



# Appendix for test report



## 1 Appendix\_A: Effective (Isotropic) Radiated Power Output Data

### Part I - Test Results

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	29.29	31.29	33	PASS
		MCH	29.16	31.16	33	PASS
		HCH	29.1	31.1	33	PASS
	GSM/TM2	LCH	25.17	27.17	33	PASS
		MCH	25.18	27.18	33	PASS
		HCH	25.08	27.08	33	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	ERP [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	32.05	31.4	38.5	PASS
		MCH	32.2	31.55	38.5	PASS
		HCH	32.29	31.64	38.5	PASS
	GSM/TM2	LCH	26.08	25.43	38.5	PASS
		MCH	26.1	25.45	38.5	PASS
		HCH	26.01	25.36	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,

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

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

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
GSM1900	GSM/TM1	LCH	0.23	13	PASS
		MCH	0.25	13	PASS
		HCH	0.22	13	PASS
	GSM/TM2	LCH	3.15	13	PASS
		MCH	3.14	13	PASS
		HCH	3.18	13	PASS
GSM850	GSM/TM1	LCH	0.22	13	PASS
		MCH	0.22	13	PASS
		HCH	0.22	13	PASS
	GSM/TM2	LCH	2.83	13	PASS
		MCH	2.8	13	PASS
		HCH	2.76	13	PASS

### 3Appendix\_C: Modulation Characteristics

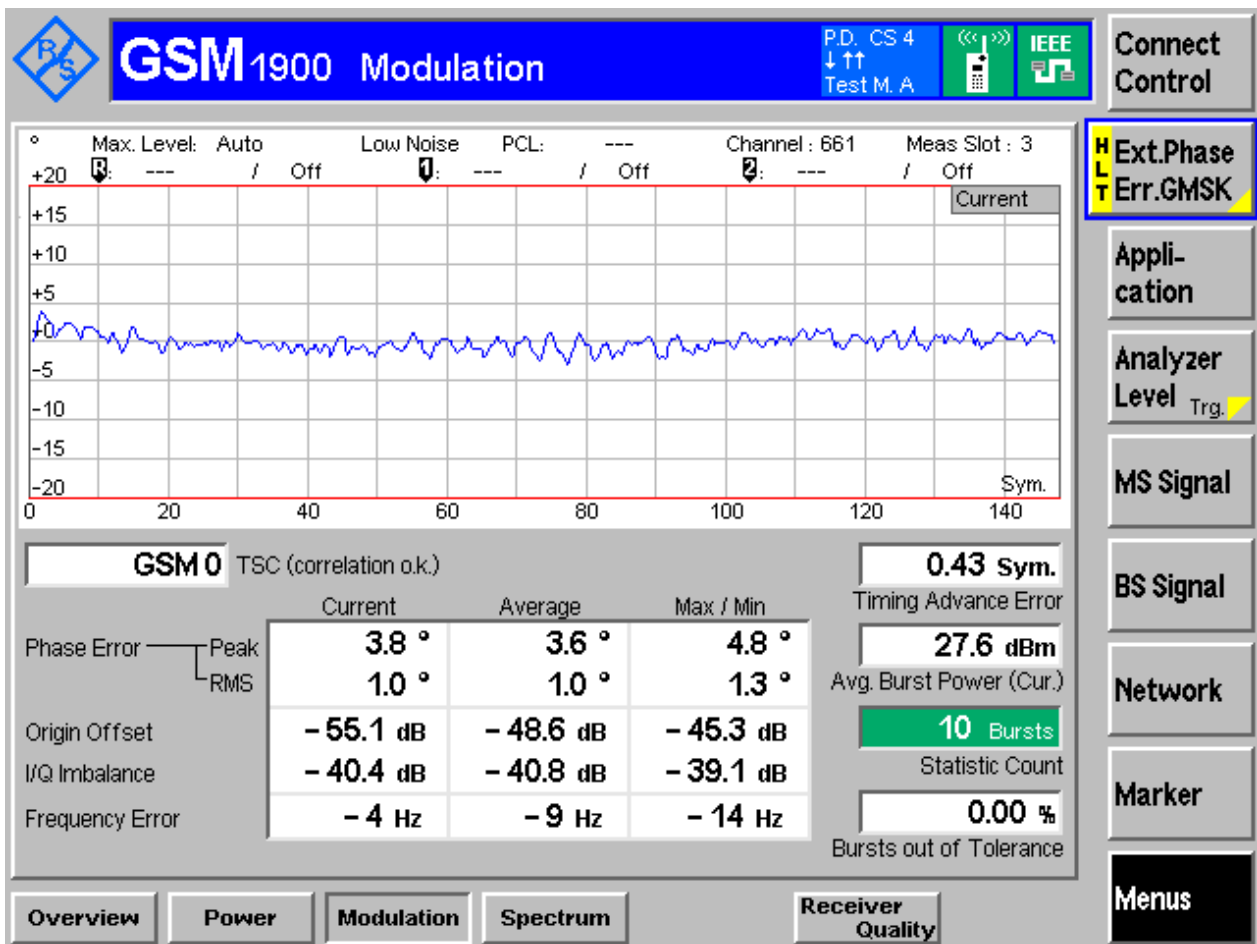
#### Part I - Test Plots

#### 3.1 For GSM

#### 3.1.1 Test Band = GSM1900

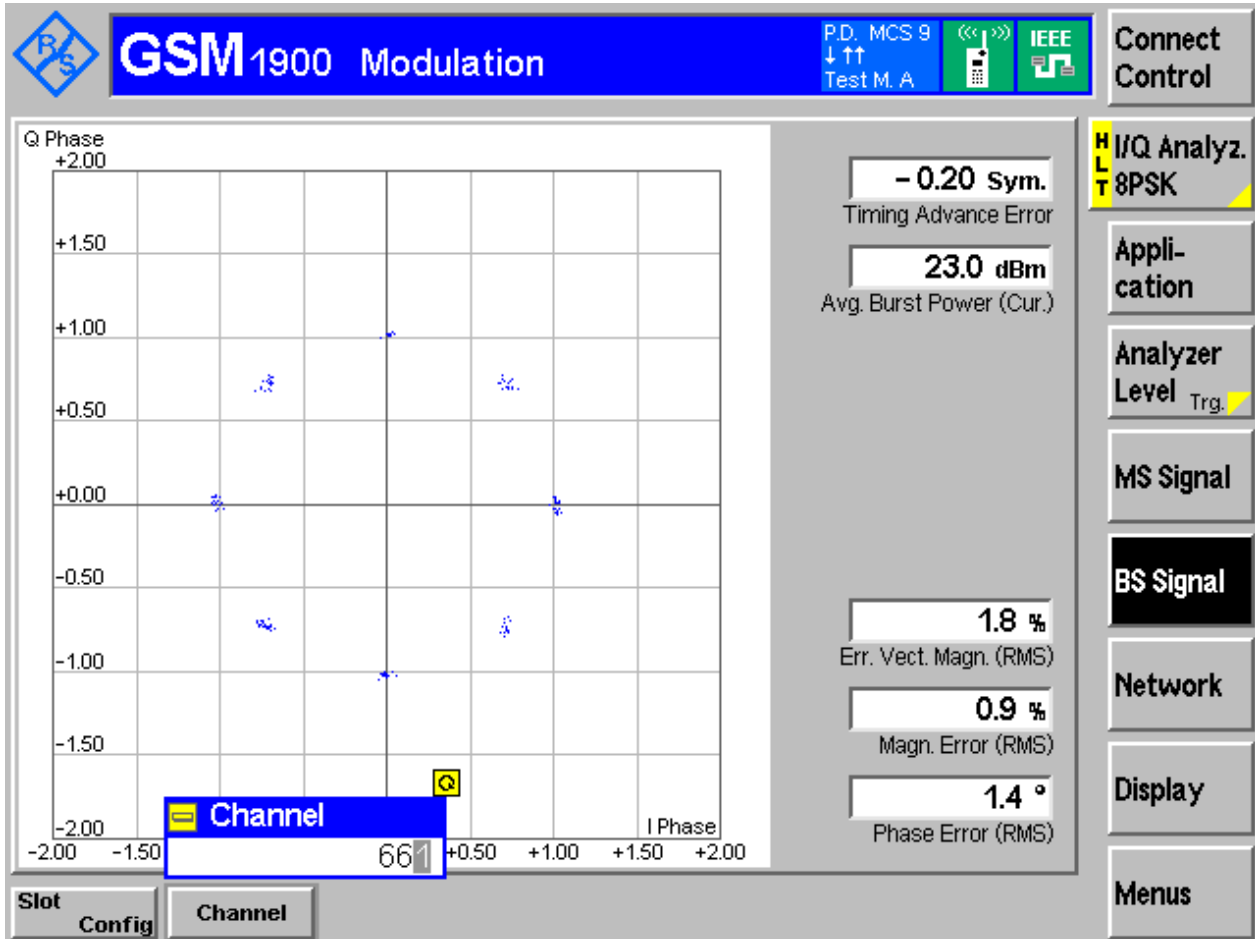
#### 3.1.1.1 Test Mode = GSM/TM1

#### 3.1.1.1.1 Test Channel = MCH



### 3.1.1.2 Test Mode = GSM/TM2

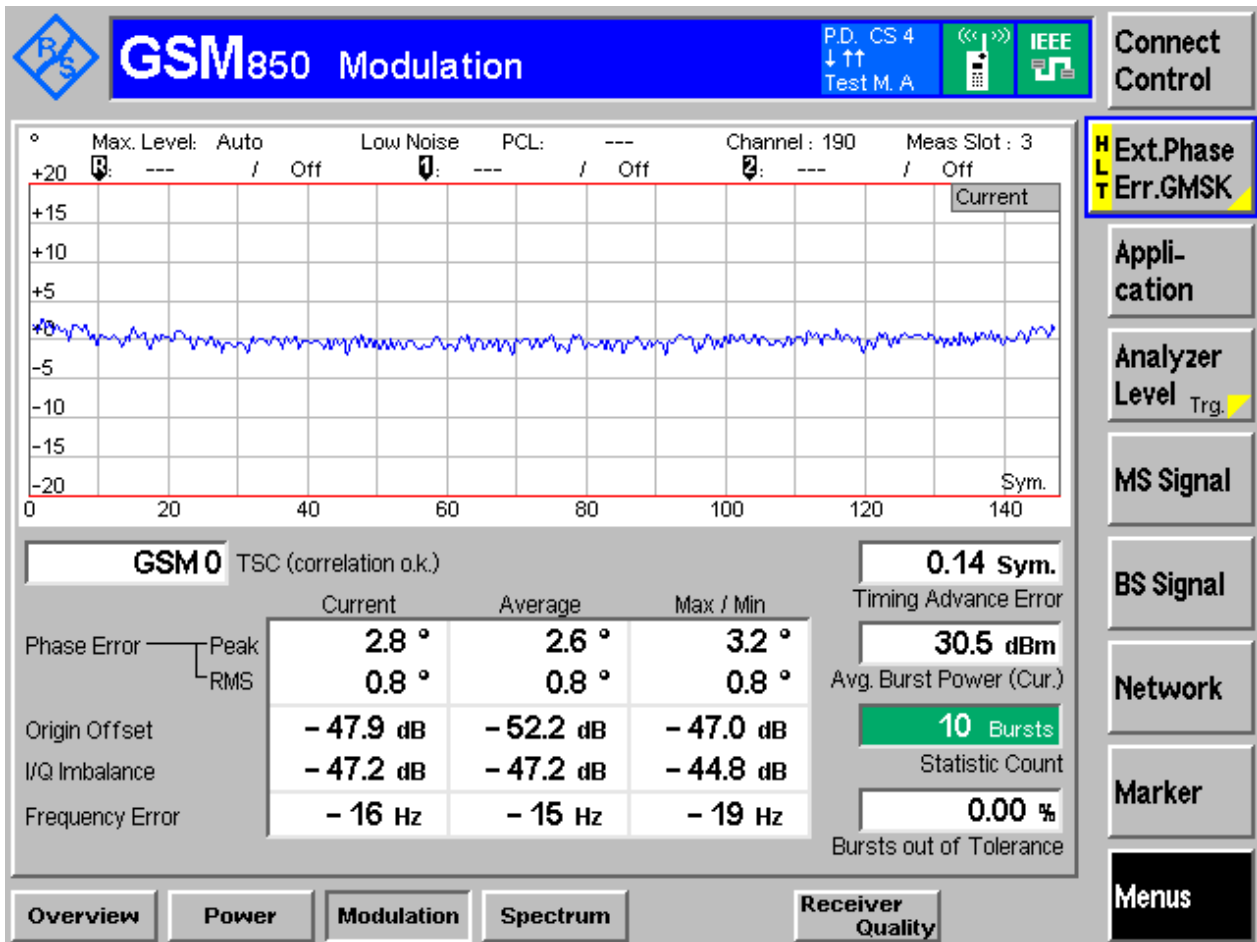
#### 3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM850

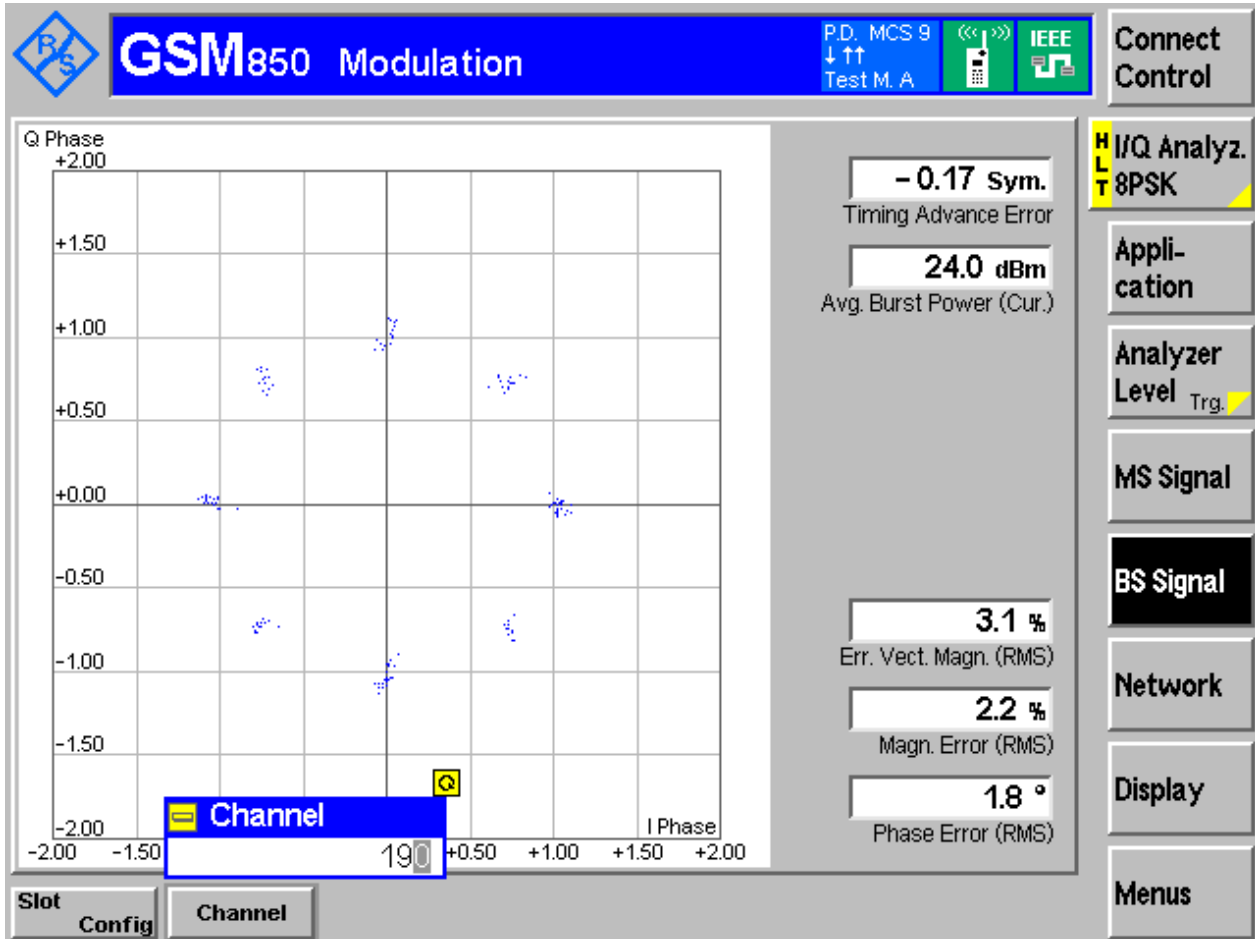
3.1.2.1 Test Mode = GSM/TM1

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
GSM1900	GSM/TM1	LCH	242.94	313.42	Pass
		MCH	244.91	315.92	Pass
		HCH	248.54	313.71	Pass
	GSM/TM2	LCH	249.23	316.50	Pass
		MCH	248.71	319.40	Pass
		HCH	247.94	323.36	Pass
GSM850	GSM/TM1	LCH	244.50	315.52	Pass
		MCH	244.58	312.63	Pass
		HCH	243.13	313.74	Pass
	GSM/TM2	LCH	249.46	317.09	Pass
		MCH	254.25	317.18	Pass
		HCH	249.84	321.32	Pass



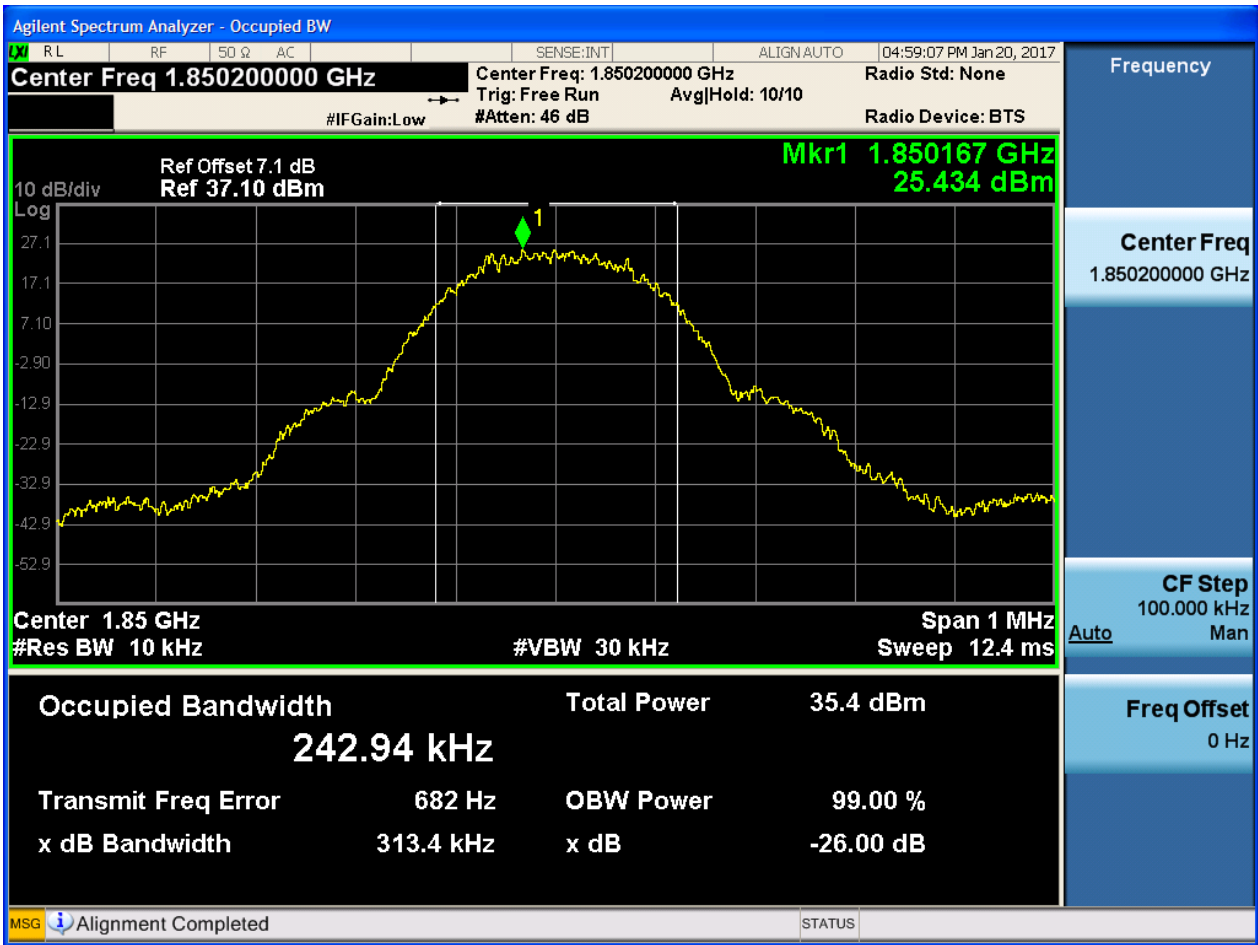
Part II - Test Plots

4.1 For GSM

4.1.1 Test Band = GSM1900

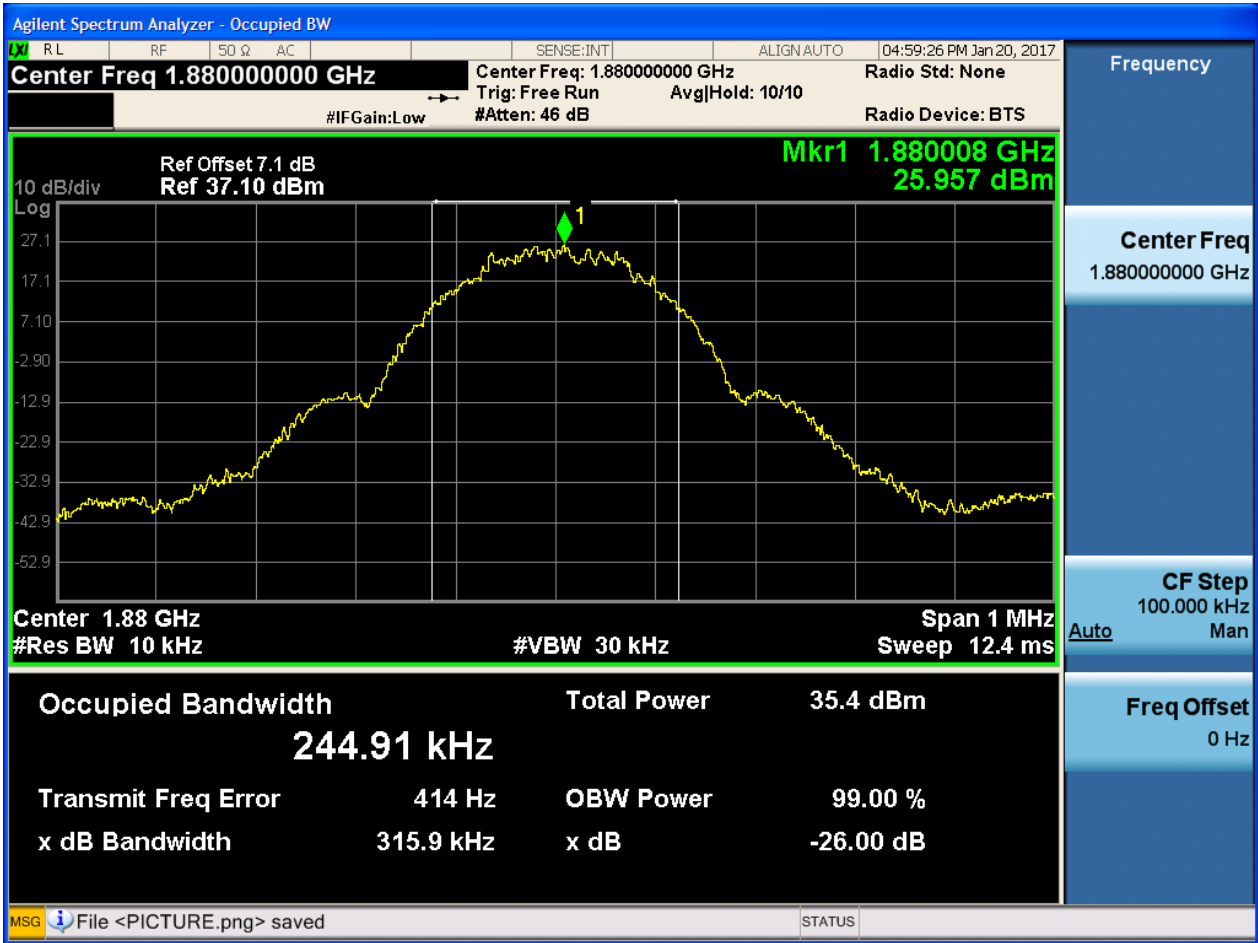
4.1.1.1 Test Mode = GSM/TM1

4.1.1.1.1 Test Channel = LCH



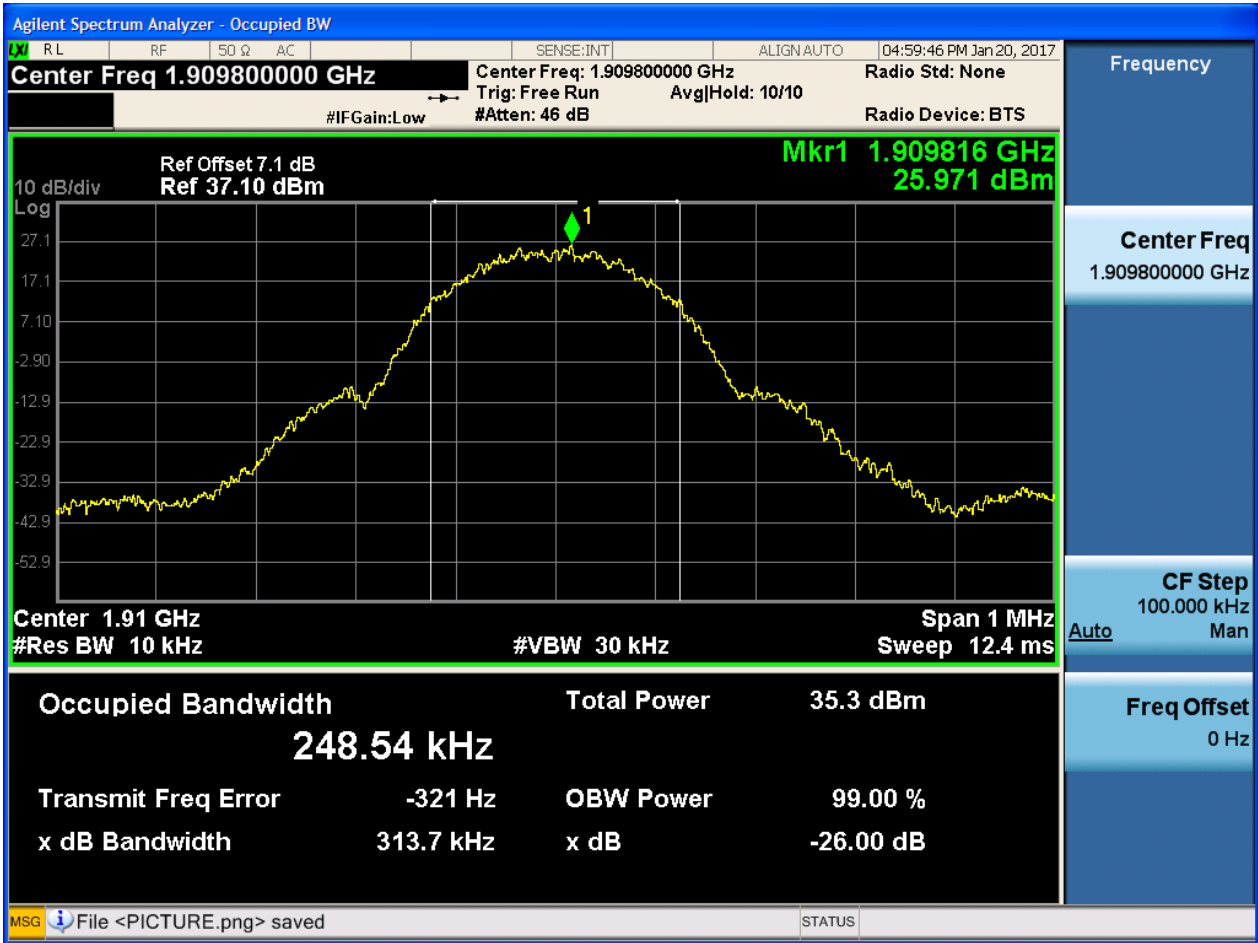


4.1.1.1.2 Test Channel = MCH





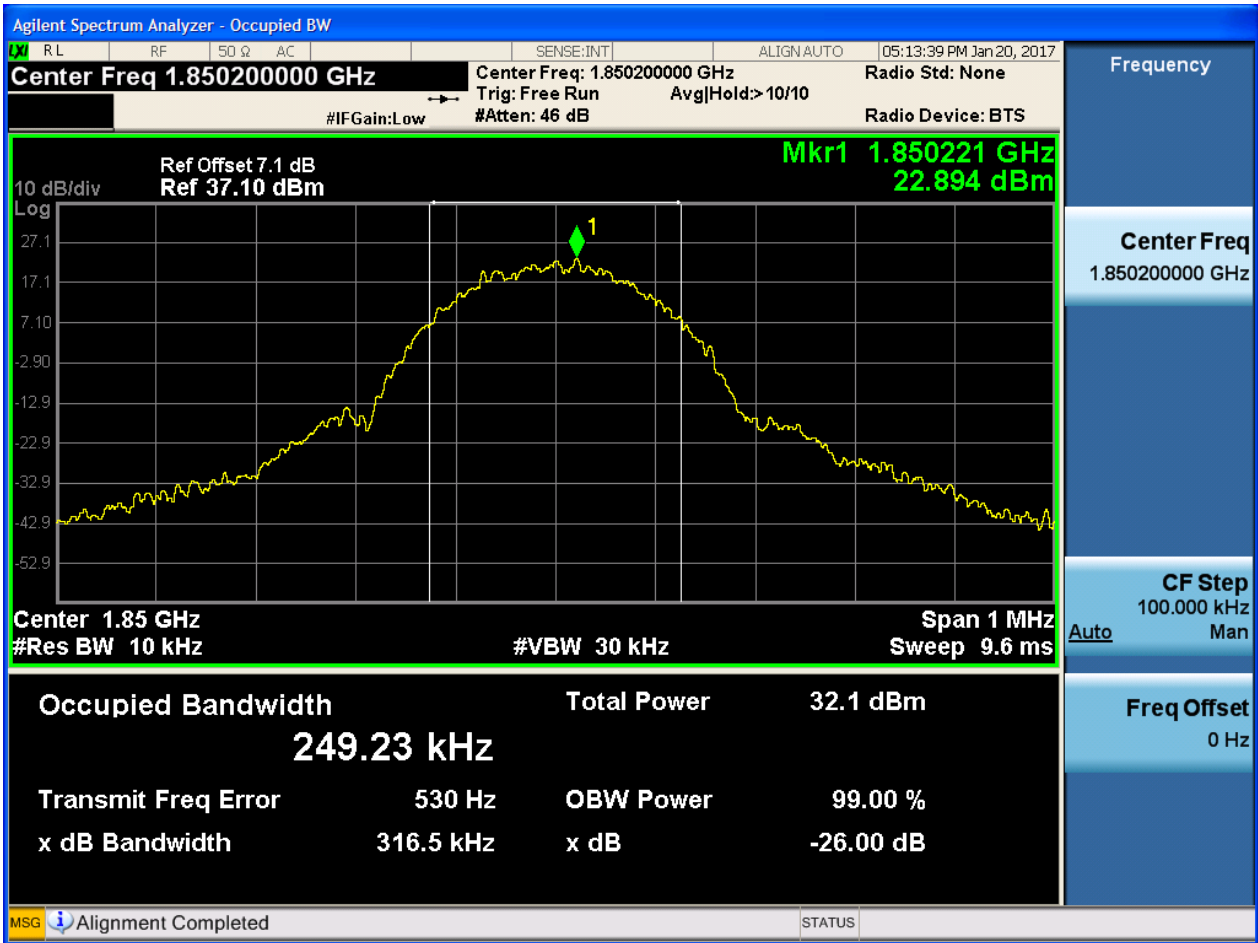
4.1.1.1.3 Test Channel = HCH





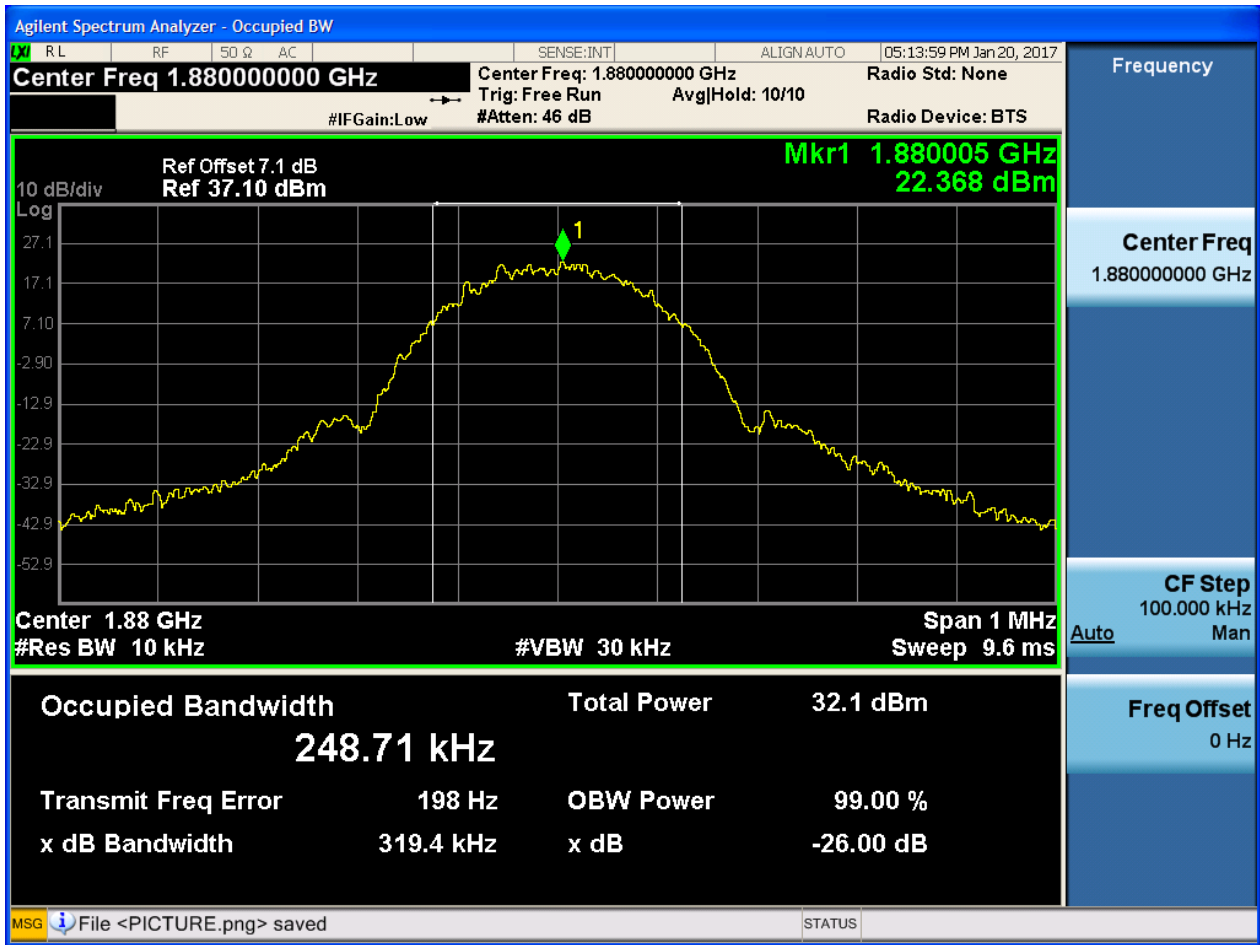
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



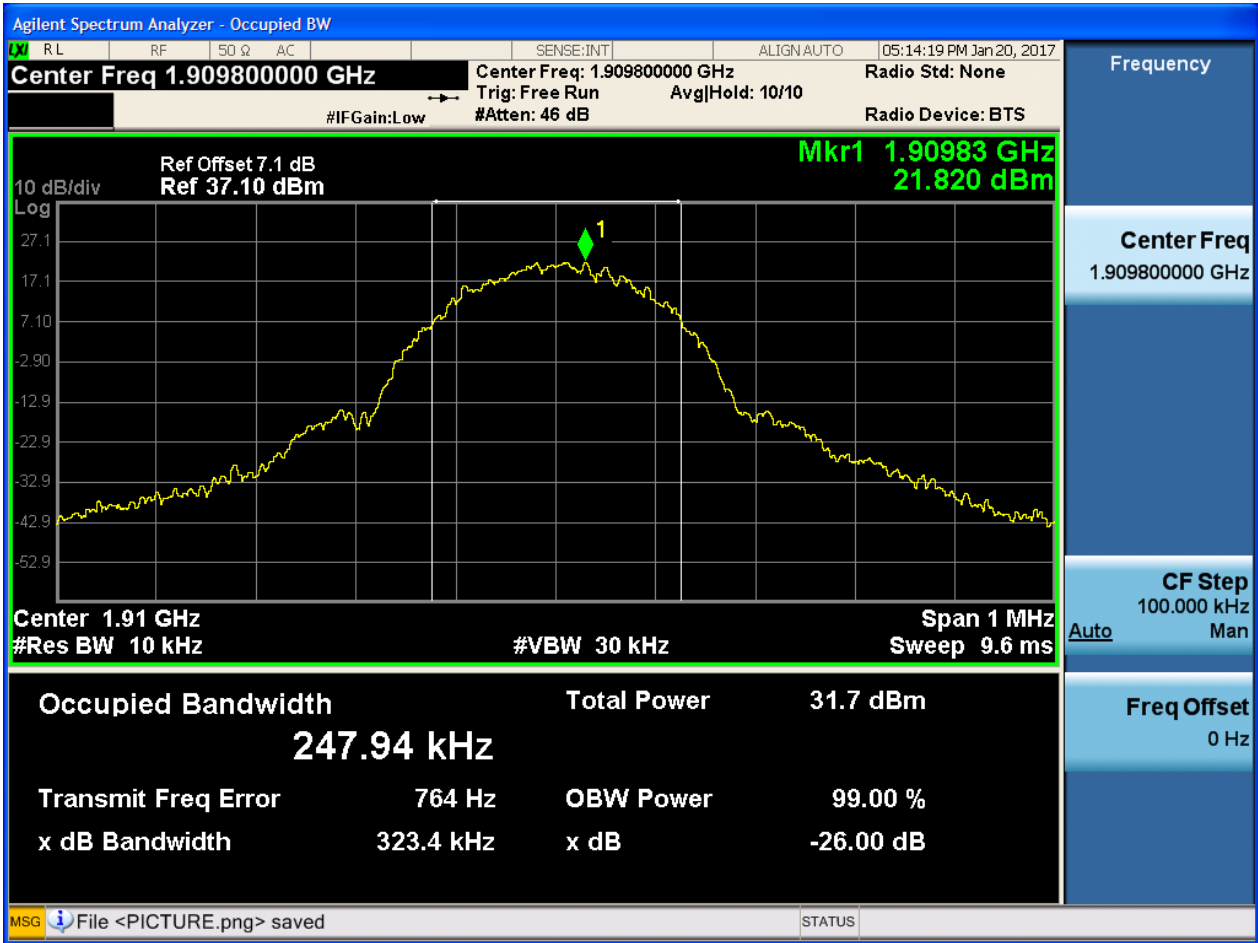


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH

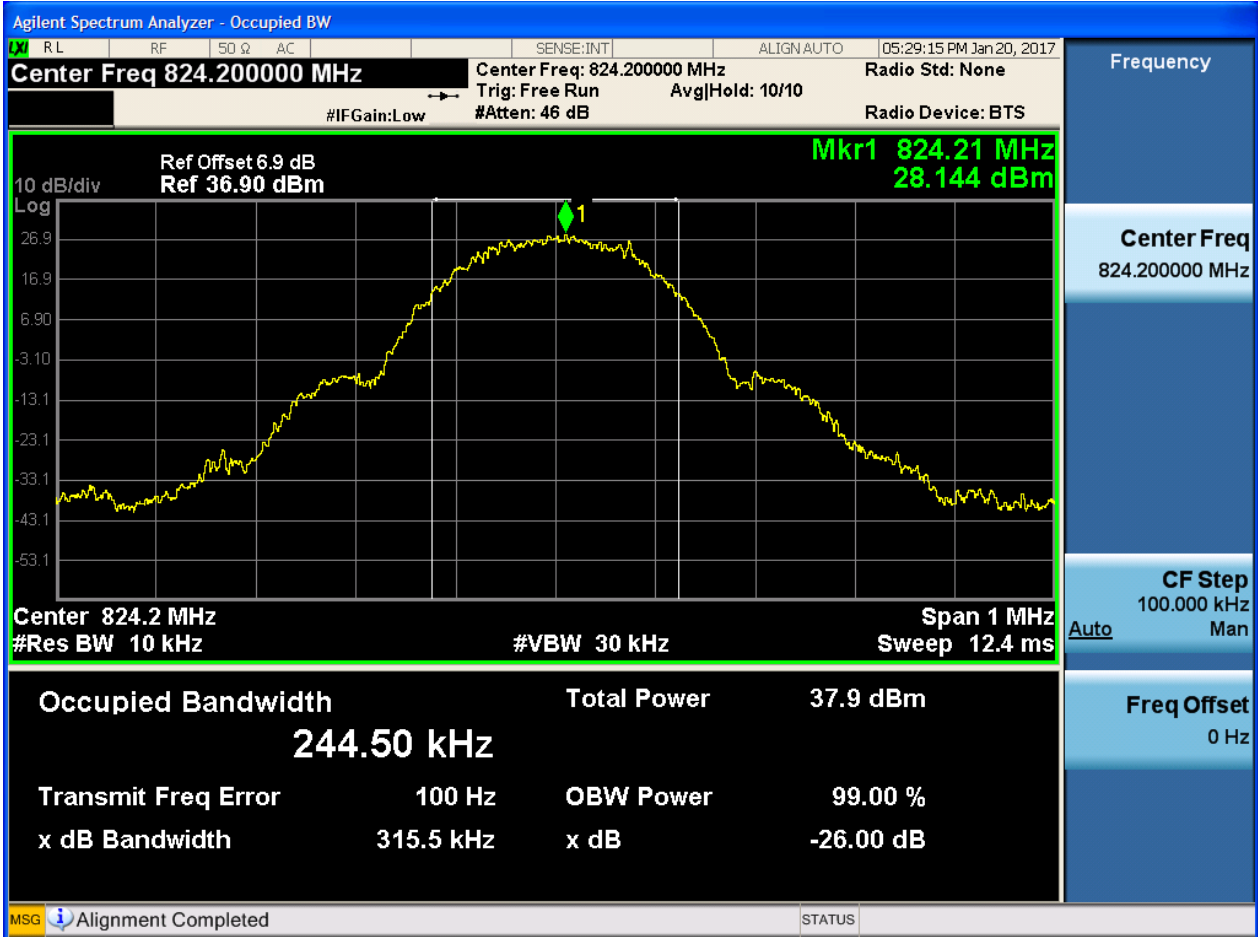




4.1.2 Test Band = GSM850

4.1.2.1 Test Mode = GSM/TM1

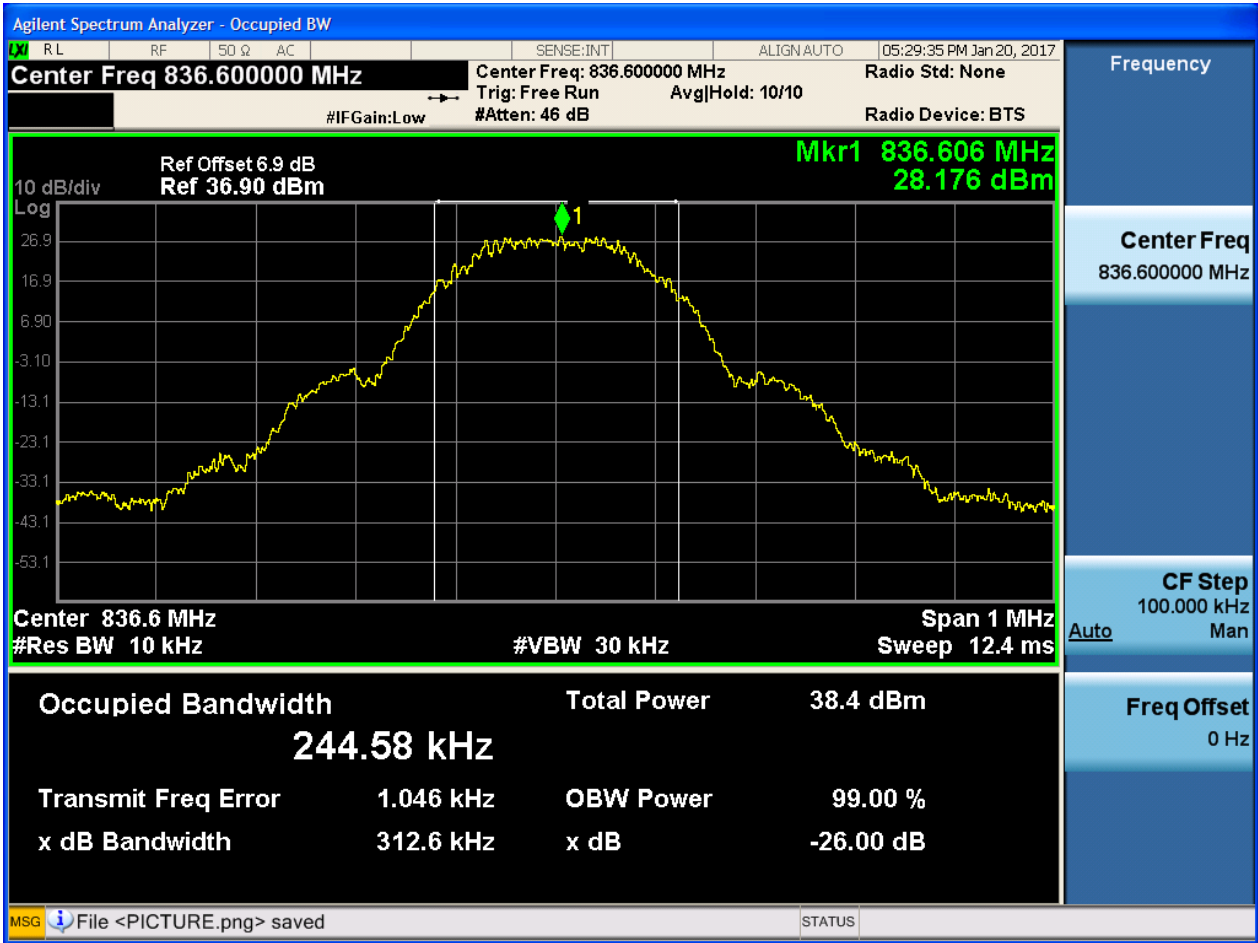
4.1.2.1.1 Test Channel = LCH





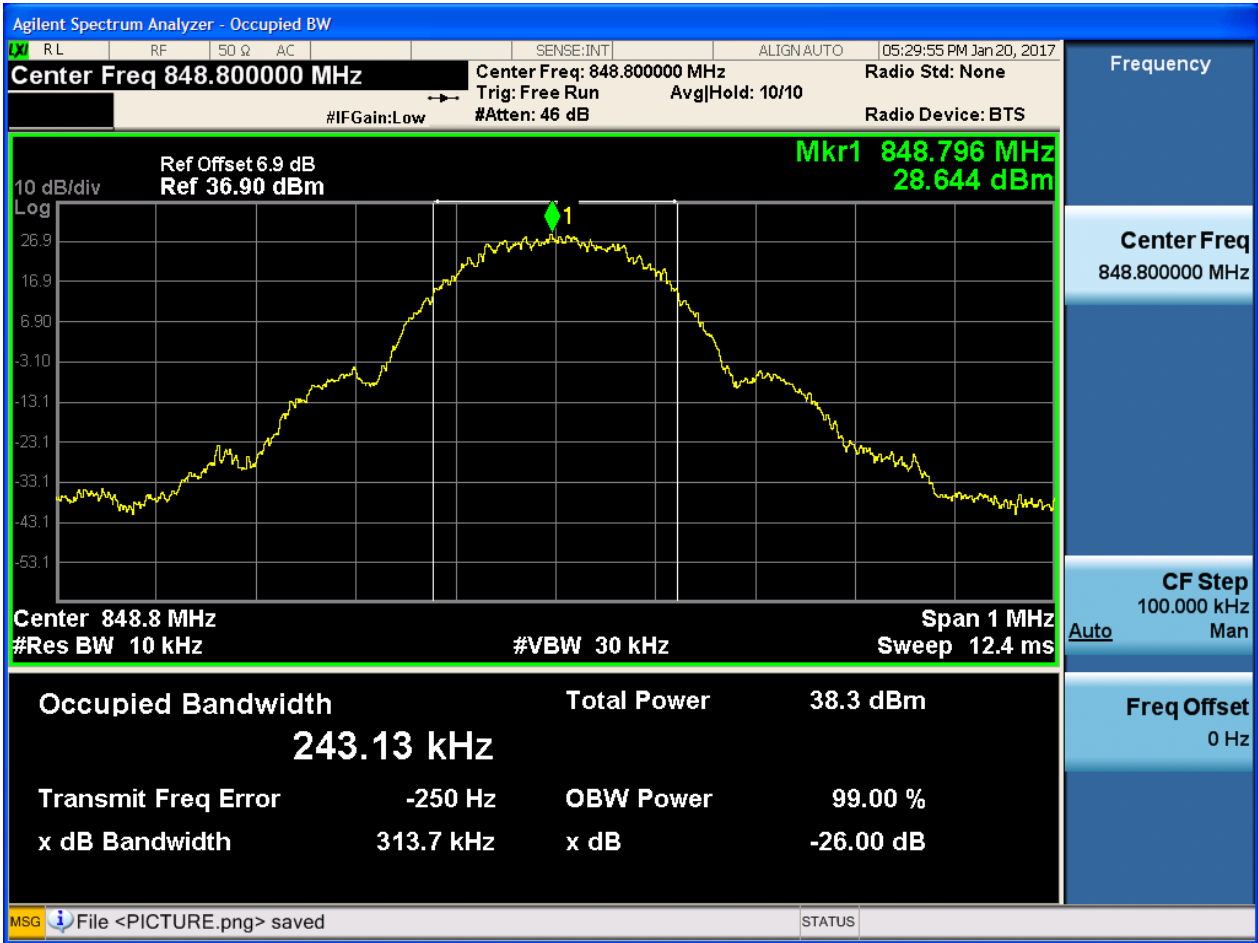


4.1.2.1.2 Test Channel = MCH





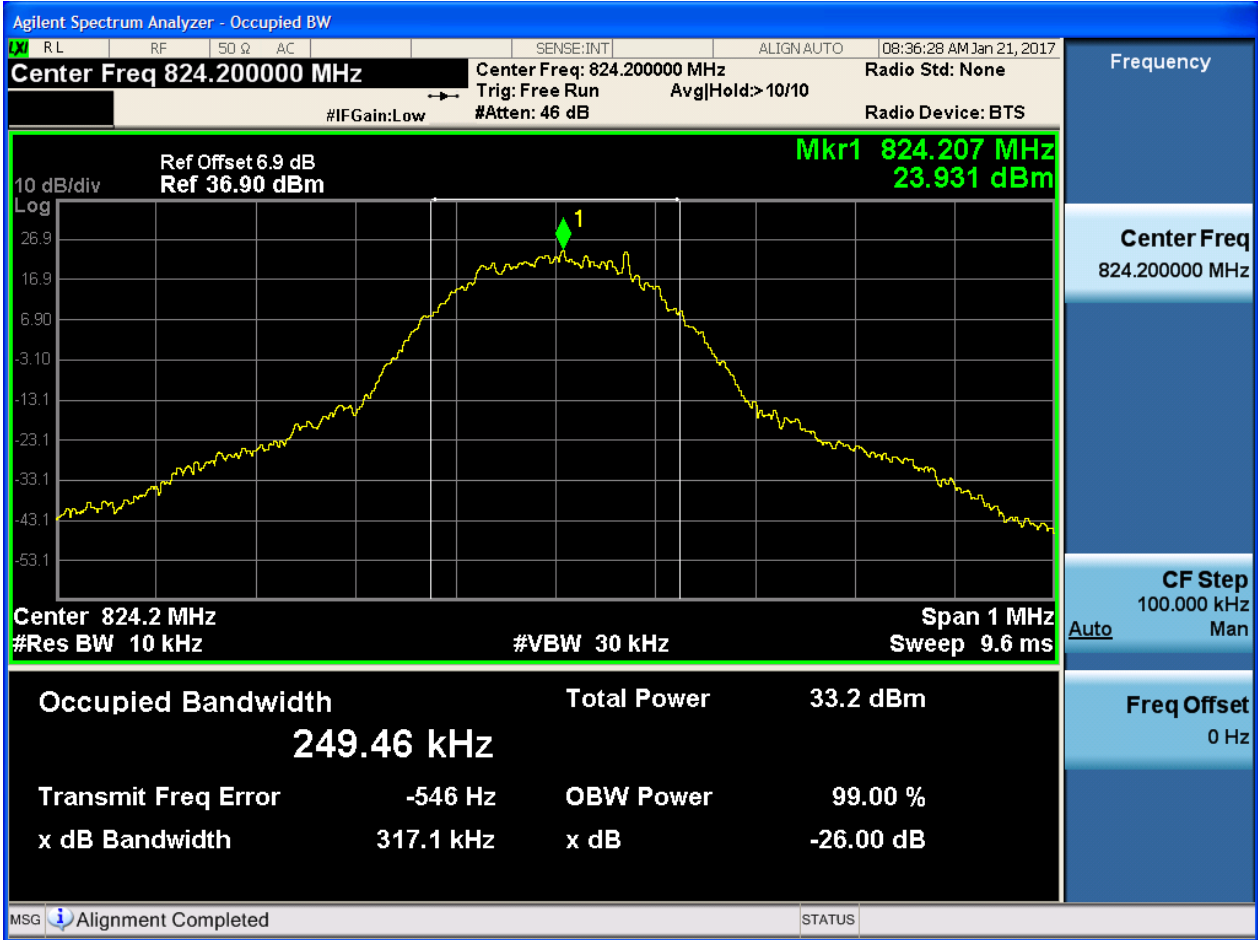
4.1.2.1.3 Test Channel = HCH





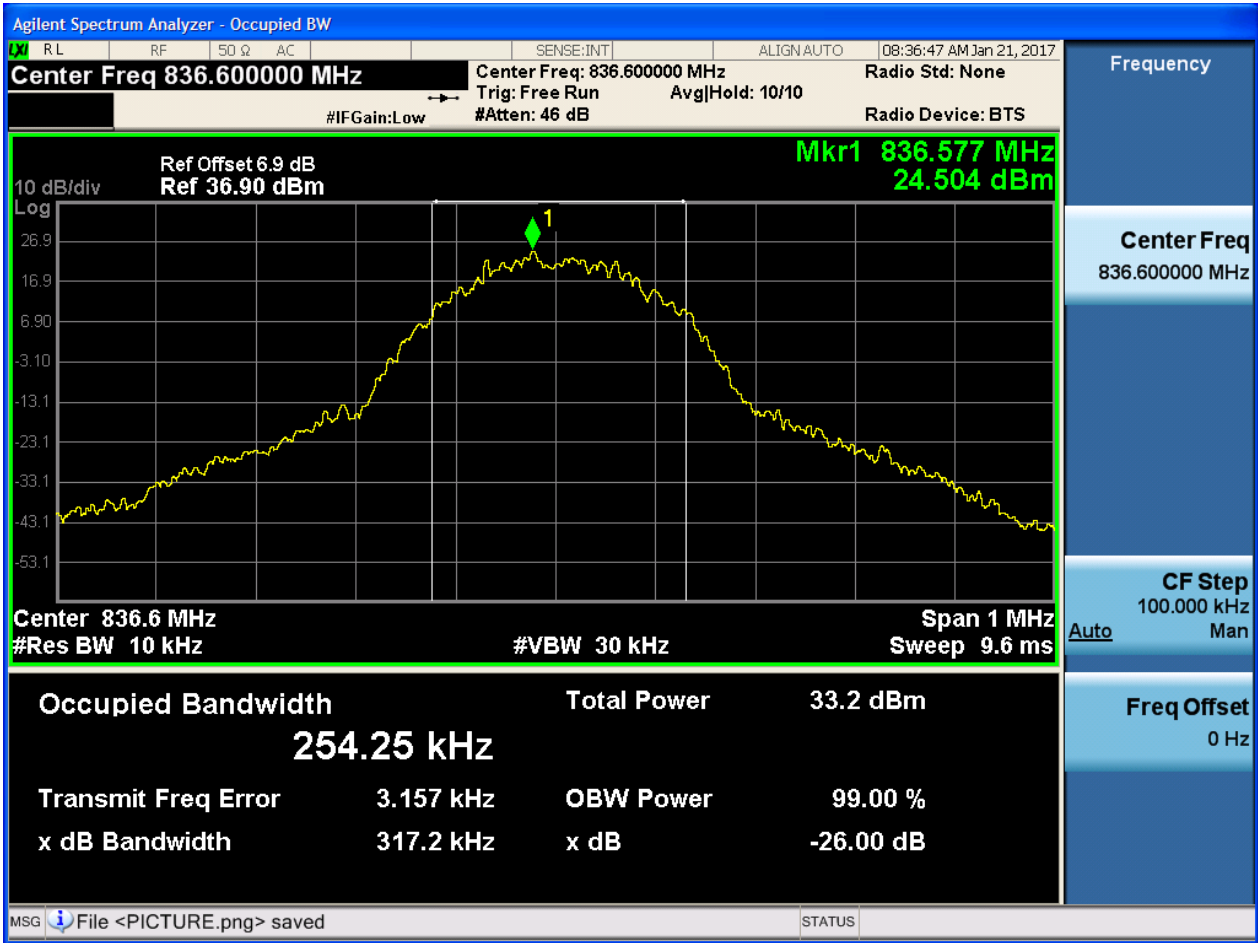
### 4.1.2.3 Test Mode = GSM/TM2

#### 4.1.2.3.1 Test Channel = LCH



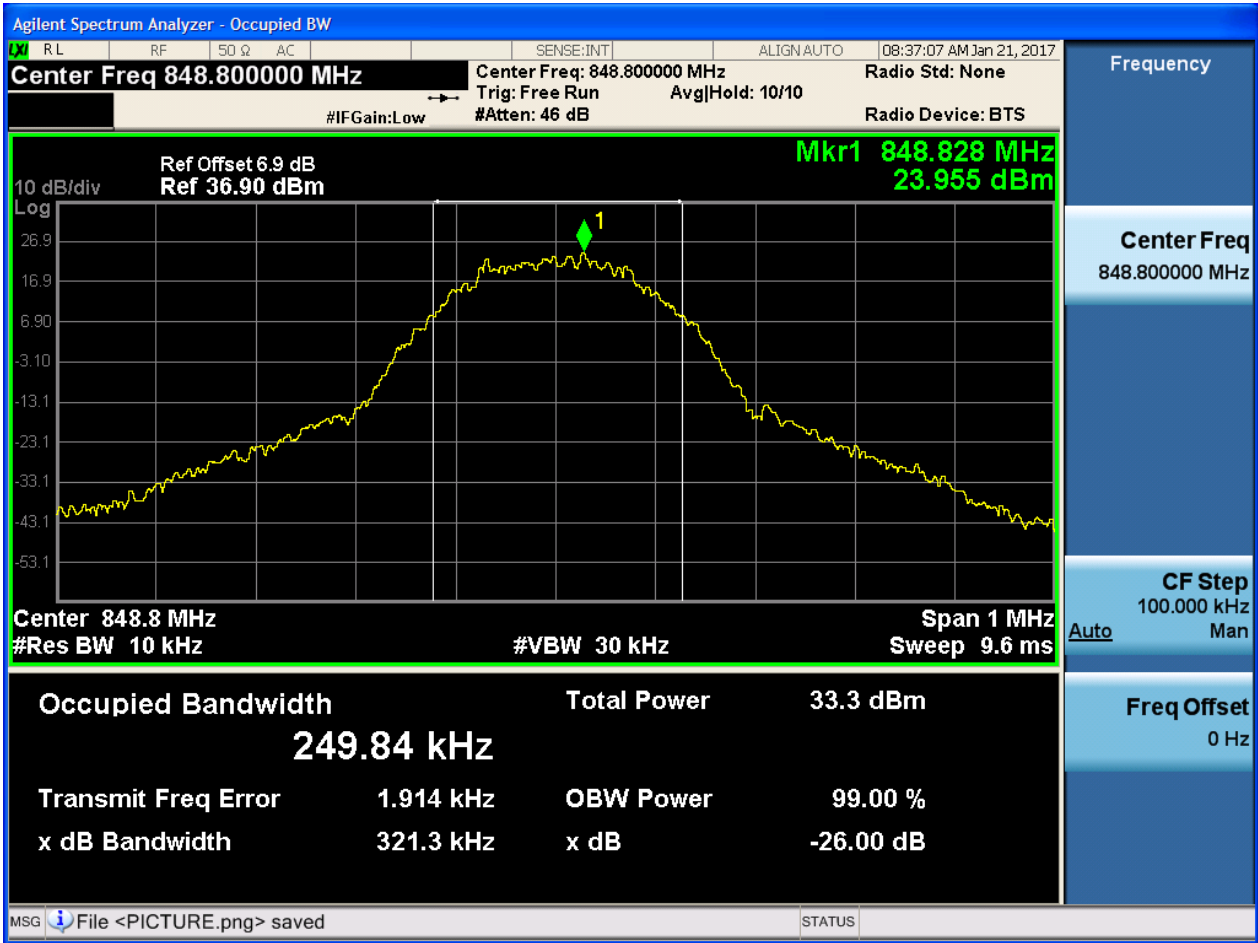


4.1.2.3.2 Test Channel = MCH





4.1.2.3.3 Test Channel = HCH





# 5Appendix\_E: Band Edges Compliance

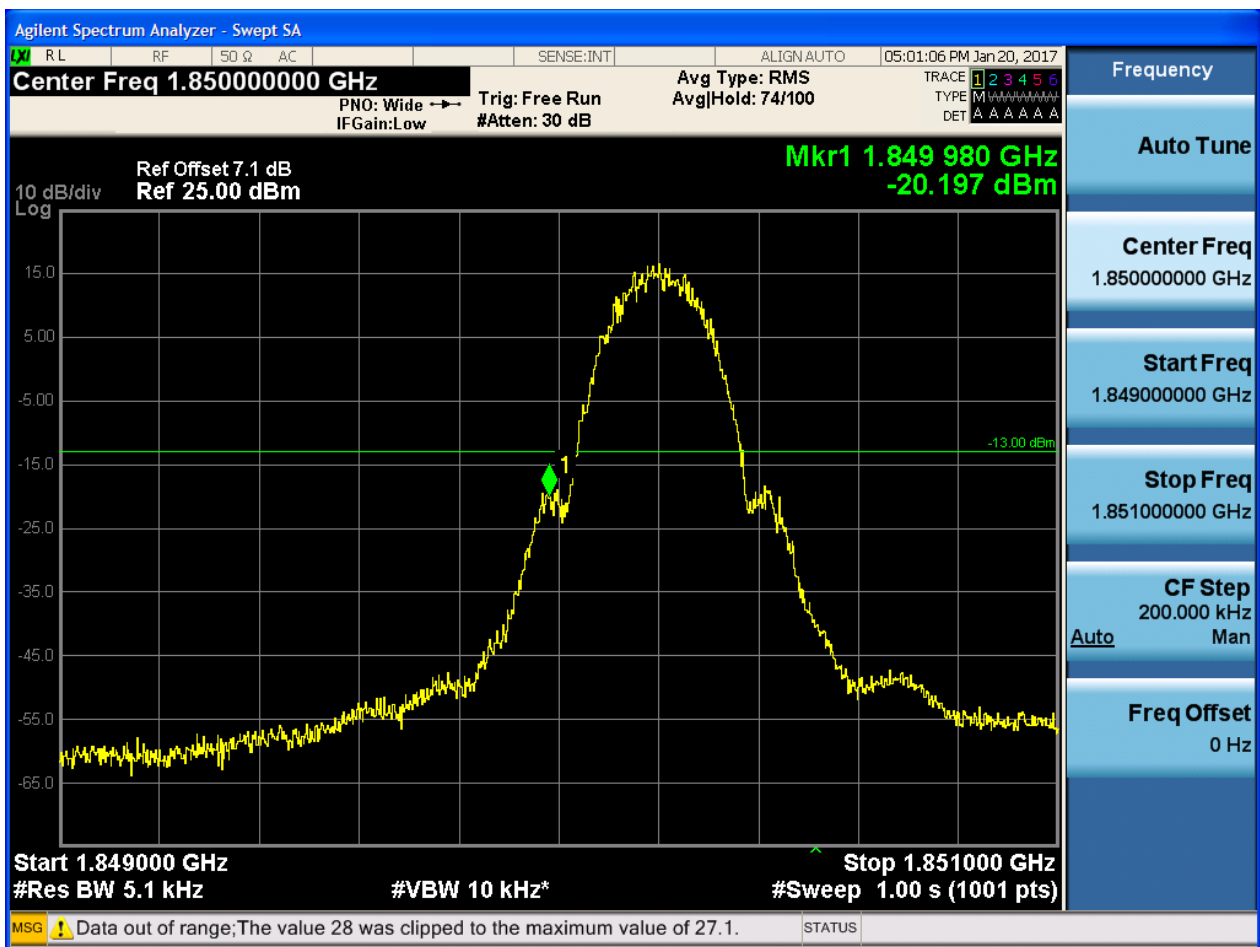
## Part I - Test Plots

### 5.1 For GSM

#### 5.1.1 Test Band = GSM1900

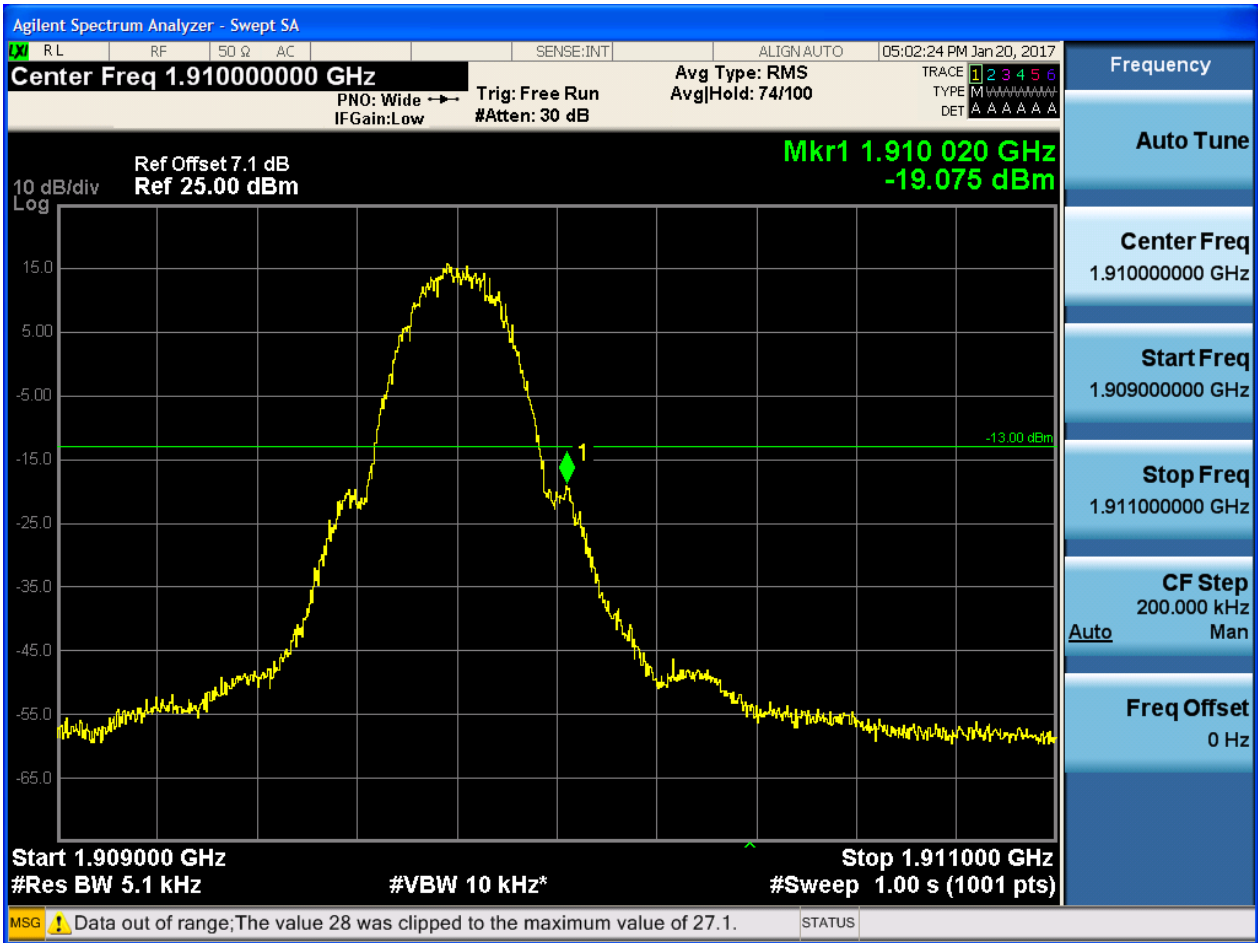
##### 5.1.1.1 Test Mode = GSM/TM1

##### 5.1.1.1.1 Test Channel = LCH





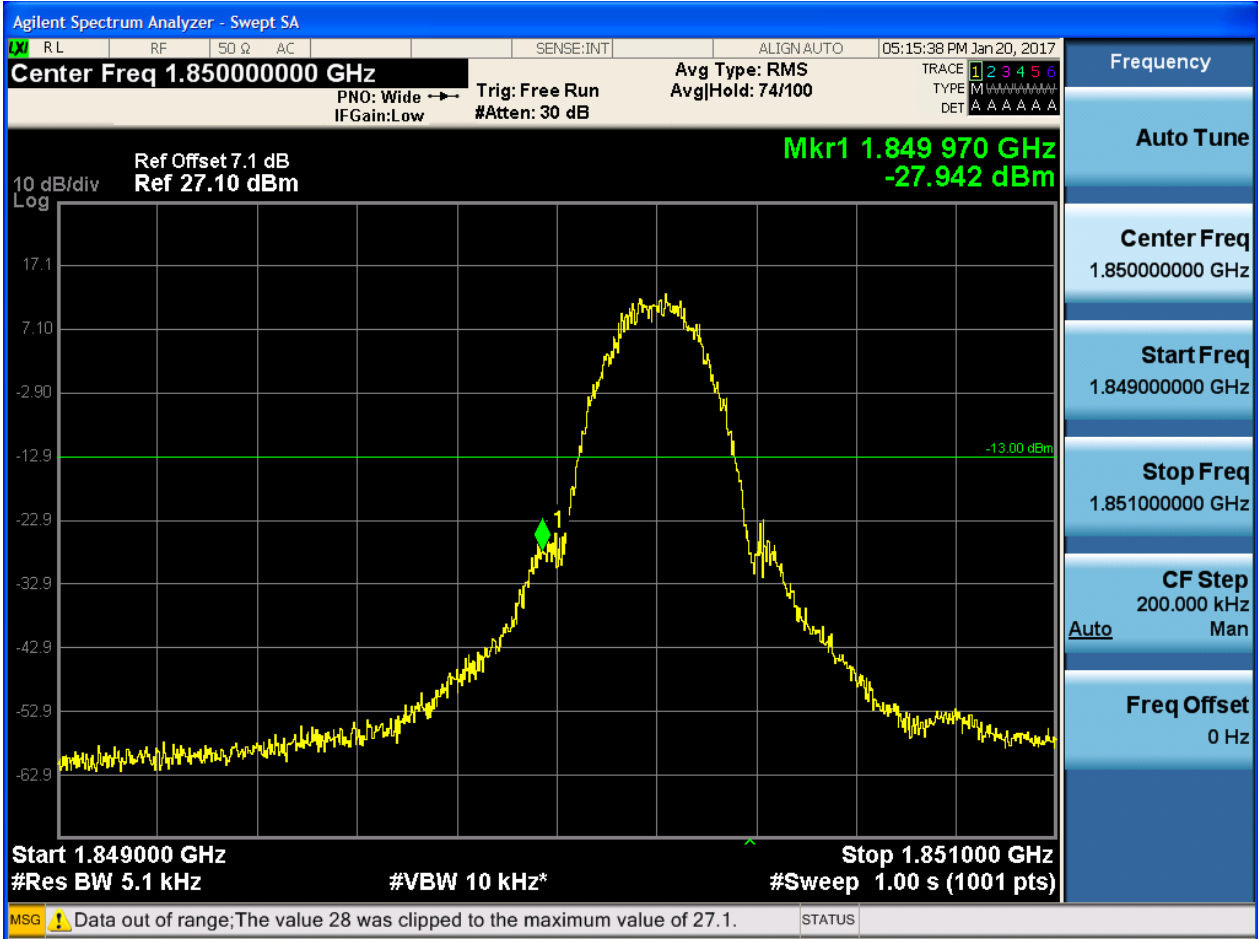
5.1.1.1.2 Test Channel = HCH





5.1.1.2 Test Mode = GSM/TM2

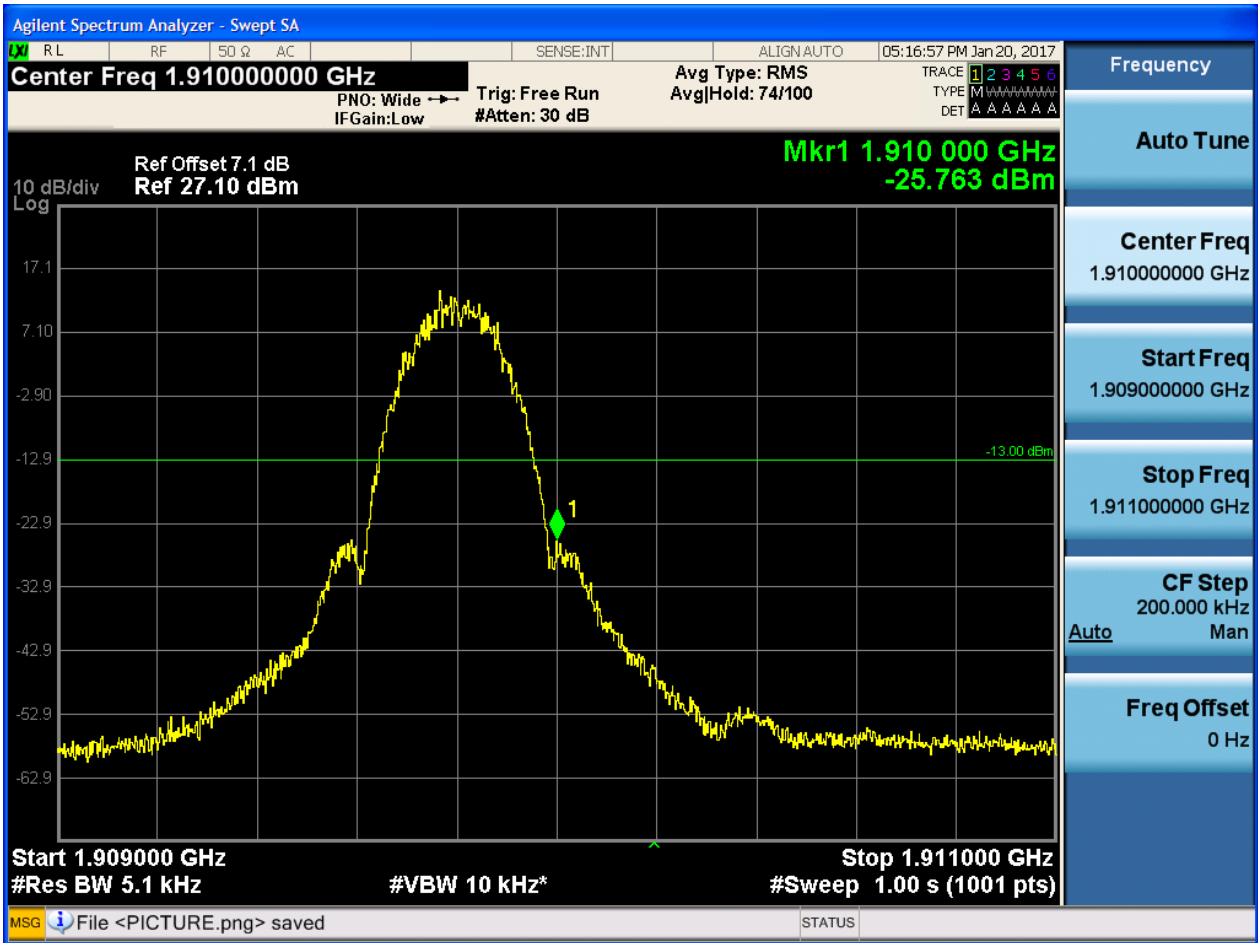
5.1.1.2.1 Test Channel = LCH







5.1.1.2.2 Test Channel = HCH

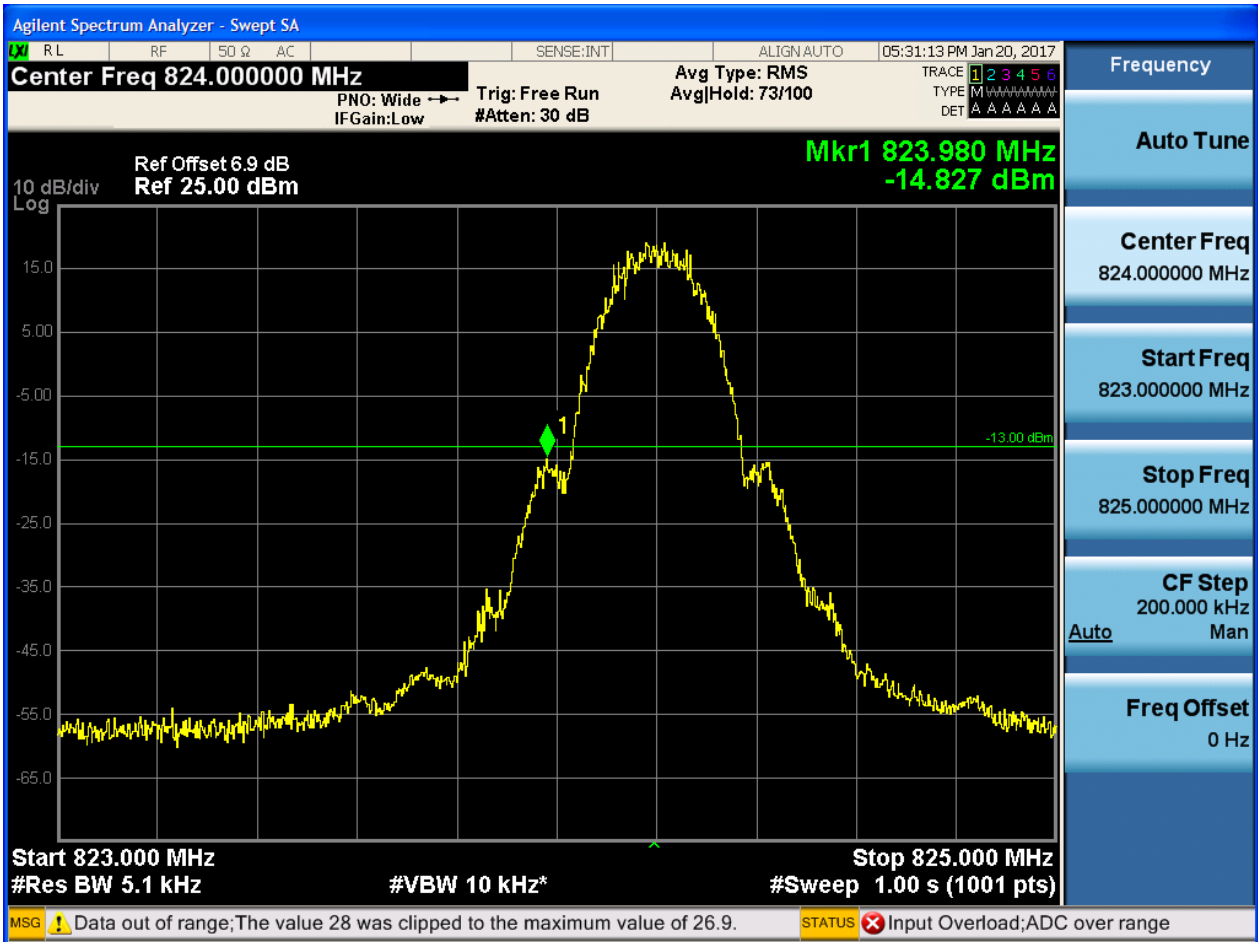




5.1.2 Test Band = GSM850

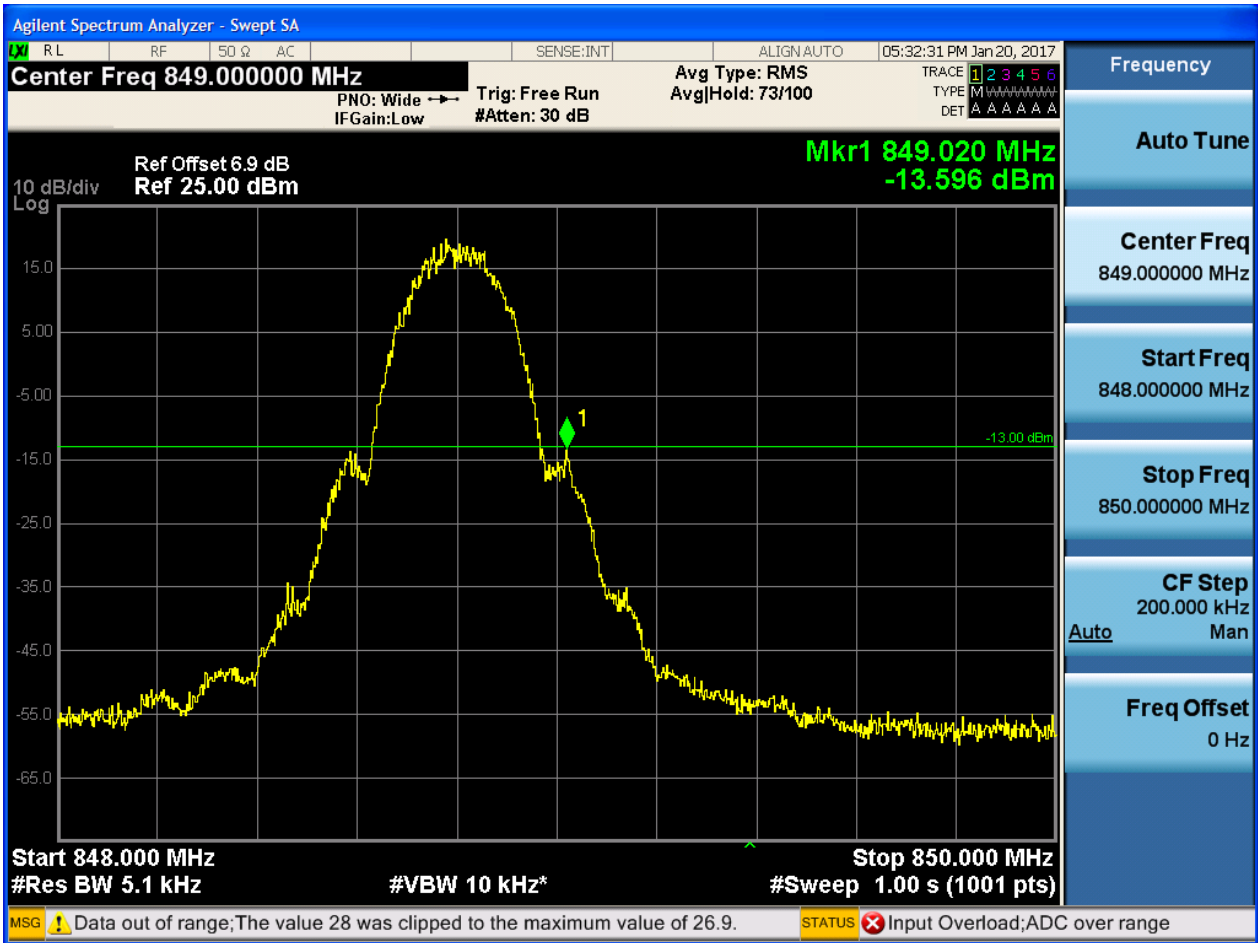
5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH





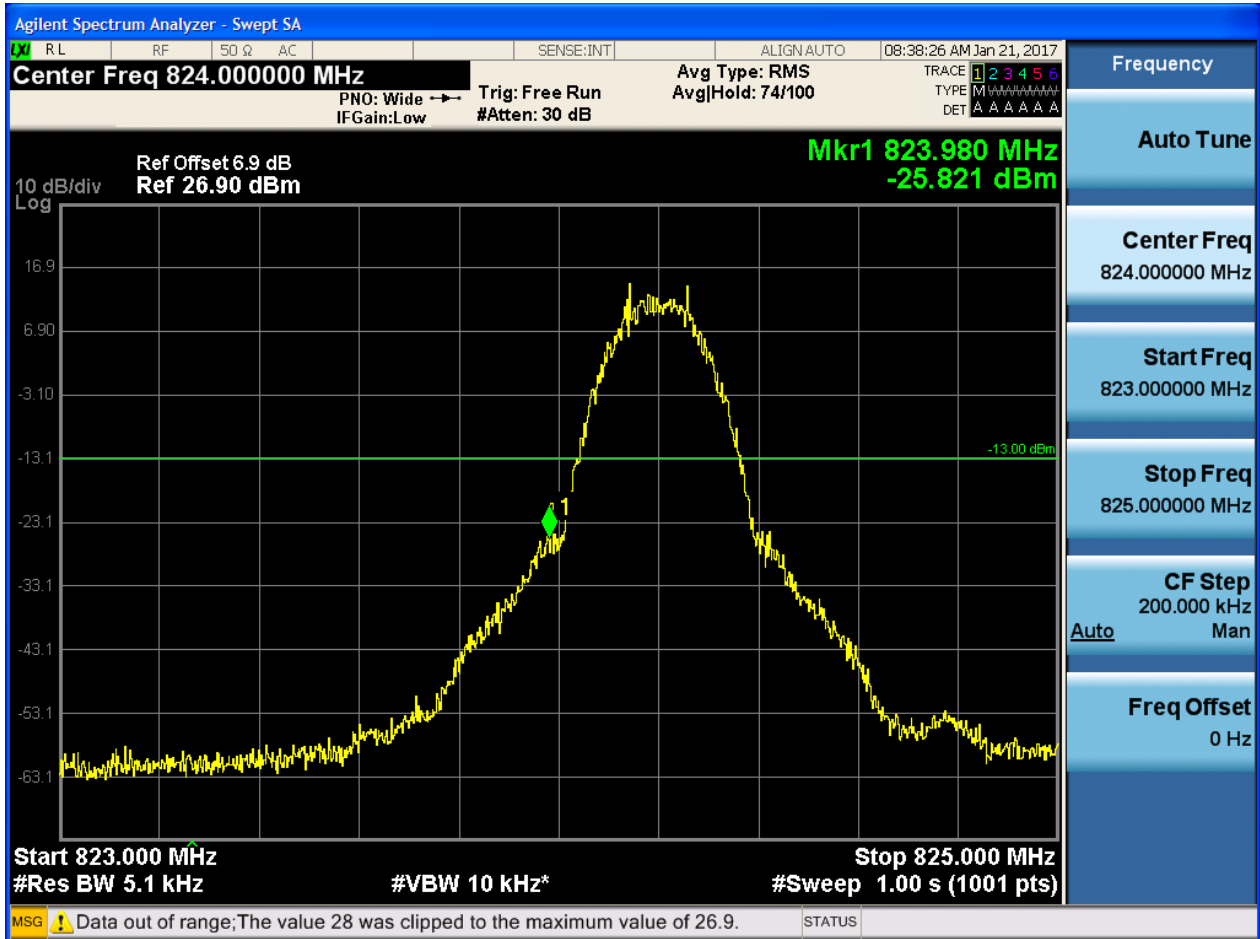
5.1.2.1.2 Test Channel = HCH



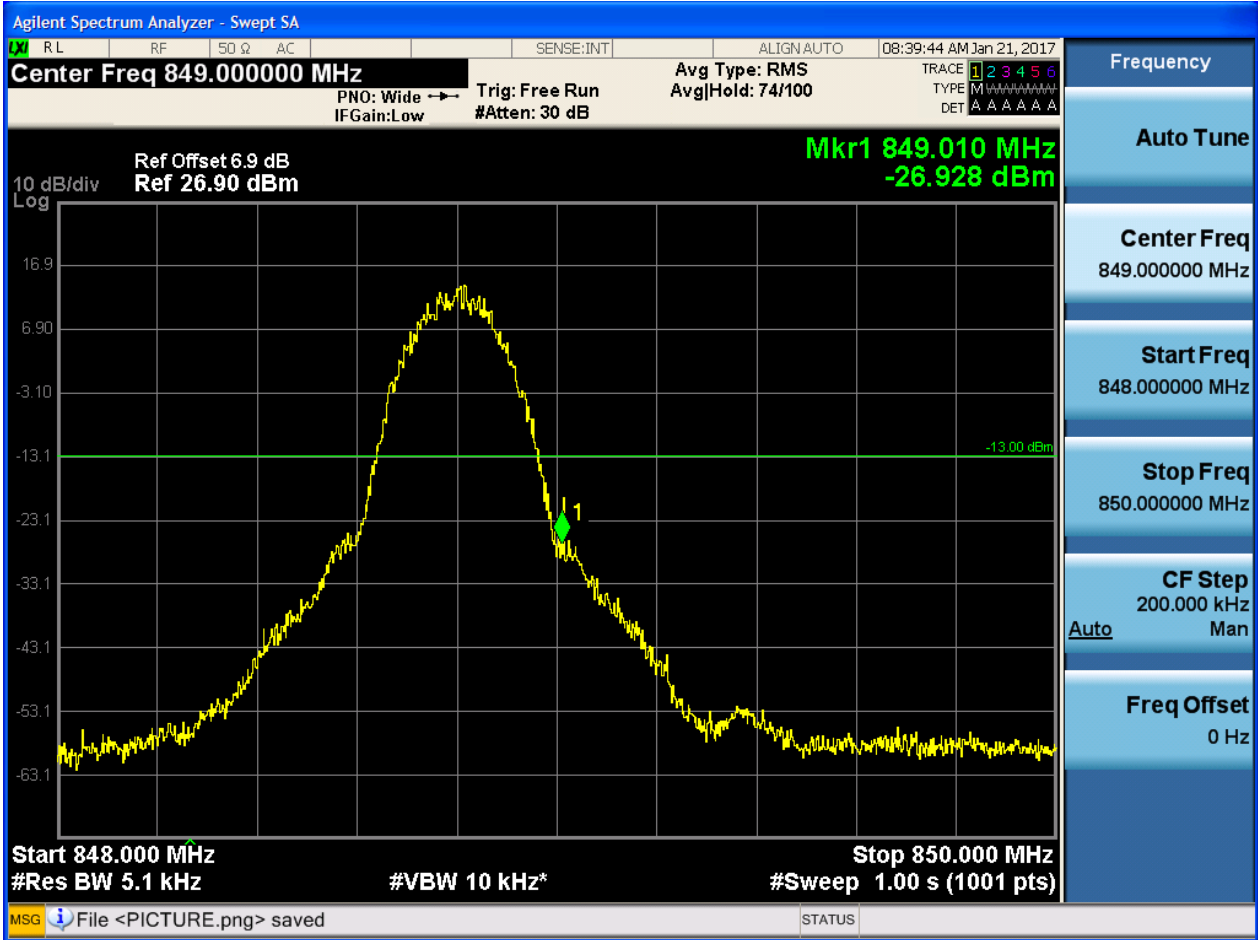


### 5.1.2.2 Test Mode = GSM/TM2

#### 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.

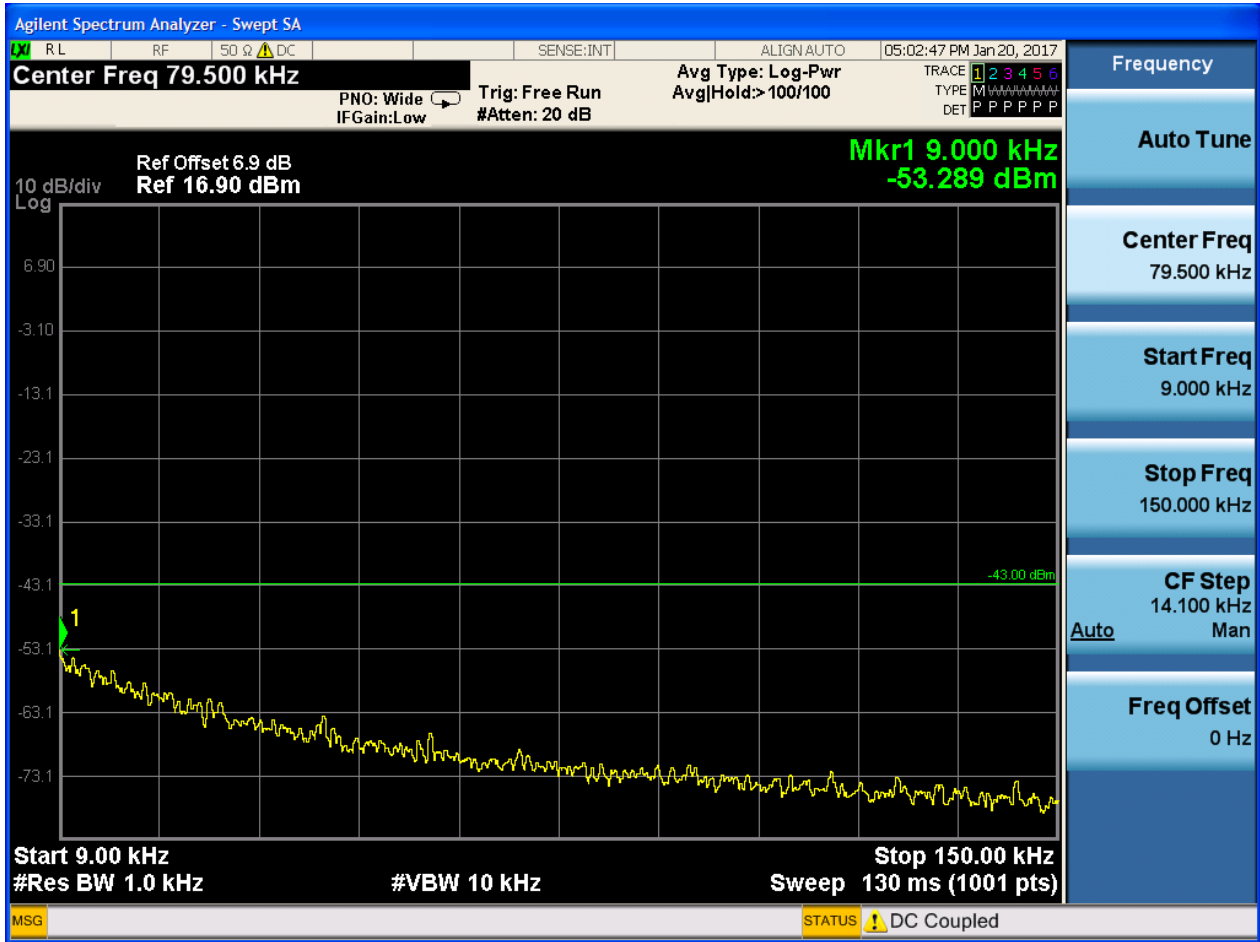
### Part I - Test Plots

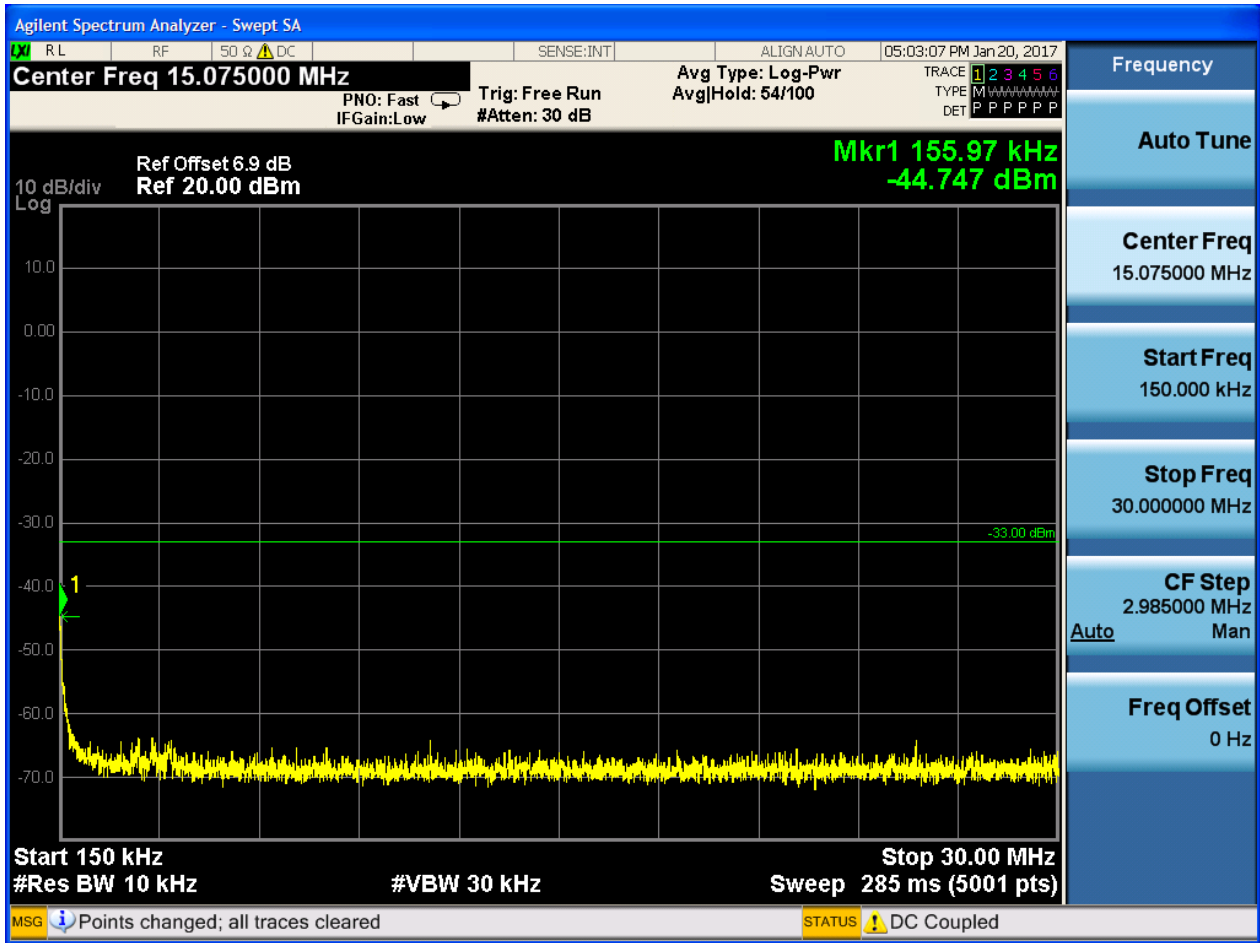
#### 6.1 For GSM

##### 6.1.1 Test Band = GSM1900

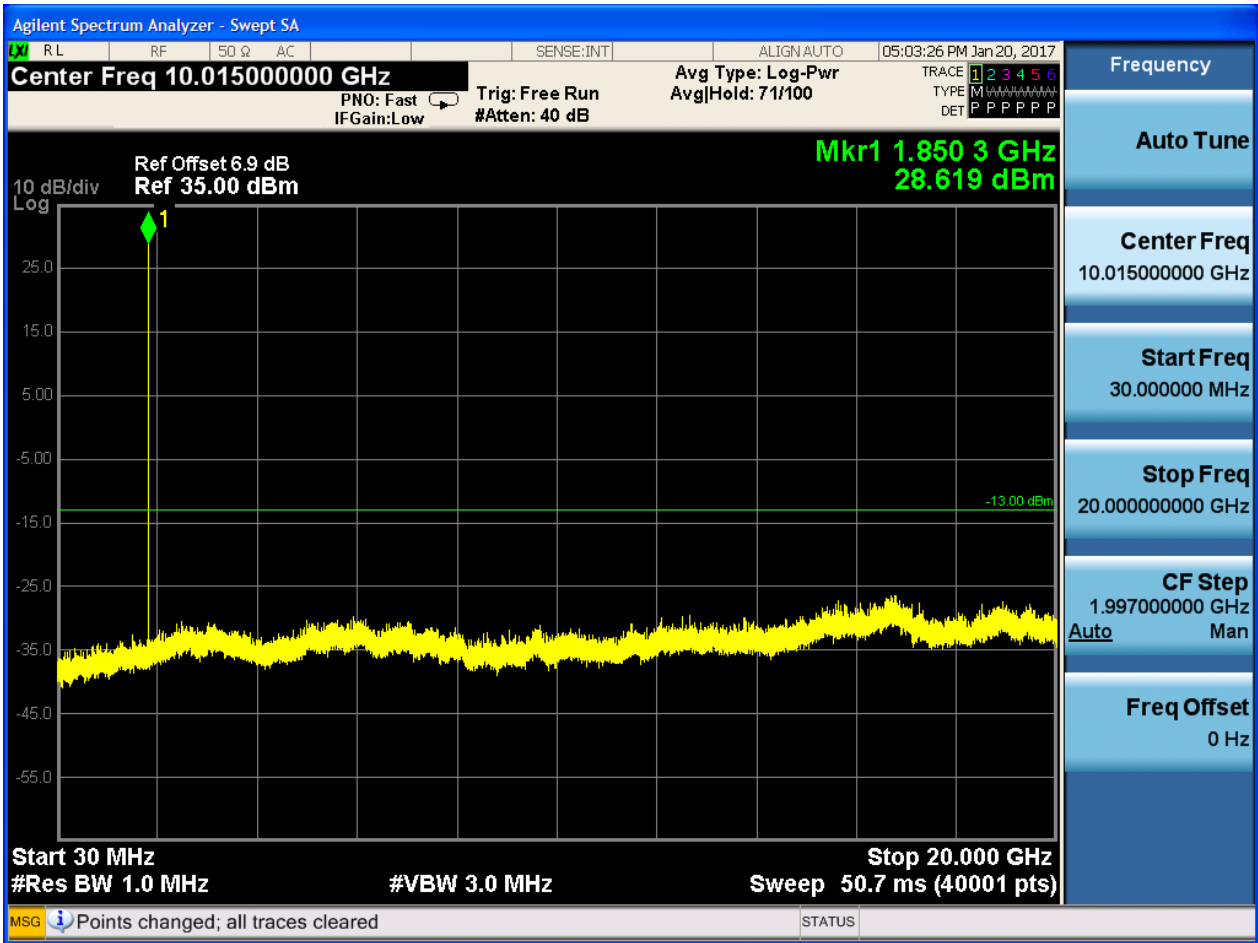
##### 6.1.1.1 Test Mode = GSM/TM1

##### 6.1.1.1.1 Test Channel = LCH



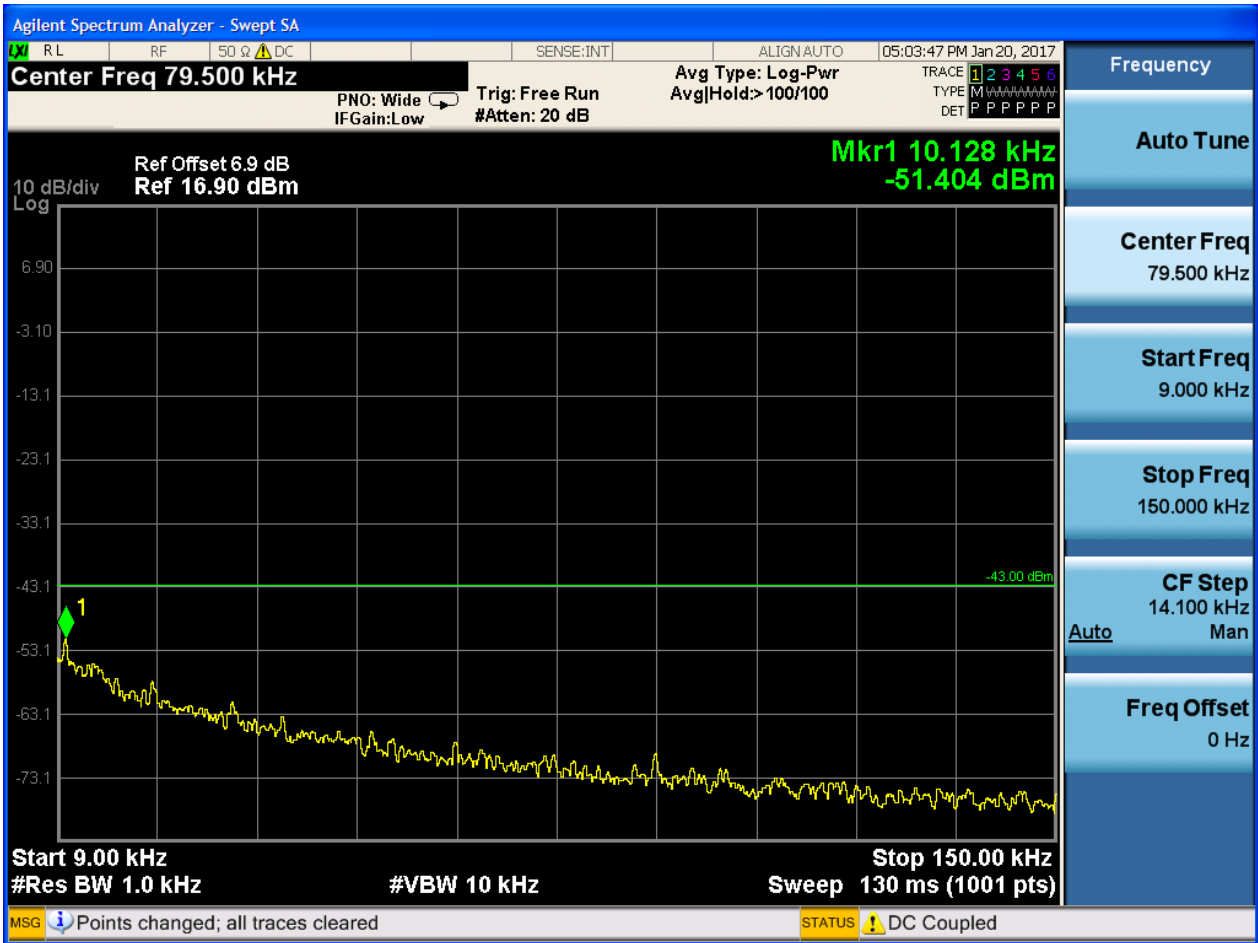


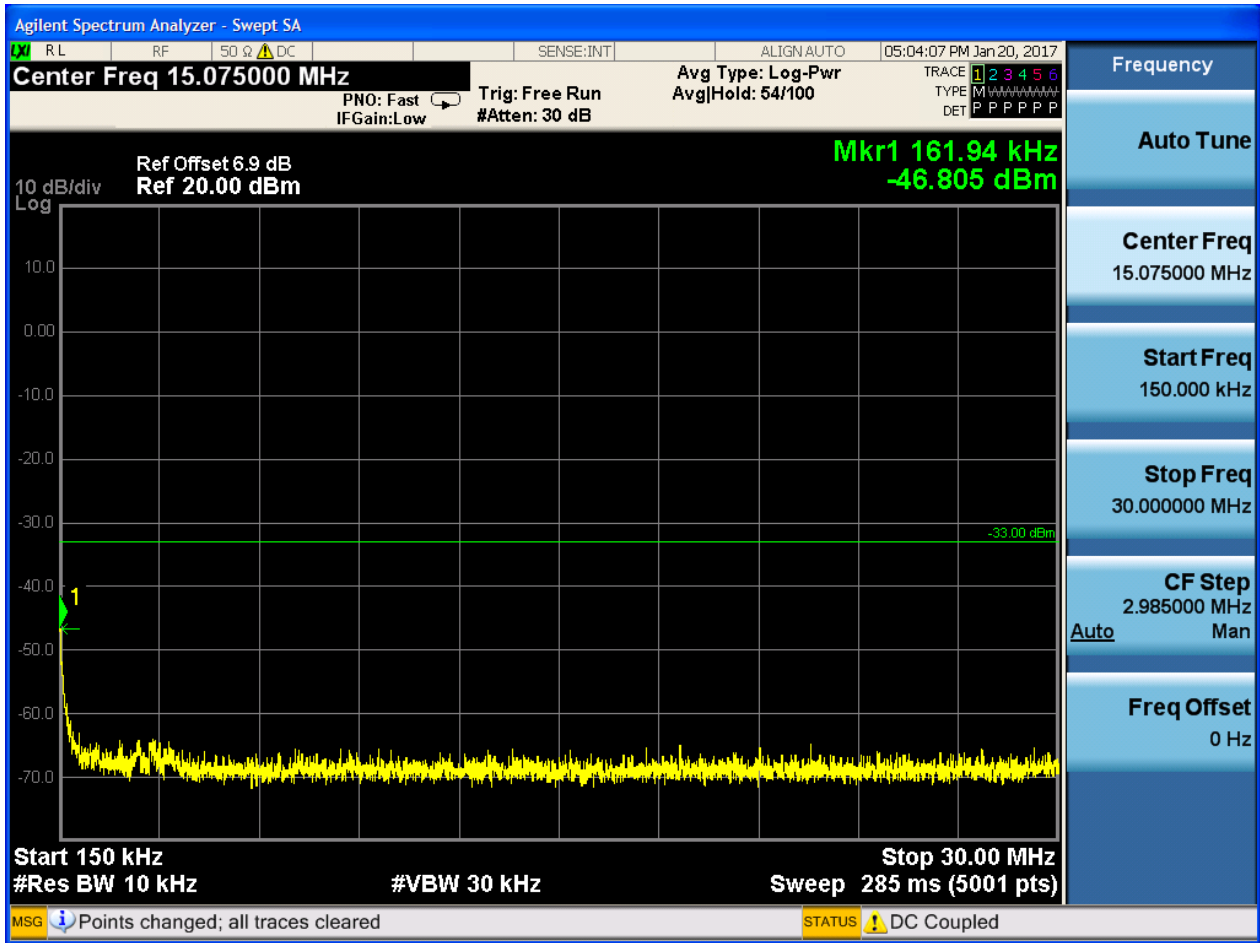


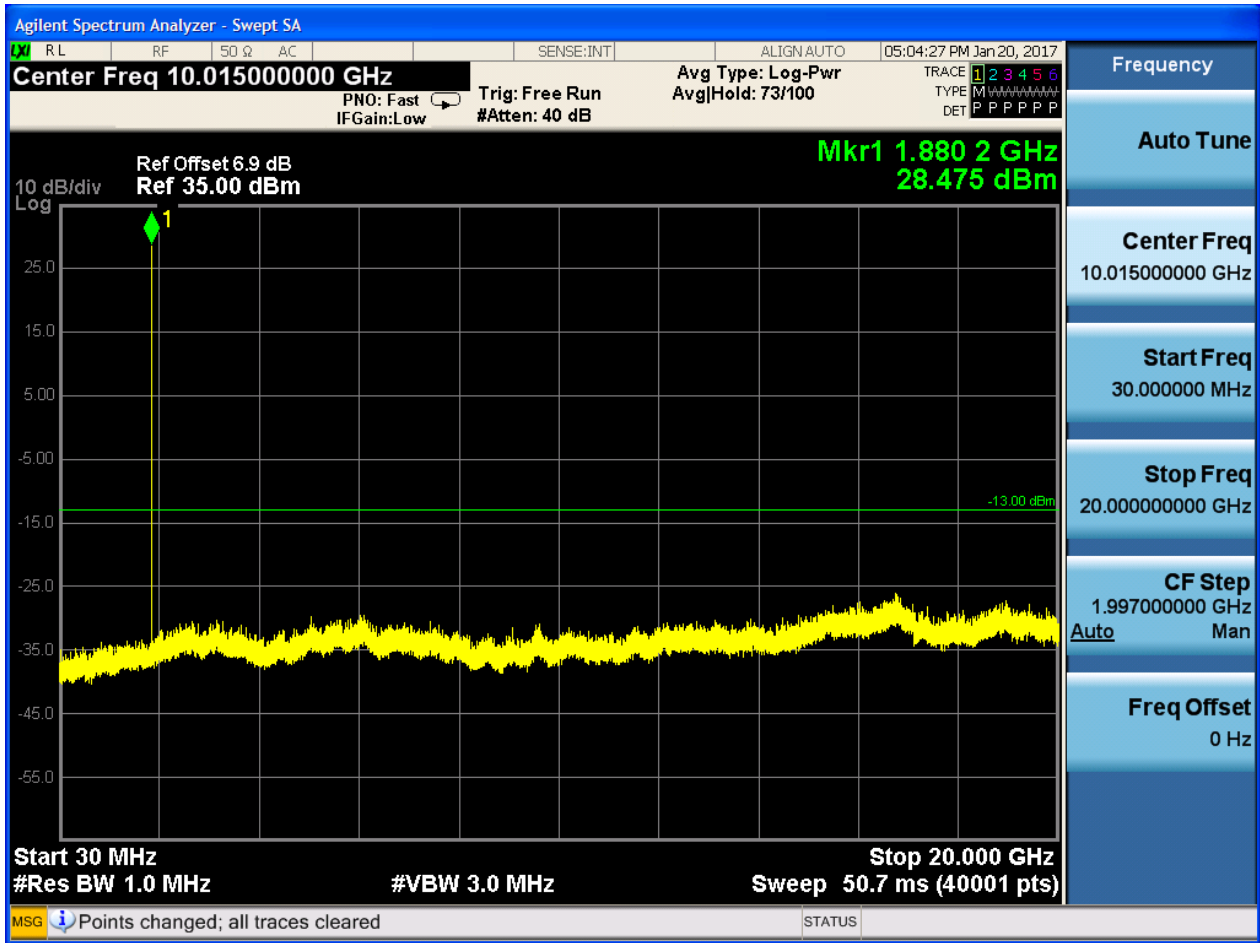




6.1.1.1.2 Test Channel = MCH

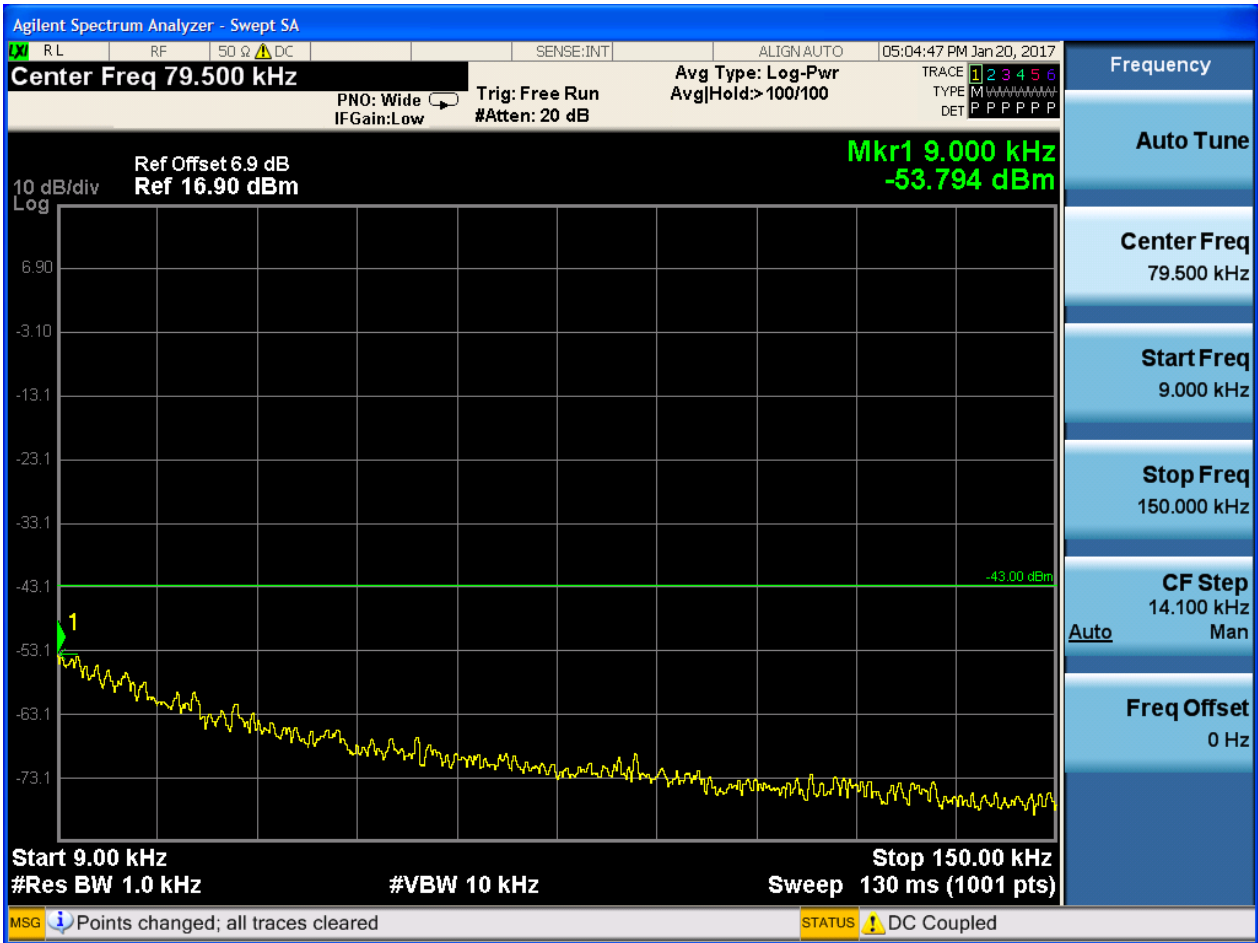


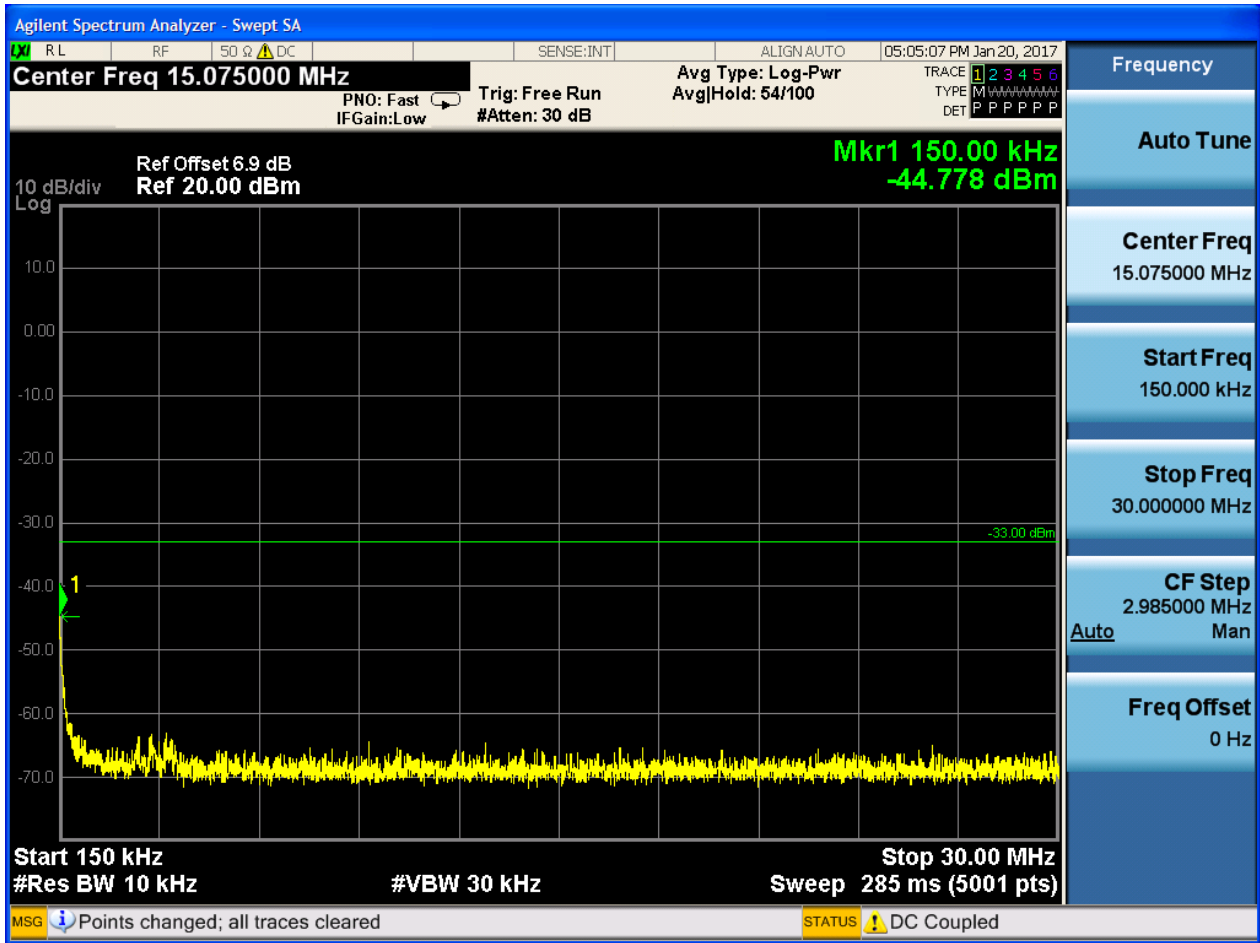


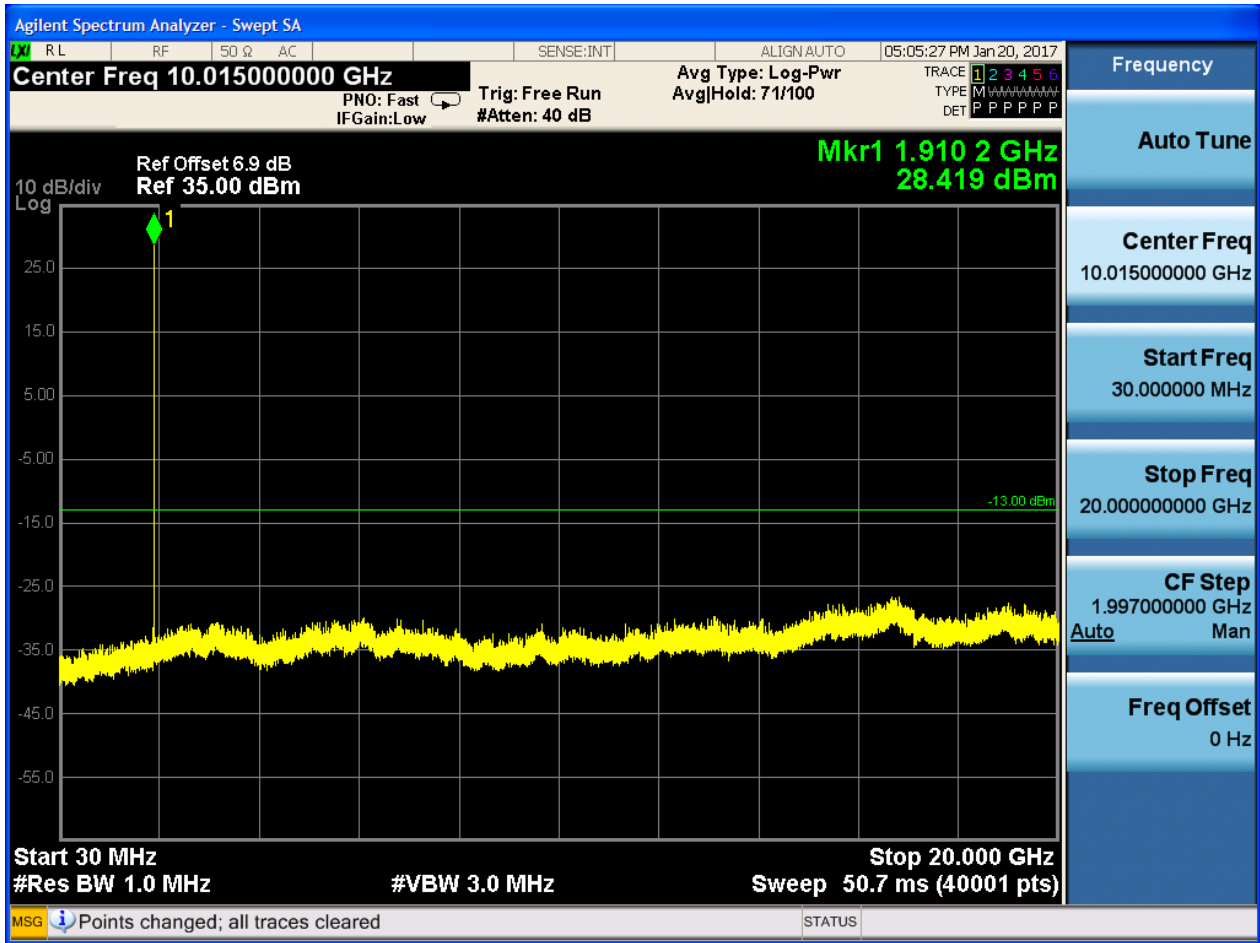




### 6.1.1.1.3 Test Channel = HCH

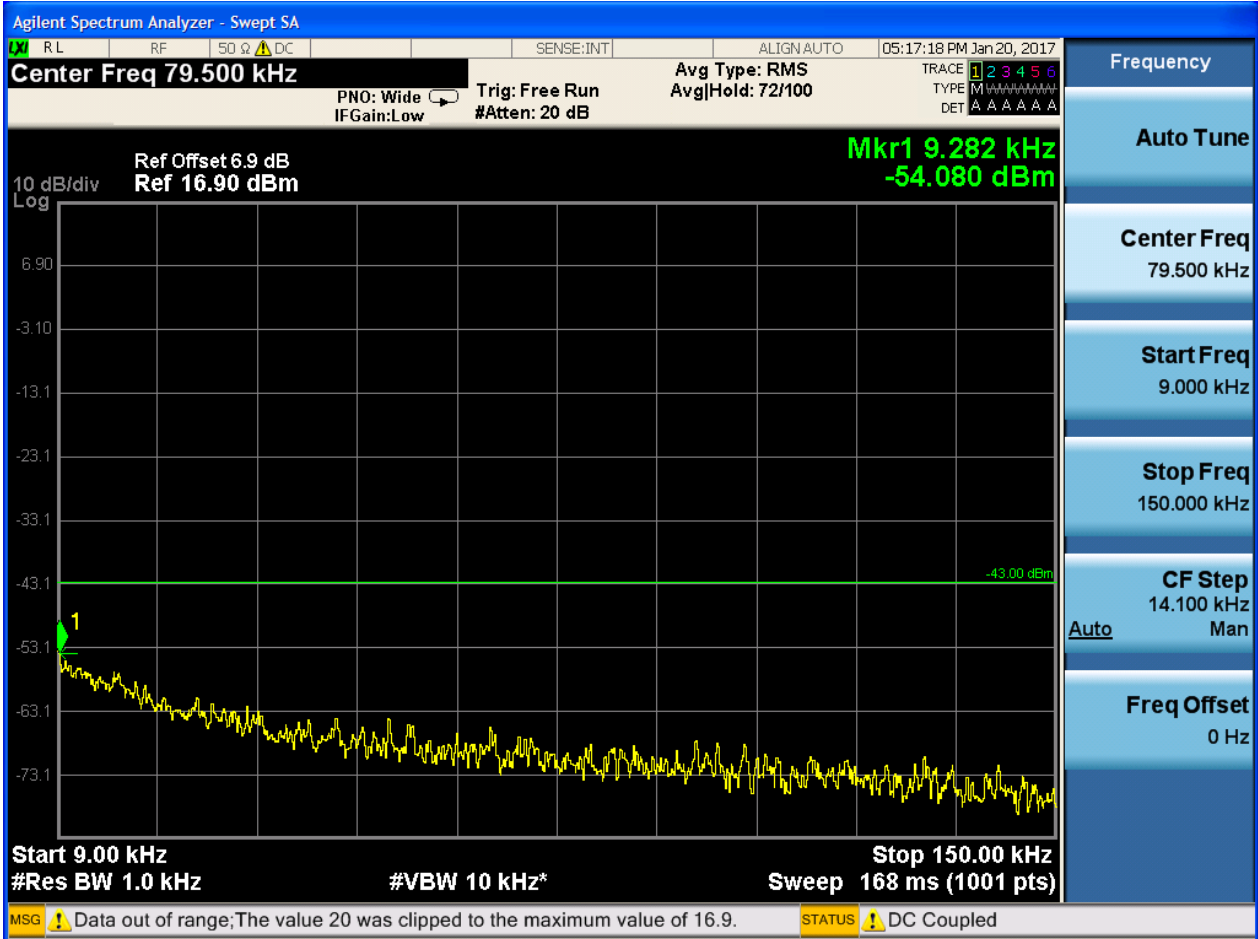




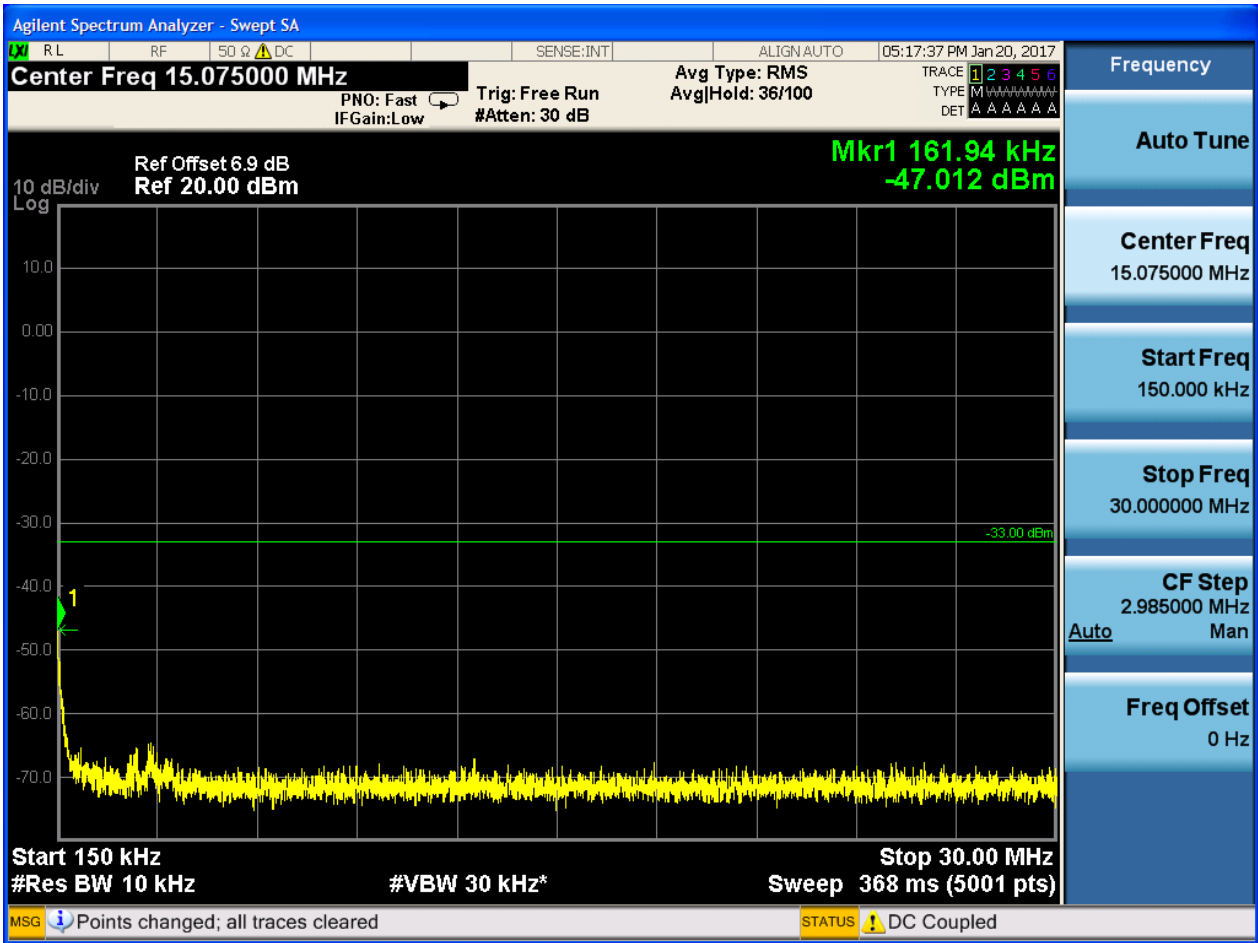


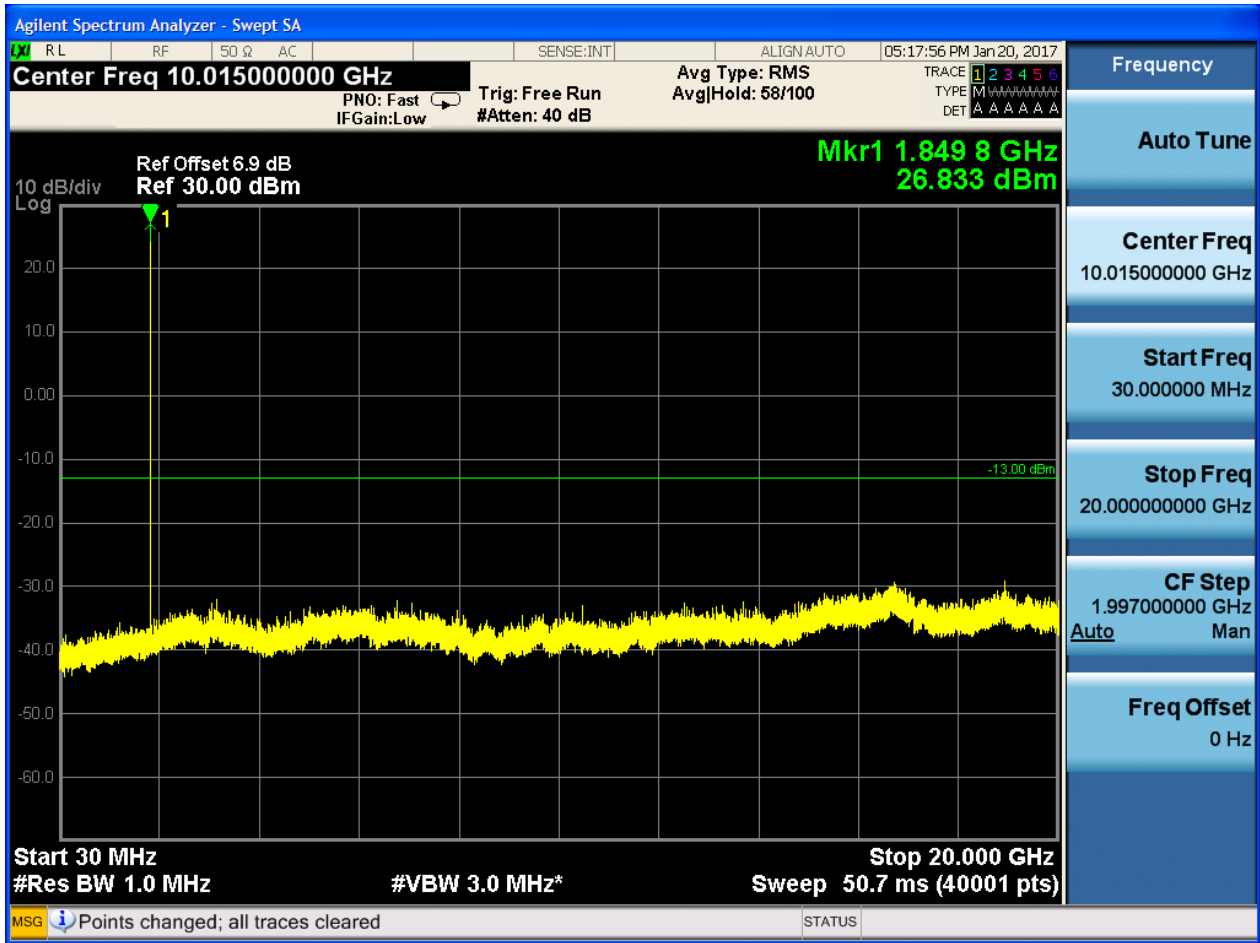
6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH



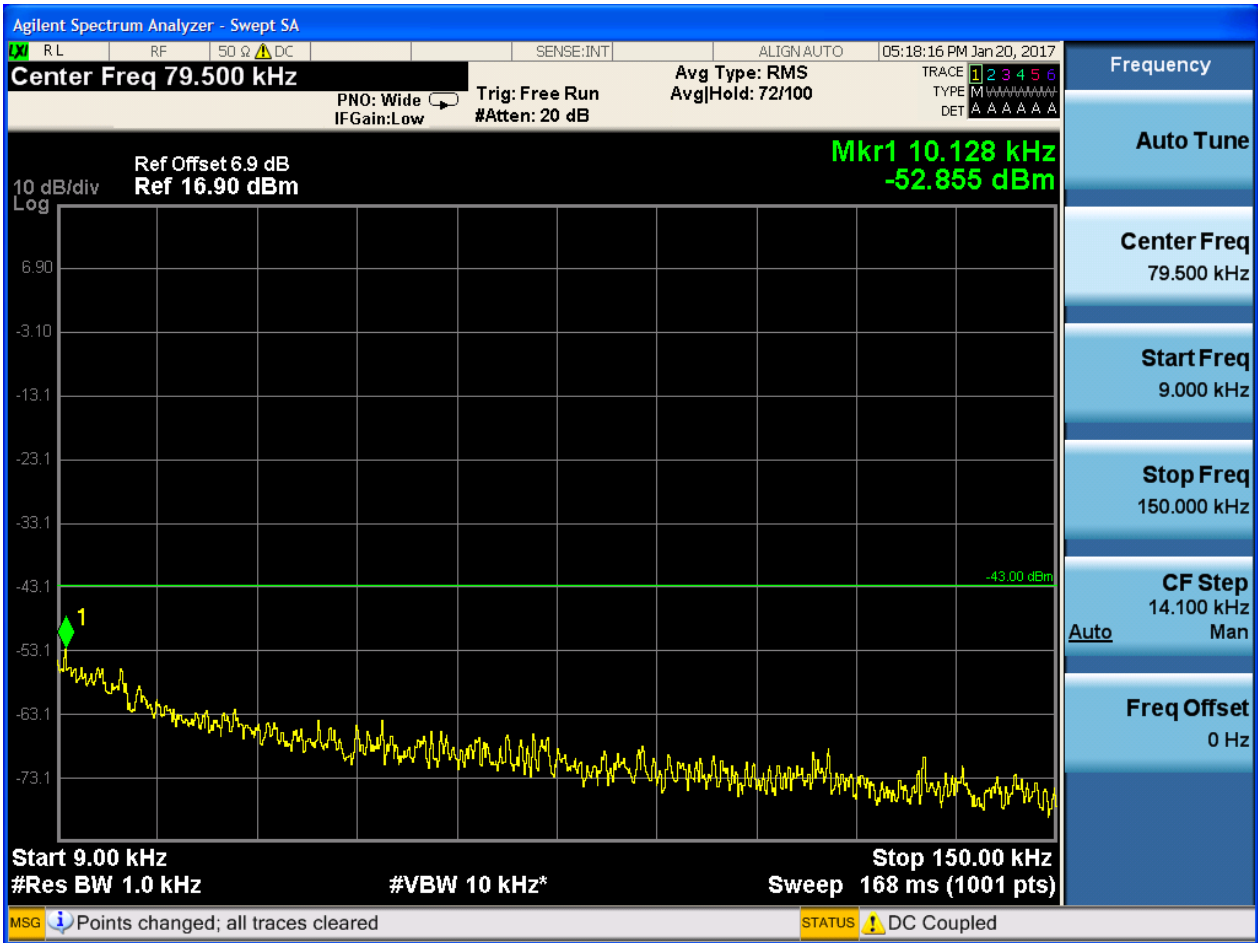


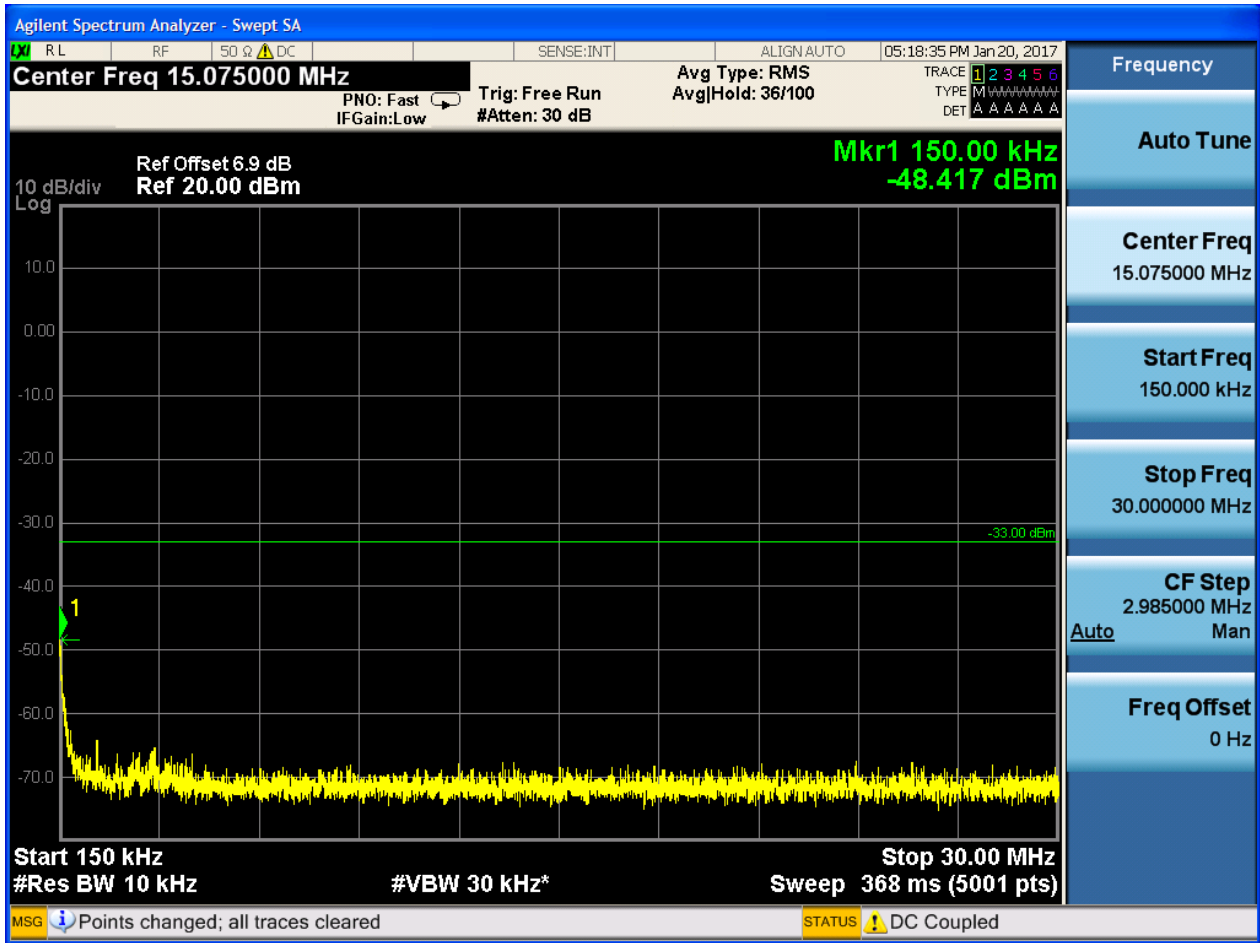


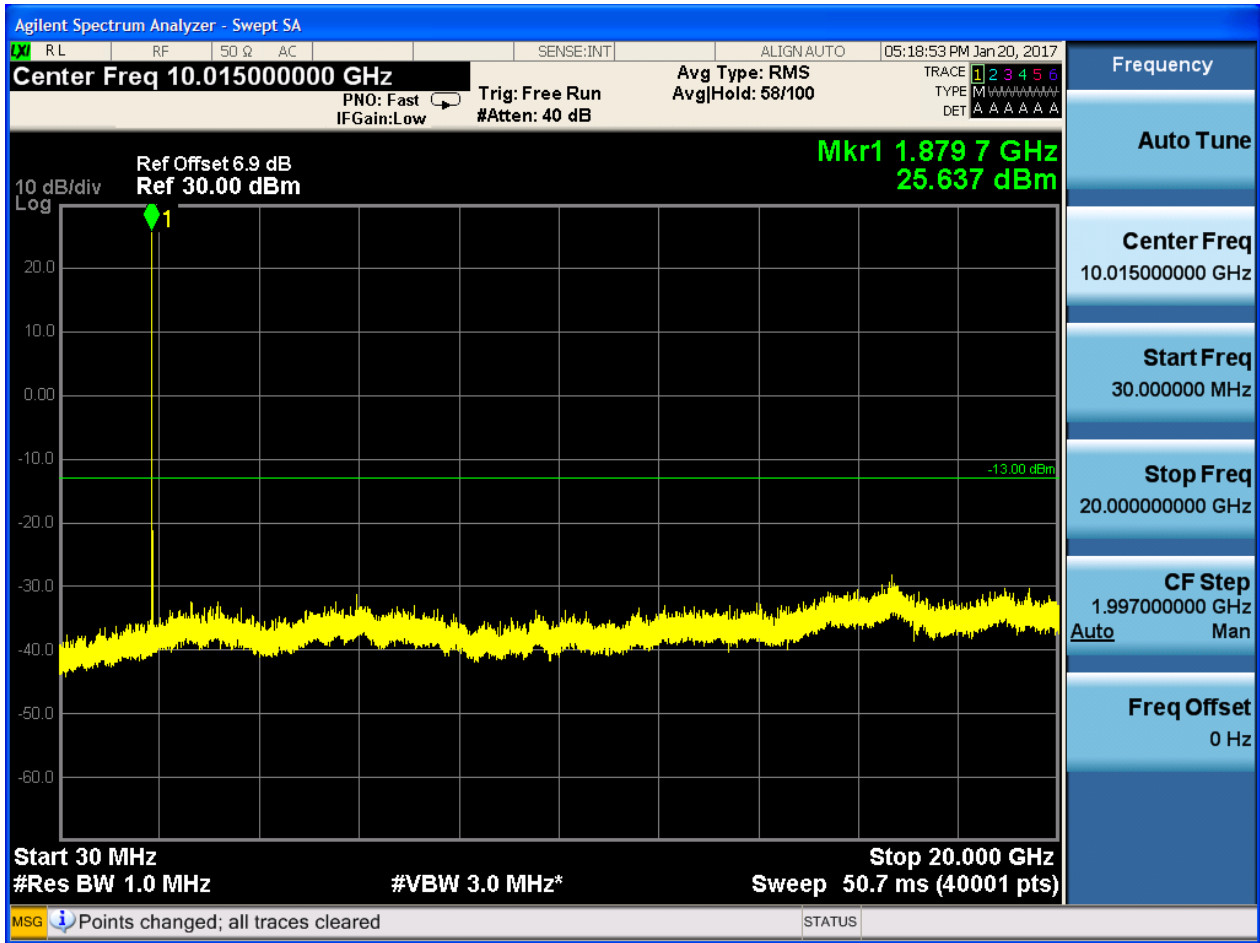




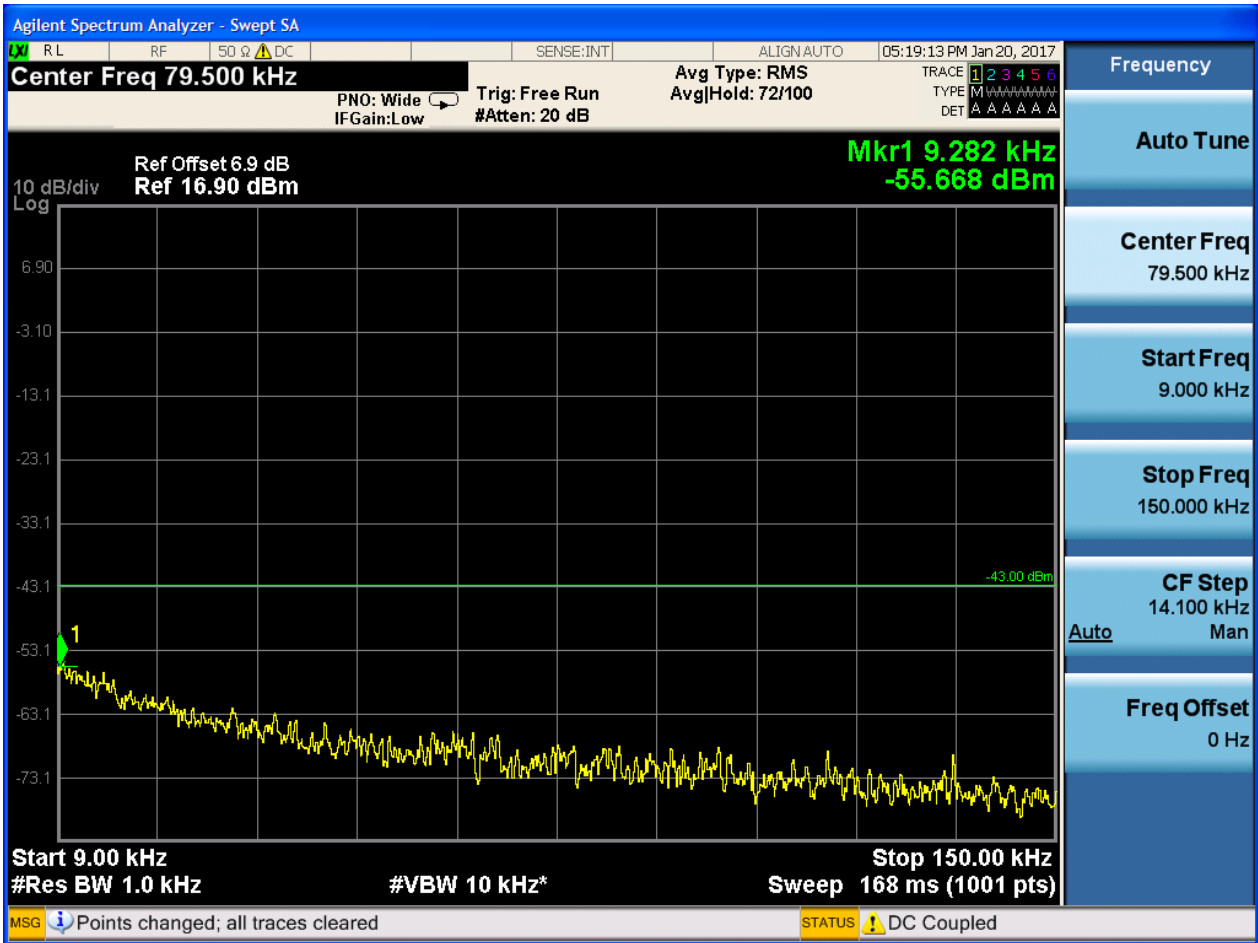
### 6.1.1.2.2 Test Channel = MCH

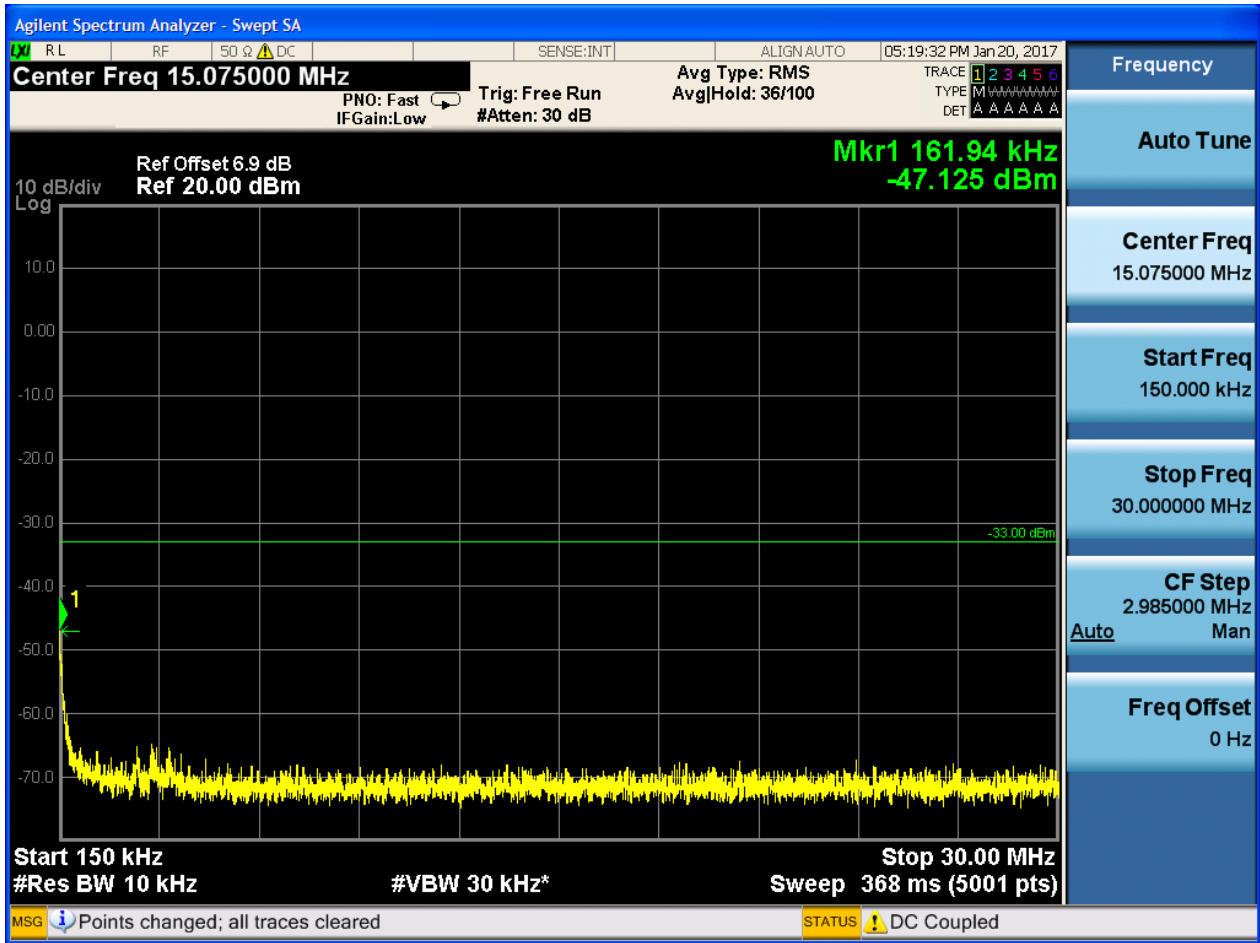


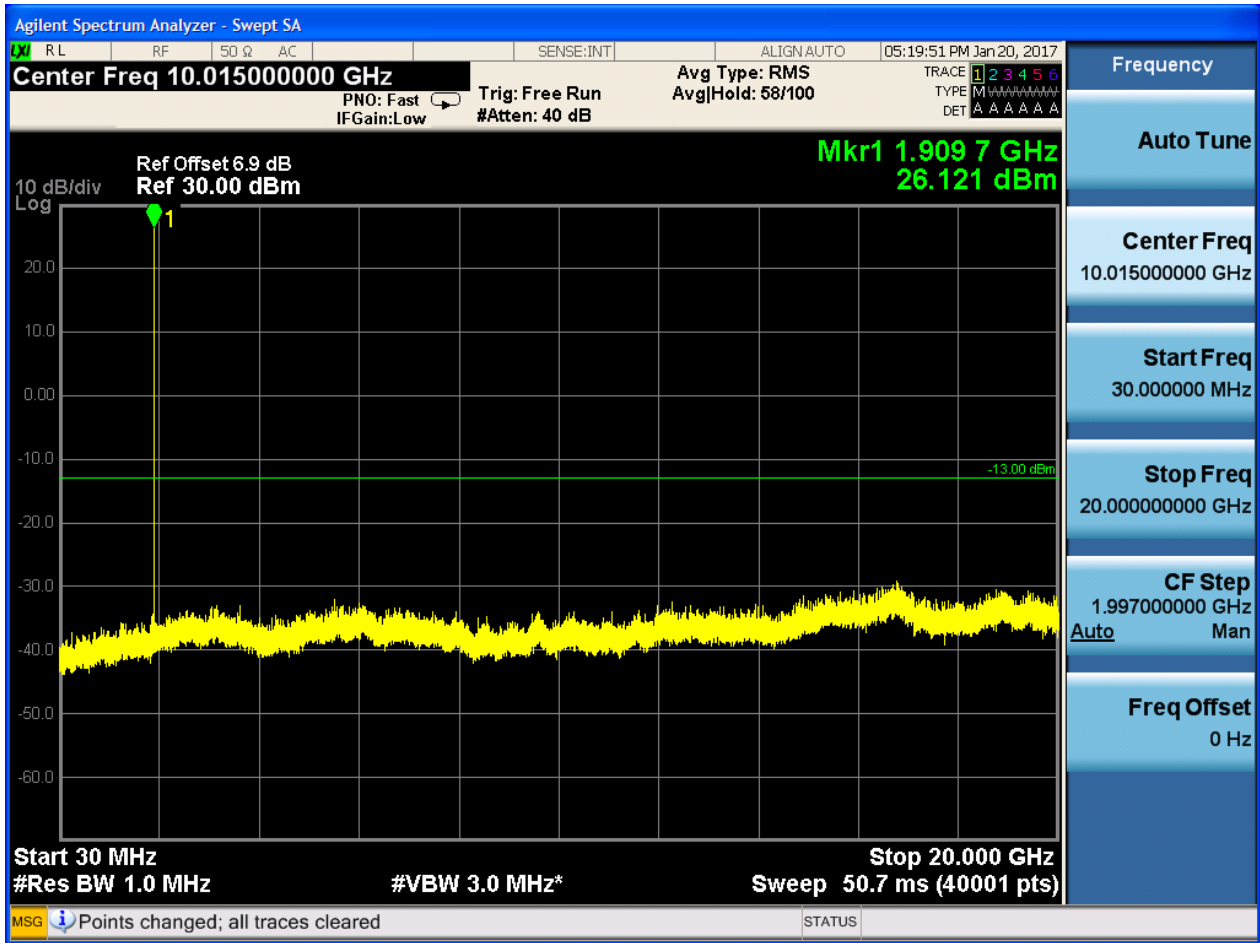




6.1.1.2.3 Test Channel = HCH







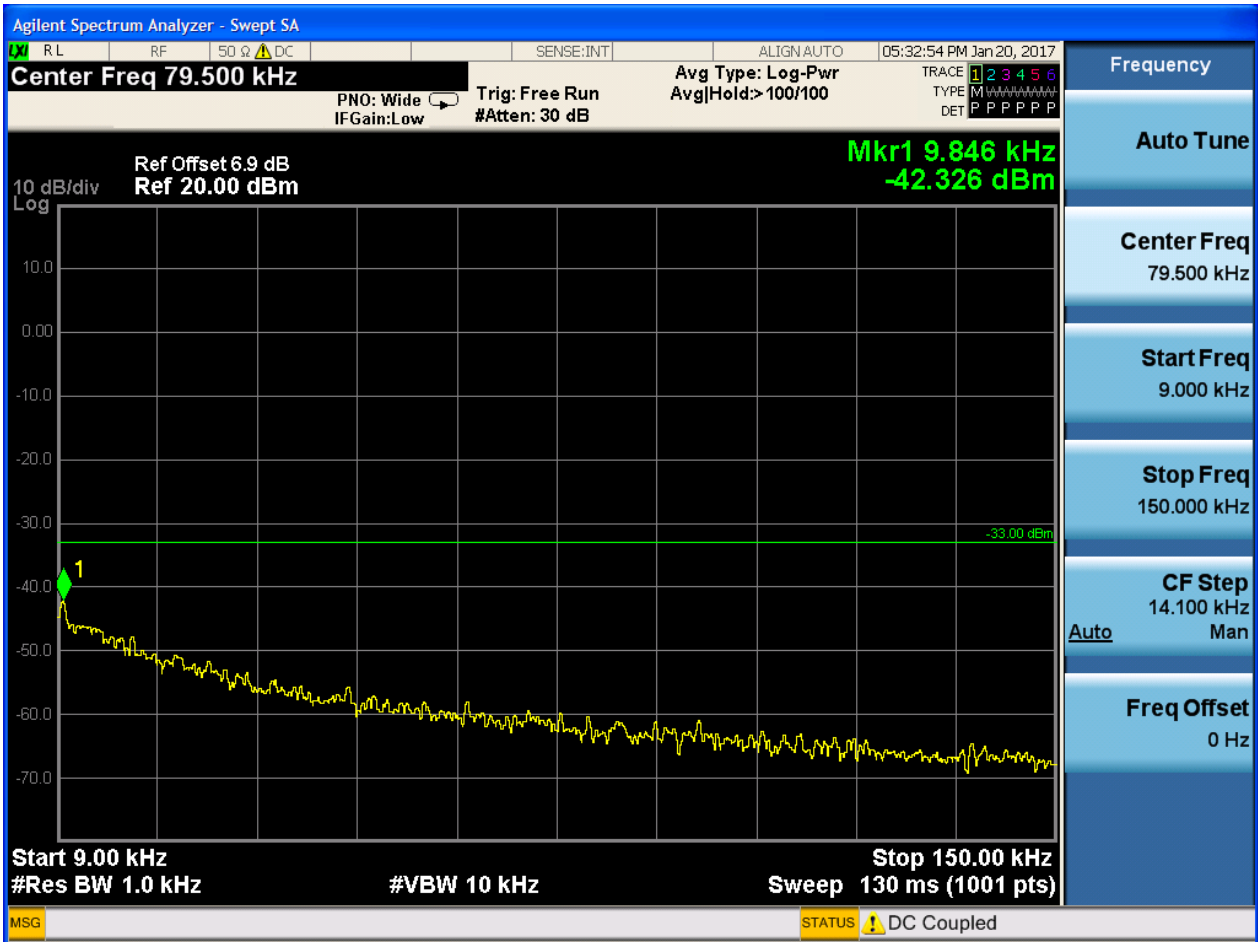


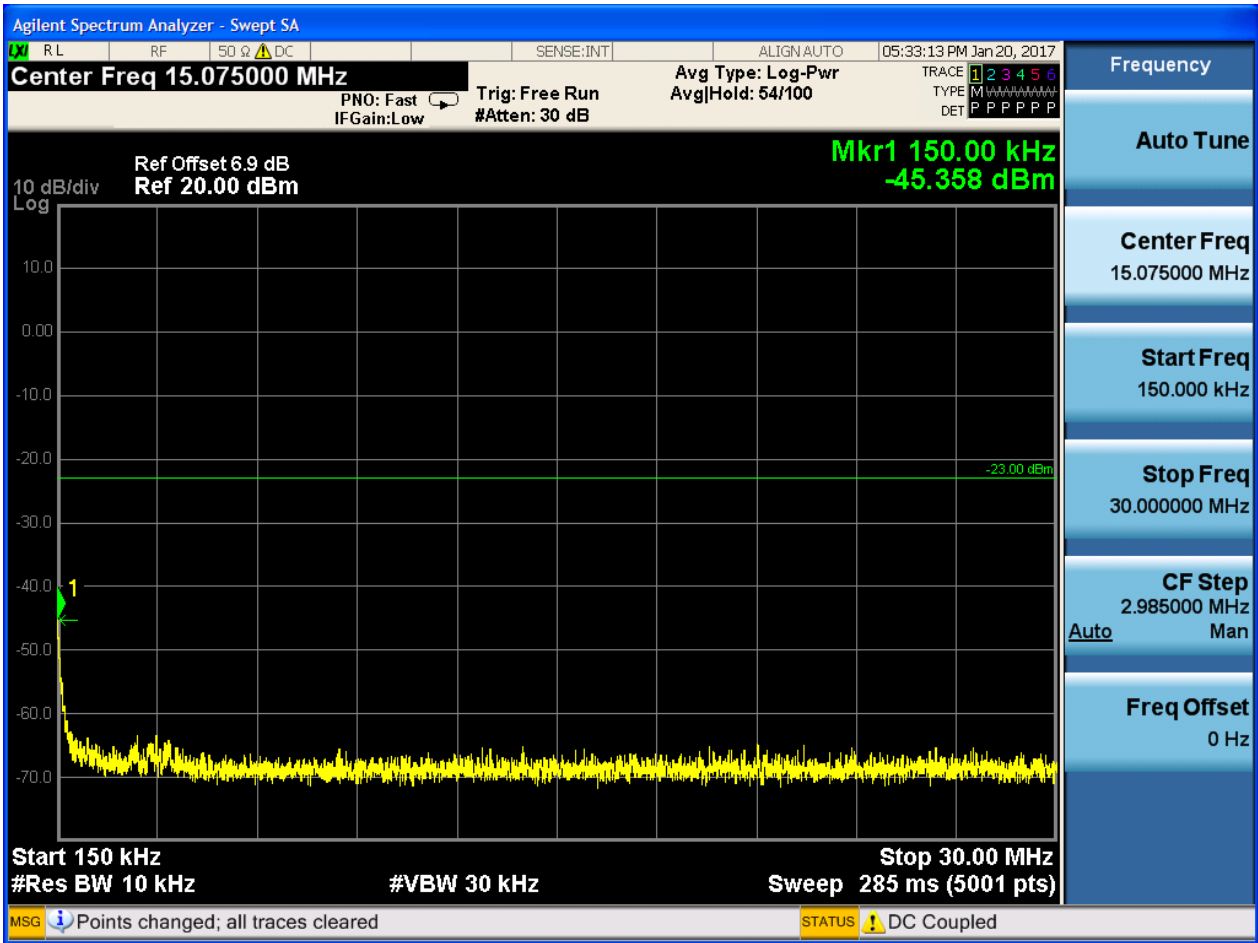


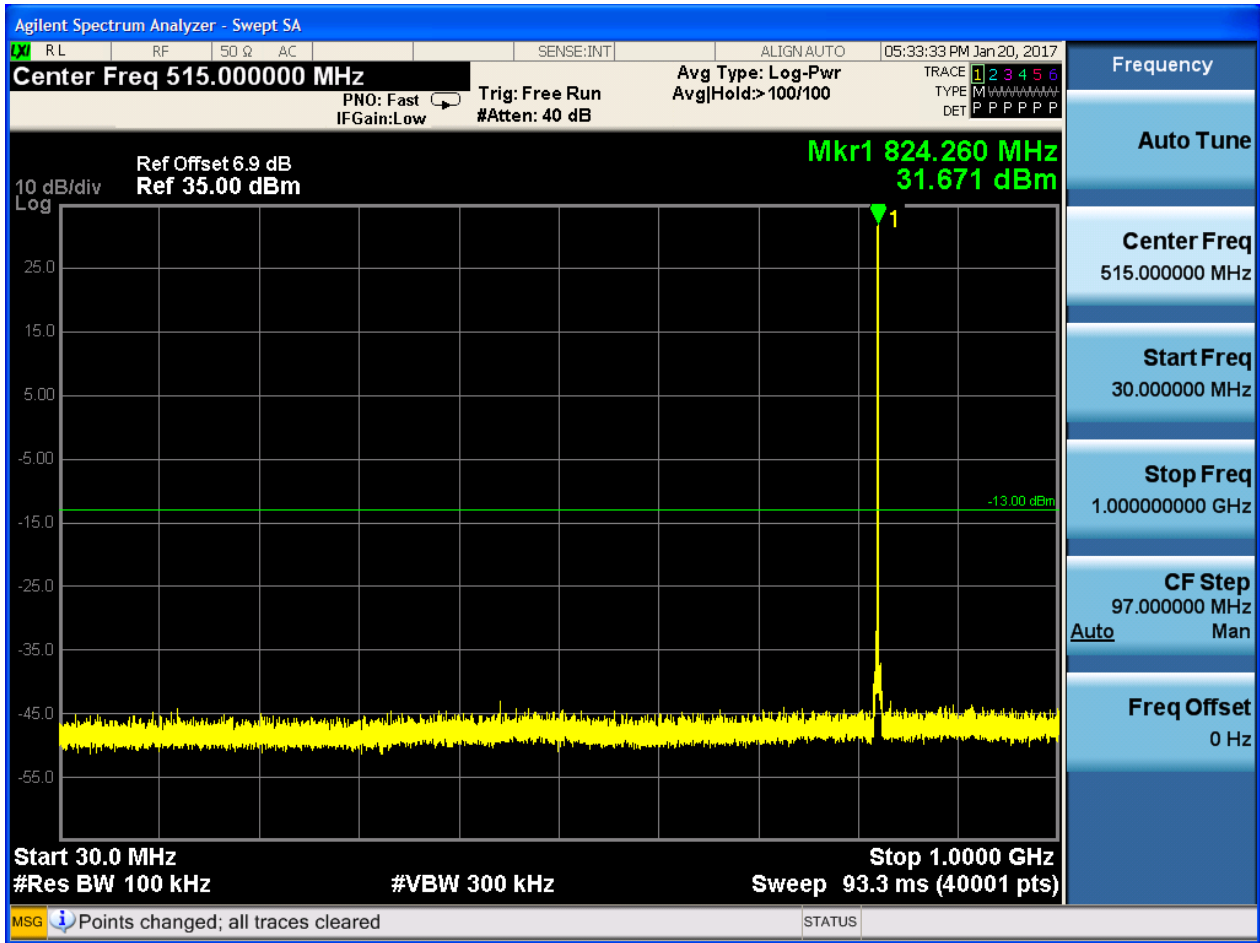
6.1.2 Test Band = GSM850

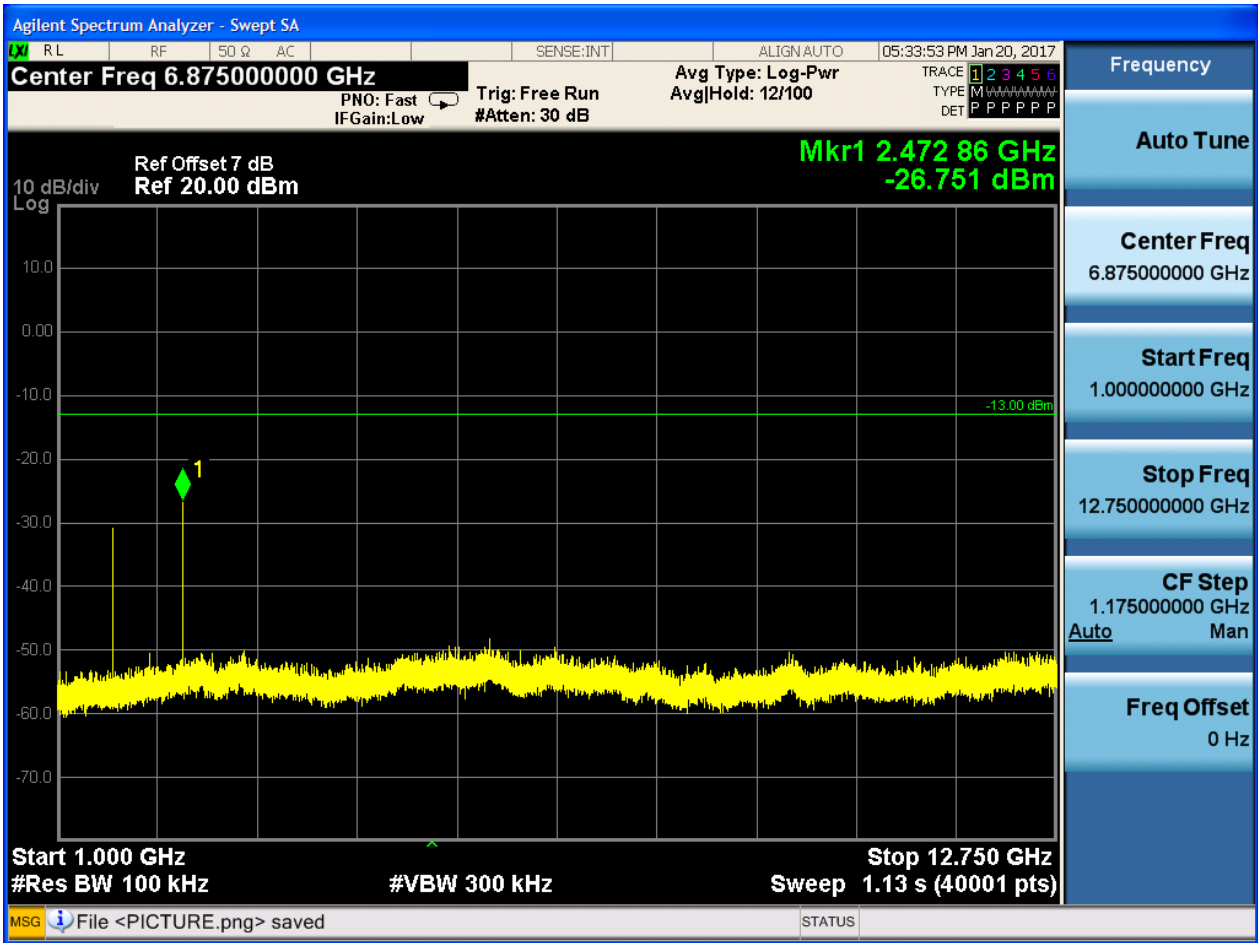
6.1.2.1 Test Mode = GSM/TM1

6.1.2.1.1 Test Channel = LCH



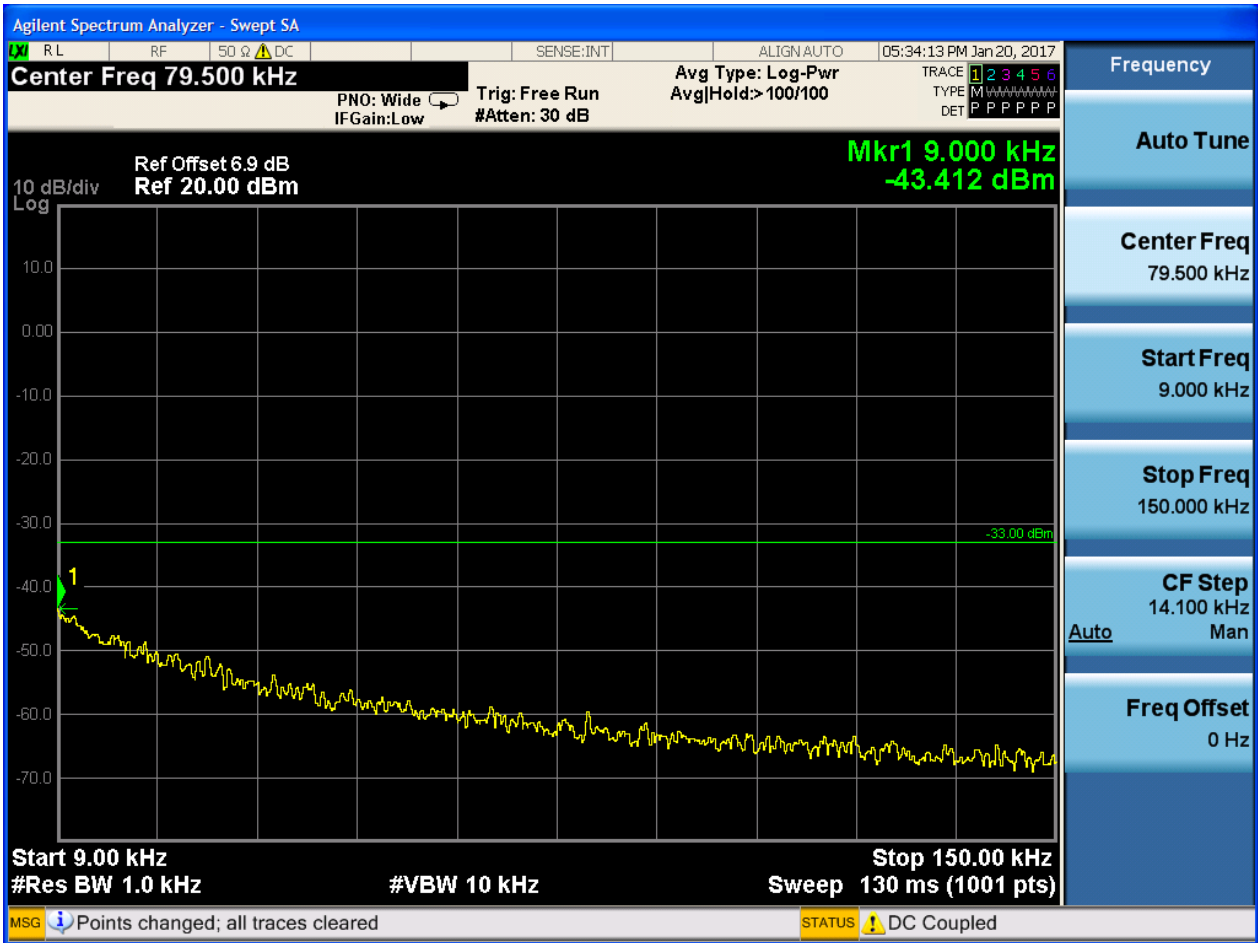


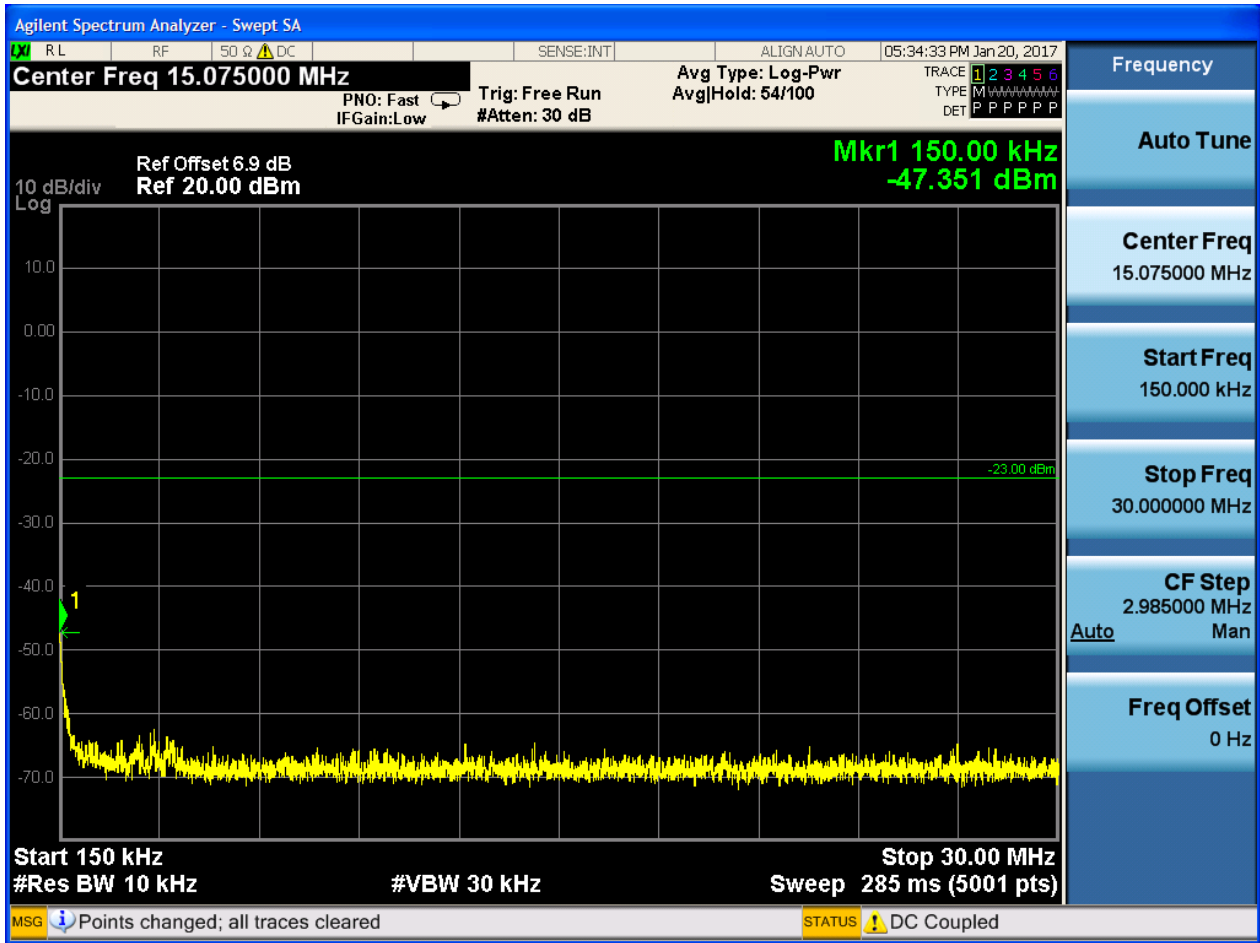


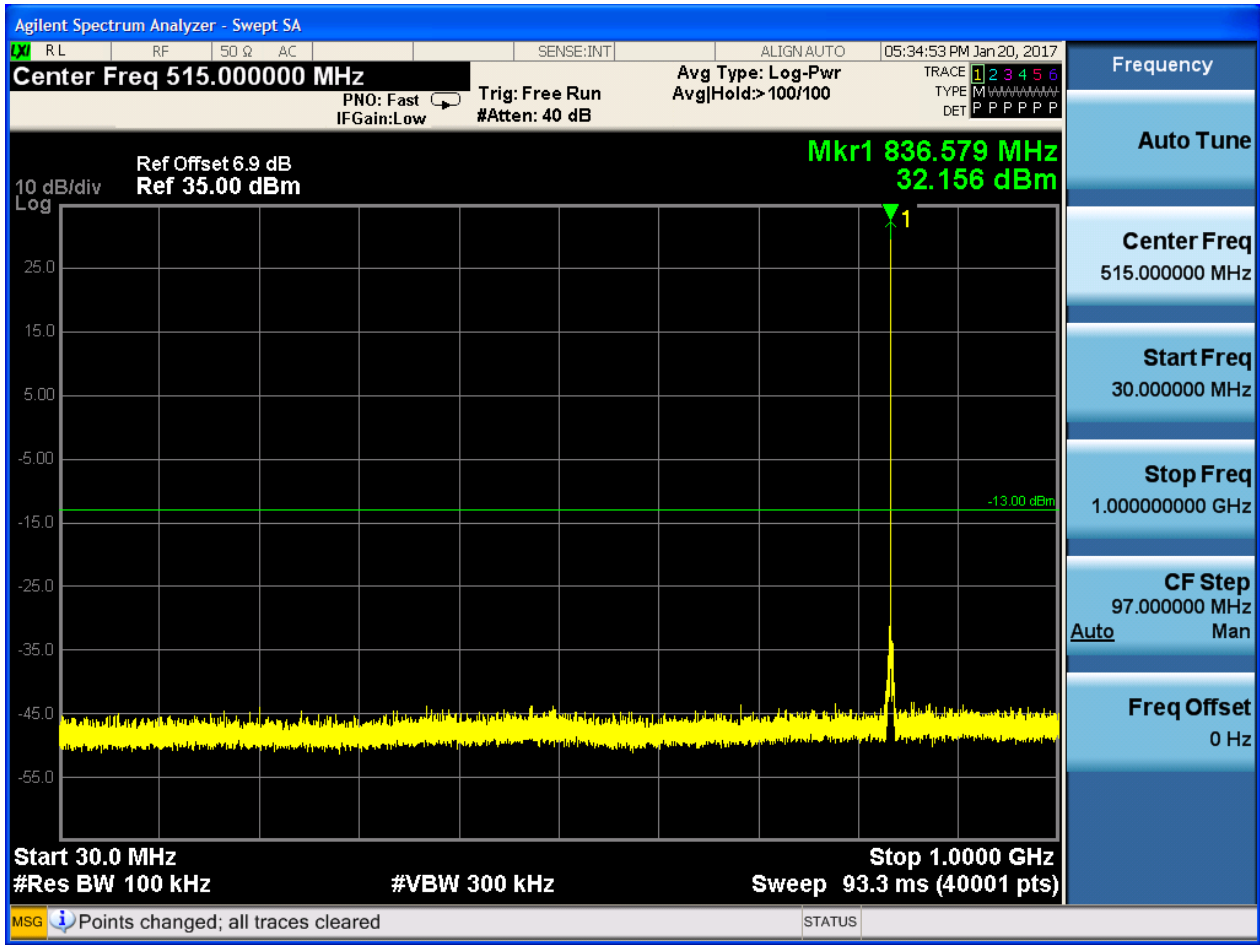


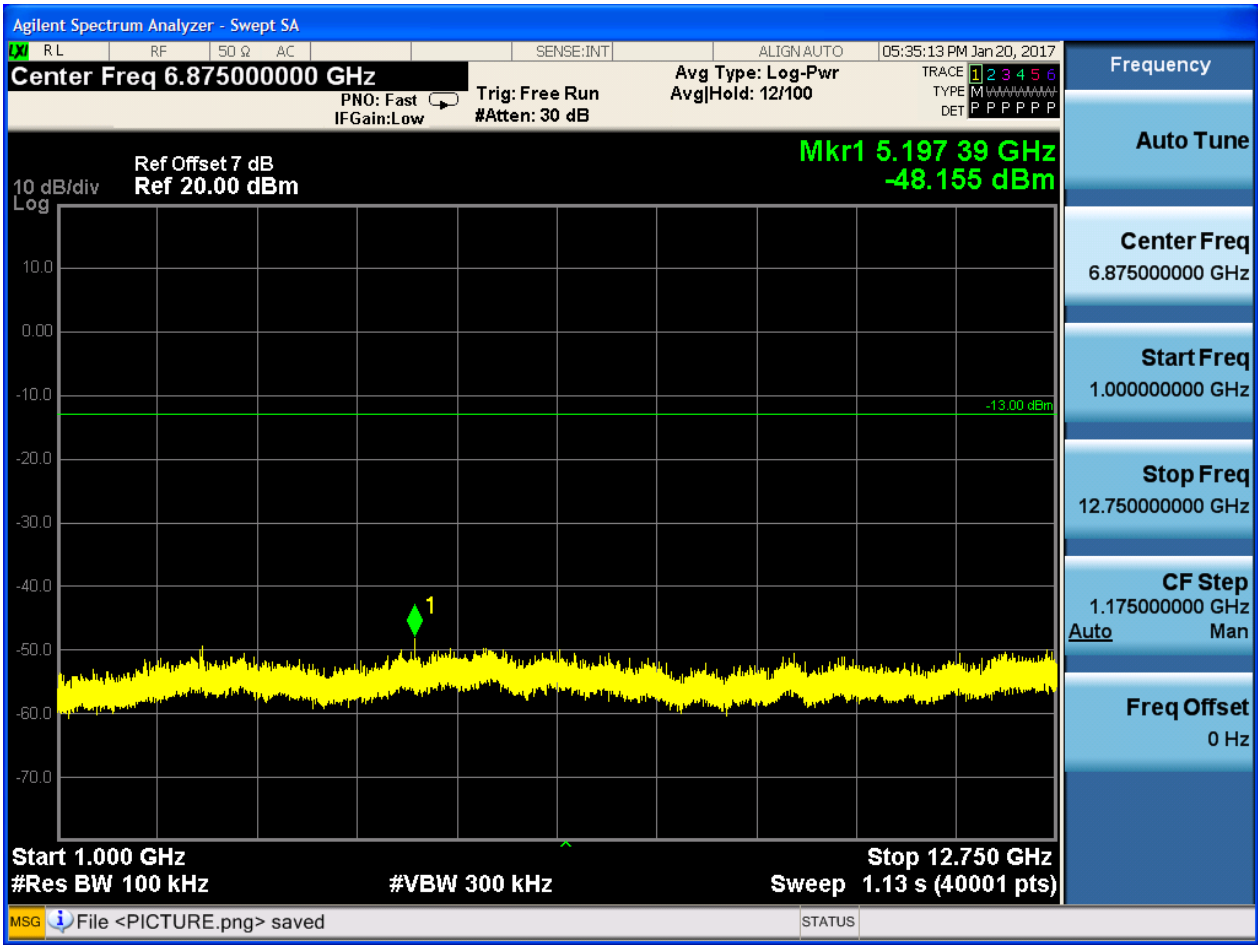


### 6.1.2.1.2 Test Channel = MCH



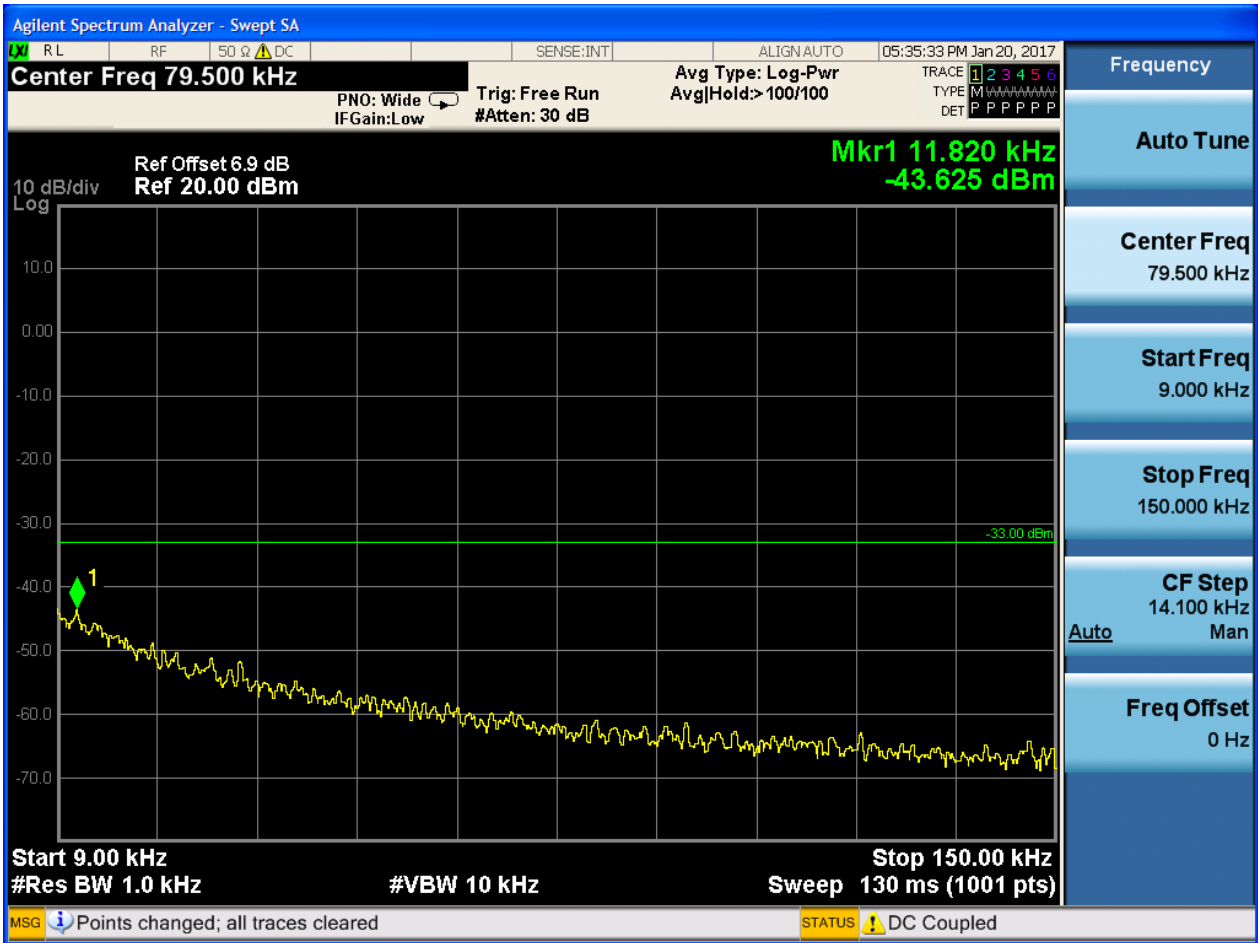


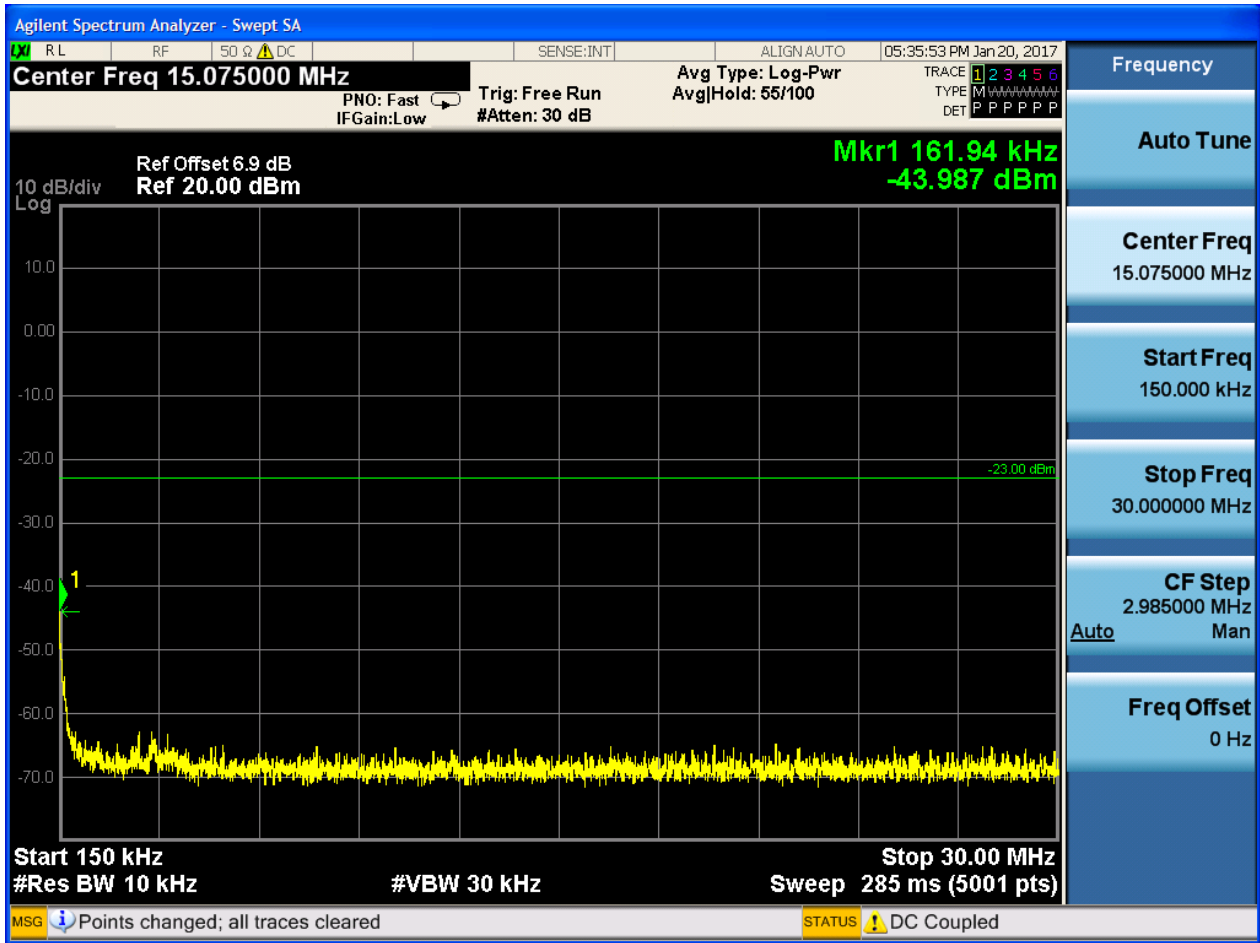


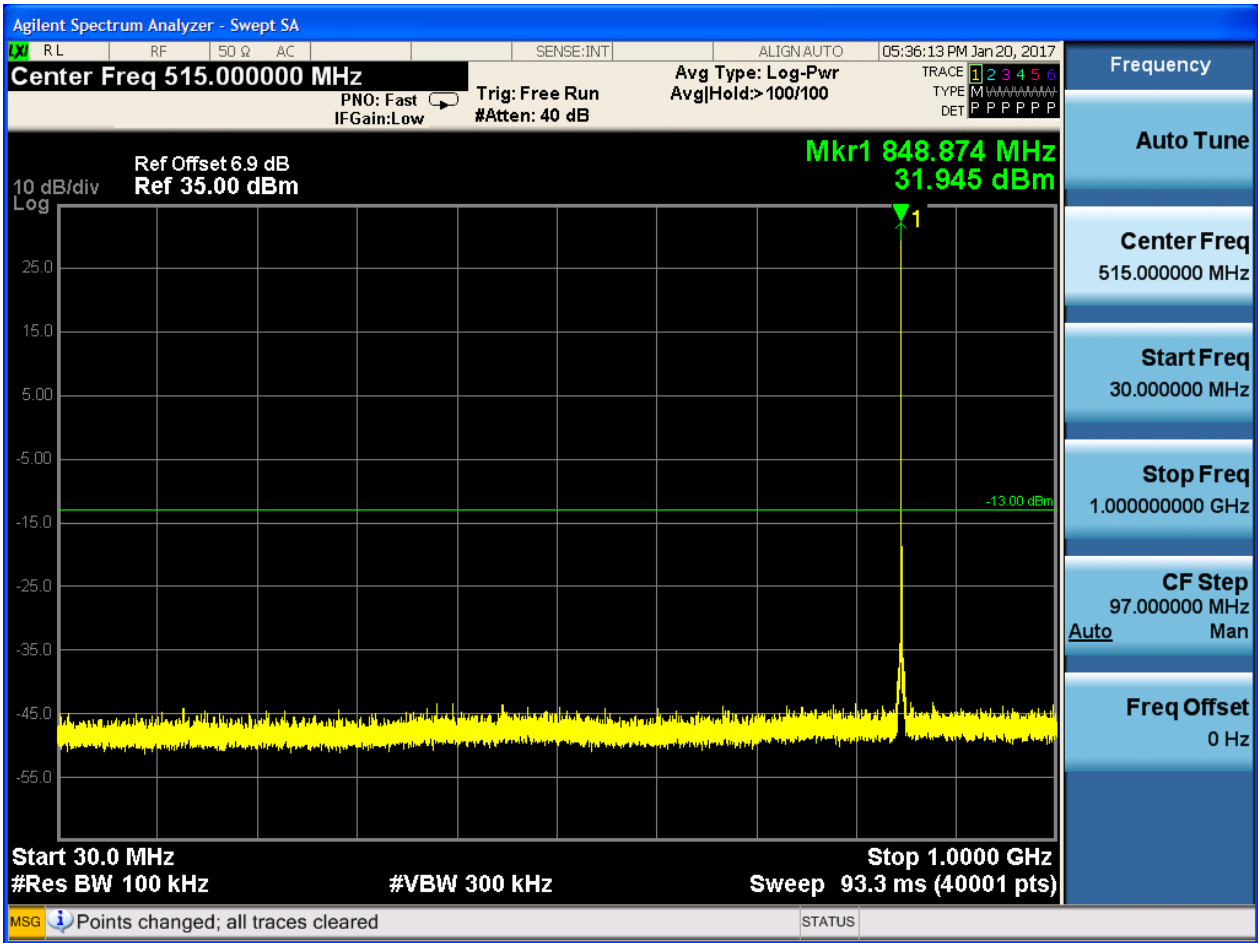


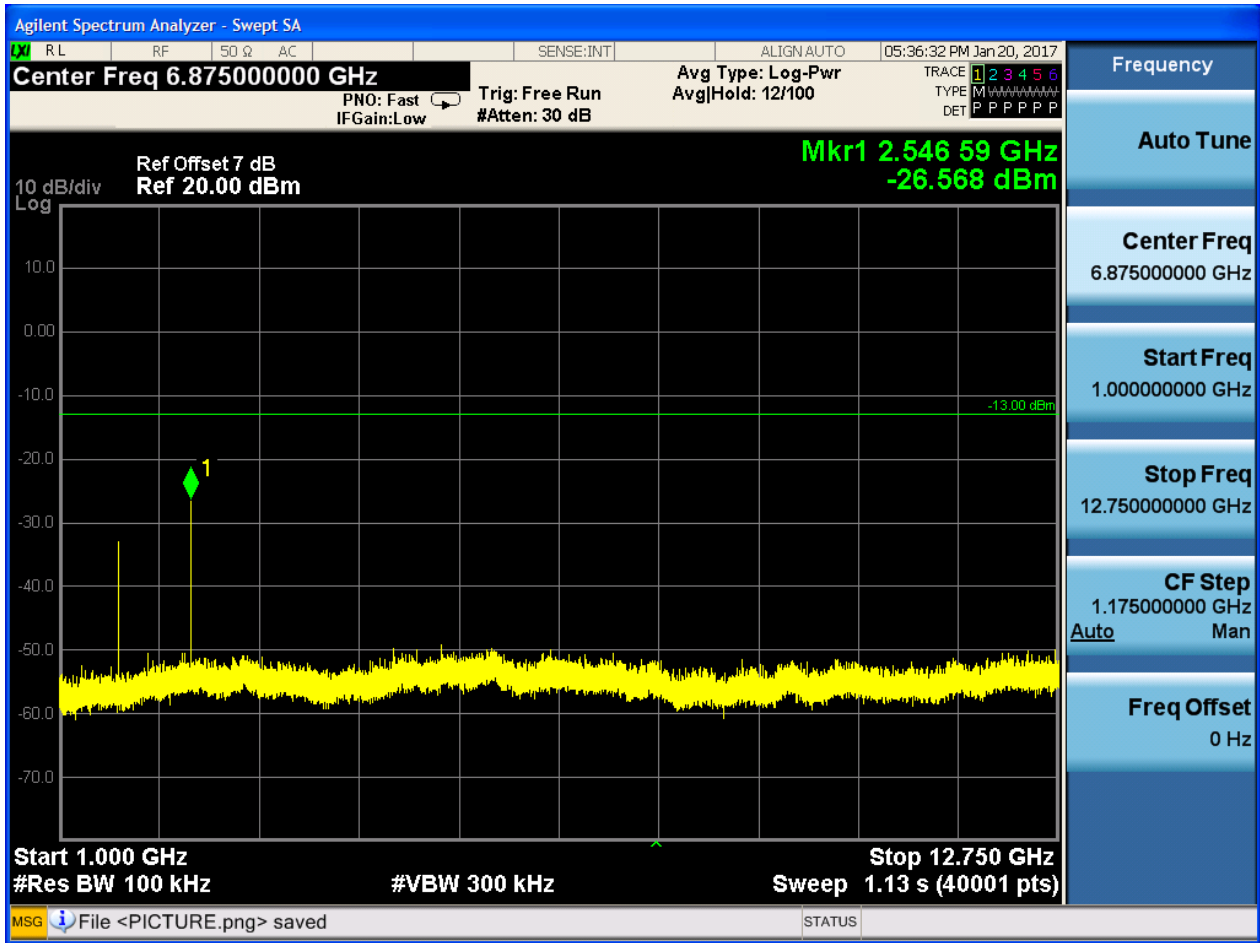


6.1.2.1.3 Test Channel = HCH







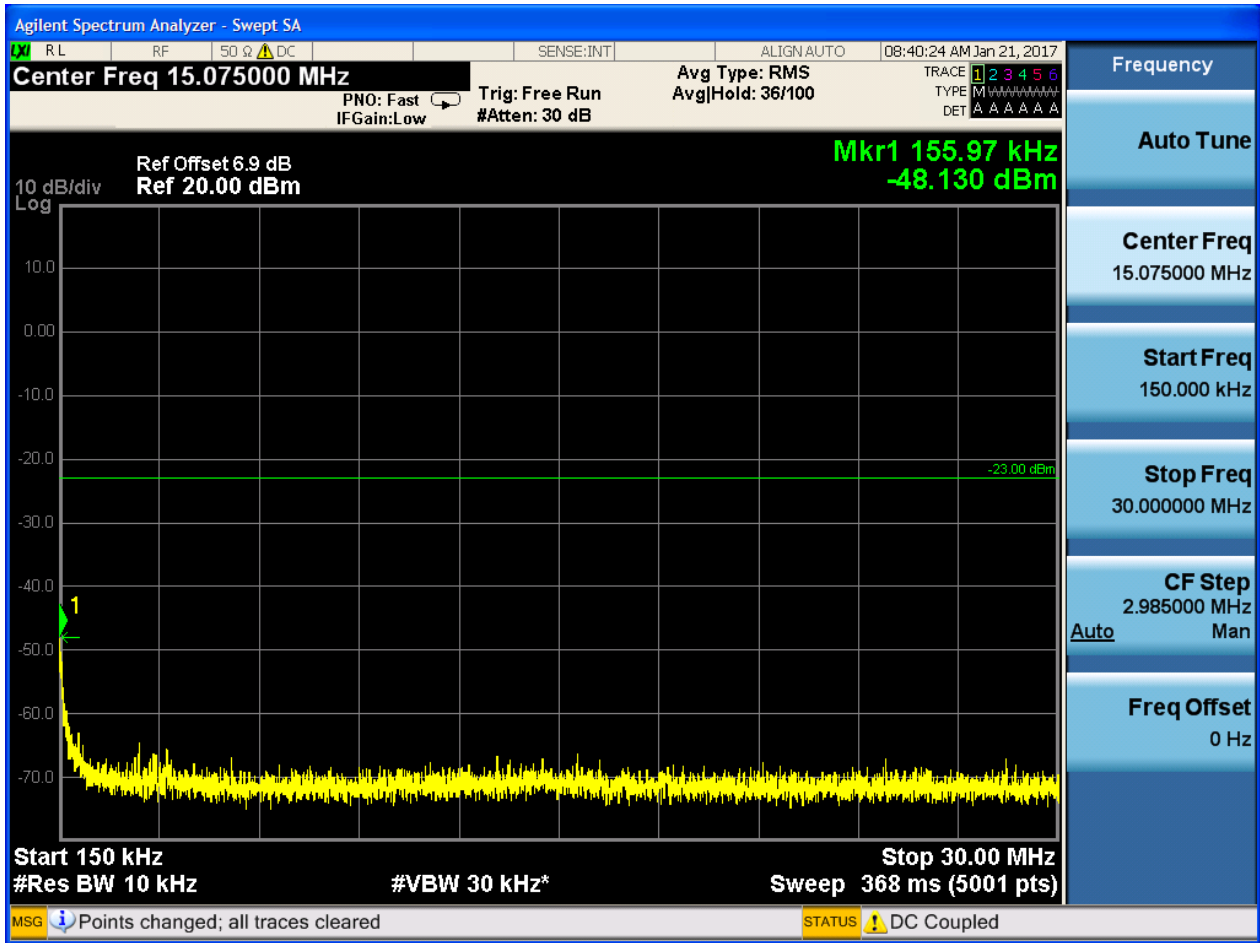


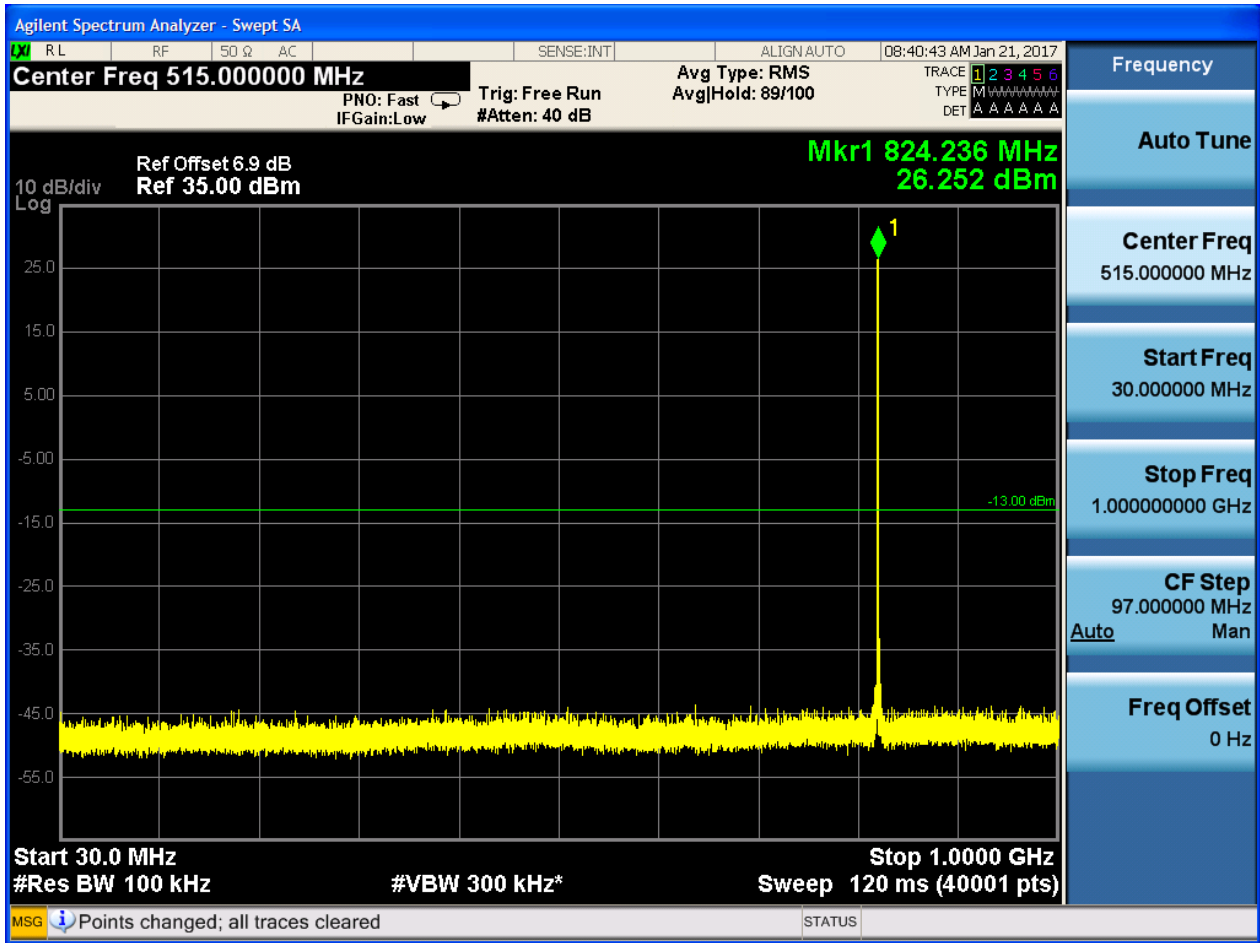


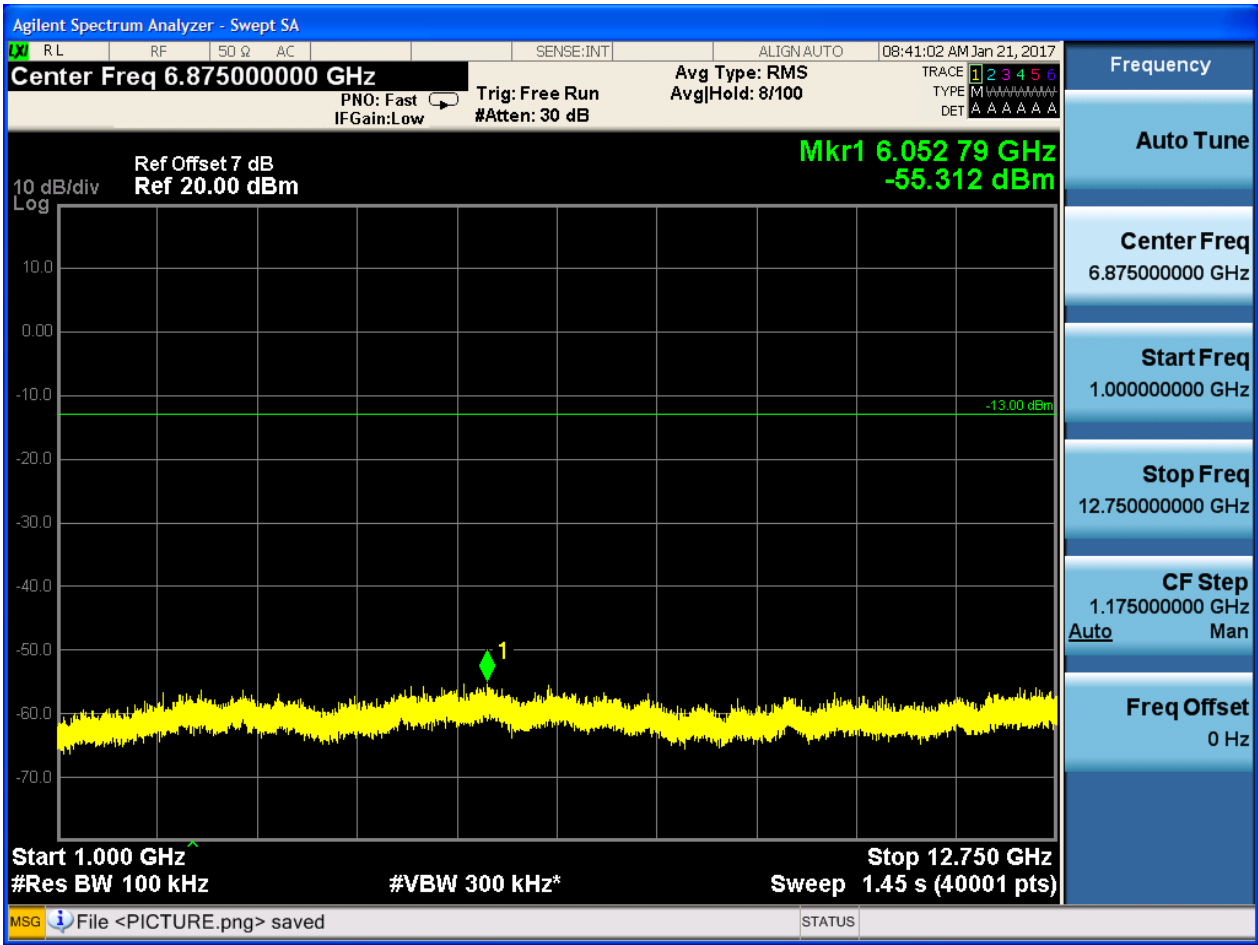
6.1.2.2 Test Mode = GSM/TM2

6.1.2.2.1 Test Channel = LCH





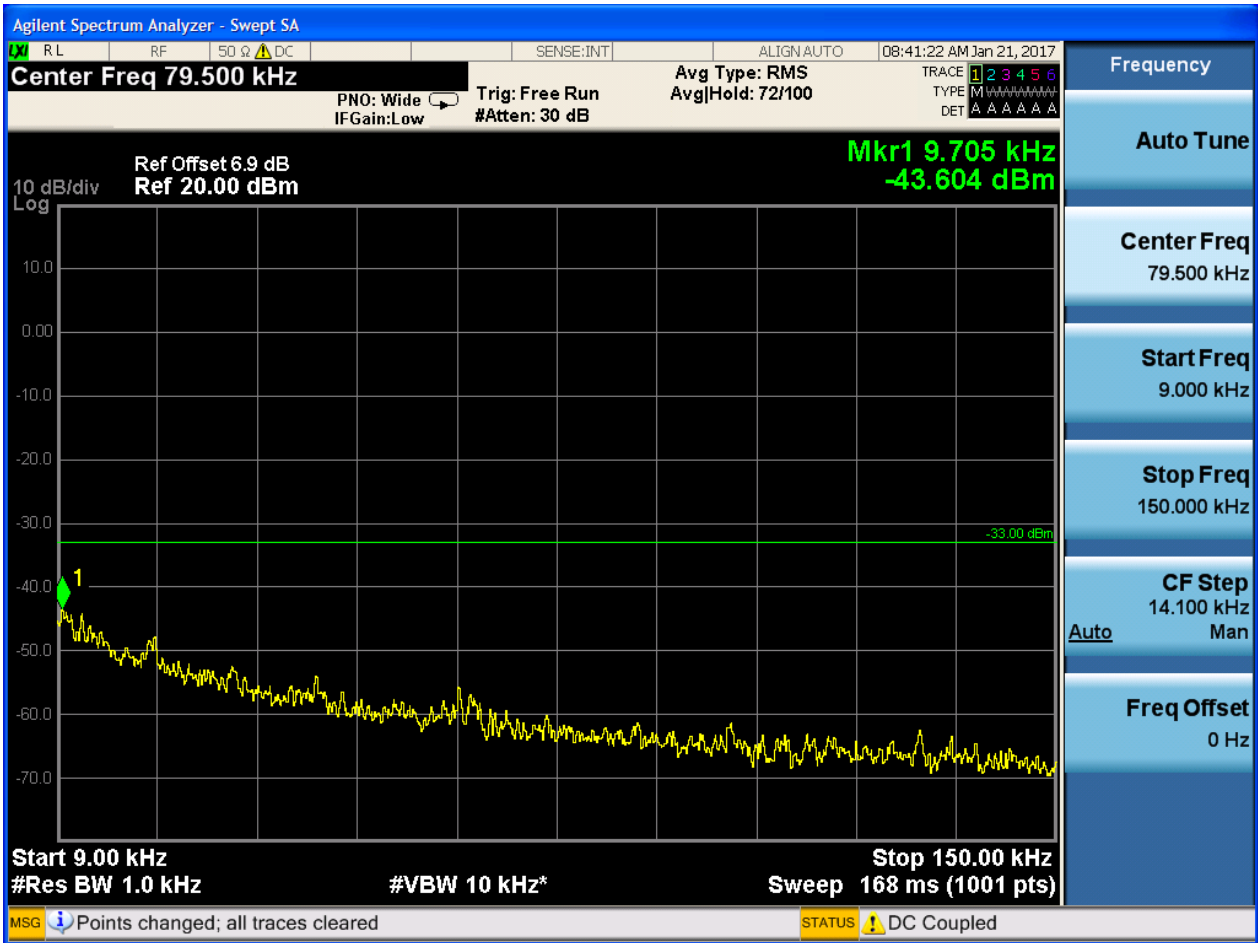


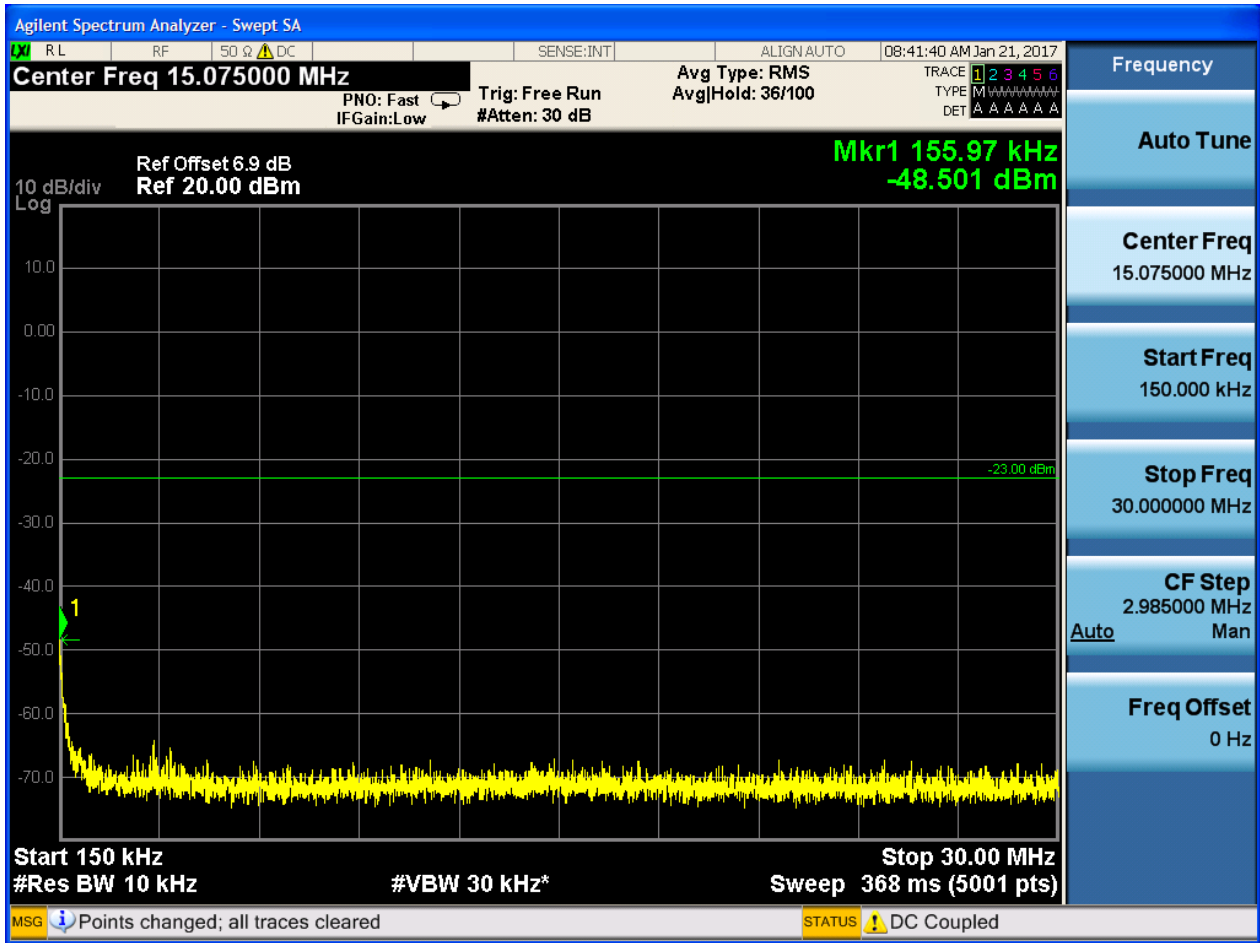


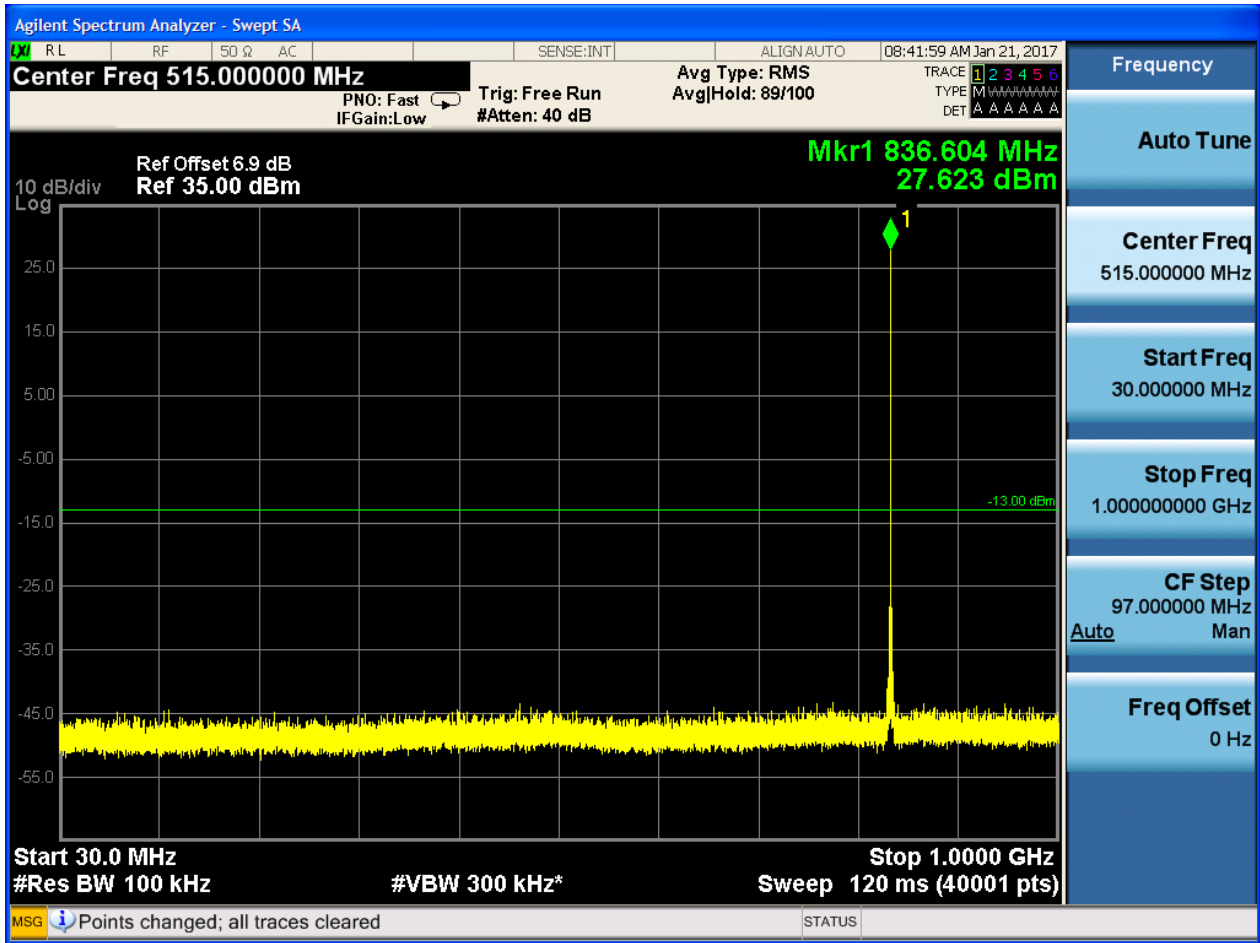


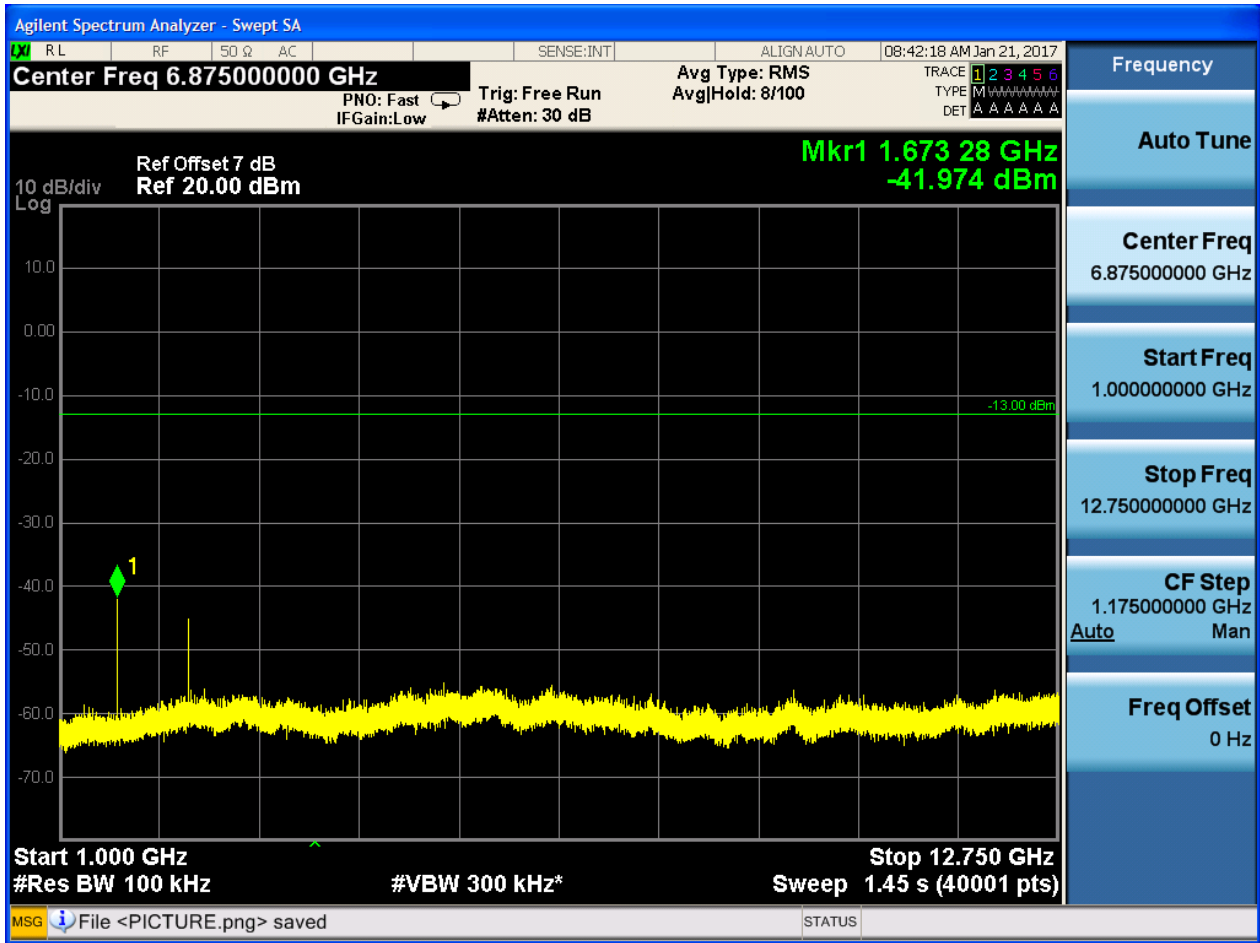


6.1.2.2.2 Test Channel = MCH



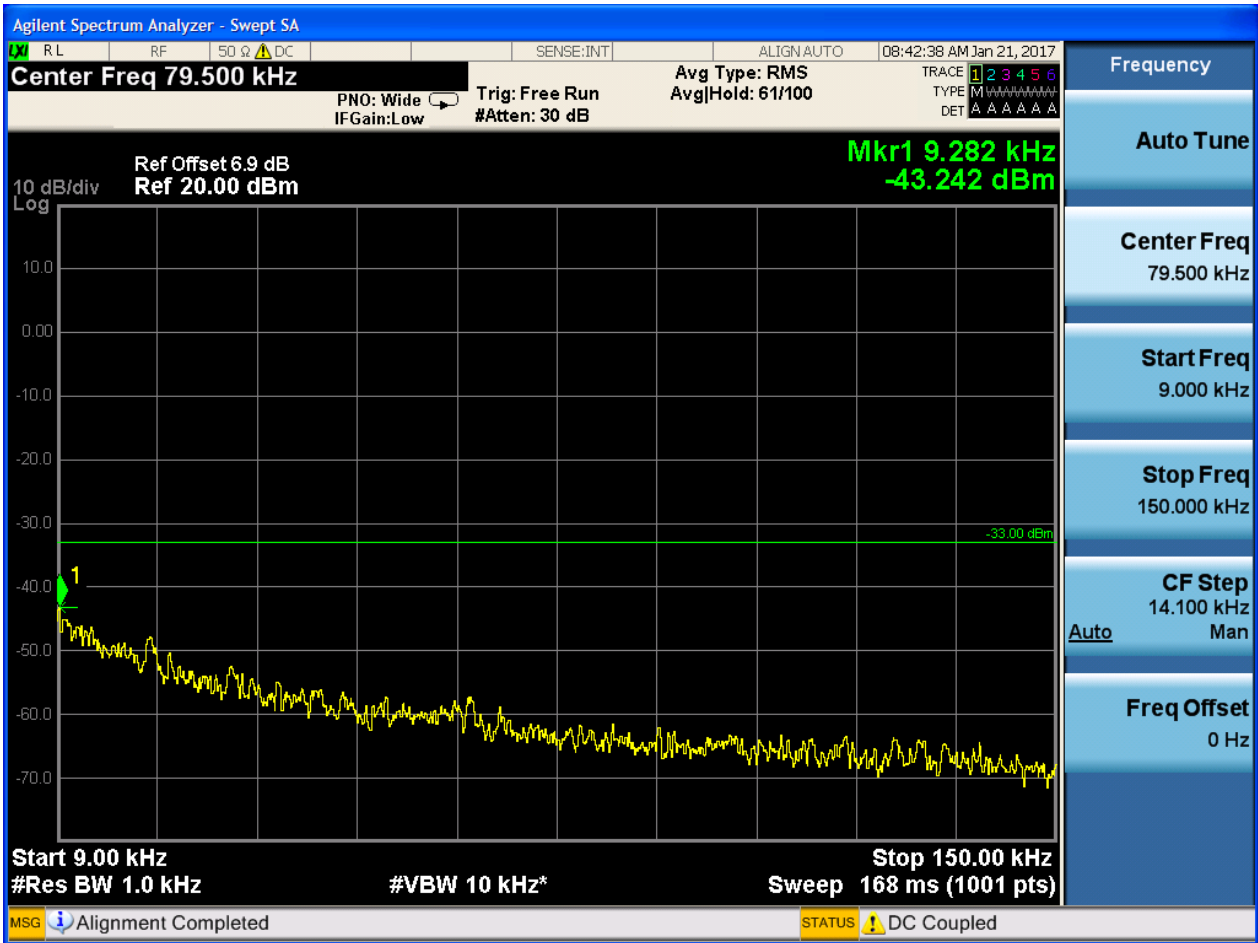


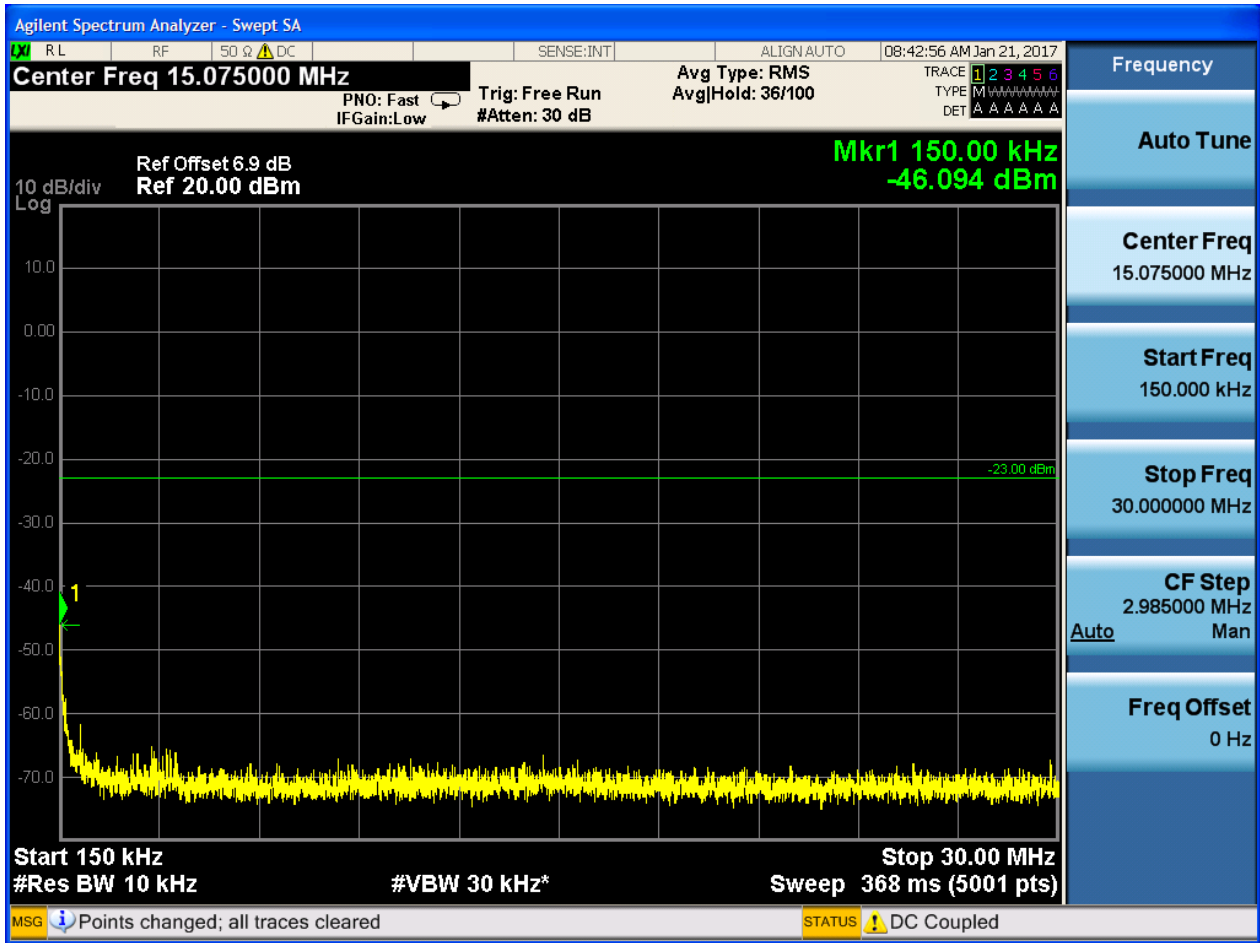


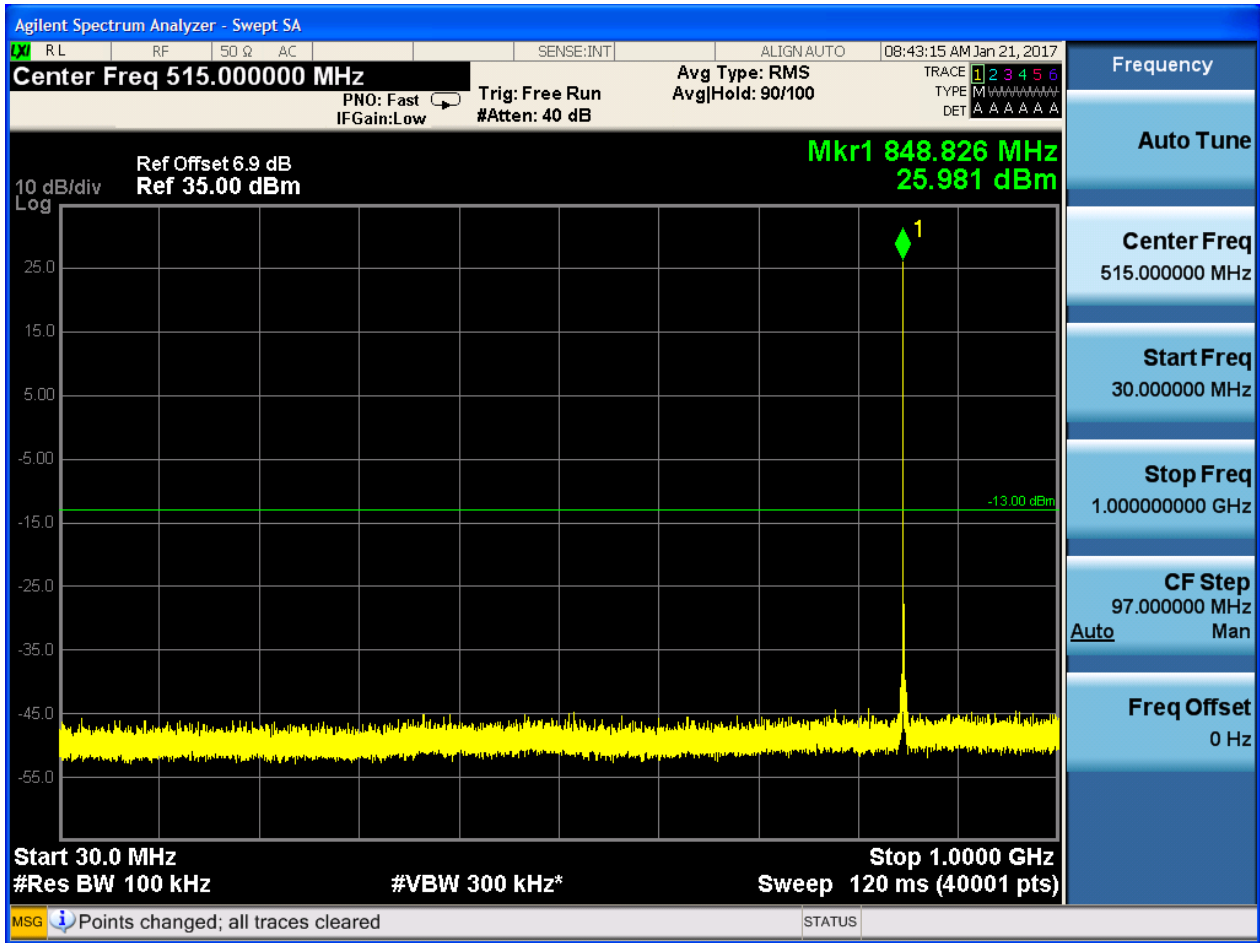


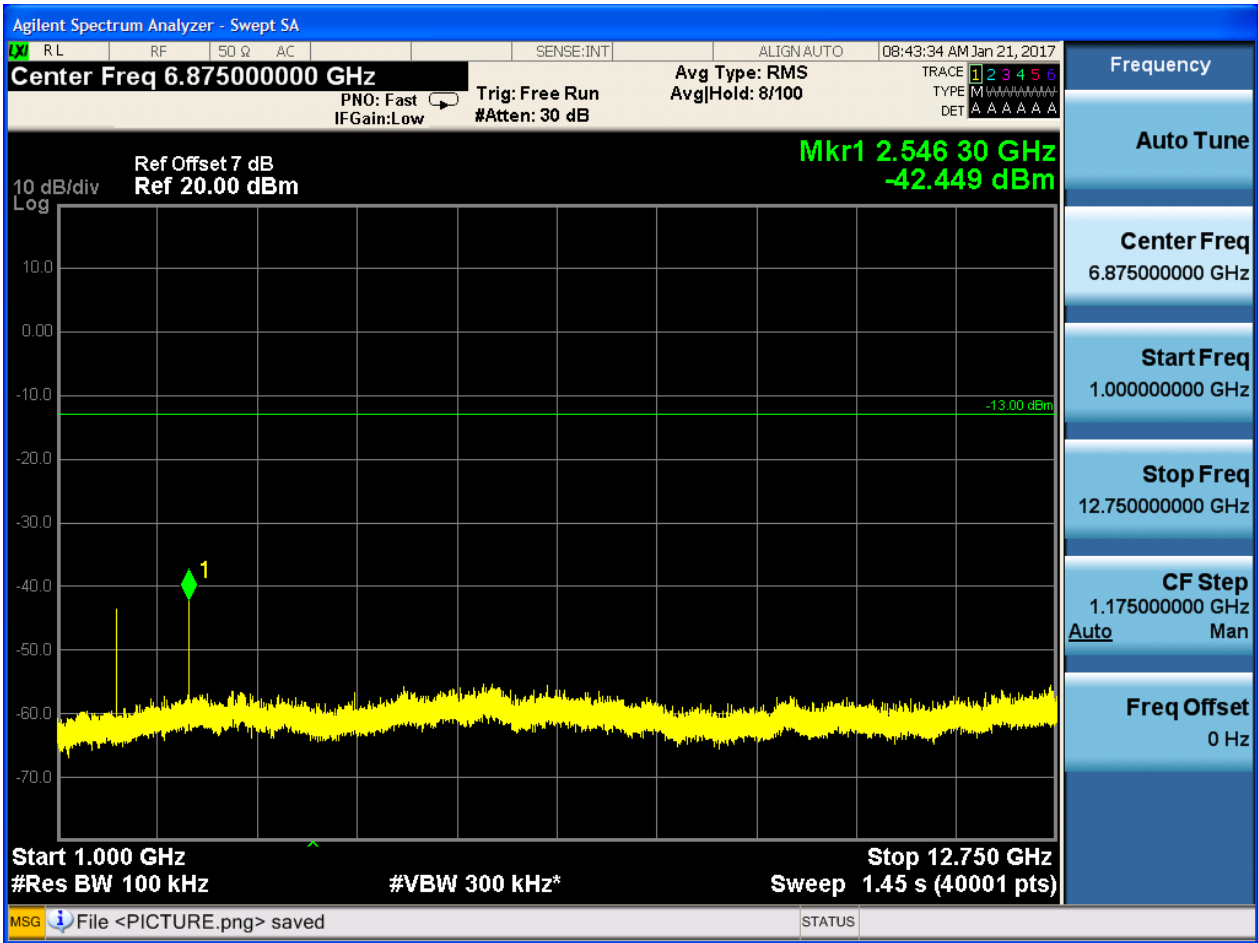


6.1.2.2.3 Test Channel = HCH













## 7Appendix\_G: Frequency Stability

### 7.1 For GSM

#### 7.1.1Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM1900	GSM/TM1	LCH	TN	VL	-21.18	-0.01145	PASS
				VN	-24.02	-0.01298	PASS
				VH	-30.35	-0.0164	PASS
		MCH	TN	VL	-14.21	-0.00756	PASS
				VN	-14.01	-0.00745	PASS
				VH	-10.53	-0.0056	PASS
		HCH	TN	VL	-9.56	-0.00501	PASS
				VN	-10.91	-0.00571	PASS
				VH	-10.20	-0.00534	PASS
	GSM/TM2	LCH	TN	VL	-28.80	-0.01557	PASS
				VN	-24.15	-0.01305	PASS
				VH	-21.53	-0.01164	PASS
		MCH	TN	VL	-22.96	-0.01221	PASS
				VN	-16.59	-0.00882	PASS
				VH	-16.01	-0.00852	PASS
		HCH	TN	VL	-3.49	-0.00183	PASS
				VN	-10.82	-0.00567	PASS
				VH	-6.46	-0.00338	PASS
GSM850	GSM/TM1	LCH	TN	VL	-14.53	-0.01763	PASS
				VN	-15.69	-0.01904	PASS
				VH	-13.82	-0.01677	PASS
		MCH	TN	VL	-15.69	-0.01875	PASS
				VN	-18.73	-0.02239	PASS
				VH	-19.44	-0.02324	PASS
	HCH	TN	VL	-13.17	-0.01552	PASS	
			VN	-14.53	-0.01712	PASS	
			VH	-15.43	-0.01818	PASS	
	GSM/TM2	LCH	TN	VL	-32.64	-0.0396	PASS
				VN	-31.38	-0.03807	PASS
				VH	-24.60	-0.02985	PASS
MCH		TN	VL	-22.44	-0.02682	PASS	

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VN	-38.23	-0.0457	PASS
				VH	-28.38	-0.03392	PASS
		HCH	TN	VL	-24.60	-0.02898	PASS
				VN	-21.86	-0.02575	PASS
				VH	-26.31	-0.031	PASS

**7.1.2 Frequency Error vs. Temperature:**

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM1900	GSM/TM1	LCH	VN	-30	-12.53	-0.00677	PASS
				-20	-17.11	-0.00925	PASS
				-10	-19.82	-0.01071	PASS
				0	-11.75	-0.00635	PASS
				10	-21.24	-0.01148	PASS
				20	-24.09	-0.01302	PASS
				30	-16.85	-0.00911	PASS
				40	-31.51	-0.01703	PASS
				50	-10.78	-0.00583	PASS
		MCH	VN	-30	-27.83	-0.0148	PASS
				-20	-6.07	-0.00323	PASS
				-10	-13.82	-0.00735	PASS
				0	-21.70	-0.01154	PASS
				10	-8.20	-0.00436	PASS
				20	-17.43	-0.00927	PASS
				30	-10.14	-0.00539	PASS
				40	-12.27	-0.00653	PASS
				50	-11.43	-0.00608	PASS
		HCH	VN	-30	0.65	0.00034	PASS
				-20	-7.81	-0.00409	PASS
				-10	-12.79	-0.0067	PASS
				0	3.62	0.0019	PASS
				10	-16.79	-0.00879	PASS
				20	3.03	0.00159	PASS
				30	4.71	0.00247	PASS
				40	3.16	0.00165	PASS
				50	-0.97	-0.00051	PASS
	GSM/TM2	LCH	VN	-30	-24.05	-0.013	PASS
				-20	-28.22	-0.01525	PASS
				-10	-27.12	-0.01466	PASS



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
				0	-21.02	-0.01136	PASS		
				10	-23.47	-0.01269	PASS		
				20	-18.66	-0.01009	PASS		
				30	-23.96	-0.01295	PASS		
				40	-33.84	-0.01829	PASS		
				50	-31.80	-0.01719	PASS		
		MCH	VN	-30	-14.69	-0.00781	PASS		
				-20	-20.05	-0.01066	PASS		
				-10	-15.37	-0.00818	PASS		
				0	-22.57	-0.01201	PASS		
				10	-12.98	-0.0069	PASS		
				20	-22.57	-0.01201	PASS		
				30	-10.72	-0.0057	PASS		
				40	-28.99	-0.01542	PASS		
		HCH	VN	50	-17.27	-0.00919	PASS		
				-30	-1.97	-0.00103	PASS		
				-20	-16.95	-0.00888	PASS		
				-10	-11.14	-0.00583	PASS		
				0	-16.37	-0.00857	PASS		
				10	-33.00	-0.01728	PASS		
				20	-22.50	-0.01178	PASS		
				30	-10.49	-0.00549	PASS		
		GSM850	GSM/TM1	LCH	VN	40	0.03	0.00002	PASS
						50	-12.17	-0.00637	PASS
						-30	-14.72	-0.01786	PASS
						-20	-14.98	-0.01818	PASS
						-10	-13.56	-0.01645	PASS
						0	-15.17	-0.01841	PASS
10	-12.27					-0.01489	PASS		
20	-19.18					-0.02327	PASS		
MCH	VN			30	-14.40	-0.01747	PASS		
				40	-15.63	-0.01896	PASS		
				50	-15.88	-0.01927	PASS		
				-30	-18.08	-0.02161	PASS		
				-20	-11.88	-0.0142	PASS		
				-10	-16.59	-0.01983	PASS		
				0	-13.95	-0.01667	PASS		
				10	-12.53	-0.01498	PASS		
				20	-14.85	-0.01775	PASS		
				30	-17.63	-0.02107	PASS		



Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		HCH	VN	40	-7.43	-0.00888	PASS
				50	-12.53	-0.01498	PASS
				-30	-12.59	-0.01483	PASS
				-20	-15.88	-0.01871	PASS
				-10	-7.88	-0.00928	PASS
				0	-15.76	-0.01857	PASS
				10	-9.69	-0.01142	PASS
				20	-15.50	-0.01826	PASS
				30	-19.18	-0.0226	PASS
				40	-15.50	-0.01826	PASS
				50	-10.33	-0.01217	PASS
				GSM/TM2	LCH	VN	-30
	-20	-32.00	-0.03883				PASS
	-10	-18.53	-0.02248				PASS
	0	-29.90	-0.03628				PASS
	10	-19.34	-0.02347				PASS
	20	-27.06	-0.03283				PASS
	30	-38.26	-0.04642				PASS
	40	-32.77	-0.03976				PASS
	50	-26.15	-0.03173				PASS
	MCH	VN	-30		-23.37	-0.02793	PASS
			-20		-29.28	-0.035	PASS
			-10		-34.29	-0.04099	PASS
			0		-28.73	-0.03434	PASS
			10		-34.22	-0.0409	PASS
			20		-23.28	-0.02783	PASS
			30		-30.09	-0.03597	PASS
			40		-31.03	-0.03709	PASS
	HCH	VN	50		-20.50	-0.0245	PASS
			-30		-30.96	-0.03648	PASS
			-20		-15.59	-0.01837	PASS
			-10		-26.05	-0.03069	PASS
0			-28.48		-0.03355	PASS	
10			-27.57		-0.03248	PASS	
20			-28.67		-0.03378	PASS	
30	-21.60	-0.02545	PASS				
40	-24.73	-0.02914	PASS				
50	-32.48	-0.03827	PASS				

END