



Appendix B

Test Data for SZEM161201075001RG



CONTENT

	Page
1 EFFECTIVE (ISOTROPIC) RADIATED POWER OUTPUT DATA.....	3
2 PEAK-TO-AVERAGE RATIO	4
2.1 FOR WCDMA.....	5
2.1.1 Test Band = WCDMA 850.....	5
3 MODULATION CHARACTERISTICS	11
3.1 FOR WCDMA.....	11
3.1.1 Test Band = WCDMA 850.....	11
4 BANDWIDTH	13
4.1 FOR WCDMA.....	14
4.1.1 Test Band = WCDMA 850.....	14
5 BAND EDGES COMPLIANCE	20
5.1 FOR WCDMA.....	20
5.1.1 Test Band = WCDMA 850.....	20
6 SPURIOUS EMISSION AT ANTENNA TERMINAL.....	24
6.1 FOR WCDMA.....	24
6.1.1 Test Band = WCDMA 850.....	24
7 FIELD STRENGTH OF SPURIOUS RADIATION	30
7.1 FOR WCDMA.....	30
7.1.1 Test Band = WCDMA 850	30
8 FREQUENCY STABILITY	31
8.1 FREQUENCY ERROR VS. VOLTAGE	31
8.2 FREQUENCY ERROR VS. TEMPERATURE	32



1 Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	ERP[dB]	Limit[dBm]	Verdict
WCDMA850	UMTS/TM1	LCH	23.51	23.62	38.45	PASS
		MCH	23.56	23.67	38.45	PASS
		HCH	23.69	23.80	38.45	PASS
	UMTS/TM2	LCH	21.79	21.90	38.45	PASS
		MCH	21.80	21.91	38.45	PASS
		HCH	21.72	21.83	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



2 Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA850	UMTS/TM1	LCH	2.67	13	PASS
		MCH	2.67	13	PASS
		HCH	2.72	13	PASS
	UMTS/TM2	LCH	4.72	13	PASS
		MCH	5.01	13	PASS
		HCH	5.19	13	PASS



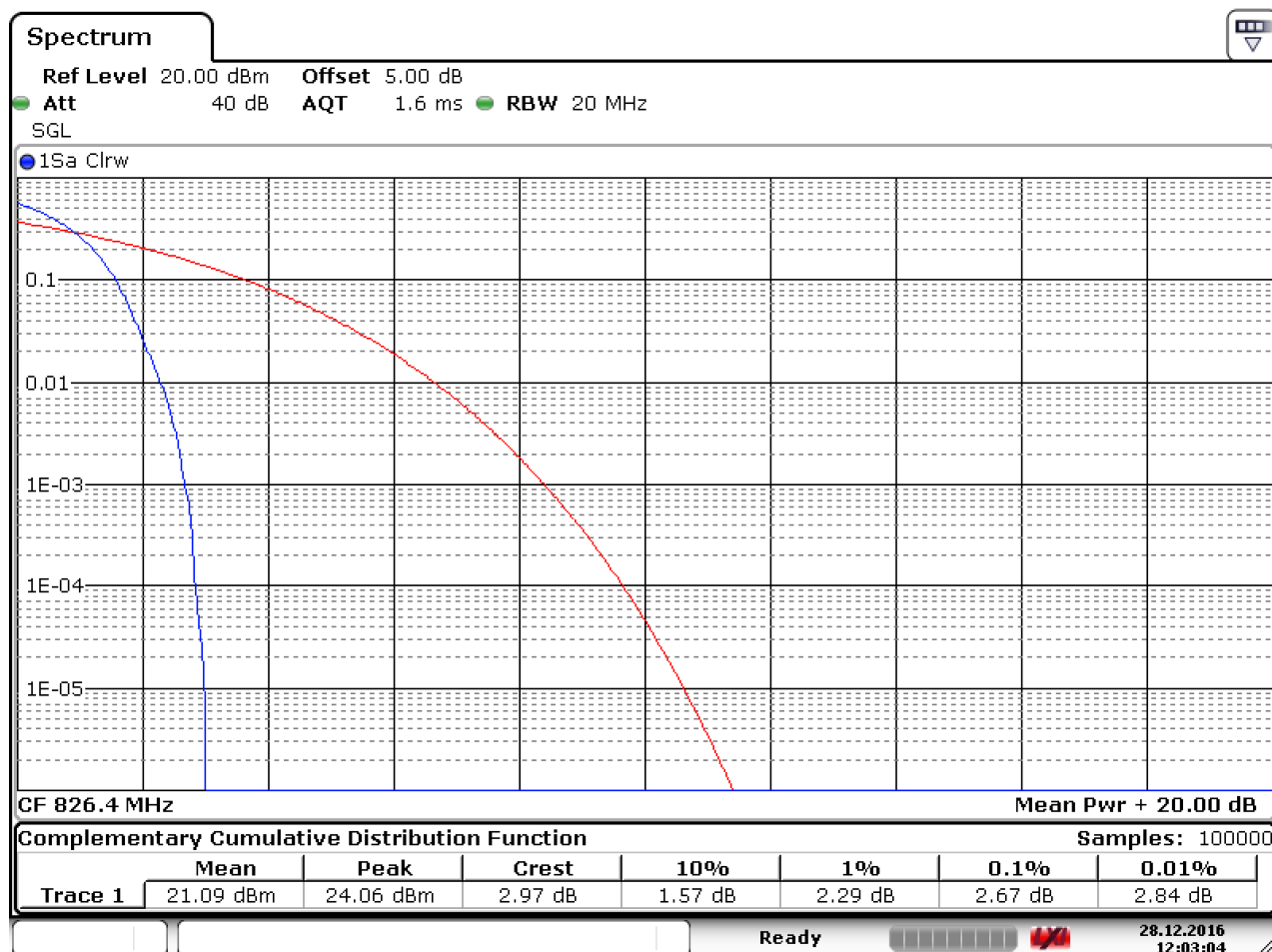
Part II - Test Plots

2.1 For WCDMA

2.1.1 Test Band = WCDMA 850

2.1.1.1 Test Mode = UMTS/TM1

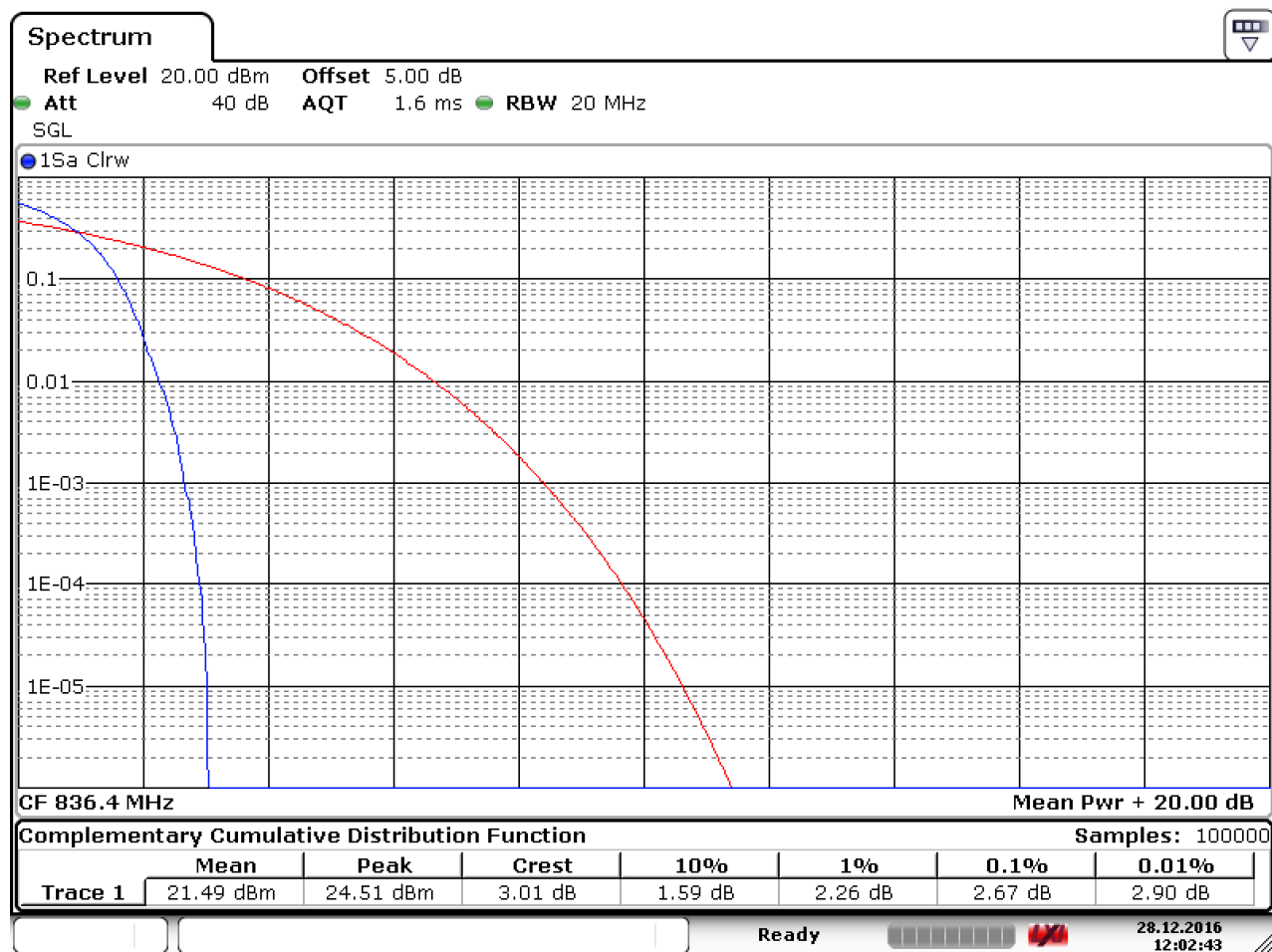
2.1.1.1.1 Test Channel = LCH



Date: 28.DEC.2016 12:03:04



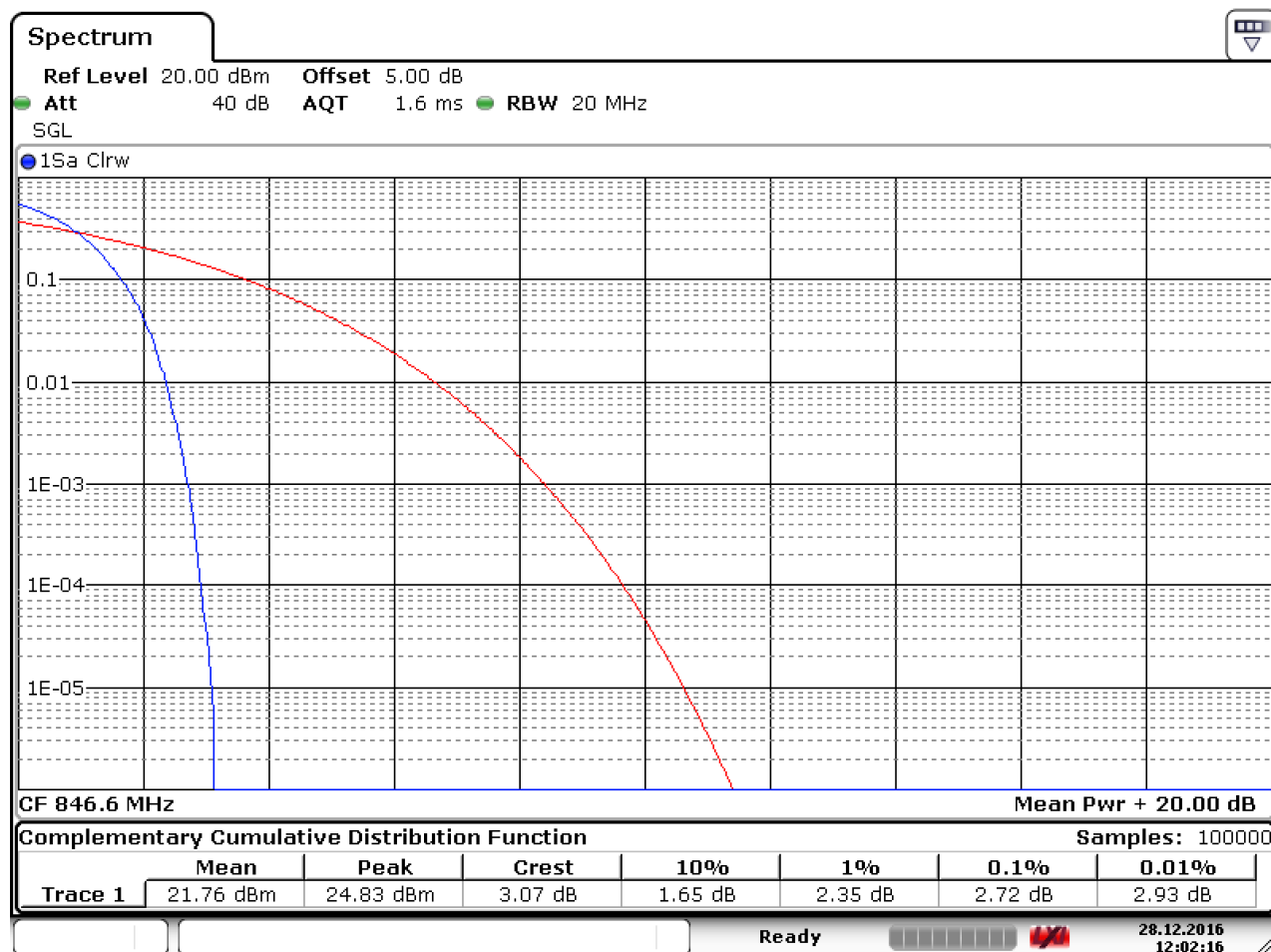
2.1.1.1.2 Test Channel = MCH



Date: 28.DEC.2016 12:02:44



2.1.1.1.3 Test Channel = HCH

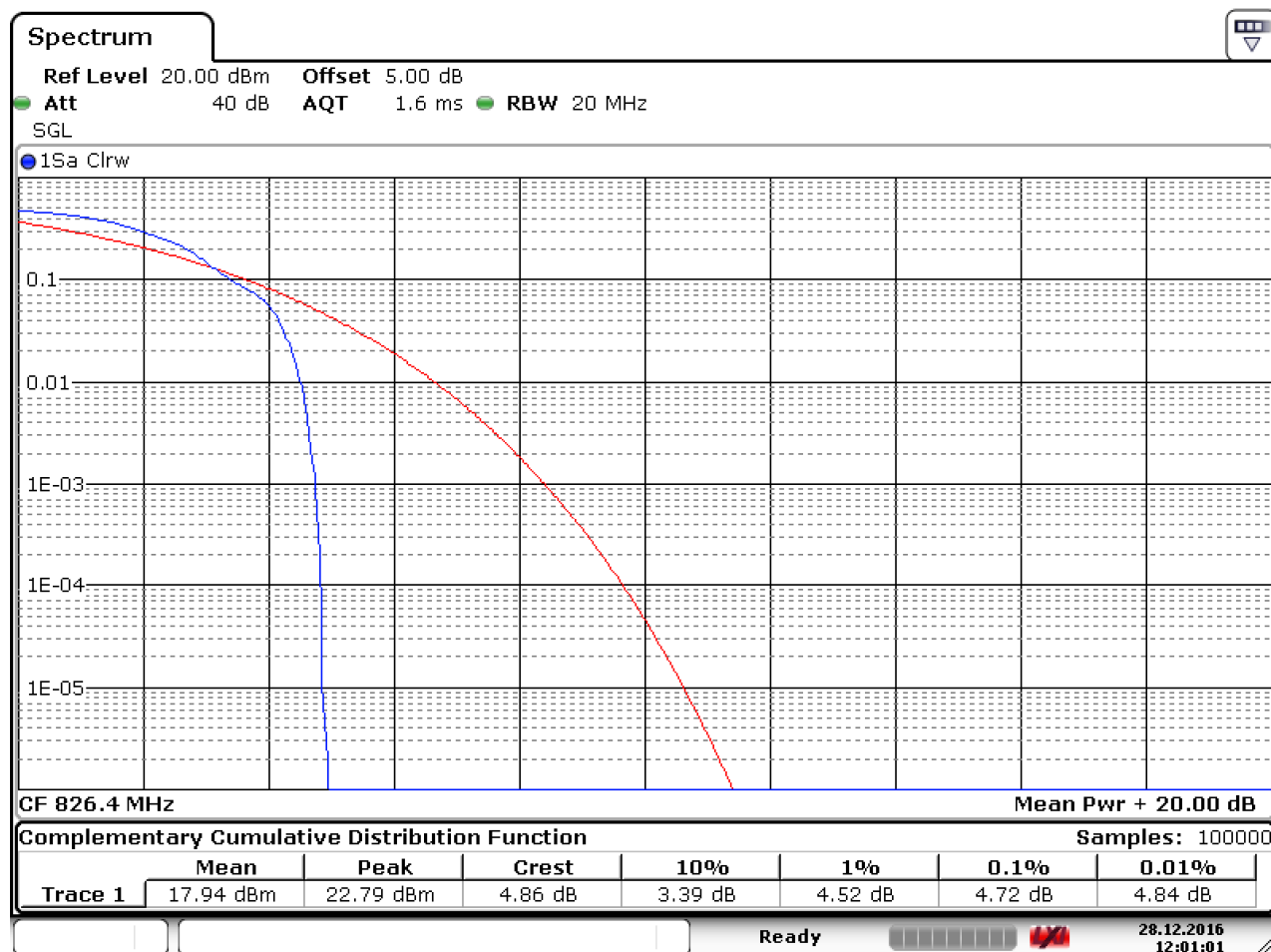


Date: 28.DEC.2016 12:02:16



2.1.1.2 Test Mode = UMTS/TM2

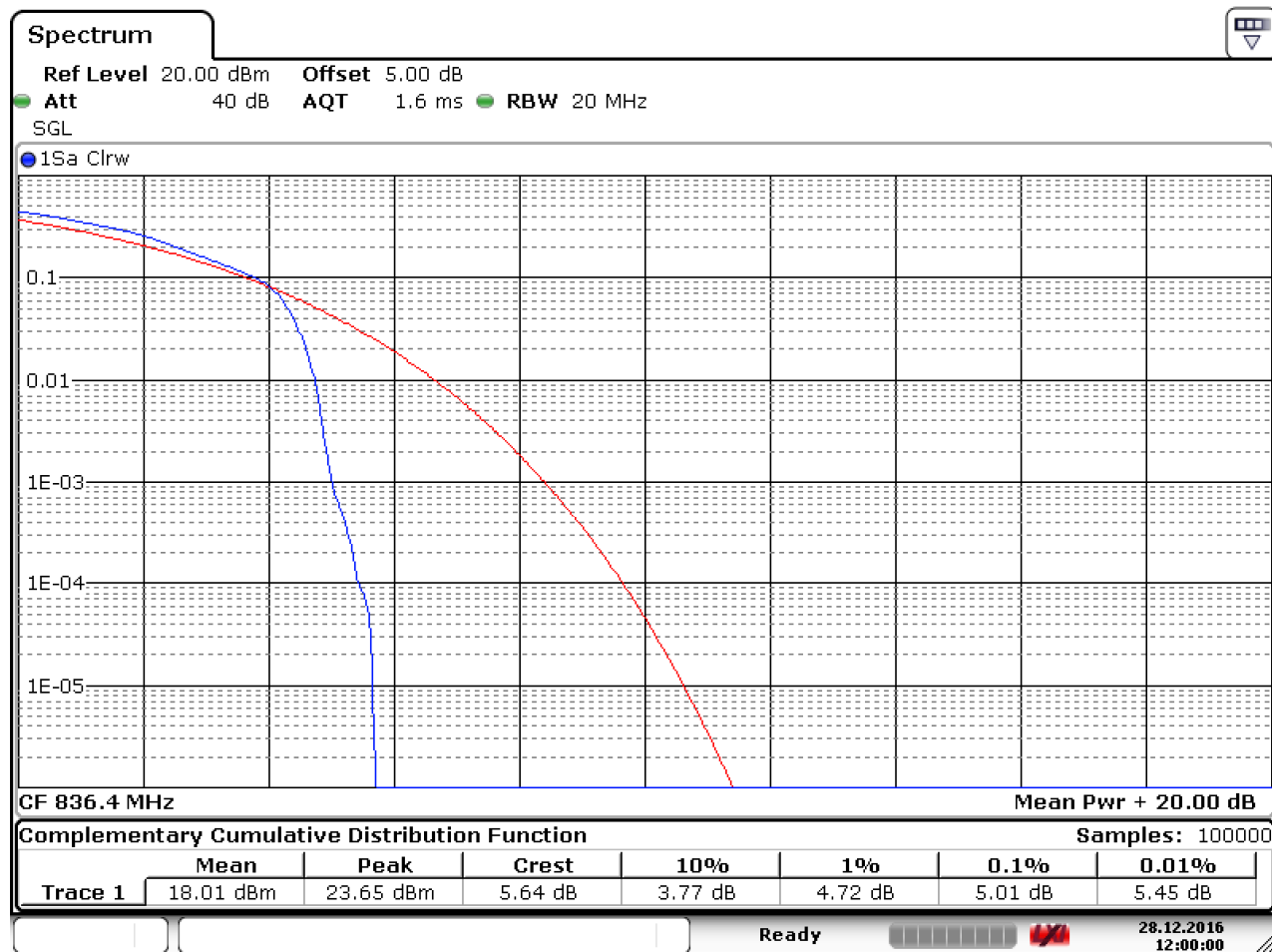
2.1.1.2.1 Test Channel = LCH



Date: 28.DEC.2016 12:01:01



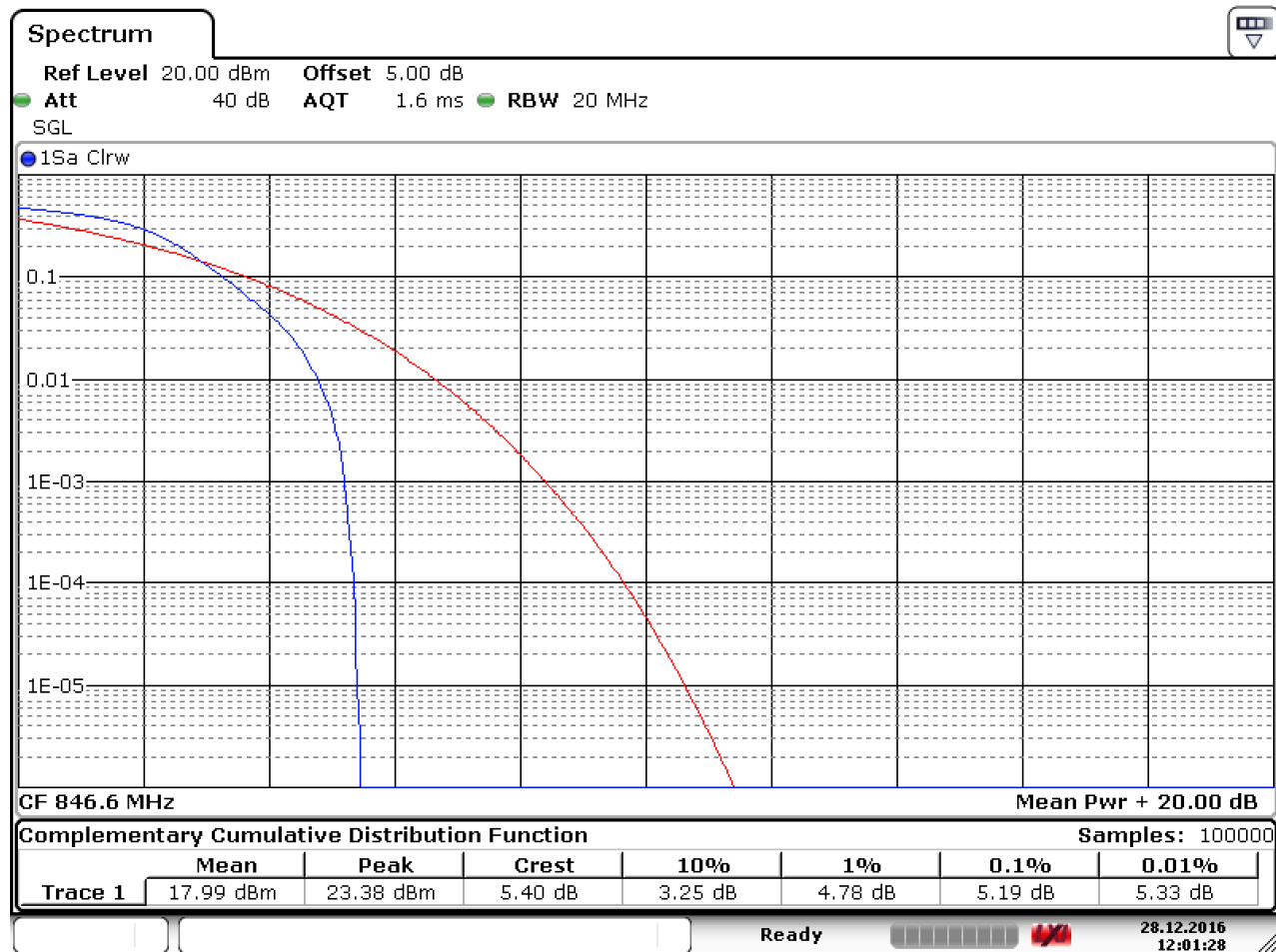
2.1.1.2.2 Test Channel = MCH



Date: 28.DEC.2016 12:00:00



2.1.1.2.3 Test Channel = HCH



Date: 28.DEC.2016 12:01:28

3 Modulation Characteristics

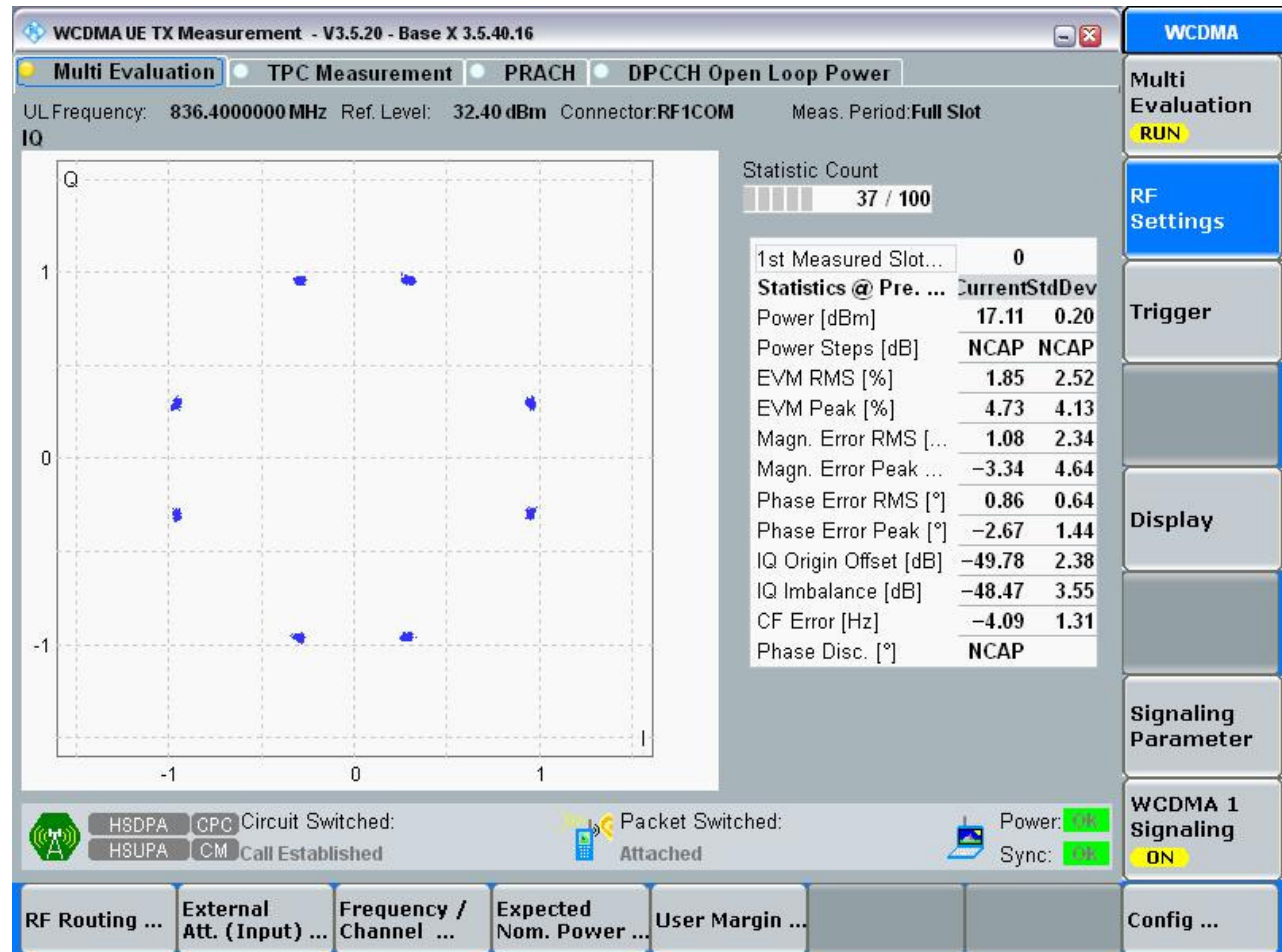
Part I - Test Plots

3.1 For WCDMA

3.1.1 Test Band = WCDMA 850

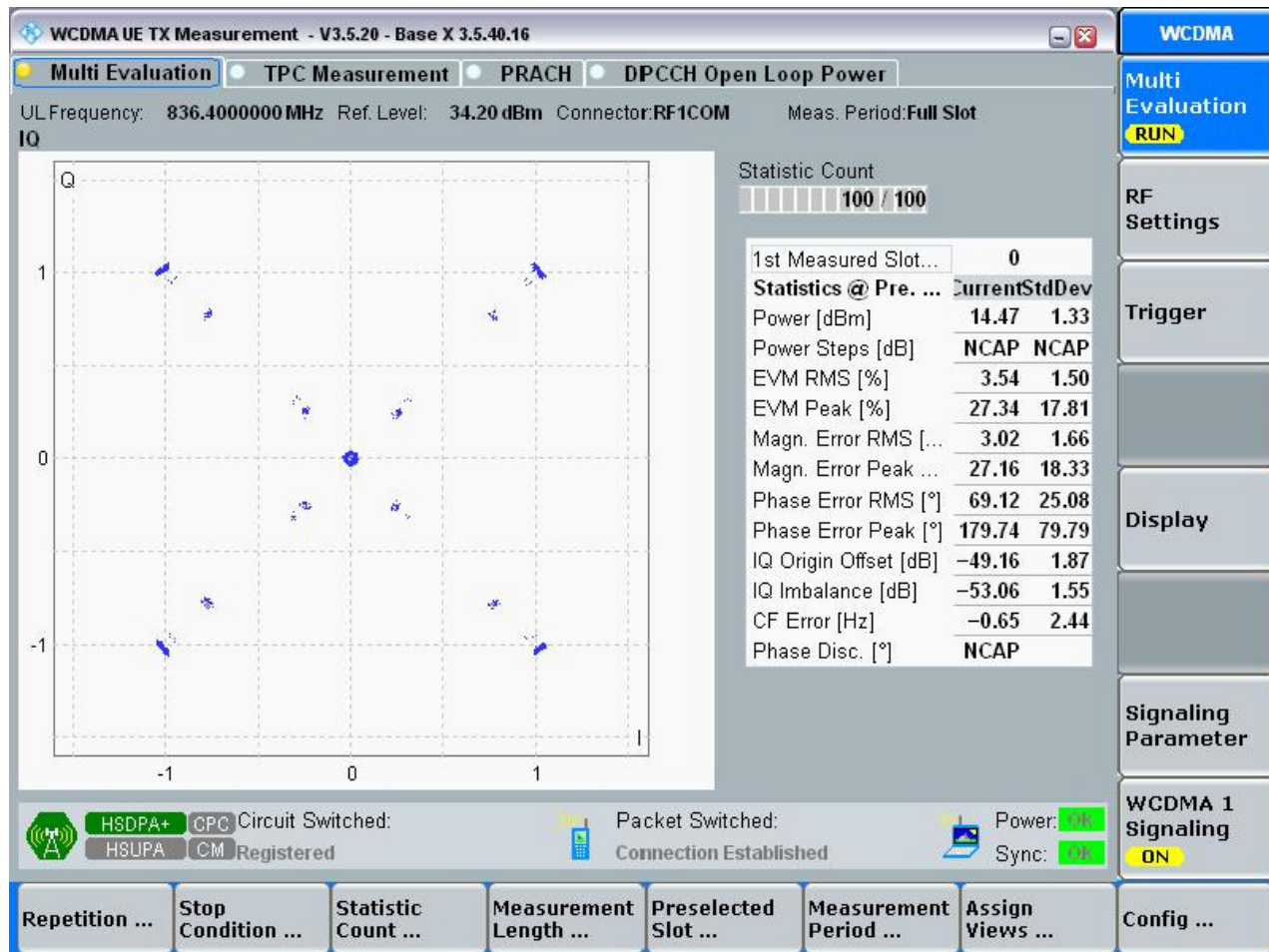
3.1.1.1 Test Mode = UMTS /TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = UMTS /TM2

3.1.1.2.1 Test Channel = MCH





4 Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.19	4.86	PASS
		MCH	4.23	4.91	PASS
		HCH	4.20	4.87	PASS
	UMTS/TM2	LCH	4.21	4.85	PASS
		MCH	4.25	4.88	PASS
		HCH	4.22	4.86	PASS

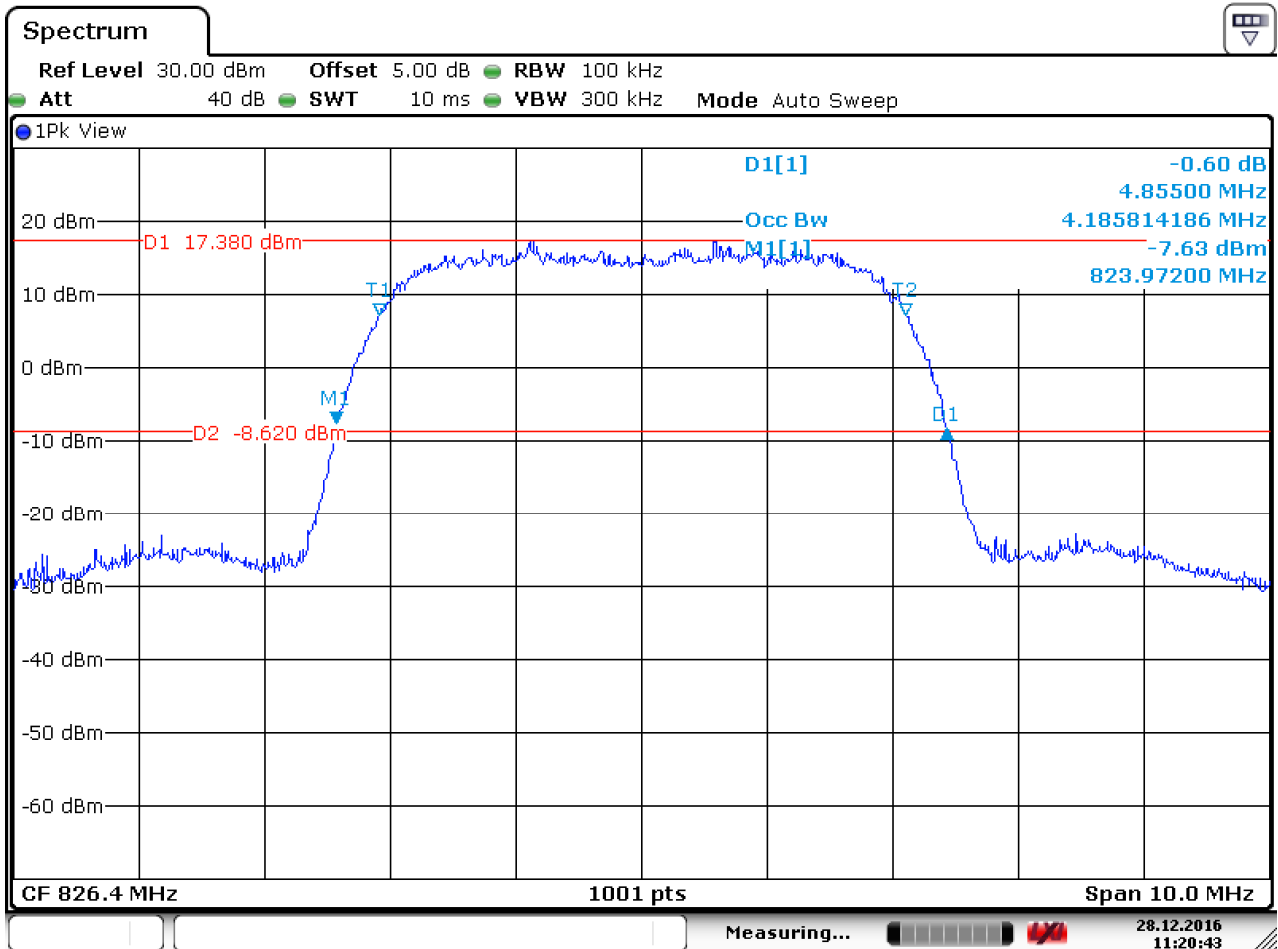


4.1 For WCDMA

4.1.1 Test Band = WCDMA 850

4.1.1.1 Test Mode = UMTS/TM1

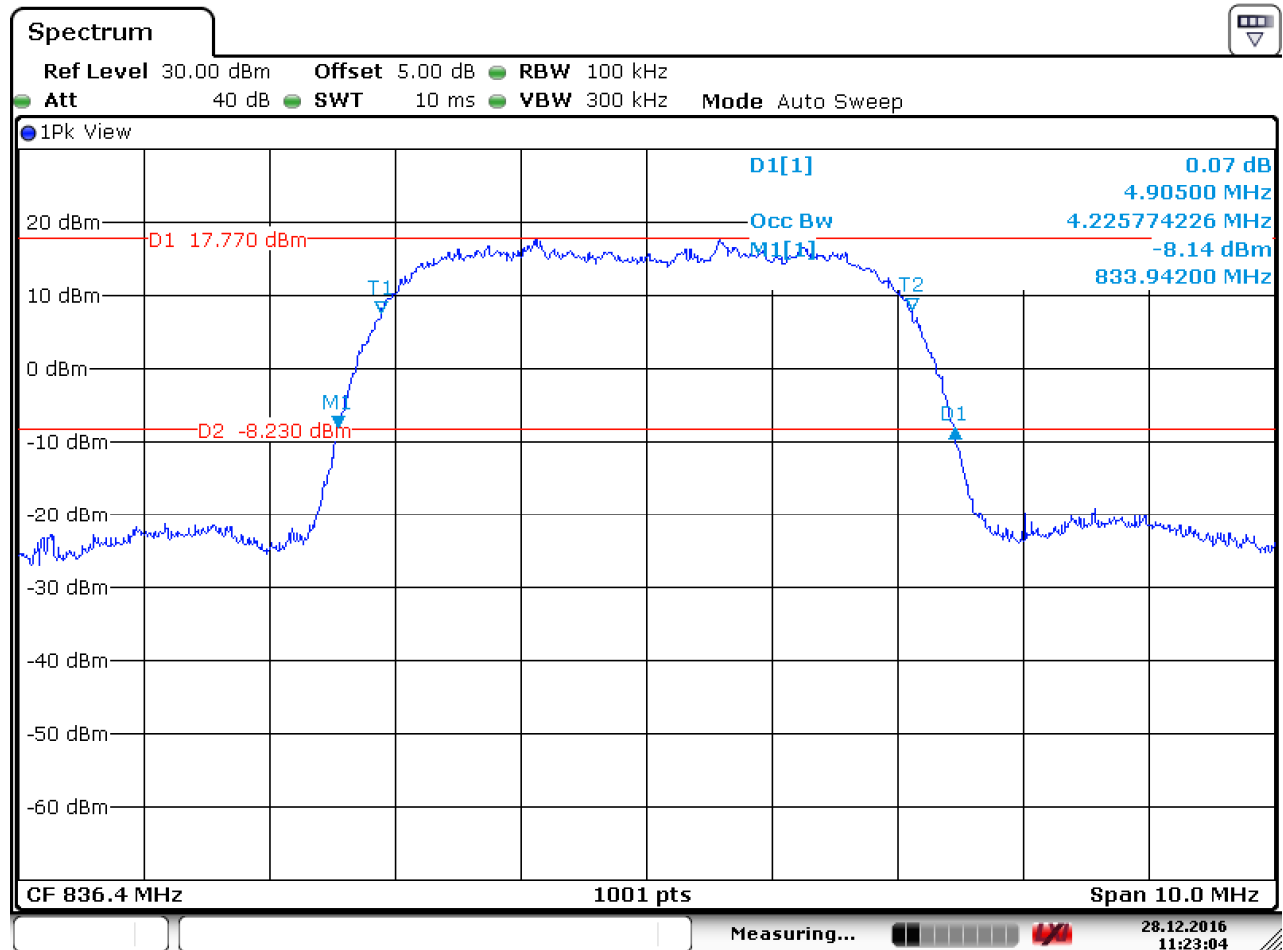
4.1.1.1.1 Test Channel = LCH



Date: 28.DEC.2016 11:20:43



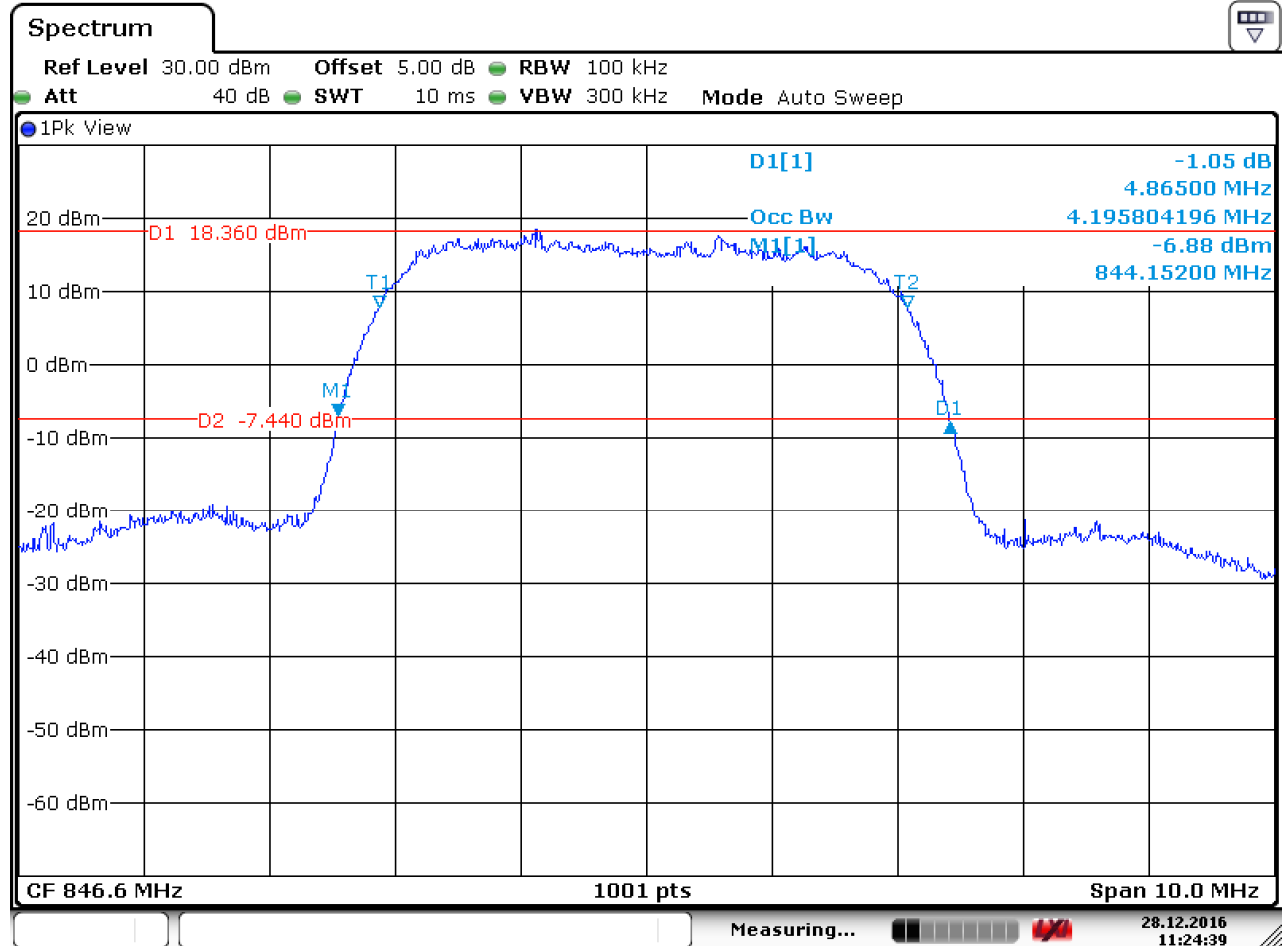
4.1.1.1.2 Test Channel = MCH



Date: 28.DEC.2016 11:23:04



4.1.1.1.3 Test Channel = HCH

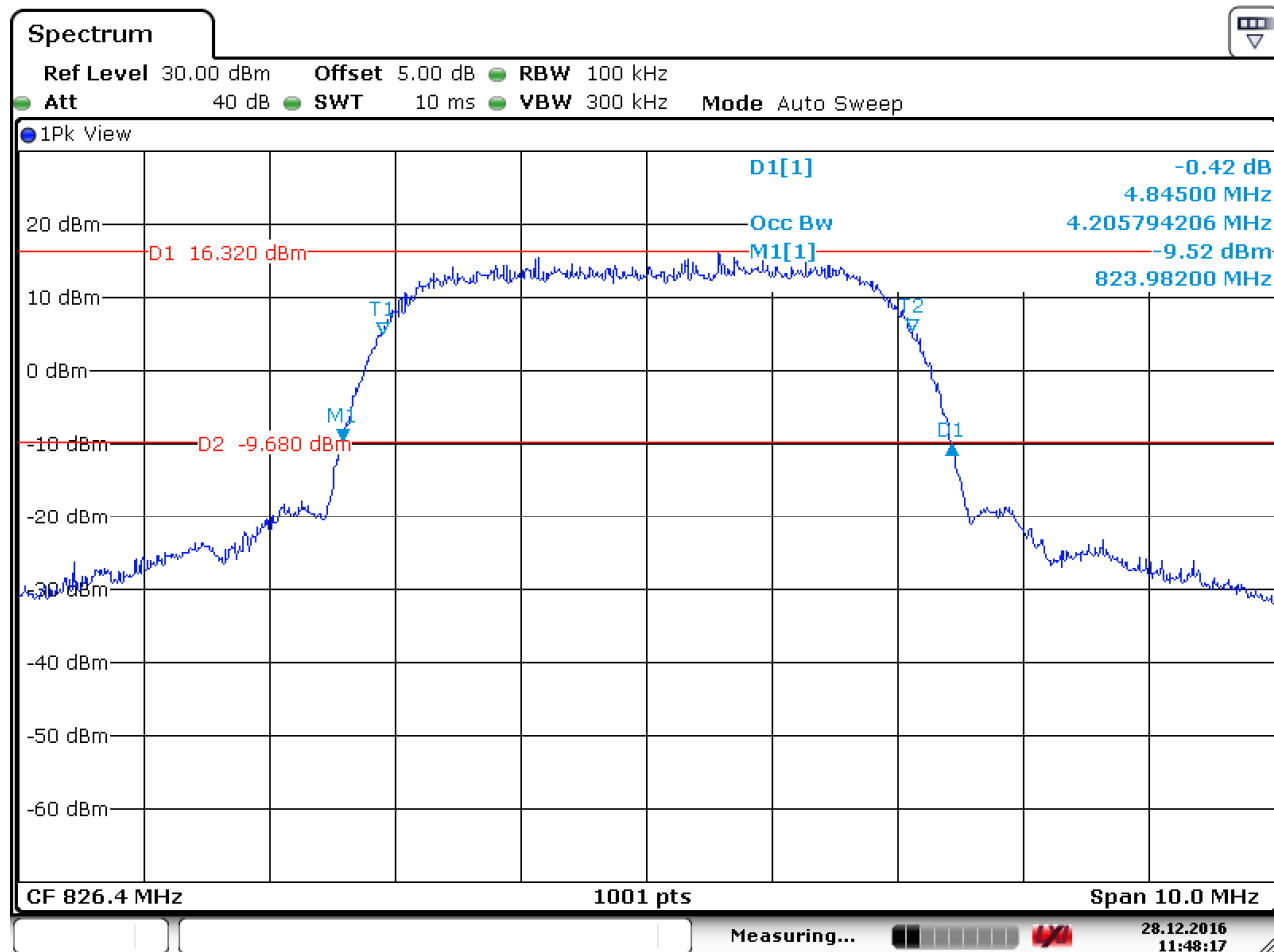


Date: 28.DEC.2016 11:24:39



4.1.1.2 Test Mode = UMTS/TM2

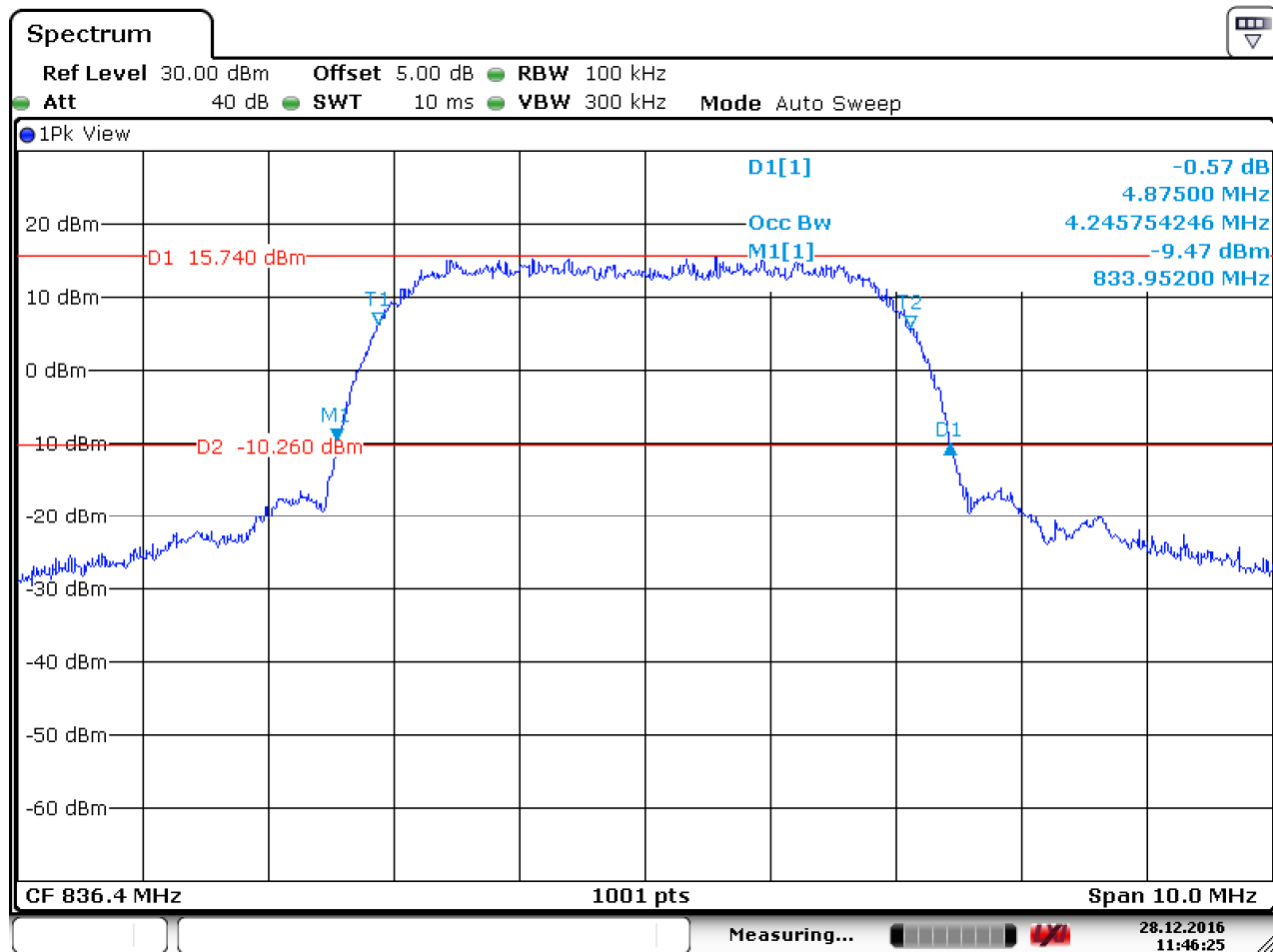
4.1.1.2.1 Test Channel = LCH



Date: 28.DEC.2016 11:48:17



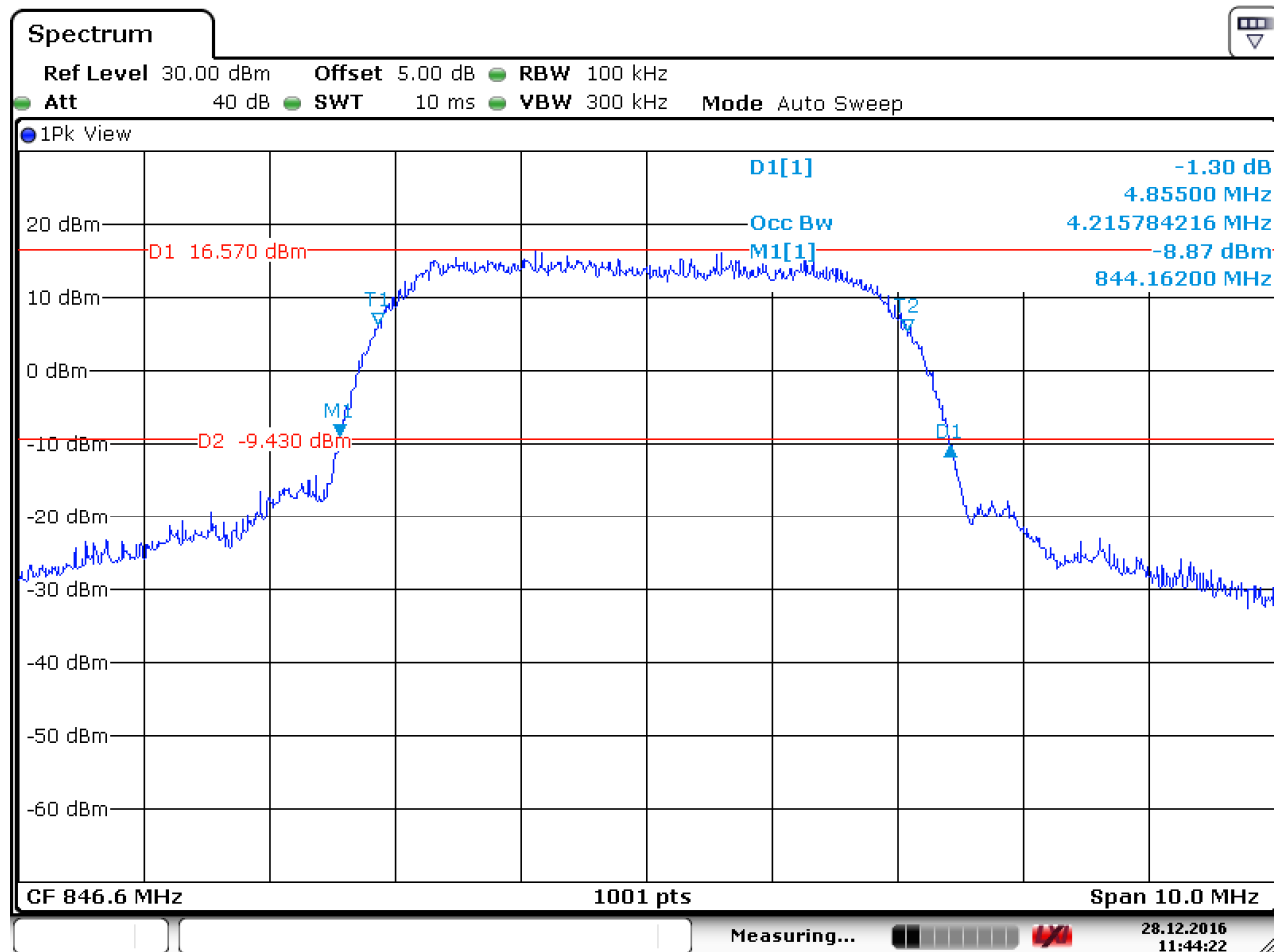
4.1.1.2.2 Test Channel = MCH



Date: 28.DEC.2016 11:46:26



4.1.1.2.3 Test Channel = HCH



Date: 28.DEC.2016 11:44:23



5 Band Edges Compliance

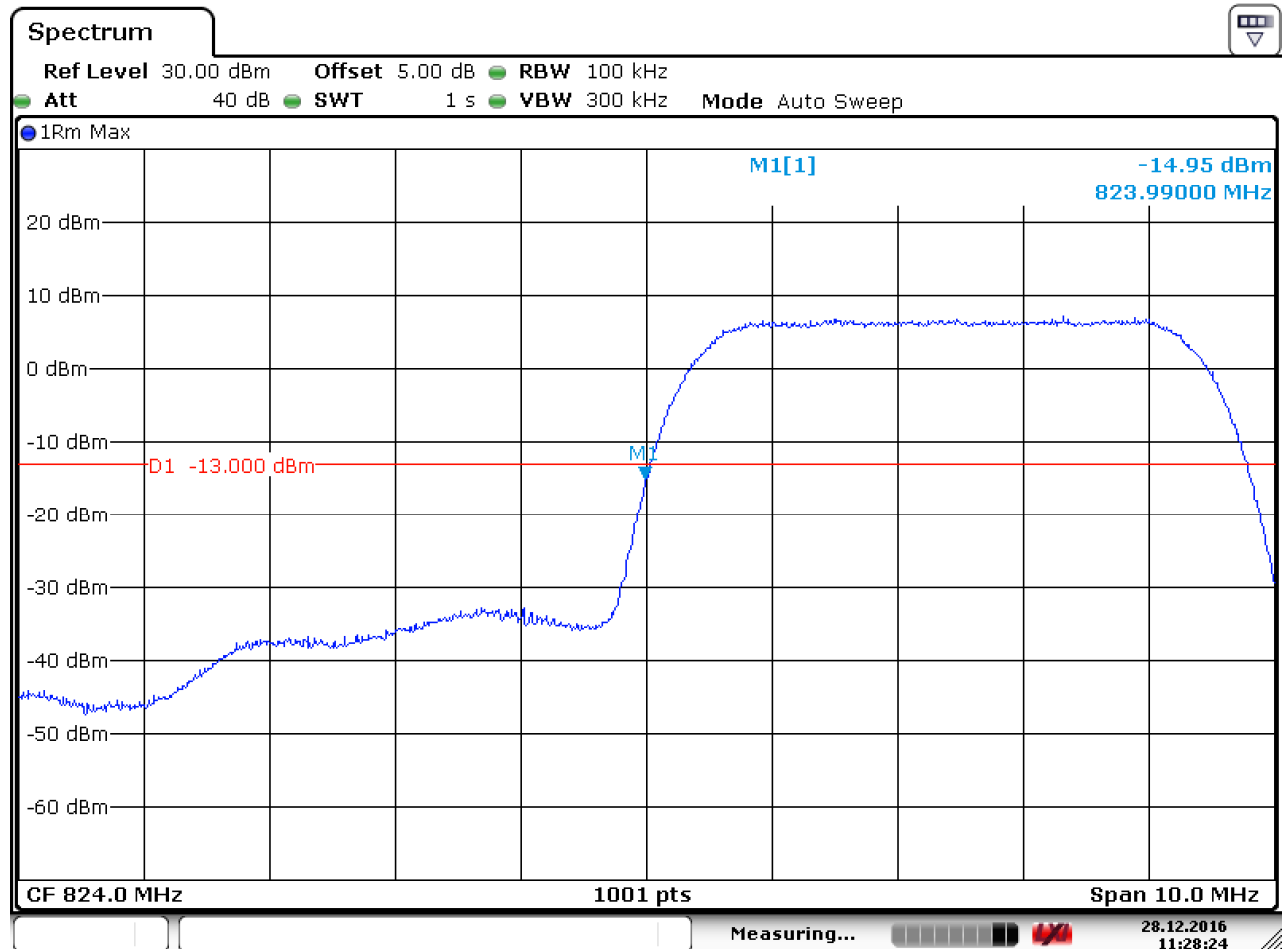
Part I - Test Plots

5.1 For WCDMA

5.1.1 Test Band = WCDMA 850

5.1.1.1 Test Mode = UMTS/TM1

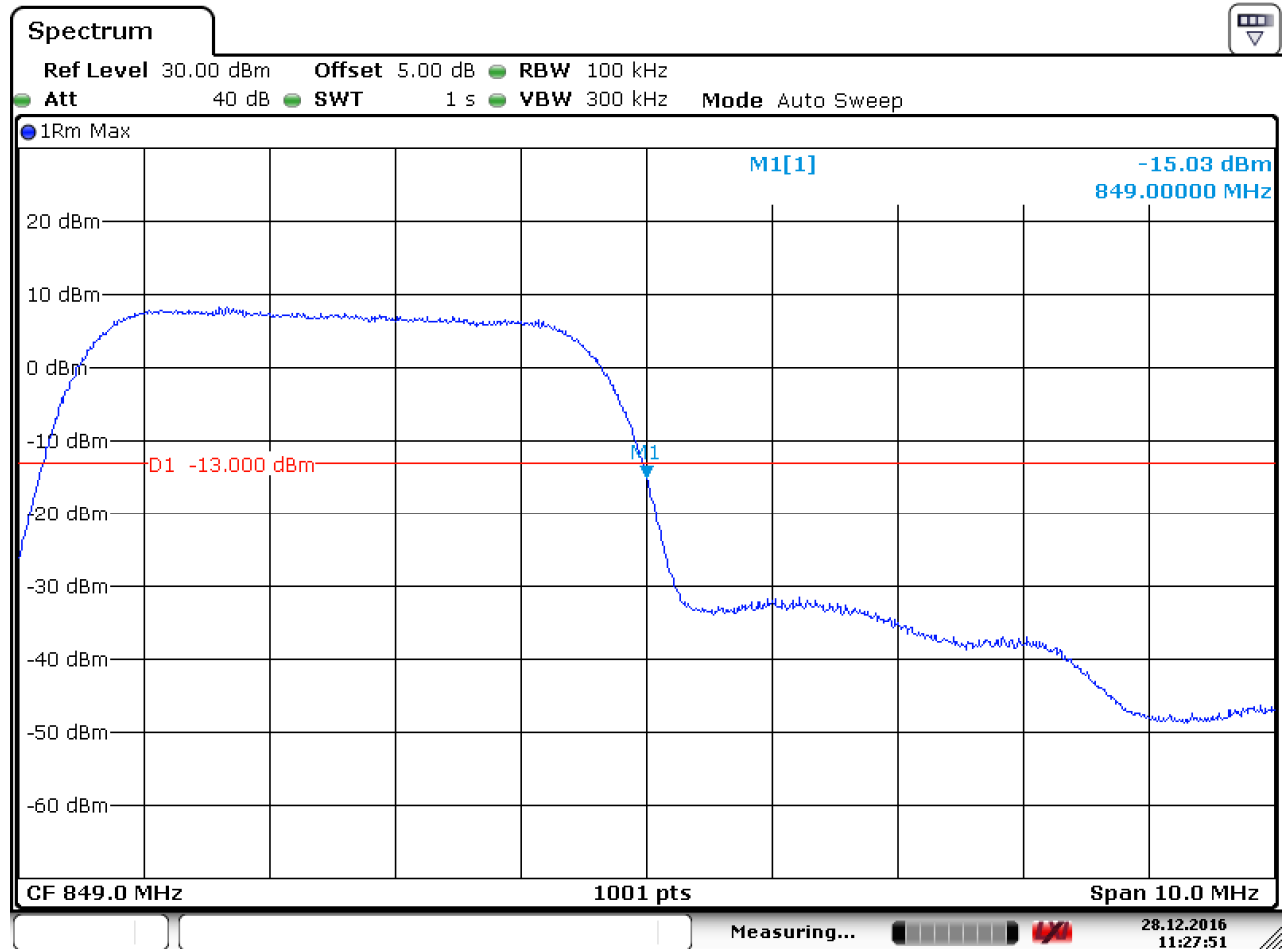
5.1.1.1.1 Test Channel = LCH



Date: 28.DEC.2016 11:28:24



5.1.1.1.2 Test Channel = HCH

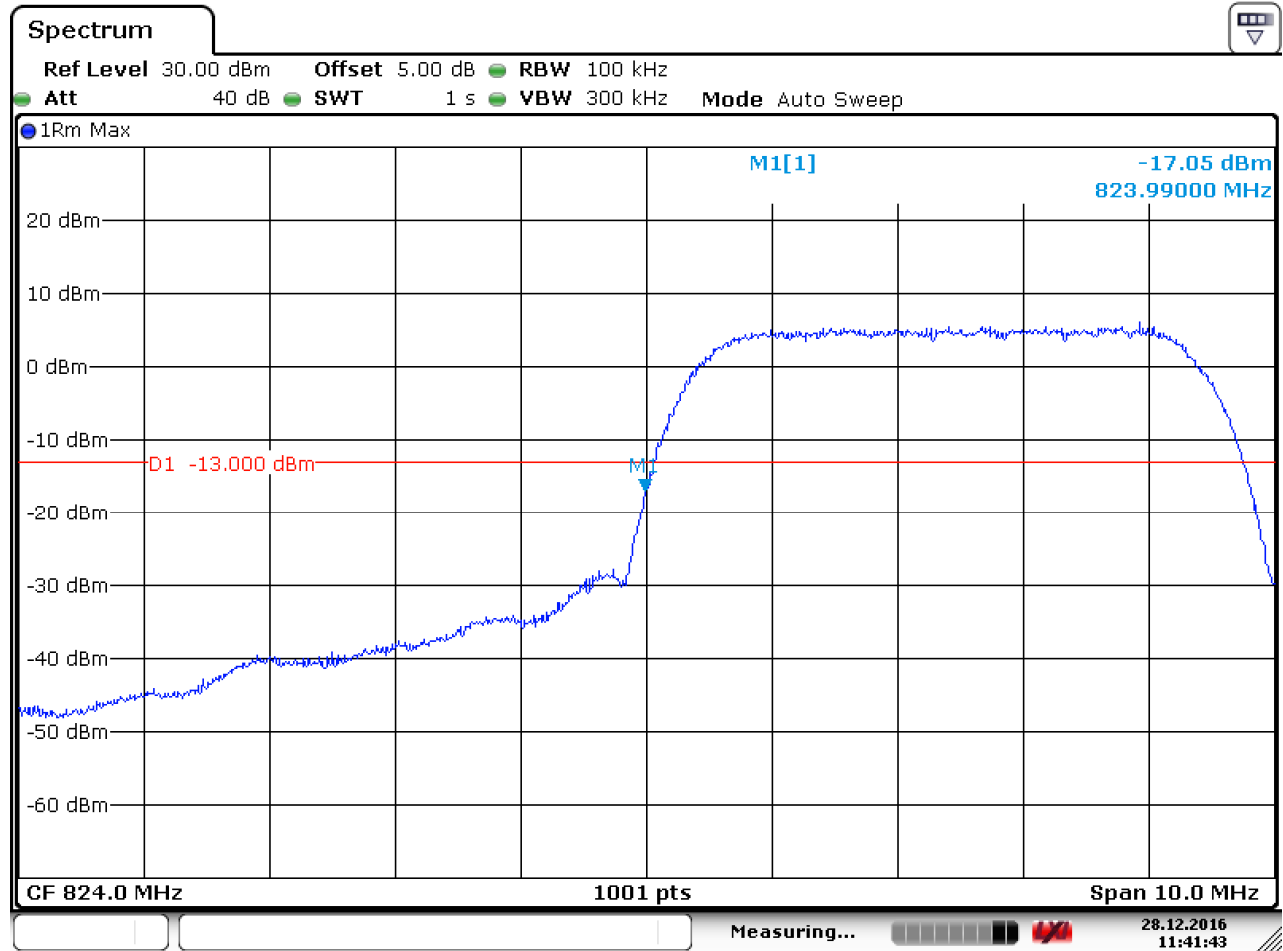


Date: 28.DEC.2016 11:27:52



5.1.1.2 Test Mode = UMTS/TM2

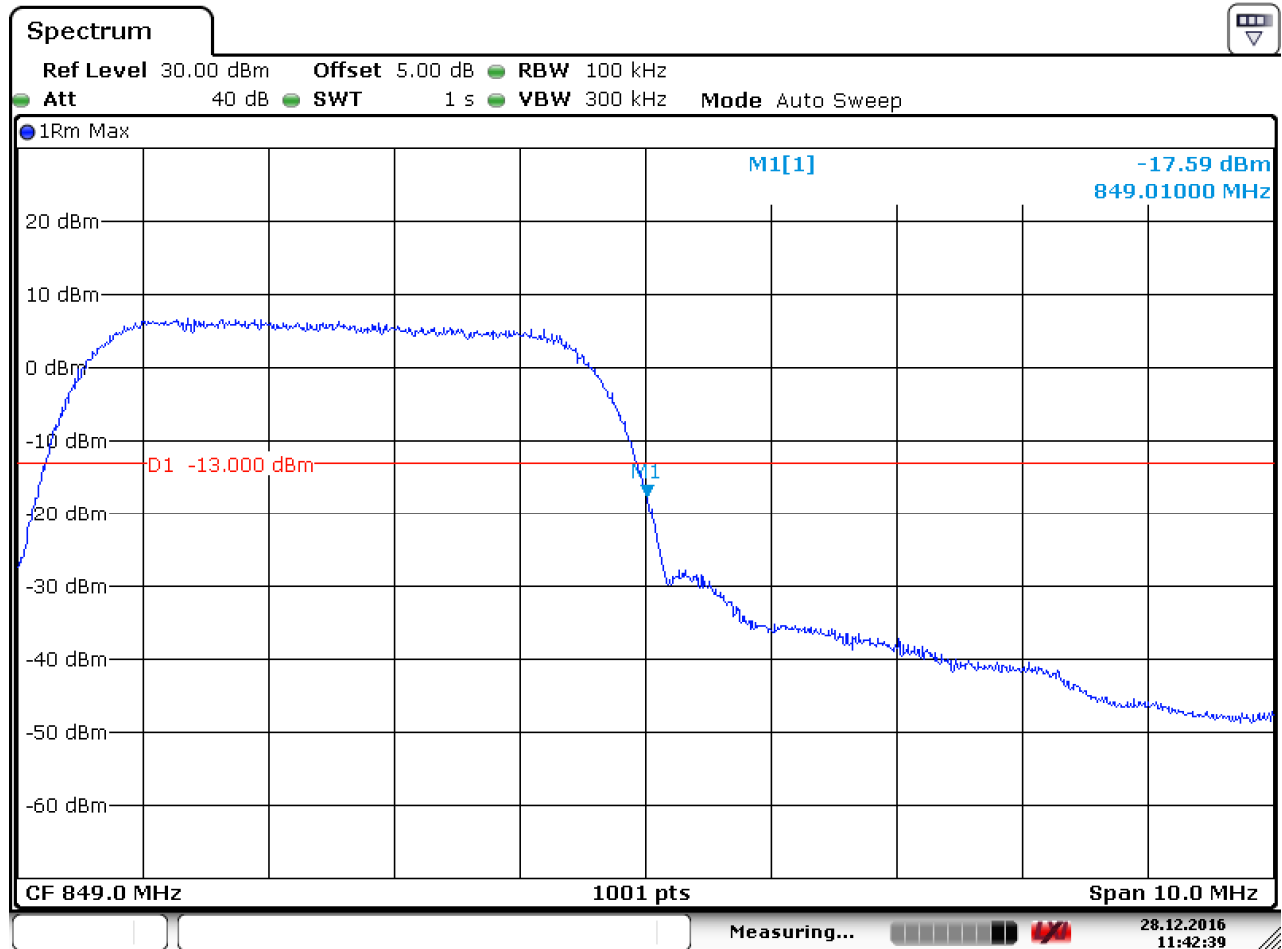
5.1.1.2.1 Test Channel = LCH



Date: 28.DEC.2016 11:41:43



5.1.1.2.2 Test Channel = HCH



Date: 28.DEC.2016 11:42:39

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.

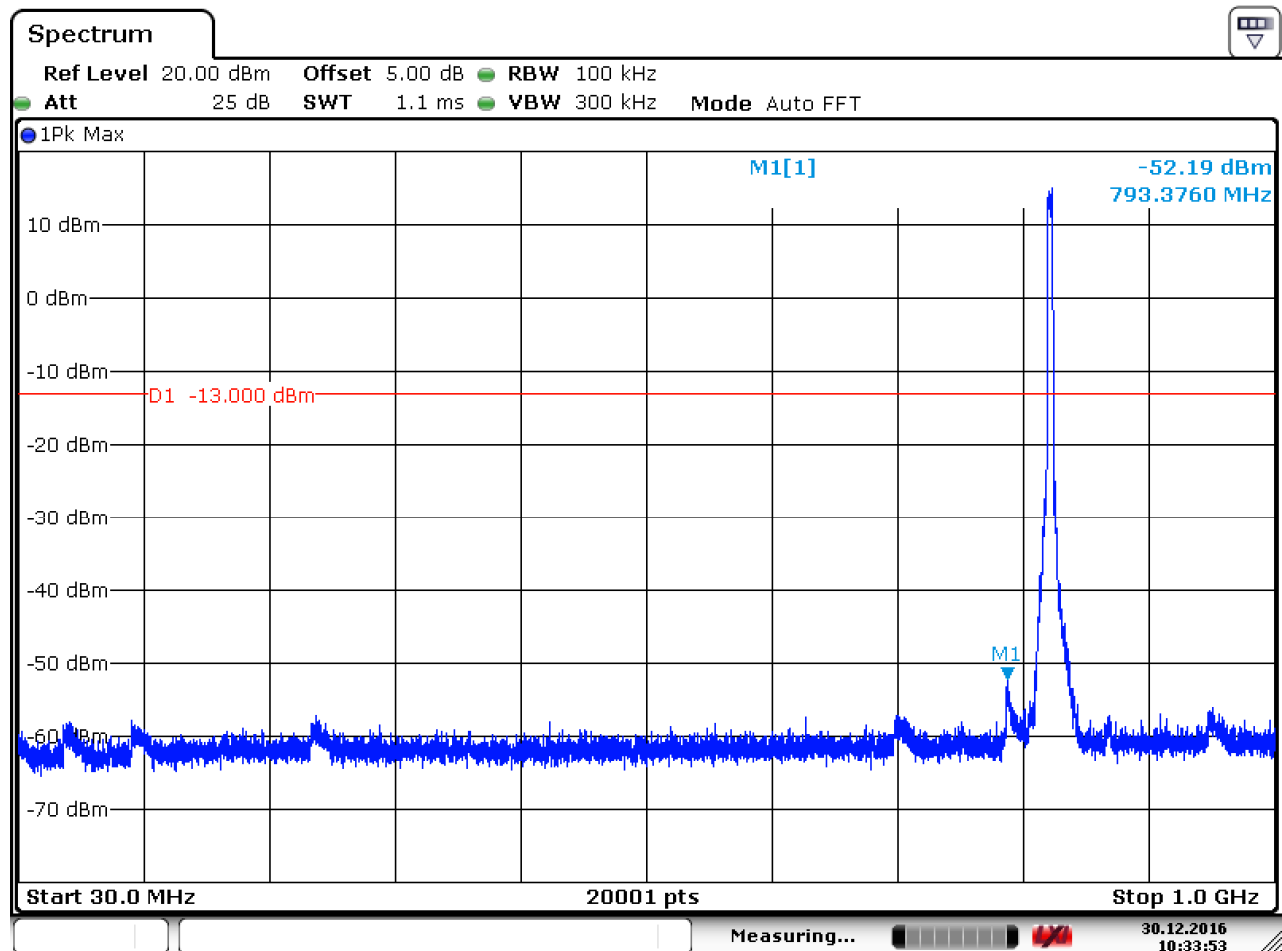
Part I - Test Plots

6.1 For WCDMA

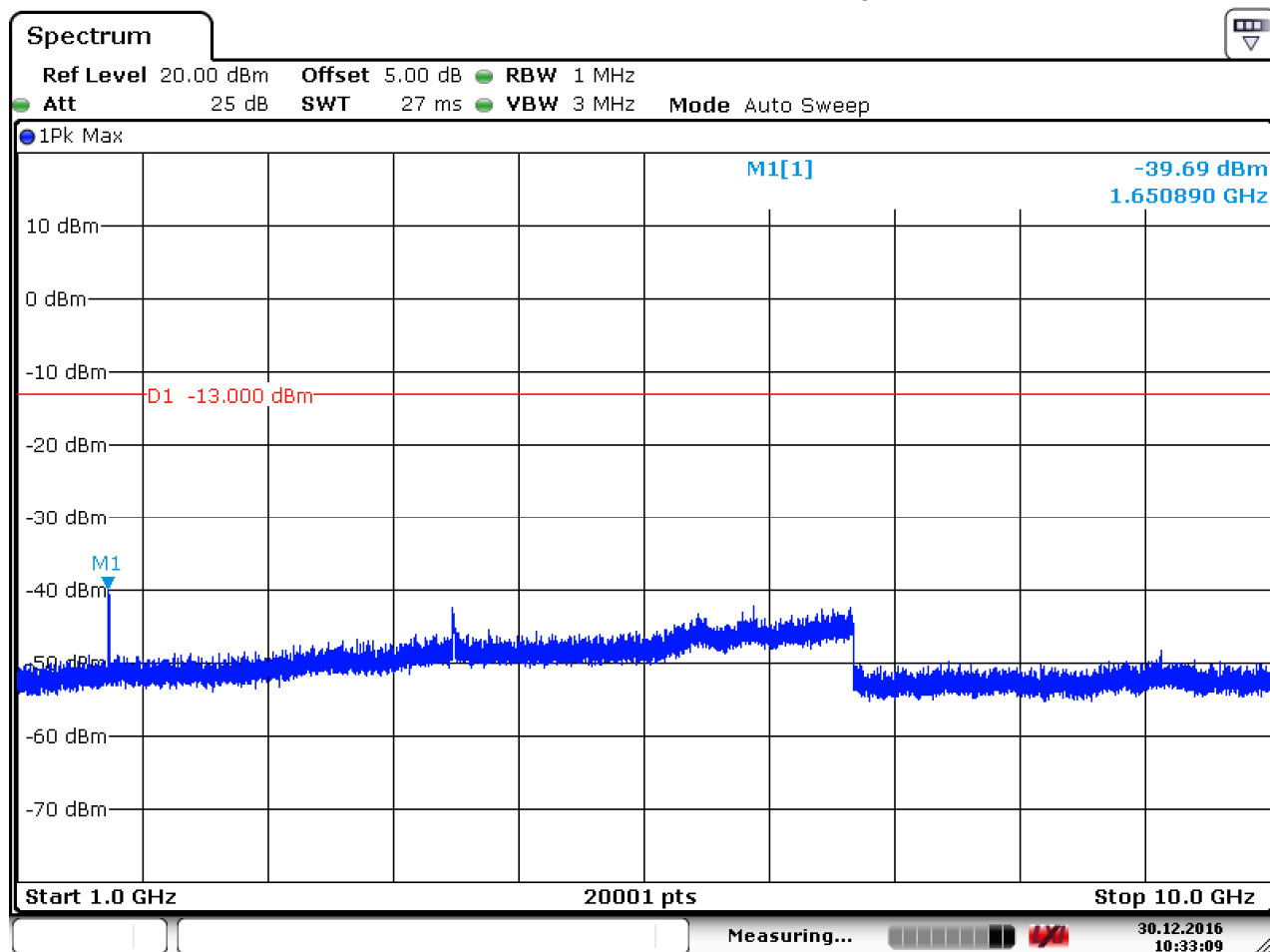
6.1.1 Test Band = WCDMA 850

6.1.1.1 Test Mode = UMTS/TM1

6.1.1.1.1 Test Channel = LCH



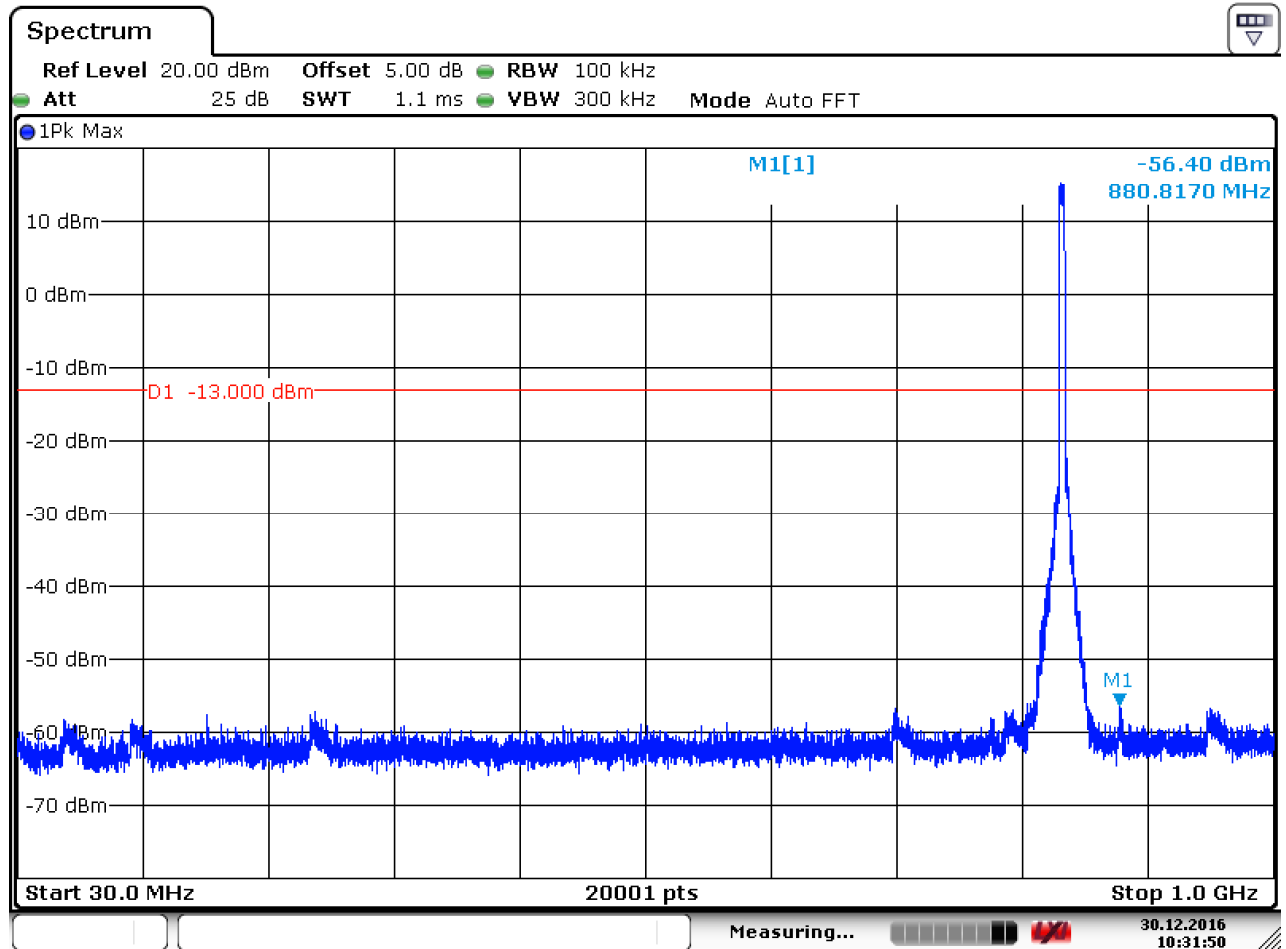
Date: 30.DEC.2016 10:33:53



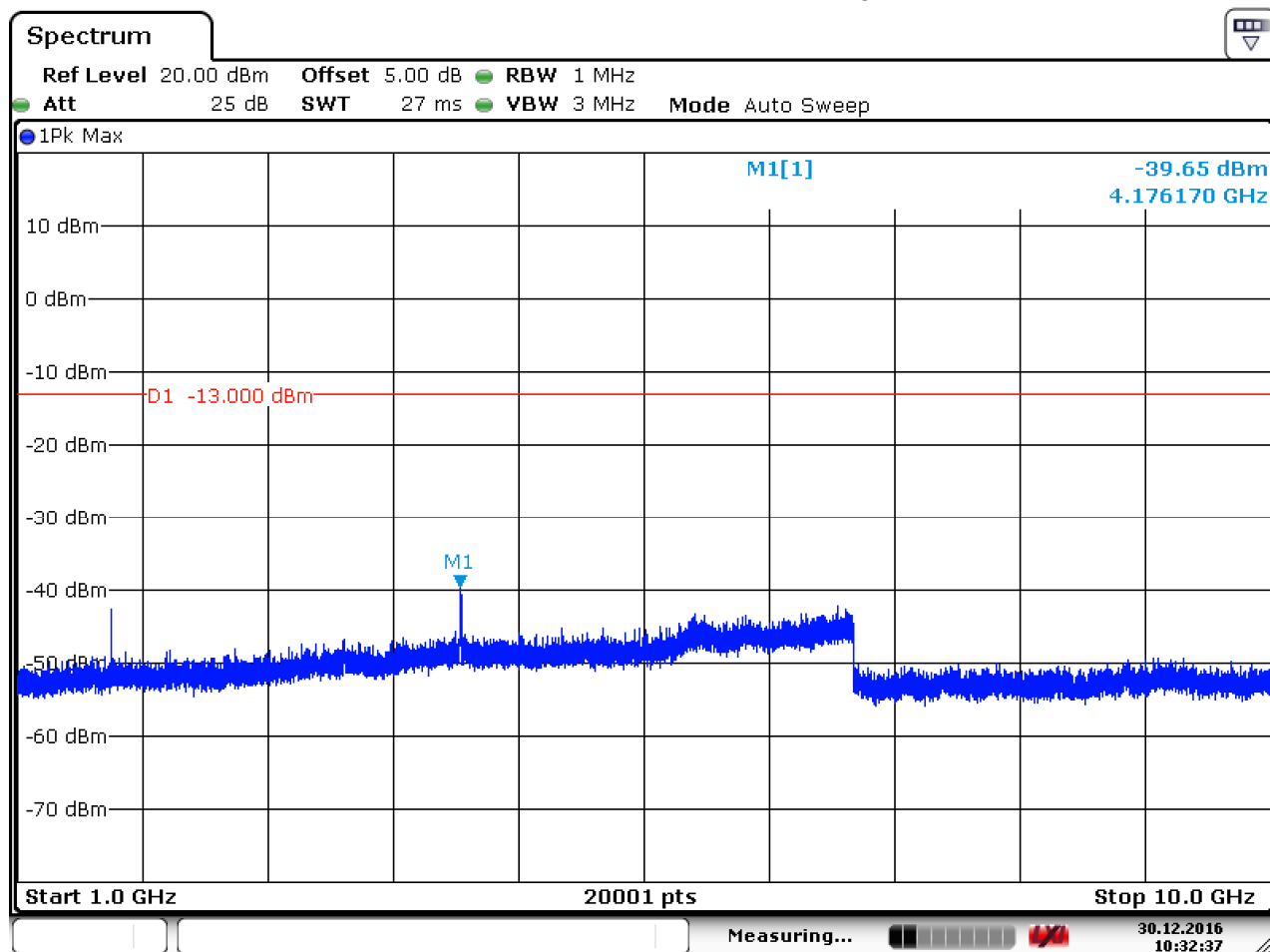
Date: 30.DEC.2016 10:33:09



6.1.1.1.2 Test Channel = MCH



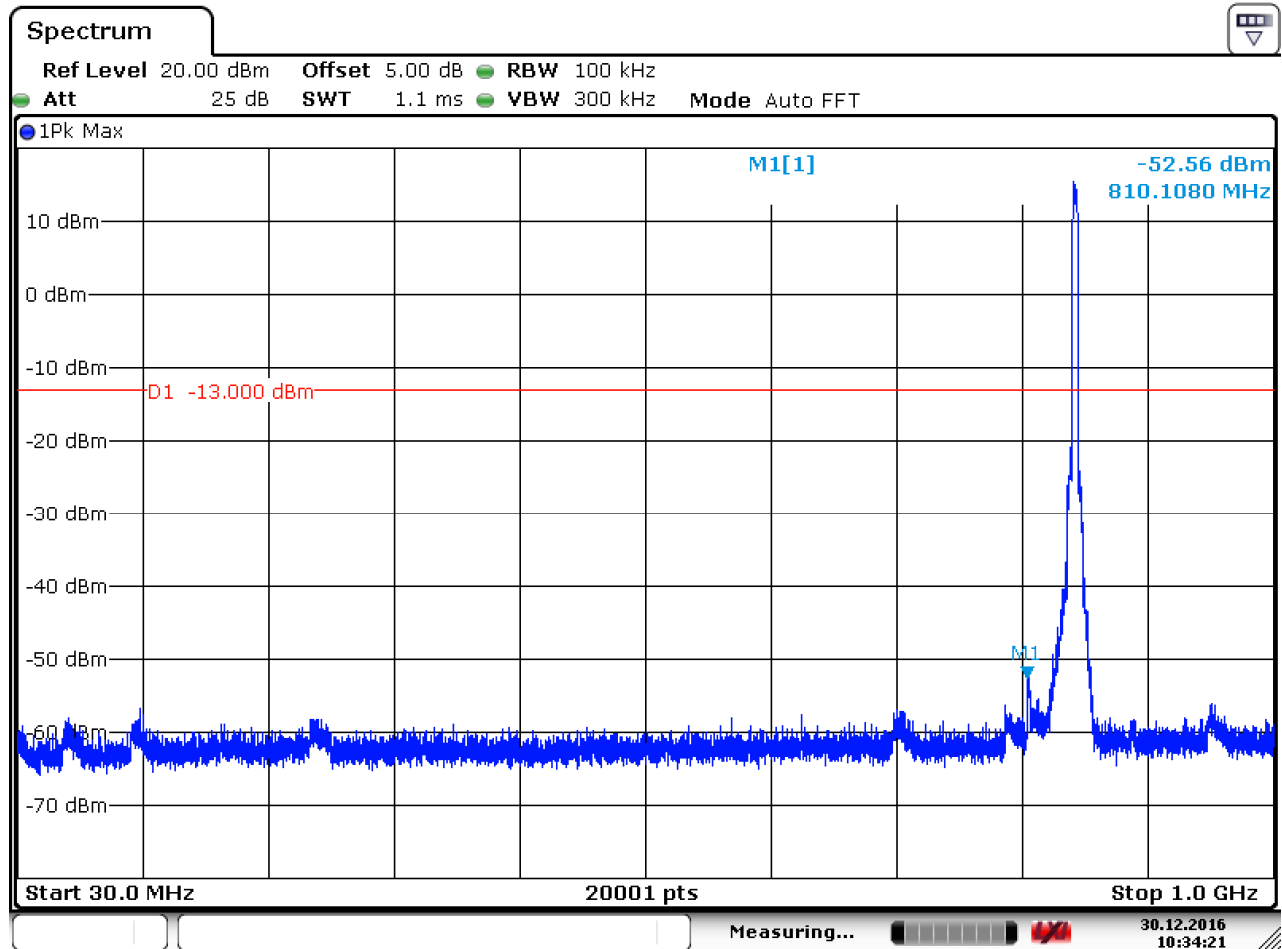
Date: 30.DEC.2016 10:31:50



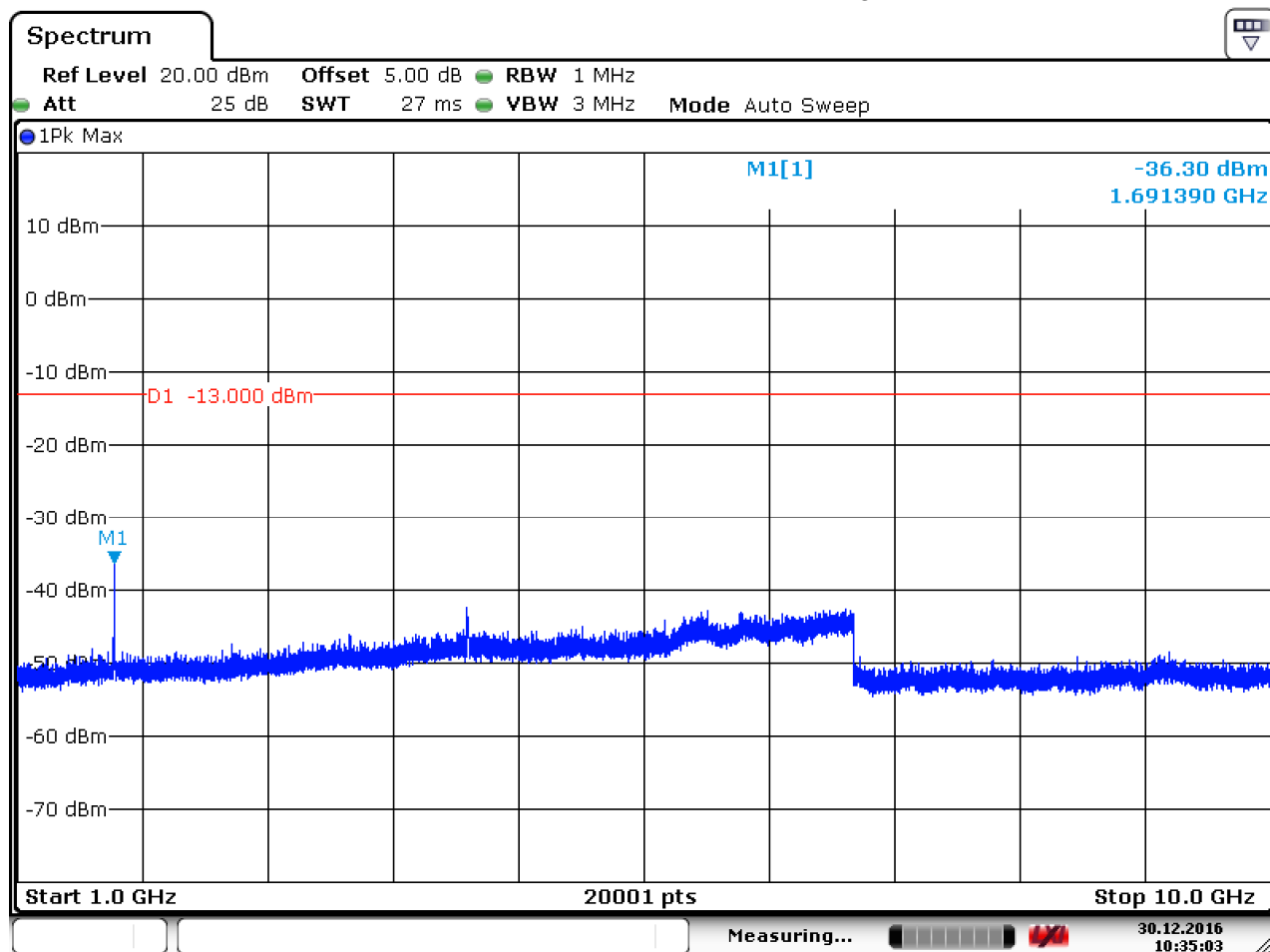
Date: 30.DEC.2016 10:32:38



6.1.1.1.3 Test Channel = HCH



Date: 30.DEC.2016 10:34:22



Date: 30.DEC.2016 10:35:03



7 Field Strength of Spurious Radiation

Part I - Test Plots

7.1 For WCDMA

7.1.1 Test Band = WCDMAband 850

7.1.1.1 Test Mode = UMTS/TM1

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1892.000	-57.35	-13.00	44.35	Vertical
3308.588	-65.50	-13.00	52.50	Vertical
4136.363	-61.48	-13.00	48.48	Vertical
1656.000	-64.02	-13.00	51.02	Horizontal
2312.500	-59.01	-13.00	46.01	Horizontal
4136.363	-56.75	-13.00	43.75	Horizontal

7.1.1.1.1 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1886.500	-60.96	-13.00	47.96	Vertical
3302.250	-66.13	-13.00	53.13	Vertical
4136.363	-61.09	-13.00	48.09	Vertical
1890.500	-46.70	-13.00	33.70	Horizontal
3308.588	-65.13	-13.00	52.13	Horizontal
4136.363	-57.02	-13.00	44.02	Horizontal

7.1.1.1.2 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1654.000	-62.14	-13.00	49.14	Vertical
1893.500	-52.97	-13.00	39.97	Vertical
4136.363	-61.37	-13.00	48.37	Vertical
1901.500	-53.82	-13.00	40.82	Horizontal
3308.588	-65.39	-13.00	52.39	Horizontal
4136.363	-57.06	-13.00	44.06	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
WCDMA 850	UMTS/TM1	LCH	TN	VL	0.99	0.00120	PASS
				VN	-0.14	-0.00017	PASS
				VH	2.29	0.00277	PASS
		MCH	TN	VL	-3.09	-0.00369	PASS
				VN	0.12	0.00014	PASS
				VH	-2.77	-0.00331	PASS
		HCH	TN	VL	1.67	0.00197	PASS
				VN	-4.39	-0.00519	PASS
				VH	2.24	0.00265	PASS
	UMTS/TM2	LCH	TN	VL	-3.98	-0.00482	PASS
				VN	3.38	0.00409	PASS
				VH	1.23	0.00149	PASS
		MCH	TN	VL	-4.29	-0.00513	PASS
				VN	-2.99	-0.00357	PASS
				VH	3.27	0.00391	PASS
		HCH	TN	VL	-0.88	-0.00104	PASS
				VN	-3.05	-0.00360	PASS
				VH	4.26	0.00503	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 850	UMTS/TM1	LCH	VN	-30	-2.30	-0.00278	PASS
				-20	0.19	0.00023	PASS
				-10	4.20	0.00508	PASS
				0	-3.23	-0.00391	PASS
				10	-1.11	-0.00134	PASS
				20	5.50	0.00666	PASS
				30	0.89	0.00108	PASS
				40	-6.00	-0.00726	PASS
				50	-4.89	-0.00592	PASS
		MCH	VN	-30	2.33	0.00279	PASS
				-20	3.40	0.00406	PASS
				-10	-2.89	-0.00345	PASS
				0	-0.77	-0.00092	PASS
				10	1.21	0.00145	PASS
				20	3.00	0.00359	PASS
				30	-3.19	-0.00381	PASS
				40	5.25	0.00628	PASS
				50	-4.48	-0.00536	PASS
		HCH	VN	-30	-5.14	-0.00607	PASS
				-20	-0.19	-0.00022	PASS
				-10	0.43	0.00051	PASS
				0	2.39	0.00282	PASS
				10	-6.01	-0.00710	PASS
				20	3.49	0.00412	PASS
				30	1.19	0.00141	PASS
				40	-3.34	-0.00395	PASS
				50	-5.04	-0.00595	PASS



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

Report No.: SZEM161201075001

Page: 33 of 33

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA 850	UMTS/TM2	LCH	VN	-30	-4.89	-0.00592	PASS
				-20	0.92	0.00111	PASS
				-10	-1.48	-0.00179	PASS
				0	4.46	0.00540	PASS
				10	3.30	0.00399	PASS
				20	-0.78	-0.00094	PASS
				30	1.40	0.00169	PASS
				40	-4.55	-0.00551	PASS
				50	6.24	0.00755	PASS
		MCH	VN	-30	0.99	0.00118	PASS
				-20	5.39	0.00644	PASS
				-10	-5.02	-0.00600	PASS
				0	1.03	0.00123	PASS
				10	5.33	0.00637	PASS
				20	-2.99	-0.00357	PASS
				30	-2.34	-0.00280	PASS
				40	1.10	0.00131	PASS
				50	-0.39	-0.00047	PASS
		HCH	VN	-30	-2.24	-0.00265	PASS
				-20	-6.04	-0.00713	PASS
				-10	3.05	0.00360	PASS
				0	2.66	0.00314	PASS
				10	1.21	0.00143	PASS
				20	-4.99	-0.00589	PASS
				30	5.90	0.00697	PASS
				40	-6.00	-0.00709	PASS
				50	2.59	0.00306	PASS

The End

"This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only."