



Appendix for test report

1Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dBm]	ERP/EIRP [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	32.92	28.57	38.5	PASS
		MCH	33.09	28.74	38.5	PASS
		HCH	33.16	28.81	38.5	PASS
	GSM/TM2	LCH	26.46	22.11	38.5	PASS
		MCH	26.47	22.12	38.5	PASS
		HCH	26.47	22.12	38.5	PASS
GSM1900	GSM/TM1	LCH	29.66	29.76	33	PASS
		MCH	29.56	29.66	33	PASS
		HCH	29.53	29.63	33	PASS
	GSM/TM2	LCH	25.46	25.56	33	PASS
		MCH	25.46	25.56	33	PASS
		HCH	25.44	25.54	33	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,

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

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

b, SGP=Signal Generator Level

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	0.16	13	PASS
		MCH	0.17	13	PASS
		HCH	0.18	13	PASS
	GSM/TM2	LCH	3.14	13	PASS
		MCH	3.2	13	PASS
		HCH	3.19	13	PASS

3Appendix_C: Modulation Characteristics

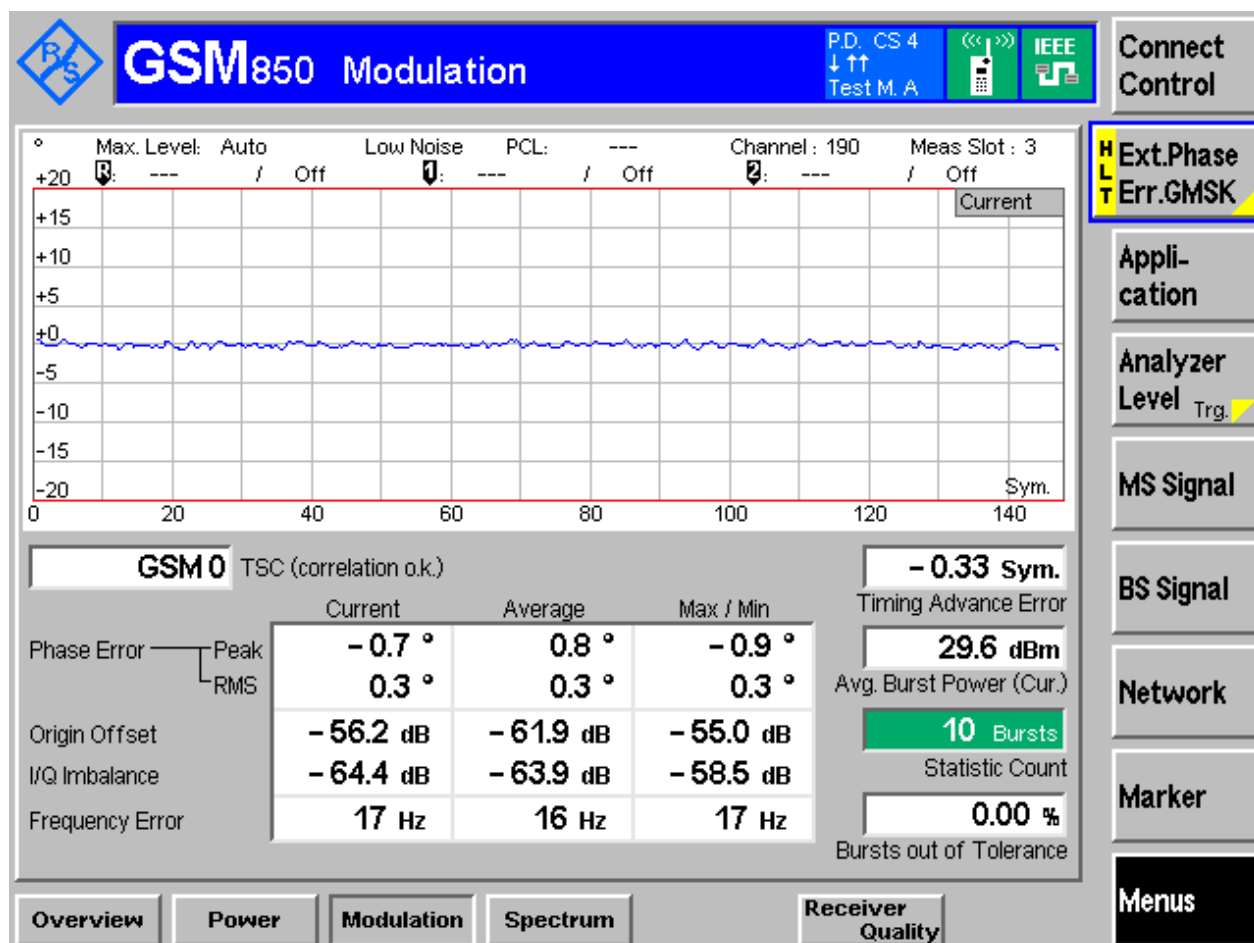
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

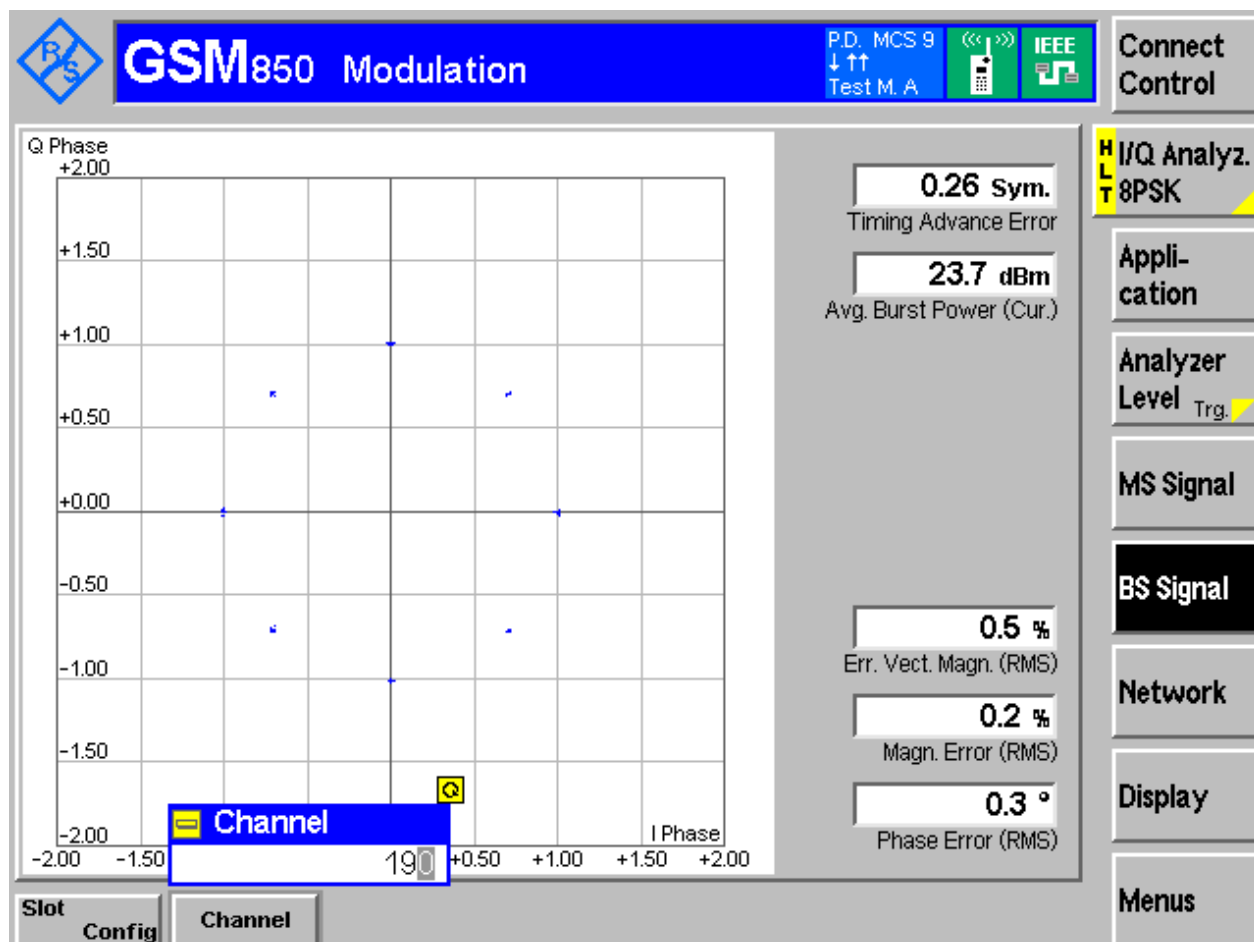
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

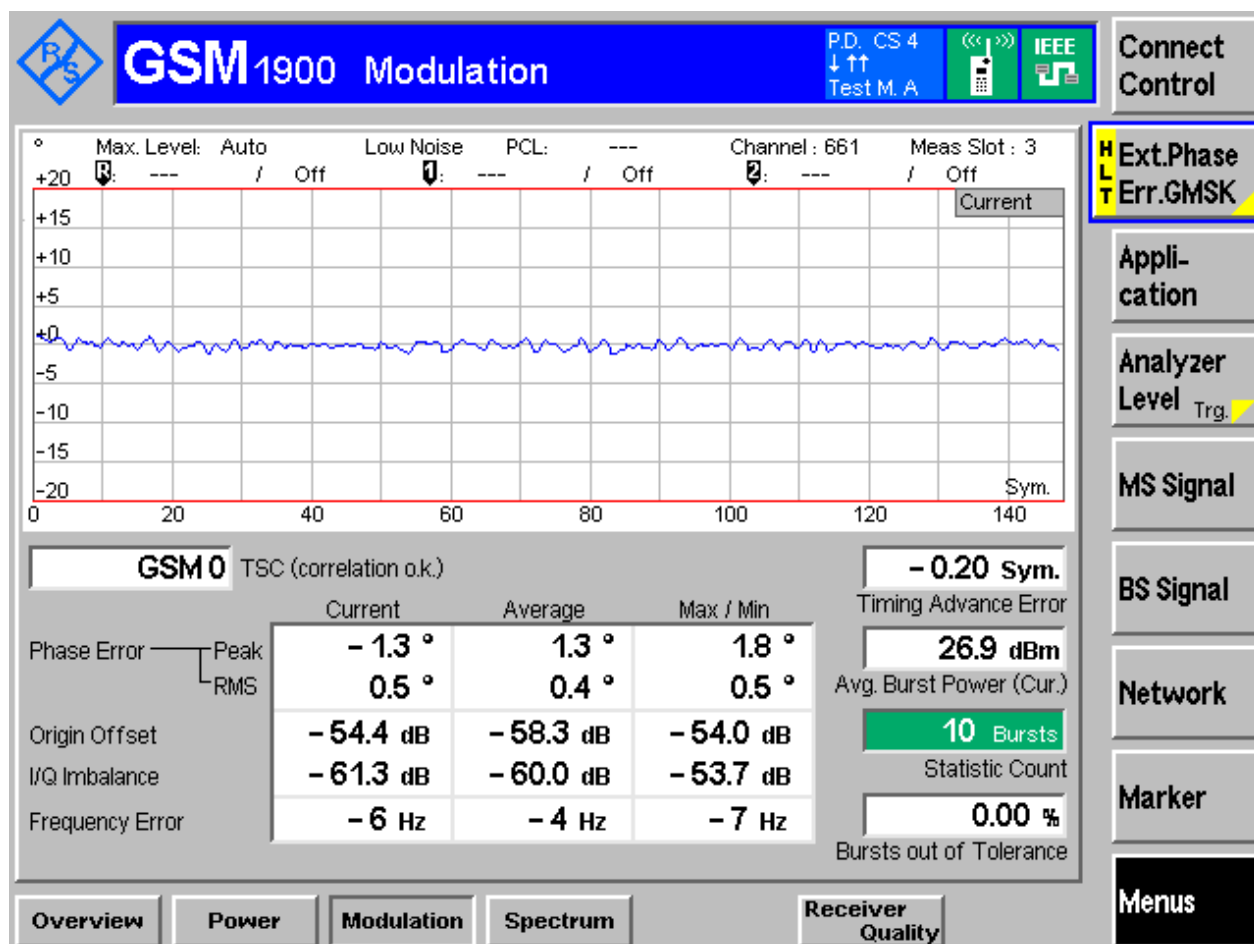
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

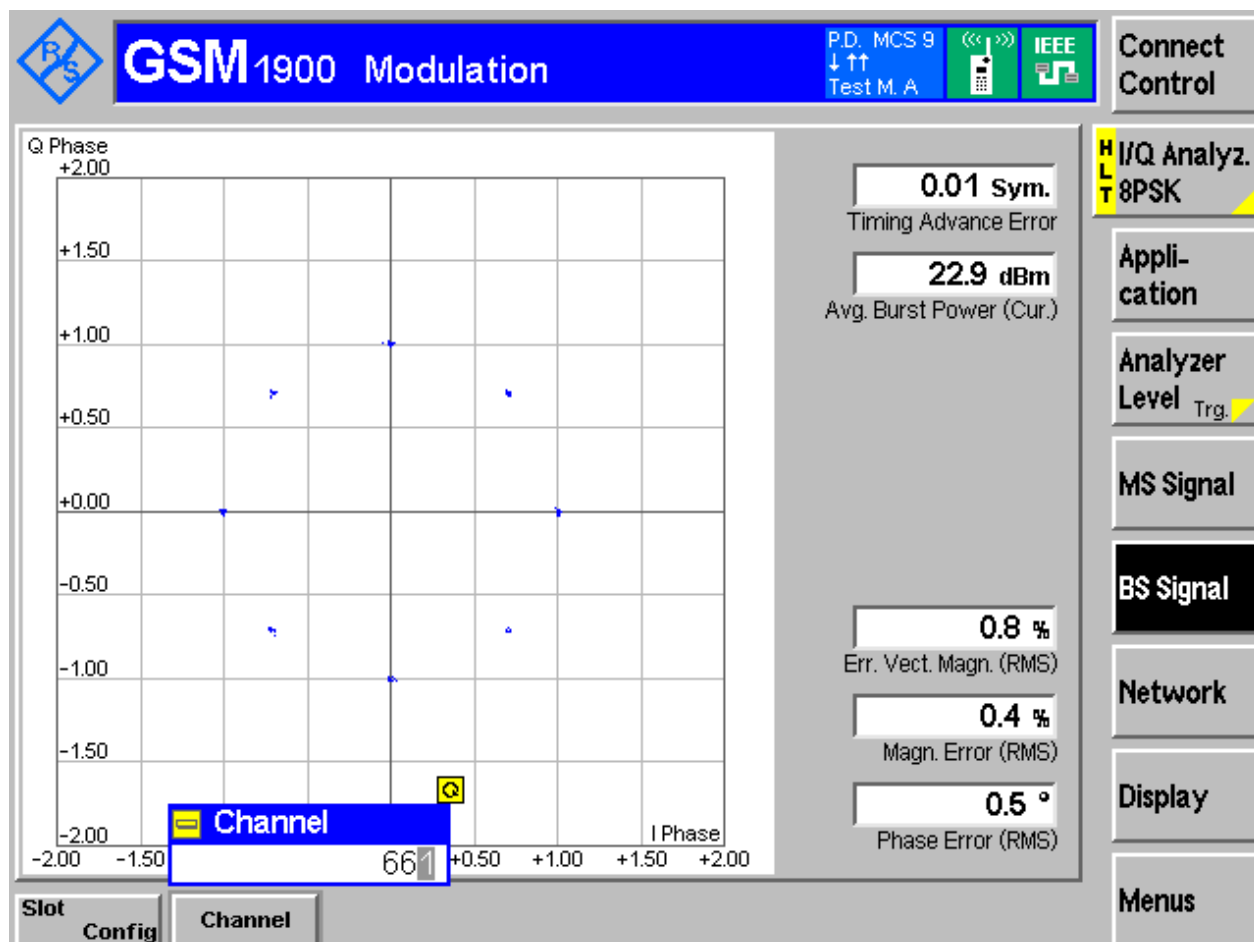
3.1.2.1 Test Mode = GSM/TM1

3.1.2.1.1 Test Channel = MCH



3.1.2.2 Test Mode = GSM/TM2

3.1.2.2.1 Test Channel = MCH



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
GSM850	GSM/TM1	LCH	243.92	309.77	Pass
		MCH	245.56	319.46	Pass
		HCH	244.41	318.99	Pass
	GSM/TM2	LCH	242.86	305.41	Pass
		MCH	246.52	312.45	Pass
		HCH	248.04	312.74	Pass
GSM1900	GSM/TM1	LCH	245.04	320.86	Pass
		MCH	245.32	319.99	Pass
		HCH	245.32	320.33	Pass
	GSM/TM2	LCH	243.65	314.33	Pass
		MCH	242.02	304.64	Pass
		HCH	244.80	318.79	Pass

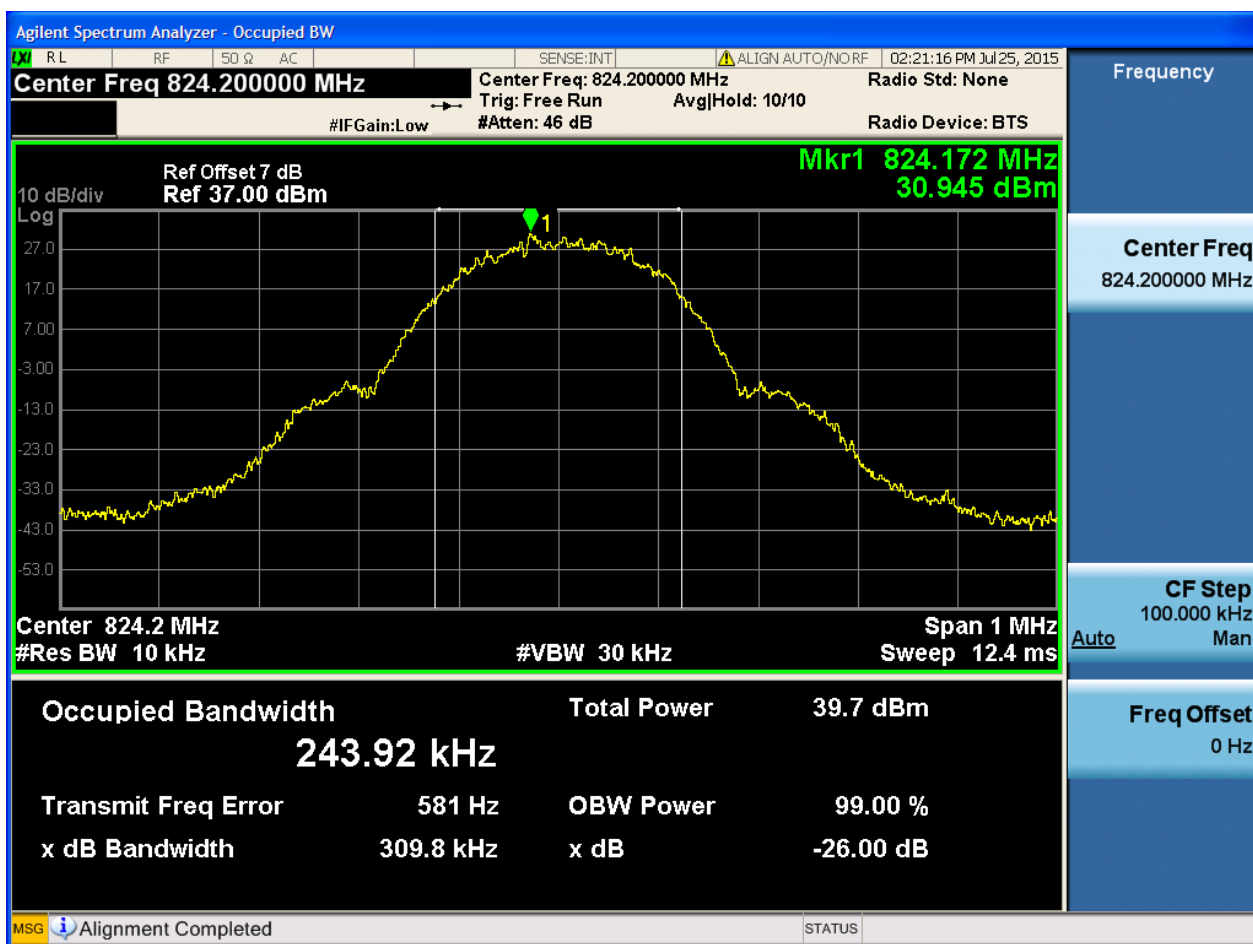
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

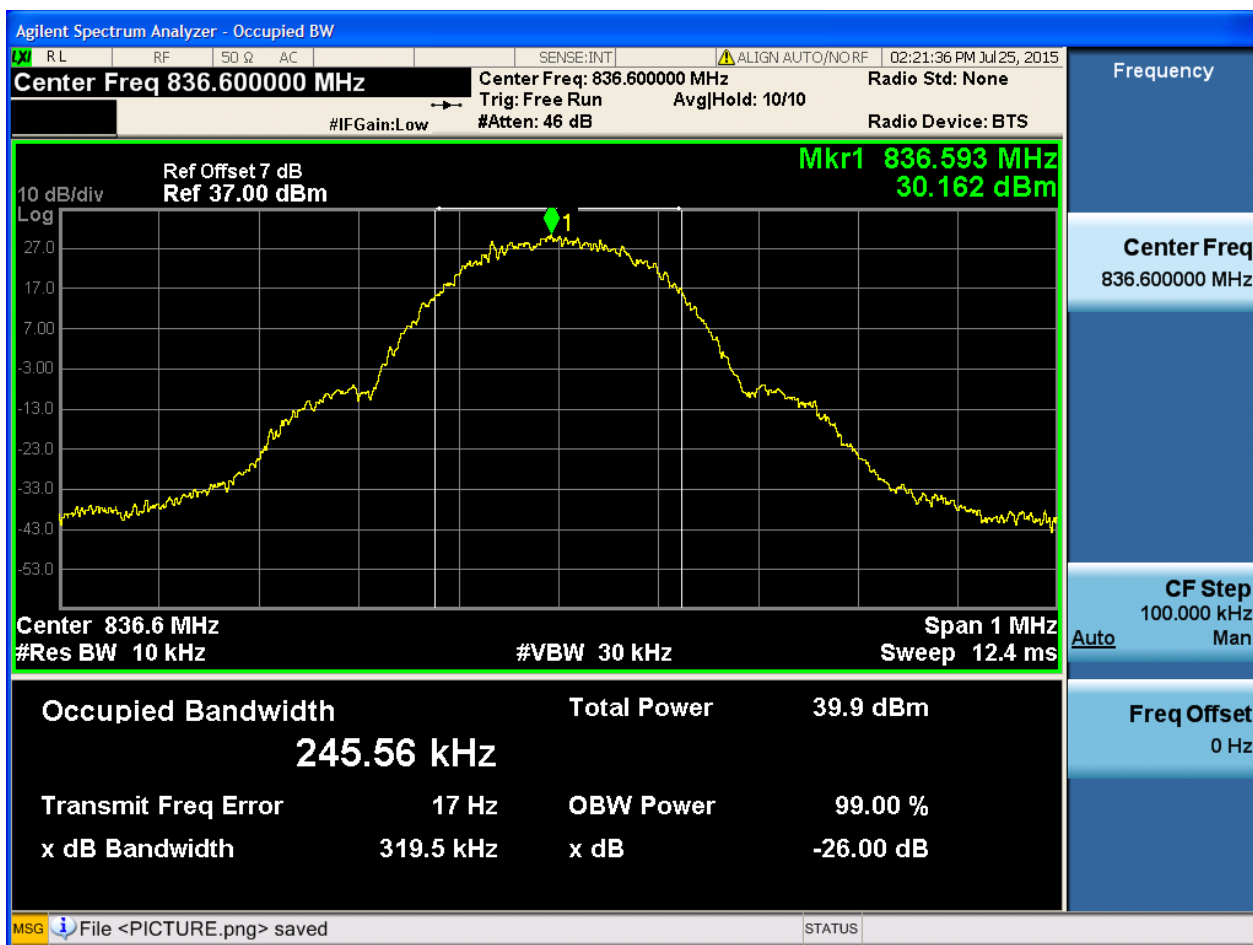
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



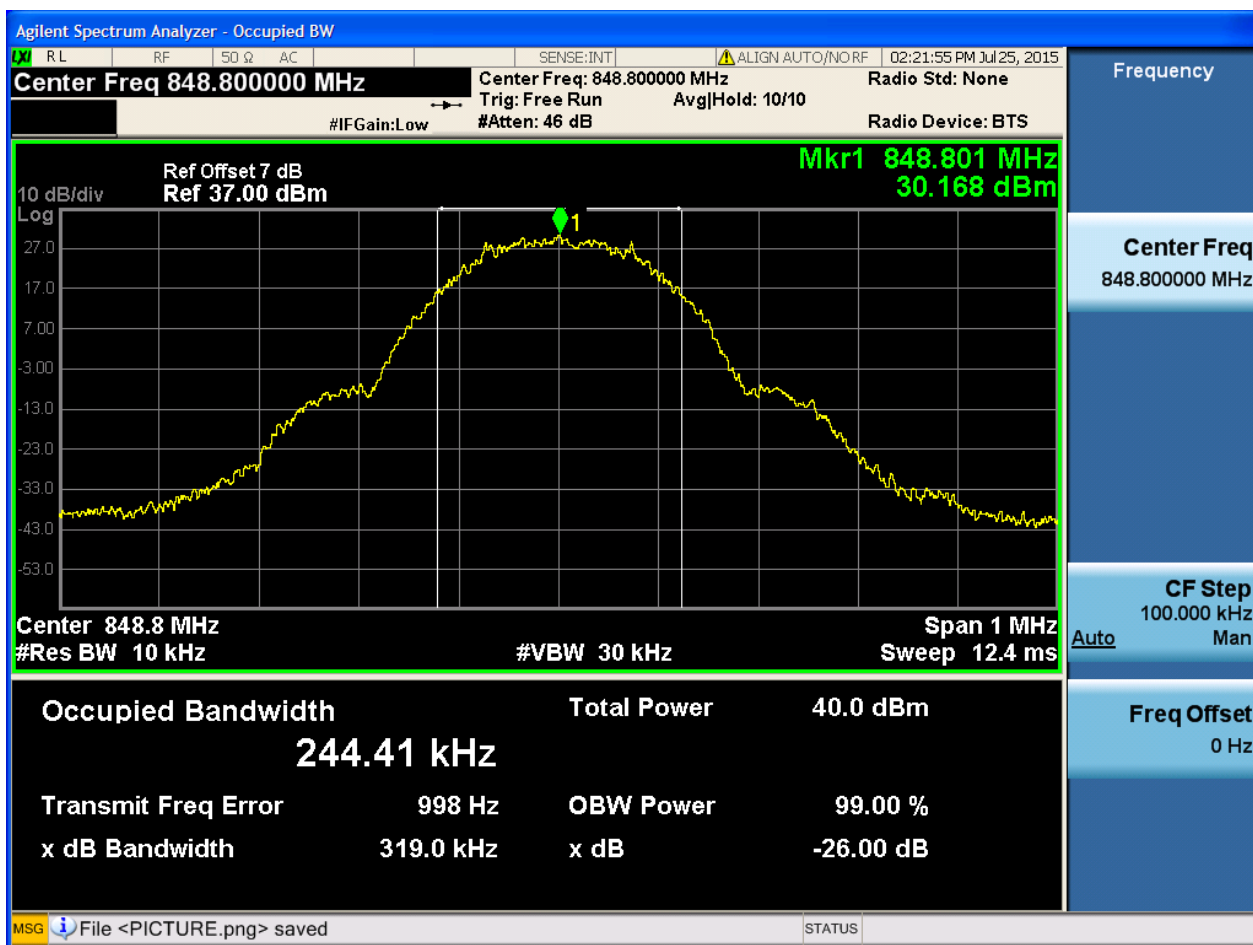


4.1.2.1.2 Test Channel = MCH





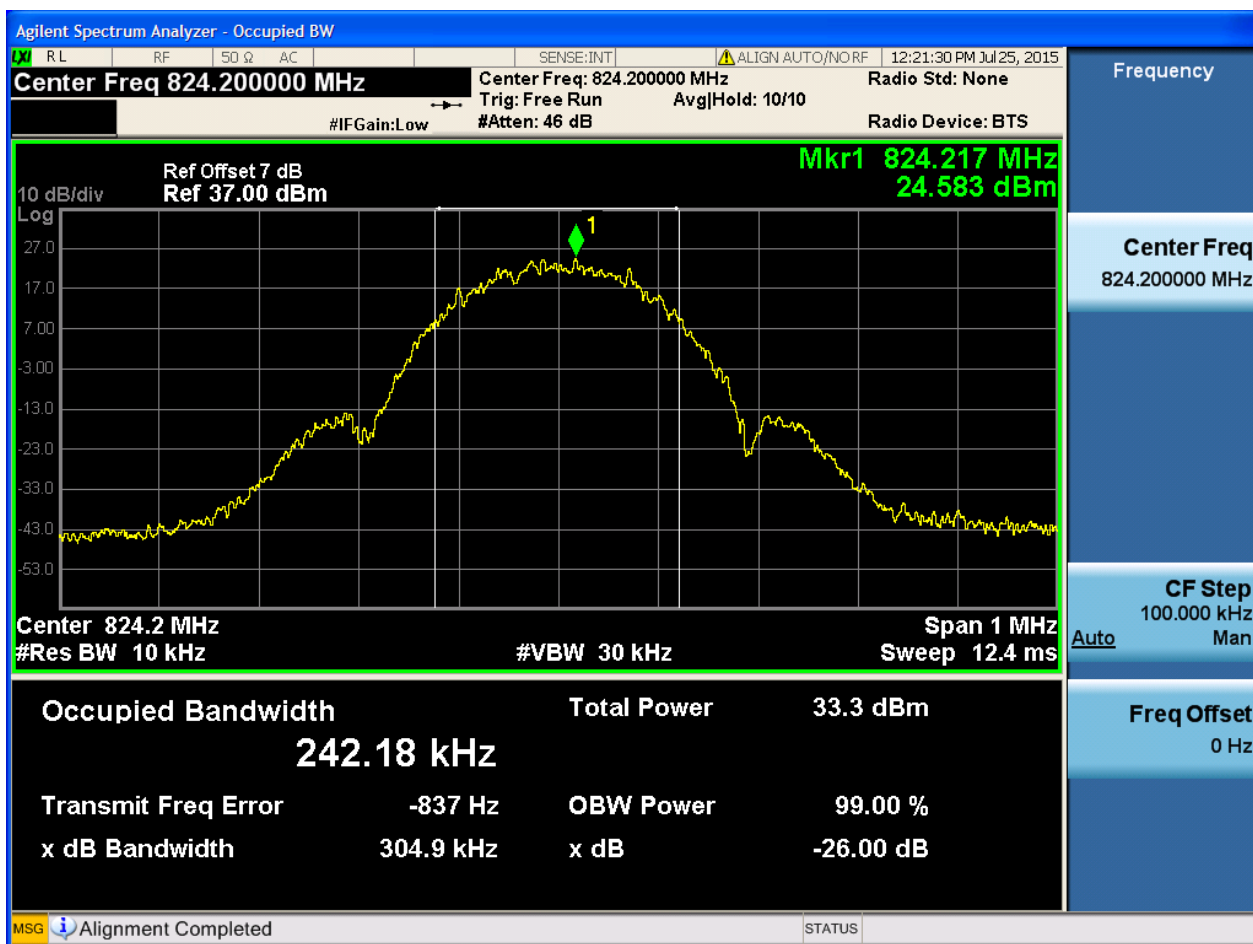
4.1.2.1.3 Test Channel = HCH





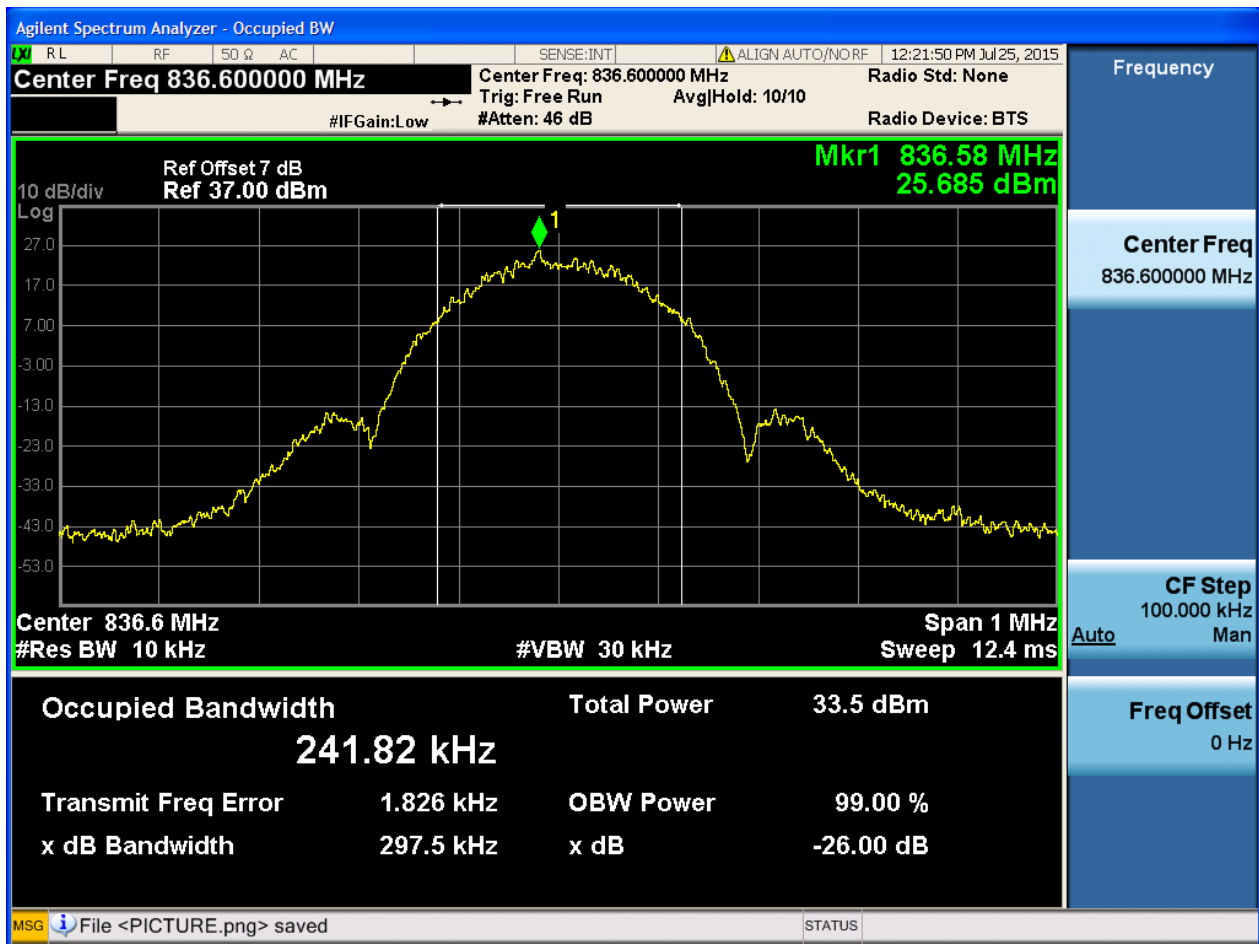
4.1.2.2 Test Mode = GSM/TM2

4.1.2.3.1 Test Channel = LCH



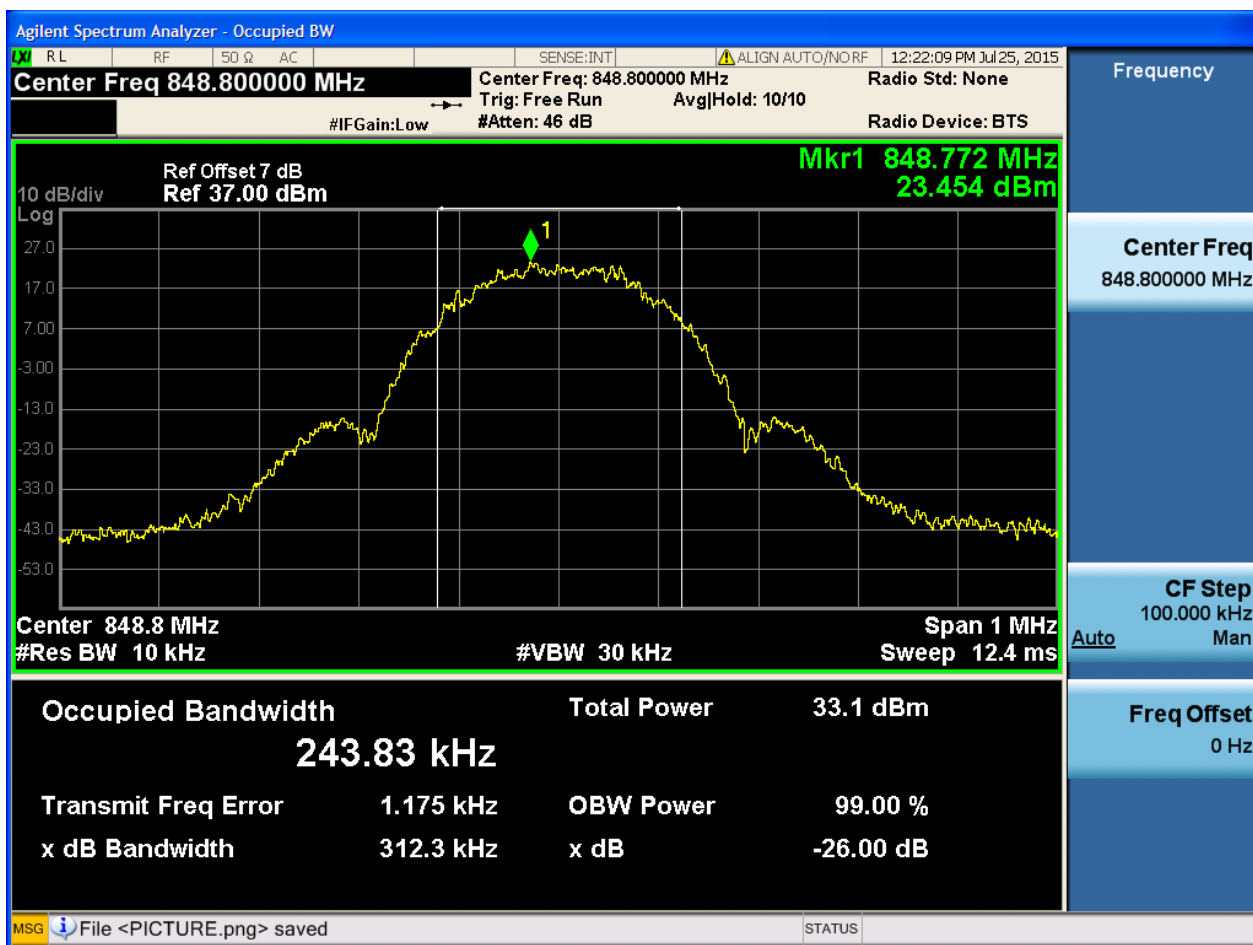


4.1.2.3.2 Test Channel = MCH





4.1.2.3.3 Test Channel = HCH

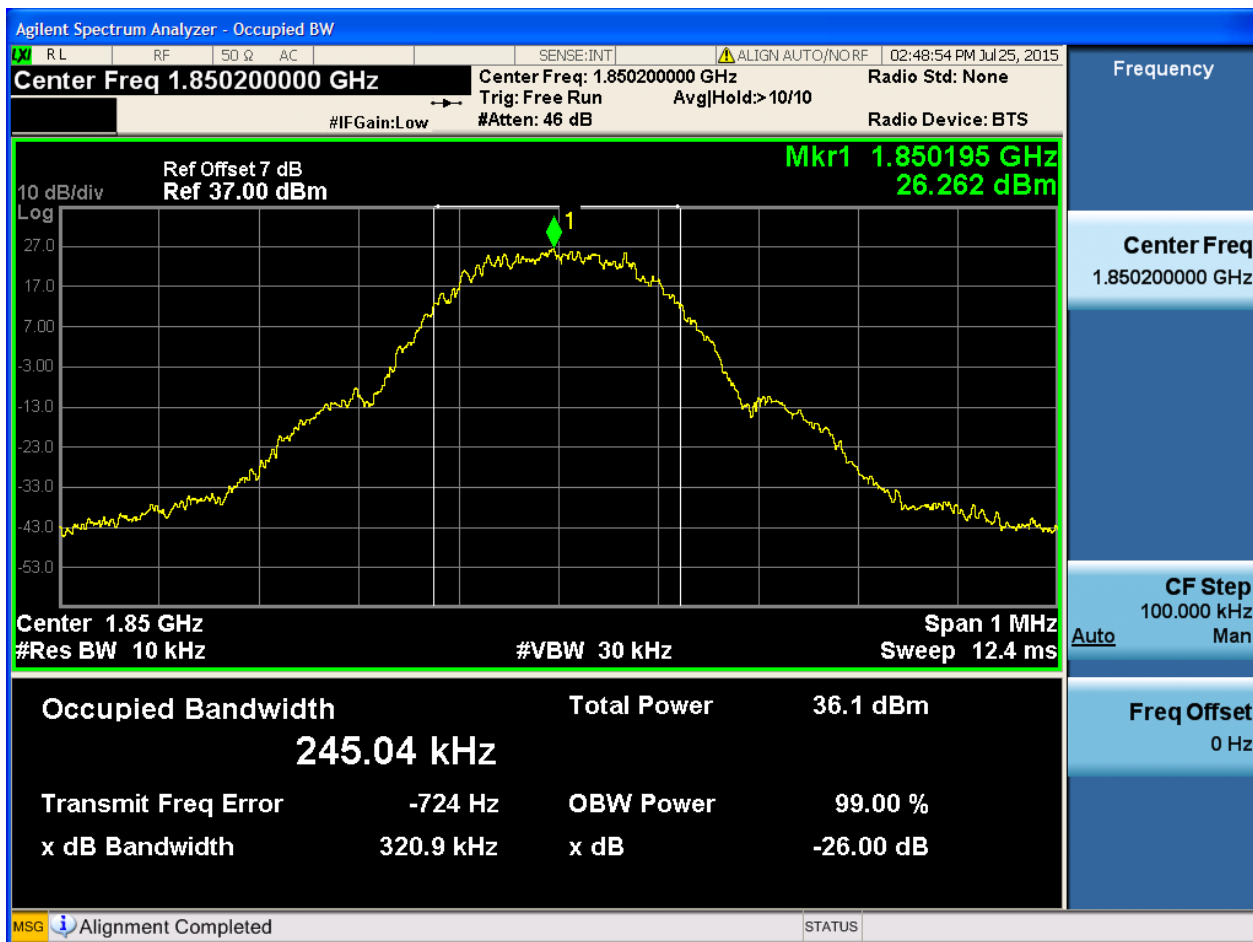




4.1.5 Test Band = GSM1900

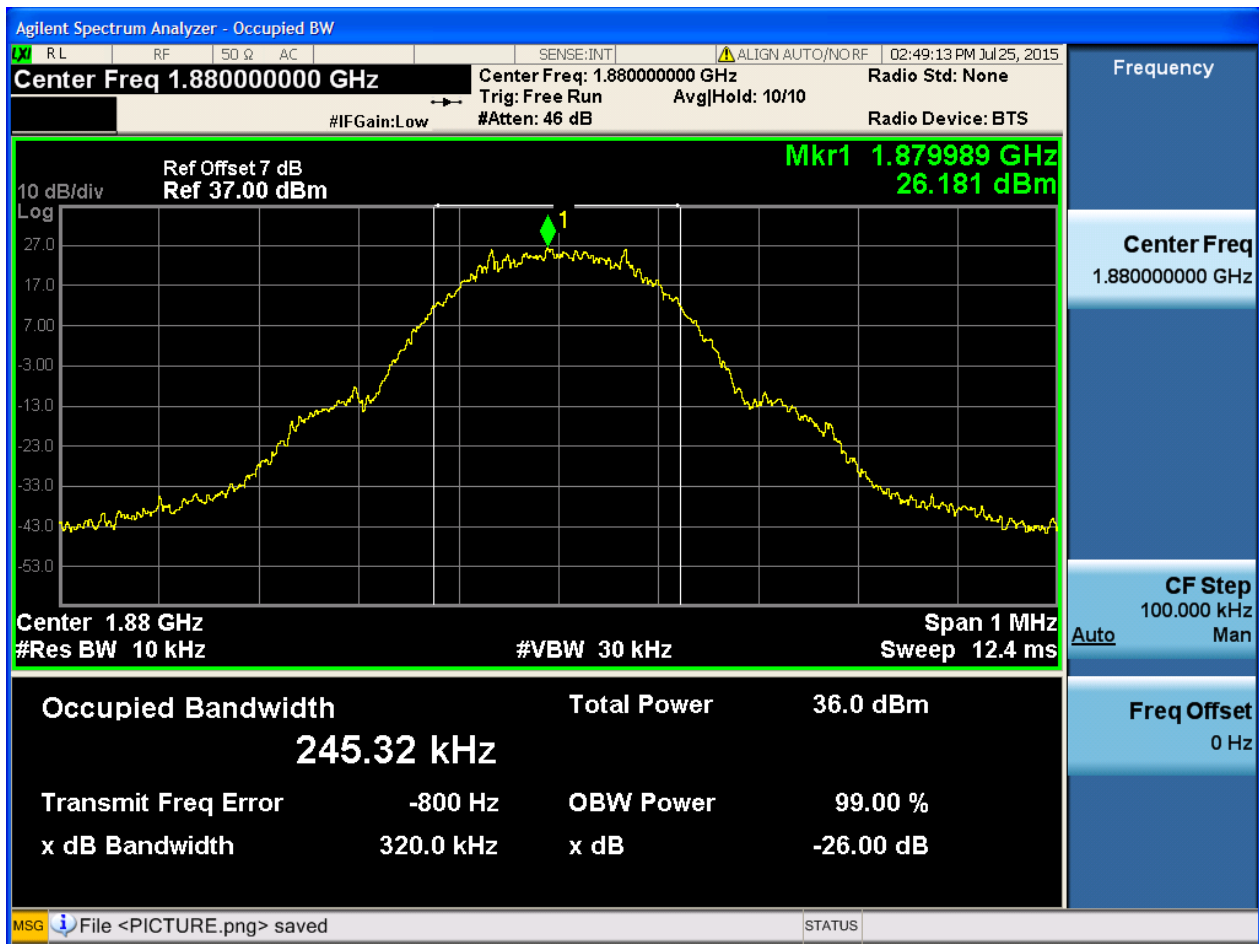
4.1.5.1 Test Mode = GSM/TM1

4.1.5.1.1 Test Channel = LCH



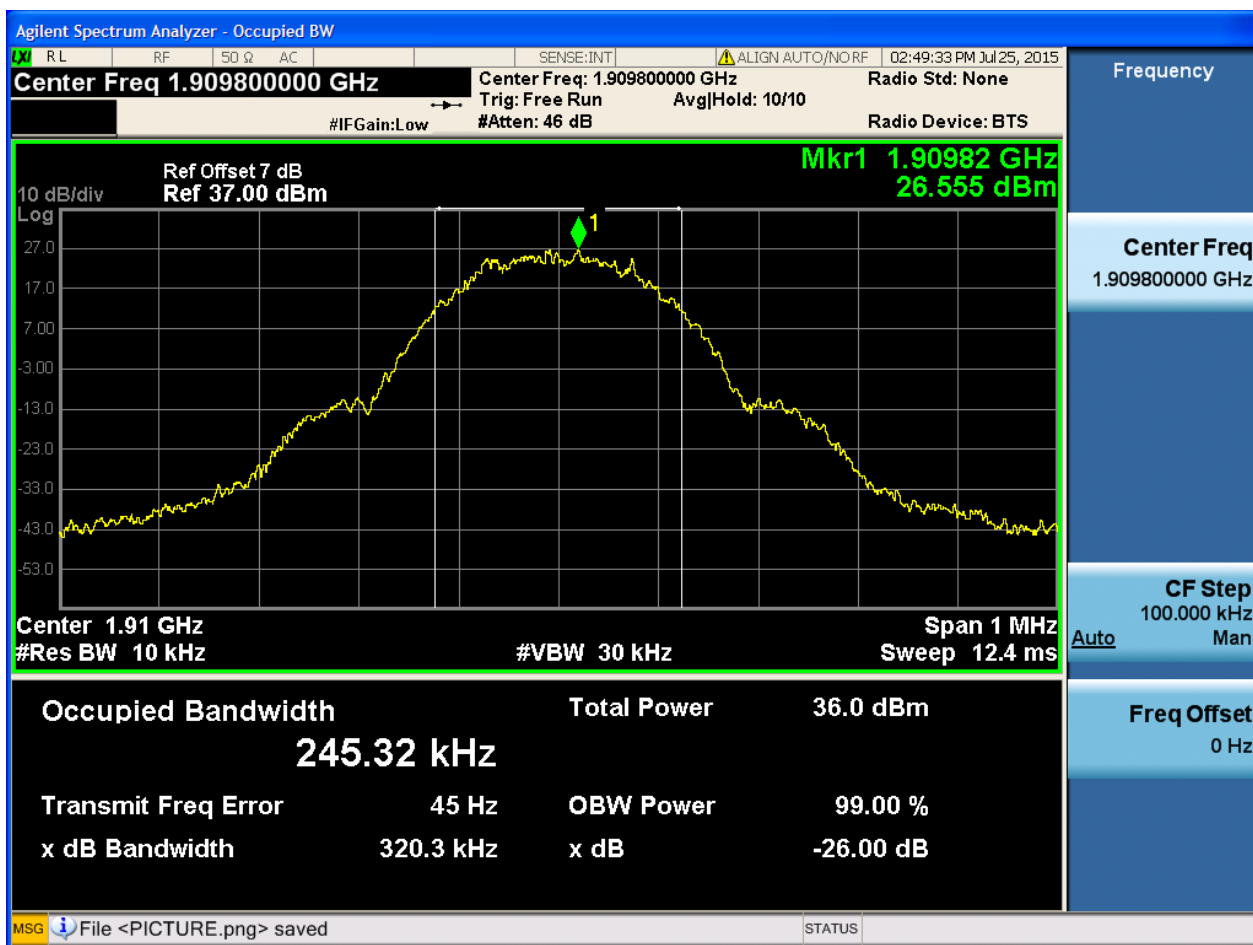


4.1.5.1.2 Test Channel = MCH





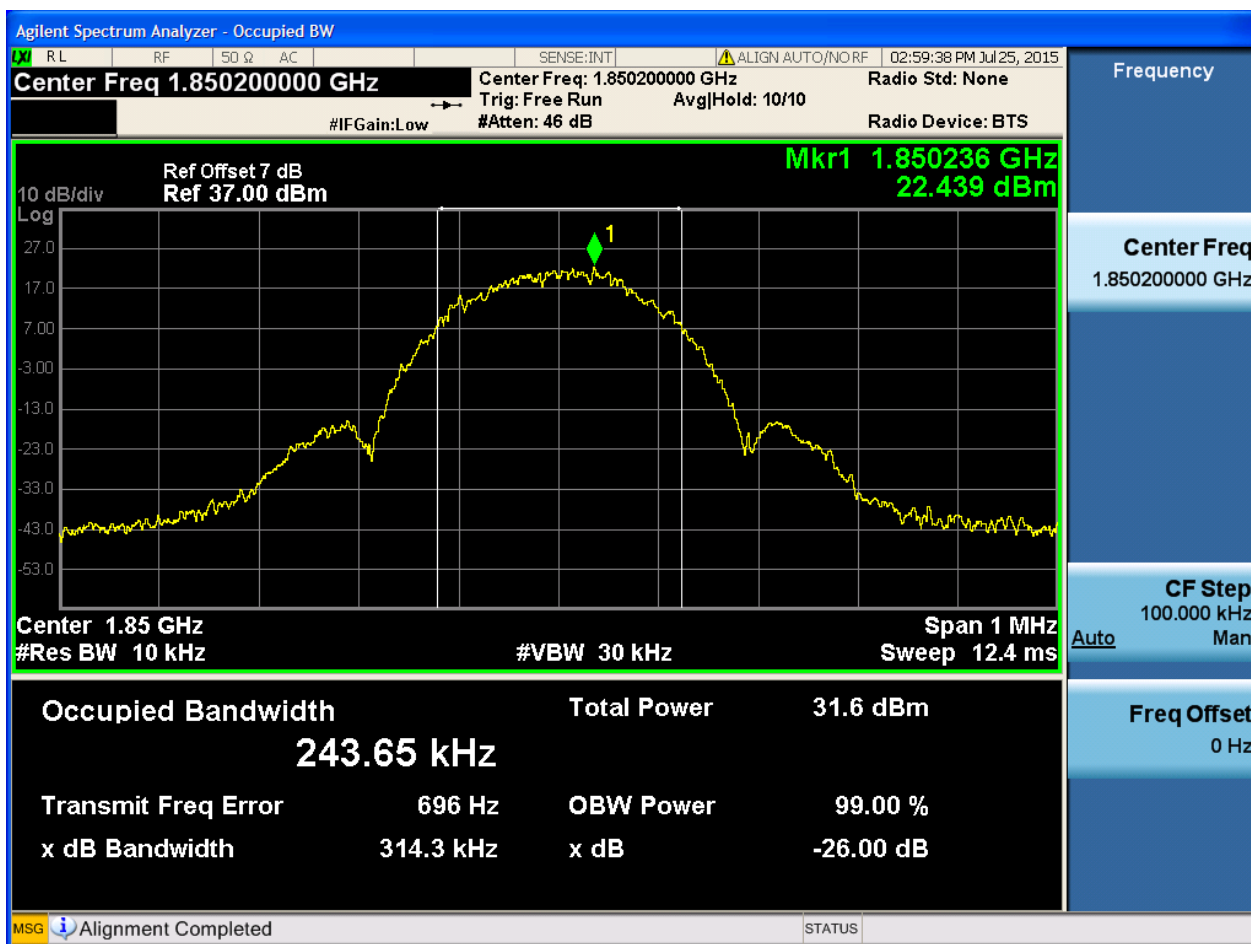
4.1.5.1.3 Test Channel = HCH





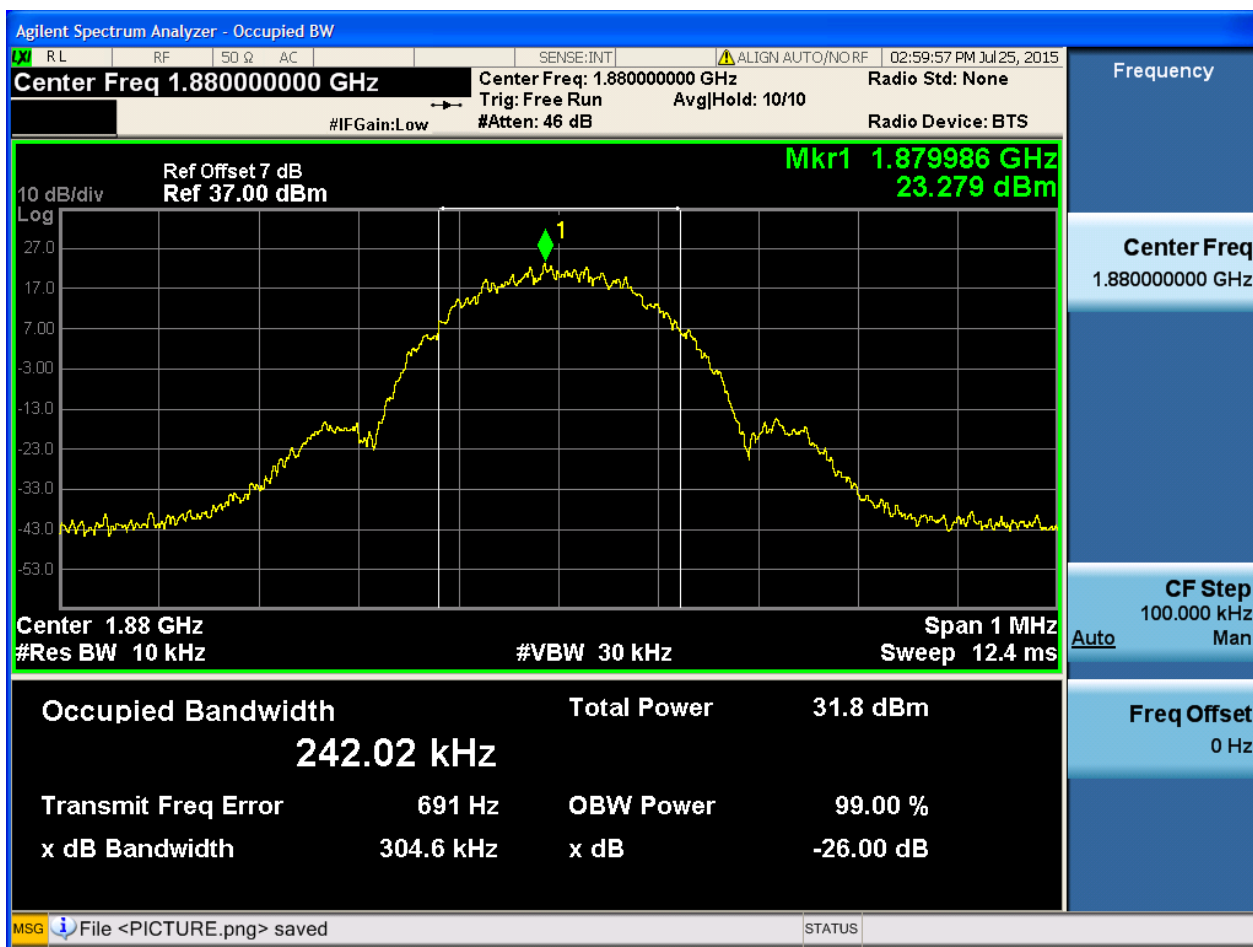
4.1.5.2 Test Mode = GSM/TM2

4.1.5.2.1 Test Channel = LCH



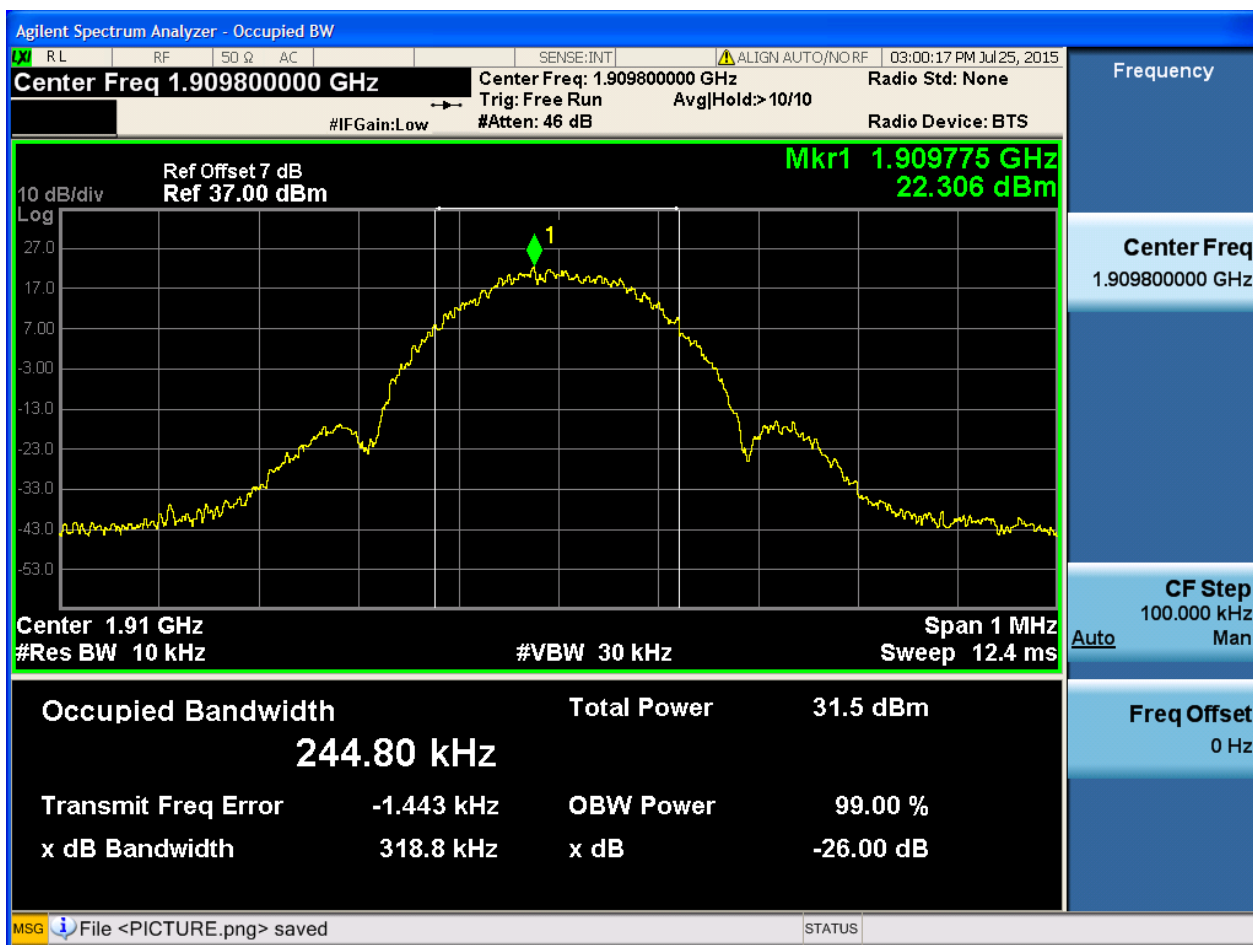


4.1.5.2.2 Test Channel = MCH





4.1.5.2.3 Test Channel = HCH

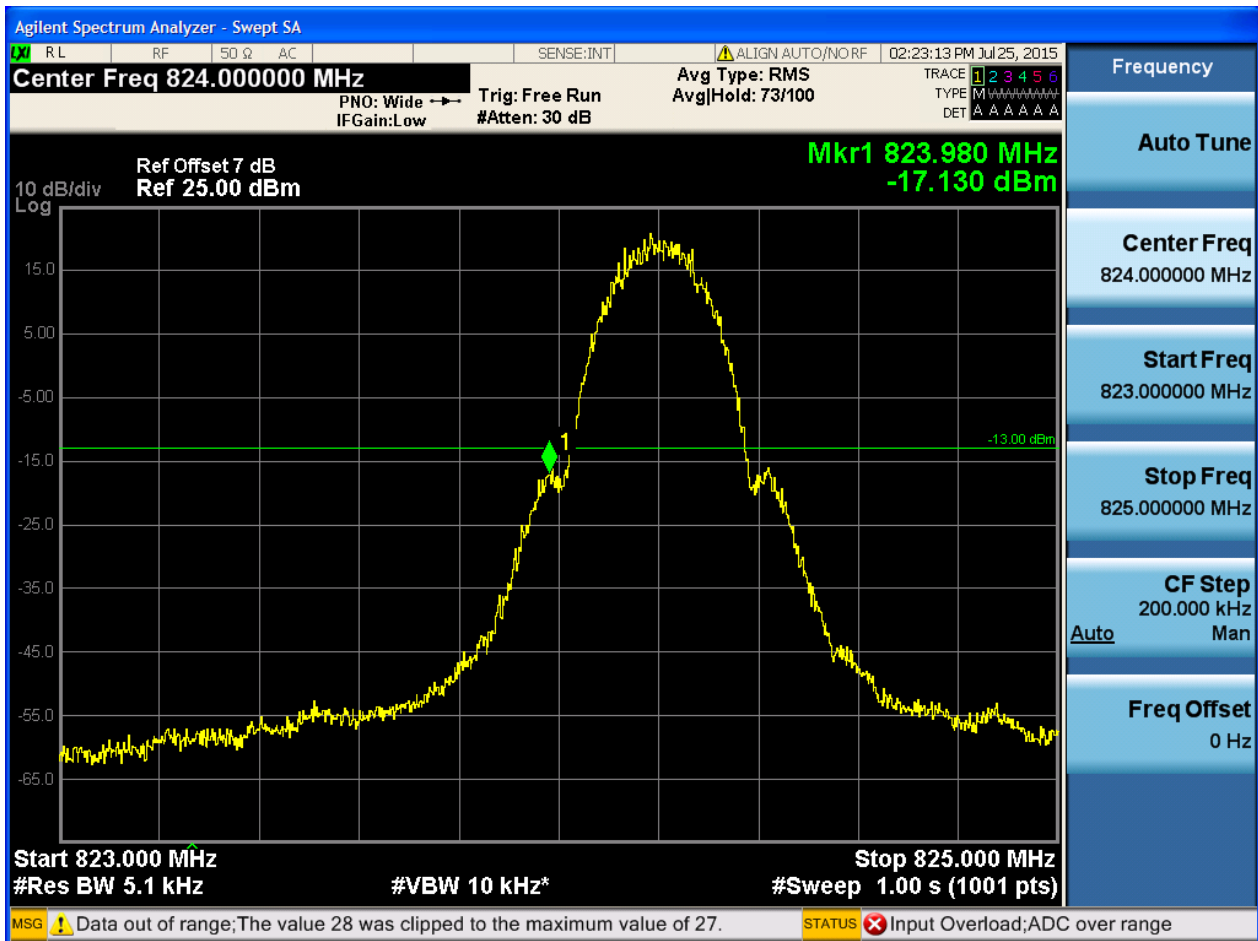




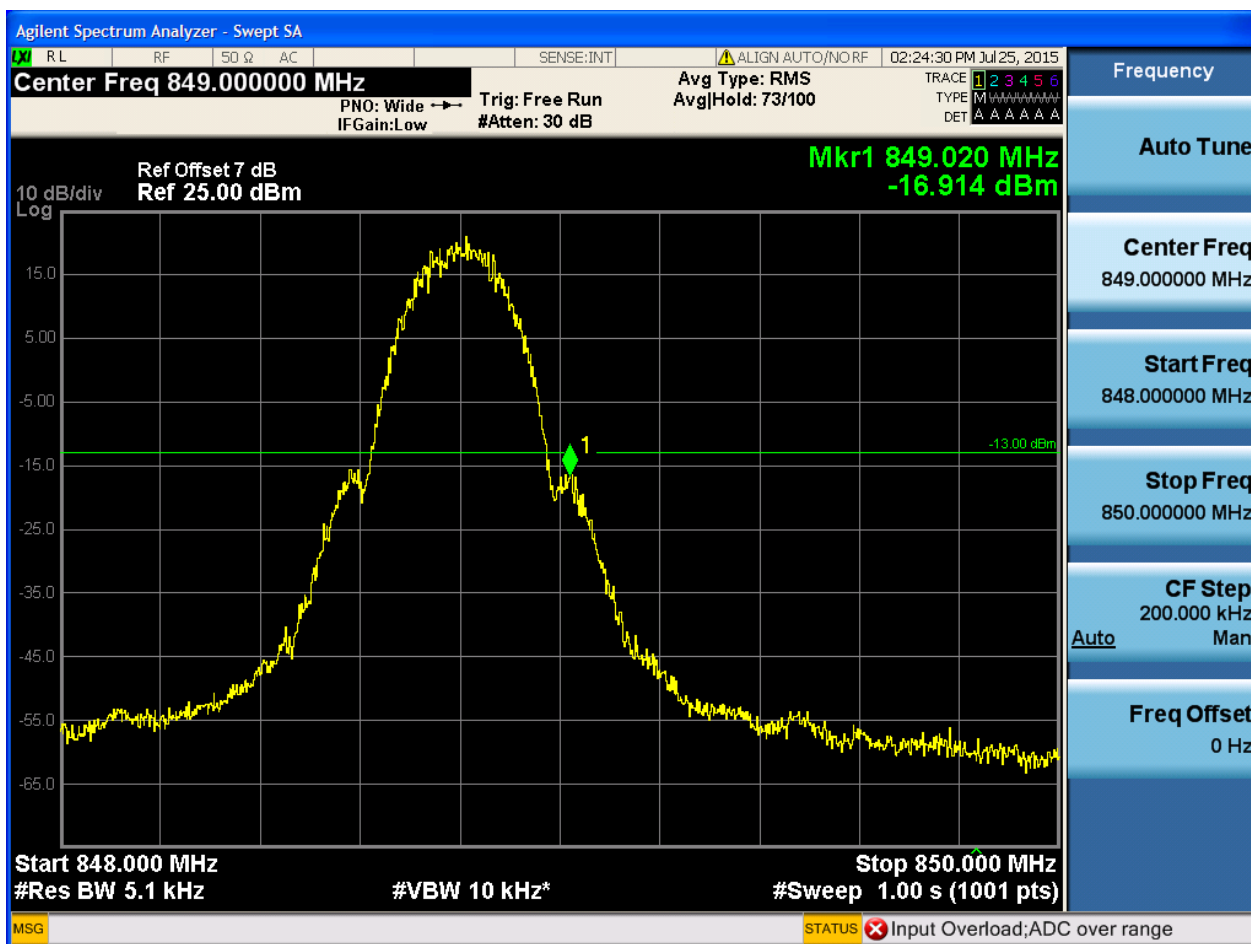
Part I - Test Plots

5.1.2 Test Band = GSM850

5.1.2.1.1 Test Channel = LCH

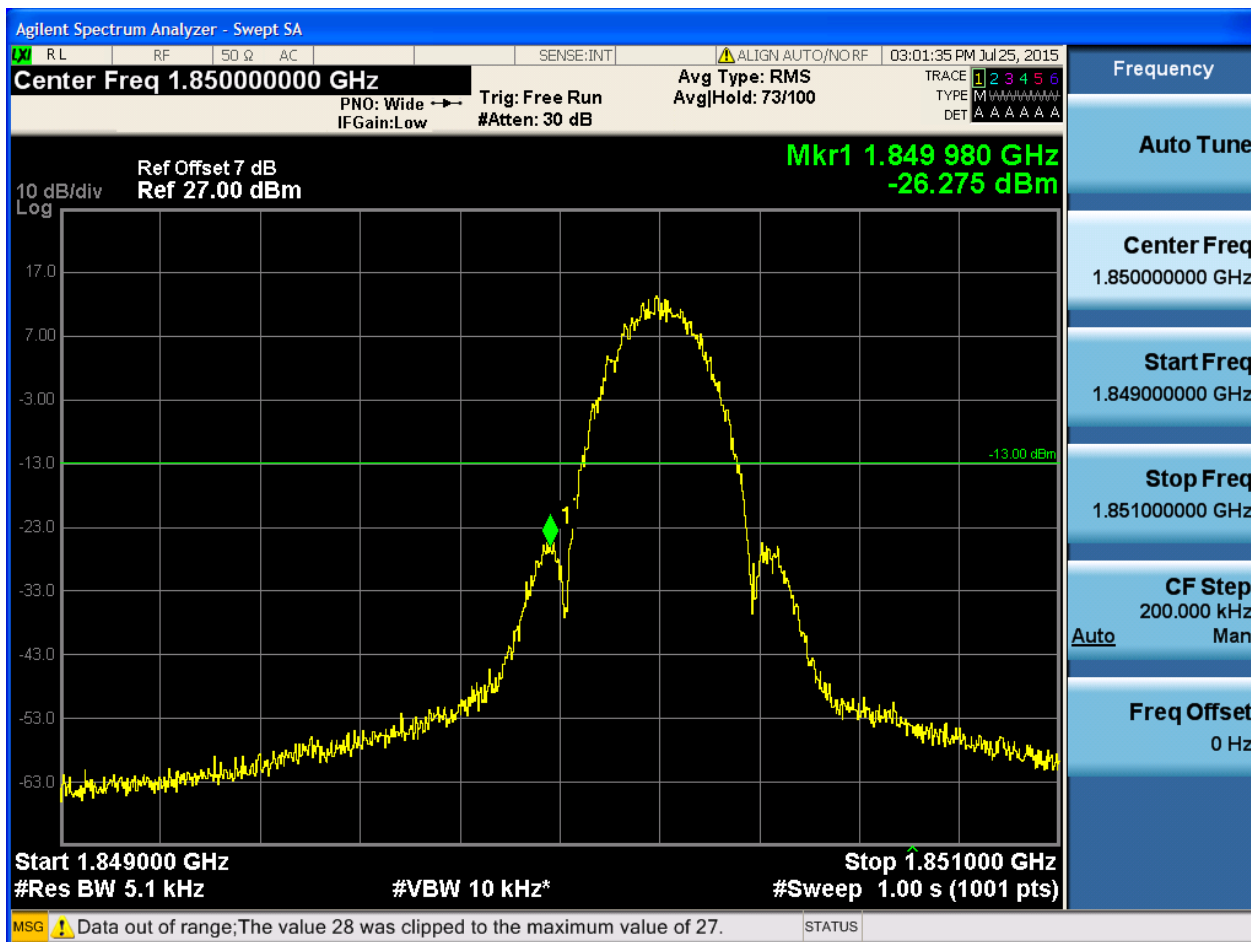


5.1.2.1.2 Test Channel = HCH



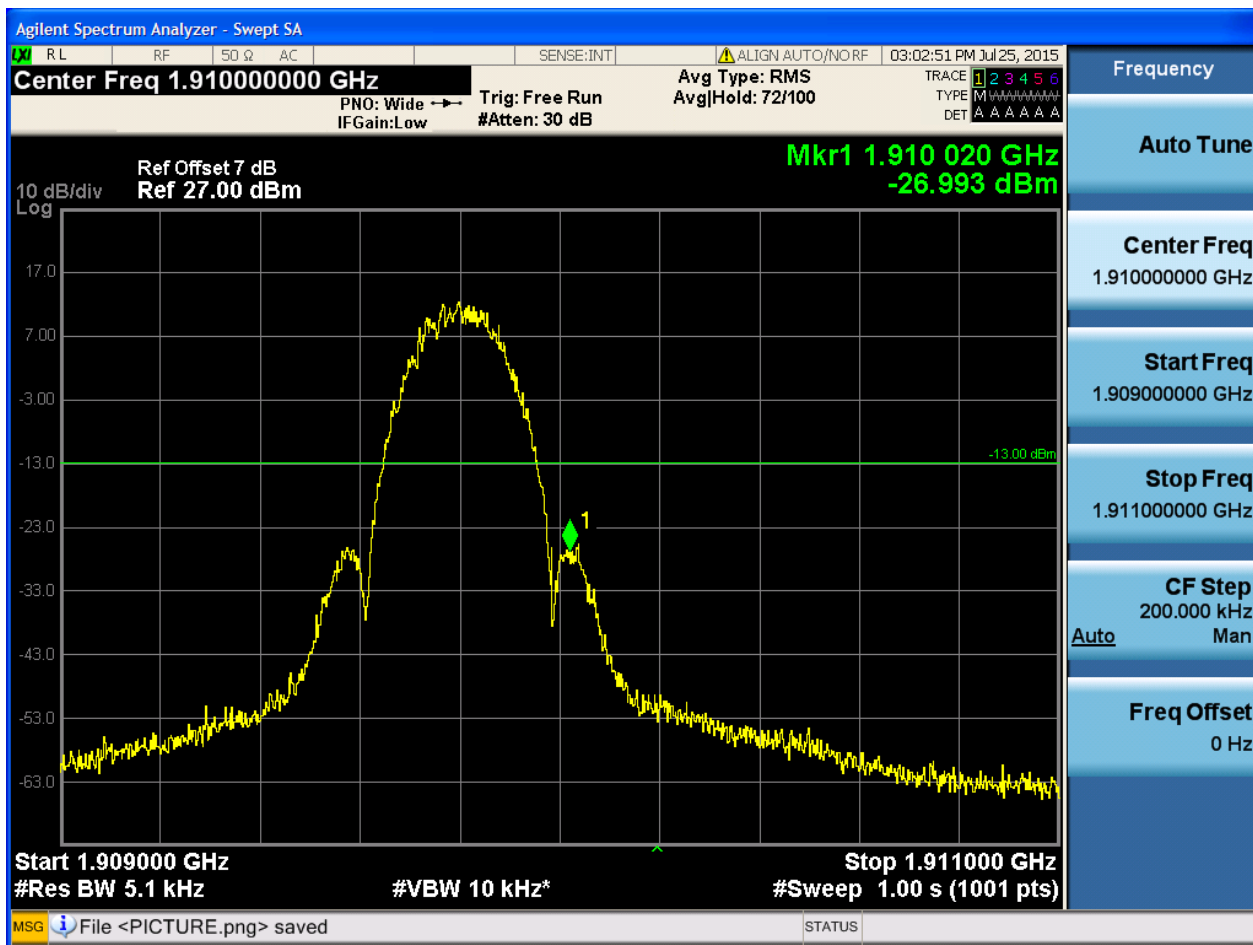
5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH





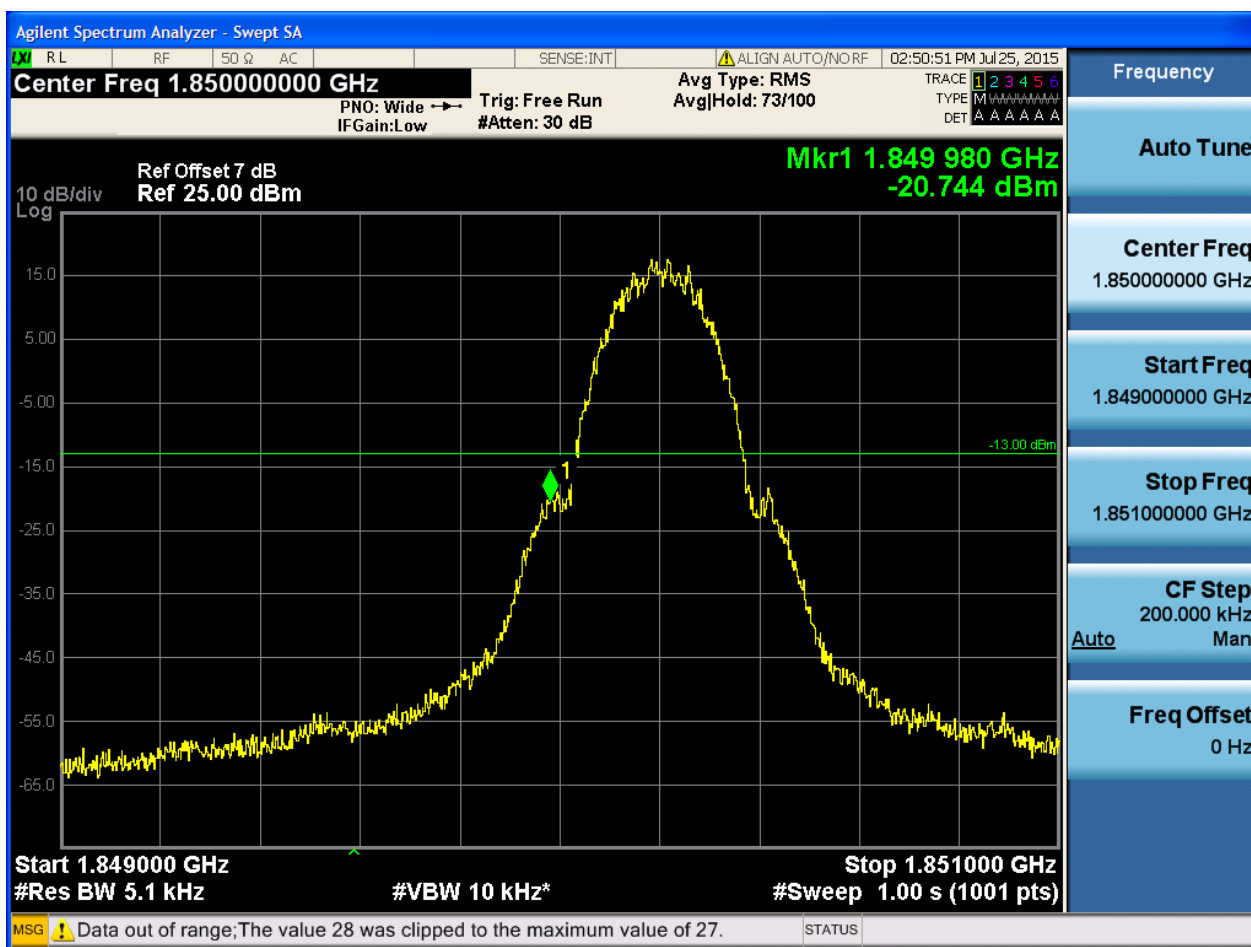
5.1.2.2.2 Test Channel = HCH



5.1.3 Test Band = GSM1900

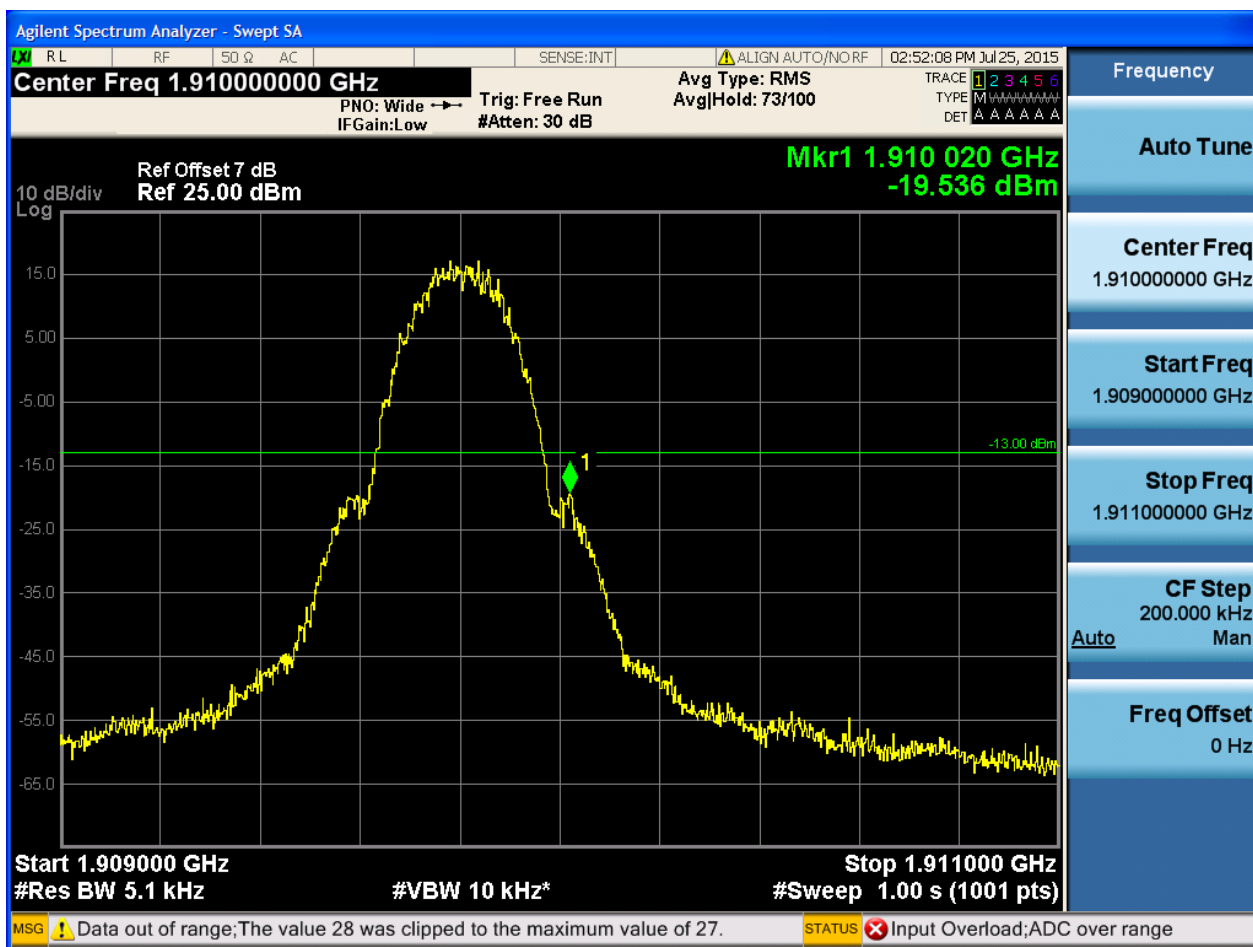
5.1.3.1 Test Mode = GSM/TM1

5.1.3.1.1 Test Channel = LCH



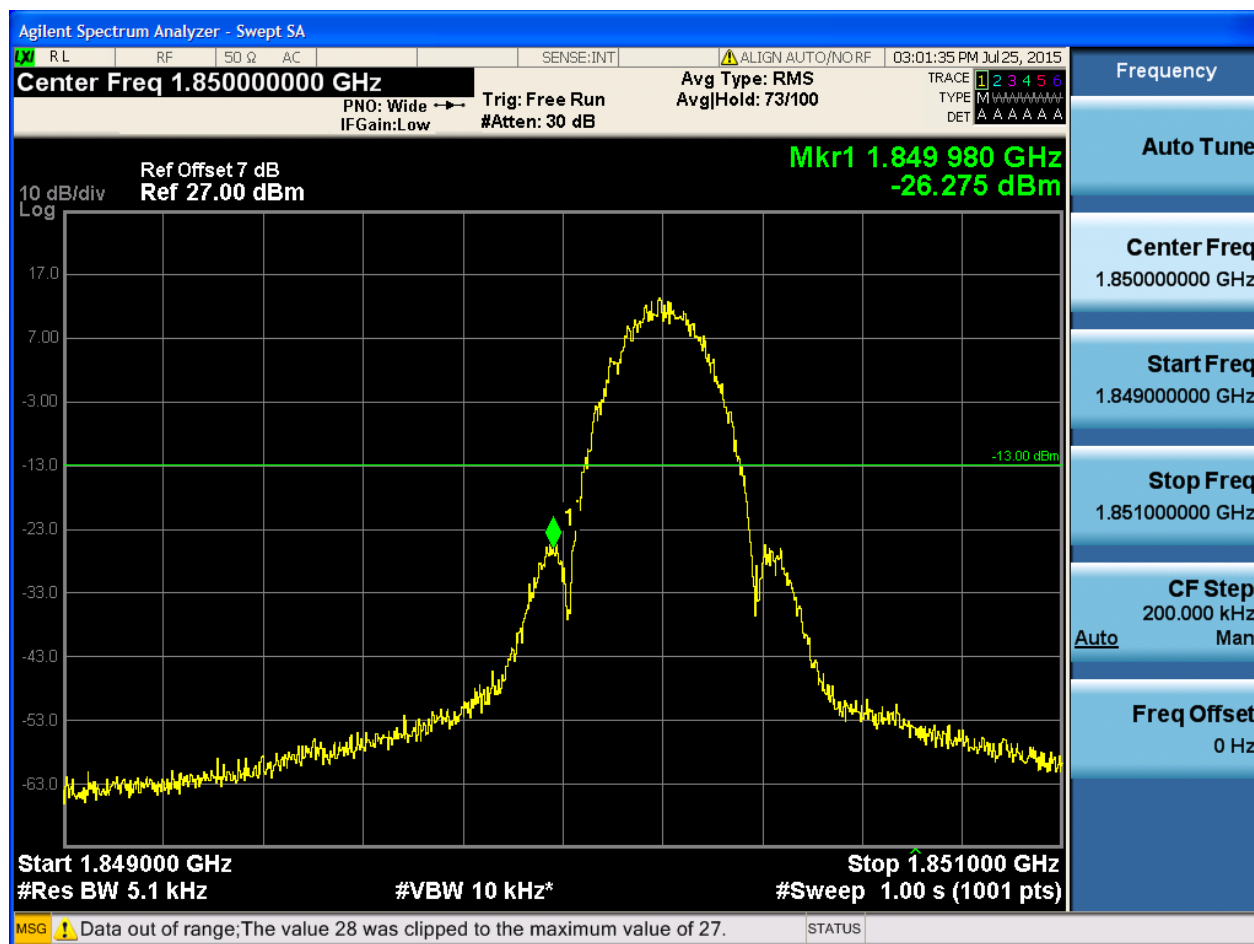


5.1.3.1.2 Test Channel = HCH

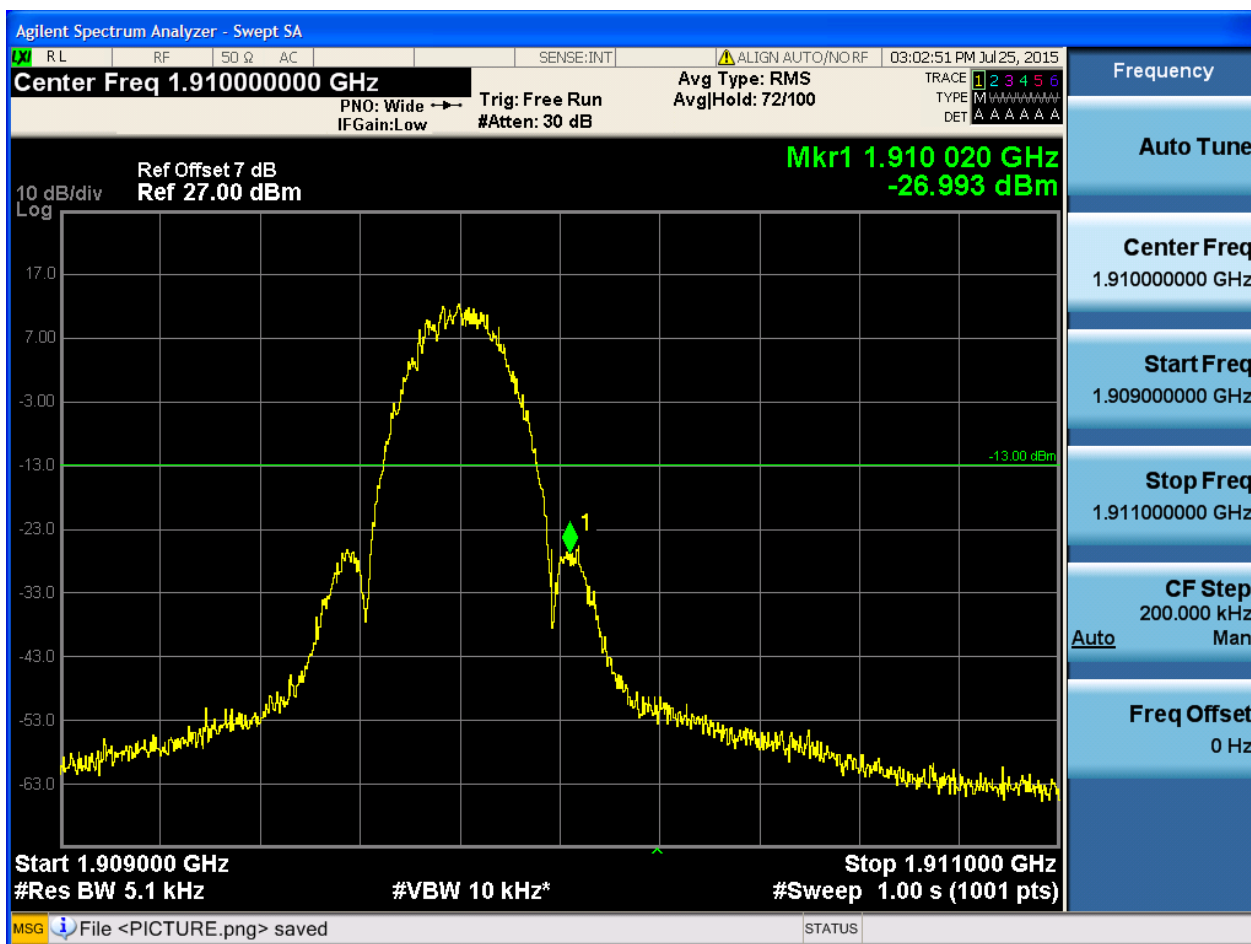


5.1.3.2 Test Mode = GSM/TM2

5.1.3.2.1 Test Channel = LCH



5.1.3.2.2 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.

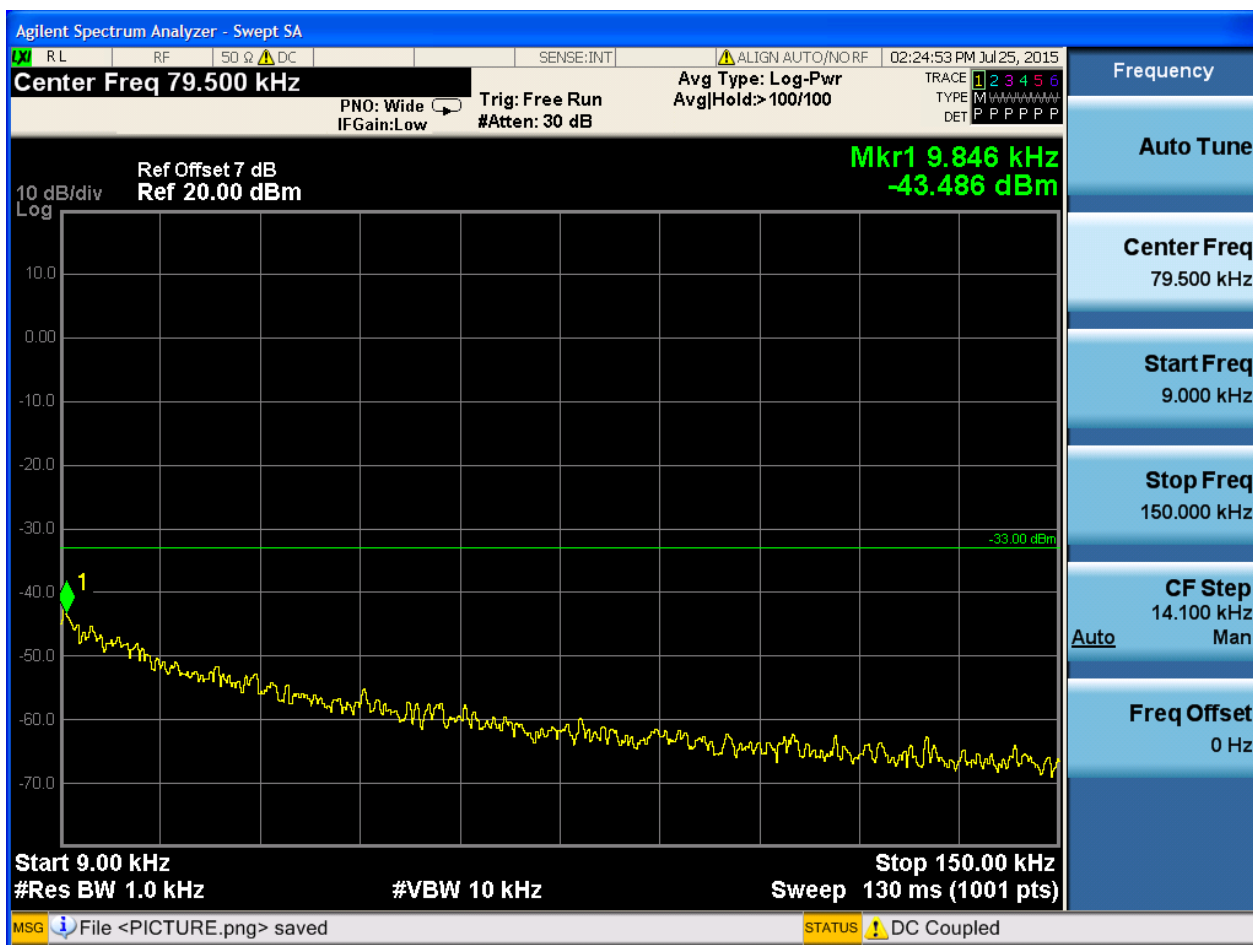
Part I - Test Plots

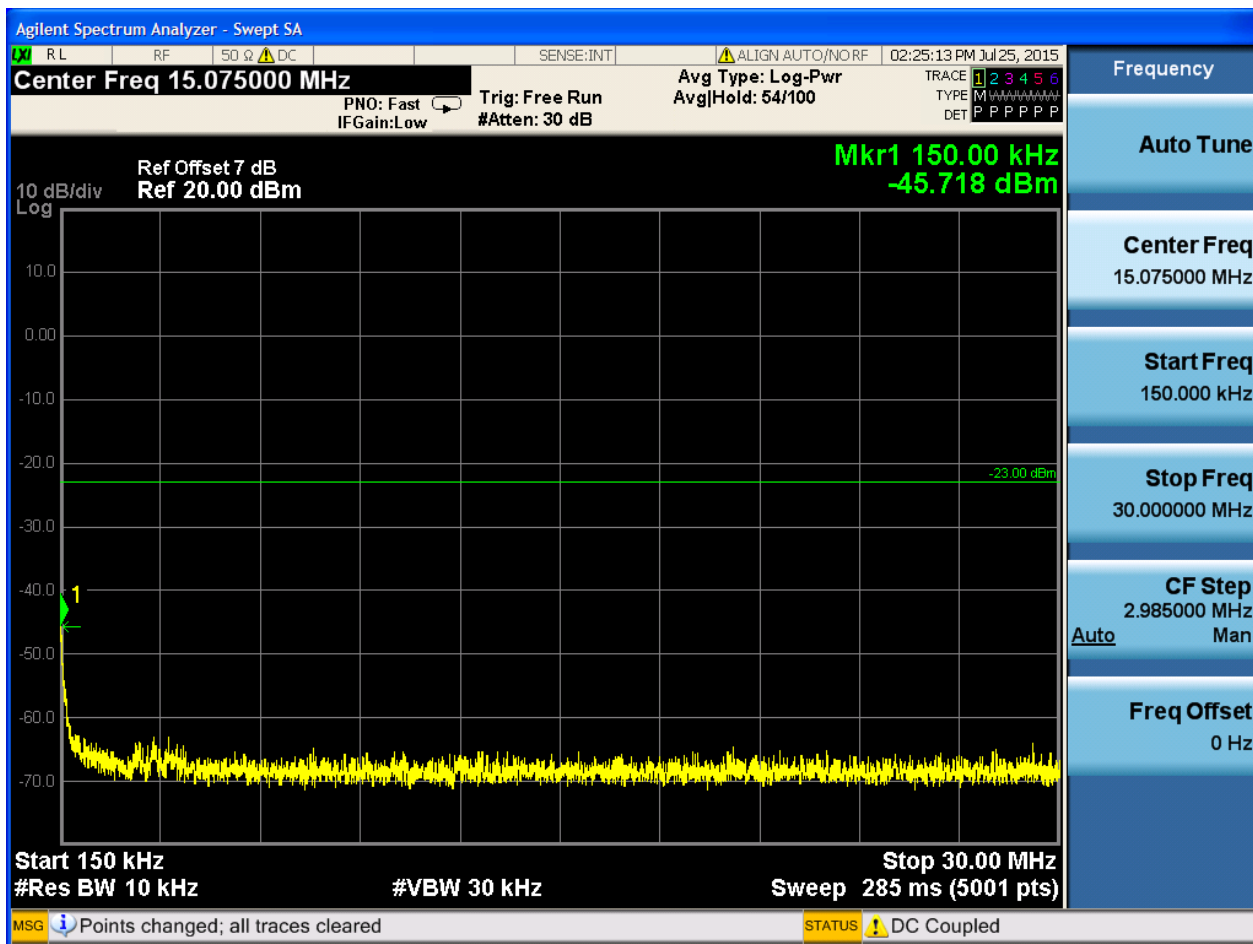
6.1 For GSM

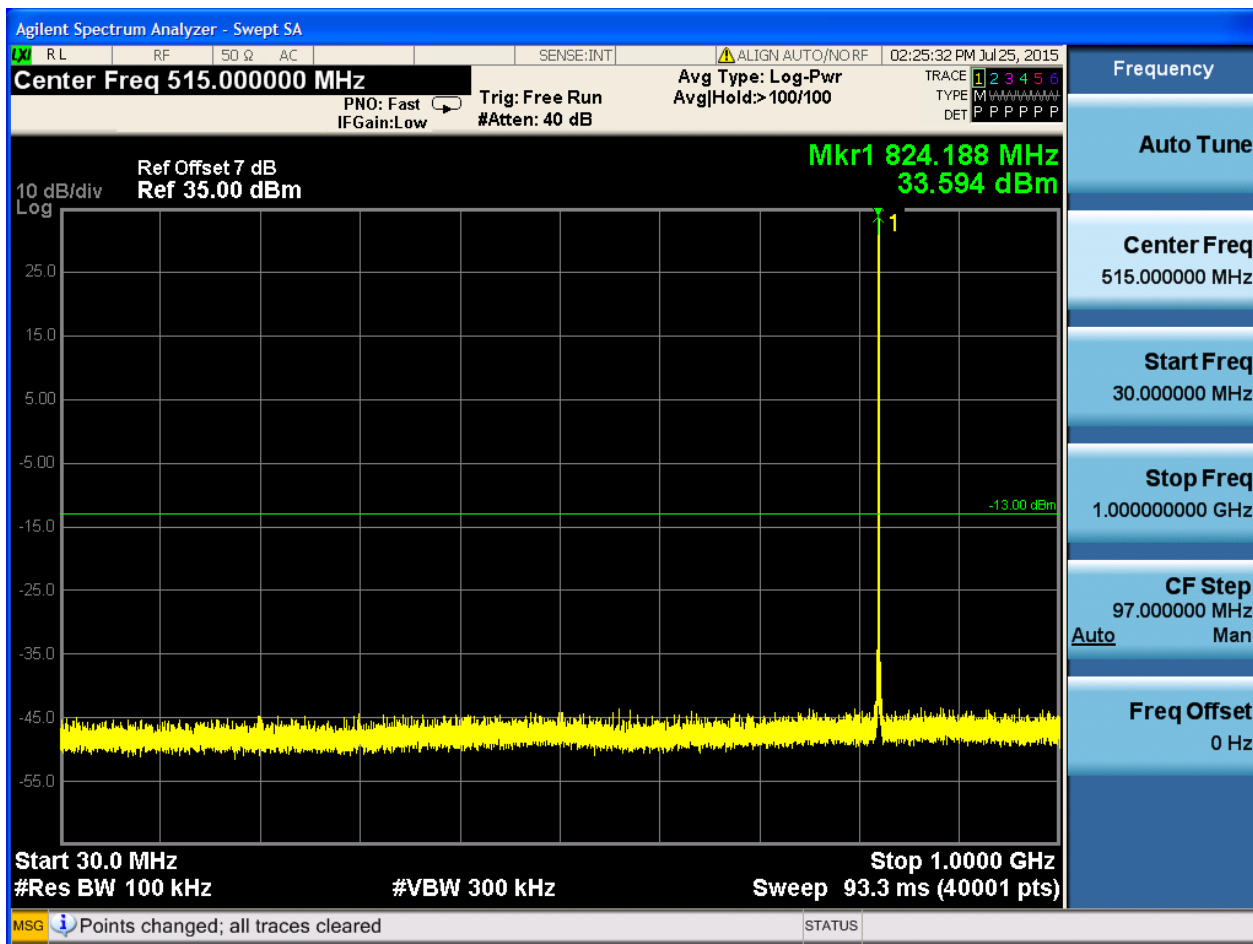
6.1.2 Test Band = GSM850

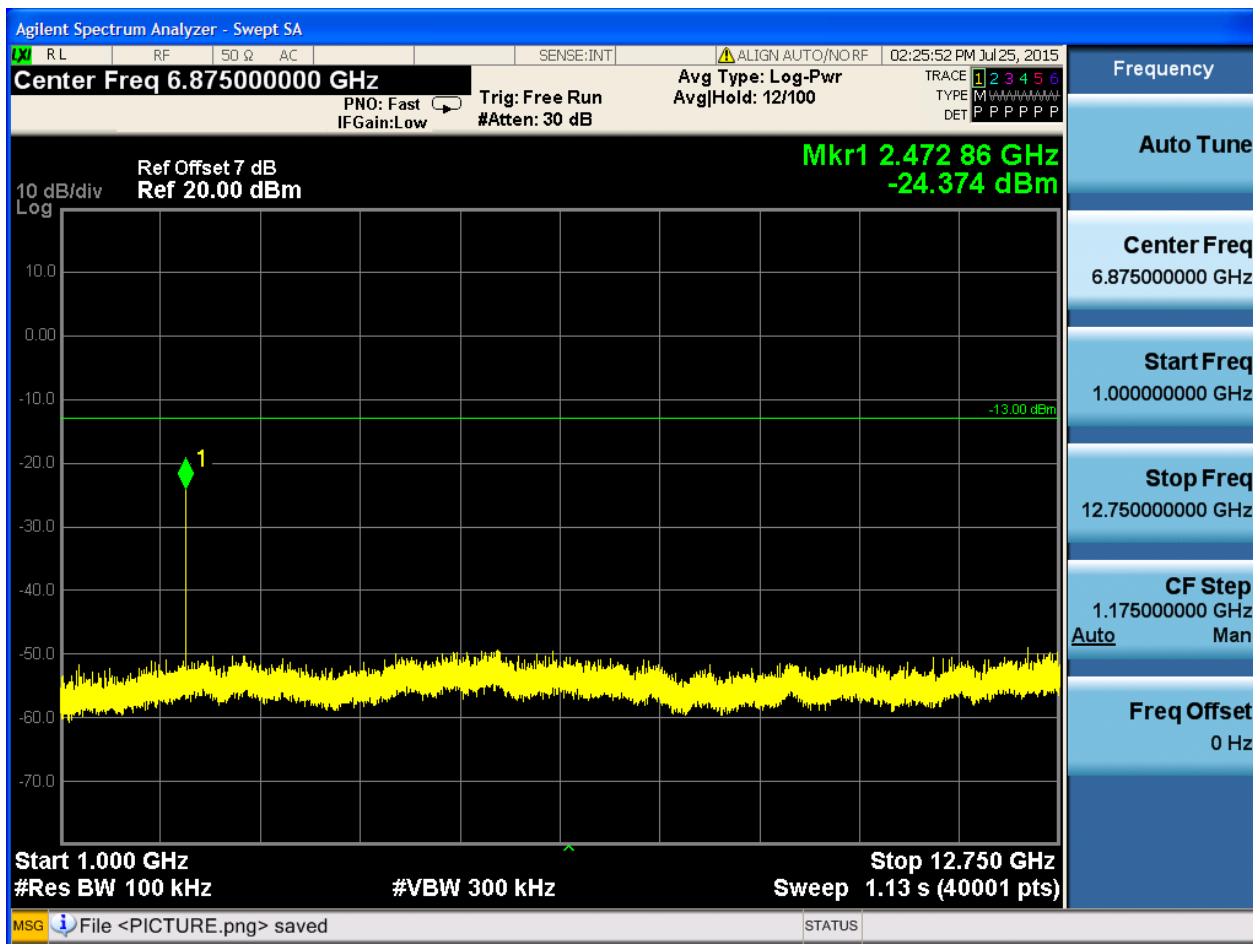
6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

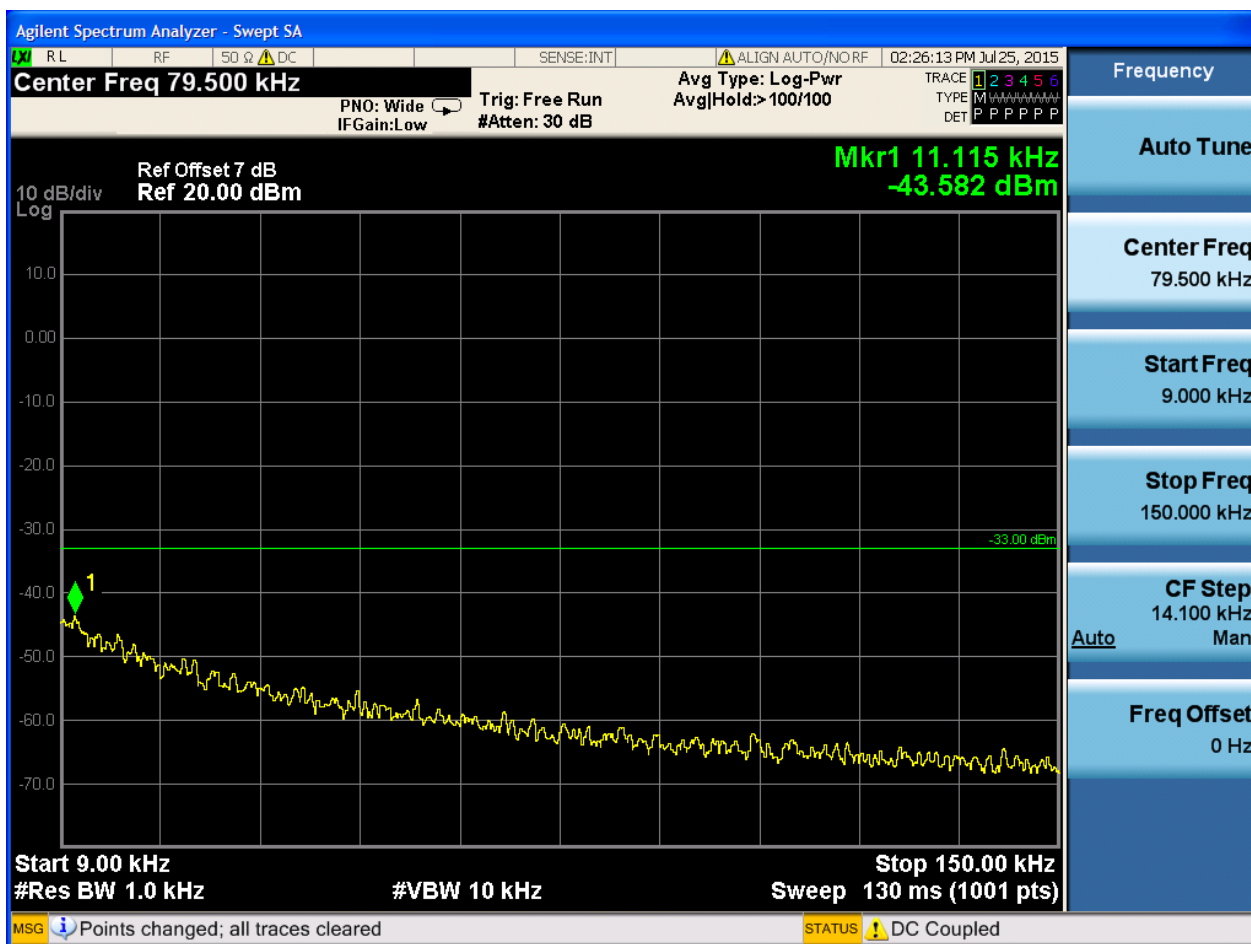


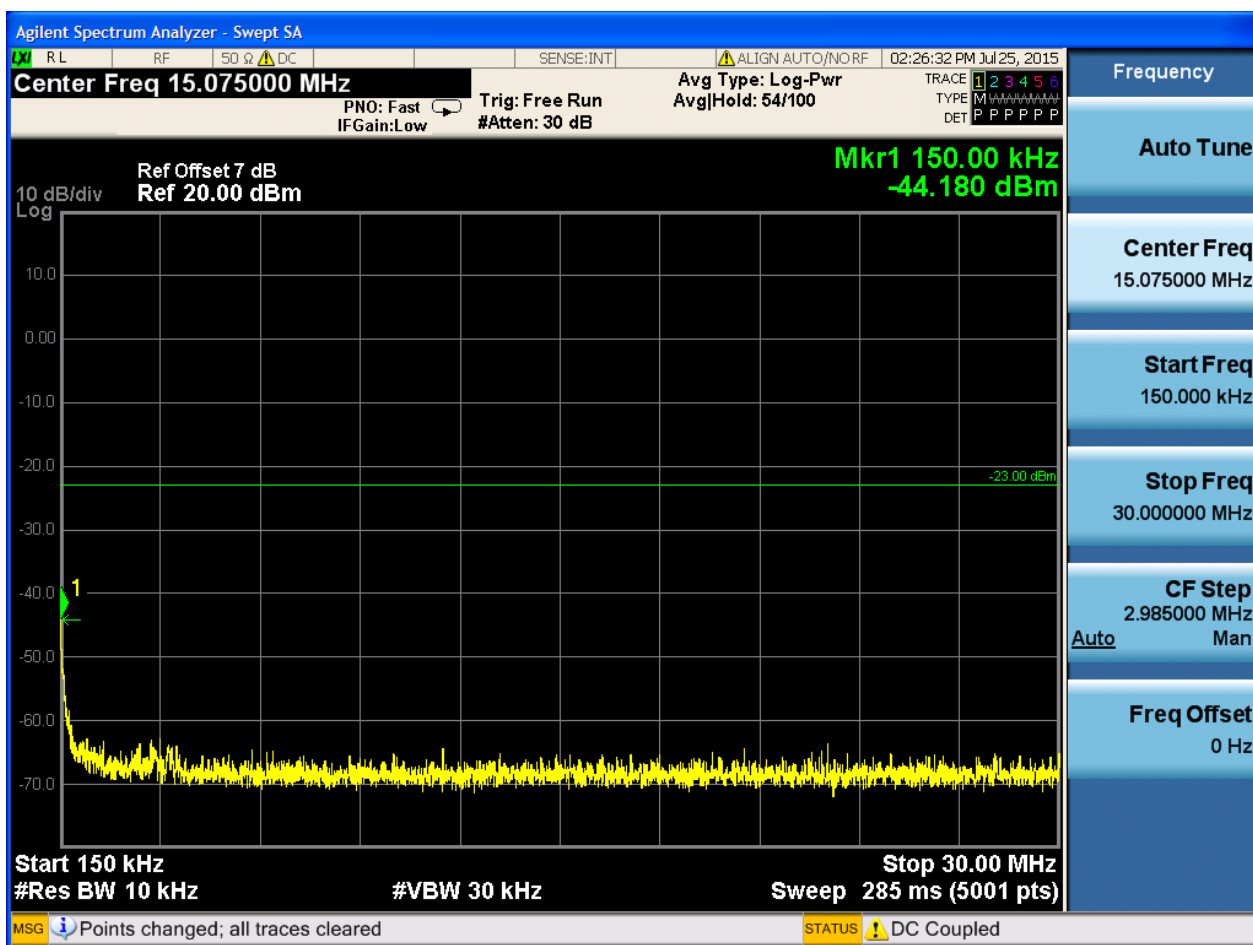


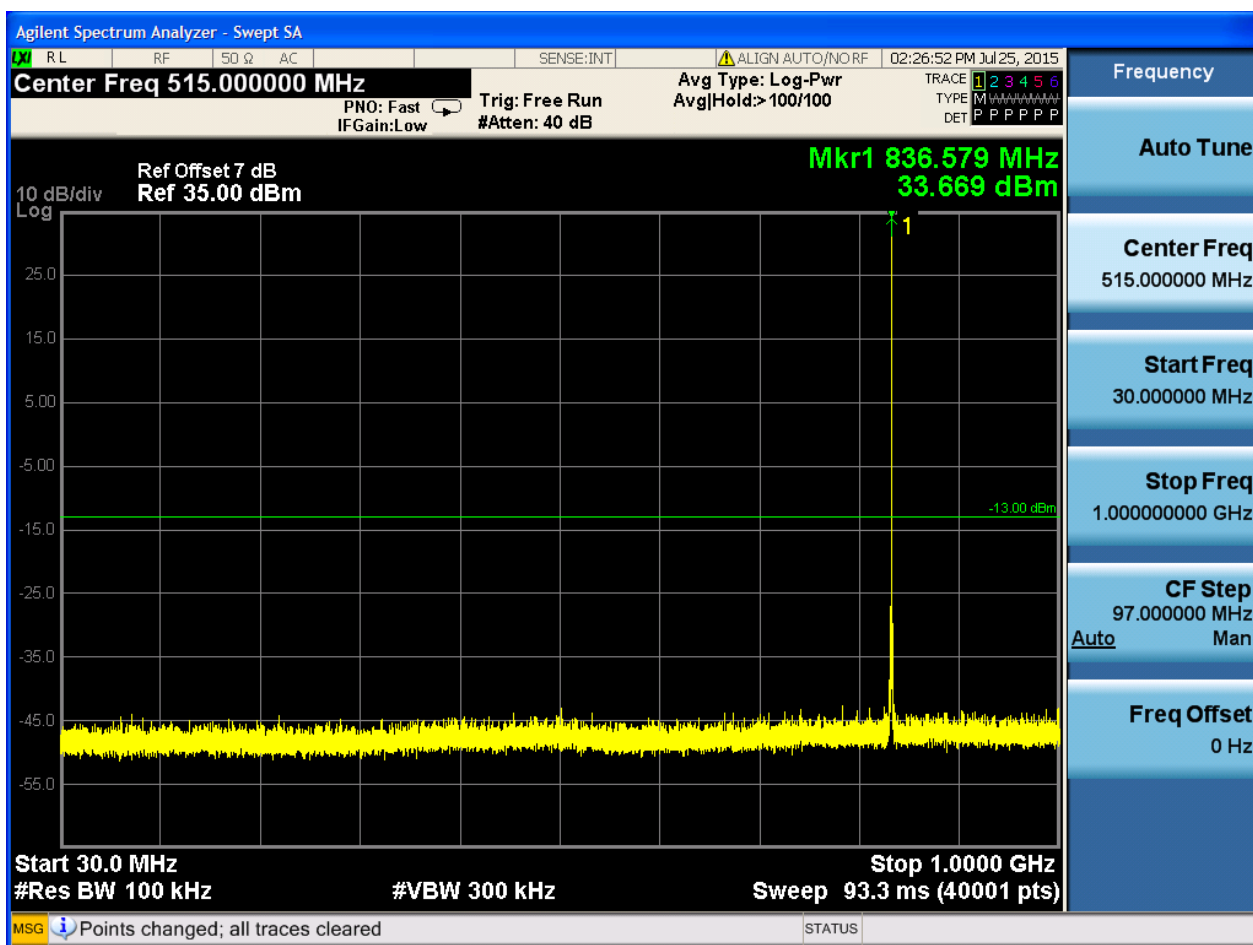


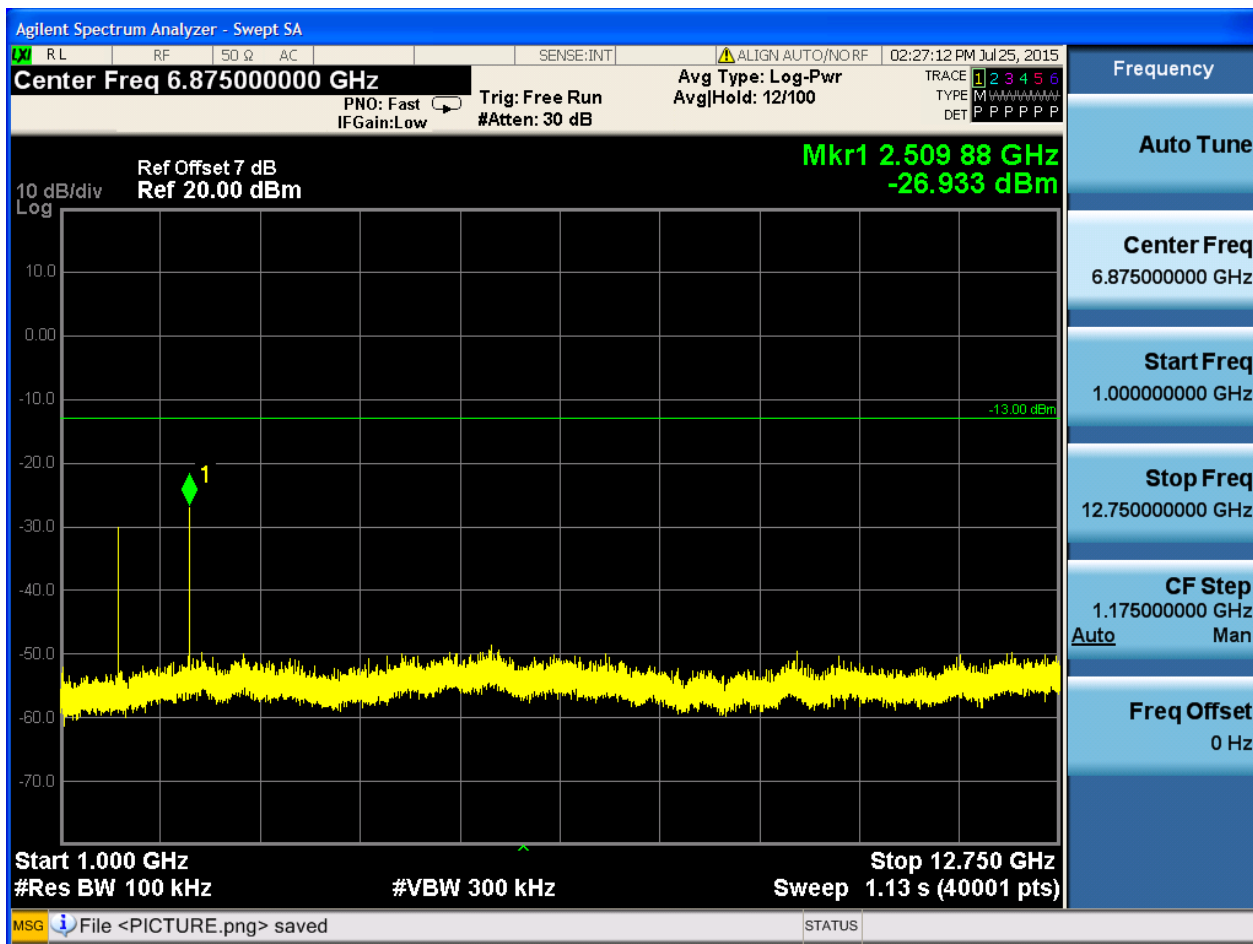


6.1.2.1.2 Test Channel = MCH

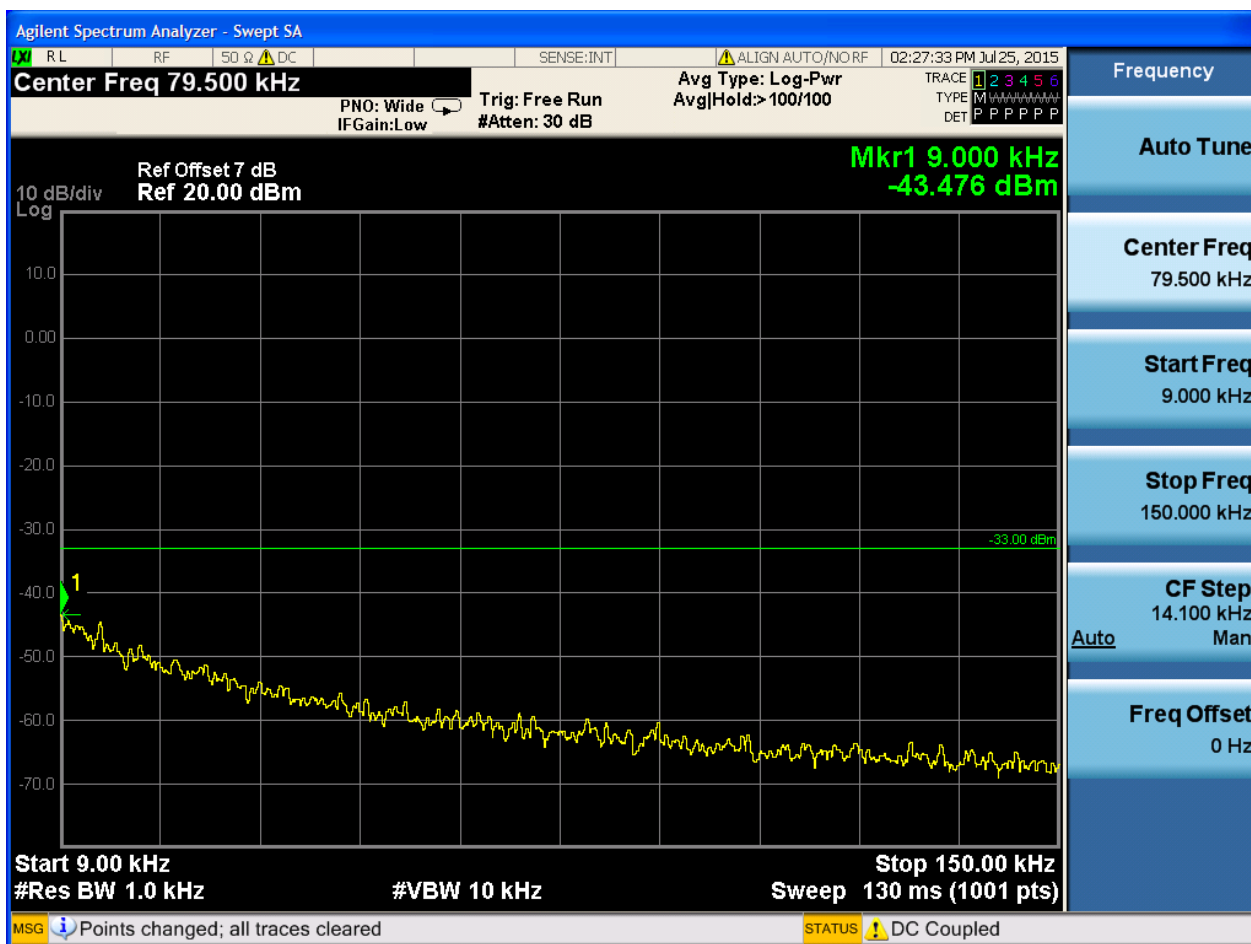


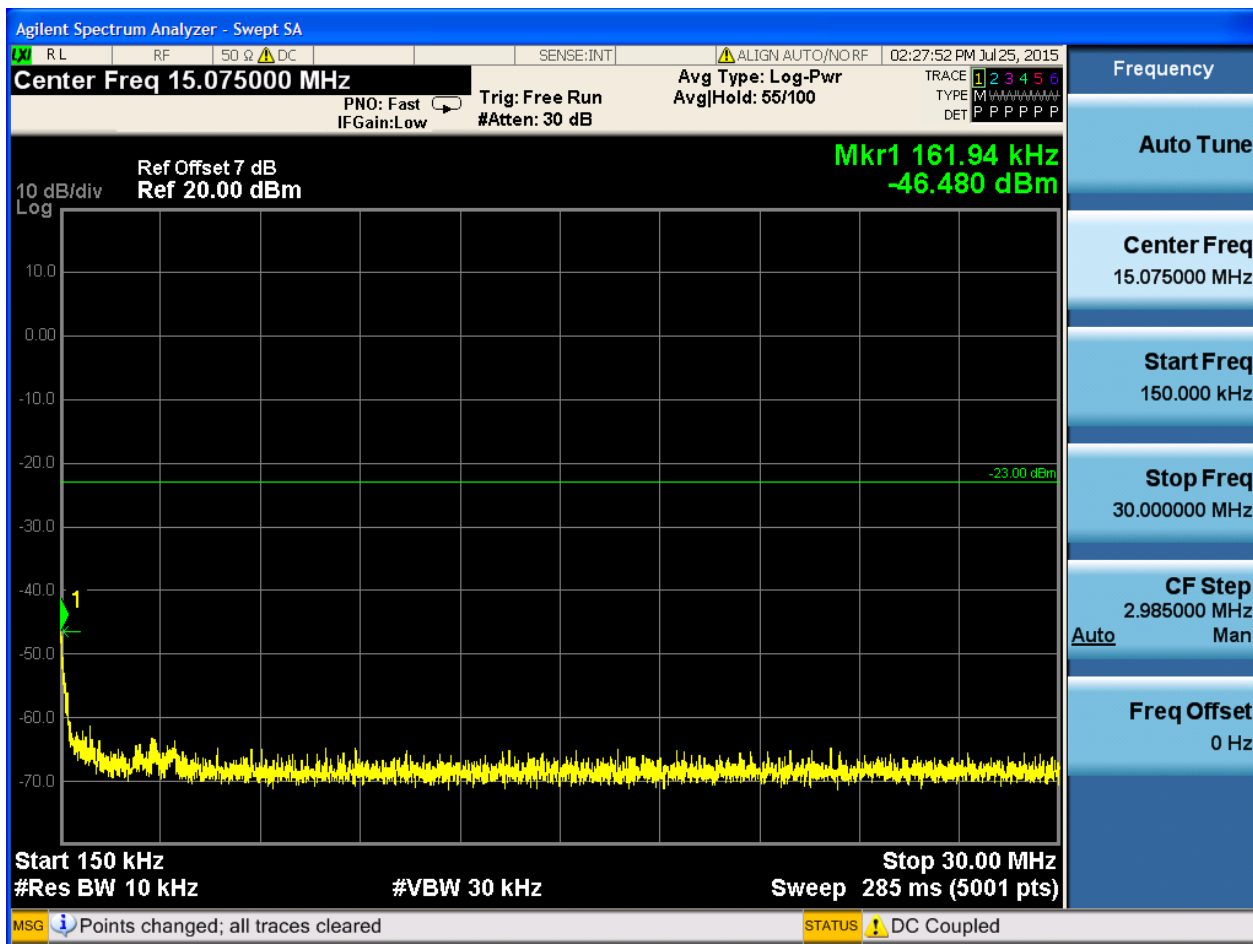


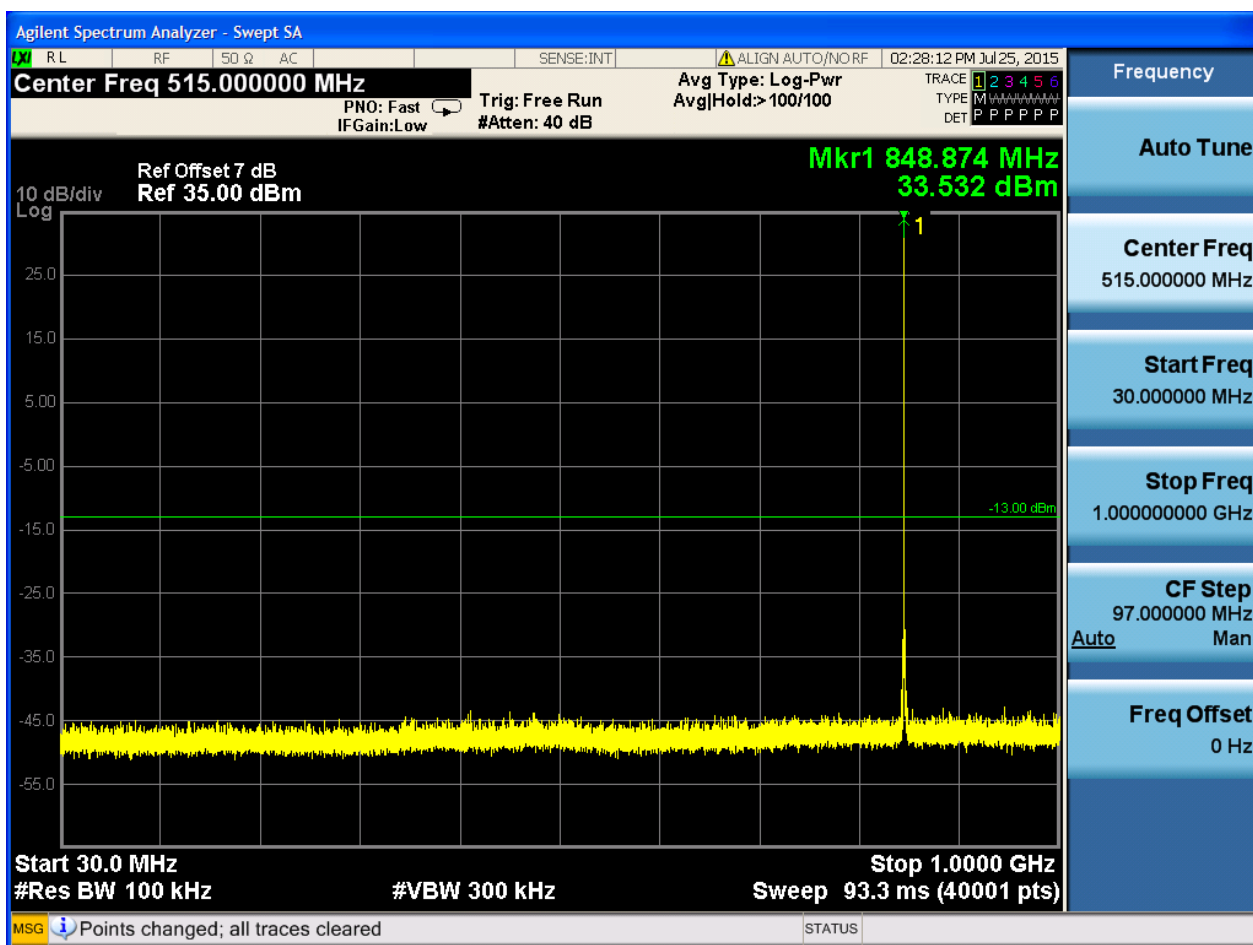


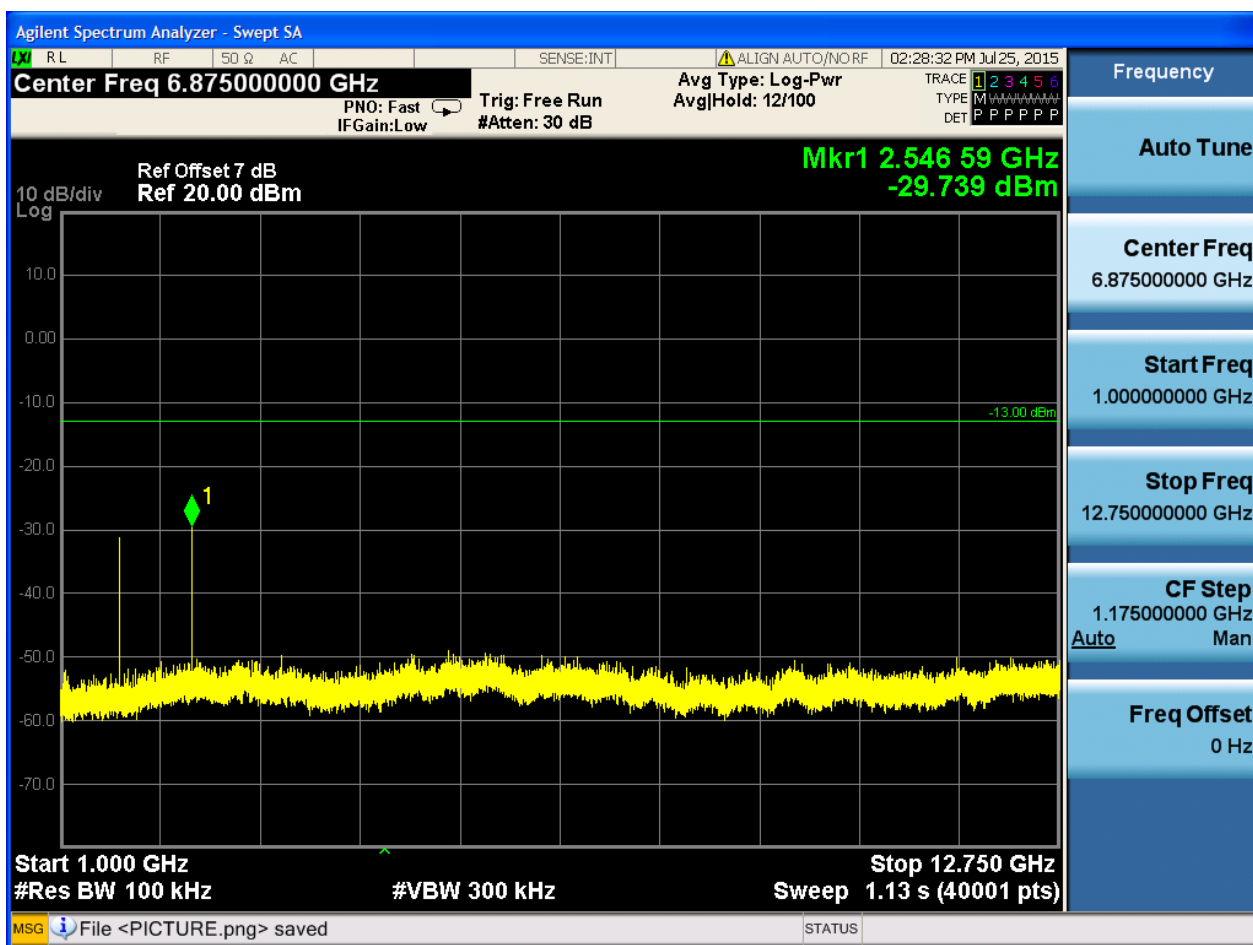


6.1.2.1.3 Test Channel = HCH





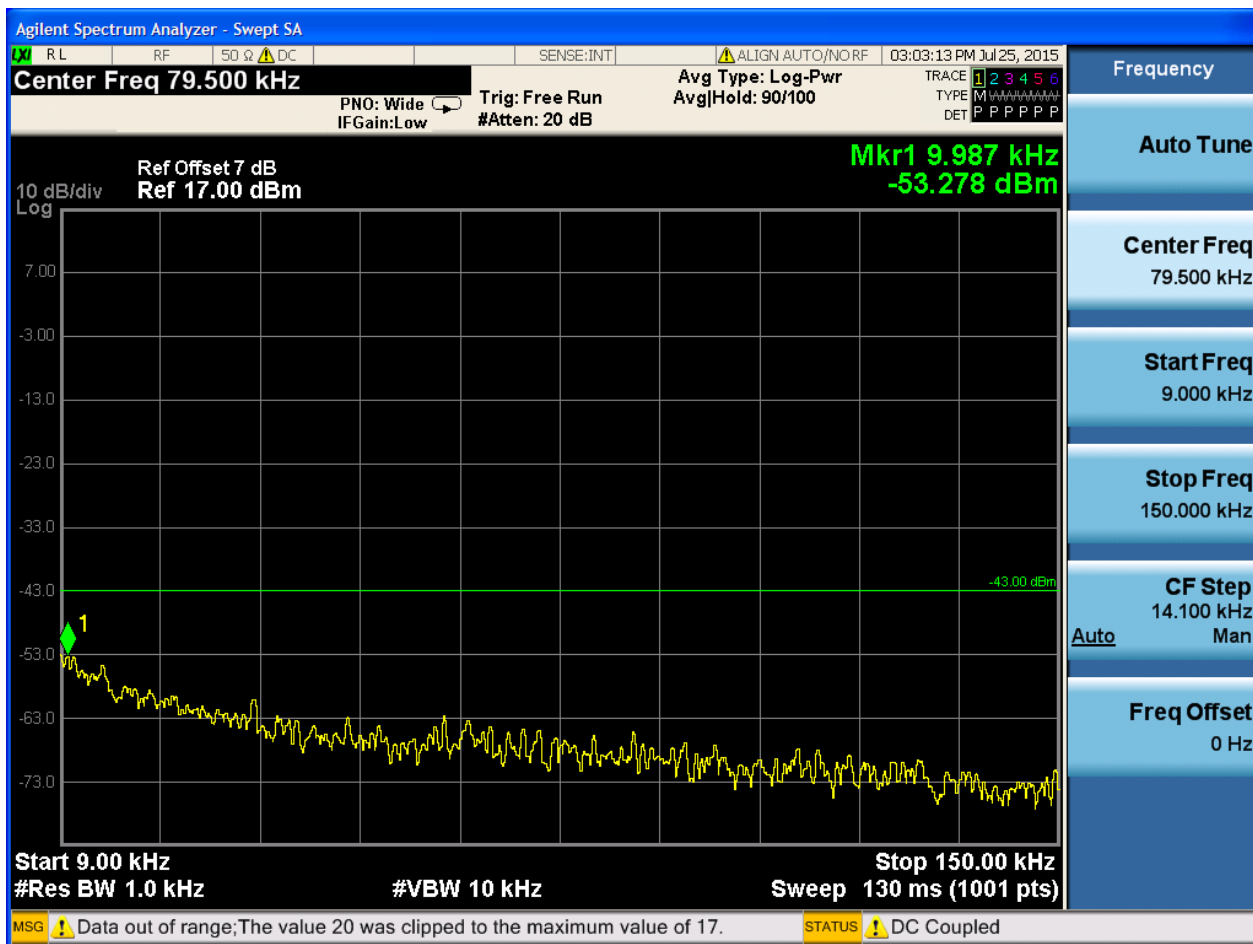


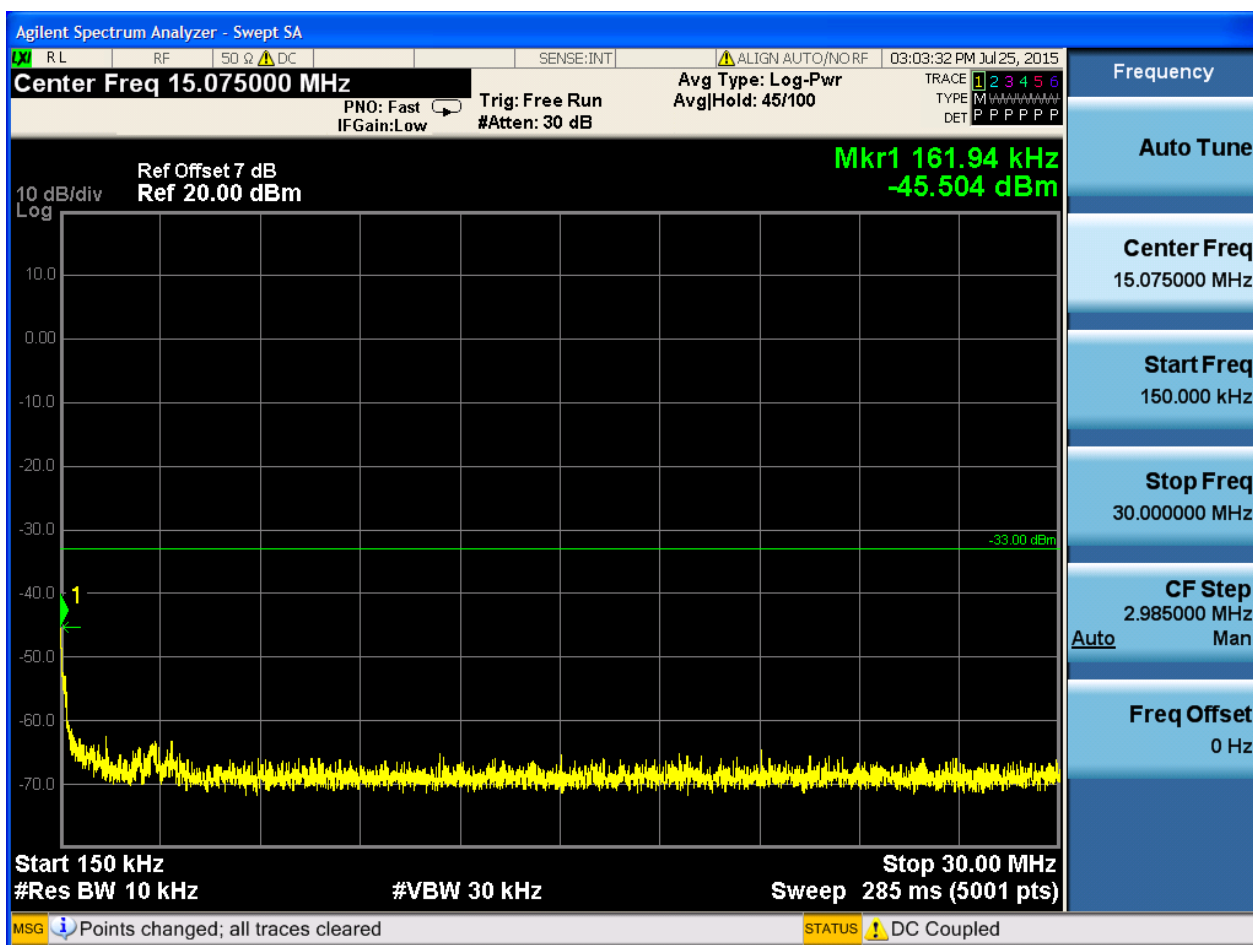


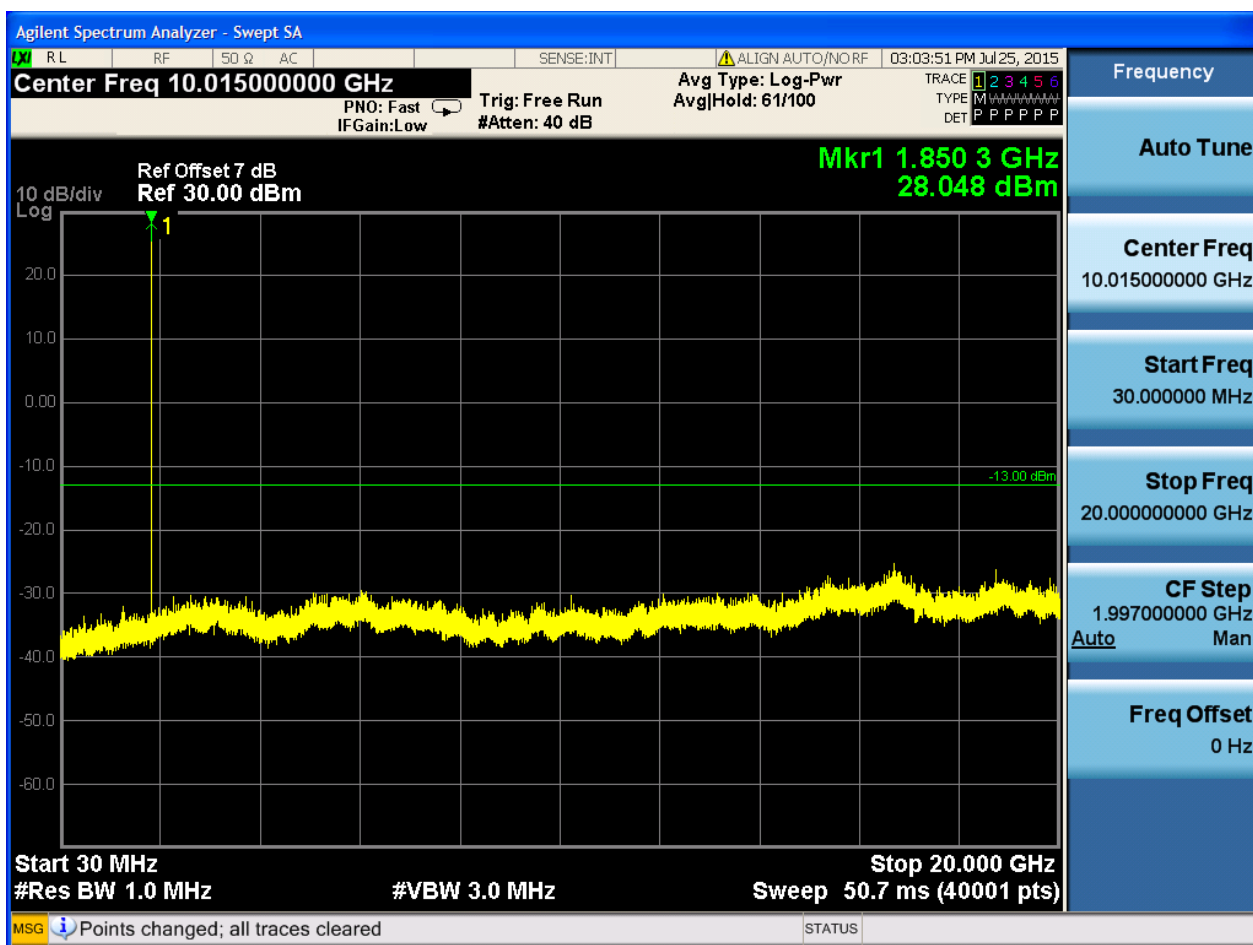


6.1.2.2 Test Mode = GSM/TM2

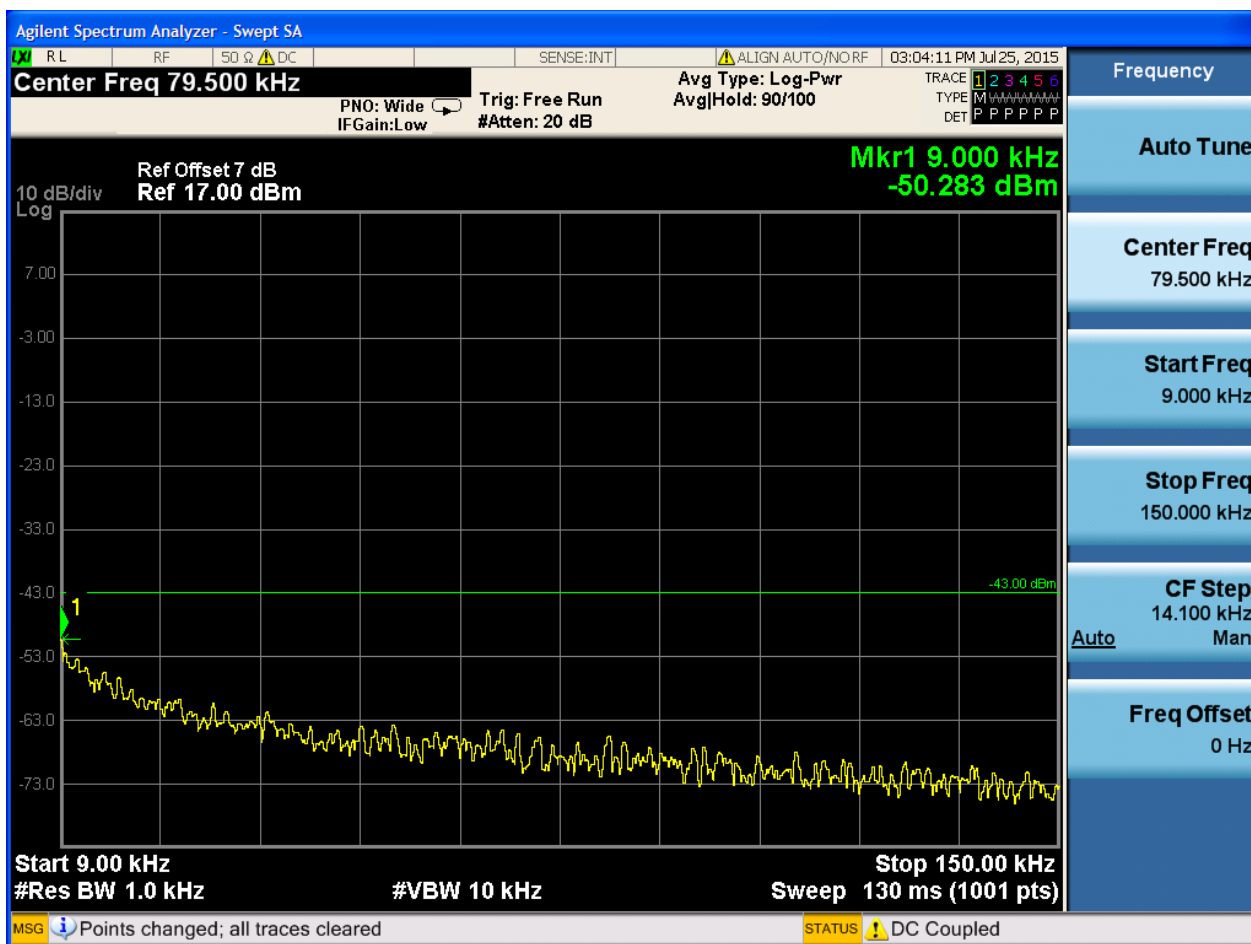
6.1.2.2.1 Test Channel = LCH

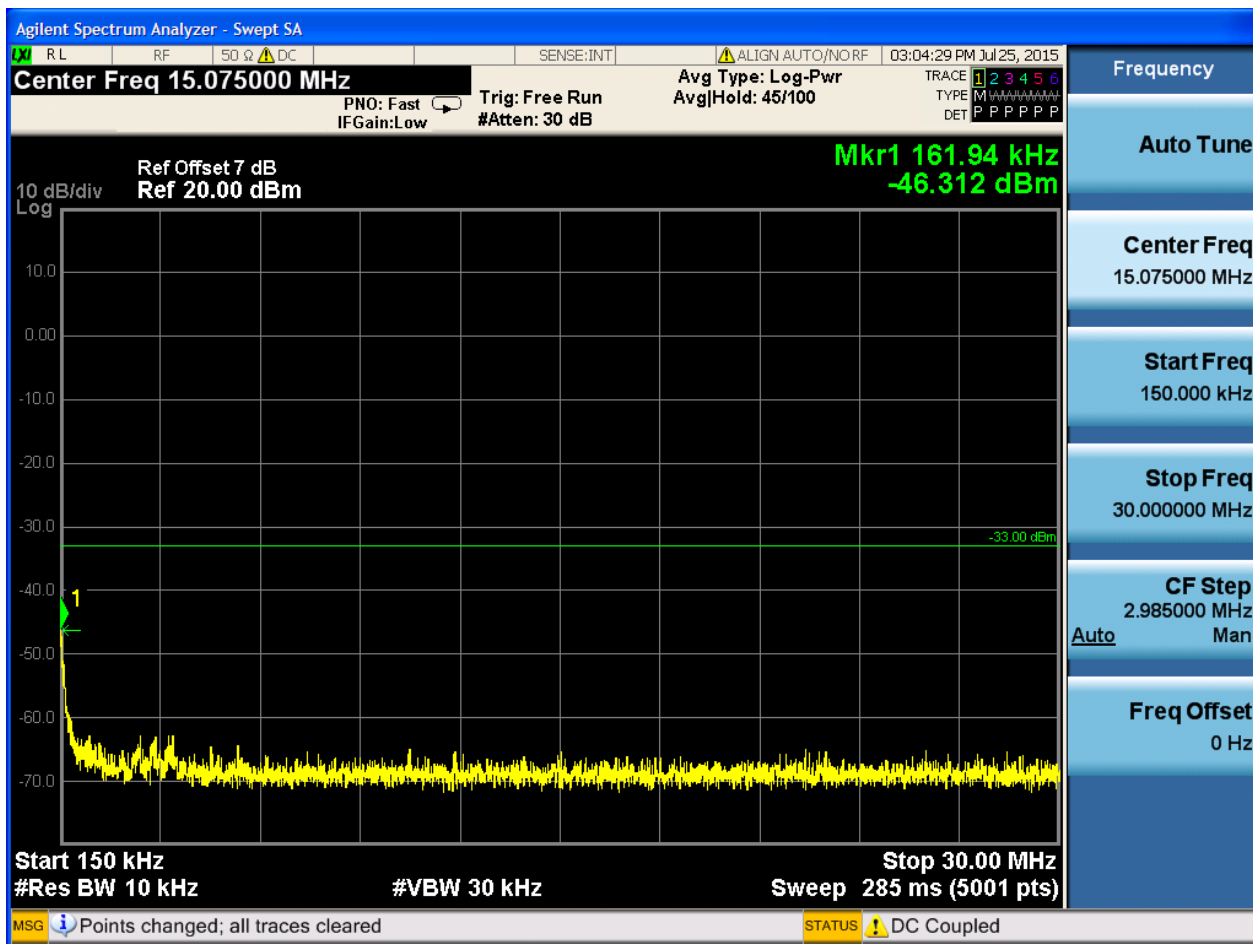


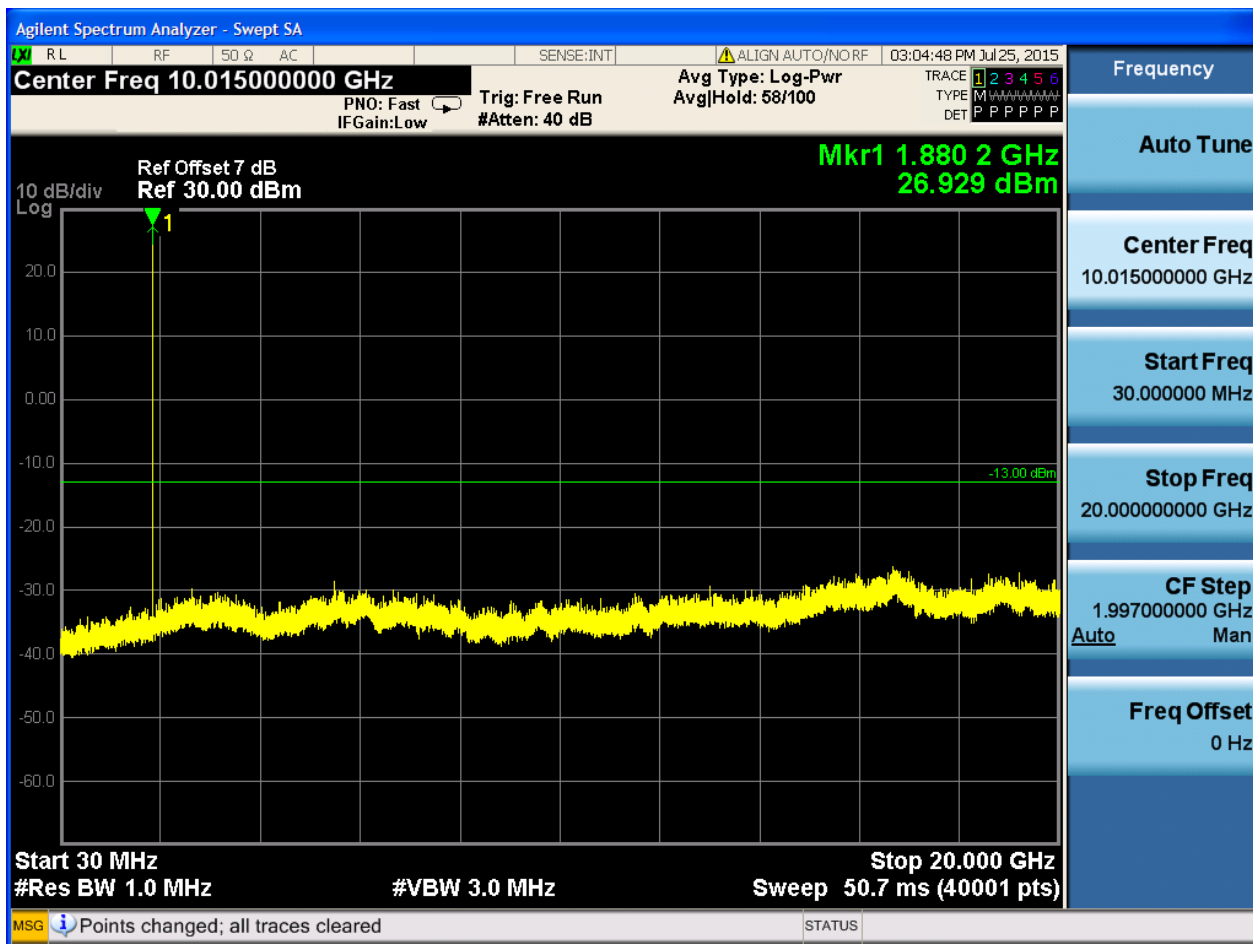




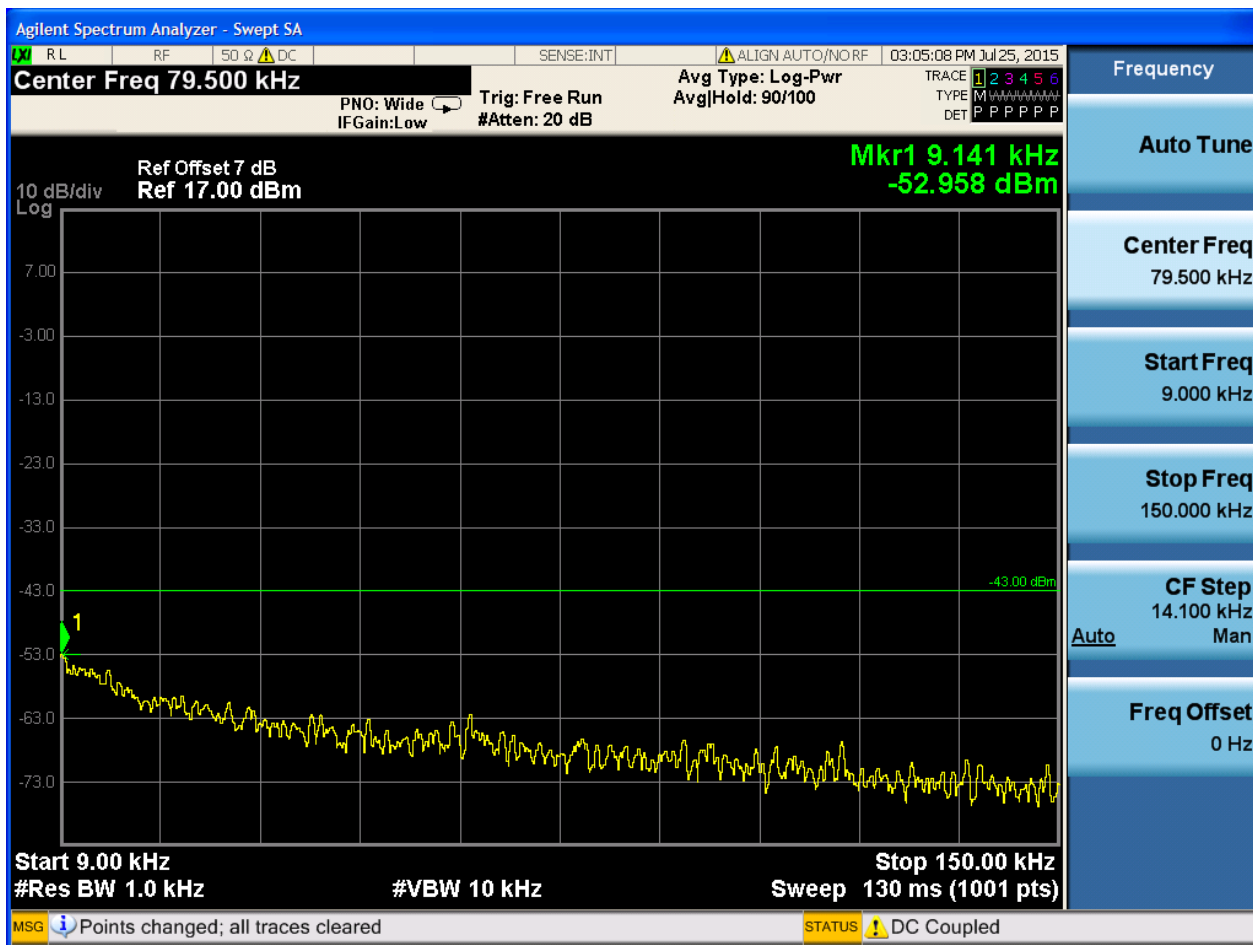
6.1.2.2.2 Test Channel = MCH

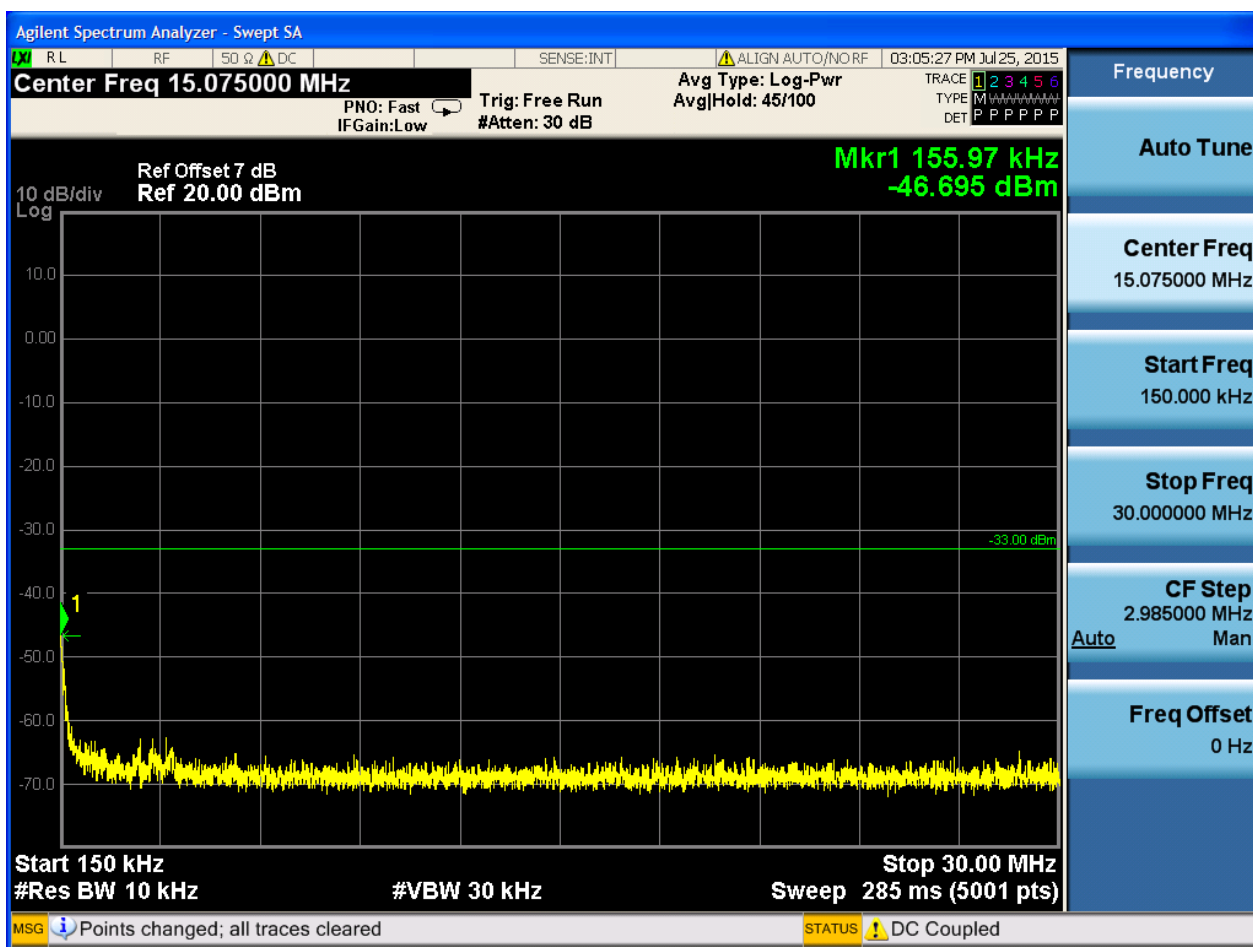


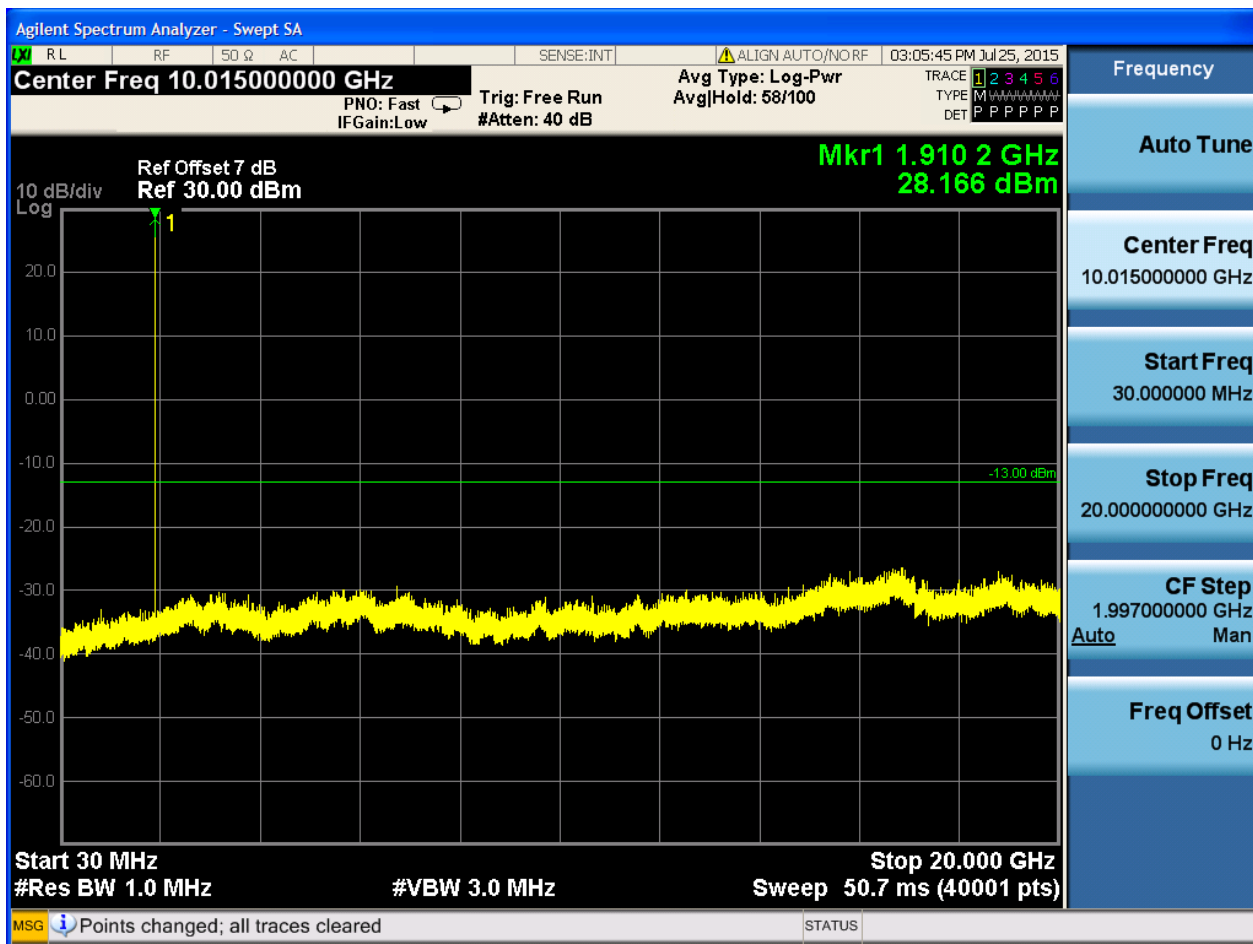




6.1.2.2.3 Test Channel = HCH







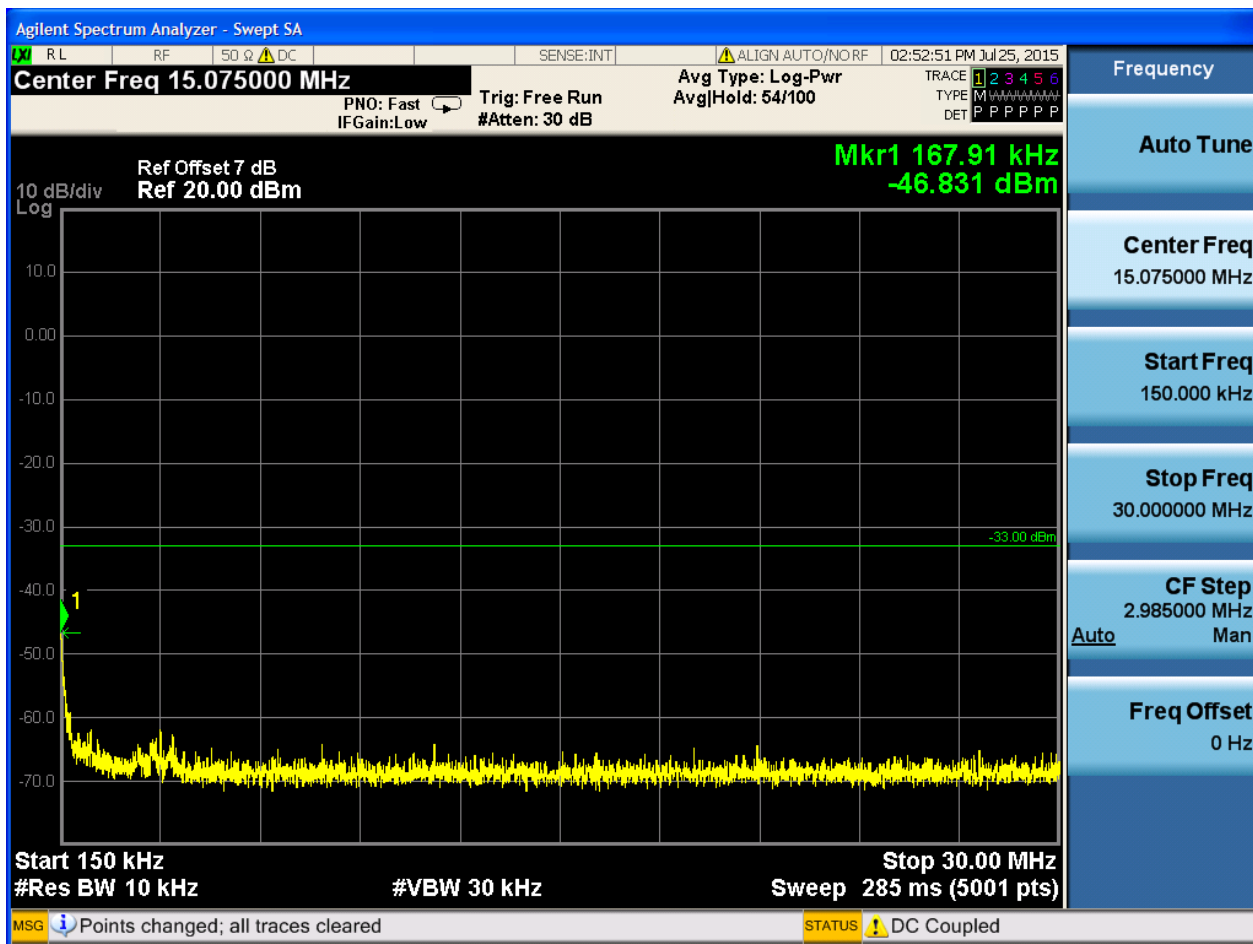


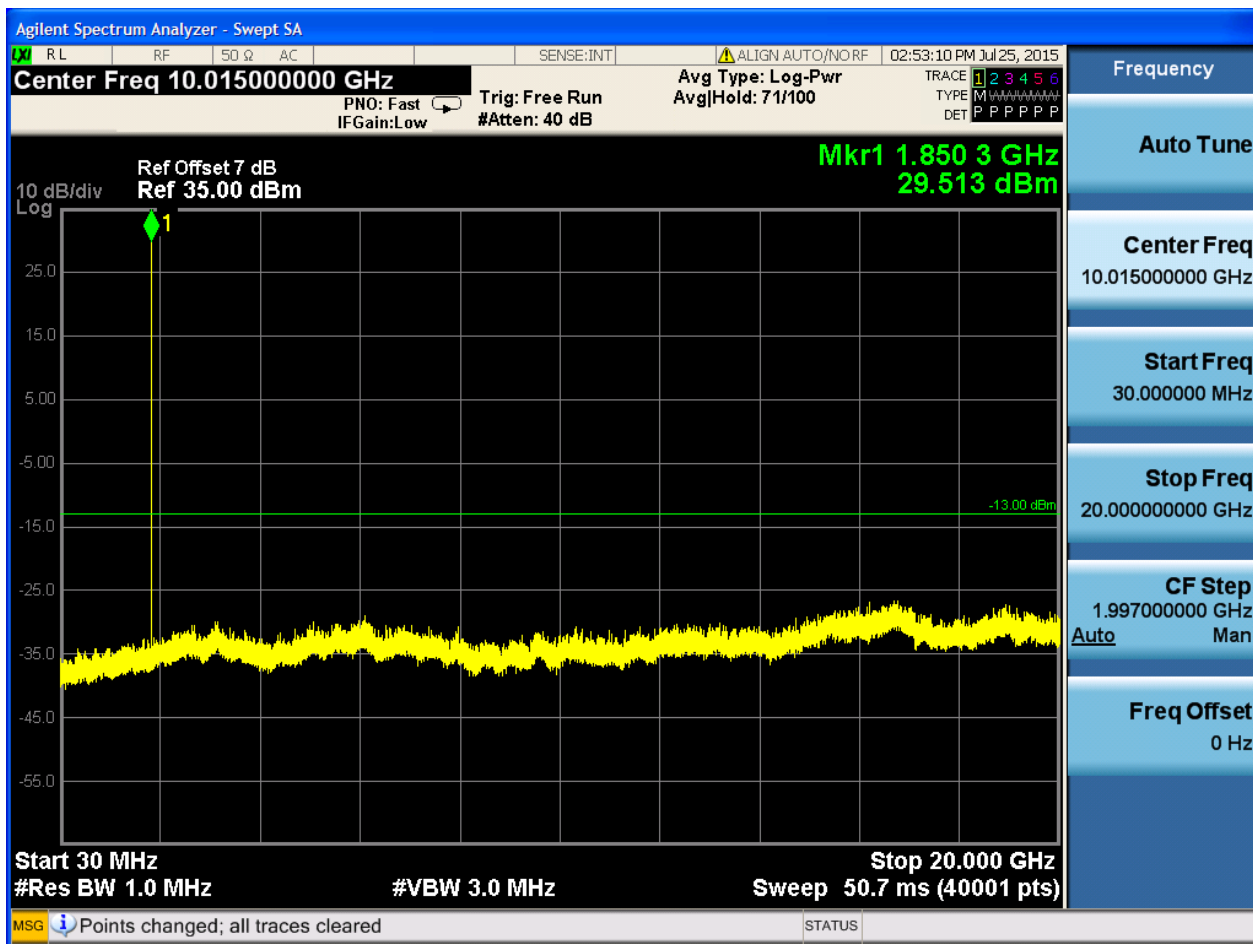
6.1.3 Test Band = GSM1900

6.1.3.1 Test Mode = GSM/TM1

6.1.3.1.1 Test Channel = LCH

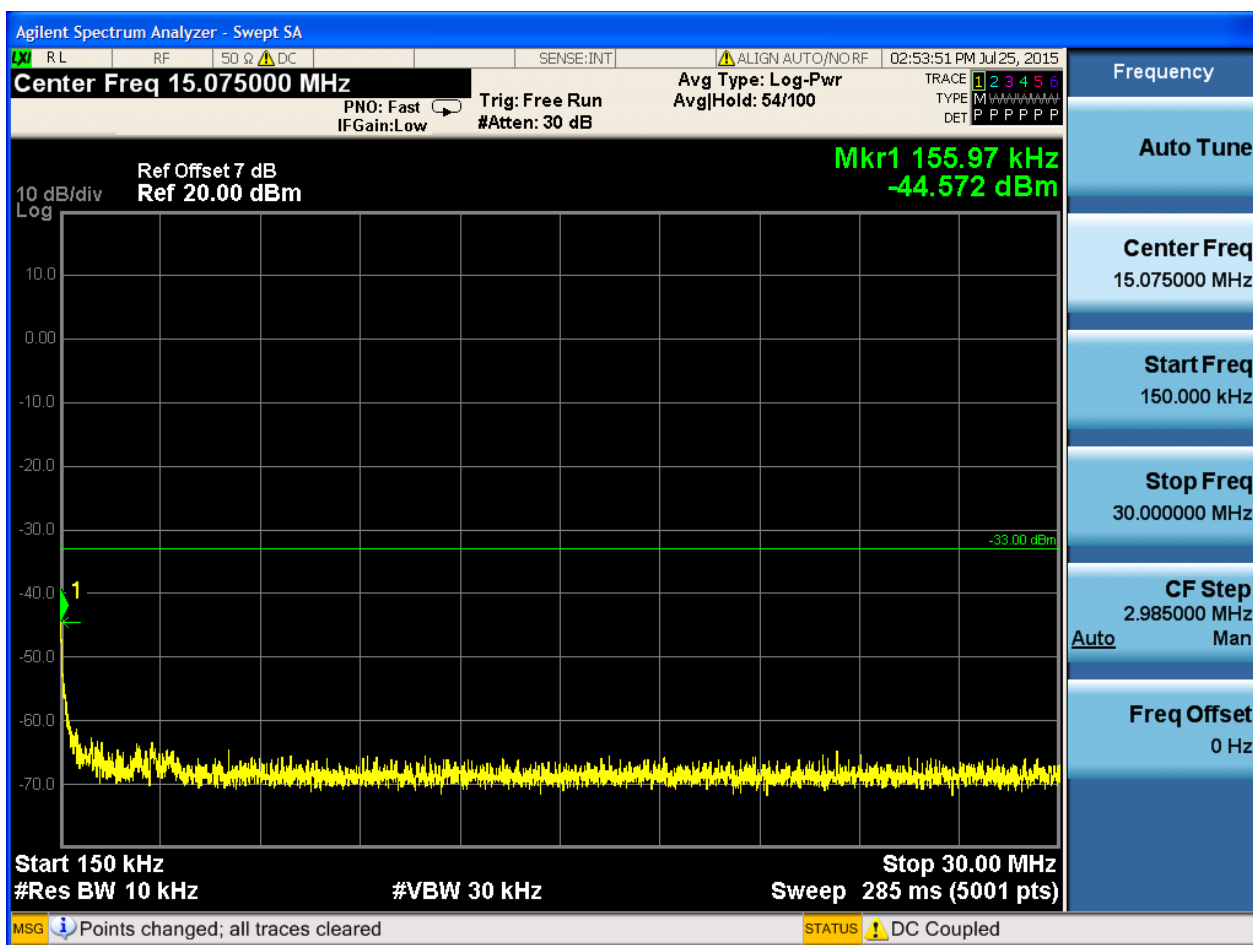


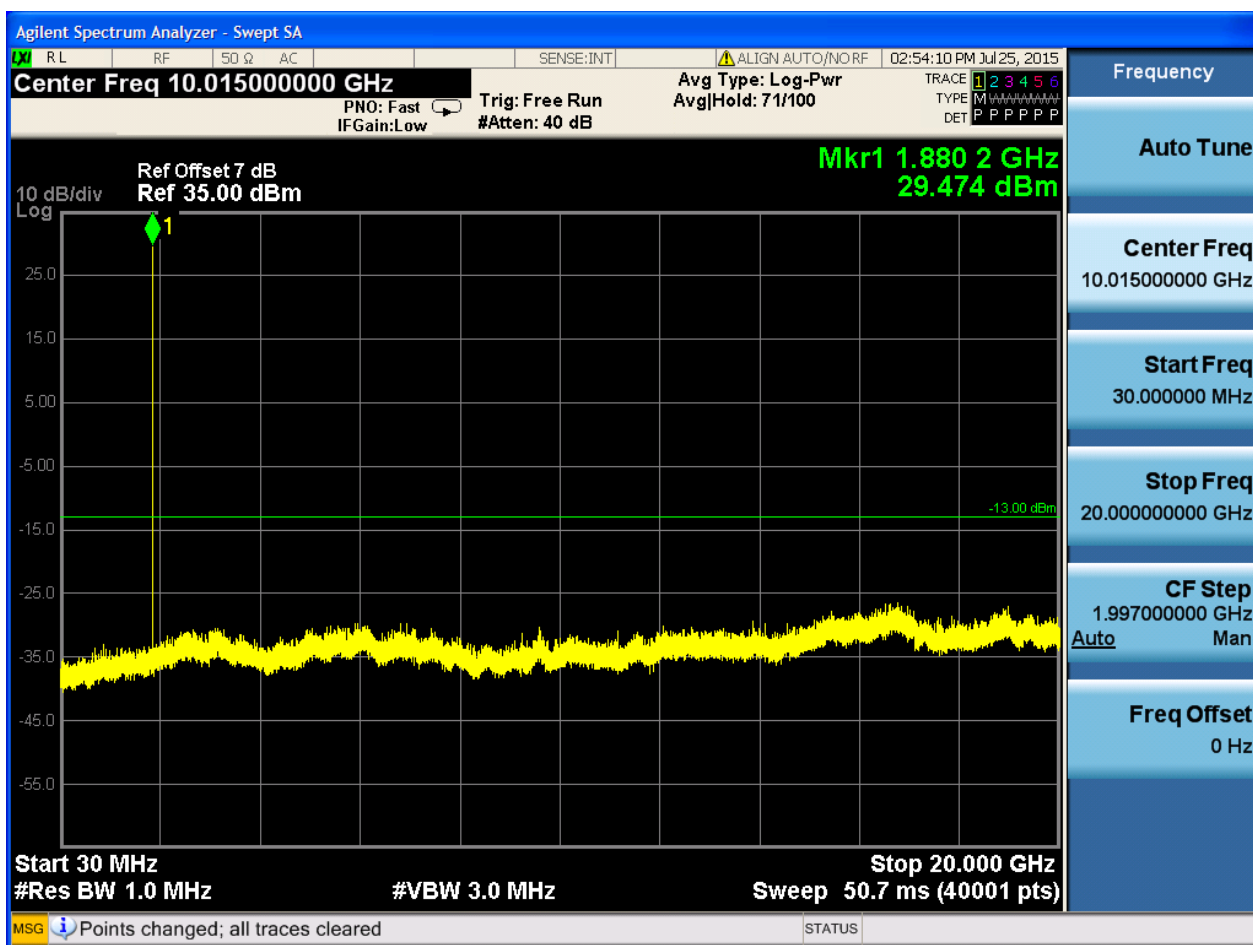




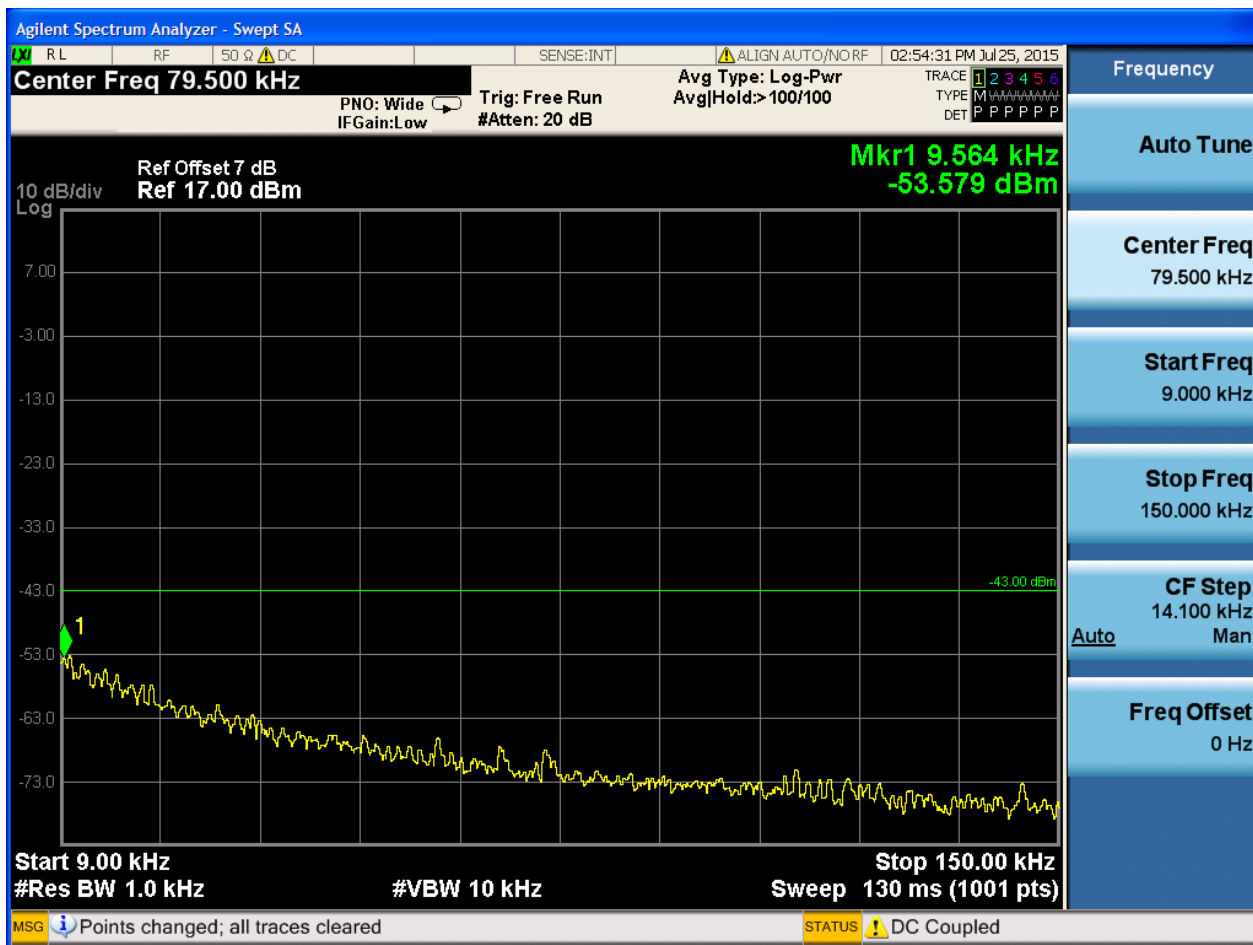
6.1.3.1.2 Test Channel = MCH

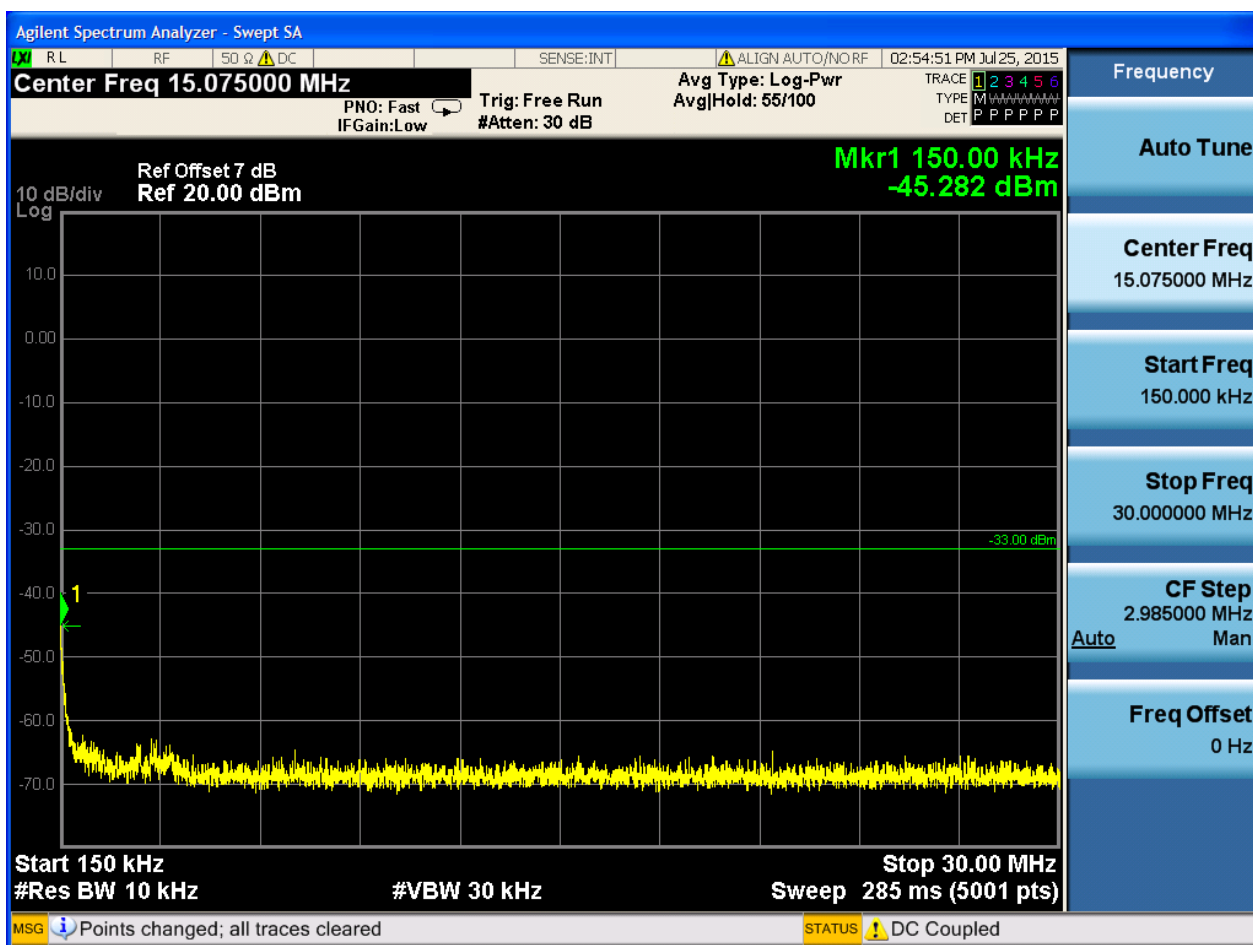


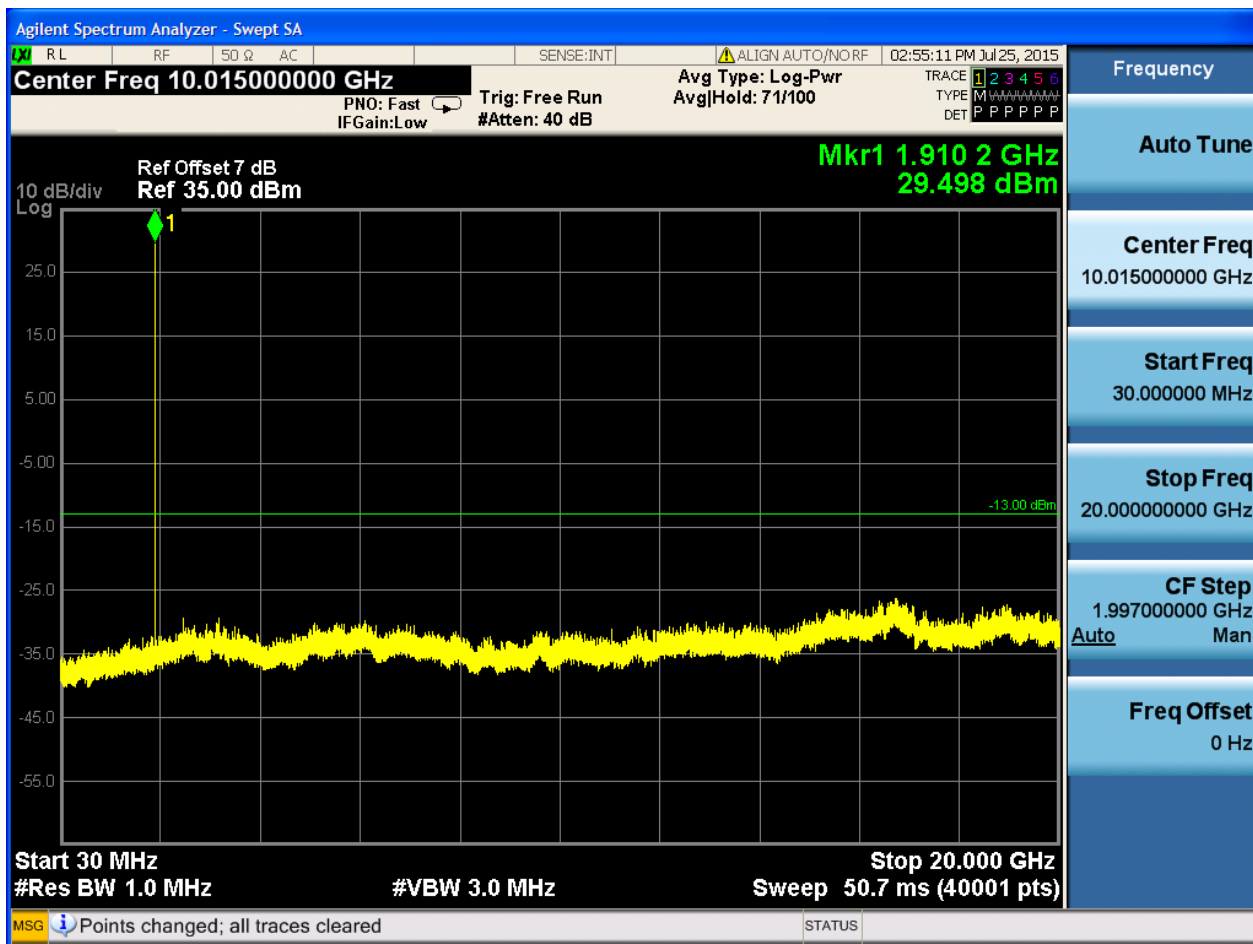




6.1.3.1.3 Test Channel = HCH



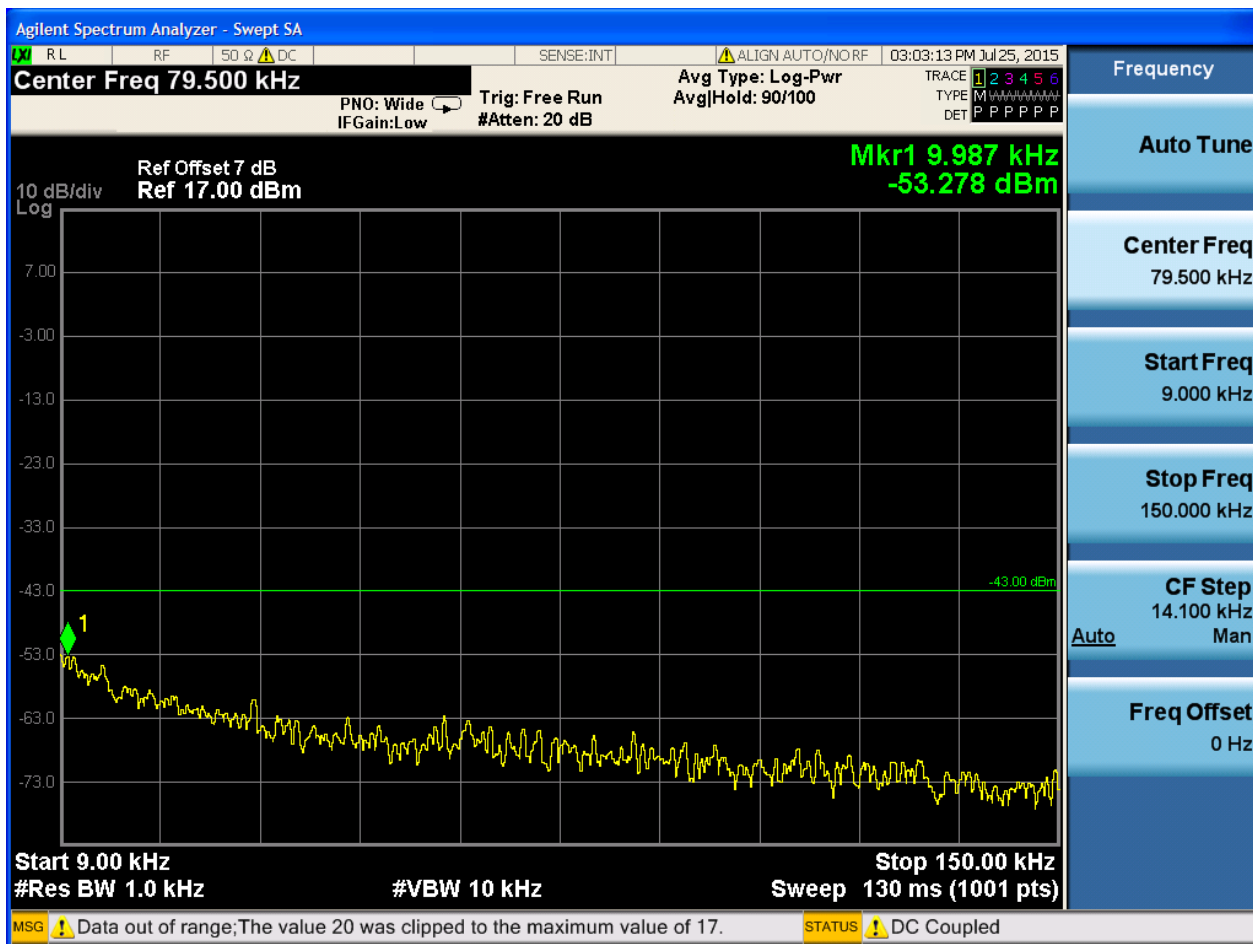


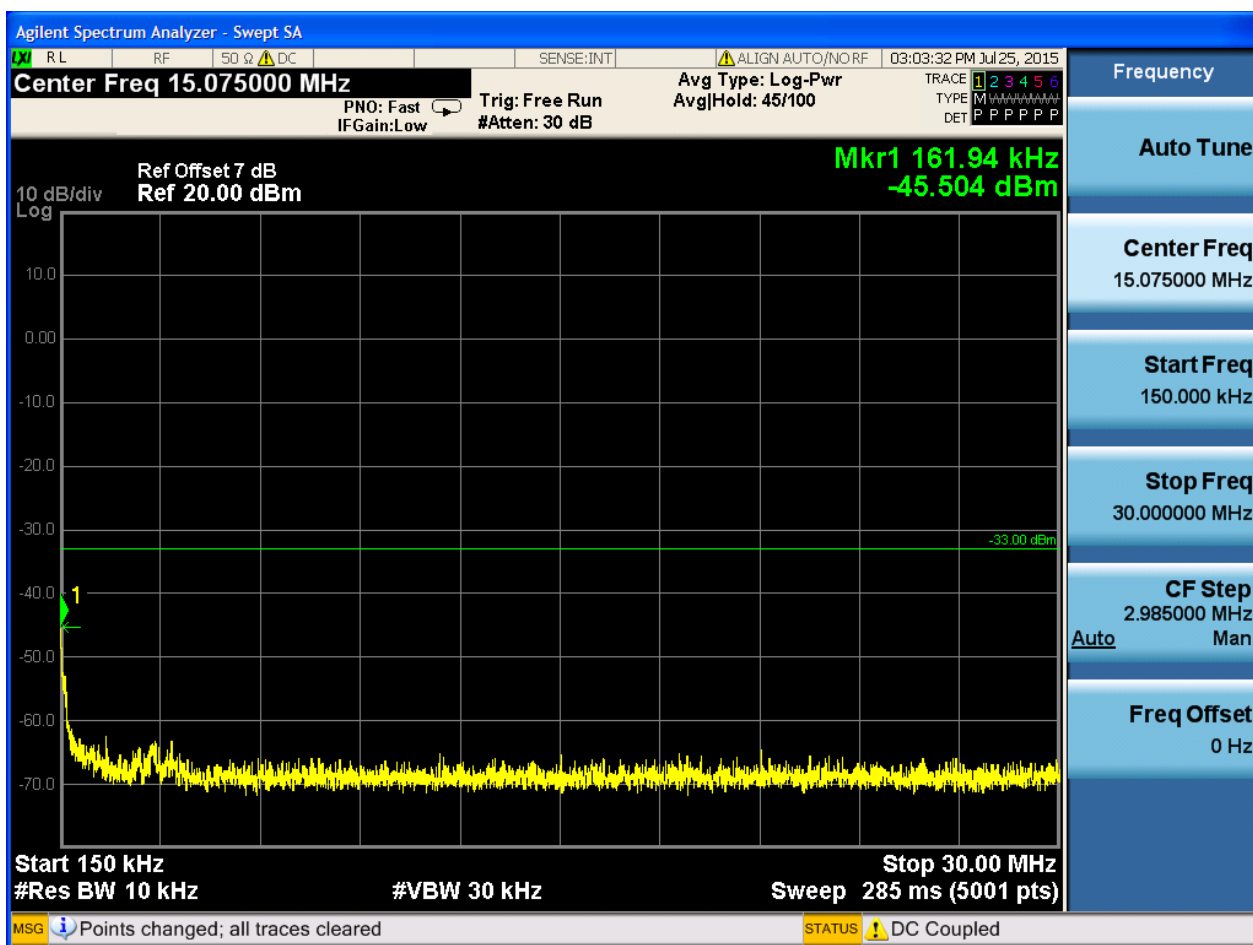


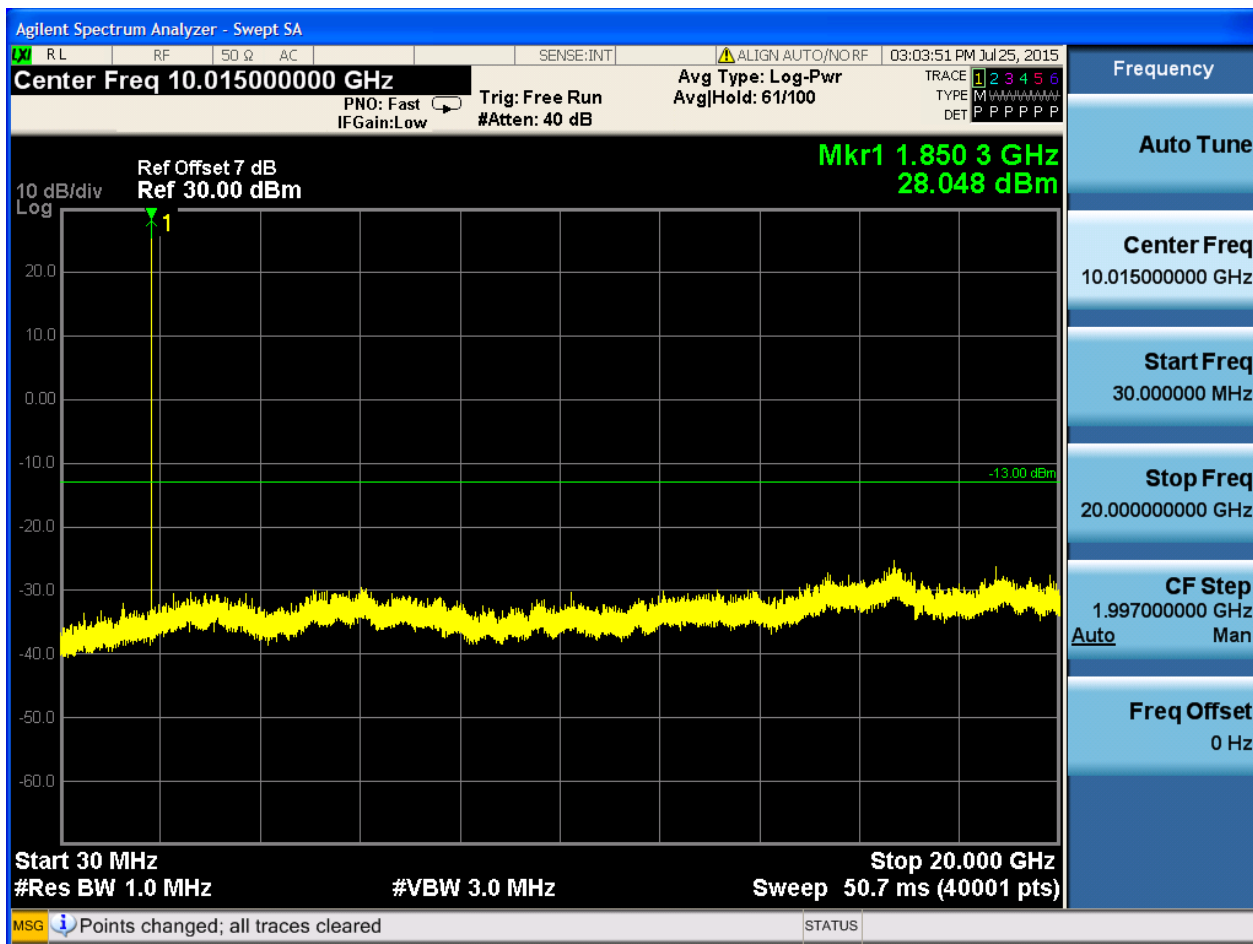


6.1.3.2 Test Mode = GSM/TM2

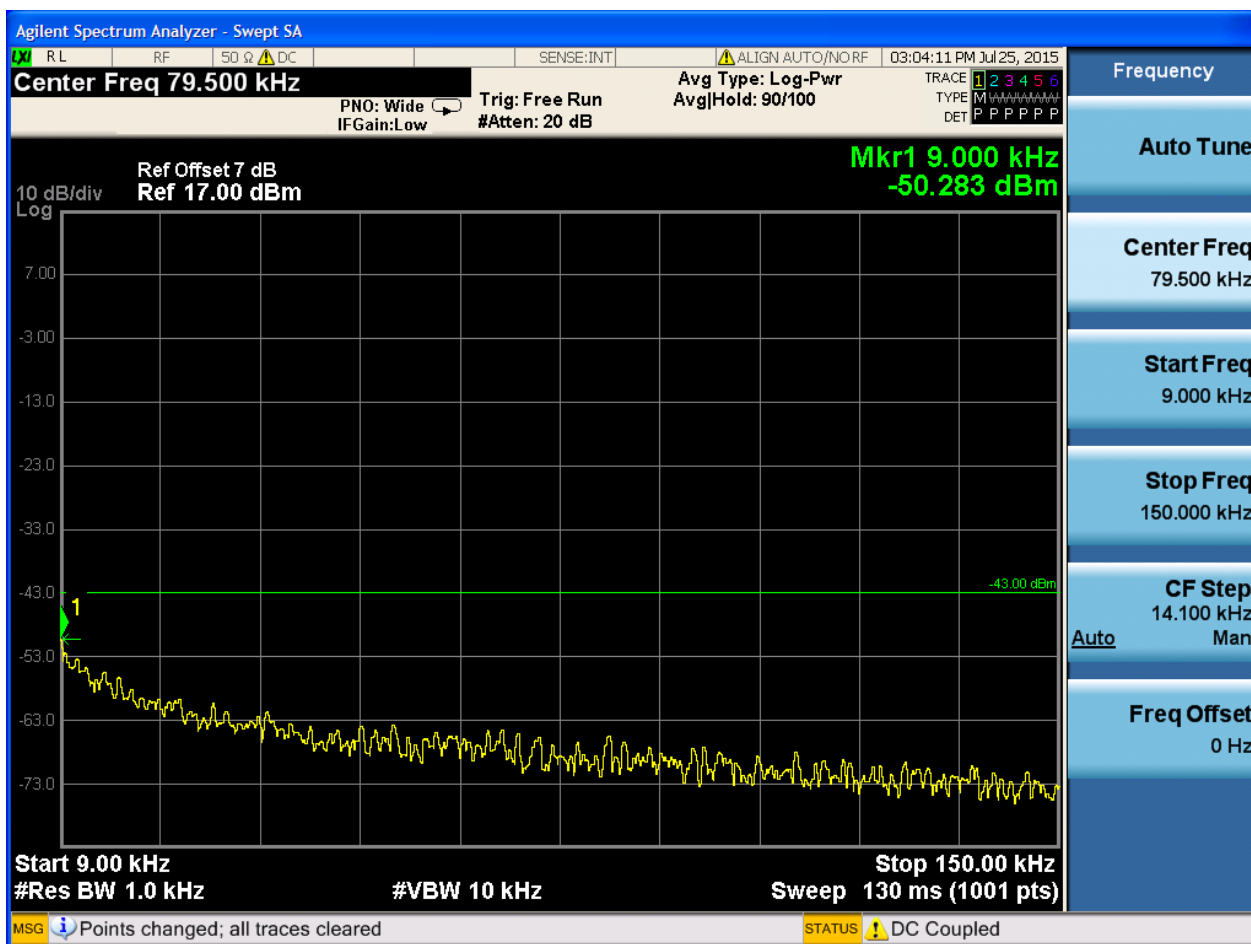
6.1.3.2.1 Test Channel = LCH

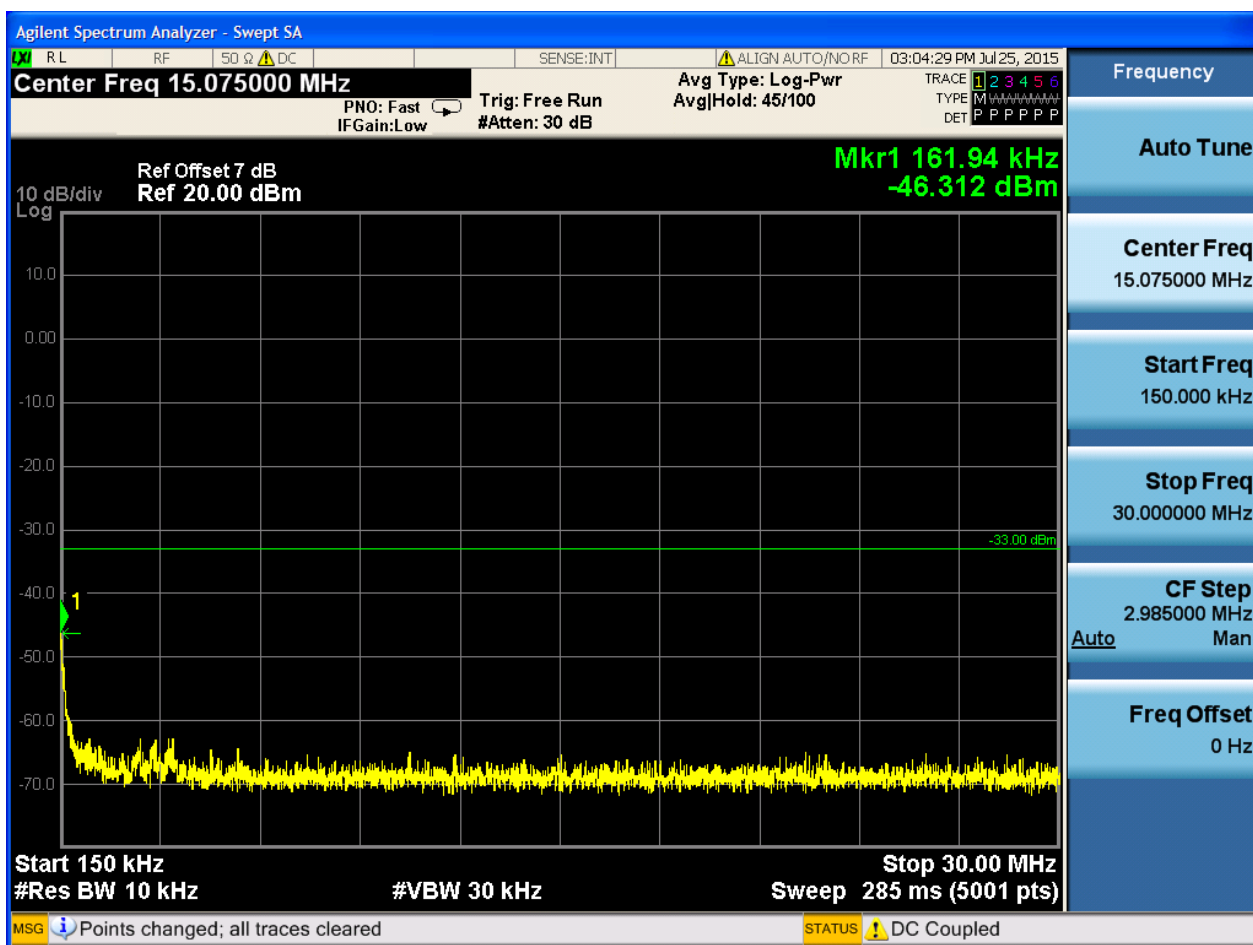


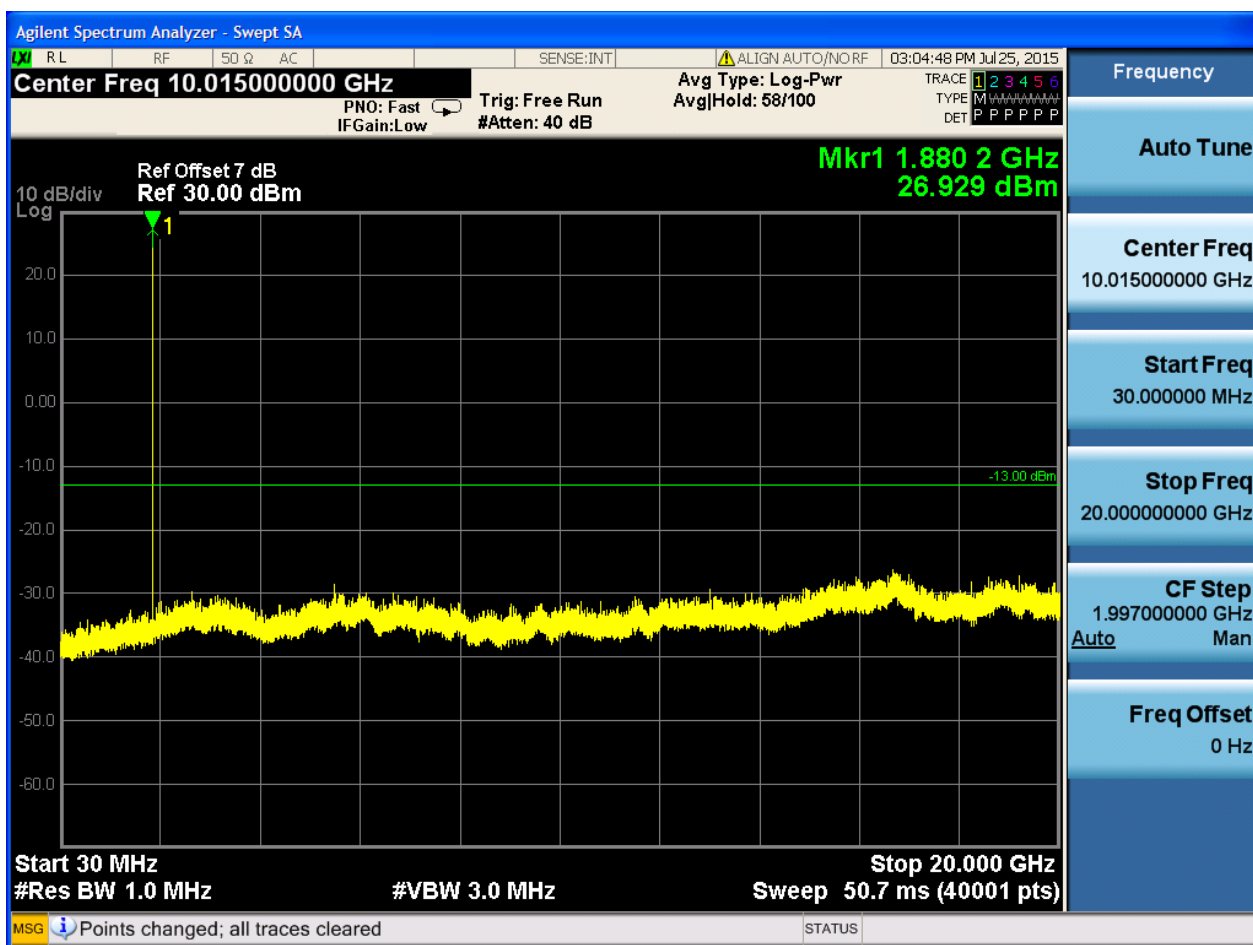




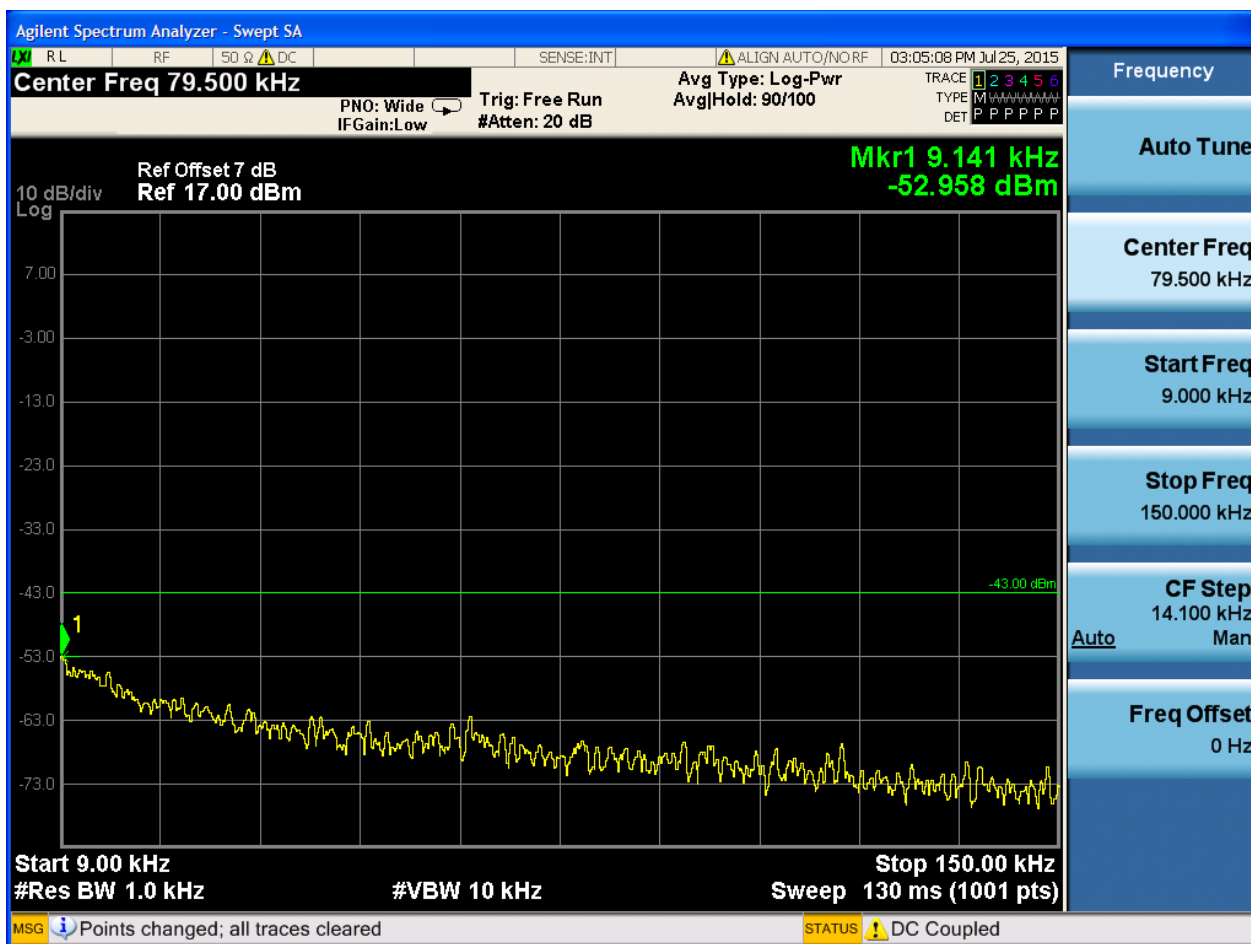
6.1.3.2.2 Test Channel = MCH

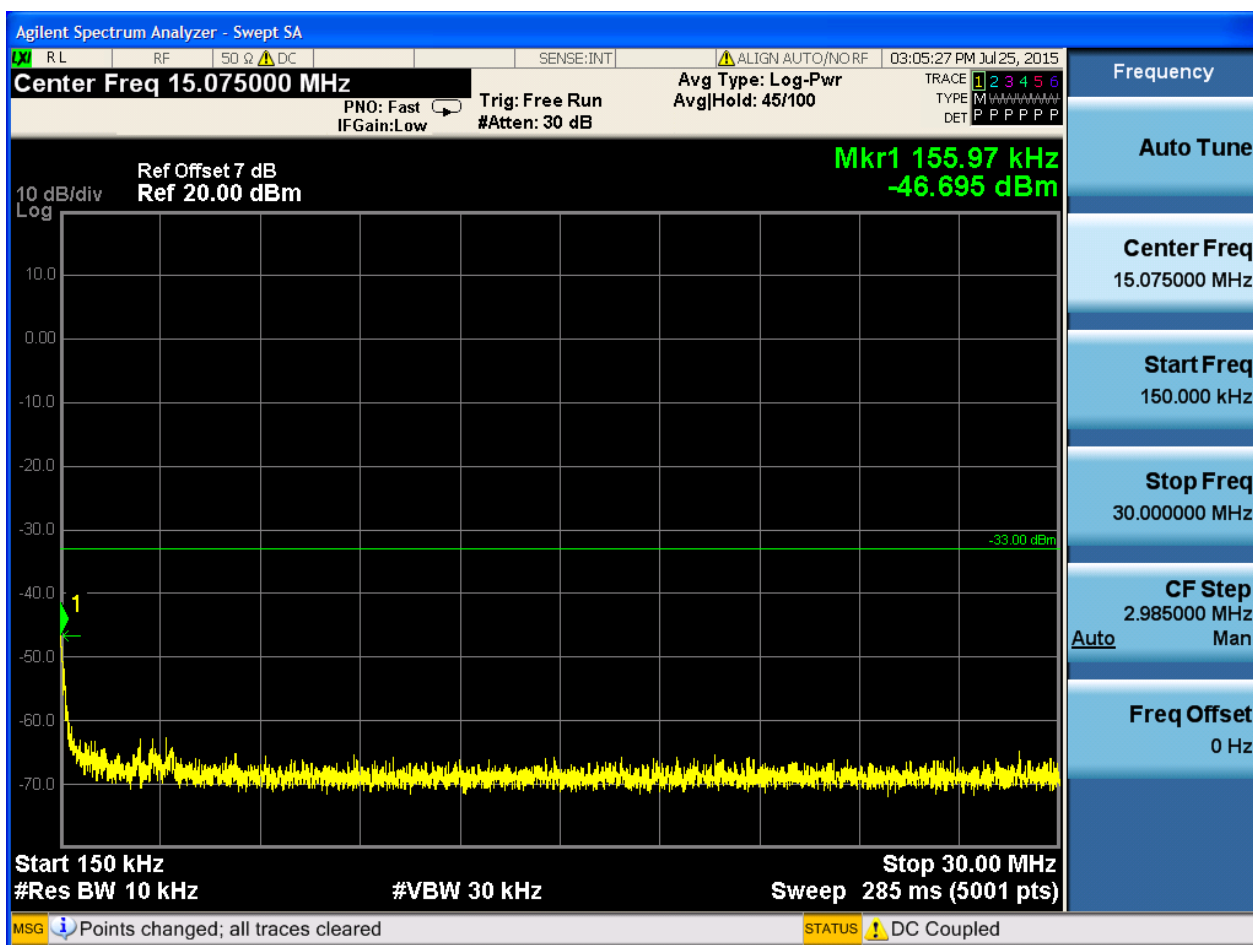


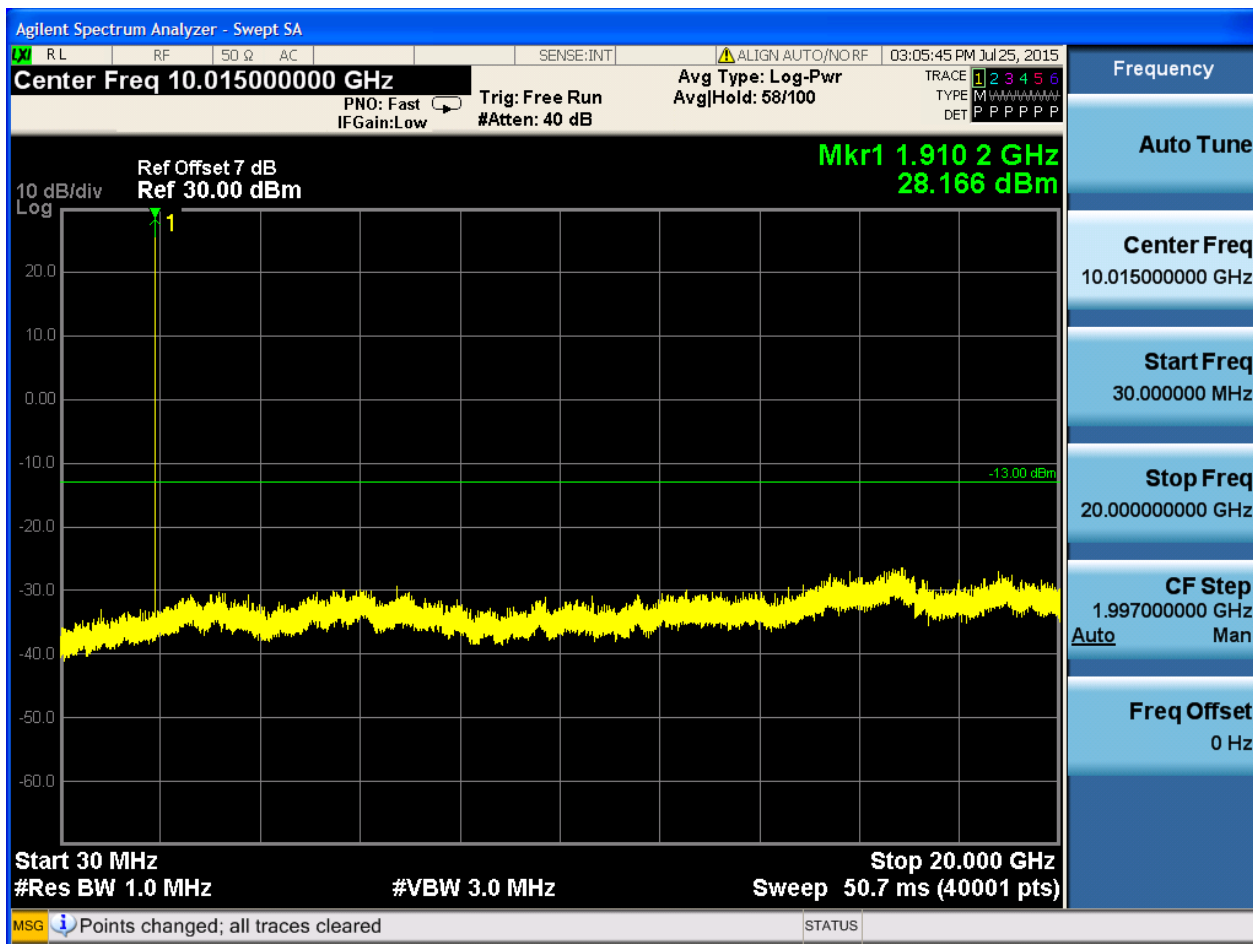




6.1.3.2.3 Test Channel = HCH







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

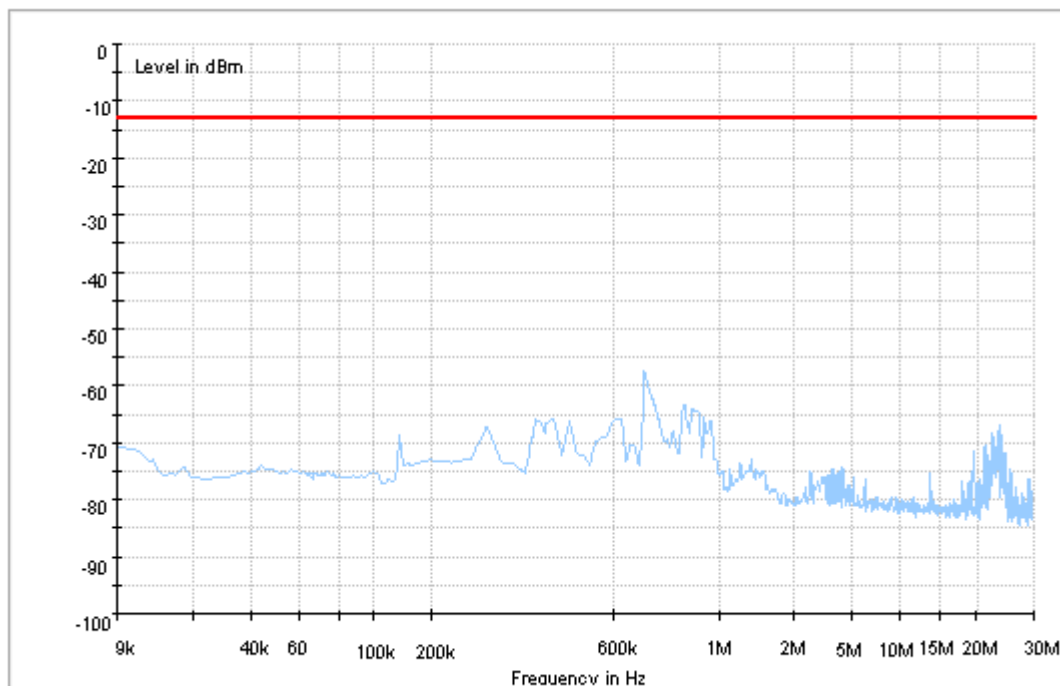
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

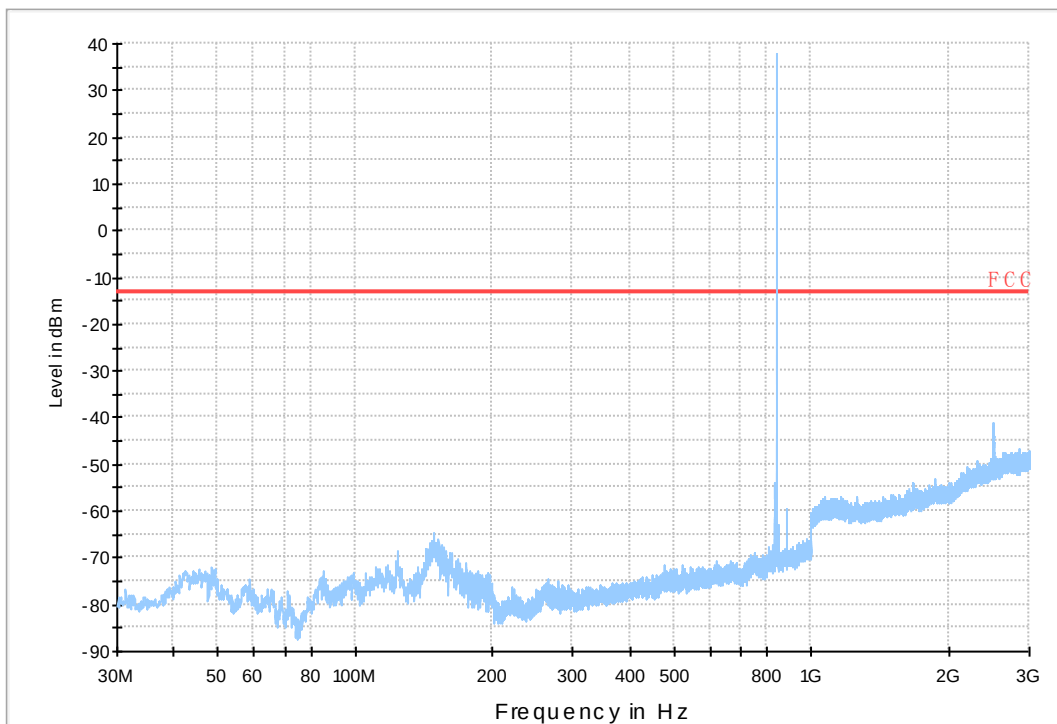
7.1 For GSM

7.1.2 Test Band = GSM850

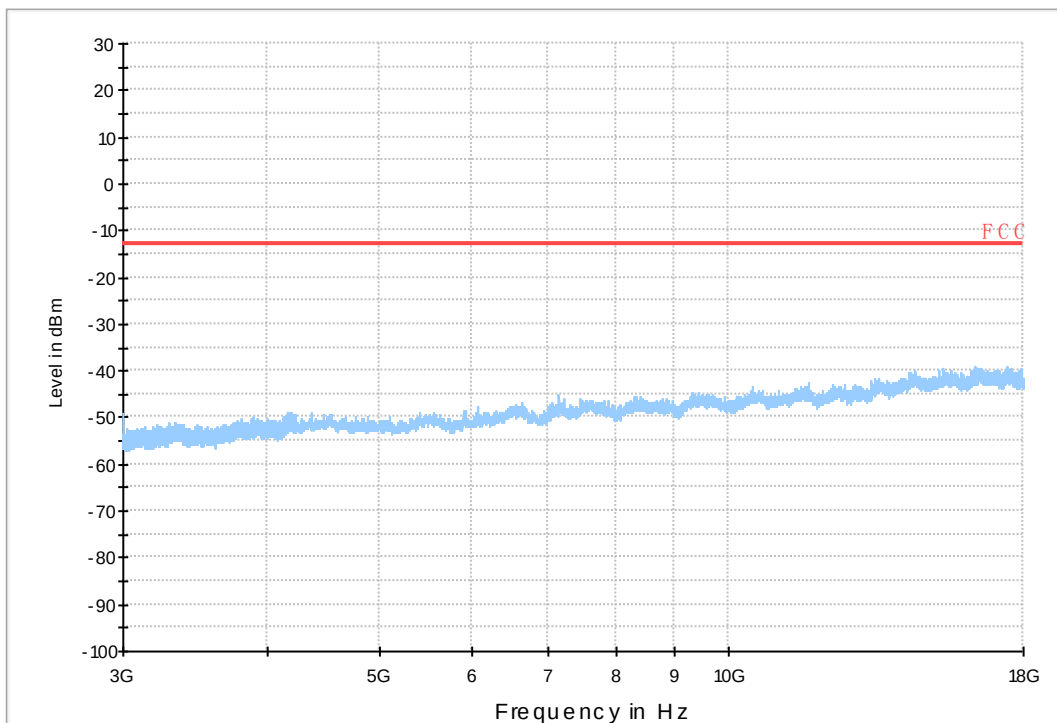
7.1.2.1 Test Mode = GSM/TM1



Copy of FCC PART22 GSM850_L

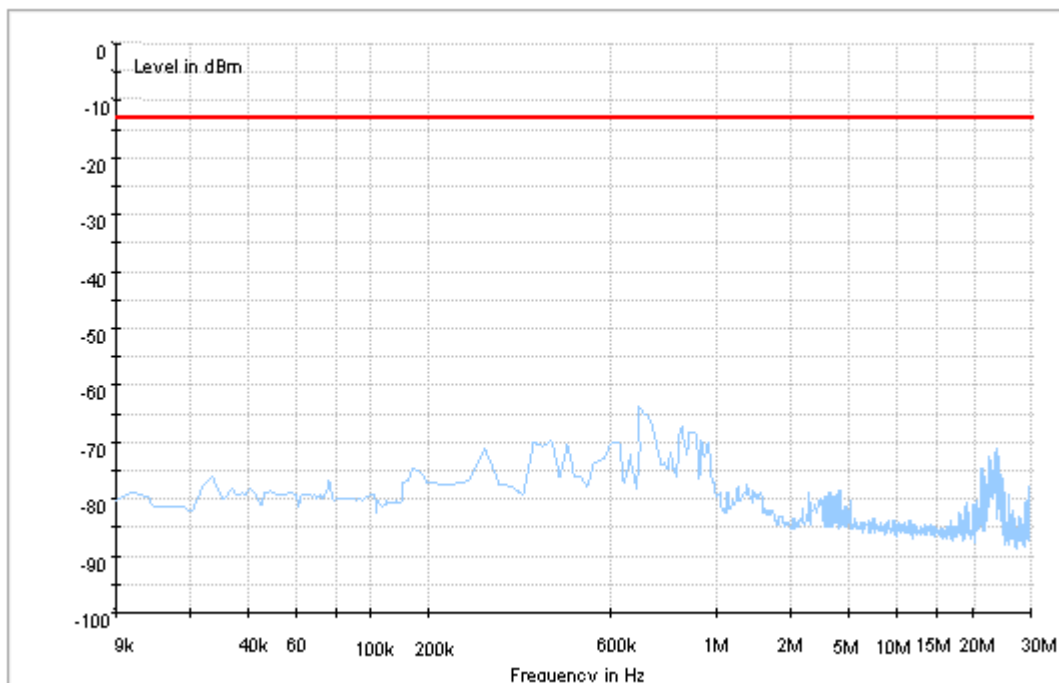


Copy of FCC PART22 GSM850_H

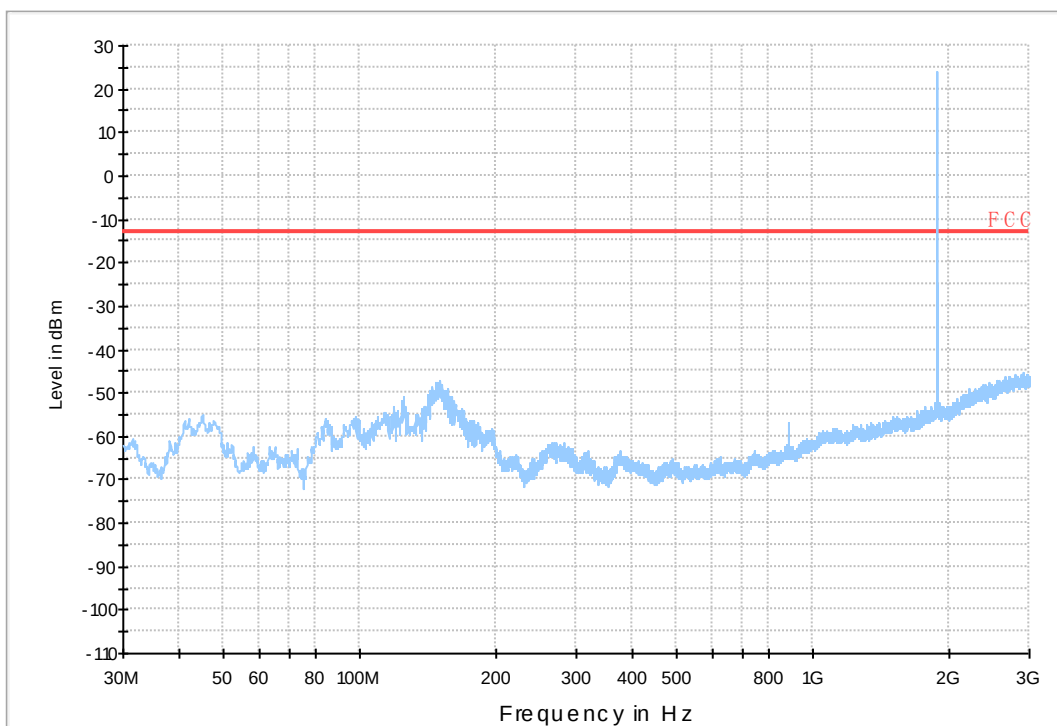


7.1.3 Test Band = GSM1900

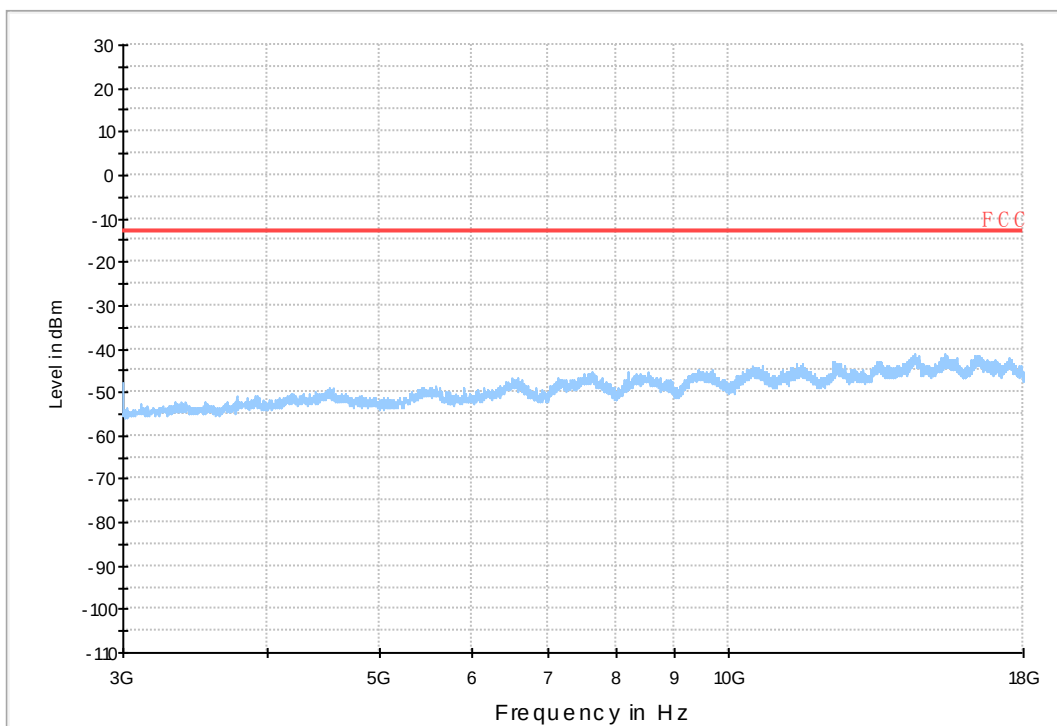
7.1.3.1 Test Mode = GSM/TM1

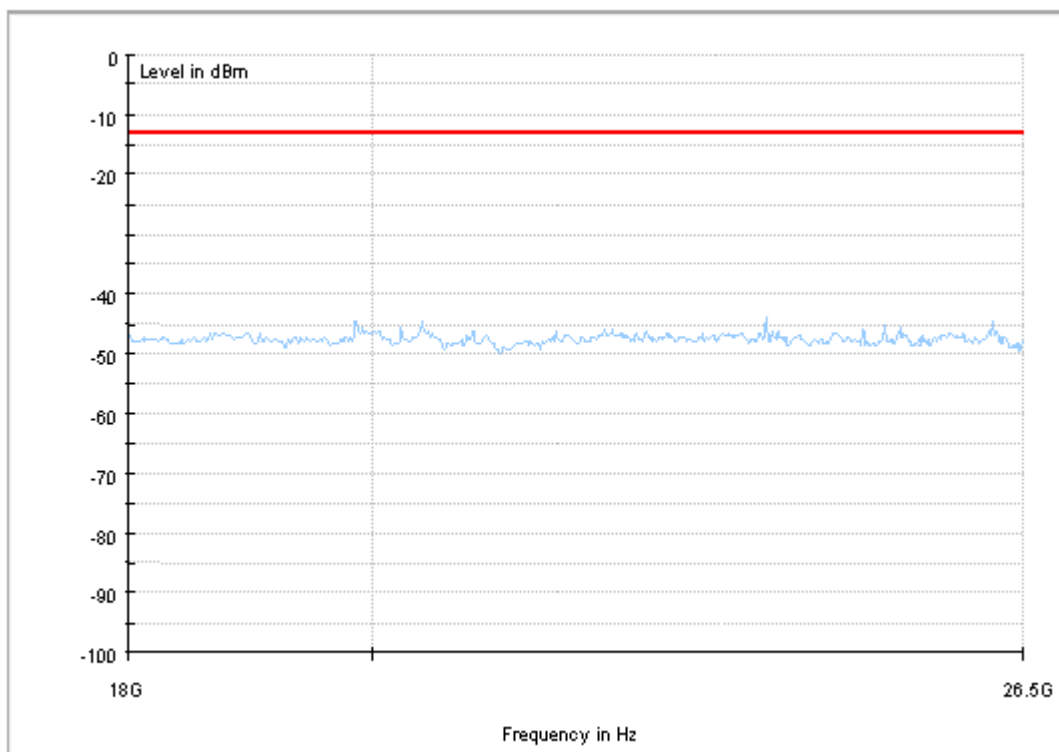


Copy of FCC PART24 GSM 1900_L



Copy of FCC PART24 GSM 1900_H





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	17.95	0.02178	PASS
				VN	10.98	0.01332	PASS
				VH	10.85	0.01316	PASS
		MCH	TN	VL	16.08	0.01922	PASS
				VN	13.30	0.0159	PASS
				VH	11.11	0.01328	PASS
		HCH	TN	VL	4.97	0.00586	PASS
				VN	5.55	0.00654	PASS
				VH	7.23	0.00852	PASS
	GSM/TM2	LCH	TN	VL	9.88	0.00534	PASS
				VN	7.85	0.00424	PASS
				VH	10.49	0.00567	PASS
		MCH	TN	VL	16.89	0.00898	PASS
				VN	15.76	0.00838	PASS
				VH	14.04	0.00747	PASS
		HCH	TN	VL	24.25	0.0127	PASS
				VN	19.44	0.01018	PASS
				VH	1.07	0.00056	PASS
GSM1900	GSM/TM1	LCH	TN	VL	16.14	0.00872	PASS
				VN	17.24	0.00932	PASS
				VH	14.46	0.00782	PASS
		MCH	TN	VL	16.47	0.00876	PASS
				VN	11.04	0.00587	PASS
				VH	13.69	0.00728	PASS
		HCH	TN	VL	13.24	0.00693	PASS
				VN	15.43	0.00808	PASS
				VH	14.27	0.00747	PASS
	GSM/TM2	LCH	TN	VL	11.91	0.00644	PASS
				VN	11.78	0.00637	PASS
				VH	12.72	0.00687	PASS
		MCH	TN	VL	16.21	0.00862	PASS
				VN	12.07	0.00642	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	TN	VH	15.95	0.00848	PASS
				VL	21.86	0.01145	PASS
				VN	21.24	0.01112	PASS
				VH	21.66	0.01134	PASS

8.1.2 Frequency 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	11.36	0.01378	PASS
				-20	12.98	0.01575	PASS
				-10	12.72	0.01543	PASS
				0	10.59	0.01285	PASS
				10	9.17	0.01113	PASS
				20	6.20	0.00752	PASS
				30	14.98	0.01818	PASS
				40	10.53	0.01278	PASS
				50	10.59	0.01285	PASS
		MCH	VN	-30	18.40	0.02199	PASS
				-20	15.50	0.01853	PASS
				-10	15.69	0.01875	PASS
				0	15.63	0.01868	PASS
				10	16.21	0.01938	PASS
				20	12.59	0.01505	PASS
				30	20.02	0.02393	PASS
				40	17.05	0.02038	PASS
				50	13.04	0.01559	PASS
		HCH	VN	-30	5.94	0.007	PASS
				-20	18.98	0.02236	PASS
				-10	1.94	0.00229	PASS
				0	3.68	0.00434	PASS
				10	4.65	0.00548	PASS
				20	0.71	0.00084	PASS
				30	1.87	0.0022	PASS
				40	1.68	0.00198	PASS
				50	2.13	0.00251	PASS
	GSM/TM2	LCH	VN	-30	12.72	0.00687	PASS
				-20	13.11	0.00709	PASS
				-10	13.33	0.0072	PASS
				0	11.56	0.00625	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	15.98	0.00864	PASS
				20	12.30	0.00665	PASS
				30	11.43	0.00618	PASS
				40	11.91	0.00644	PASS
				50	9.10	0.00492	PASS
		MCH	VN	-30	12.98	0.0069	PASS
				-20	10.23	0.00544	PASS
				-10	7.94	0.00422	PASS
				0	11.75	0.00625	PASS
				10	9.01	0.00479	PASS
				20	14.75	0.00785	PASS
				30	12.95	0.00689	PASS
				40	8.46	0.0045	PASS
				50	9.69	0.00515	PASS
		HCH	VN	-30	18.56	0.00972	PASS
				-20	23.31	0.01221	PASS
				-10	18.92	0.00991	PASS
				0	20.89	0.01094	PASS
				10	18.02	0.00944	PASS
				20	19.50	0.01021	PASS
				30	21.41	0.01121	PASS
				40	21.21	0.01111	PASS
				50	2.00	0.00105	PASS
GSM1900	GSM/TM1	LCH	VN	-30	13.37	0.00723	PASS
				-20	10.59	0.00572	PASS
				-10	14.21	0.00768	PASS
				0	13.56	0.00733	PASS
				10	8.85	0.00478	PASS
				20	13.95	0.00754	PASS
				30	5.55	0.003	PASS
				40	14.79	0.00799	PASS
				50	15.69	0.00848	PASS
		MCH	VN	-30	15.88	0.00845	PASS
				-20	12.53	0.00666	PASS
				-10	9.23	0.00491	PASS
				0	10.91	0.0058	PASS
				10	18.79	0.00999	PASS
				20	12.27	0.00653	PASS
				30	13.82	0.00735	PASS
				40	14.66	0.0078	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	VN	50	13.30	0.00707	PASS
				-30	13.95	0.0073	PASS
				-20	-7.81	-0.00409	PASS
				-10	17.69	0.00926	PASS
				0	16.01	0.00838	PASS
				10	16.47	0.00862	PASS
				20	-1.74	-0.00091	PASS
				30	15.37	0.00805	PASS
				40	16.92	0.00886	PASS
				50	15.88	0.00832	PASS
	GSM/TM2	LCH	VN	-30	10.53	0.00569	PASS
				-20	7.59	0.0041	PASS
				-10	10.59	0.00572	PASS
				0	17.76	0.0096	PASS
				10	13.04	0.00705	PASS
				20	14.75	0.00797	PASS
				30	12.46	0.00673	PASS
				40	12.88	0.00696	PASS
				50	15.92	0.0086	PASS
		MCH	VN	-30	16.14	0.00859	PASS
				-20	20.08	0.01068	PASS
				-10	18.08	0.00962	PASS
				0	16.59	0.00882	PASS
				10	13.50	0.00718	PASS
				20	12.56	0.00668	PASS
				30	15.59	.00829	PASS
				40	13.62	0.00724	PASS
				50	13.88	0.00738	PASS
		HCH	VN	-30	22.34	0.0117	PASS
				-20	26.09	0.01366	PASS
				-10	17.98	0.00941	PASS
				0	21.18	0.01109	PASS
				10	23.50	0.0123	PASS
				20	15.08	0.0079	PASS
				30	18.89	0.00989	PASS
				40	18.37	0.00962	PASS
				50	19.21	0.01006	PASS

END