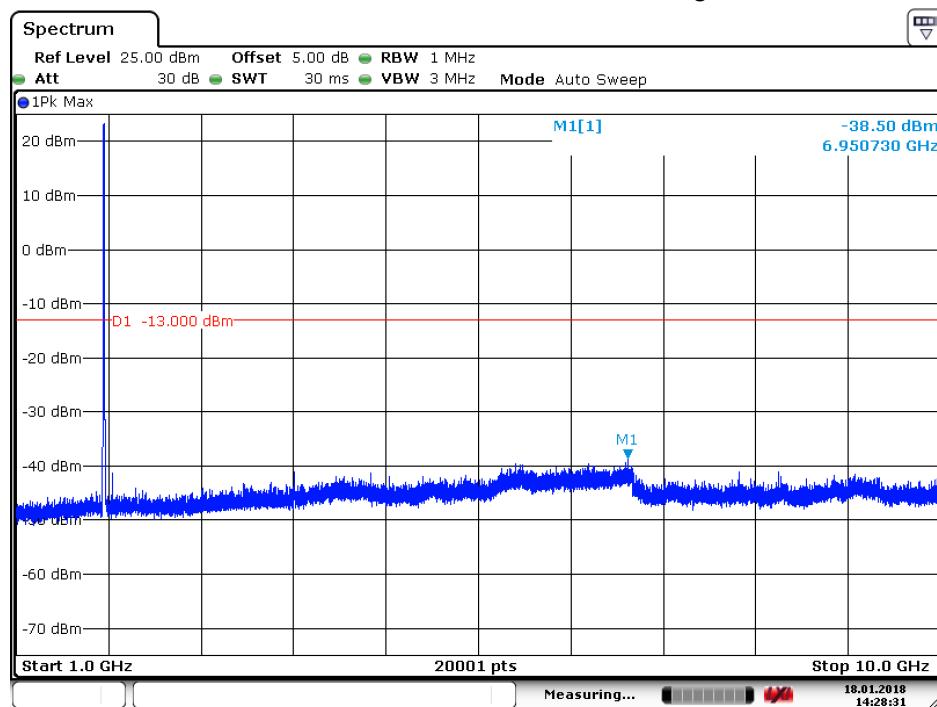
6.1.1 Test Band = WCDMA 1900

6.1.1.1 Test Mode = UMTS/TM1

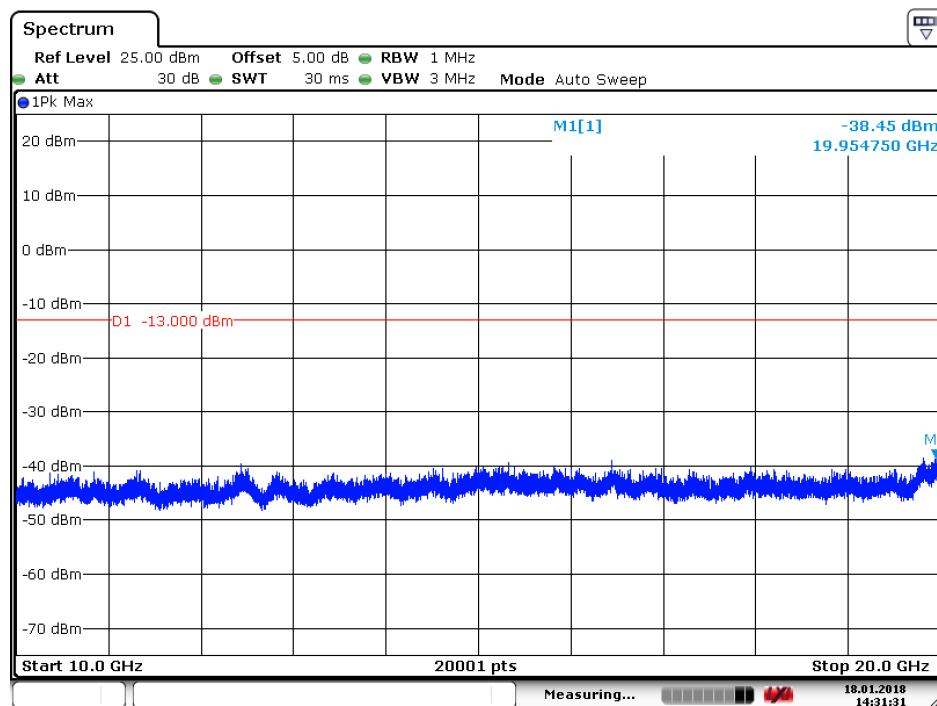
6.1.1.1.1 Test Channel = LCH



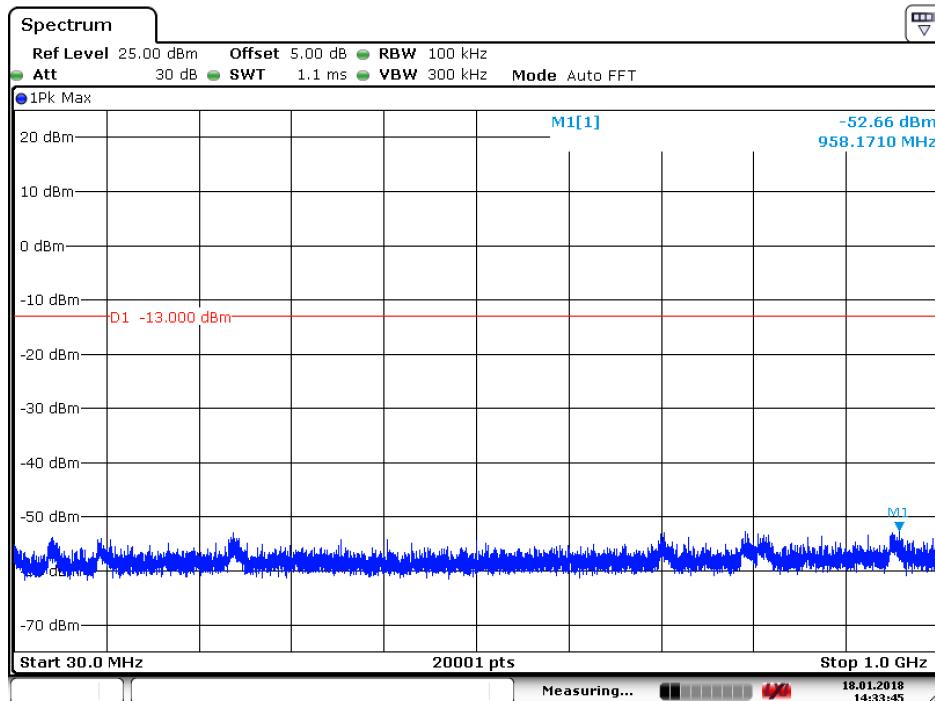
Date: 18.JAN.2018 14:33:26



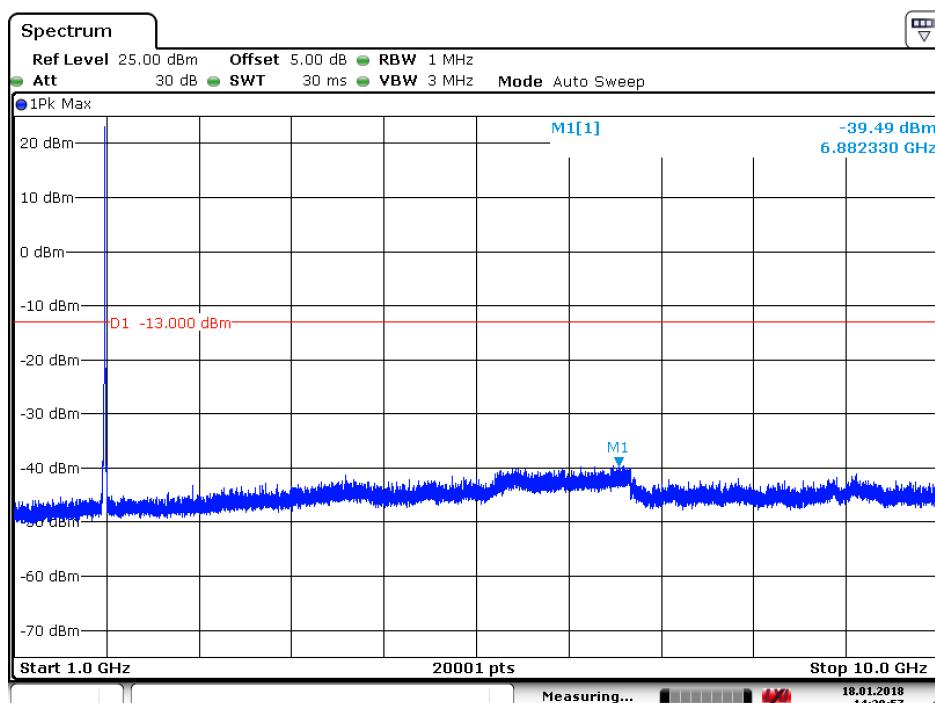
Date: 18.JAN.2018 14:28:32



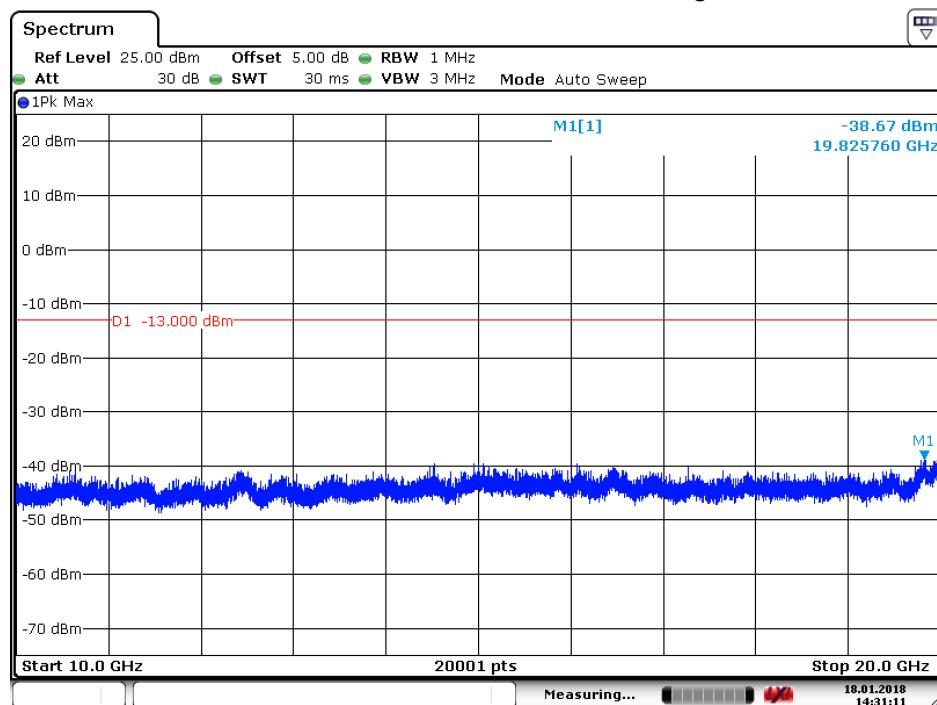
Date: 18.JAN.2018 14:31:31

6.1.1.1.2 Test Channel = MCH


Date: 18.JAN.2018 14:33:45

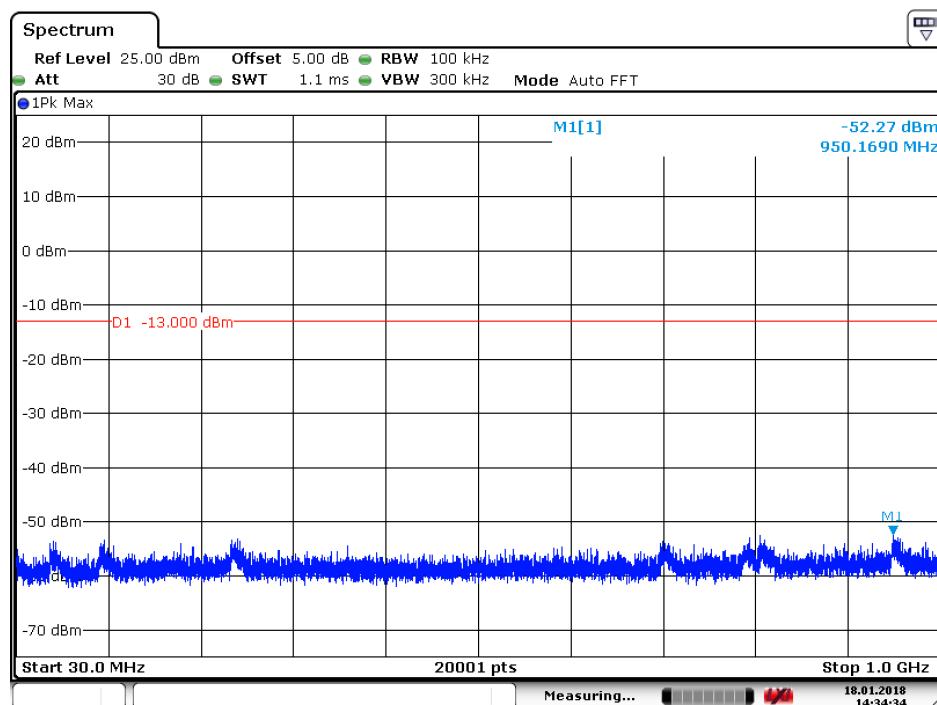


Date: 18.JAN.2018 14:29:58

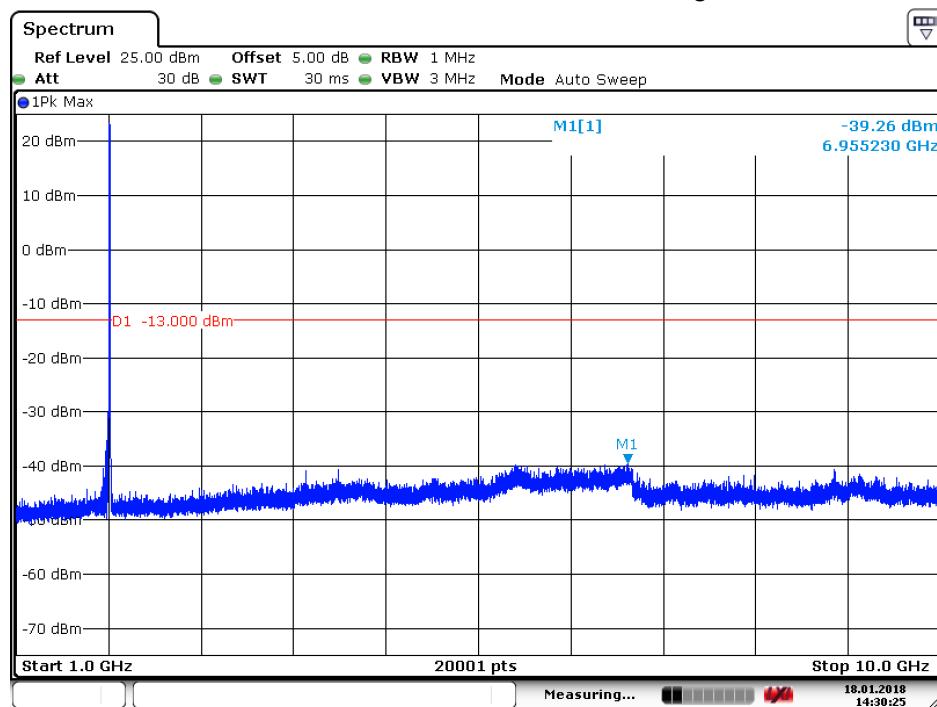


Date: 18.JAN.2018 14:31:12

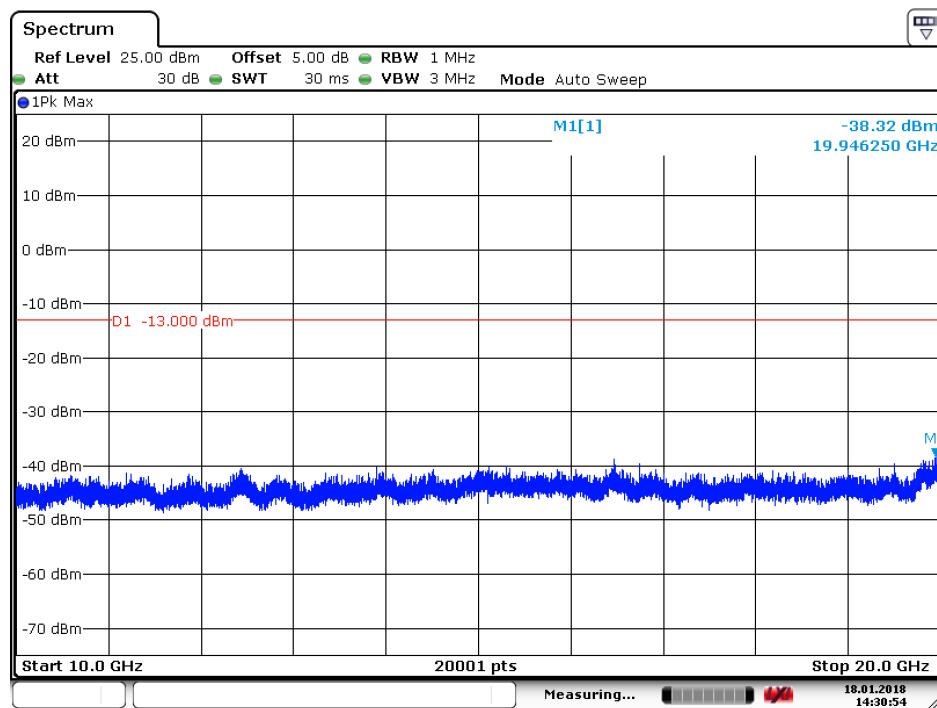
6.1.1.1.3 Test Channel = HCH



Date: 18.JAN.2018 14:34:34



Date: 18.JAN.2018 14:30:25

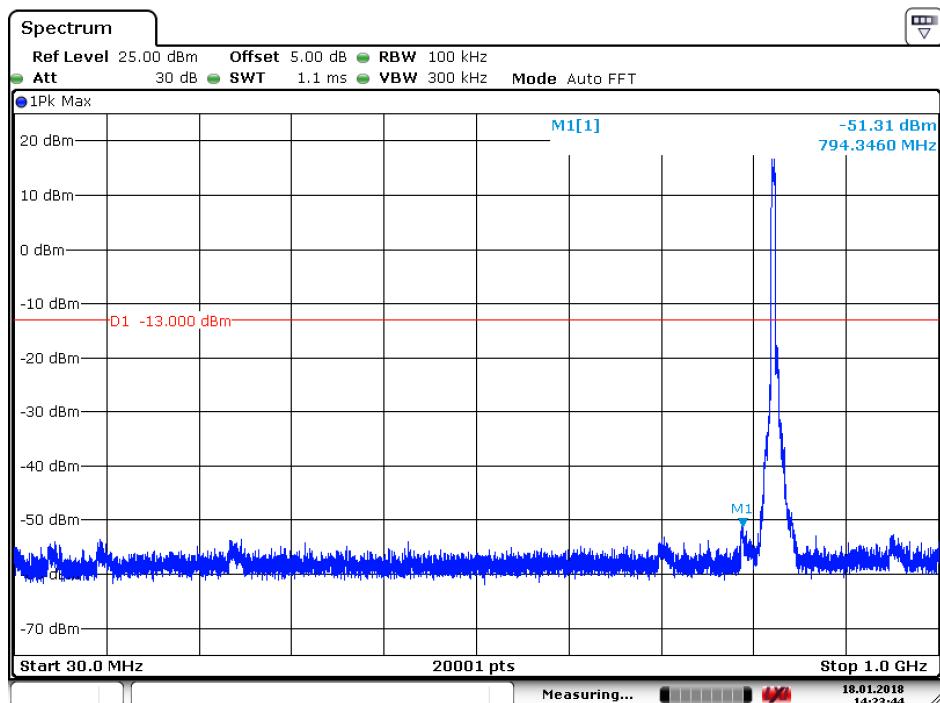


Date: 18.JAN.2018 14:30:54

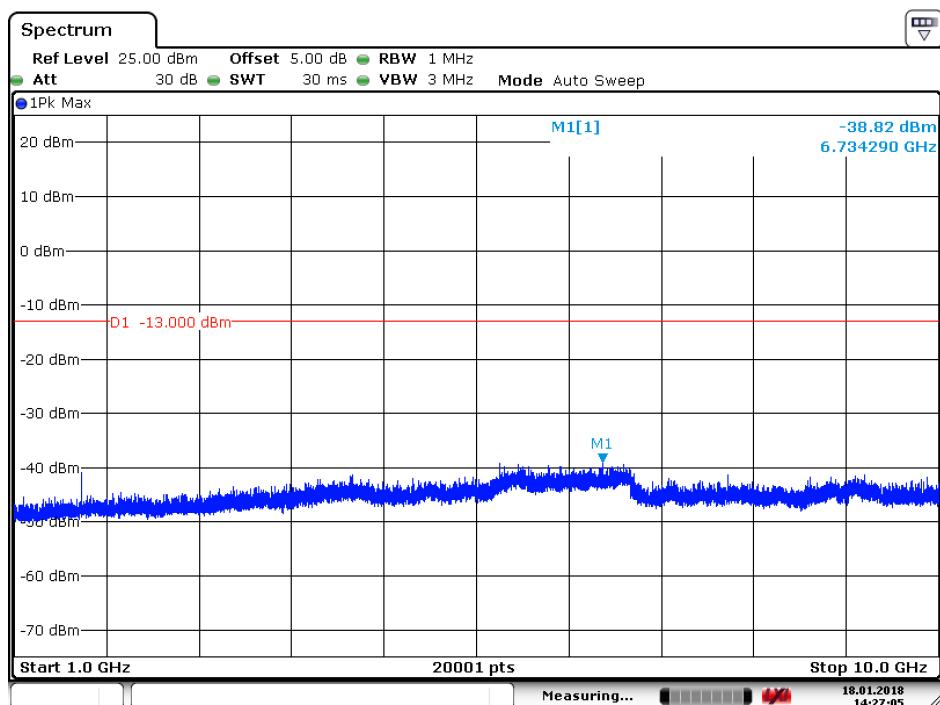
6.1.2 Test Band = WCDMA 850

6.1.2.1 Test Mode = UMTS/TM1

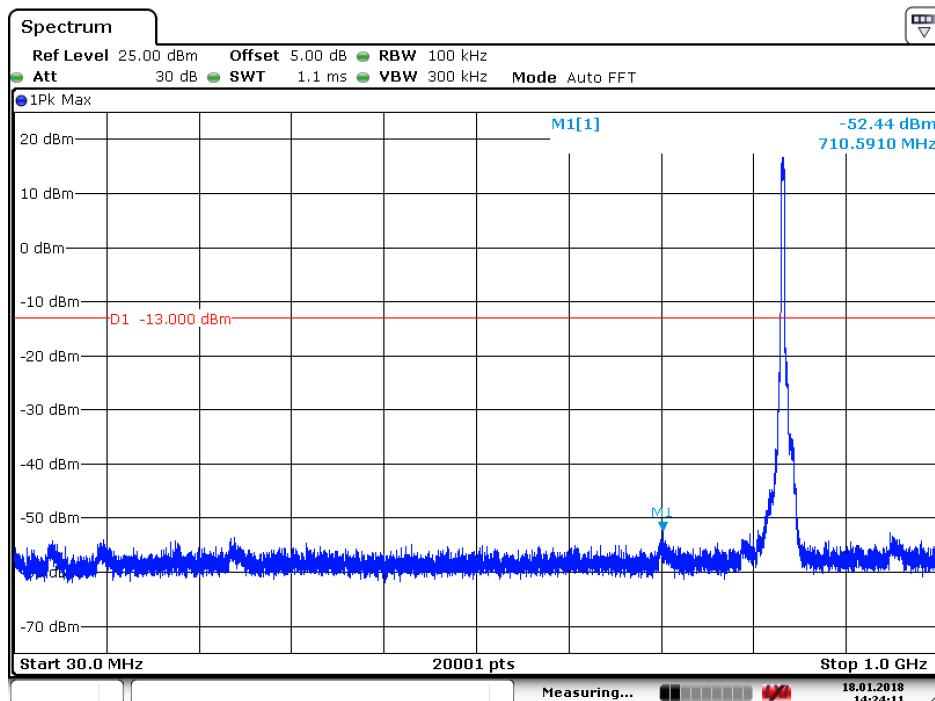
6.1.2.1.1 Test Channel = LCH



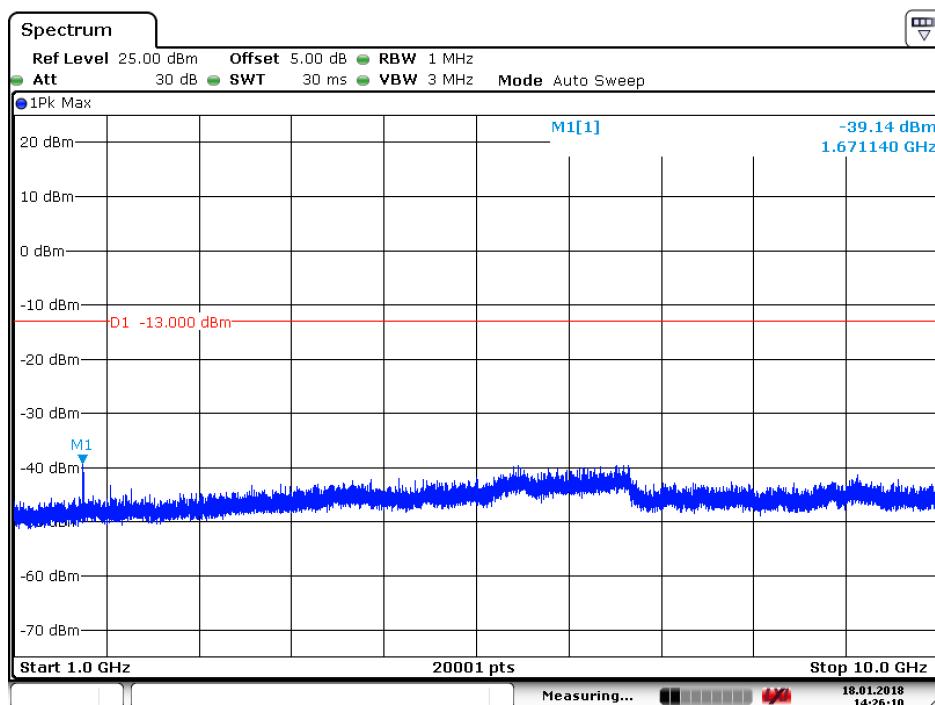
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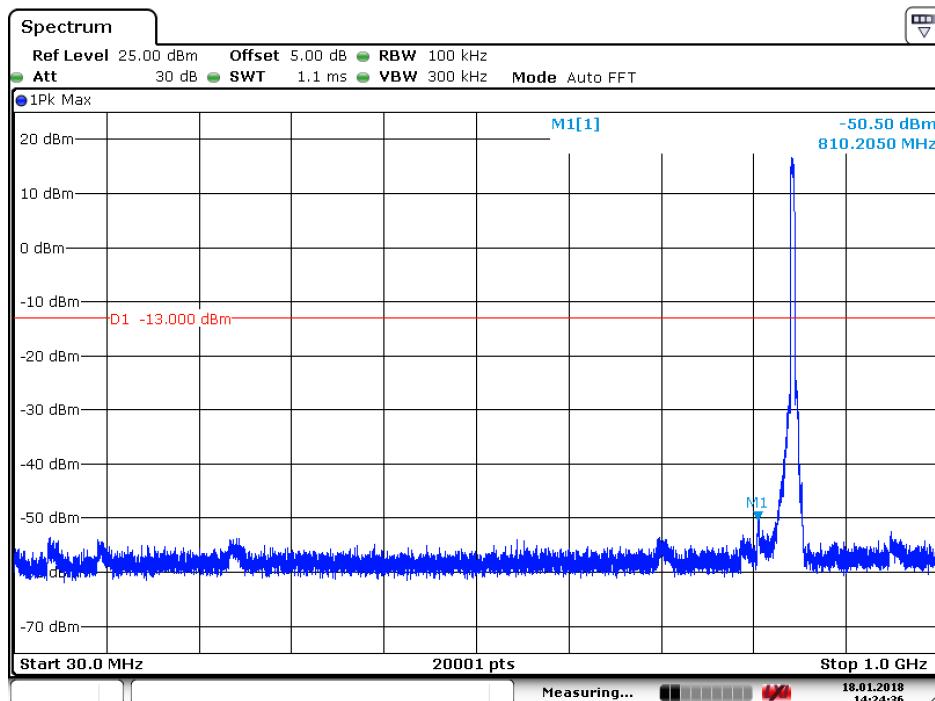
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6.1.2.1.2 Test Channel = MCH


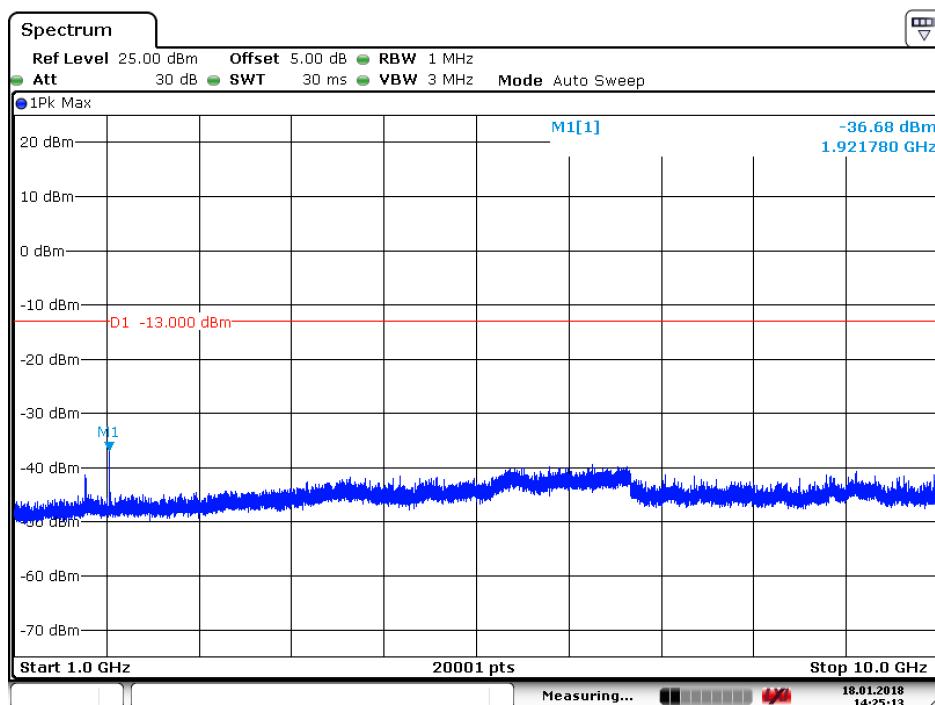
Date: 18.JAN.2018 14:24:12



Date: 18.JAN.2018 14:26:11

6.1.2.1.3 Test Channel = HCH


Date: 18.JAN.2018 14:24:36



Date: 18.JAN.2018 14:25:14

7 Field Strength of Spurious Radiation

Part I - Test Plots

7.1 For WCDMA

7.1.1 Test Band = WCDMA 1900

7.1.1.1 Test Mode = UMTS/TM1

7.1.1.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
40.200000	-66.85	-13.00	53.85	Vertical
121.750000	-74.75	-13.00	61.75	Vertical
1260.000000	-48.73	-13.00	35.73	Vertical
3706.875000	-51.43	-13.00	38.43	Vertical
5554.987500	-51.55	-13.00	38.55	Vertical
8527.275000	-51.56	-13.00	38.56	Vertical
55.300000	-68.69	-13.00	55.69	Horizontal
610.004167	-73.86	-13.00	60.86	Horizontal
1511.000000	-49.03	-13.00	36.03	Horizontal
3706.875000	-51.40	-13.00	38.40	Horizontal
5554.012500	-51.06	-13.00	38.06	Horizontal
9288.750000	-52.11	-13.00	39.11	Horizontal

7.1.1.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
65.150000	-73.38	-13.00	60.38	Vertical
591.304167	-74.22	-13.00	61.22	Vertical
1237.000000	-48.89	-13.00	35.89	Vertical
3757.575000	-49.41	-13.00	36.41	Vertical
5635.912500	-48.34	-13.00	35.34	Vertical
9218.062500	-51.45	-13.00	38.45	Vertical
62.050000	-68.90	-13.00	55.90	Horizontal
945.137500	-68.05	-13.00	55.05	Horizontal
1577.500000	-48.16	-13.00	35.16	Horizontal
3757.087500	-49.80	-13.00	36.80	Horizontal
5643.225000	-52.36	-13.00	39.36	Horizontal
8653.537500	-52.45	-13.00	39.45	Horizontal

7.1.1.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
40.400000	-66.78	-13.00	53.78	Vertical
120.100000	-75.35	-13.00	62.35	Vertical
1558.500000	-46.21	-13.00	33.21	Vertical
3813.637500	-45.79	-13.00	32.79	Vertical
5720.737500	-52.79	-13.00	39.79	Vertical
10654.237500	-51.21	-13.00	38.21	Vertical
57.150000	-69.14	-13.00	56.14	Horizontal
62.600000	-68.03	-13.00	55.03	Horizontal
1500.000000	-48.68	-13.00	35.68	Horizontal
3817.537500	-48.48	-13.00	35.48	Horizontal
5722.687500	-52.49	-13.00	39.49	Horizontal
10260.825000	-52.61	-13.00	39.61	Horizontal

7.1.2 Test Band = WCDMA 850
7.1.2.1 Test Mode = UMTS/TM1
7.1.2.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
40.050000	-73.65	-13.00	60.65	Vertical
133.700000	-81.27	-13.00	68.27	Vertical
1651.000000	-45.31	-13.00	32.31	Vertical
2476.000000	-52.26	-13.00	39.26	Vertical
3300.787500	-63.08	-13.00	50.08	Vertical
6364.725000	-65.56	-13.00	52.56	Vertical
63.350000	-79.08	-13.00	66.08	Horizontal
1134.000000	-67.47	-13.00	54.47	Horizontal
1650.500000	-49.38	-13.00	36.38	Horizontal
2476.000000	-54.29	-13.00	41.29	Horizontal
3300.787500	-66.43	-13.00	53.43	Horizontal
6715.237500	-65.22	-13.00	52.22	Horizontal

7.1.2.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
40.250000	-74.77	-13.00	61.77	Vertical
605.925000	-80.20	-13.00	67.20	Vertical
1671.000000	-52.07	-13.00	39.07	Vertical
2506.000000	-55.23	-13.00	42.23	Vertical
3348.562500	-64.20	-13.00	51.20	Vertical
6260.887500	-65.23	-13.00	52.23	Vertical
62.500000	-77.41	-13.00	64.41	Horizontal
620.545833	-78.71	-13.00	65.71	Horizontal
1674.500000	-47.30	-13.00	34.30	Horizontal
2506.000000	-56.47	-13.00	43.47	Horizontal
3348.075000	-64.13	-13.00	51.13	Horizontal
5930.362500	-65.89	-13.00	52.89	Horizontal

7.1.2.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
40.200000	-74.95	-13.00	61.95	Vertical
71.700000	-81.73	-13.00	68.73	Vertical
1695.000000	-49.81	-13.00	36.81	Vertical
2536.500000	-54.64	-13.00	41.64	Vertical
3381.712500	-65.24	-13.00	52.24	Vertical
6053.700000	-65.23	-13.00	52.23	Vertical
63.200000	-78.30	-13.00	65.30	Horizontal
627.512500	-79.27	-13.00	66.27	Horizontal
1691.500000	-51.21	-13.00	38.21	Horizontal
2542.500000	-57.75	-13.00	44.75	Horizontal
3383.175000	-68.50	-13.00	55.50	Horizontal
7934.475000	-64.01	-13.00	51.01	Horizontal

NOTE:

- 1) The disturbance between 9KHz to 30MHz and above 13GHz 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) We have tested all modulation, but only the worst case data presented in this report.

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
WCDMA 1900	UMTS/TM1	LCH	TN	VL	2.25	0.00121	PASS
				VN	-0.33	-0.00018	PASS
				VH	0.05	0.00003	PASS
		MCH	TN	VL	1.86	0.00099	PASS
				VN	0.45	0.00024	PASS
				VH	-1.17	-0.00062	PASS
		HCH	TN	VL	1.74	0.00091	PASS
				VN	-2.94	-0.00154	PASS
				VH	-4.64	-0.00243	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA 850	UMTS/TM1	LCH	TN	VL	-3.78	-0.00457	PASS
				VN	-0.48	-0.00058	PASS
				VH	2.22	0.00269	PASS
		MCH	TN	VL	-3.64	-0.00435	PASS
				VN	0.24	0.00029	PASS
				VH	-2.45	-0.00293	PASS
		HCH	TN	VL	1.65	0.00195	PASS
				VN	-4.71	-0.00556	PASS
				VH	2.20	0.00260	PASS

8.2 Frequency Error VS. Temperature

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA 1900	UMTS/TM1	LCH	VN	-30	-4.53	-0.00245	PASS
				-20	1.20	0.00065	PASS
				-10	0.17	0.00009	PASS
				0	-2.65	-0.00143	PASS
				10	0.57	0.00031	PASS
				20	-4.83	-0.00261	PASS
				30	1.67	0.00090	PASS
				40	-0.09	-0.00005	PASS
				50	-6.05	-0.00327	PASS
		MCH	VN	-30	-3.87	-0.00206	PASS
				-20	-5.05	-0.00269	PASS
				-10	-0.38	-0.00020	PASS
				0	-3.34	-0.00178	PASS
				10	1.33	0.00071	PASS
				20	2.75	0.00146	PASS
				30	1.68	0.00089	PASS
				40	0.12	0.00006	PASS
				50	-4.38	-0.00233	PASS
		HCH	VN	-30	-0.13	-0.00007	PASS
				-20	3.67	0.00192	PASS
				-10	2.52	0.00132	PASS
				0	-5.58	-0.00292	PASS
				10	1.52	0.00080	PASS
				20	-2.73	-0.00143	PASS
				30	3.69	0.00193	PASS
				40	-0.64	-0.00034	PASS
				50	-4.69	-0.00246	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA 850	UMTS/TM1	LCH	VN	-30	0.45	0.00054	PASS
				-20	4.22	0.00511	PASS
				-10	2.76	0.00334	PASS
				0	-2.86	-0.00346	PASS
				10	5.32	0.00644	PASS
				20	1.76	0.00213	PASS
				30	-5.79	-0.00701	PASS
				40	2.75	0.00333	PASS
				50	3.29	0.00398	PASS
		MCH	VN	-30	1.14	0.00136	PASS
				-20	5.83	0.00697	PASS
				-10	-2.14	-0.00256	PASS
				0	4.58	0.00548	PASS
				10	1.84	0.00220	PASS
				20	2.97	0.00355	PASS
				30	-4.75	-0.00568	PASS
				40	-2.33	-0.00279	PASS
				50	1.09	0.00130	PASS
		HCH	VN	-30	7.74	0.00914	PASS
				-20	3.32	0.00392	PASS
				-10	4.02	0.00475	PASS
				0	-3.80	-0.00449	PASS
				10	2.94	0.00347	PASS
				20	3.37	0.00398	PASS
				30	-2.07	-0.00245	PASS
				40	1.46	0.00172	PASS
				50	2.43	0.00287	PASS

The End