Appendix B

GSM850&1900

CONTENT

Page

1 Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured [dBm]	ERP[dBm]	Limit[dBm]	Verdict
GSM 850	GSM/TM1	LCH	32.77	27.02	38.45	PASS
		MCH	32.81	27.06	38.45	PASS
		HCH	32.71	26.96	38.45	PASS
	GSM/TM2	LCH	27.51	21.76	38.45	PASS
		MCH	27.6	21.85	38.45	PASS
		HCH	27.69	21.94	38.45	PASS

Test Band	Test Mode	Test Channel	Measured [dBm]	EIRP[dBm]	Limit[dBm]	Verdict
GSM 1900	GSM/TM1	LCH	30.29	27.49	33	PASS
		MCH	30.2	27.4	33	PASS
		HCH	29.93	27.13	33	PASS
	GSM/TM2	LCH	26.69	23.89	33	PASS
		MCH	26.64	23.84	33	PASS
		HCH	26.99	24.19	33	PASS

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

ERP [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBd]

EIRP [dBm] = SGP [dBm] – Cable Loss [dB] + 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	5.43	13	PASS
		MCH	5.46	13	PASS
		HCH	5.46	13	PASS
	GSM/TM2	LCH	8.41	13	PASS
		MCH	8.20	13	PASS
		HCH	8.29	13	PASS
GSM 1900	GSM/TM1	LCH	5.41	13	PASS
		MCH	5.41	13	PASS
		HCH	7.57	13	PASS
	GSM/TM2	LCH	8.41	13	PASS
		MCH	8.52	13	PASS
		HCH	8.41	13	PASS

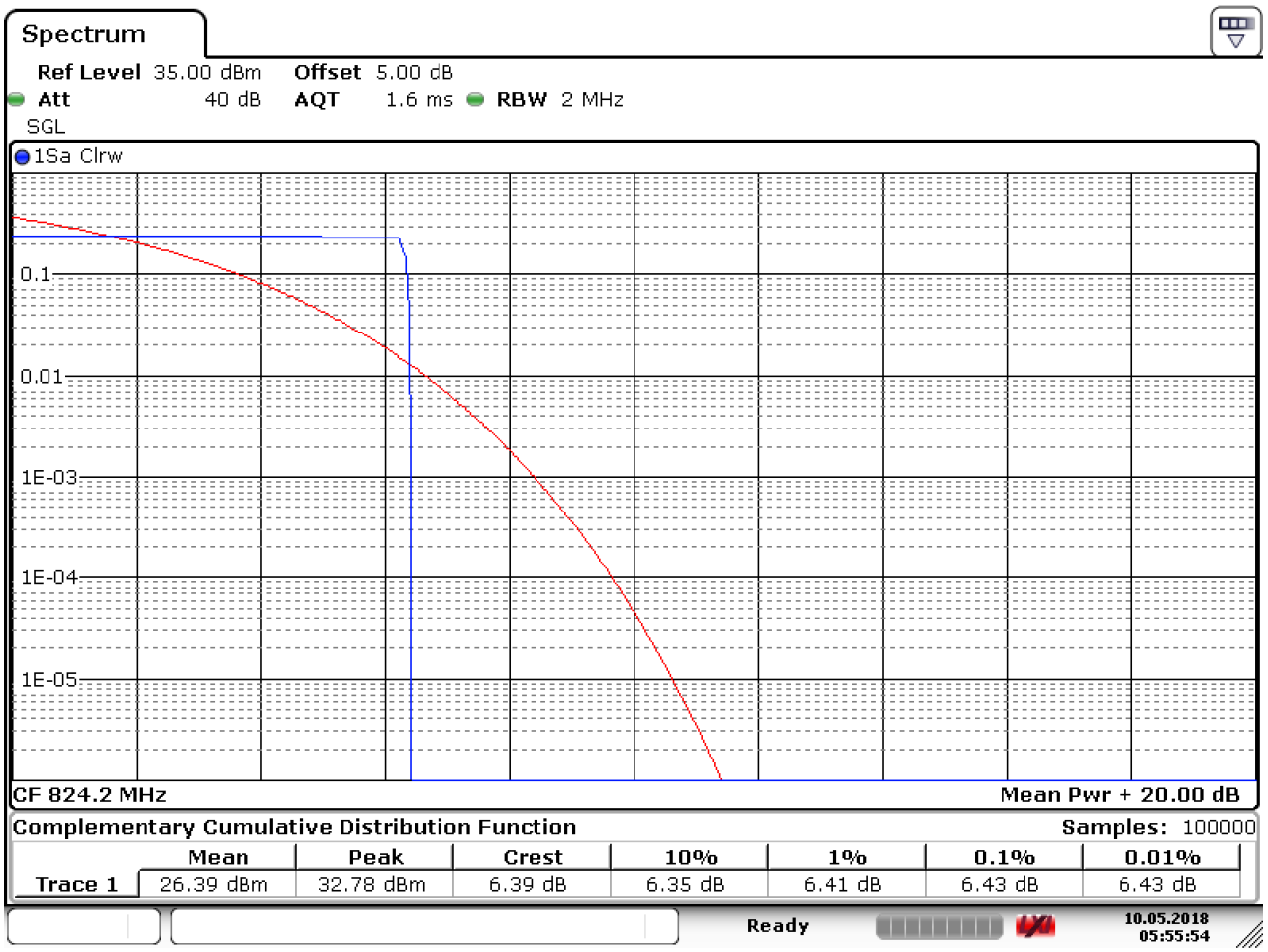
Part II - Test Plots

2.1 For GSM

2.1.1 Test Band = GSM 850

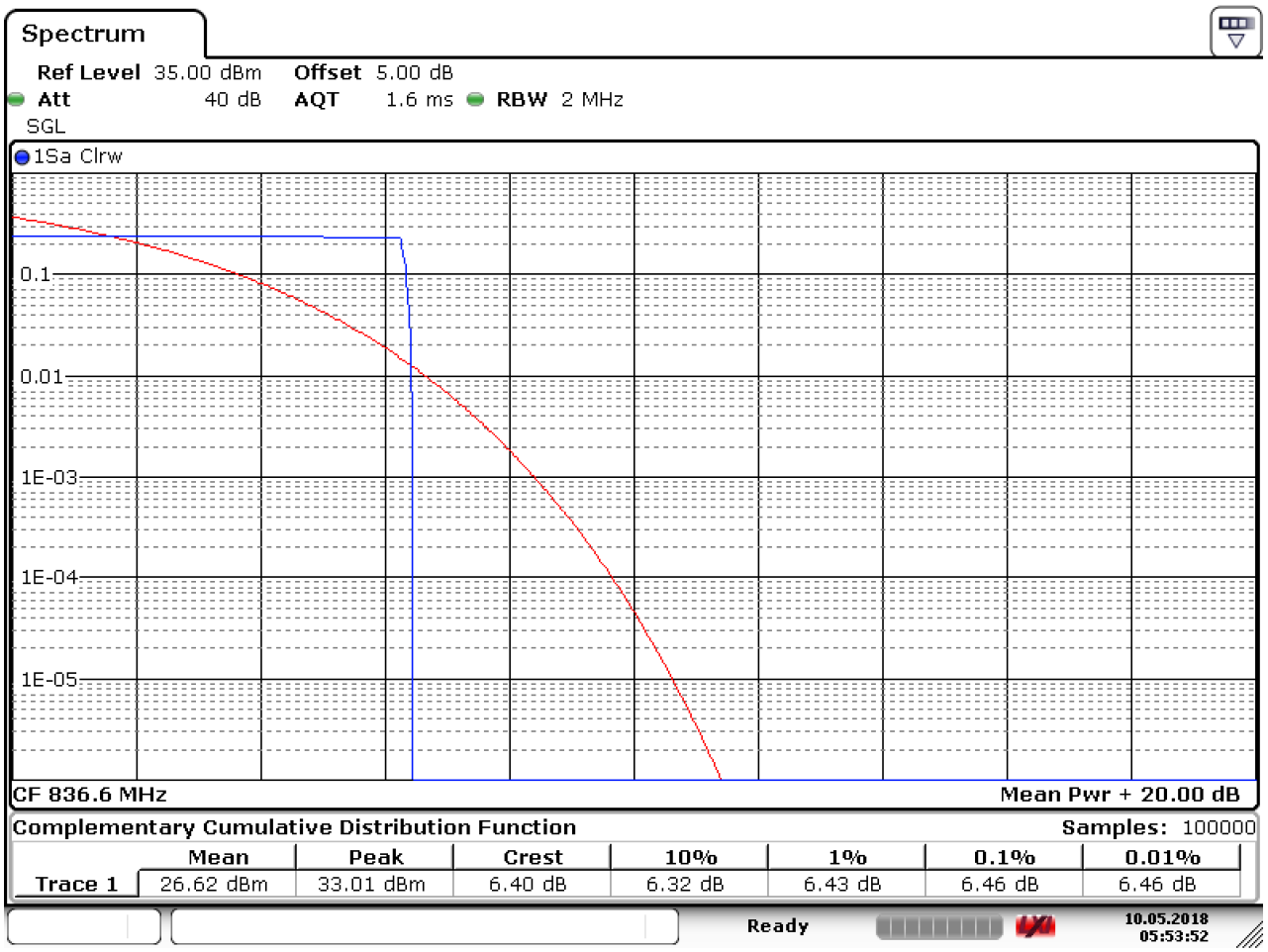
2.1.1.1 Test Mode = GSM/TM1

2.1.1.1.1 Test Channel = LCH



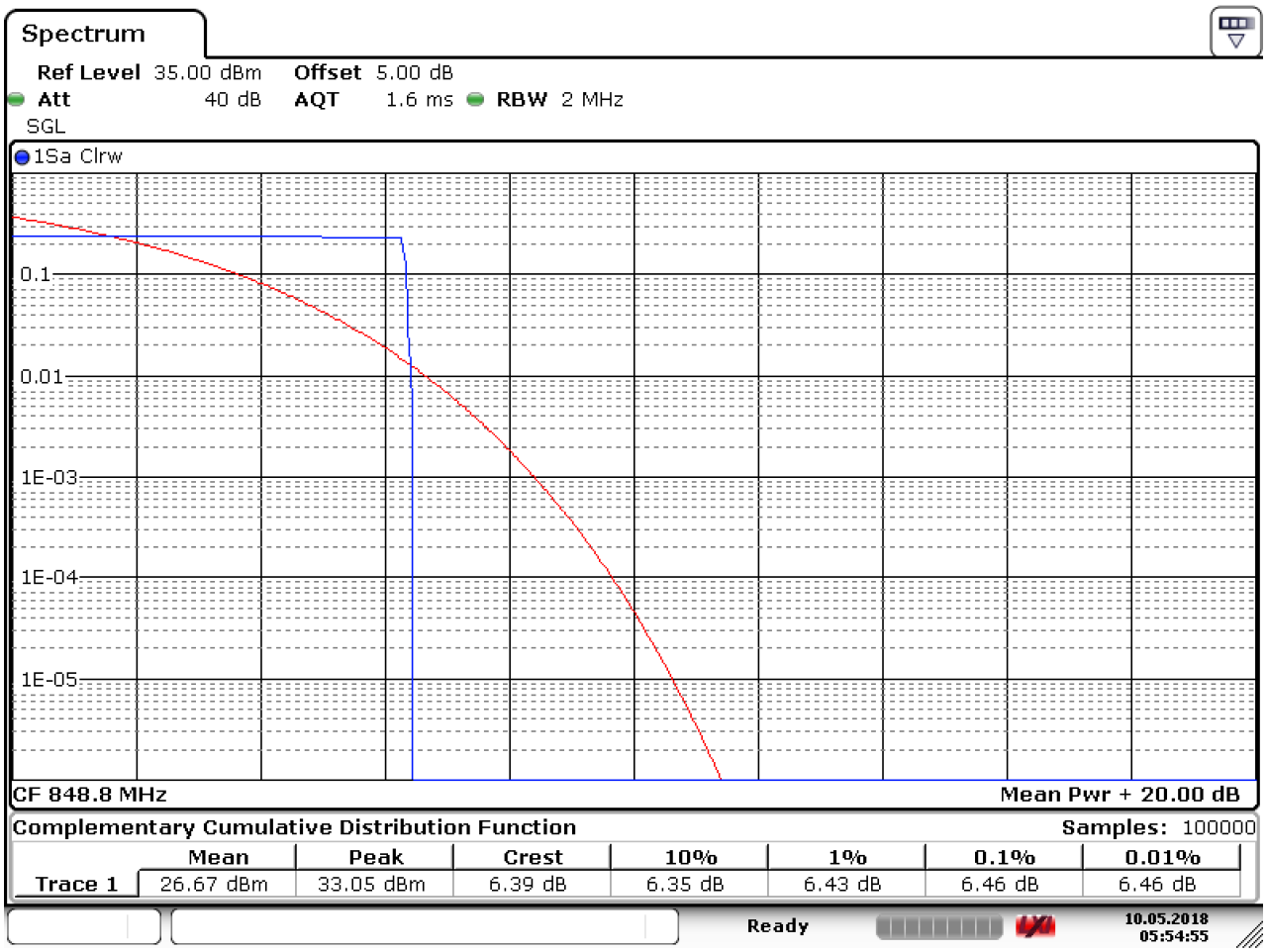
Date: 10.MAY.2018 05:55:54

2.1.1.1.2 Test Channel = MCH



Date: 10.MAY.2018 05:53:53

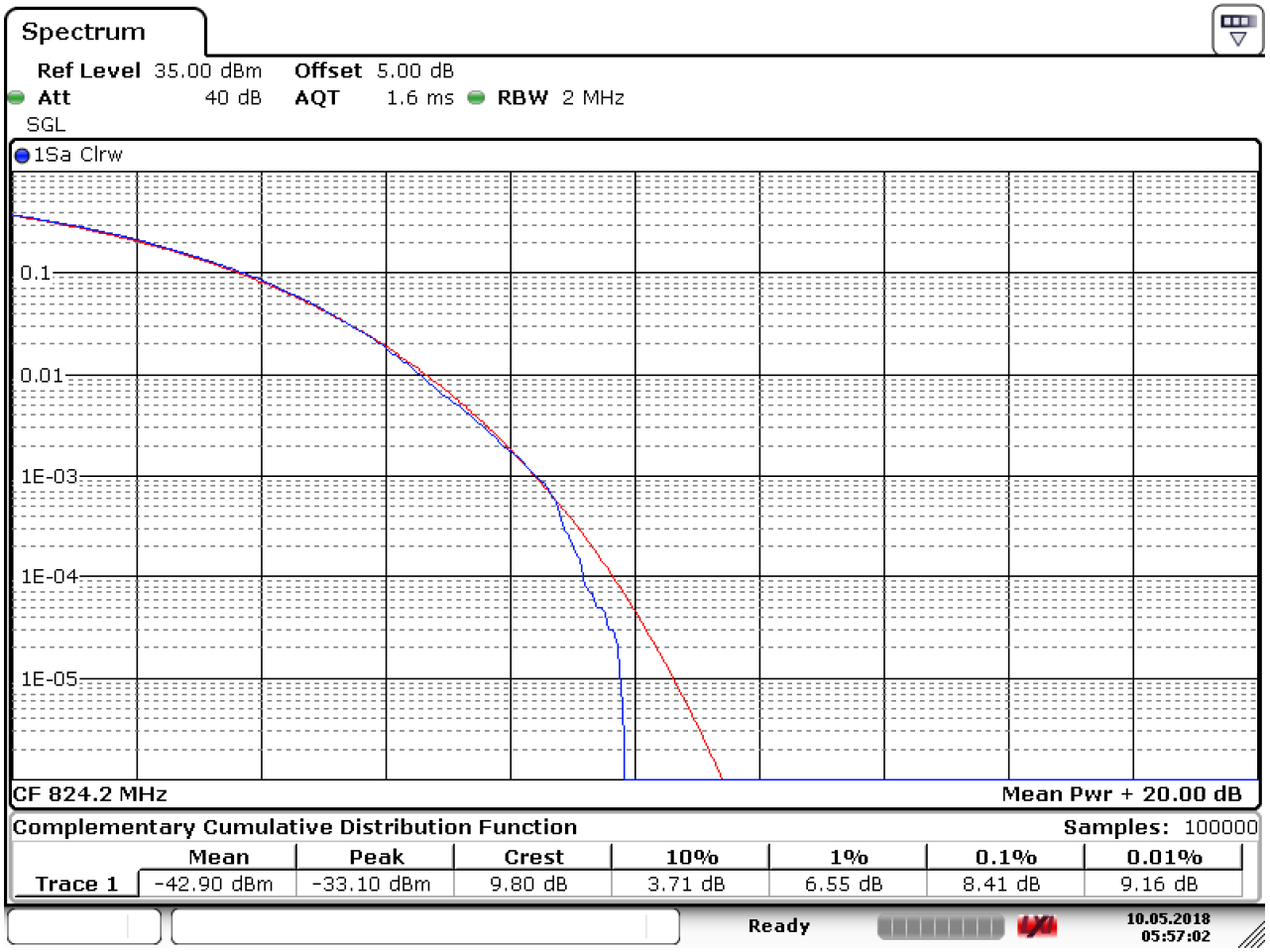
2.1.1.1.3 Test Channel = HCH



Date: 10.MAY.2018 05:54:56

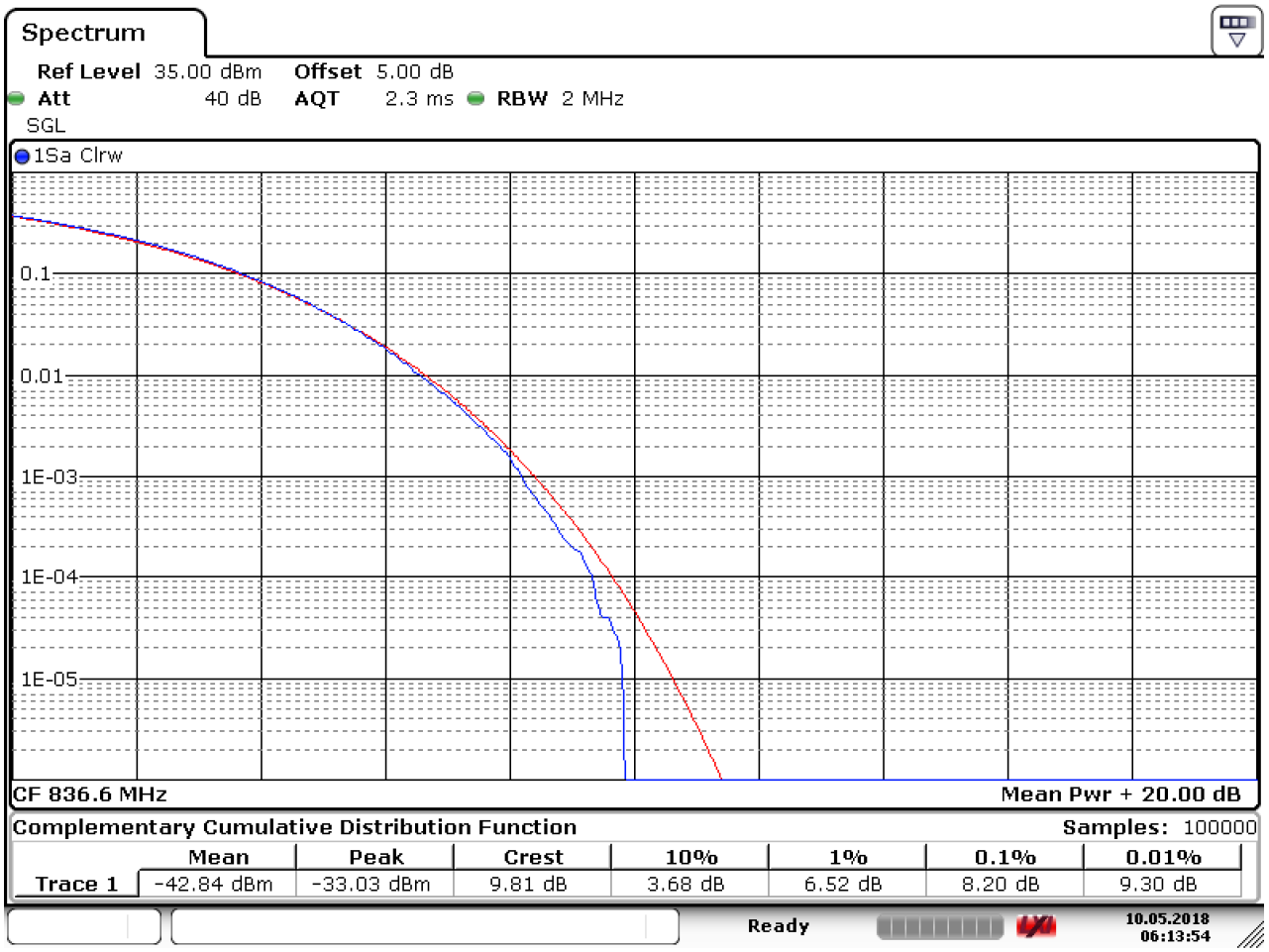
2.1.1.2 Test Mode = GSM/TM2

2.1.1.2.1 Test Channel = LCH



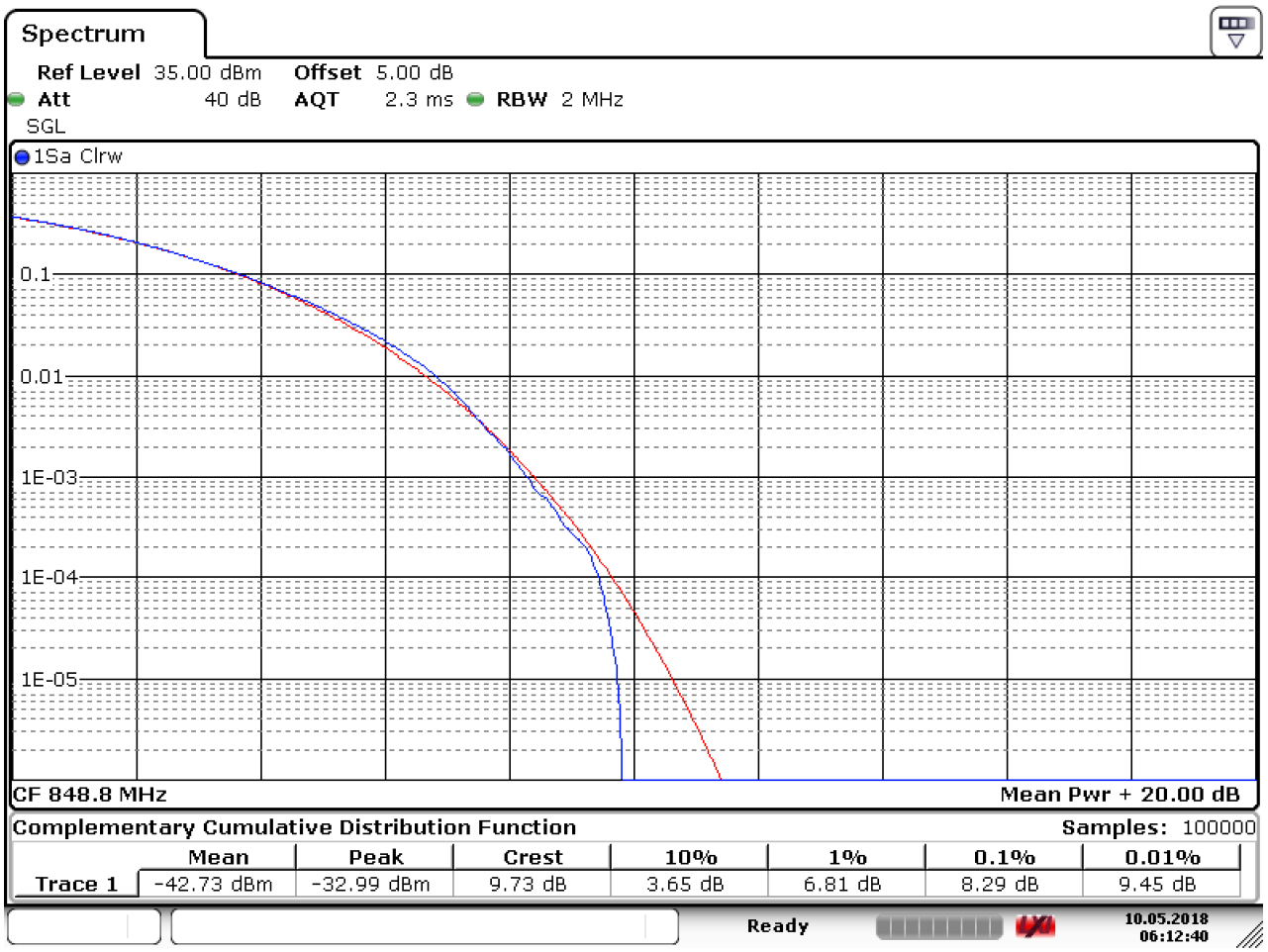
Date: 10.MAY.2018 05:57:02

2.1.1.2.2 Test Channel = MCH



Date: 10.MAY.2018 06:13:54

2.1.1.2.3 Test Channel = HCH

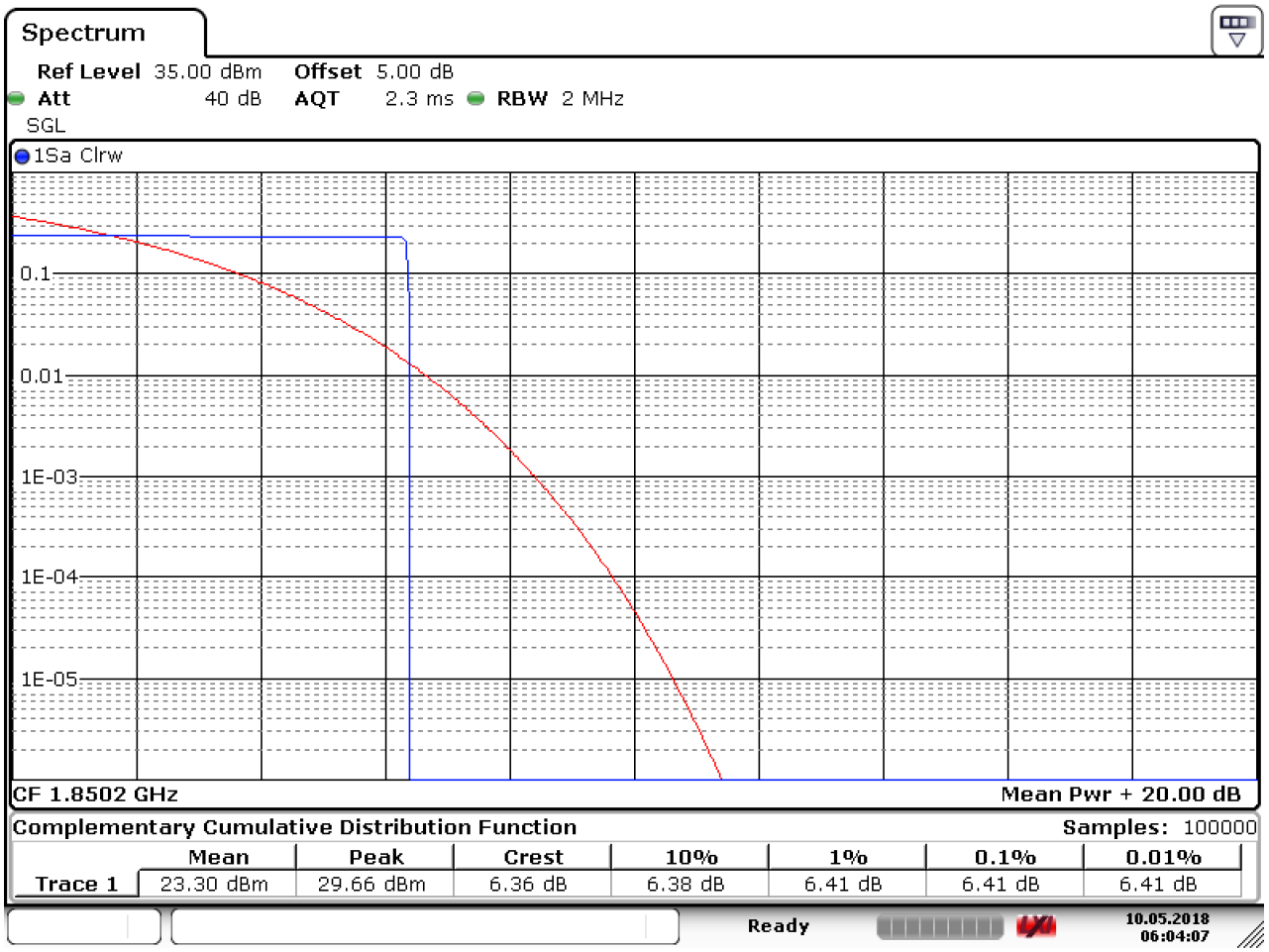


Date: 10.MAY.2018 06:12:40

2.1.2 Test Band = GSM 1900

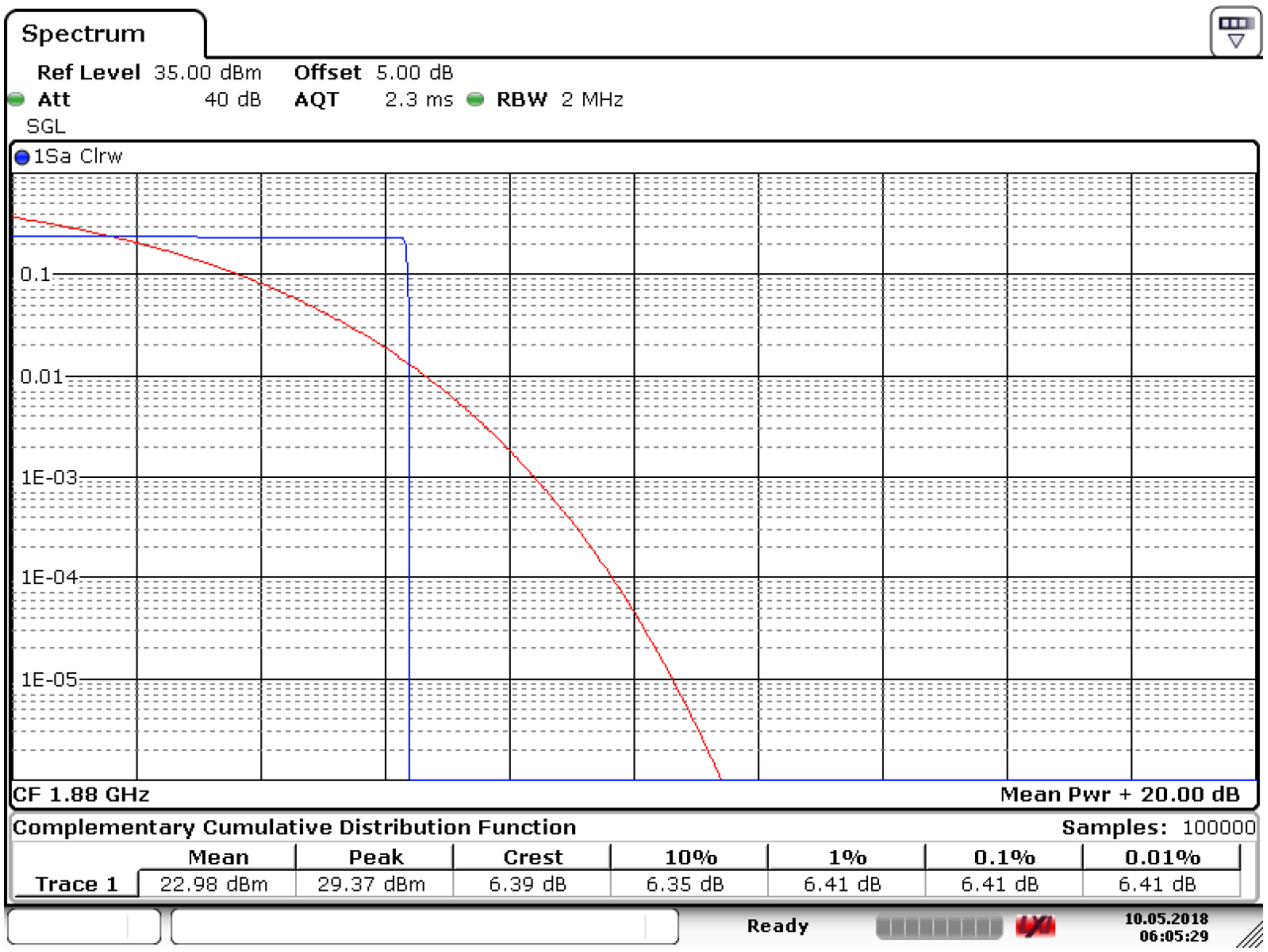
2.1.2.1 Test Mode = GSM/TM1

2.1.2.1.1 Test Channel = LCH



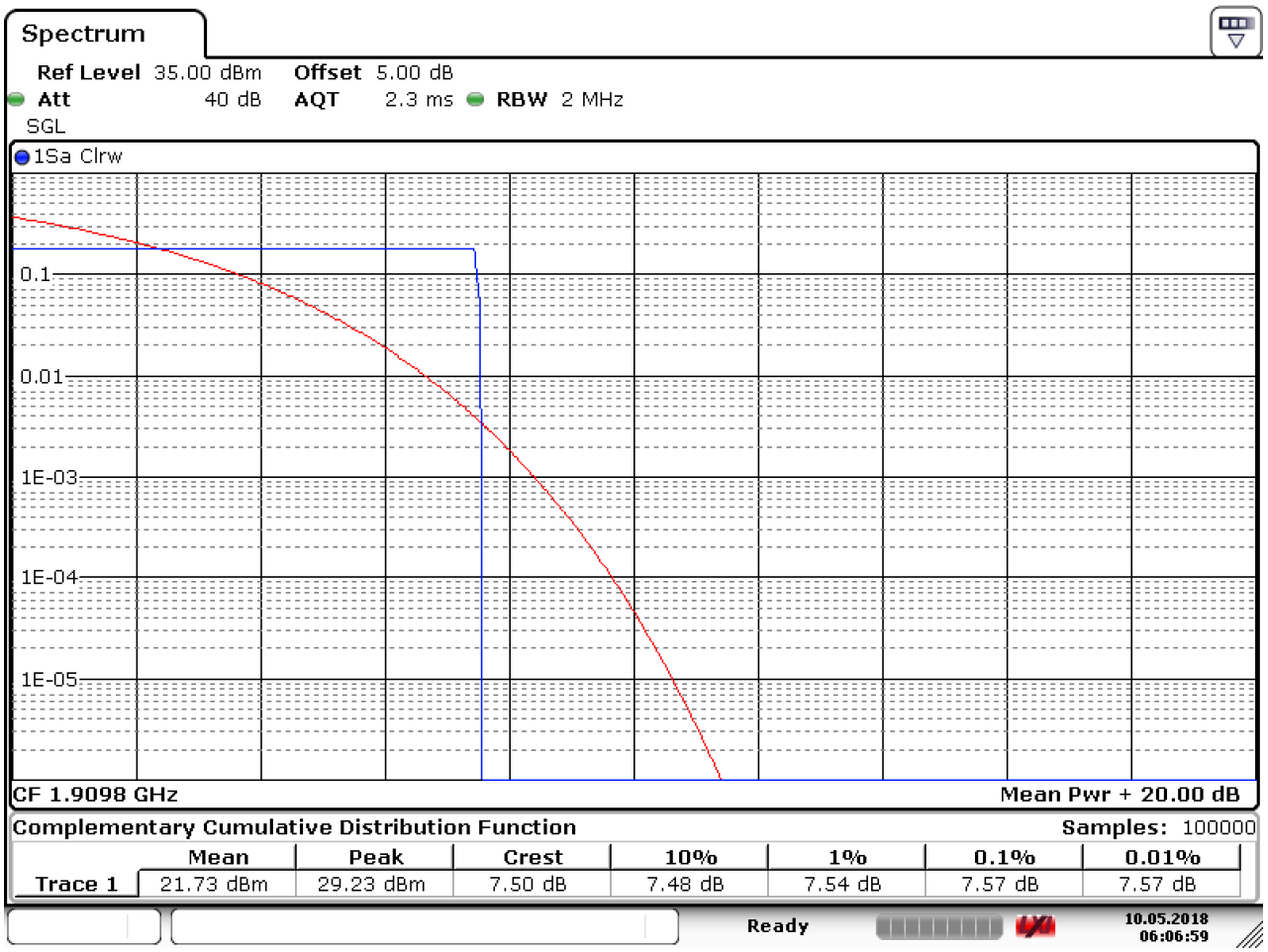
Date: 10.MAY.2018 06:04:08

2.1.2.1.2 Test Channel = MCH



Date: 10.MAY.2018 06:05:29

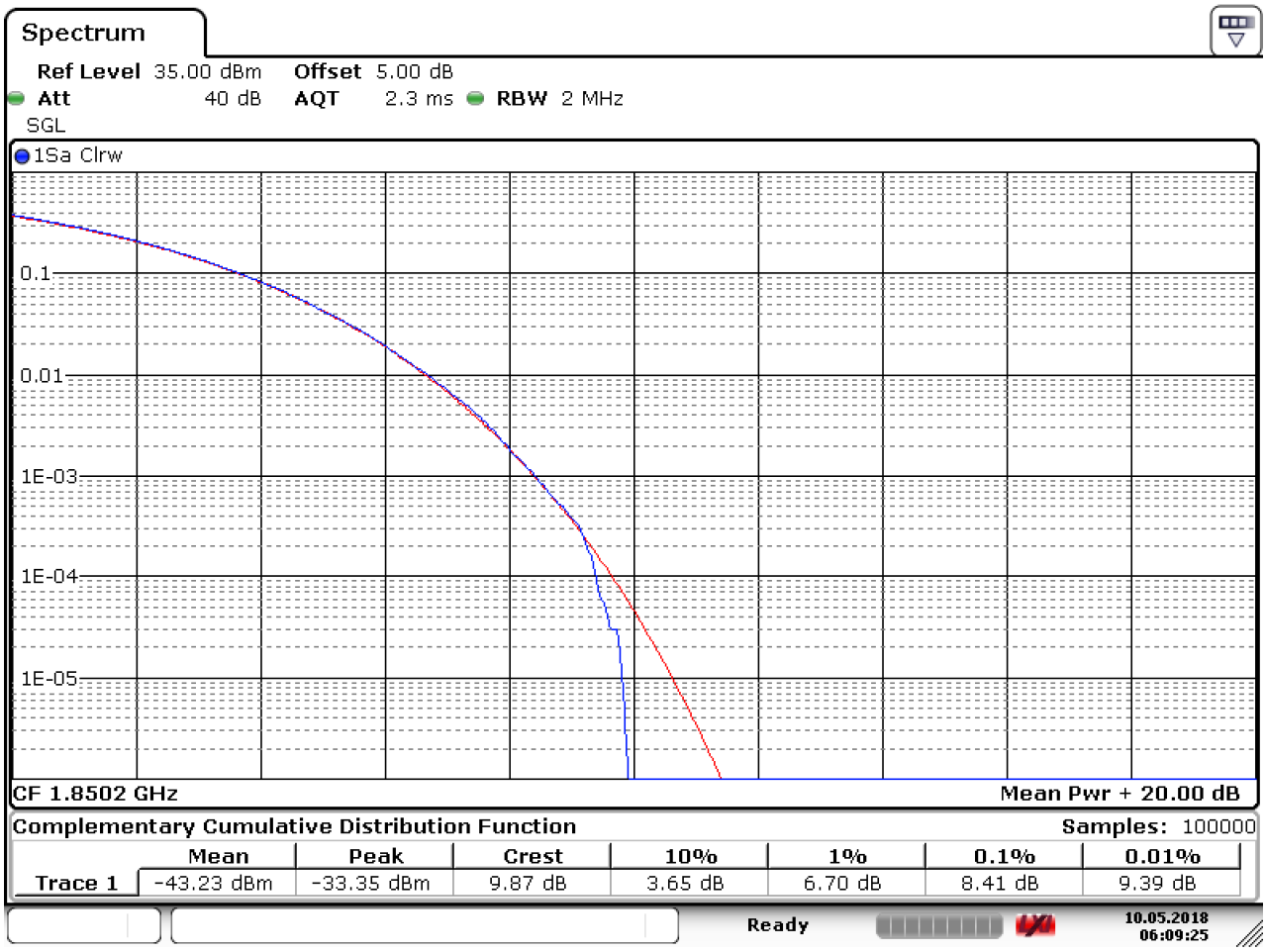
2.1.2.1.3 Test Channel = HCH



Date: 10.MAY.2018 06:06:59

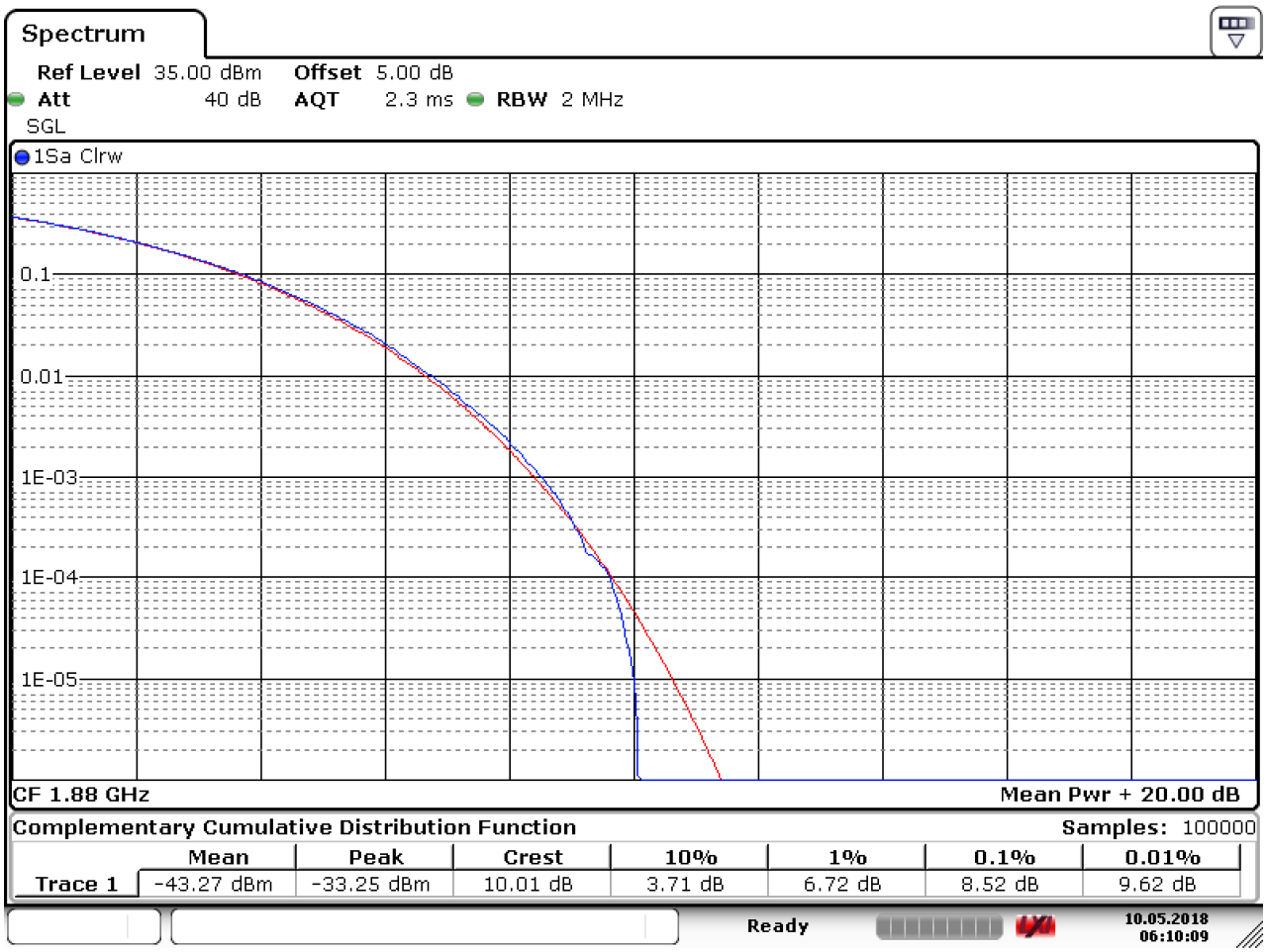
2.1.2.2 Test Mode = GSM/TM2

2.1.2.2.1 Test Channel = LCH



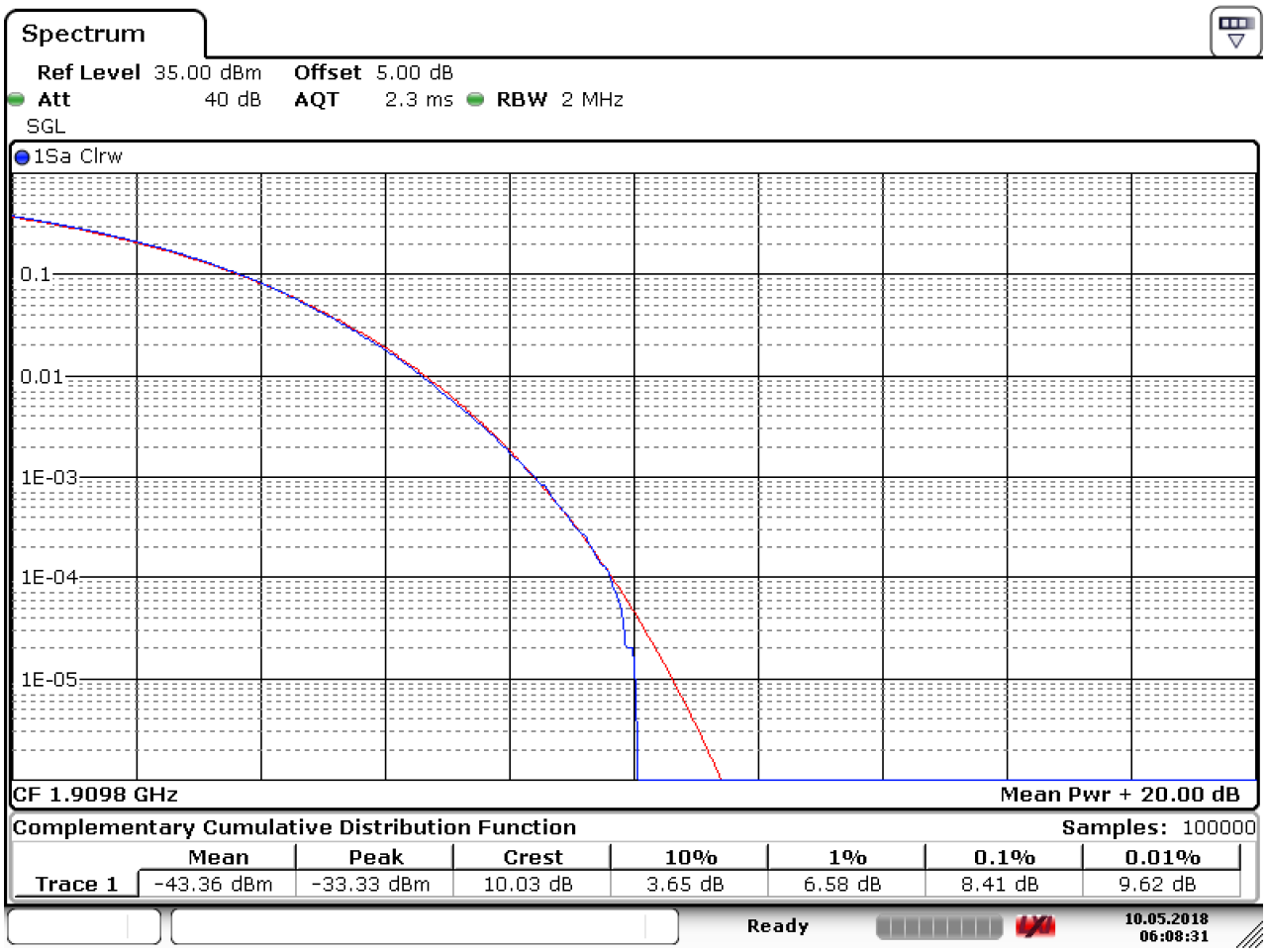
Date: 10.MAY.2018 06:09:25

2.1.2.2.2 Test Channel = MCH



Date: 10.MAY.2018 06:10:09

2.1.2.2.3 Test Channel = HCH



Date: 10.MAY.2018 06:08:31

3 Modulation Characteristics

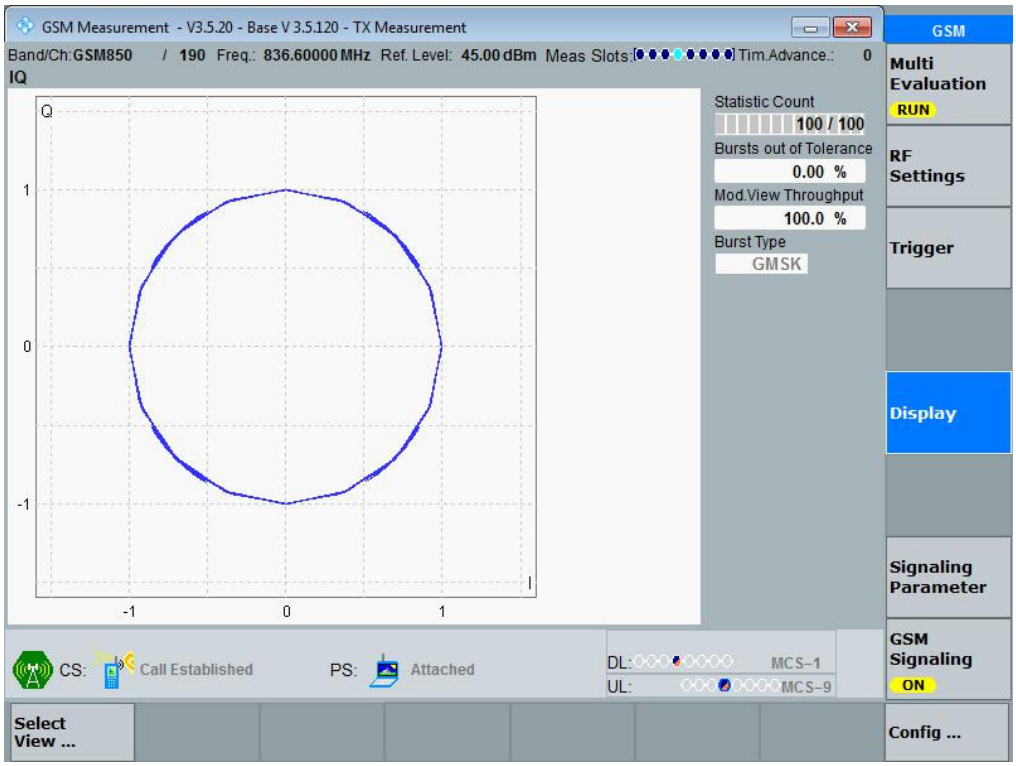
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM 850

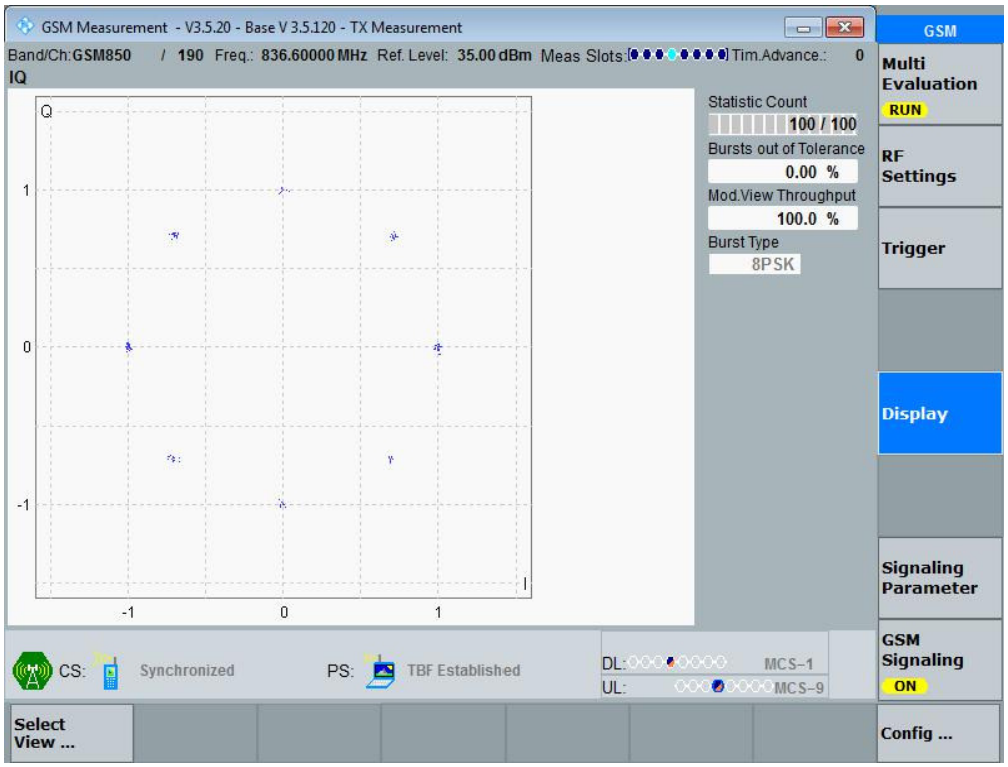
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

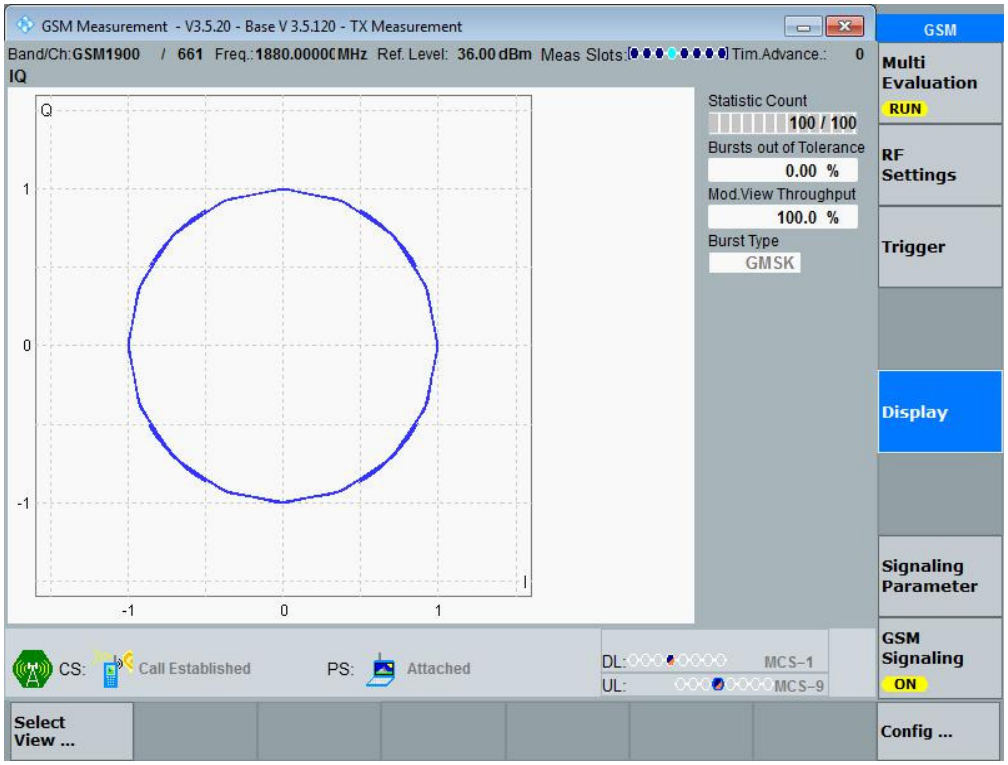
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM 1900

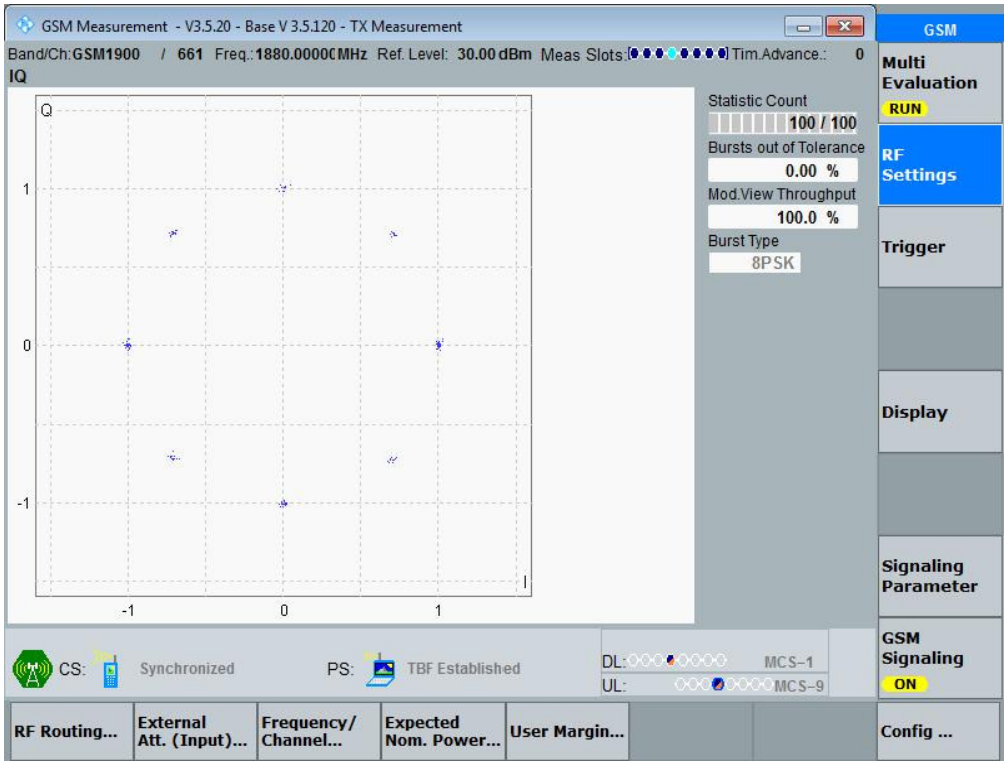
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH



4 Bandwidth

Part I - Test Results

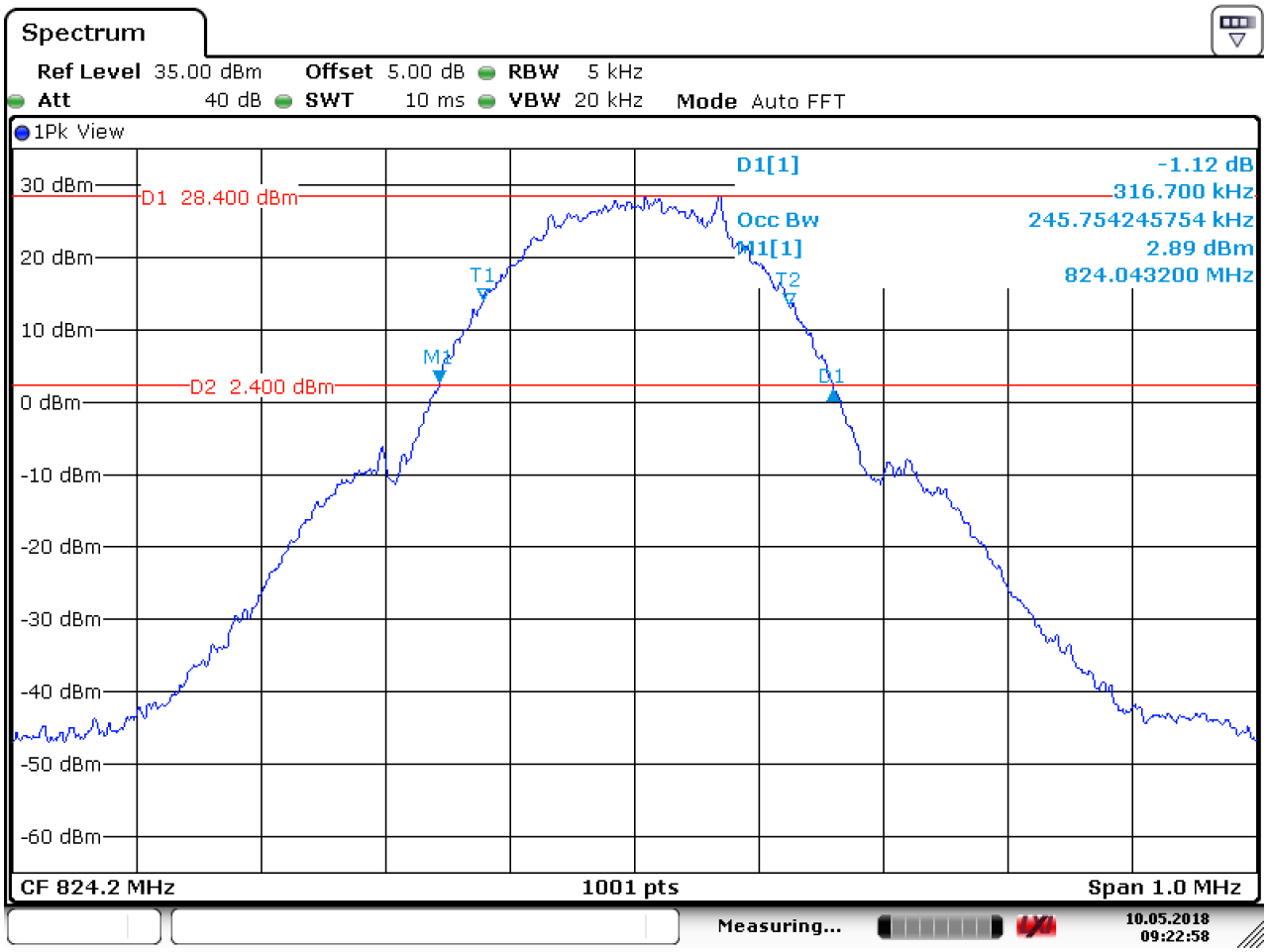
Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM 850	GSM/TM1	LCH	245.75	316.70	PASS
		MCH	246.75	313.70	PASS
		HCH	245.75	319.70	PASS
	GSM/TM2	LCH	243.76	315.70	PASS
		MCH	240.76	315.60	PASS
		HCH	240.76	311.70	PASS
GSM 1900	GSM/TM1	LCH	244.76	319.70	PASS
		MCH	244.76	312.70	PASS
		HCH	244.76	314.70	PASS
	GSM/TM2	LCH	238.76	314.70	PASS
		MCH	237.76	313.70	PASS
		HCH	239.76	315.70	PASS

4.1 For GSM

4.1.1 Test Band = GSM 850

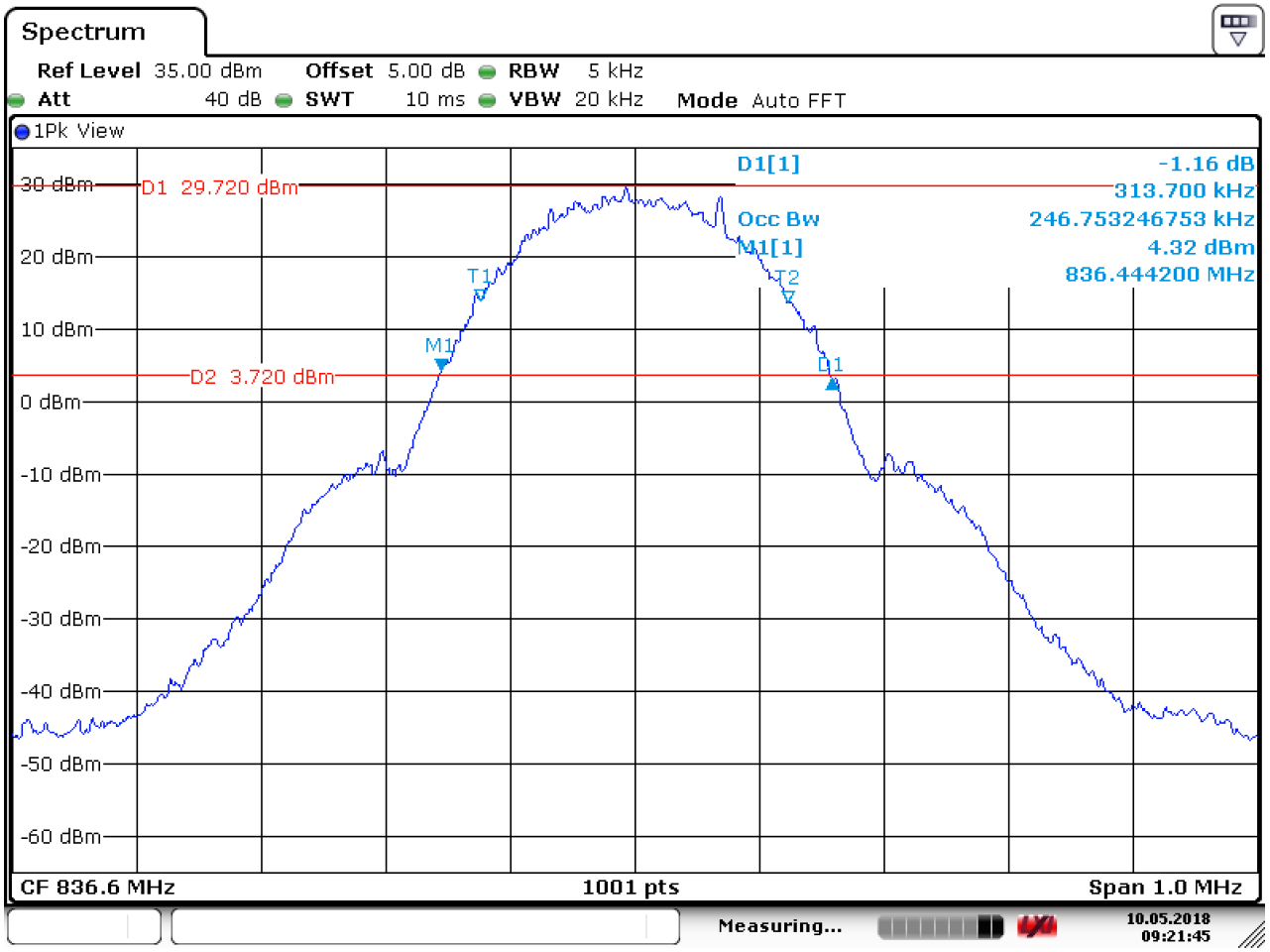
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



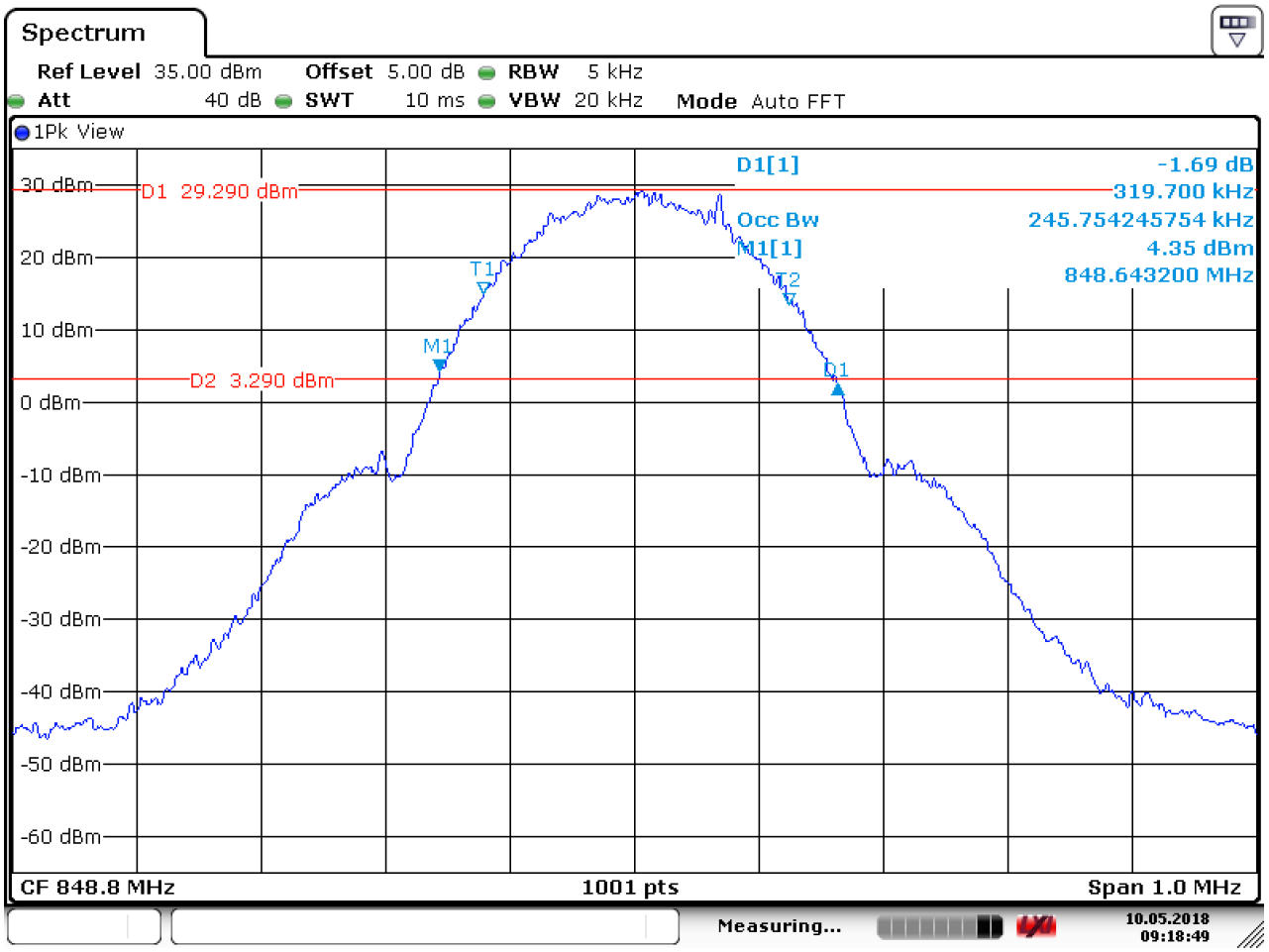
Date: 10.MAY.2018 09:22:58

4.1.1.1.2 Test Channel = MCH



Date: 10.MAY.2018 09:21:45

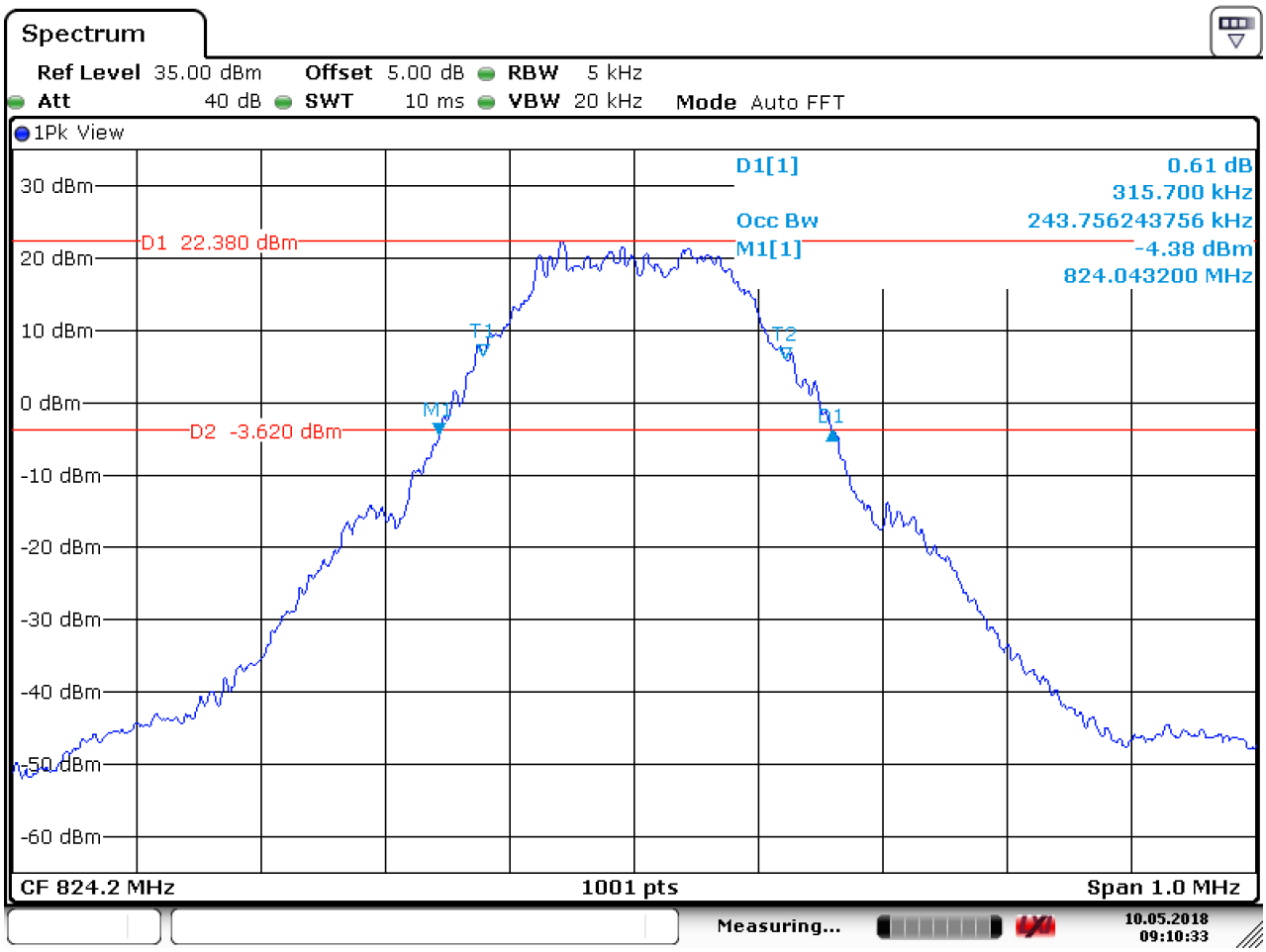
4.1.1.1.3 Test Channel = HCH



Date: 10.MAY.2018 09:18:49

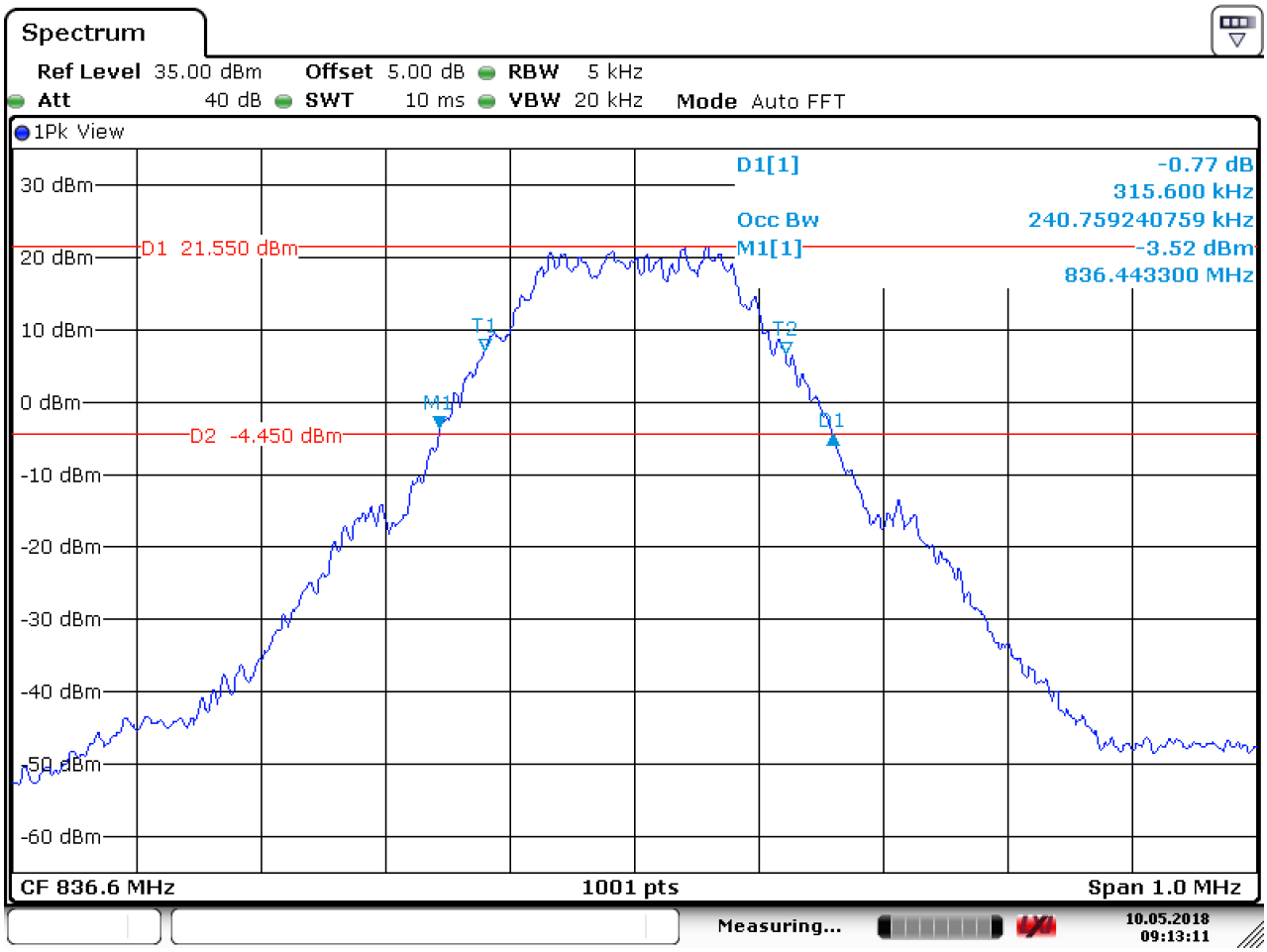
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



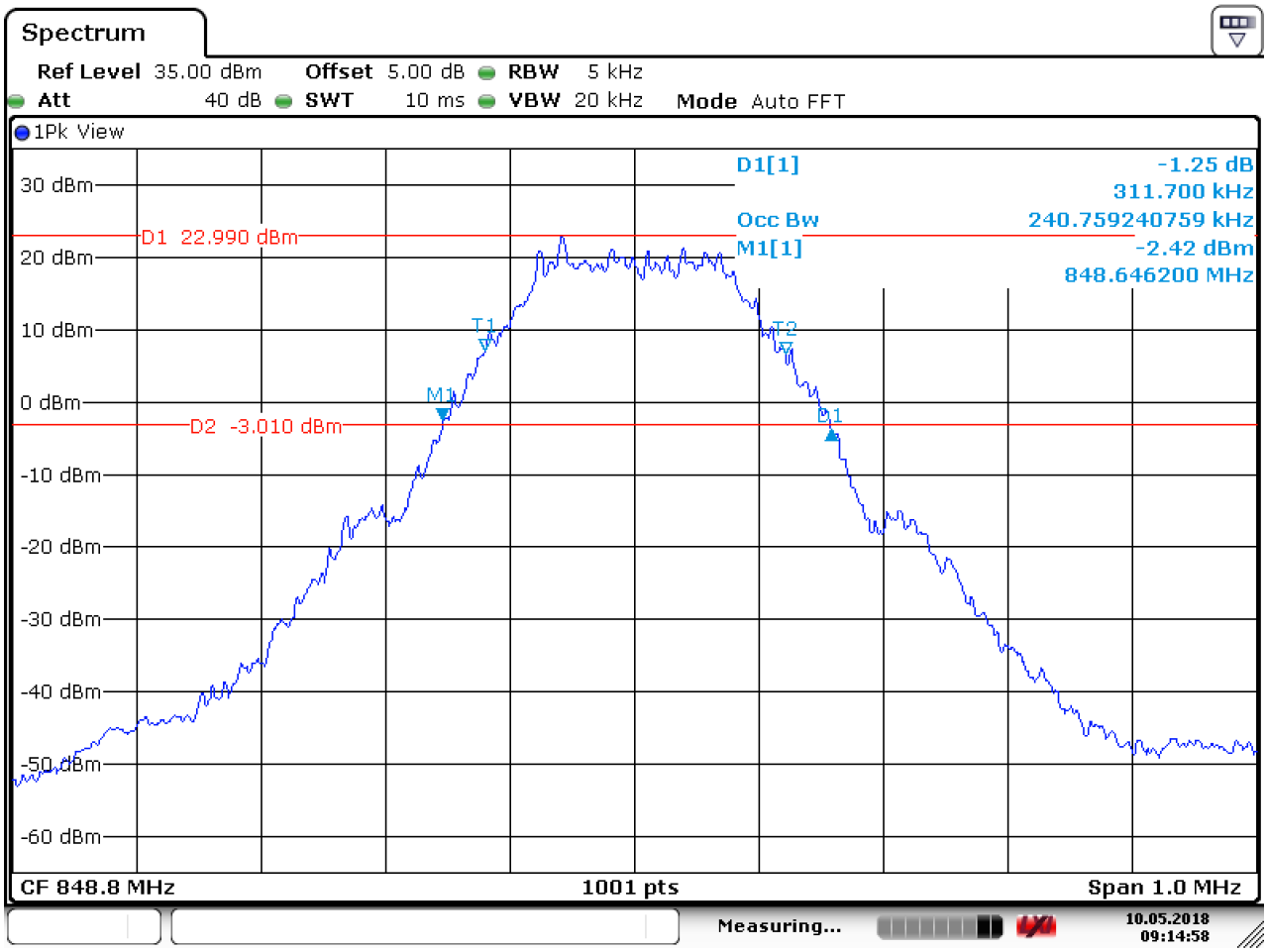
Date: 10.MAY.2018 09:10:34

4.1.1.2.2 Test Channel = MCH



Date: 10.MAY.2018 09:13:12

4.1.1.2.3 Test Channel = HCH

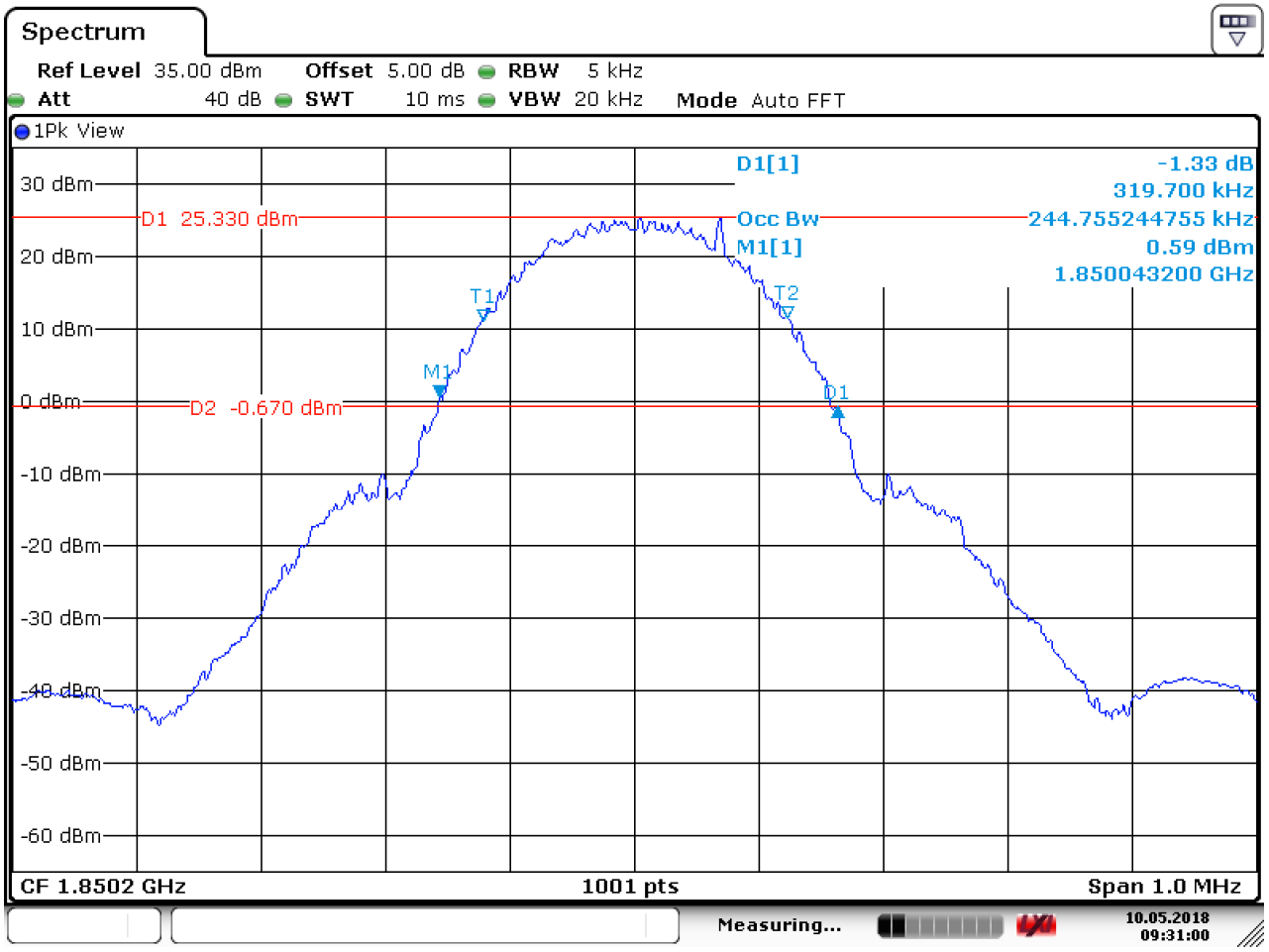


Date: 10.MAY.2018 09:14:58

4.1.2 Test Band = GSM 1900

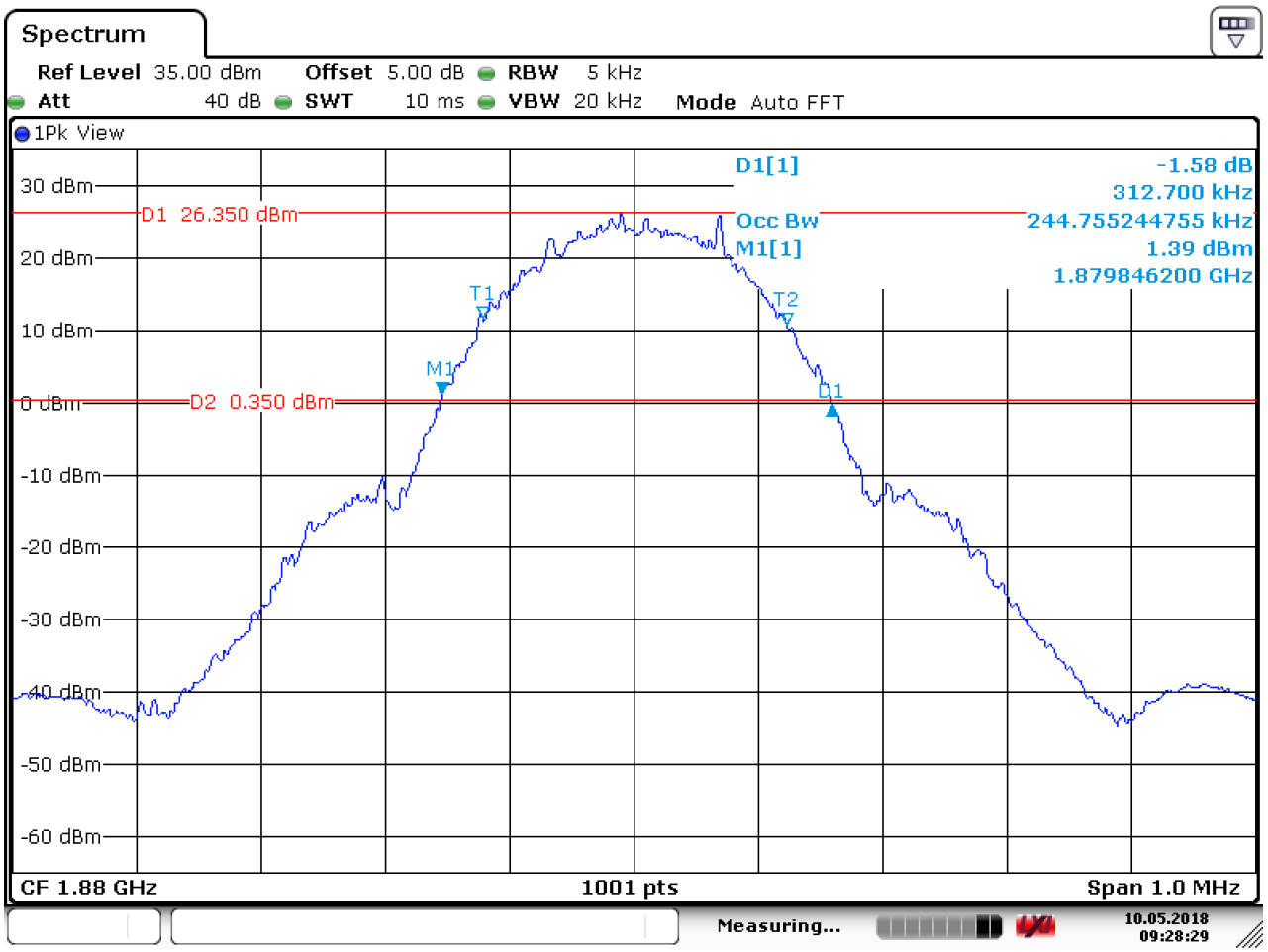
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



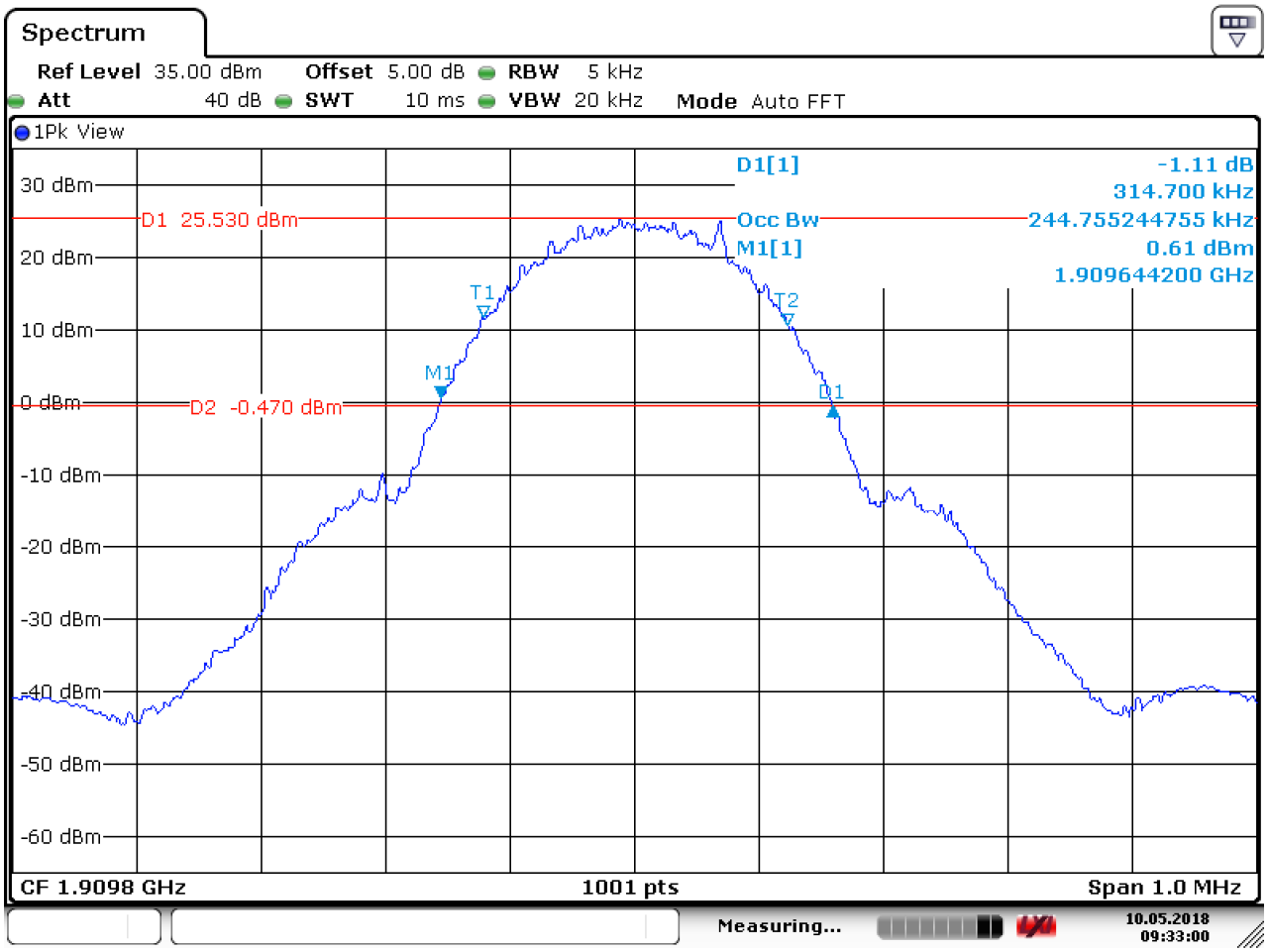
Date: 10.MAY.2018 09:31:00

4.1.2.1.2 Test Channel = MCH



Date: 10.MAY.2018 09:28:29

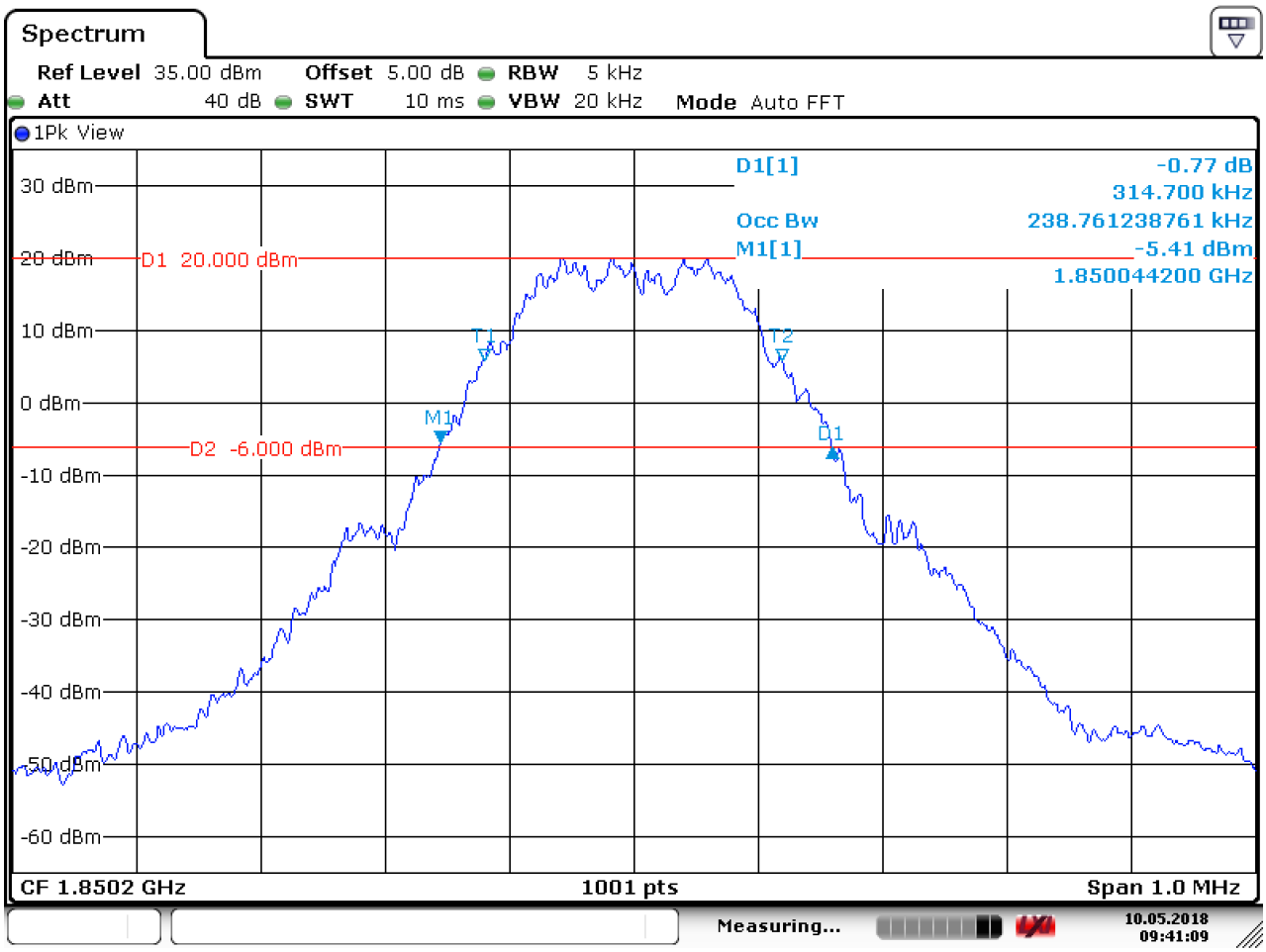
4.1.2.1.3 Test Channel = HCH



Date: 10.MAY.2018 09:33:00

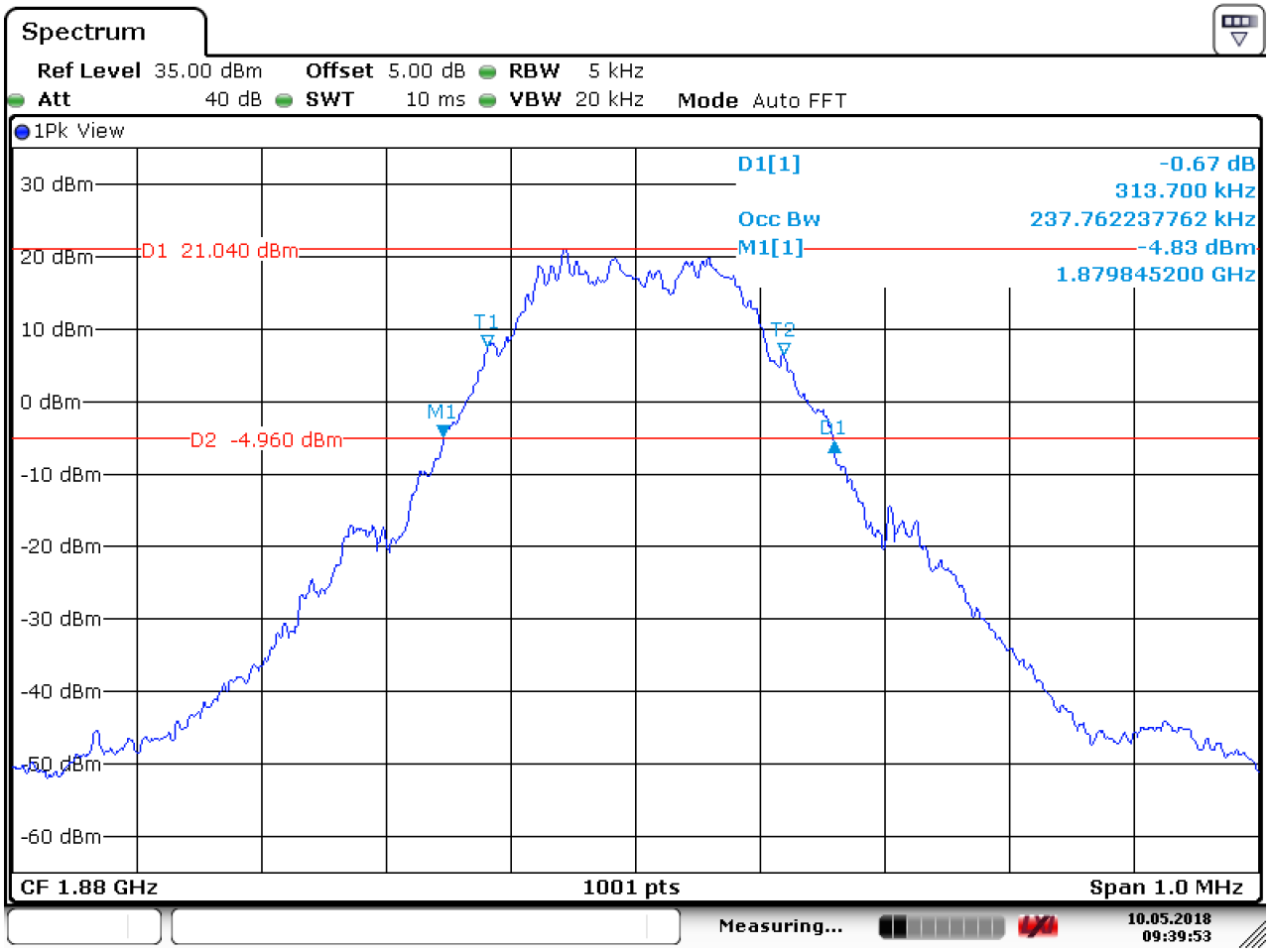
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



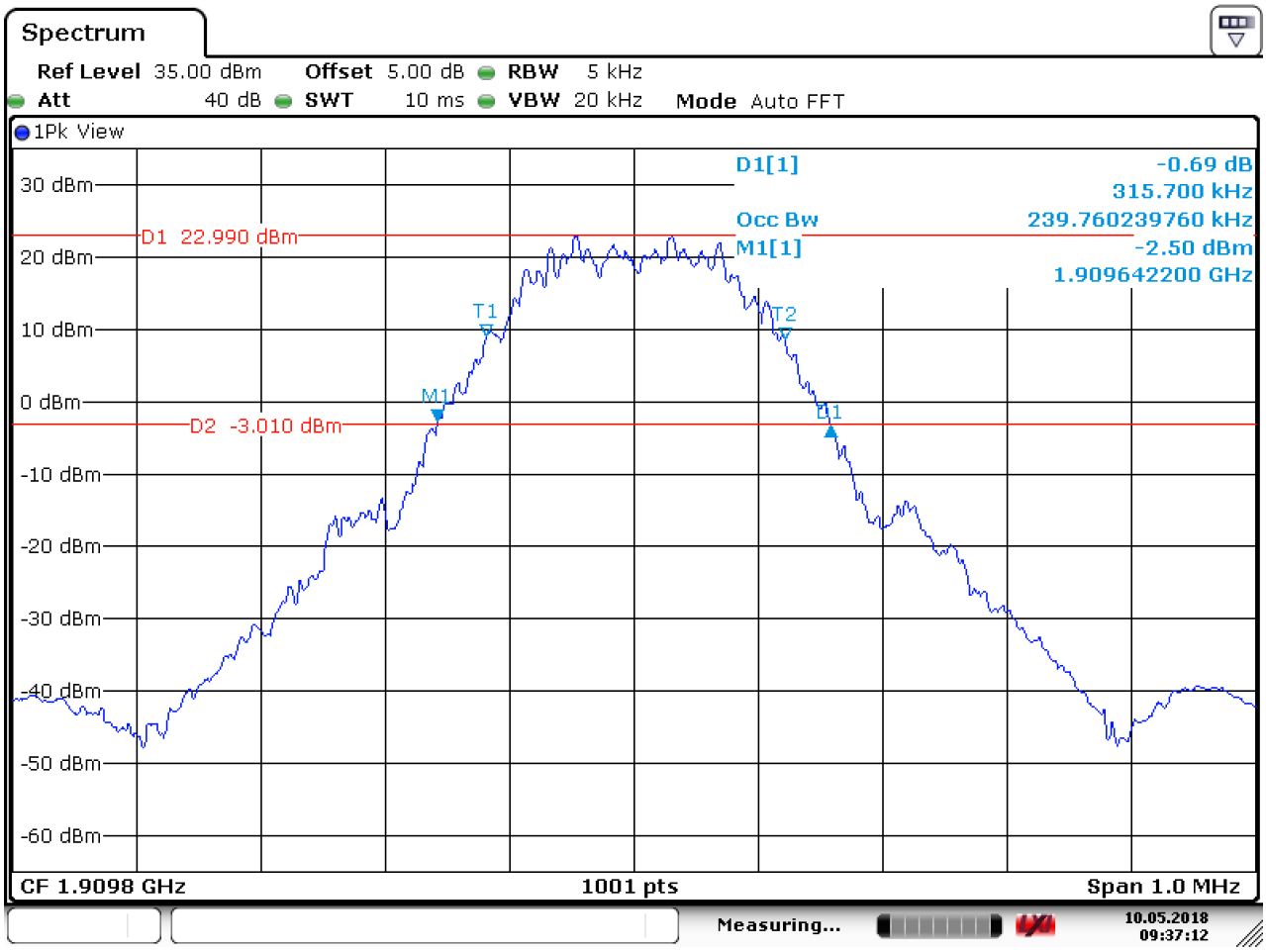
Date: 10.MAY.2018 09:41:10

4.1.2.2.2 Test Channel = MCH



Date: 10.MAY.2018 09:39:53

4.1.2.2.3 Test Channel = HCH



Date: 10.MAY.2018 09:37:12

5 Band Edges Compliance

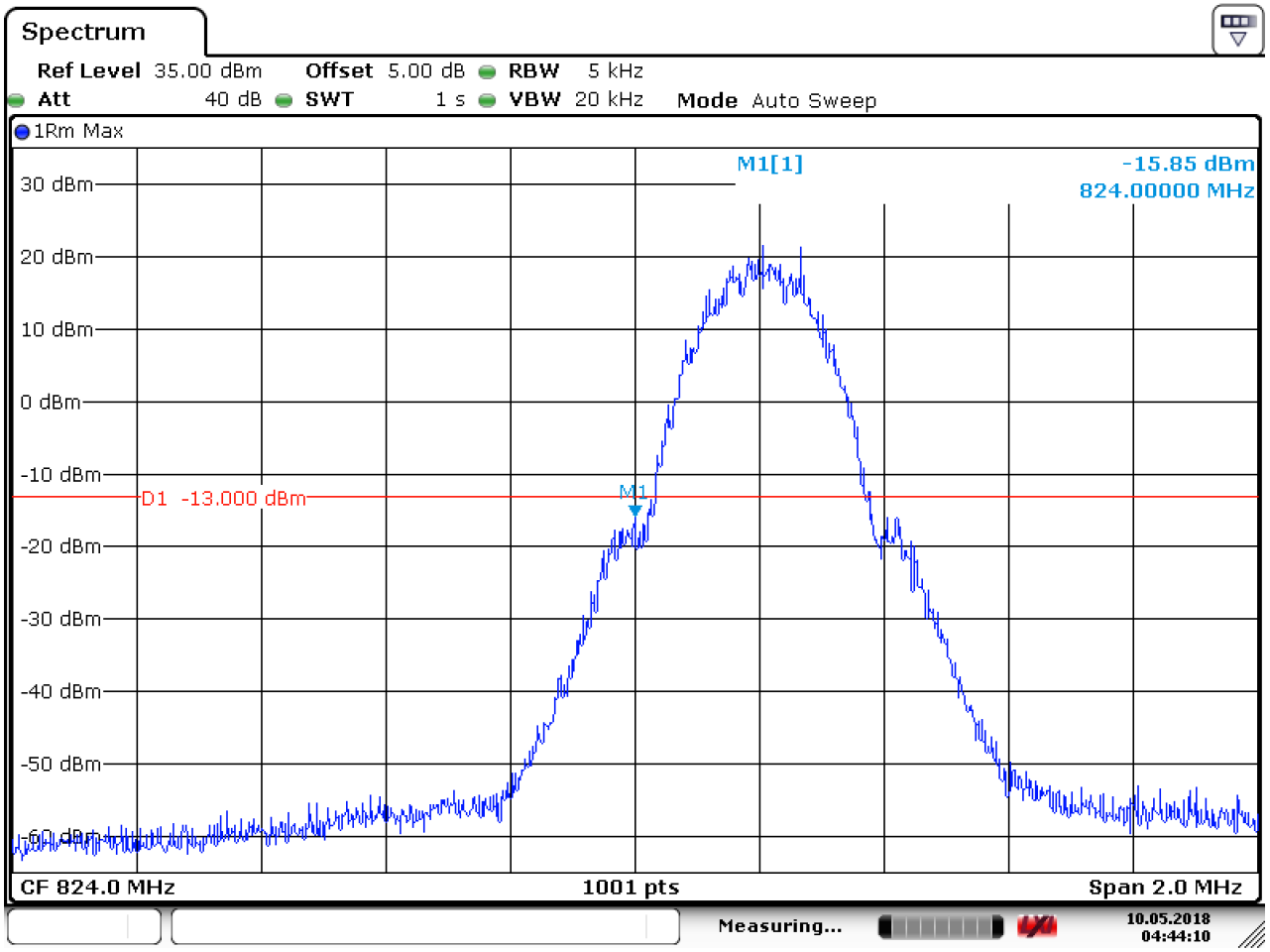
Part I - Test Plots

5.1 For GSM

5.1.1 Test Band = GSM 850

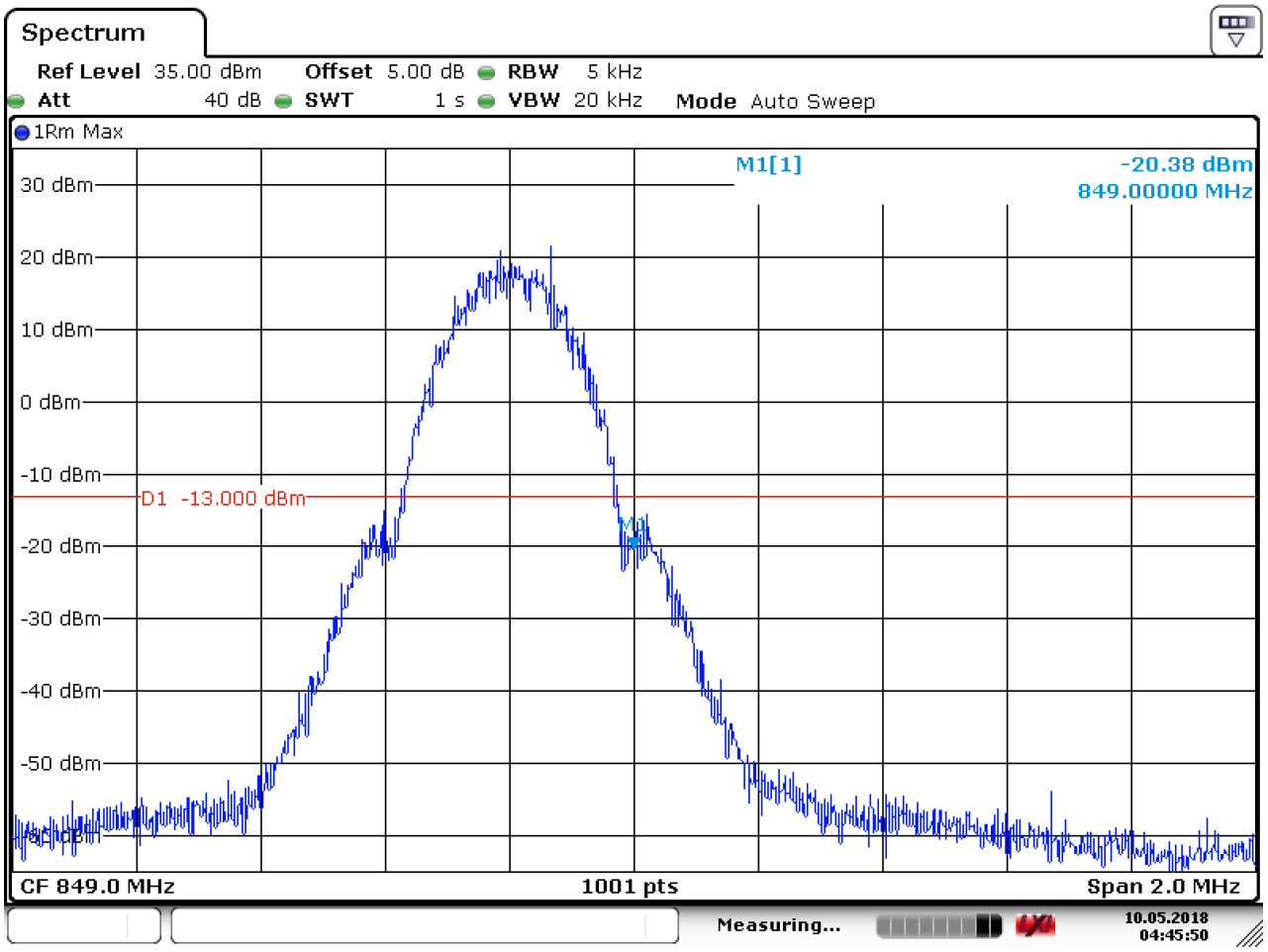
5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH



Date: 10.MAY.2018 04:44:10

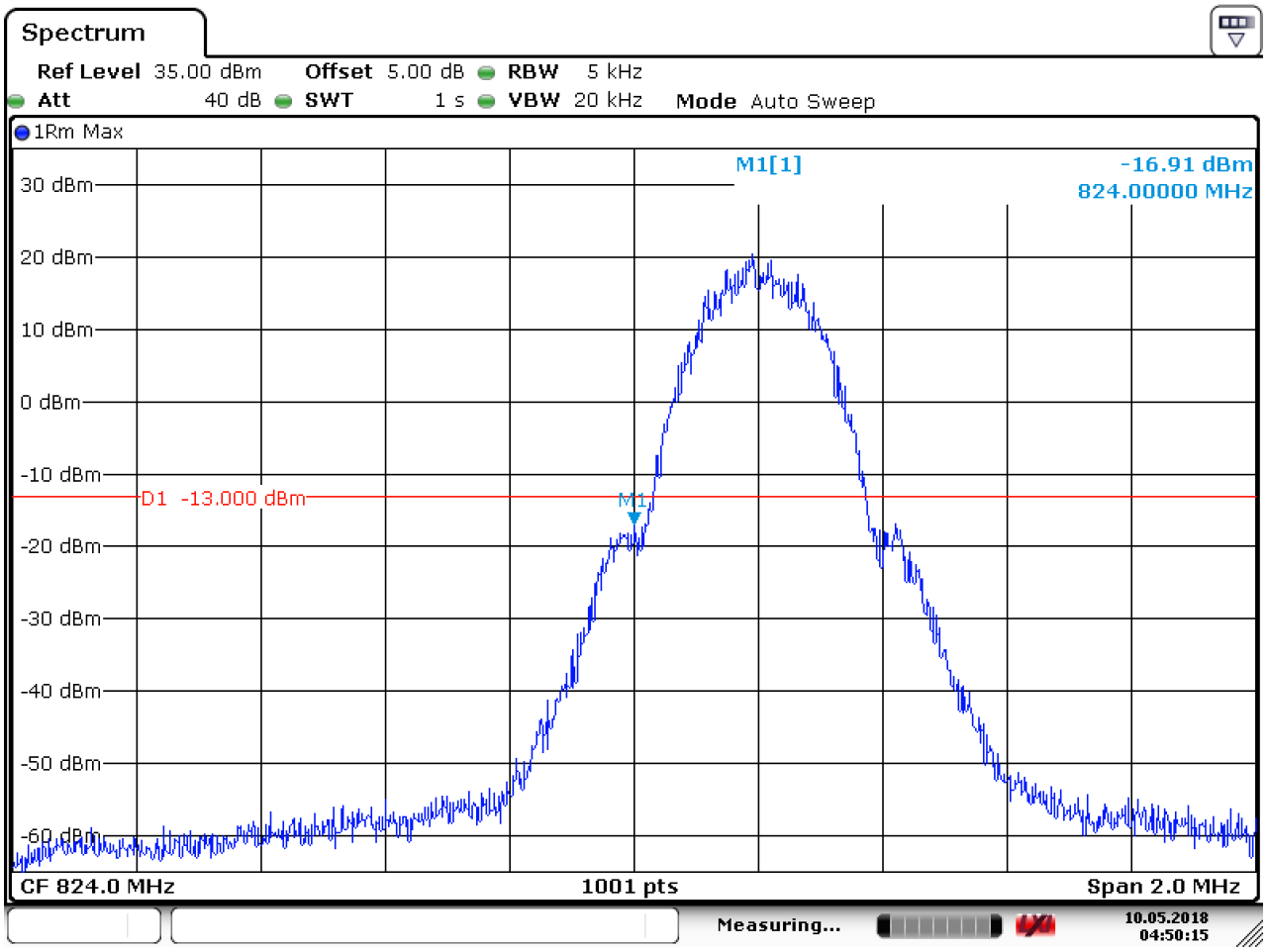
5.1.1.1.2 Test Channel = HCH



Date: 10.MAY.2018 04:45:50

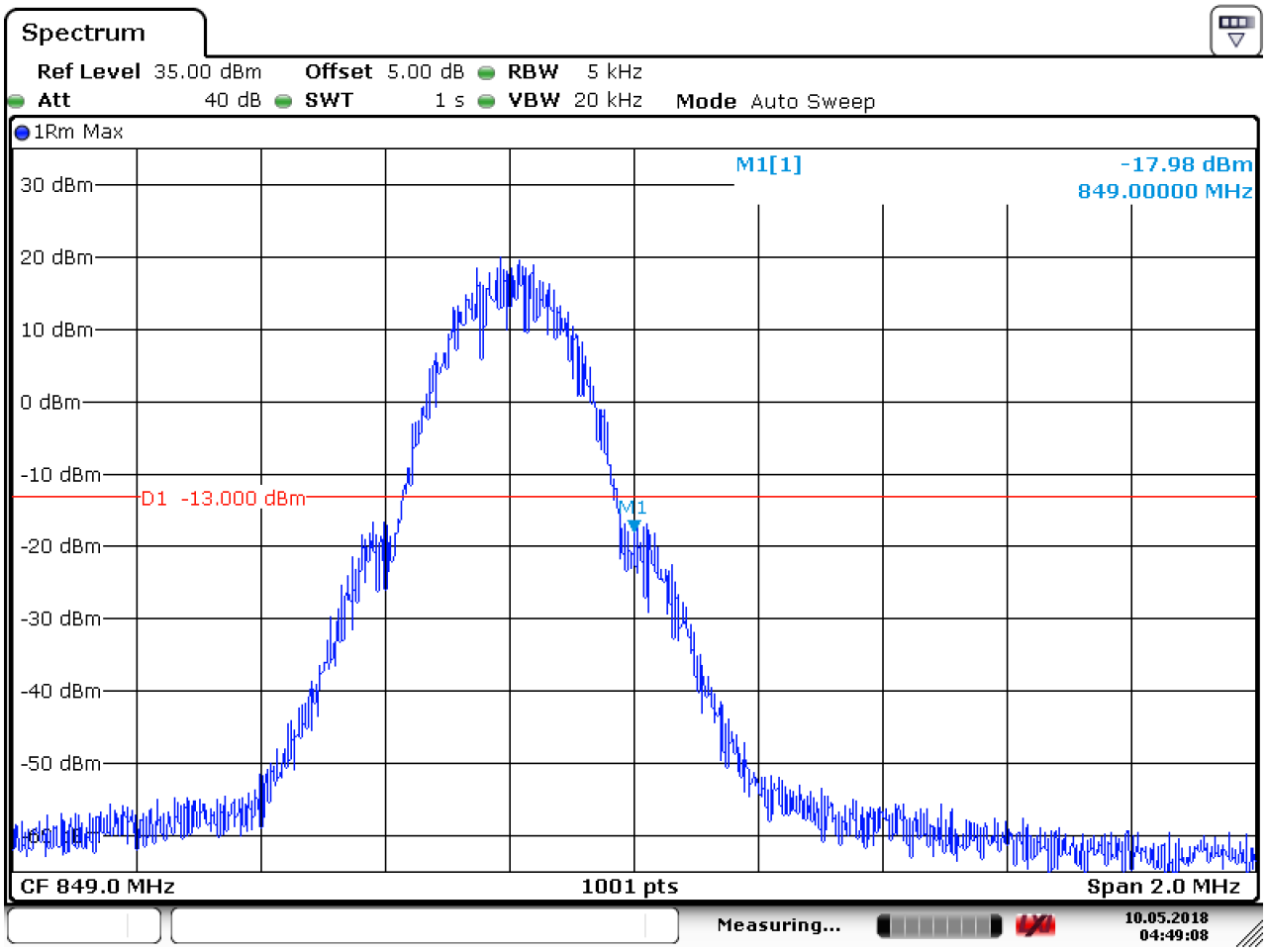
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



Date: 10.MAY.2018 04:50:15

5.1.1.2.2 Test Channel = HCH

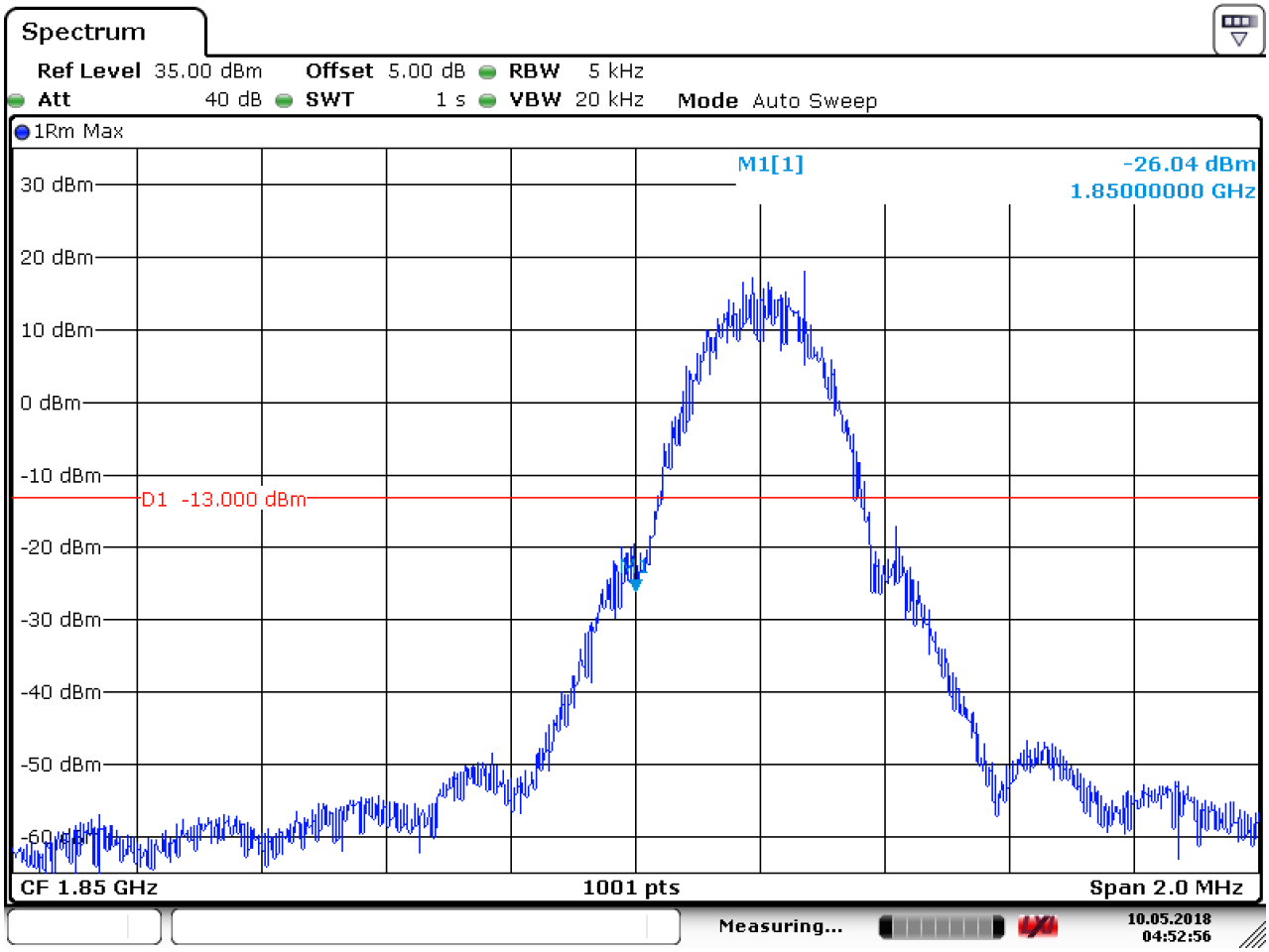


Date: 10.MAY.2018 04:49:08

5.1.2 Test Band = GSM 1900

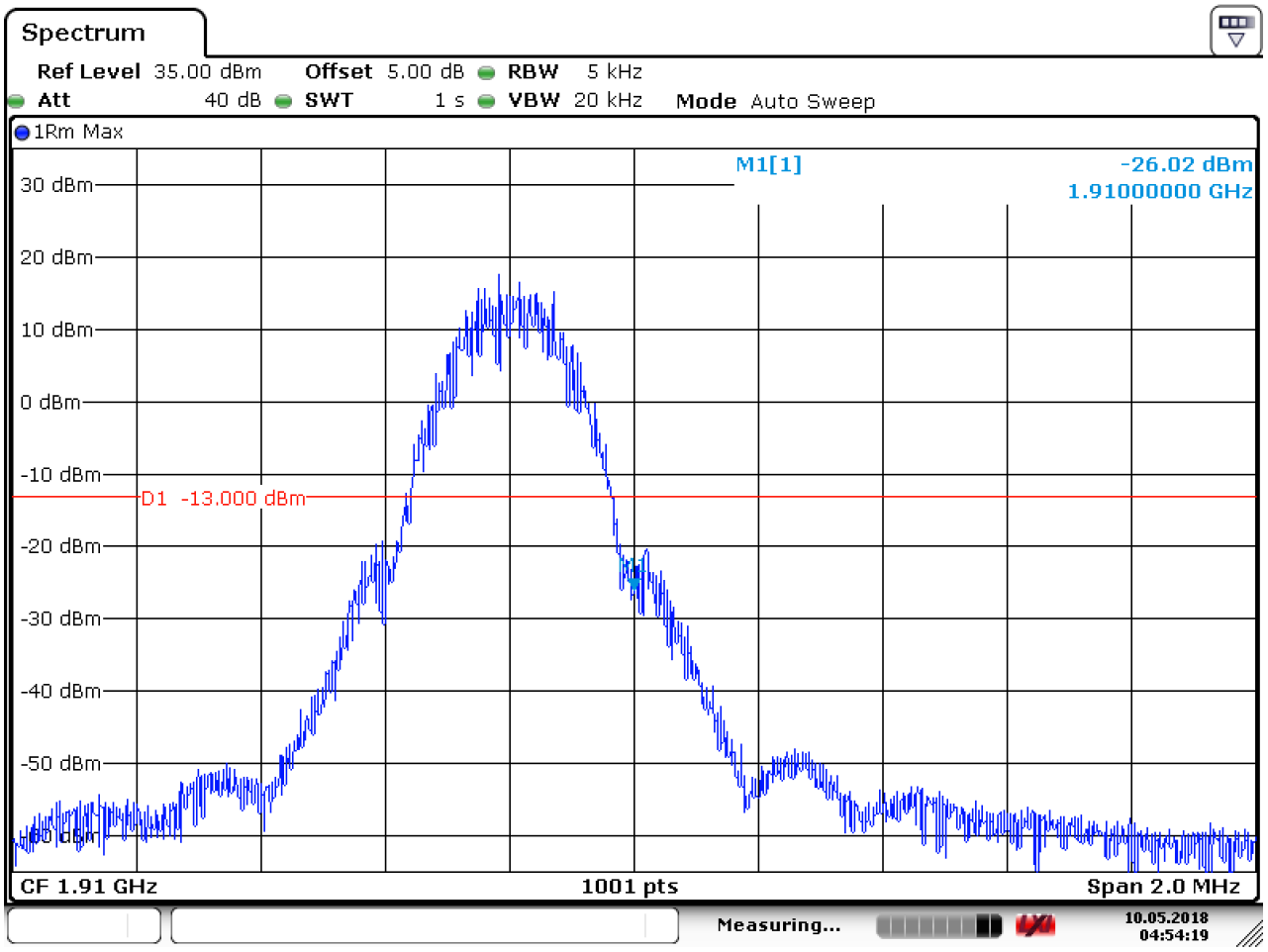
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



Date: 10.MAY.2018 04:52:57

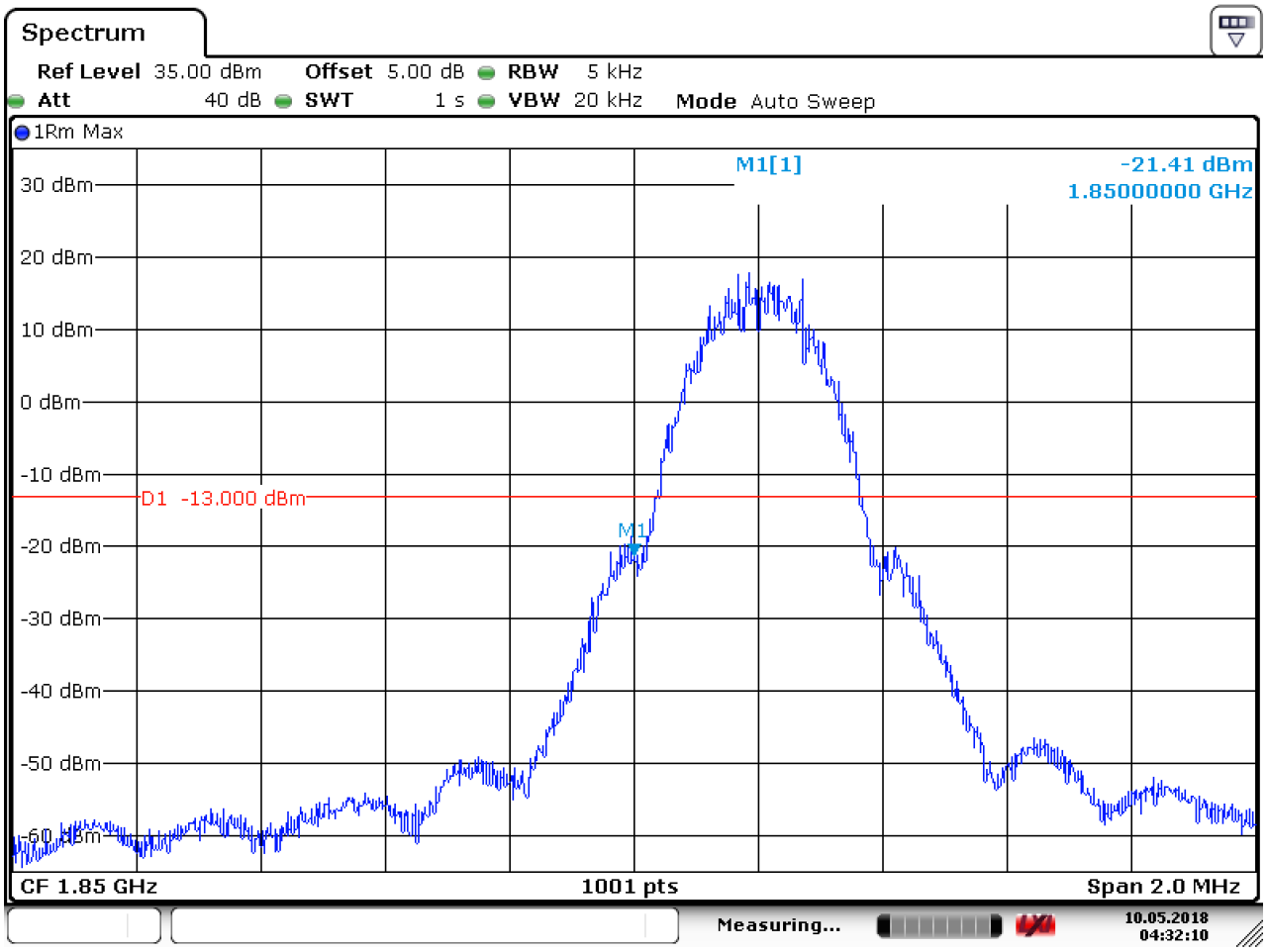
5.1.2.1.2 Test Channel = HCH



Date: 10.MAY.2018 04:54:19

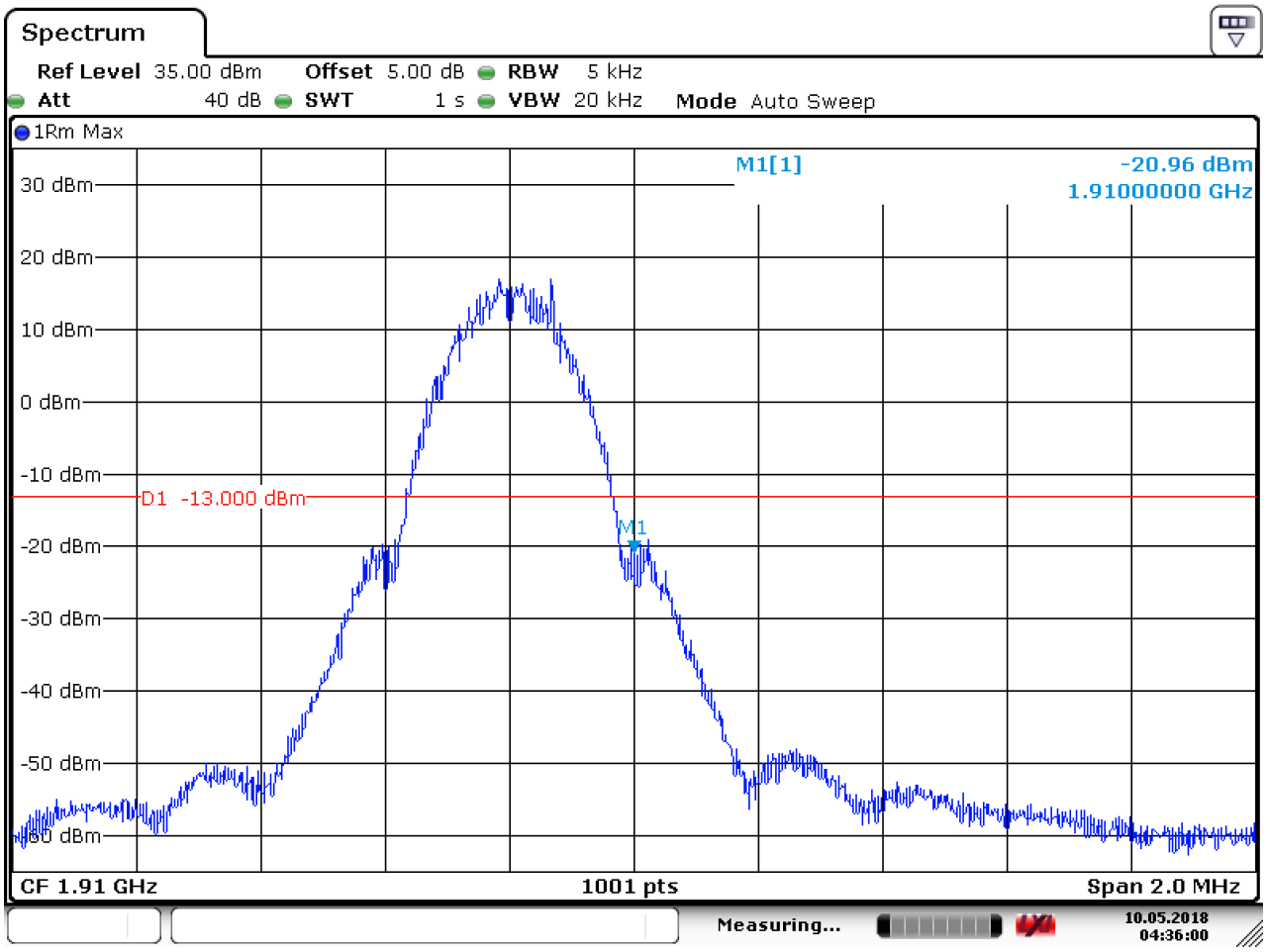
5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH



Date: 10.MAY.2018 04:32:10

5.1.2.2.2 Test Channel = HCH



Date: 10.MAY.2018 04:36:00

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.

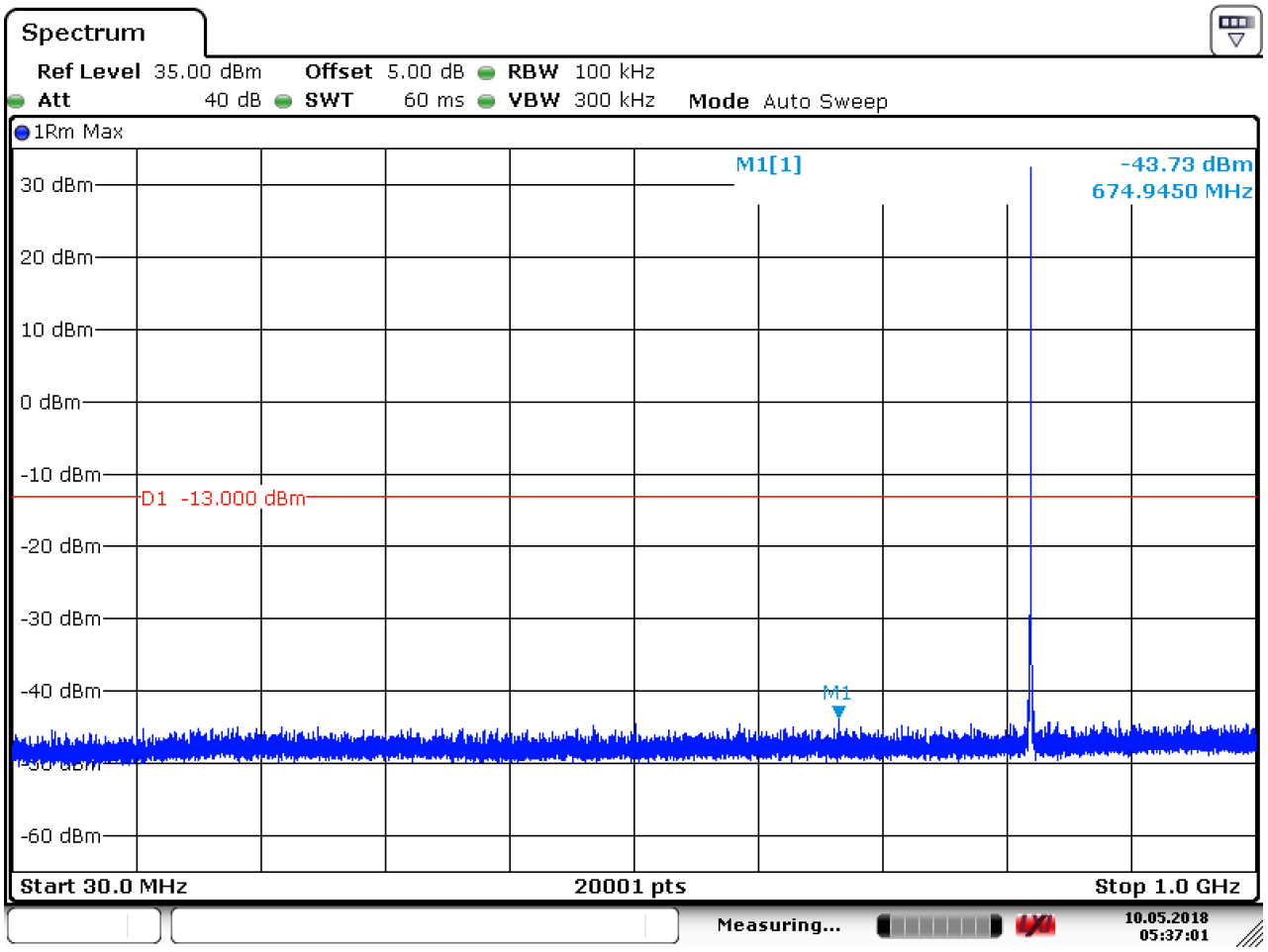
Part I - Test Plots

6.1 For GSM

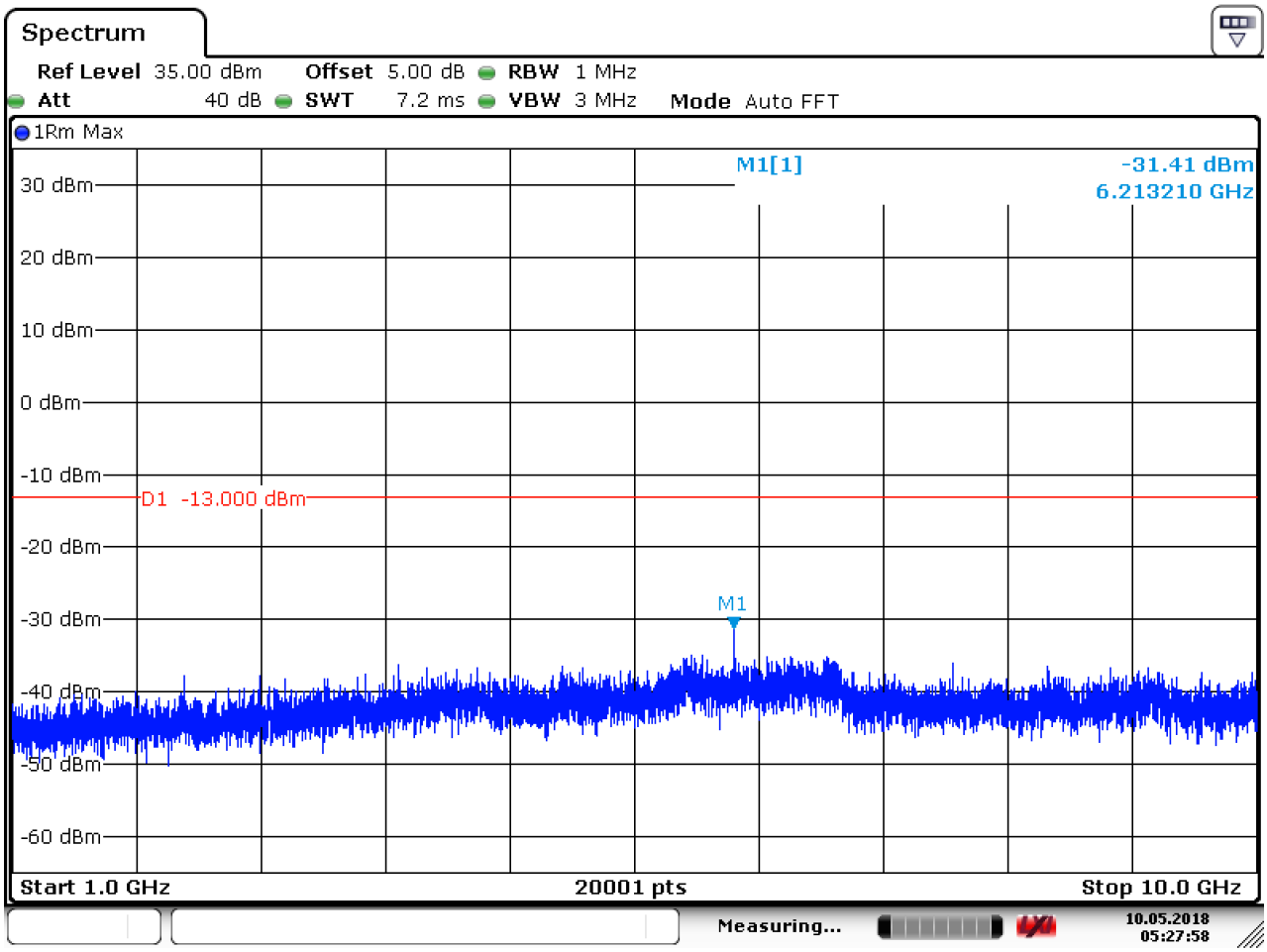
6.1.1 Test Band = GSM 850

6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

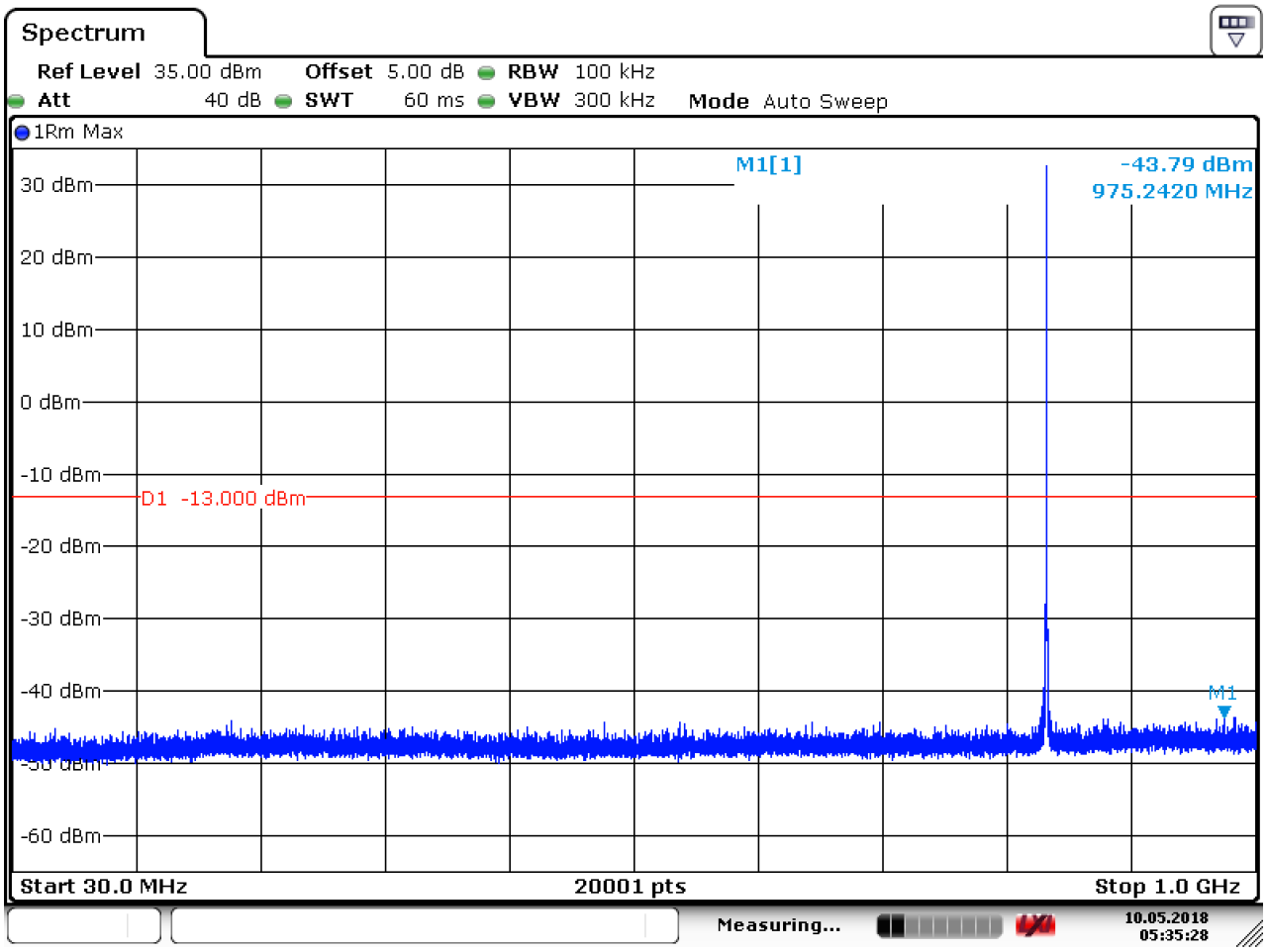


Date: 10.MAY.2018 05:37:02

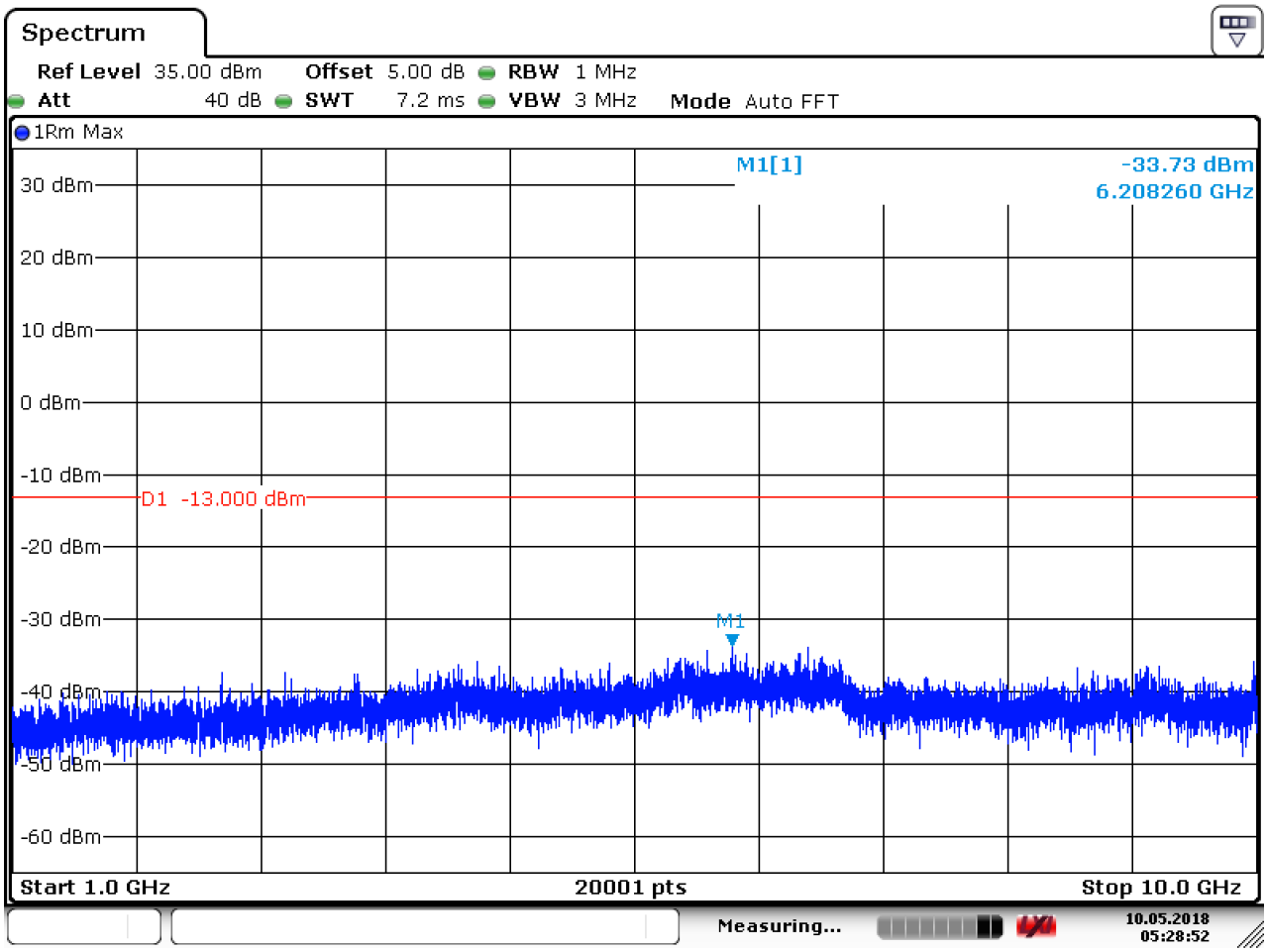


Date: 10.MAY.2018 05:27:58

6.1.1.1.2 Test Channel = MCH

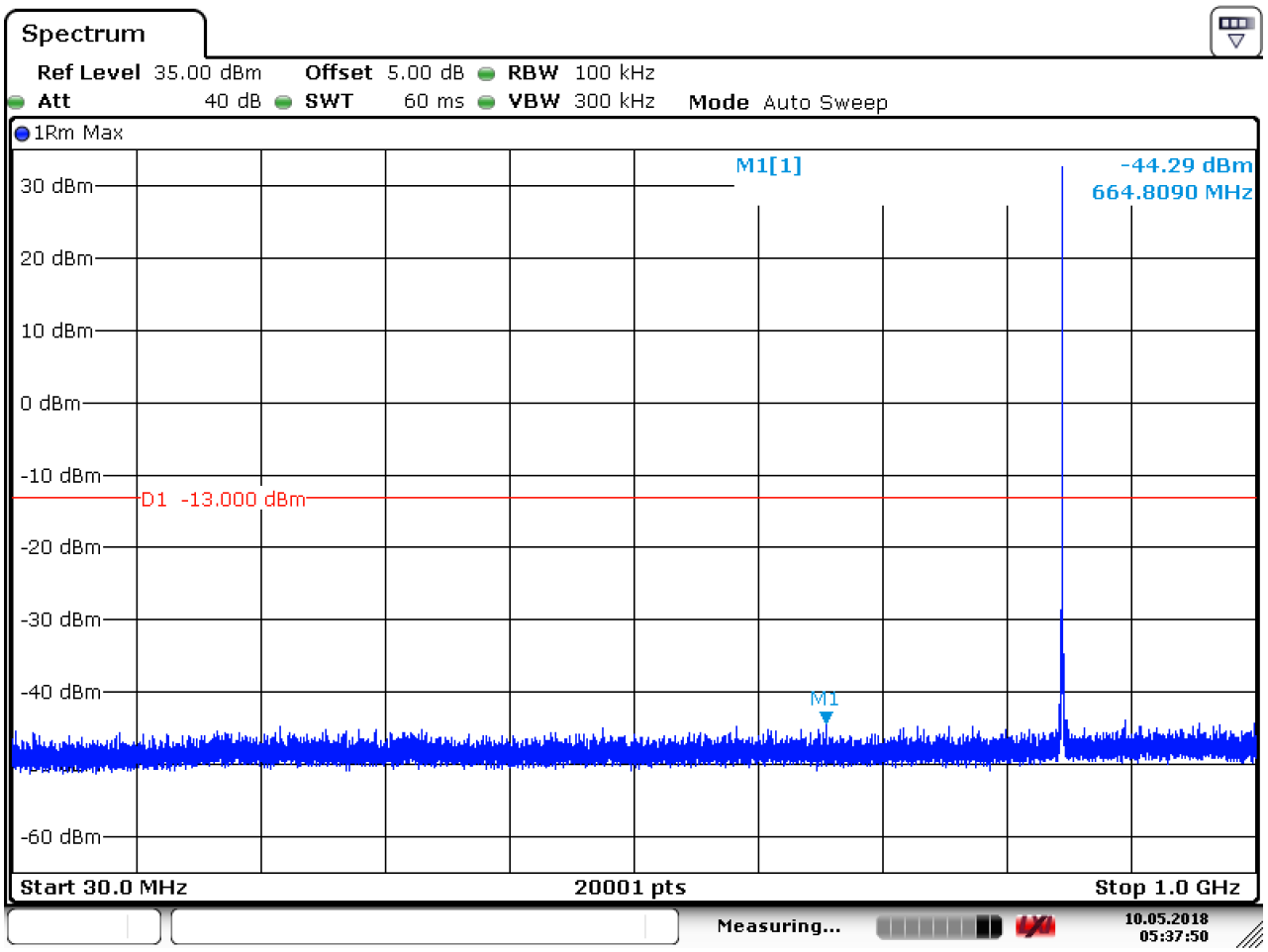


Date: 10.MAY.2018 05:35:28

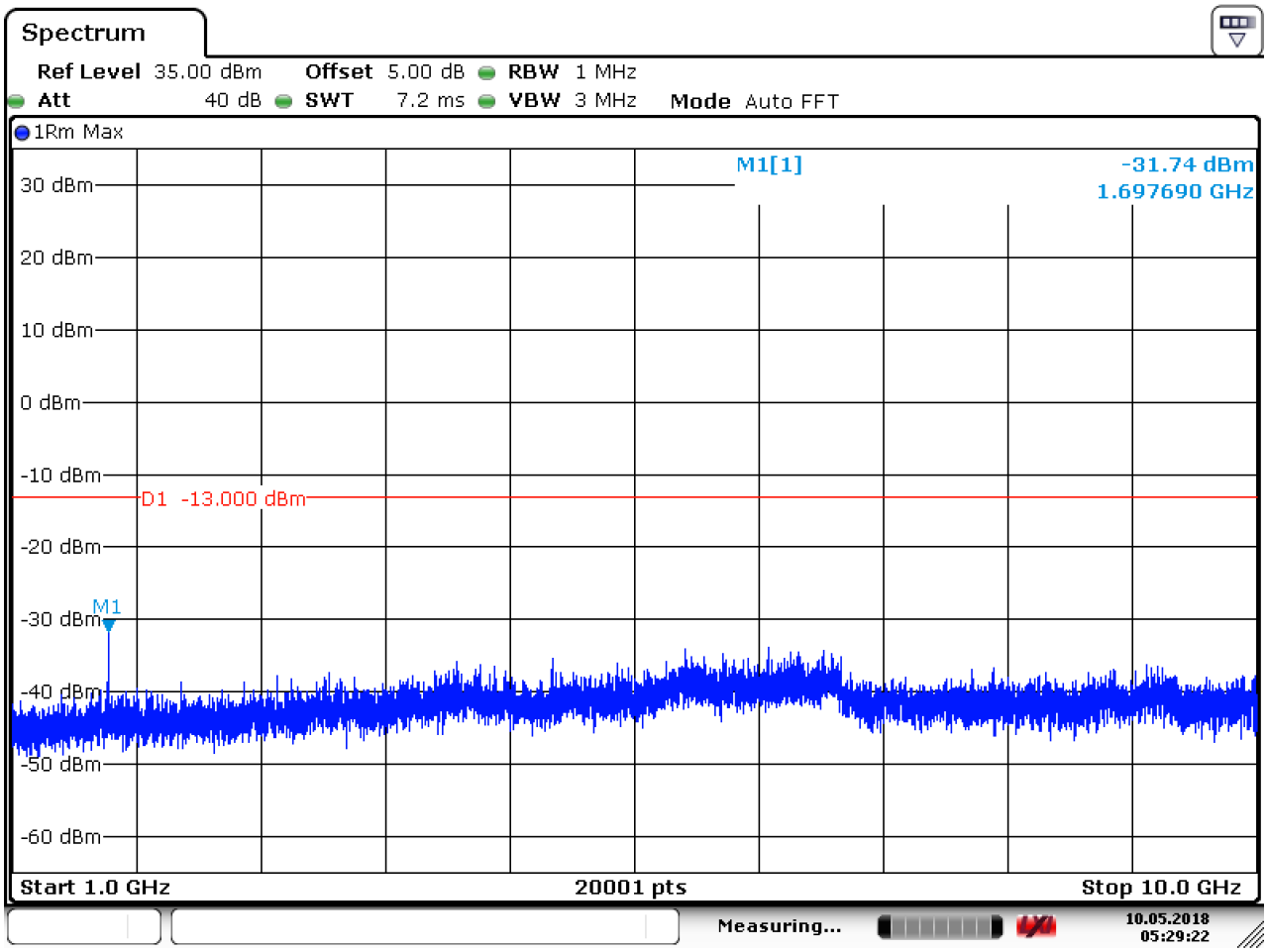


Date: 10.MAY.2018 05:28:52

6.1.1.1.3 Test Channel = HCH



Date: 10.MAY.2018 05:37:51

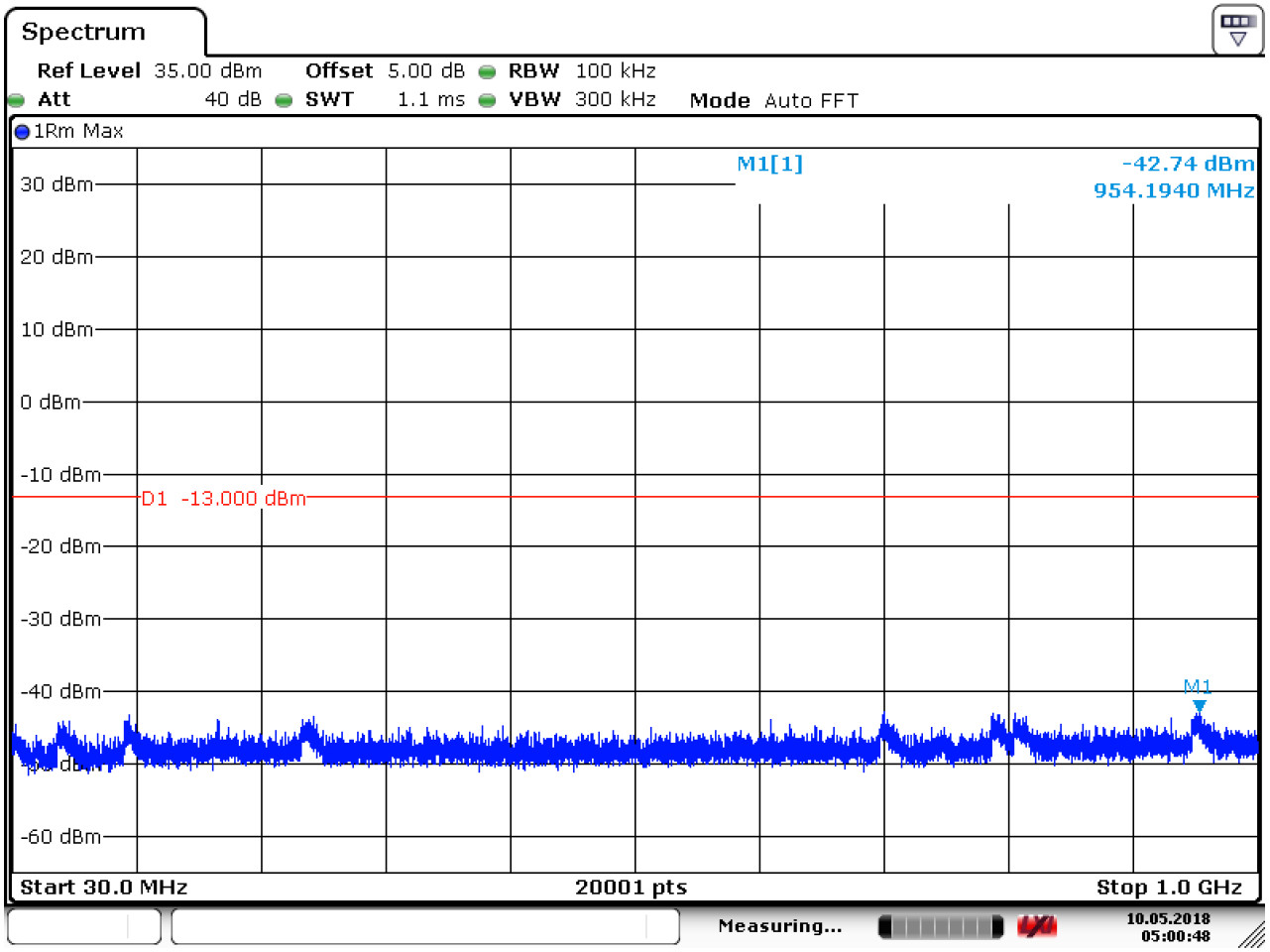


Date: 10.MAY.2018 05:29:22

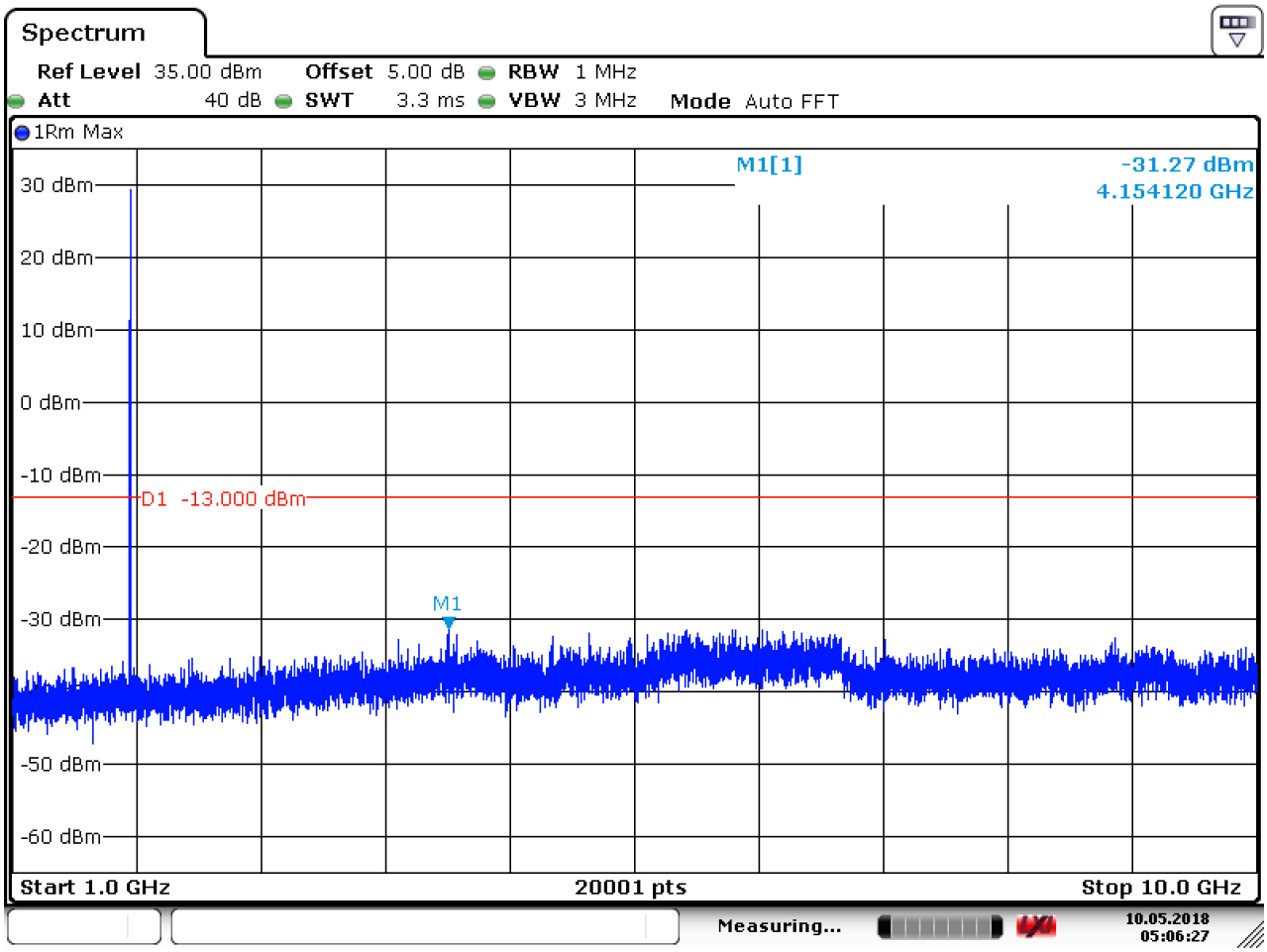
6.1.2 Test Band = GSM 1900

6.1.2.1 Test Mode = GSM/TM1

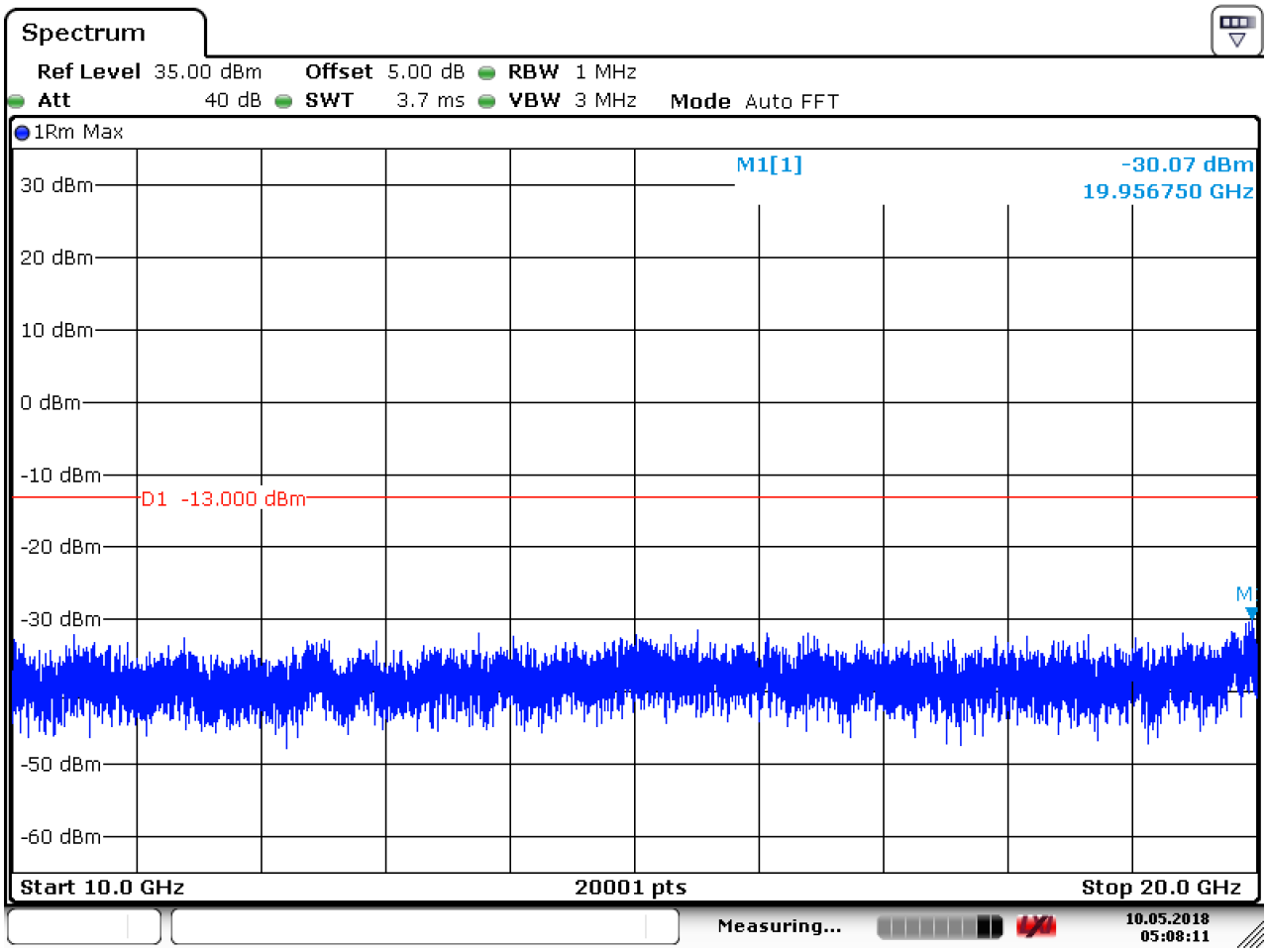
6.1.2.1.1 Test Channel = LCH



Date: 10.MAY.2018 05:00:49

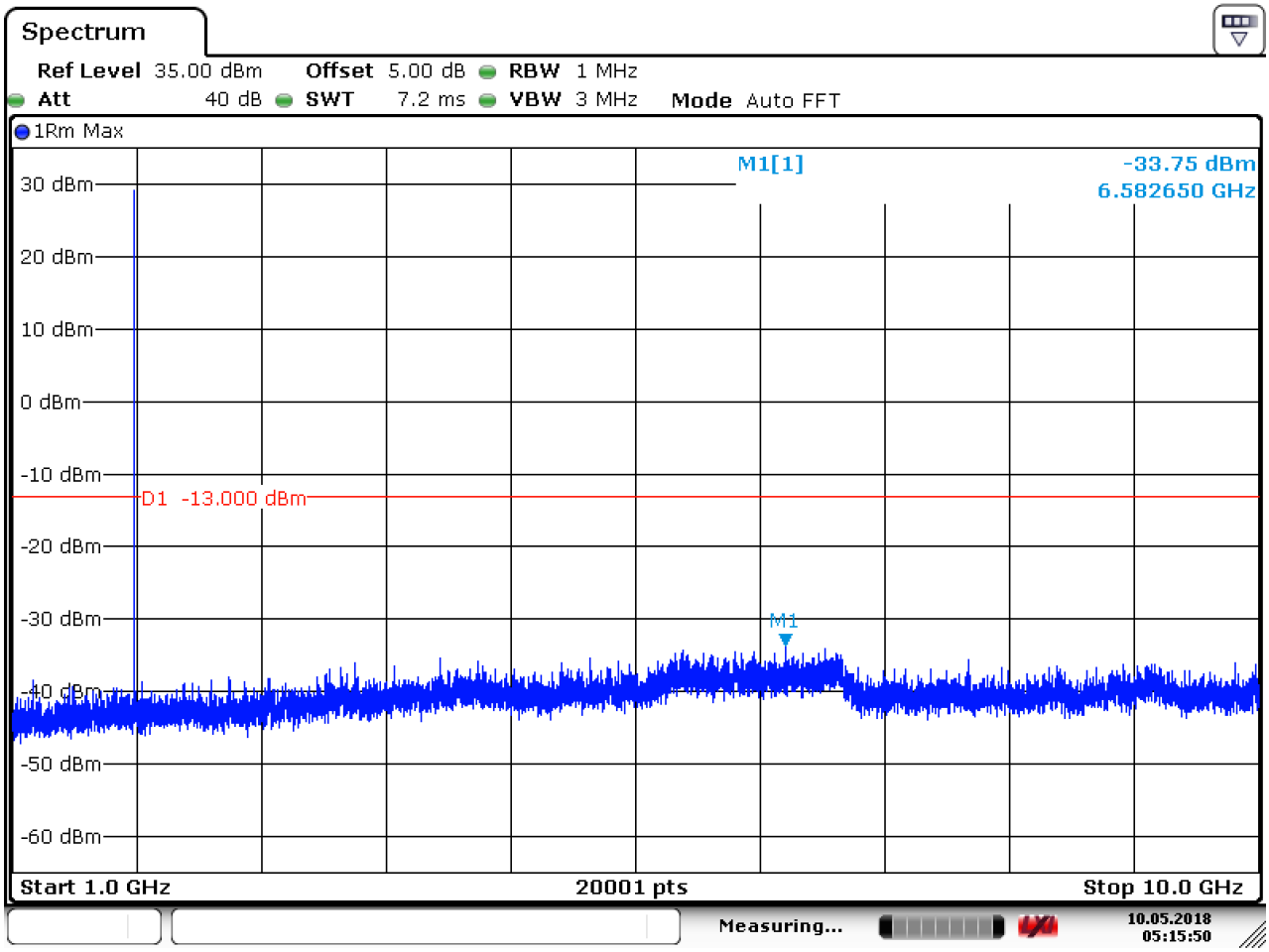


Date: 10.MAY.2018 05:06:27

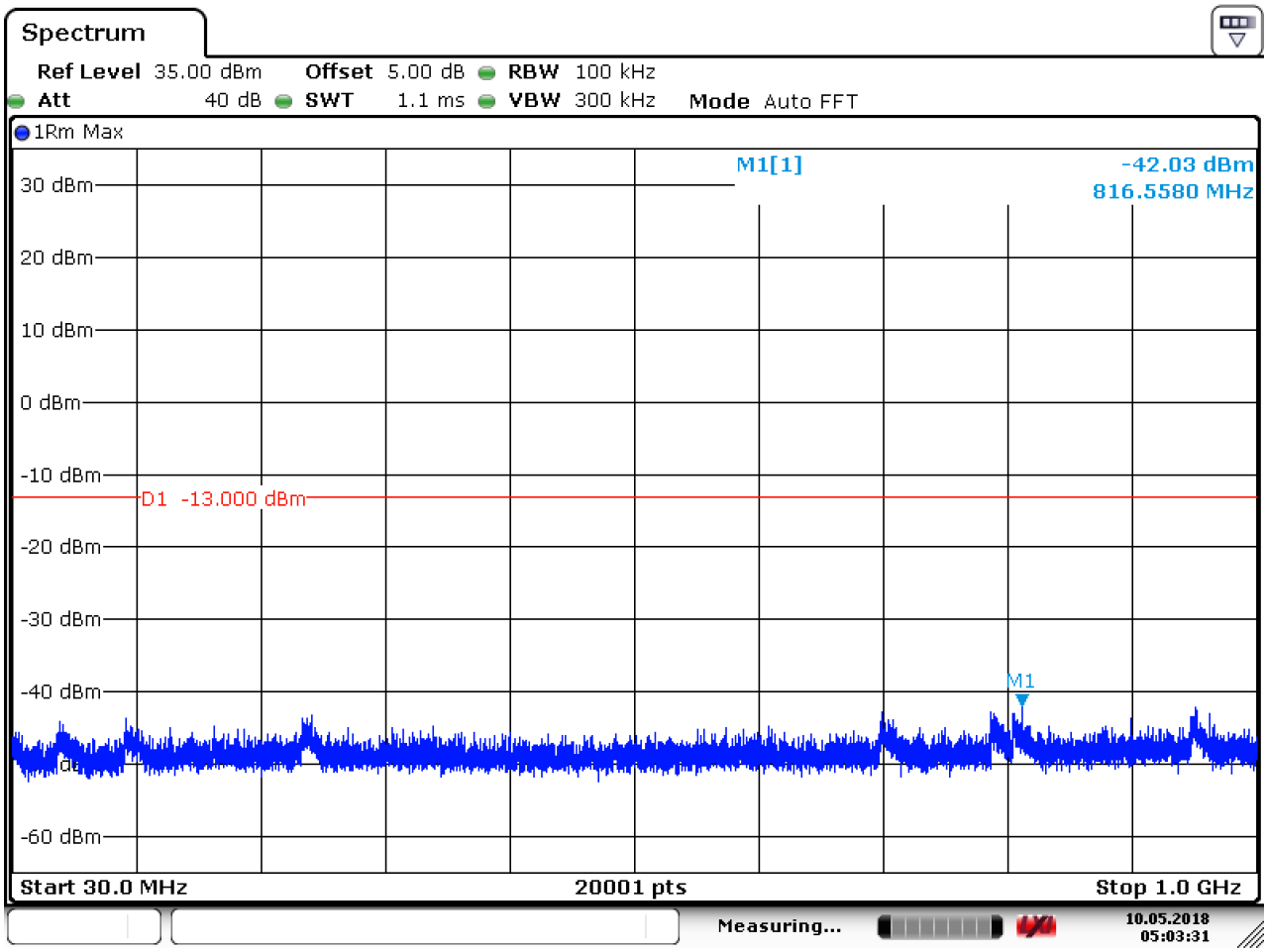


Date: 10.MAY.2018 05:08:12

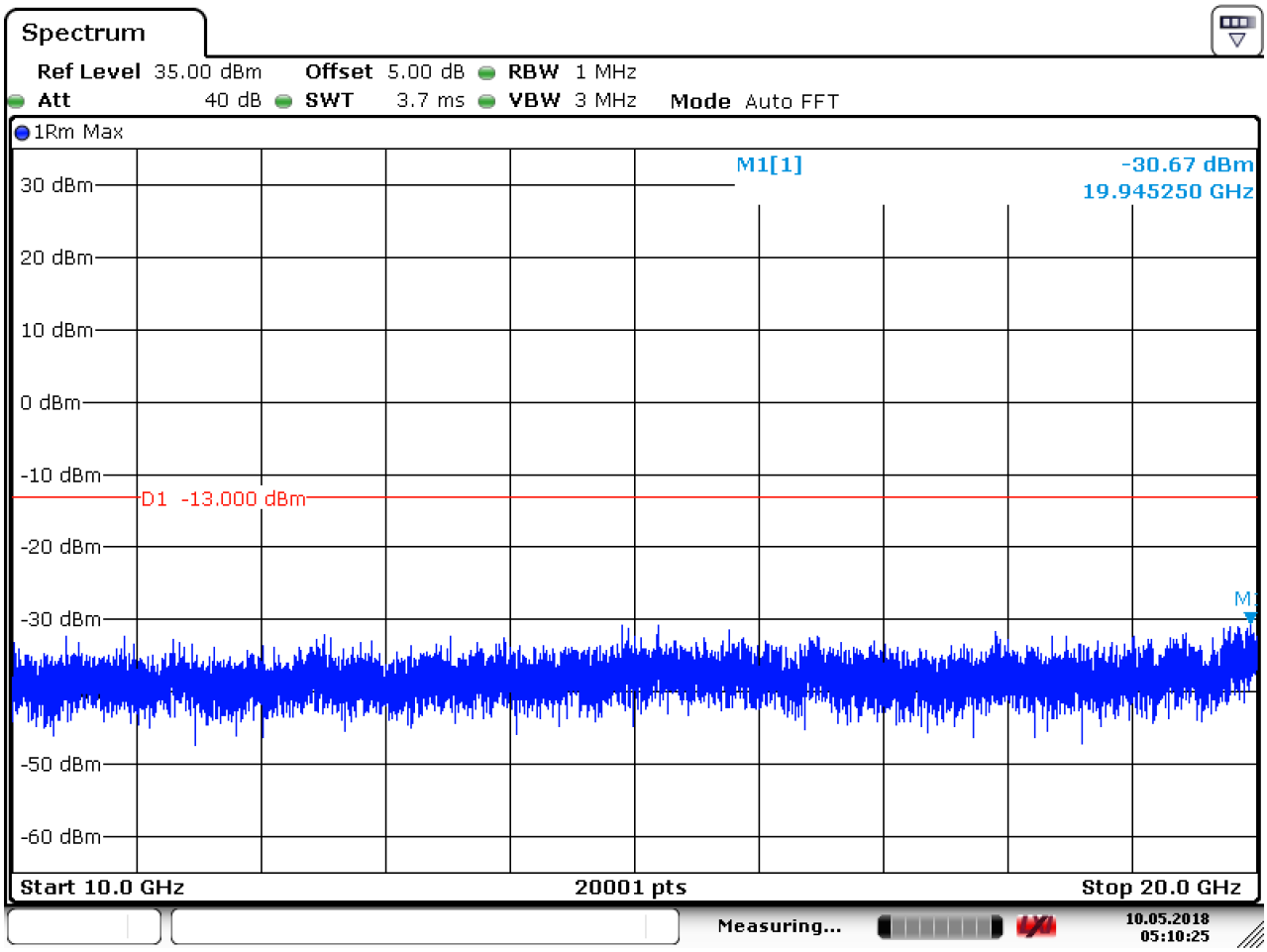
6.1.2.1.2 Test Channel = MCH



Date: 10.MAY.2018 05:15:50

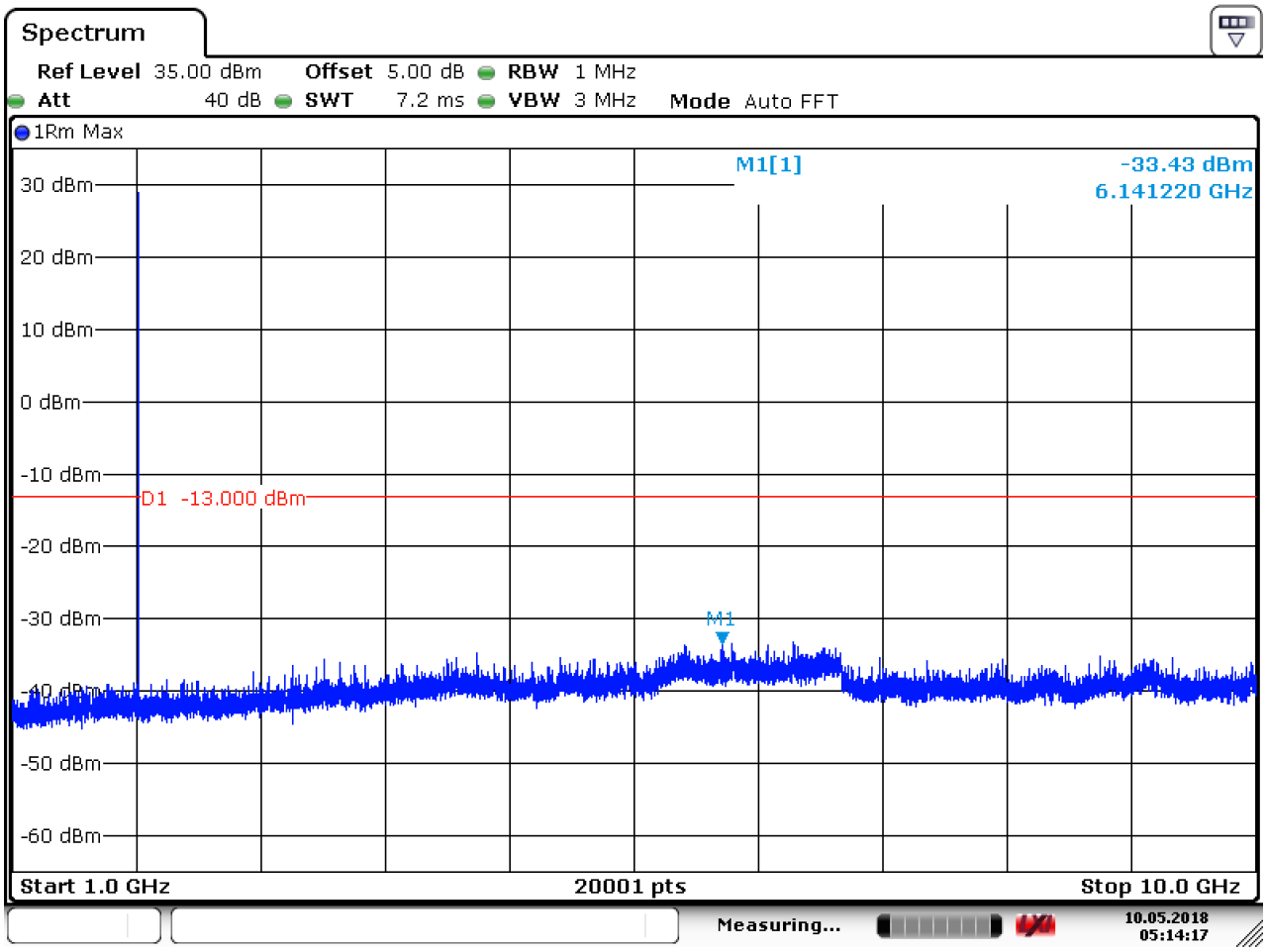


Date: 10.MAY.2018 05:03:30

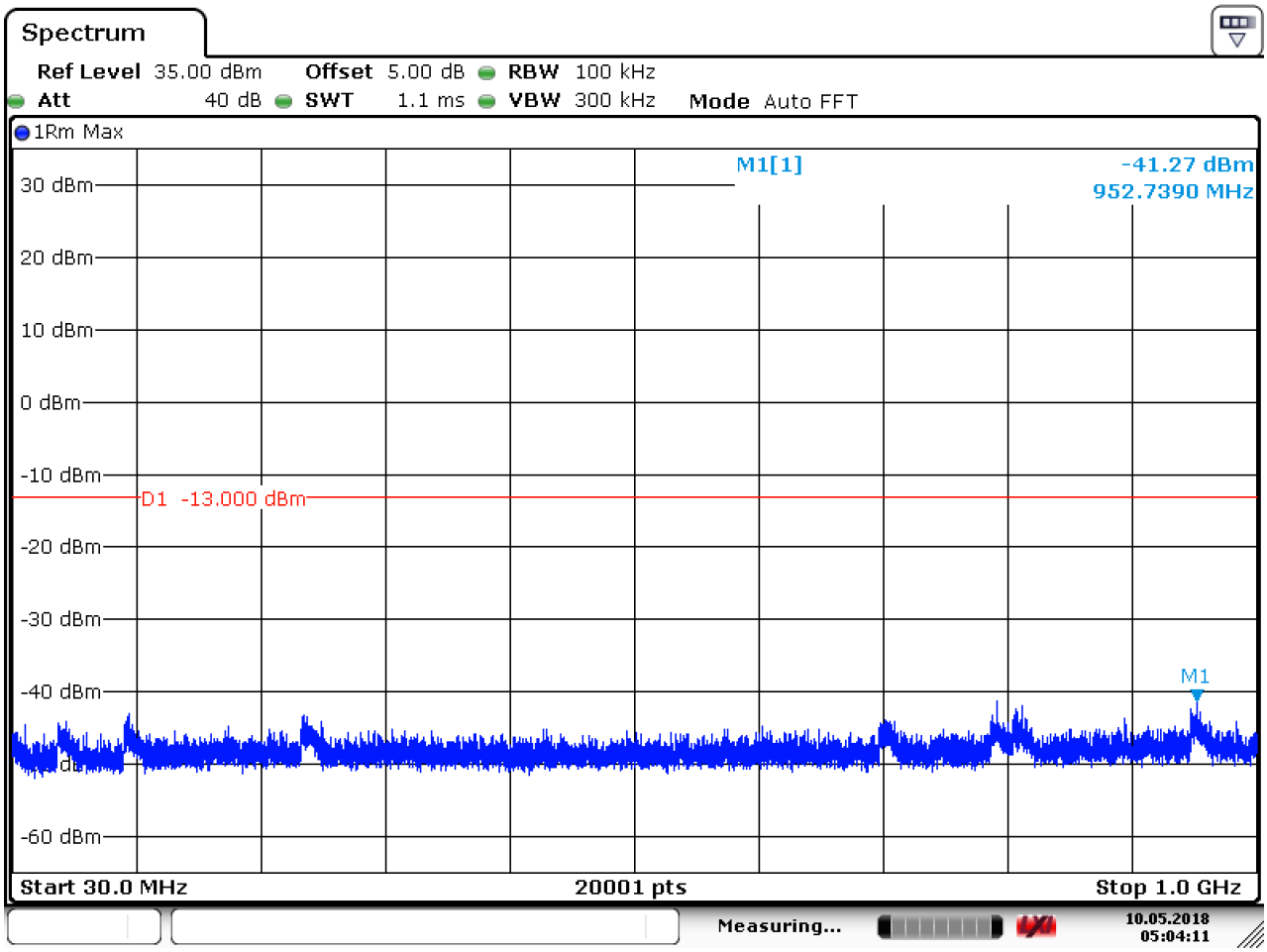


Date: 10.MAY.2018 05:10:25

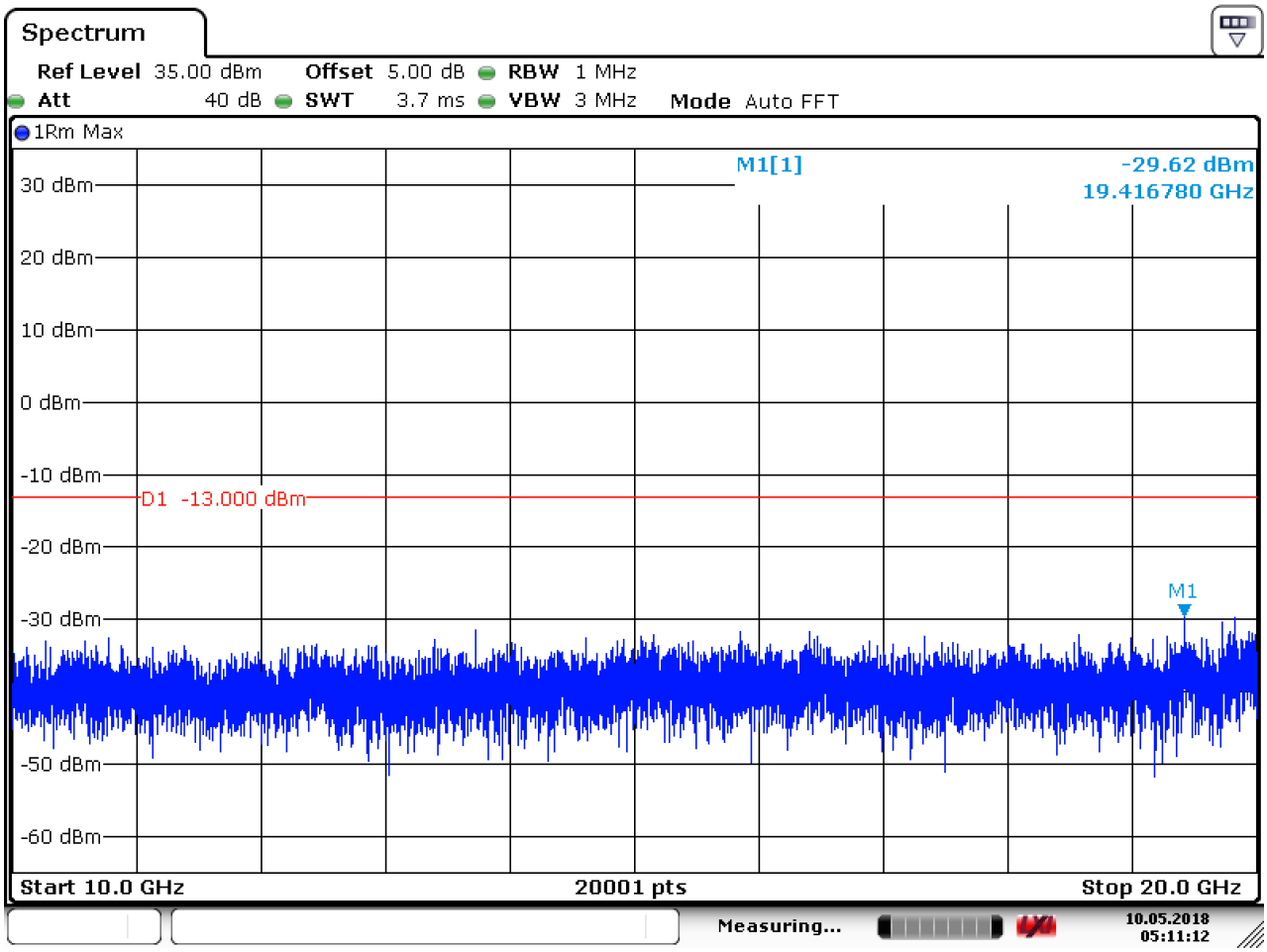
6.1.2.1.3 Test Channel = HCH



Date: 10.MAY.2018 05:14:18



Date: 10.MAY.2018 05:04:12



Date: 10.MAY.2018 05:11:12

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
62.543500	-74.22	-13.00	61.22	Vertical
125.011500	-82.87	-13.00	69.87	Vertical
1648.350000	-48.75	-13.00	35.75	Vertical
2589.375000	-42.98	-13.00	29.98	Vertical
3296.800000	-49.07	-13.00	36.07	Vertical
4120.700000	-52.18	-13.00	39.18	Vertical
62.010000	-69.31	-13.00	56.31	Horizontal
1648.275000	-50.44	-13.00	37.44	Horizontal
2472.600000	-42.79	-13.00	29.79	Horizontal
3296.800000	-47.77	-13.00	34.77	Horizontal
4121.050000	-51.51	-13.00	38.51	Horizontal
8241.950000	-48.53	-13.00	35.53	Horizontal

7.1.1.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
63.077000	-75.08	-13.00	62.08	Vertical
122.974500	-81.70	-13.00	68.70	Vertical
354.125500	-74.52	-13.00	61.52	Vertical
1824.300000	-42.38	-13.00	29.38	Vertical
2586.675000	-42.42	-13.00	29.42	Vertical
3346.150000	-45.94	-13.00	32.94	Vertical
62.252500	-70.54	-13.00	57.54	Horizontal
239.956500	-75.71	-13.00	62.71	Horizontal
437.497000	-70.08	-13.00	57.08	Horizontal
1673.250000	-48.38	-13.00	35.38	Horizontal
2587.875000	-42.77	-13.00	29.77	Horizontal
3346.150000	-46.24	-13.00	33.24	Horizontal

7.1.1.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
61.379500	-75.84	-13.00	62.84	Vertical
124.090000	-82.72	-13.00	69.72	Vertical
400.006500	-70.72	-13.00	57.72	Vertical
1697.700000	-48.51	-13.00	35.51	Vertical
2546.850000	-48.43	-13.00	35.43	Vertical
8487.300000	-50.08	-13.00	37.08	Vertical
61.913000	-70.23	-13.00	57.23	Horizontal
240.005000	-76.14	-13.00	63.14	Horizontal
437.497000	-69.56	-13.00	56.56	Horizontal
1697.550000	-46.41	-13.00	33.41	Horizontal
2478.900000	-38.42	-13.00	25.42	Horizontal
3395.500000	-44.97	-13.00	31.97	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
64.629000	-74.21	-13.00	61.21	Vertical
104.302000	-58.33	-13.00	45.33	Vertical
212.505500	-69.18	-13.00	56.18	Vertical
3700.350000	-49.53	-13.00	36.53	Vertical
6135.650000	-53.55	-13.00	40.55	Vertical
9251.350000	-50.66	-13.00	37.66	Vertical
62.252500	-69.48	-13.00	56.48	Horizontal
104.302000	-62.86	-13.00	49.86	Horizontal
3699.650000	-49.65	-13.00	36.65	Horizontal
5550.450000	-53.56	-13.00	40.56	Horizontal
7400.900000	-51.28	-13.00	38.28	Horizontal
9250.300000	-49.31	-13.00	36.31	Horizontal

7.1.2.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
62.252500	-74.53	-13.00	61.53	Vertical
104.302000	-58.83	-13.00	45.83	Vertical
299.999500	-67.00	-13.00	54.00	Vertical
3739.200000	-50.50	-13.00	37.50	Vertical
6762.150000	-52.87	-13.00	39.87	Vertical
10670.400000	-51.04	-13.00	38.04	Vertical
62.689000	-69.56	-13.00	56.56	Horizontal
104.302000	-61.92	-13.00	48.92	Horizontal
212.505500	-66.91	-13.00	53.91	Horizontal
3738.850000	-49.39	-13.00	36.39	Horizontal
9348.650000	-46.96	-13.00	33.96	Horizontal
14959.200000	-51.71	-13.00	38.71	Horizontal

7.1.2.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
65.162500	-73.90	-13.00	60.90	Vertical
104.302000	-59.21	-13.00	46.21	Vertical
212.505500	-68.83	-13.00	55.83	Vertical
3819.350000	-54.94	-13.00	41.94	Vertical
6081.050000	-54.03	-13.00	41.03	Vertical
10634.000000	-51.41	-13.00	38.41	Vertical
63.077000	-69.30	-13.00	56.30	Horizontal
104.302000	-61.75	-13.00	48.75	Horizontal
212.457000	-67.27	-13.00	54.27	Horizontal
437.497000	-67.81	-13.00	54.81	Horizontal
3975.800000	-54.97	-13.00	41.97	Horizontal
7638.900000	-50.10	-13.00	37.10	Horizontal

NOTE:

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	7.59	0.00921	PASS
				VN	-0.97	-0.00118	PASS
				VH	-4.81	-0.00584	PASS
		MCH	TN	VL	3.39	0.00405	PASS
				VN	-5.48	-0.00654	PASS
				VH	-7.20	-0.00861	PASS
		HCH	TN	VL	9.28	0.01094	PASS
				VN	3.36	0.00395	PASS
				VH	7.19	0.00847	PASS
	GSM/TM2	LCH	TN	VL	2.67	0.00324	PASS
				VN	0.47	0.00057	PASS
				VH	9.82	0.01191	PASS
		MCH	TN	VL	3.33	0.00398	PASS
				VN	-9.30	-0.01112	PASS
				VH	3.83	0.00457	PASS
		HCH	TN	VL	-1.22	-0.00144	PASS
				VN	-2.04	-0.00240	PASS
				VH	-6.45	-0.00760	PASS

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	7.29	0.00394	PASS
				VN	9.09	0.00491	PASS
				VH	6.46	0.00349	PASS
		MCH	TN	VL	-1.65	-0.00088	PASS
				VN	-4.07	-0.00216	PASS
				VH	3.05	0.00162	PASS
		HCH	TN	VL	-5.54	-0.00290	PASS
				VN	-3.49	-0.00183	PASS
				VH	8.59	0.00450	PASS
	GSM/TM2	LCH	TN	VL	7.75	0.00419	PASS
				VN	4.86	0.00262	PASS
				VH	-5.10	-0.00276	PASS
		MCH	TN	VL	-6.87	-0.00365	PASS
				VN	7.20	0.00383	PASS
				VH	7.10	0.00377	PASS
		HCH	TN	VL	5.82	0.00305	PASS
				VN	-6.99	-0.00366	PASS
				VH	8.19	0.00429	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
GSM 850	GSM/TM1	LCH	VN	-30	-0.64	-0.00077	PASS
				-20	3.05	0.00370	PASS
				-10	8.12	0.00985	PASS
				0	8.69	0.01055	PASS
				10	2.97	0.00361	PASS
				20	-5.47	-0.00663	PASS
				30	7.41	0.00900	PASS
				40	8.87	0.01076	PASS
				50	-3.88	-0.00470	PASS
		MCH	VN	-30	-5.19	-0.00621	PASS
				-20	4.97	0.00594	PASS
				-10	7.03	0.00840	PASS
				0	-5.09	-0.00609	PASS
				10	-0.67	-0.00080	PASS
				20	3.41	0.00408	PASS
				30	2.28	0.00272	PASS
				40	-0.43	-0.00052	PASS
				50	-7.34	-0.00878	PASS
		HCH	VN	-30	3.87	0.00456	PASS
				-20	3.21	0.00378	PASS
				-10	-7.88	-0.00928	PASS
				0	-7.74	-0.00912	PASS
				10	-4.07	-0.00479	PASS
				20	8.68	0.01023	PASS
				30	9.36	0.01102	PASS
				40	-5.29	-0.00623	PASS
				50	8.81	0.01038	PASS

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	-8.97	-0.01088	PASS
				-20	8.79	0.01067	PASS
				-10	5.78	0.00701	PASS
				0	-8.65	-0.01049	PASS
				10	0.98	0.00119	PASS
				20	4.92	0.00597	PASS
				30	-4.23	-0.00513	PASS
				40	0.59	0.00072	PASS
				50	5.87	0.00712	PASS
		MCH	VN	-30	0.47	0.00056	PASS
				-20	-3.13	-0.00374	PASS
				-10	-7.48	-0.00894	PASS
				0	-7.86	-0.00940	PASS
				10	-0.83	-0.00100	PASS
				20	-5.26	-0.00628	PASS
				30	3.77	0.00451	PASS
				40	-0.89	-0.00107	PASS
				50	1.22	0.00145	PASS
		HCH	VN	-30	2.86	0.00337	PASS
				-20	-6.31	-0.00744	PASS
				-10	-3.03	-0.00358	PASS
				0	-2.55	-0.00300	PASS
				10	4.79	0.00564	PASS
				20	3.95	0.00465	PASS
				30	-1.52	-0.00179	PASS
				40	-4.98	-0.00586	PASS
				50	3.61	0.00426	PASS

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	0.46	0.00025	PASS
				-20	2.92	0.00158	PASS
				-10	7.42	0.00401	PASS
				0	-3.21	-0.00173	PASS
				10	-5.91	-0.00319	PASS
				20	5.14	0.00278	PASS
				30	-5.40	-0.00292	PASS
				40	-4.94	-0.00267	PASS
				50	8.27	0.00447	PASS
		MCH	VN	-30	-5.51	-0.00293	PASS
				-20	3.02	0.00161	PASS
				-10	-7.80	-0.00415	PASS
				0	-0.69	-0.00036	PASS
				10	6.64	0.00353	PASS
				20	-8.81	-0.00469	PASS
				30	-3.95	-0.00210	PASS
				40	-4.35	-0.00231	PASS
				50	7.56	0.00402	PASS
		HCH	VN	-30	0.44	0.00023	PASS
				-20	7.31	0.00383	PASS
				-10	9.53	0.00499	PASS
				0	-8.35	-0.00437	PASS
				10	9.45	0.00495	PASS
				20	-8.74	-0.00457	PASS
				30	9.82	0.00514	PASS
				40	6.51	0.00341	PASS
				50	-0.32	-0.00017	PASS

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	-2.61	-0.00141	PASS
				-20	-7.56	-0.00408	PASS
				-10	-7.04	-0.00381	PASS
				0	6.10	0.00330	PASS
				10	-3.98	-0.00215	PASS
				20	6.16	0.00333	PASS
				30	-8.06	-0.00435	PASS
				40	3.04	0.00164	PASS
				50	-7.01	-0.00379	PASS
		MCH	VN	-30	-5.76	-0.00306	PASS
				-20	7.15	0.00381	PASS
				-10	6.96	0.00370	PASS
				0	-2.92	-0.00156	PASS
				10	4.88	0.00260	PASS
				20	-2.88	-0.00153	PASS
				30	5.89	0.00313	PASS
				40	9.00	0.00479	PASS
				50	-2.94	-0.00157	PASS
		HCH	VN	-30	5.56	0.00291	PASS
				-20	-2.66	-0.00139	PASS
				-10	5.12	0.00268	PASS
				0	-9.86	-0.00516	PASS
				10	-1.86	-0.00097	PASS
				20	8.55	0.00448	PASS
				30	8.28	0.00434	PASS
				40	-1.97	-0.00103	PASS
				50	-3.36	-0.00176	PASS

The End