



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	32.41	27.66	38.5	PASS
		MCH	32.71	27.96	38.5	PASS
		HCH	32.68	27.93	38.5	PASS
	GSM/TM2	LCH	26.81	22.06	38.5	PASS
		MCH	26.72	21.97	38.5	PASS
		HCH	26.69	21.94	38.5	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.72	30.72	33	PASS
		MCH	29.6	30.6	33	PASS
		HCH	29.5	30.5	33	PASS
	GSM/TM2	LCH	25.85	26.85	33	PASS
		MCH	25.81	26.81	33	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
		HCH	25.79	26.79	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:

$$\text{SET Span} = 1.5 * \text{OBW}$$

$$\text{SET RBW} = 1\% \text{ of the OBW, not to exceed 1MHz}$$

$$\text{SET VBW} \geq 3 * \text{RBW}$$

SET Sweep time=auto-couple.

Detector:RMS

2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM850	GSM/TM1	LCH	0.25	13	PASS
		MCH	0.27	13	PASS
		HCH	0.24	13	PASS
	GSM/TM2	LCH	2.79	13	PASS
		MCH	2.93	13	PASS
		HCH	2.92	13	PASS
GSM1900	GSM/TM1	LCH	0.31	13	PASS
		MCH	0.27	13	PASS
		HCH	0.29	13	PASS
	GSM/TM2	LCH	2.86	13	PASS
		MCH	2.96	13	PASS
		HCH	2.86	13	PASS

3Appendix_C: Modulation Characteristics

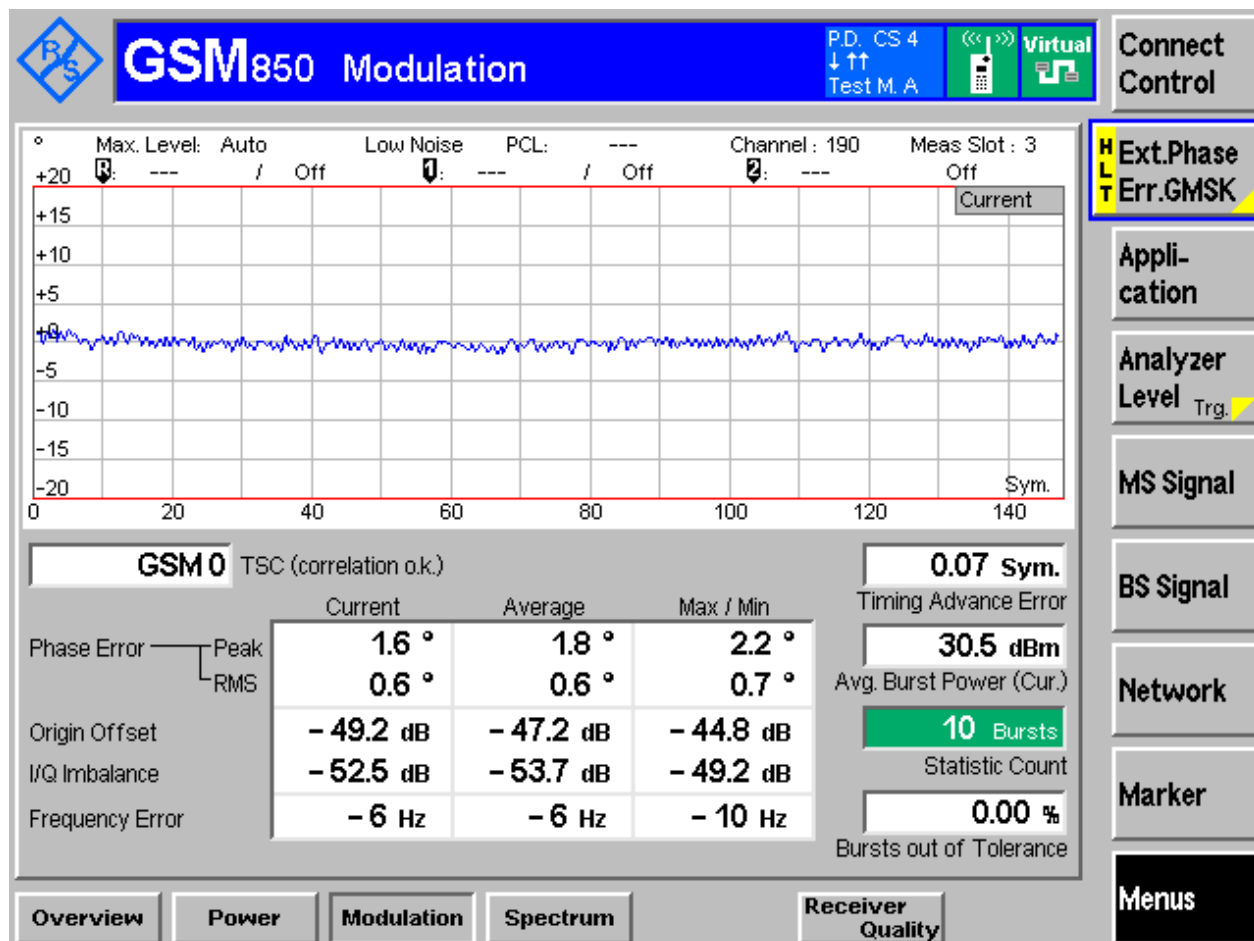
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

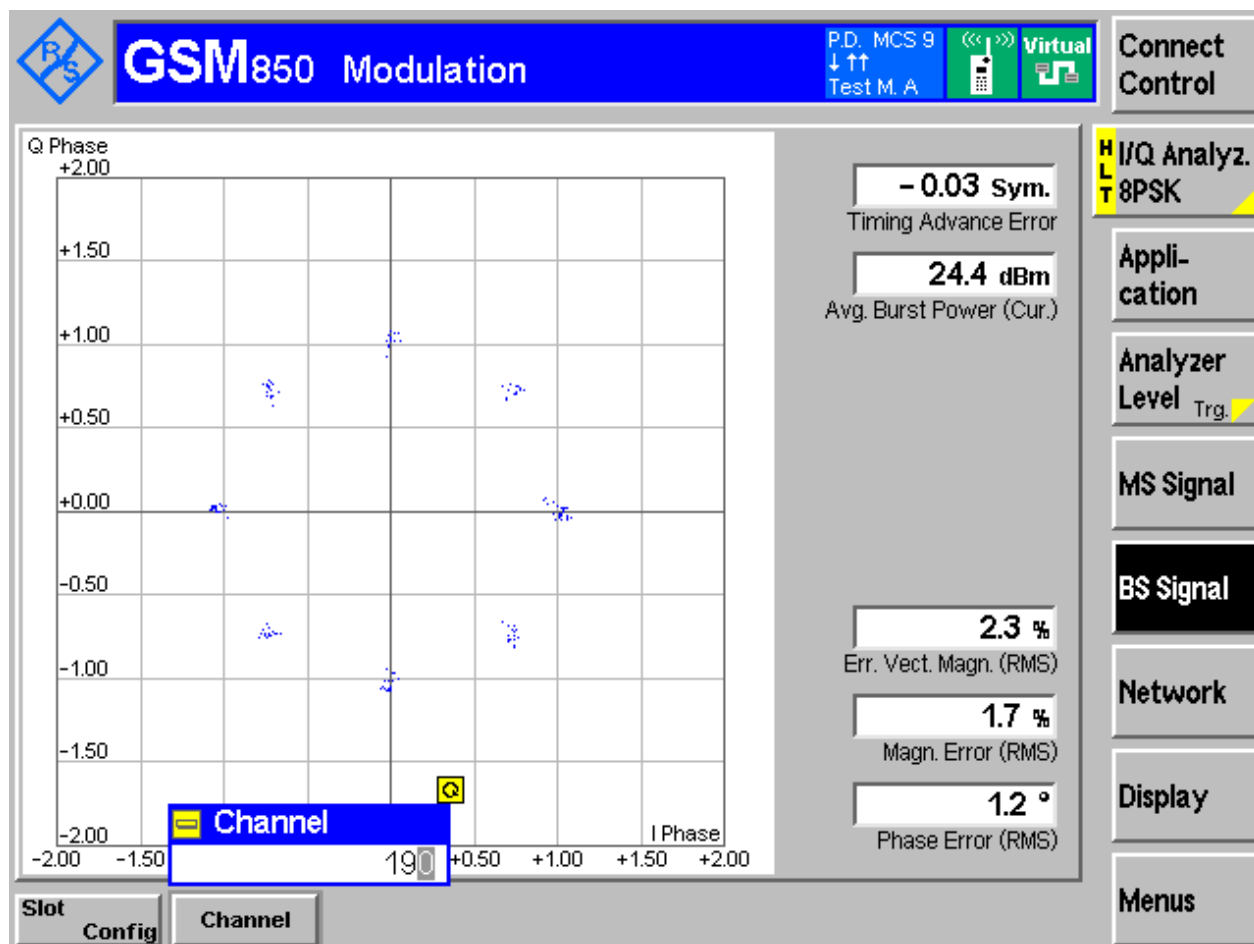
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

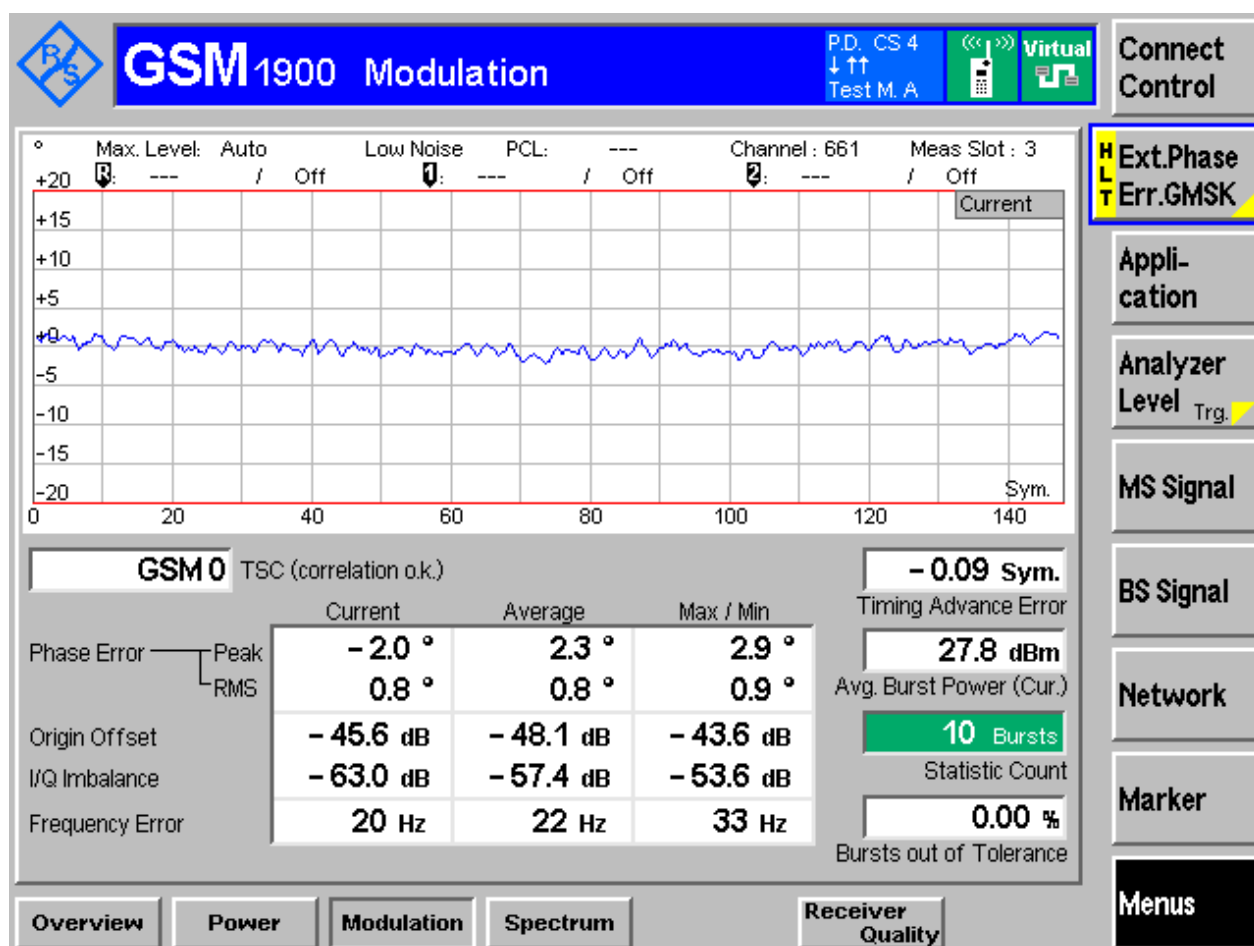
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

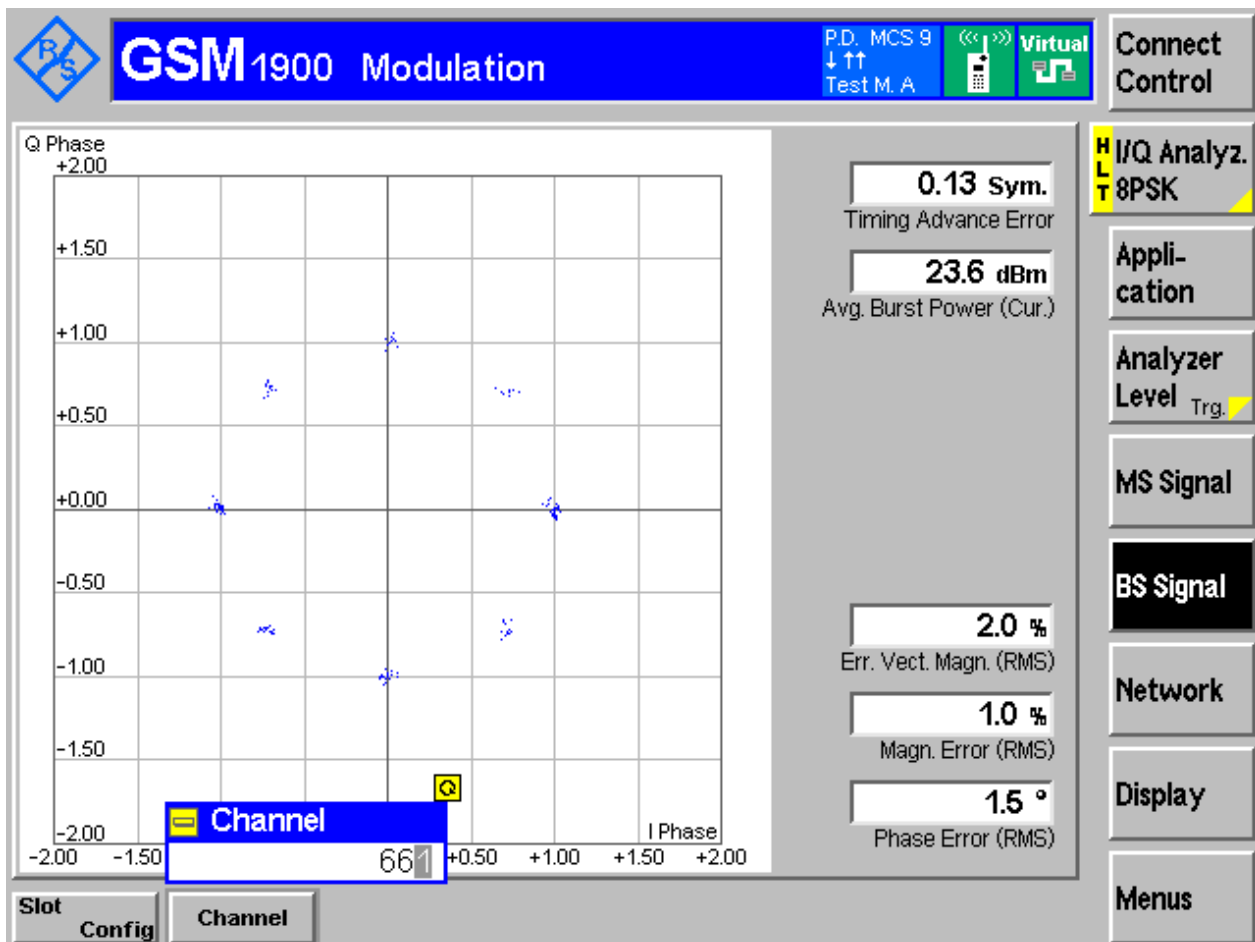
3.1.2.1 Test Mode = GSM/TM1

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	245.56	312.82	Pass
		MCH	244.67	314.89	Pass
		HCH	244.38	312.02	Pass
	GSM/TM2	LCH	252.05	337.22	Pass
		MCH	252.62	321.84	Pass
		HCH	253.48	329.80	Pass
GSM1900	GSM/TM1	LCH	245.77	315.03	Pass
		MCH	247.19	316.71	Pass
		HCH	245.36	315.20	Pass
	GSM/TM2	LCH	251.22	328.36	Pass
		MCH	248.72	325.85	Pass
		HCH	253.49	320.79	Pass

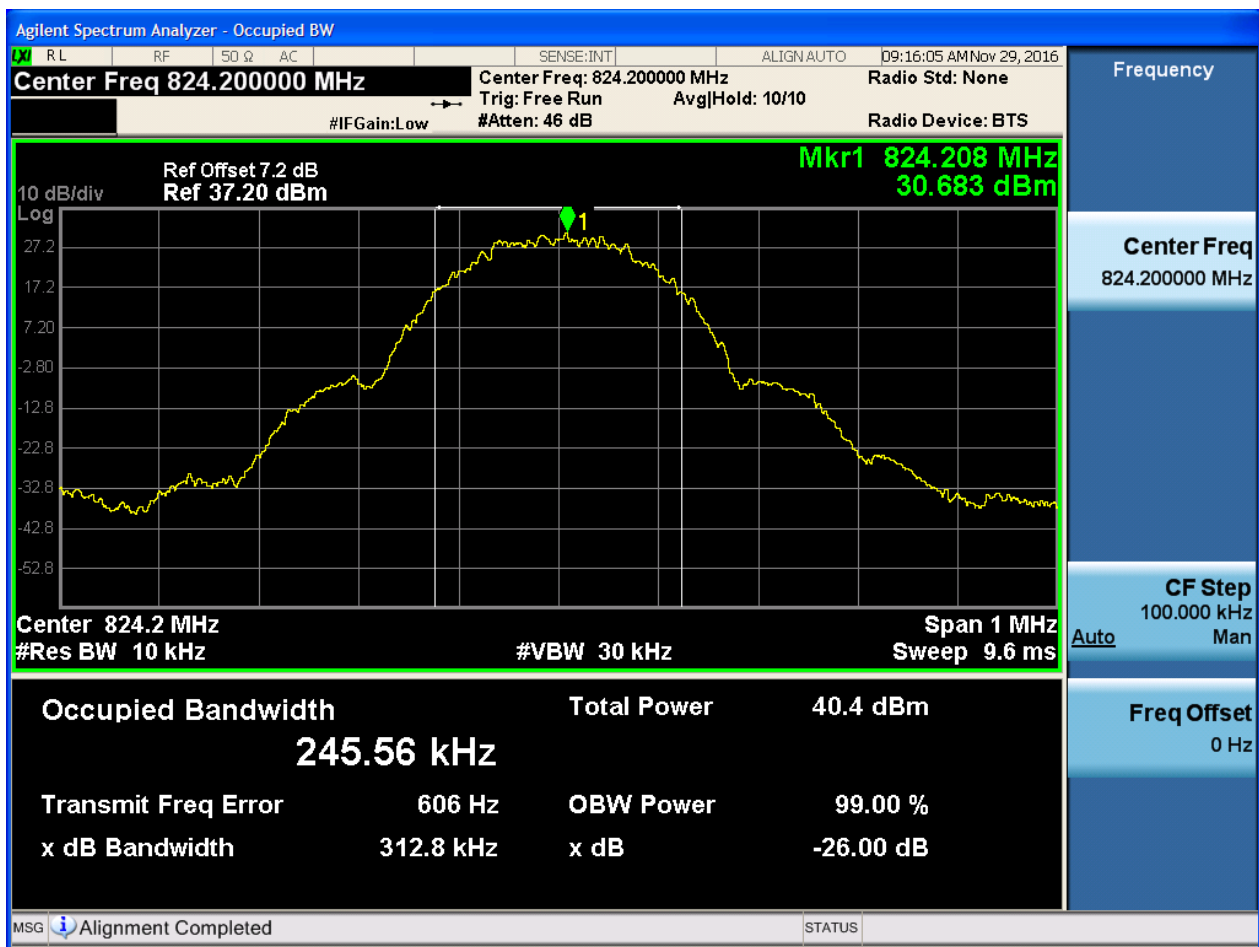
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM850

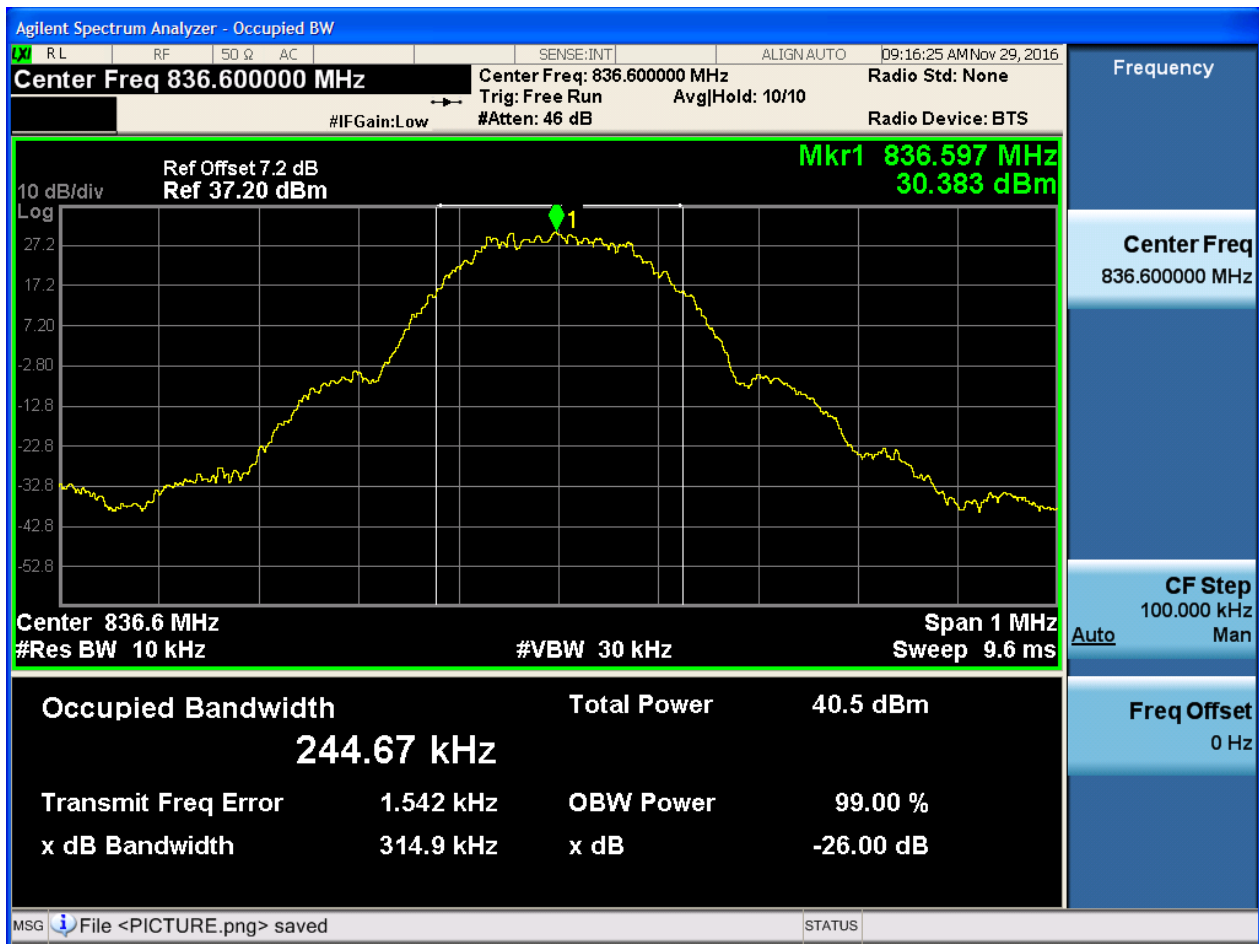
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



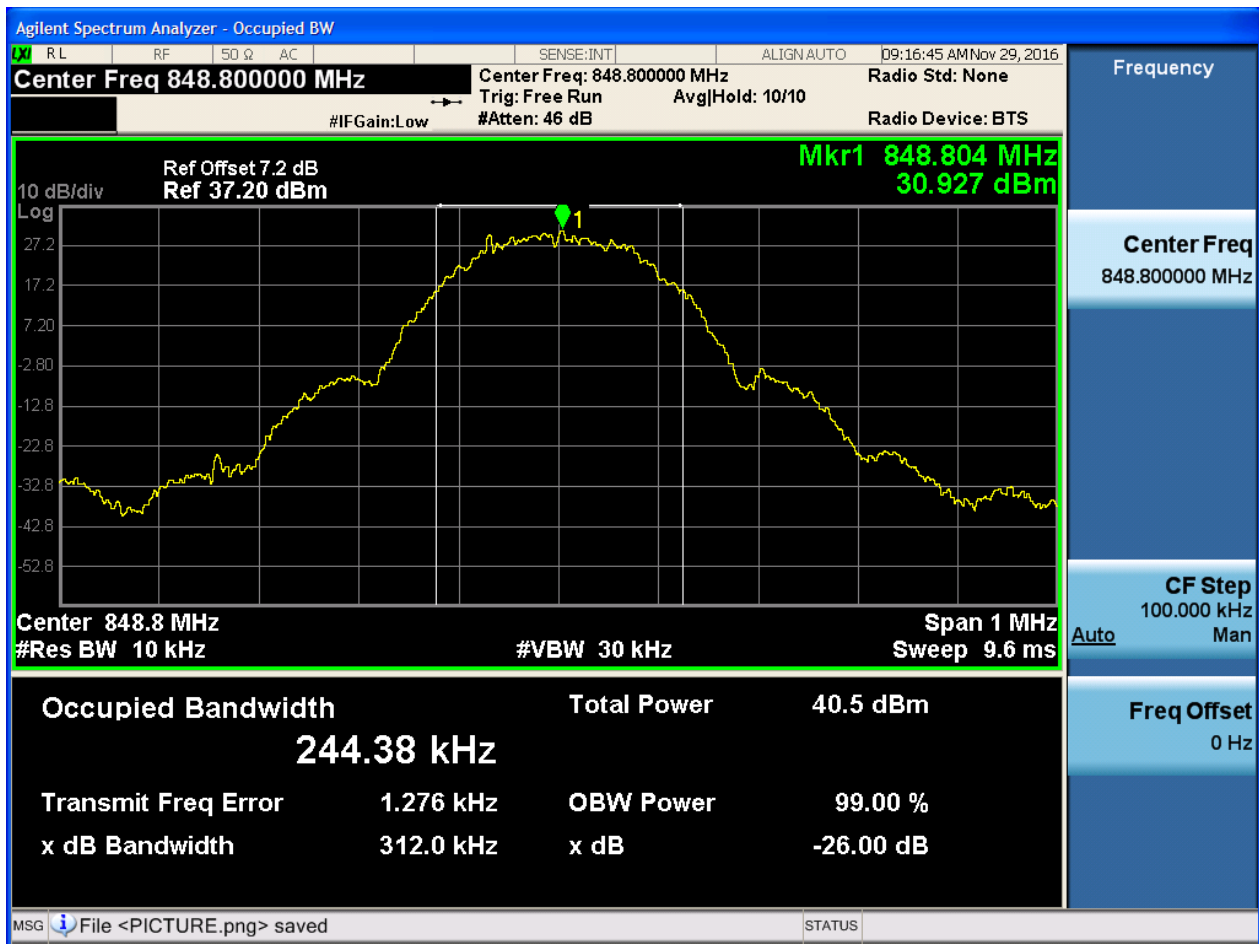


4.1.1.1.2 Test Channel = MCH





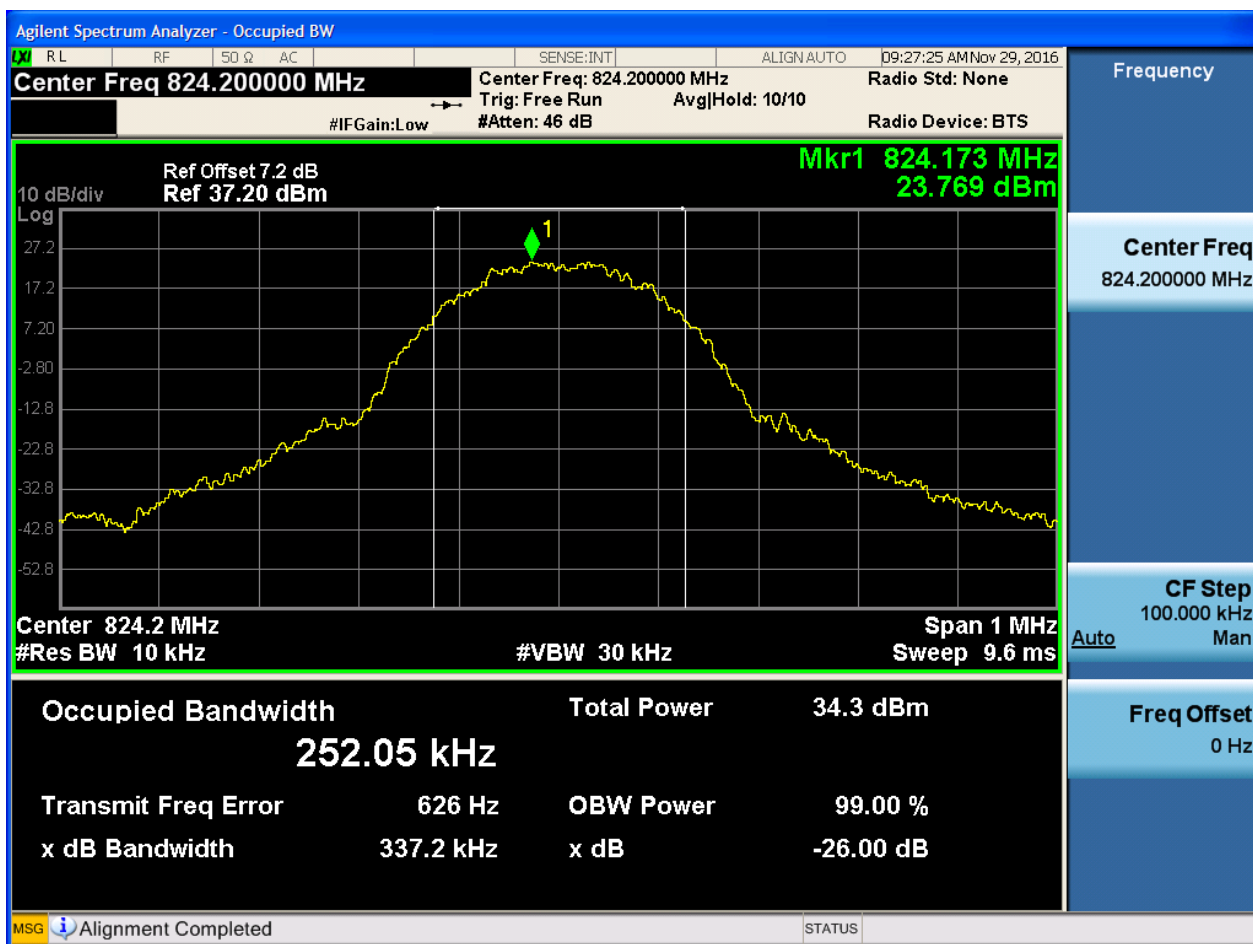
4.1.1.1.3 Test Channel = HCH





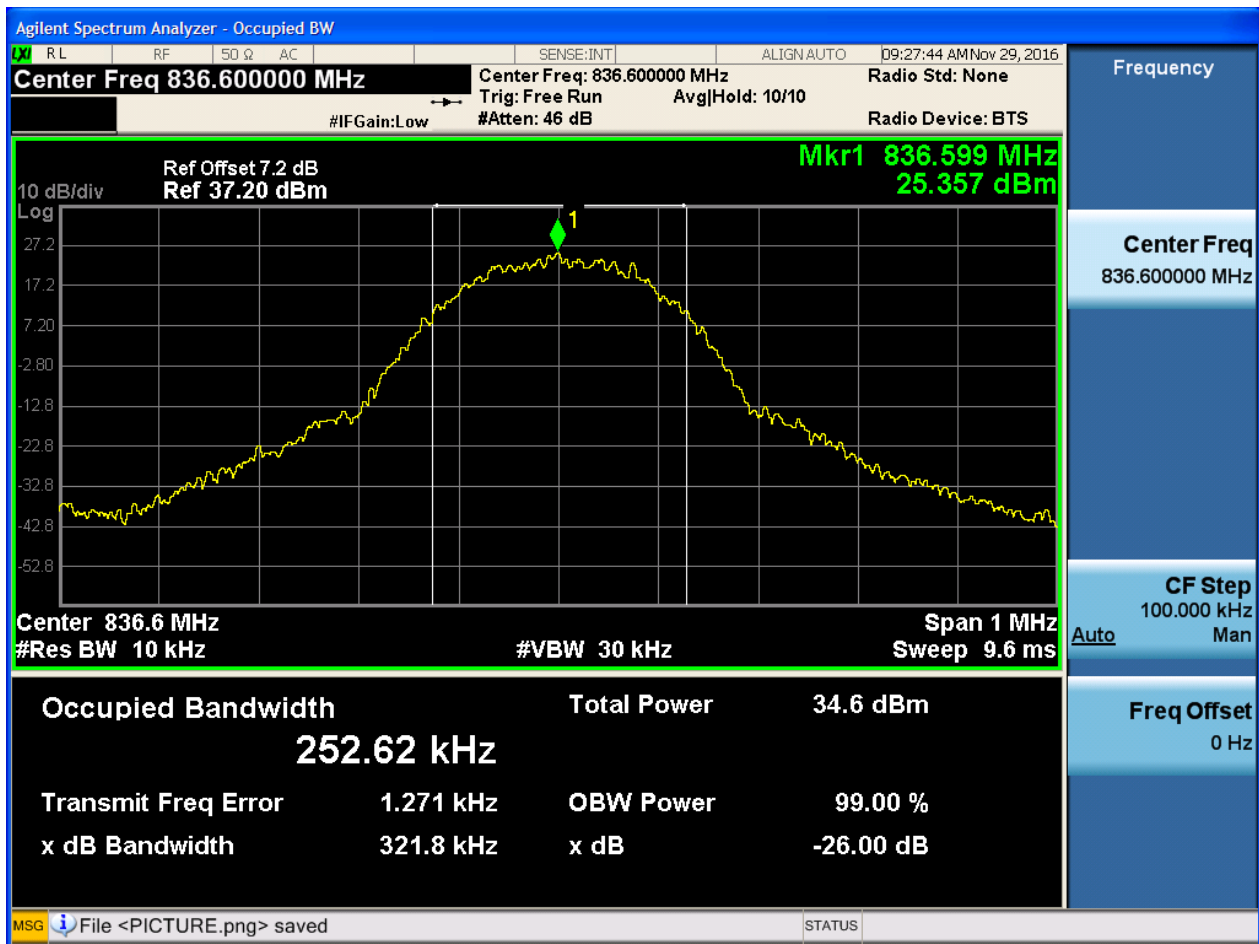
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4.1.1.2.1 Test Channel = LCH



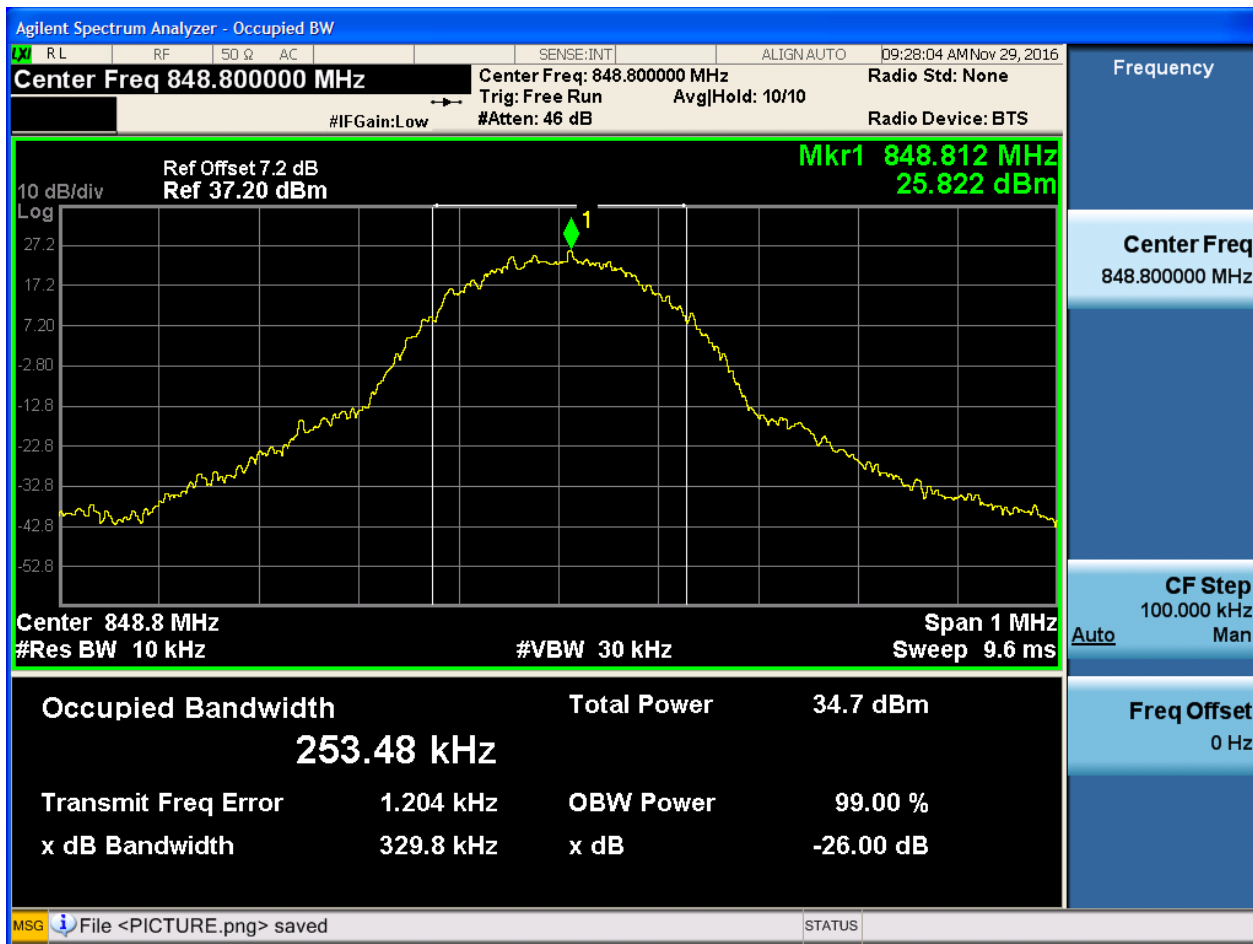


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

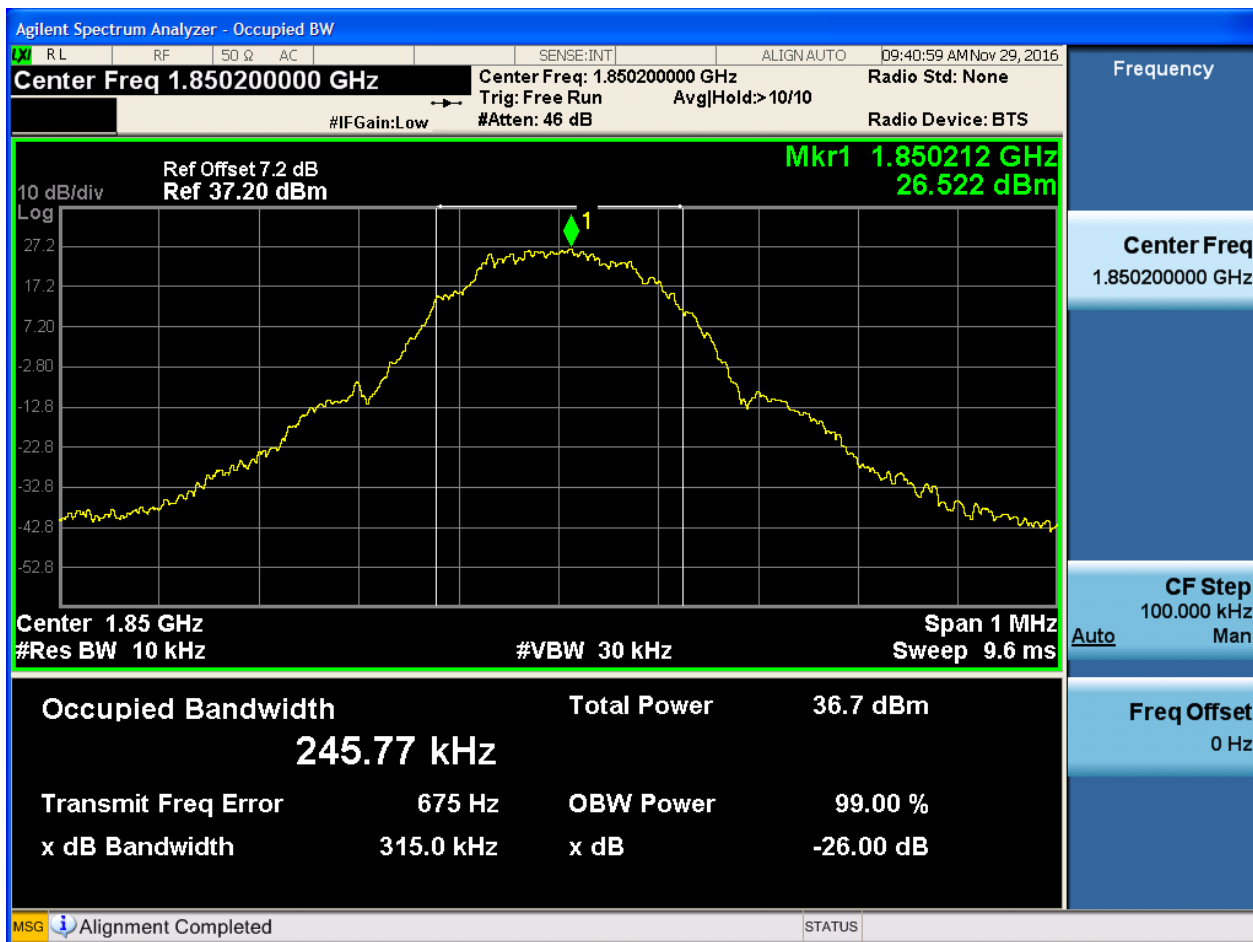




4.1.2 Test Band = GSM1900

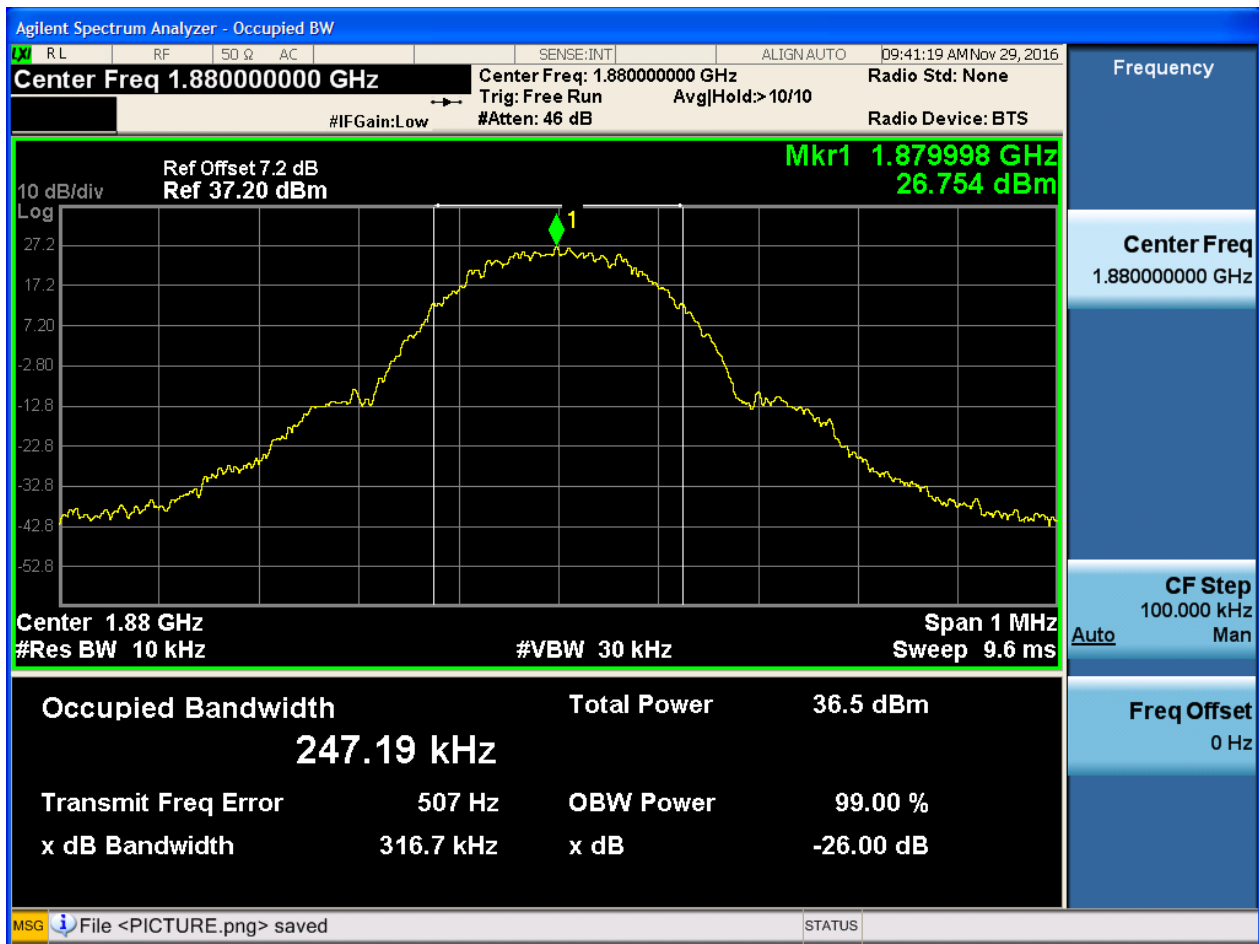
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



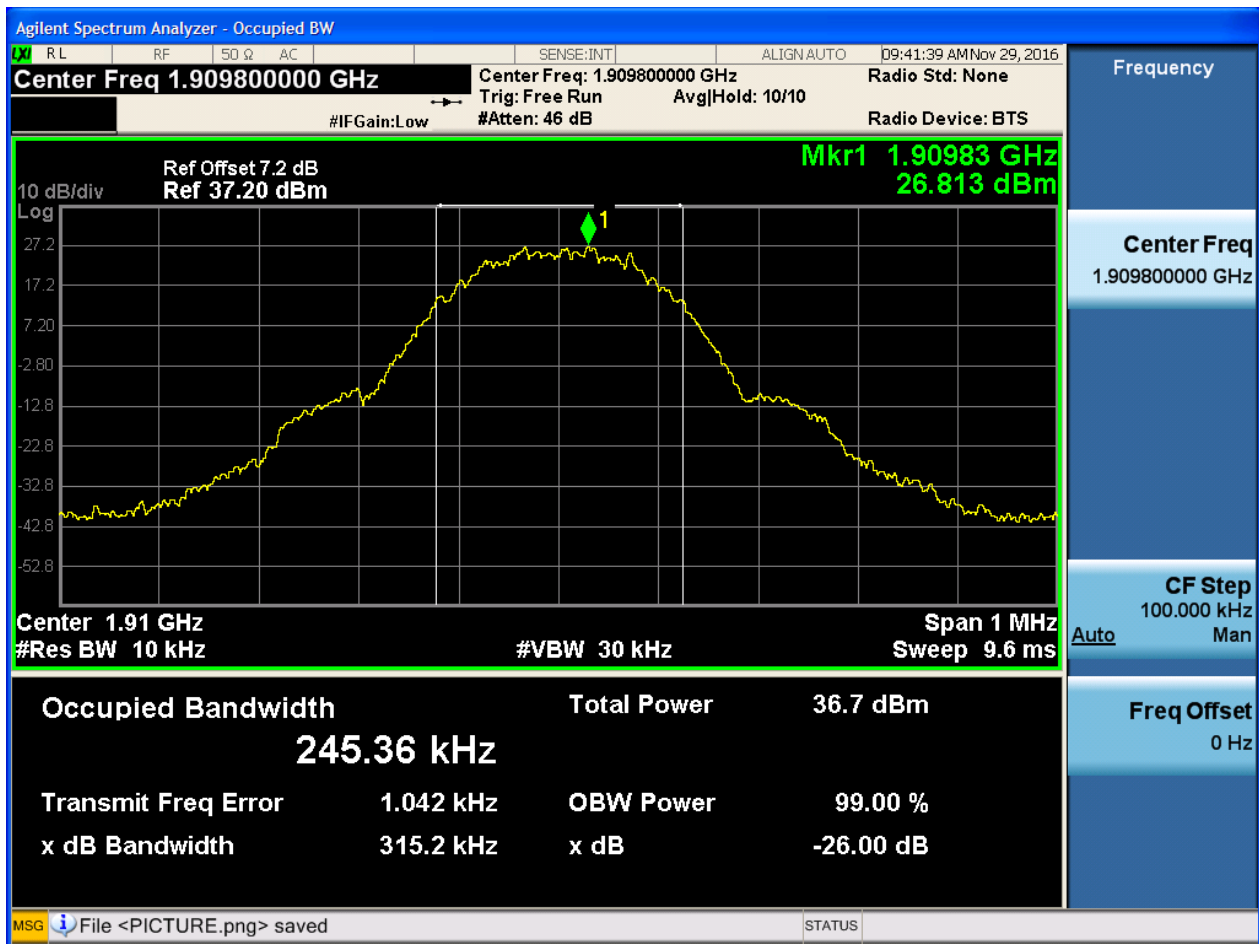


4.1.2.1.2 Test Channel = MCH





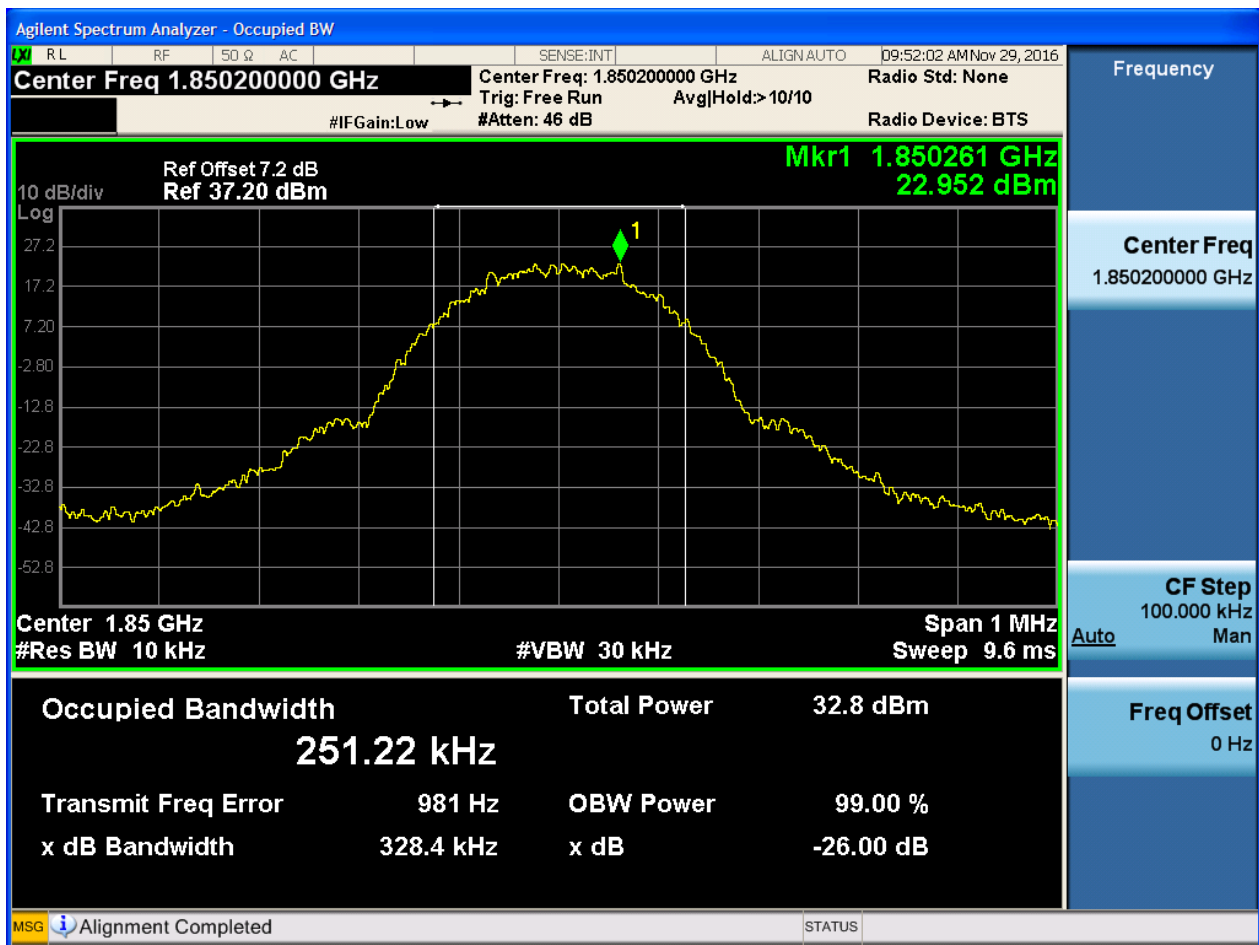
4.1.2.1.3 Test Channel = HCH





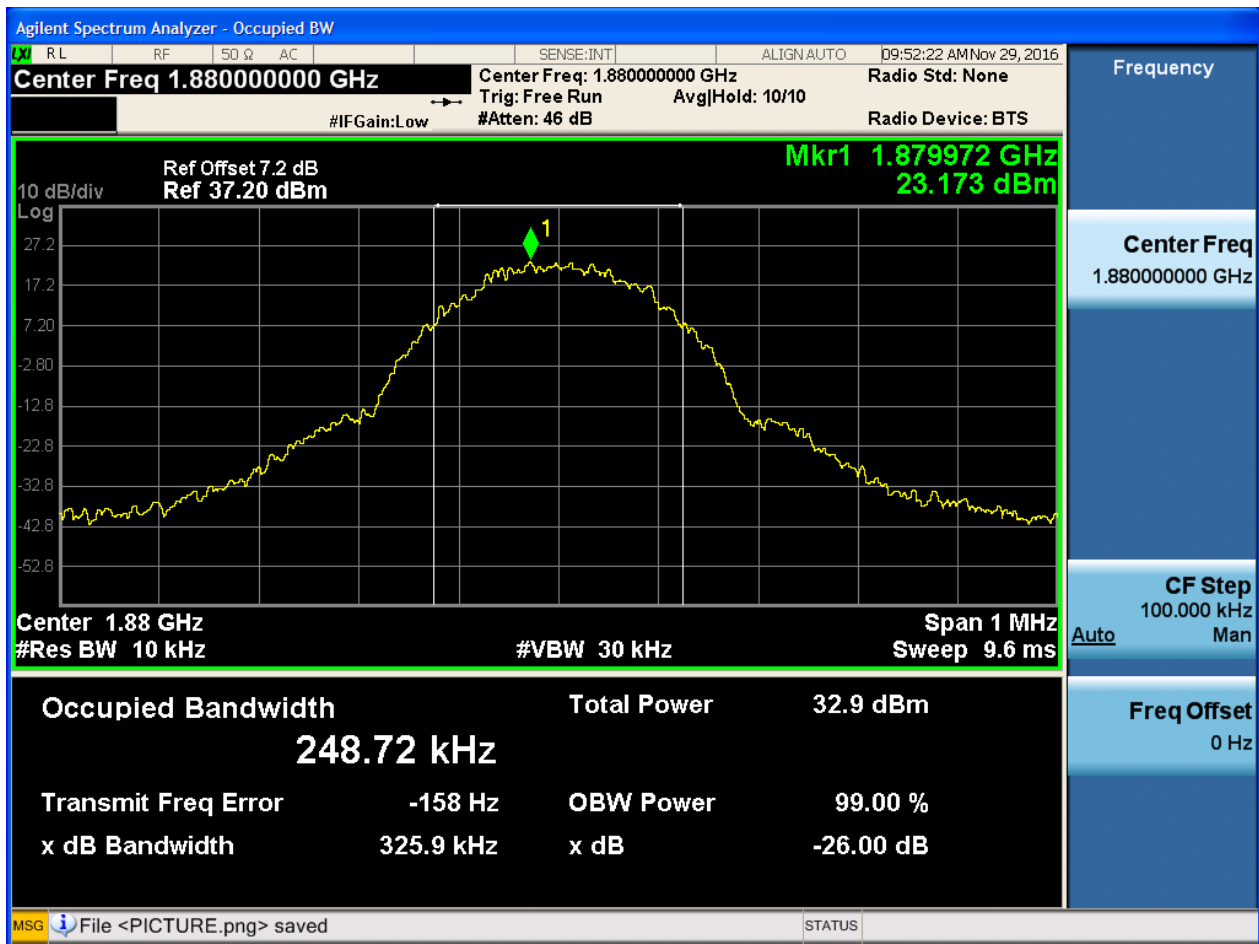
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



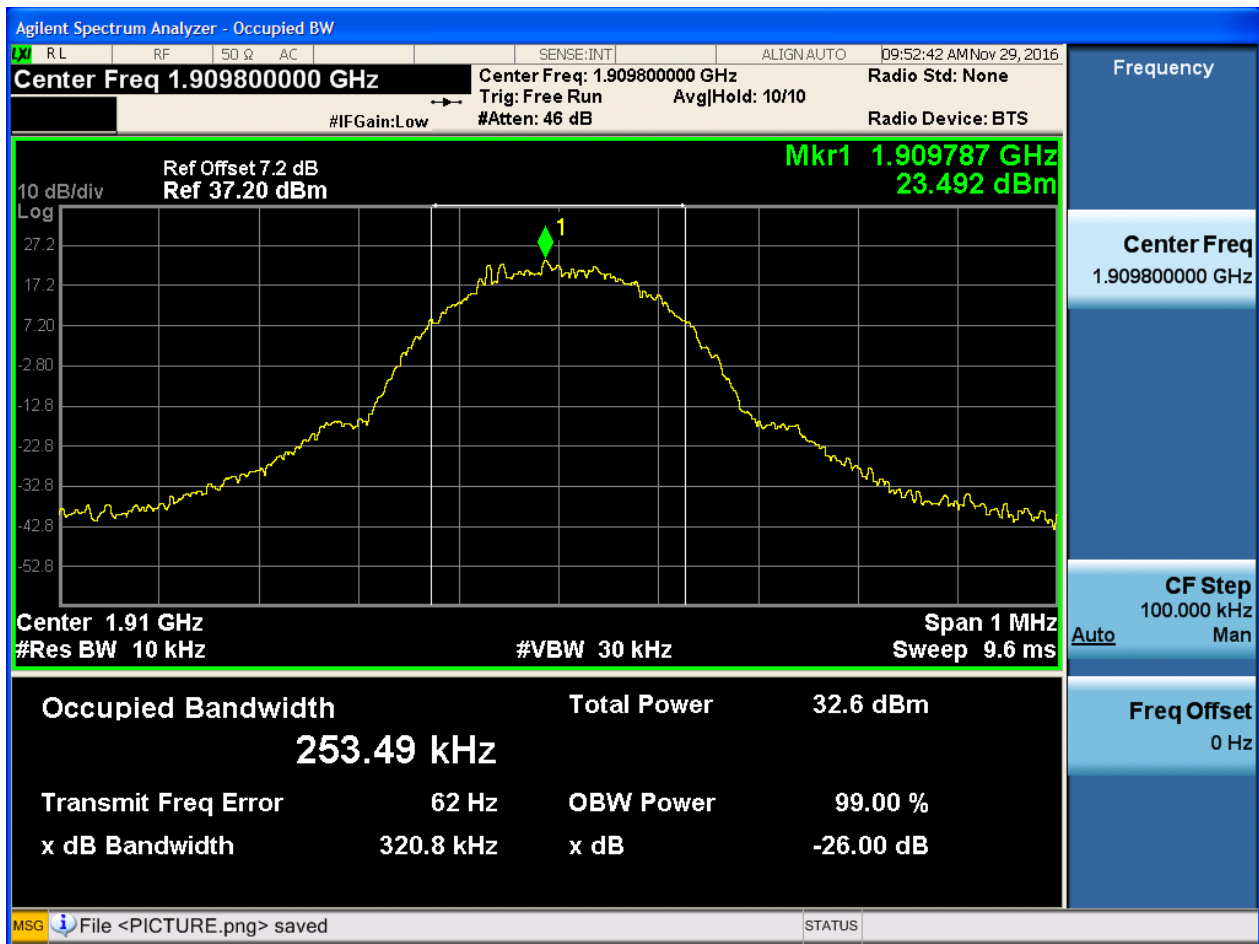


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH



5Appendix_E: Band Edges Compliance

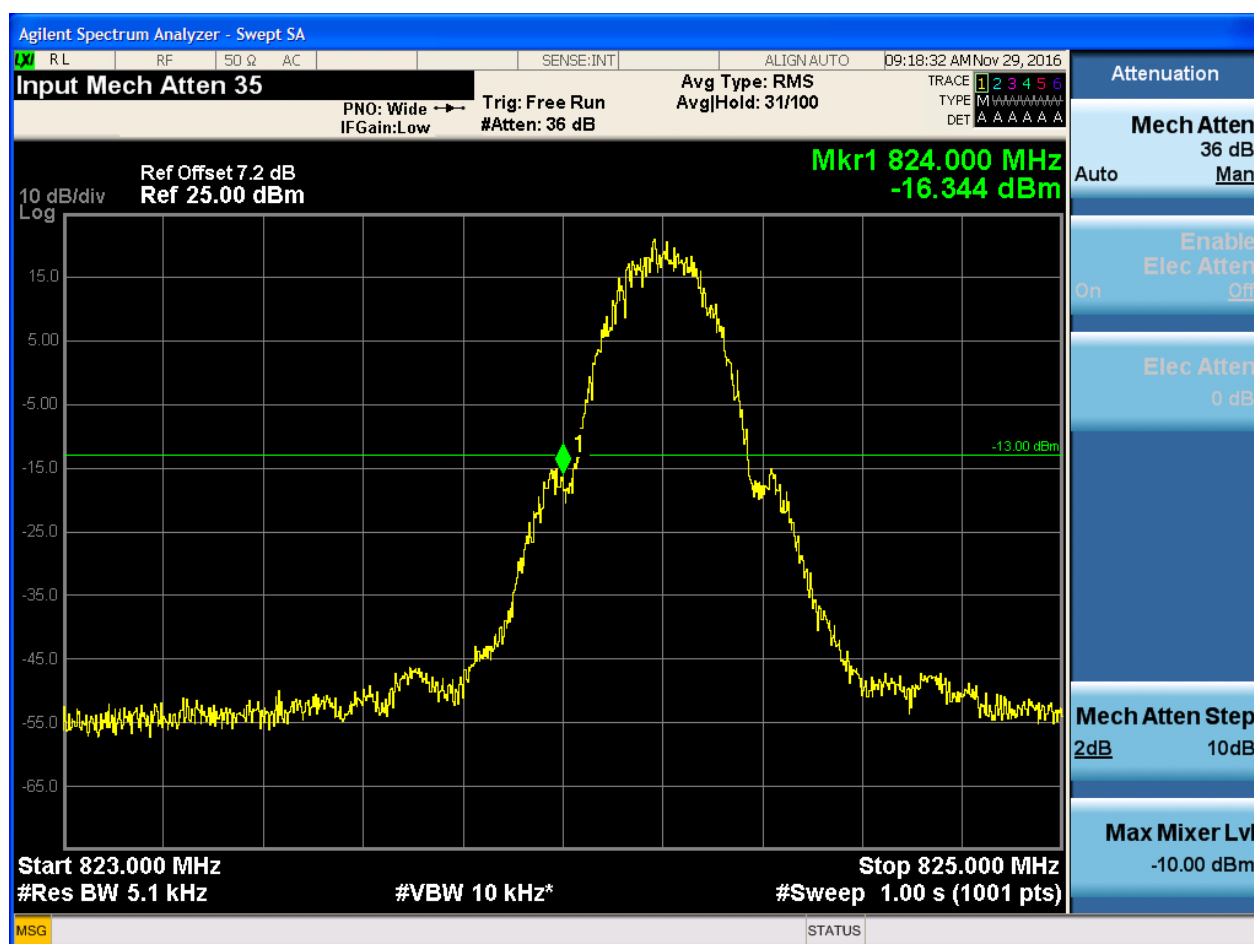
Part I - Test Plots

5.1 For GSM

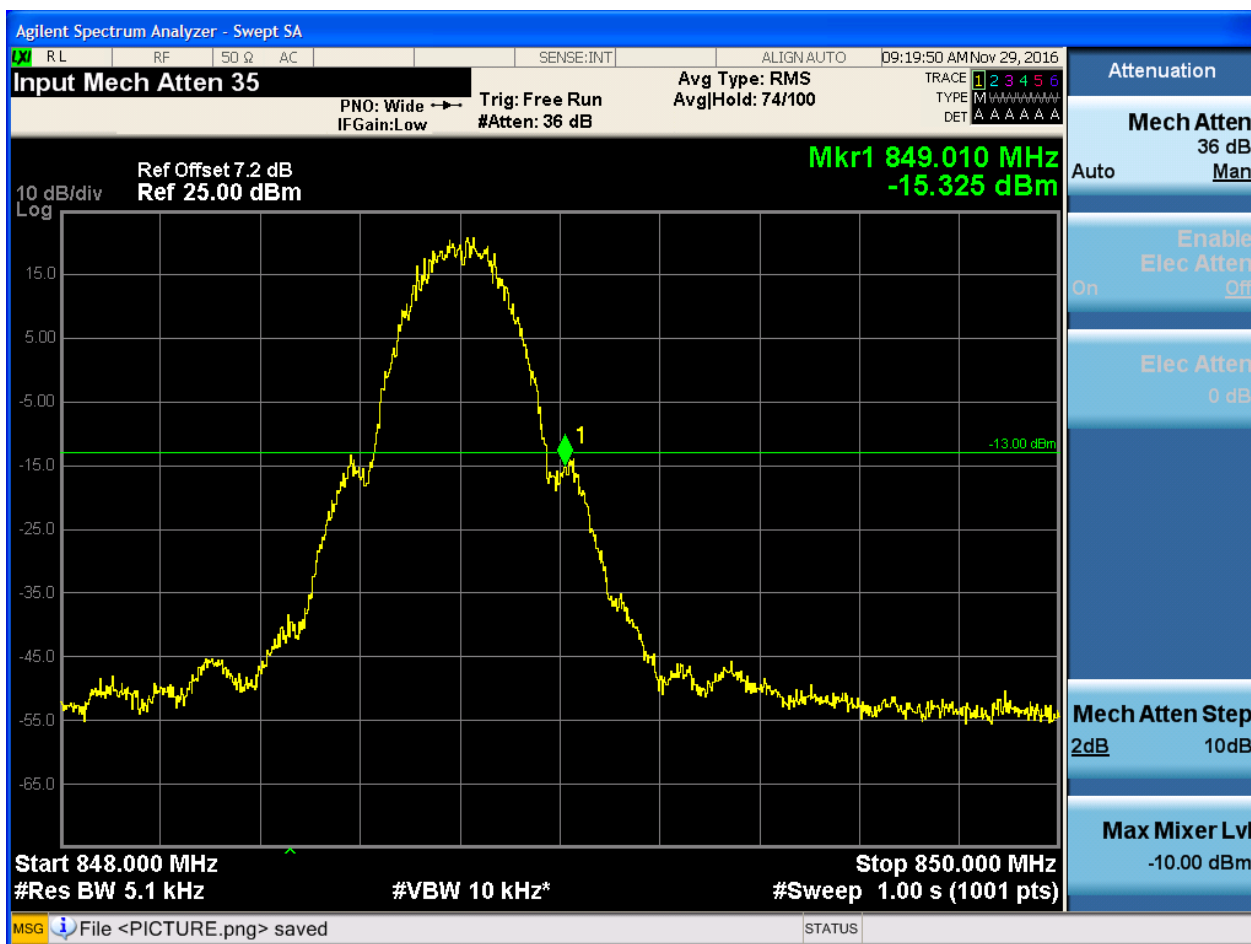
5.1.1 Test Band = GSM850

5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH

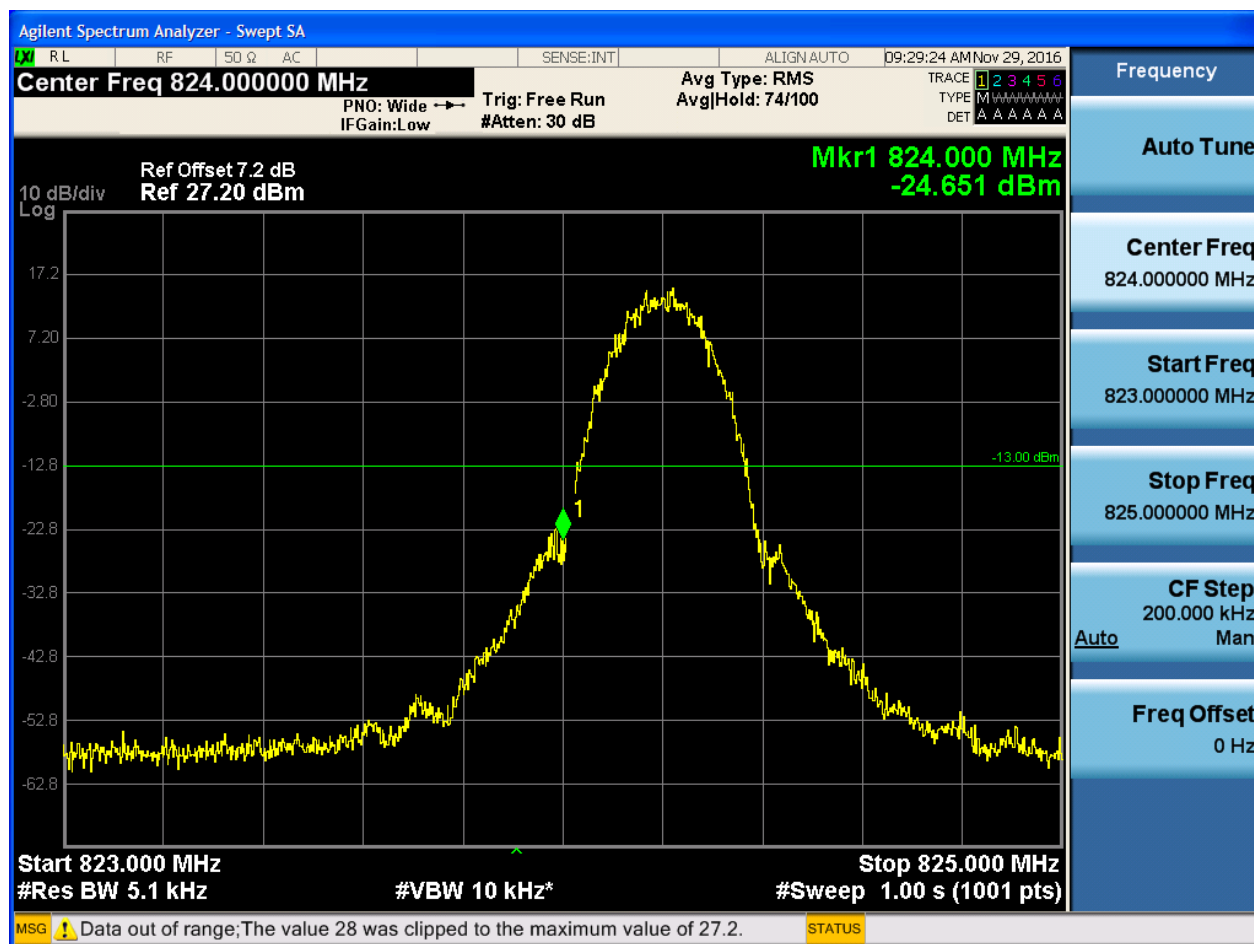


5.1.1.1.2 Test Channel = HCH

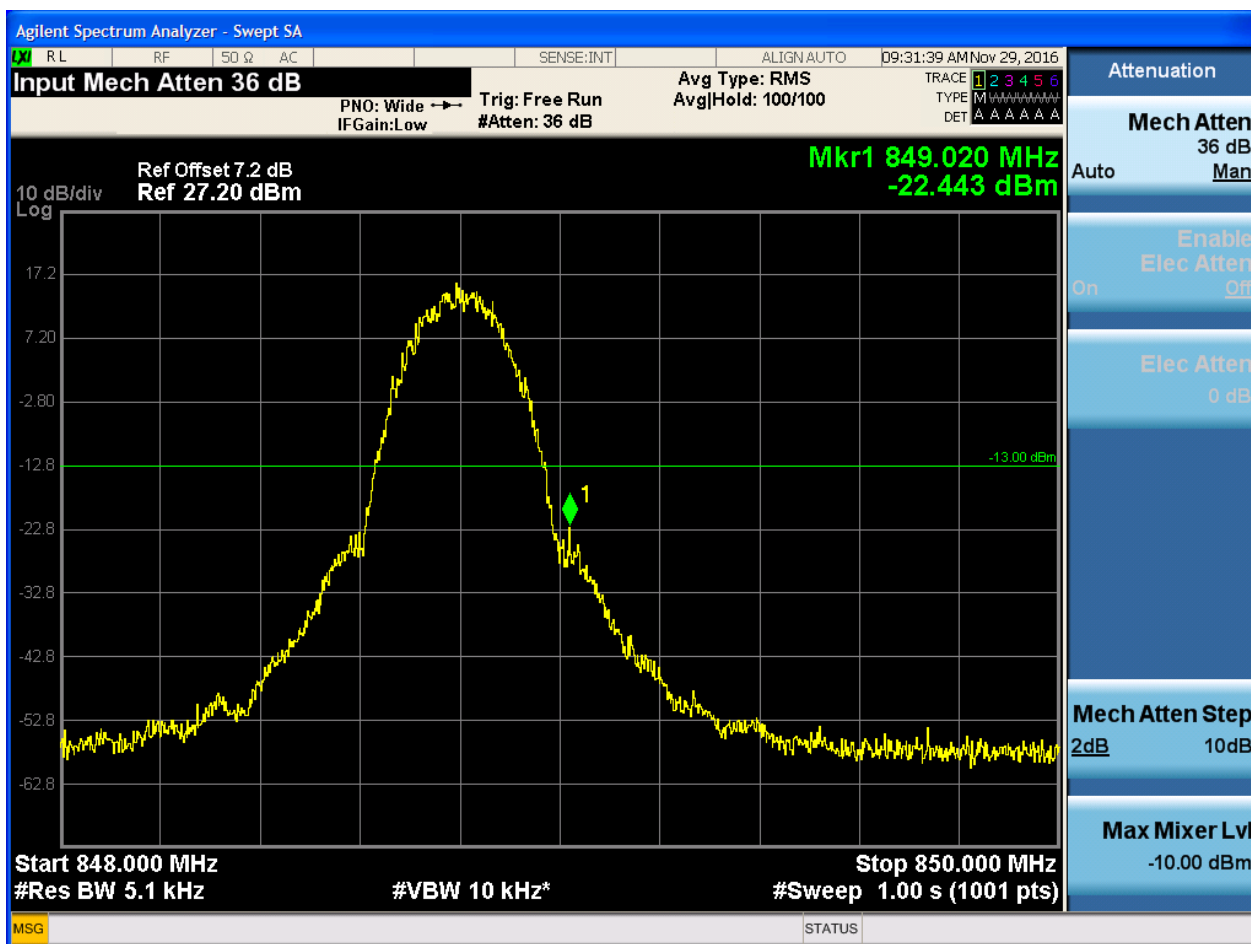


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



5.1.1.2.2 Test Channel = HCH

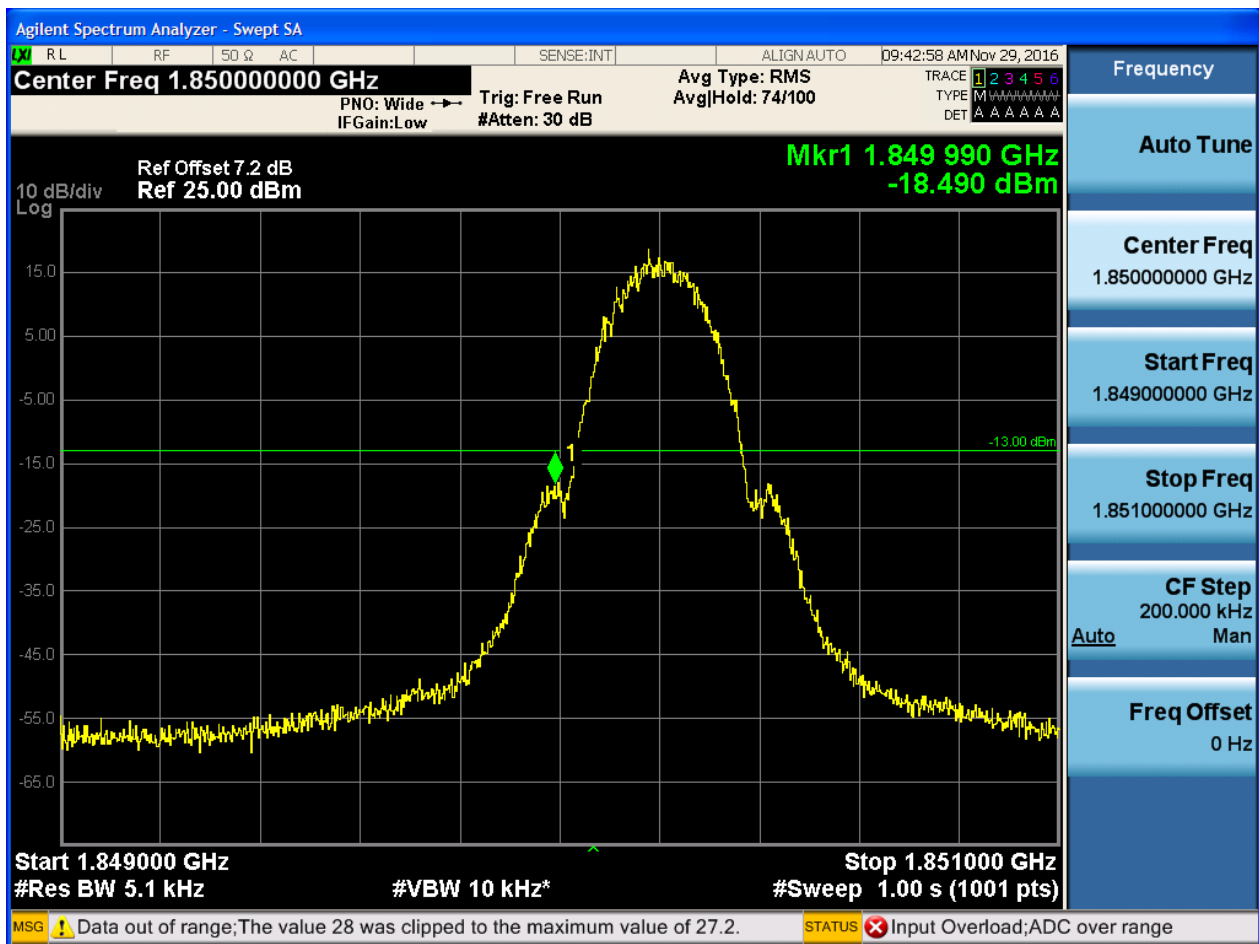




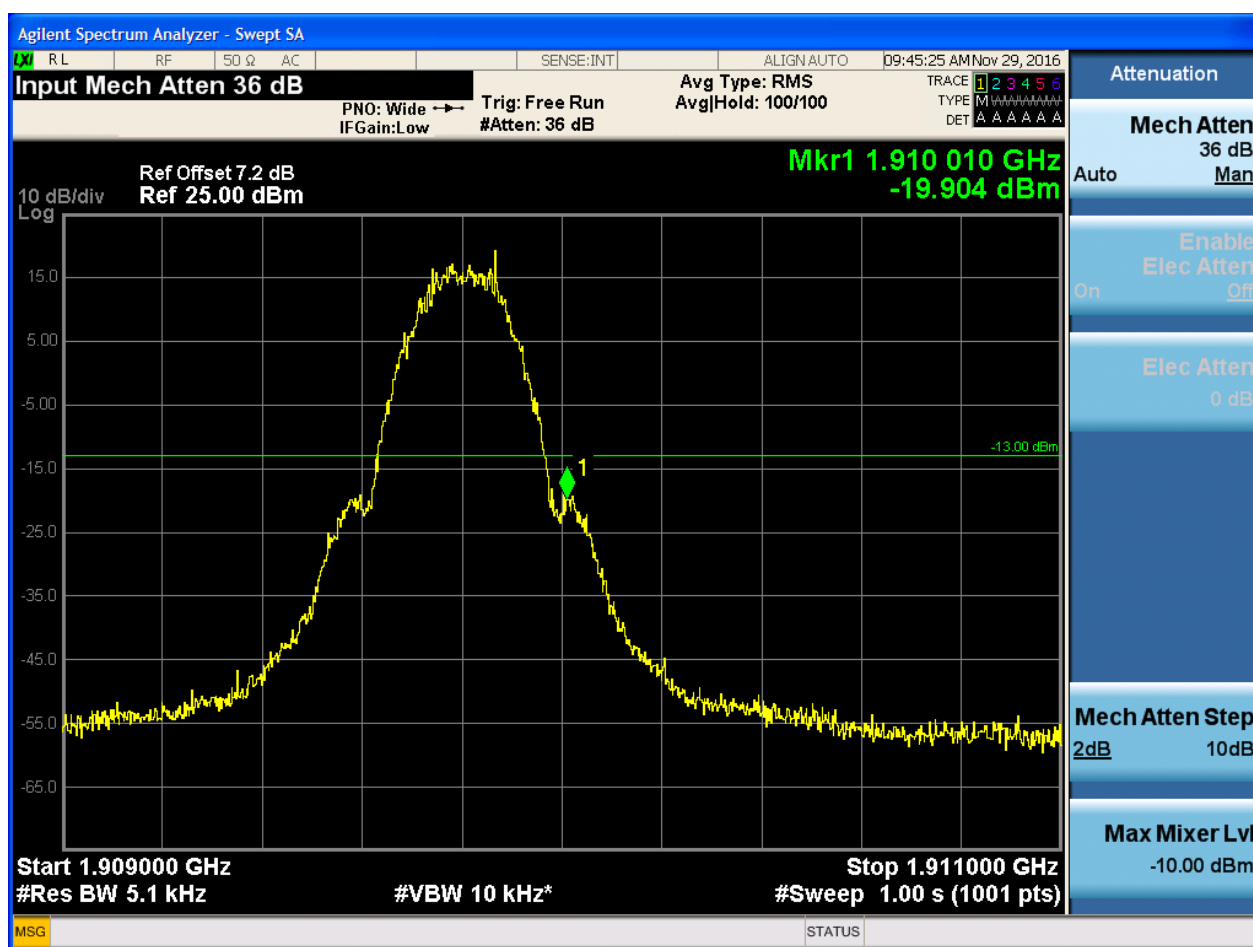
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

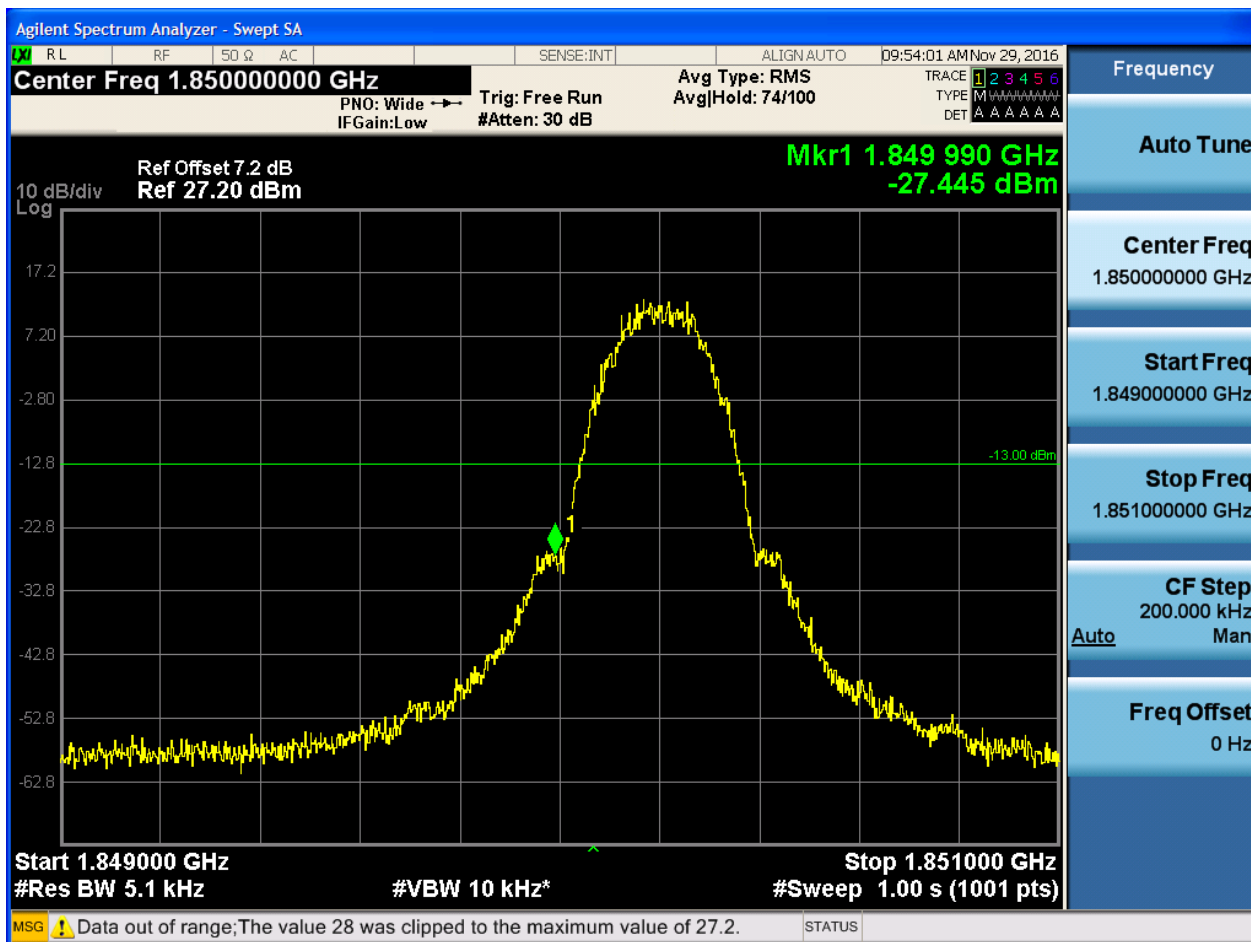


5.1.2.1.2 Test Channel = HCH

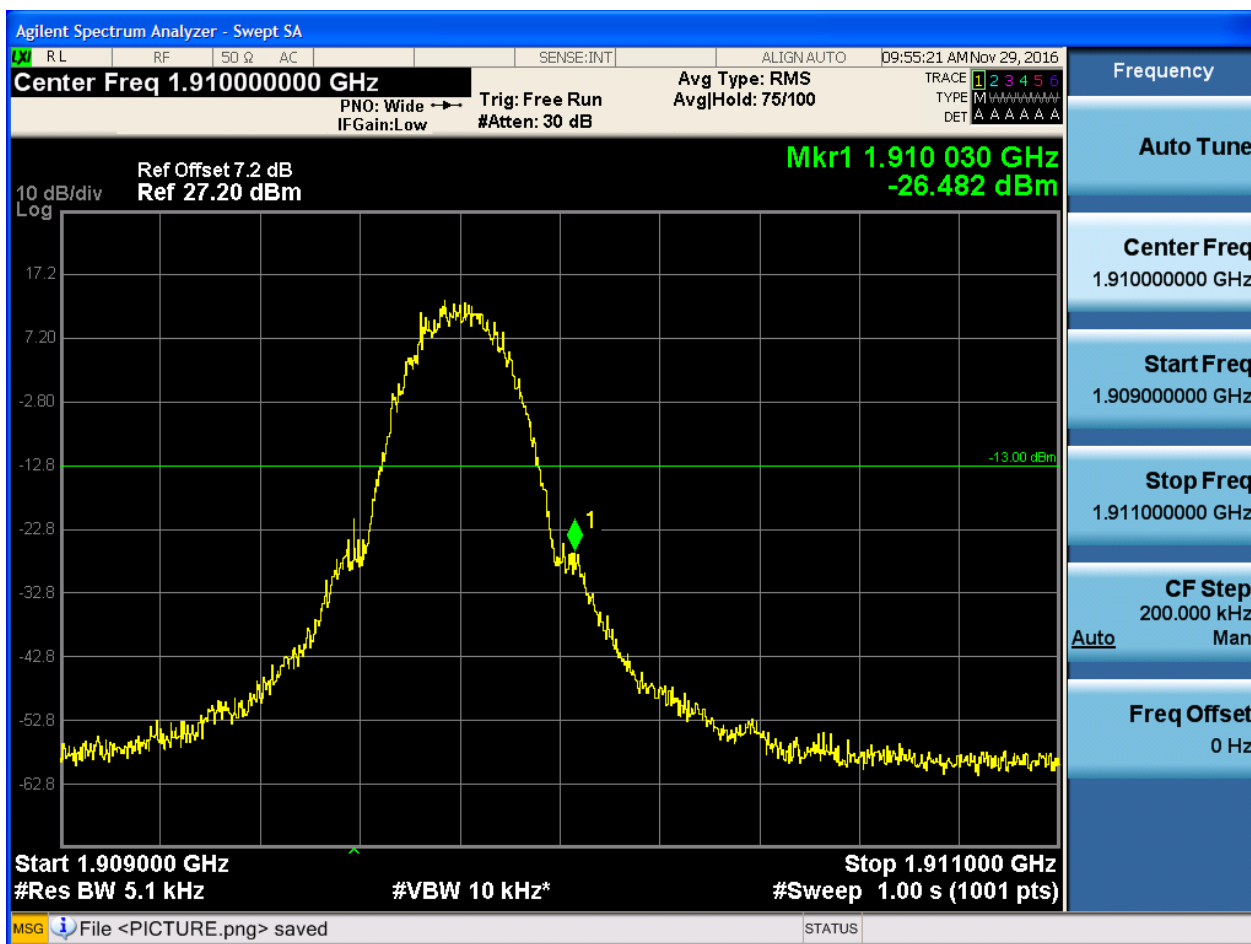


5.1.2.2 Test Mode = GSM/TM2

5.1.2.2.1 Test Channel = LCH



5.1.2.2.2 Test Channel = HCH



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

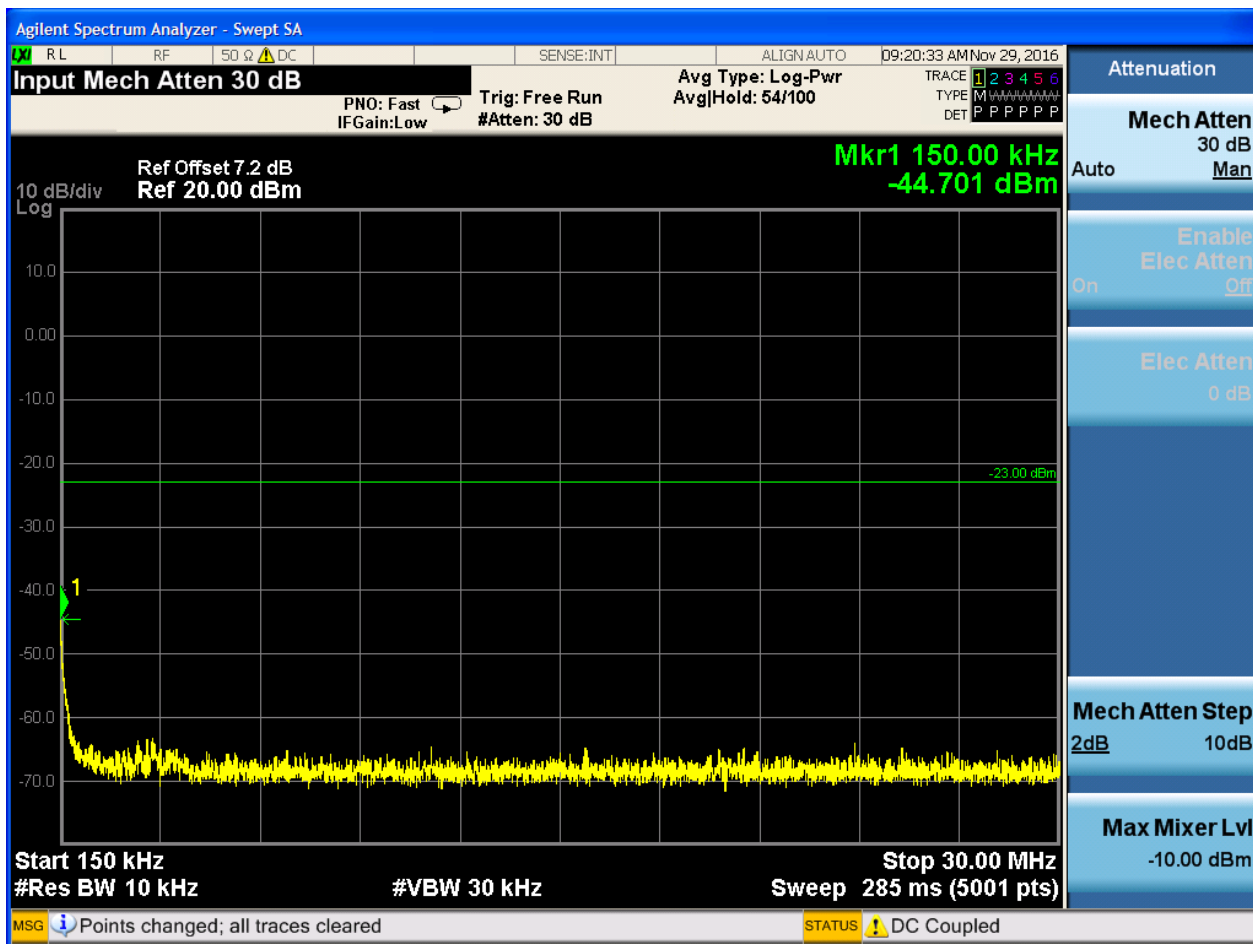
6.1 For GSM

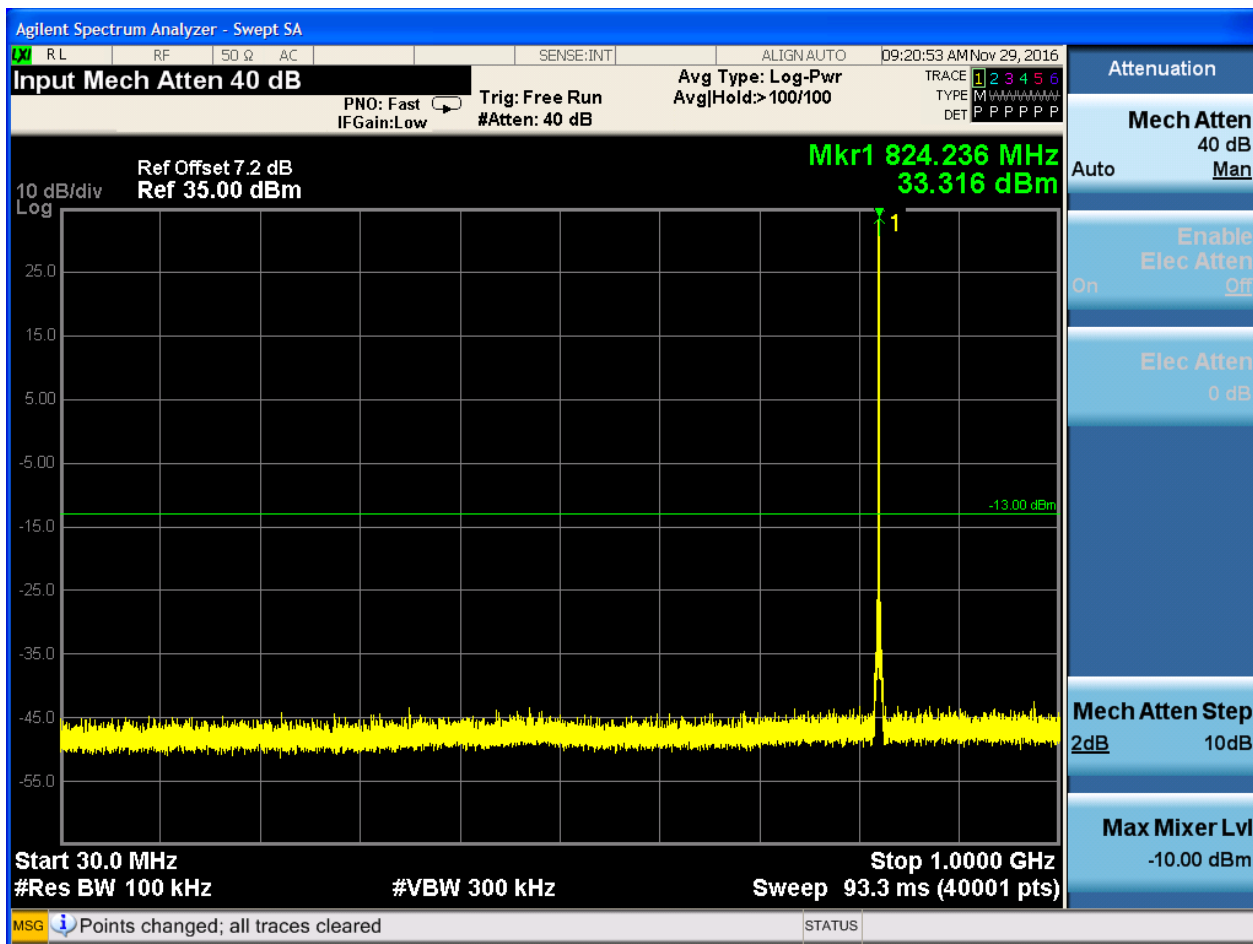
6.1.1 Test Band = GSM850

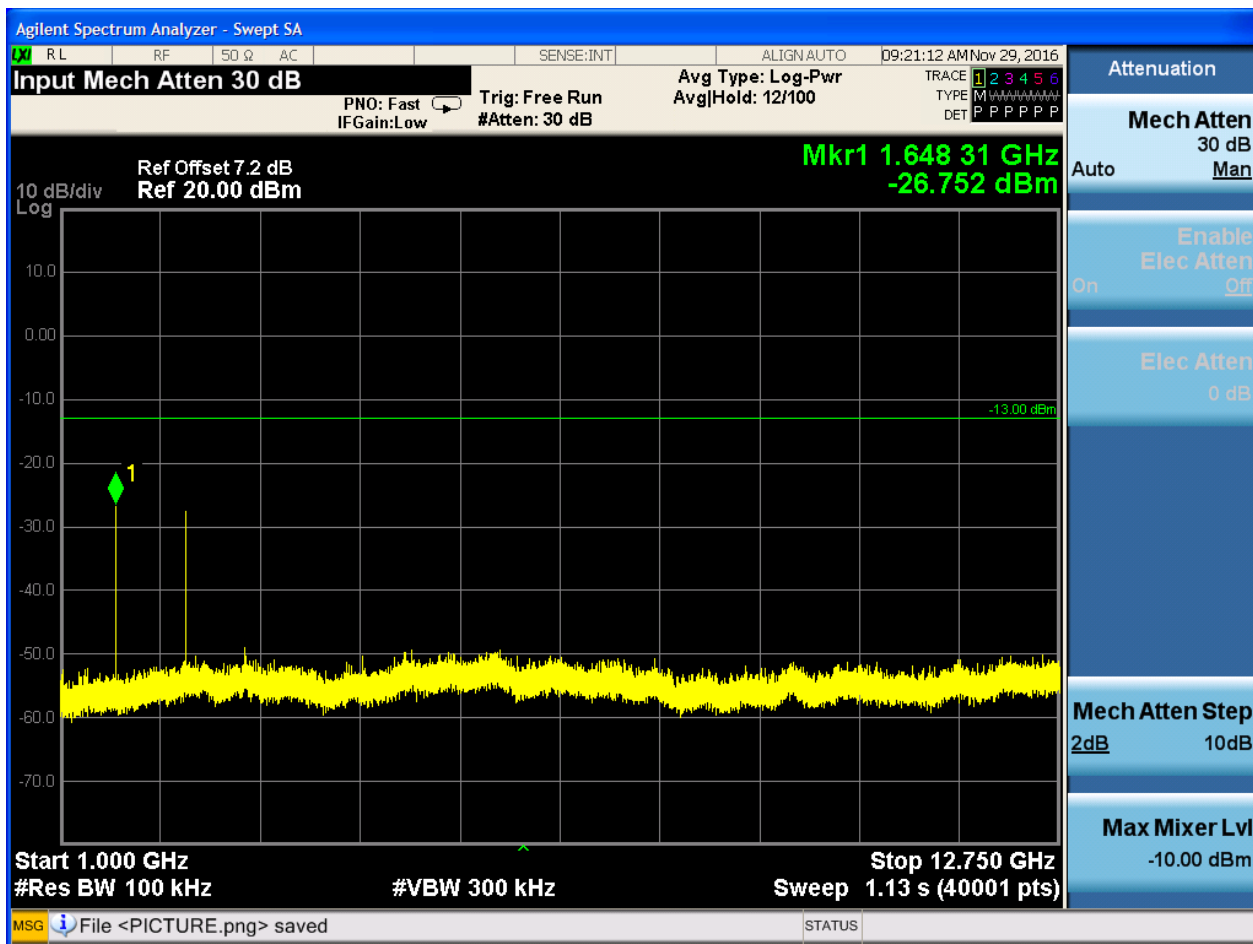
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH

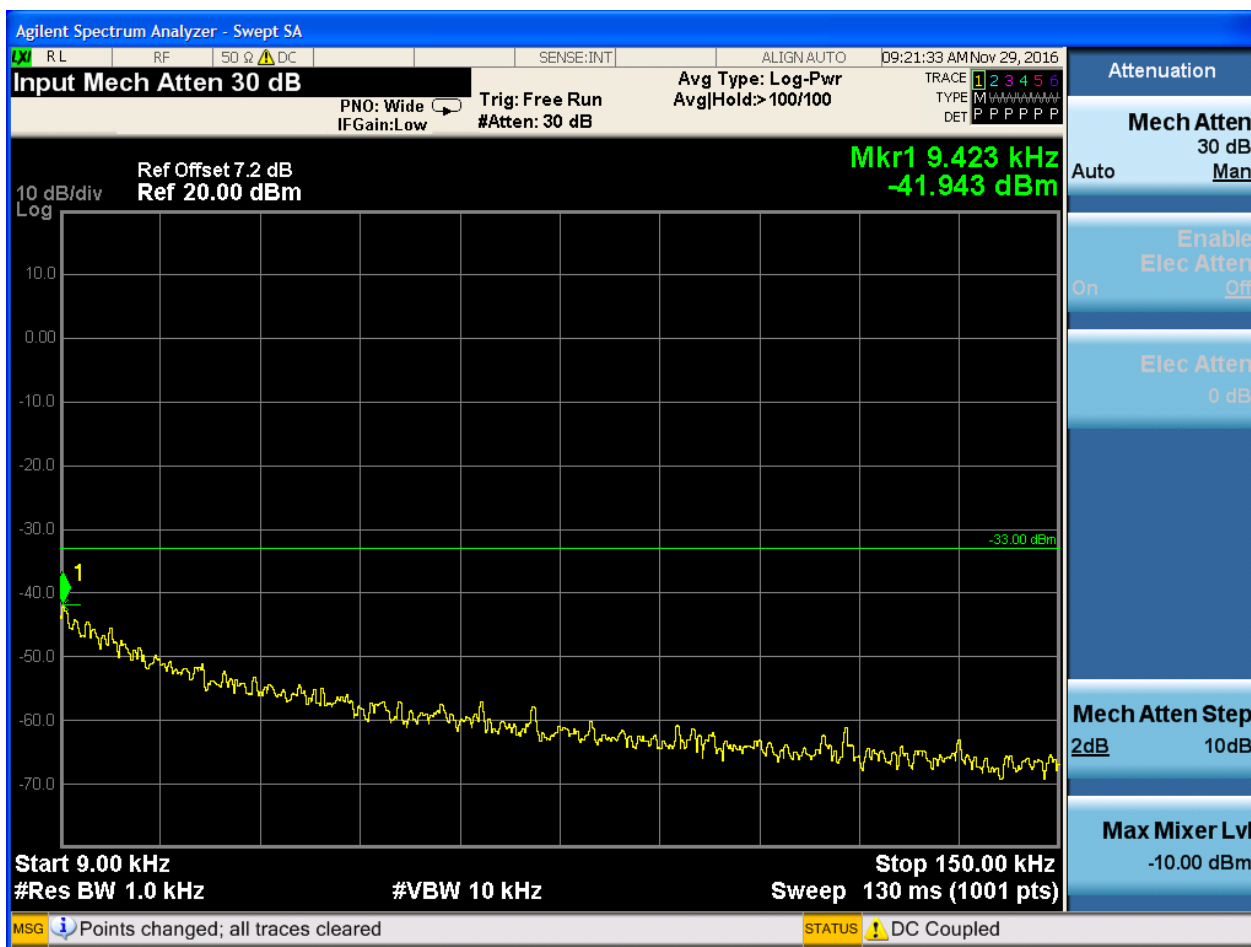


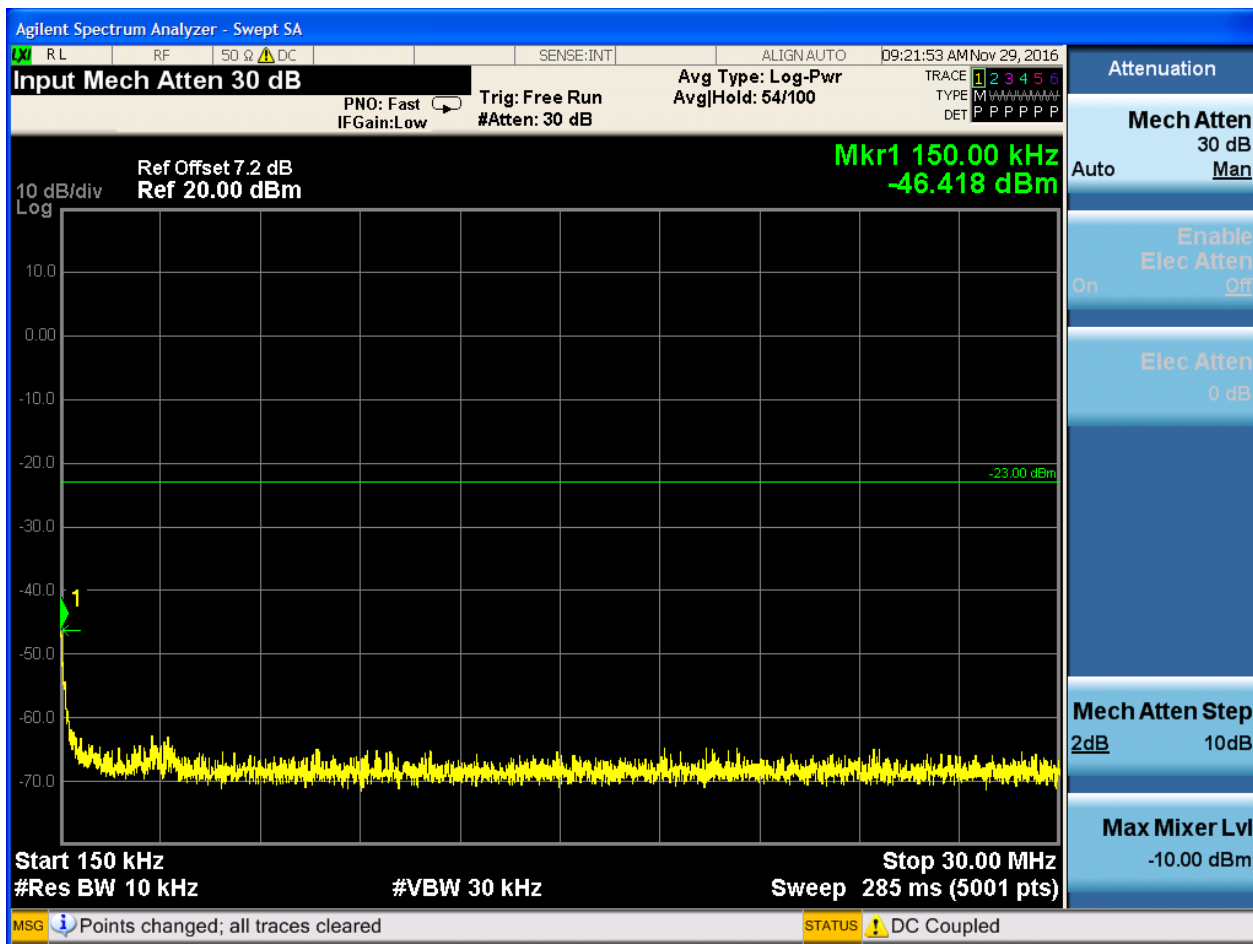


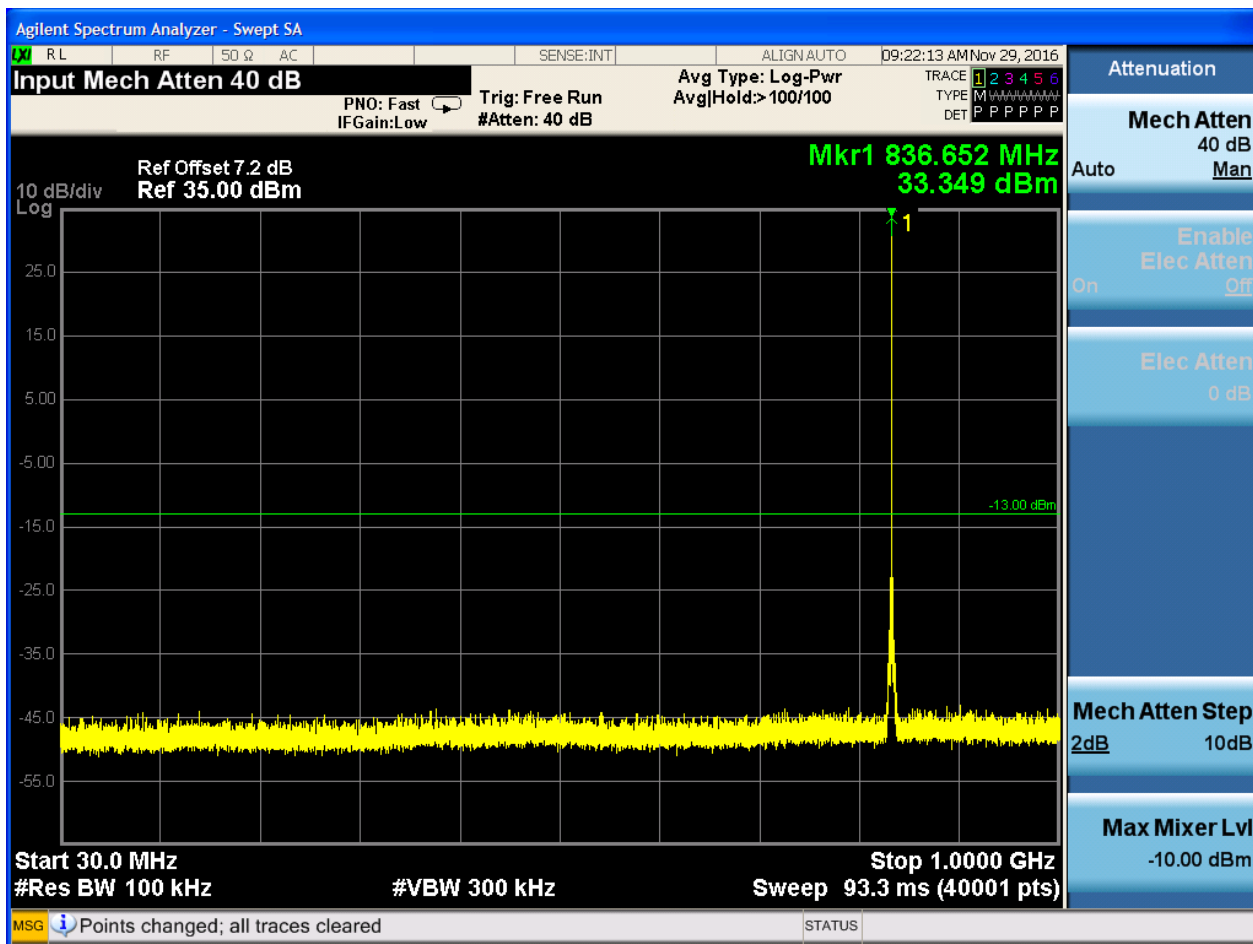


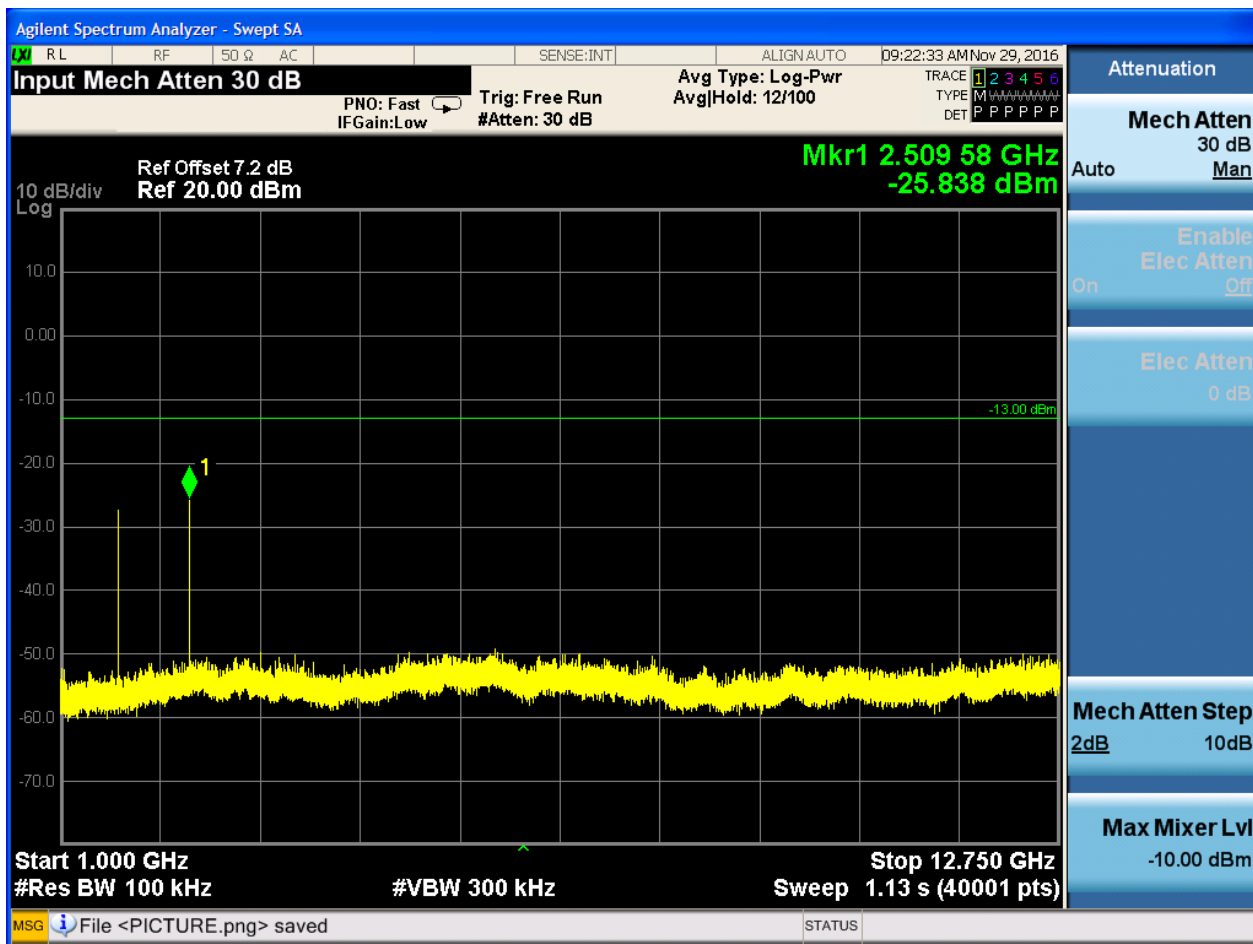


6.1.1.1.2 Test Channel = MCH

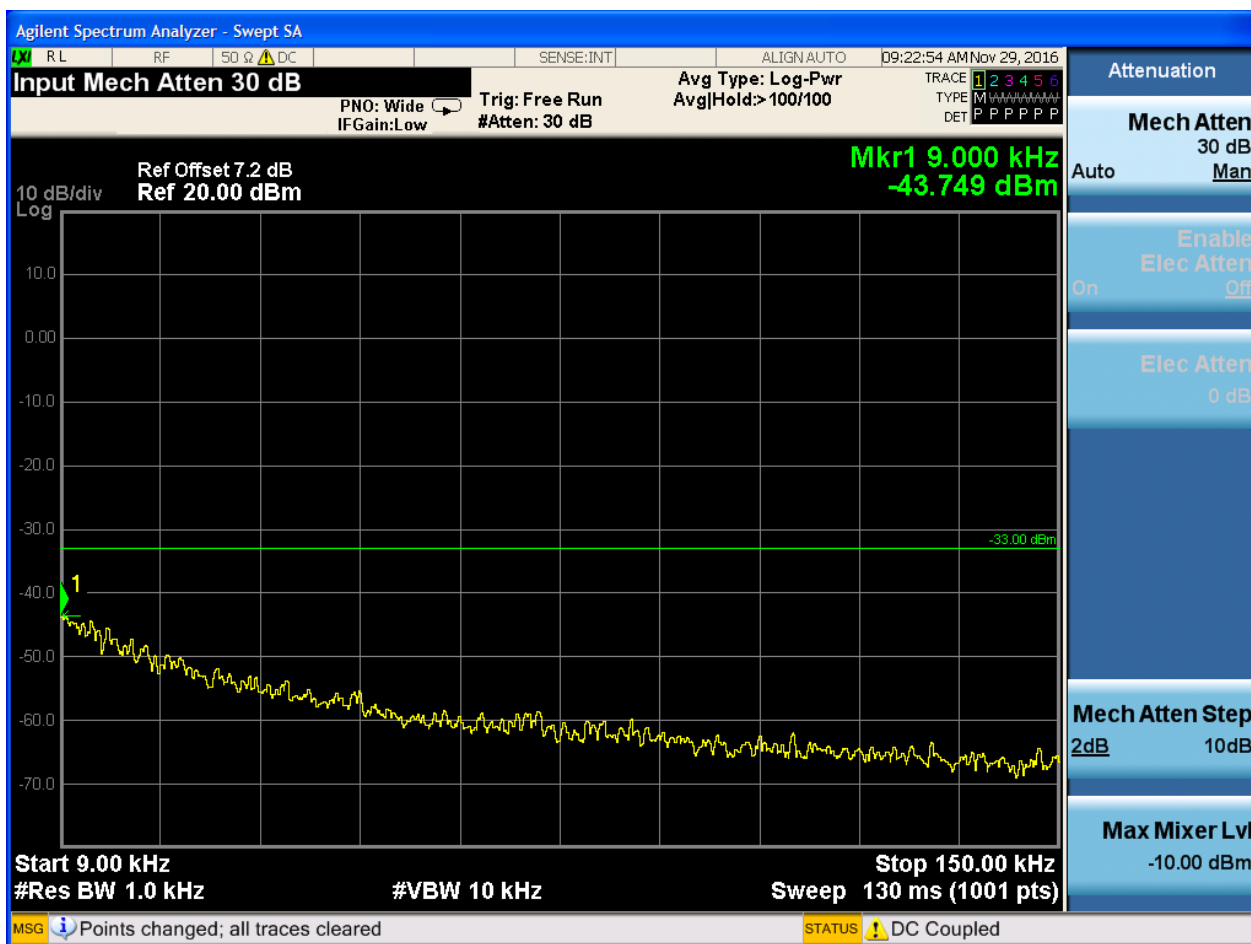


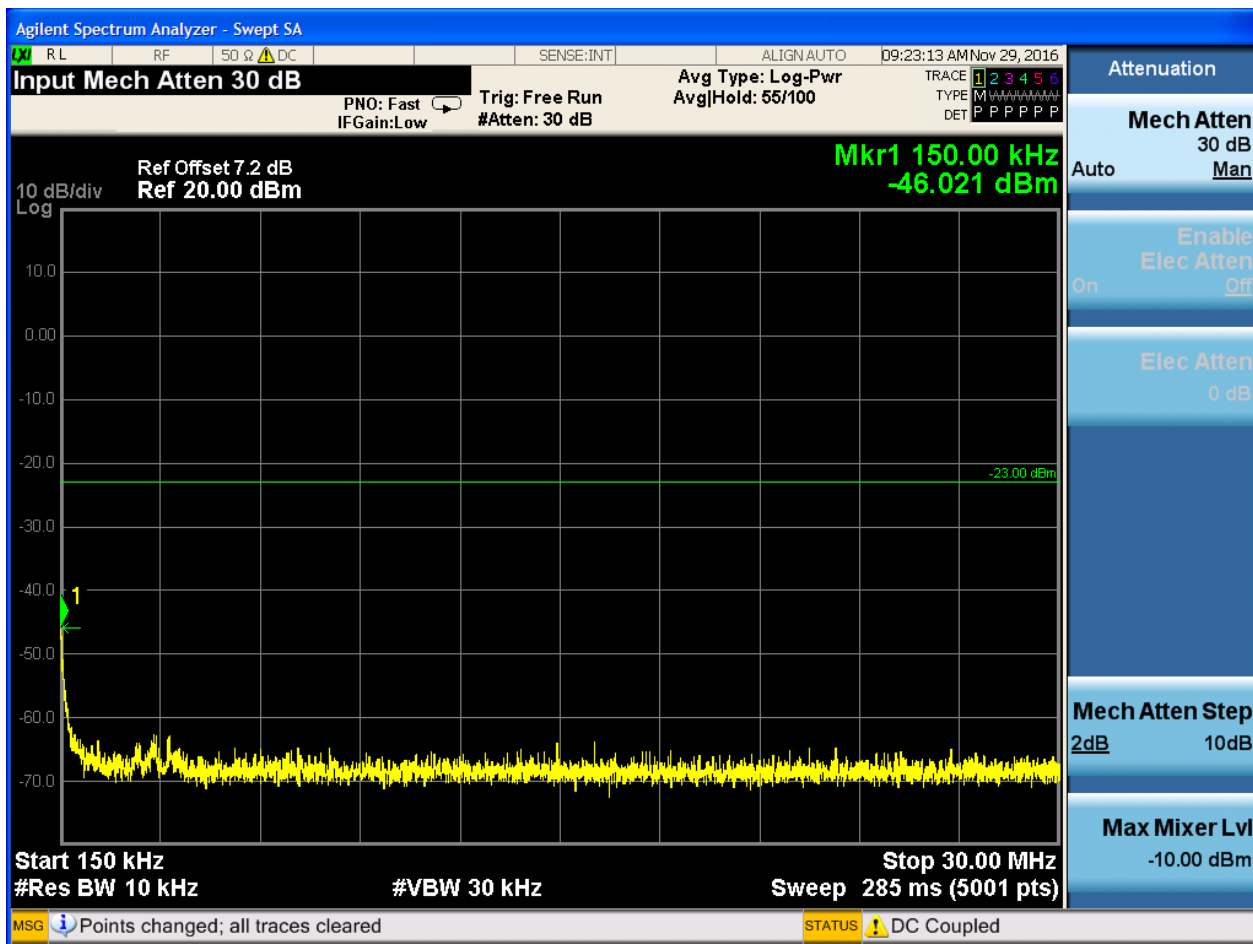


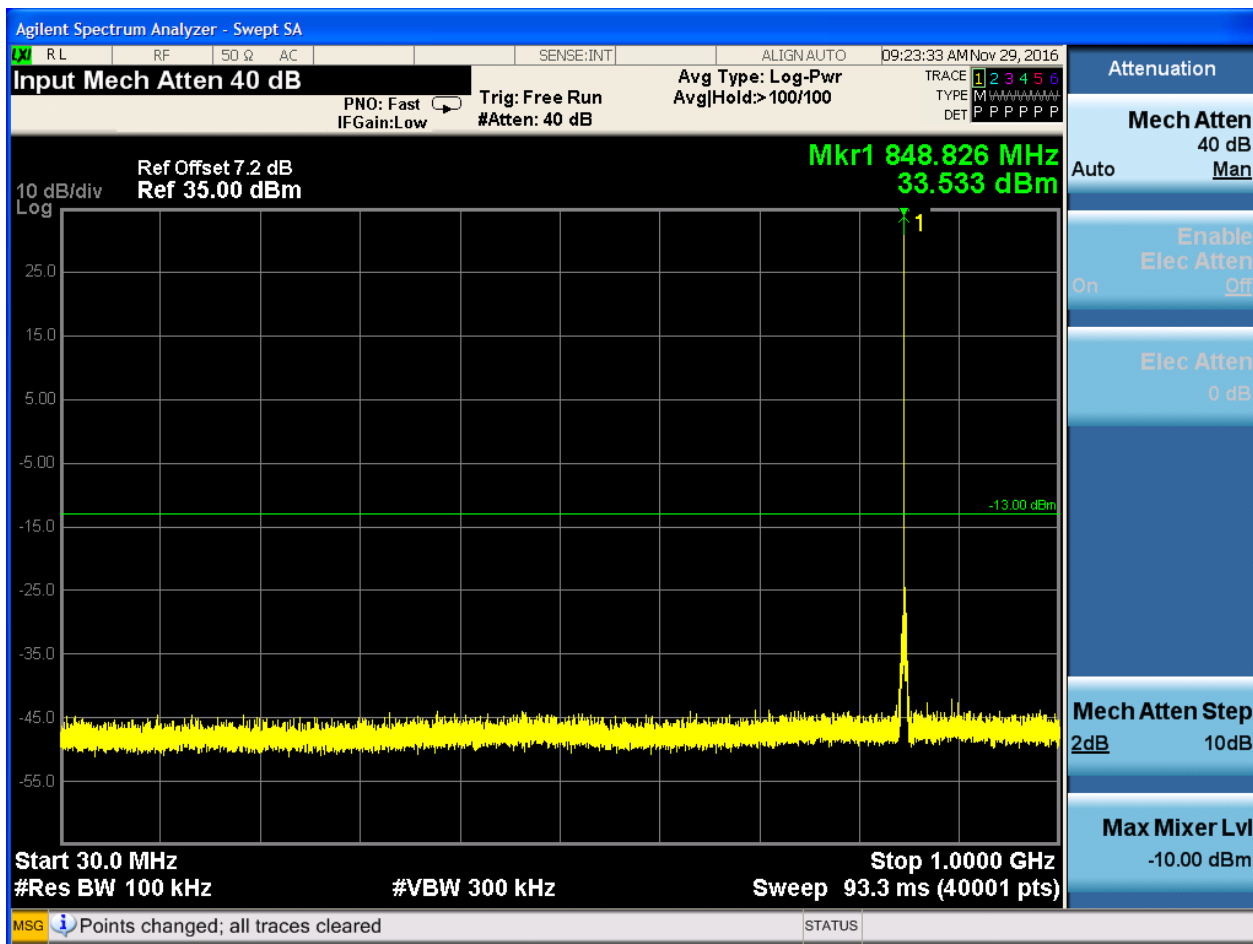


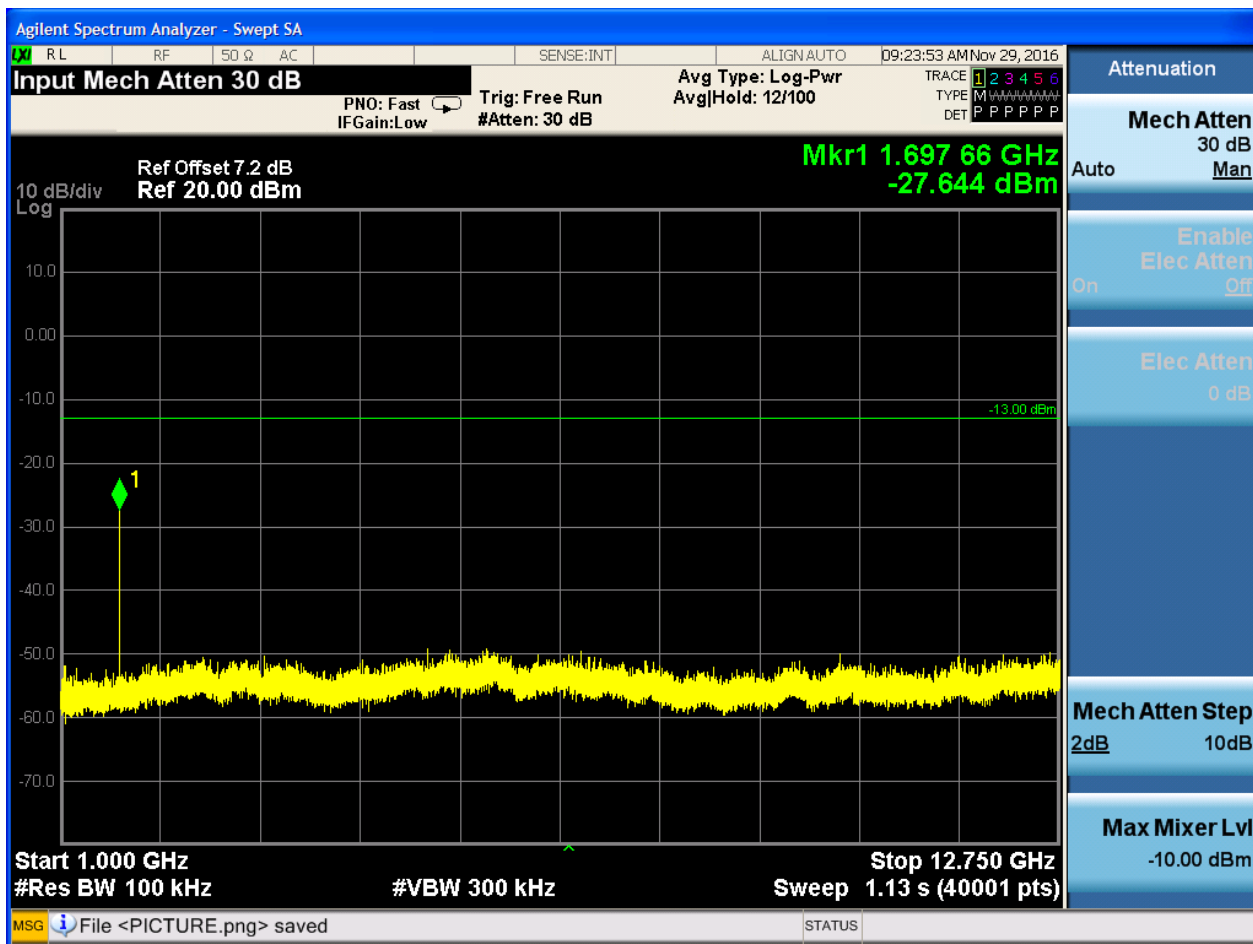


6.1.1.1.3 Test Channel = HCH





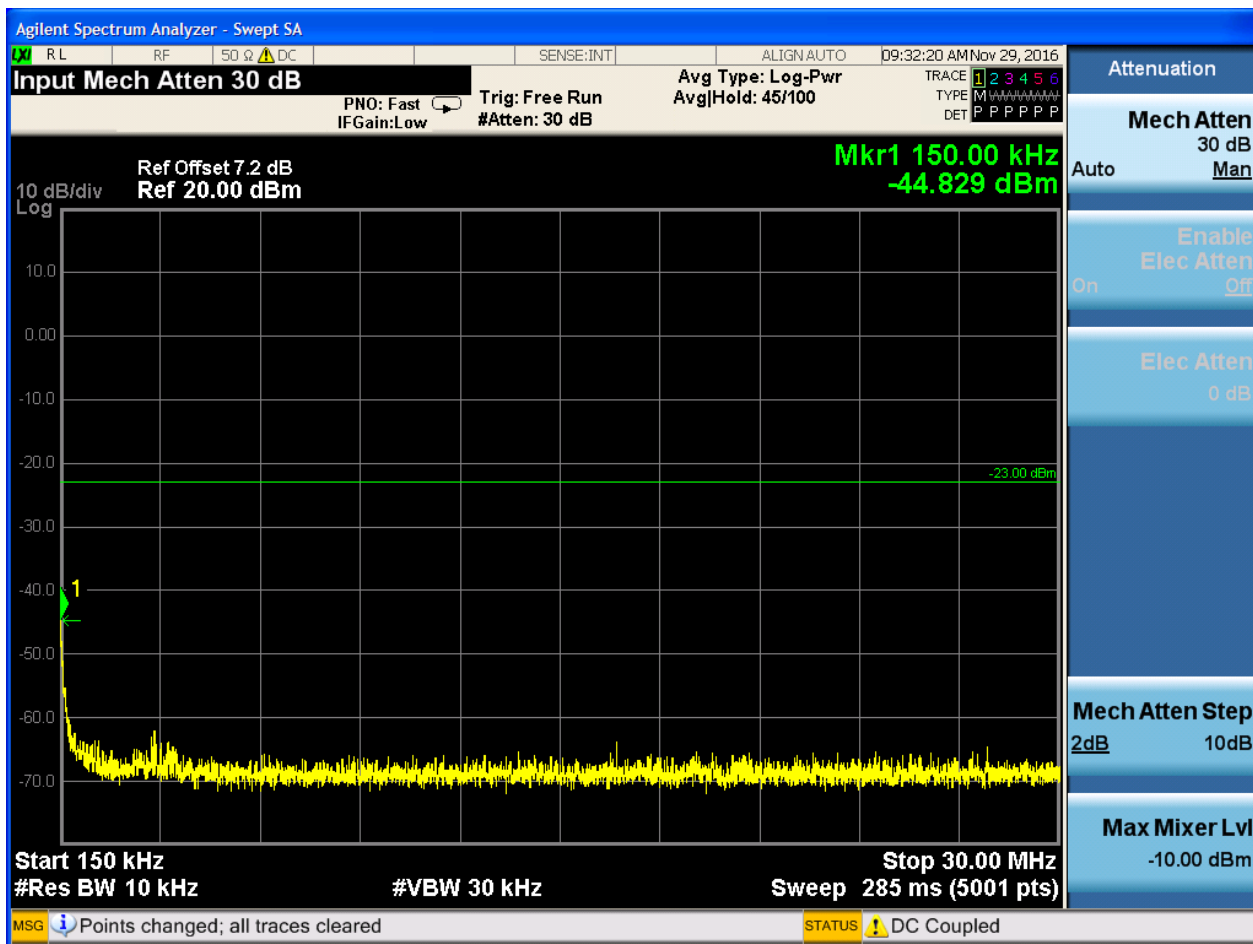


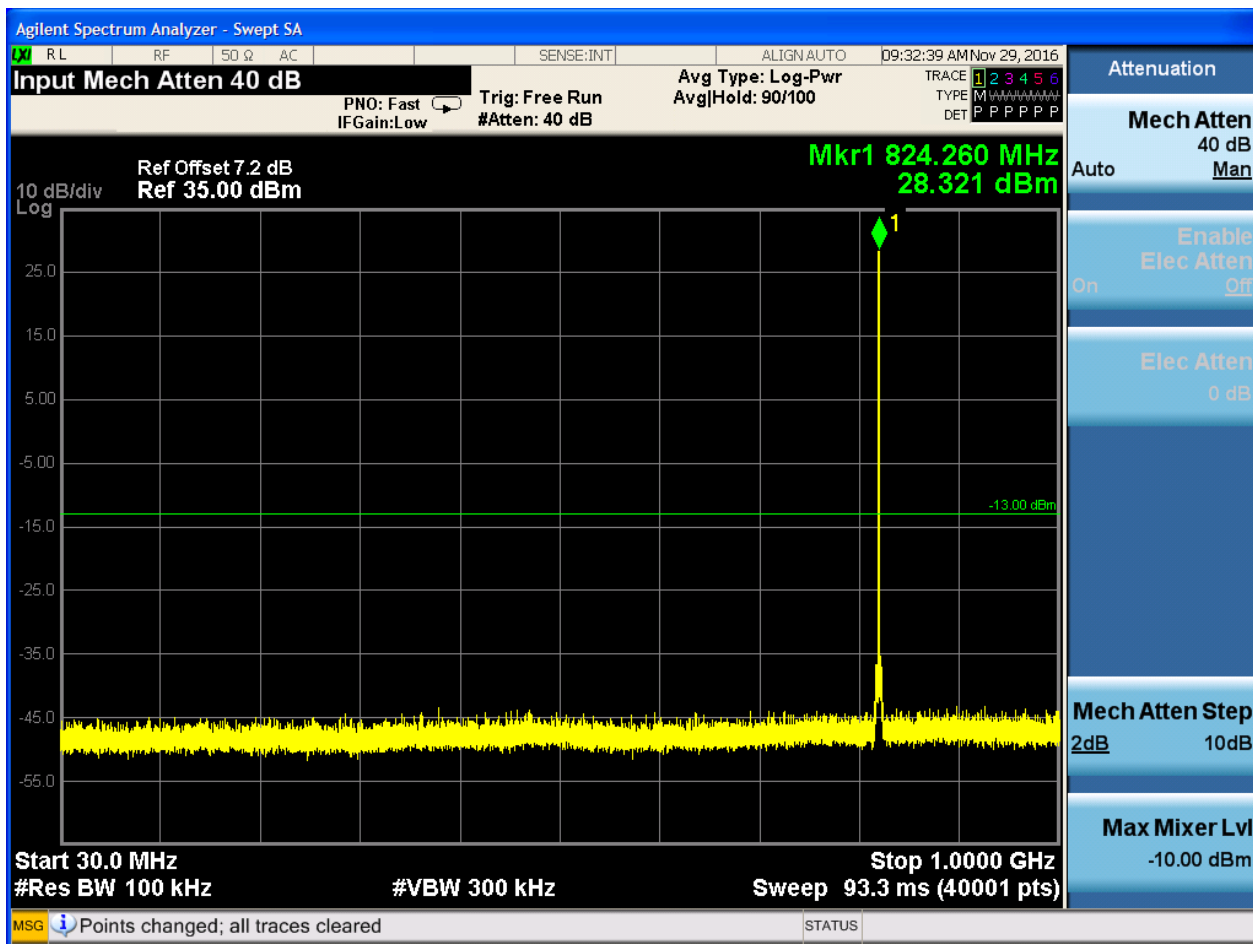


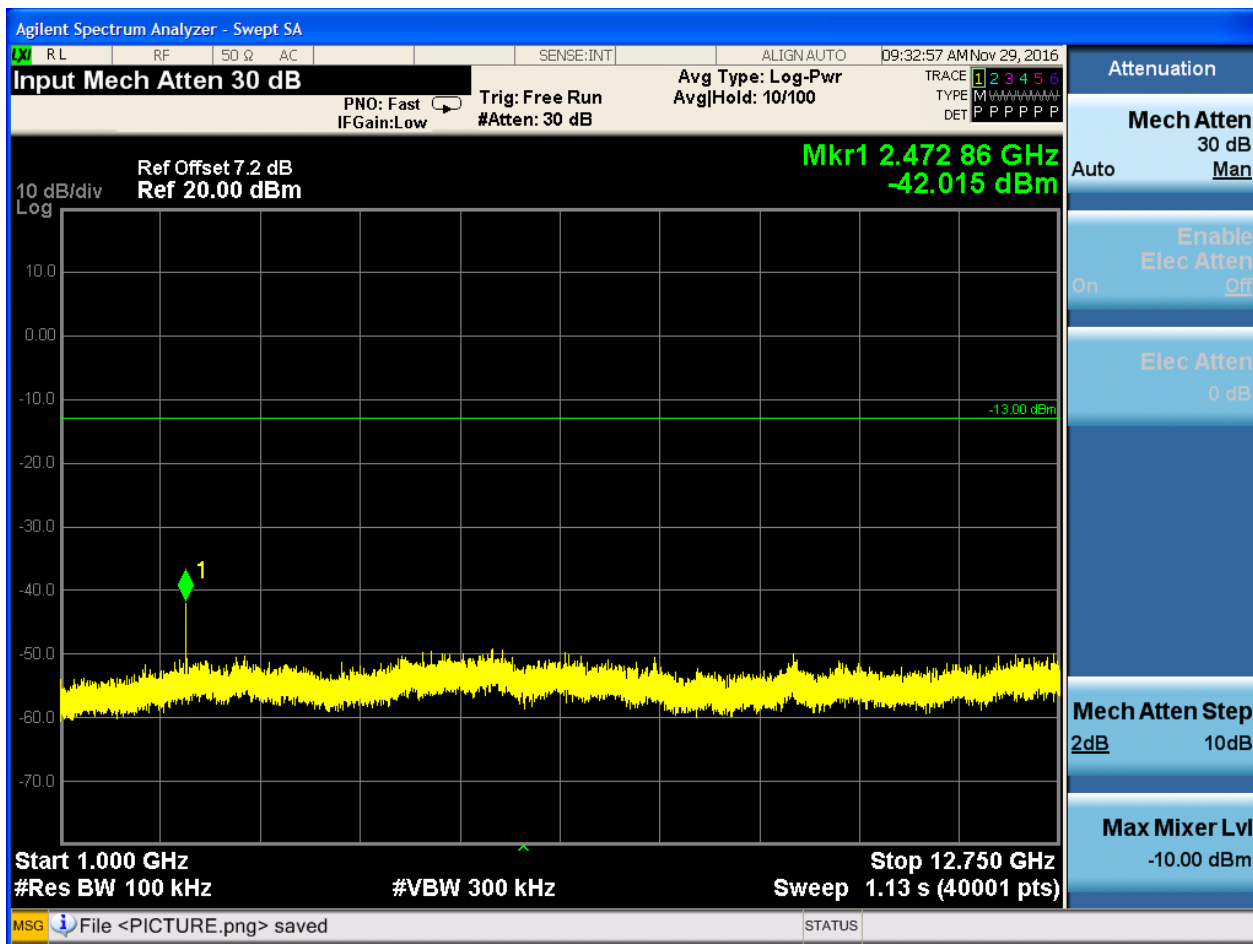
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

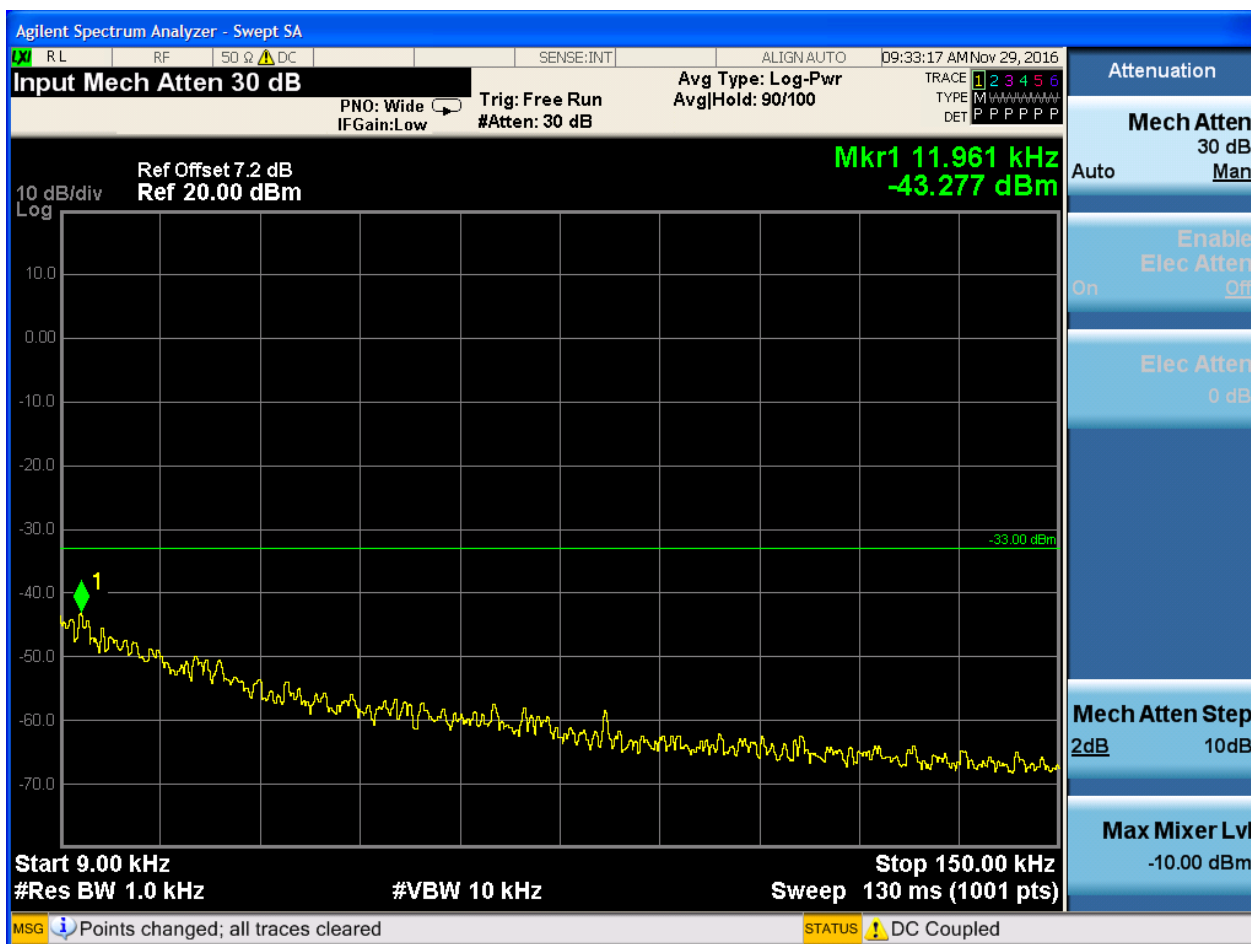


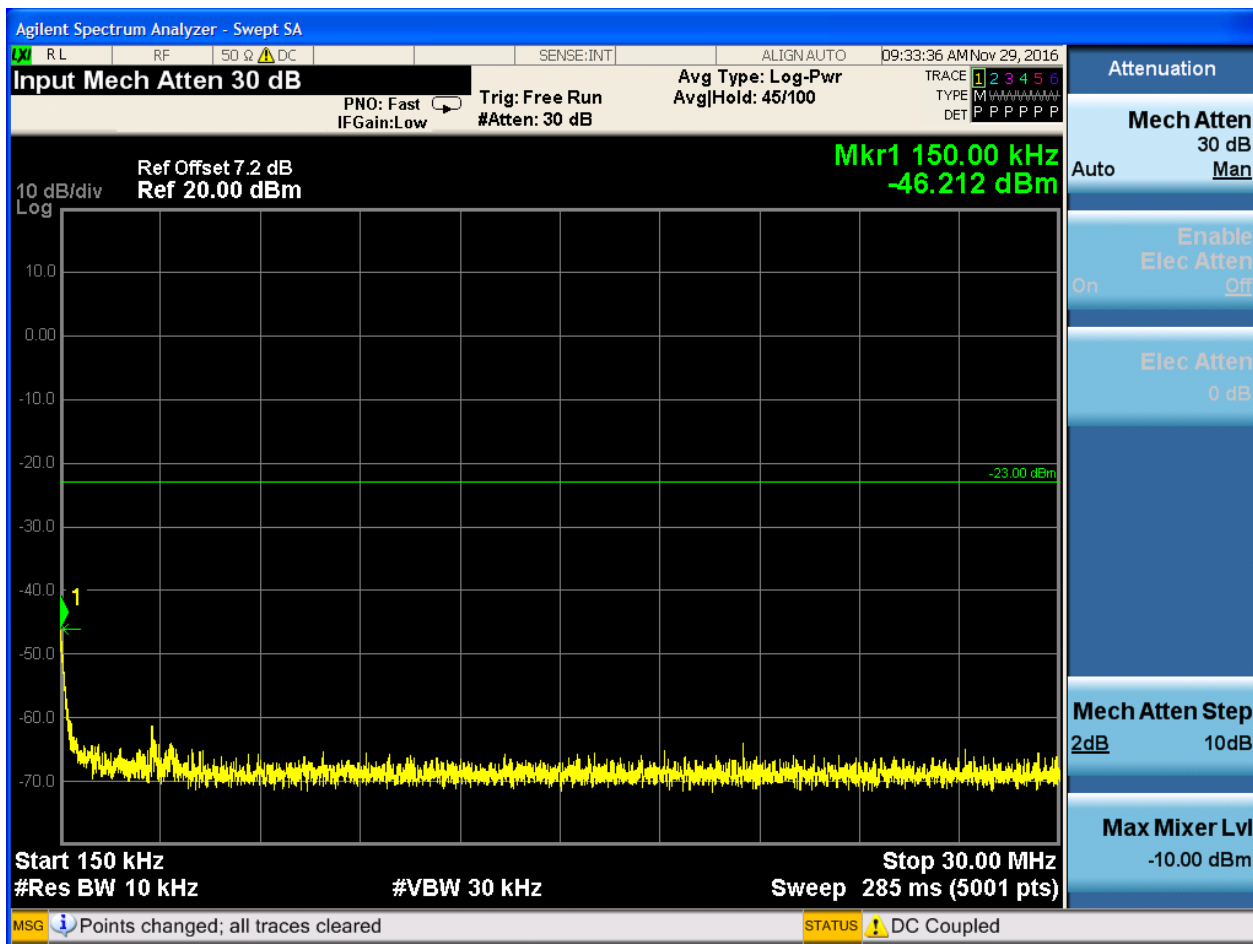


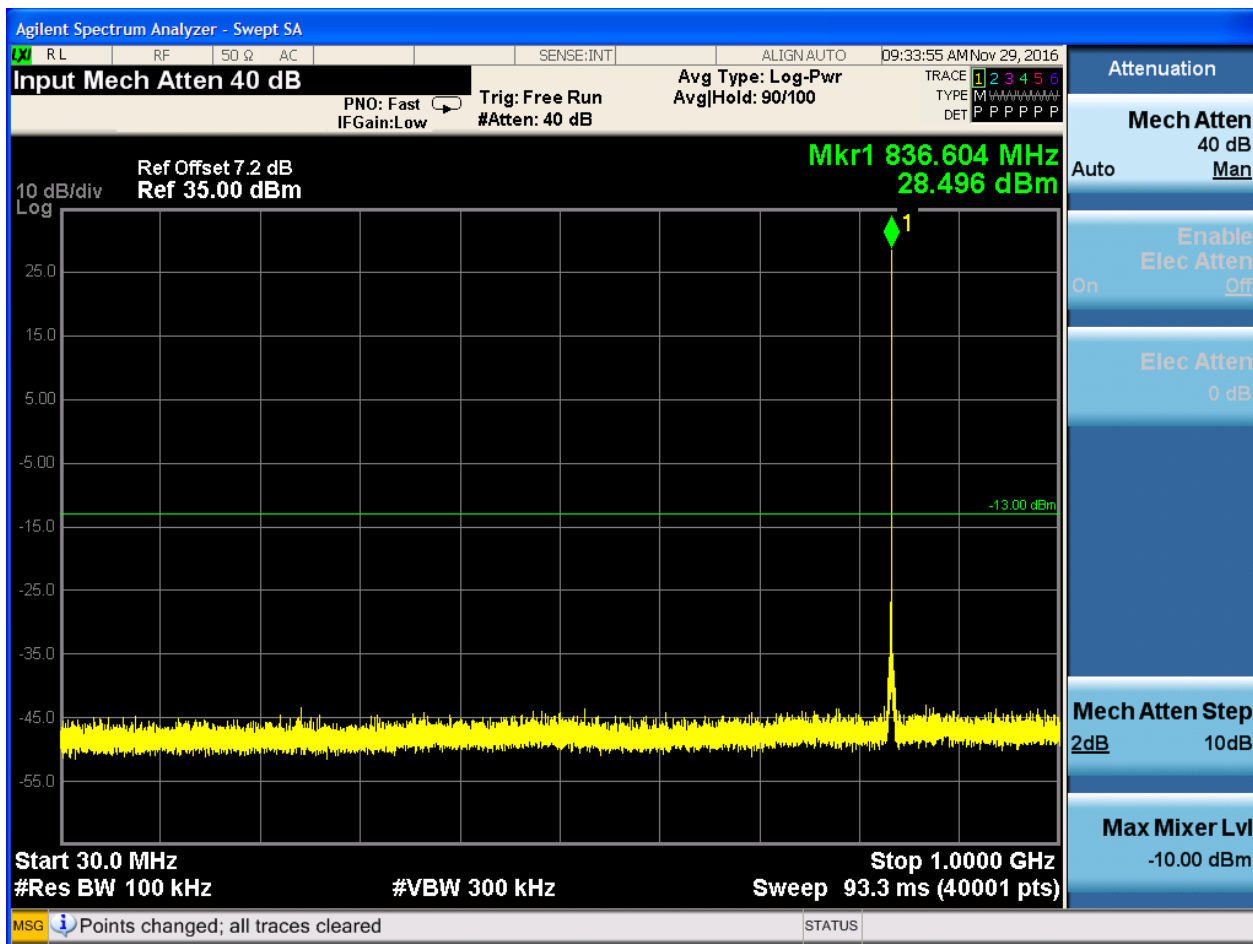


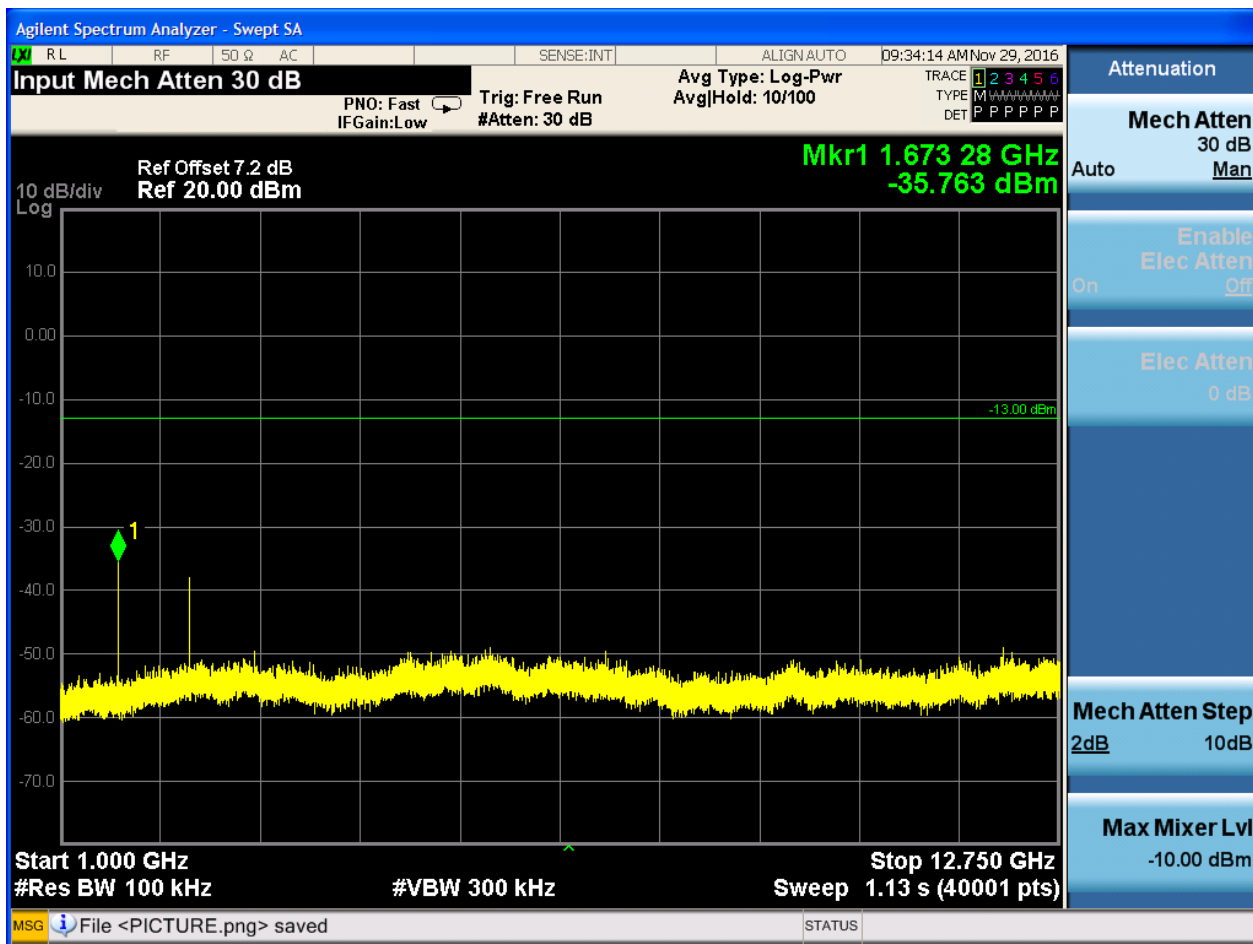


6.1.1.2.2 Test Channel = MCH

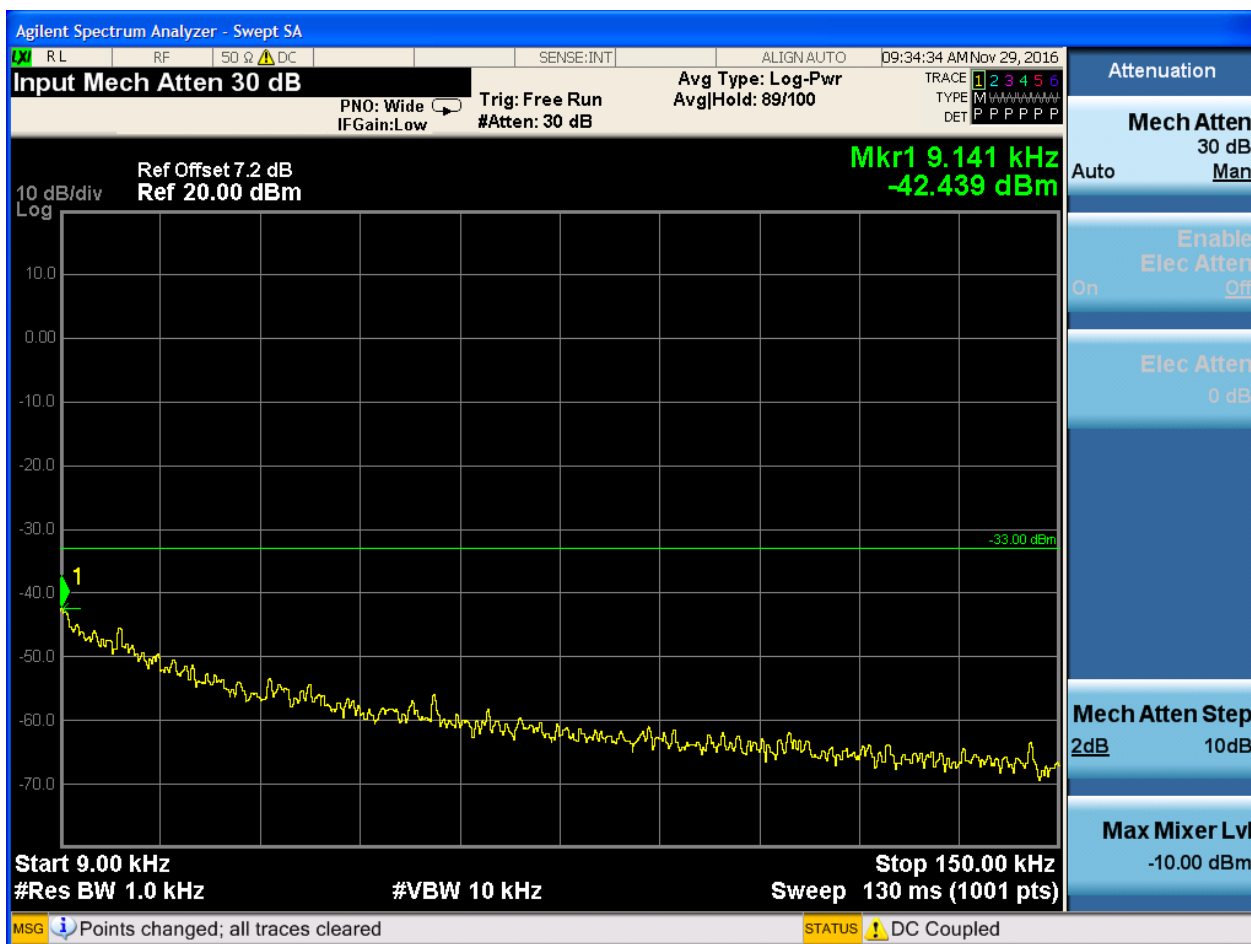


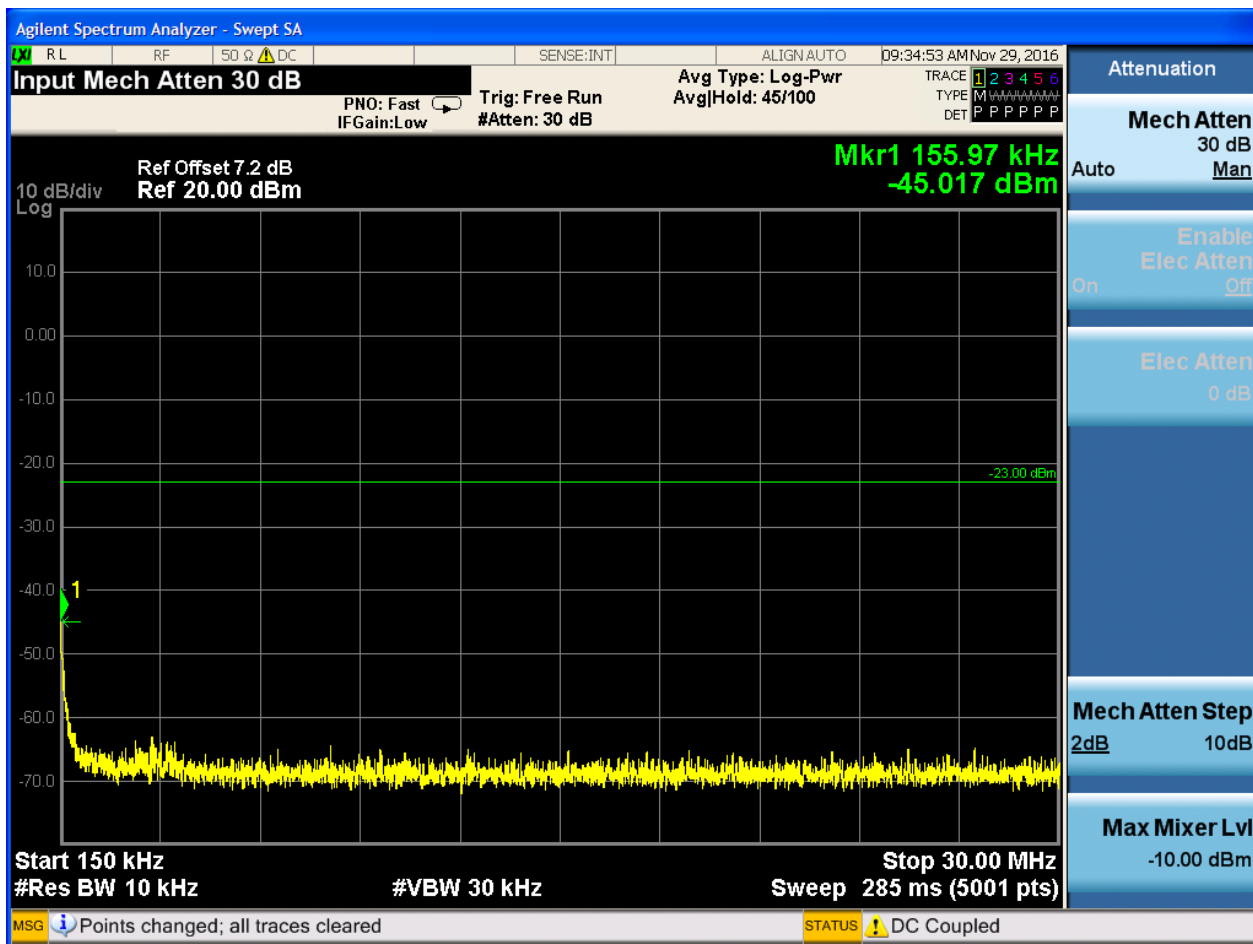


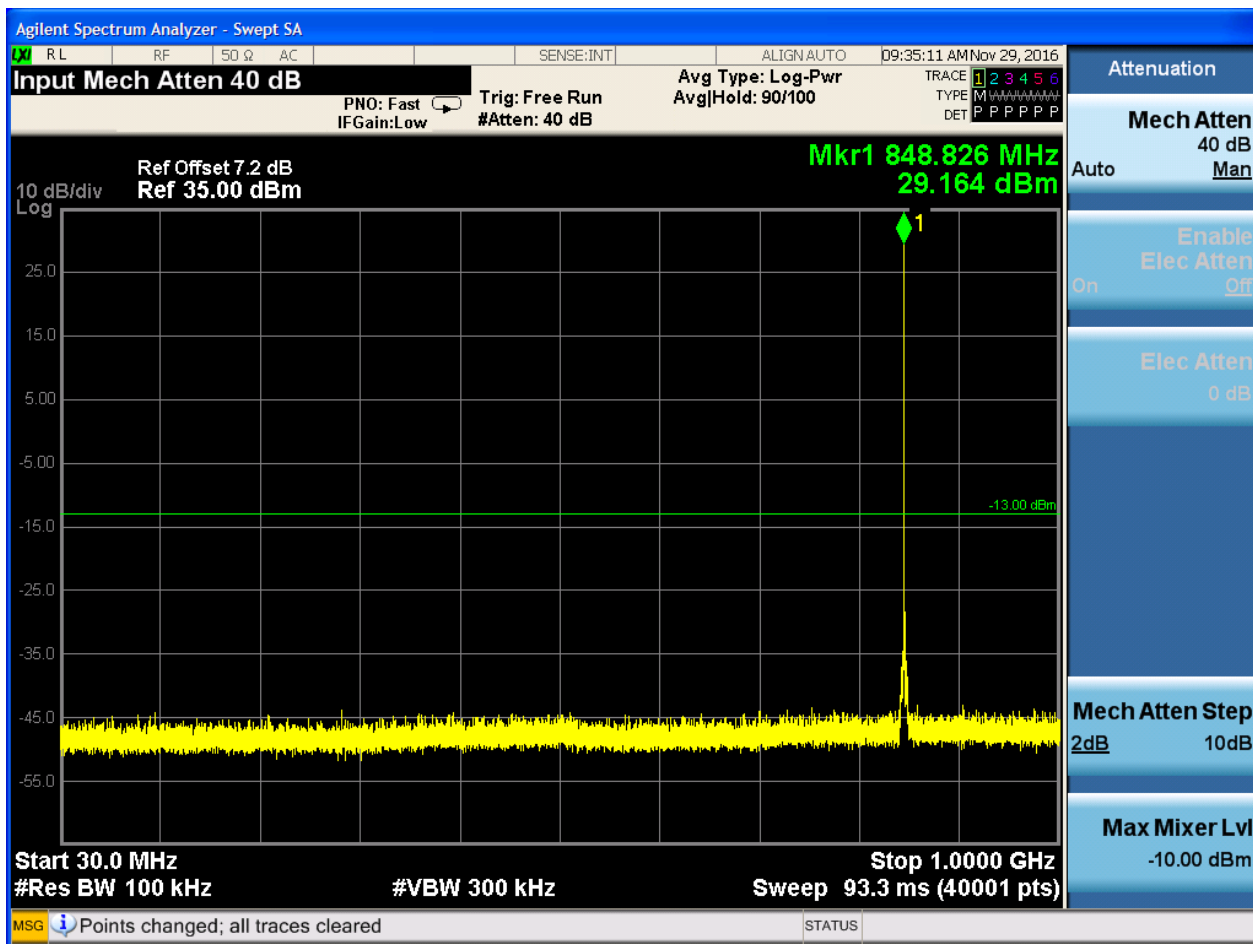


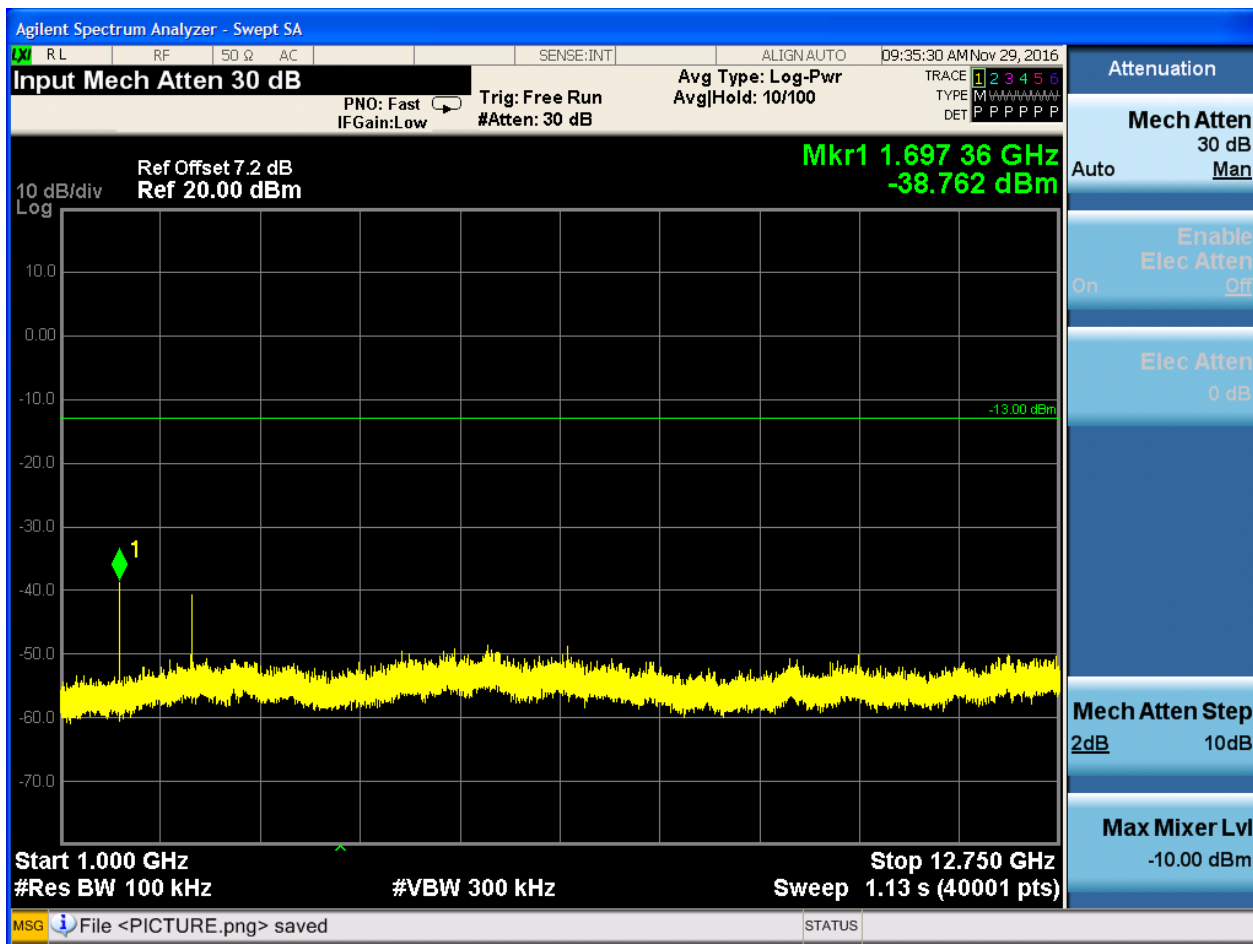


6.1.1.2.3 Test Channel = HCH



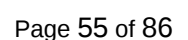


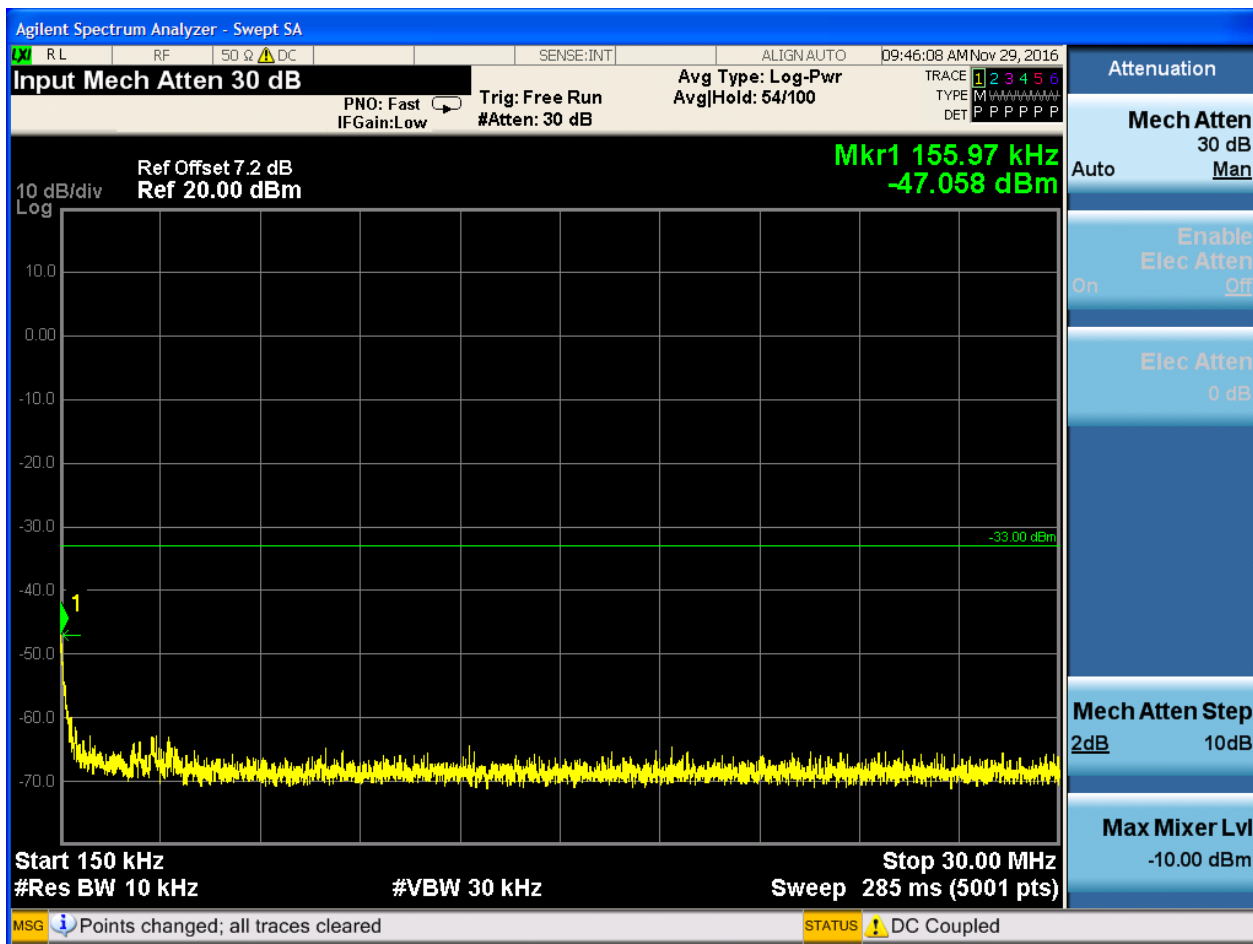


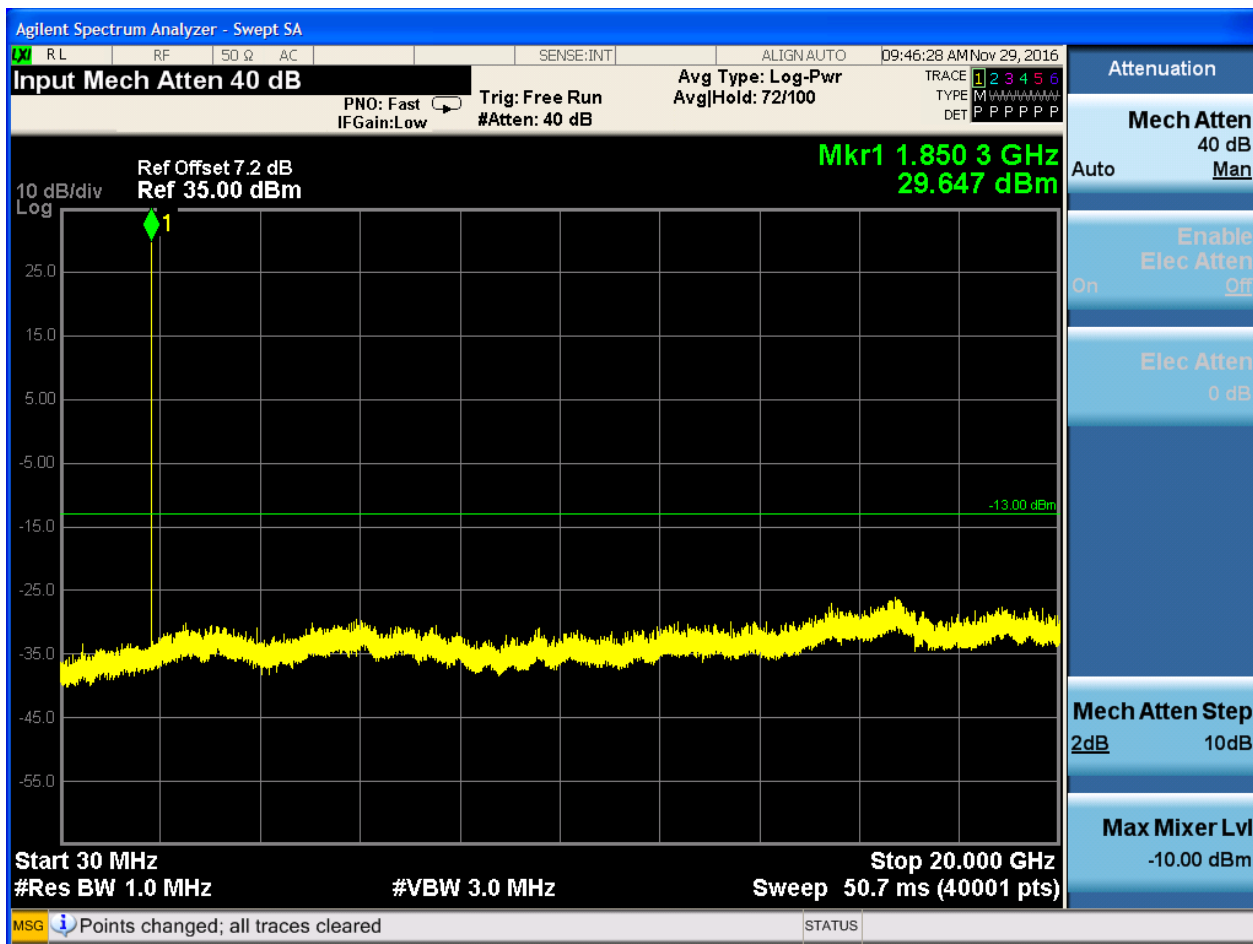




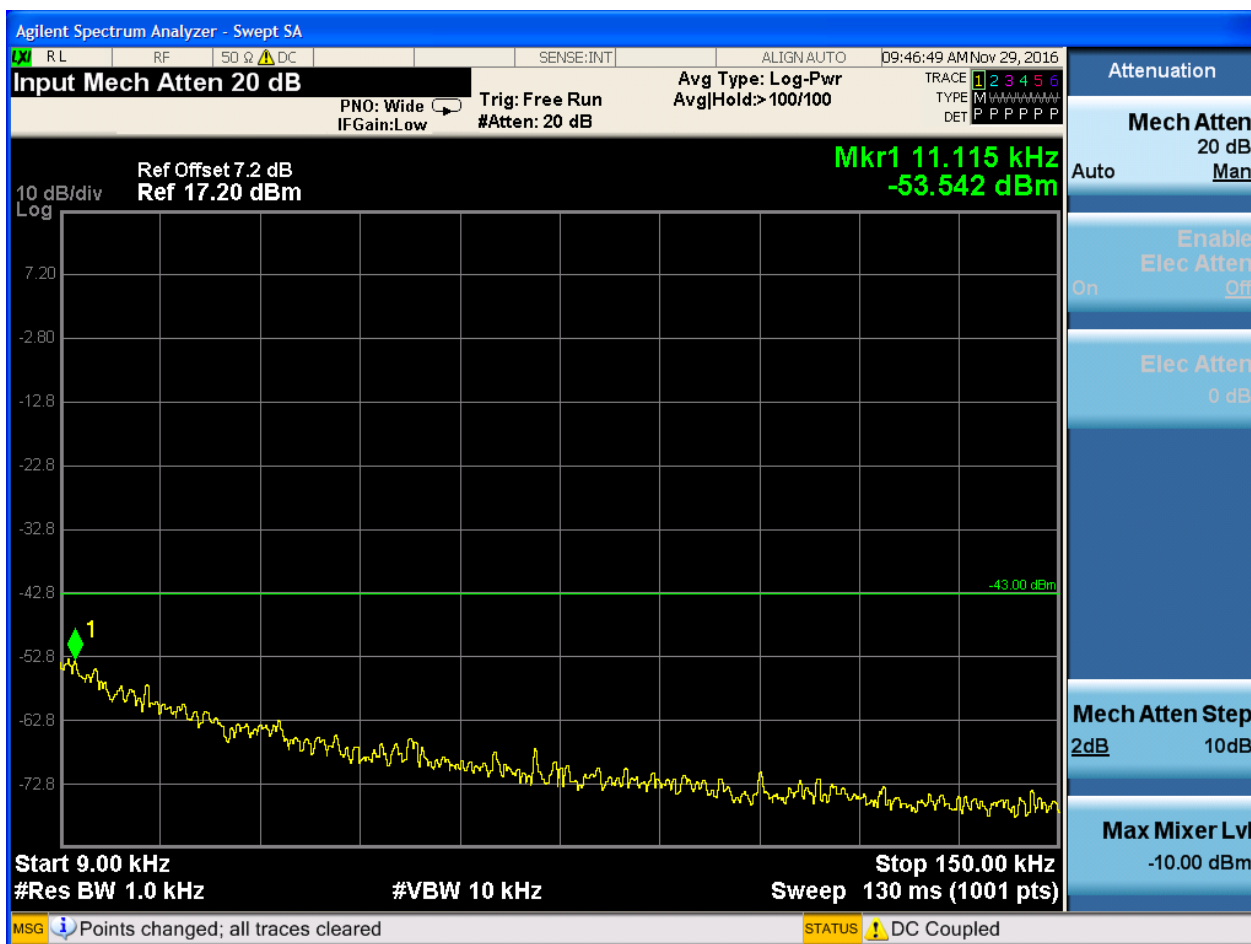
6.1.2.1.1 Test Channel = LCH

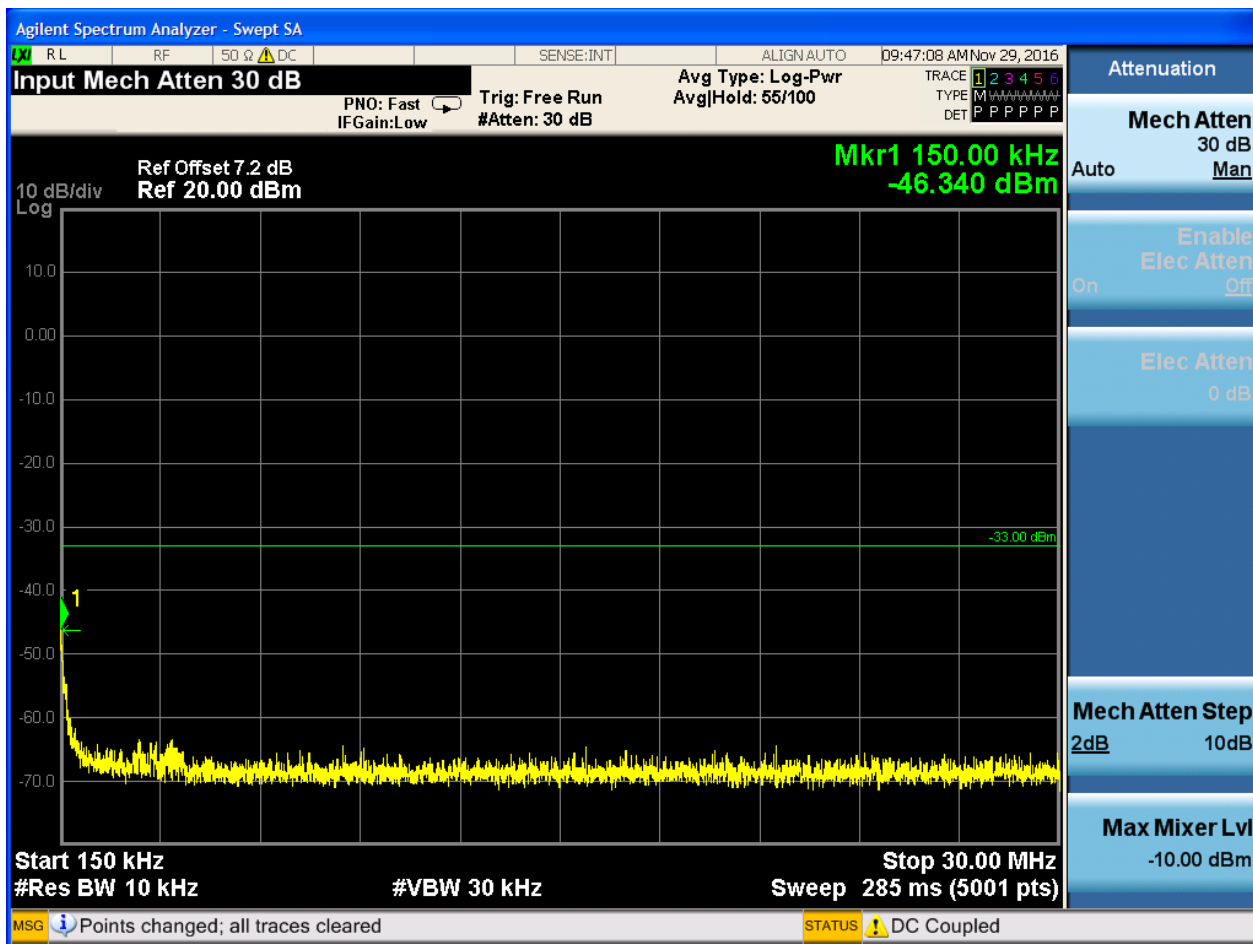


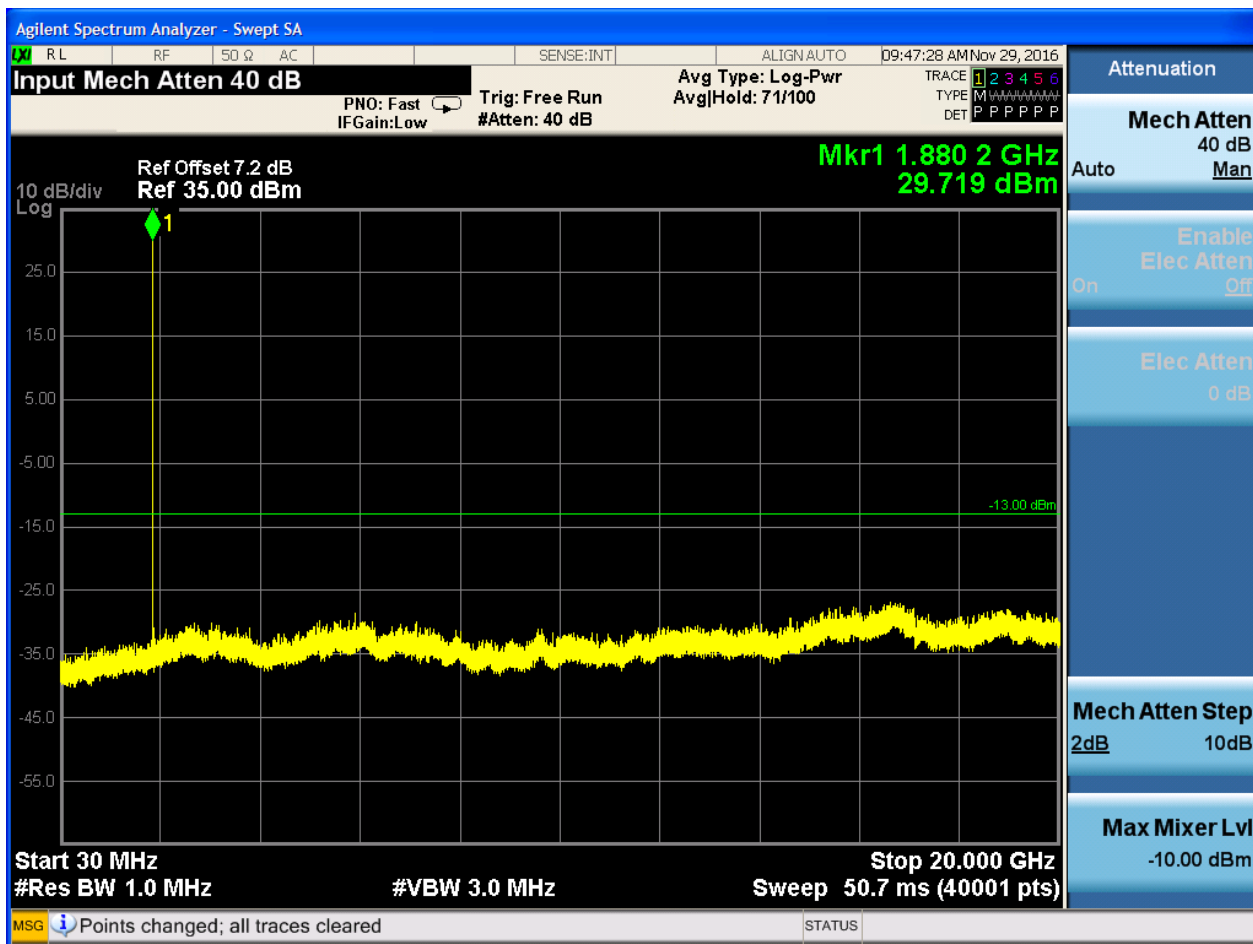




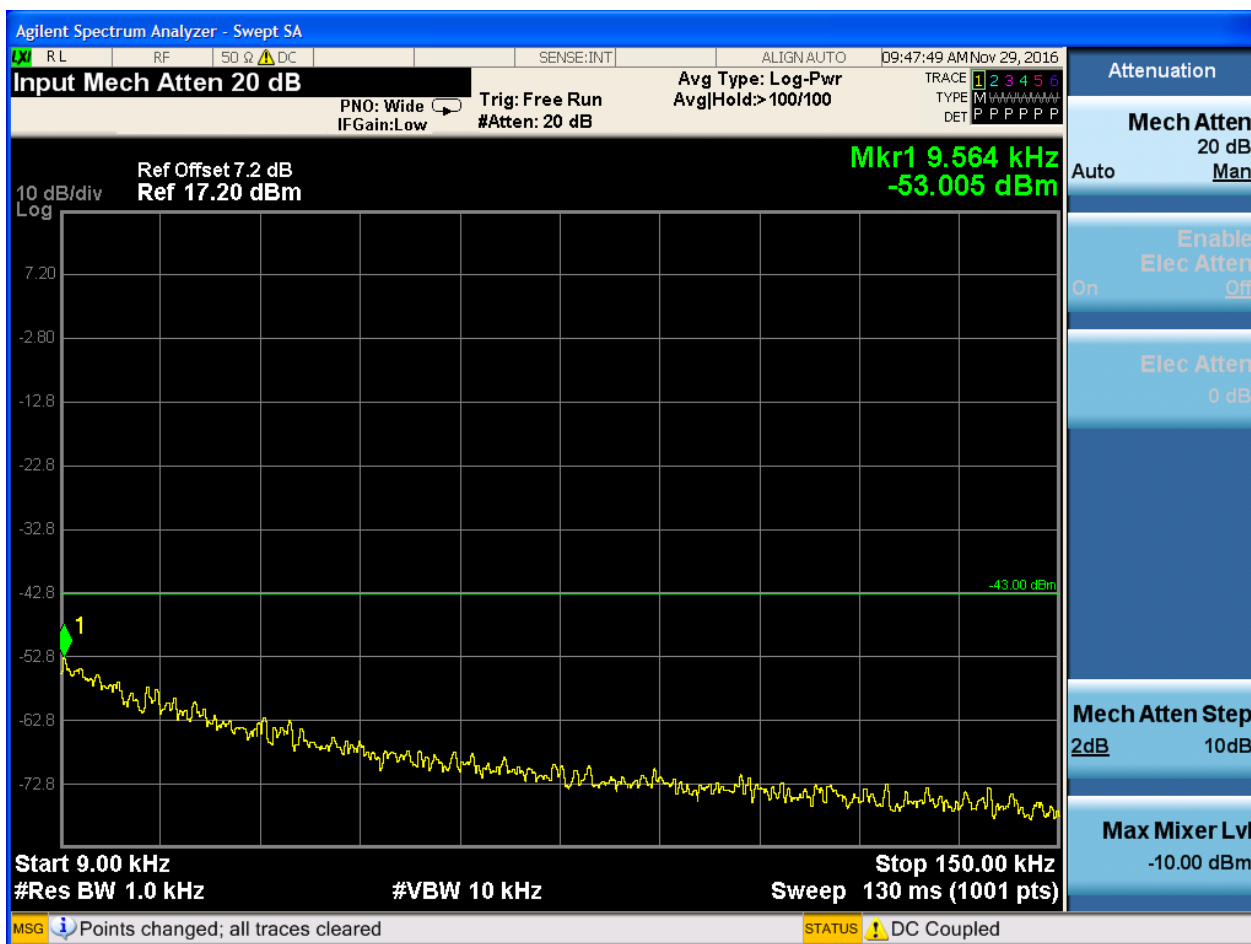
6.1.2.1.2 Test Channel = MCH

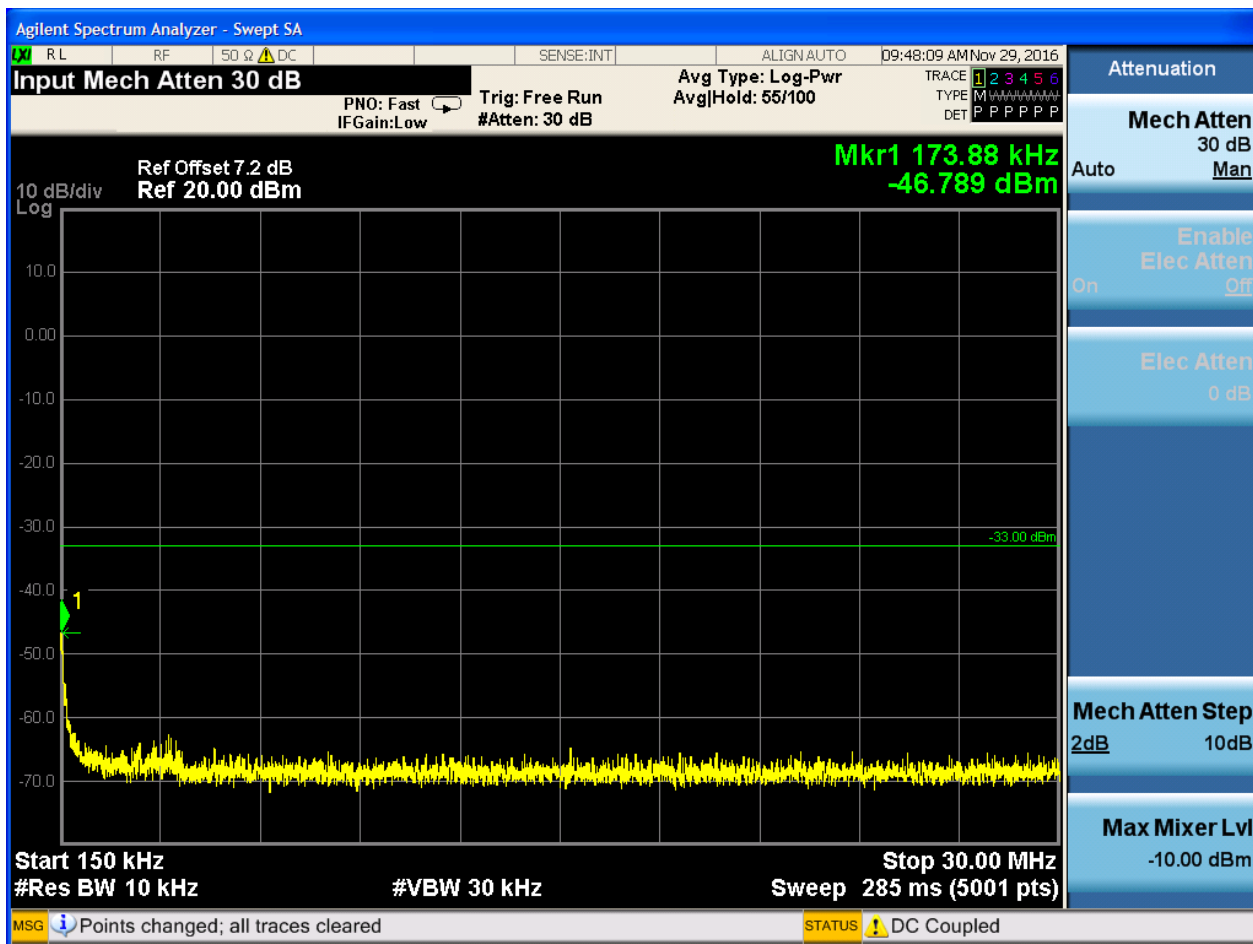


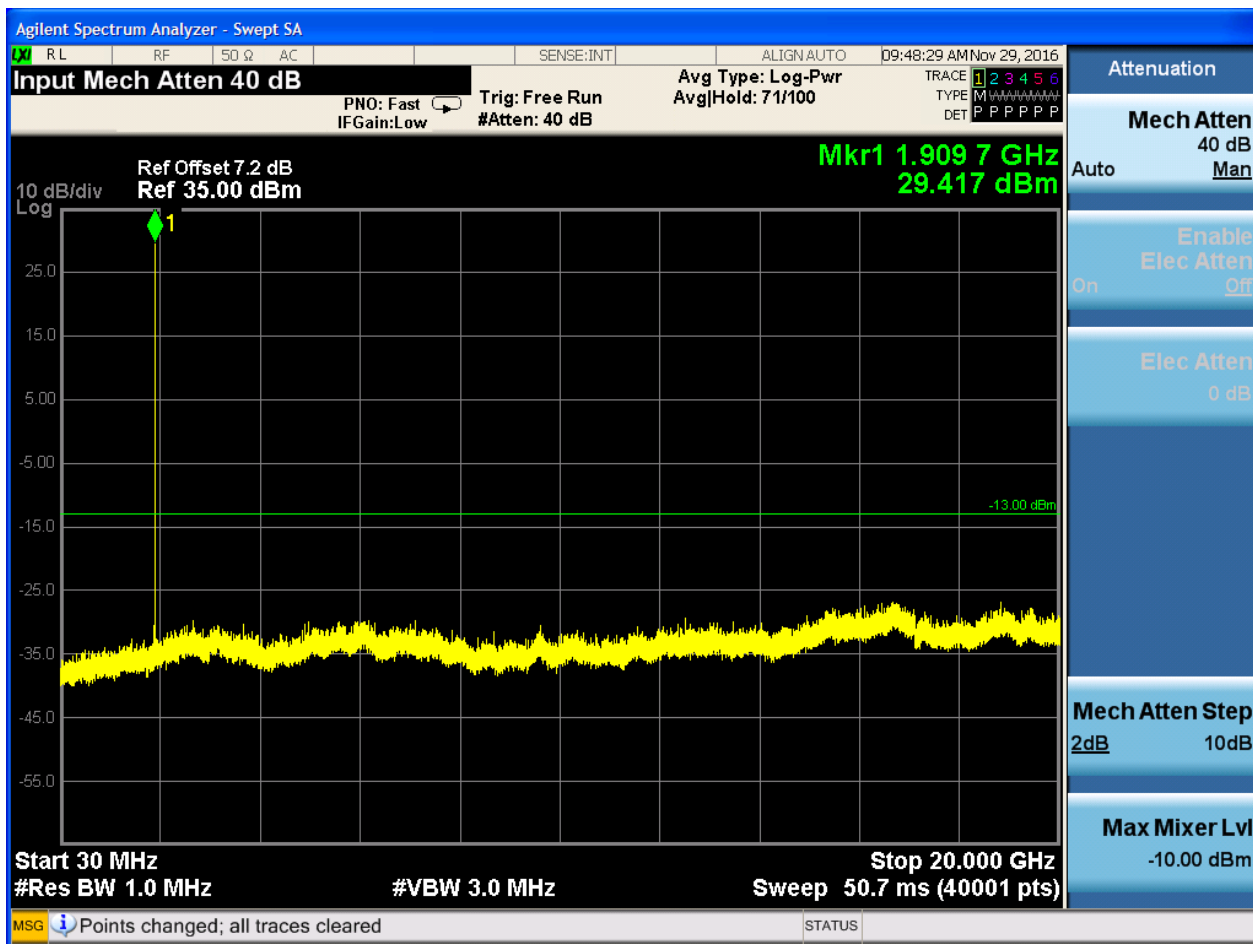




6.1.2.1.3 Test Channel = HCH



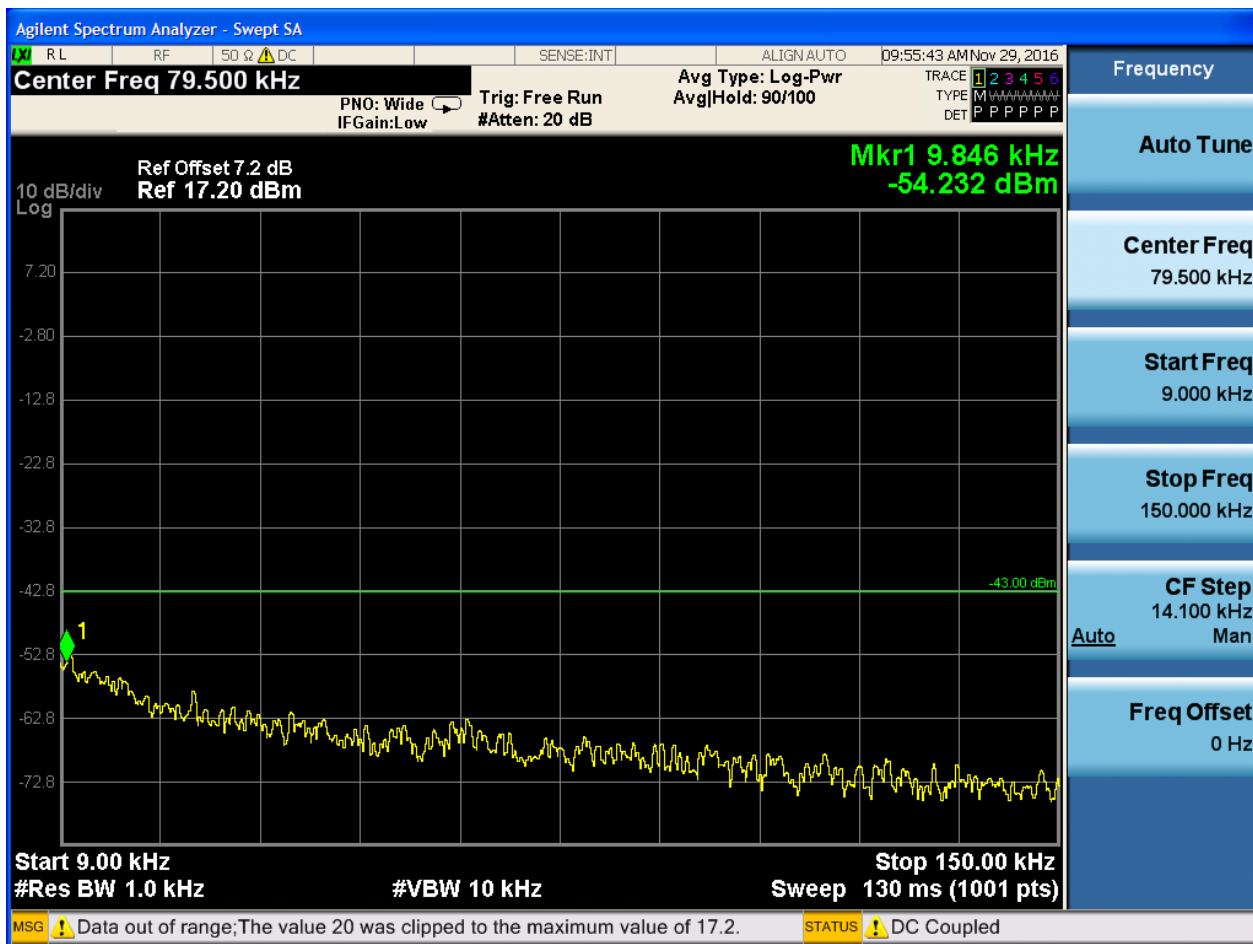


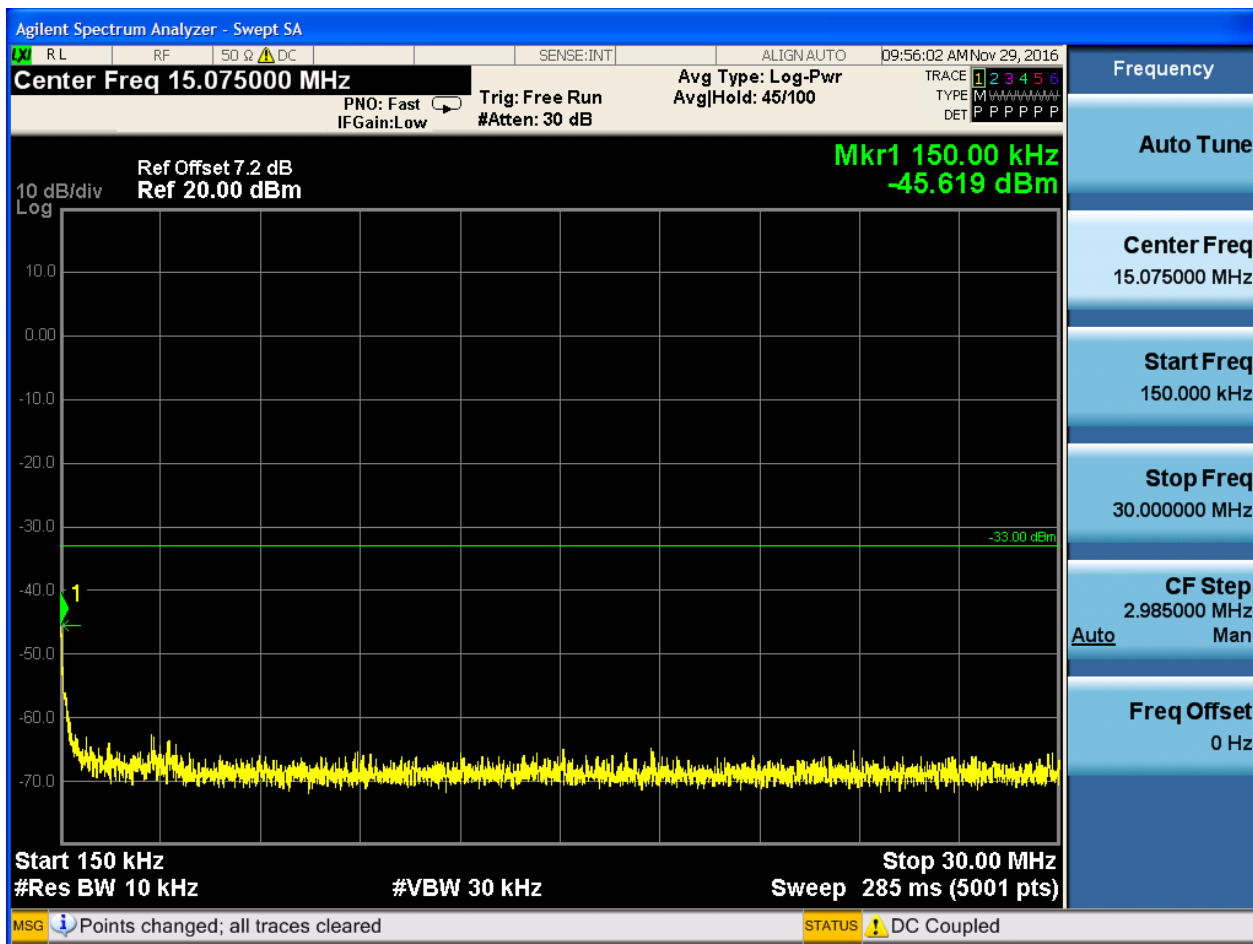


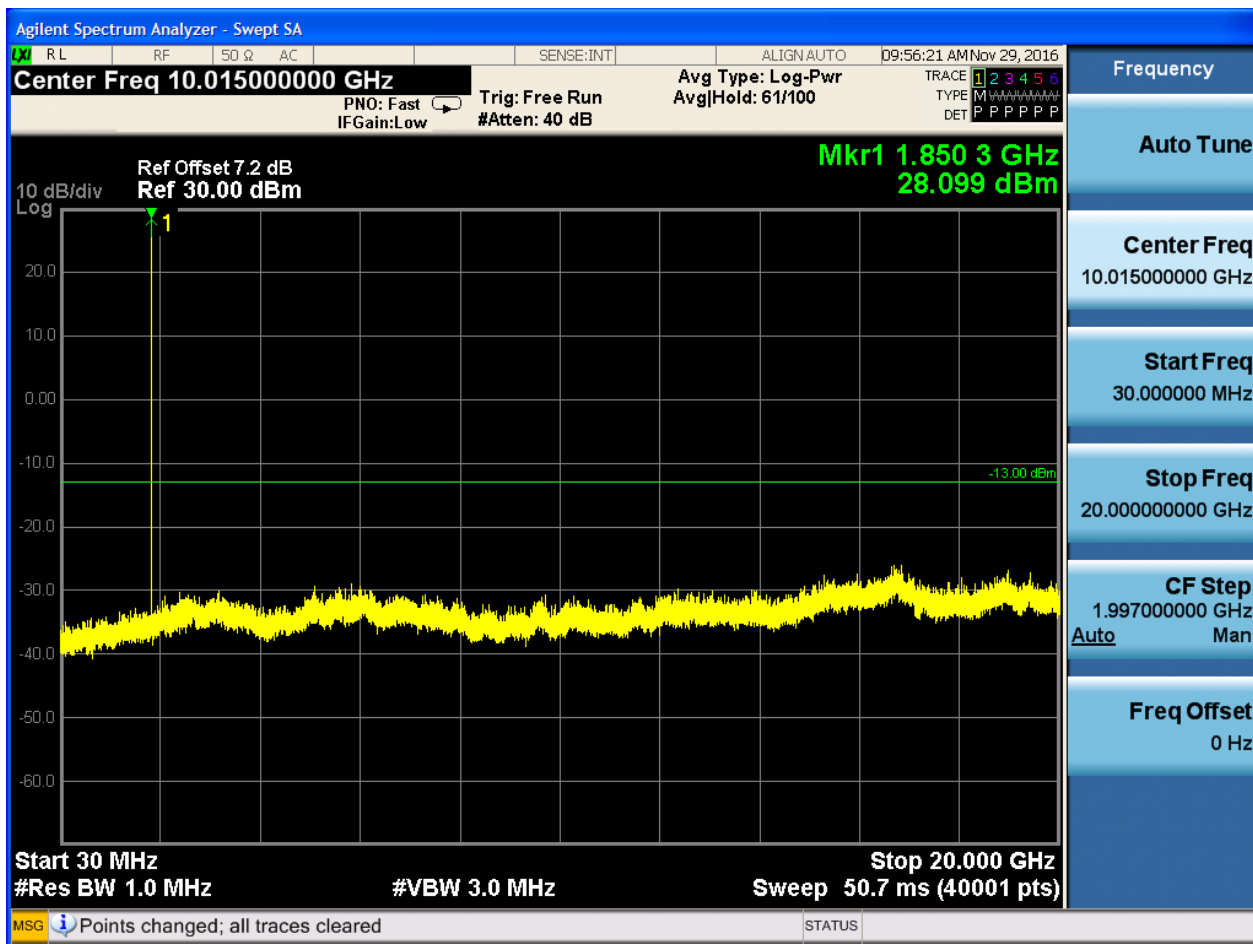


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

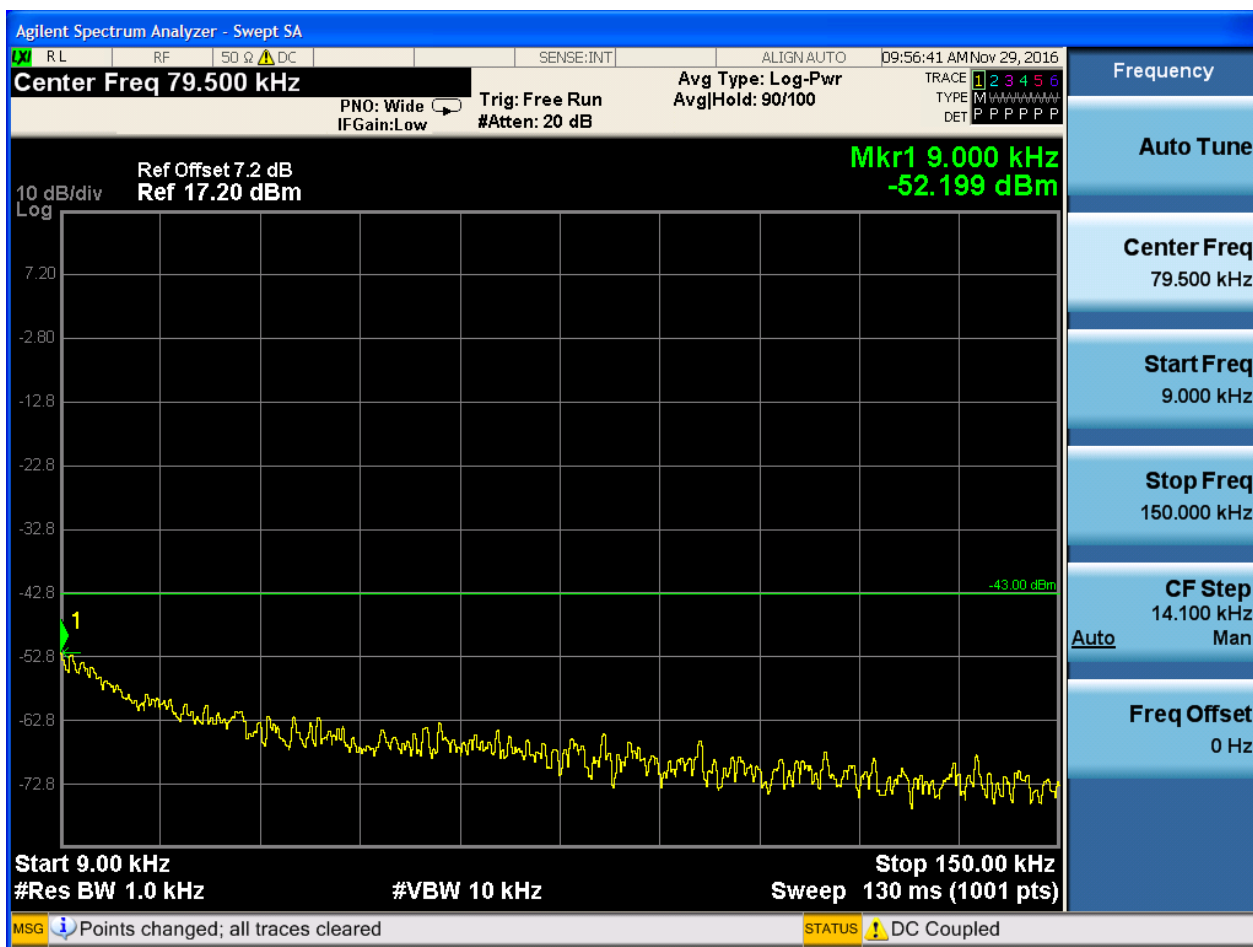


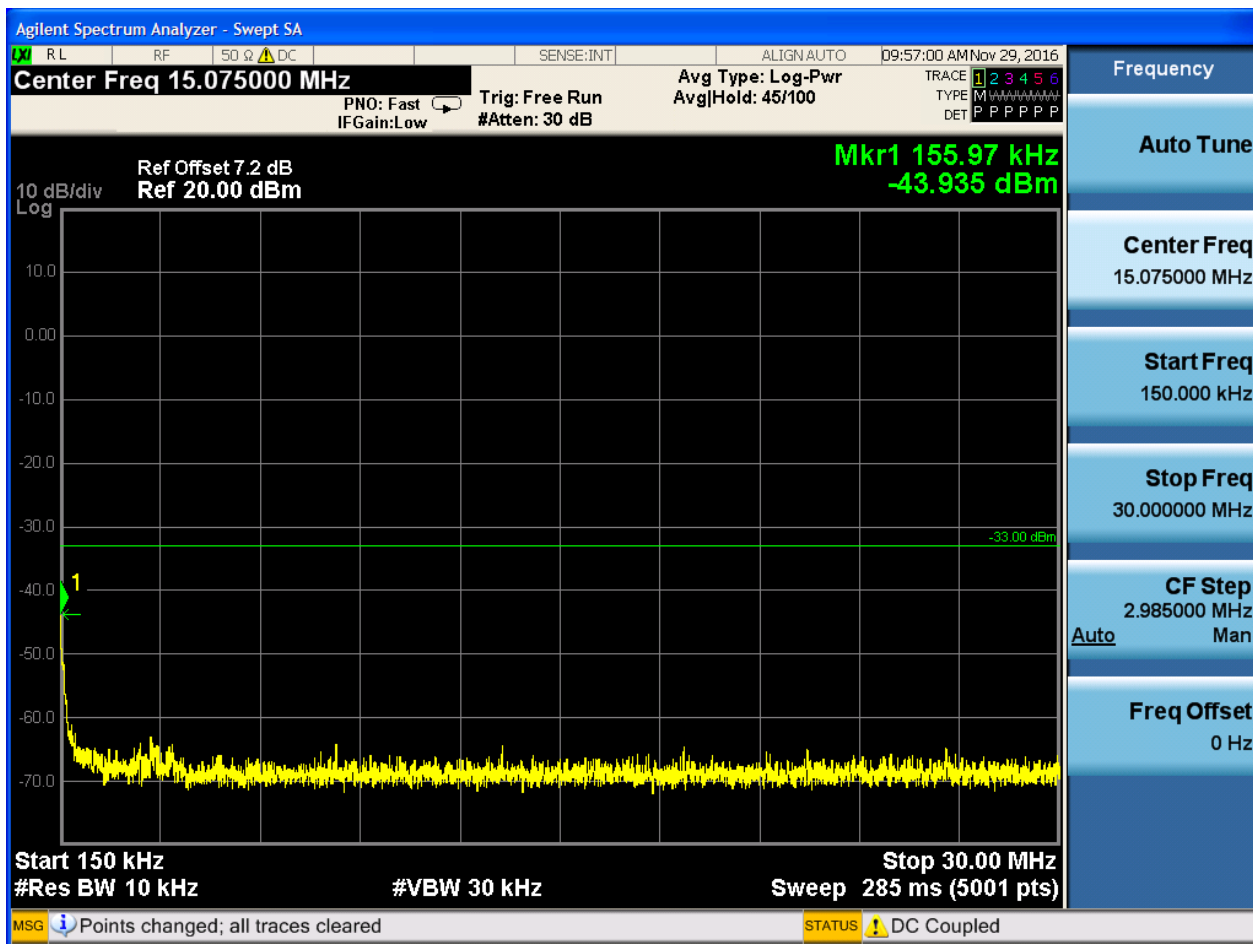


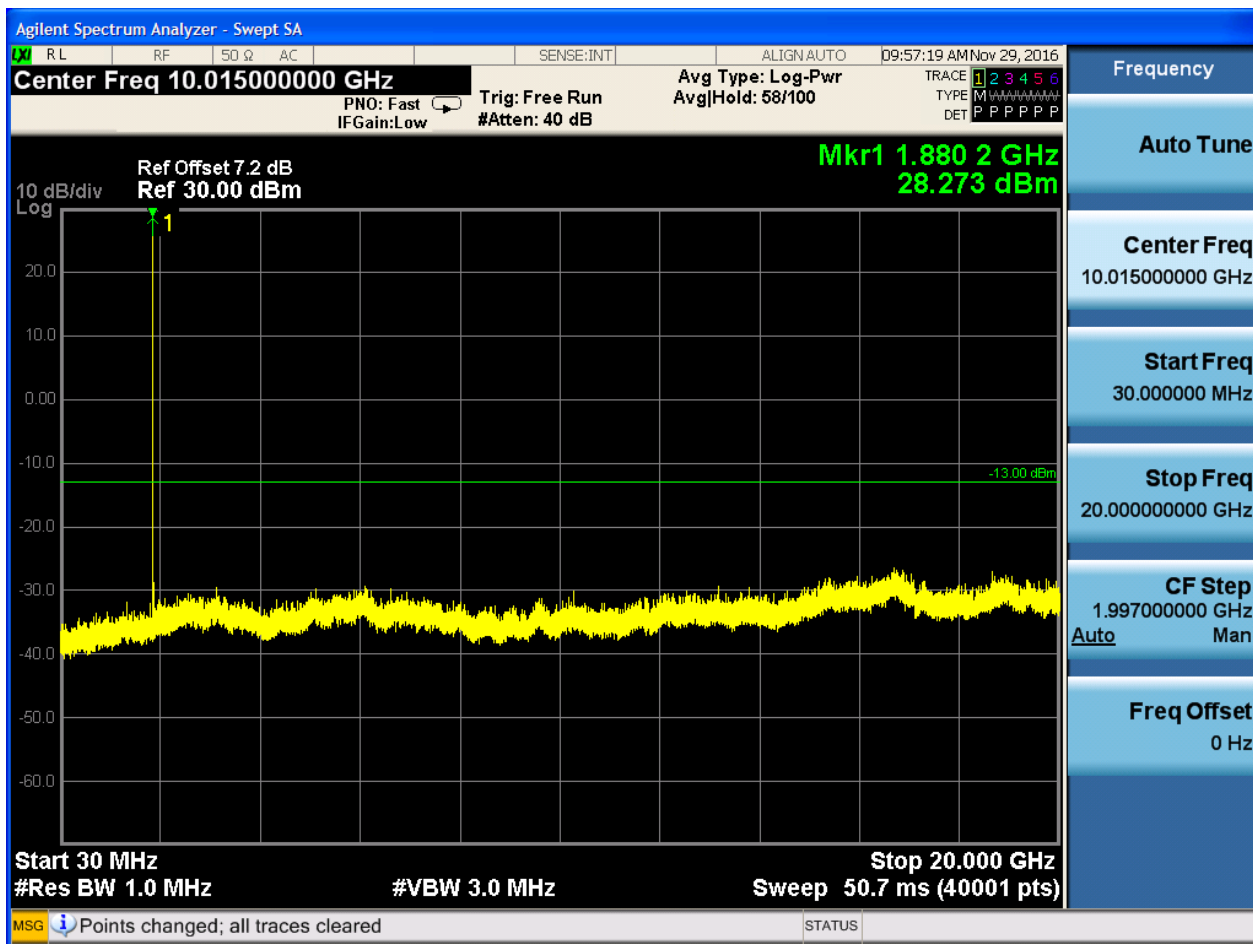




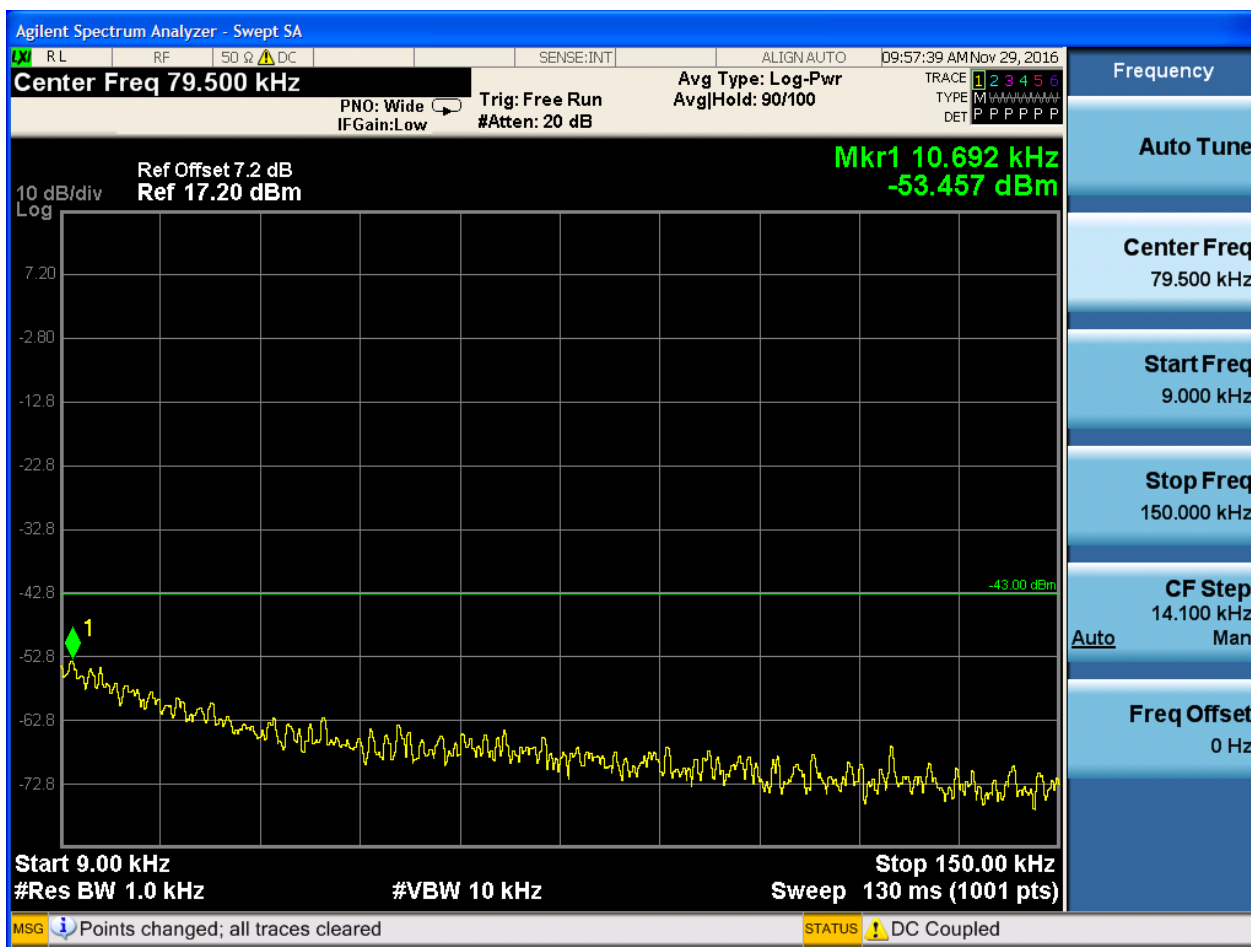
6.1.2.2.2 Test Channel = MCH

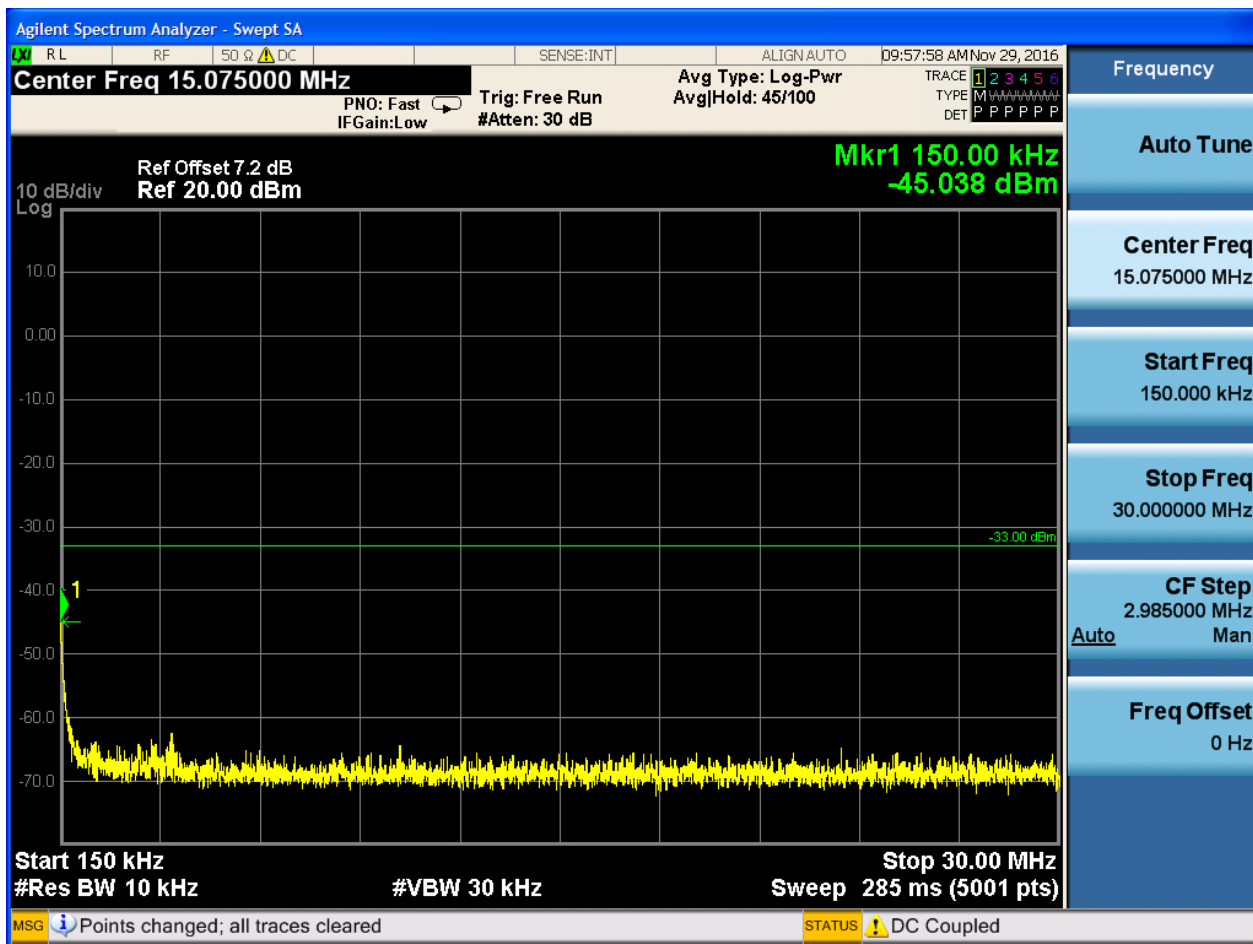


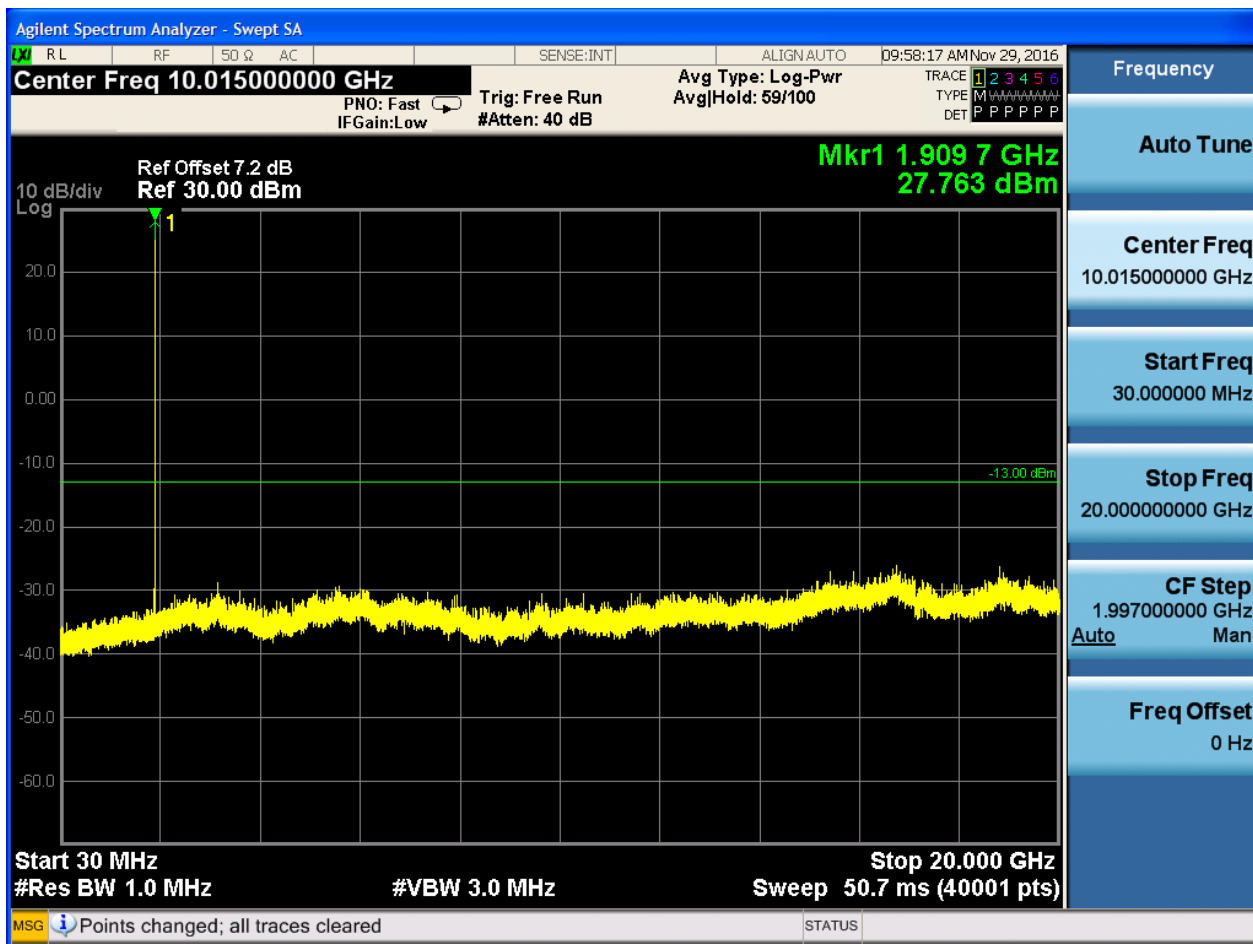




6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note: We tested all modes, but the data presented below is the worst case.

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

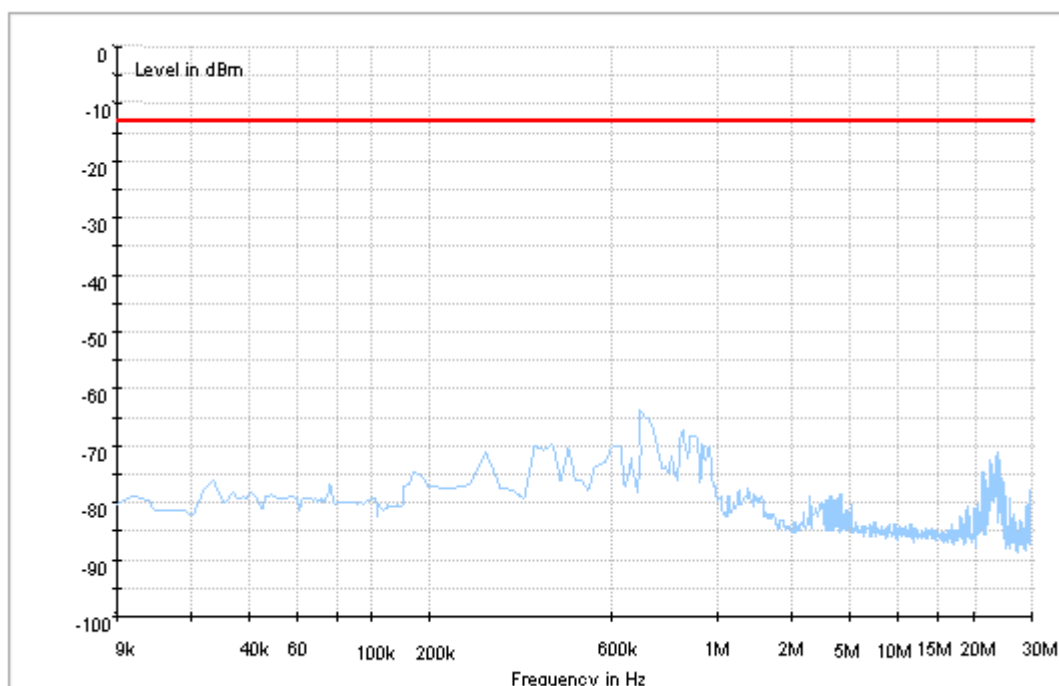
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz. Detector: PK

Part I - Test Plots

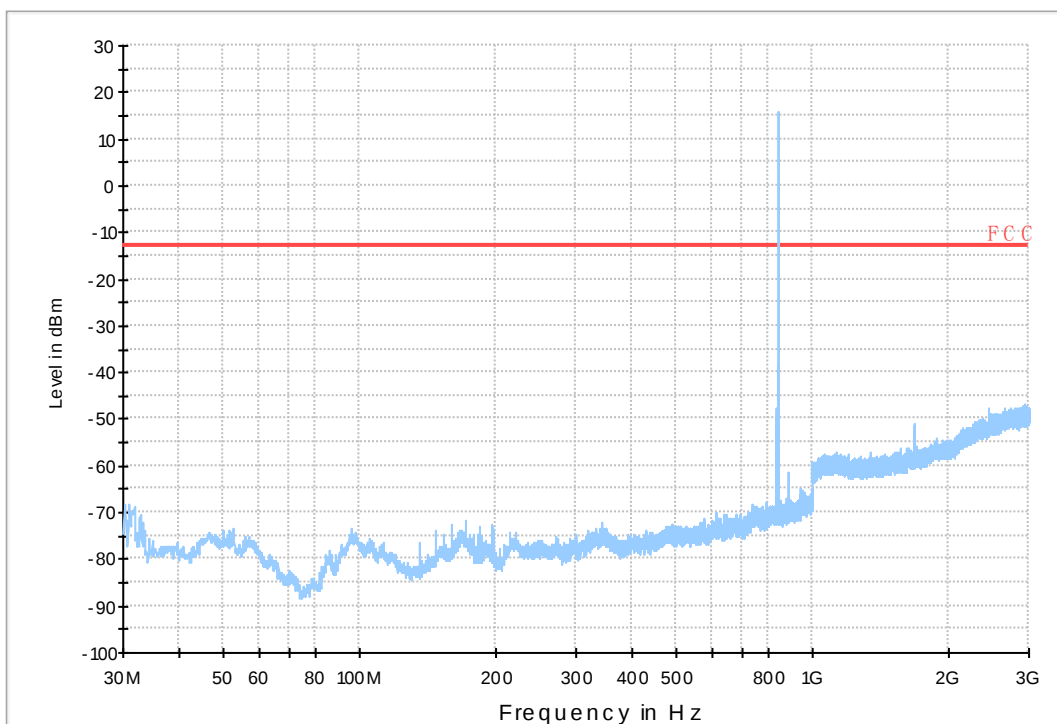
7.1 For GSM

7.1.1 Test Band = GSM850_Ant1

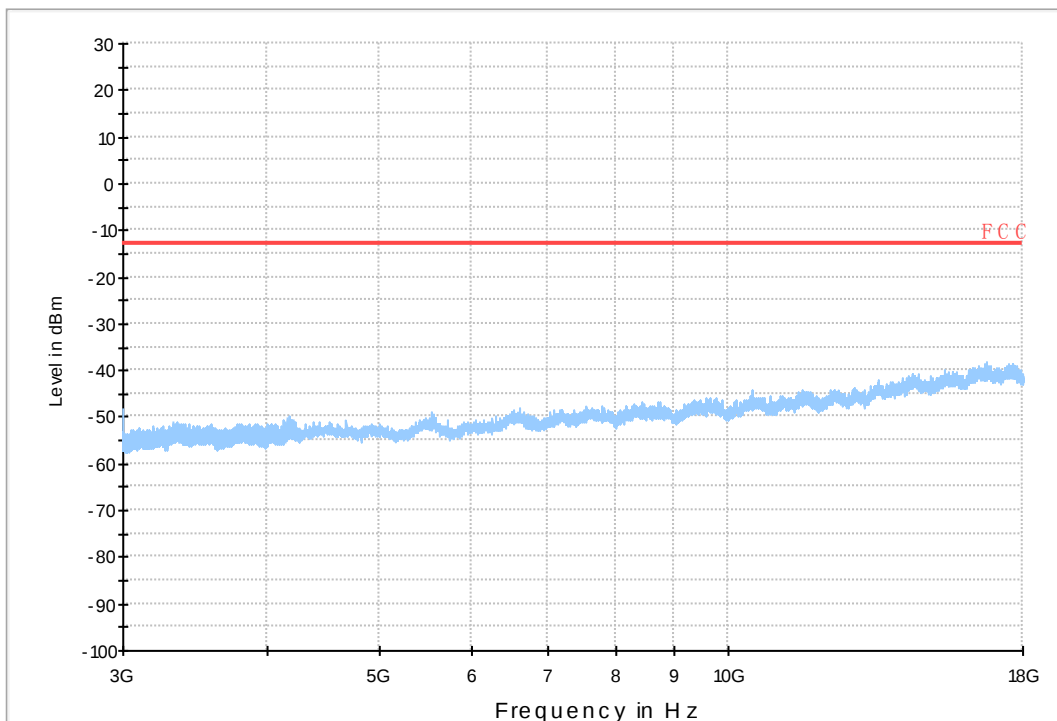
7.1.1.1 Test Mode = GSM/TM1



Copy of FCC PART22 GSM850_L

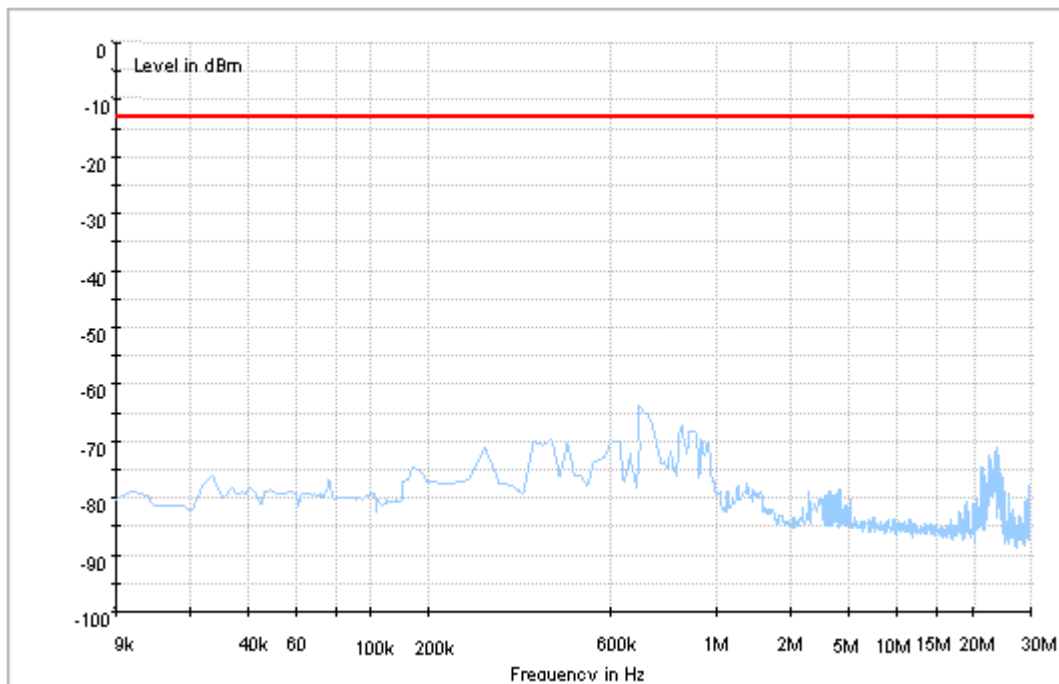


Copy of FCC PART22 GSM850_H

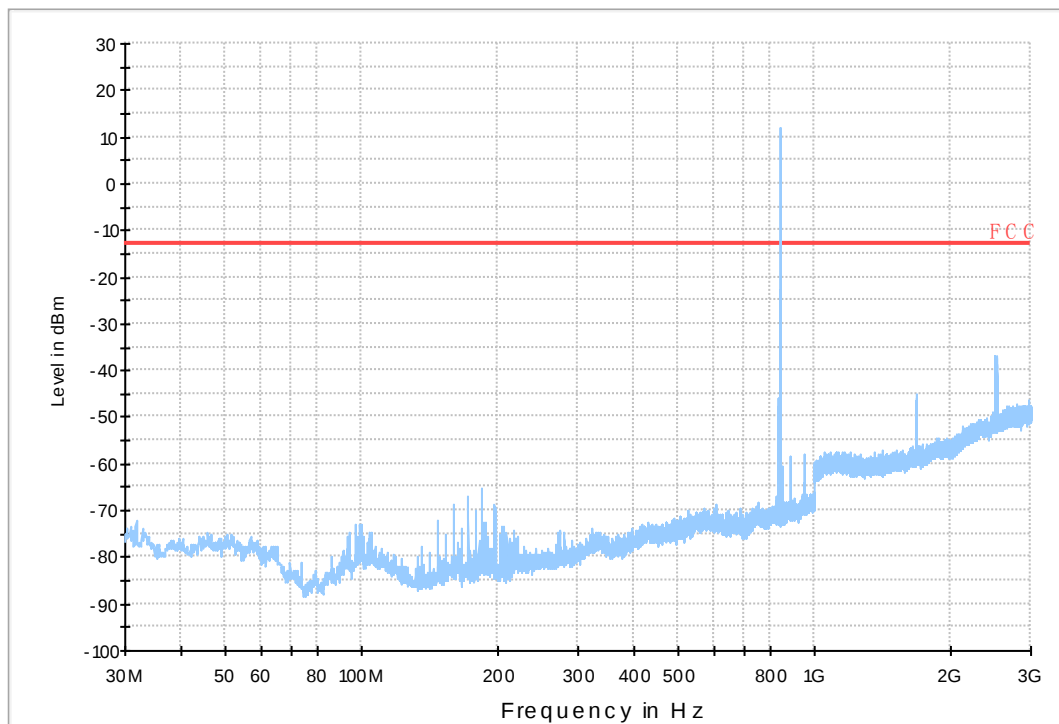


7.1.2 Test Band = GSM850_Ant2

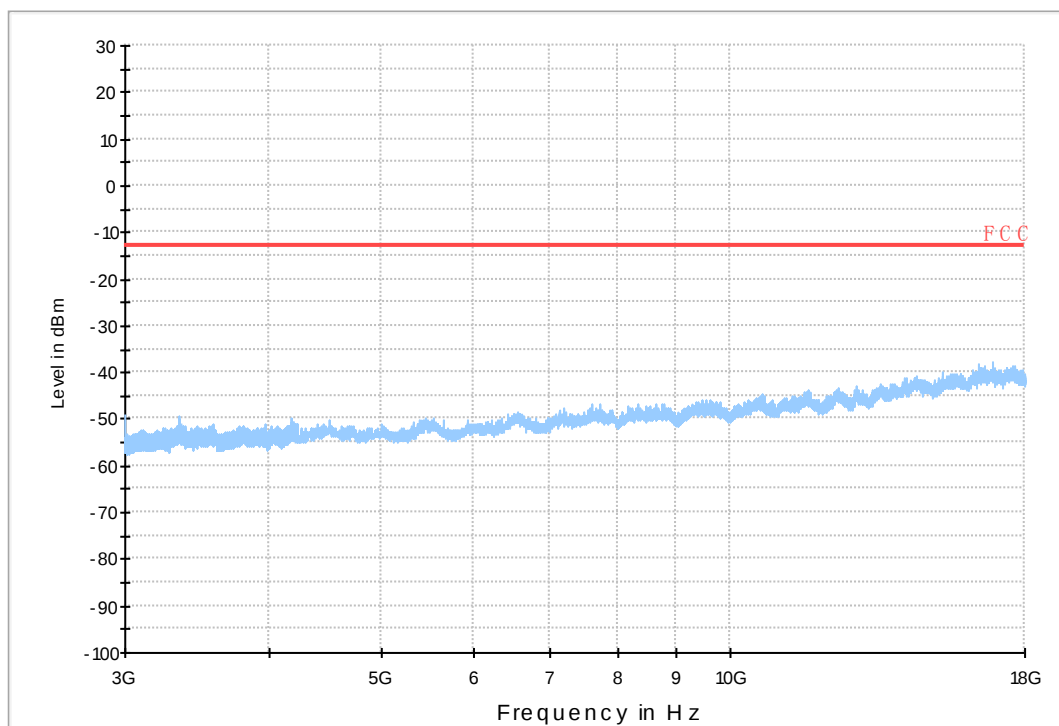
7.1.2.1 Test Mode = GSM/TM1



Copy of FCC PART22 GSM850_L

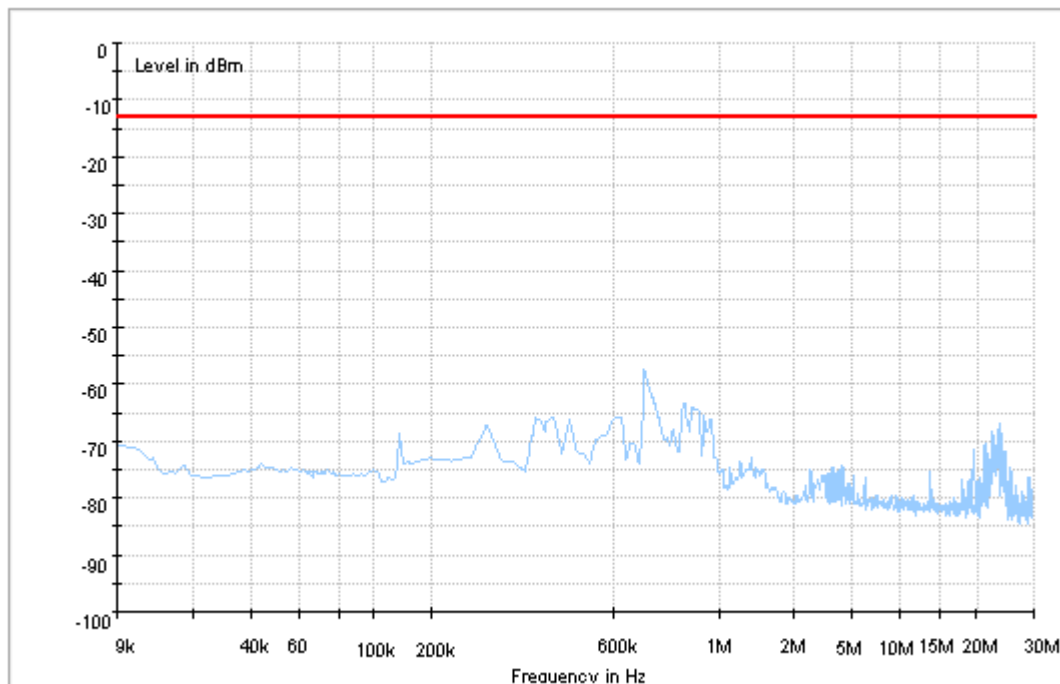


Copy of FCC PART22 GSM850_H

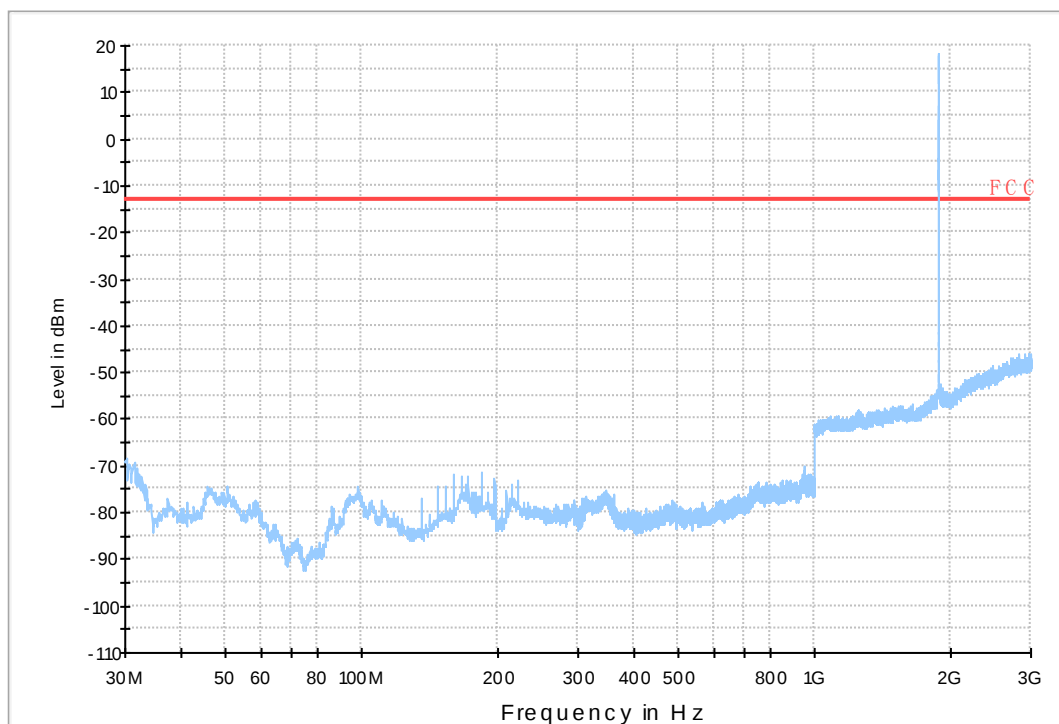


7.1.3 Test Band = GSM1900_Ant1

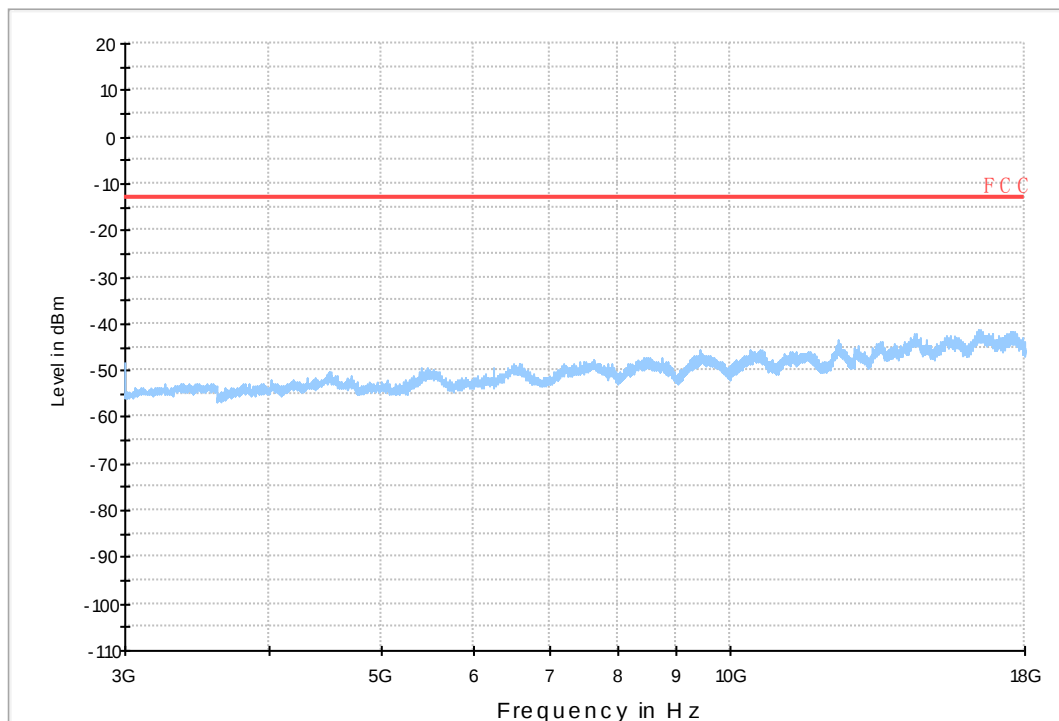
7.1.3.1 Test Mode = GSM/TM1

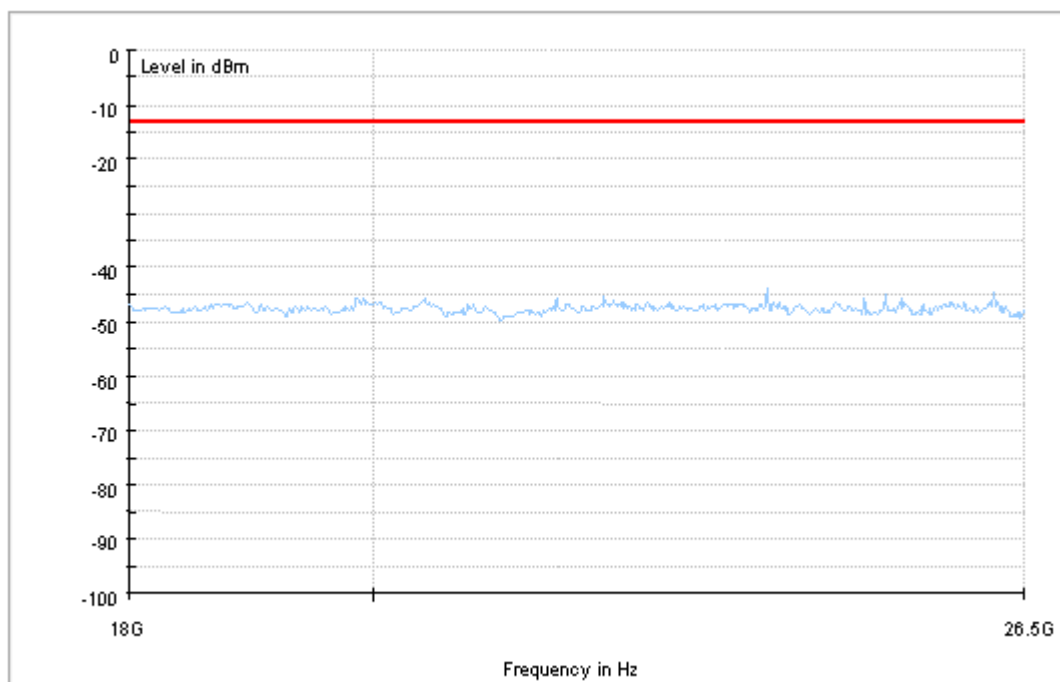


Copy of FCC PART24 W CDMA1900_L



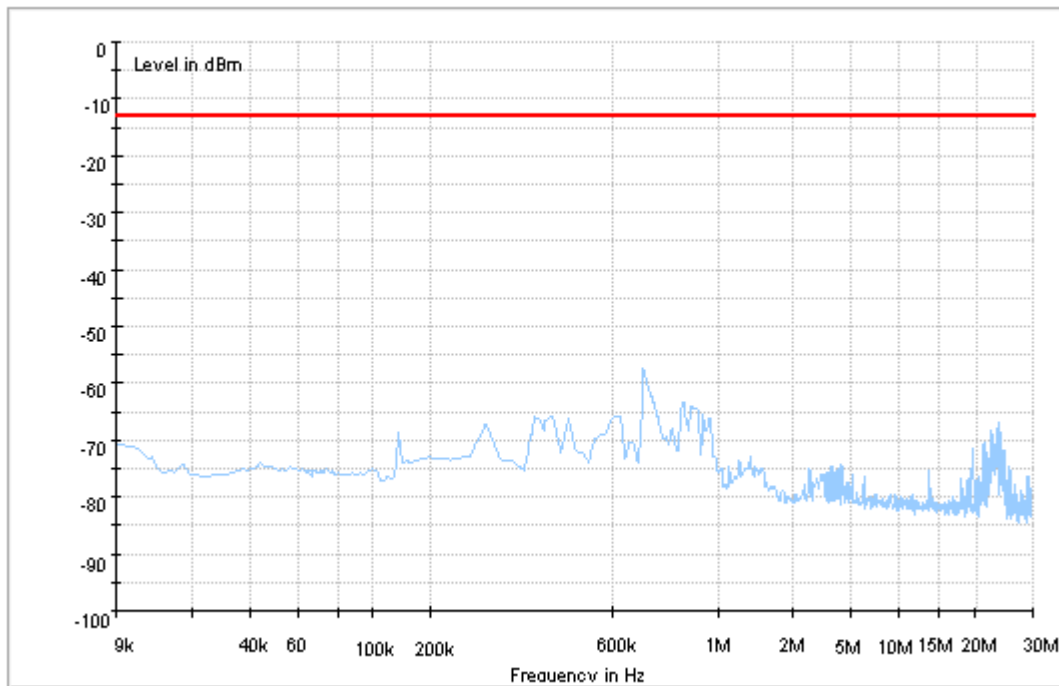
Copy of FCC PART24 W CDMA1900_H



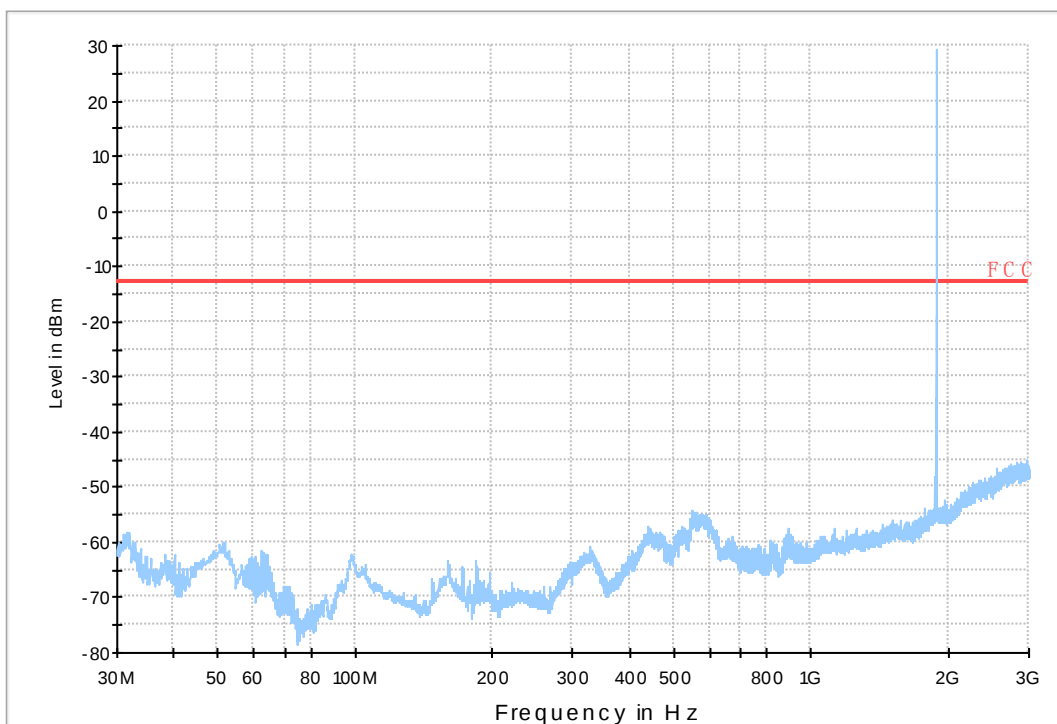


7.1.4 Test Band = GSM1900_Ant2

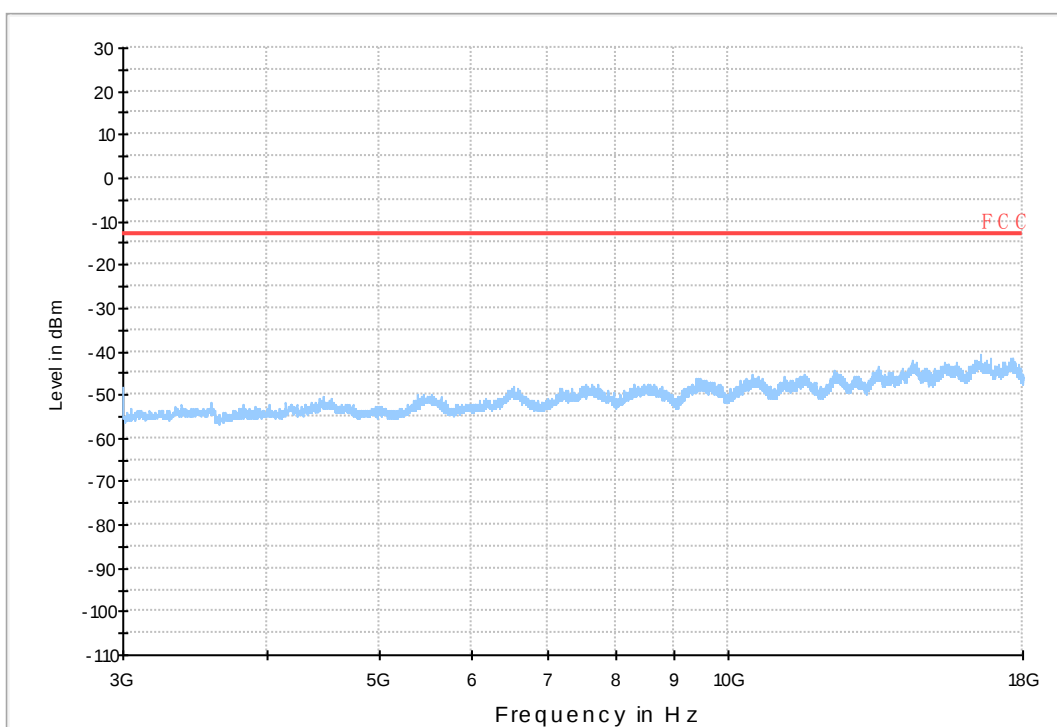
7.1.4.1 Test Mode = GSM/TM1

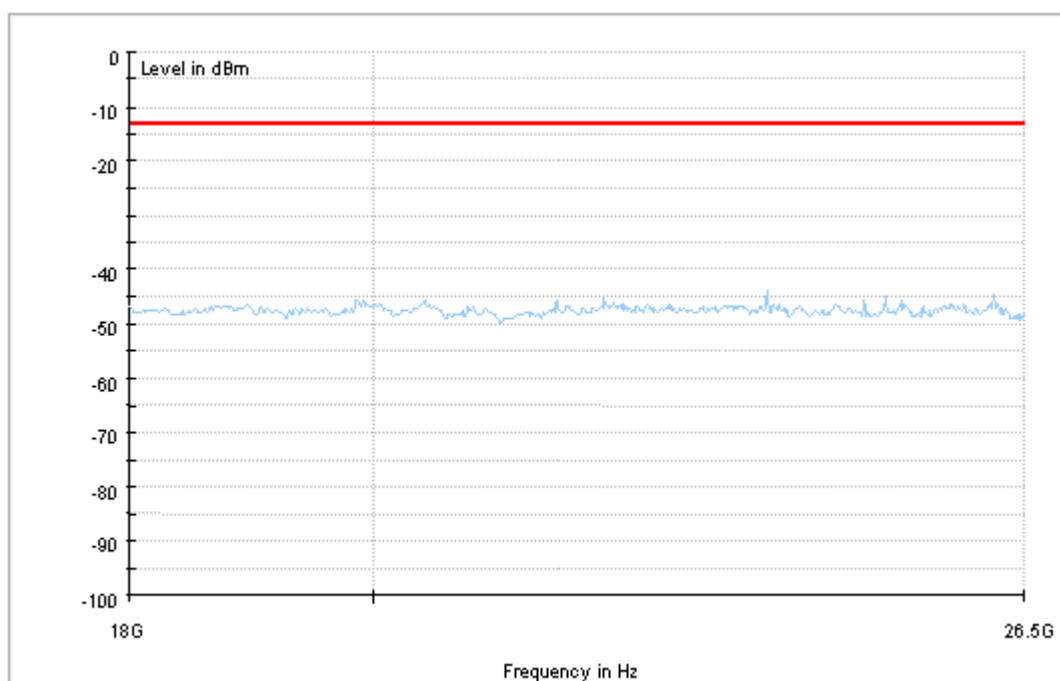


Copy of FCC PART24 GSM1900_L



Copy of FCC PART24 GSM1900_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	-14.59	-0.0177	PASS
				VN	-7.75	-0.0094	PASS
				VH	-9.43	-0.01144	PASS
		MCH	TN	VL	-11.43	-0.01366	PASS
				VN	-6.72	-0.00803	PASS
				VH	-13.62	-0.01628	PASS
		HCH	TN	VL	-6.13	-0.00722	PASS
				VN	-8.20	-0.00966	PASS
				VH	-3.62	-0.00426	PASS
	GSM/TM2	LCH	TN	VL	-14.85	-0.01802	PASS
				VN	-8.81	-0.01069	PASS
				VH	-8.23	-0.00999	PASS
		MCH	TN	VL	-17.95	-0.02146	PASS
				VN	-17.53	-0.02095	PASS
				VH	-10.56	-0.01262	PASS
		HCH	TN	VL	-12.75	-0.01502	PASS
				VN	-8.07	-0.00951	PASS
				VH	-12.79	-0.01507	PASS
GSM1900	GSM/TM1	LCH	TN	VL	2.20	0.00119	PASS
				VN	1.49	0.00081	PASS
				VH	9.36	0.00506	PASS
		MCH	TN	VL	25.89	0.01377	PASS
				VN	21.18	0.01127	PASS
				VH	10.20	0.00543	PASS
		HCH	TN	VL	10.53	0.00551	PASS
				VN	9.17	0.0048	PASS
				VH	20.08	0.01051	PASS
	GSM/TM2	LCH	TN	VL	-11.01	-0.00595	PASS
				VN	-19.53	-0.01056	PASS
				VH	-17.01	-0.00919	PASS
		MCH	TN	VL	-6.62	-0.00352	PASS
				VN	-11.72	-0.00623	PASS
				VH	-11.72	-0.00623	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	TN	VH	-4.29	-0.00228	PASS
				VL	-4.91	-0.00257	PASS
				VN	-20.99	-0.01099	PASS
				VH	-3.23	-0.00169	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	-11.95	-0.0145	PASS
				-20	-16.21	-0.01967	PASS
				-10	-11.49	-0.01394	PASS
				0	-12.53	-0.0152	PASS
				10	-13.17	-0.01598	PASS
				20	-16.34	-0.01983	PASS
				30	-12.72	-0.01543	PASS
				40	-10.91	-0.01324	PASS
				50	-12.33	-0.01496	PASS
		MCH	VN	-30	-10.53	-0.01259	PASS
				-20	-9.75	-0.01165	PASS
				-10	-12.91	-0.01543	PASS
				0	-12.14	-0.01451	PASS
				10	-9.10	-0.01088	PASS
				20	-7.43	-0.00888	PASS
				30	-10.01	-0.01197	PASS
				40	-9.81	-0.01173	PASS
				50	-11.24	-0.01344	PASS
		HCH	VN	-30	-8.85	-0.01043	PASS
				-20	-10.01	-0.01179	PASS
				-10	-10.14	-0.01195	PASS
				0	-6.97	-0.00821	PASS
				10	-9.23	-0.01087	PASS
				20	-11.88	-0.014	PASS
				30	-9.49	-0.01118	PASS
				40	-9.94	-0.01171	PASS
				50	-7.43	-0.00875	PASS
	GSM/TM2	LCH	VN	-30	-17.21	-0.02088	PASS
				-20	-17.50	-0.02123	PASS
				-10	-13.72	-0.01665	PASS
				0	-13.92	-0.01689	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	-17.47	-0.0212	PASS
				20	-14.82	-0.01798	PASS
				30	-9.17	-0.01113	PASS
				40	-14.08	-0.01708	PASS
				50	-17.43	-0.02115	PASS
		MCH	VN	-30	-14.82	-0.01771	PASS
				-20	-16.40	-0.0196	PASS
				-10	-10.56	-0.01262	PASS
				0	-10.69	-0.01278	PASS
				10	-13.53	-0.01617	PASS
				20	-22.63	-0.02705	PASS
				30	-4.71	-0.00563	PASS
				40	-14.75	-0.01763	PASS
				50	-16.50	-0.01972	PASS
		HCH	VN	-30	-9.43	-0.01111	PASS
				-20	-11.75	-0.01384	PASS
				-10	-9.72	-0.01145	PASS
				0	-9.23	-0.01087	PASS
				10	-10.59	-0.01248	PASS
				20	-6.17	-0.00727	PASS
				30	-14.46	-0.01704	PASS
				40	-8.56	-0.01008	PASS
				50	-14.30	-0.01685	PASS
GSM1900	GSM/TM1	LCH	VN	-30	14.79	0.00799	PASS
				-20	1.55	0.00084	PASS
				-10	9.69	0.00524	PASS
				0	12.01	0.00649	PASS
				10	-1.68	-0.00091	PASS
				20	12.20	0.00659	PASS
				30	5.23	0.00283	PASS
				40	5.55	0.003	PASS
				50	14.08	0.00761	PASS
		MCH	VN	-30	14.98	0.00797	PASS
				-20	12.46	0.00663	PASS
				-10	0.71	0.00038	PASS
				0	14.66	0.0078	PASS
				10	22.41	0.01192	PASS
				20	15.63	0.00831	PASS
				30	10.78	0.00573	PASS
				40	25.70	0.01367	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	VN	50	17.31	0.00921	PASS
				-30	16.34	0.00856	PASS
				-20	21.89	0.01146	PASS
				-10	19.05	0.00997	PASS
				0	13.95	0.0073	PASS
				10	11.04	0.00578	PASS
				20	24.41	0.01278	PASS
				30	20.99	0.01099	PASS
				40	14.92	0.00781	PASS
				50	13.50	0.00707	PASS
	GSM/TM2	LCH	VN	-30	-17.53	-0.00947	PASS
				-20	-13.56	-0.00733	PASS
				-10	-3.39	-0.00183	PASS
				0	-18.24	-0.00986	PASS
				10	-7.68	-0.00415	PASS
				20	-15.27	-0.00825	PASS
				30	-7.62	-0.00412	PASS
				40	-5.46	-0.00295	PASS
				50	-2.84	-0.00153	PASS
		MCH	VN	-30	-16.27	-0.00865	PASS
				-20	-17.40	-0.00926	PASS
				-10	-7.07	-0.00376	PASS
				0	-7.20	-0.00383	PASS
				10	-7.88	-0.00419	PASS
				20	-2.07	-0.0011	PASS
				30	-0.23	-0.00012	PASS
				40	-2.42	-0.00129	PASS
				50	1.78	0.00095	PASS
		HCH	VN	-30	17.56	0.00919	PASS
				-20	-5.78	-0.00303	PASS
				-10	-5.33	-0.00279	PASS
				0	-3.87	-0.00203	PASS
				10	7.20	0.00377	PASS
				20	-13.79	-0.00722	PASS
				30	-10.82	-0.00567	PASS
				40	-17.14	-0.00897	PASS
				50	-4.68	-0.00245	PASS

END