



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	32.39	26.24	38.5	PASS
		MCH	32.3	26.15	38.5	PASS
		HCH	32.31	26.16	38.5	PASS
	GSM/TM2	LCH	26.2	20.05	38.5	PASS
		MCH	26.2	20.05	38.5	PASS
		HCH	26.21	20.06	38.5	PASS
GSM1900	GSM/TM1	LCH	29.98	30.98	33	PASS
		MCH	30	31	33	PASS
		HCH	29.81	30.81	33	PASS
	GSM/TM2	LCH	25.78	26.78	33	PASS
		MCH	25.79	26.79	33	PASS
		HCH	25.74	26.74	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:

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

SET RBW=1% of the OBW ,not to wxceed 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
GSM1900	GSM/TM1	LCH	0.13	13	PASS
		MCH	0.15	13	PASS
		HCH	0.13	13	PASS
	GSM/TM2	LCH	2.62	13	PASS
		MCH	2.65	13	PASS
		HCH	2.67	13	PASS

3Appendix_C: Modulation Characteristics

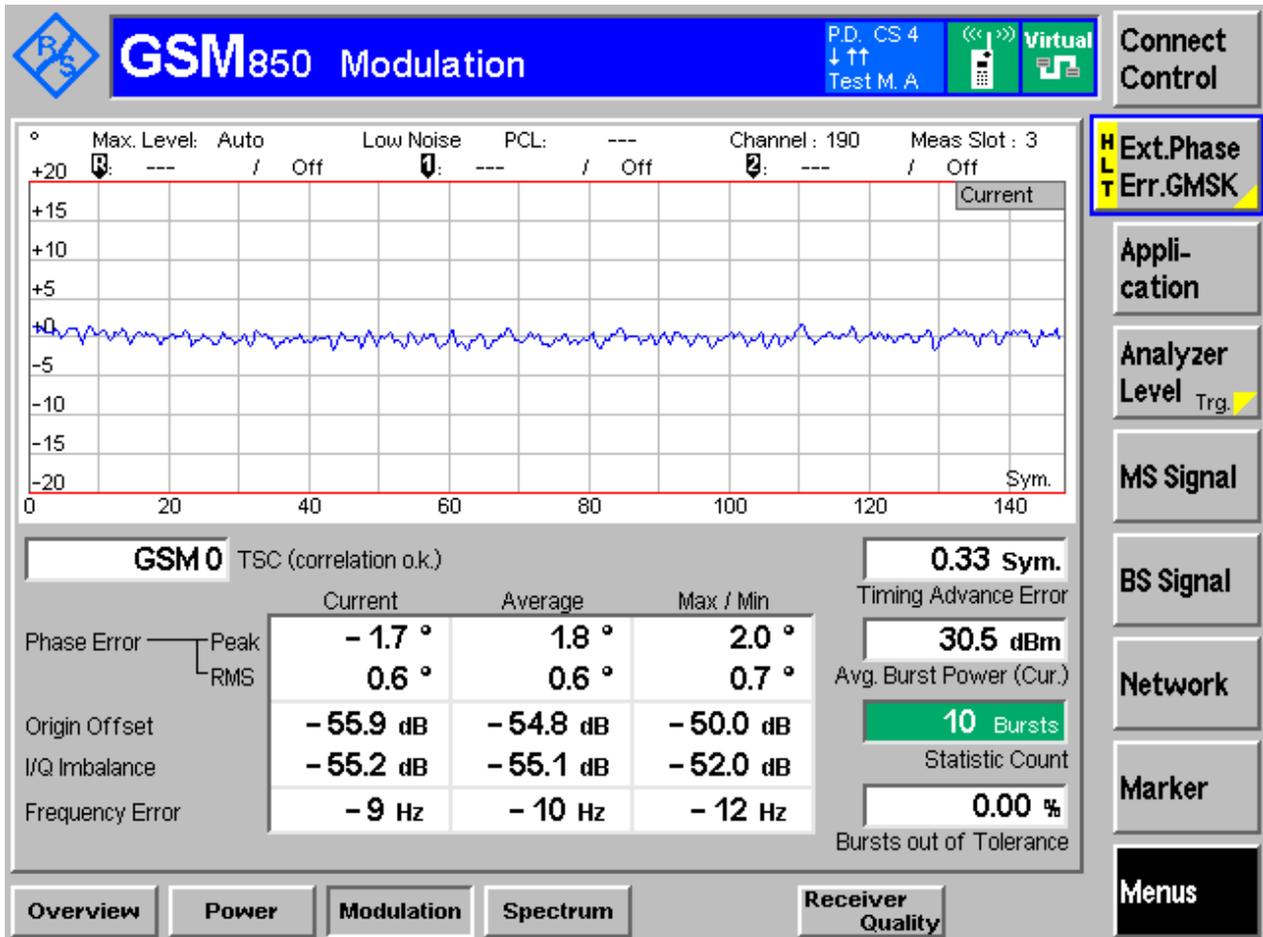
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

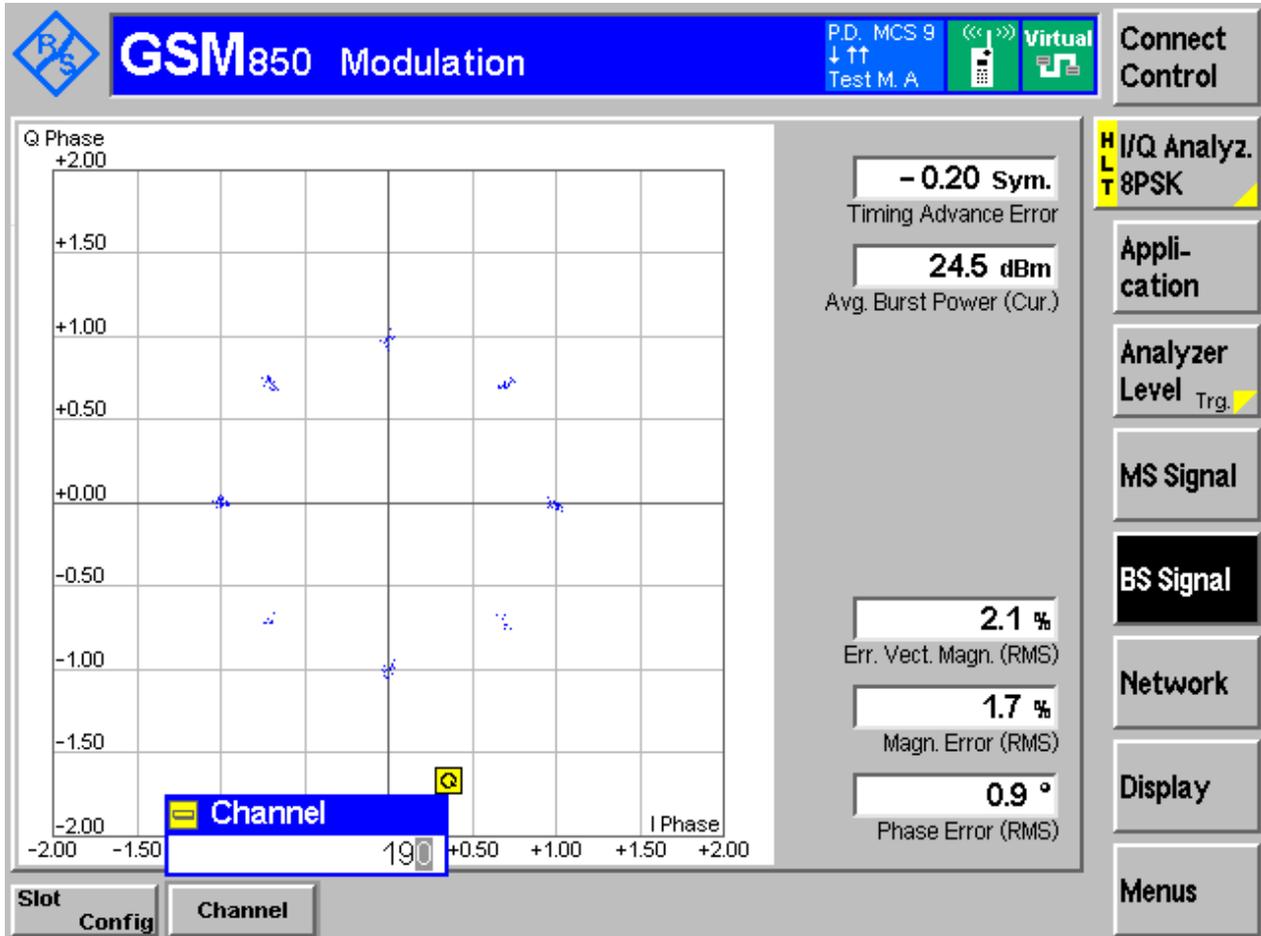
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

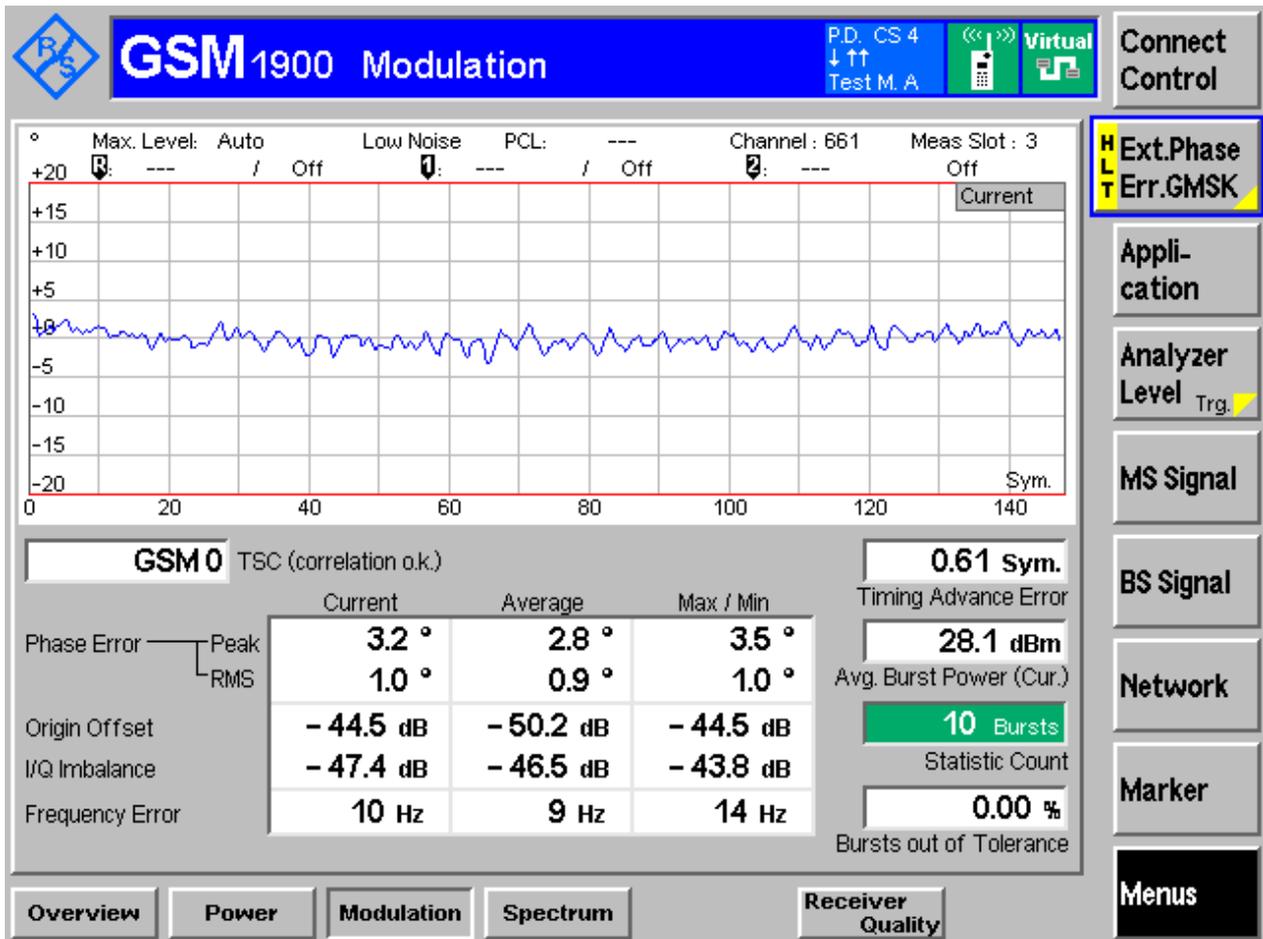
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

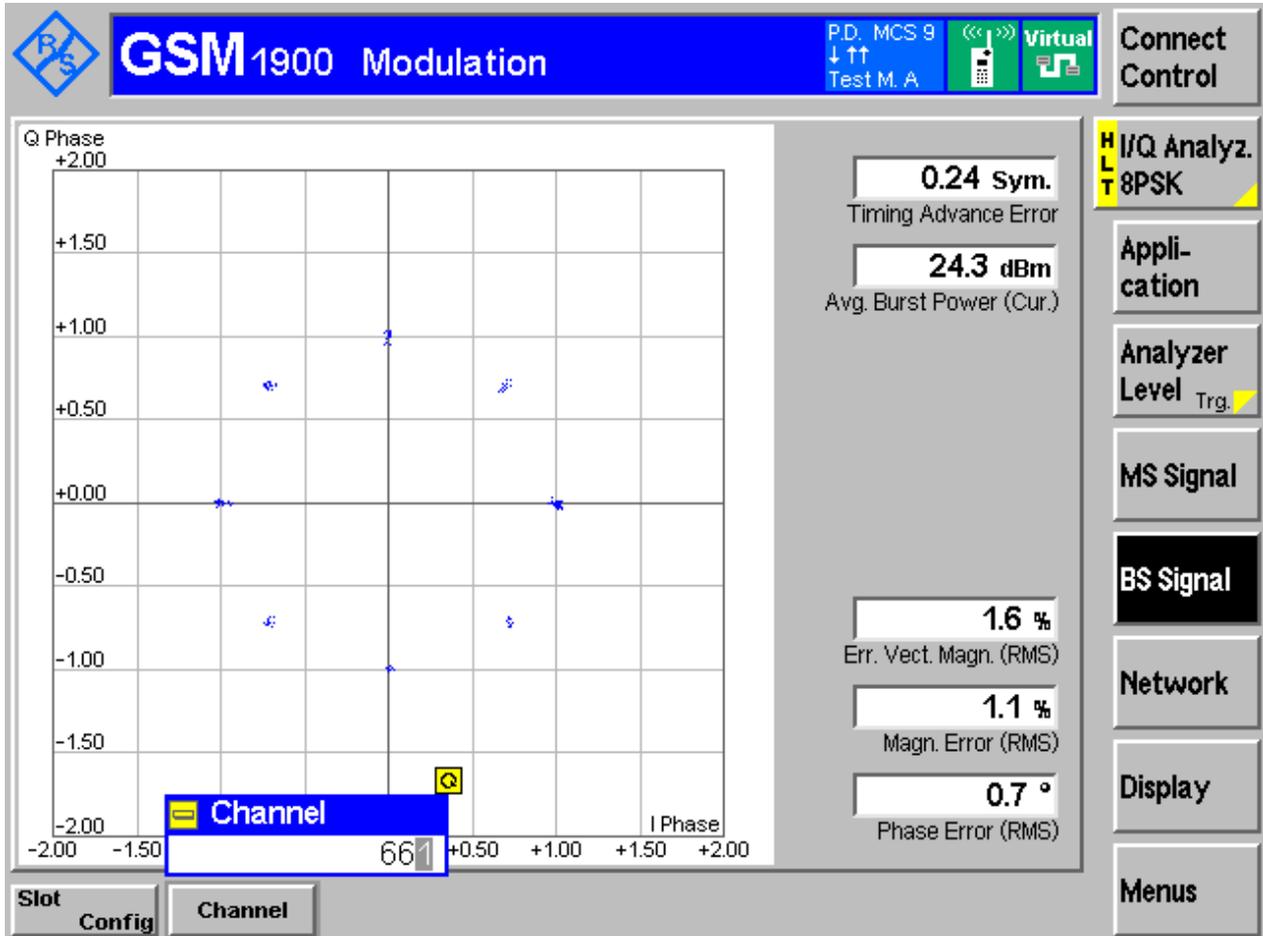
3.1.2.1 Test Mode = GSM/TM1

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	243.58	319.04	Pass
		MCH	240.76	311.80	Pass
		HCH	242.84	311.60	Pass
	GSM/TM2	LCH	245.72	310.79	Pass
		MCH	250.51	321.05	Pass
		HCH	245.10	303.05	Pass
GSM1900	GSM/TM1	LCH	243.86	315.70	Pass
		MCH	243.97	317.10	Pass
		HCH	242.11	318.68	Pass
	GSM/TM2	LCH	245.68	319.88	Pass
		MCH	248.03	322.44	Pass
		HCH	249.25	316.45	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





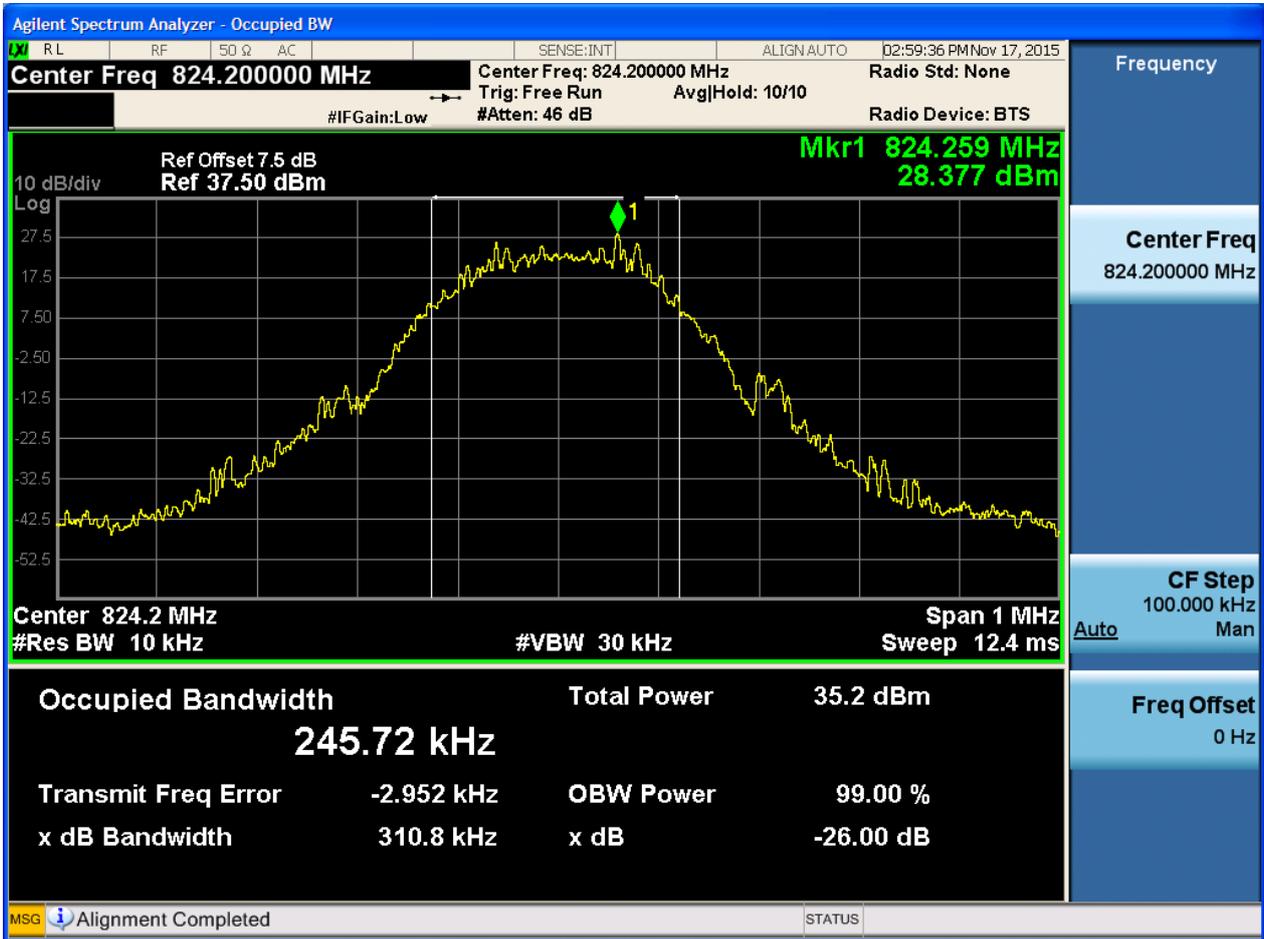
4.1.1.1.3 Test Channel = HCH





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



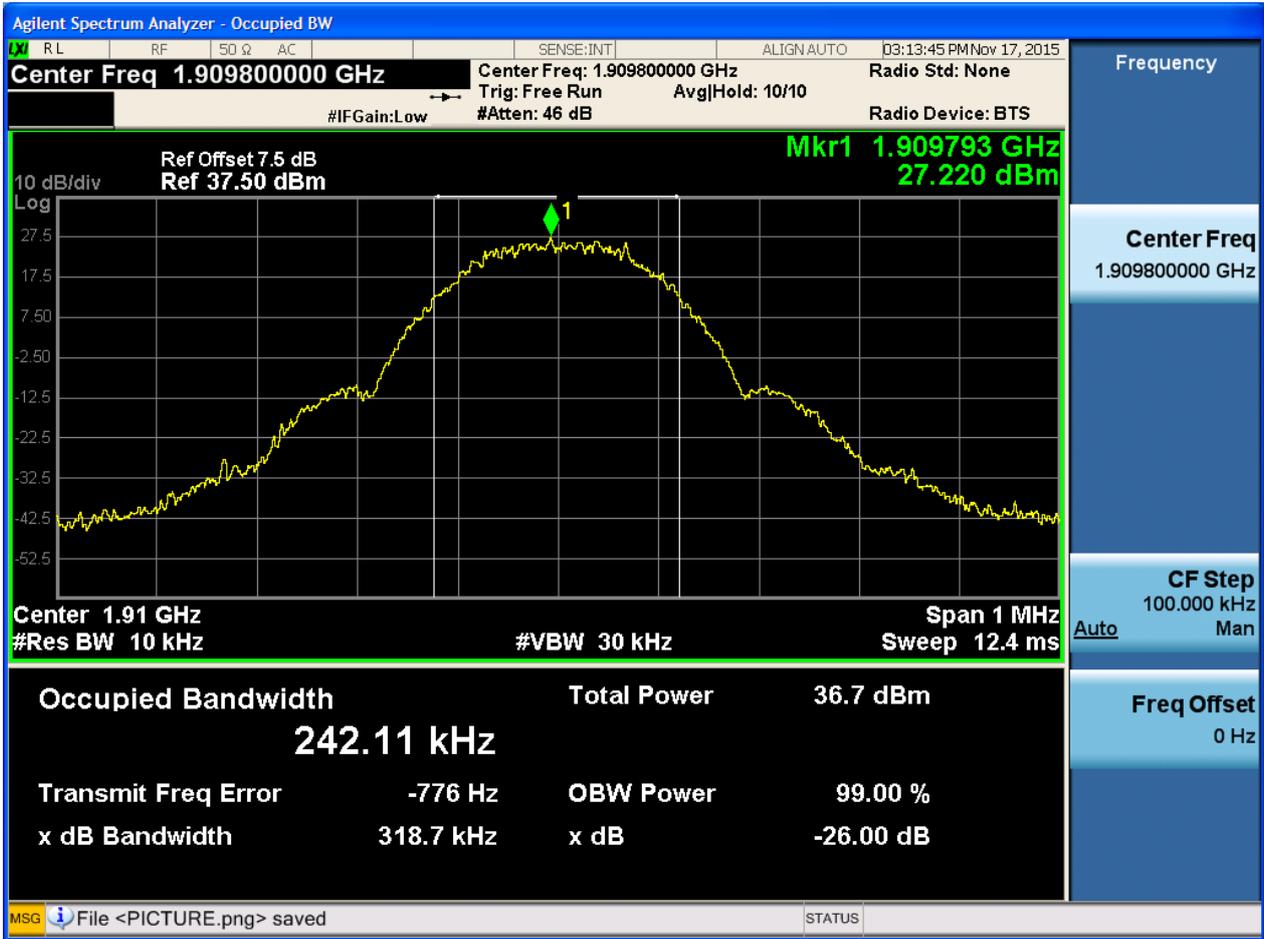


4.1.2.1.2 Test Channel = MCH





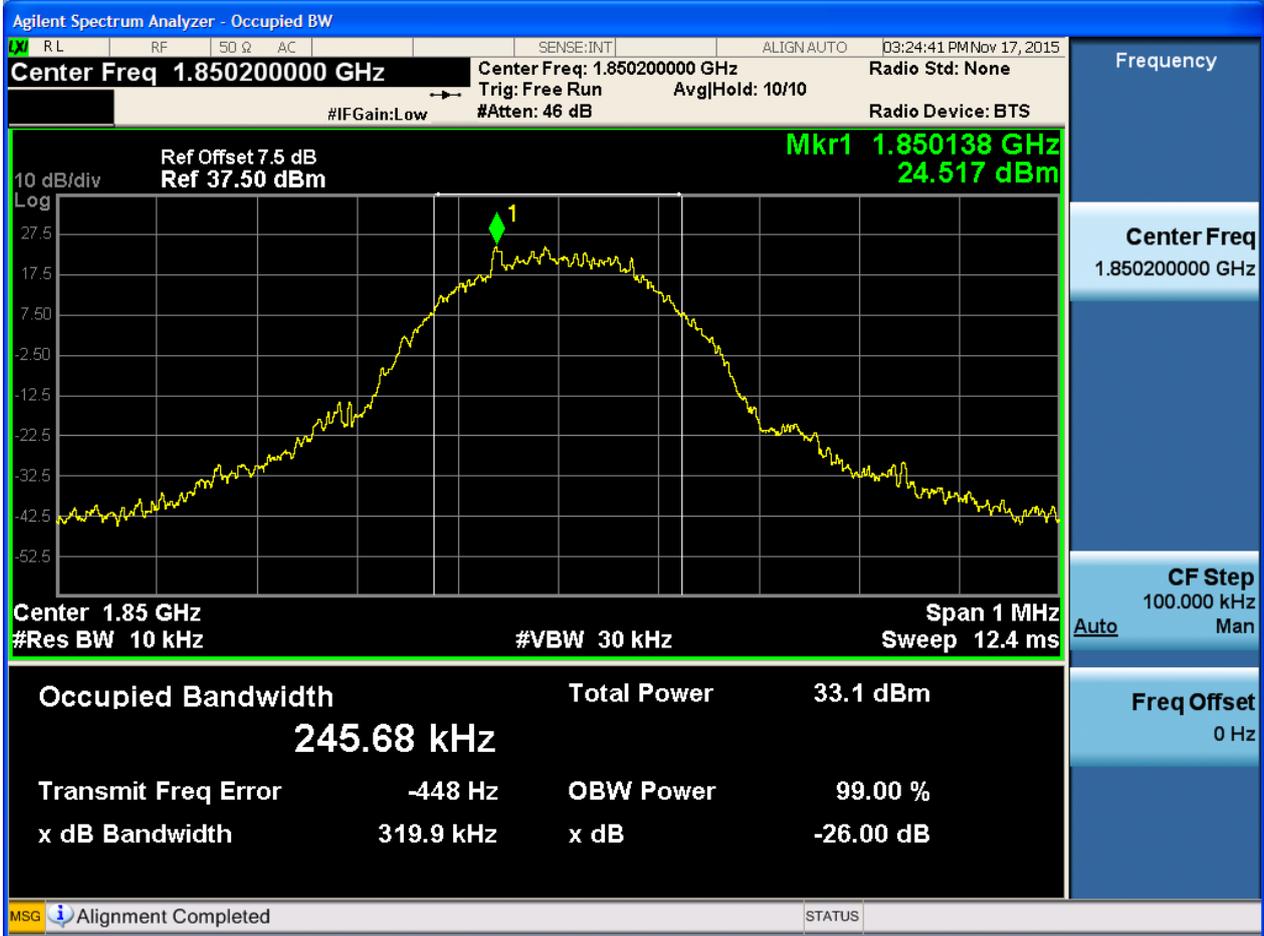
4.1.2.1.3 Test Channel = HCH





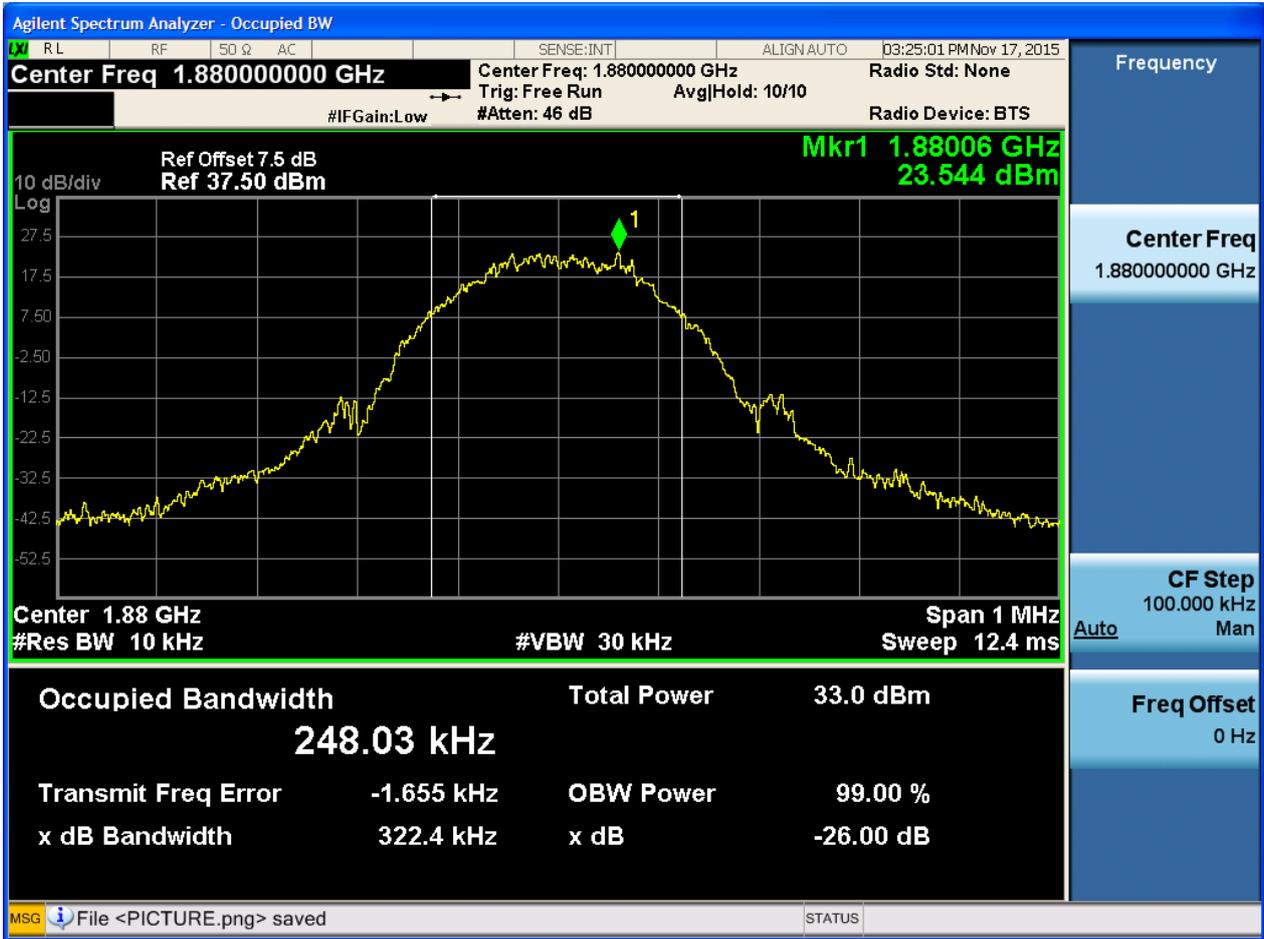
4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



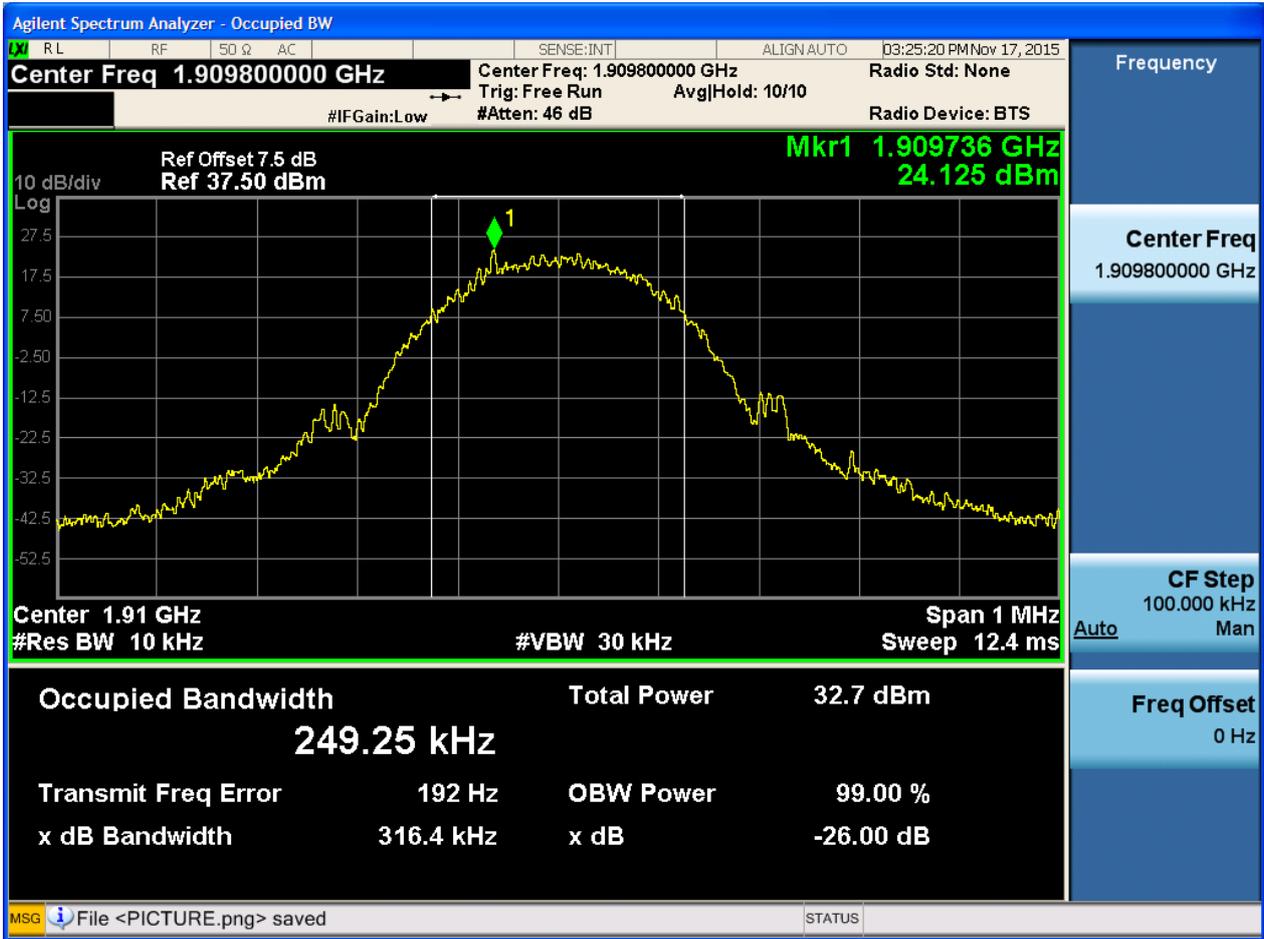


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH





5Appendix_E: Band Edges Compliance

Part I - Test Plots

5.1 For GSM

5.1.1 Test Band = GSM850

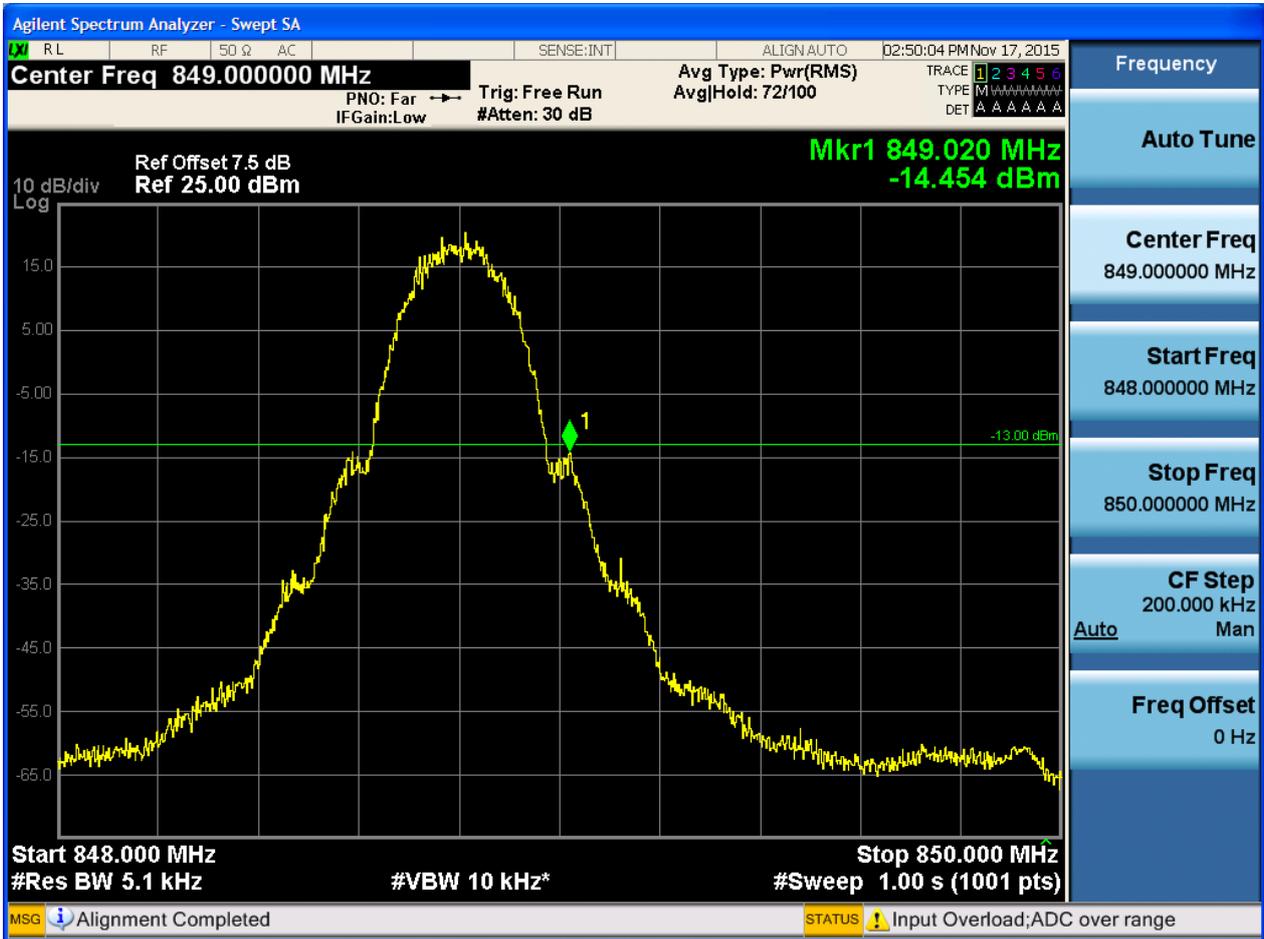
5.1.1.1 Test Mode = GSM/TM1

5.1.1.1.1 Test Channel = LCH





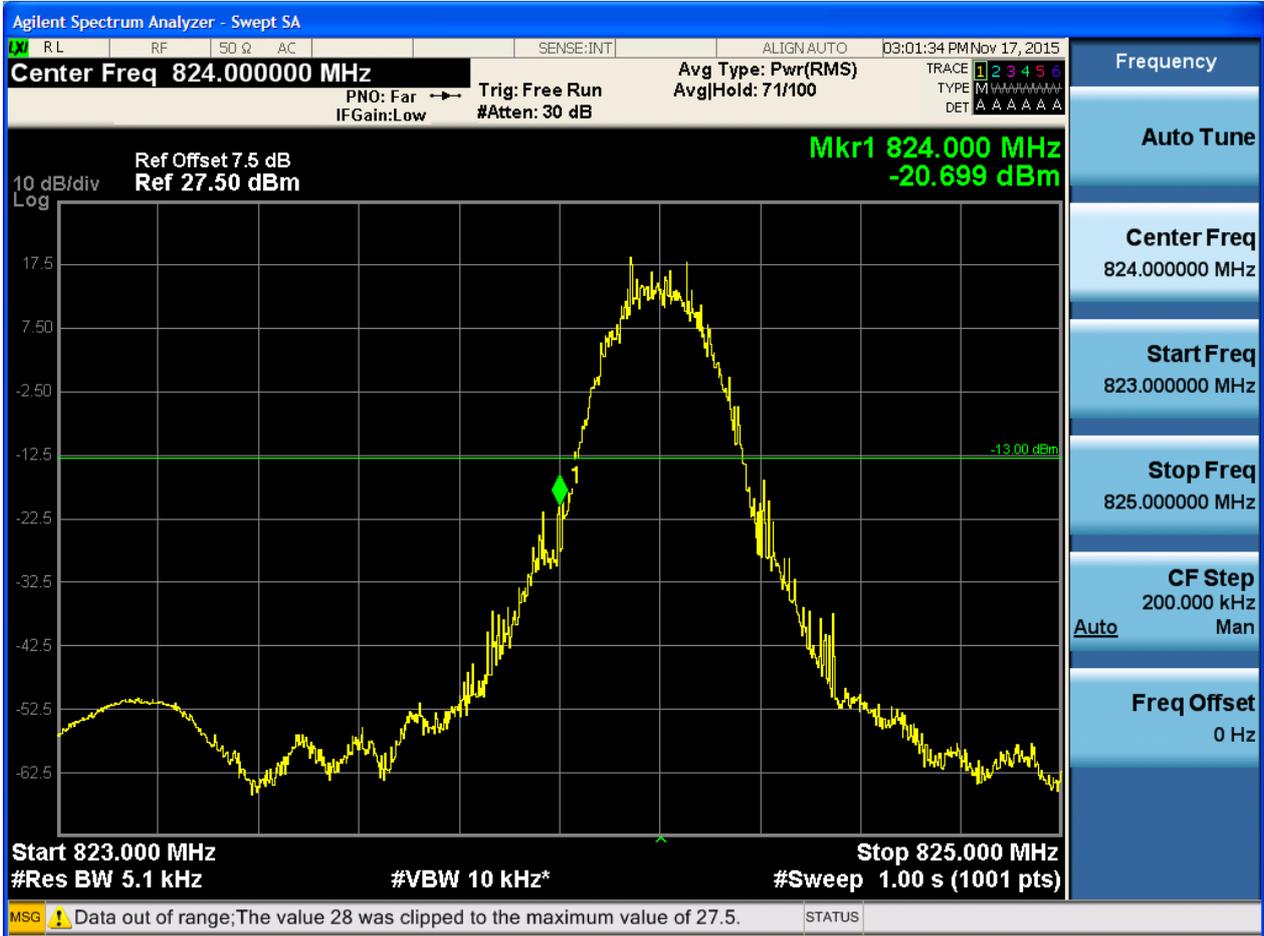
5.1.1.1.2 Test Channel = HCH





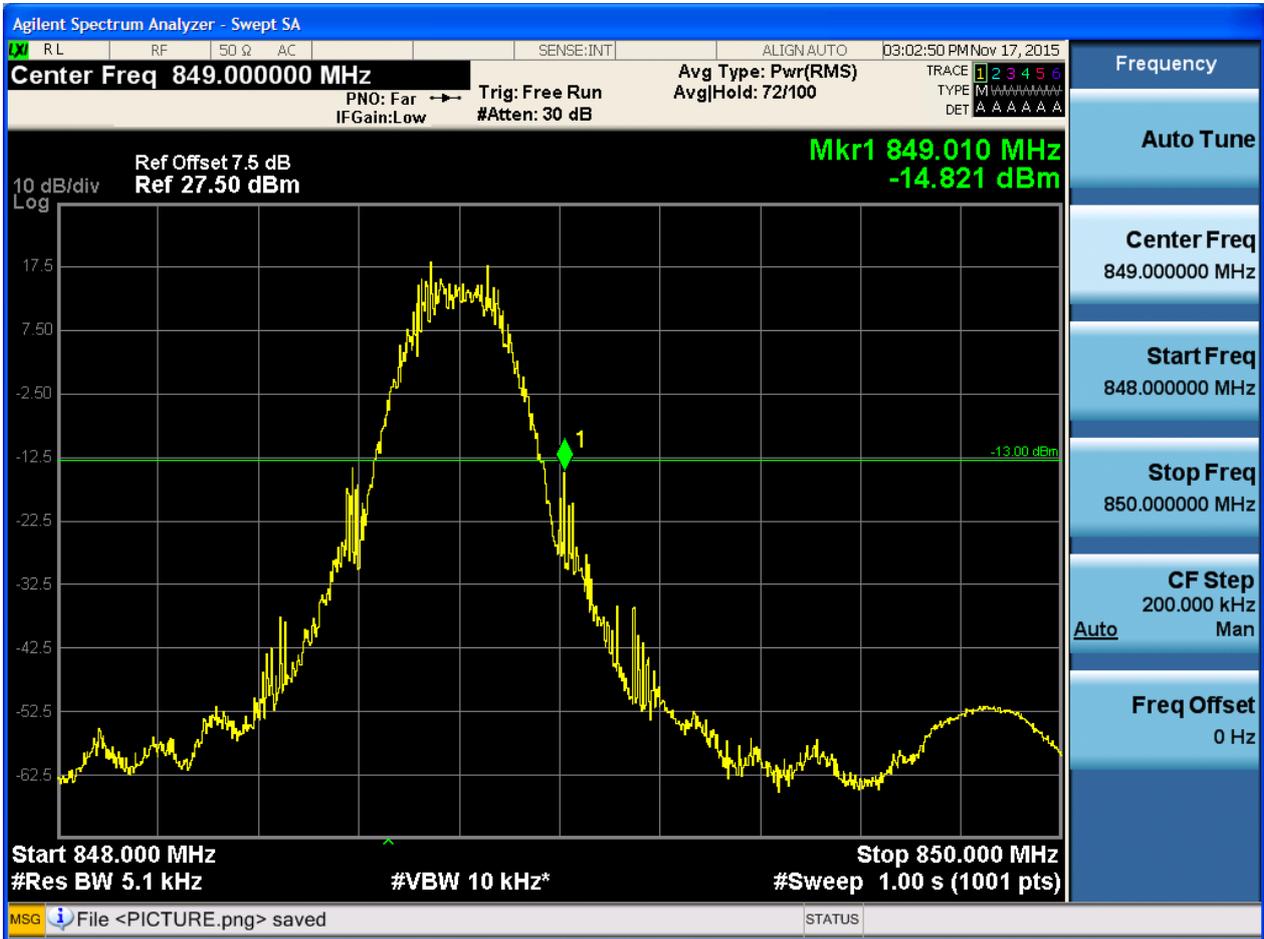
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





5.1.1.2.2 Test Channel = HCH

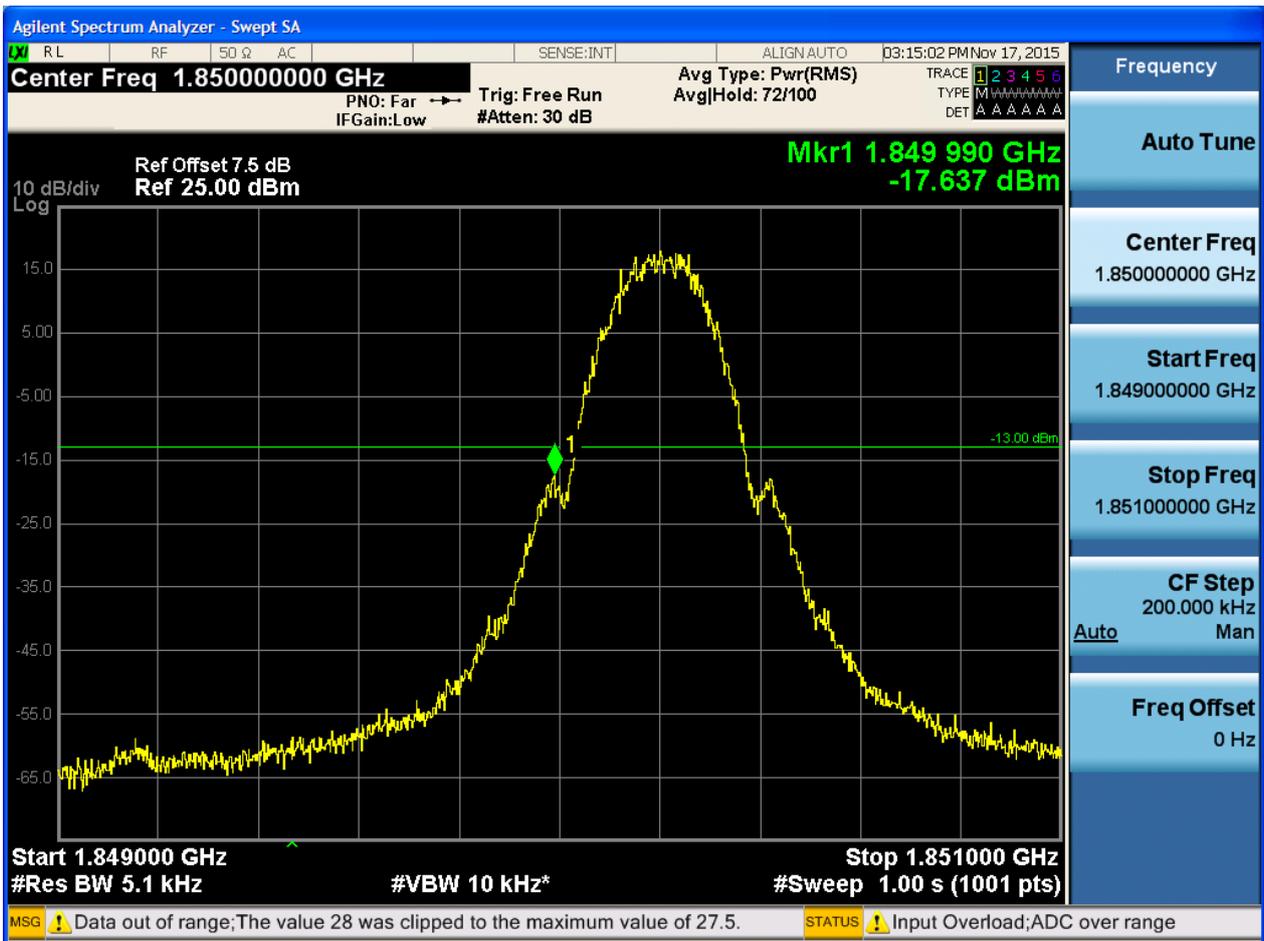




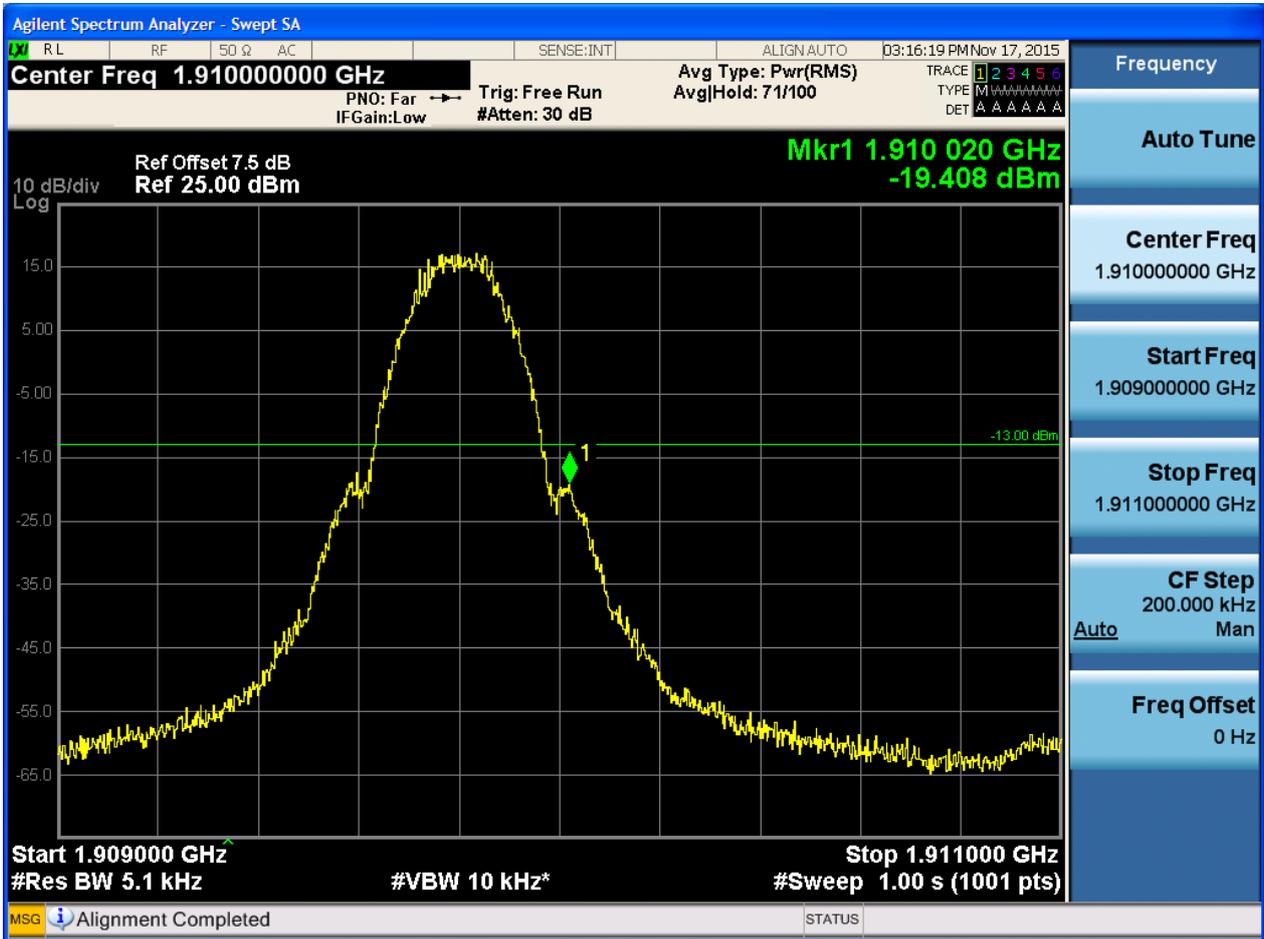
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH



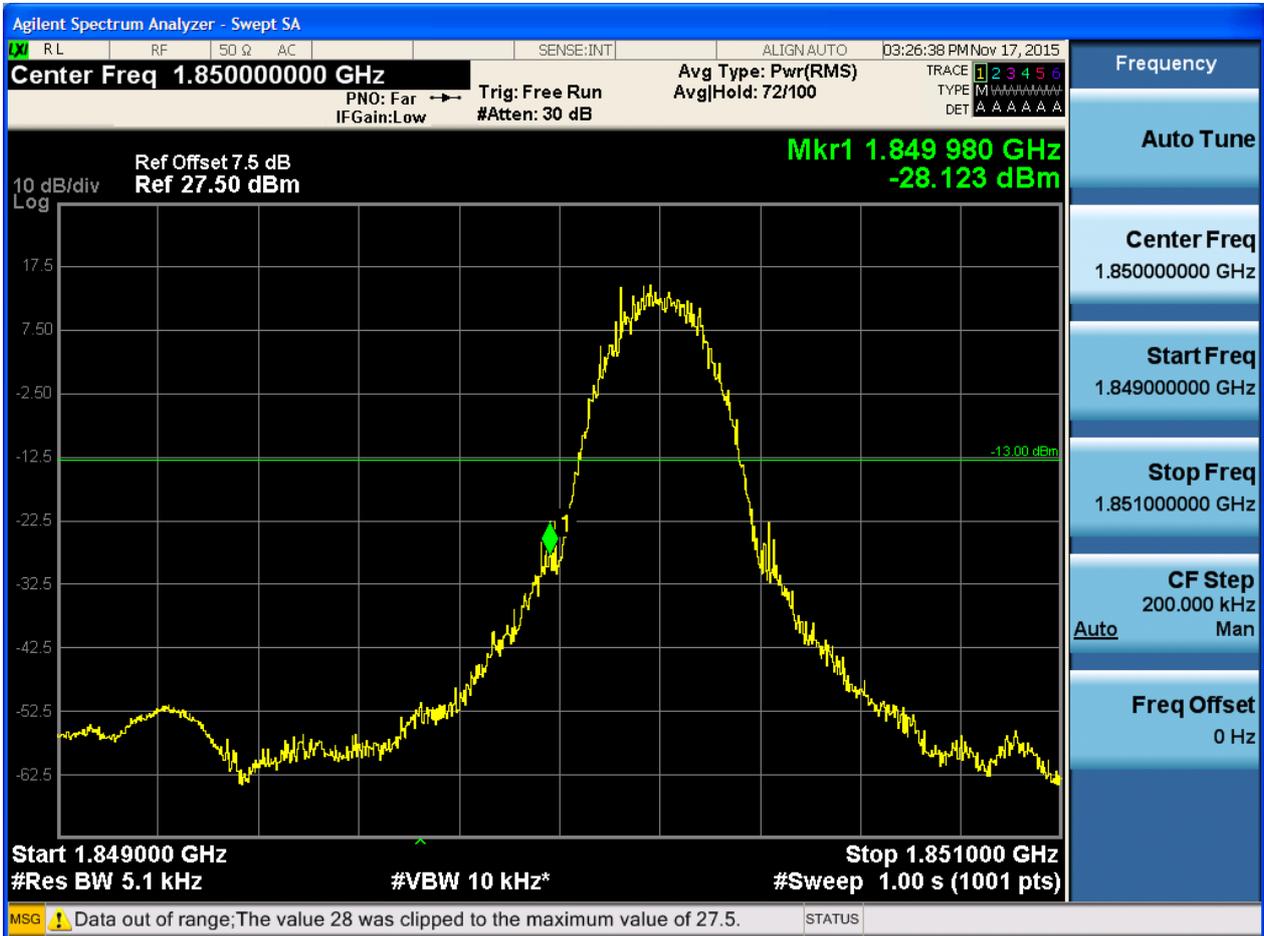
5.1.2.1.2 Test Channel = HCH



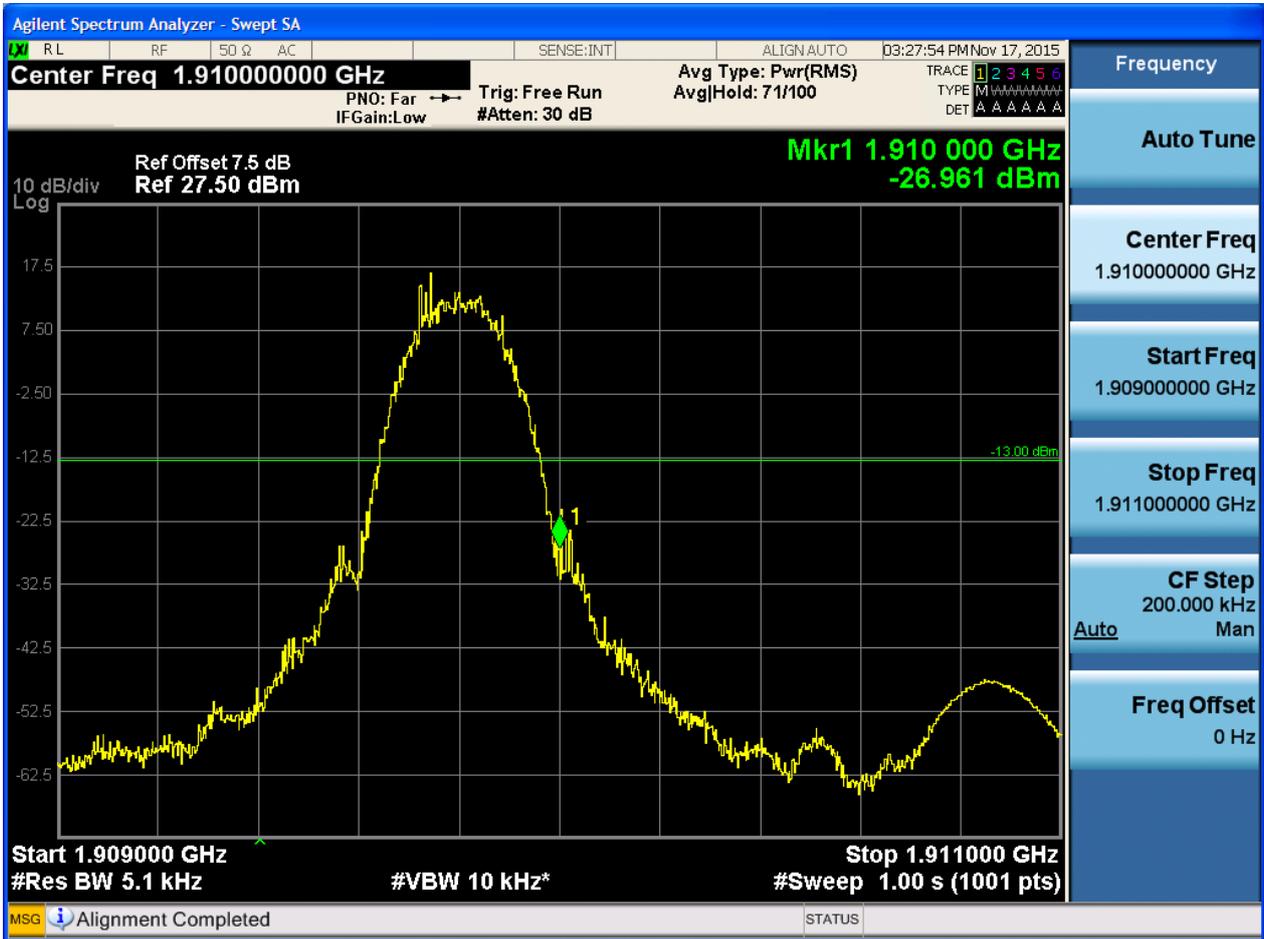


5.1.2.2 Test Mode = GSM/TM2

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.

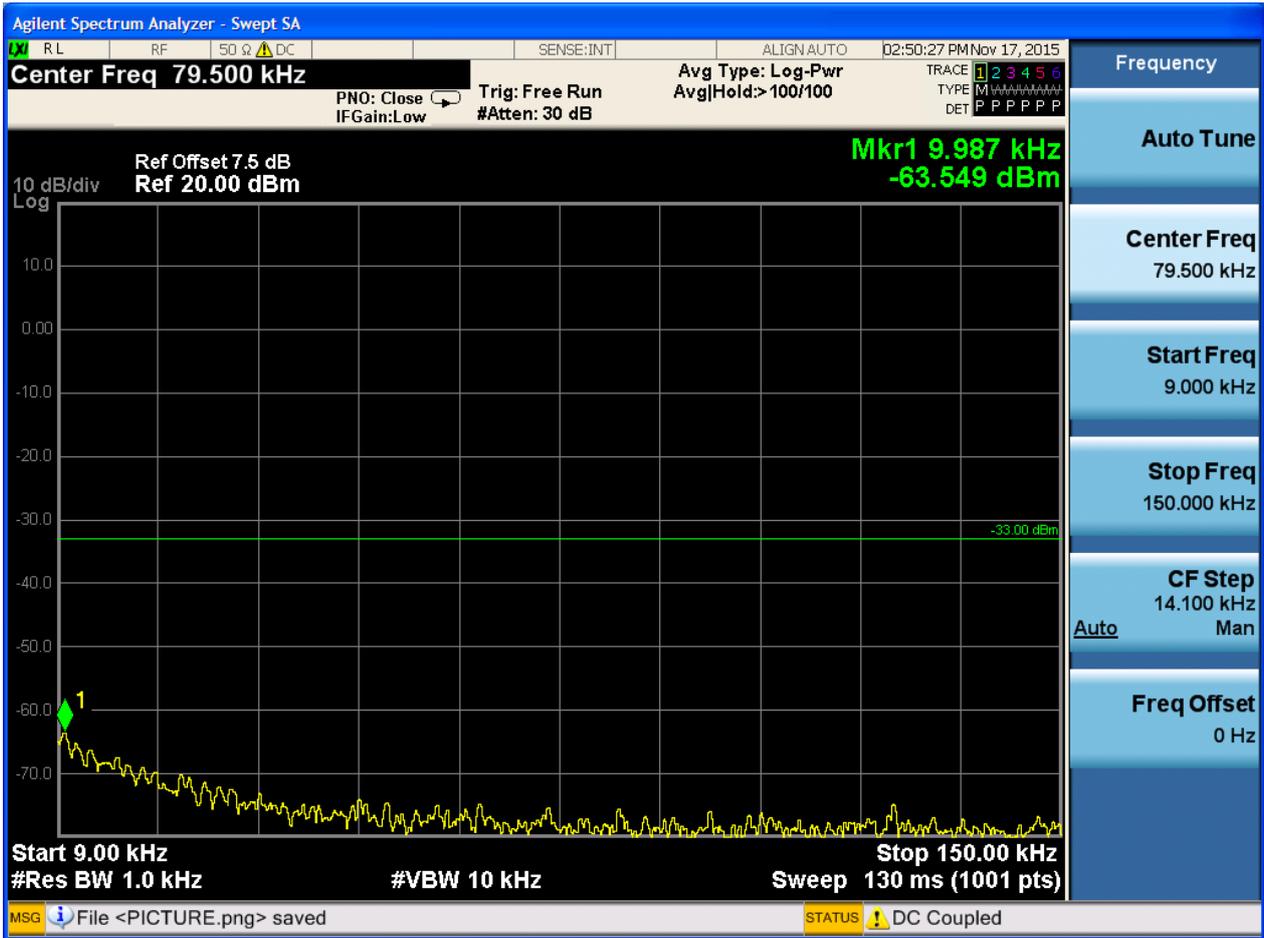
Part I - Test Plots

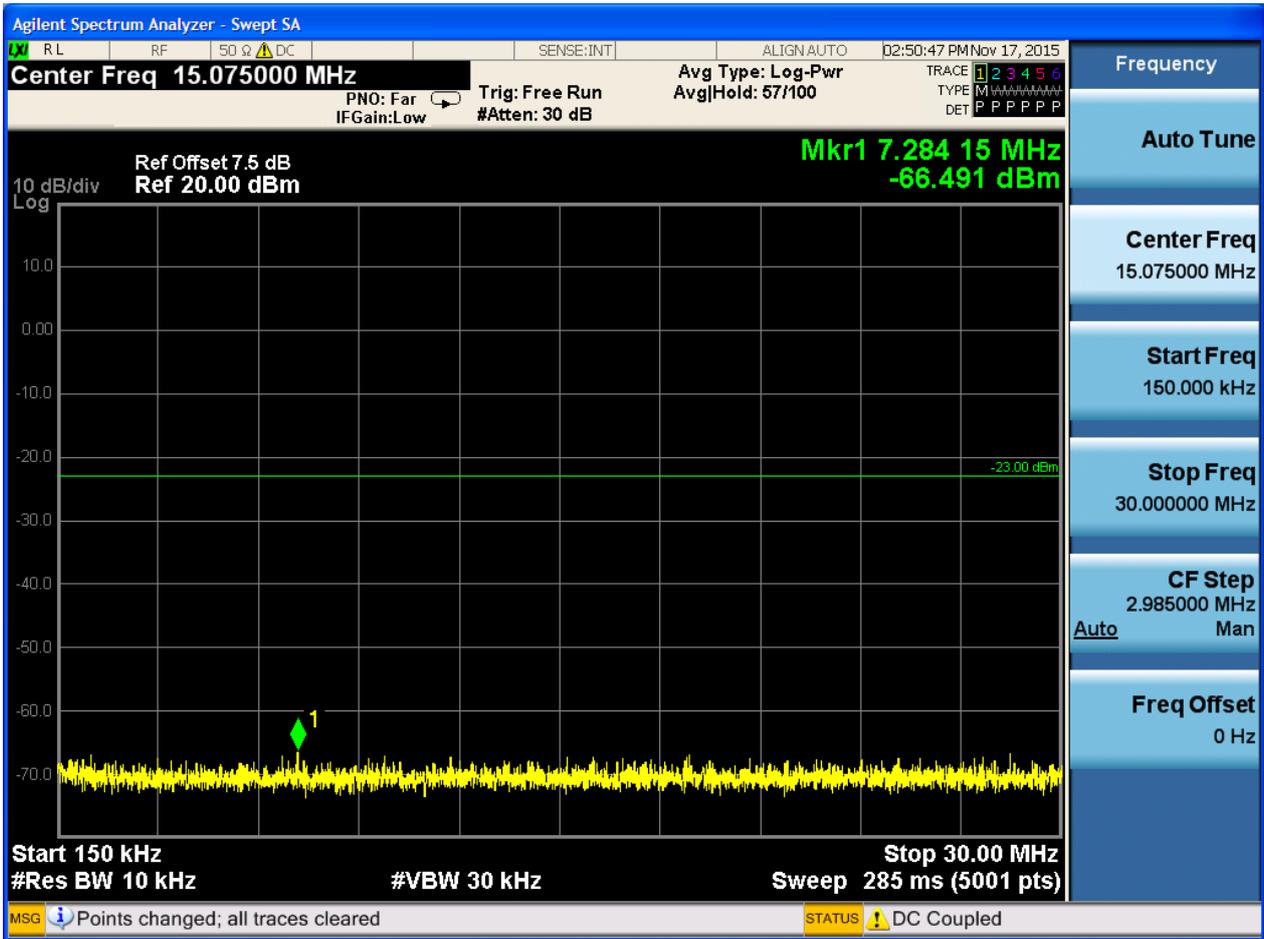
6.1 For GSM

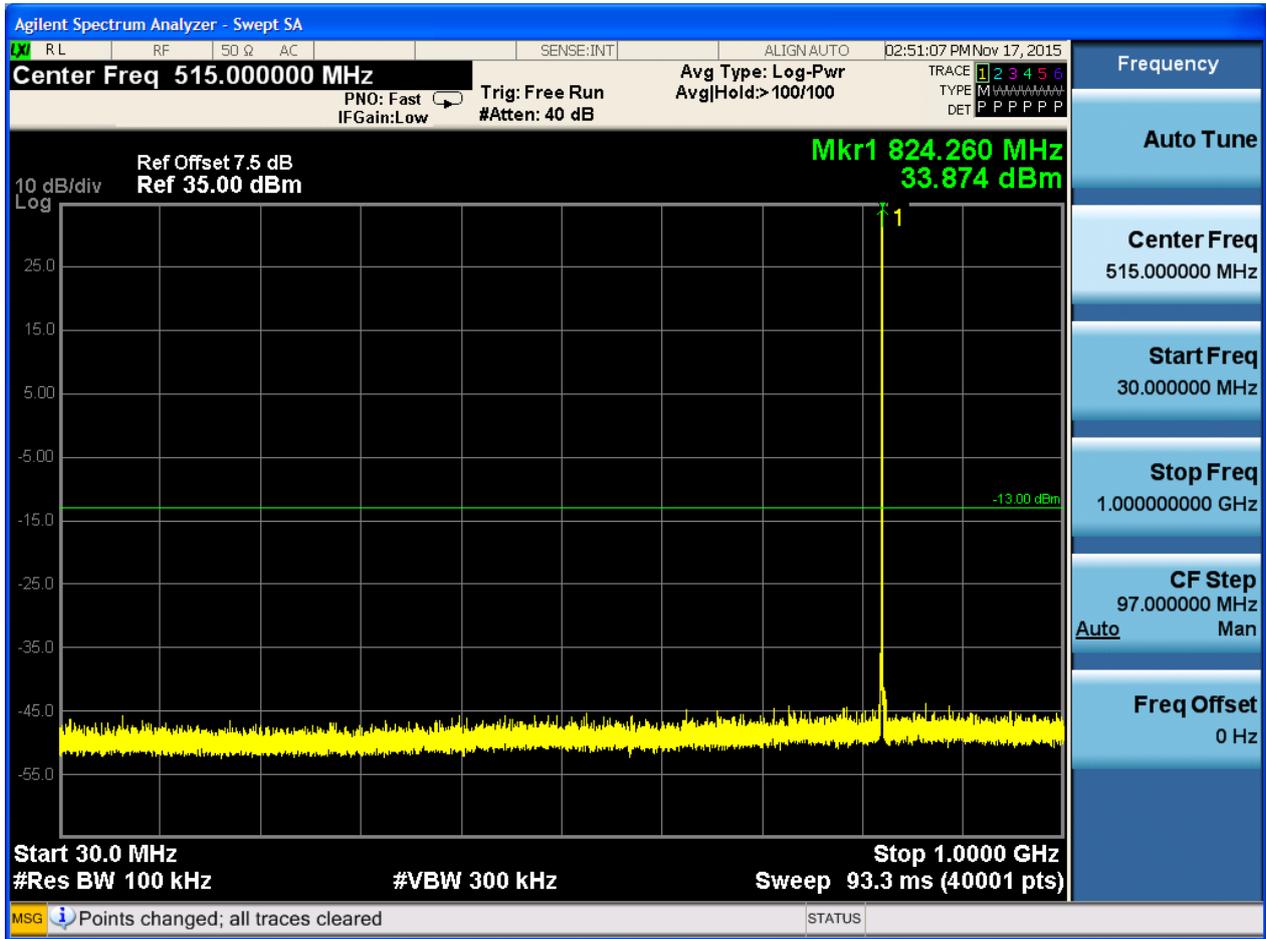
6.1.1 Test Band = GSM850

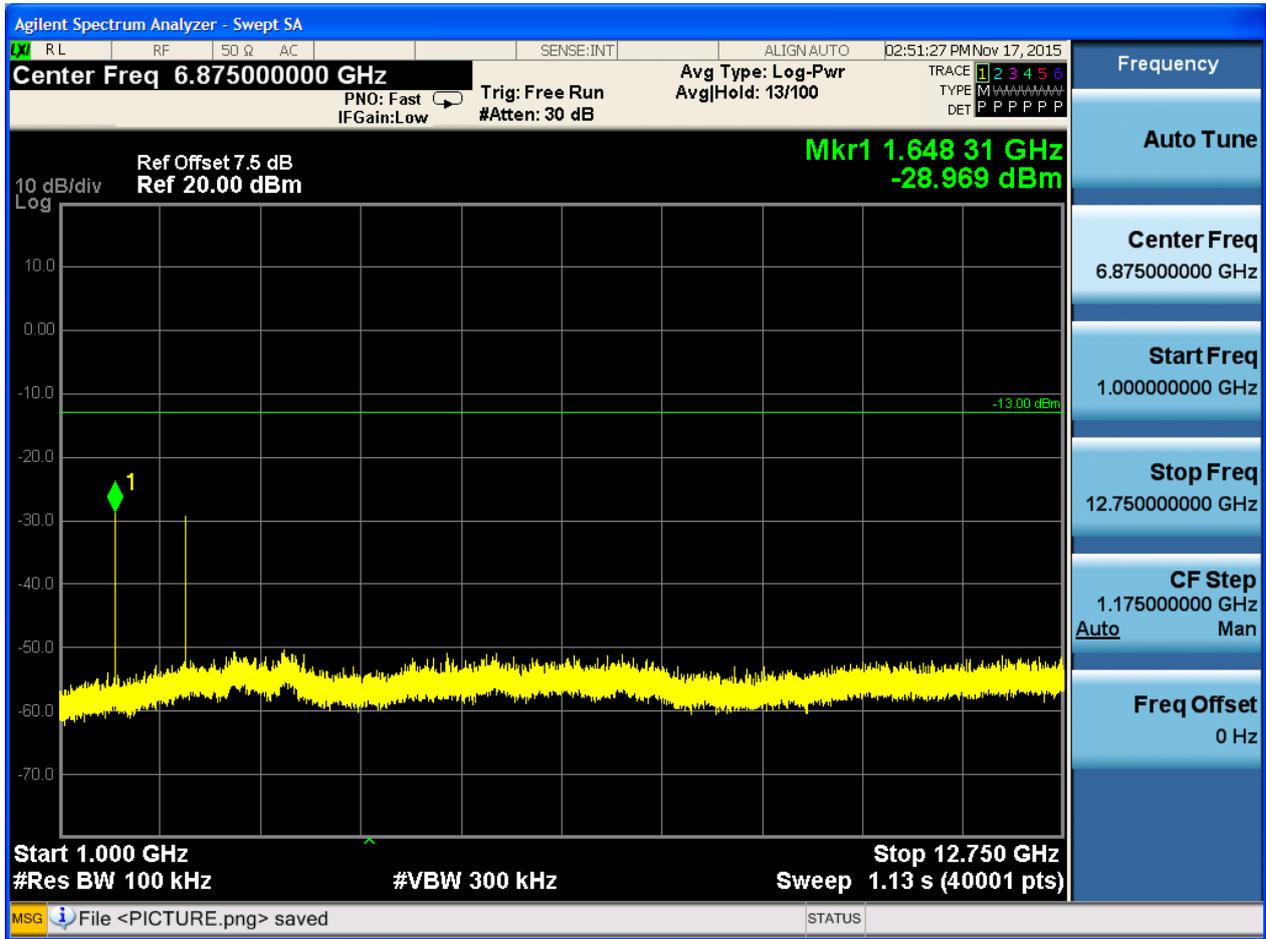
6.1.1.1 Test Mode = GSM/TM1

6.1.1.1.1 Test Channel = LCH



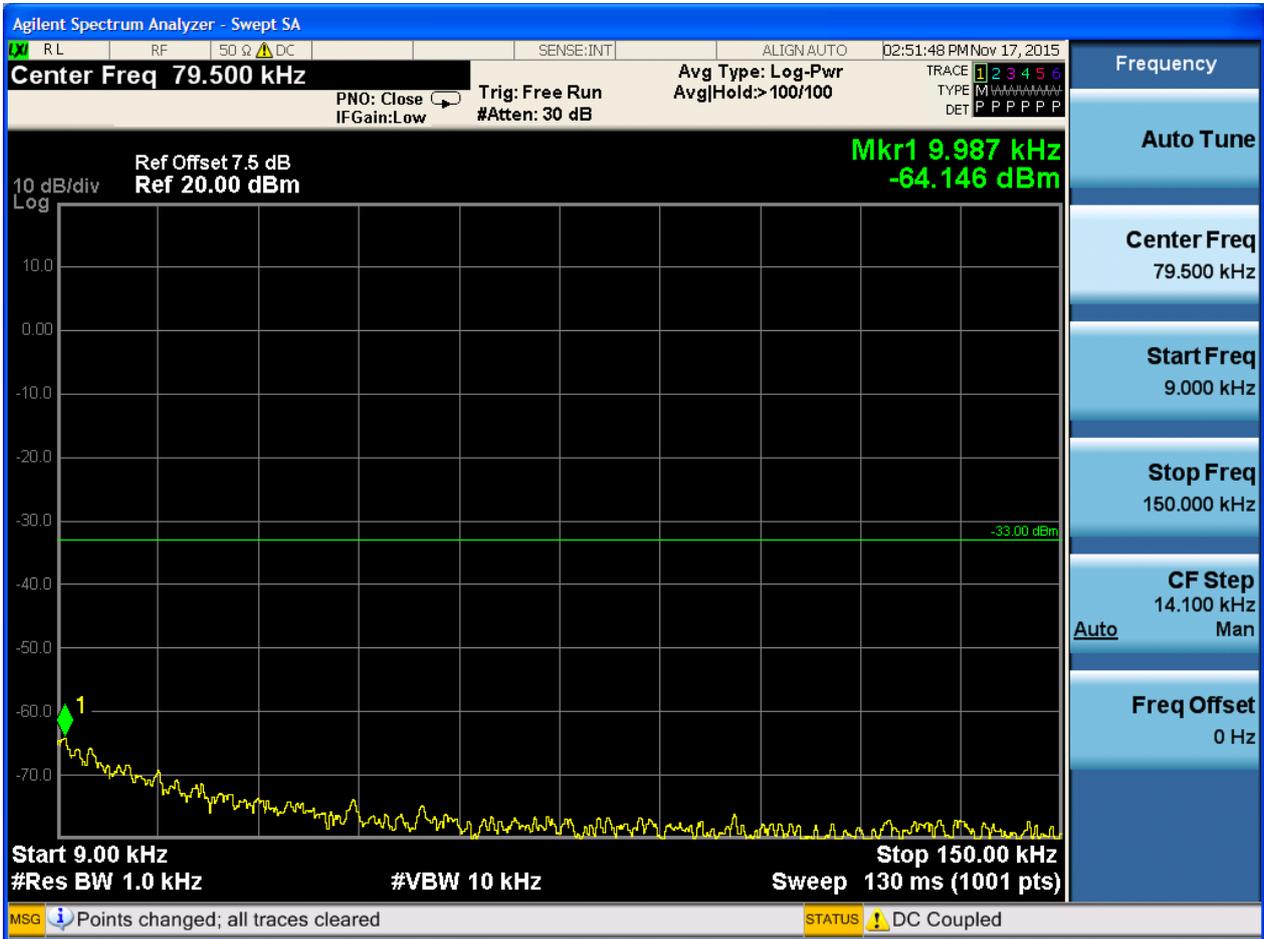


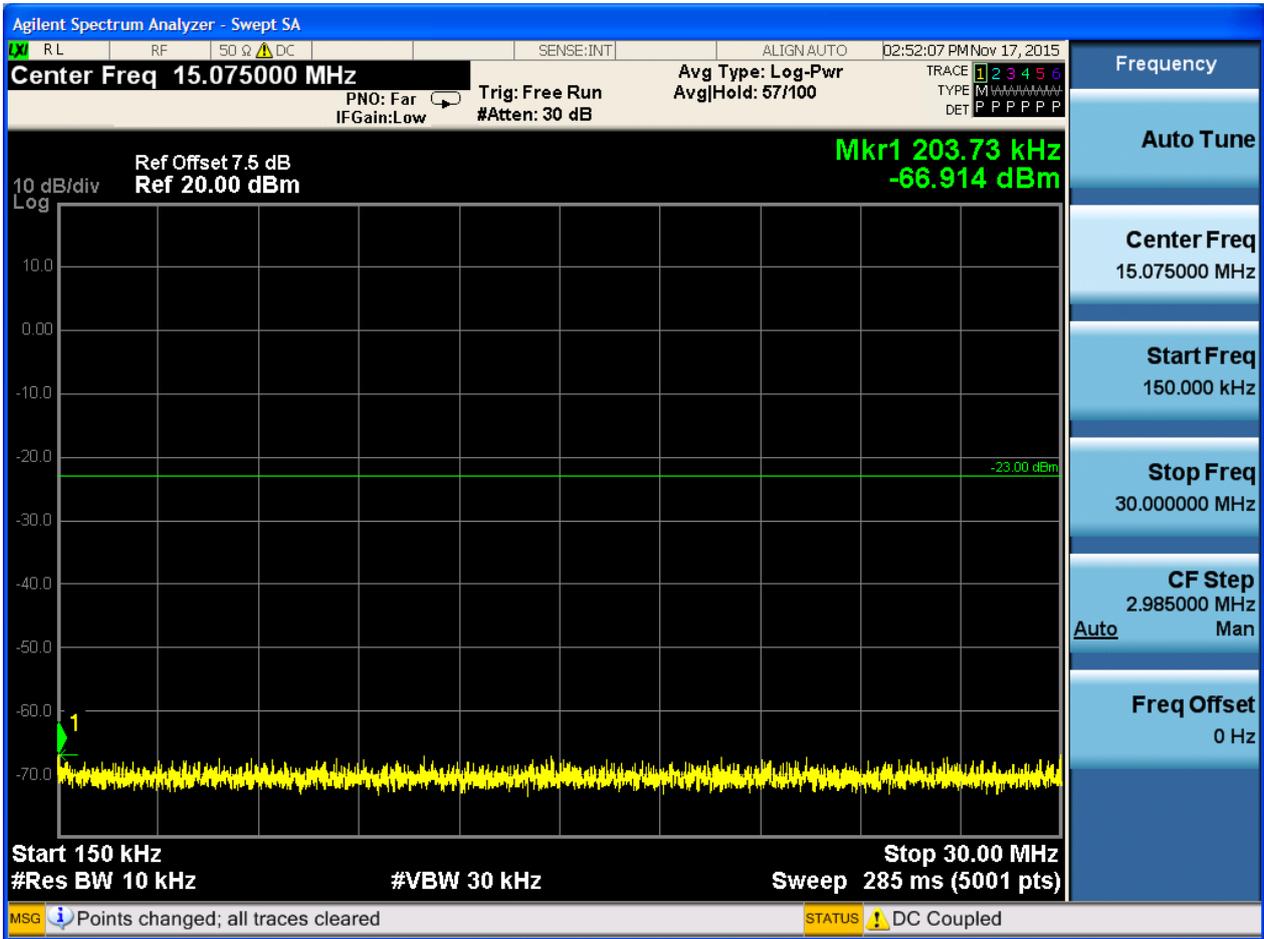


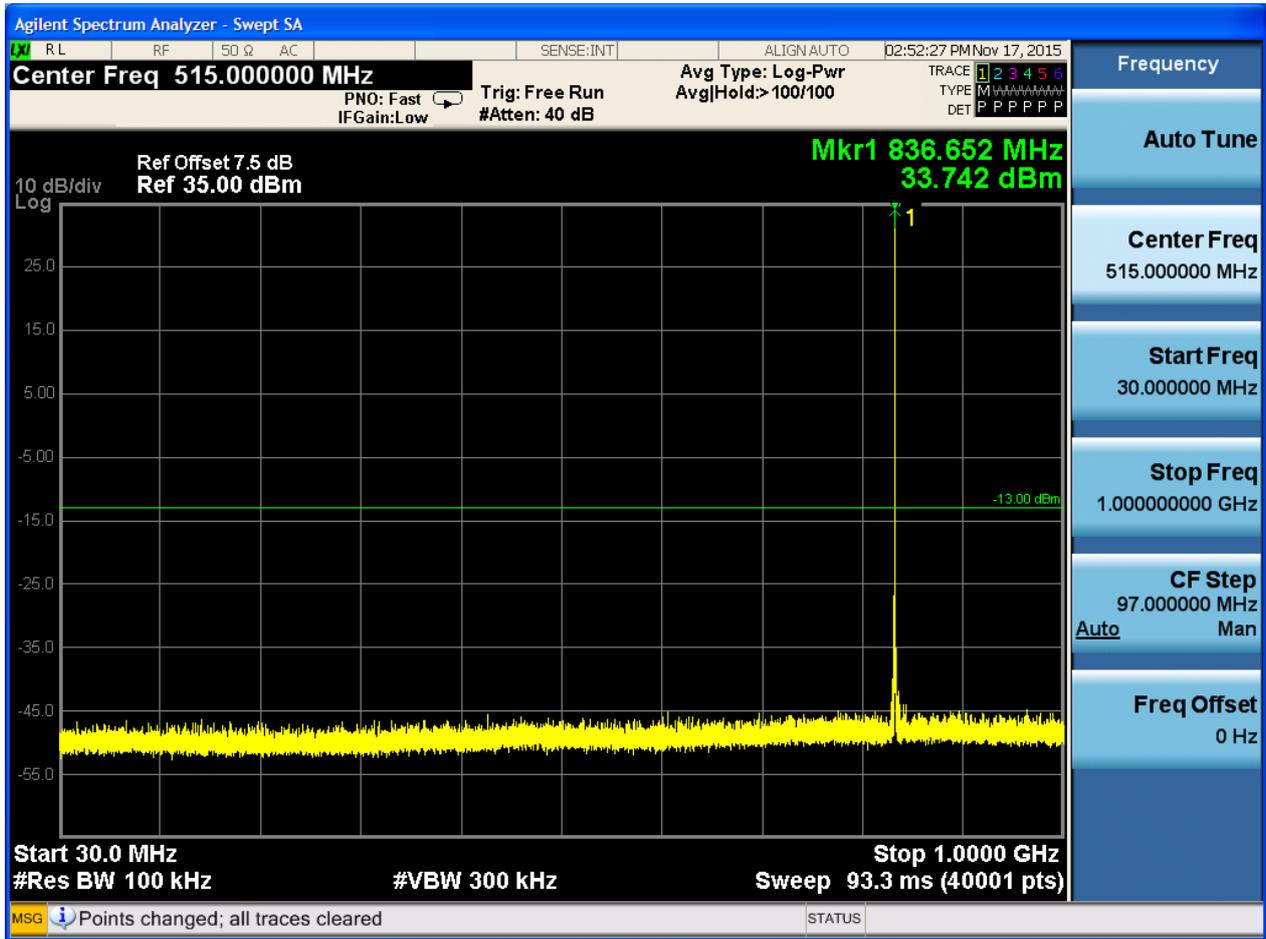


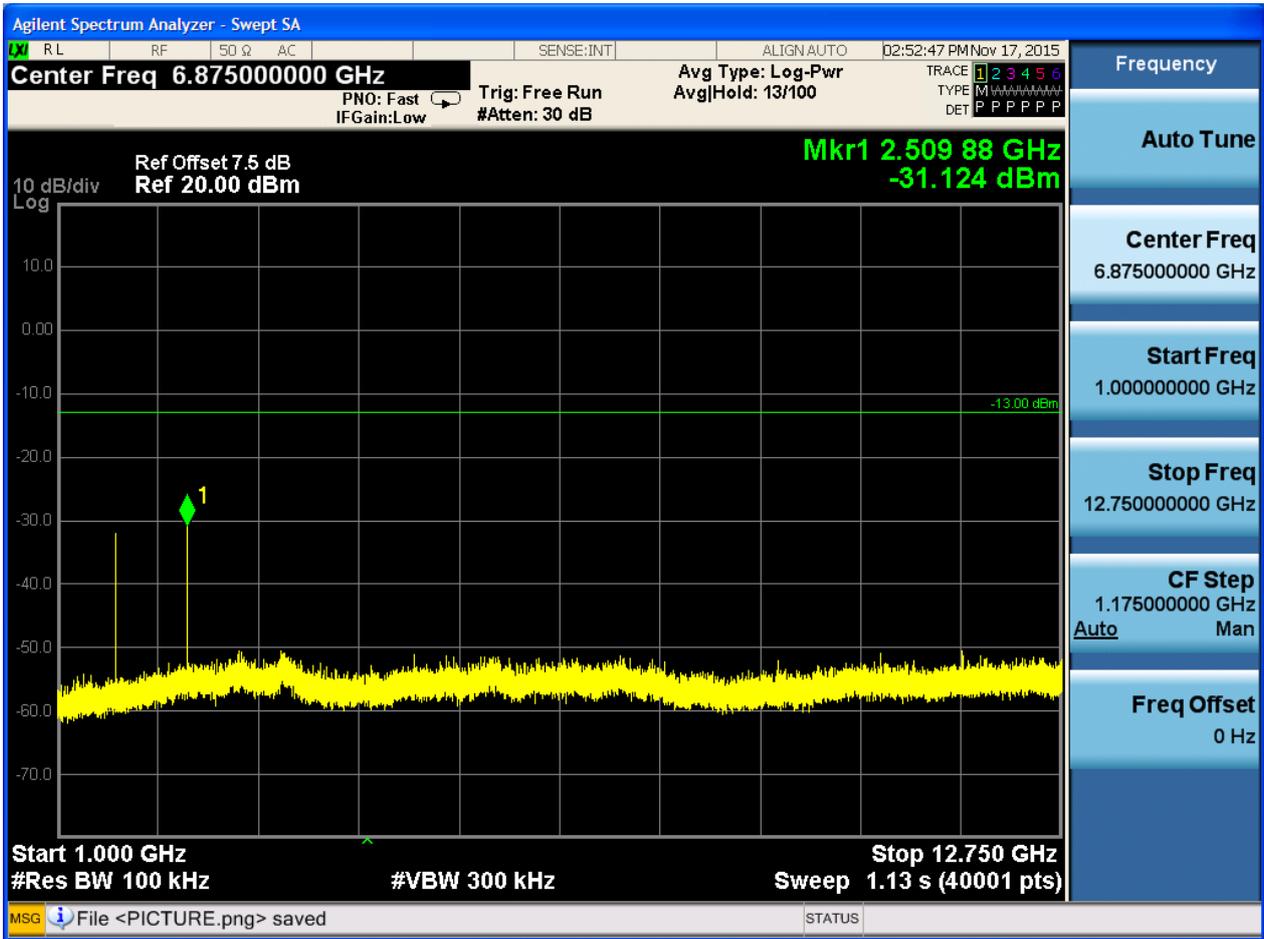


6.1.1.1.2 Test Channel = MCH



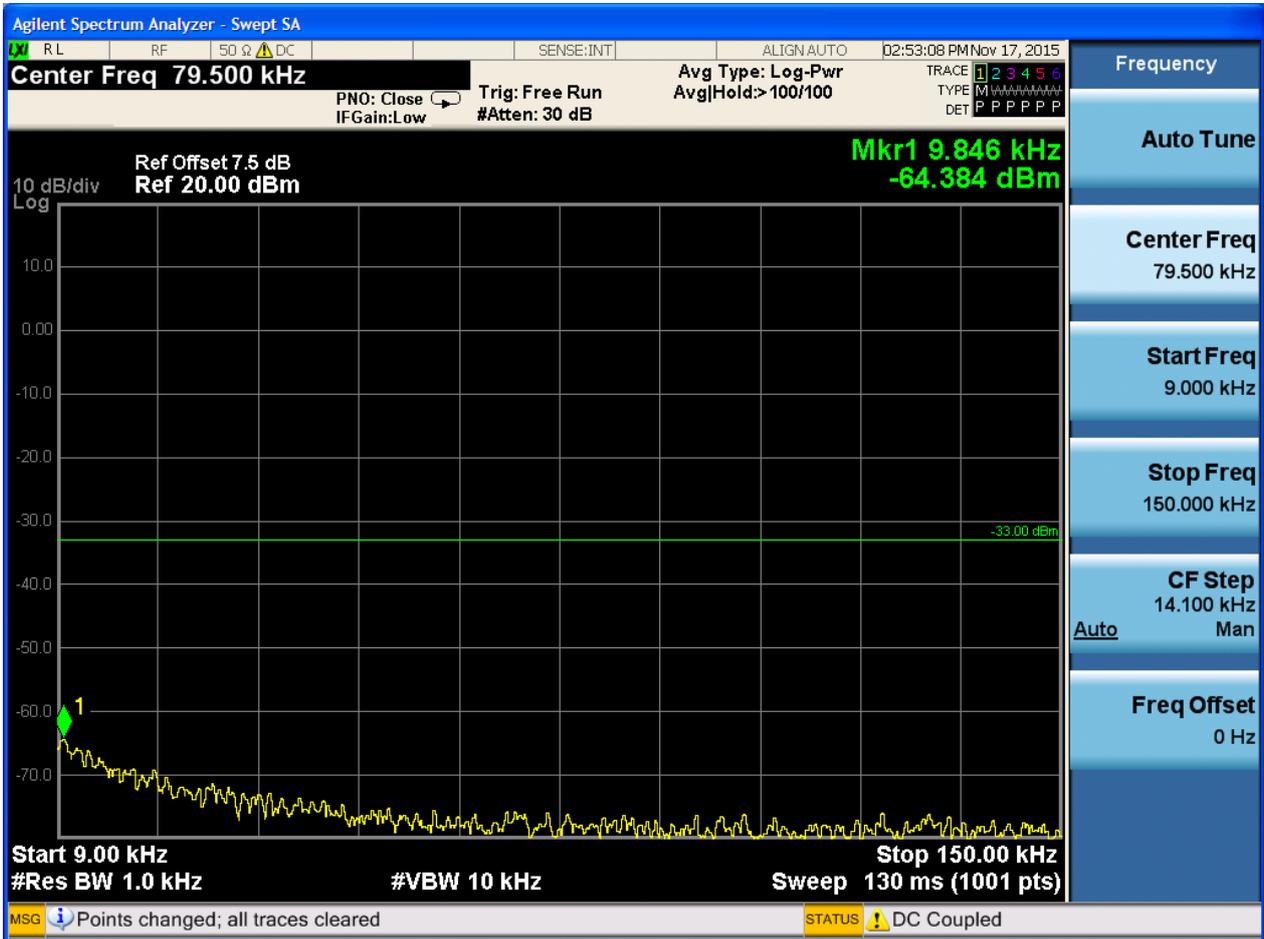


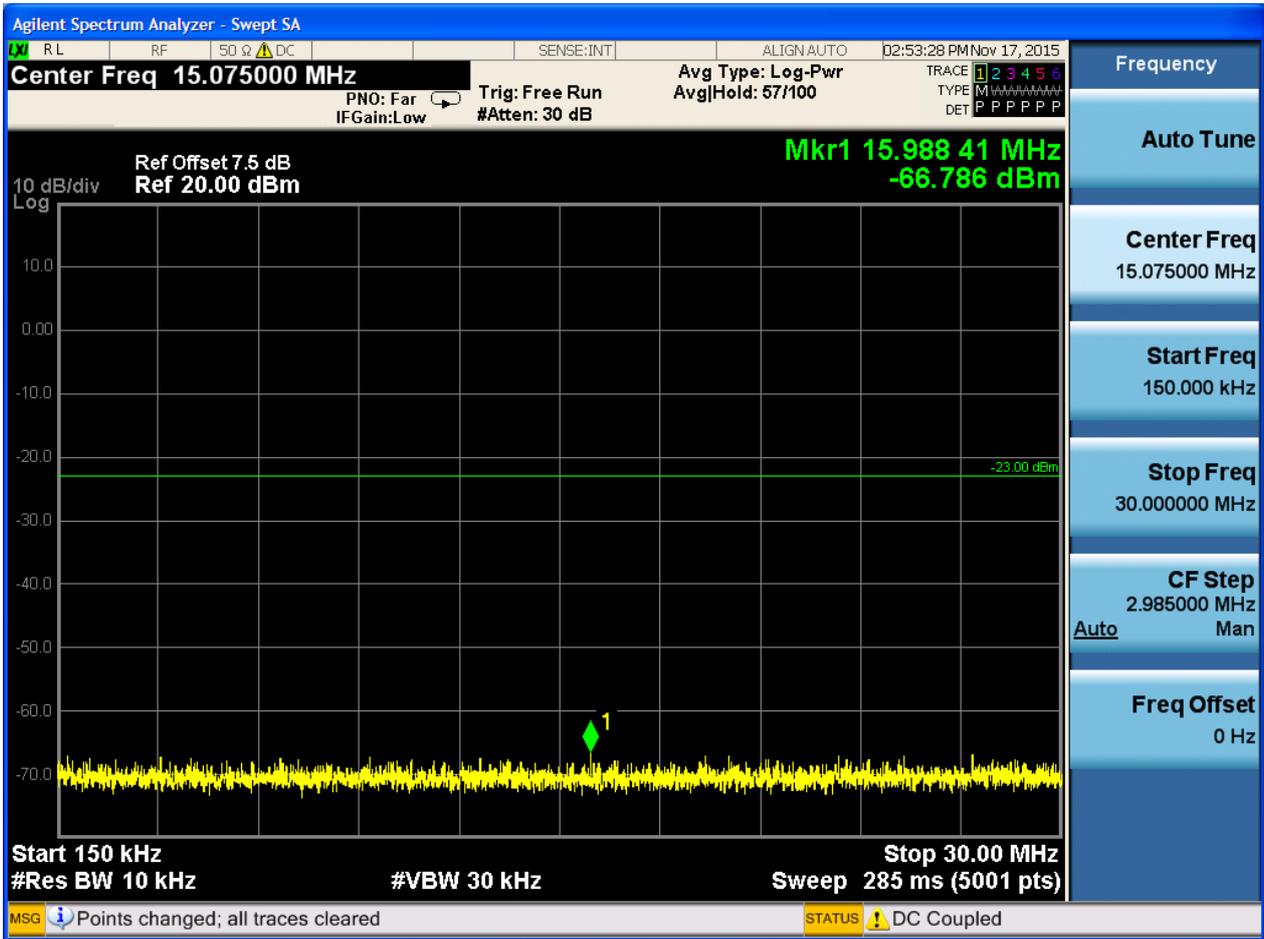


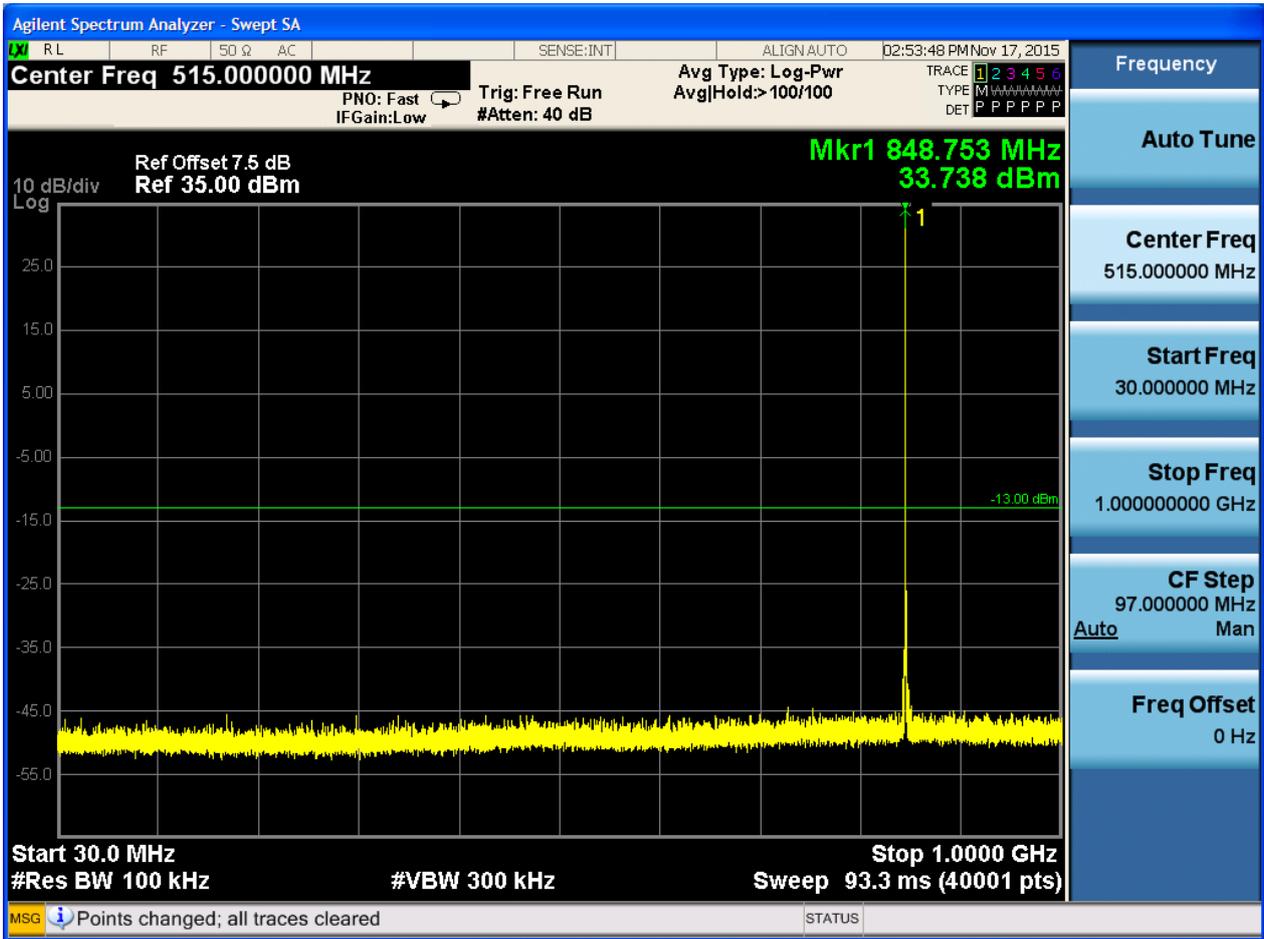


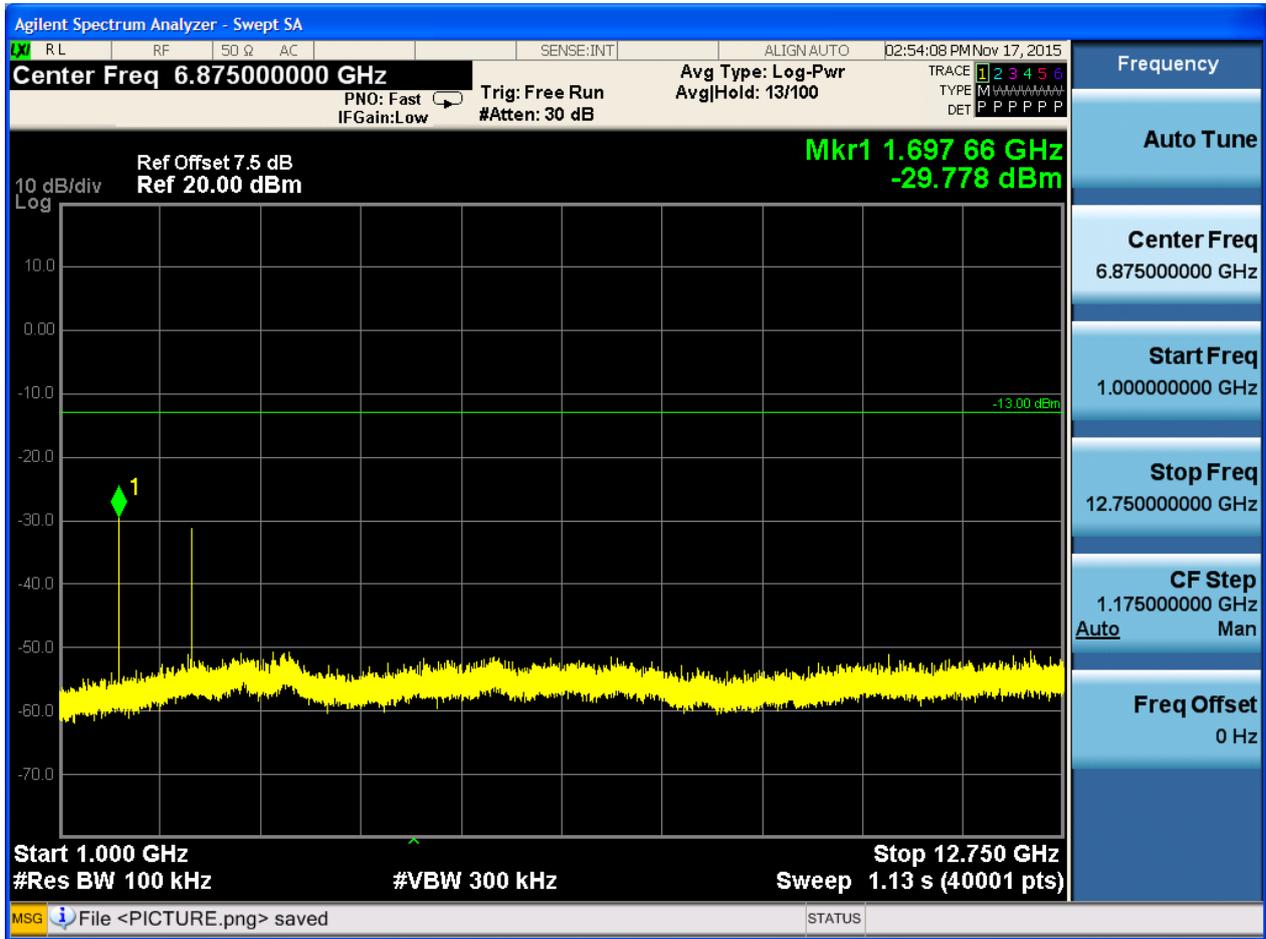


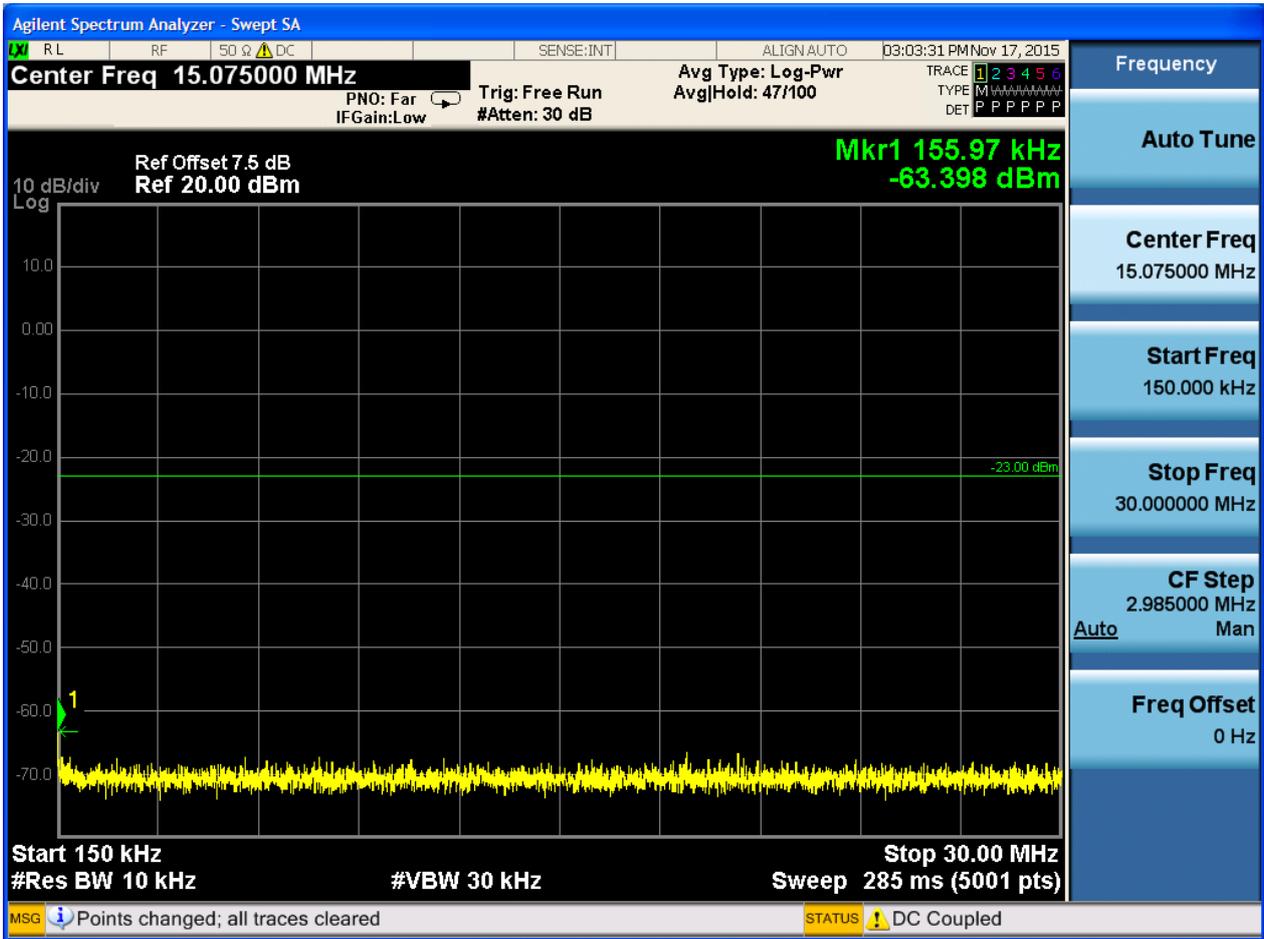
6.1.1.1.3 Test Channel = HCH

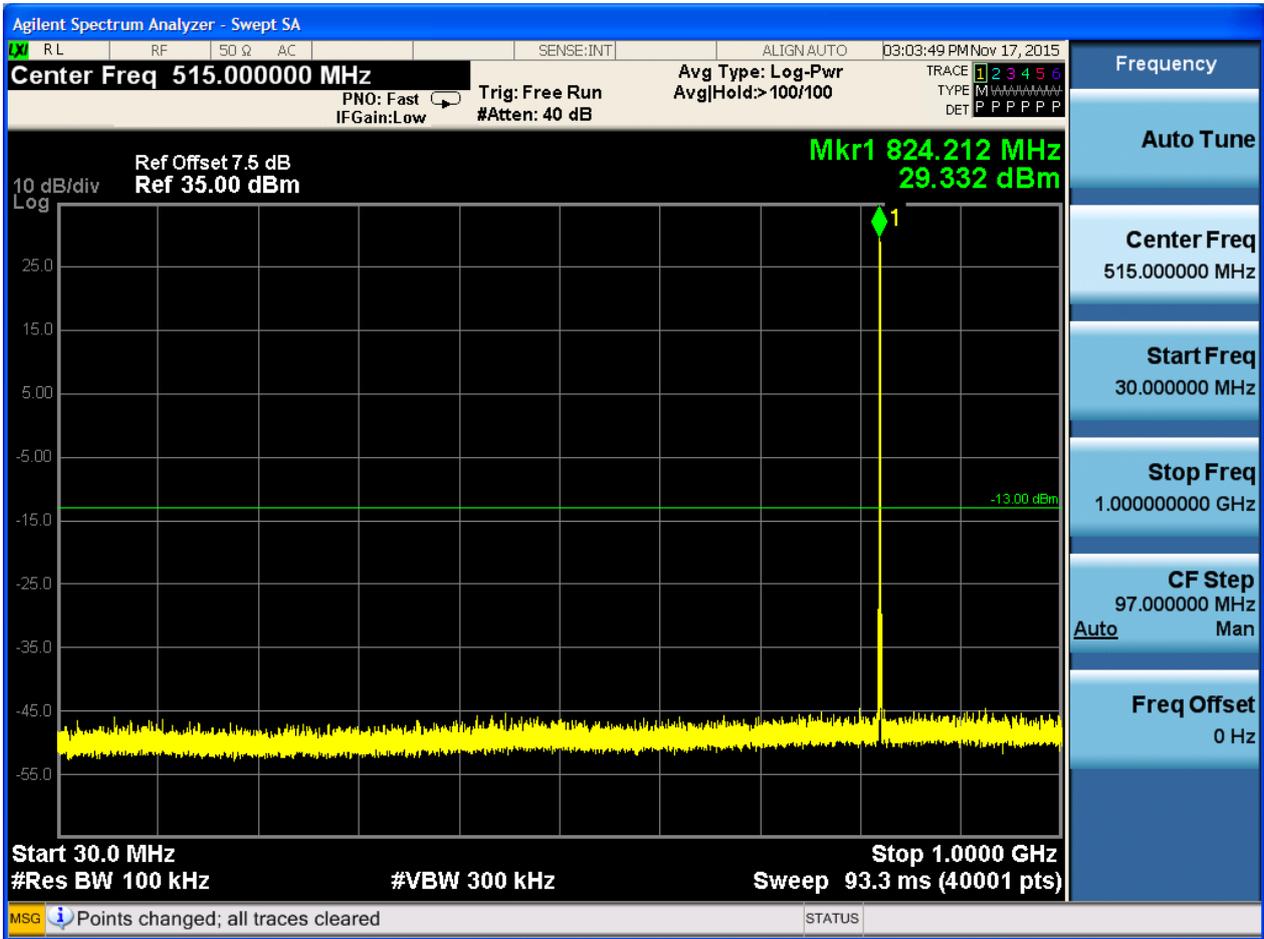


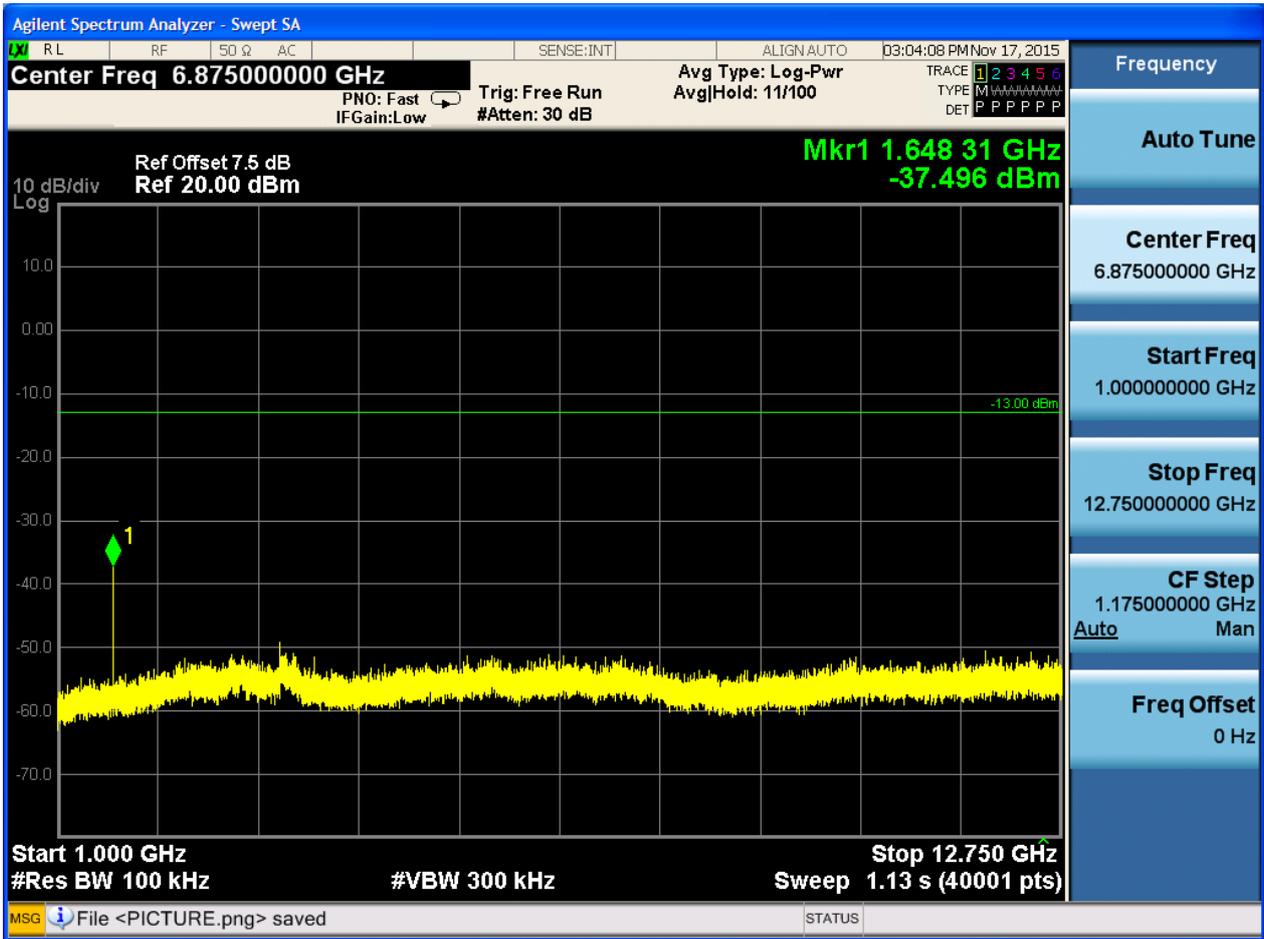






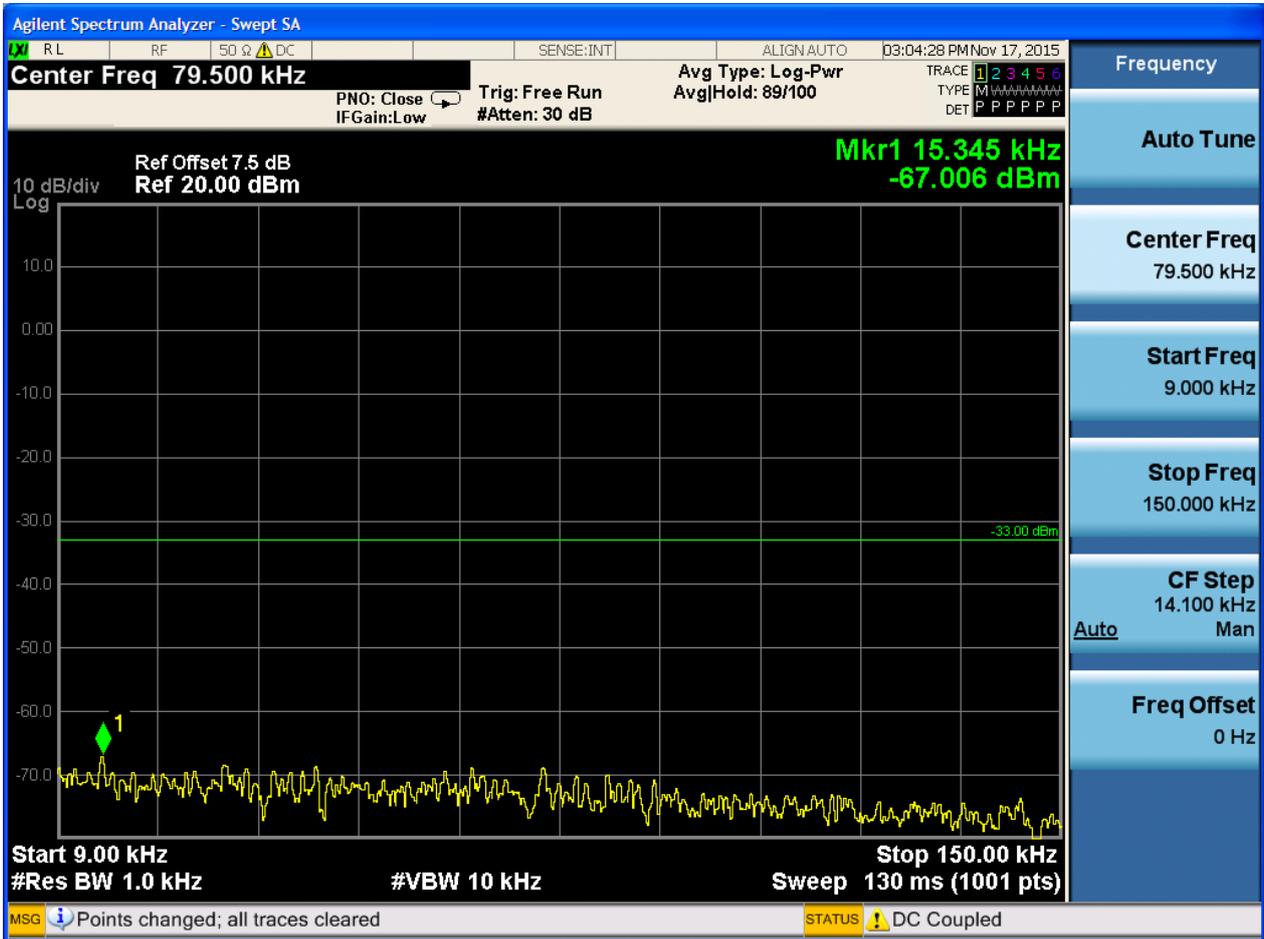


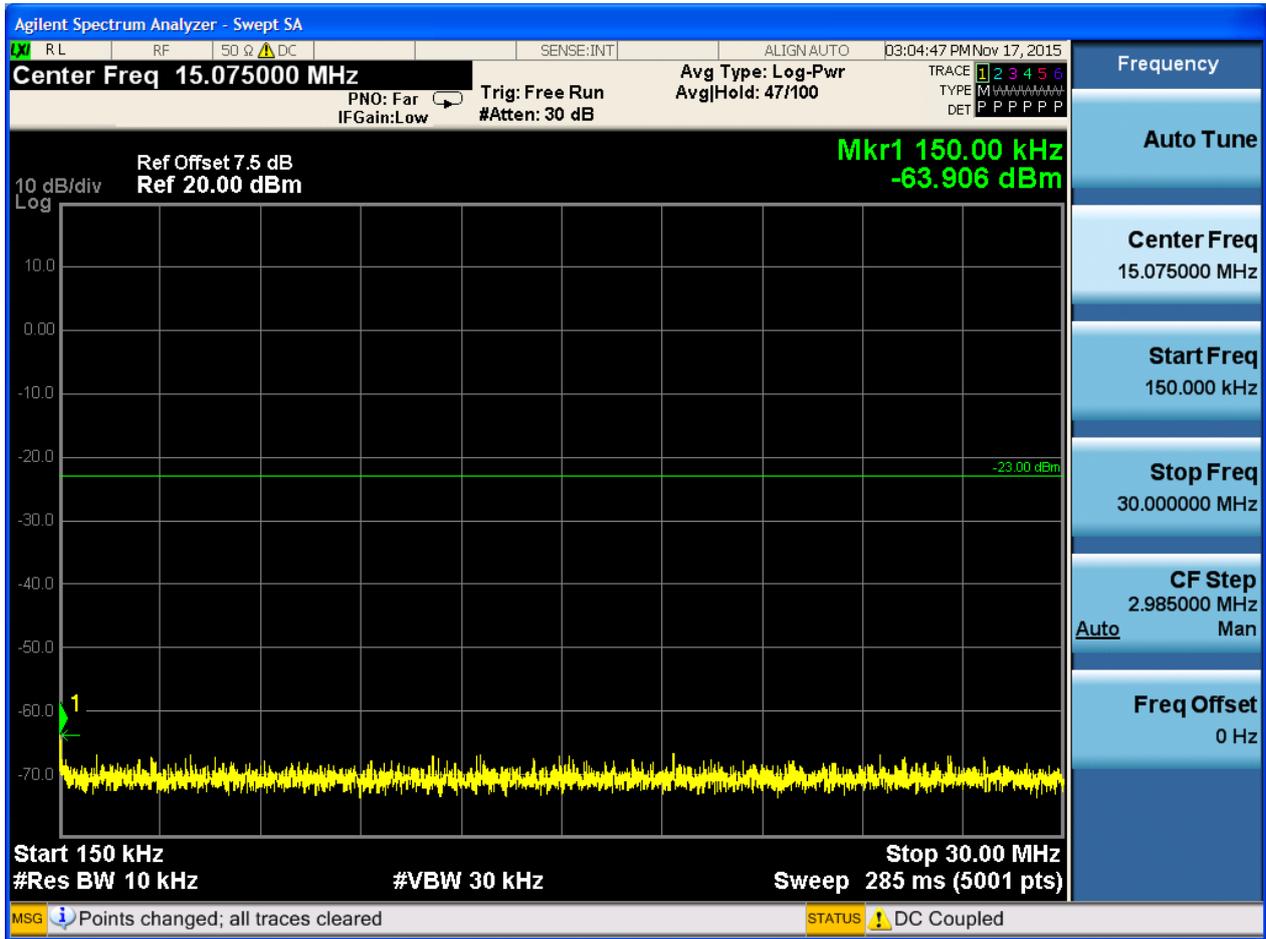


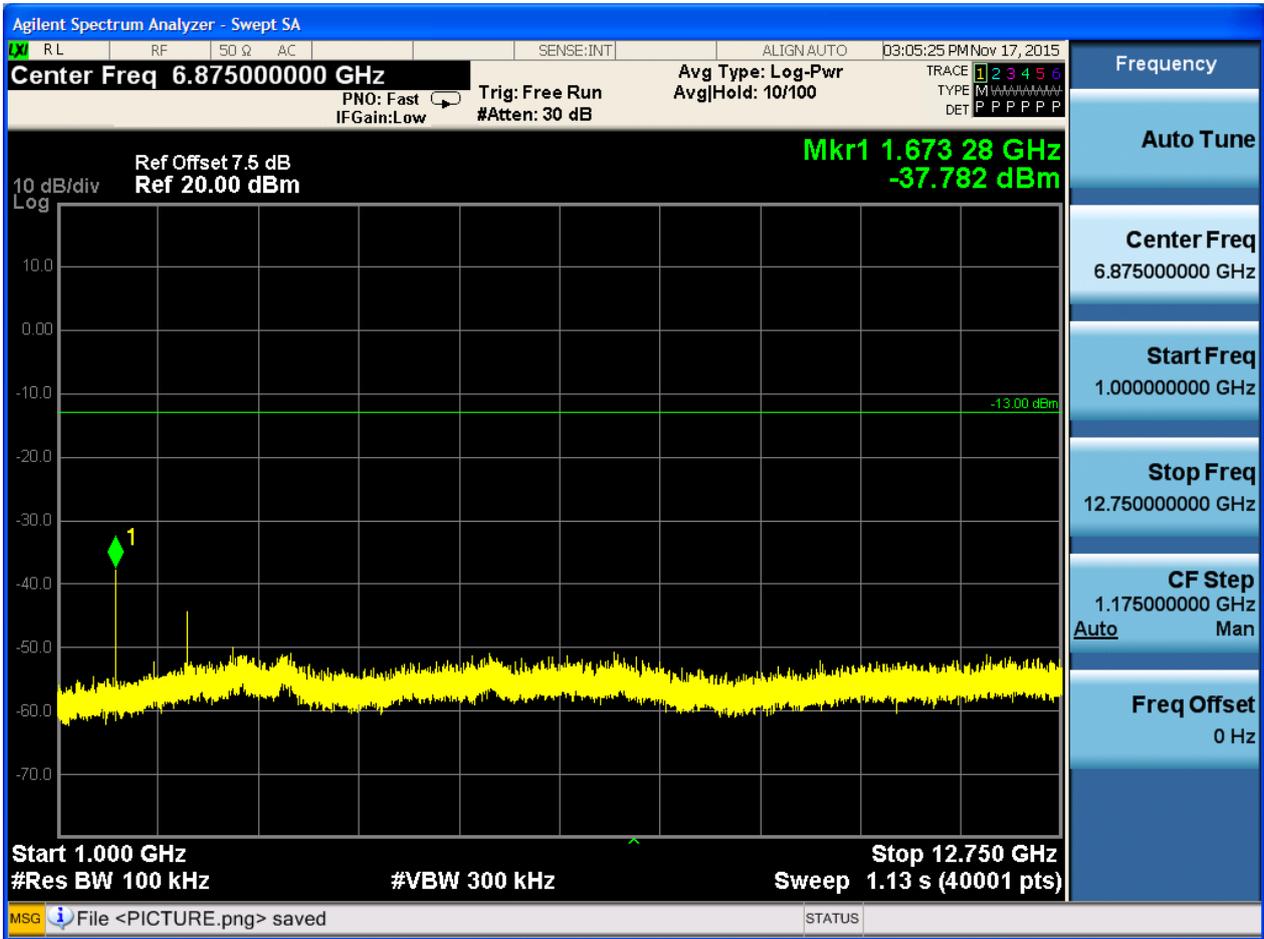




6.1.1.2.2 Test Channel = MCH

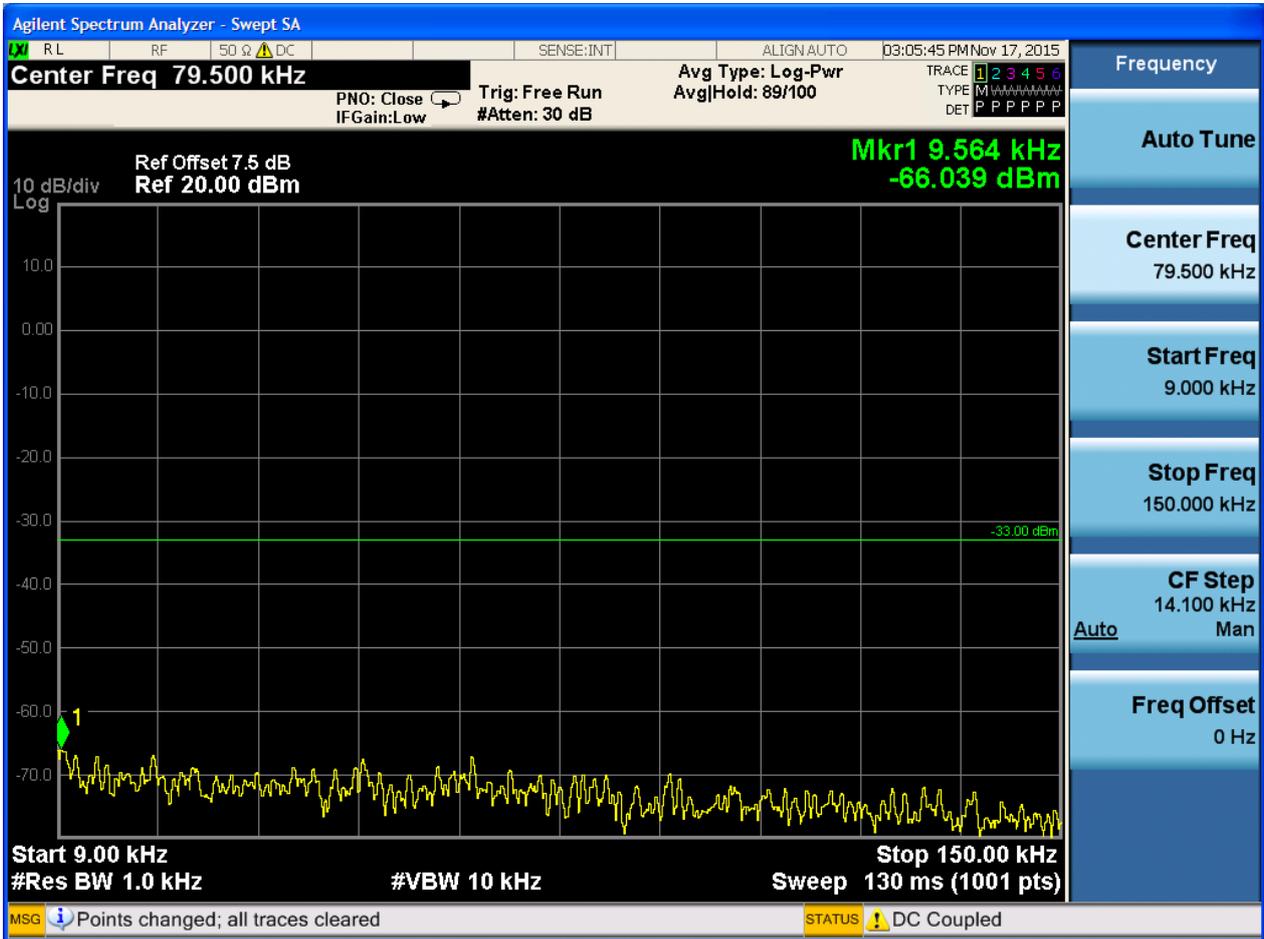


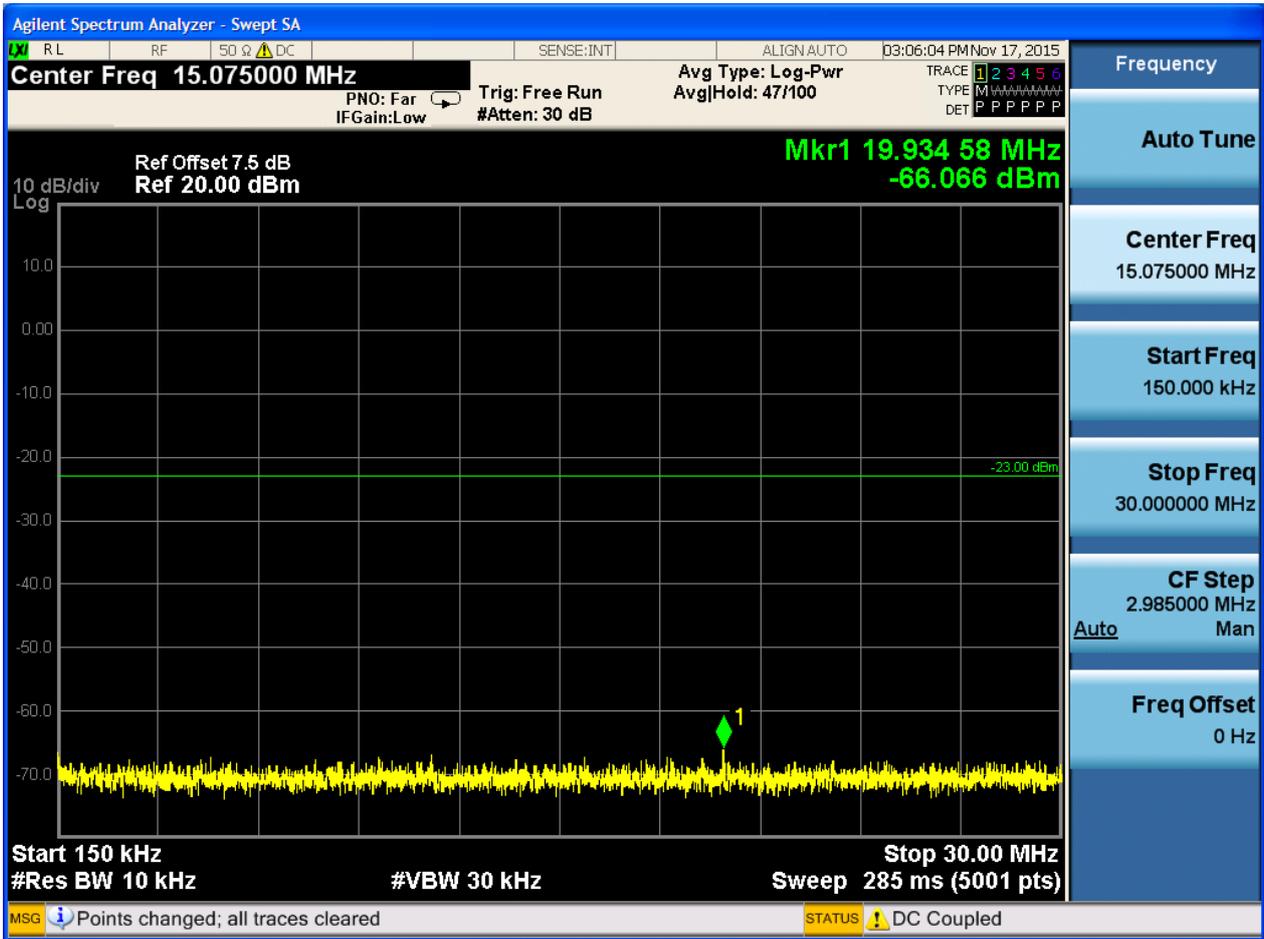


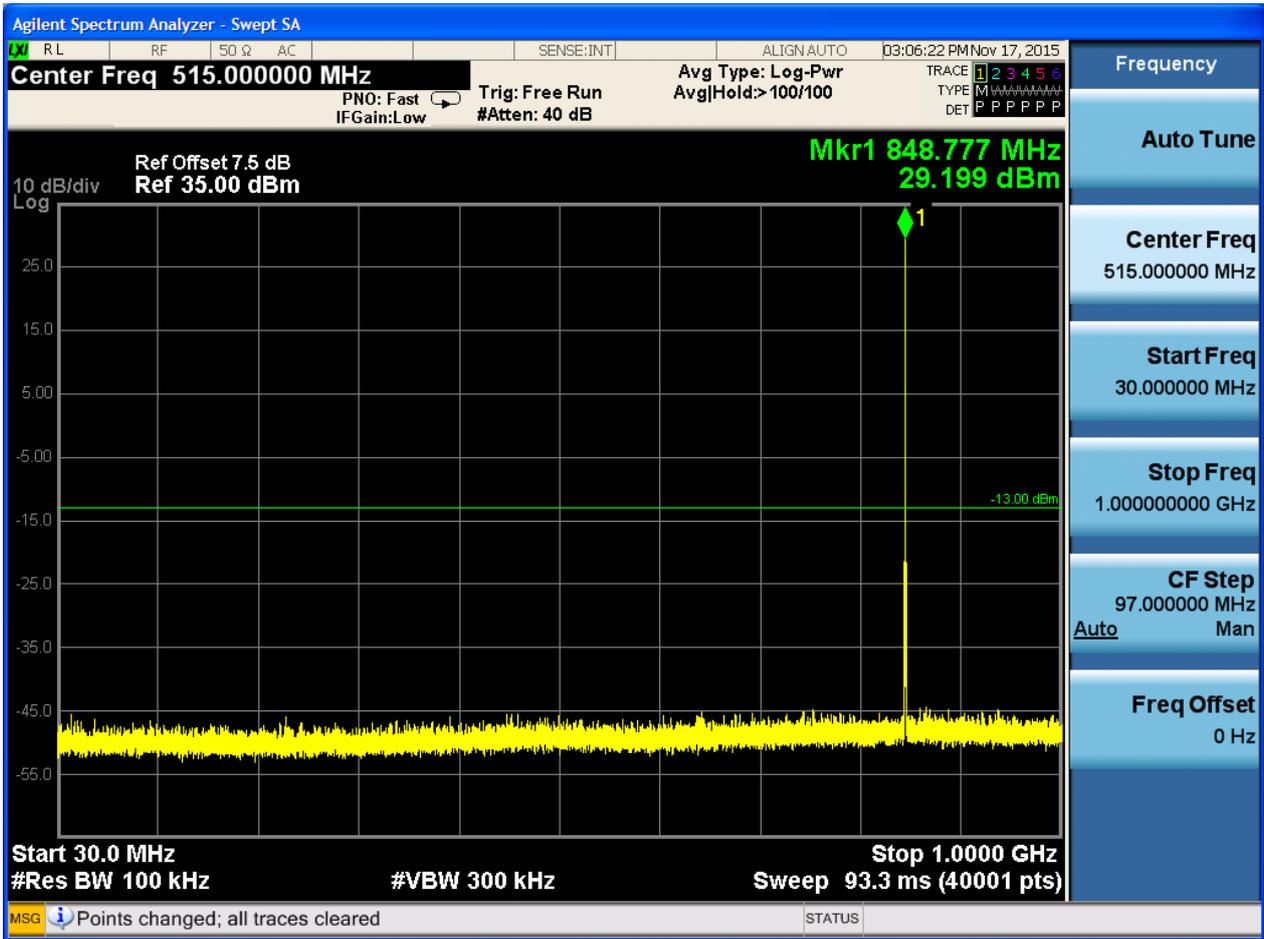


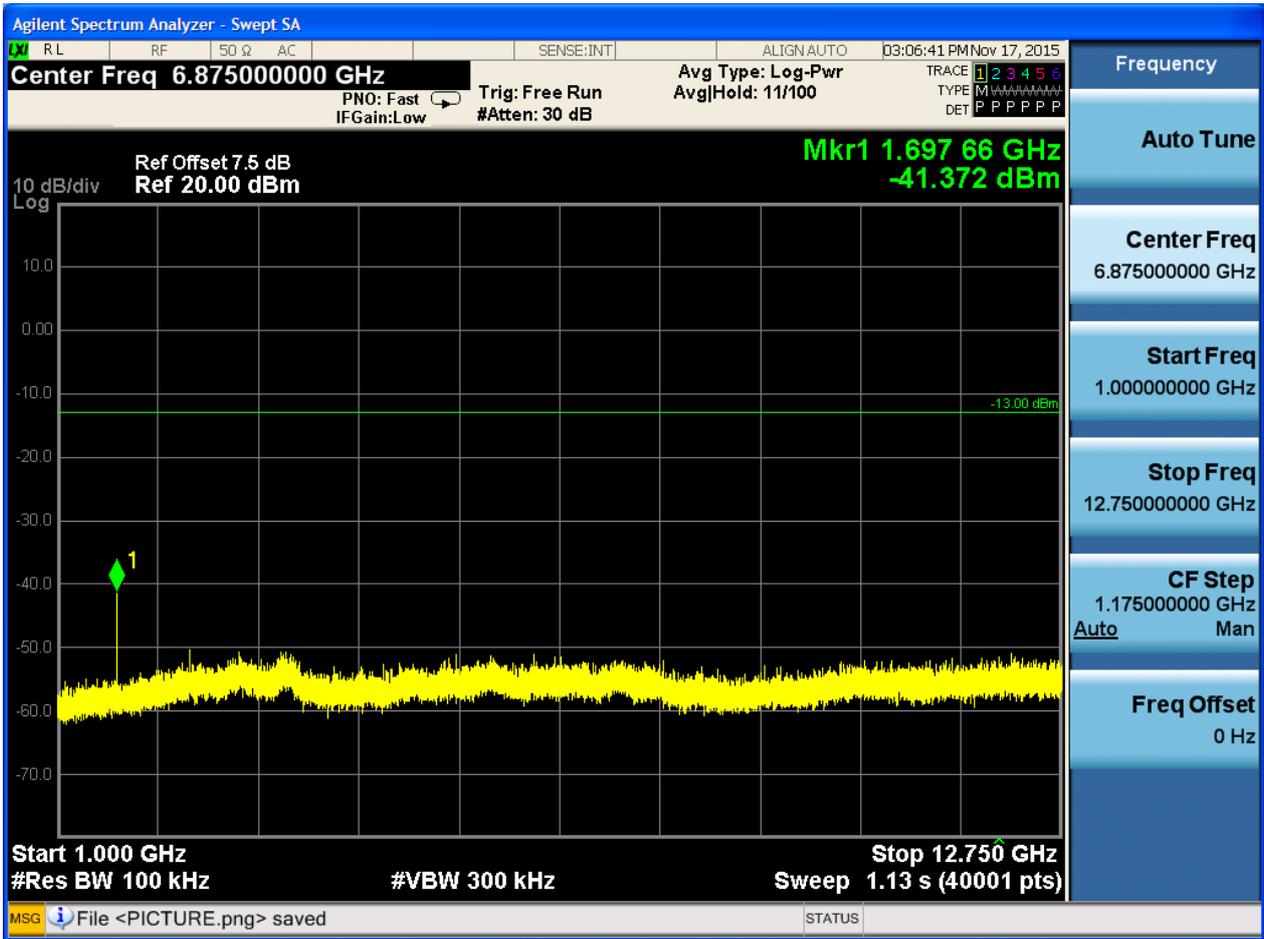


6.1.1.2.3 Test Channel = HCH









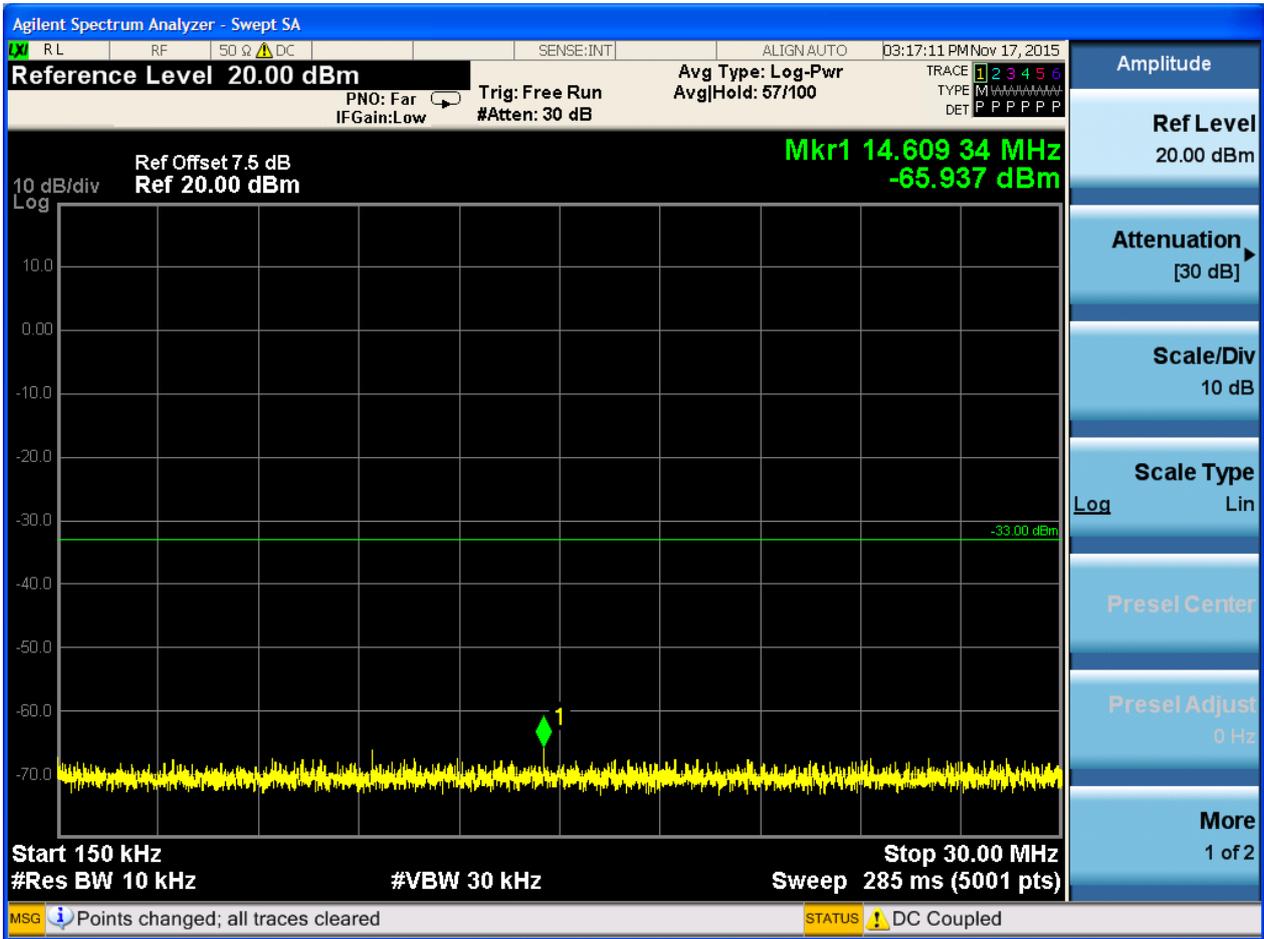


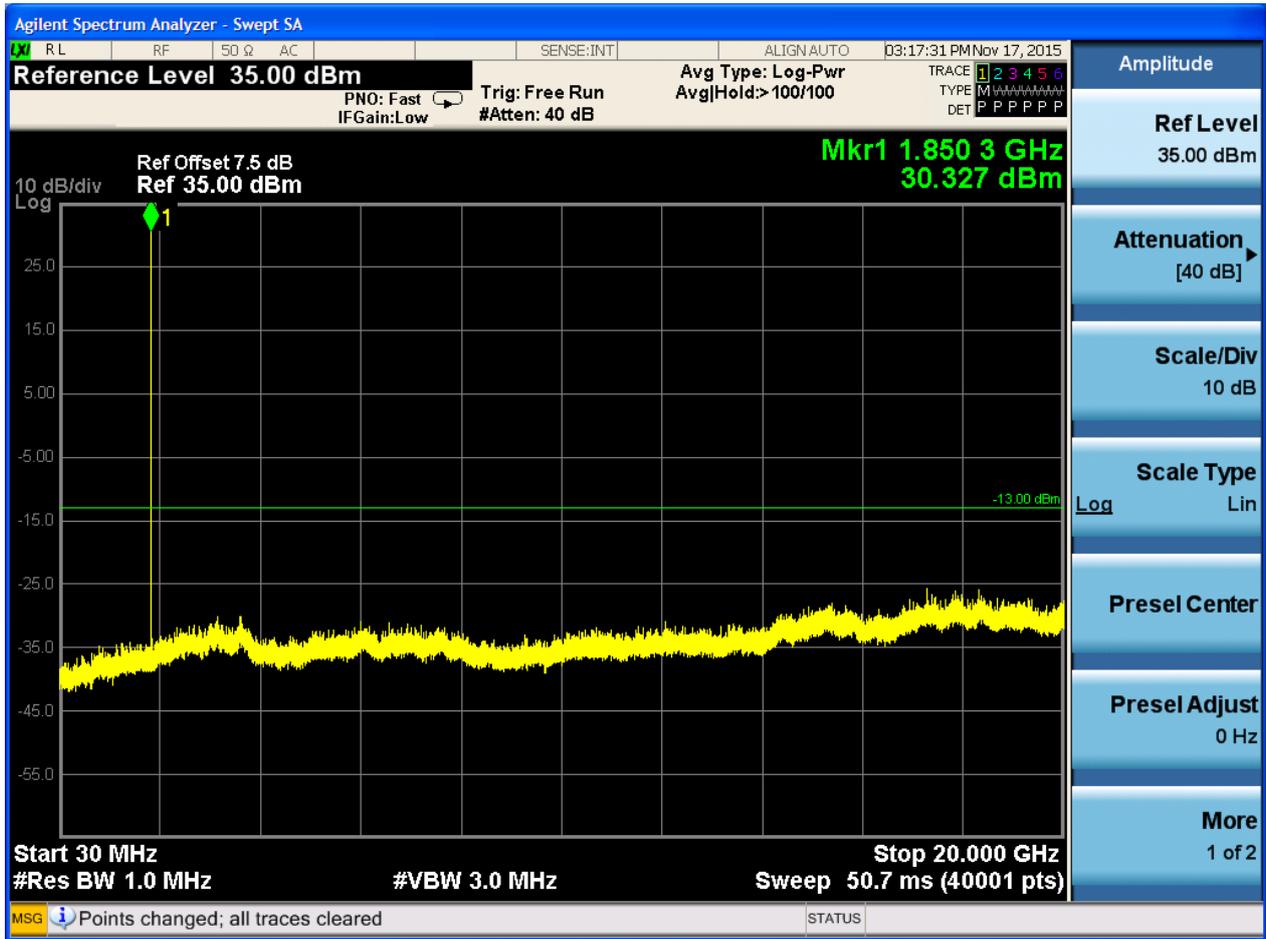
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH

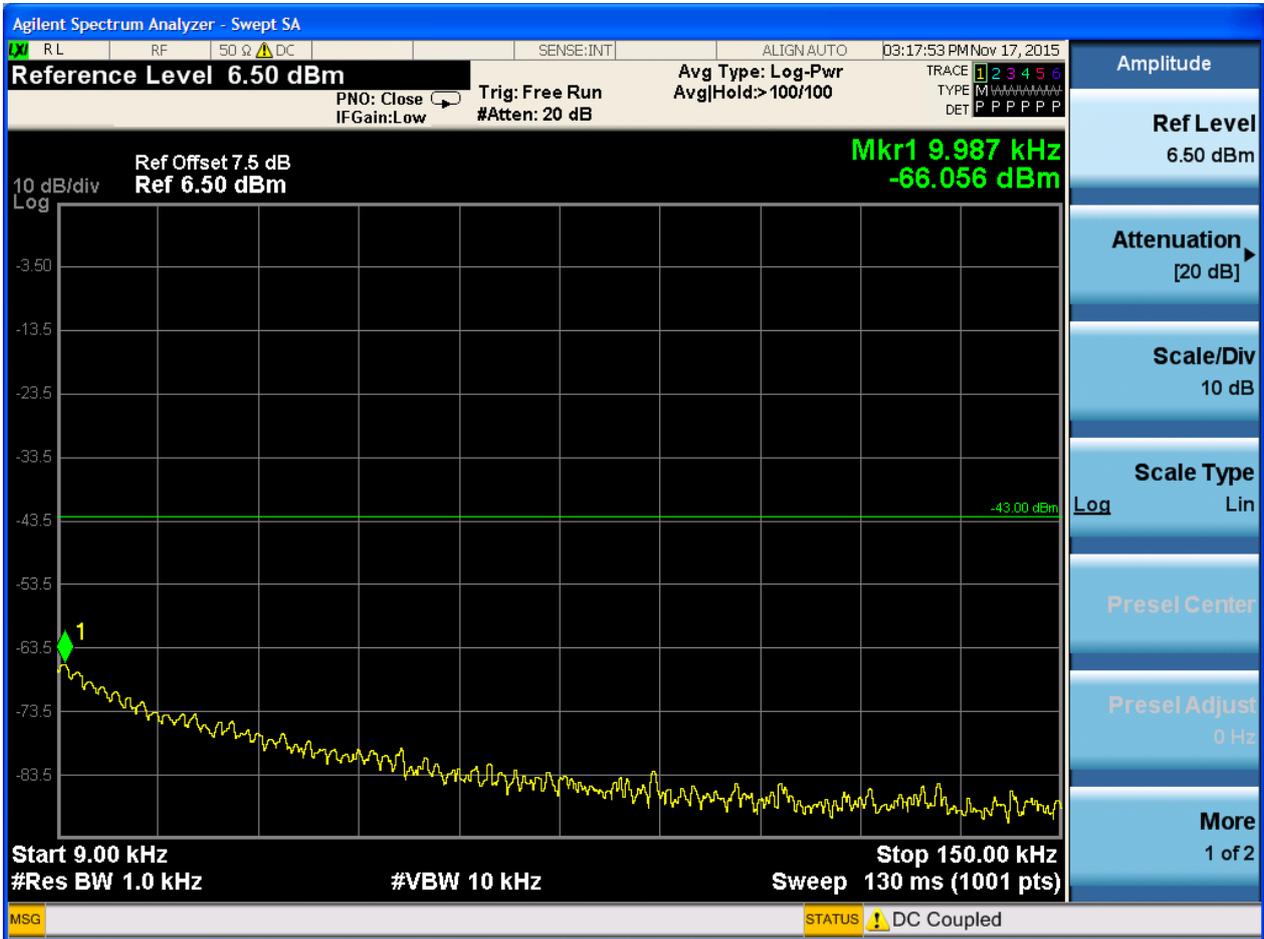


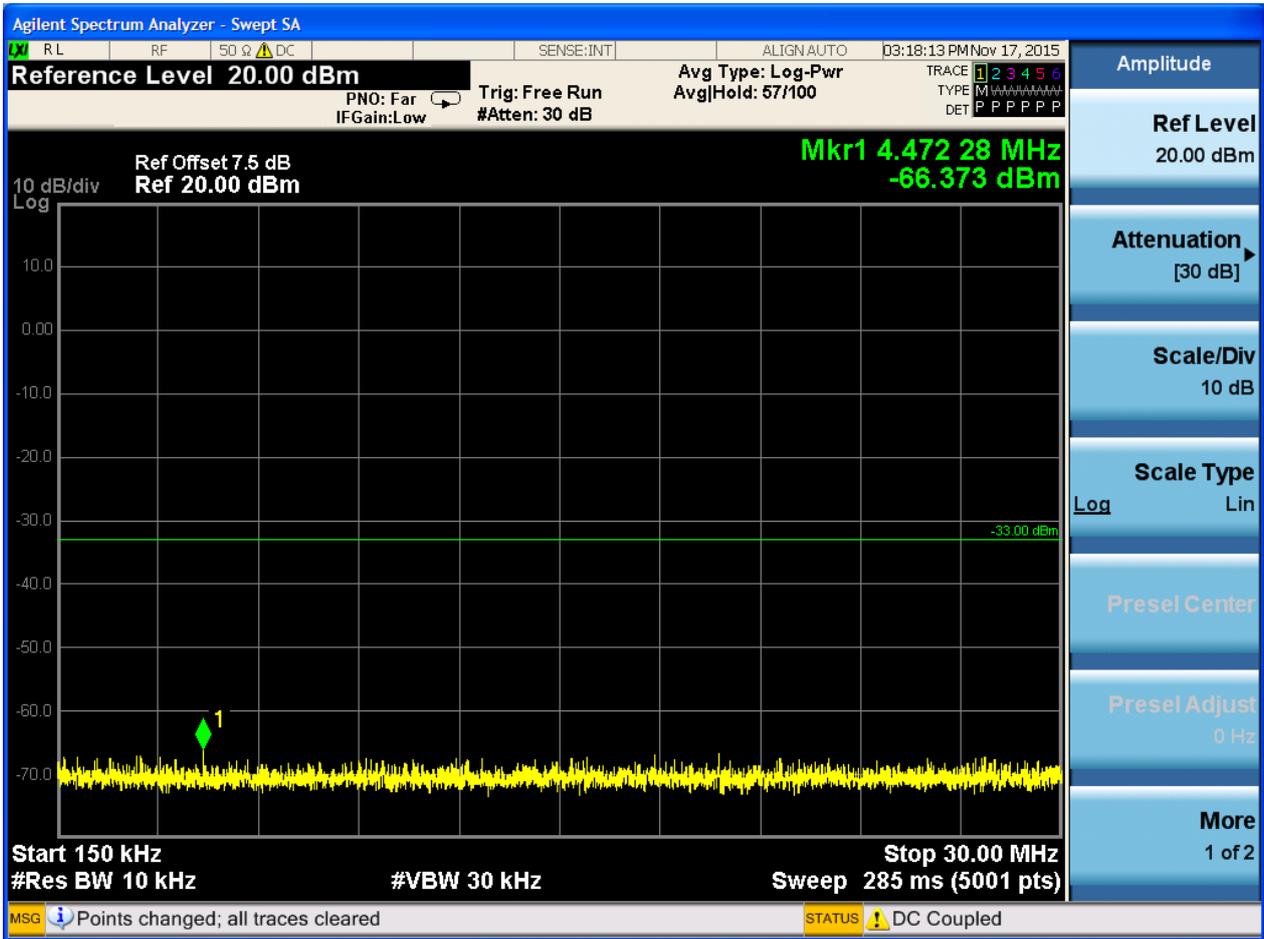


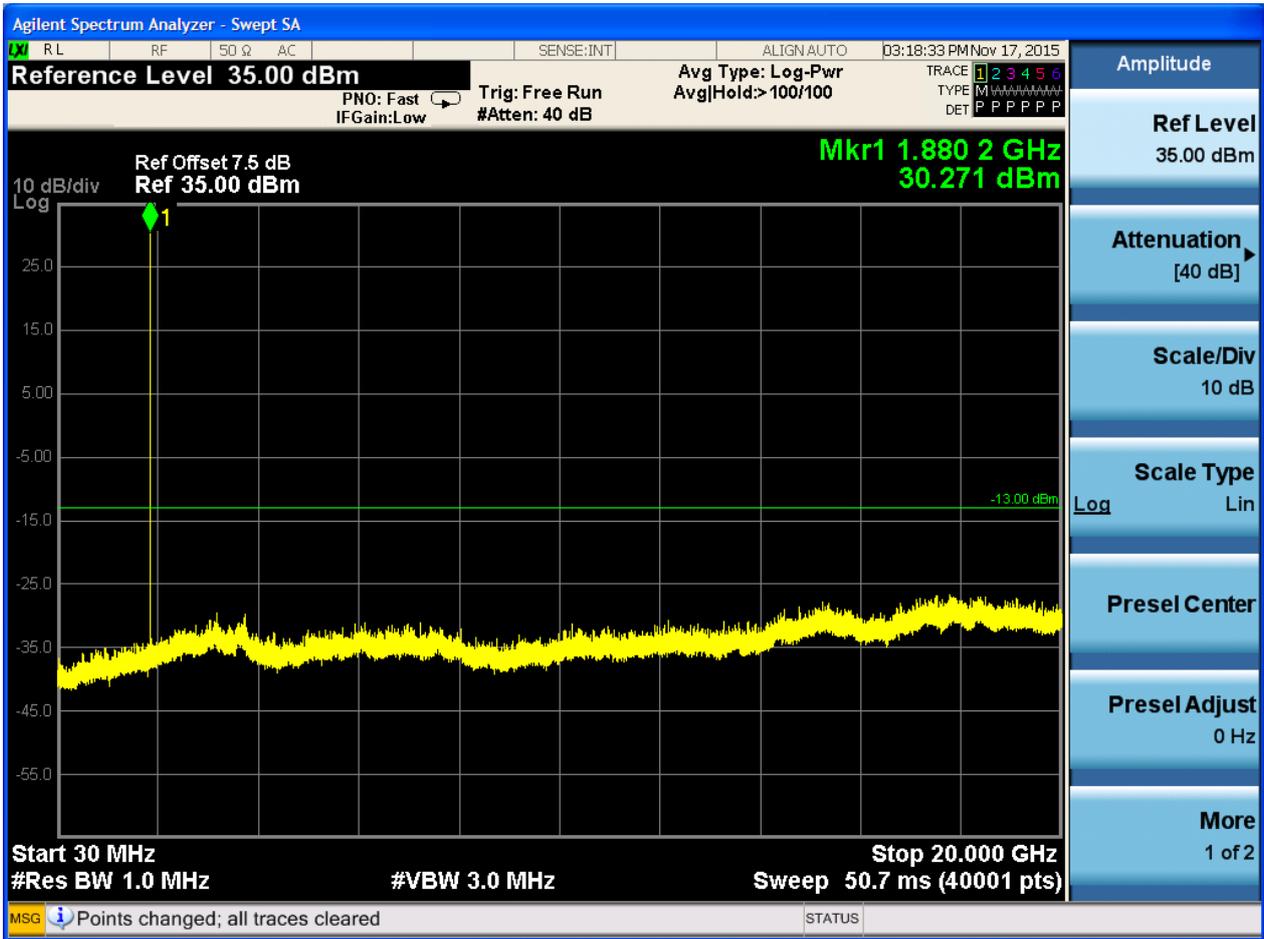


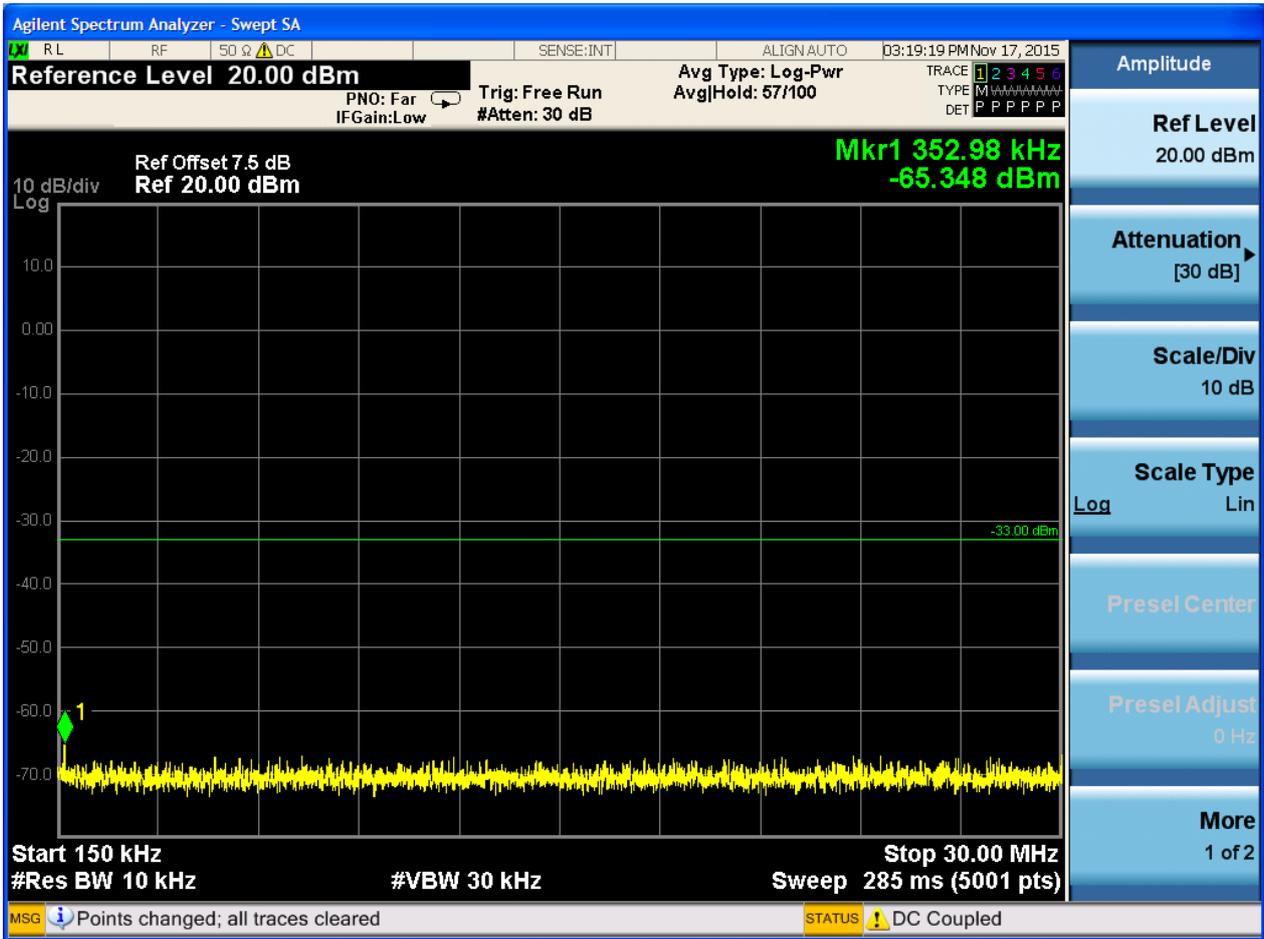


6.1.2.1.2 Test Channel = MCH







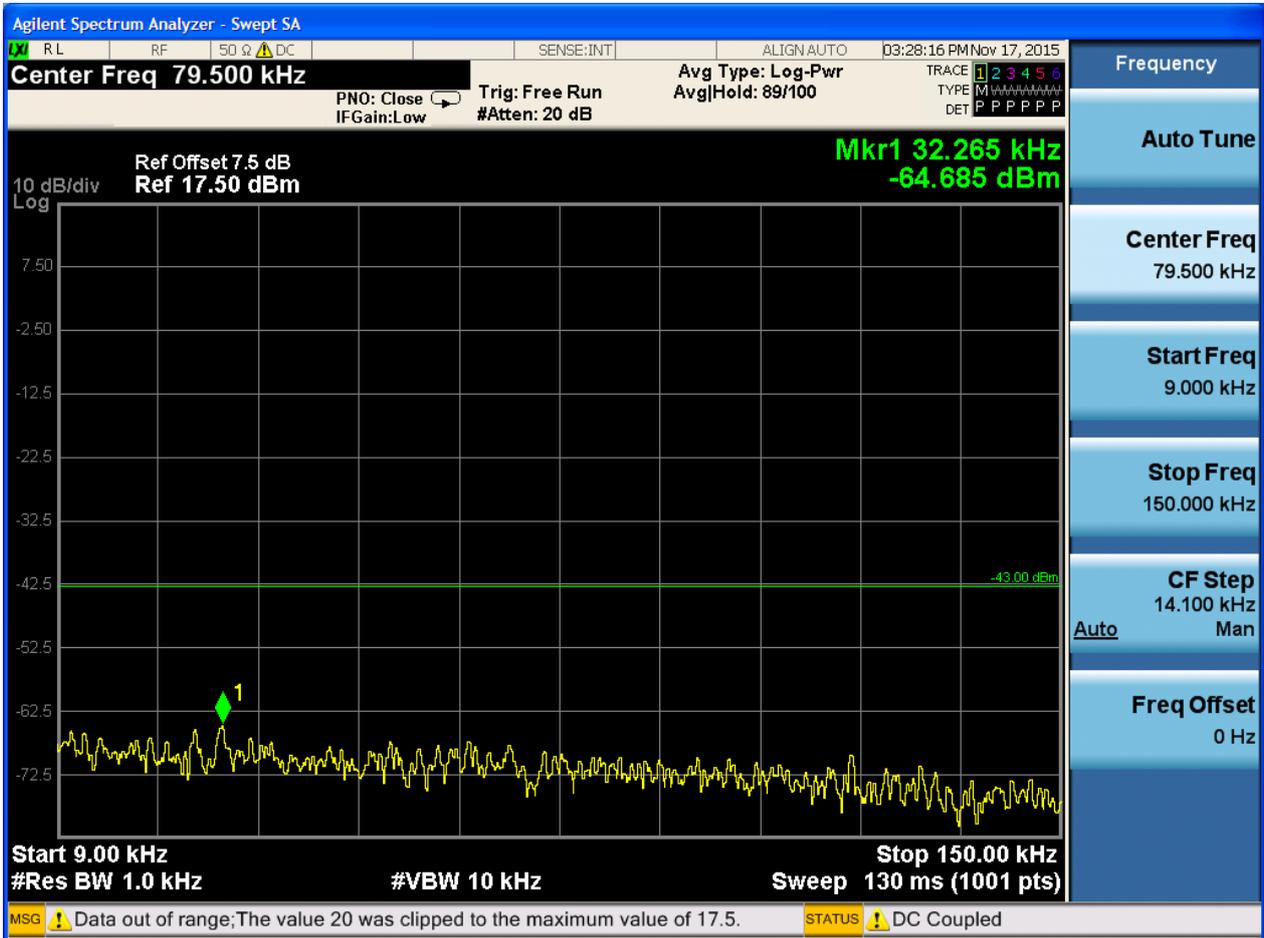


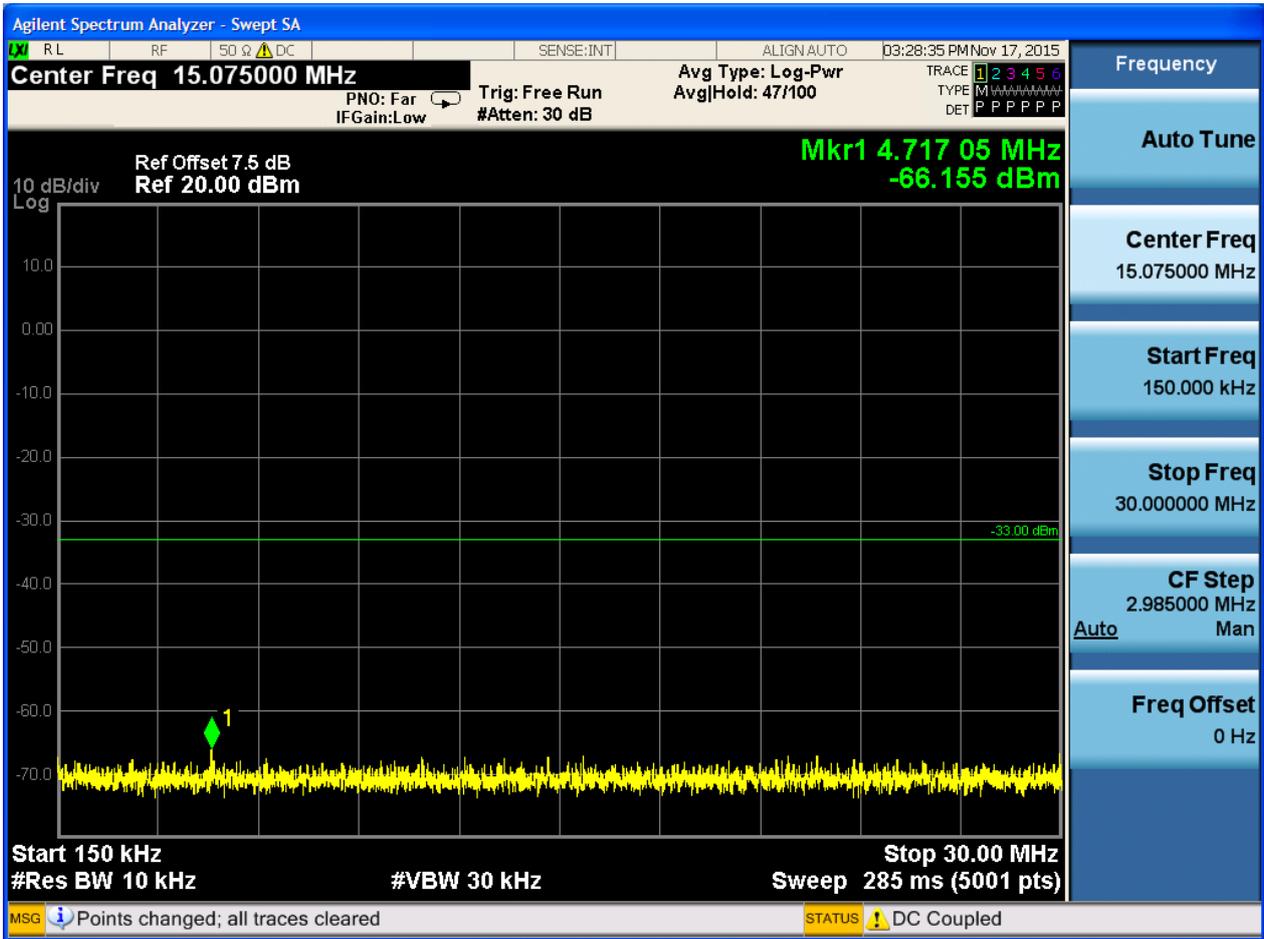


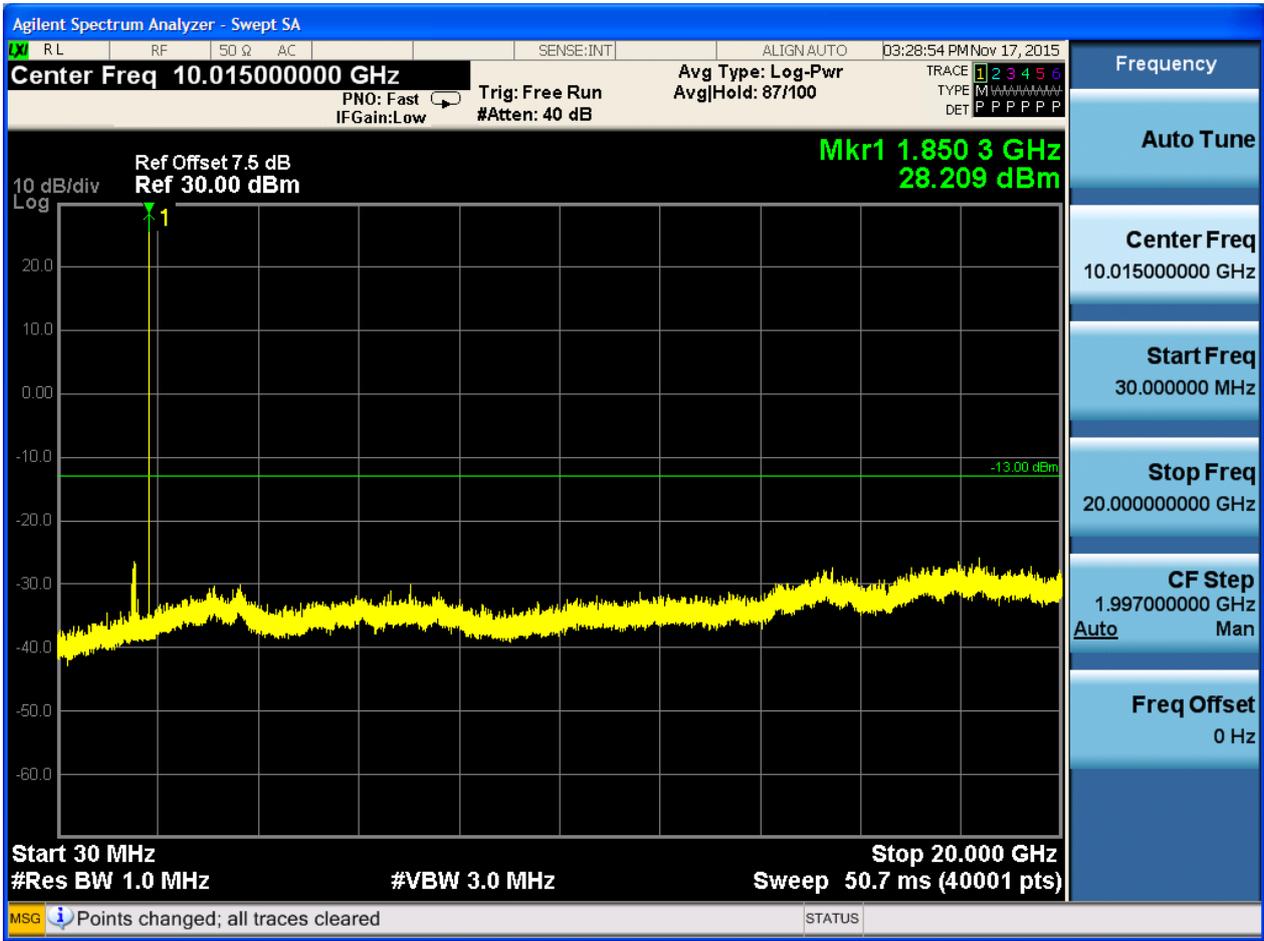


6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH

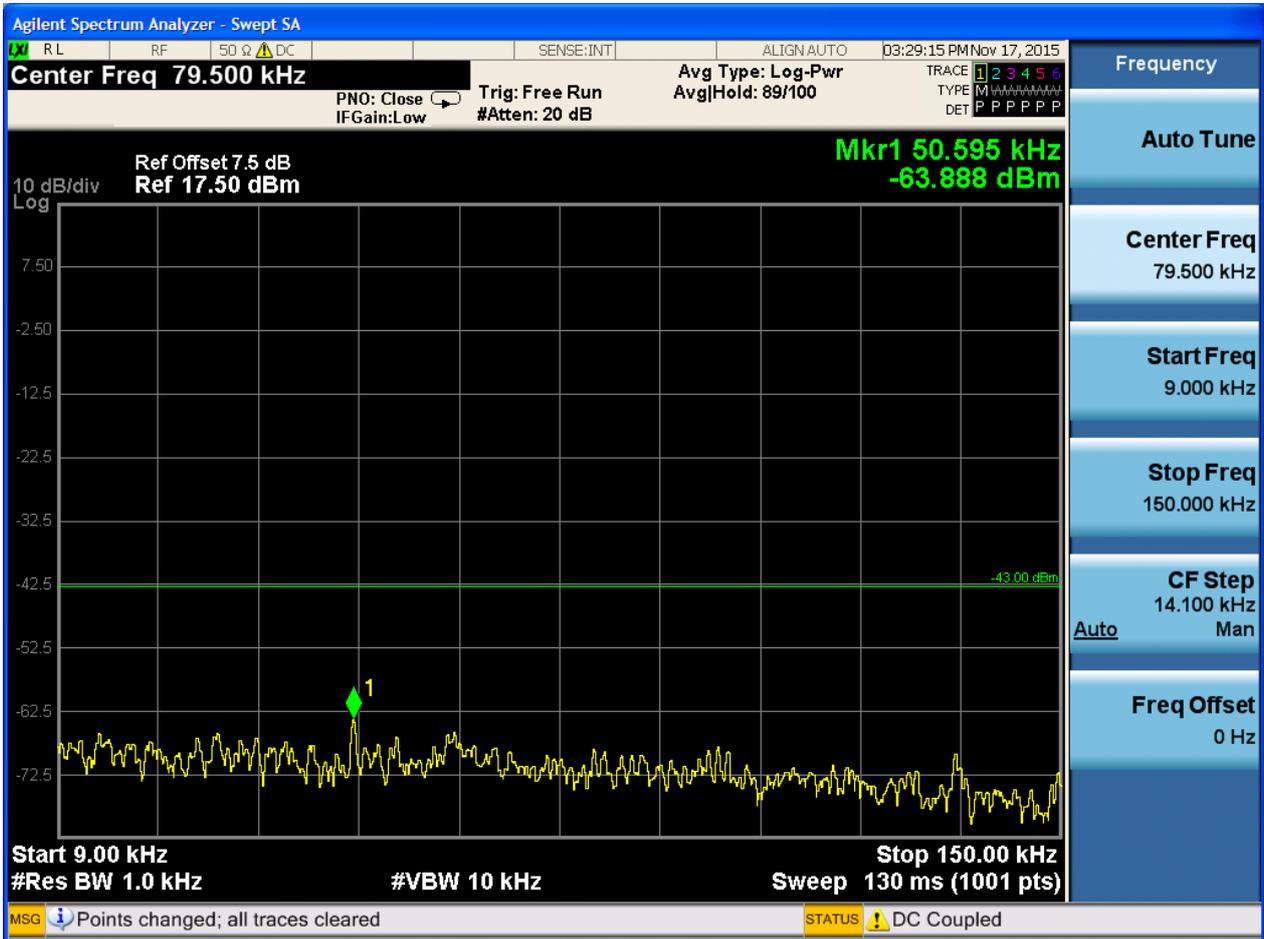


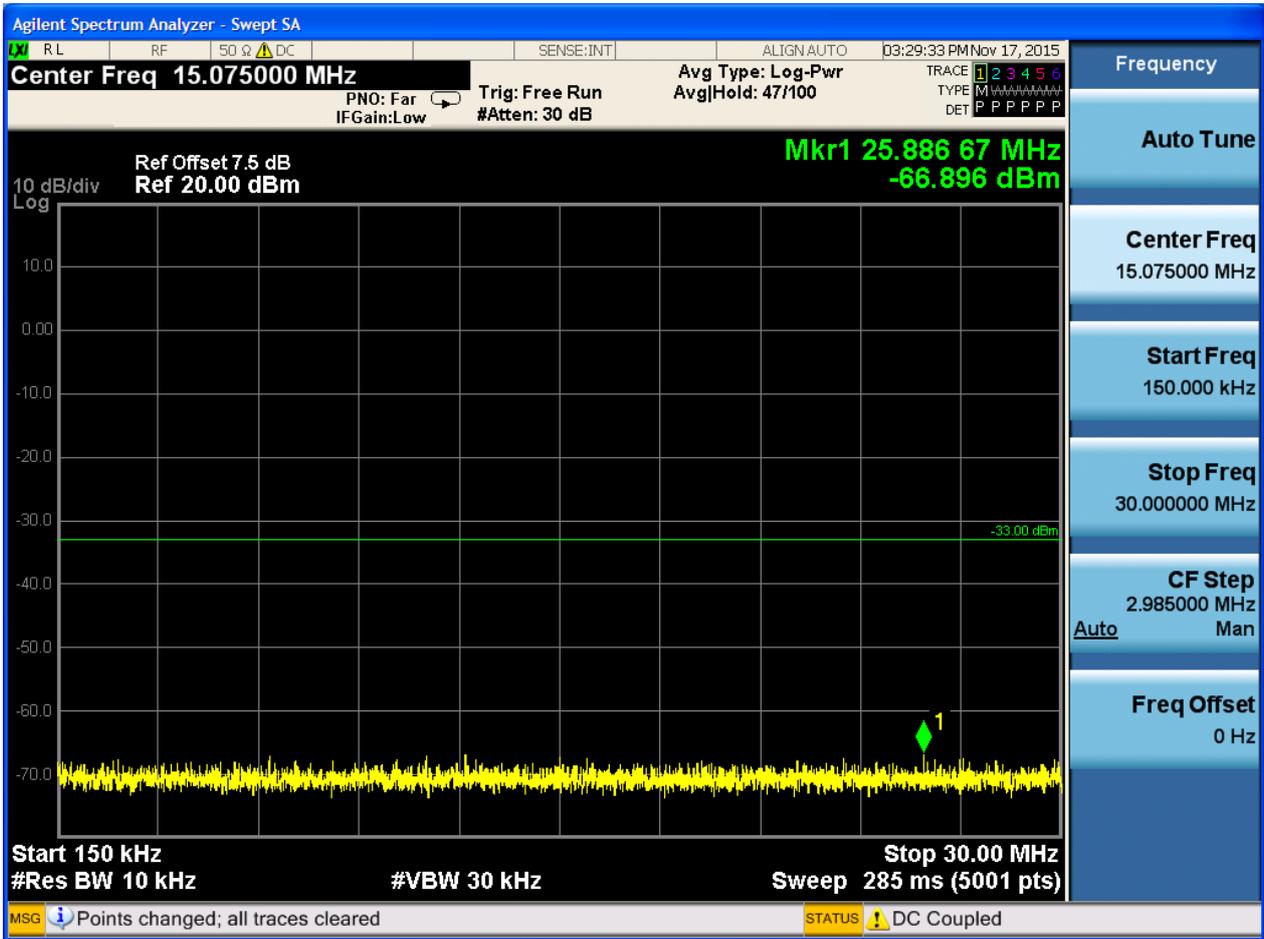


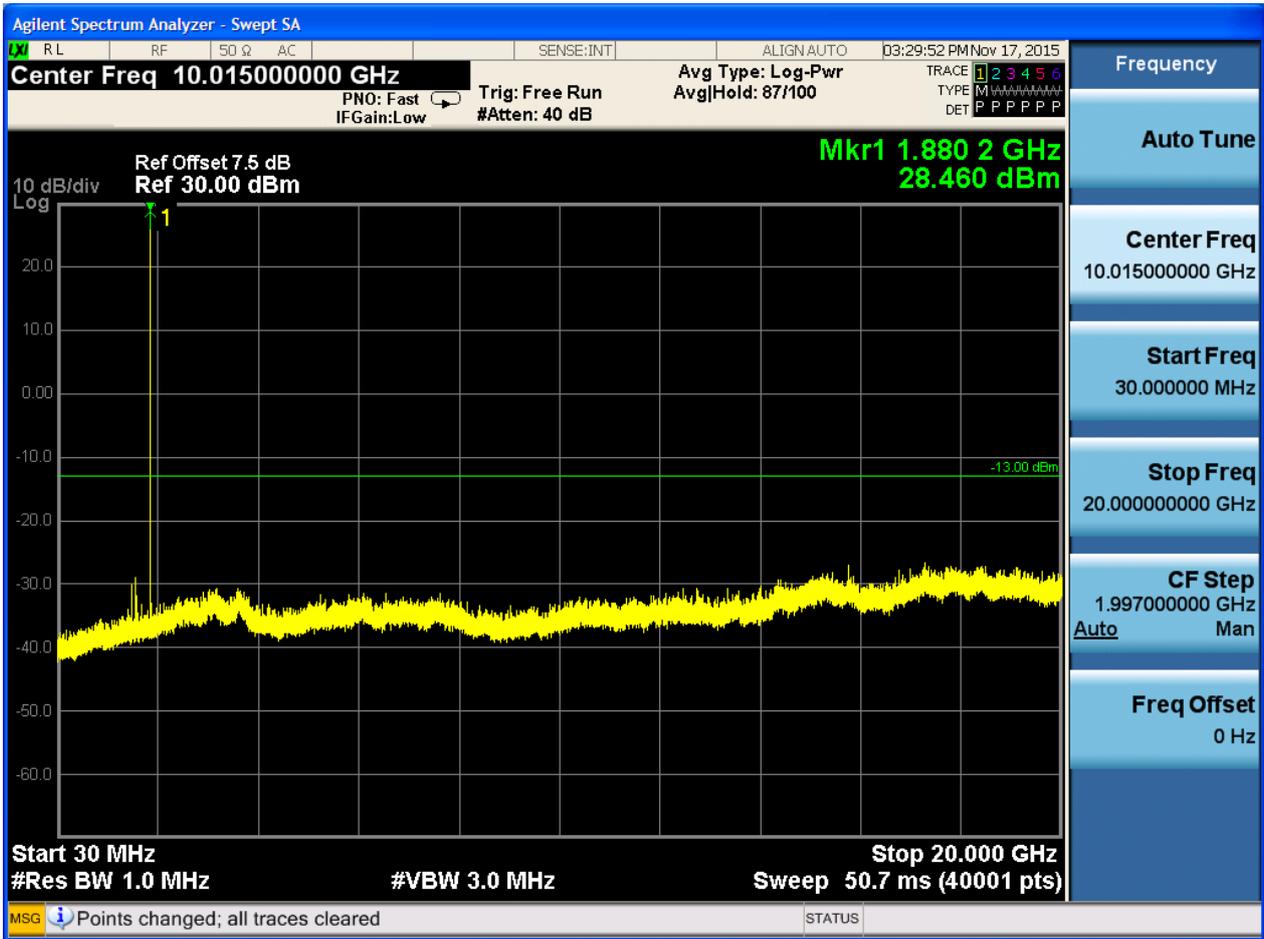




6.1.2.2.2 Test Channel = MCH

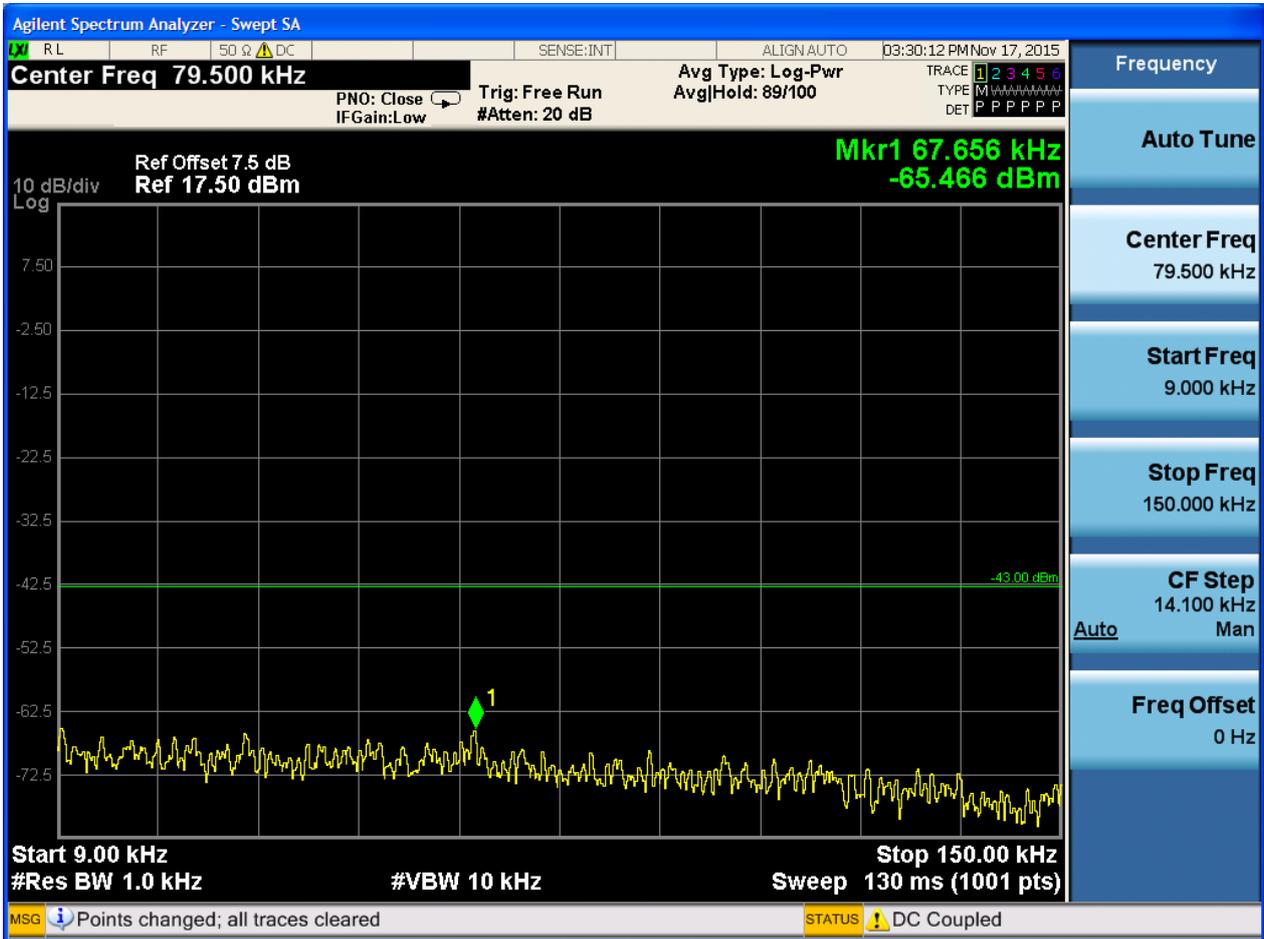


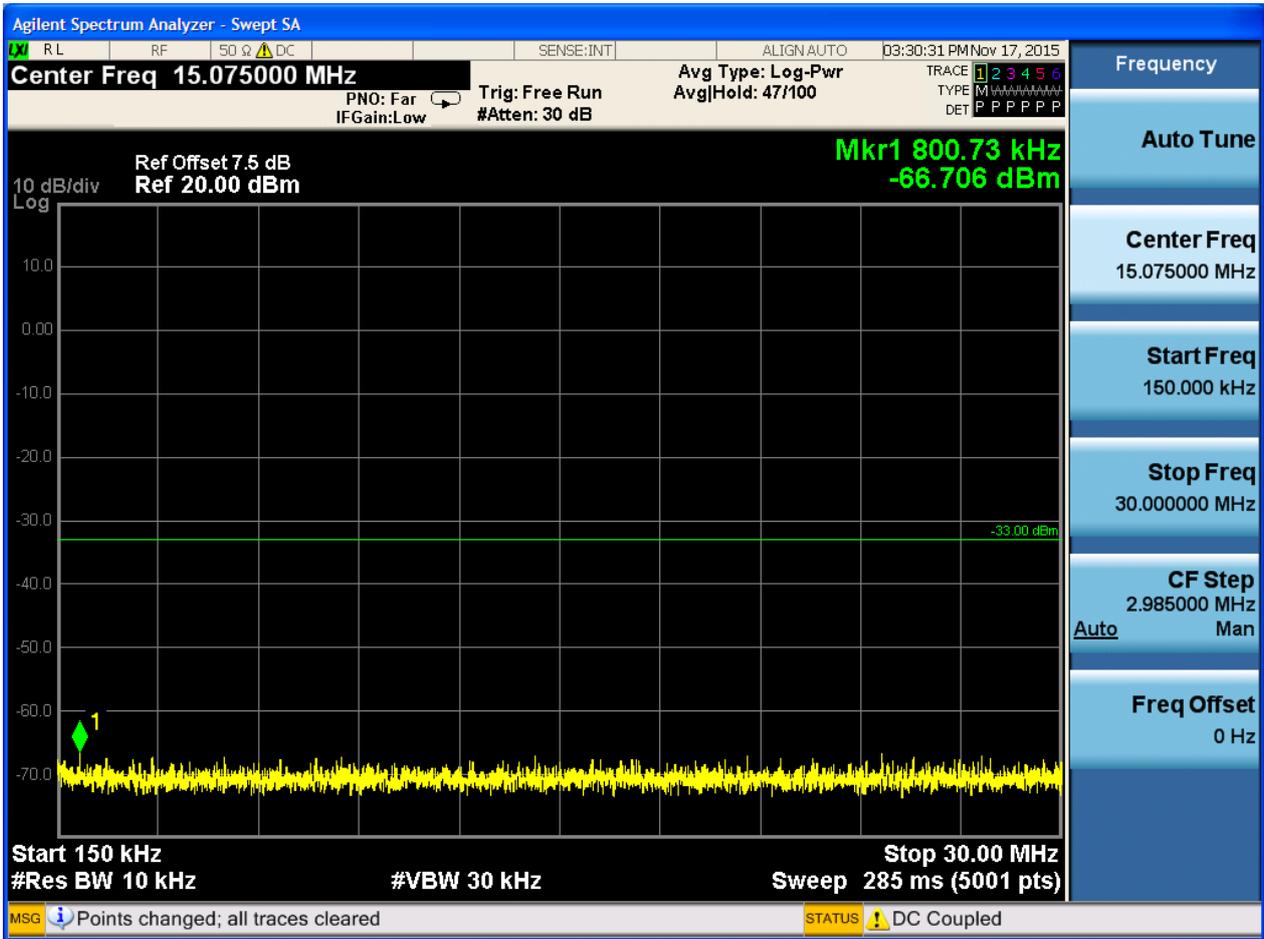


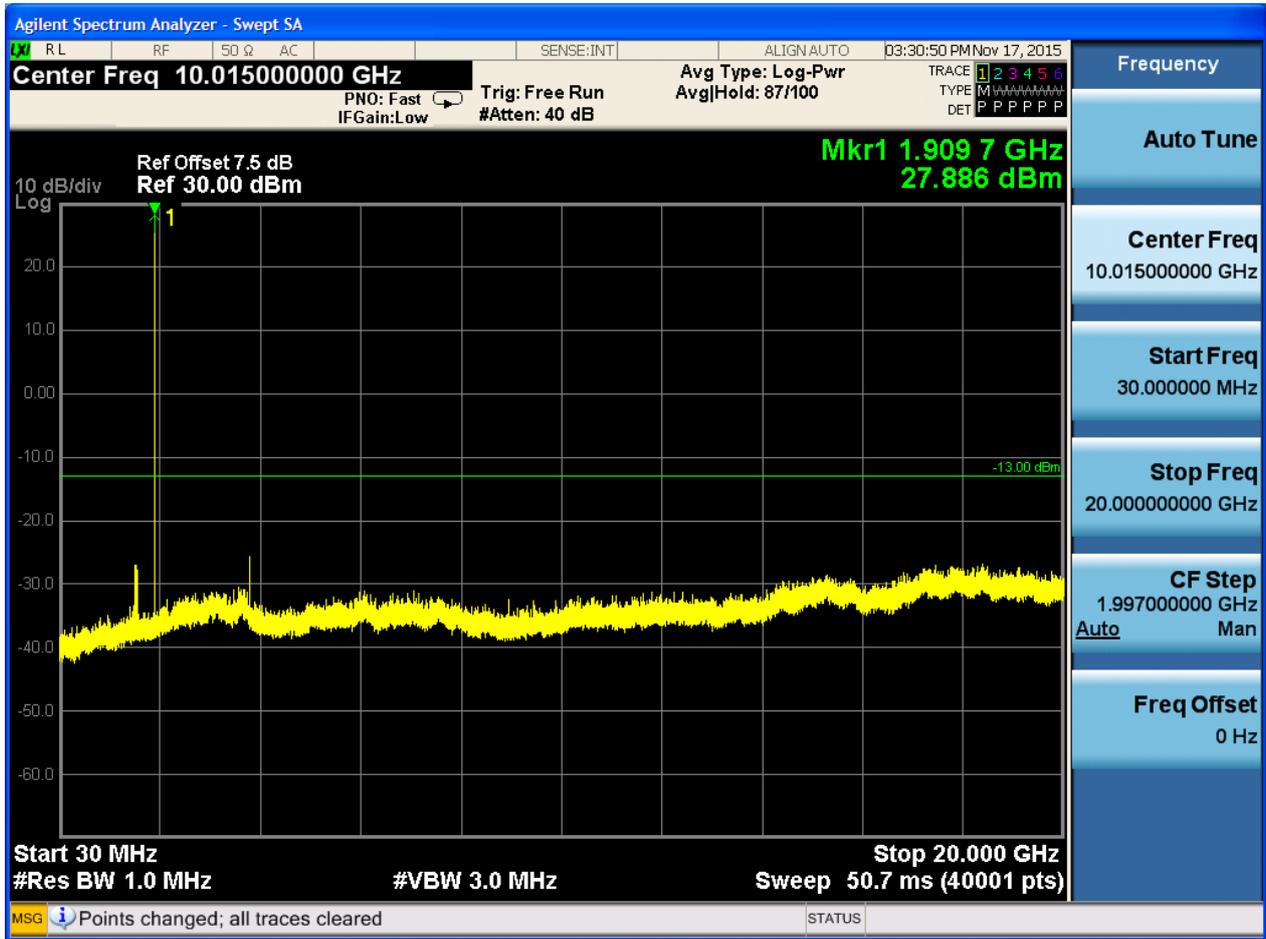




6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

Note:

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

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

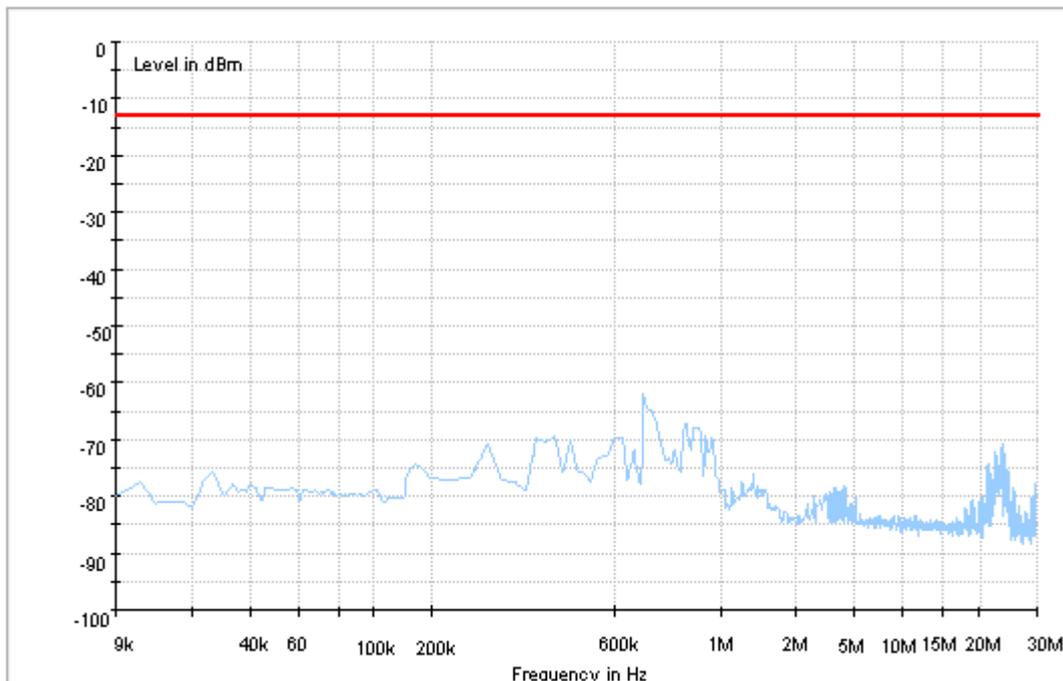
30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Detector: PK

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

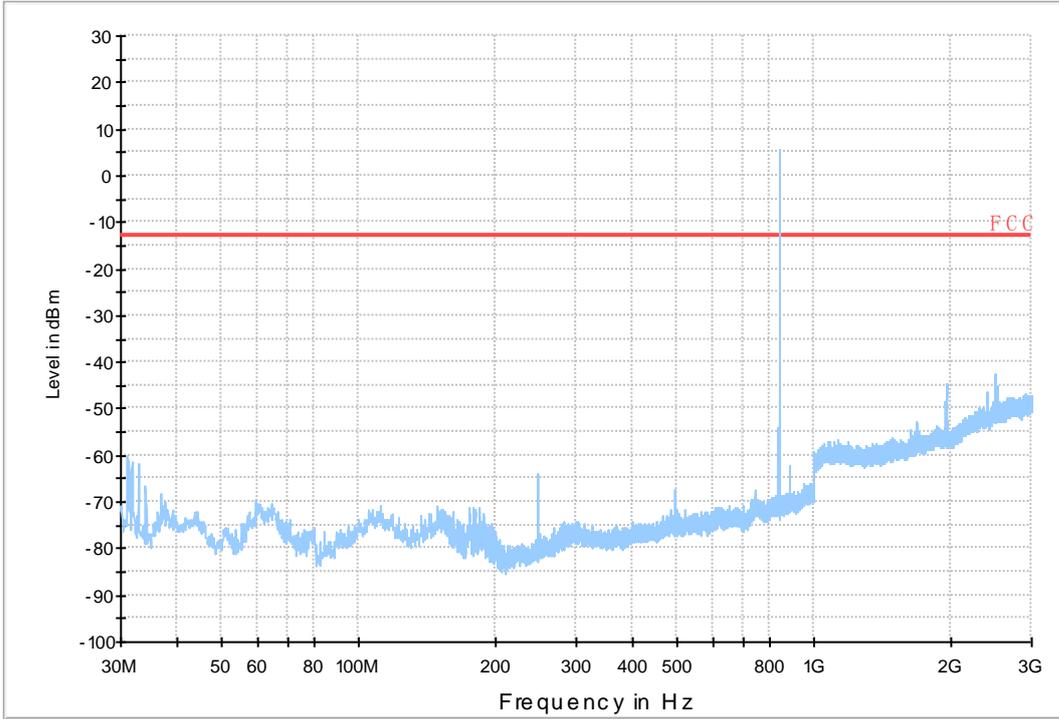
Part I - Test Plots

7.1 For GSM

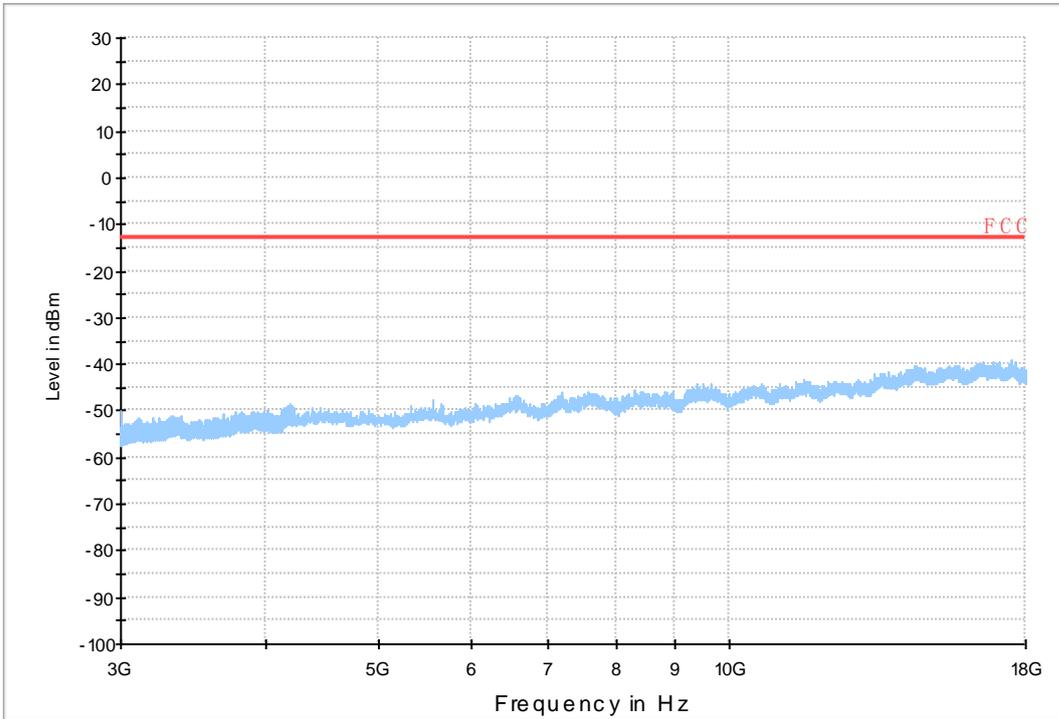
7.1.1 Test Band = GSM850



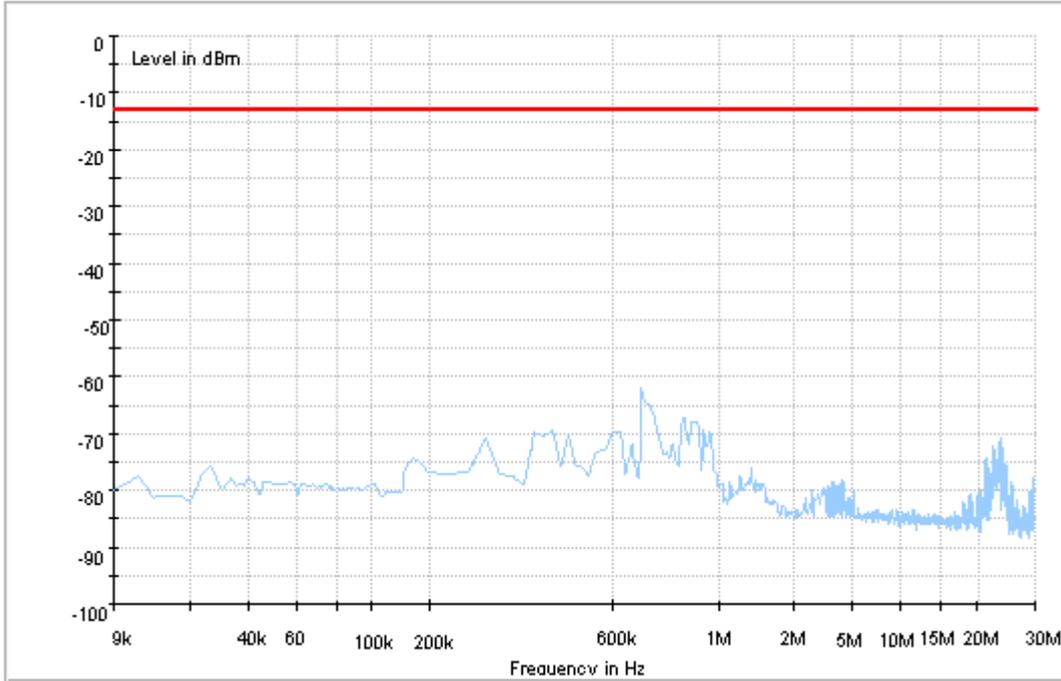
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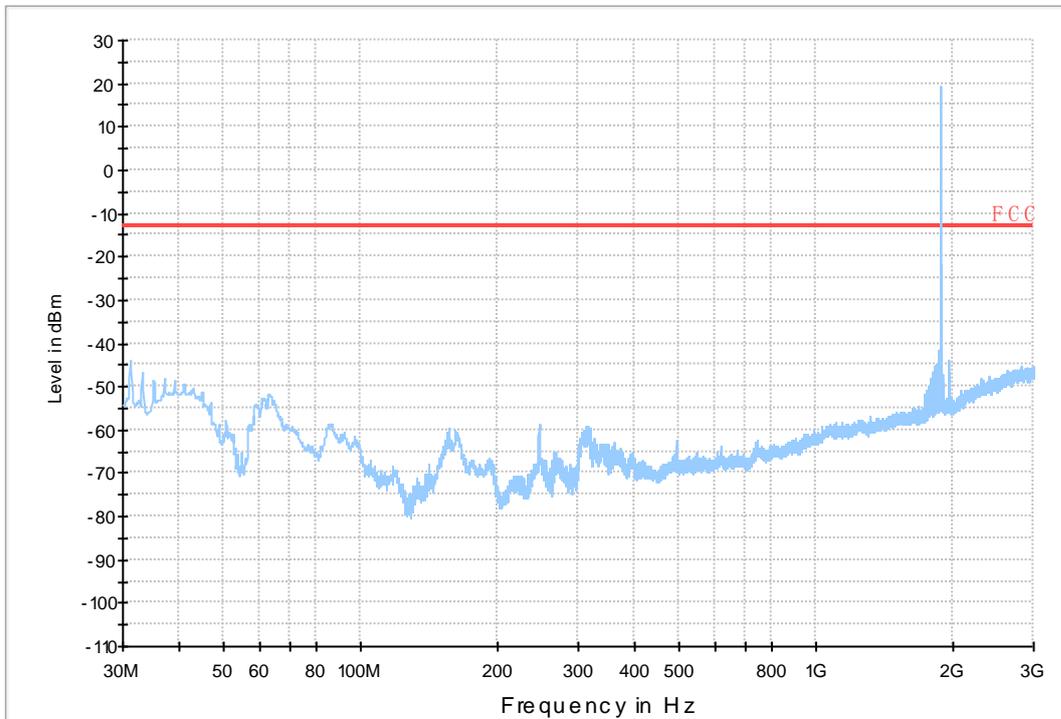
Copy of FCC PART22 GSM850_H



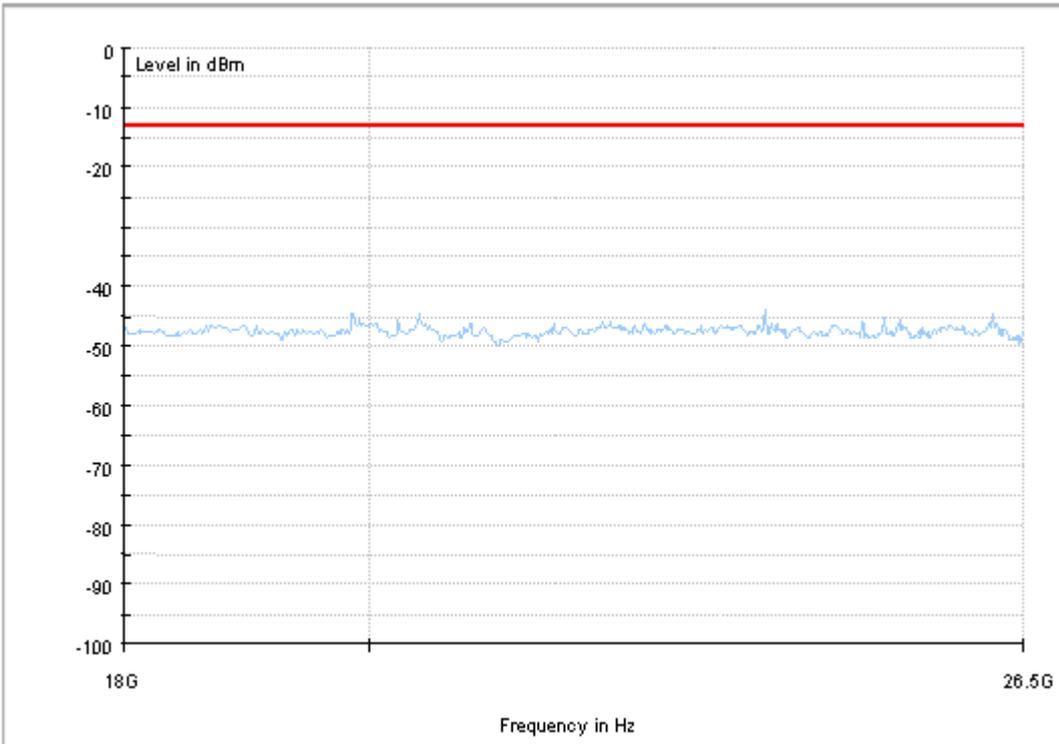
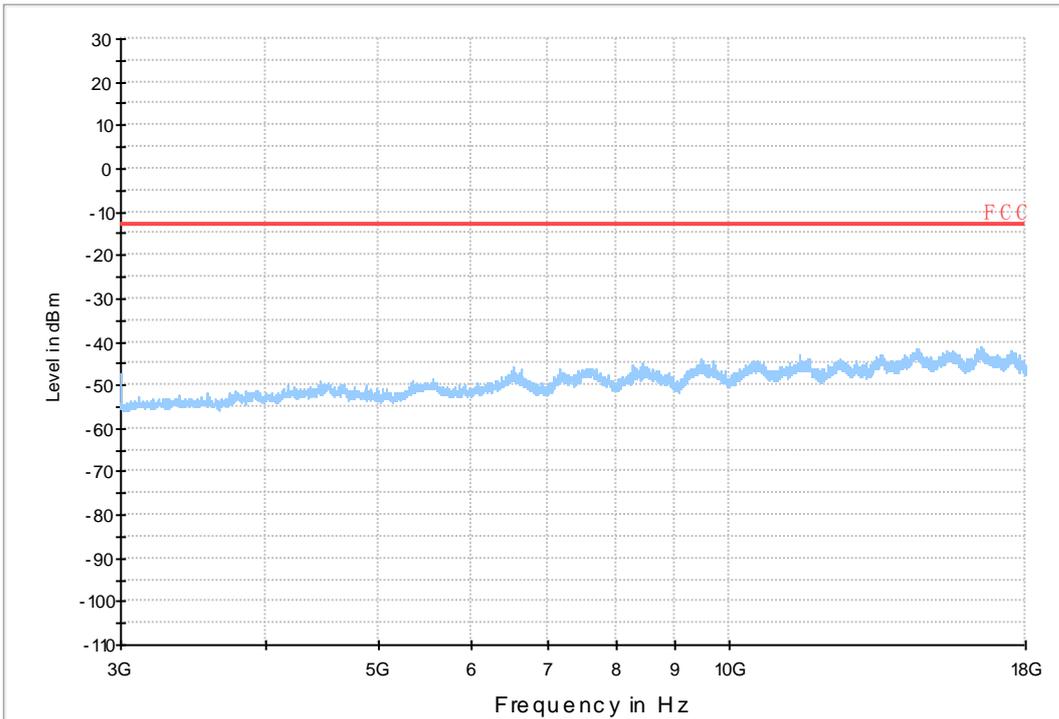
7.1.2 Test Band = GSM1900



Copy of FCC PART24 GSM 1900_L



Copy of FCC PART24 GSM 1900_H



8Appendix_H: Frequency Stability

8.1 For GSM

8.1.1 Frequency 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	-6.65	-0.00807	PASS
				VN	-6.78	-0.00823	PASS
				VH	-5.29	-0.00642	PASS
		MCH	TN	VL	-12.46	-0.01489	PASS
				VN	-9.23	-0.01103	PASS
				VH	-10.14	-0.01212	PASS
		HCH	TN	VL	-4.26	-0.00502	PASS
				VN	-7.55	-0.00889	PASS
				VH	-6.20	-0.0073	PASS
	GSM/TM2	LCH	TN	VL	-13.59	-0.01649	PASS
				VN	-12.40	-0.01504	PASS
				VH	-14.17	-0.01719	PASS
		MCH	TN	VL	-18.18	-0.02173	PASS
				VN	-16.34	-0.01953	PASS
				VH	-20.37	-0.02435	PASS
		HCH	TN	VL	-13.08	-0.01541	PASS
				VN	-12.95	-0.01526	PASS
				VH	-10.36	-0.01221	PASS
GSM1900	GSM/TM1	LCH	TN	VL	11.69	0.00632	PASS
				VN	4.46	0.00241	PASS
				VH	3.03	0.00164	PASS
		MCH	TN	VL	5.23	0.00278	PASS
				VN	12.59	0.0067	PASS
				VH	11.49	0.00611	PASS
		HCH	TN	VL	30.28	0.01586	PASS
				VN	24.15	0.01265	PASS
				VH	25.96	0.01359	PASS
	GSM/TM2	LCH	TN	VL	14.82	0.00801	PASS
				VN	9.69	0.00524	PASS
				VH	5.42	0.00293	PASS
		MCH	TN	VL	2.74	0.00146	PASS
				VN	9.04	0.00481	PASS
				VH			



Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	7.75	0.00412	PASS
		HCH	TN	VL	17.37	0.0091	PASS
				VN	16.69	0.00874	PASS
				VH	17.24	0.00903	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	-6.65	-0.00807	PASS
				-20	-7.81	-0.00948	PASS
				-10	-7.68	-0.00932	PASS
				0	-5.49	-0.00666	PASS
				10	-5.81	-0.00705	PASS
				20	-8.78	-0.01065	PASS
				30	-6.91	-0.00838	PASS
				40	-6.39	-0.00775	PASS
		50	-6.26	-0.0076	PASS		
		MCH	VN	-30	-9.69	-0.01158	PASS
				-20	-9.69	-0.01158	PASS
				-10	-10.59	-0.01266	PASS
				0	-7.75	-0.00926	PASS
				10	-8.78	-0.01049	PASS
				20	-8.07	-0.00965	PASS
				30	-8.27	-0.00989	PASS
				40	-6.78	-0.0081	PASS
		50	-9.10	-0.01088	PASS		
		HCH	VN	-30	-9.17	-0.0108	PASS
				-20	-9.56	-0.01126	PASS
				-10	-9.94	-0.01171	PASS
				0	-7.49	-0.00882	PASS
				10	-8.65	-0.01019	PASS
				20	-6.72	-0.00792	PASS
	30			-7.49	-0.00882	PASS	
	40			-9.69	-0.01142	PASS	
	50	-8.59	-0.01012	PASS			
	GSM/TM2	LCH	VN	-30	-11.01	-0.01336	PASS
				-20	-11.59	-0.01406	PASS
				-10	-11.36	-0.01378	PASS
				0	-11.98	-0.01454	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				10	-14.82	-0.01798	PASS
				20	-15.21	-0.01845	PASS
				30	-11.49	-0.01394	PASS
				40	-7.07	-0.00858	PASS
				50	-14.75	-0.0179	PASS
		MCH	VN	-30	-11.36	-0.01358	PASS
				-20	-13.01	-0.01555	PASS
				-10	-10.62	-0.01269	PASS
				0	-6.59	-0.00788	PASS
				10	-2.97	-0.00355	PASS
				20	-10.82	-0.01293	PASS
				30	-16.37	-0.01957	PASS
				40	-14.66	-0.01752	PASS
				50	-18.34	-0.02192	PASS
				HCH	VN	-30	-18.14
		-20	-13.79			-0.01625	PASS
		-10	-14.40			-0.01697	PASS
		0	-15.50			-0.01826	PASS
		10	-11.30			-0.01331	PASS
		20	-20.15			-0.02374	PASS
		30	-11.91			-0.01403	PASS
		40	-16.95			-0.01997	PASS
		50	-17.14	-0.02019	PASS		
		GSM1900	GSM/TM1	LCH	VN	-30	12.27
-20	8.33					0.0045	PASS
-10	7.81					0.00422	PASS
0	8.65					0.00468	PASS
10	2.45					0.00132	PASS
20	8.39					0.00453	PASS
30	9.49					0.00513	PASS
40	10.27					0.00555	PASS
50	12.33					0.00666	PASS
MCH	VN			-30	19.24	0.01023	PASS
				-20	11.62	0.00618	PASS
				-10	18.40	0.00979	PASS
				0	15.50	0.00824	PASS
				10	14.08	0.00749	PASS
				20	15.69	0.00835	PASS
				30	17.69	0.00941	PASS
				40	12.20	0.00649	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	VN	50	13.95	0.00742	PASS
				-30	20.34	0.01065	PASS
				-20	25.83	0.01352	PASS
				-10	27.77	0.01454	PASS
				0	26.47	0.01386	PASS
				10	29.12	0.01525	PASS
				20	24.99	0.01309	PASS
				30	27.77	0.01454	PASS
				40	22.08	0.01156	PASS
				50	24.60	0.01288	PASS
	GSM/TM2	LCH	VN	-30	11.01	0.00595	PASS
				-20	5.29	0.00286	PASS
				-10	-0.65	-0.00035	PASS
				0	-1.10	-0.00059	PASS
				10	11.40	0.00616	PASS
				20	-5.29	-0.00286	PASS
				30	4.20	0.00227	PASS
				40	1.00	0.00054	PASS
				50	0.71	0.00038	PASS
				MCH	VN	-30	0.03
		-20	7.97			0.00424	PASS
		-10	8.23			0.00438	PASS
		0	17.47			0.00929	PASS
		10	10.85			0.00577	PASS
		20	12.01			0.00639	PASS
		30	17.92			0.00953	PASS
		40	6.36			0.00338	PASS
		50	9.59			0.0051	PASS
		HCH	VN			-30	16.27
				-20	20.11	0.01053	PASS
				-10	14.33	0.0075	PASS
				0	20.47	0.01072	PASS
10	18.76			0.00982	PASS		
20	23.96			0.01255	PASS		
30	20.31			0.01063	PASS		
40	20.57			0.01077	PASS		
50	22.96	0.01202	PASS				

END