Appendix for test report

1Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	ERP [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	32.8	28.05	38.5	PASS
		MCH	32.98	28.23	38.5	PASS
		HCH	32.71	27.96	38.5	PASS
	GSM/TM2	LCH	26.28	21.53	38.5	PASS
		MCH	26.27	21.52	38.5	PASS
		HCH	26.22	21.47	38.5	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.5	27.48	33	PASS
		MCH	29.39	27.37	33	PASS
		HCH	29.61	27.59	33	PASS
	GSM/TM2	LCH	25.46	23.44	33	PASS
		MCH	25.42	23.4	33	PASS
		HCH	25.4	23.38	33	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	ERP/EIRP [dBm]	Limit [dBm]	Verdict
WCDMA1900	UMTS/TM1	LCH	23.67	21.65	33	PASS
		MCH	23.5	21.48	33	PASS
		HCH	23.48	21.46	33	PASS
WCDMA1700	UMTS/TM1	LCH	22.77	21.63	30	PASS
		MCH	22.93	21.79	30	PASS
		HCH	22.83	21.69	30	PASS
WCDMA850	UMTS/TM1	LCH	23.54	18.79	38.5	PASS
		MCH	23.61	18.86	38.5	PASS
		HCH	23.53	18.78	38.5	PASS

Note1:

a, For getting the ERP (Efficient Radiated Power) or 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

Note2: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS

2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM1900	GSM/TM1	LCH	0.19	13	PASS
		MCH	0.17	13	PASS
		HCH	0.18	13	PASS
	GSM/TM2	LCH	3.12	13	PASS
		MCH	3.2	13	PASS
		HCH	3.24	13	PASS

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA1900	UMTS/TM1	LCH	3.09	13	PASS
		MCH	3.11	13	PASS
		HCH	2.87	13	PASS
WCDMA1700	UMTS/TM1	LCH	2.97	13	PASS
		MCH	3.23	13	PASS
		HCH	2.9	13	PASS

3Appendix_C: Modulation Characteristics

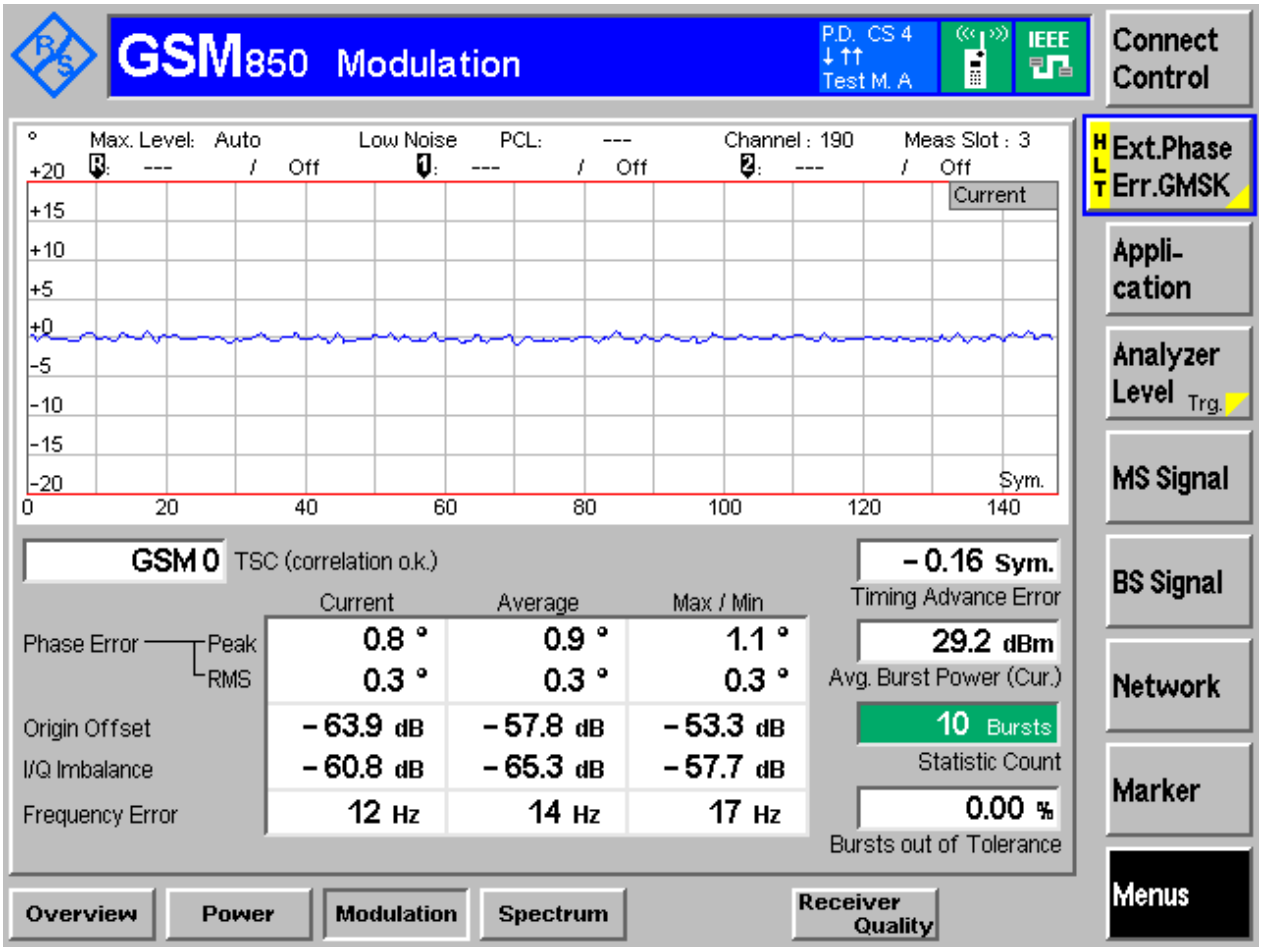
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

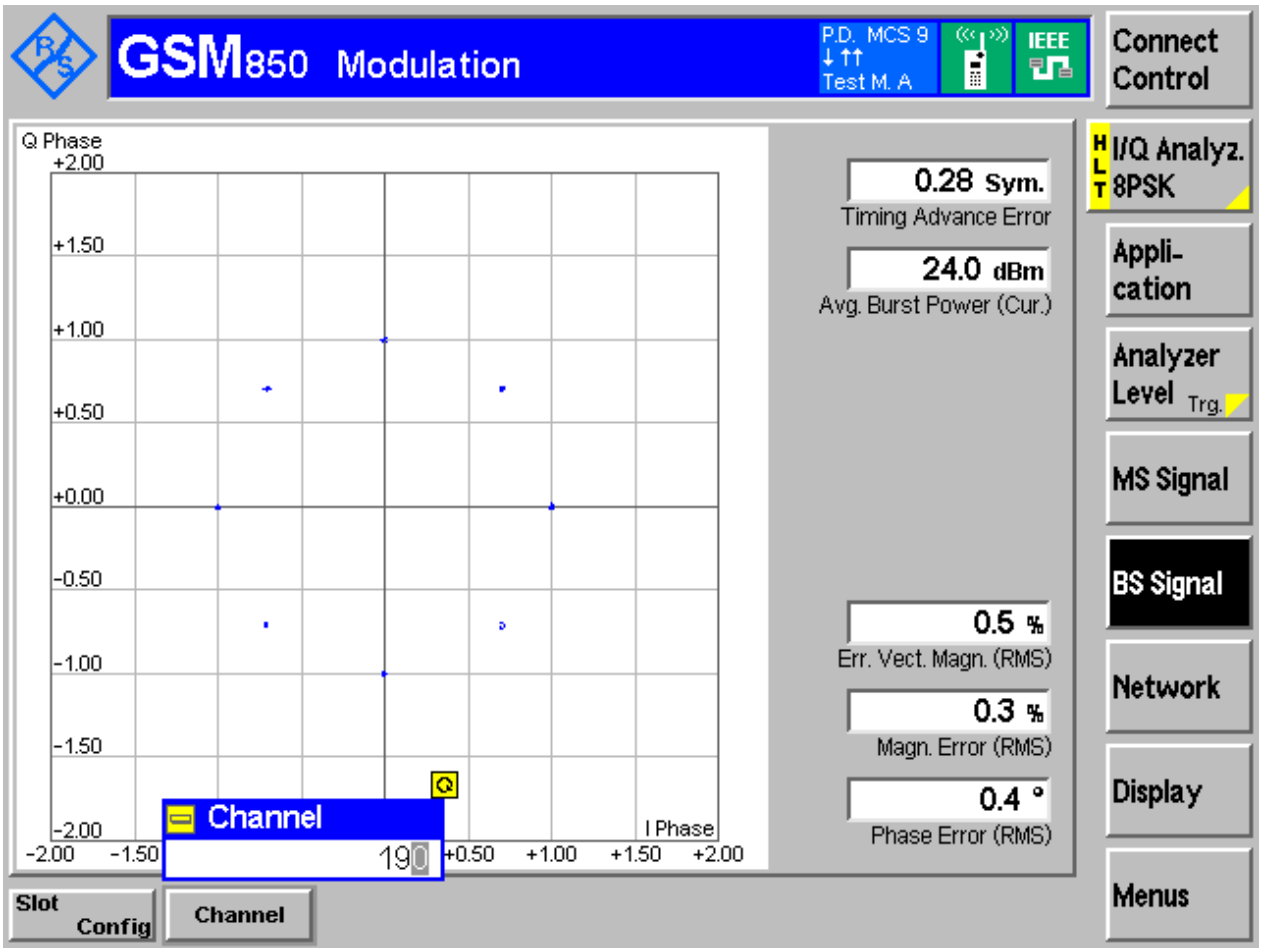
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

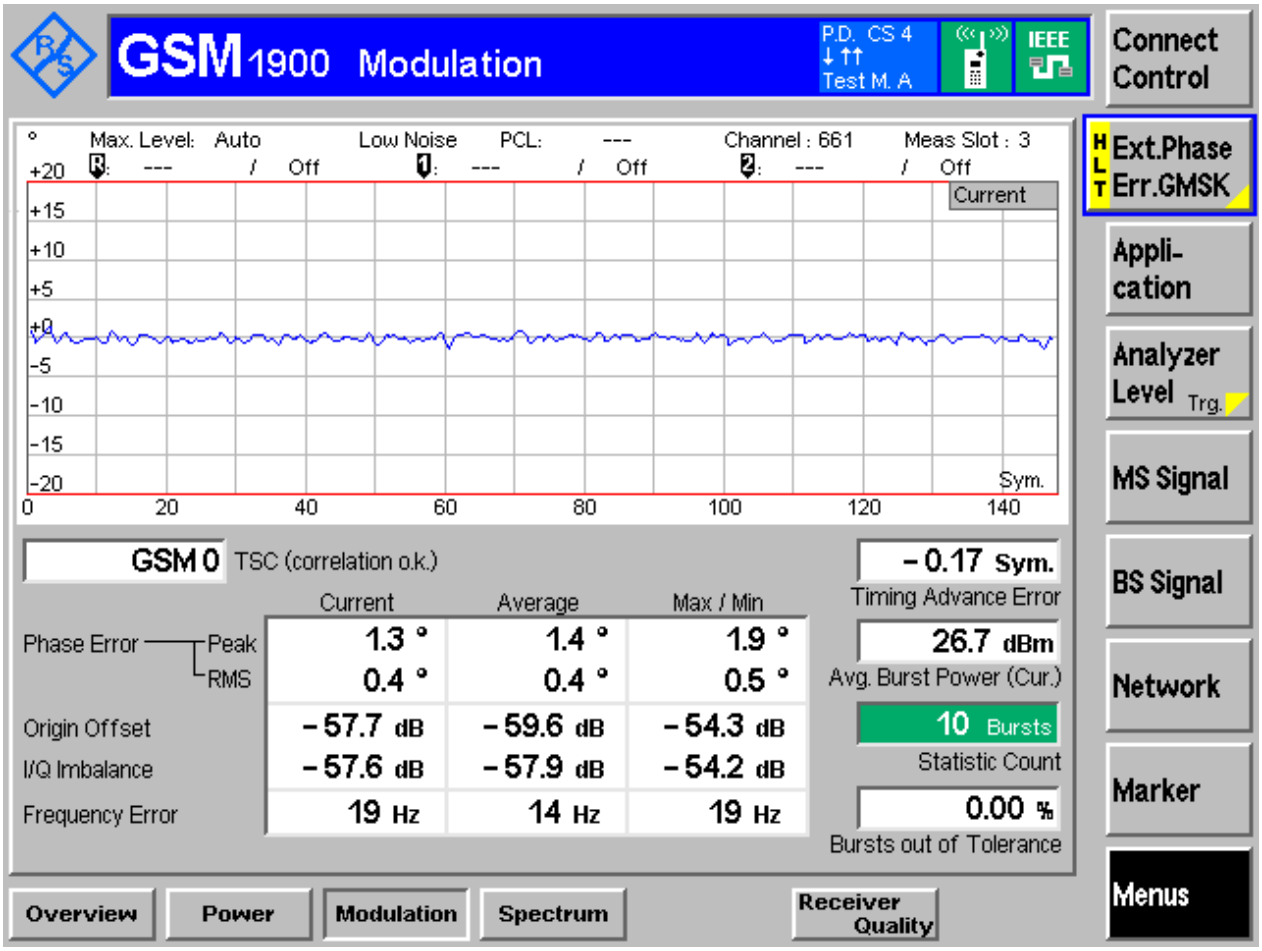
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

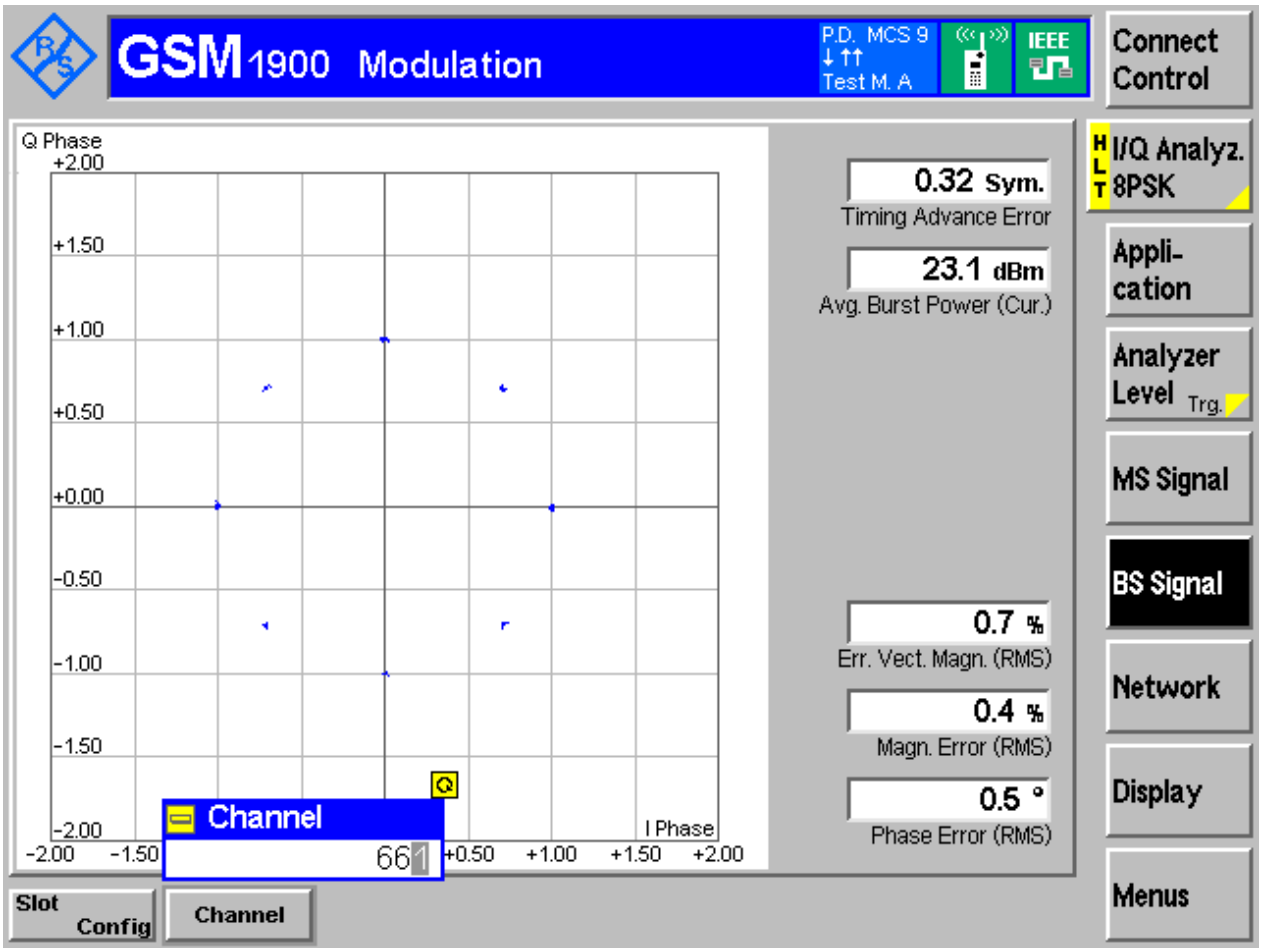
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH

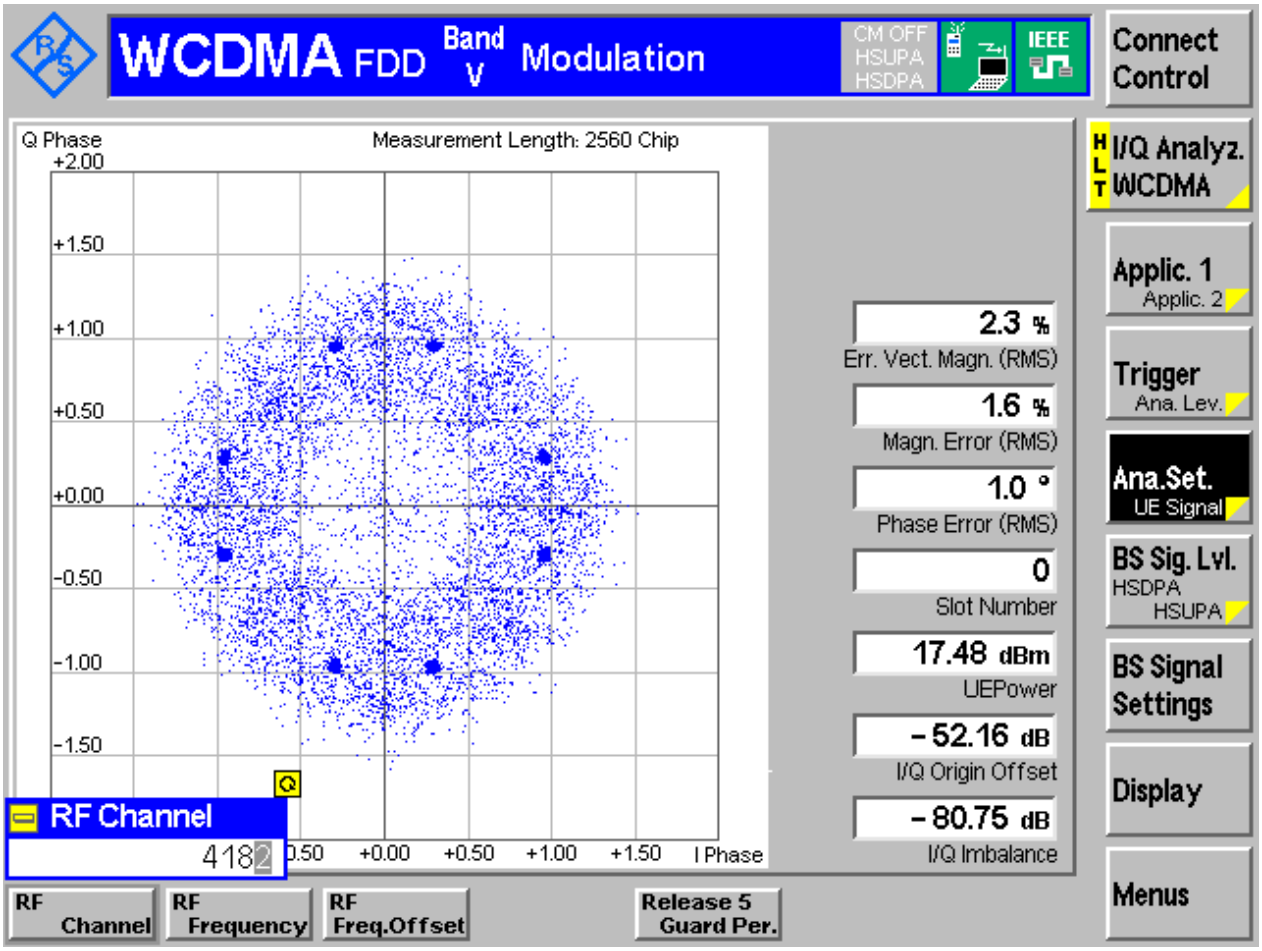


3.2 For UMTS

3.2.1 Test Band = WCDMA850

3.2.1.1 Test Mode = UMTS/TM1

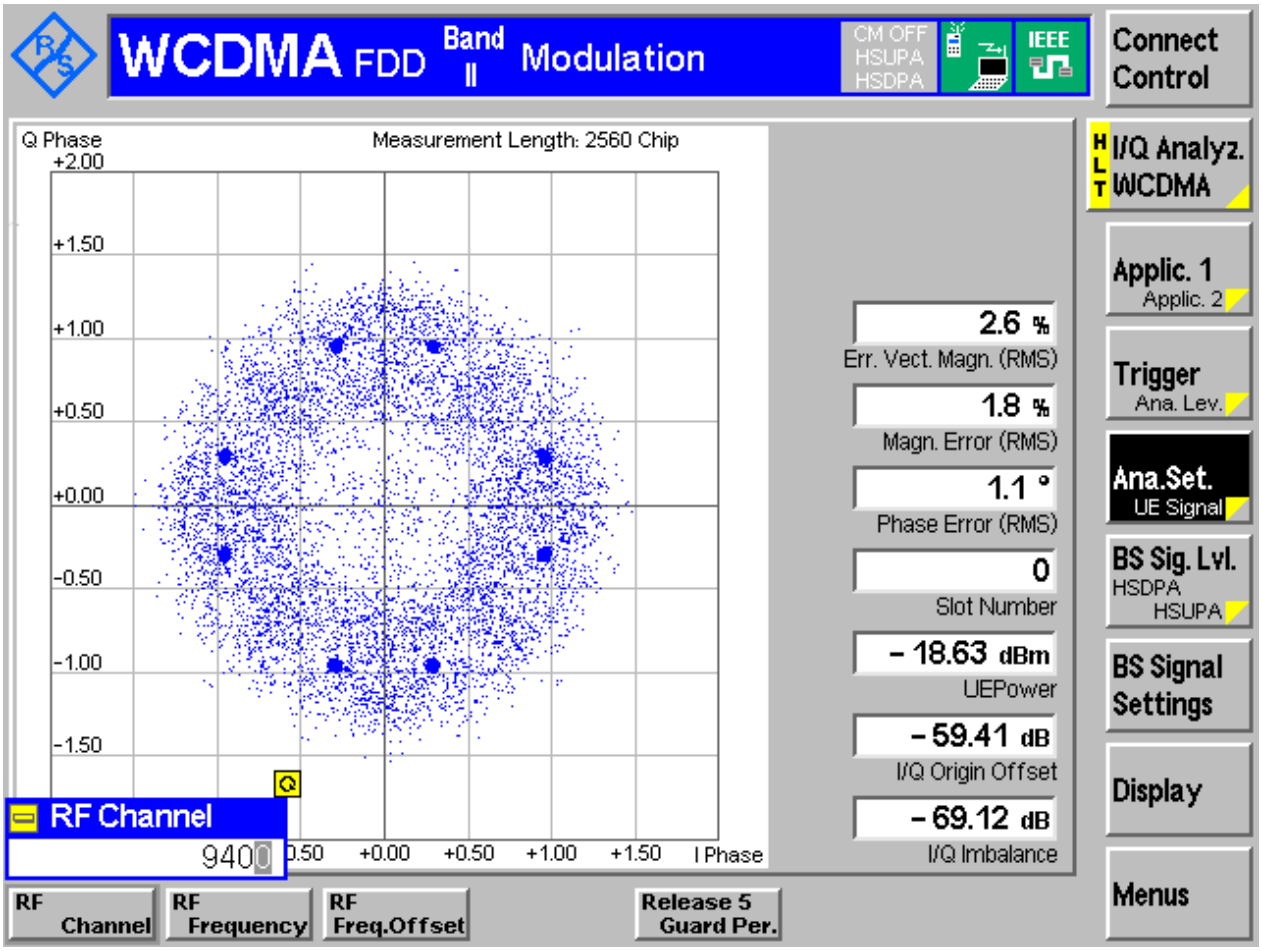
3.2.1.1.1 Test Channel = MCH



3.2.2 Test Band = WCDMA1900

3.2.2.1 Test Mode = UMTS/TM1

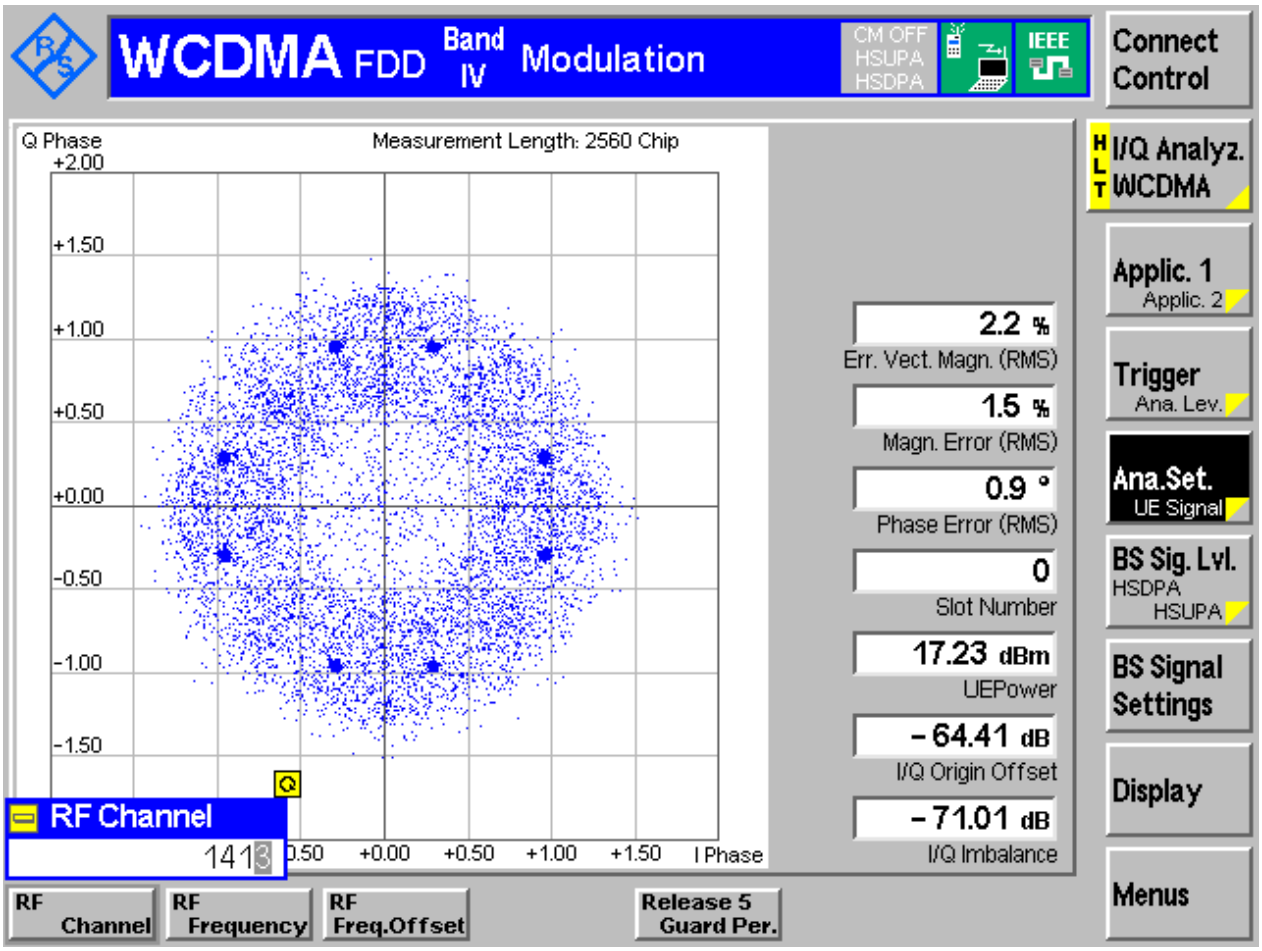
3.2.2.1.1 Test Channel = MCH



3.2.4 Test Band = WCDMA1700

3.2.4.1 Test Mode = UMTS/TM1

3.2.4.1.1 Test Channel = MCH



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM850	GSM/TM1	LCH	243.89	312.16	Pass
		MCH	245.54	313.40	Pass
		HCH	246.51	318.98	Pass
	GSM/TM2	LCH	238.79	302.64	Pass
		MCH	240.65	295.88	Pass
		HCH	234.05	312.77	Pass
GSM1900	GSM/TM1	LCH	242.65	310.85	Pass
		MCH	242.56	316.94	Pass
		HCH	244.05	316.29	Pass
	GSM/TM2	LCH	239.62	314.92	Pass
		MCH	245.86	313.85	Pass
		HCH	243.09	310.10	Pass

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.15	4.73	Pass
		MCH	4.13	4.72	Pass
		HCH	4.13	4.72	Pass
WCDMA1900	UMTS/TM1	LCH	4.15	4.74	Pass
		MCH	4.16	4.74	Pass
		HCH	4.17	4.76	Pass
WCDMA1700	UMTS/TM1	LCH	4.16	4.75	Pass
		MCH	4.16	4.74	Pass
		HCH	4.16	4.75	Pass

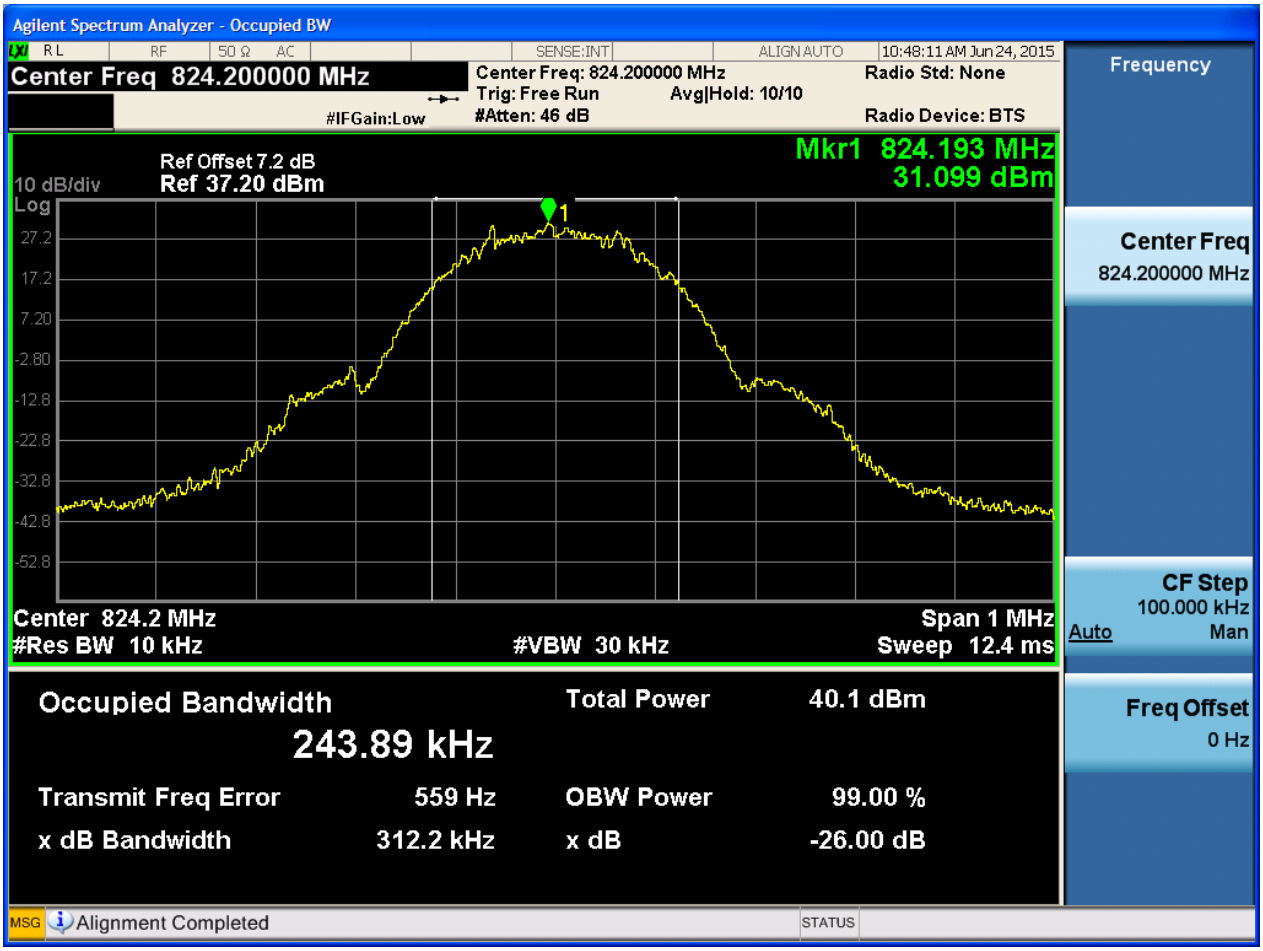
Part II - Test Plots

4.1 For GSM

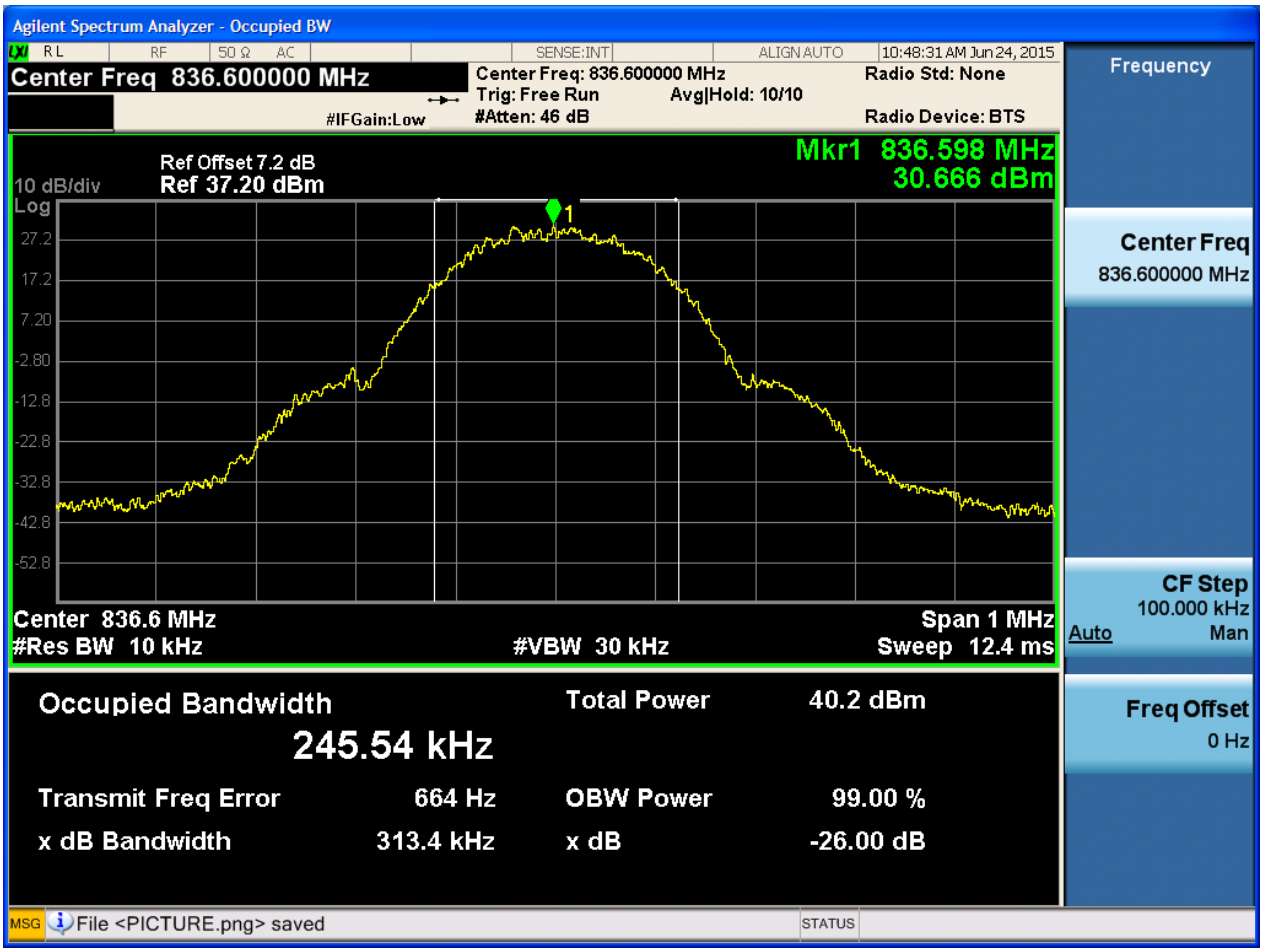
4.1.1 Test Band = GSM850

4.1.1.1 Test Mode = GSM/TM1

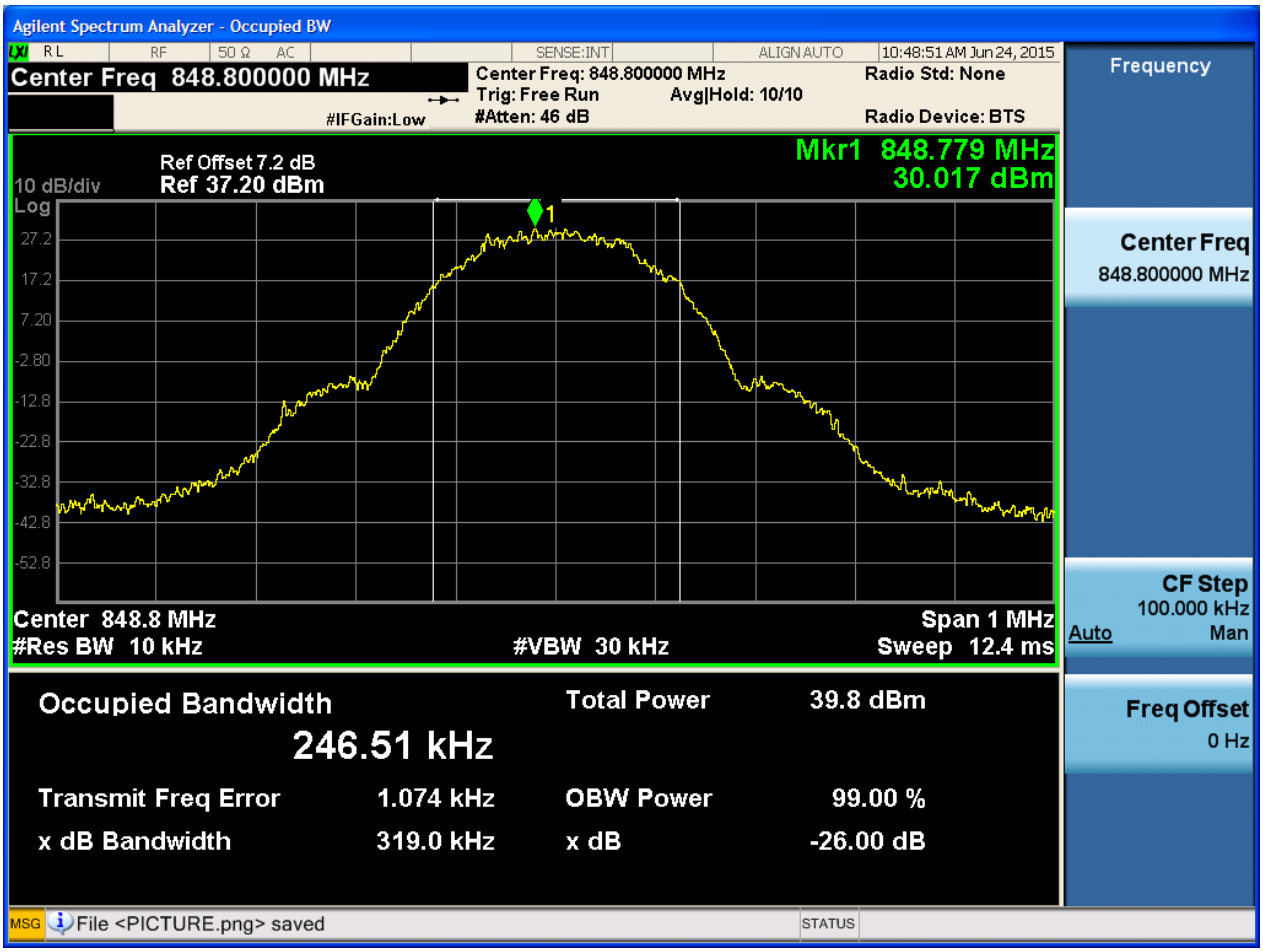
4.1.1.1.1 Test Channel = LCH



4.1.1.1.2 Test Channel = MCH

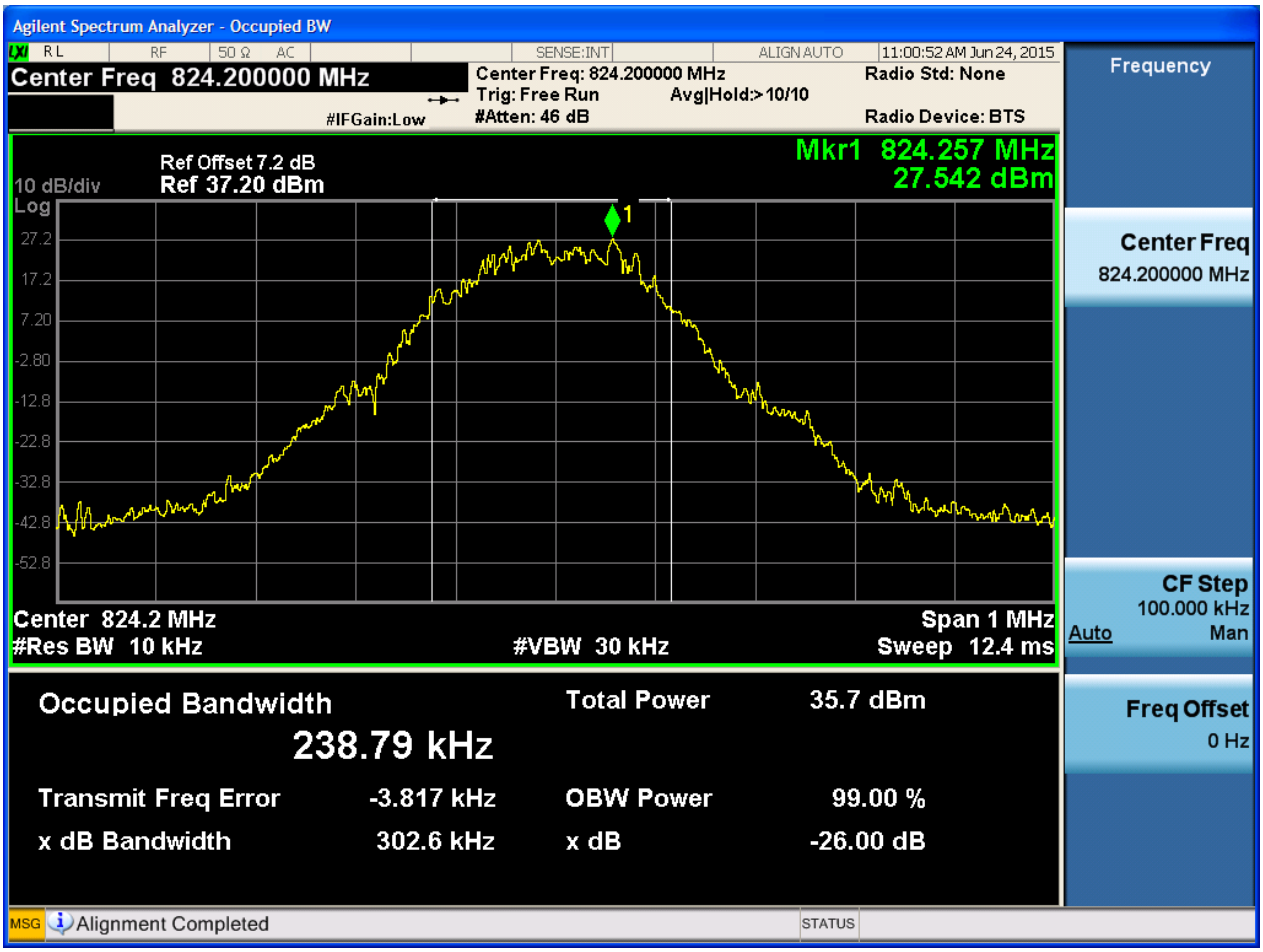


4.1.1.1.3 Test Channel = HCH

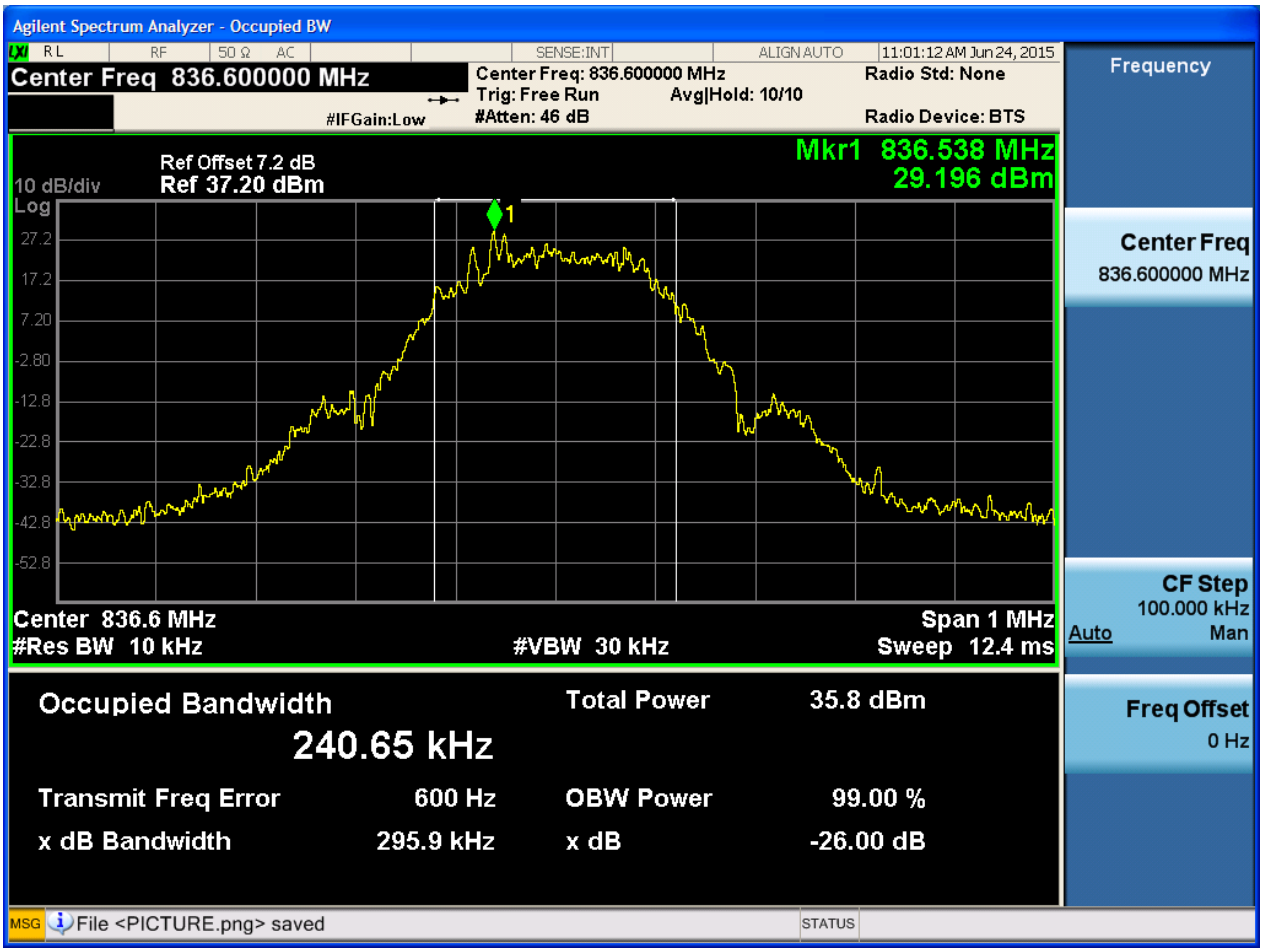


4.1.1.2 Test Mode = GSM/TM2

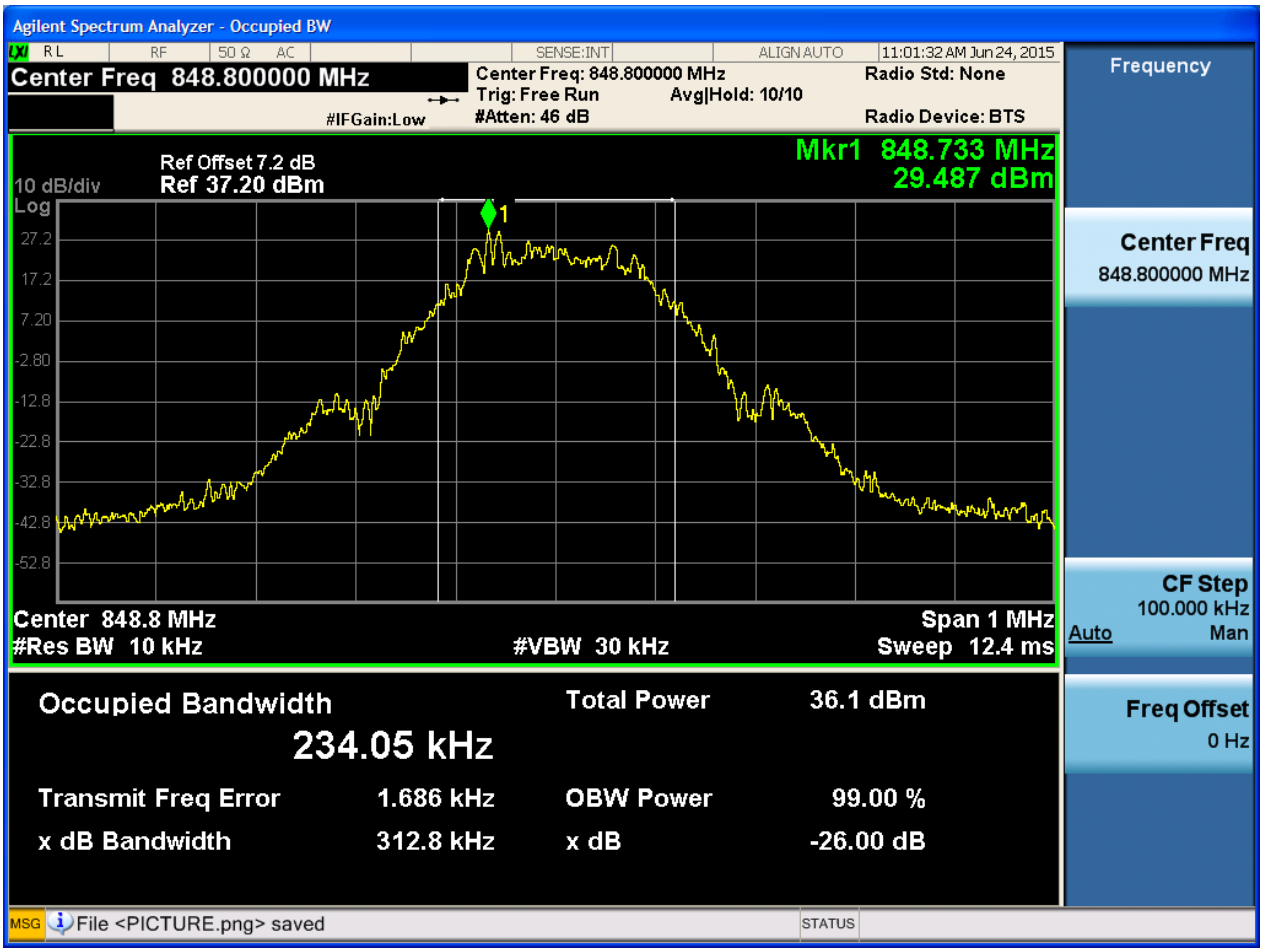
4.1.1.2.1 Test Channel = LCH



4.1.1.2.2 Test Channel = MCH



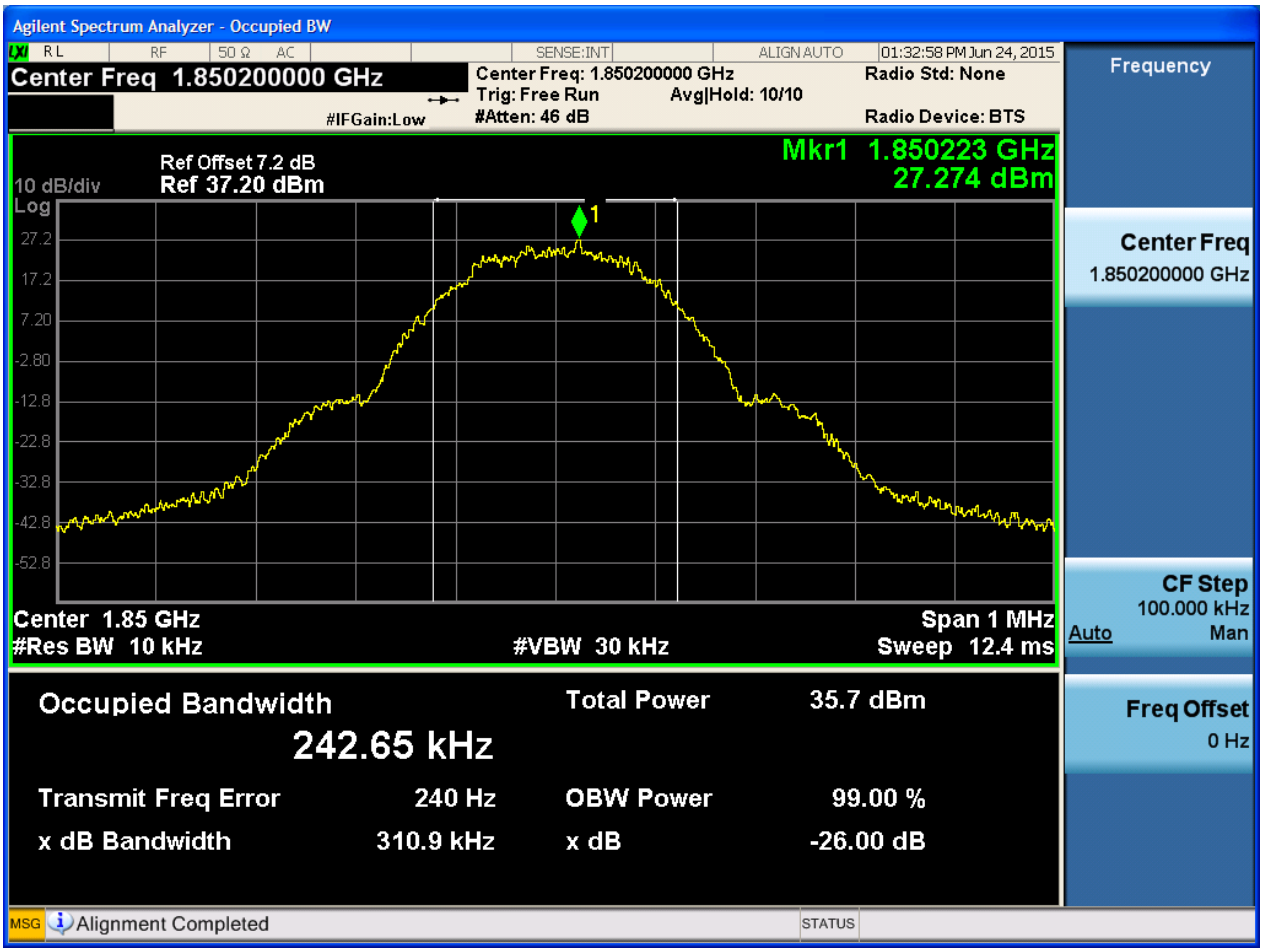
4.1.1.2.3 Test Channel = HCH



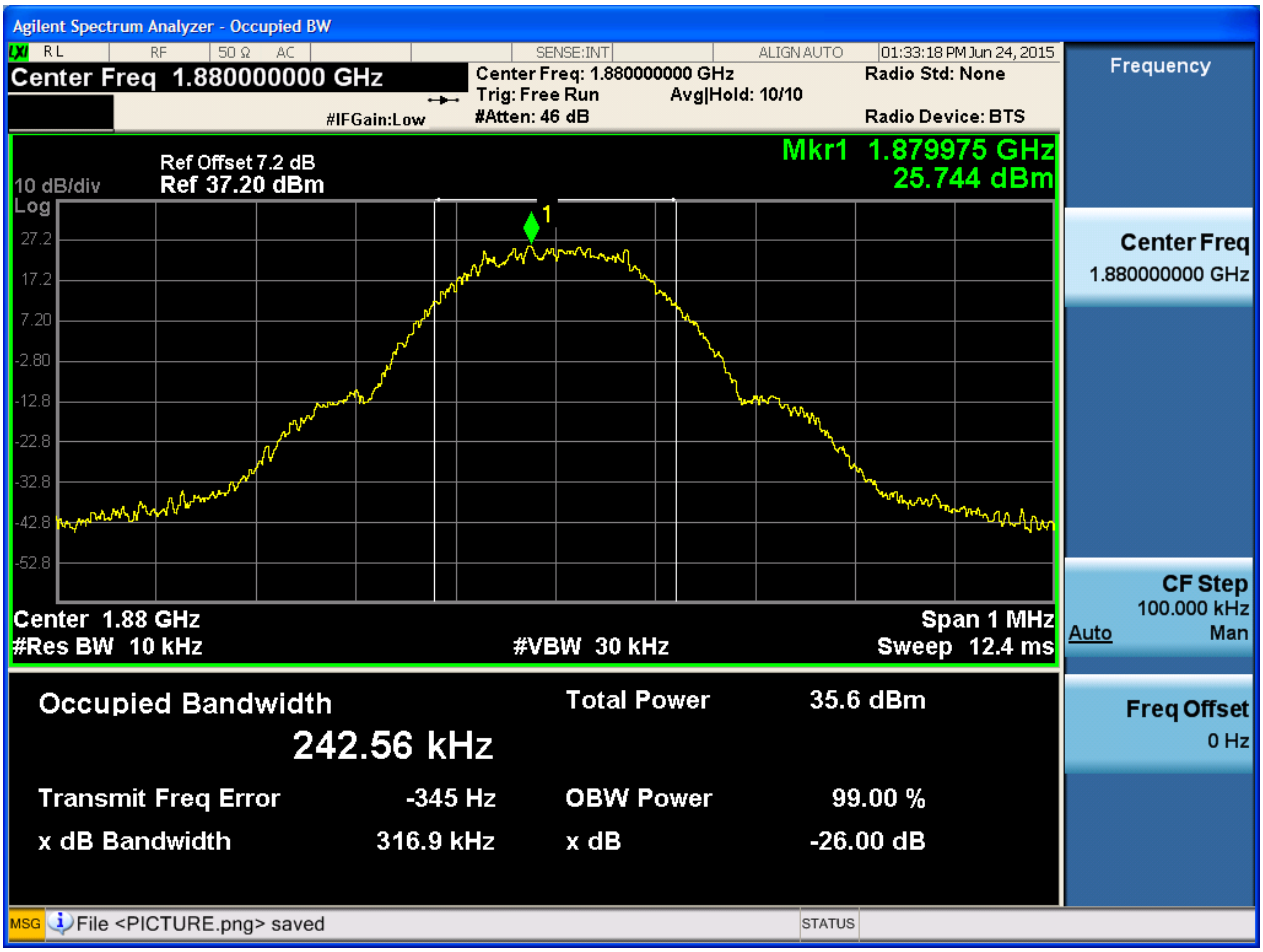
4.1.2 Test Band = GSM1900

4.1.2.1 Test Mode = GSM/TM1

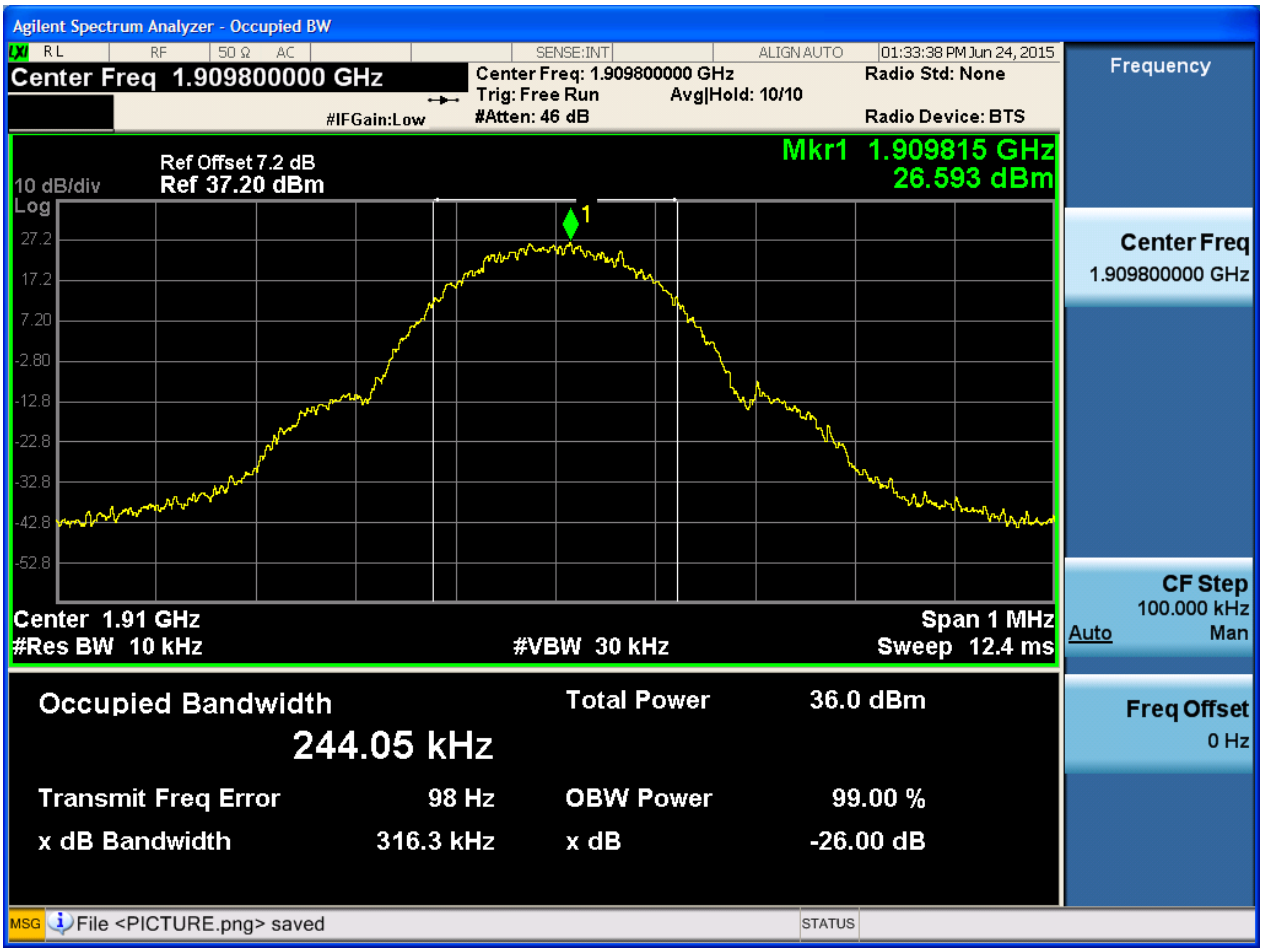
4.1.2.1.1 Test Channel = LCH



4.1.2.1.2 Test Channel = MCH

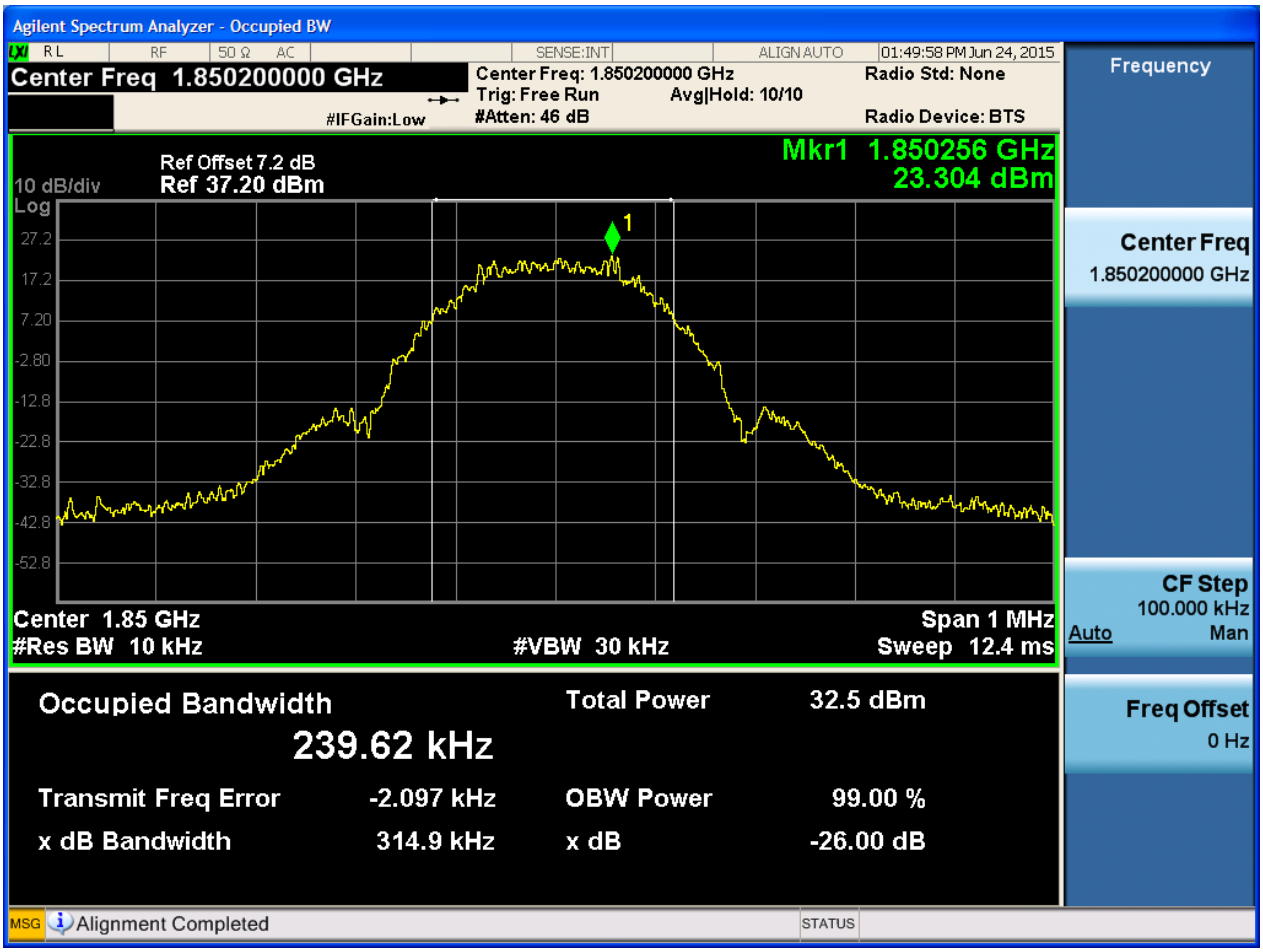


4.1.2.1.3 Test Channel = HCH

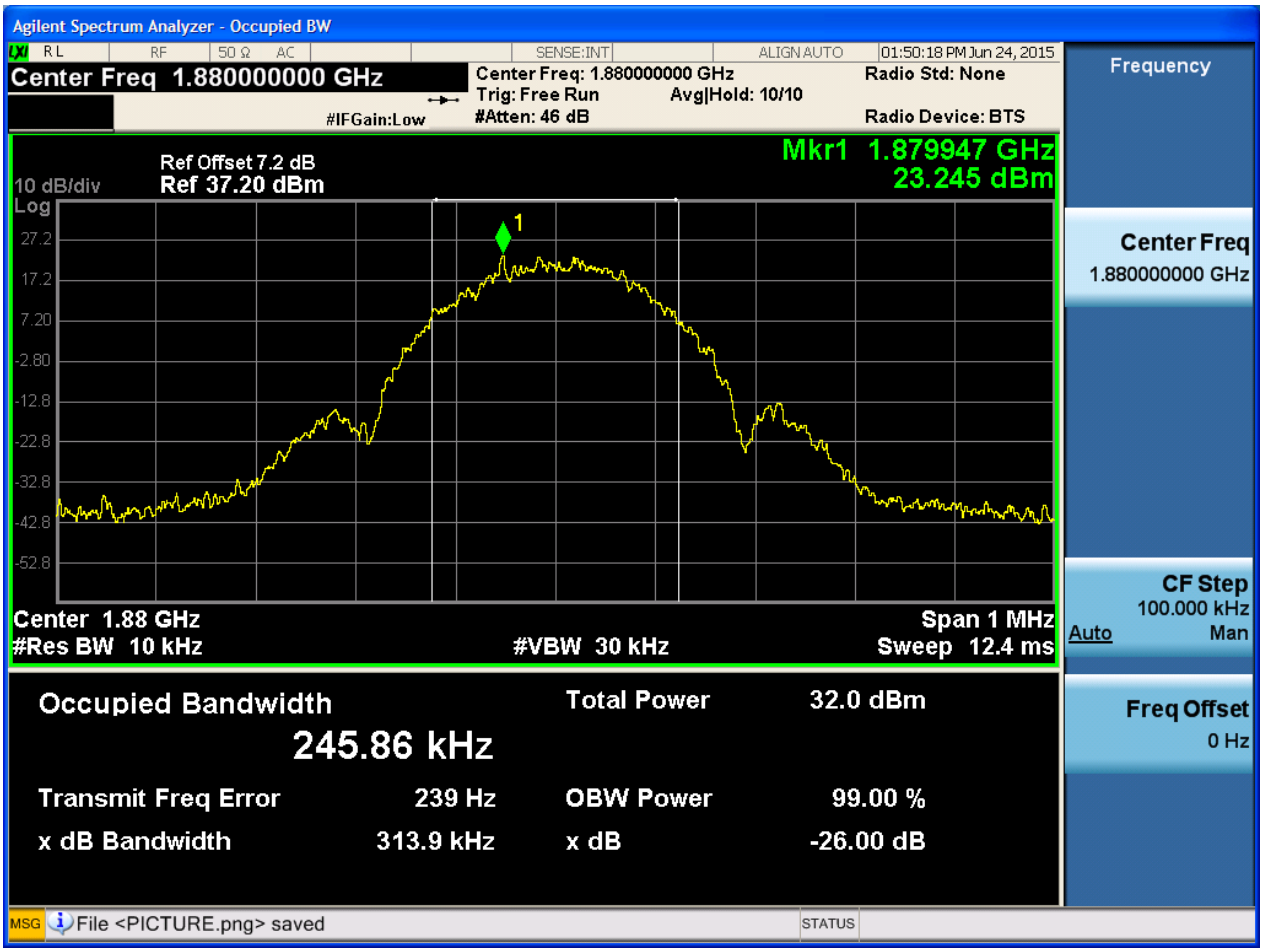


4.1.2.2 Test Mode = GSM/TM2

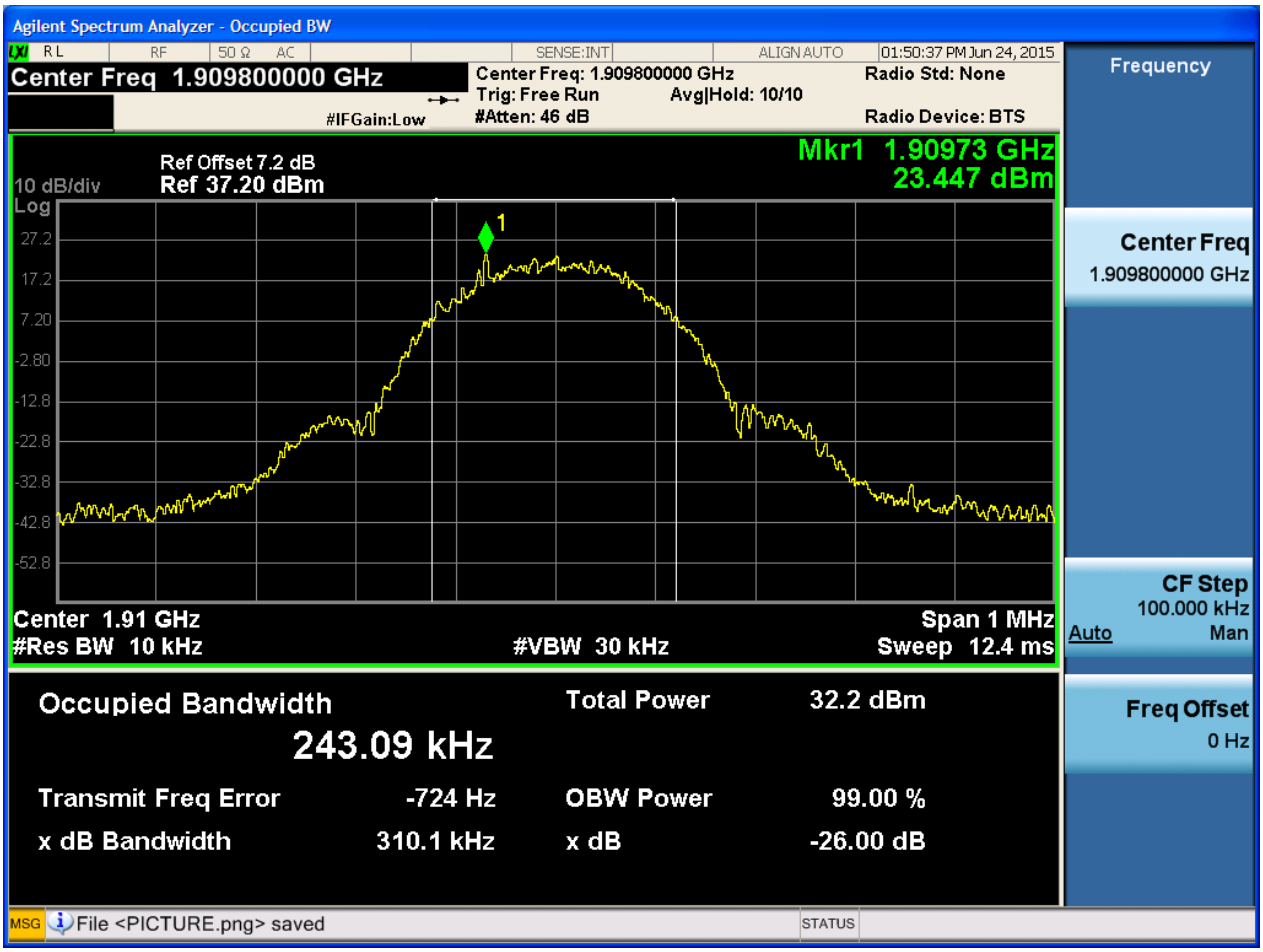
4.1.2.2.1 Test Channel = LCH



4.1.2.2.2 Test Channel = MCH



4.1.2.2.3 Test Channel = HCH

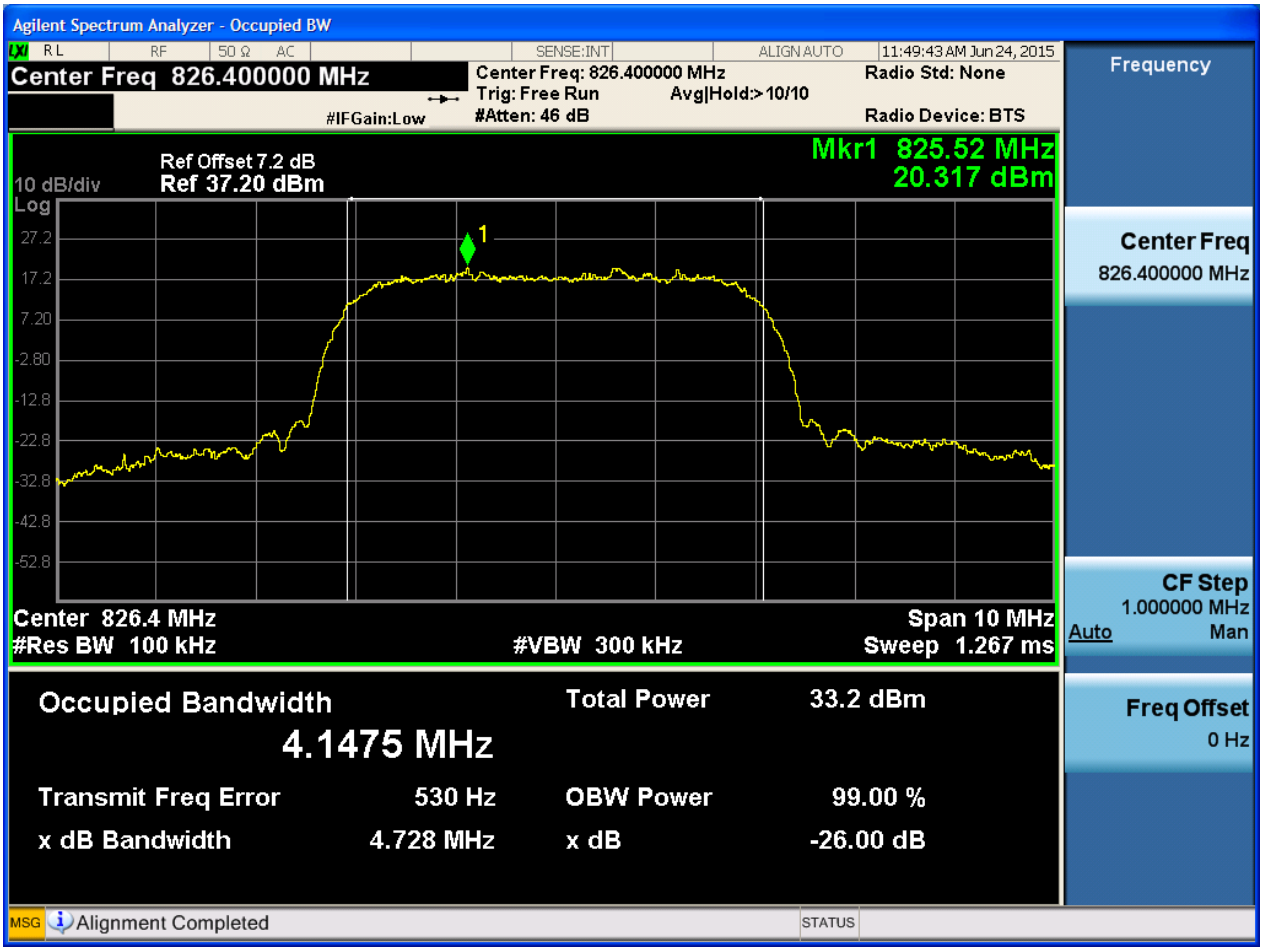


4.2 For UMTS

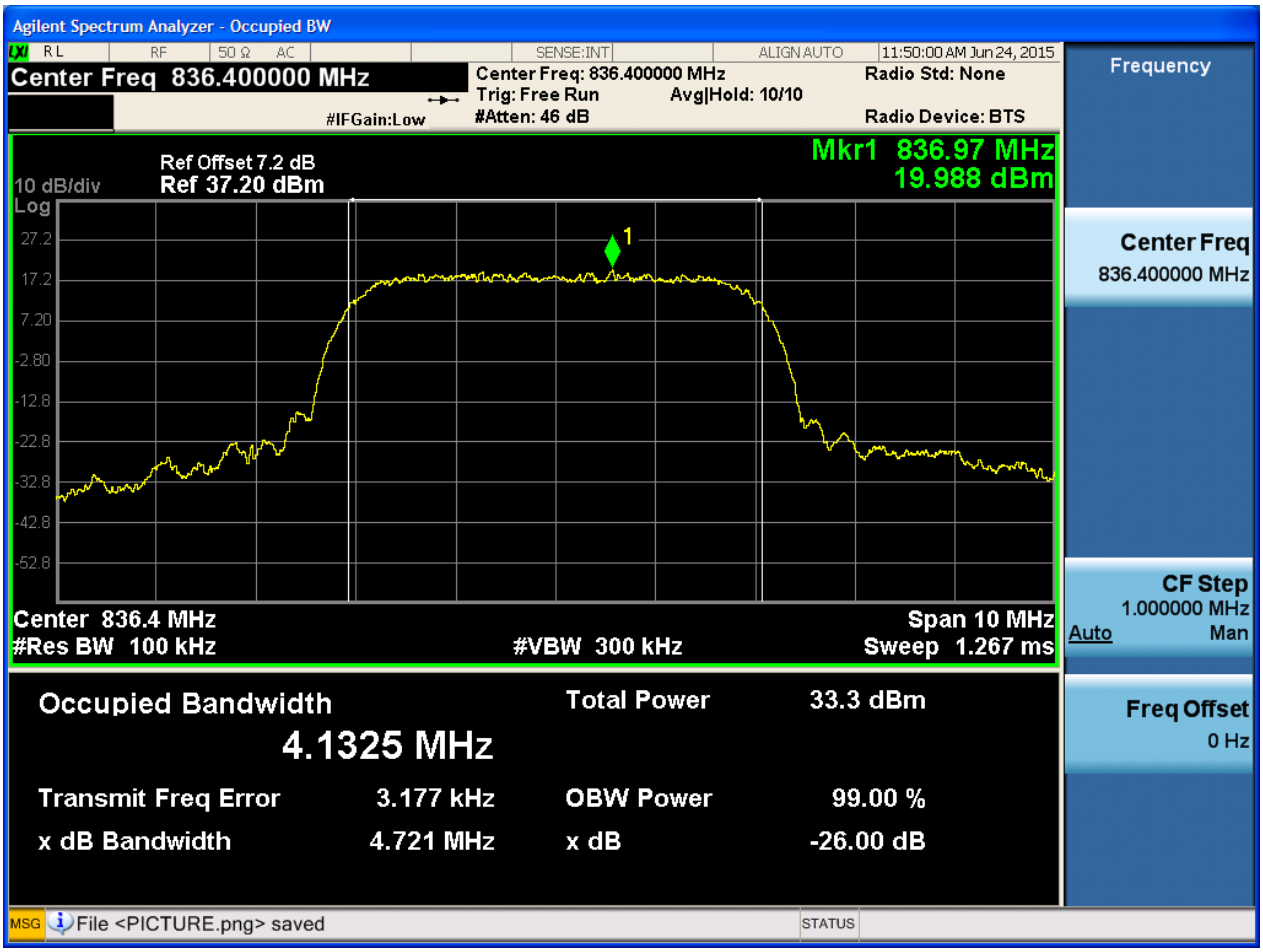
4.2.1 Test Band = WCDMA850

4.2.1.1 Test Mode = UMTS/TM1

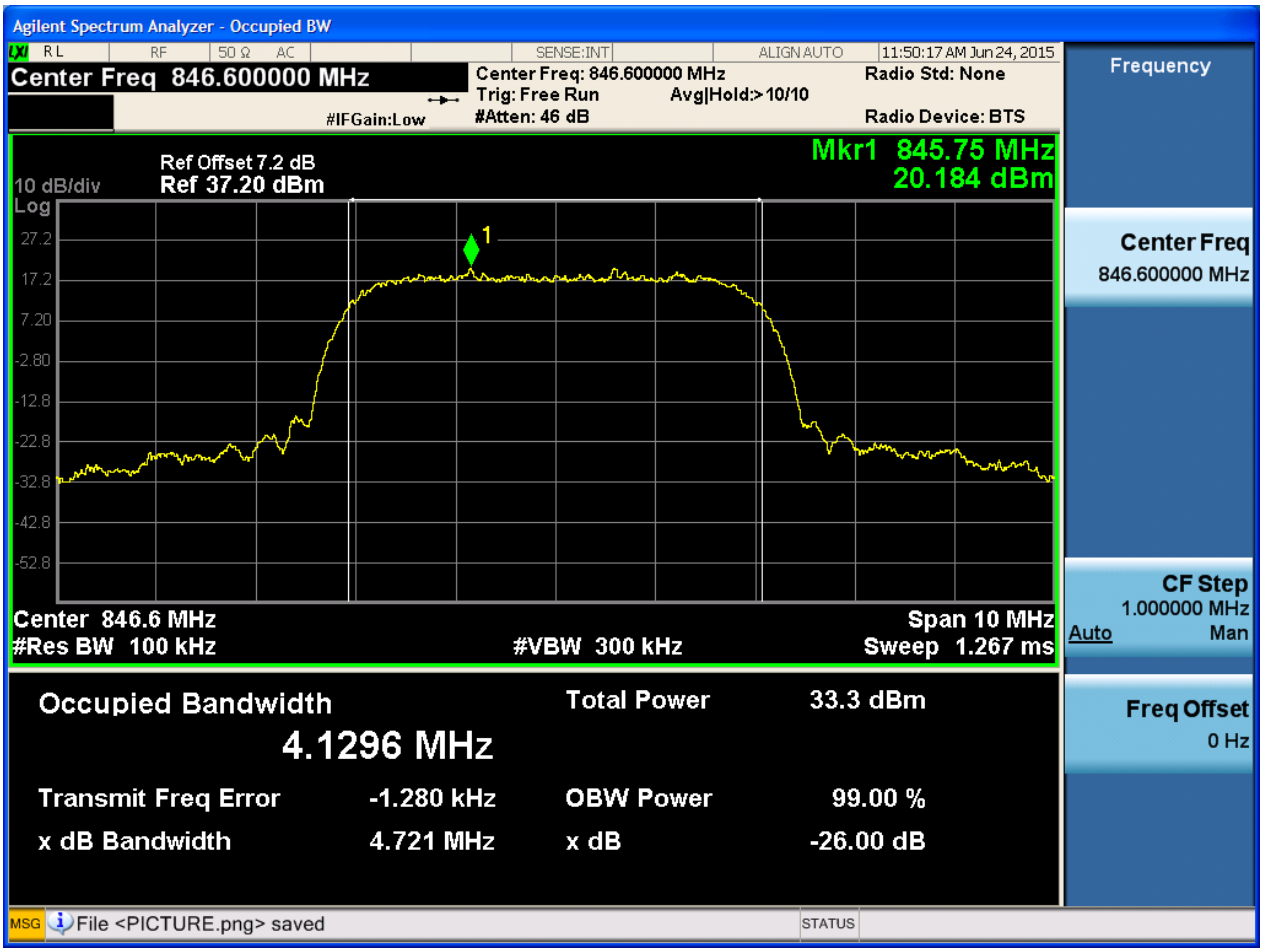
4.2.1.1.1 Test Channel = LCH



4.2.1.1.2 Test Channel = MCH



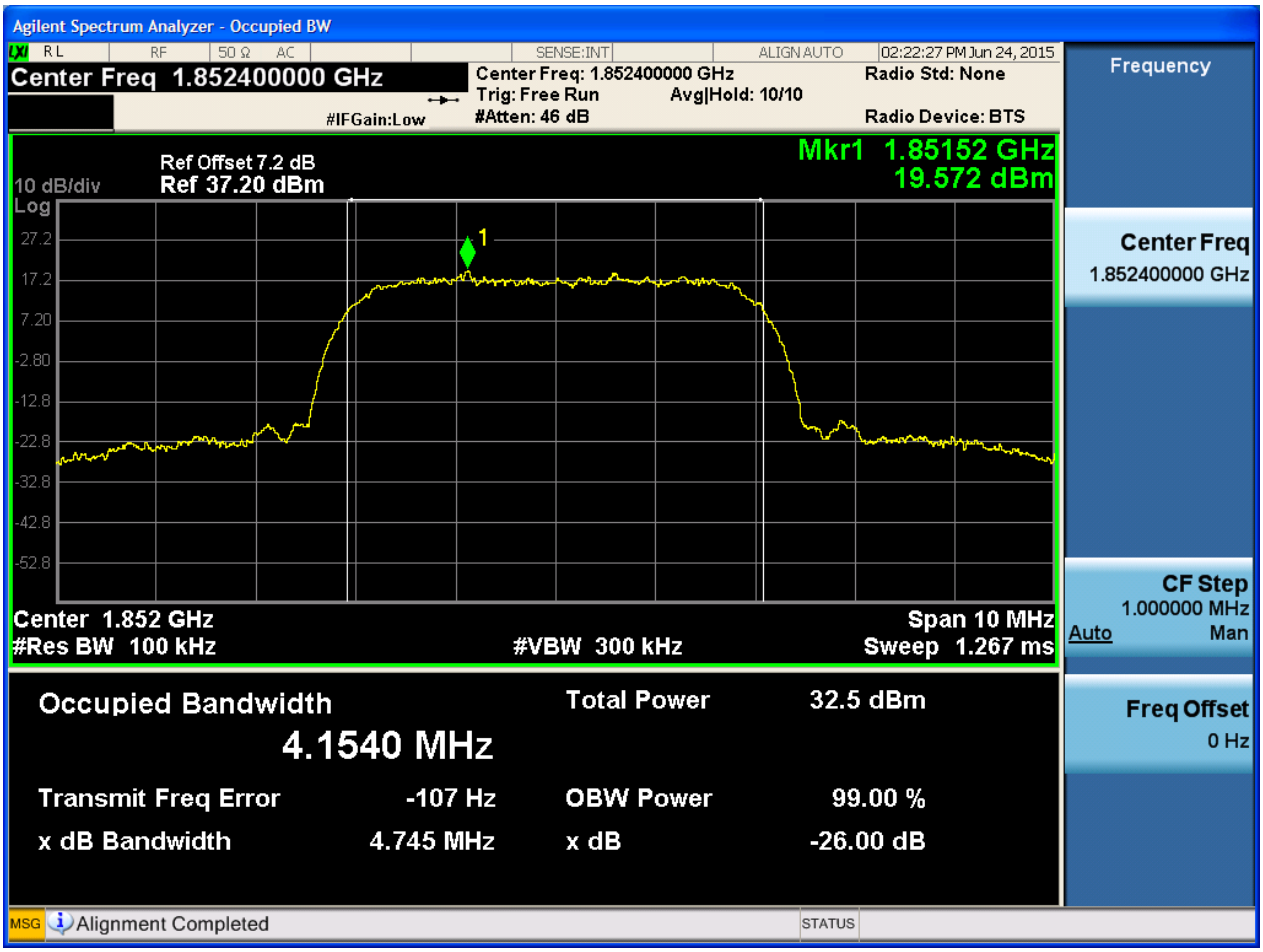
4.2.1.1.3 Test Channel = HCH



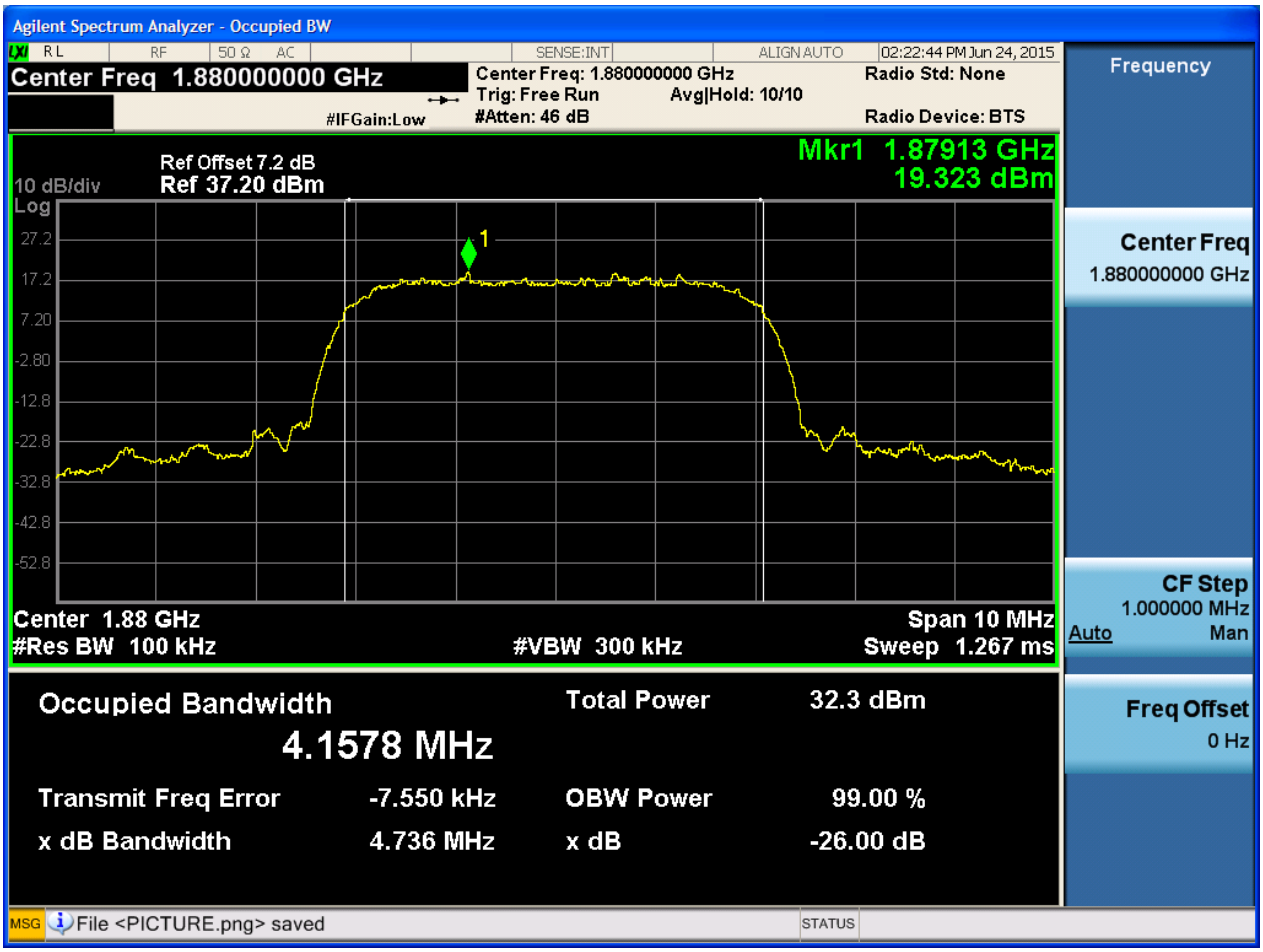
4.2.2 Test Band = WCDMA1900

4.2.2.1 Test Mode = UMTS/TM1

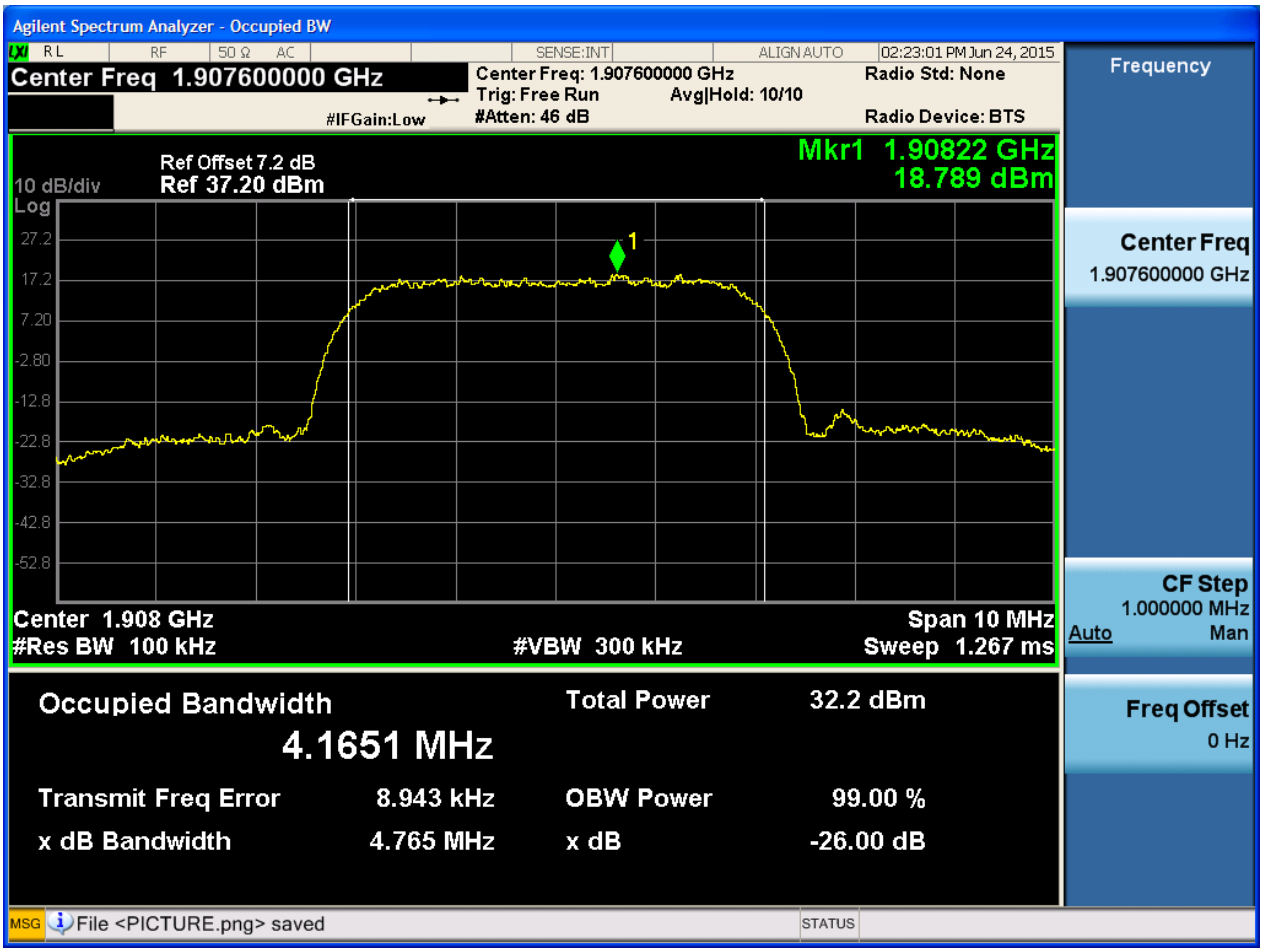
4.2.2.1.1 Test Channel = LCH



4.2.2.1.2 Test Channel = MCH



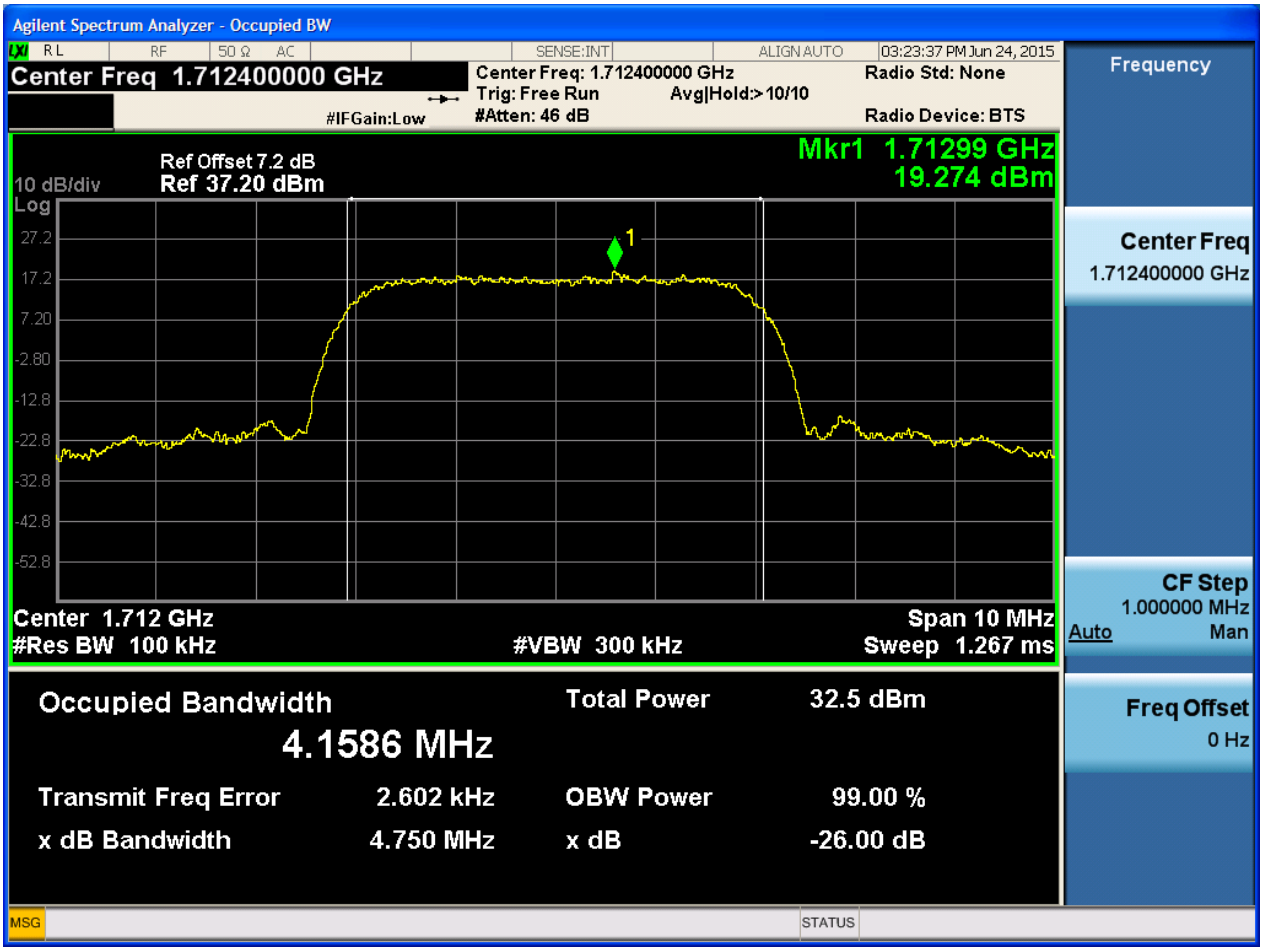
4.2.2.1.3 Test Channel = HCH



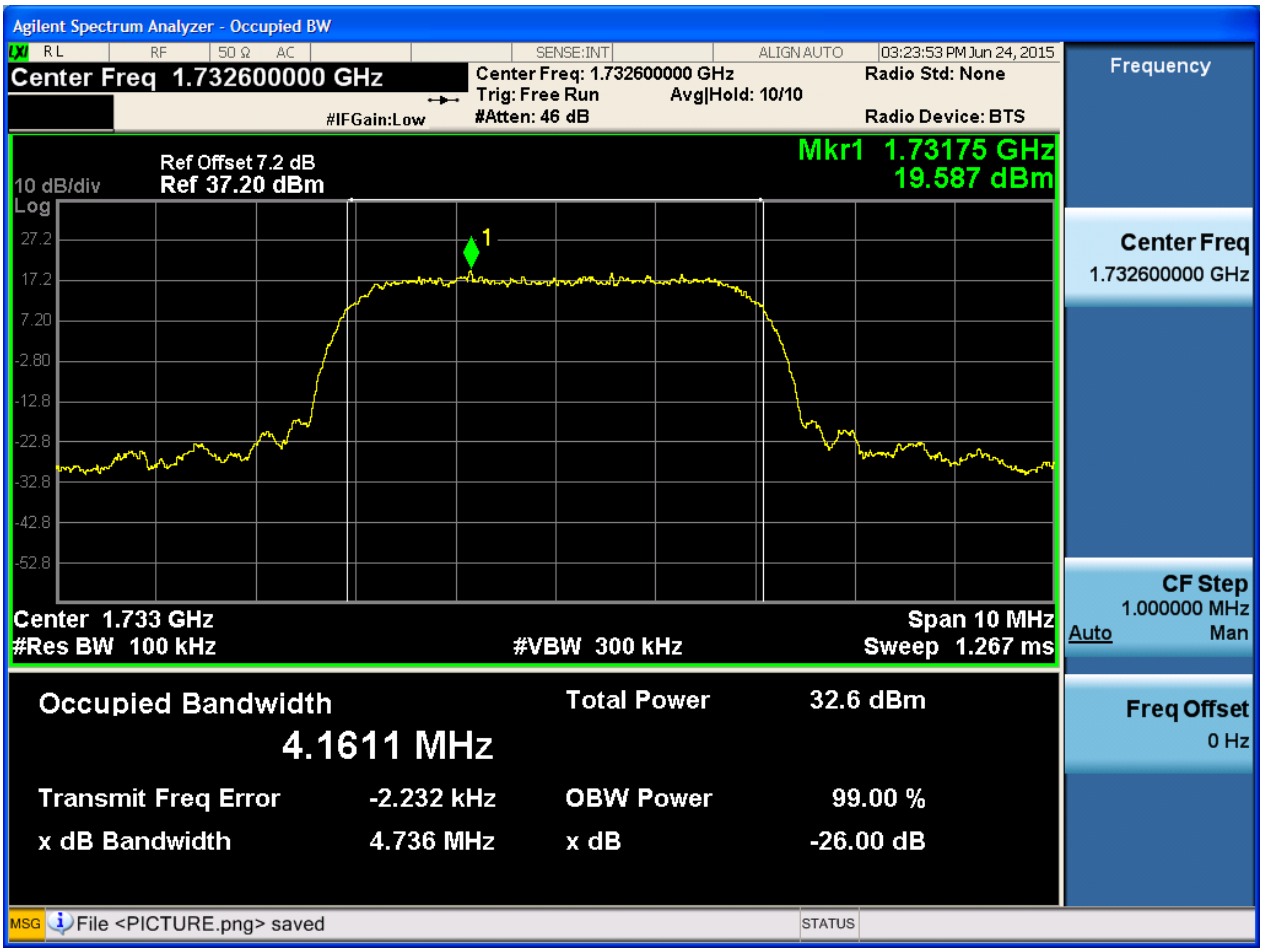
4.2.4 Test Band = WCDMA1700

4.2.4.1 Test Mode = UMTS/TM1

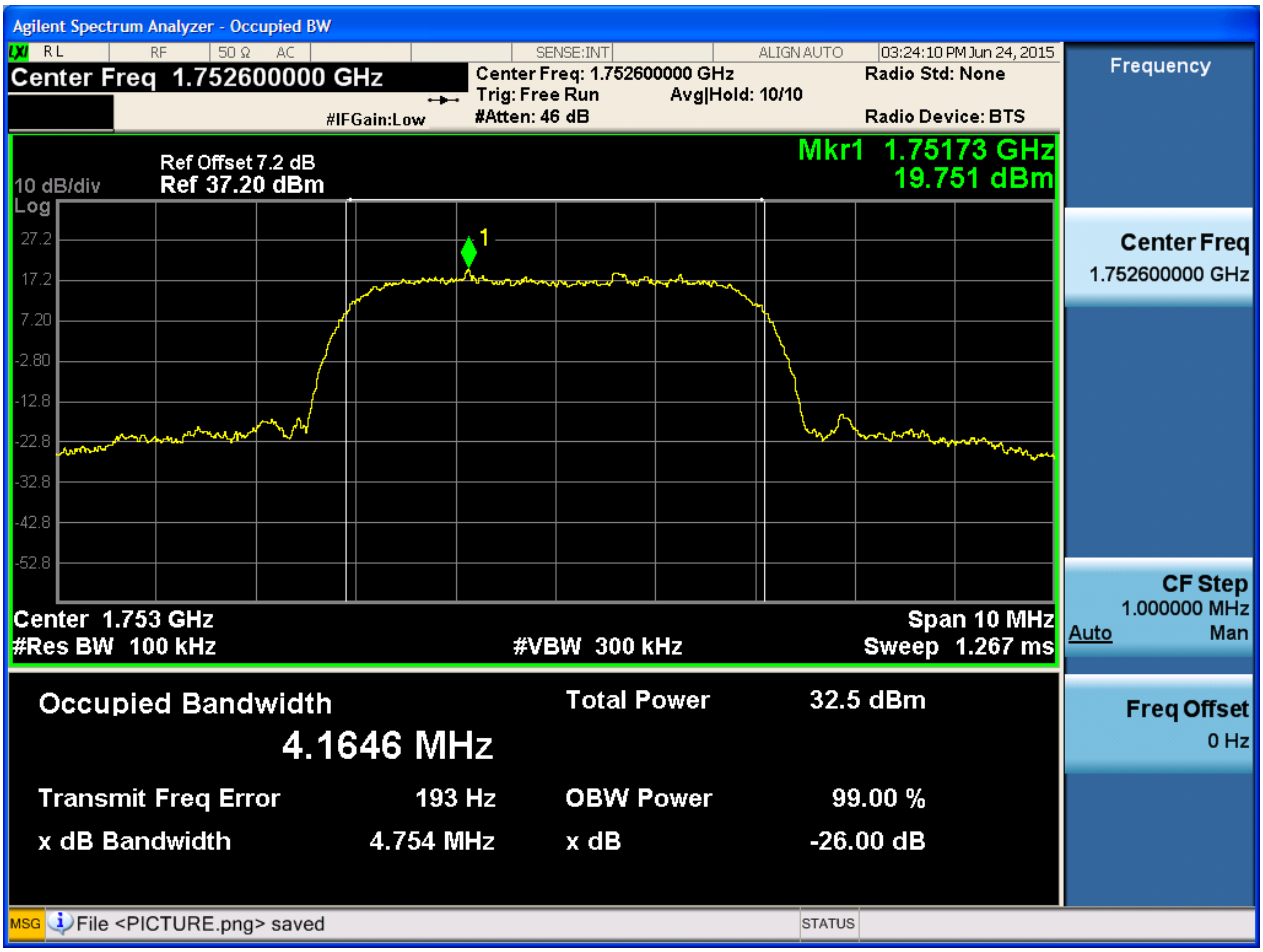
4.2.4.1.1 Test Channel = LCH



4.2.4.1.2 Test Channel = MCH



4.2.4.1.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

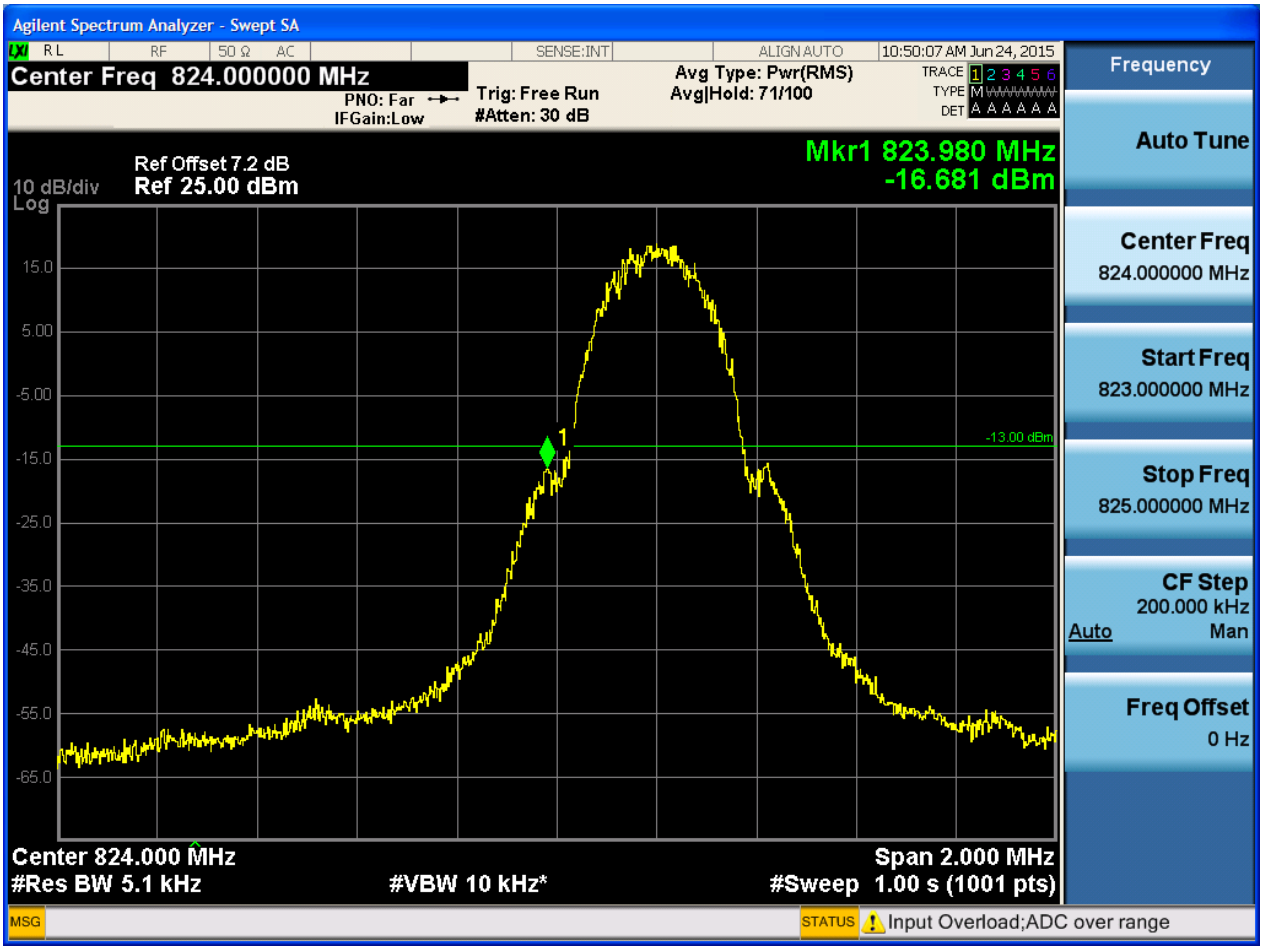
Part I - Test Plots

5.1 For GSM

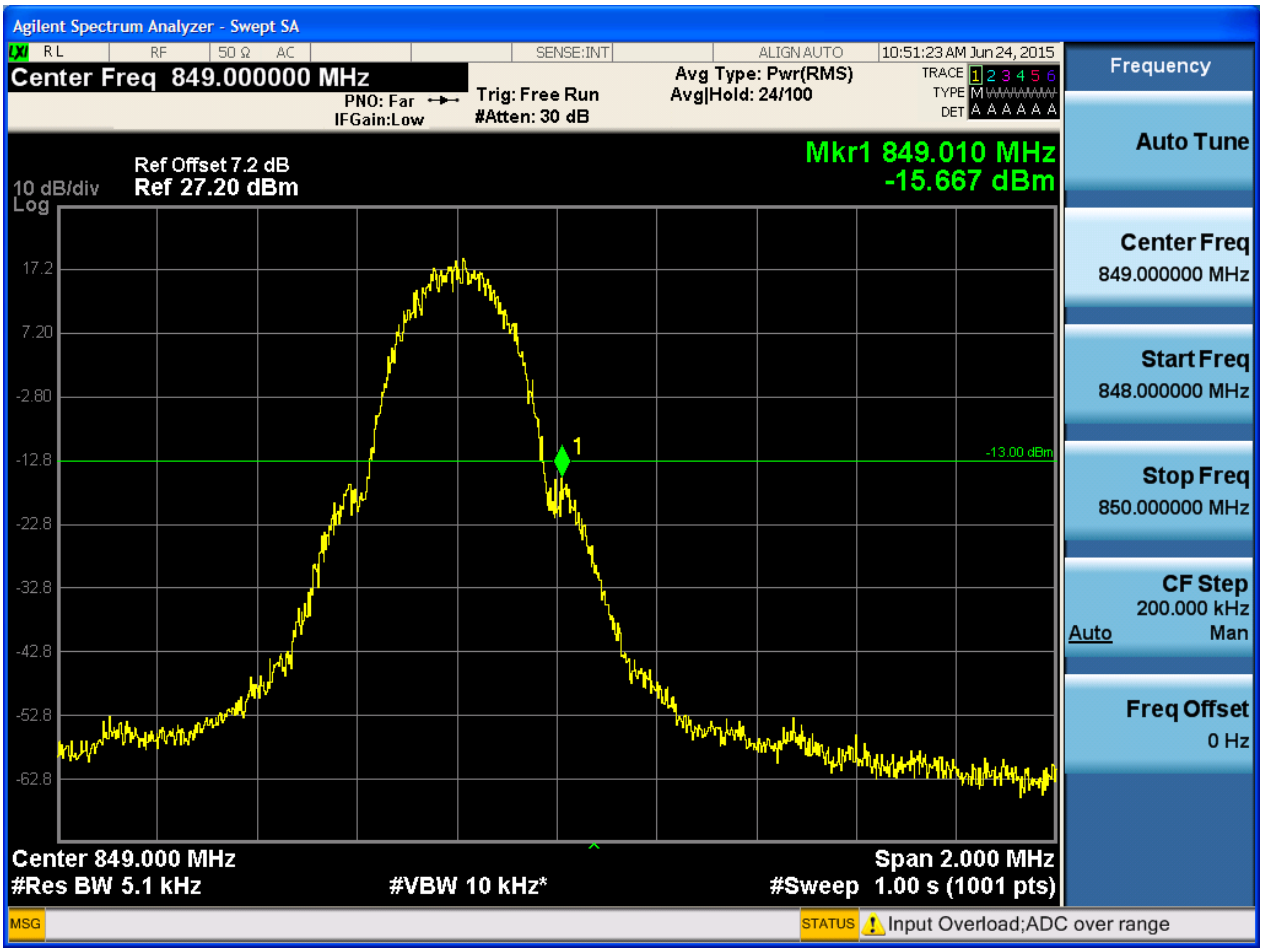
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

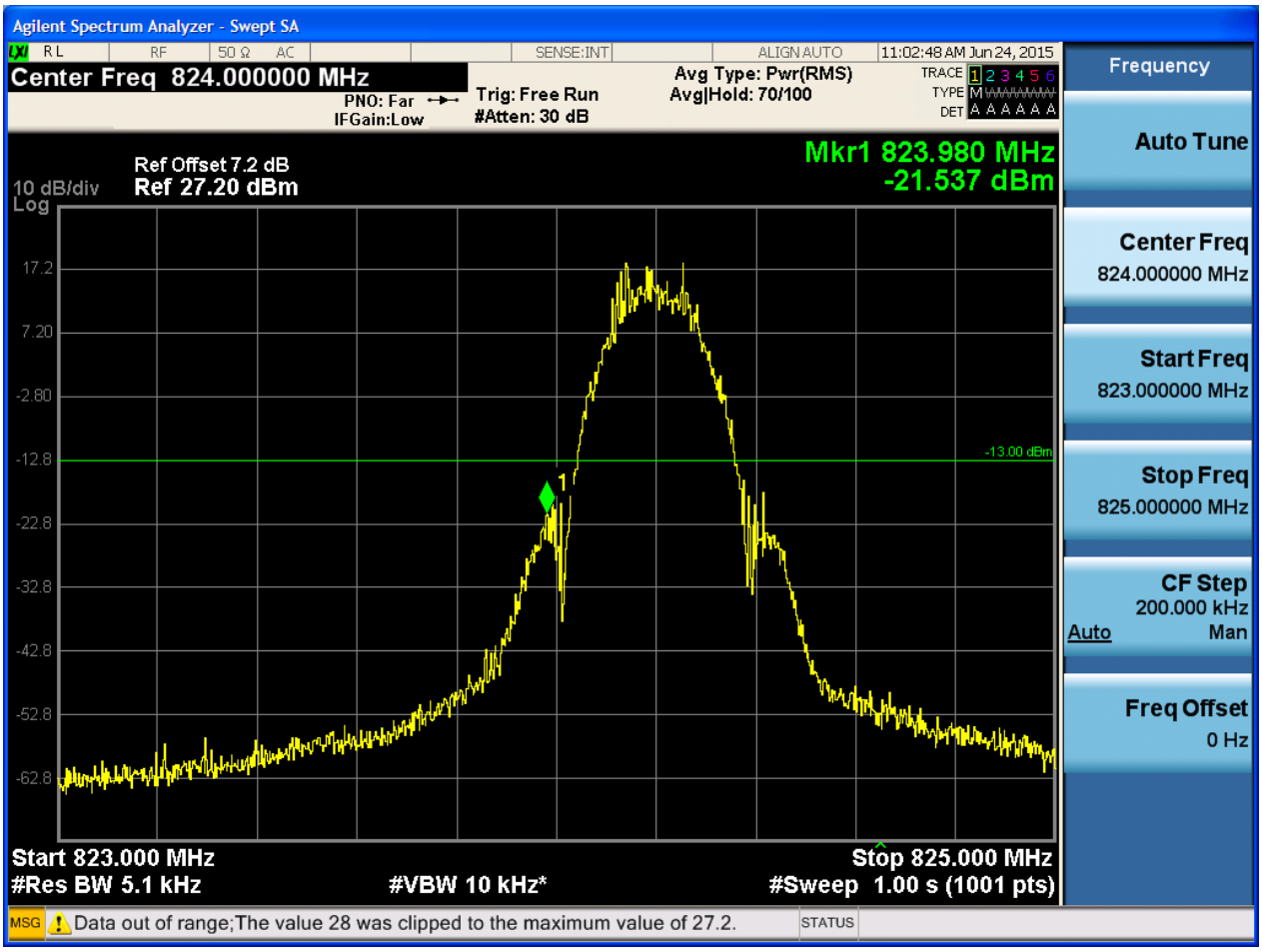


5.1.1.1.2 Test Channel = HCH

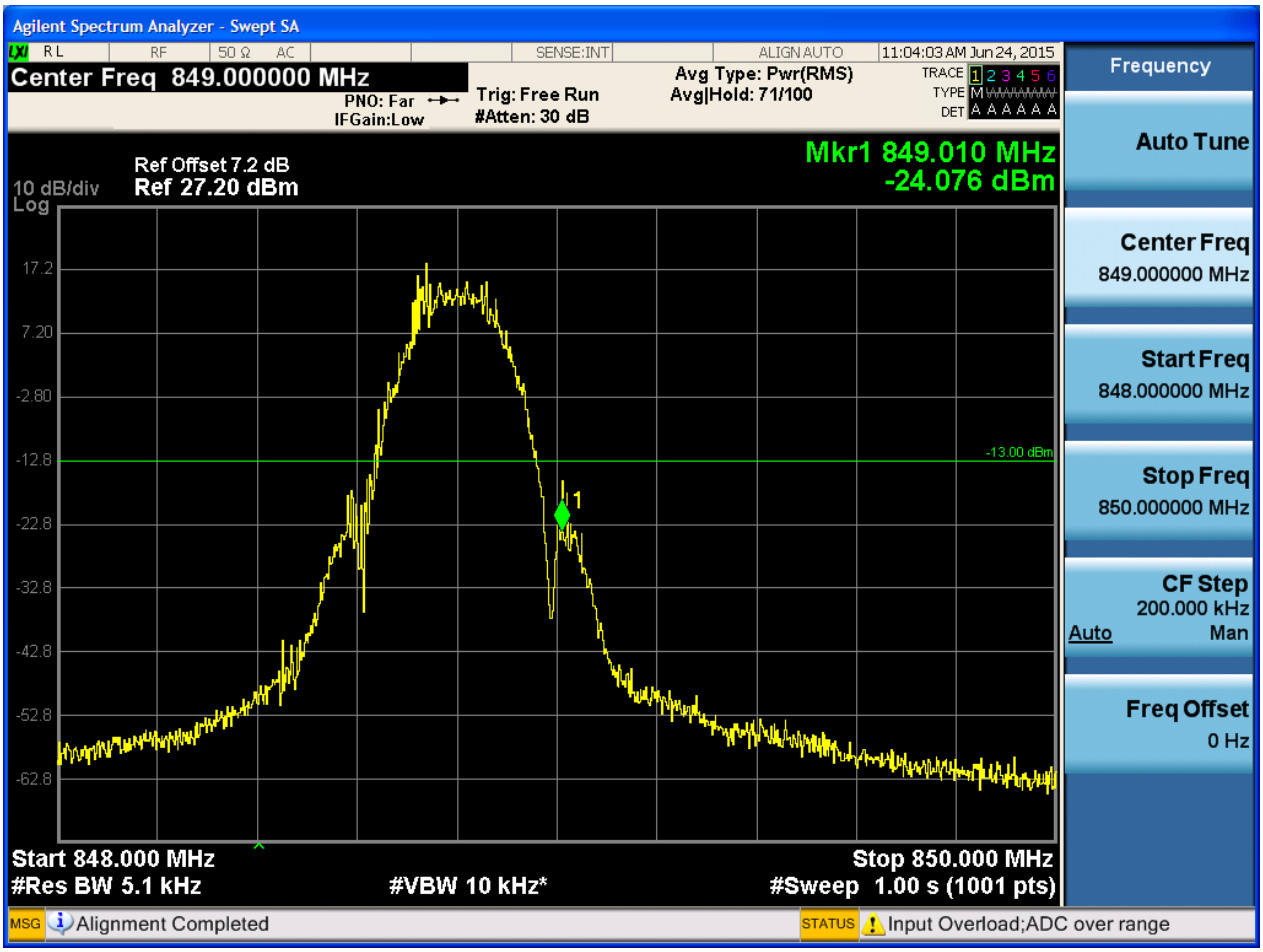


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



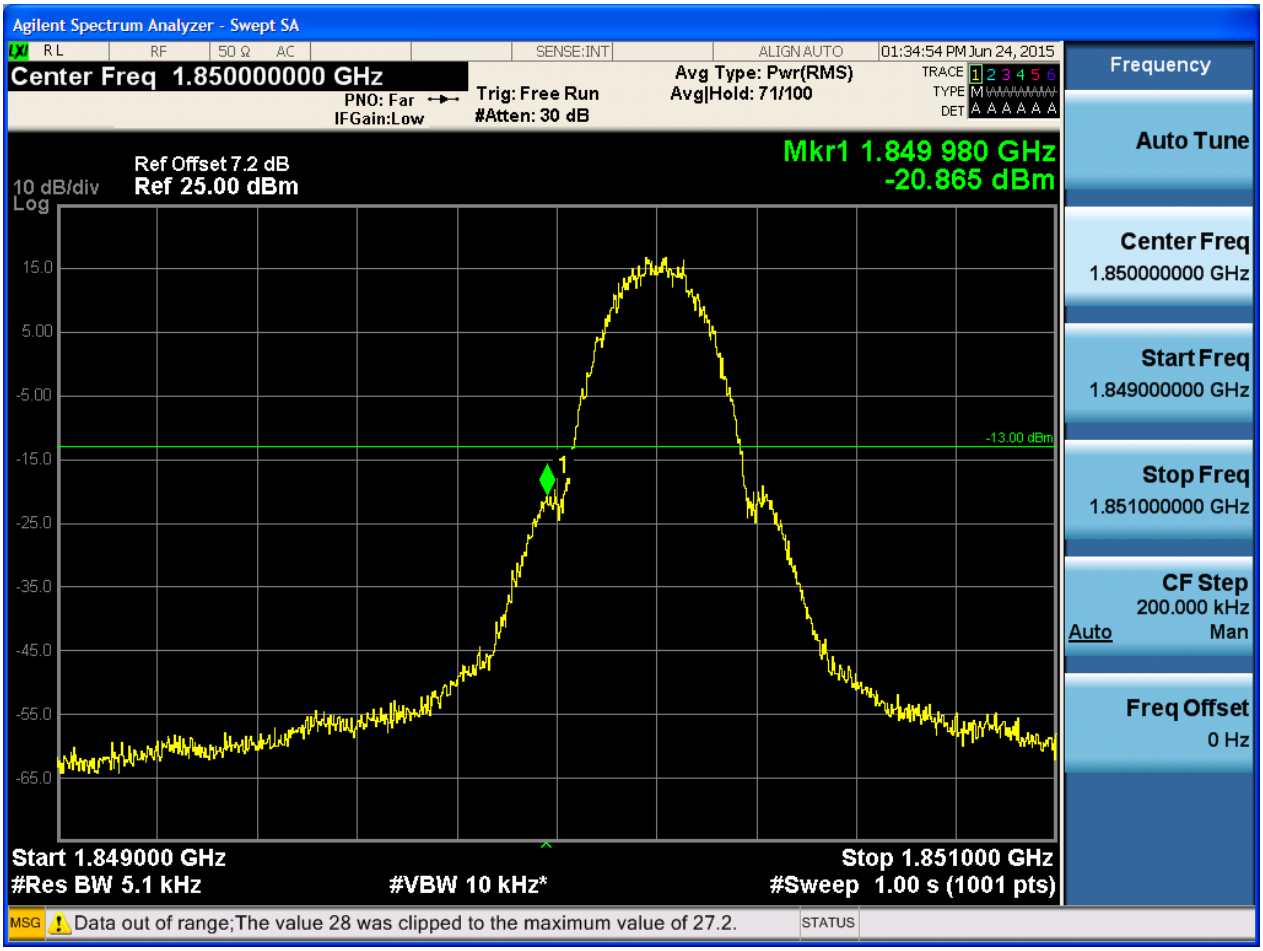
5.1.1.2.2 Test Channel = HCH



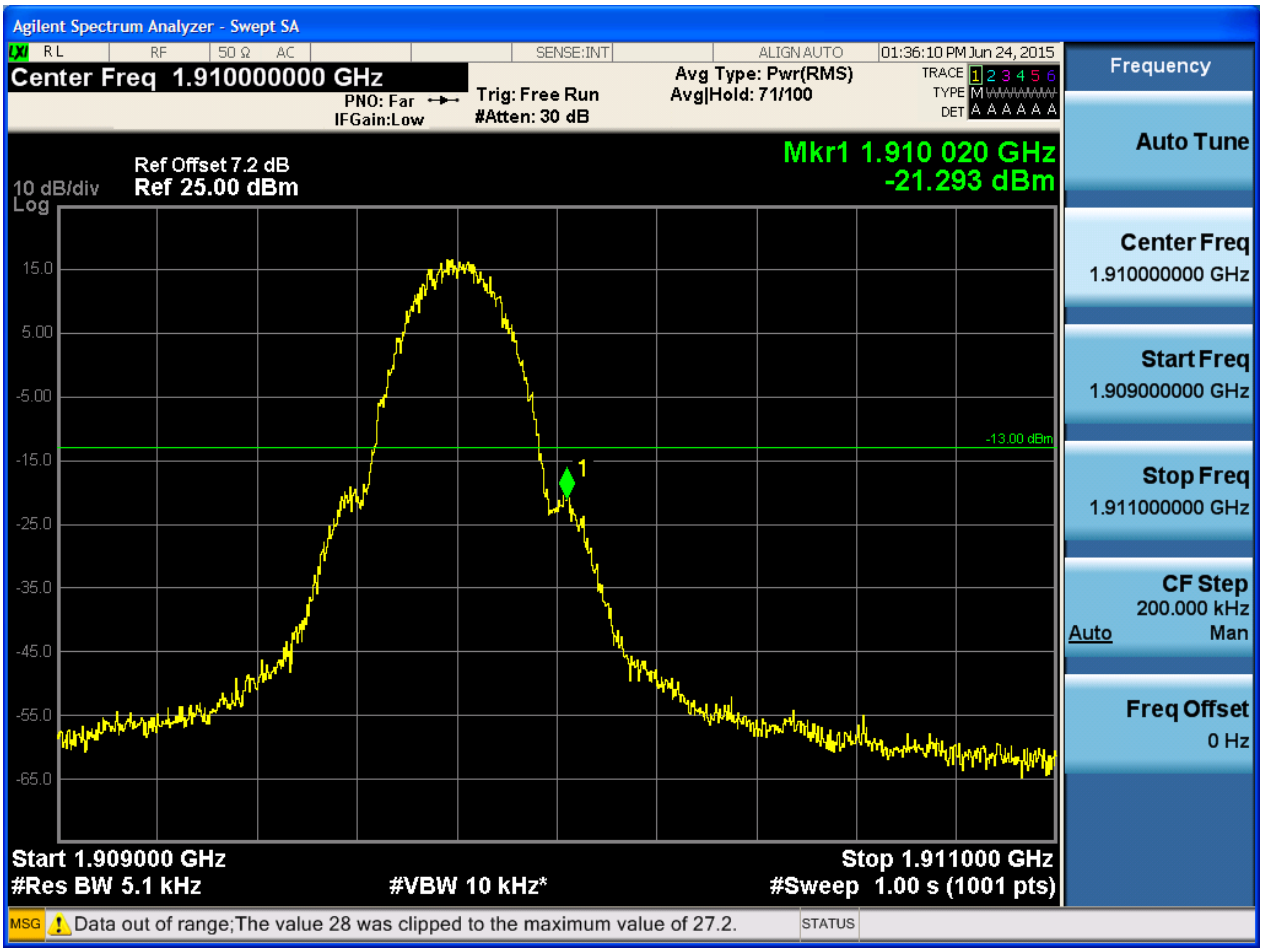
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

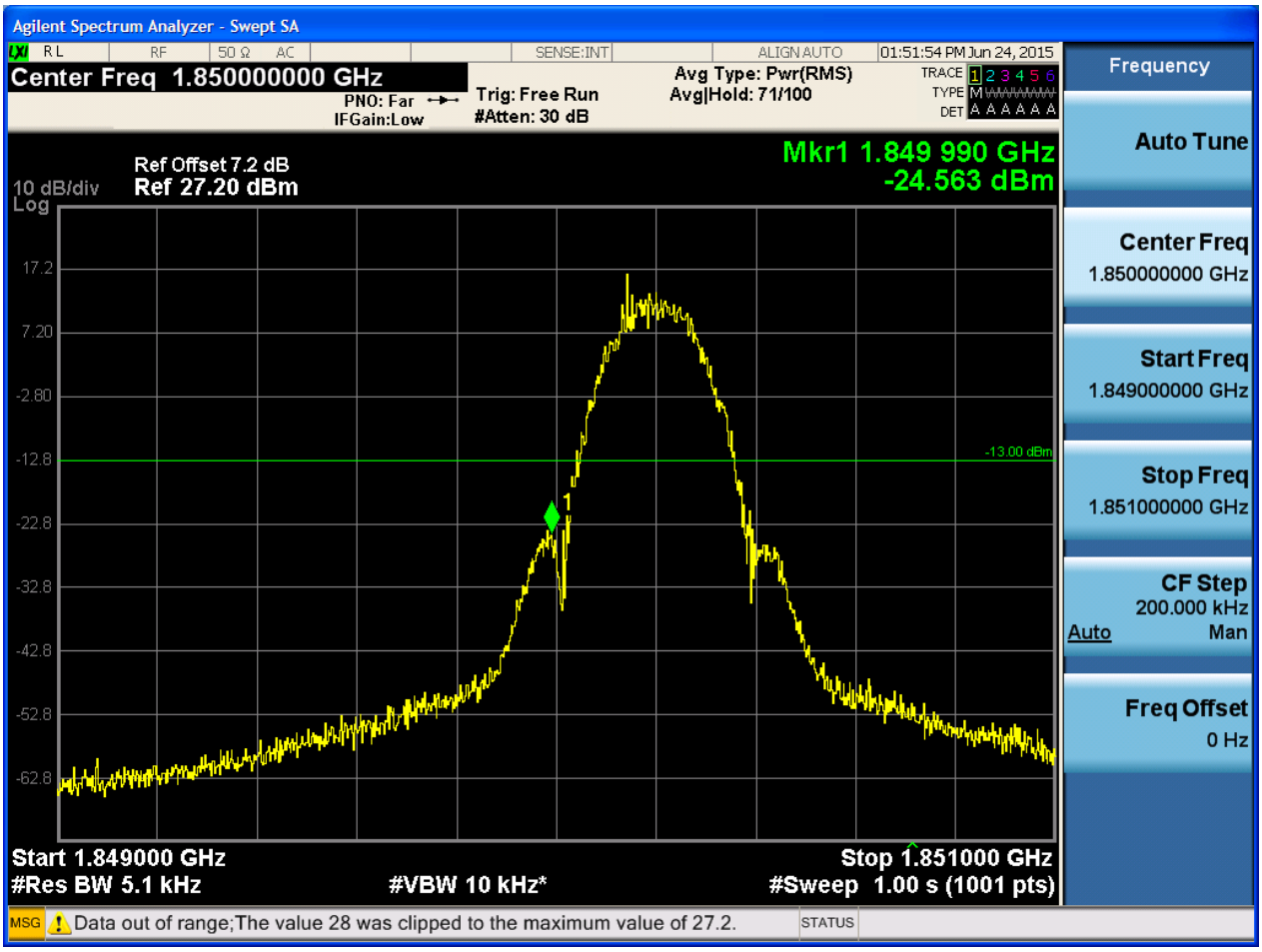


5.1.2.1.2 Test Channel = HCH

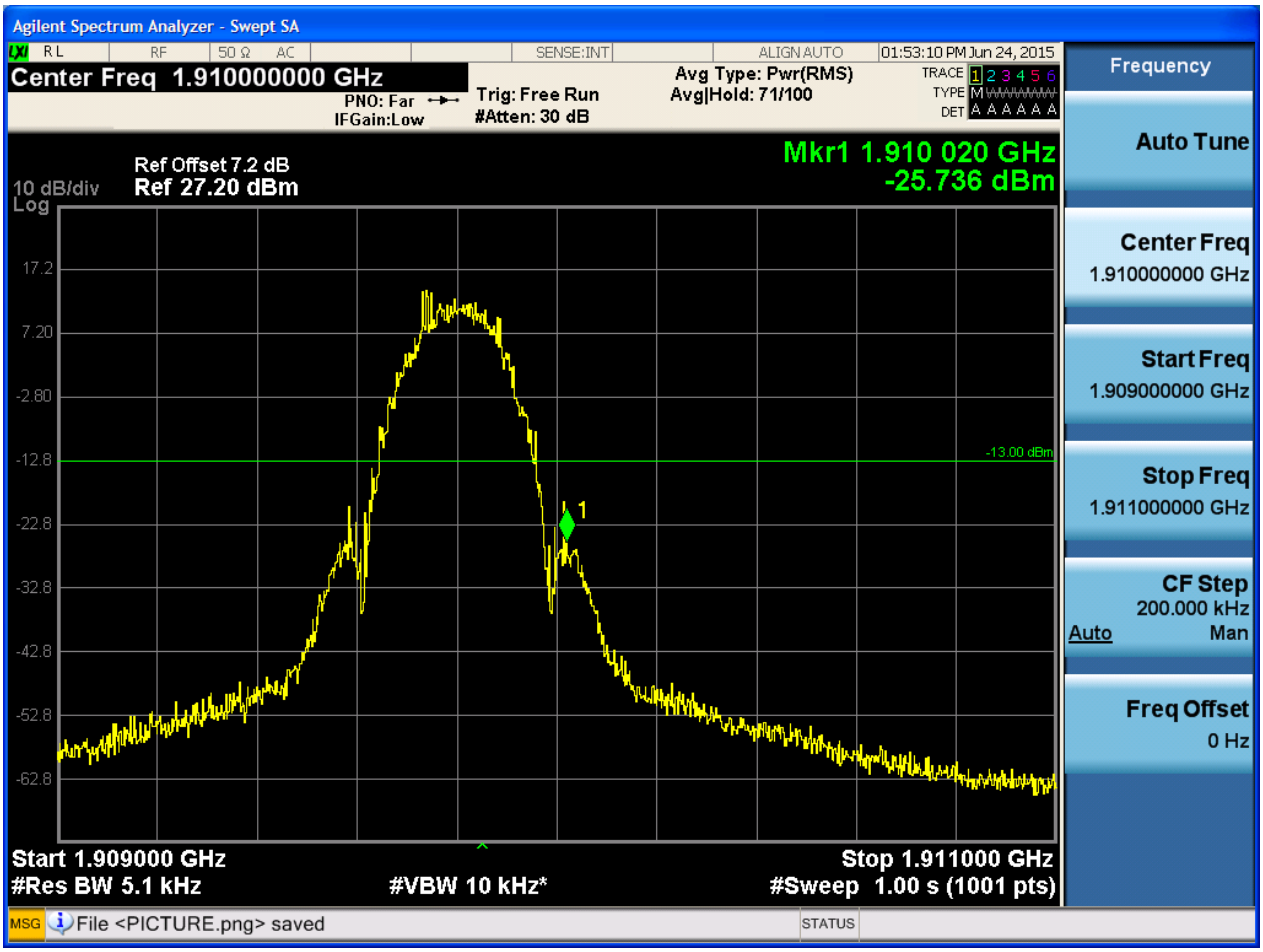


5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH



5.1.2.2.2 Test Channel = HCH

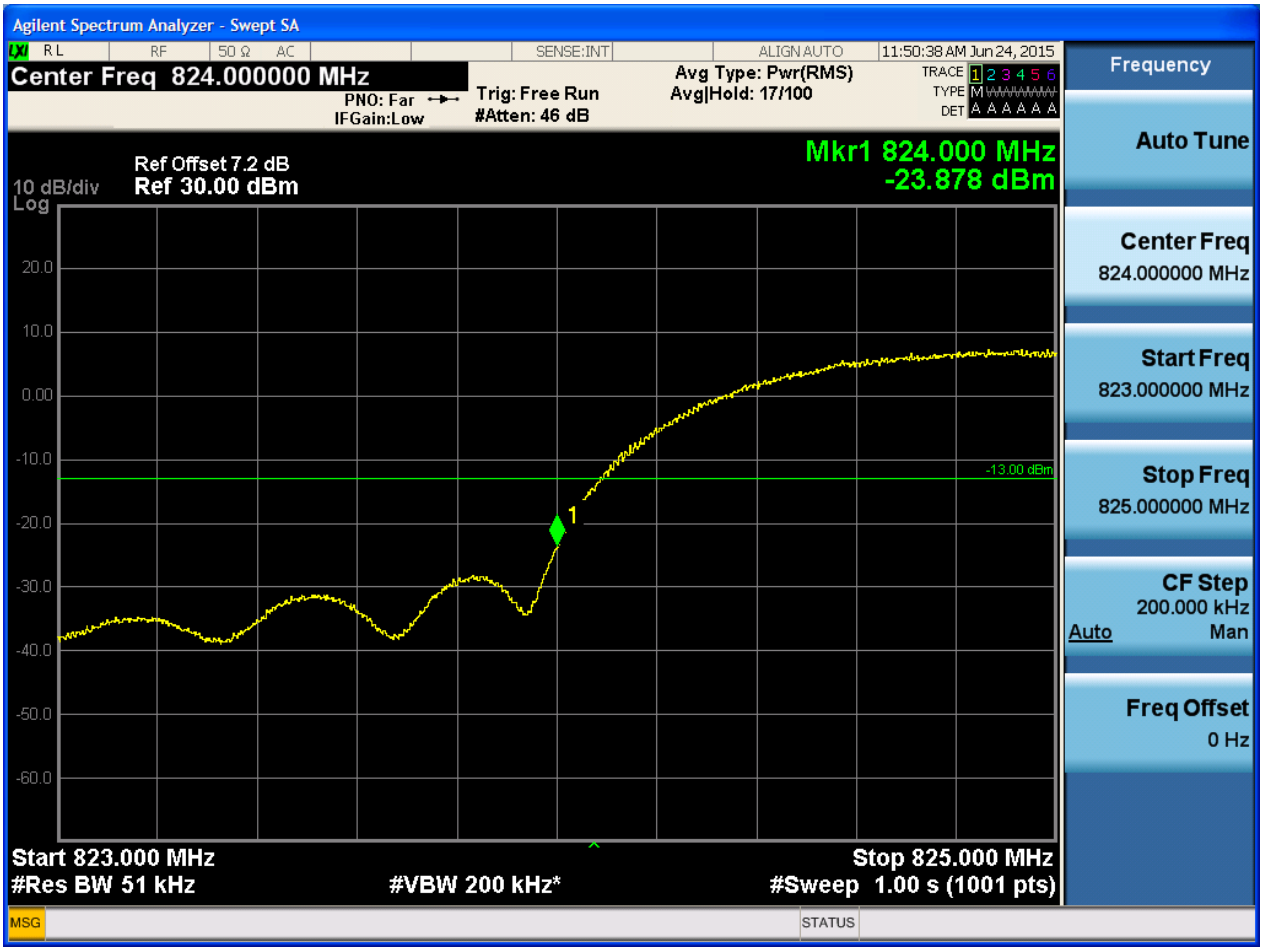


5.2 For UMTS

5.2.1 Test Band = WCDMA850

5.2.1.1 Test Mode = UMTS/TM1

5.2.1.1.1 Test Channel = LCH

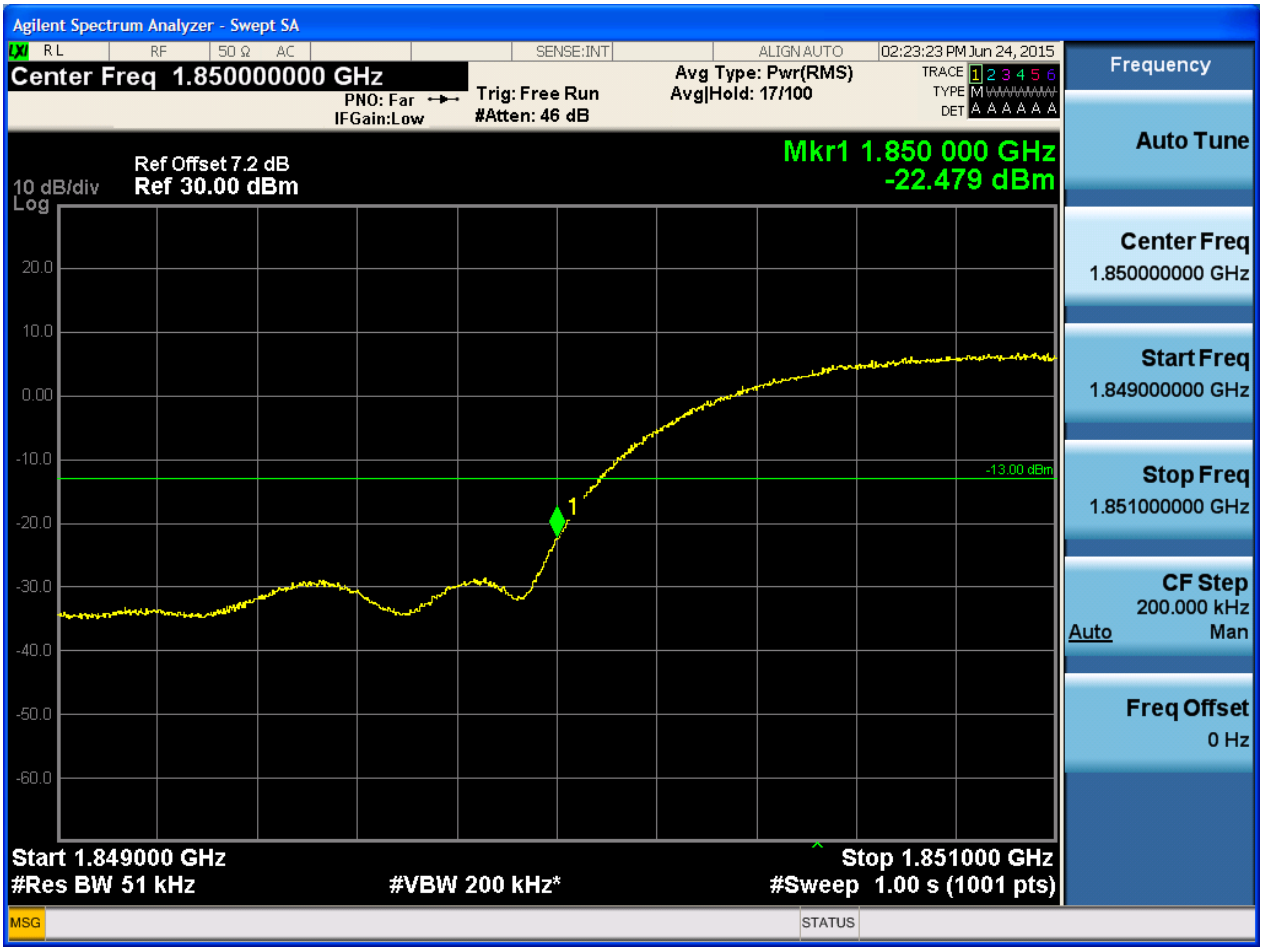


5.2.1.1.2 Test Channel = HCH

5.2.2 Test Band = WCDMA1900

5.2.2.1 Test Mode = UMTS/TM1

5.2.2.1.1 Test Channel = LCH

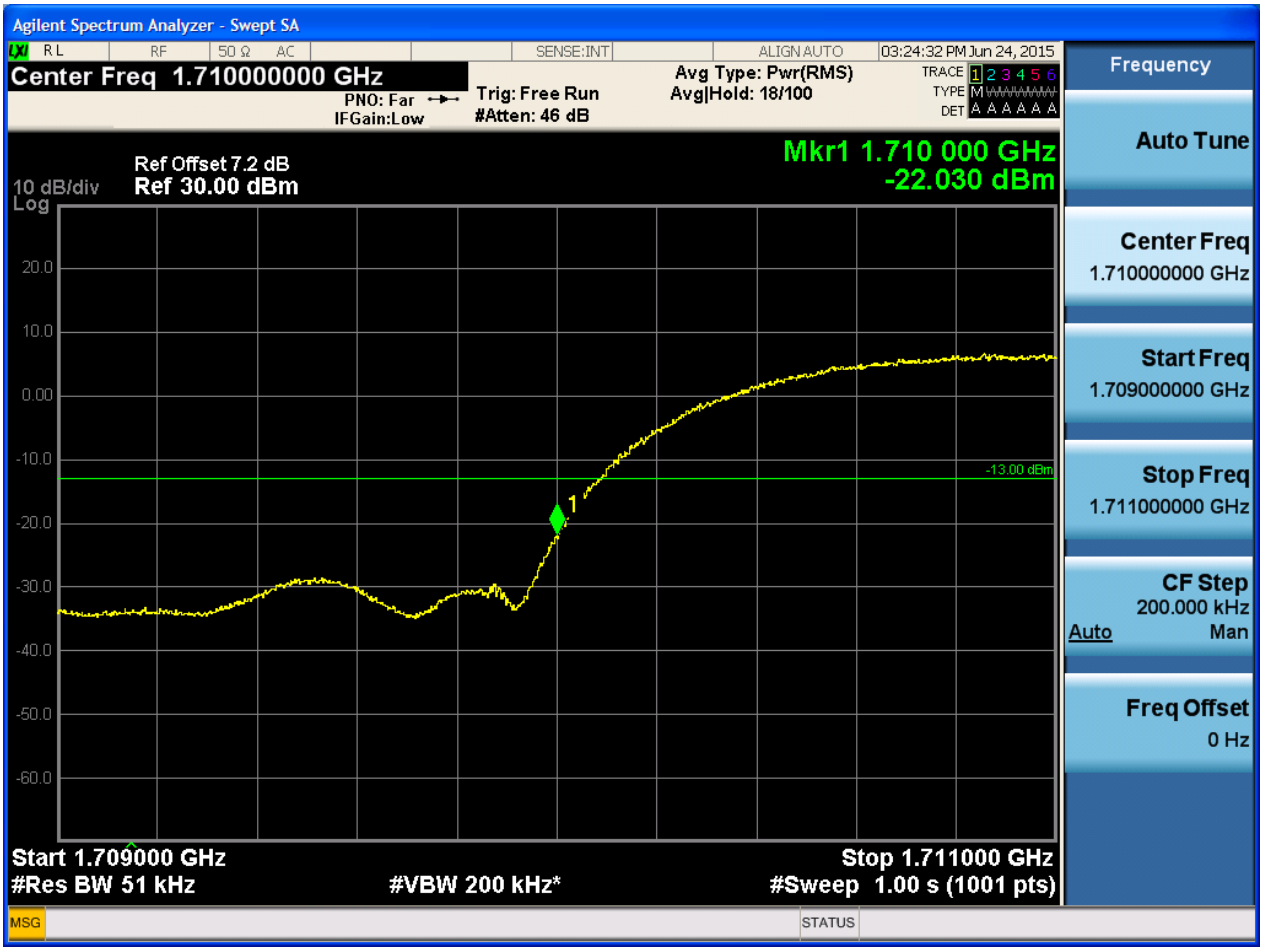


5.2.3.1.2 Test Channel = HCH

5.2.4 Test Band = WCDMA1700

5.2.4.1 Test Mode = UMTS/TM1

5.2.4.1.1 Test Channel = LCH



5.2.4.1.2 Test Channel = HCH

6Appendix_F: 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.

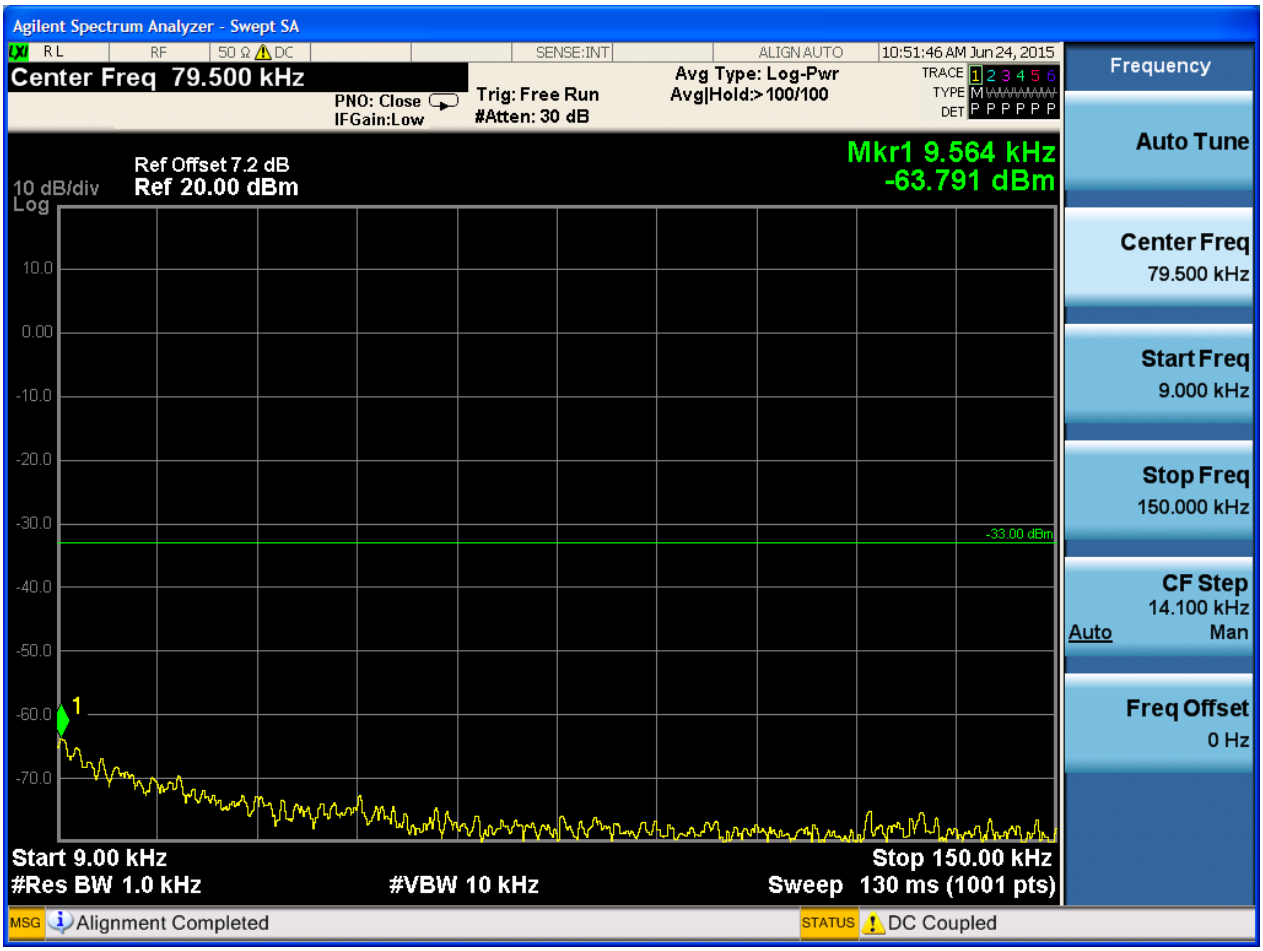
Part I - Test Plots

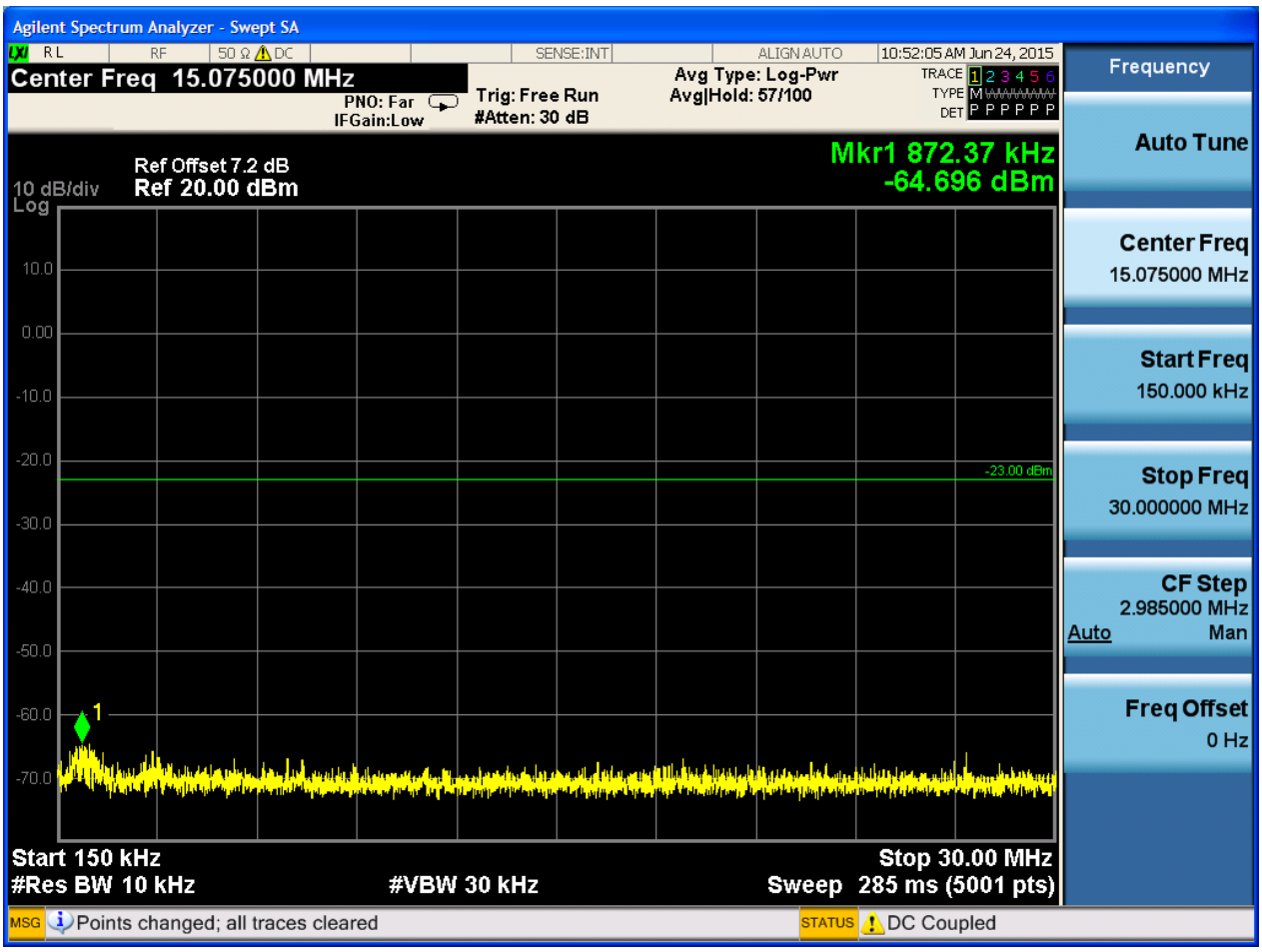
6.1 For GSM

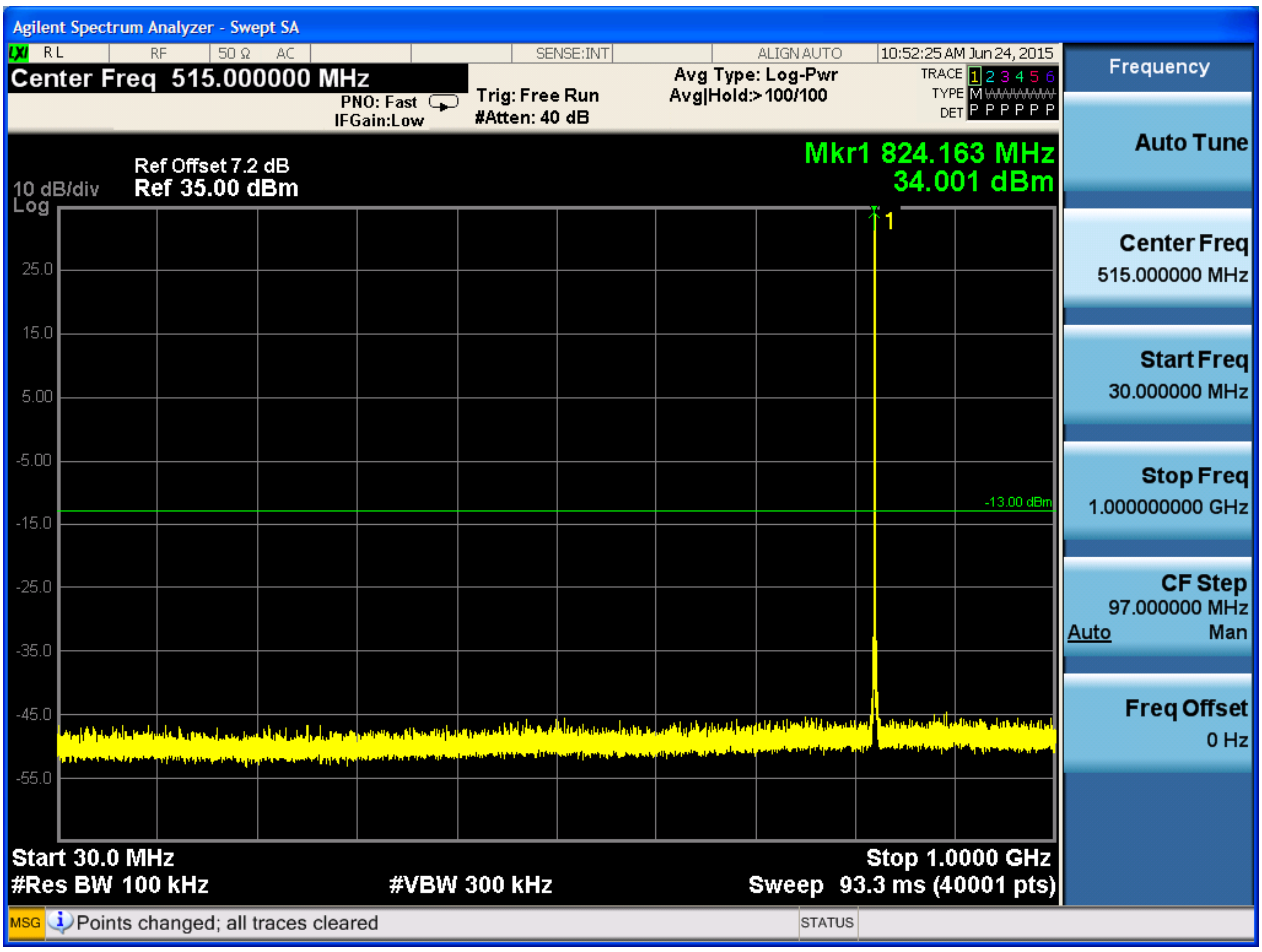
6.1.1 Test Band = GSM850

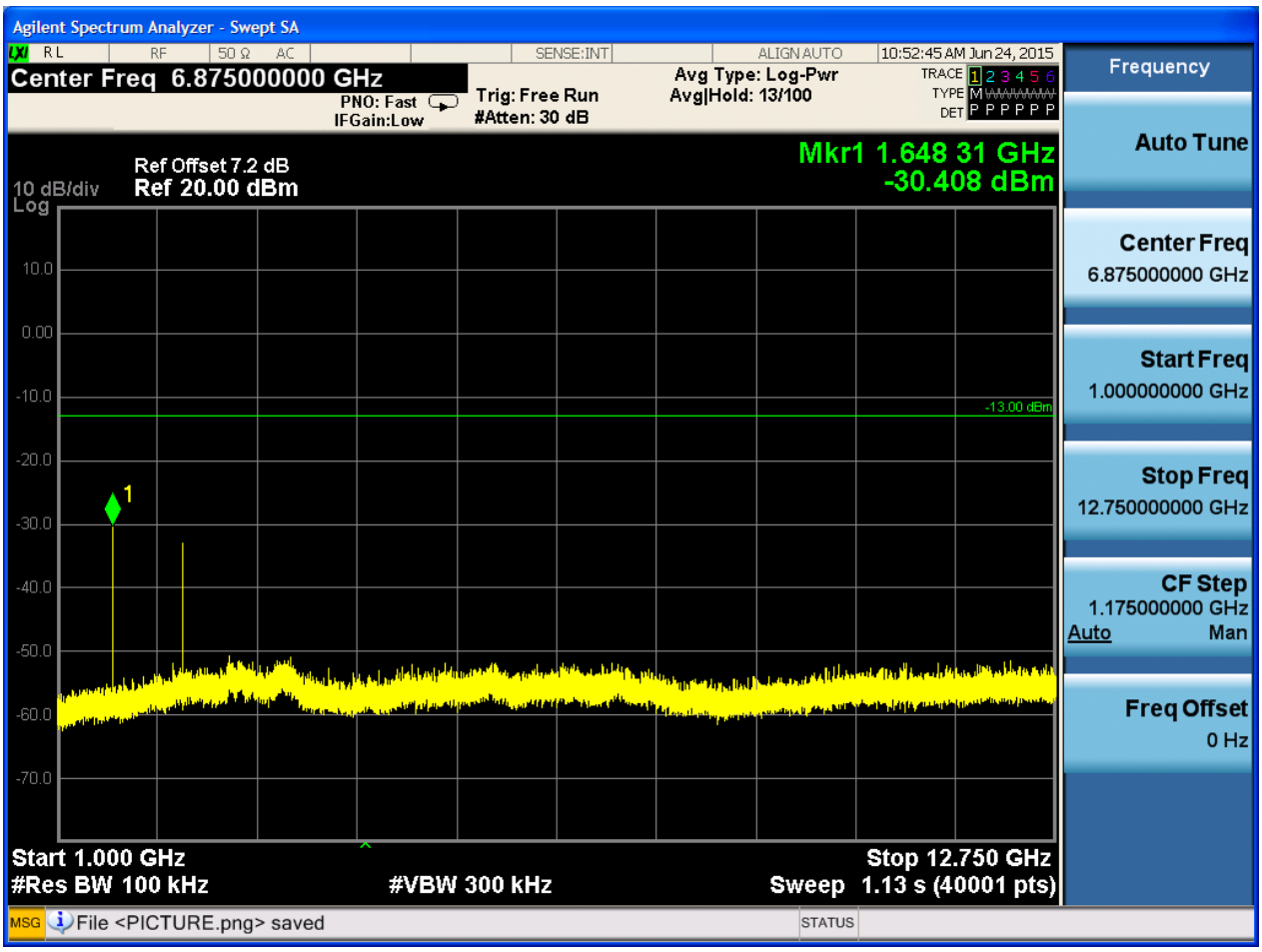
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

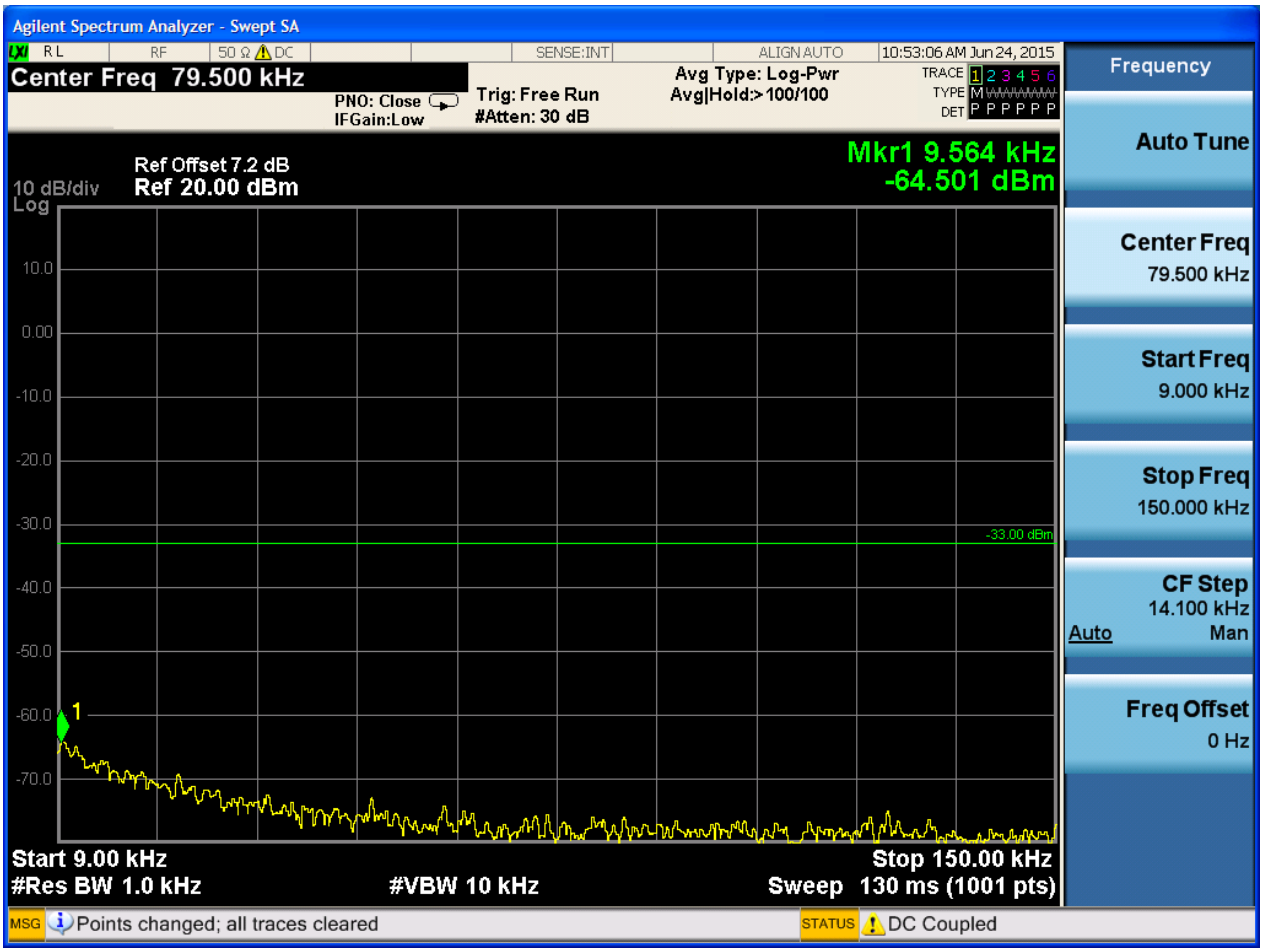


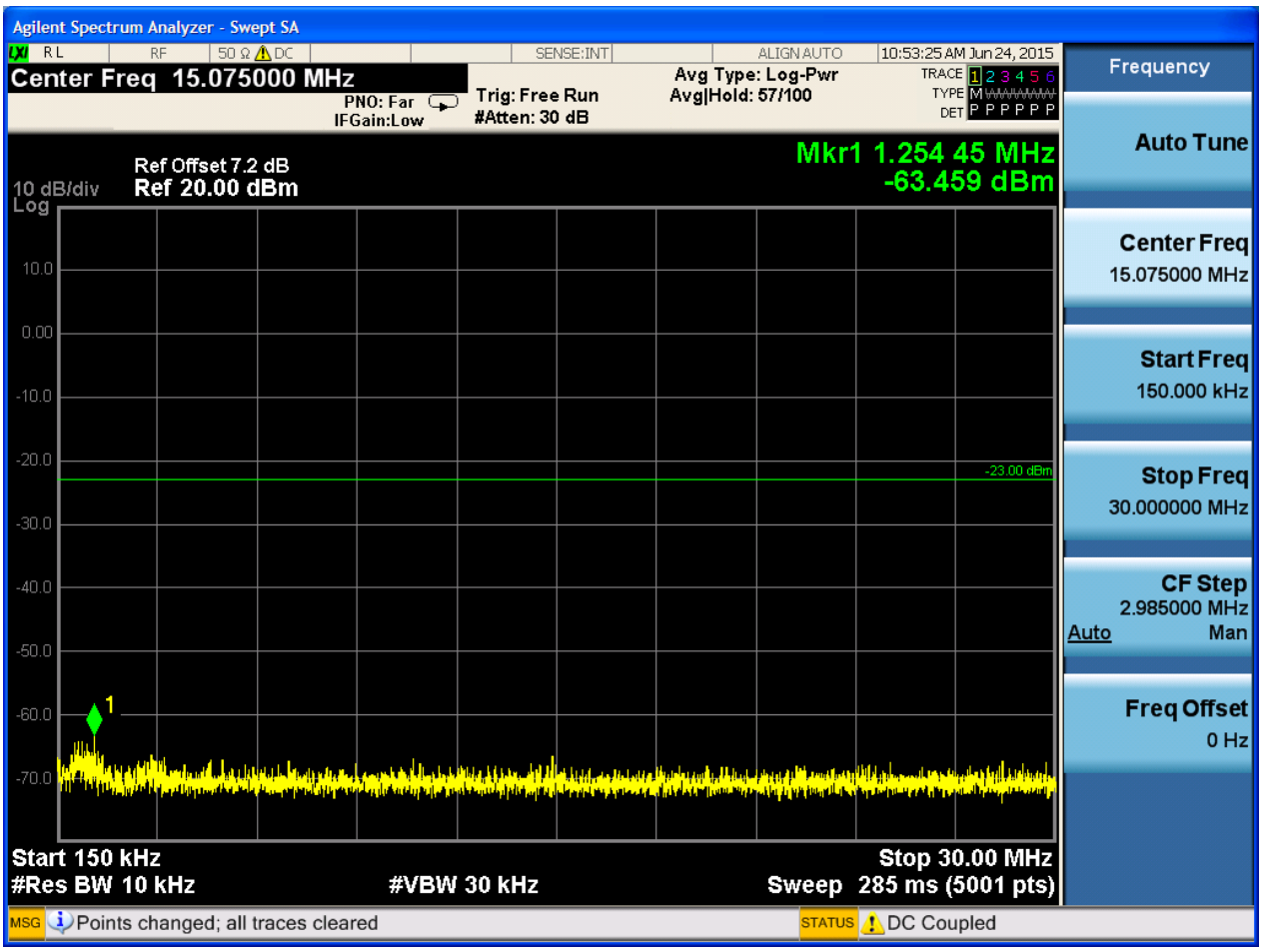


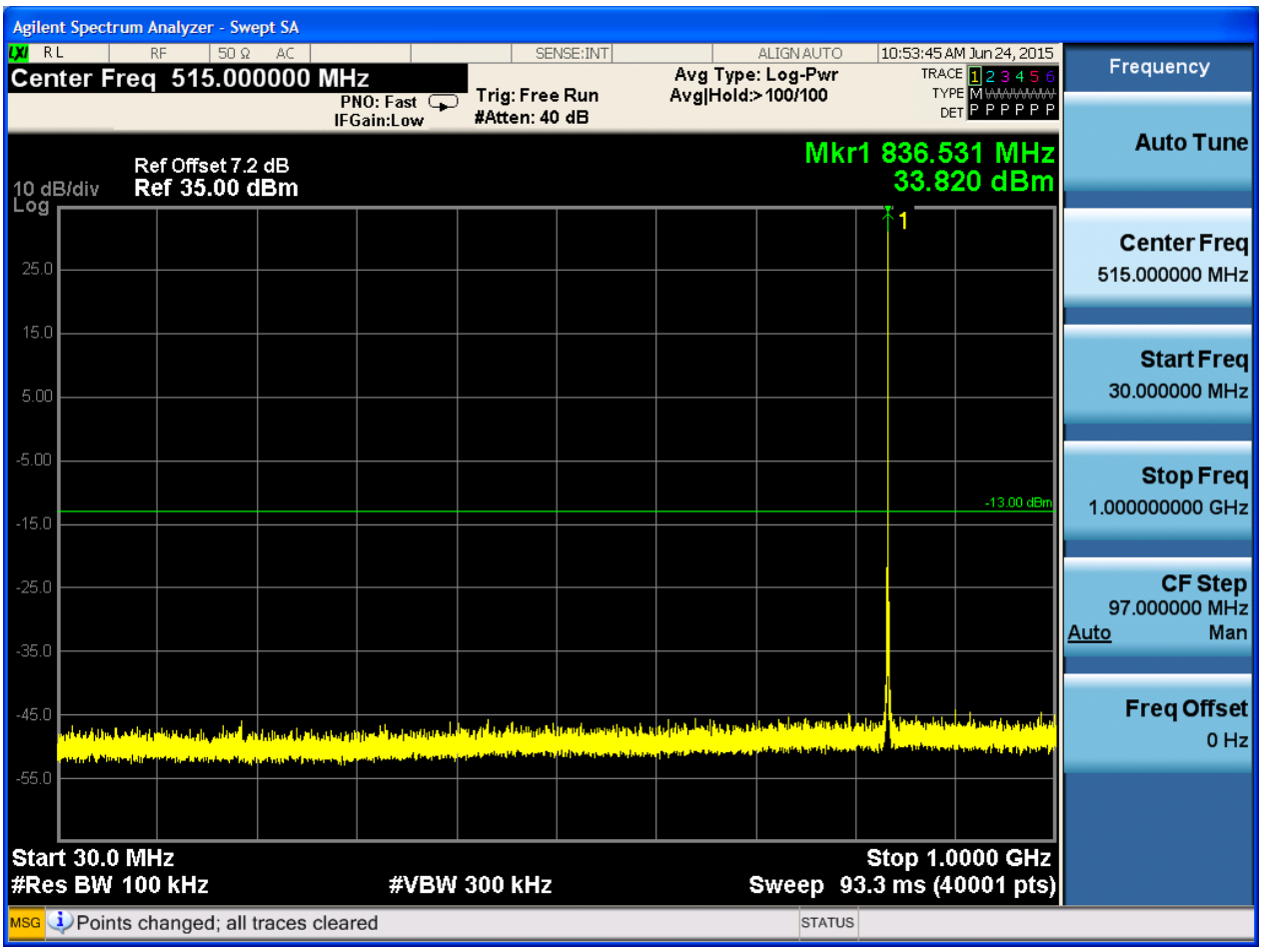


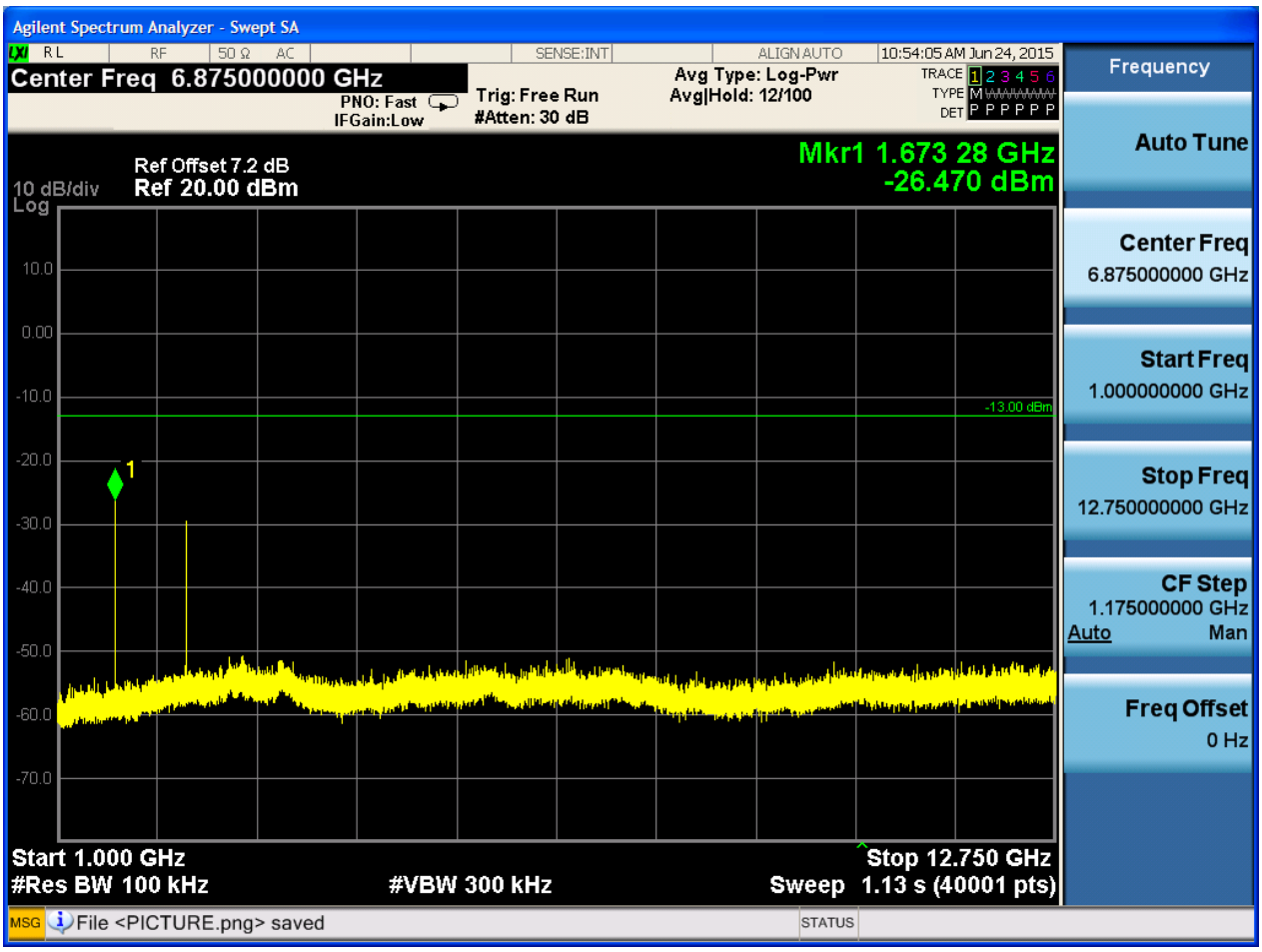


6.1.1.1.2 Test Channel = MCH

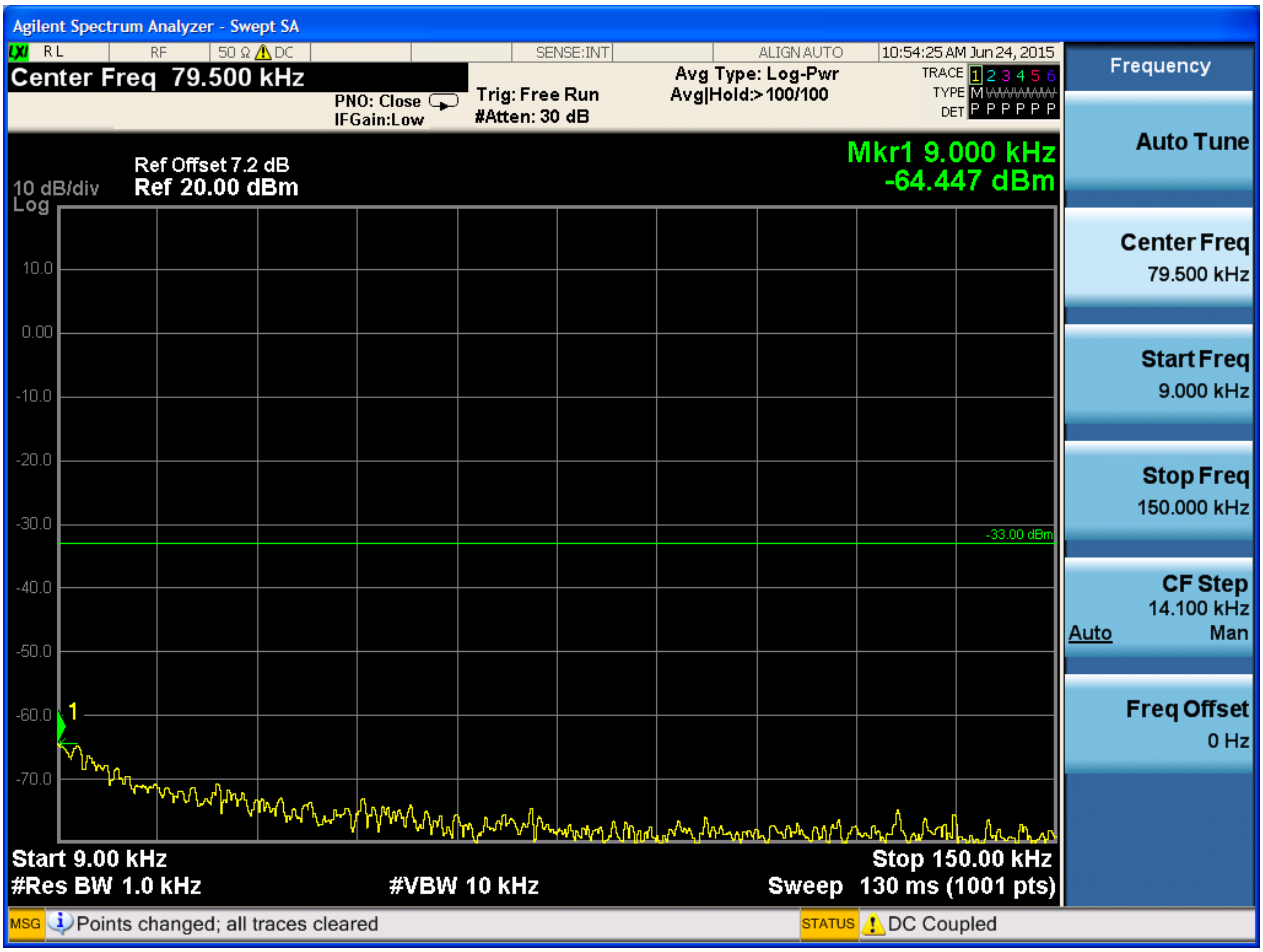


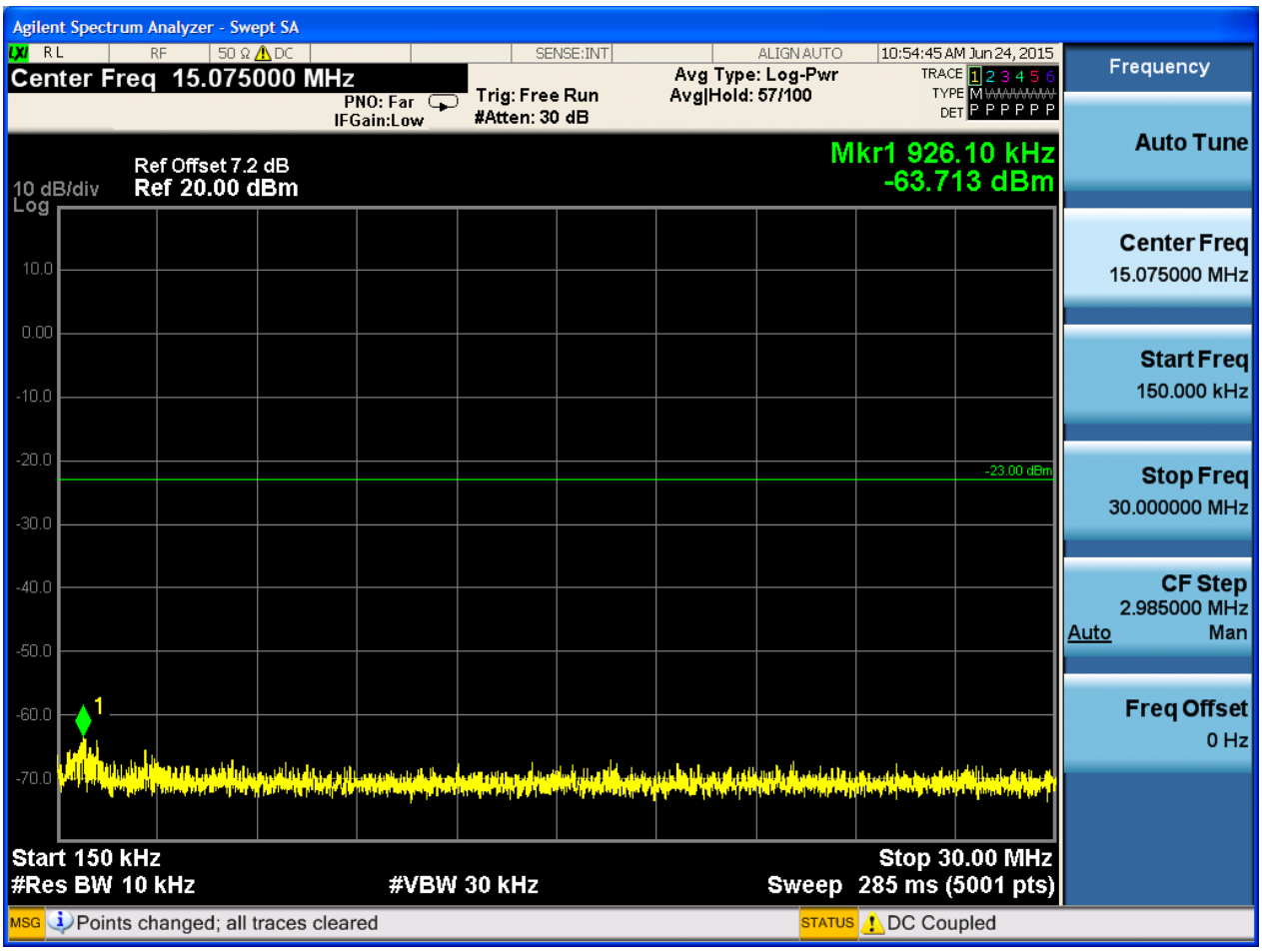


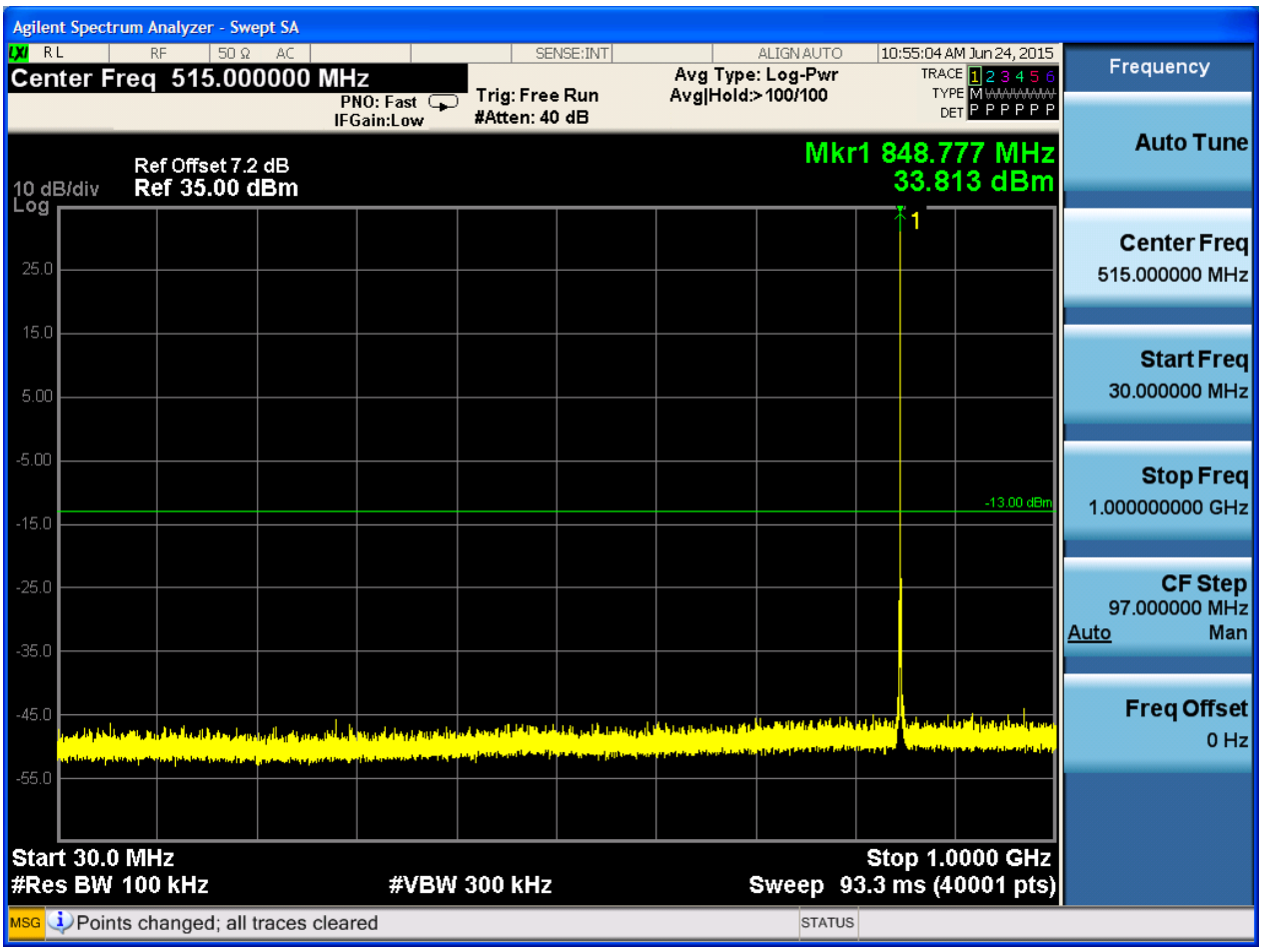


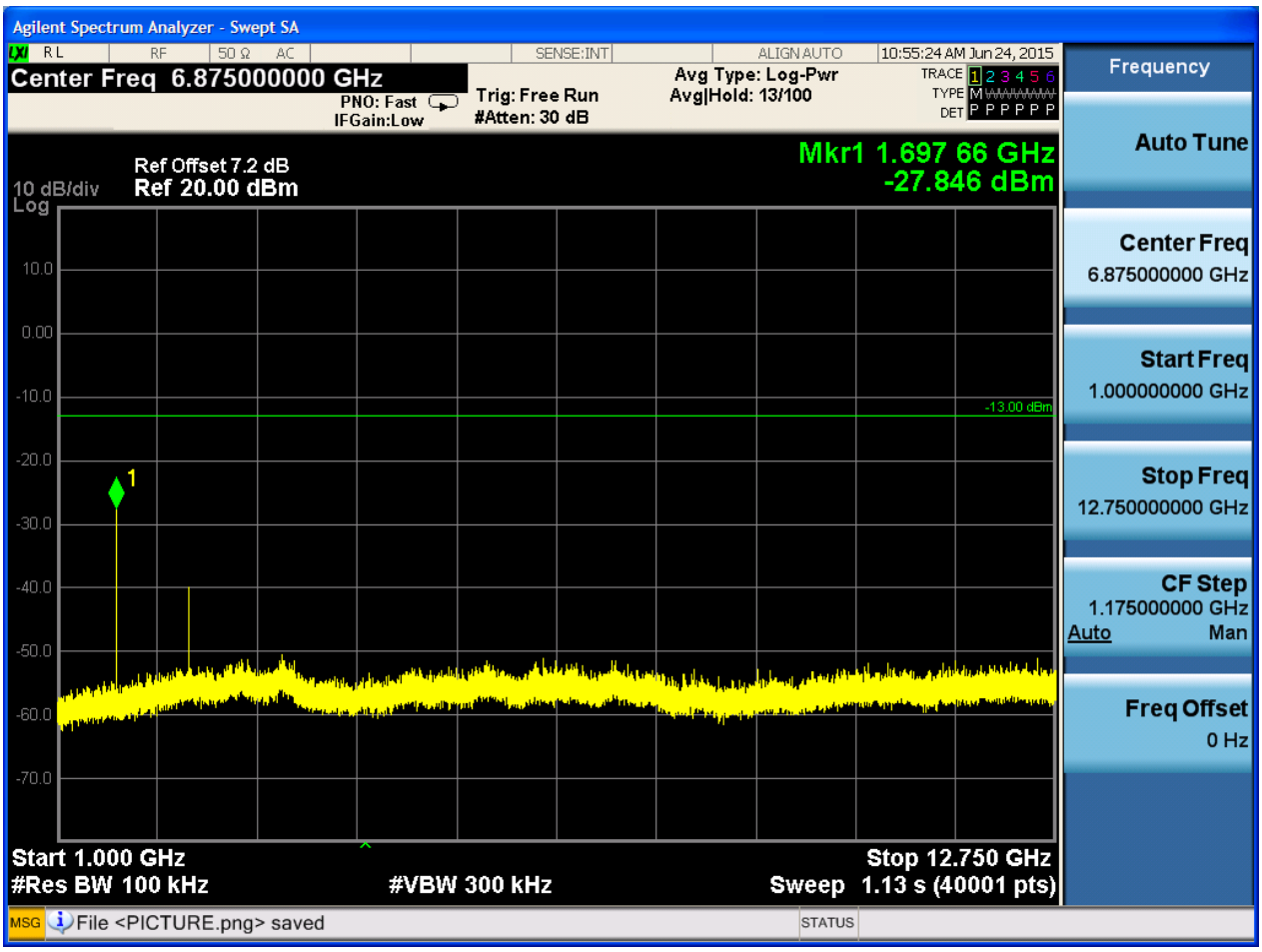


6.1.1.1.3 Test Channel = HCH



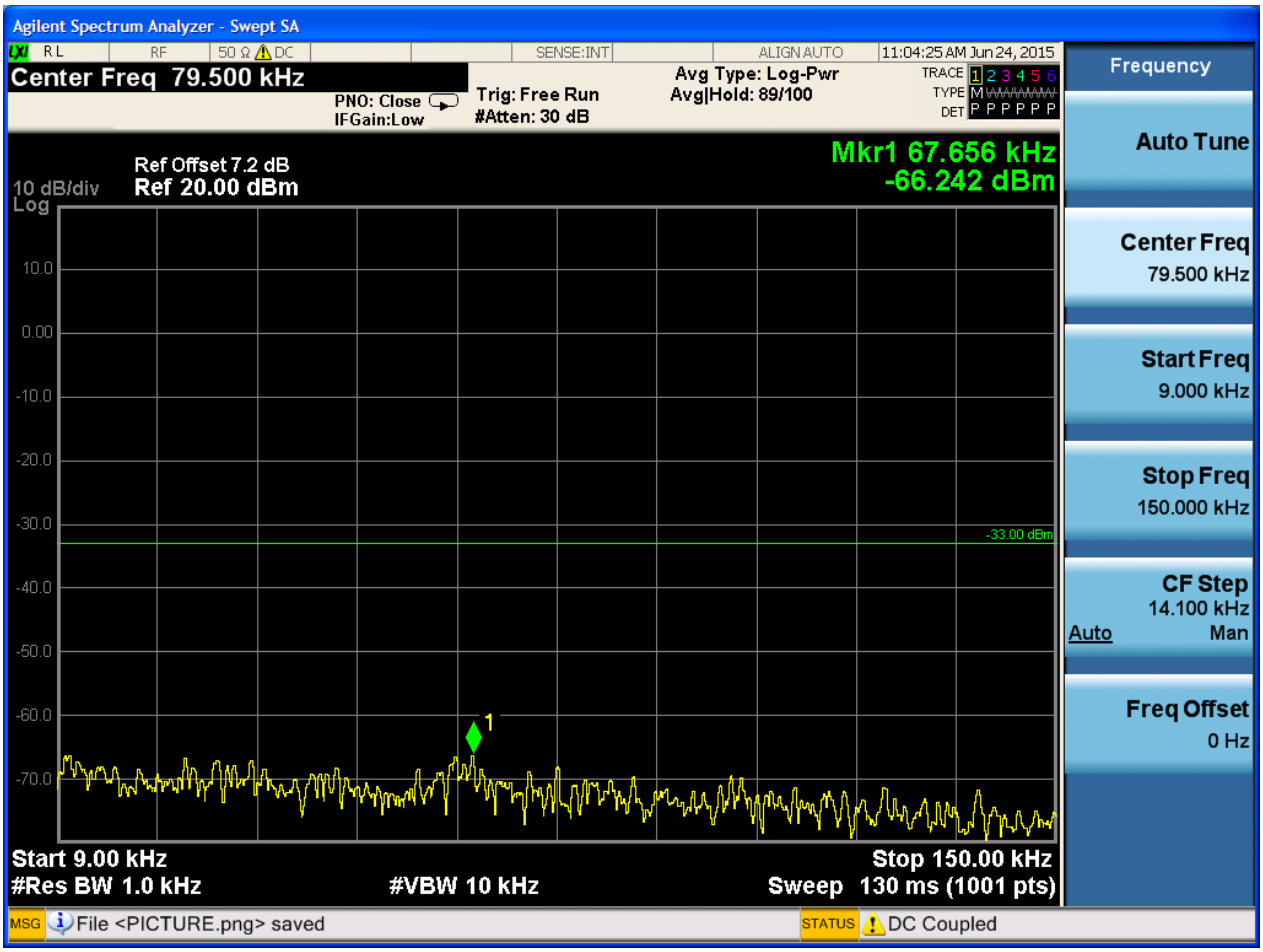


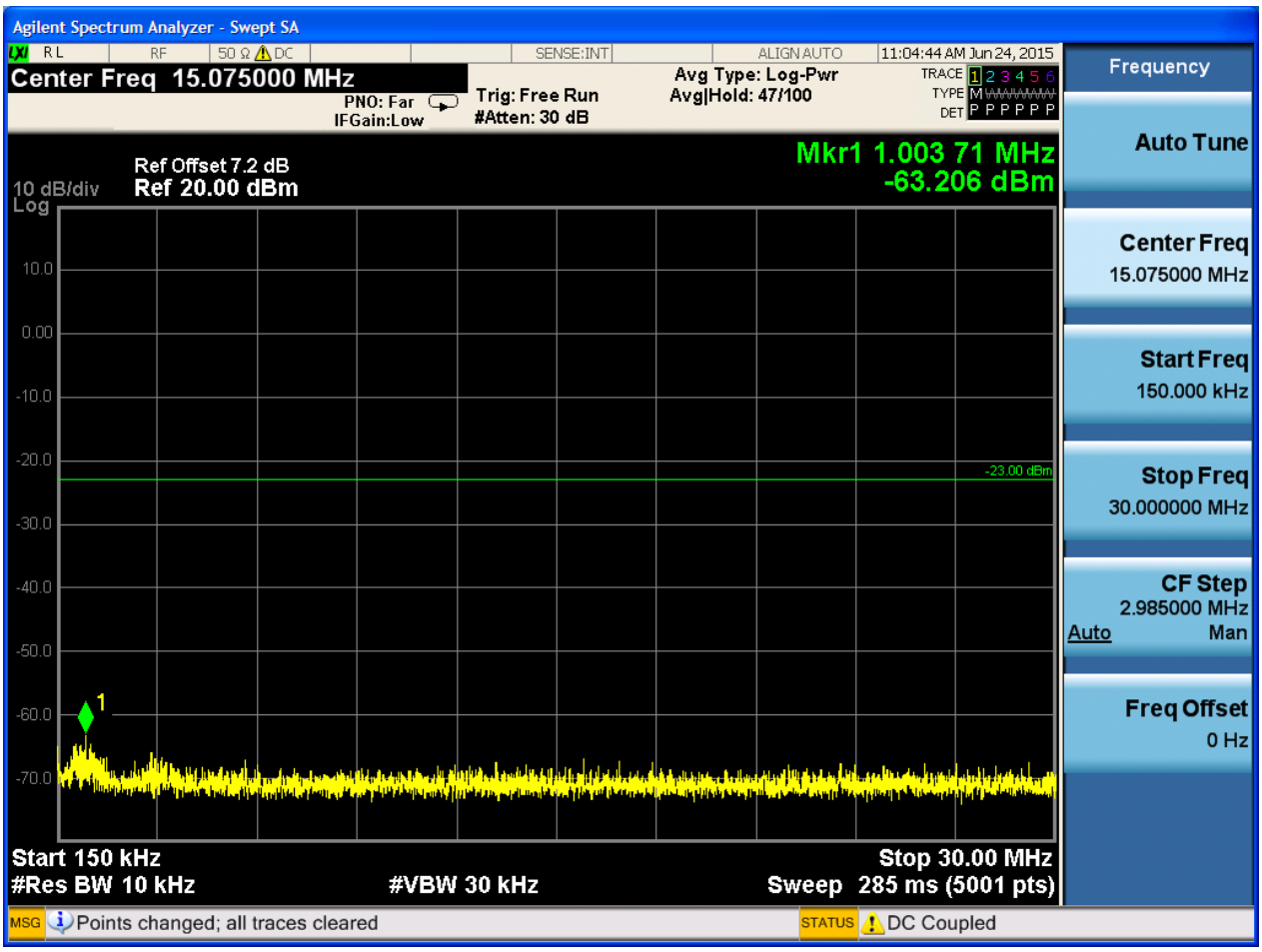


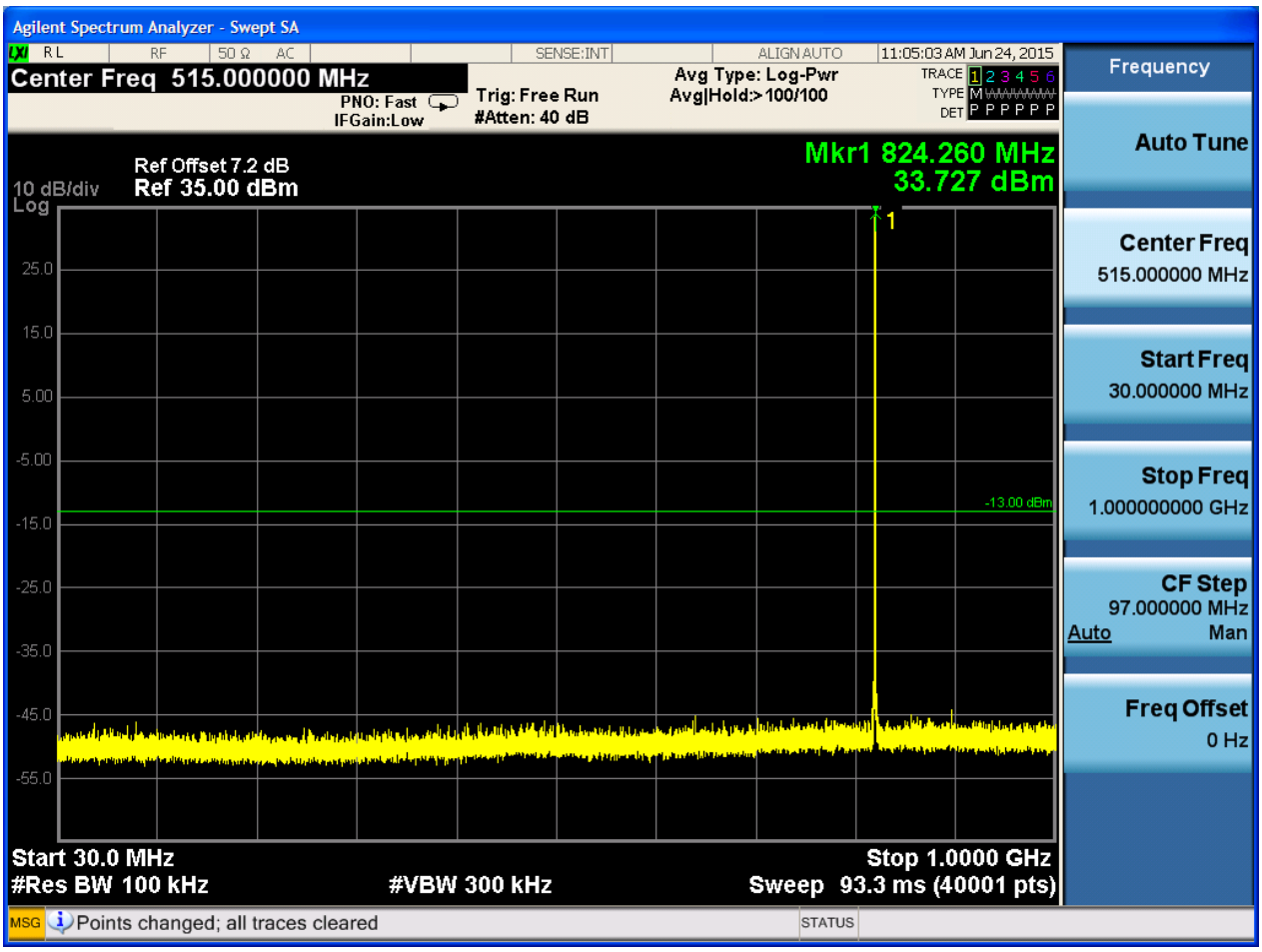


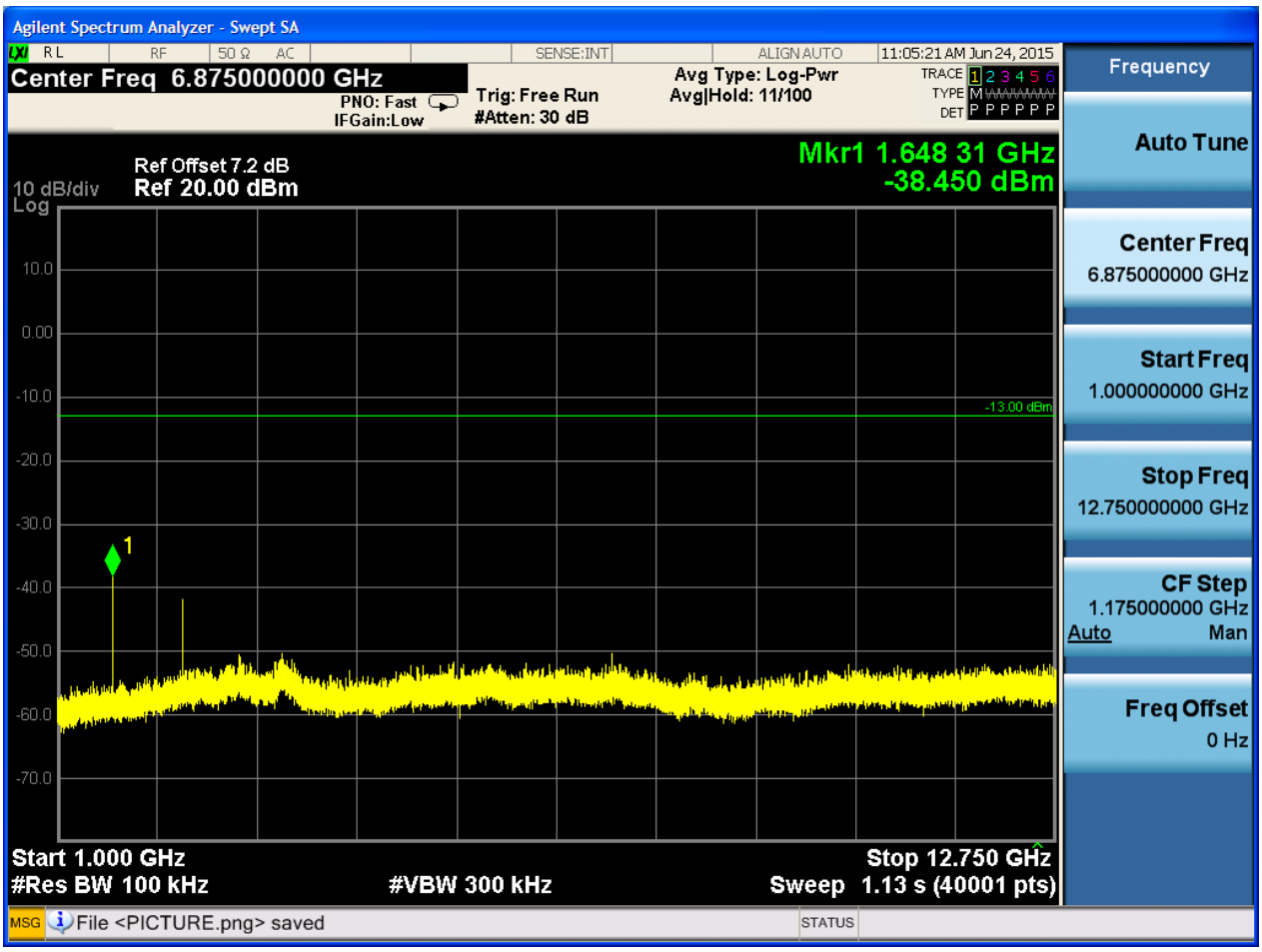
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

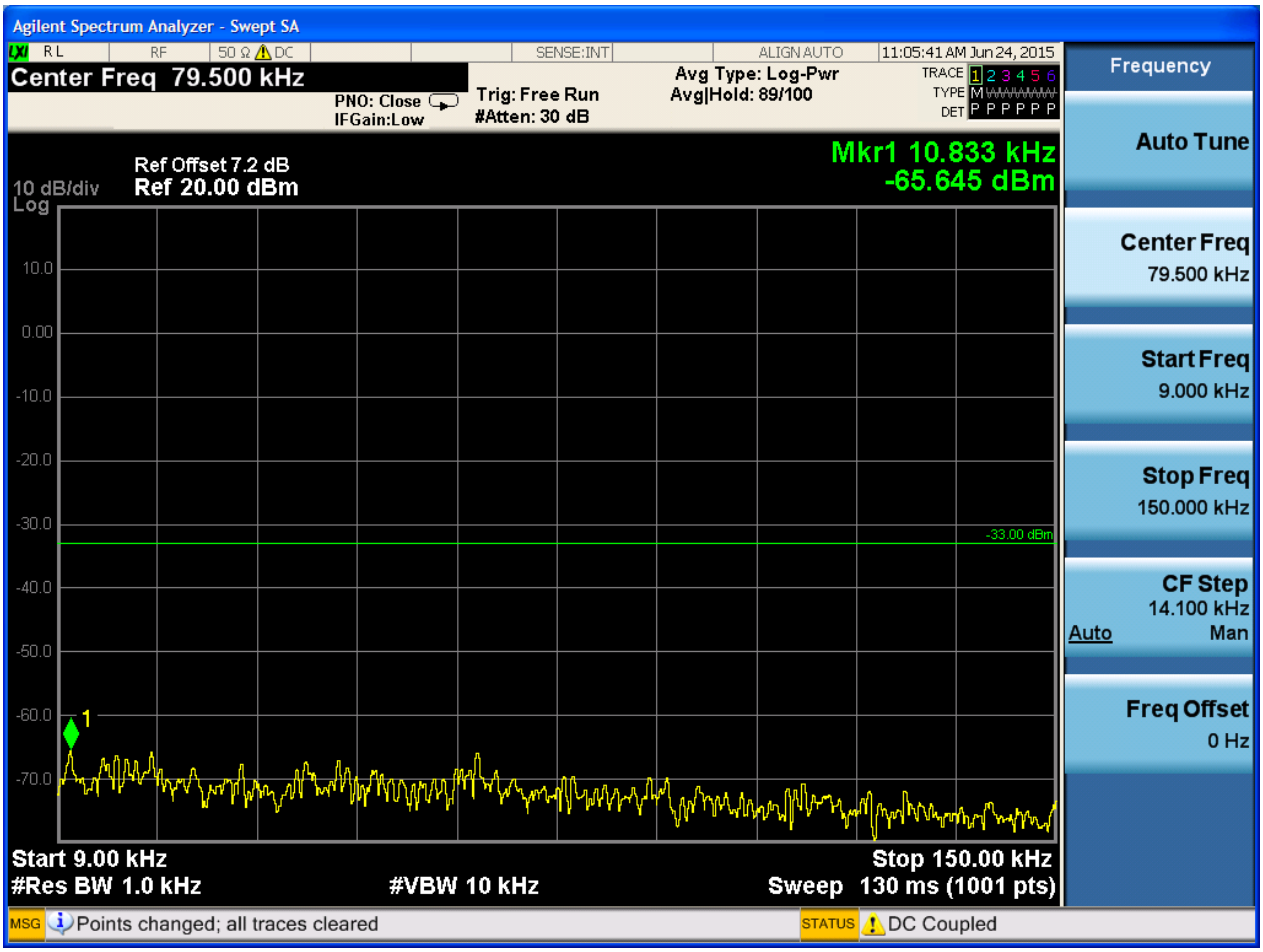


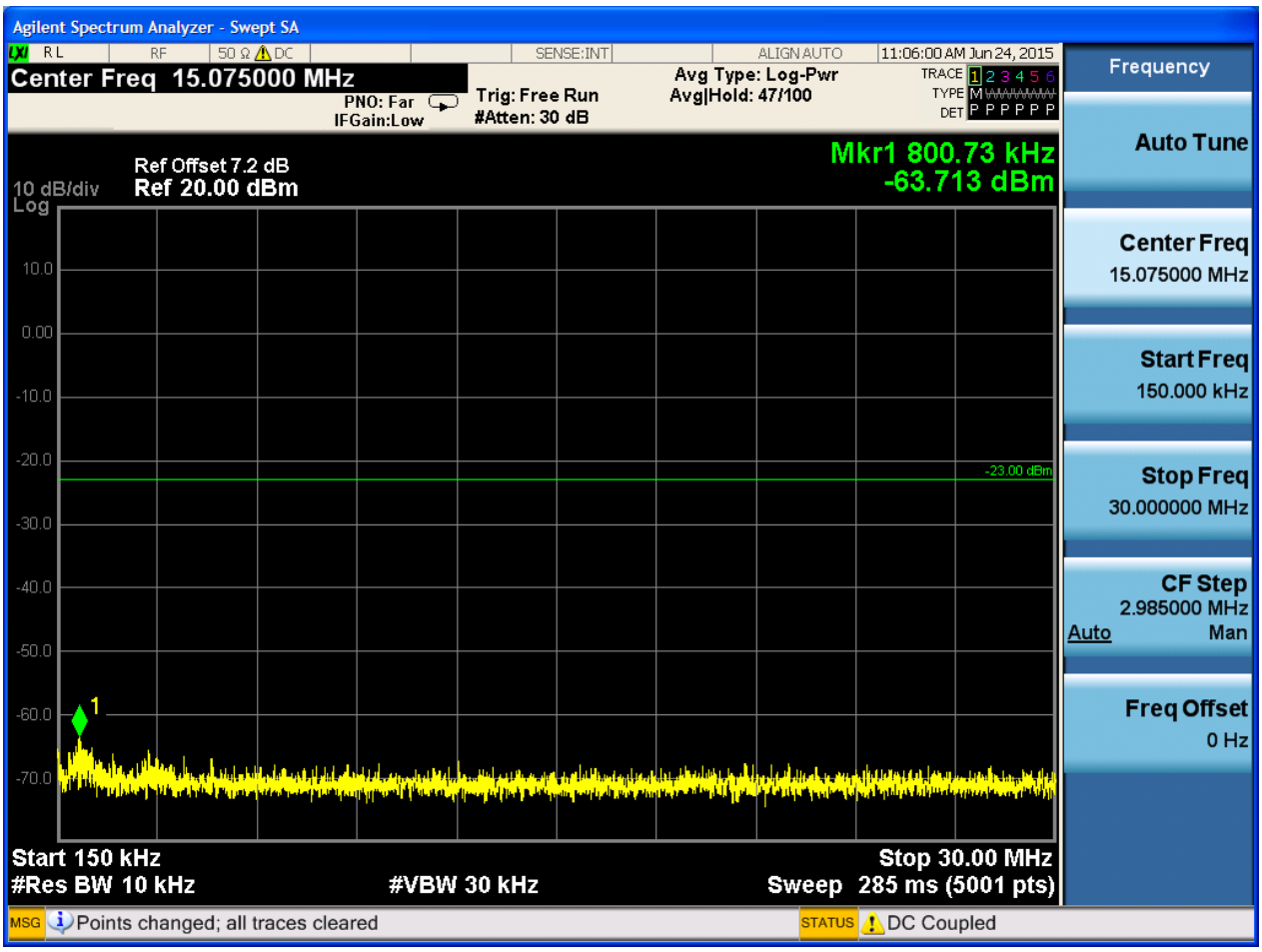


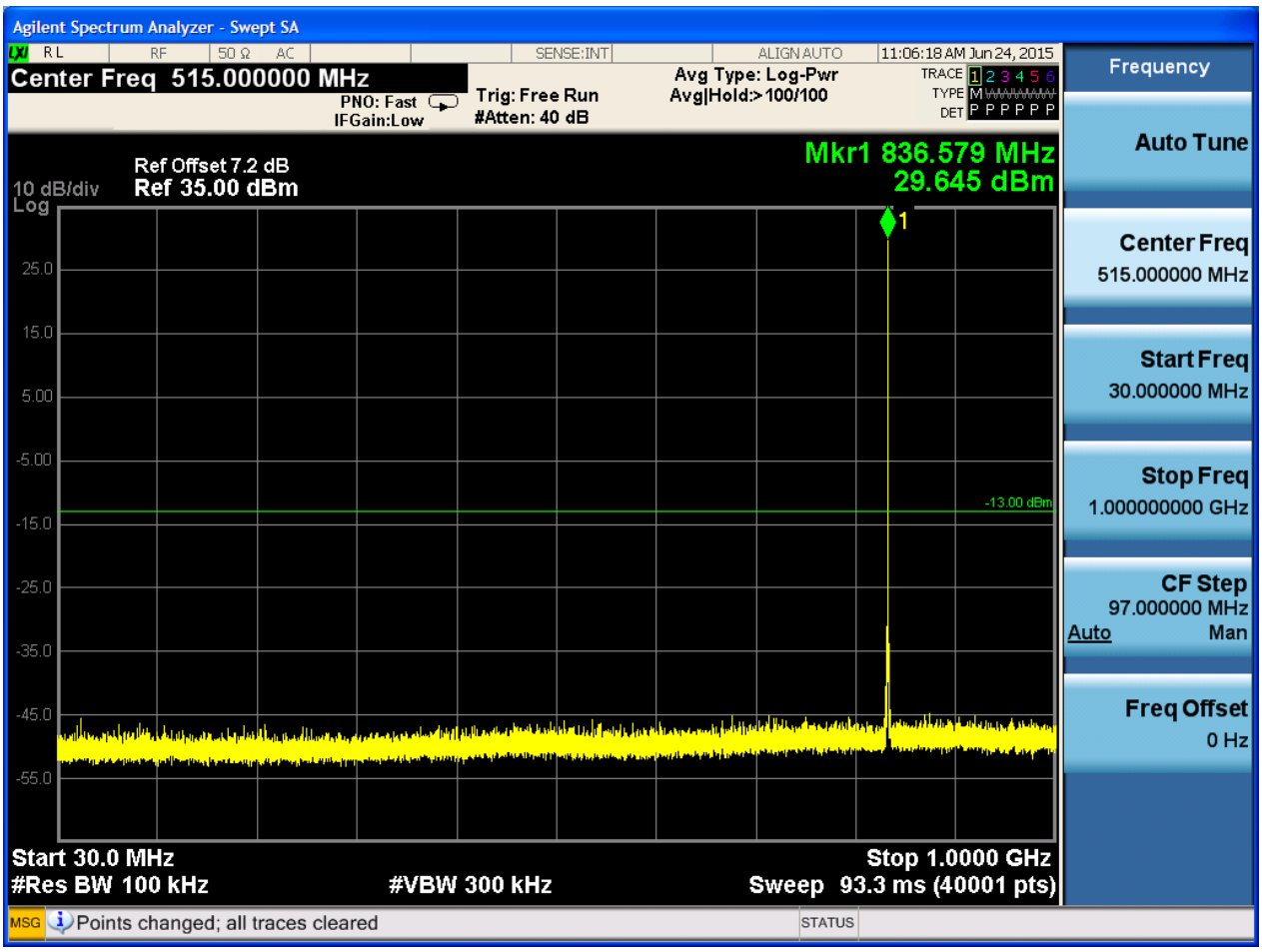


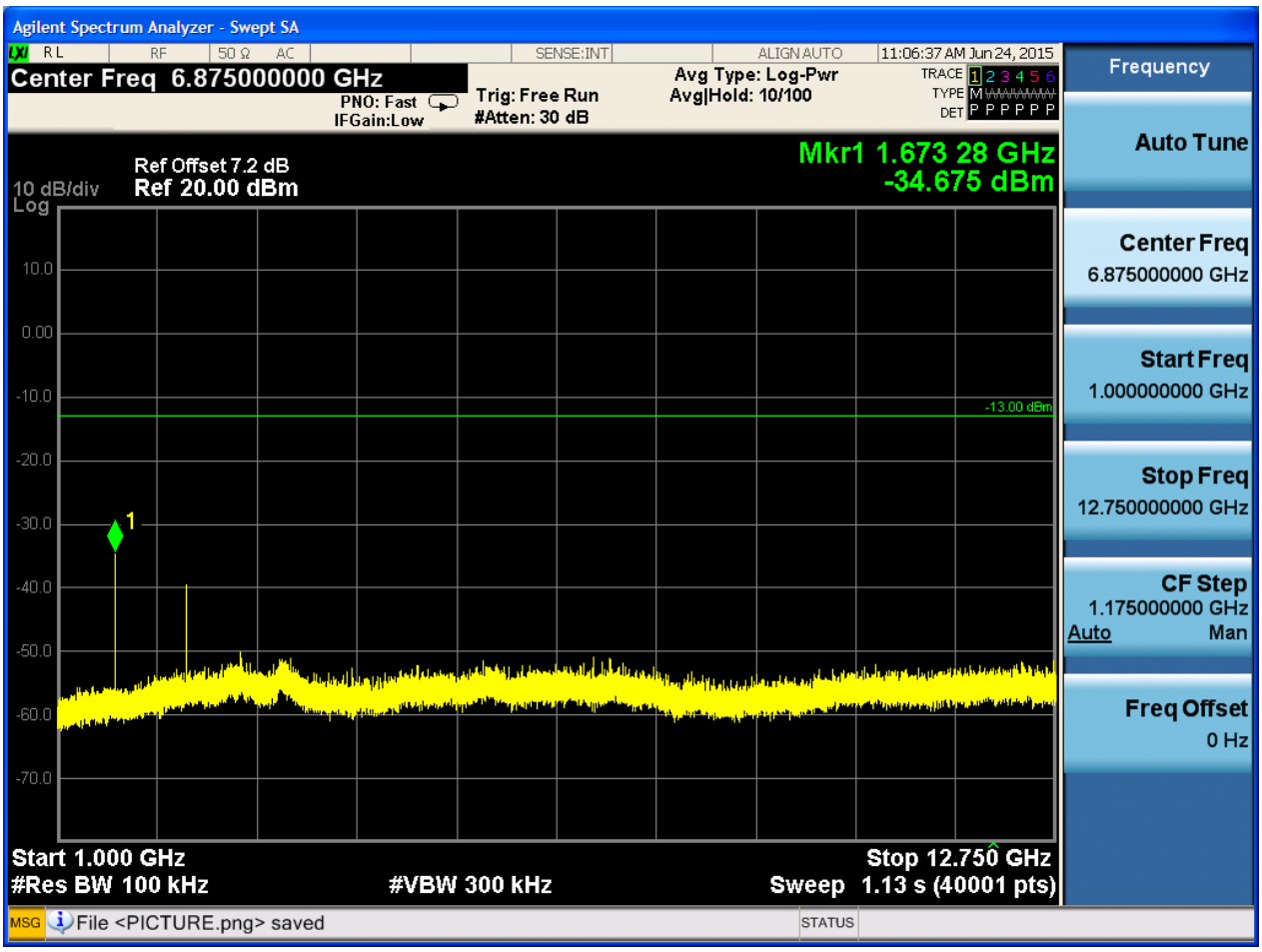


6.1.1.2.2 Test Channel = MCH

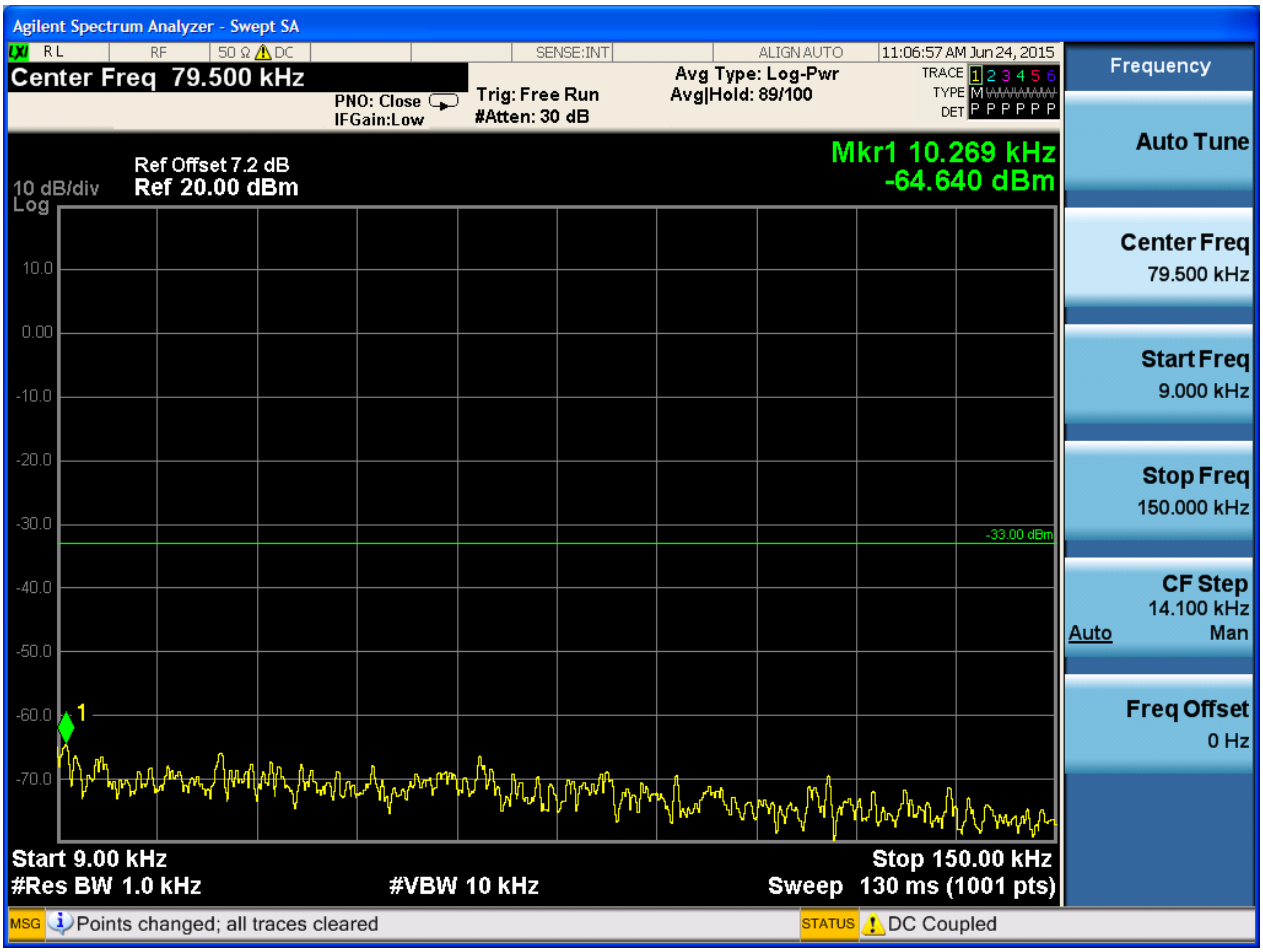


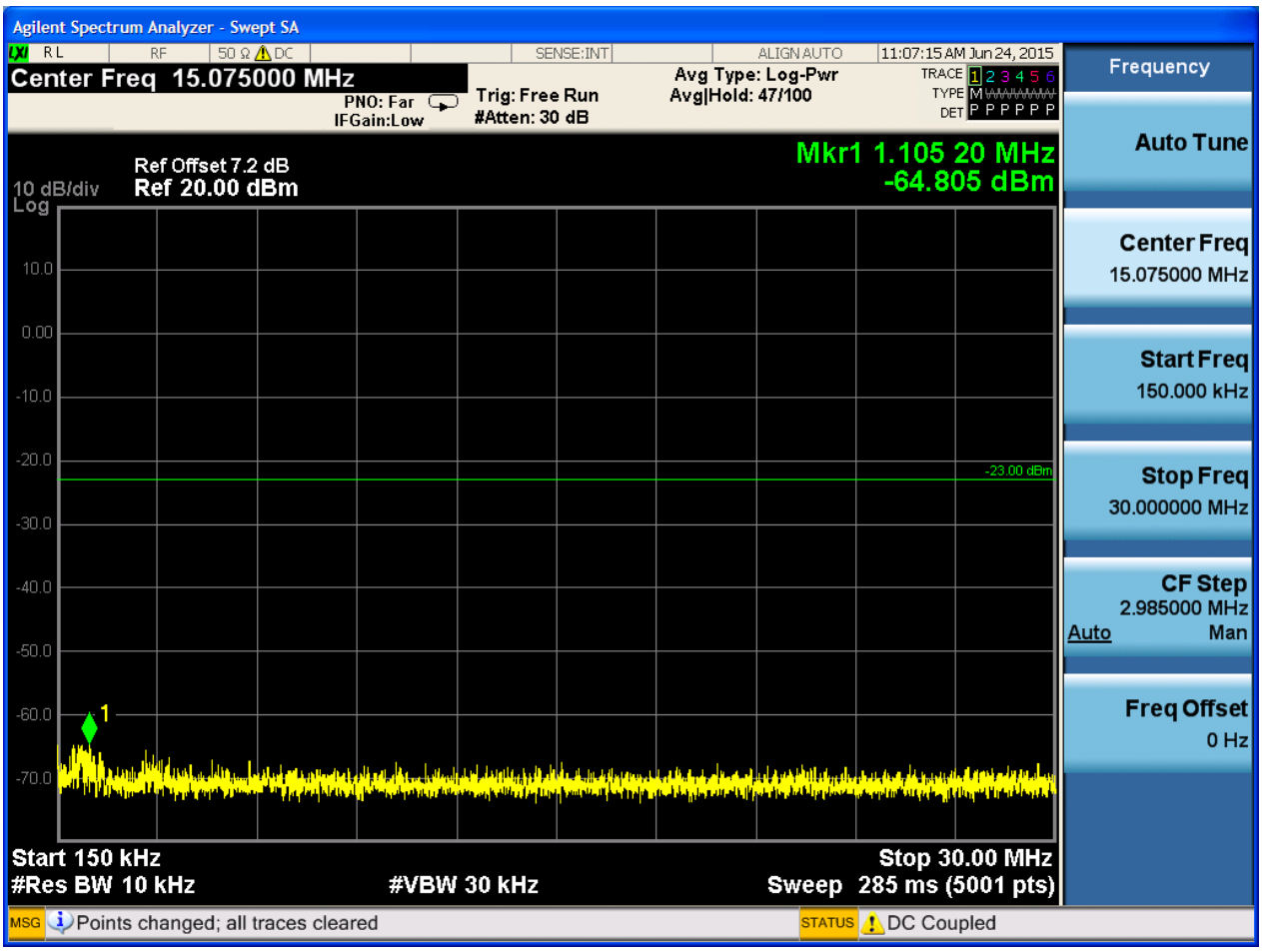


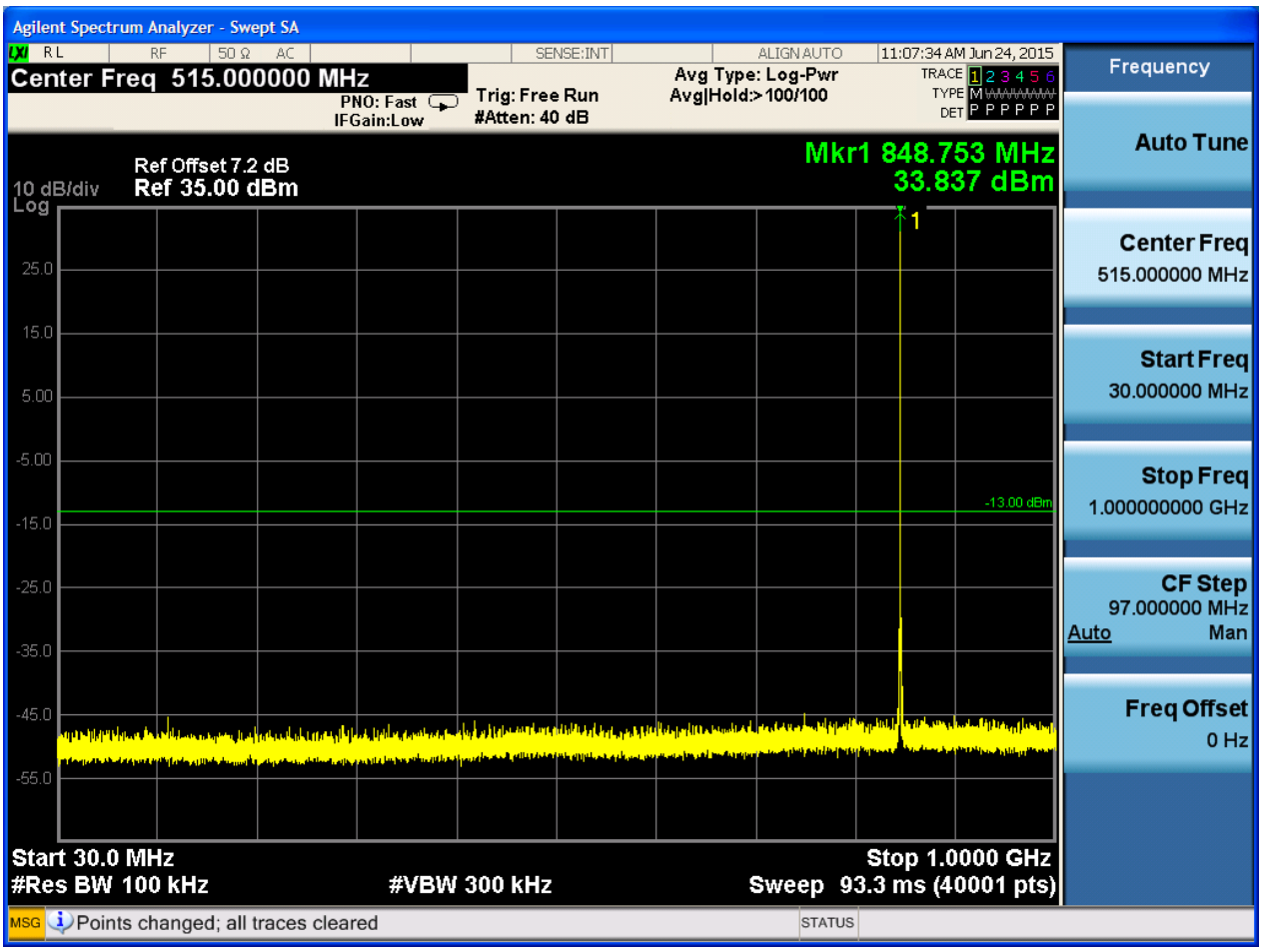


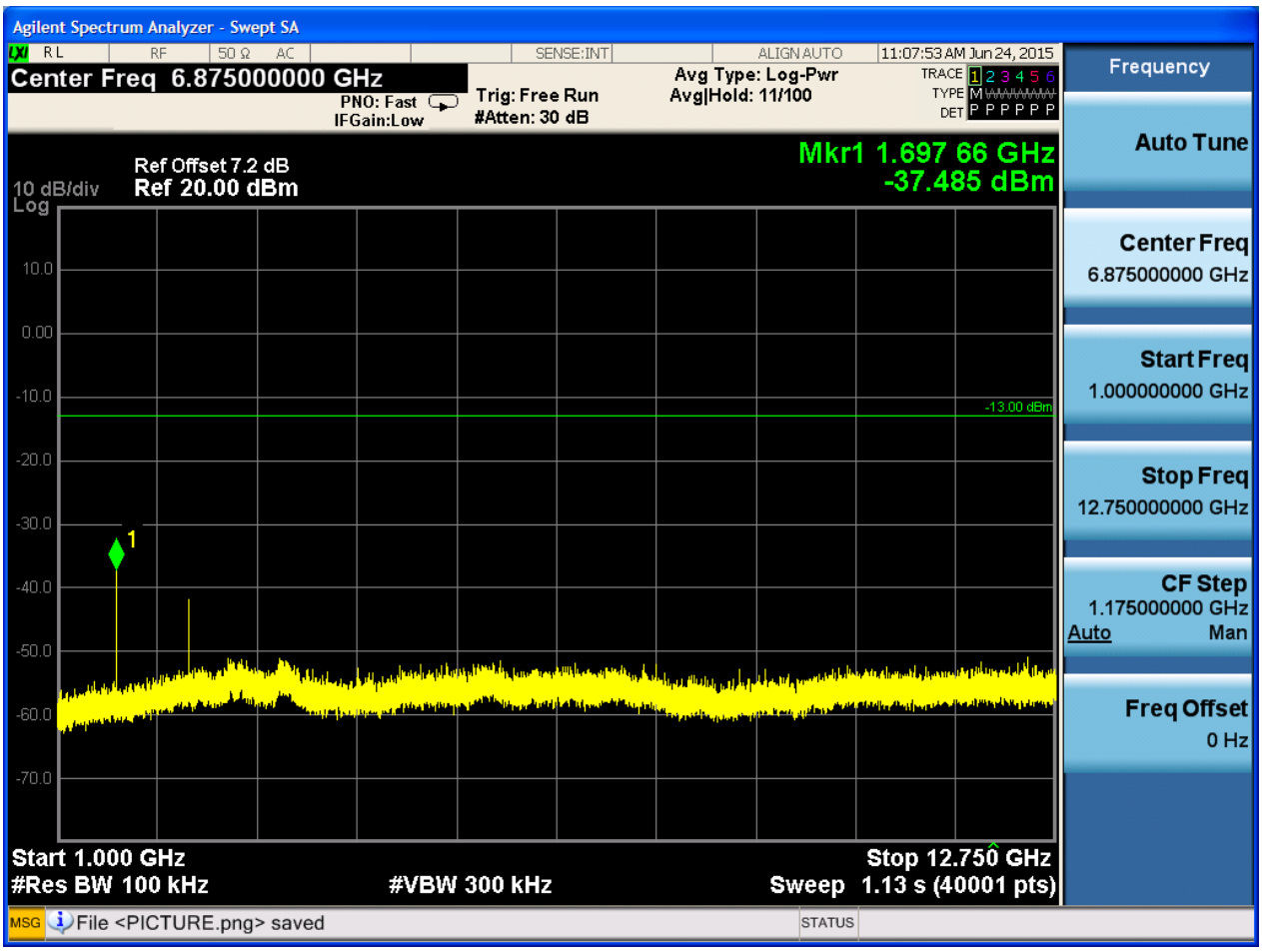


6.1.1.2.3 Test Channel = HCH





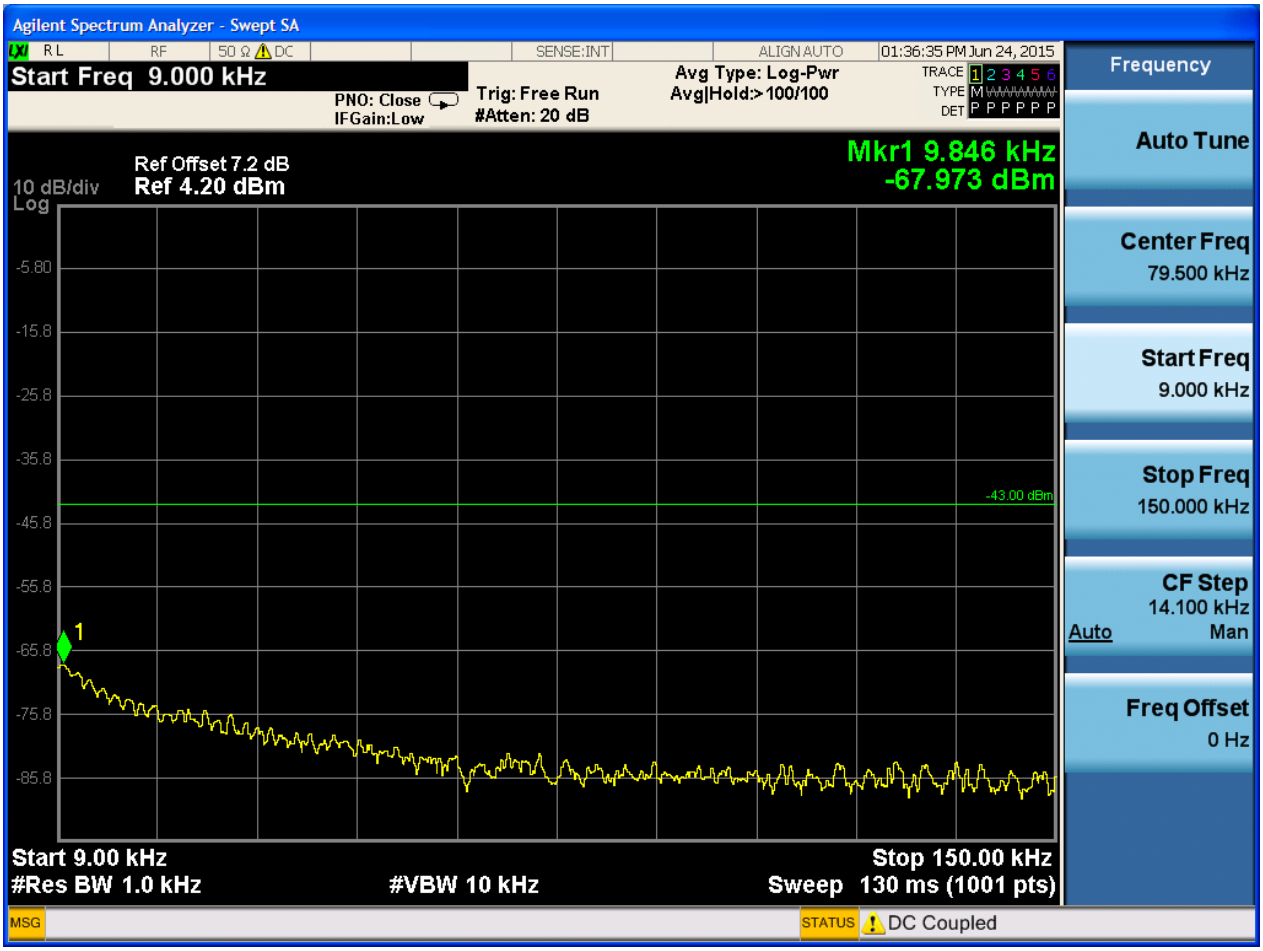


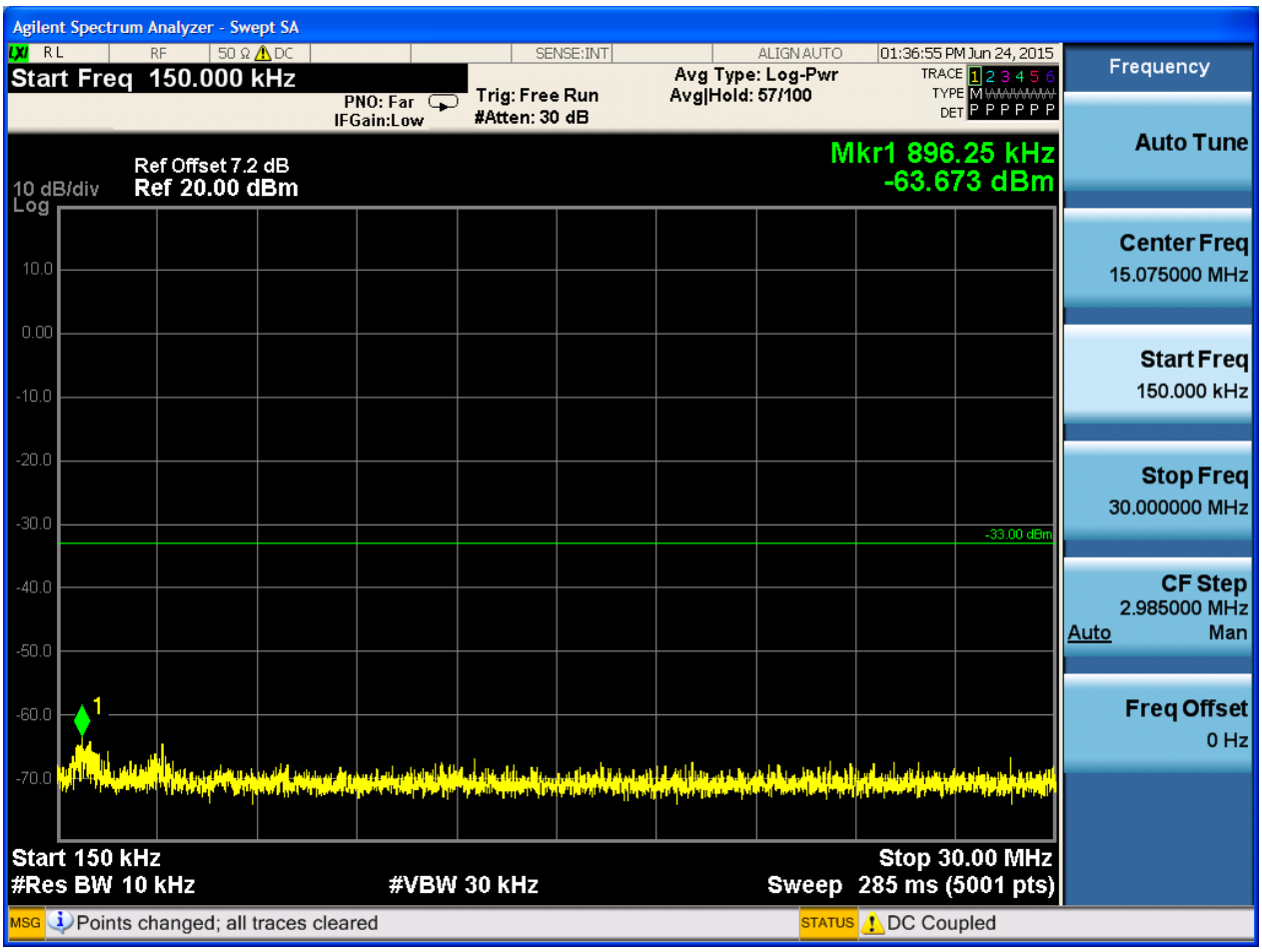


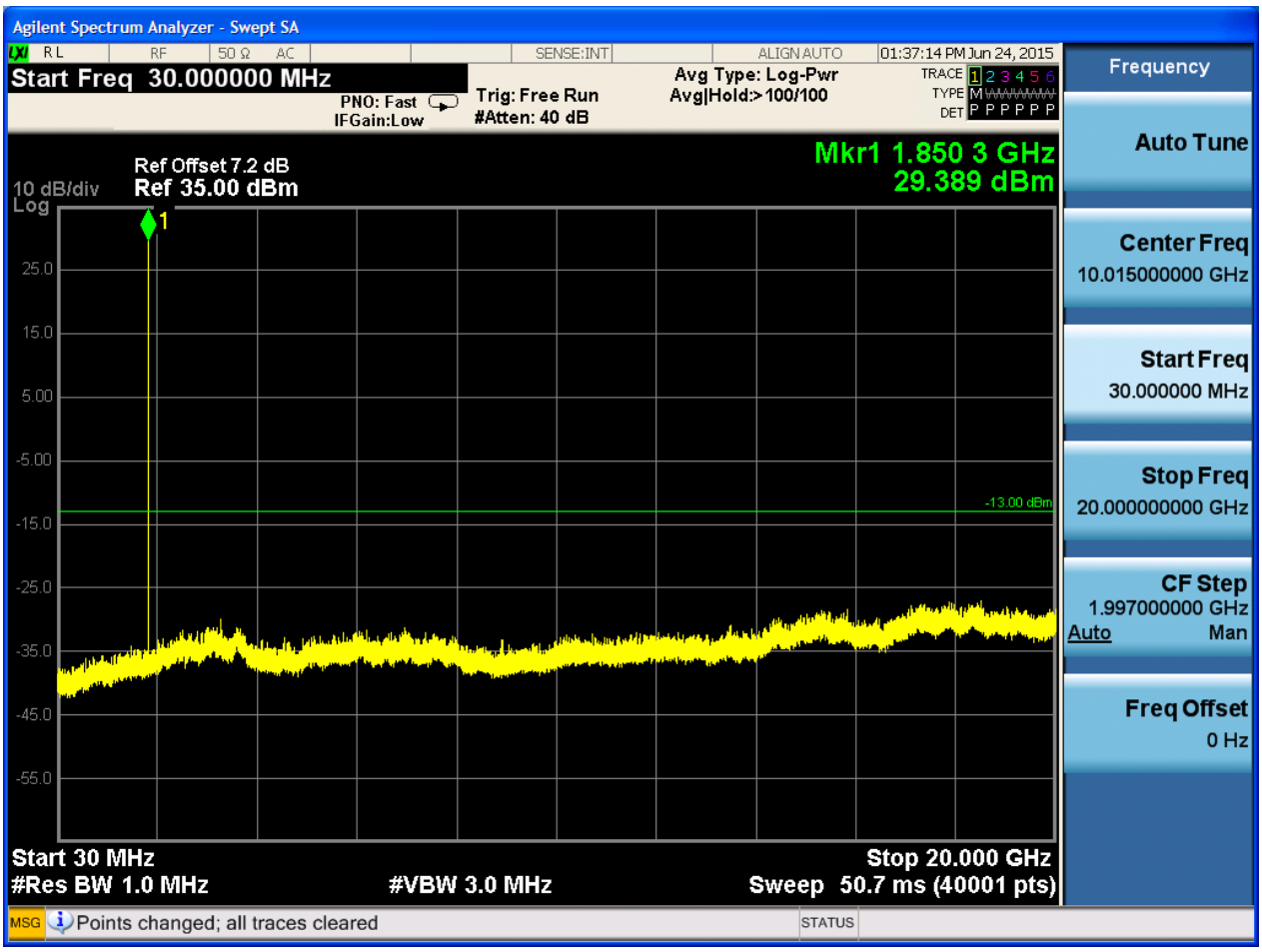
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

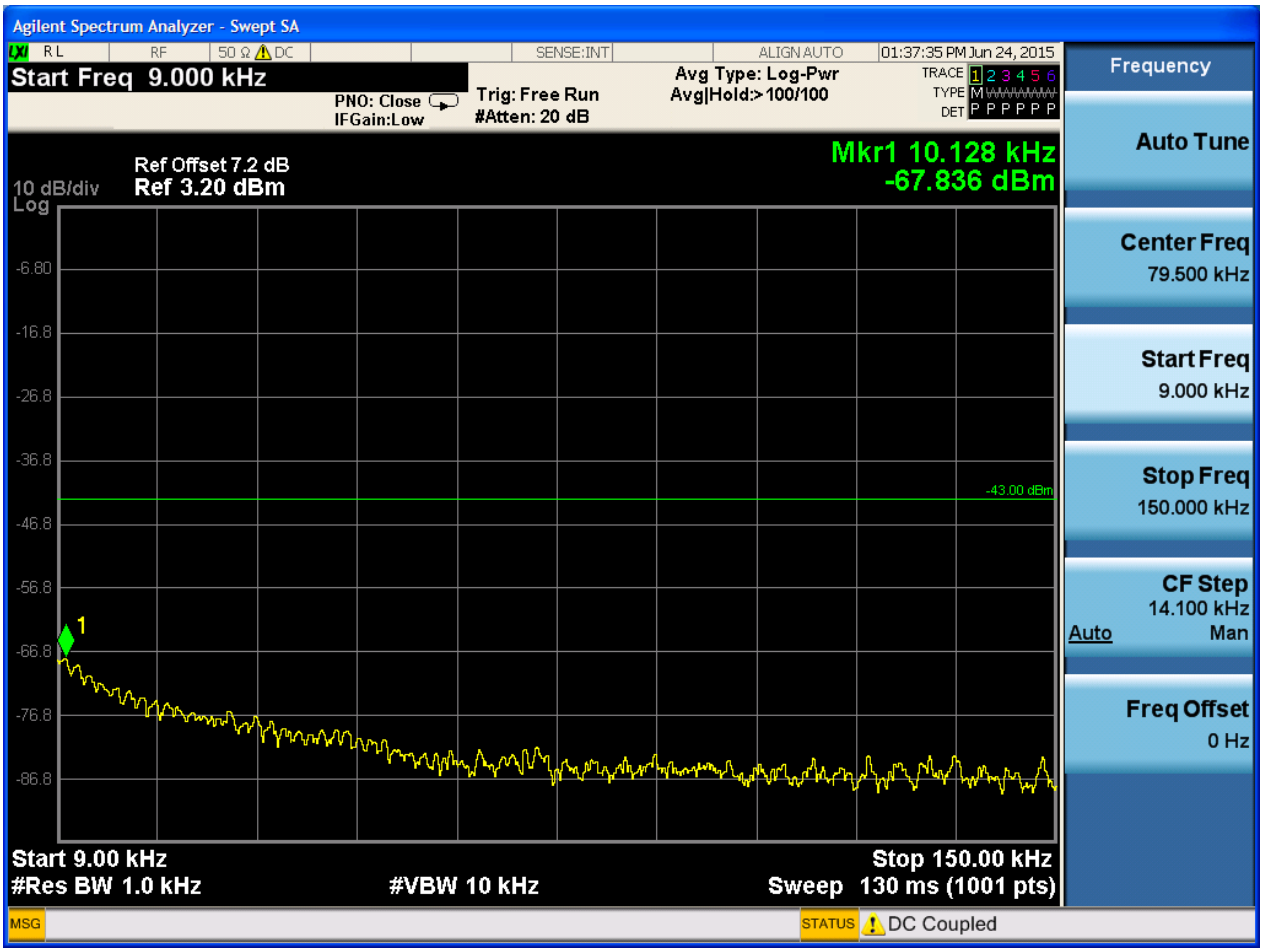
6.1.2.1.1 Test Channel = LCH

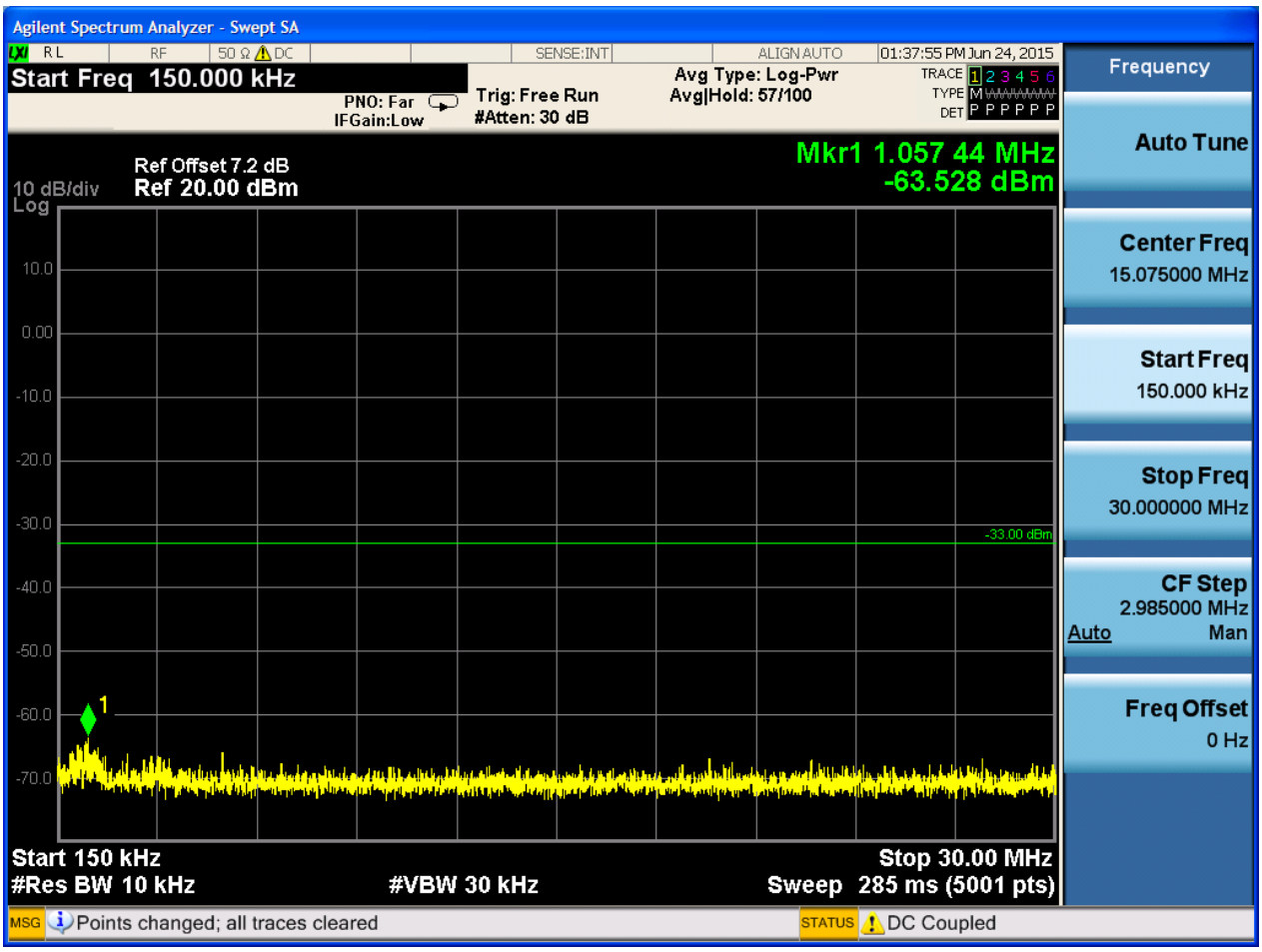


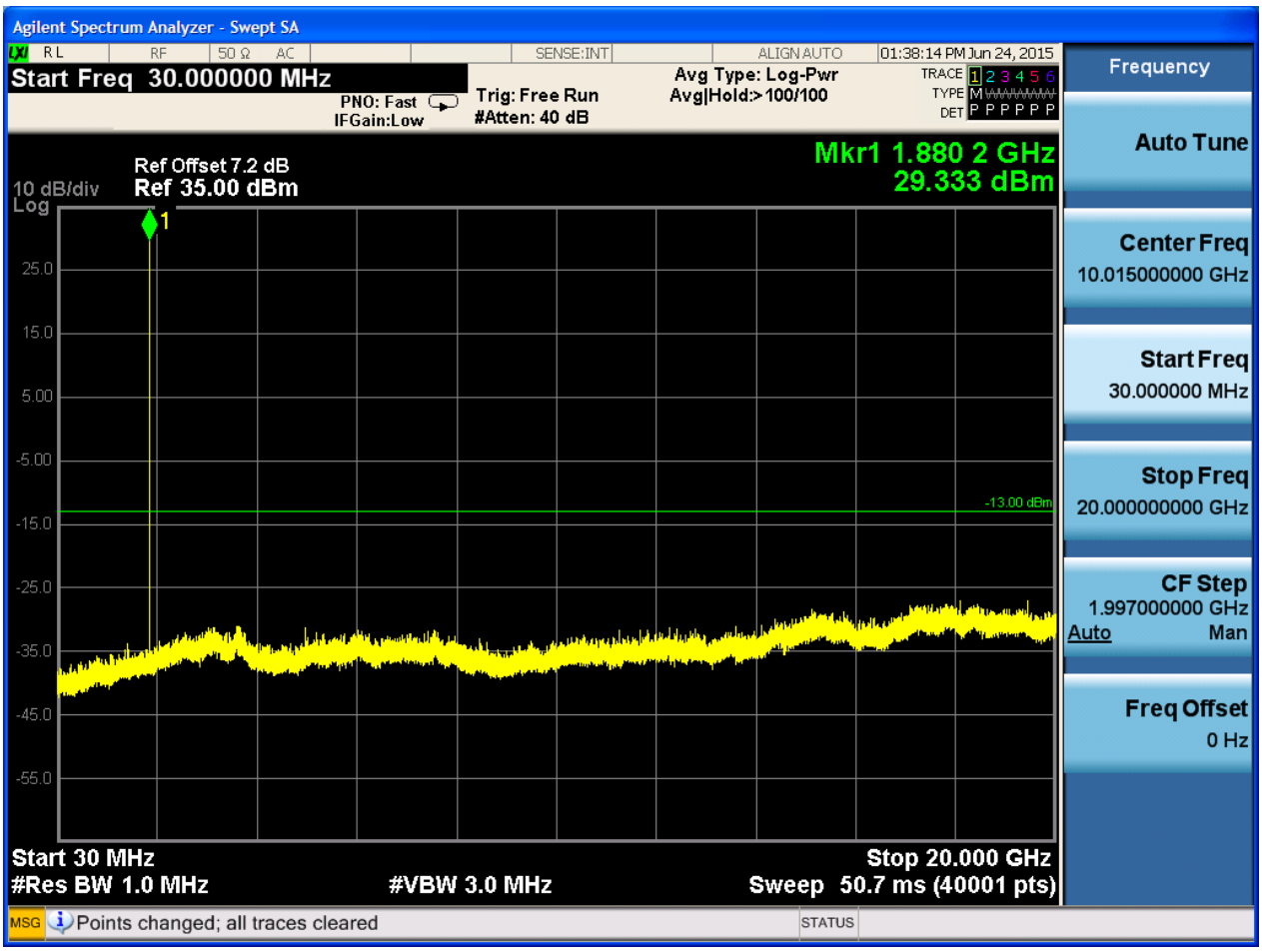




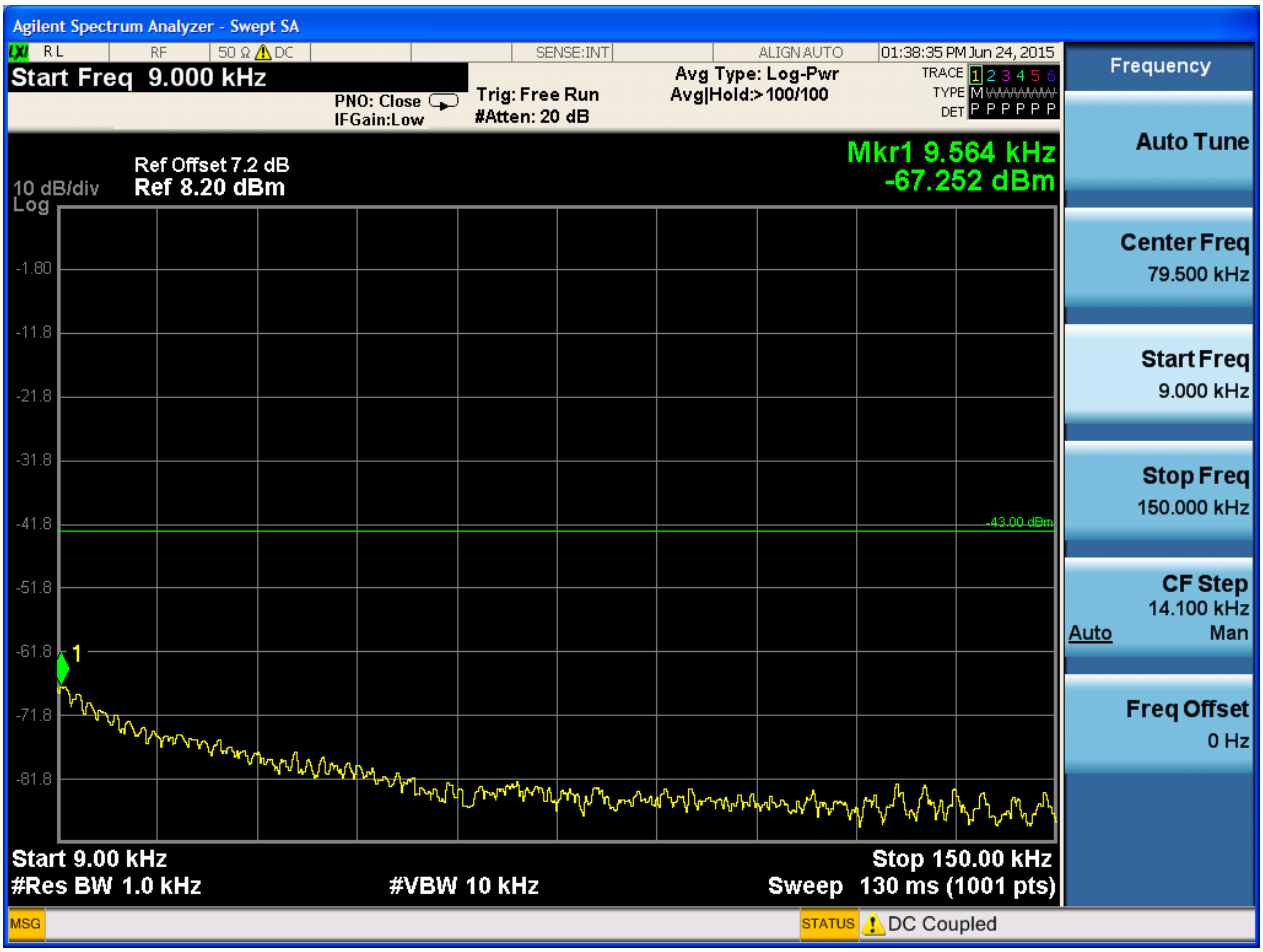
6.1.2.1.2 Test Channel = MCH

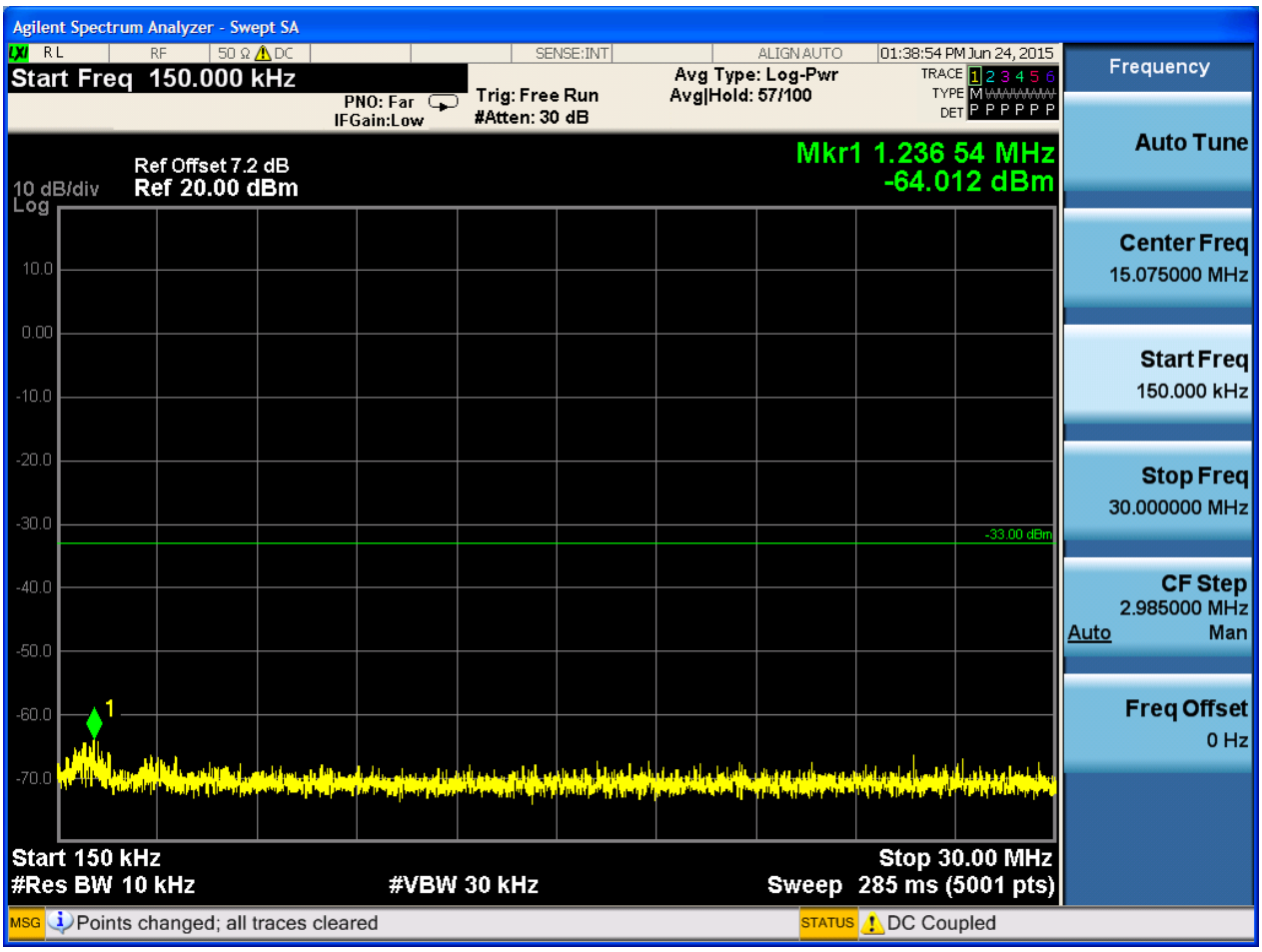


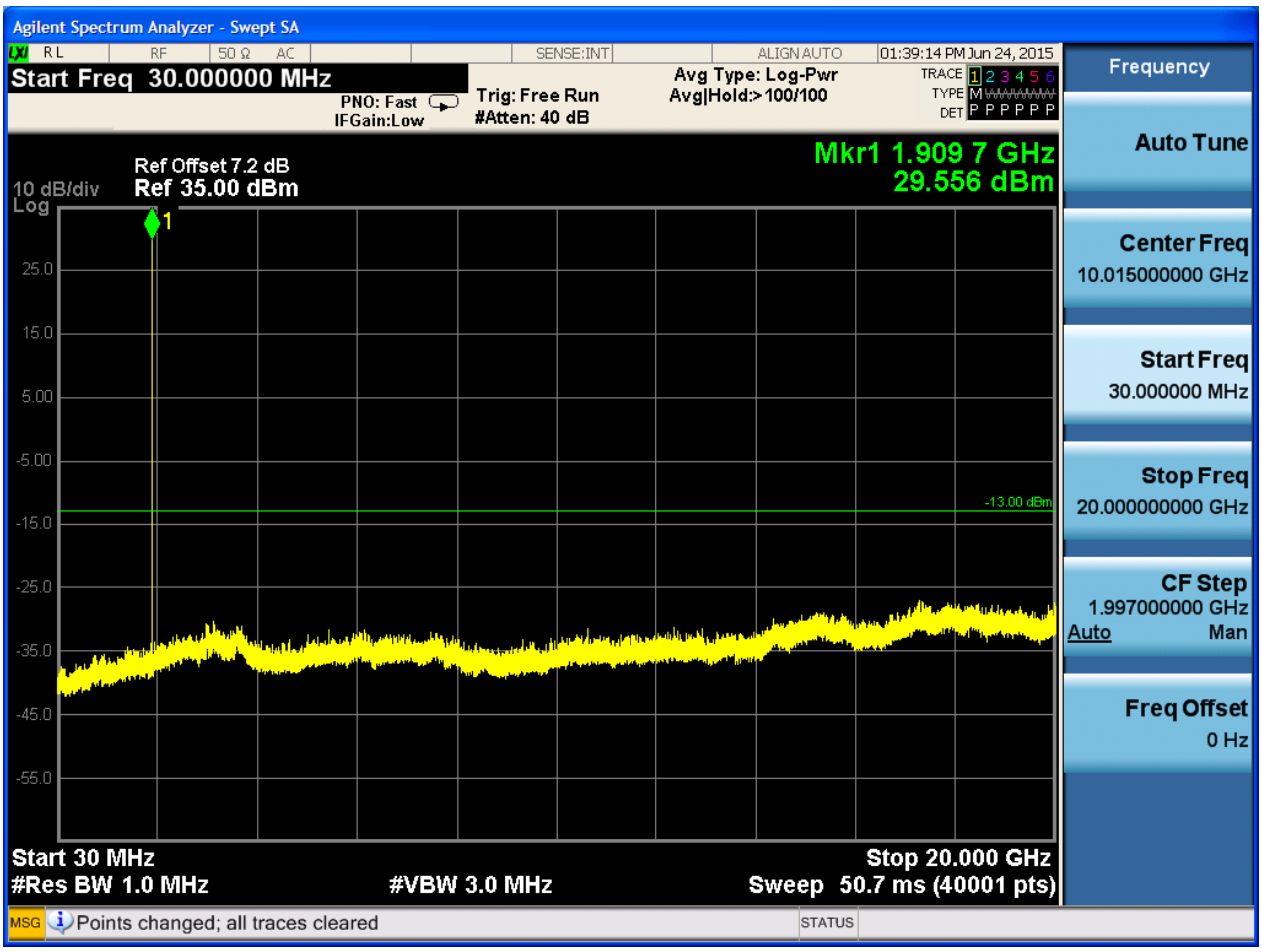




6.1.2.1.3 Test Channel = HCH

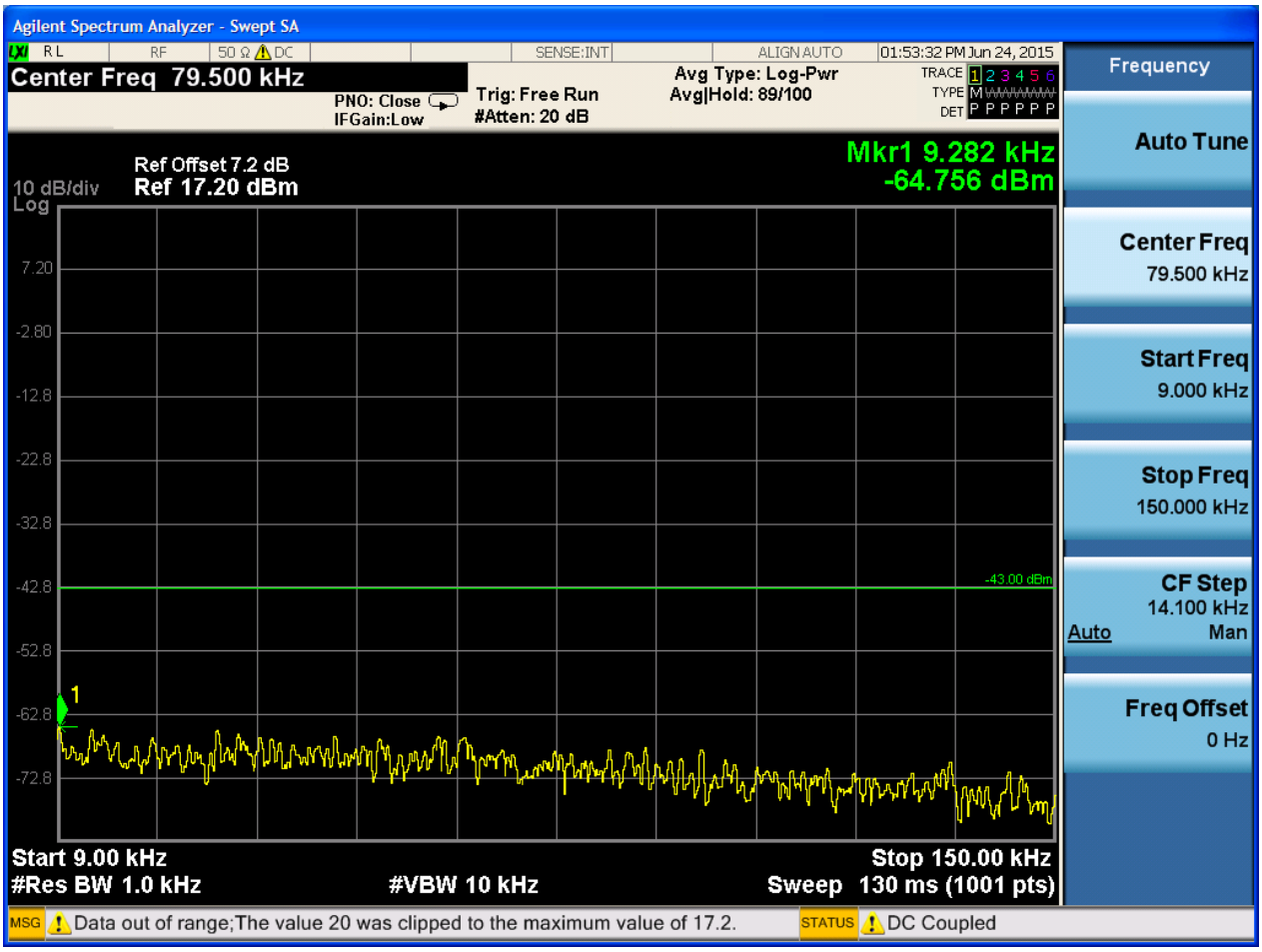


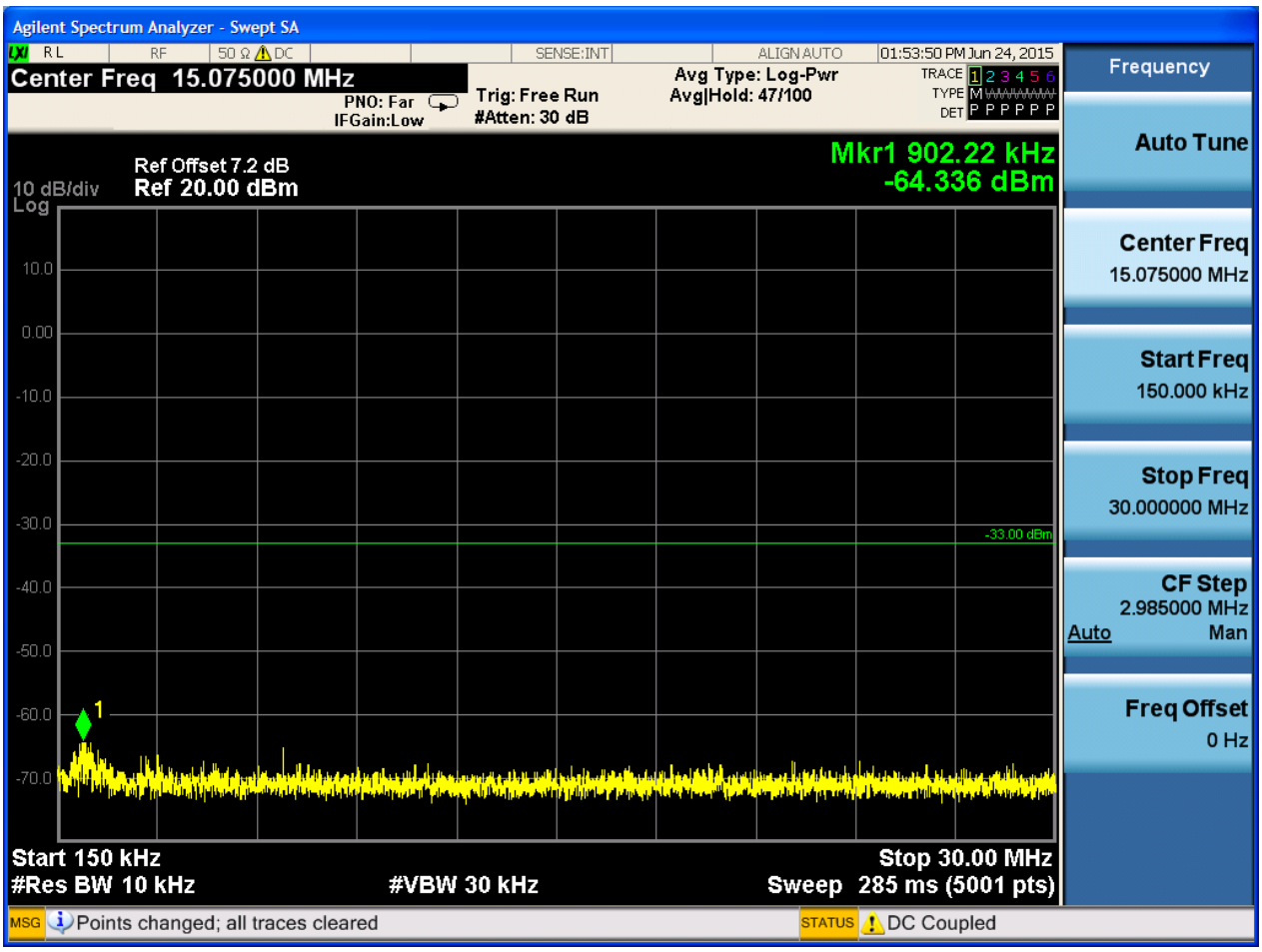


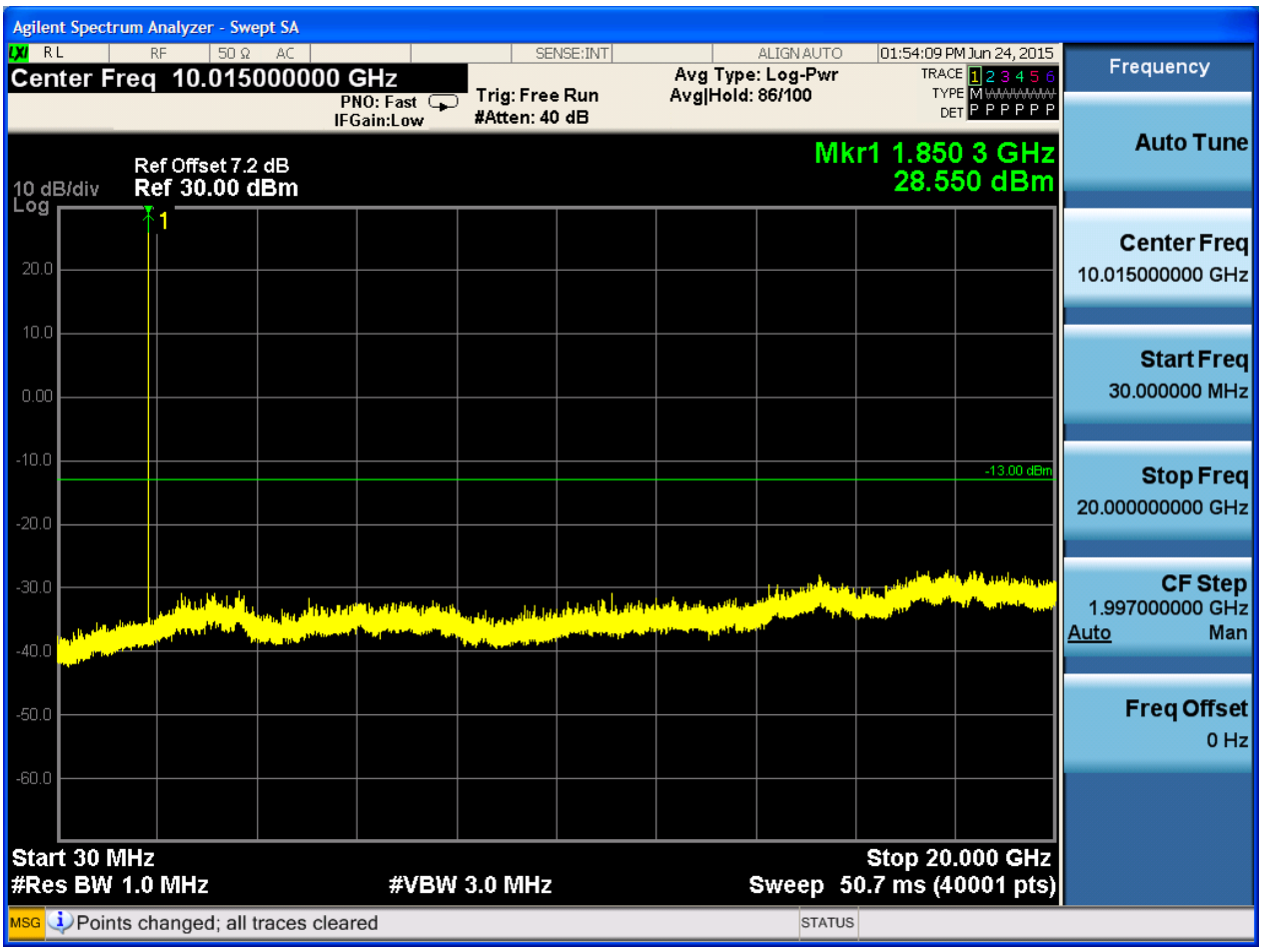


6.1.2.2 Test Mode = GSM/TM2

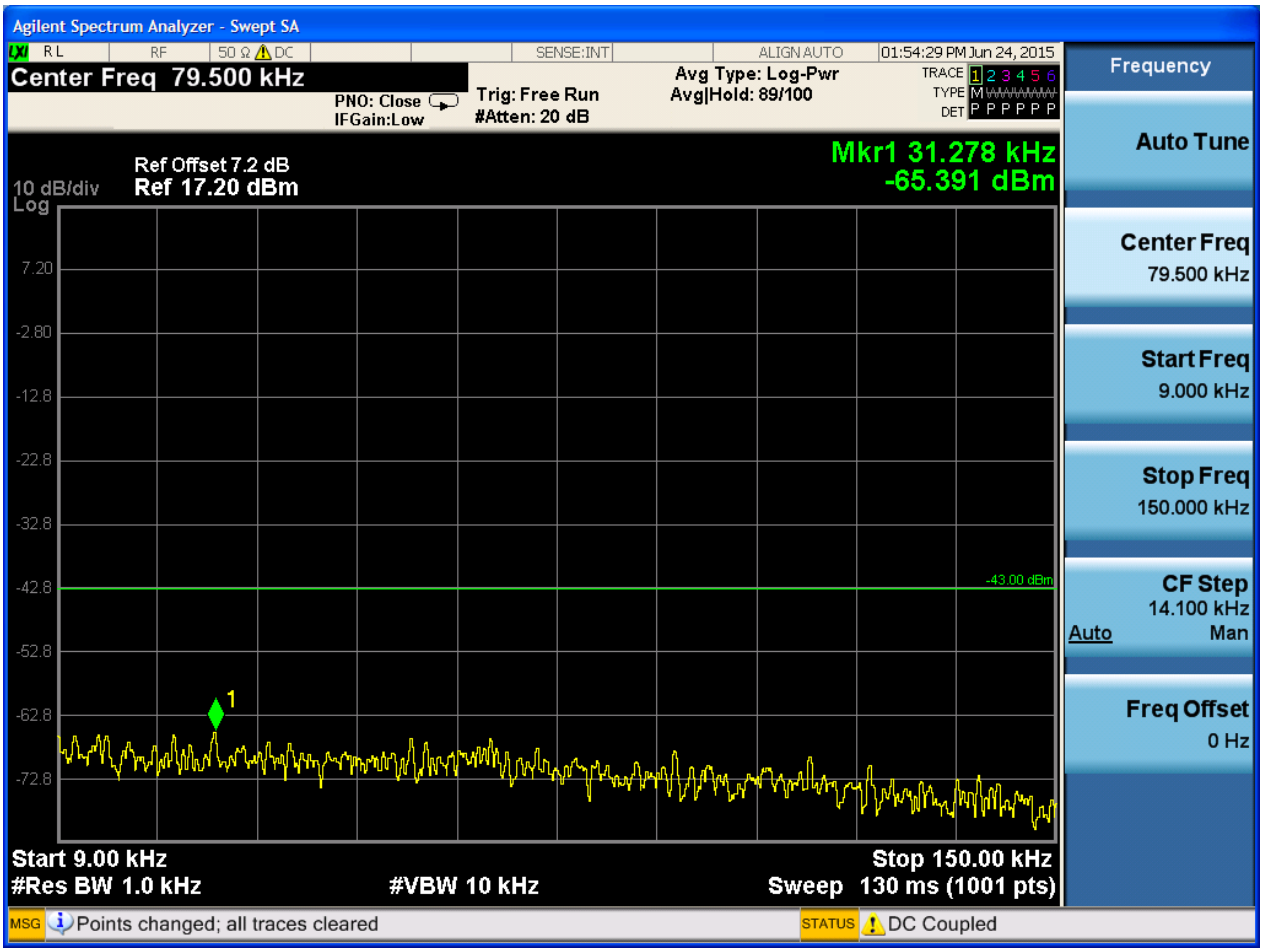
6.1.2.2.1 Test Channel = LCH

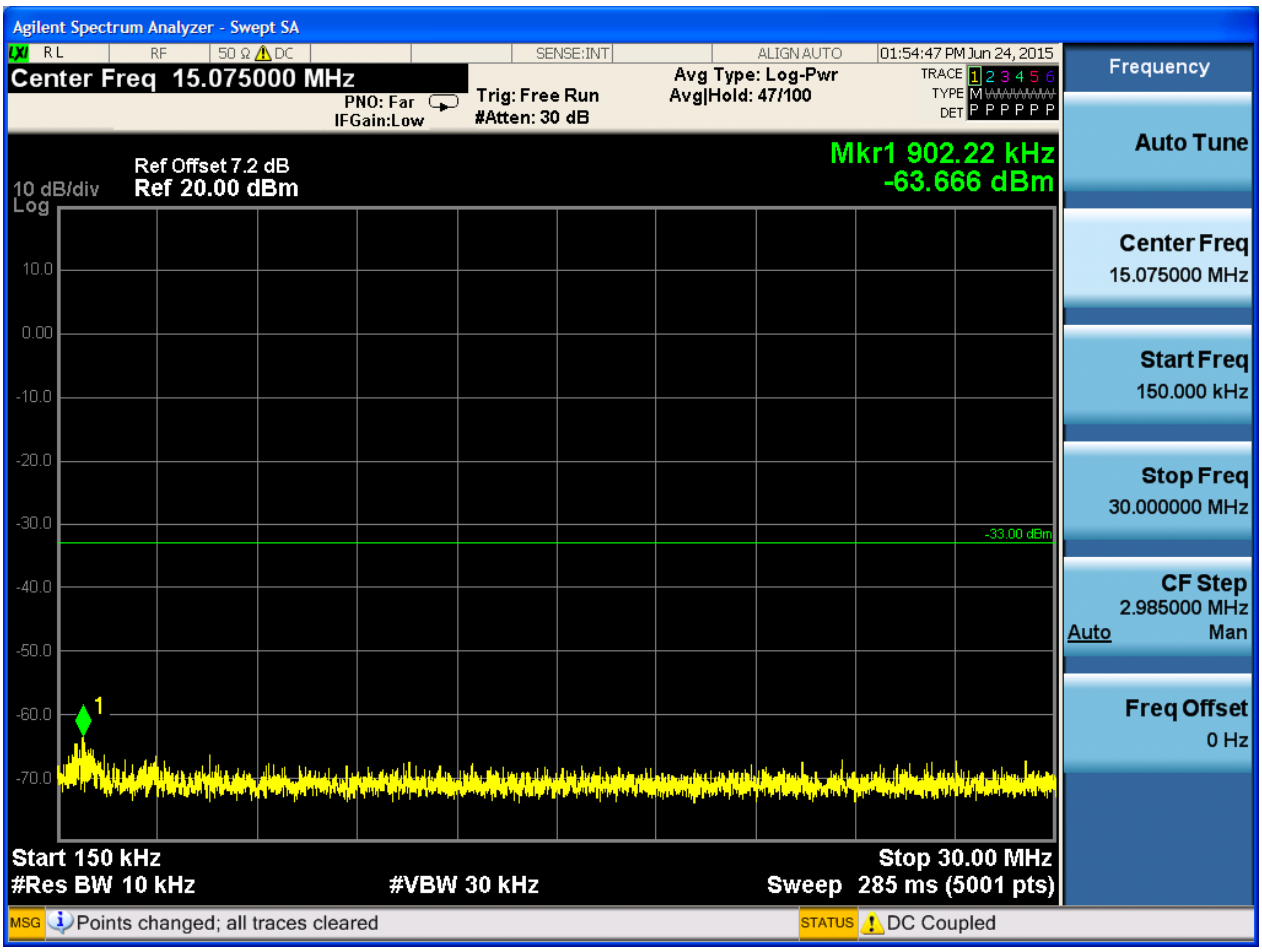


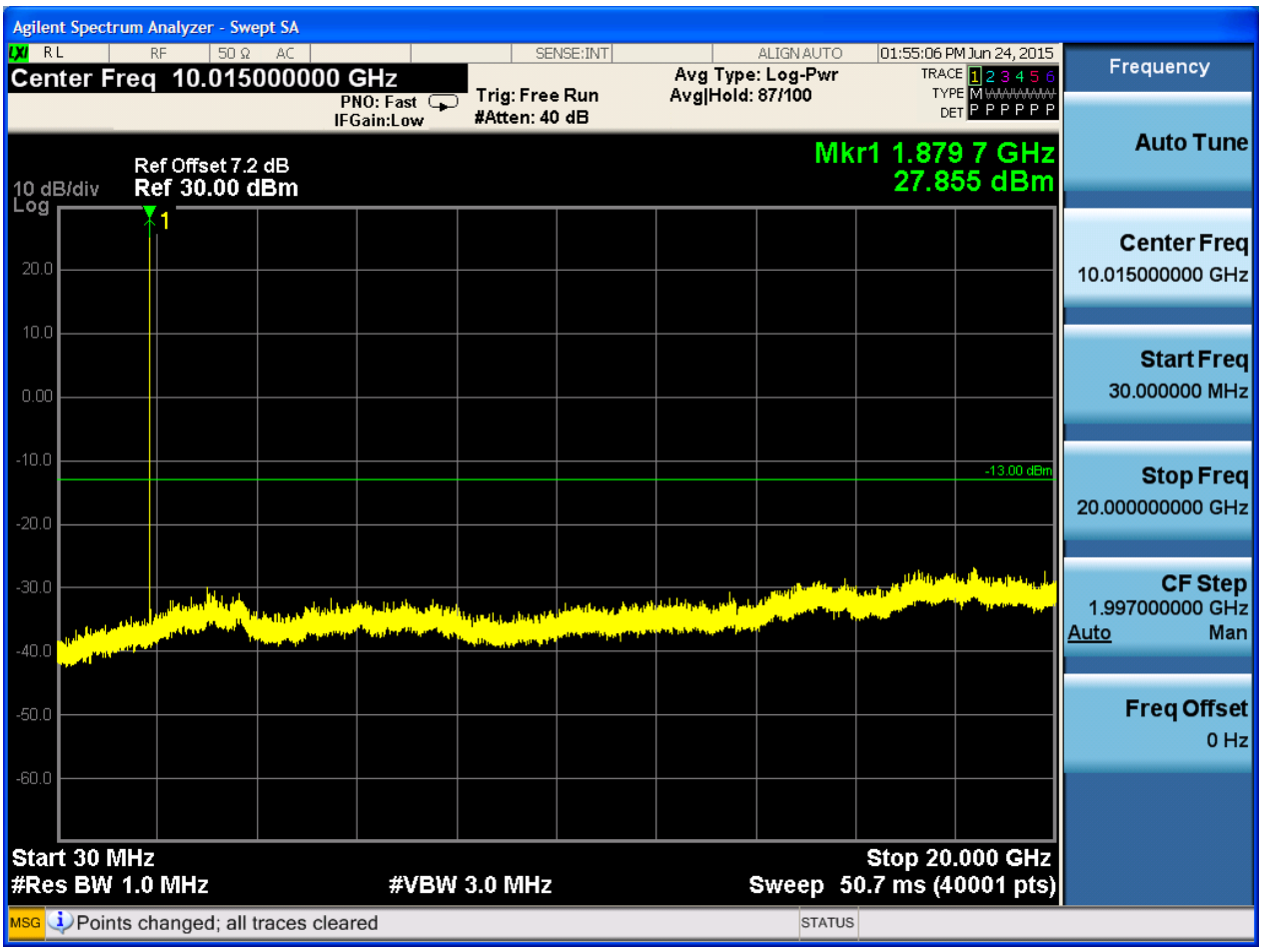




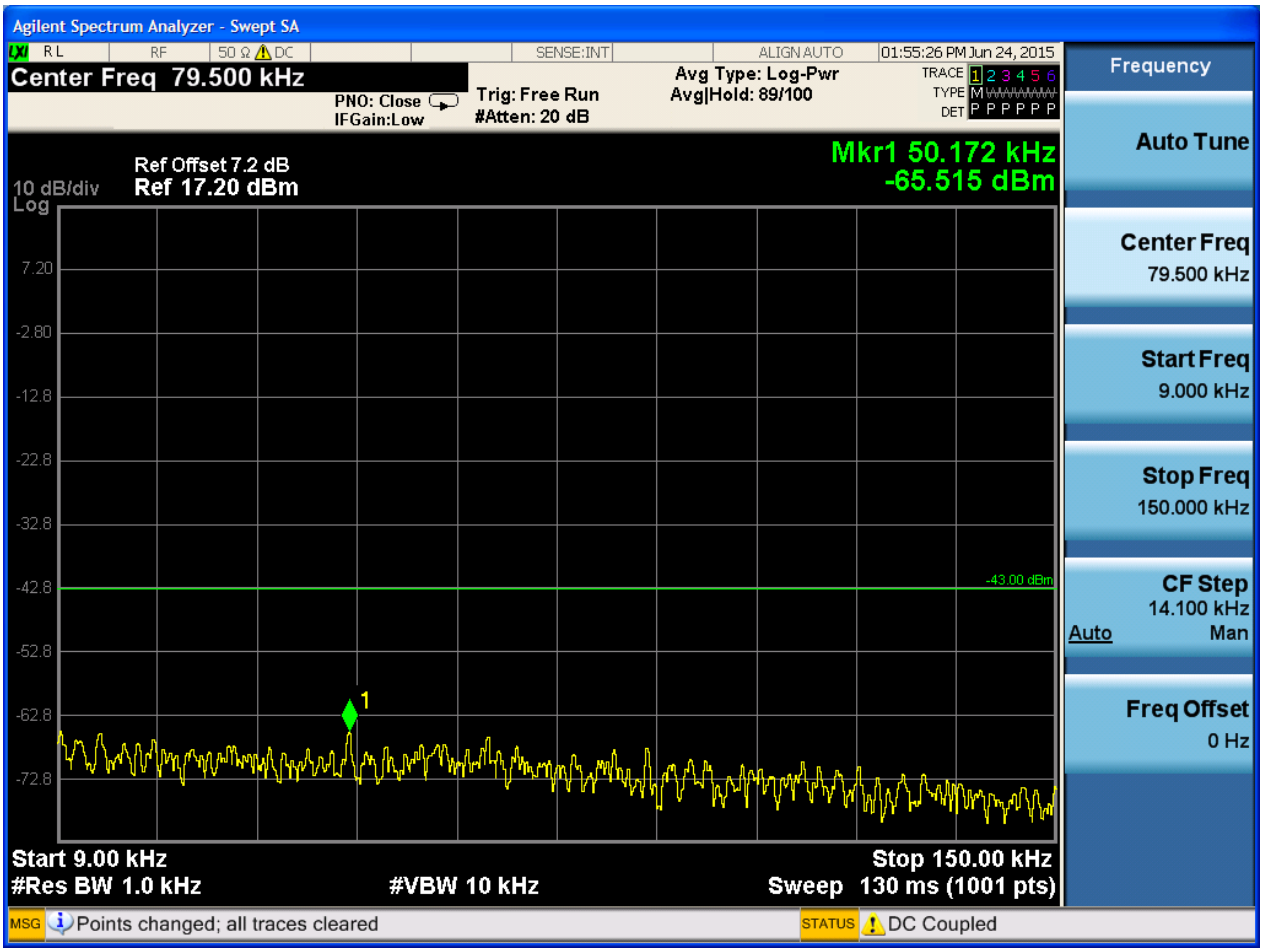
6.1.2.2.2 Test Channel = MCH

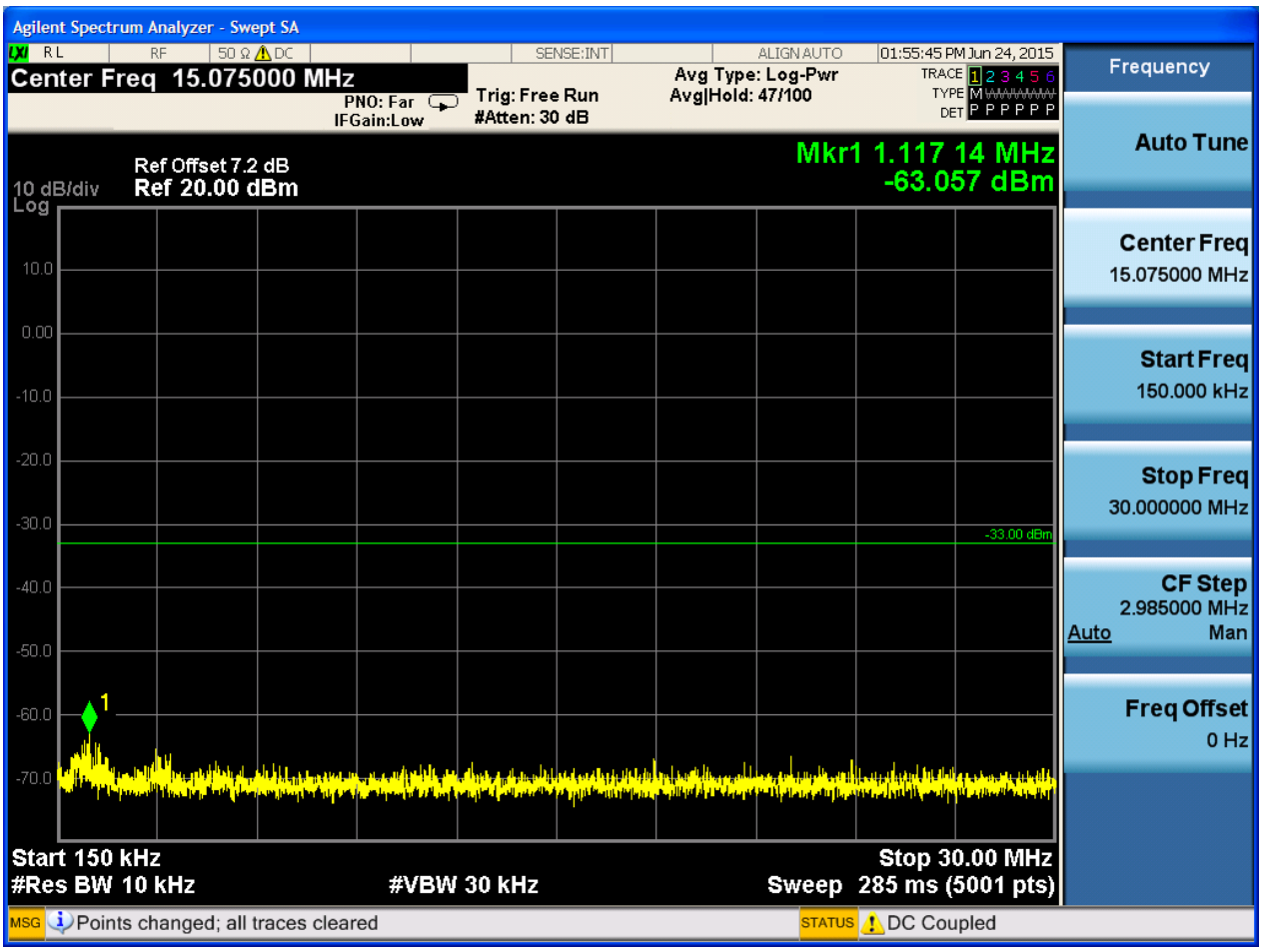


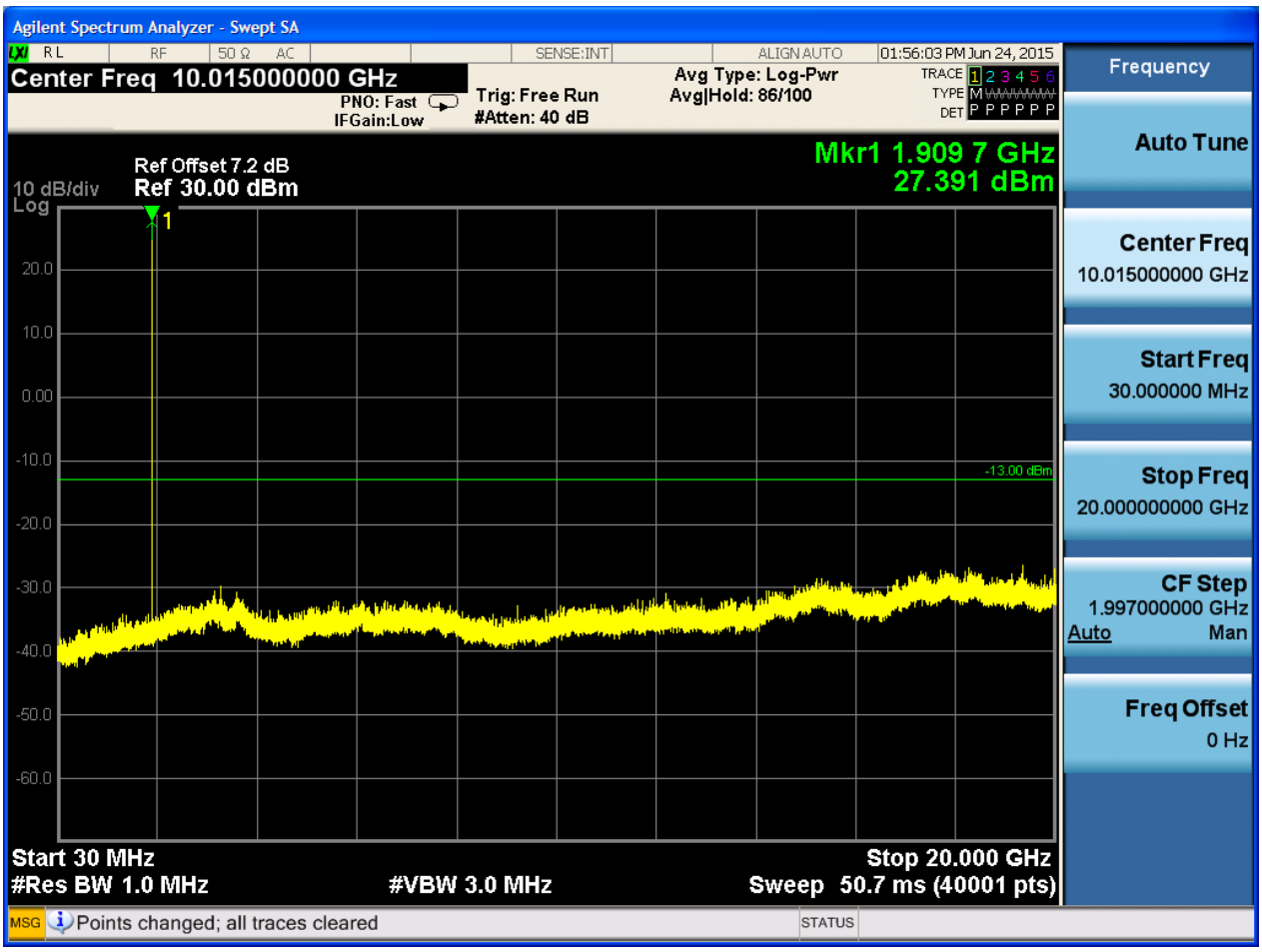




6.1.2.2.3 Test Channel = HCH





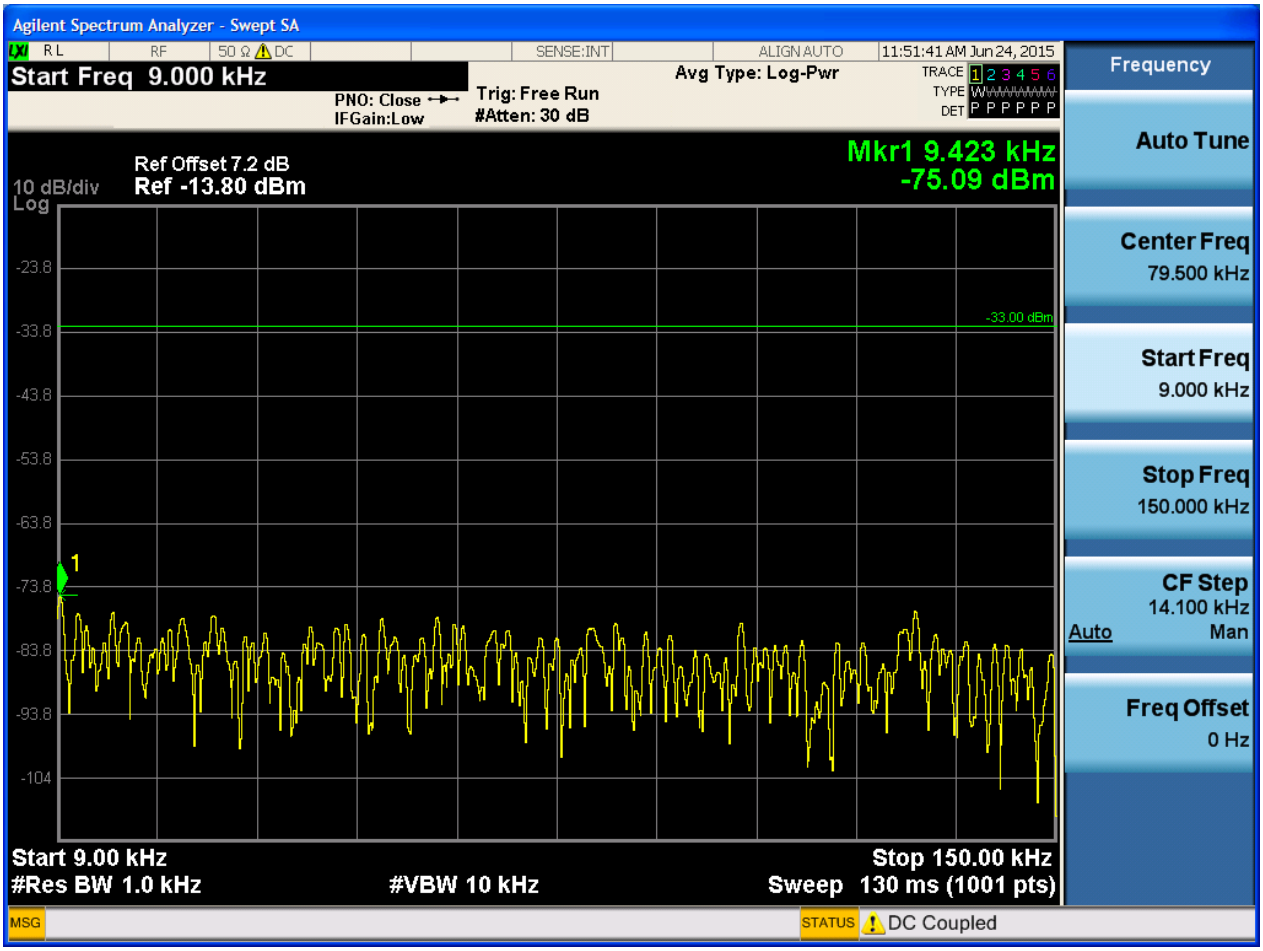


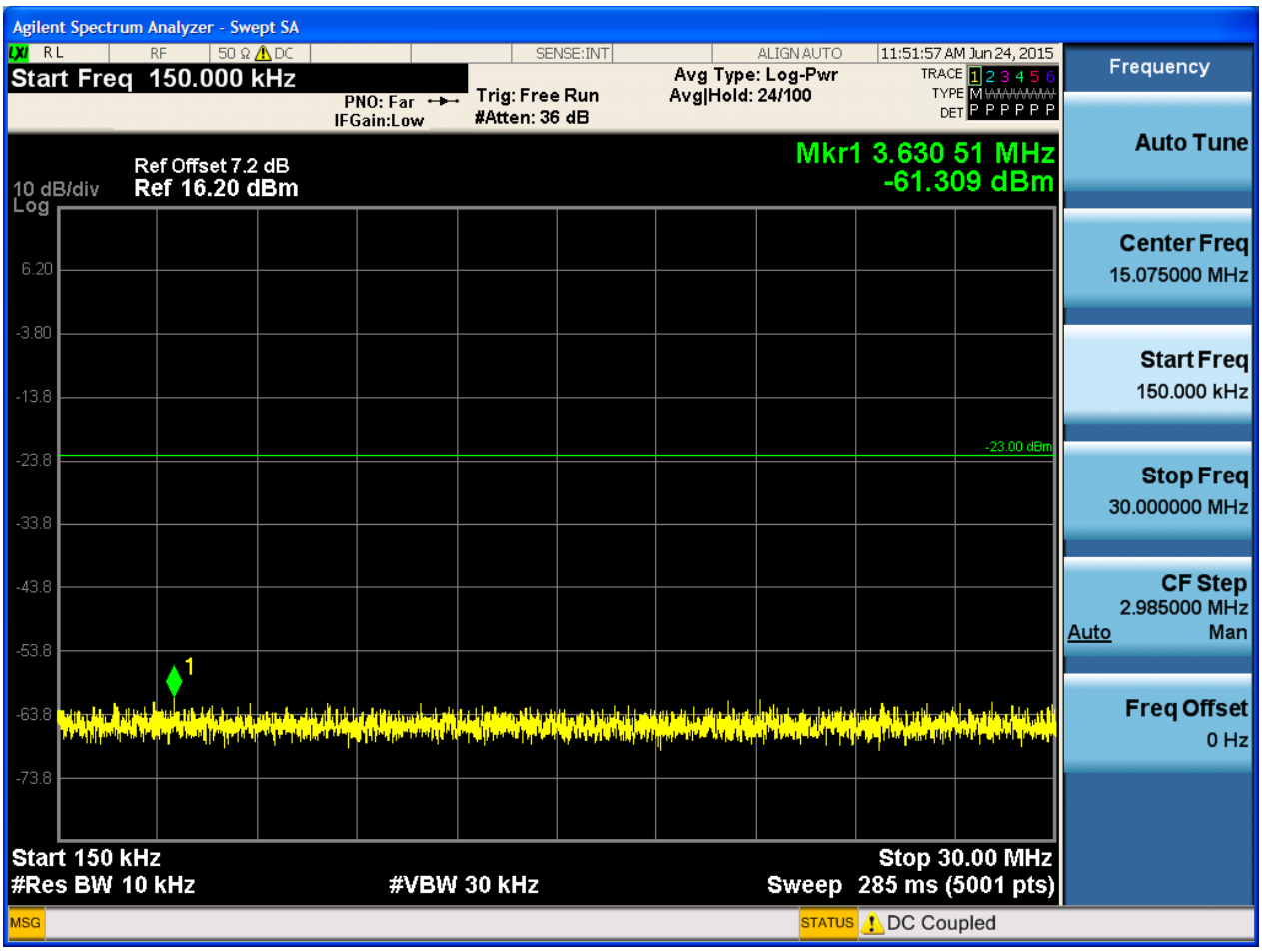
6.2 For UMTS

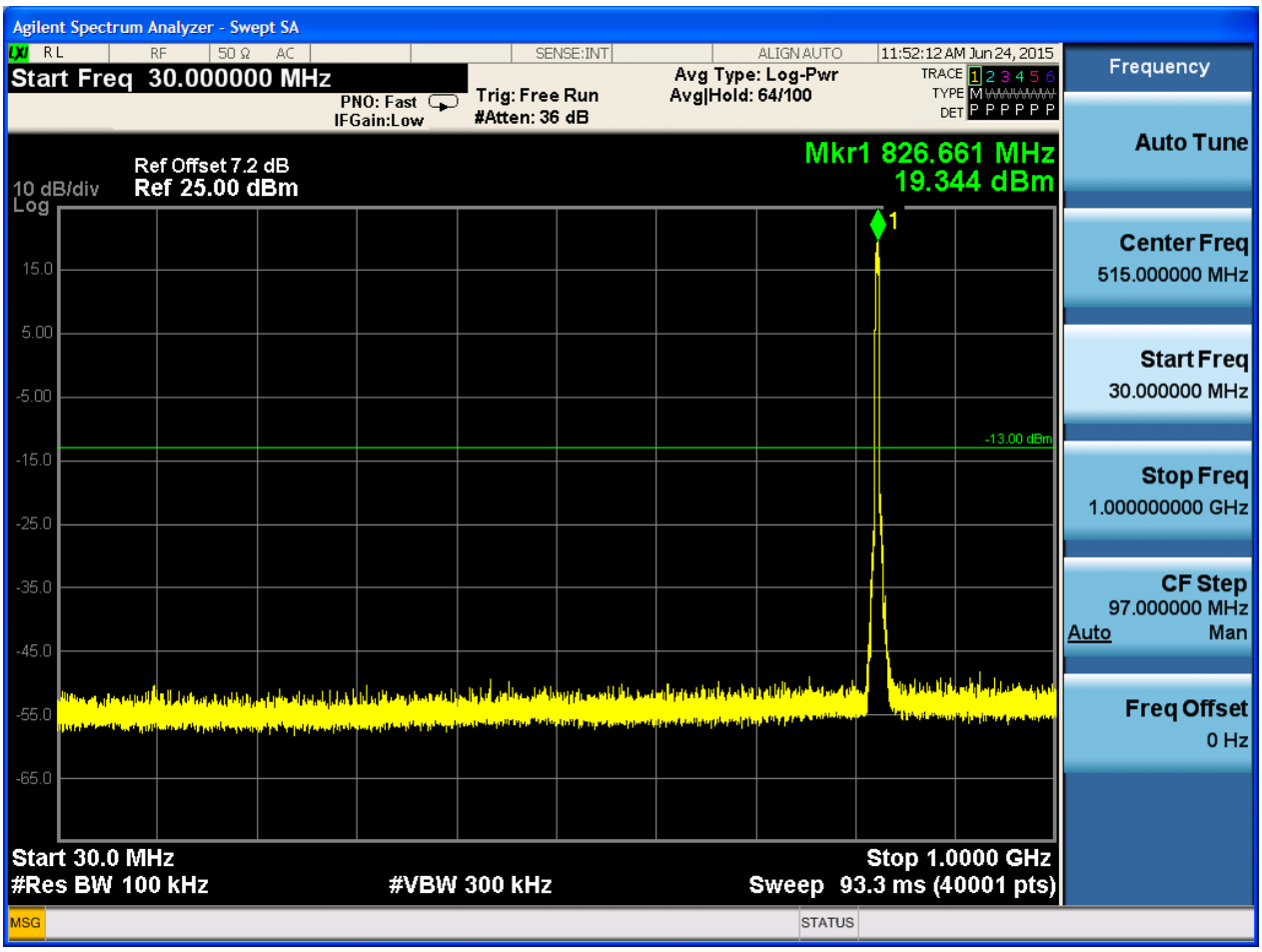
6.2.1 Test Band = WCDMA850

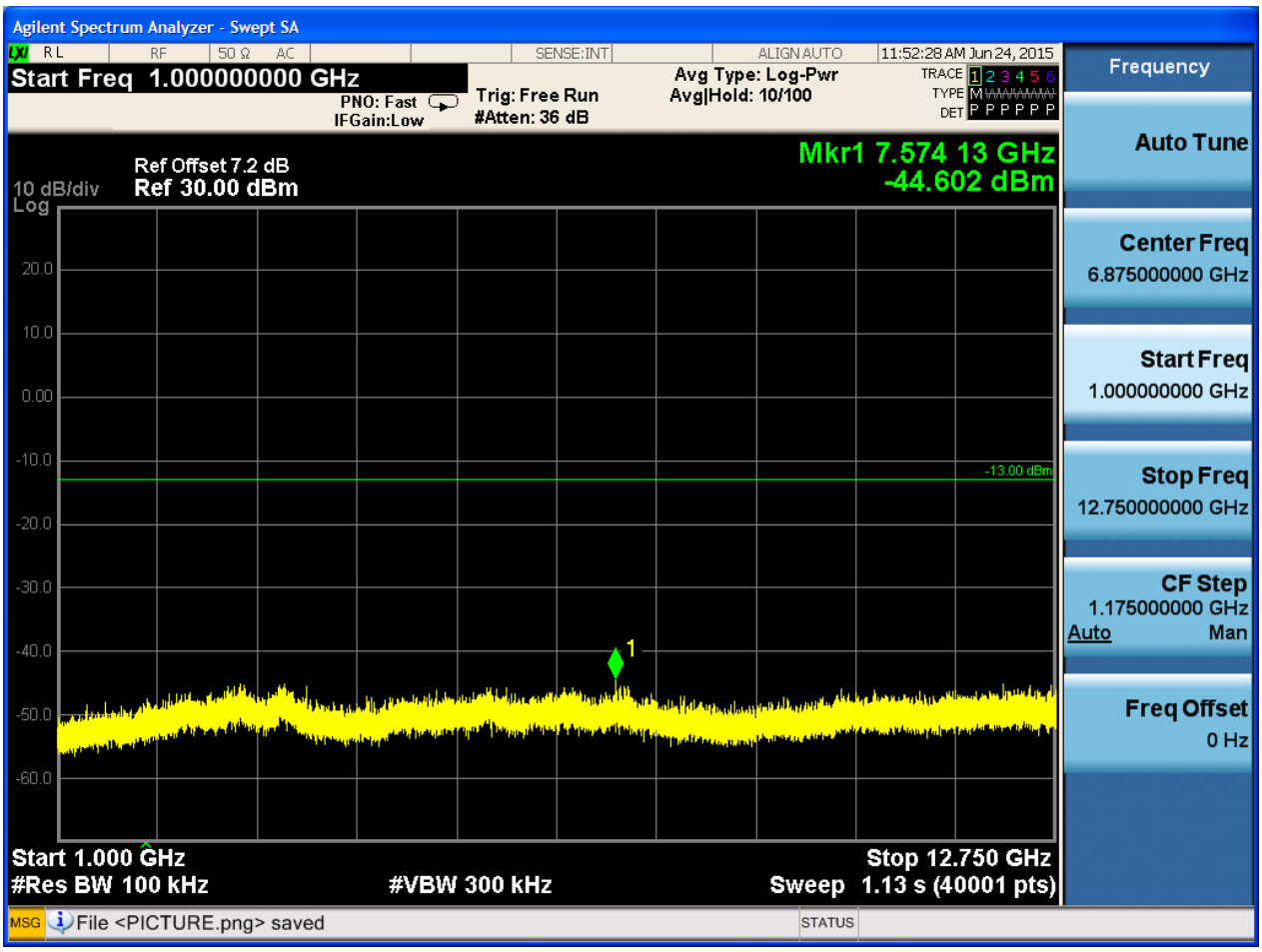
6.2.1.1 Test Mode = UMTS/TM1

6.2.1.1.1 Test Channel = LCH

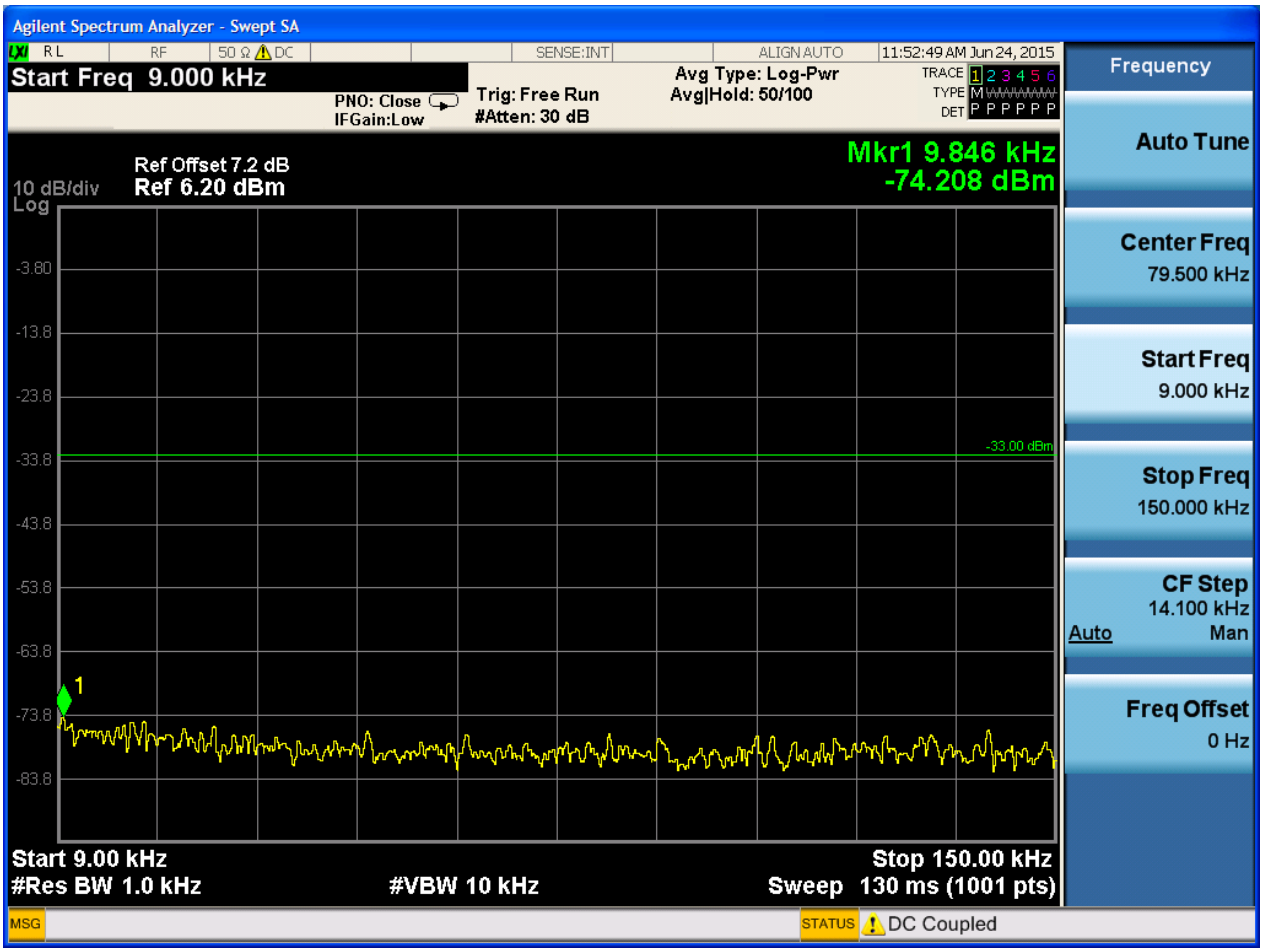


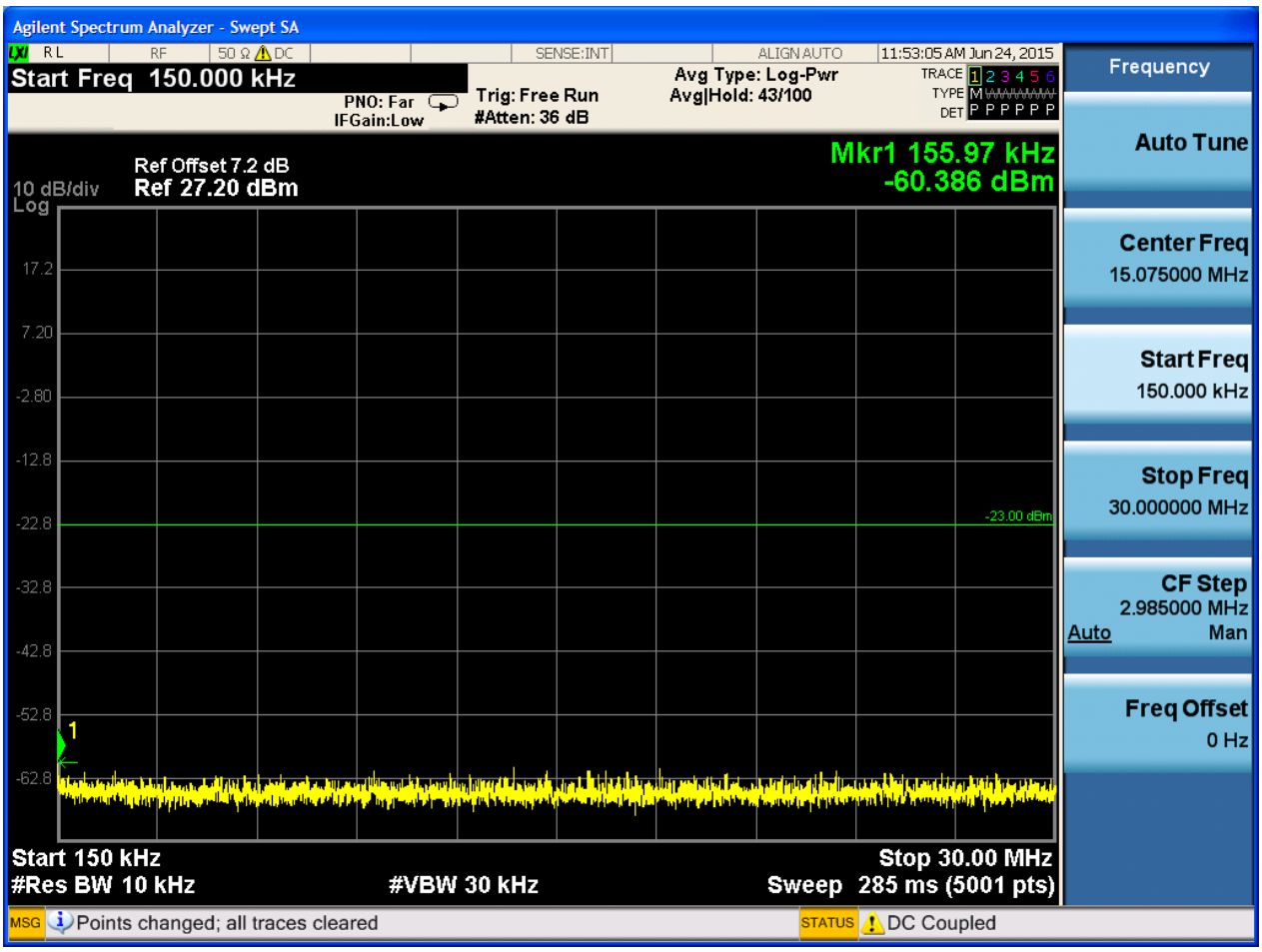


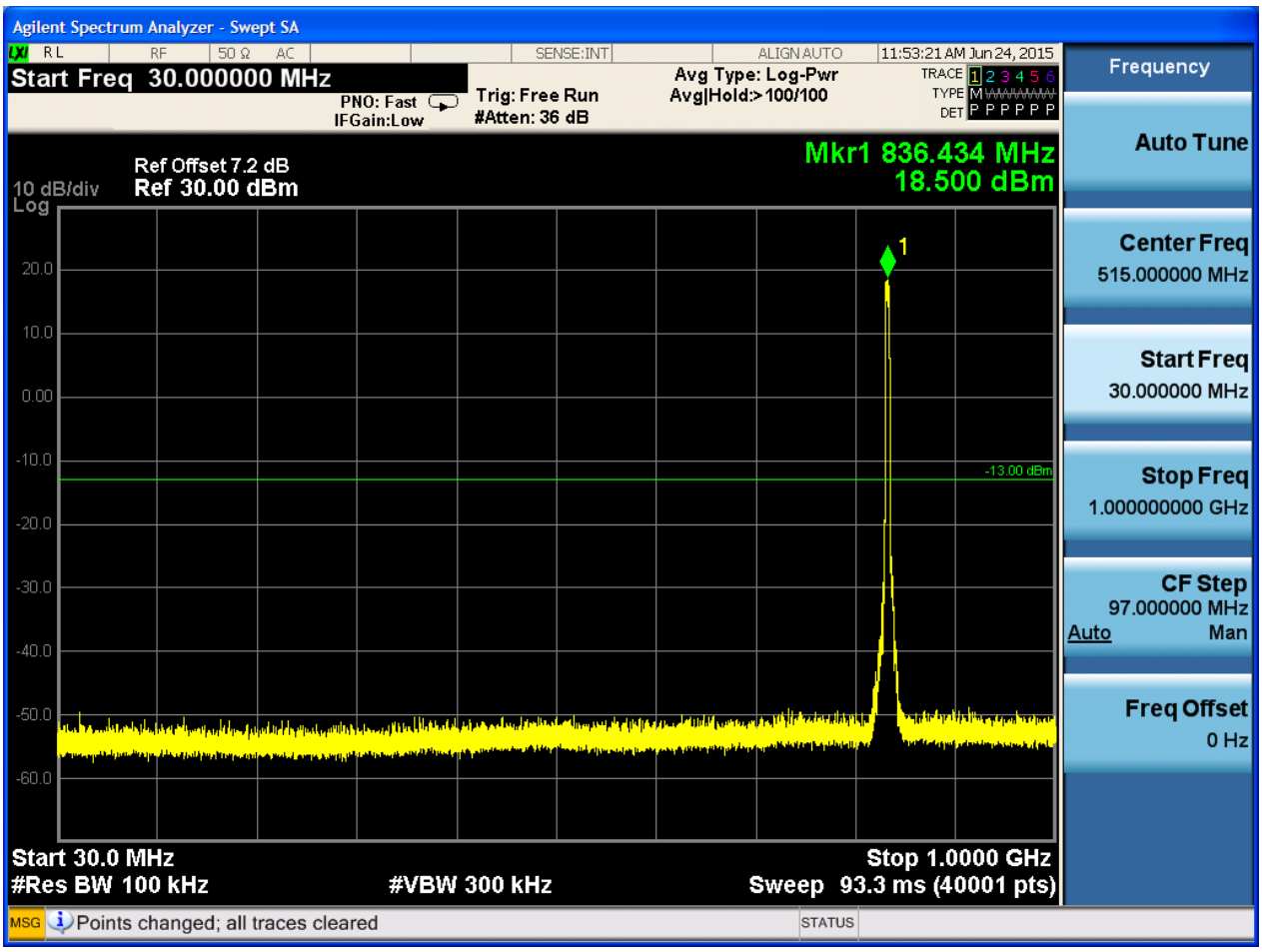


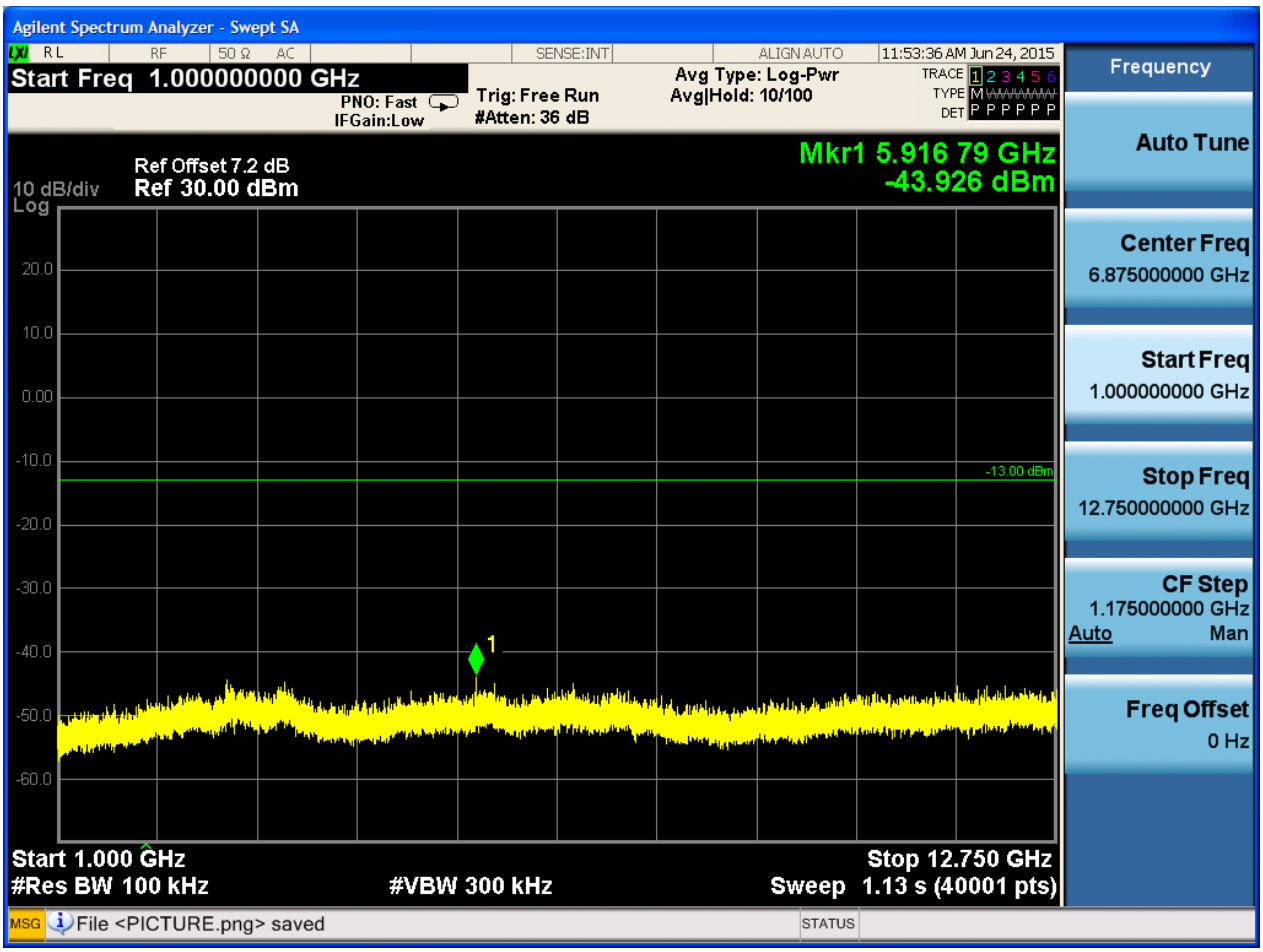


6.2.1.1.2 Test Channel = MCH

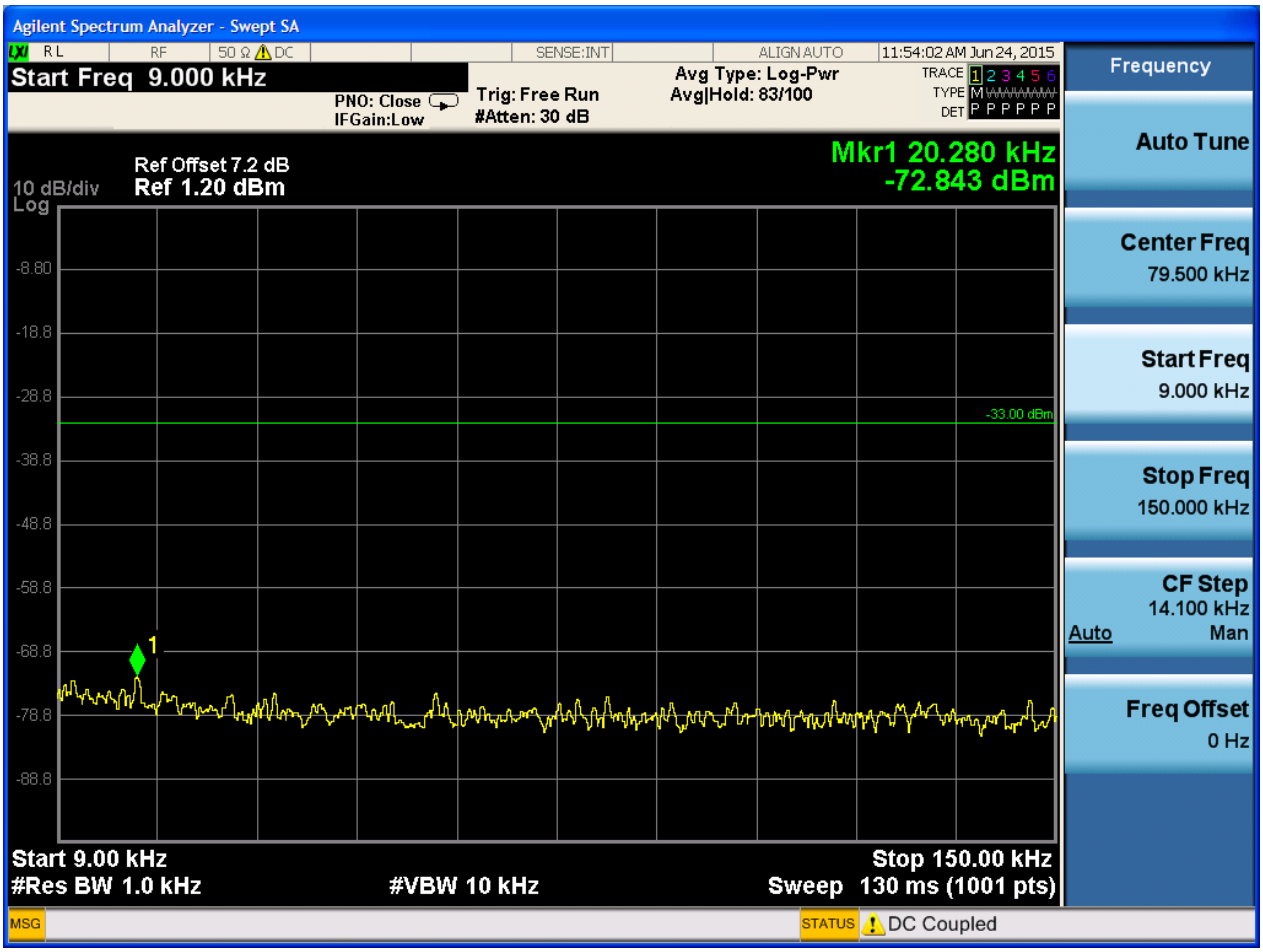


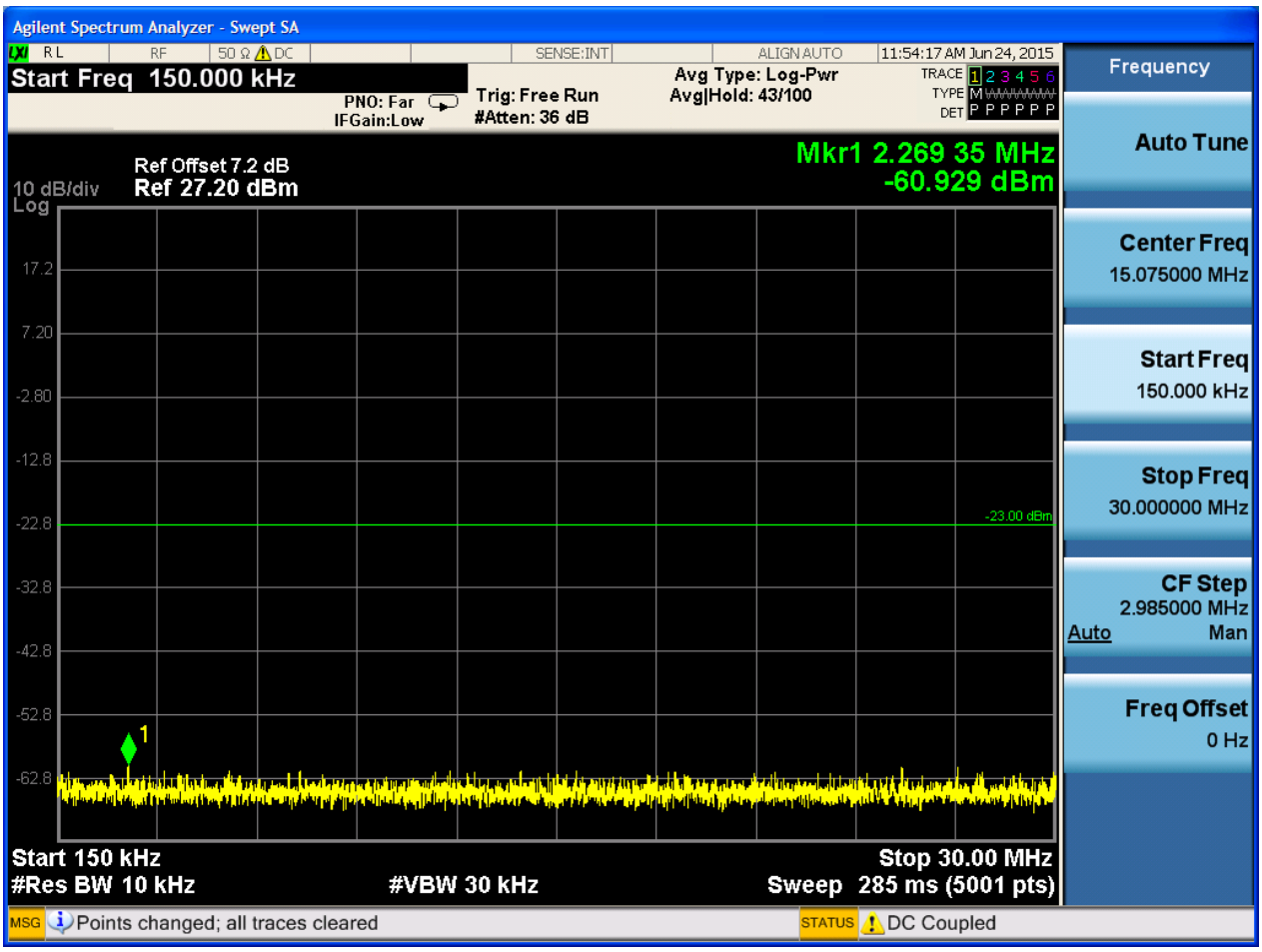


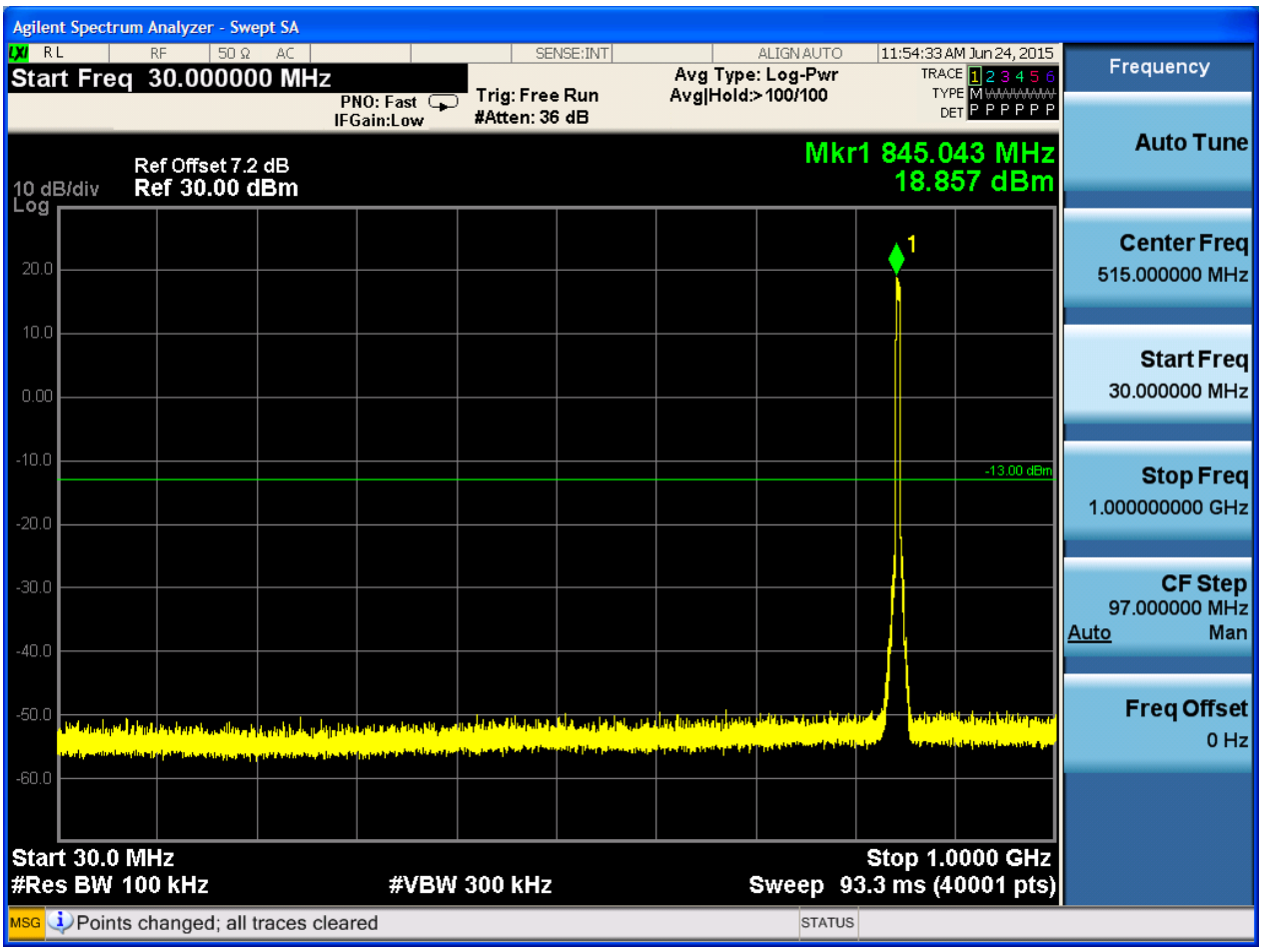


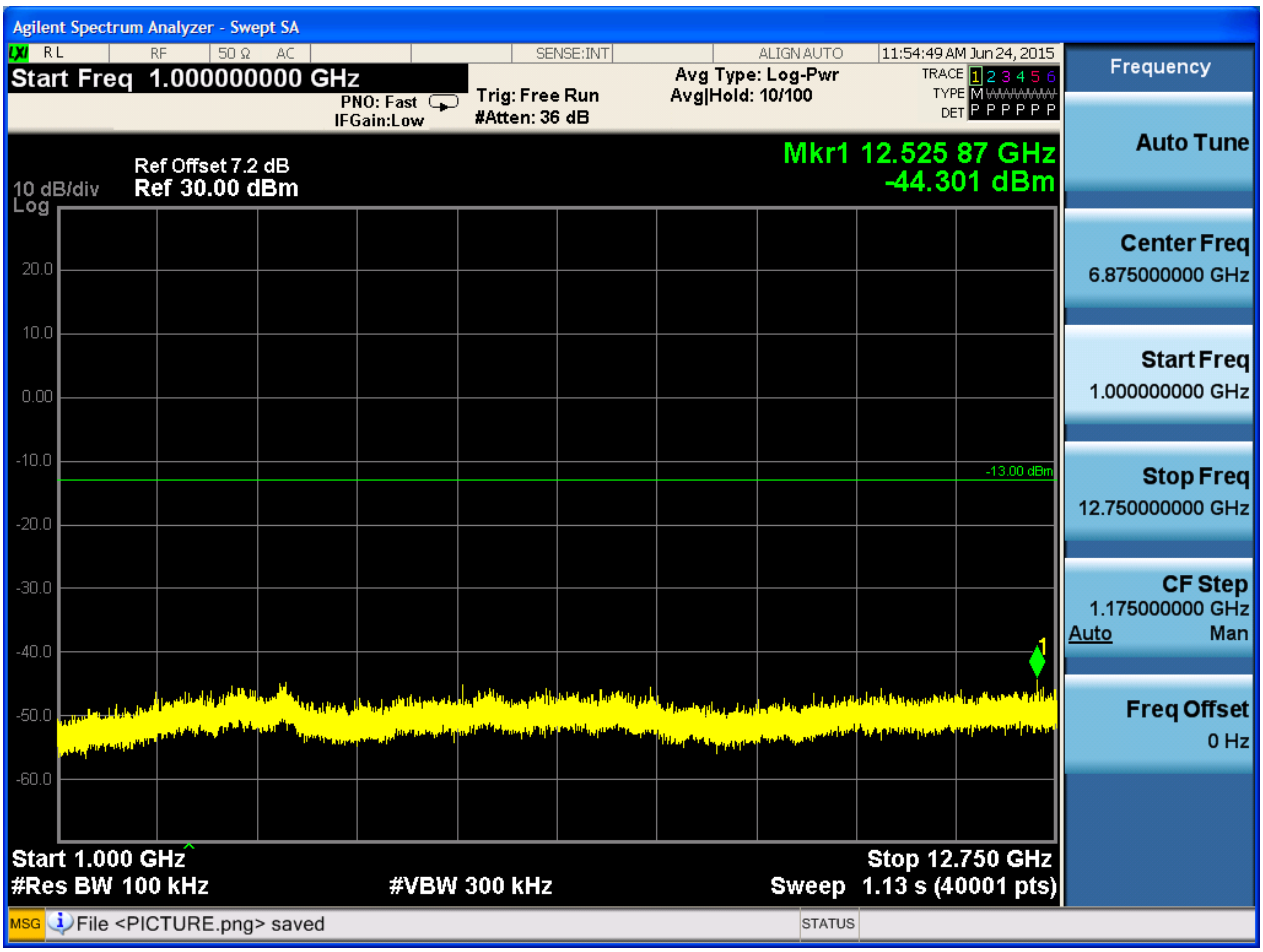


6.2.1.1.3 Test Channel = HCH





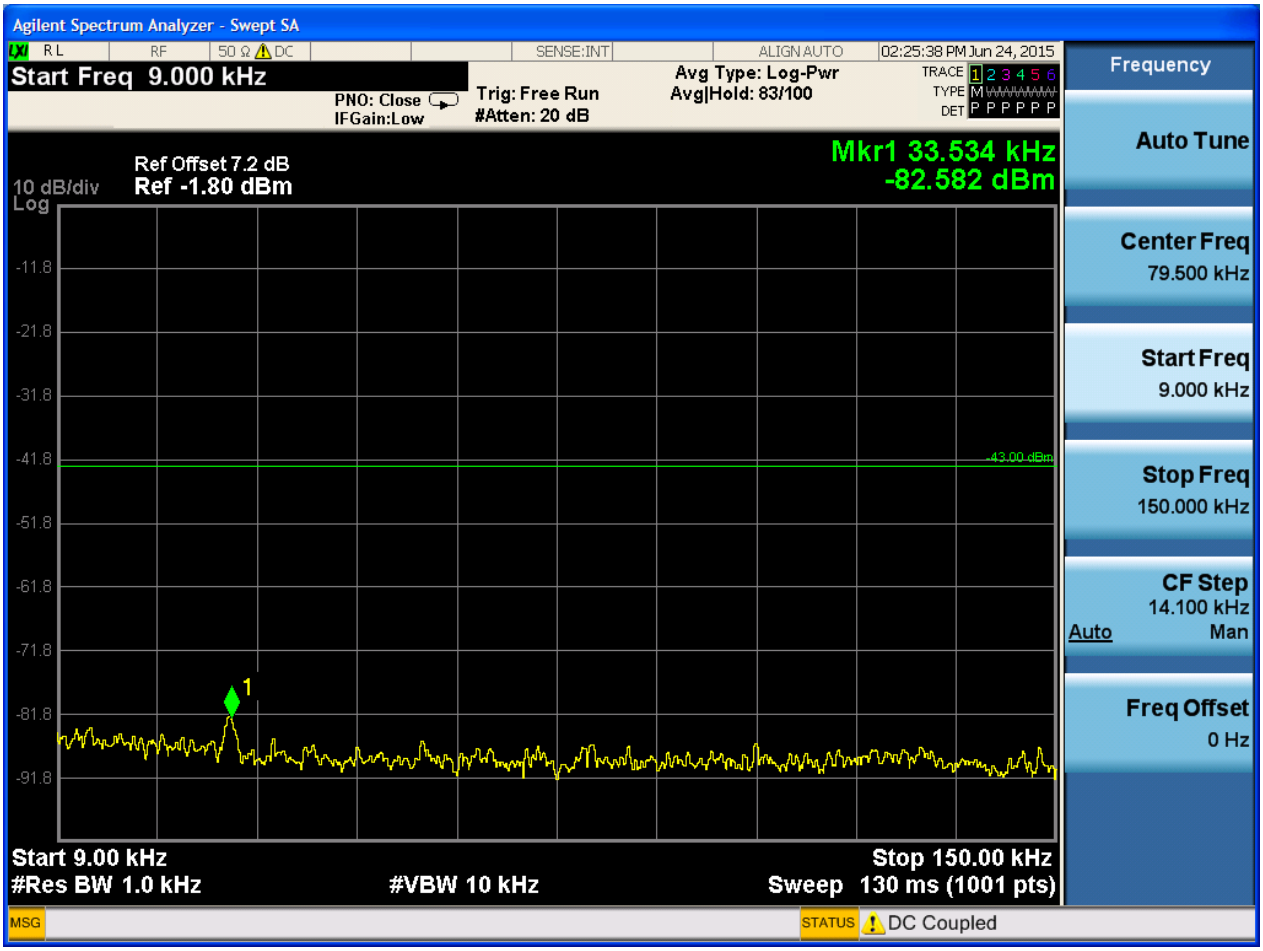


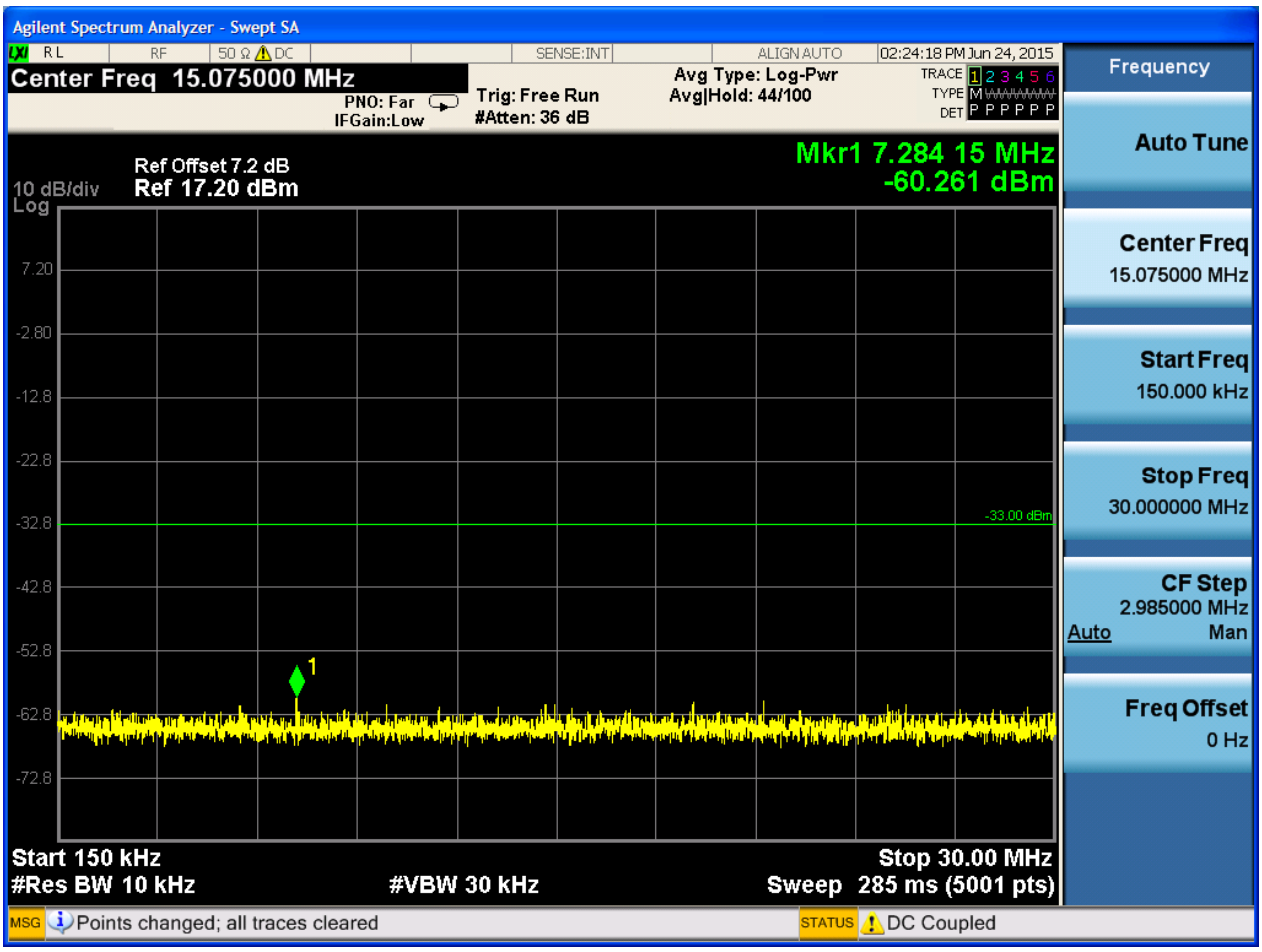


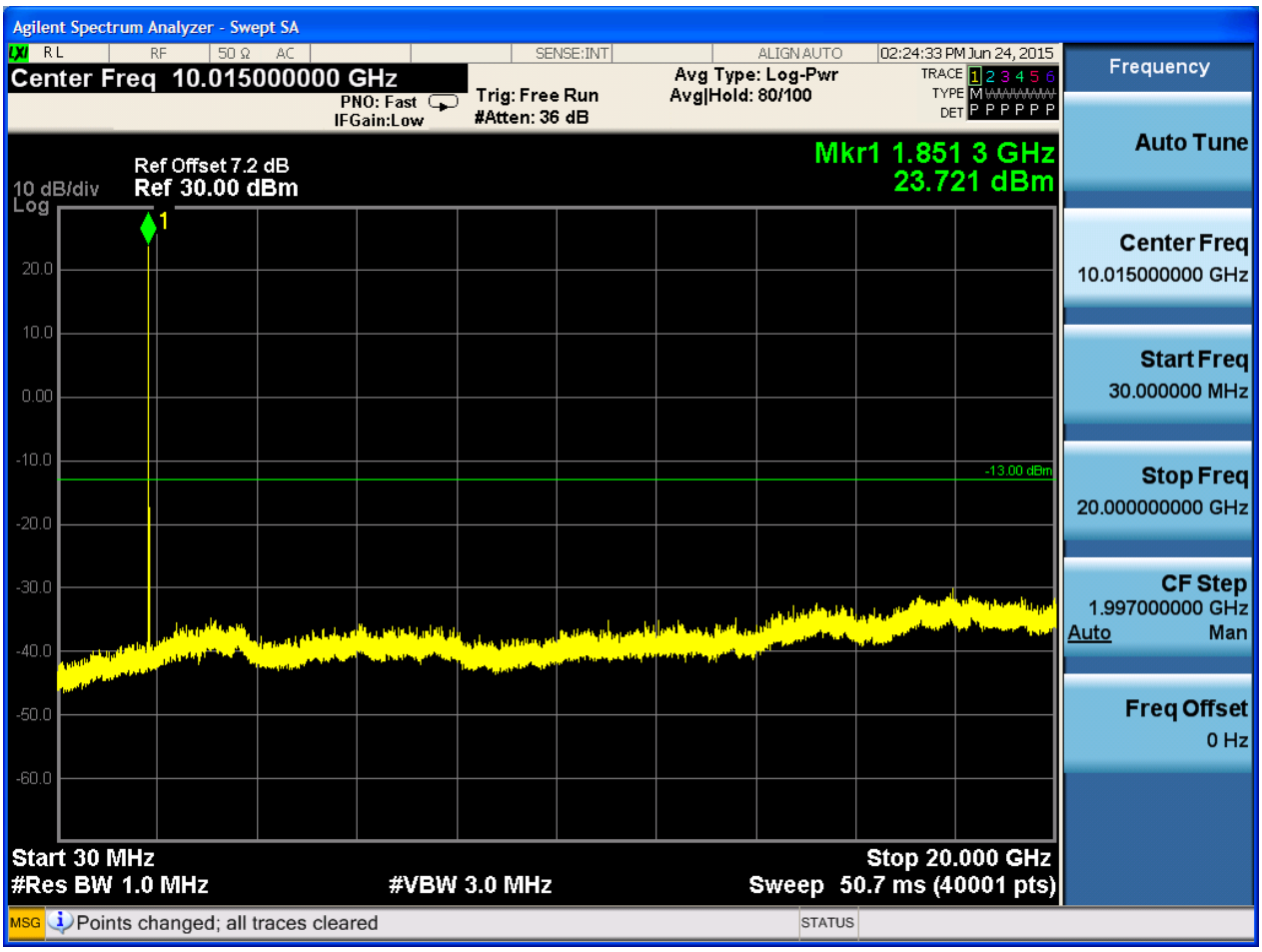
6.2.2 Test Band = WCDMA1900

6.2.2.1 Test Mode = UMTS/TM1

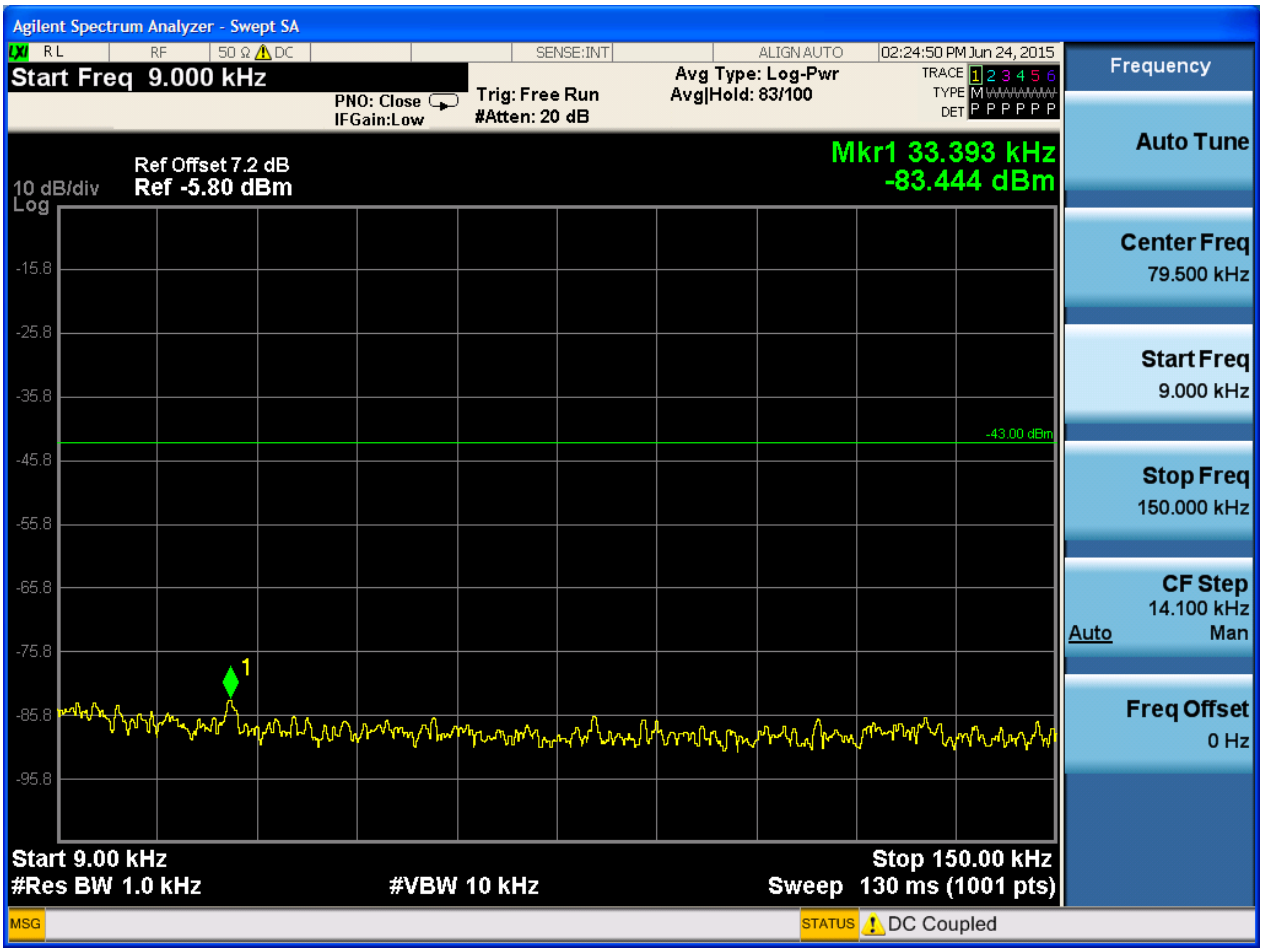
6.2.2.1.1 Test Channel = LCH

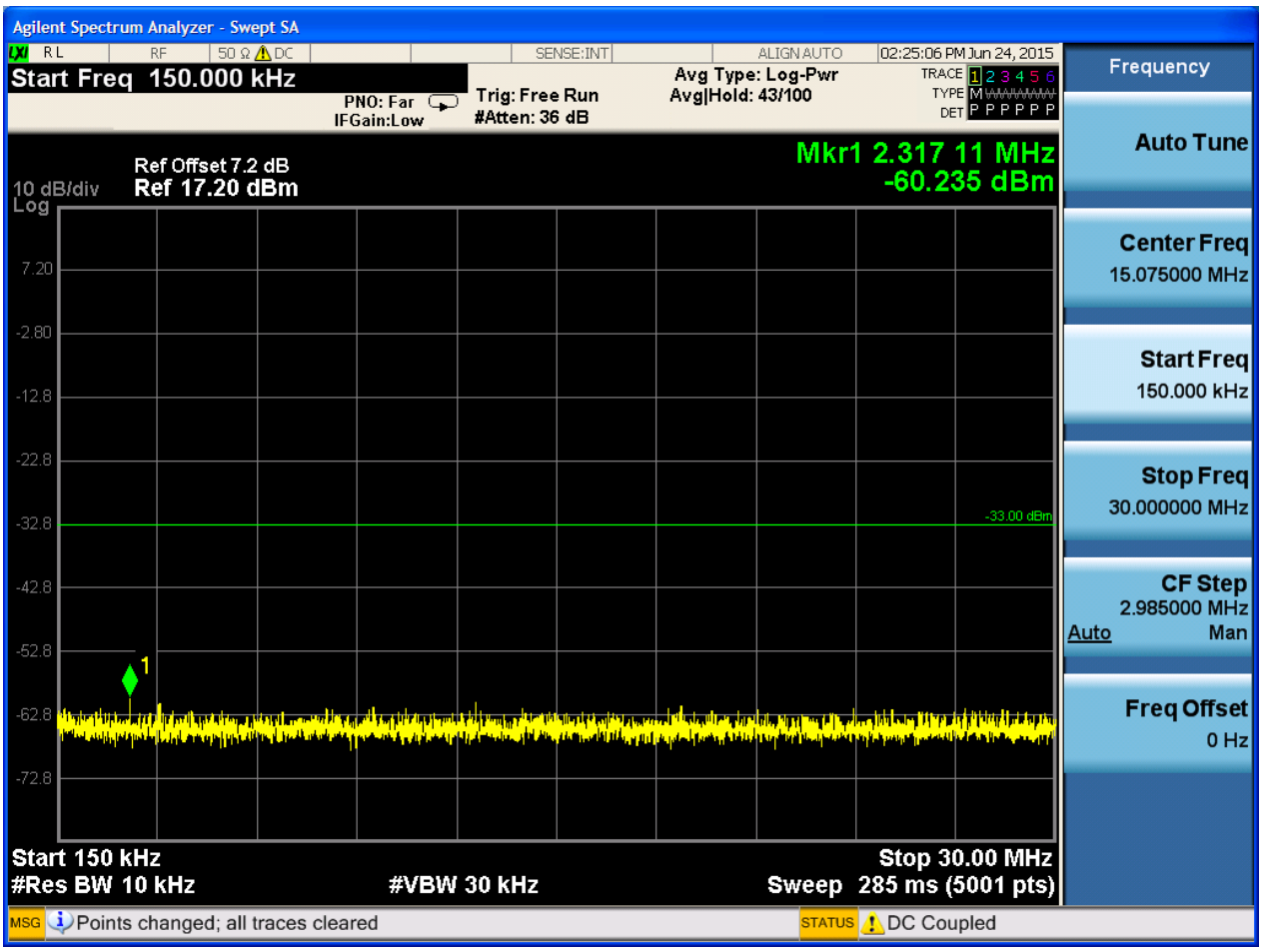


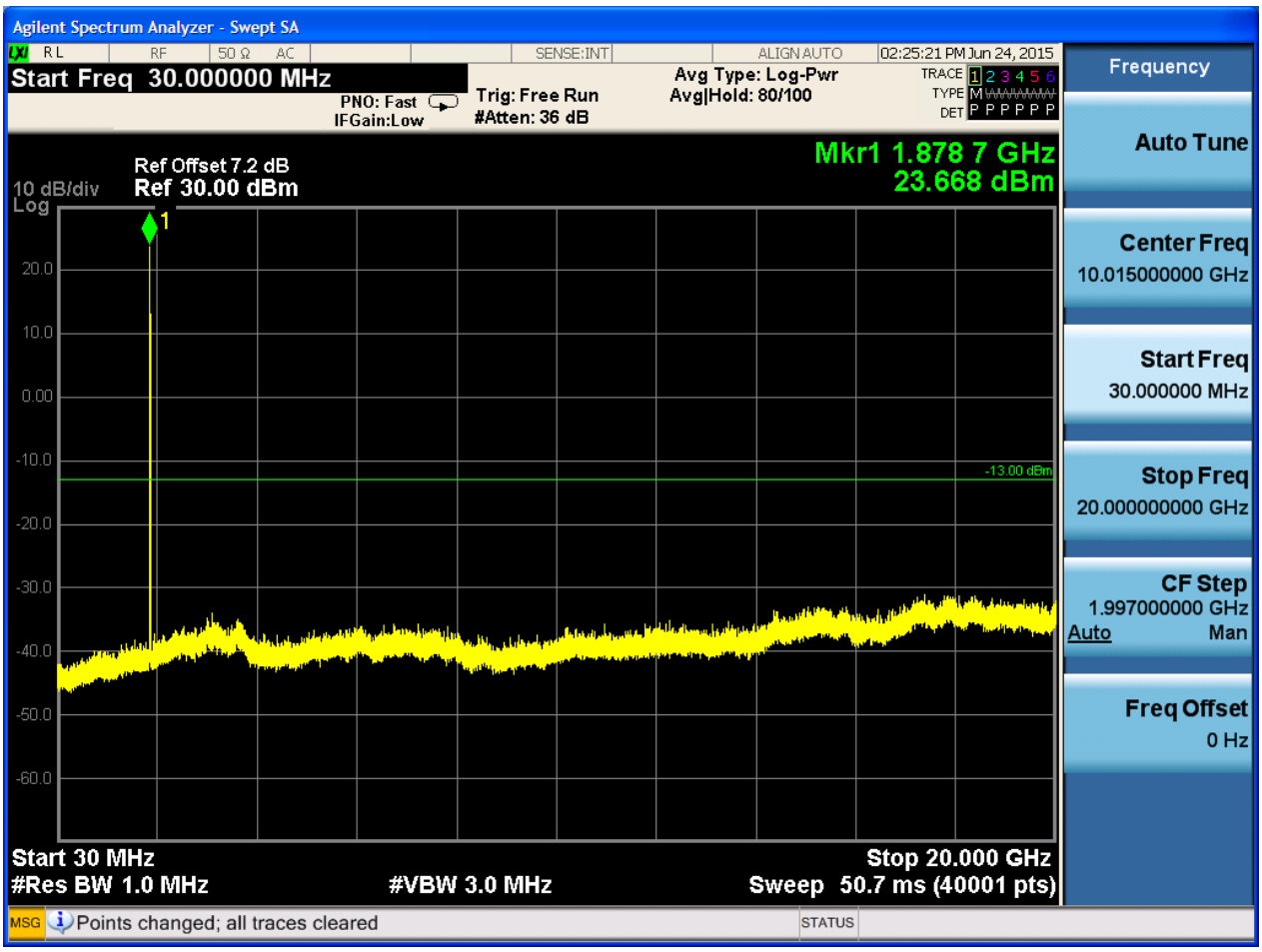




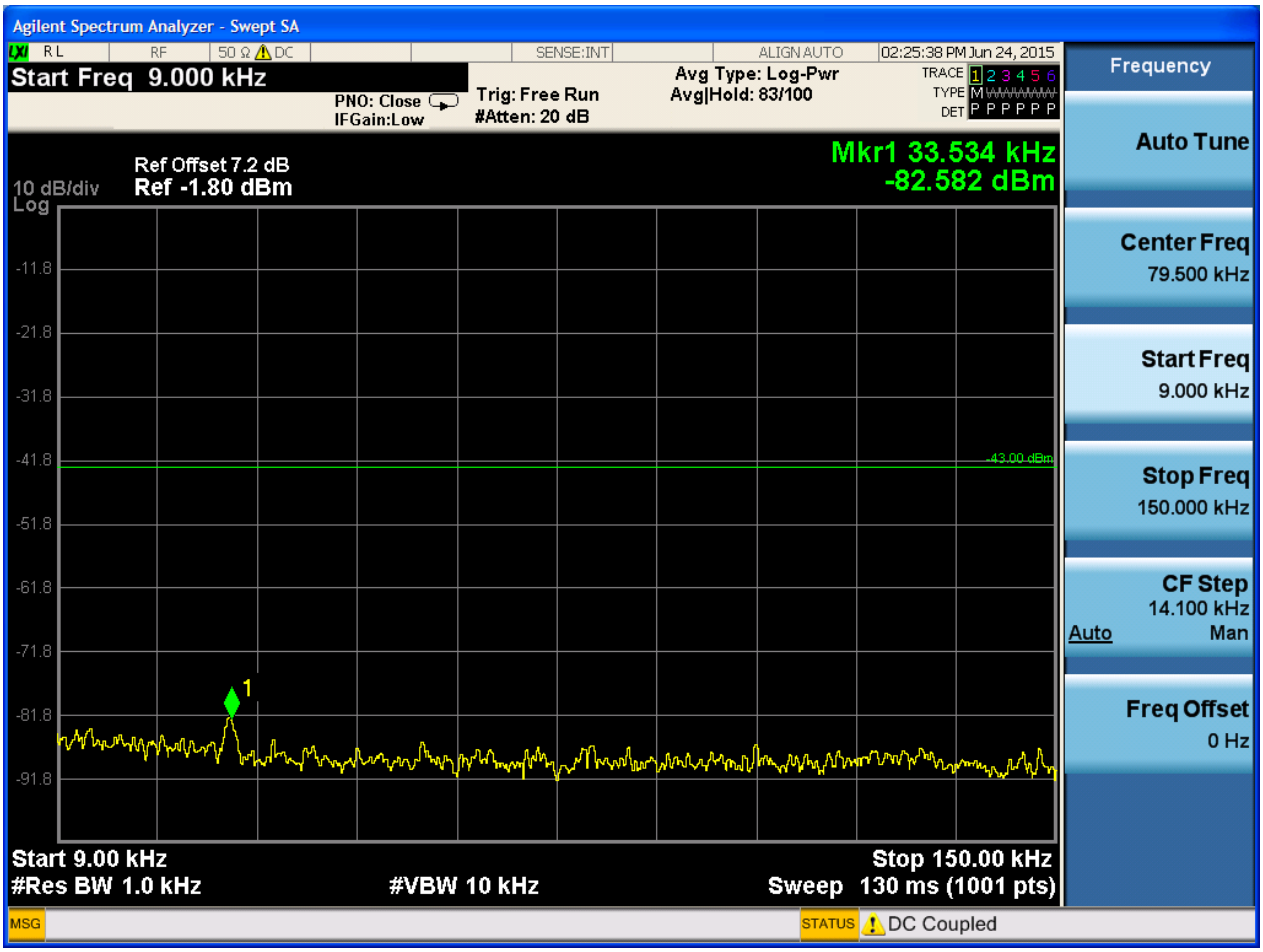
6.2.2.1.2 Test Channel = MCH

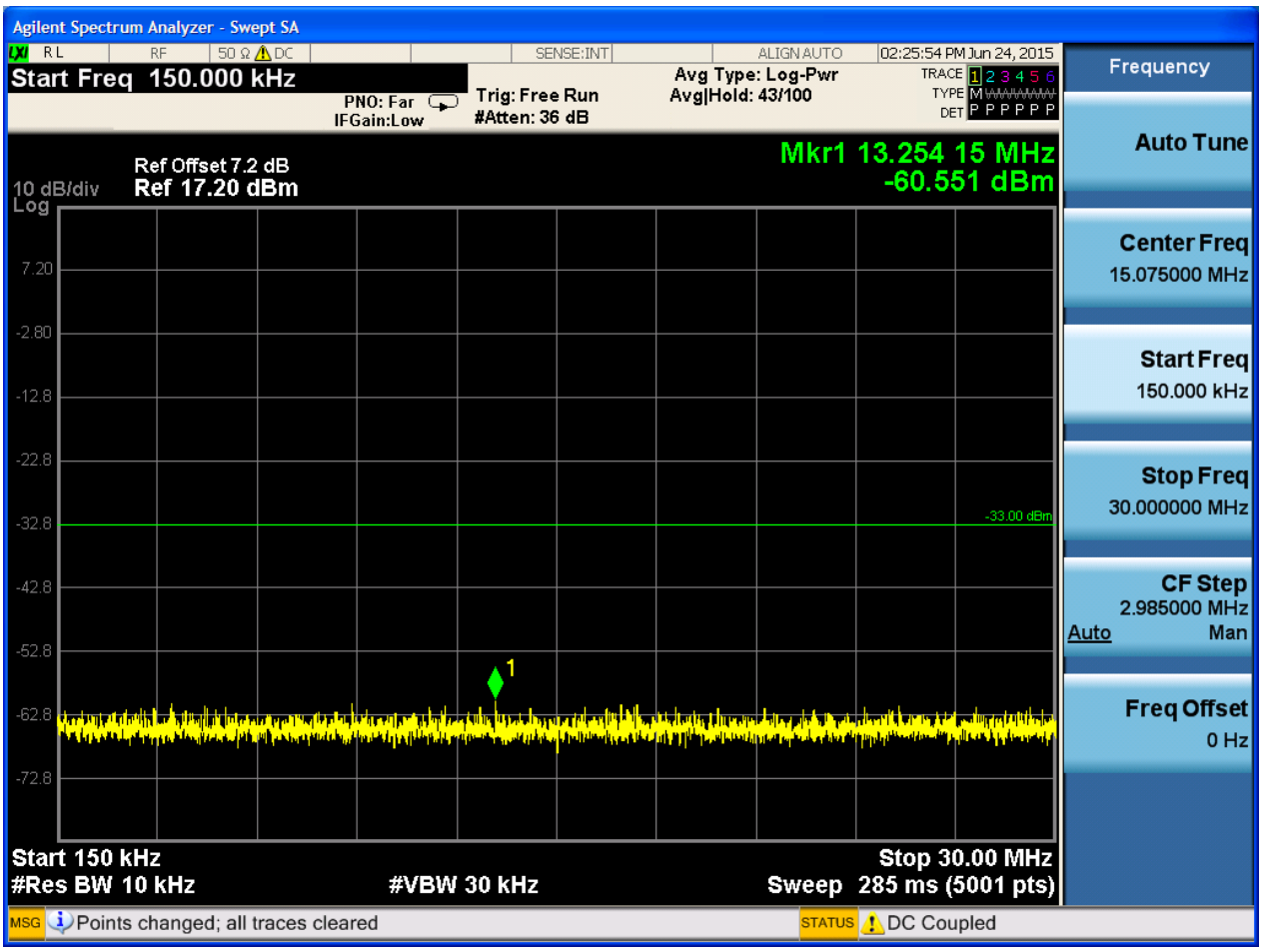


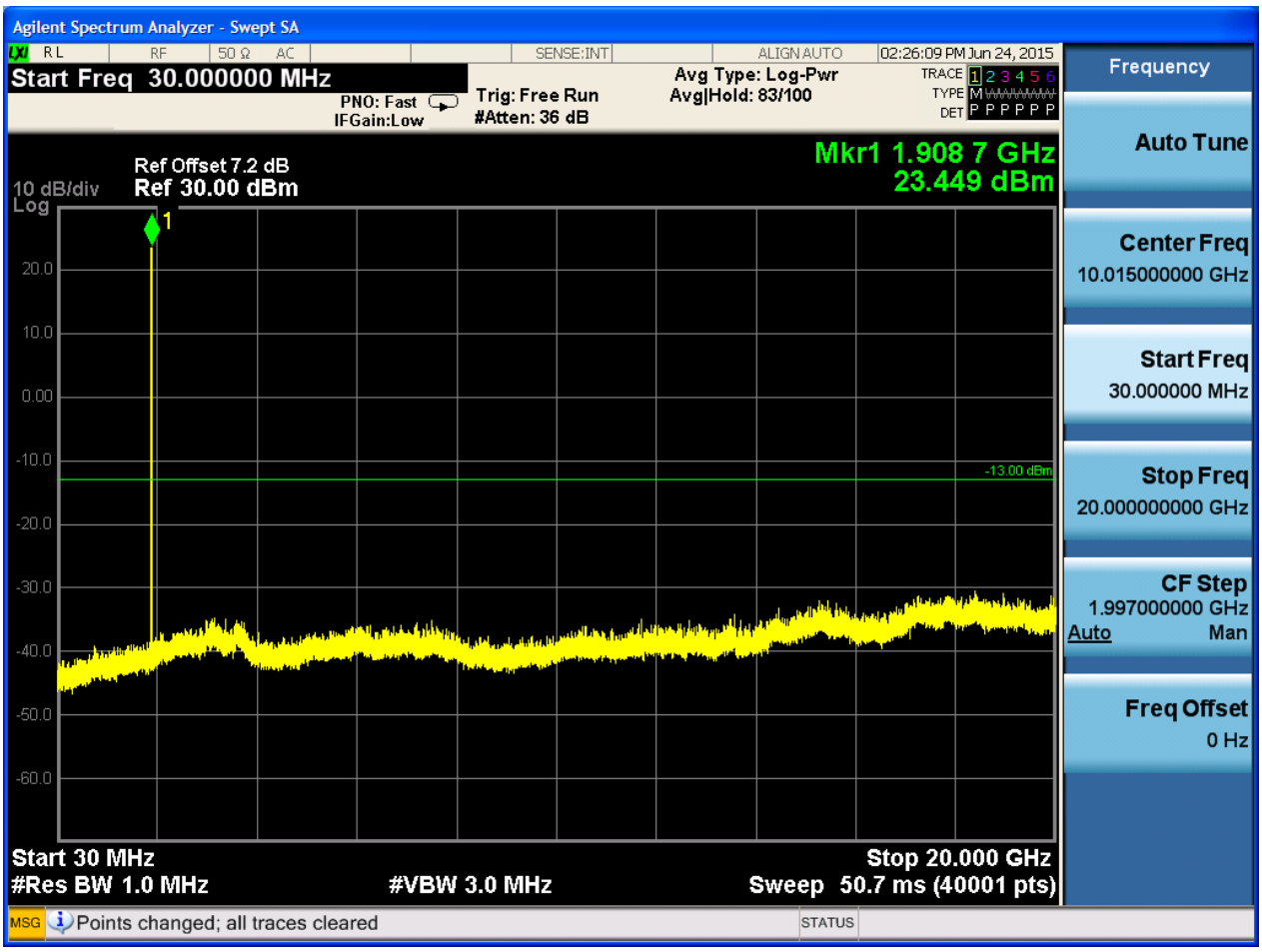




6.2.2.1.3 Test Channel = HCH



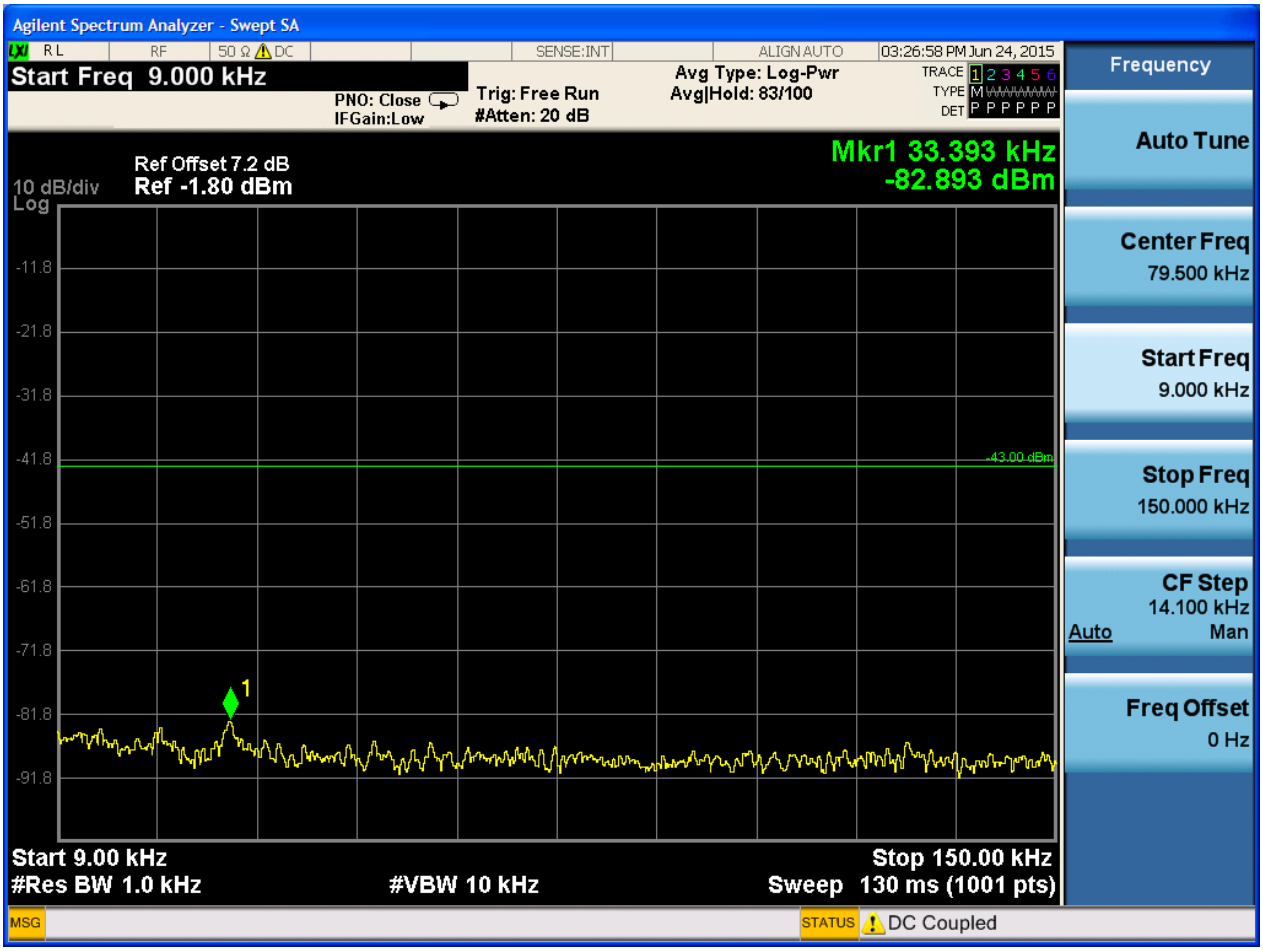


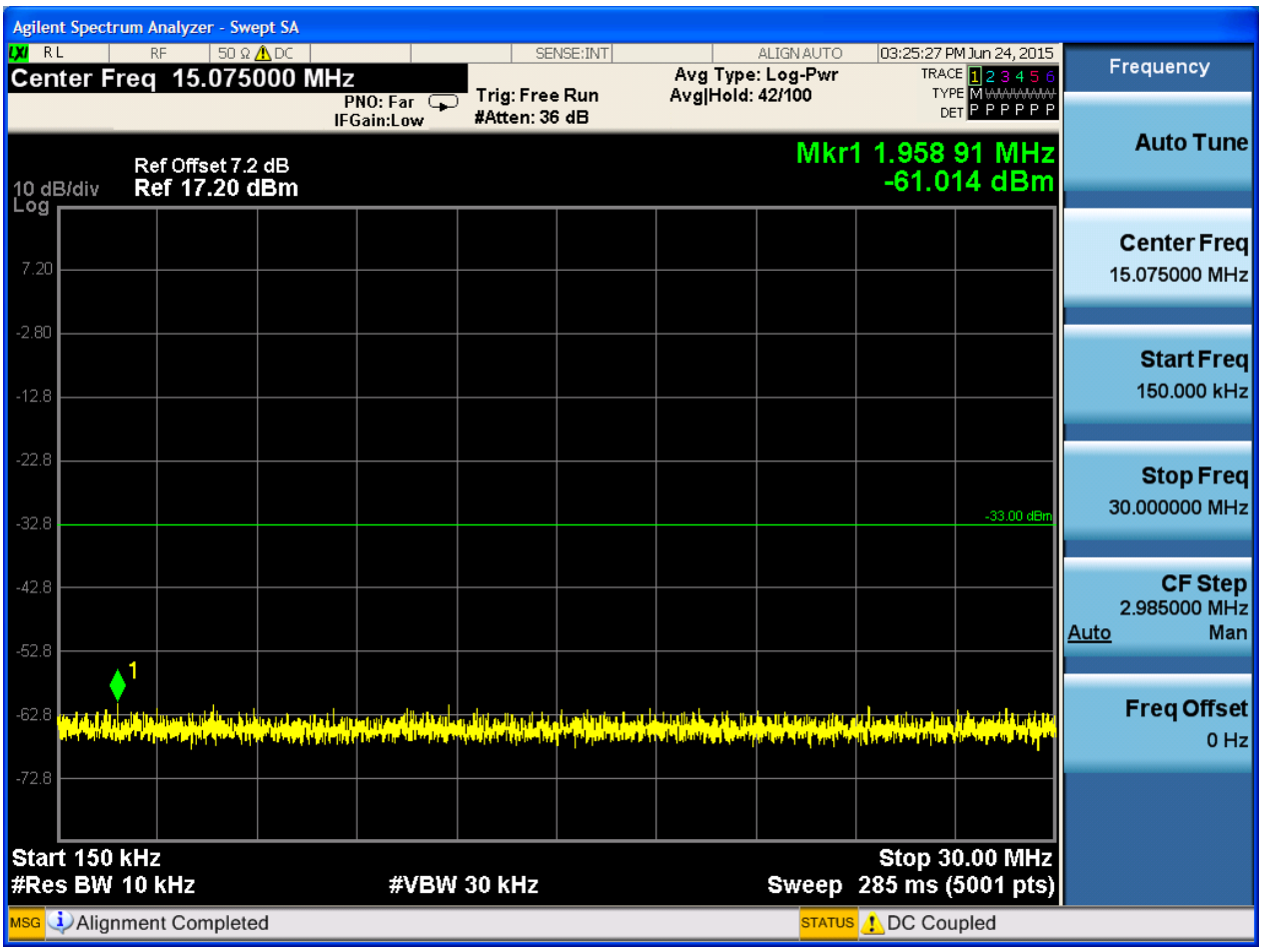


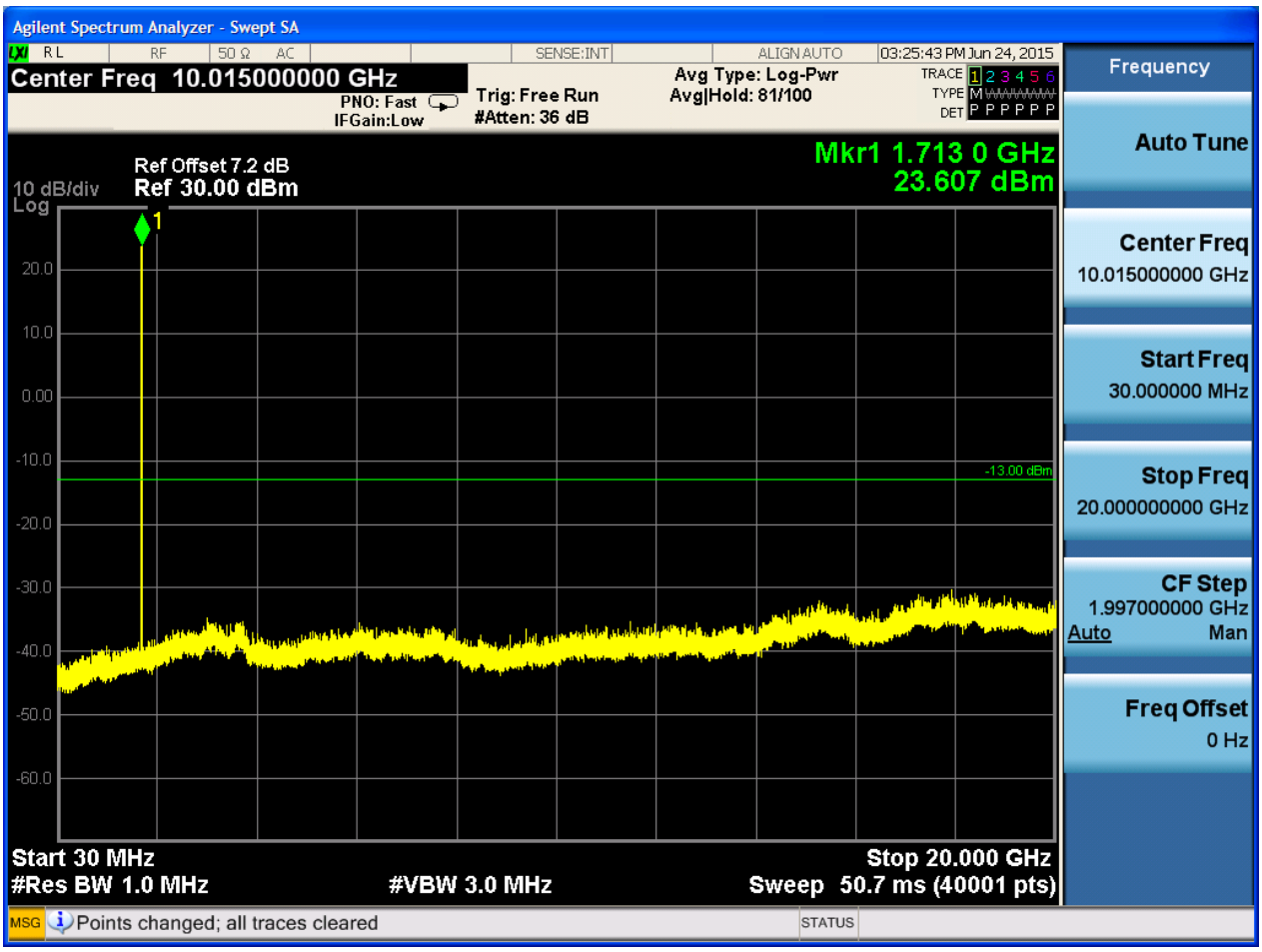
6.2.3 Test Band = WCDMA1700

6.2.3.1 Test Mode = UMTS/TM1

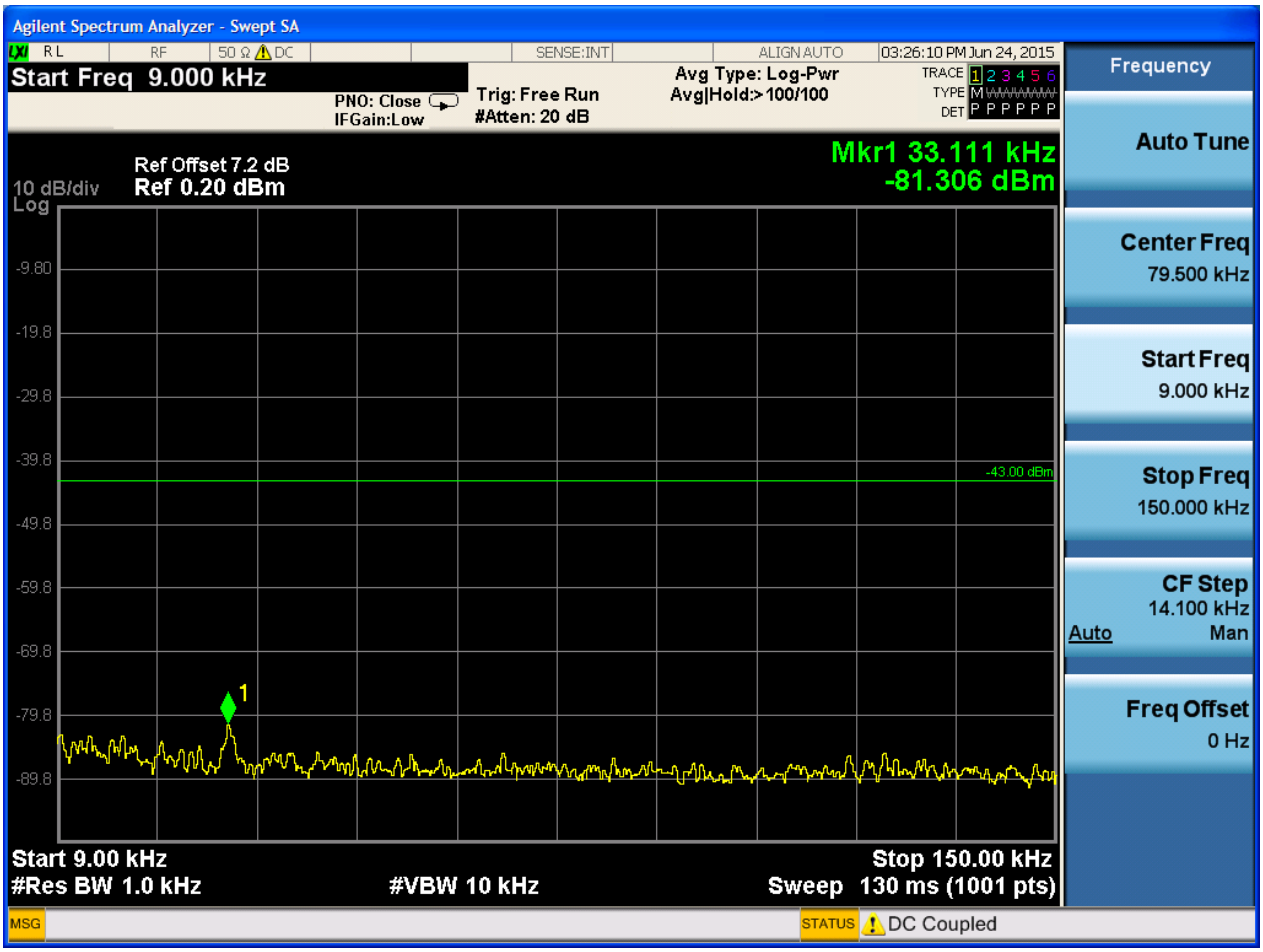
6.2.3.1.1 Test Channel = LCH

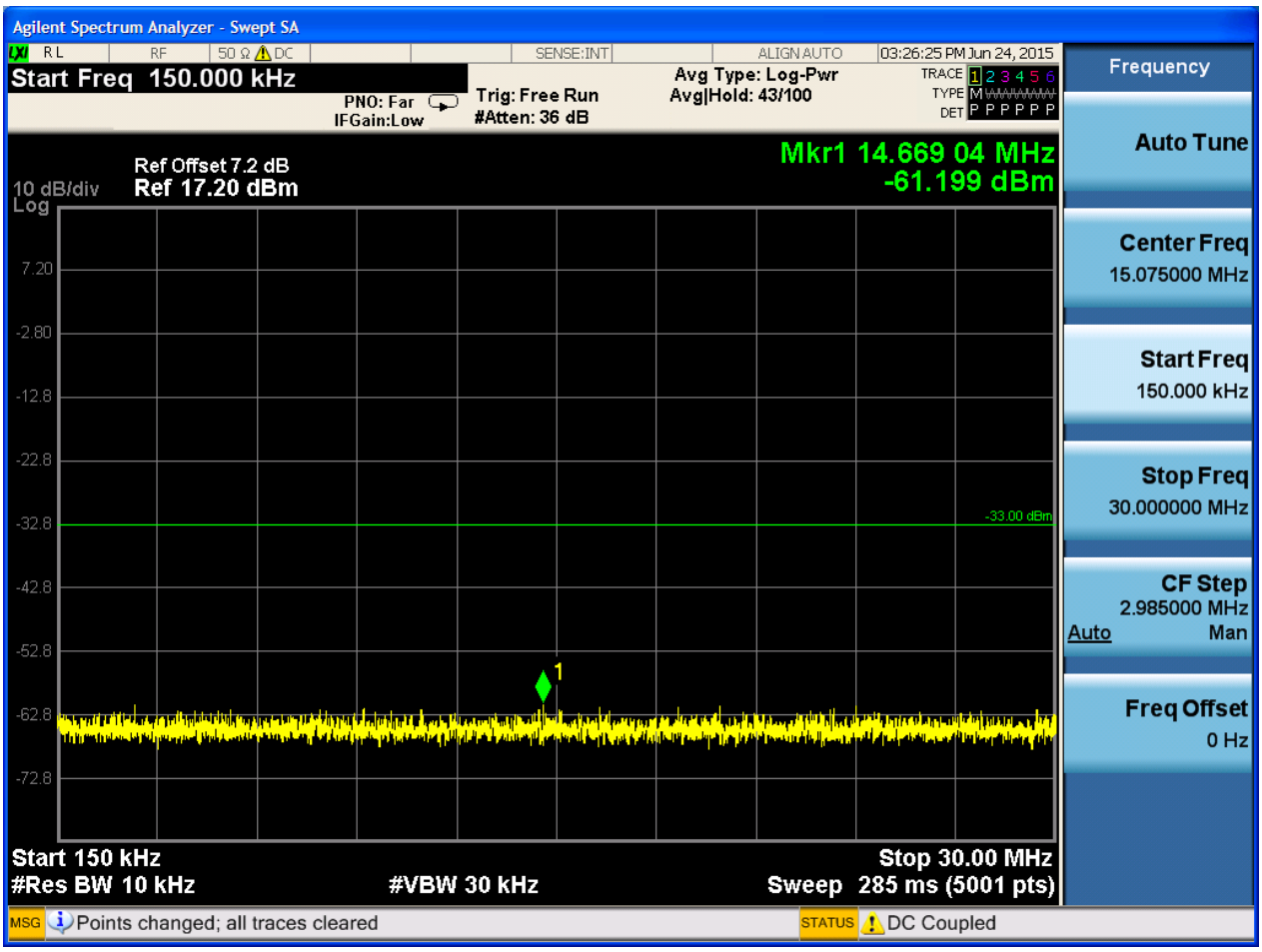


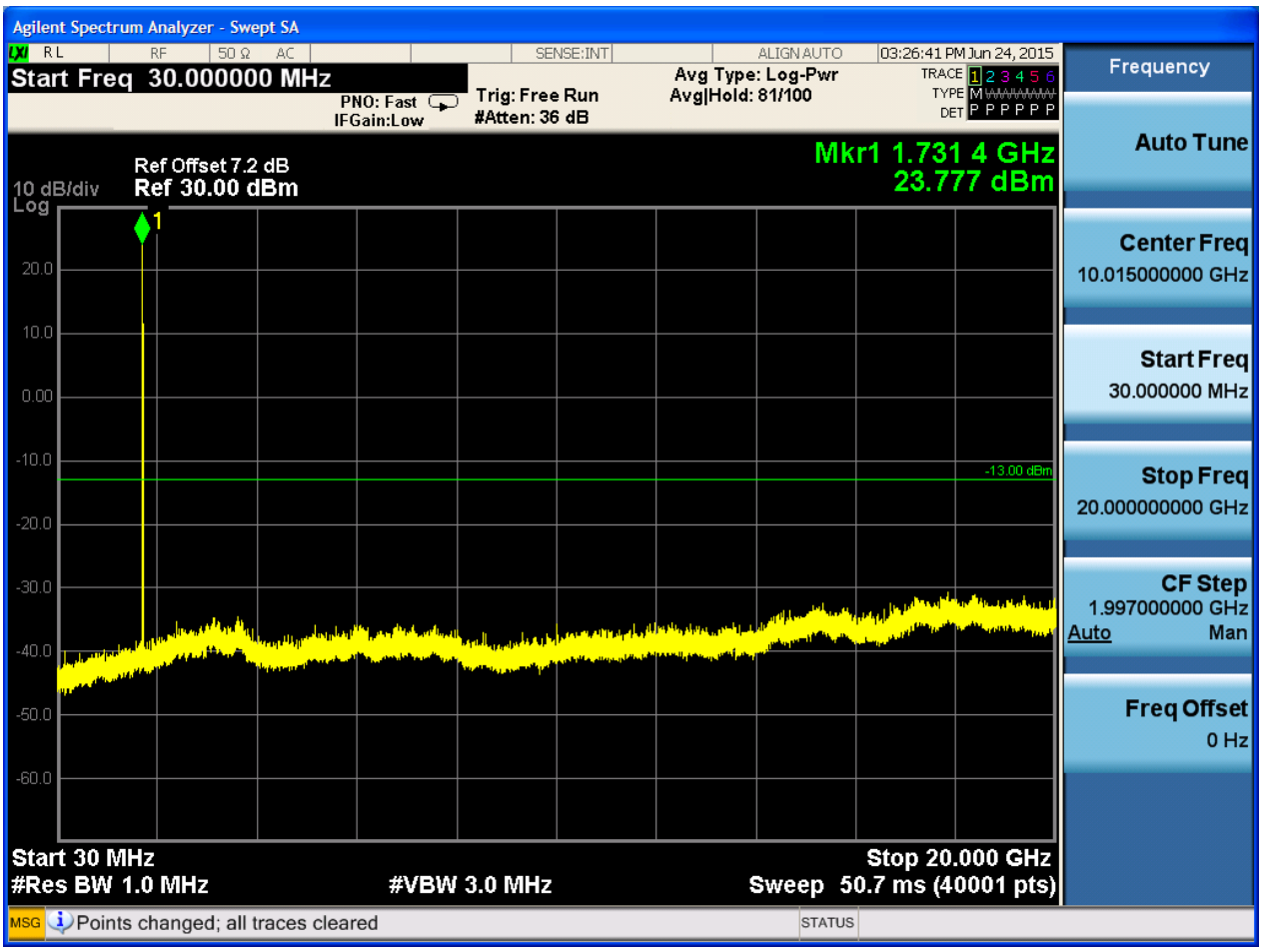




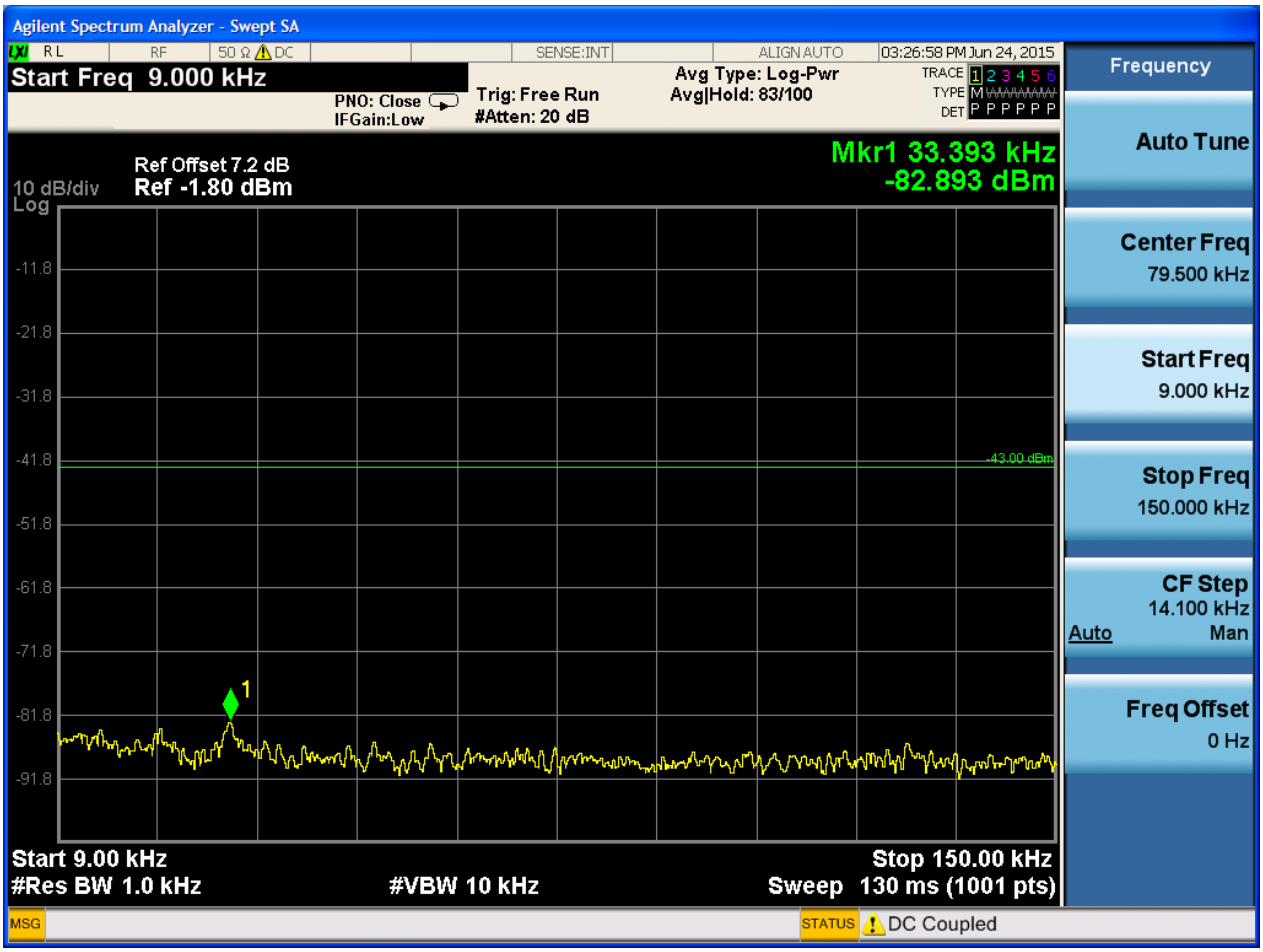
6.2.3.1.2 Test Channel = MCH

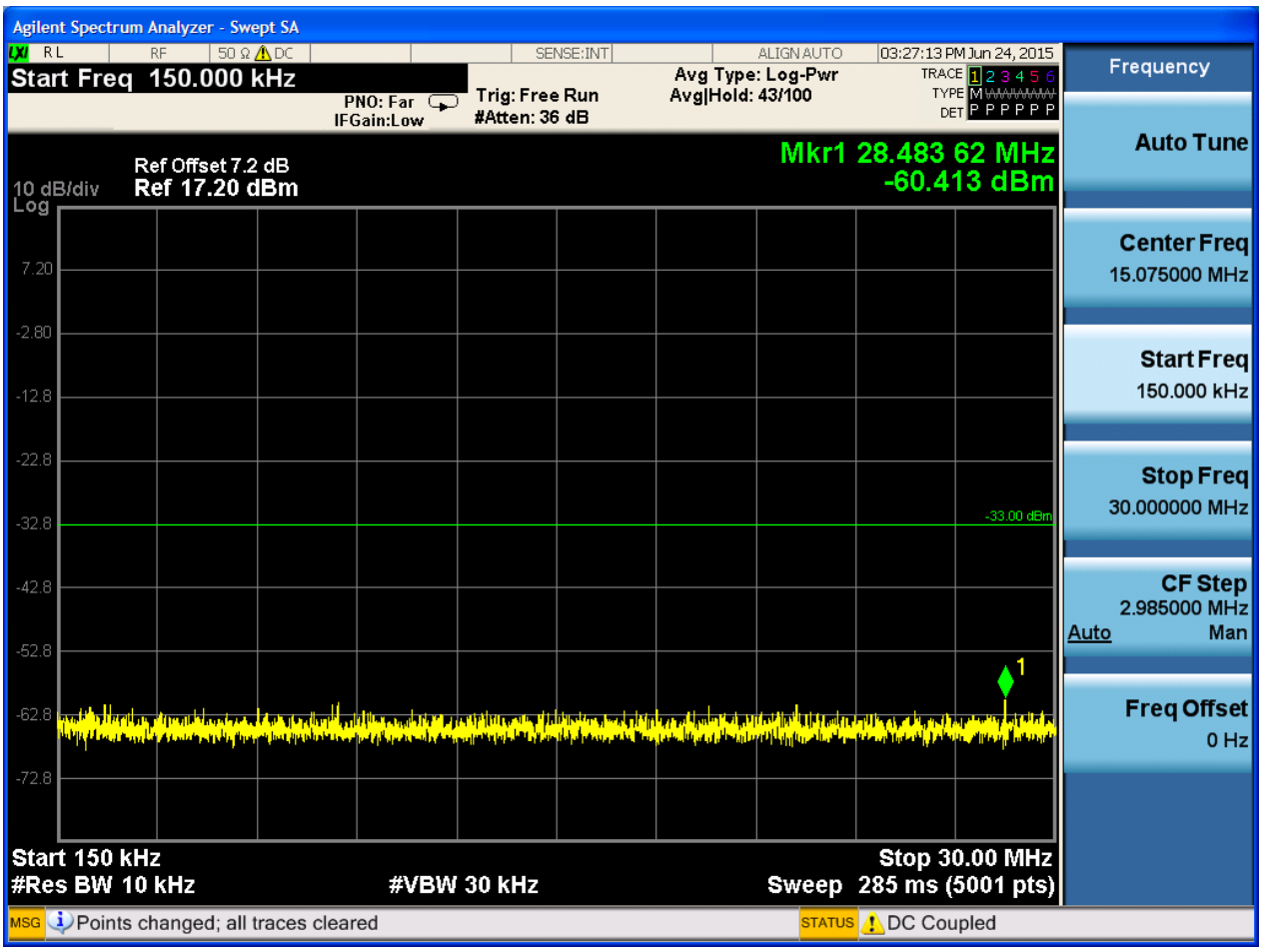


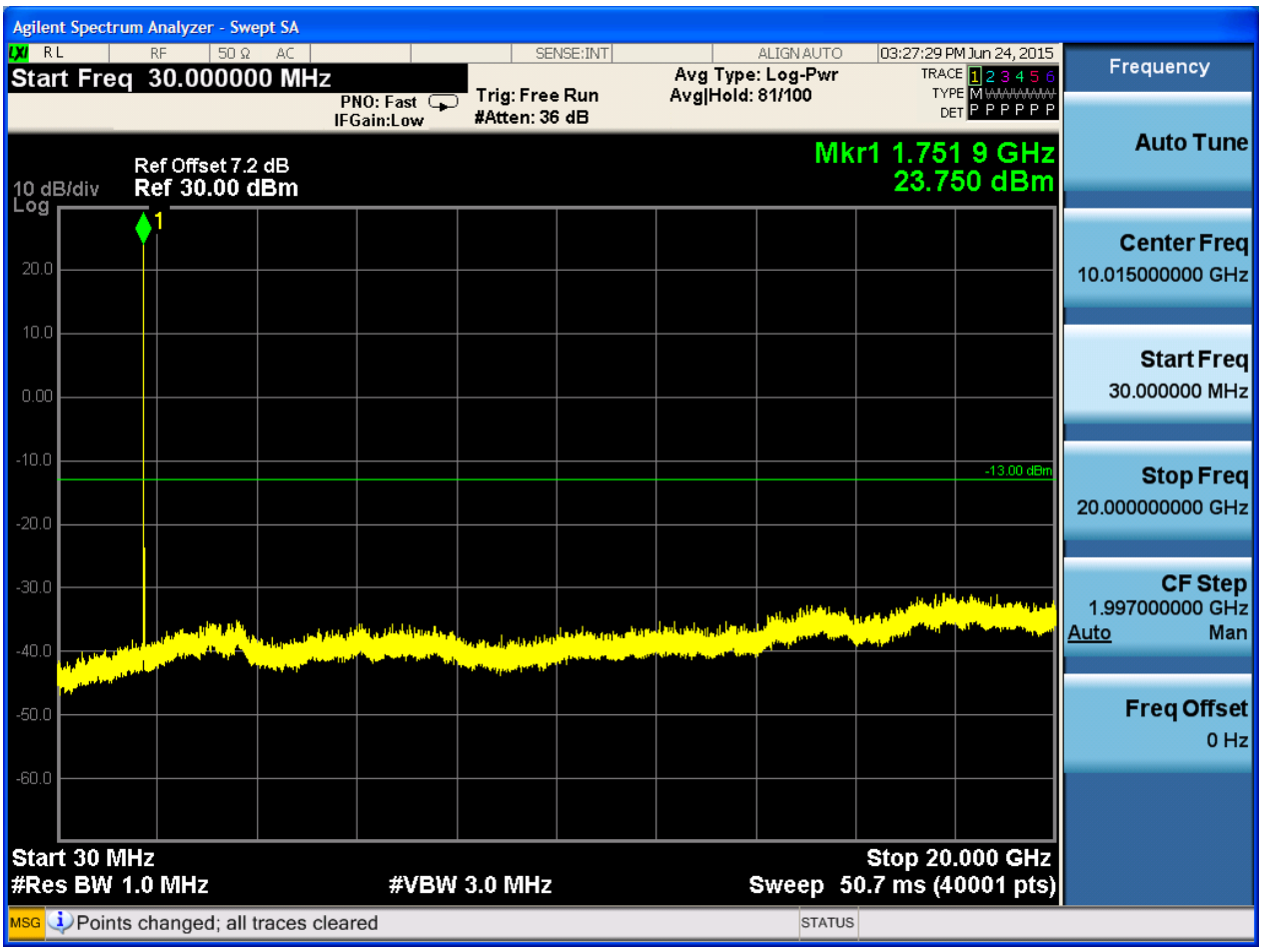




6.2.3.1.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note:

9kHz~150kHz, VBW = 200Hz, VBW = 600 Hz, Detector: PK

150kHz~30MHz, VBW = 9kHz, VBW = 30k Hz, Detector: PK

30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

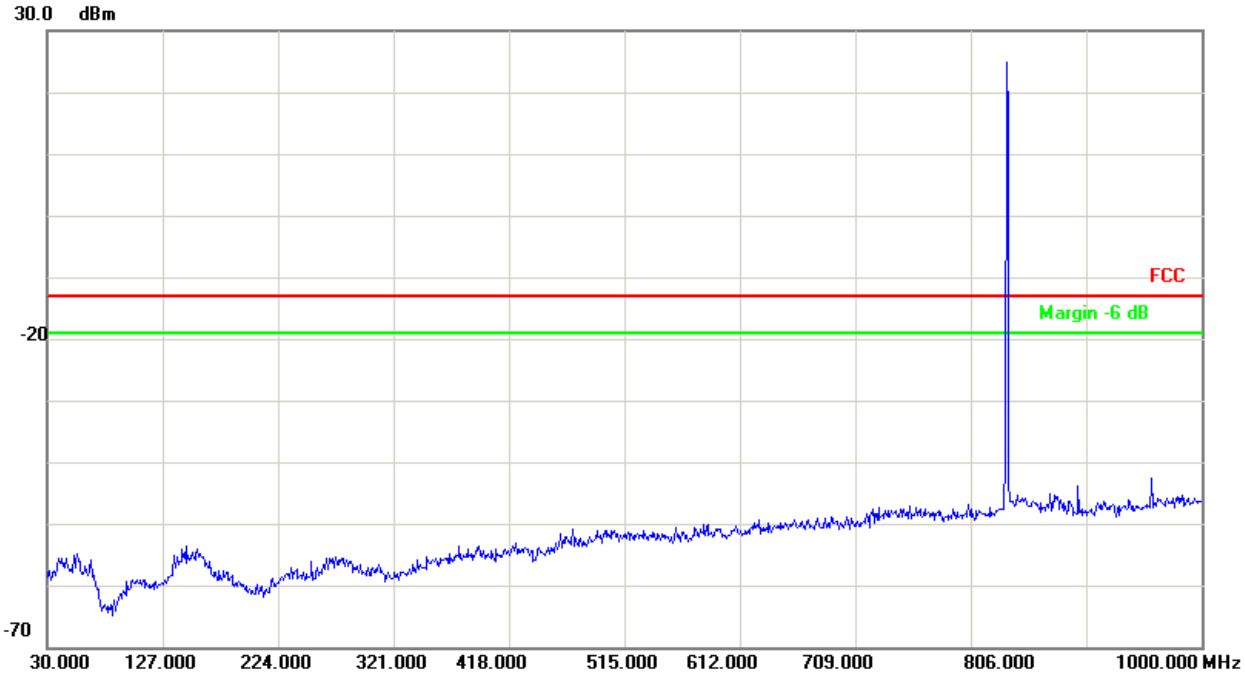
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

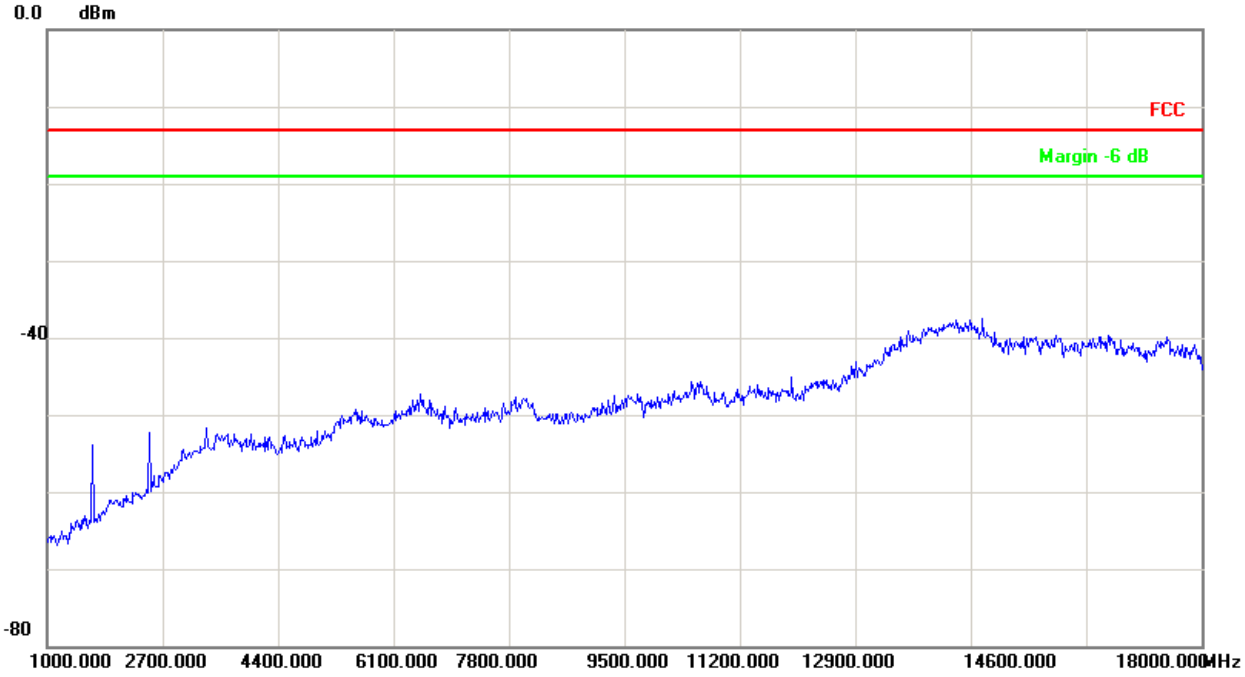
Part I - Test Plots

7.1 For GSM

7.1.1 Test Band = GSM850

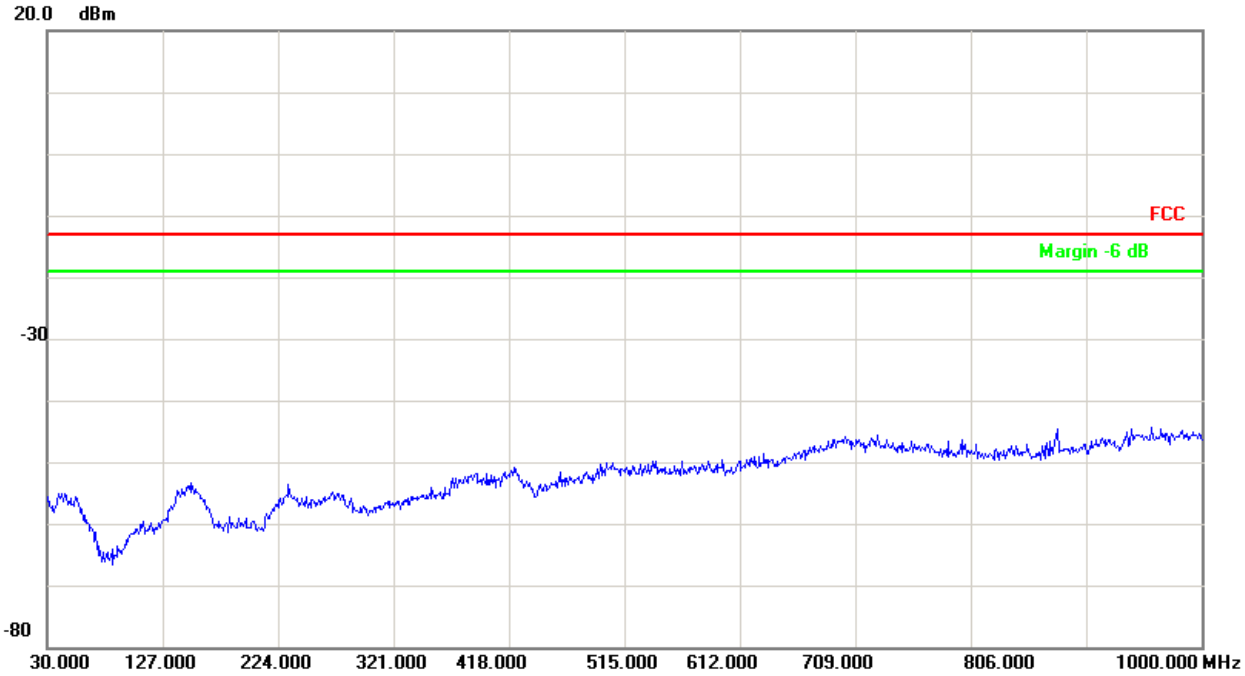
7.1.1.1 Test Mode = GSM/TM1

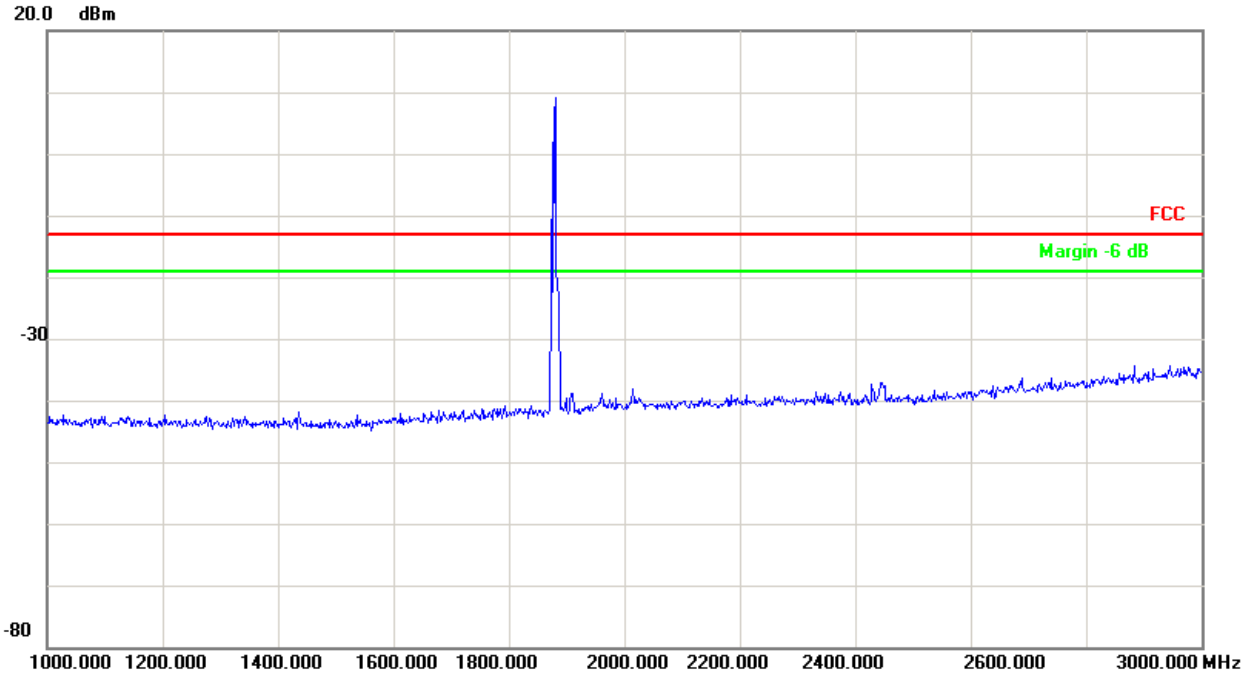


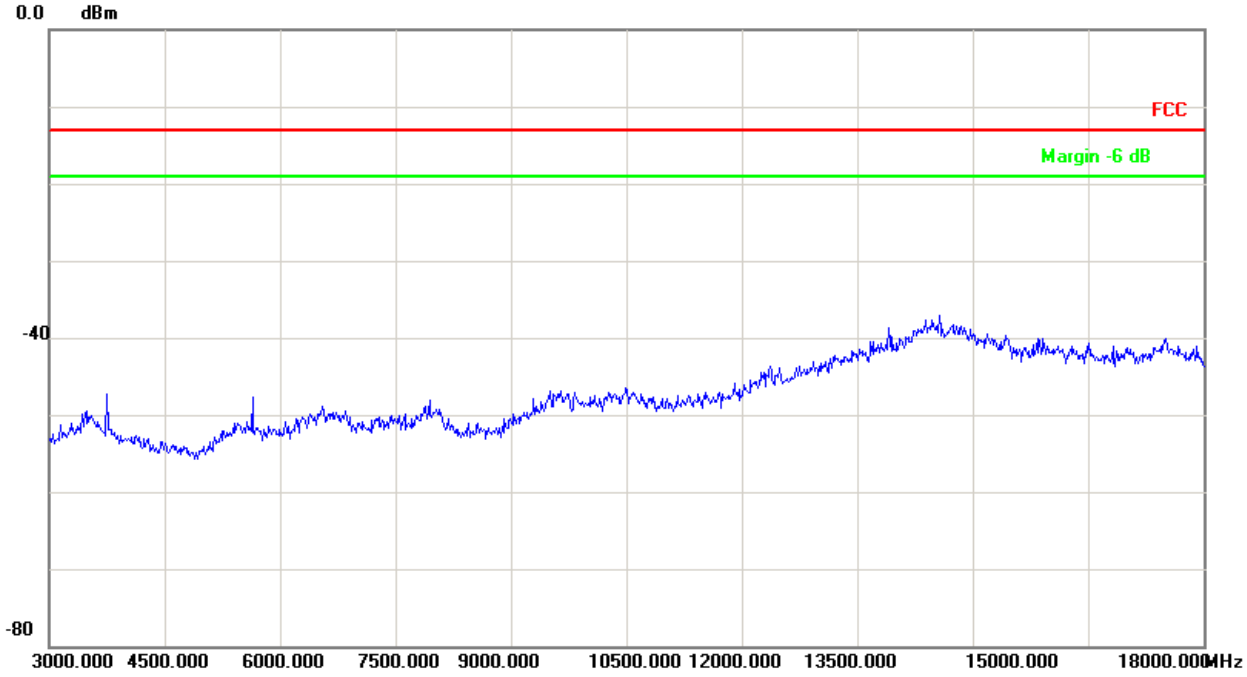


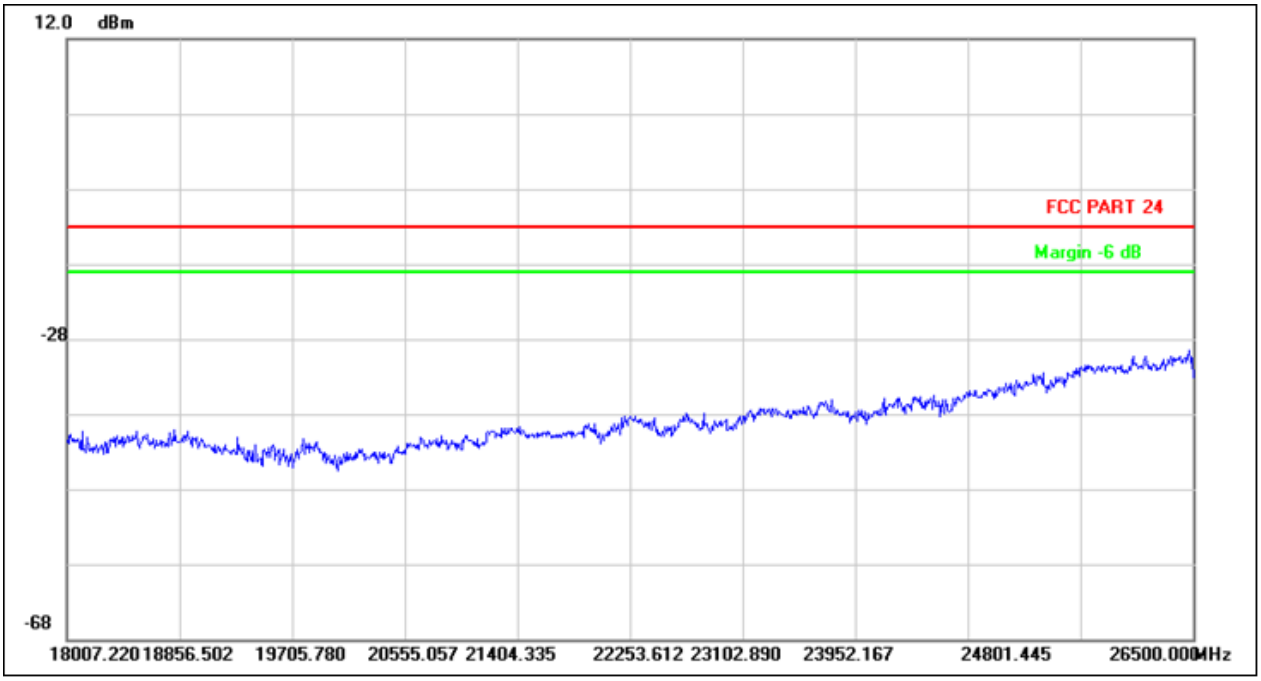
7.1.2 Test Band = GSM1900

7.1.2.1 Test Mode = GSM/TM1





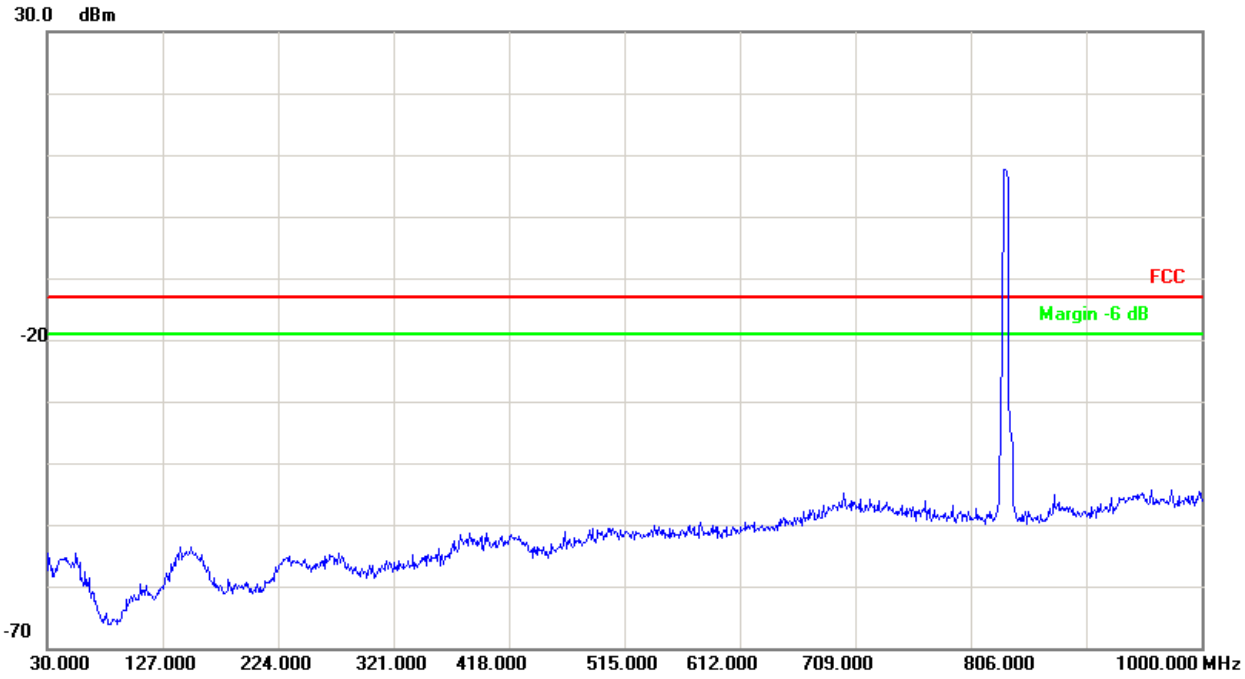


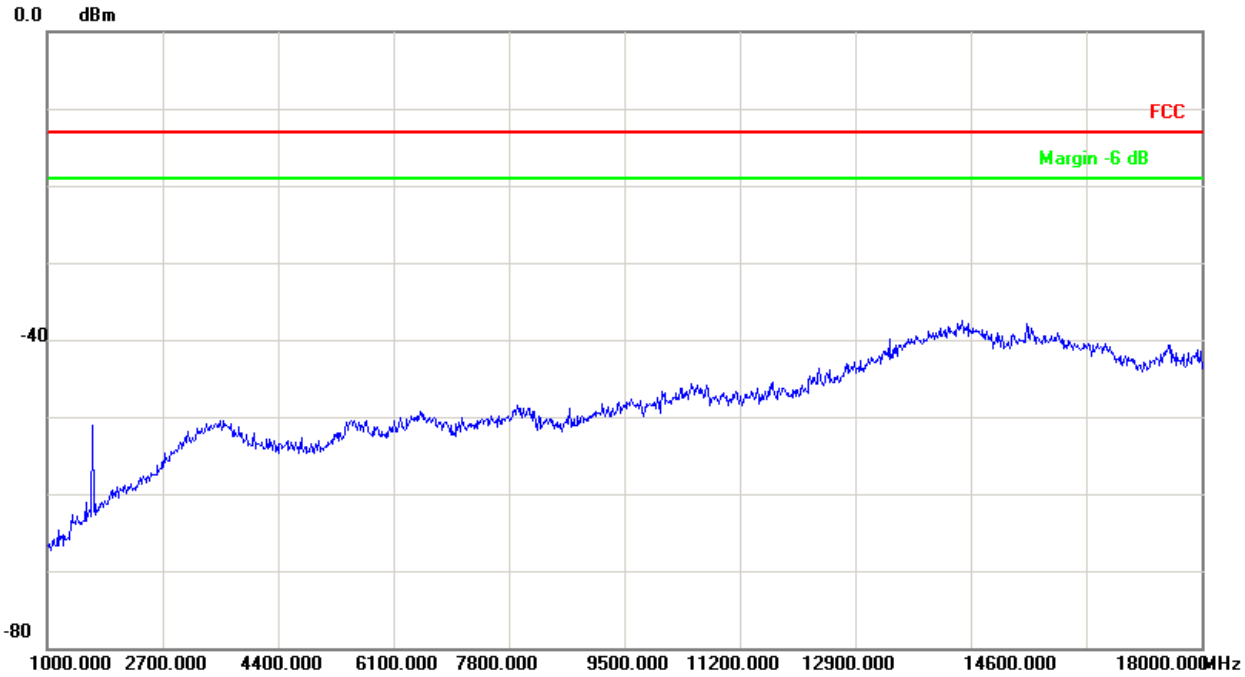


7.2 For UMTS

7.2.1 Test Band = WCDMA850

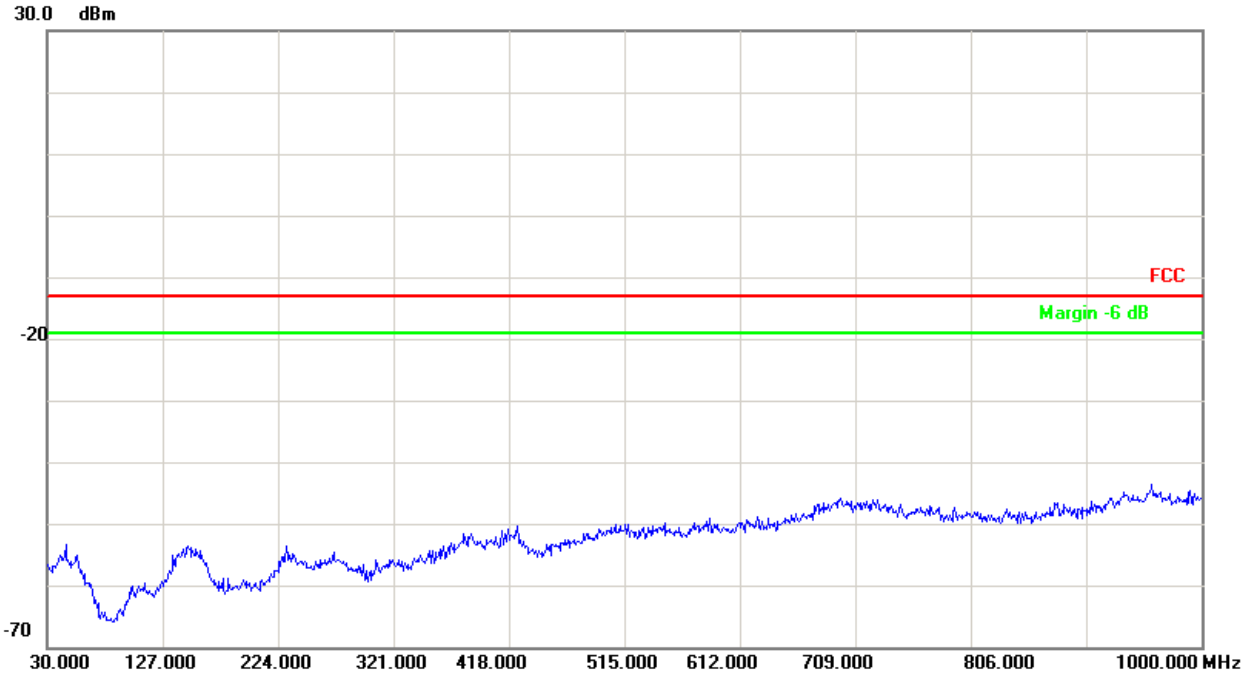
7.2.1.1 Test Mode = UMTS/TM1

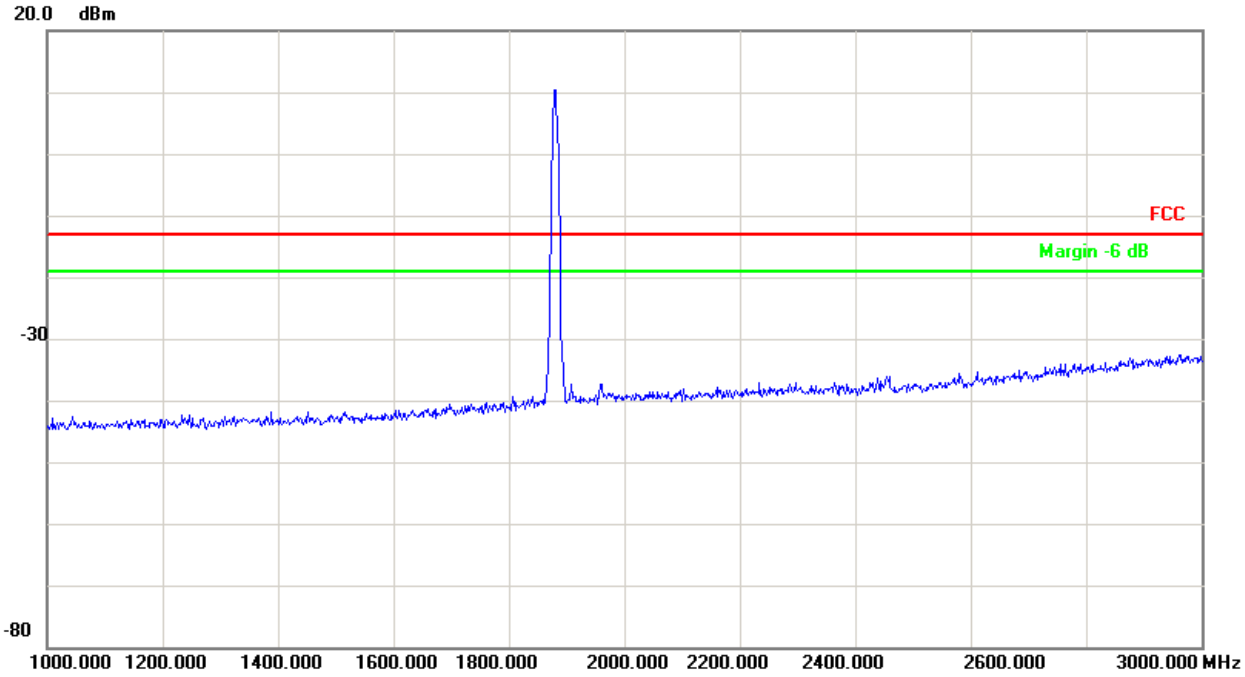


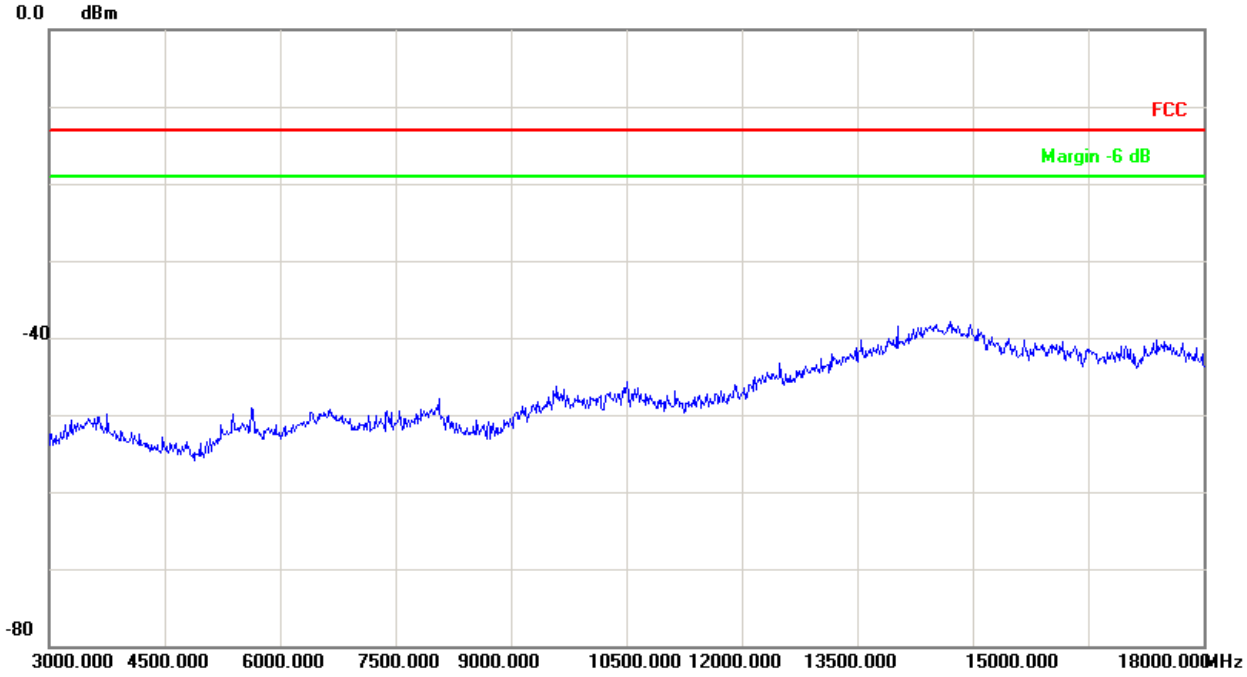


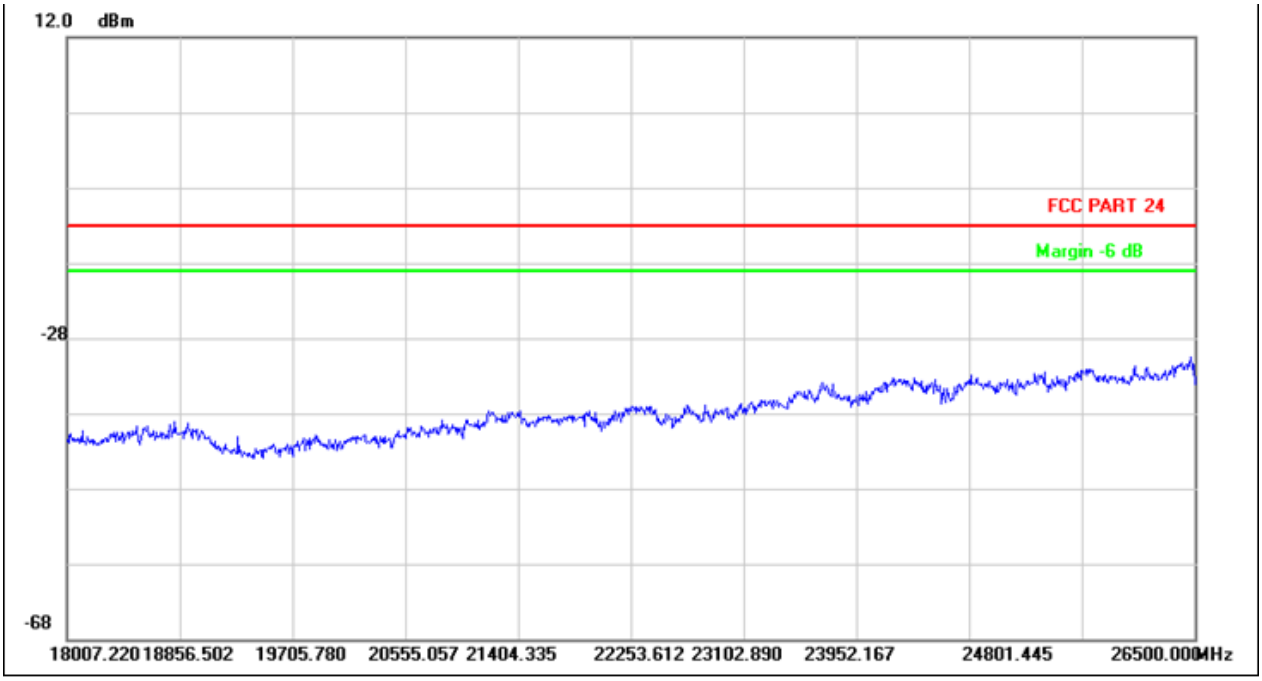
7.2.2 Test Band = WCDMA1900

7.2.2.1 Test Mode = UMTS/TM1



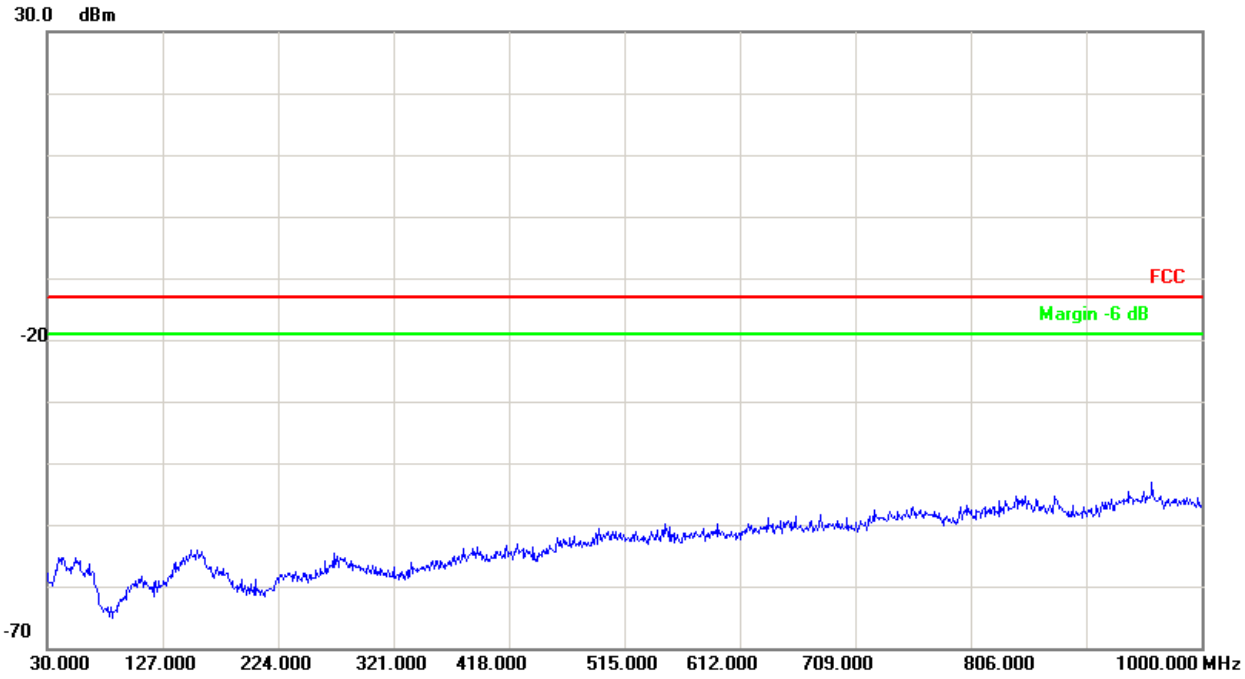


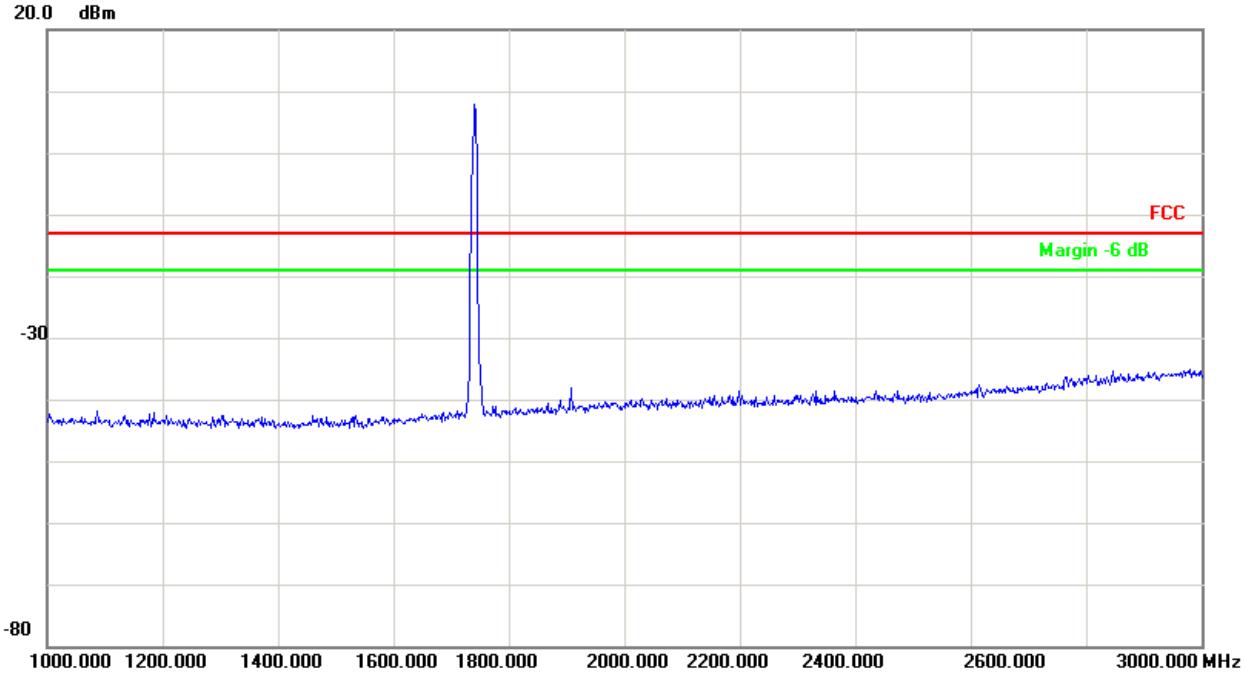


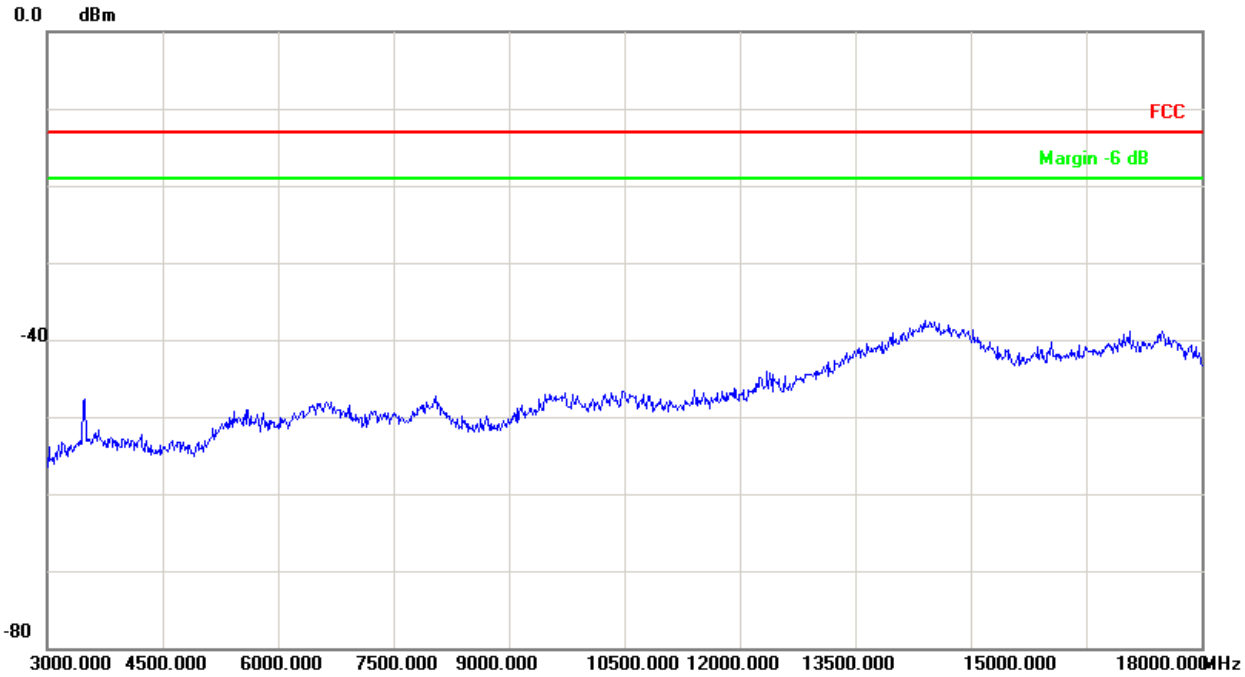


7.2.3 Test Band = WCDMA1700

7.2.3.1 Test Mode = UMTS/TM1







8Appendix_H: Frequency Stability

8.1 For GSM

8.1.1Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM850	GSM/TM1	LCH	TN	VL	13.24	0.01606	PASS
				VN	8.65	0.0105	PASS
				VH	10.4	0.01262	PASS
		MCH	TN	VL	29.83	0.03566	PASS
				VN	22.47	0.02686	PASS
				VH	14.53	0.01737	PASS
		HCH	TN	VL	6.65	0.00783	PASS
				VN	8.07	0.00951	PASS
				VH	9.36	0.01103	PASS
	GSM/TM2	LCH	TN	VL	13.69	0.01661	PASS
				VN	12.43	0.01508	PASS
				VH	13.56	0.01645	PASS
		MCH	TN	VL	20.57	0.02459	PASS
				VN	25.47	0.03044	PASS
				VH	9.98	0.01193	PASS
		HCH	TN	VL	1.84	0.00217	PASS
				VN	6.62	0.0078	PASS
				VH	6.26	0.00738	PASS
GSM1900	GSM/TM1	LCH	TN	VL	15.95	0.00862	PASS
				VN	23.44	0.01267	PASS
				VH	24.28	0.01312	PASS
		MCH	TN	VL	19.37	0.0103	PASS
				VN	16.14	0.00859	PASS
				VH	10.07	0.00536	PASS
		HCH	TN	VL	5.94	0.00311	PASS
				VN	9.36	0.0049	PASS
				VH	7.1	0.00372	PASS
	GSM/TM2	LCH	TN	VL	18.69	0.0101	PASS
				VN	22.34	0.01207	PASS
				VH	23.89	0.01291	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	TN	VL	18.53	0.00986	PASS
				VN	13.85	0.00737	PASS
				VH	16.85	0.00896	PASS
		HCH	TN	VL	7.62	0.00399	PASS
				VN	14.33	0.0075	PASS
				VH	10.91	0.00571	PASS

8.1.2Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM850	GSM/TM1	LCH	VN	-30	4.78	0.0058	PASS
				-20	6.78	0.00823	PASS
				-10	12.79	0.01552	PASS
				0	7.88	0.00956	PASS
				10	6.01	0.00729	PASS
				20	12.91	0.01566	PASS
				30	6.33	0.00768	PASS
				40	9.94	0.01206	PASS
				50	8.01	0.00972	PASS
		MCH	VN	-30	19.31	0.02308	PASS
				-20	7.17	0.00857	PASS
				-10	12.07	0.01443	PASS
				0	15.82	0.01891	PASS
				10	14.92	0.01783	PASS
				20	21.76	0.02601	PASS
				30	14.98	0.01791	PASS
				40	17.31	0.02069	PASS
				50	10.07	0.01204	PASS
		HCH	VN	-30	8.59	0.01012	PASS
				-20	8.01	0.00944	PASS
				-10	8.91	0.0105	PASS
				0	5.42	0.00639	PASS
				10	6.46	0.00761	PASS
				20	3.29	0.00388	PASS
				30	7.62	0.00898	PASS
				40	7.3	0.0086	PASS
				50	3.42	0.00403	PASS
	GSM/TM2	LCH	VN	-30	12.66	0.01536	PASS
				-20	14.46	0.01754	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				-10	13.69	0.01661	PASS
				0	16.85	0.02044	PASS
				10	15.01	0.01821	PASS
				20	15.82	0.01919	PASS
				30	13.27	0.0161	PASS
				40	13.98	0.01696	PASS
				50	13.14	0.01594	PASS
		MCH	VN	-30	28.57	0.03415	PASS
				-20	26.99	0.03226	PASS
				-10	18.21	0.02177	PASS
				0	27.7	0.03311	PASS
				10	8.3	0.00992	PASS
				20	10.72	0.01281	PASS
				30	21.79	0.02605	PASS
				40	10.43	0.01247	PASS
				50	16.66	0.01991	PASS
		HCH	VN	-30	6.46	0.00761	PASS
				-20	14.17	0.01669	PASS
				-10	5.94	0.007	PASS
				0	5.75	0.00677	PASS
				10	7.3	0.0086	PASS
				20	16.21	0.0191	PASS
				30	13.5	0.0159	PASS
				40	12.85	0.01514	PASS
				50	5.1	0.00601	PASS
GSM1900	GSM/TM1	LCH	VN	-30	16.98	0.00918	PASS
				-20	15.69	0.00848	PASS
				-10	2.52	0.00136	PASS
				0	18.53	0.01002	PASS
				10	21.05	0.01138	PASS
				20	12.07	0.00652	PASS
				30	5.62	0.00304	PASS
				40	5.17	0.00279	PASS
				50	4.13	0.00223	PASS
		MCH	VN	-30	18.08	0.00962	PASS
				-20	13.3	0.00707	PASS
				-10	19.44	0.01034	PASS
				0	13.37	0.00711	PASS
				10	12.4	0.0066	PASS
				20	16.53	0.00879	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				30	11.49	0.00611	PASS
				40	14.46	0.00769	PASS
				50	13.88	0.00738	PASS
		HCH	VN	-30	10.14	0.00531	PASS
				-20	11.11	0.00582	PASS
				-10	6.46	0.00338	PASS
				0	10.91	0.00571	PASS
				10	5.75	0.00301	PASS
				20	11.88	0.00622	PASS
				30	2.91	0.00152	PASS
				40	4.46	0.00234	PASS
				50	10.33	0.00541	PASS
	GSM/TM2	LCH	VN	-30	20.99	0.01134	PASS
				-20	22.92	0.01239	PASS
				-10	21.83	0.0118	PASS
				0	23.63	0.01277	PASS
				10	18.5	0.01	PASS
				20	17.85	0.00965	PASS
				30	19.63	0.01061	PASS
				40	23.37	0.01263	PASS
				50	19.24	0.0104	PASS
		MCH	VN	-30	12.66	0.00673	PASS
				-20	14.04	0.00747	PASS
				-10	25.38	0.0135	PASS
				0	21.15	0.01125	PASS
				10	23.76	0.01264	PASS
				20	15.76	0.00838	PASS
				30	14.98	0.00797	PASS
				40	16.98	0.00903	PASS
				50	14.21	0.00756	PASS
		HCH	VN	-30	13.53	0.00708	PASS
				-20	8.23	0.00431	PASS
				-10	16.4	0.00859	PASS
				0	13.56	0.0071	PASS
				10	16.24	0.0085	PASS
				20	14.79	0.00774	PASS
				30	12.95	0.00678	PASS
				40	11.91	0.00624	PASS
				50	8.75	0.00458	PASS

8.2 For UMTS

8.2.1Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	TN	VL	2.5	0.00303	PASS
				VN	2.26	0.00273	PASS
				VH	1.91	0.00231	PASS
		MCH	TN	VL	0.05	0.00006	PASS
				VN	-3.19	-0.00381	PASS
				VH	-0.12	-0.00014	PASS
		HCH	TN	VL	-2.46	-0.00291	PASS
				VN	-1.83	-0.00216	PASS
				VH	-1.13	-0.00133	PASS
WCDMA1900	UMTS/TM1	LCH	TN	VL	3.97	0.00214	PASS
				VN	5.2	0.00281	PASS
				VH	2.93	0.00158	PASS
		MCH	TN	VL	-2.93	-0.00156	PASS
				VN	0.02	0.00001	PASS
				VH	-0.12	-0.00006	PASS
		HCH	TN	VL	-4.33	-0.00227	PASS
				VN	-3.51	-0.00184	PASS
				VH	-5.71	-0.00299	PASS
WCDMA1700	UMTS/TM1	LCH	TN	VL	18.37	0.01073	PASS
				VN	19.36	0.01131	PASS
				VH	21.3	0.01244	PASS
		MCH	TN	VL	0.98	0.00057	PASS
				VN	-3.14	-0.00181	PASS
				VH	3.46	0.002	PASS
		HCH	TN	VL	-17.2	-0.00981	PASS
				VN	-18.05	-0.0103	PASS
				VH	-16.59	-0.00947	PASS

8.2.2Frequency Error vs. Temperature:

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA850	UMTS/TM1	LCH	VN	-30	1.3	0.00157	PASS
				-20	2.24	0.00271	PASS
				-10	1.07	0.00129	PASS
				0	1.5	0.00182	PASS
				10	1.72	0.00208	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				20	-1.43	-0.00173	PASS
				30	1.75	0.00212	PASS
				40	0.08	0.0001	PASS
				50	3.45	0.00417	PASS
		MCH	VN	-30	-1.88	-0.00225	PASS
				-20	1.11	0.00133	PASS
				-10	-2.94	-0.00352	PASS
				0	0.66	0.00079	PASS
				10	2.14	0.00256	PASS
				20	-0.02	-0.00002	PASS
				30	-0.96	-0.00115	PASS
				40	-2.11	-0.00252	PASS
				50	-1.5	-0.00179	PASS
		HCH	VN	-30	-0.35	-0.00041	PASS
				-20	-1.31	-0.00155	PASS
				-10	-1.83	-0.00216	PASS
				0	-2.4	-0.00283	PASS
				10	-3.42	-0.00404	PASS
				20	1.11	0.00131	PASS
				30	0.08	0.0001	PASS
				40	-4.7	-0.00555	PASS
				50	-4.23	-0.005	PASS
WCDMA1900	UMTS/TM1	LCH	VN	-30	3.36	0.00181	PASS
				-20	1.48	0.0008	PASS
				-10	2.5	0.00135	PASS
				0	8.54	0.00461	PASS
				10	5.48	0.00296	PASS
				20	7.46	0.00403	PASS
				30	4.29	0.00232	PASS
				40	6.35	0.00343	PASS
				50	3.62	0.00195	PASS
		MCH	VN	-30	-0.64	-0.00034	PASS
				-20	0.17	0.00009	PASS
				-10	-3.08	-0.00164	PASS
				0	-2.66	-0.00141	PASS
				10	0.46	0.00024	PASS
				20	-0.96	-0.00051	PASS
				30	-2.43	-0.00129	PASS
				40	-1.51	-0.0008	PASS
				50	-1.34	-0.00071	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	VN	-30	-4.27	-0.00224	PASS
				-20	-5.71	-0.00299	PASS
				-10	-5.63	-0.00295	PASS
				0	-4.99	-0.00262	PASS
				10	-3.97	-0.00208	PASS
				20	-5.6	-0.00294	PASS
				30	-4.3	-0.00225	PASS
				40	-4.79	-0.00251	PASS
				50	-4.64	-0.00243	PASS
WCDMA1700	UMTS/TM1	LCH	VN	-30	20.31	0.01186	PASS
				-20	17.9	0.01045	PASS
				-10	18.83	0.011	PASS
				0	17.49	0.01021	PASS
				10	18.52	0.01082	PASS
				20	15.88	0.00927	PASS
				30	19.88	0.01161	PASS
				40	19.27	0.01125	PASS
				50	16.36	0.00955	PASS
		MCH	VN	-30	-2.3	-0.00133	PASS
				-20	-1.94	-0.00112	PASS
				-10	-0.49	-0.00028	PASS
				0	0.08	0.00005	PASS
				10	0.89	0.00051	PASS
				20	-2.2	-0.00127	PASS
				30	-0.41	-0.00024	PASS
				40	-0.69	-0.0004	PASS
				50	1.04	0.0006	PASS
		HCH	VN	-30	-15.21	-0.00868	PASS
				-20	-15.72	-0.00897	PASS
				-10	-15.69	-0.00895	PASS
				0	-17.3	-0.00987	PASS
				10	-19.26	-0.01099	PASS
				20	-20.11	-0.01147	PASS
				30	-19.36	-0.01105	PASS
				40	-19.82	-0.01131	PASS
				50	-17.97	-0.01025	PASS

END