



# 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]	ERP [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	32.32	27.74	38.5	PASS
		MCH	32.49	27.84	38.5	PASS
		HCH	32.77	27.95	38.5	PASS
	GSM/TM2	LCH	26.2	21.40	38.5	PASS
		MCH	26.17	21.60	38.5	PASS
		HCH	26.06	21.39	38.5	PASS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
GSM1900	GSM/TM1	LCH	30.47	29.46	33	PASS
		MCH	30.19	29.01	33	PASS
		HCH	30.21	28.98	33	PASS
	GSM/TM2	LCH	25.54	24.43	33	PASS
		MCH	25.58	24.57	33	PASS



Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP [dBm]	Limit [dBm]	Verdict
		HCH	25.52	24.48	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
GSM850	GSM/TM1	LCH	0.31	13	PASS
		MCH	0.32	13	PASS
		HCH	0.34	13	PASS
	GSM/TM2	LCH	2.89	13	PASS
		MCH	2.87	13	PASS
		HCH	2.77	13	PASS
GSM1900	GSM/TM1	LCH	0.32	13	PASS
		MCH	0.39	13	PASS
		HCH	0.39	13	PASS
	GSM/TM2	LCH	3.05	13	PASS
		MCH	3.14	13	PASS
		HCH	3	13	PASS

### 3Appendix\_C: Modulation Characteristics

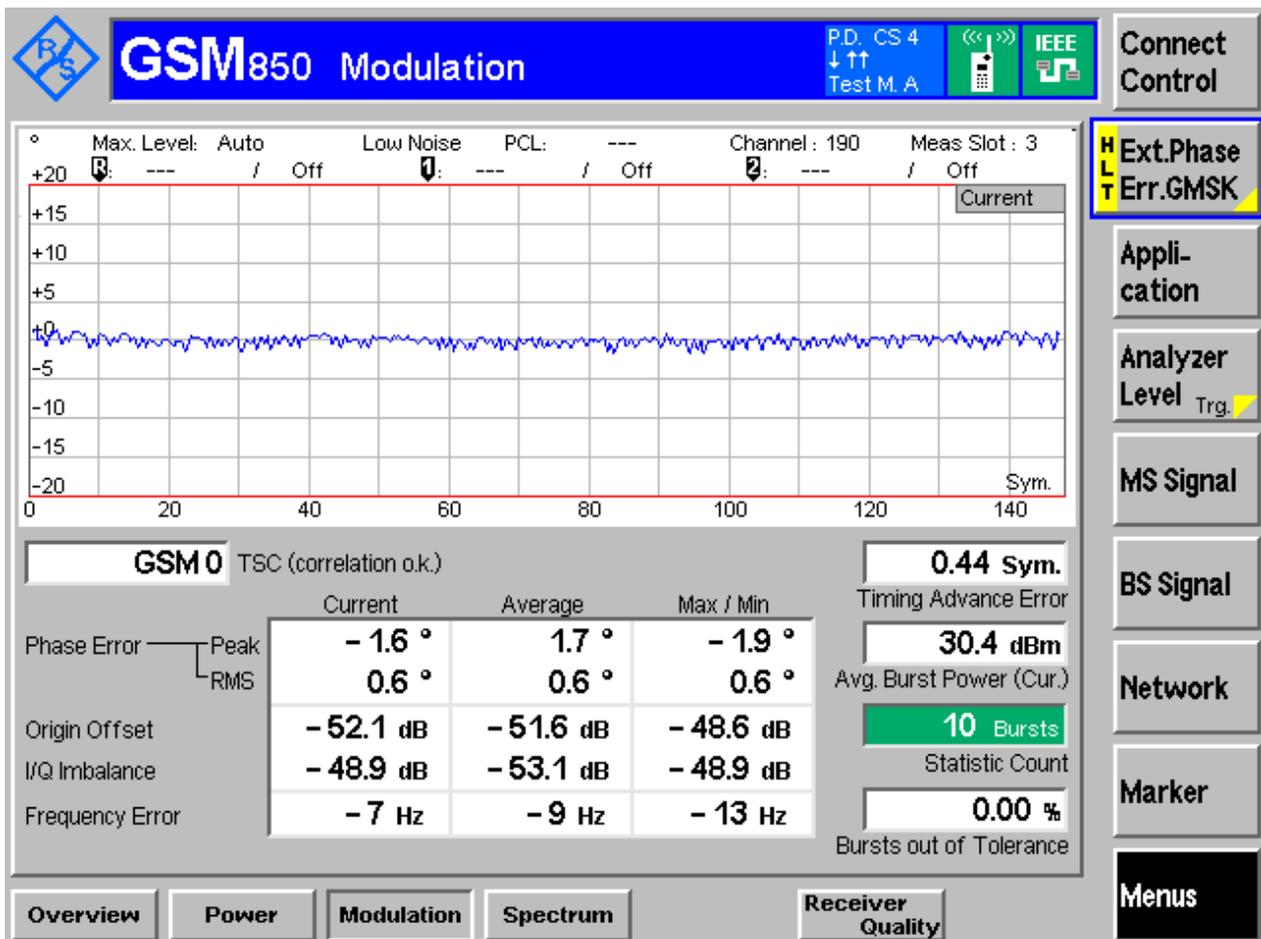
#### Part I - Test Plots

#### 3.1 For GSM

#### 3.1.1 Test Band = GSM850

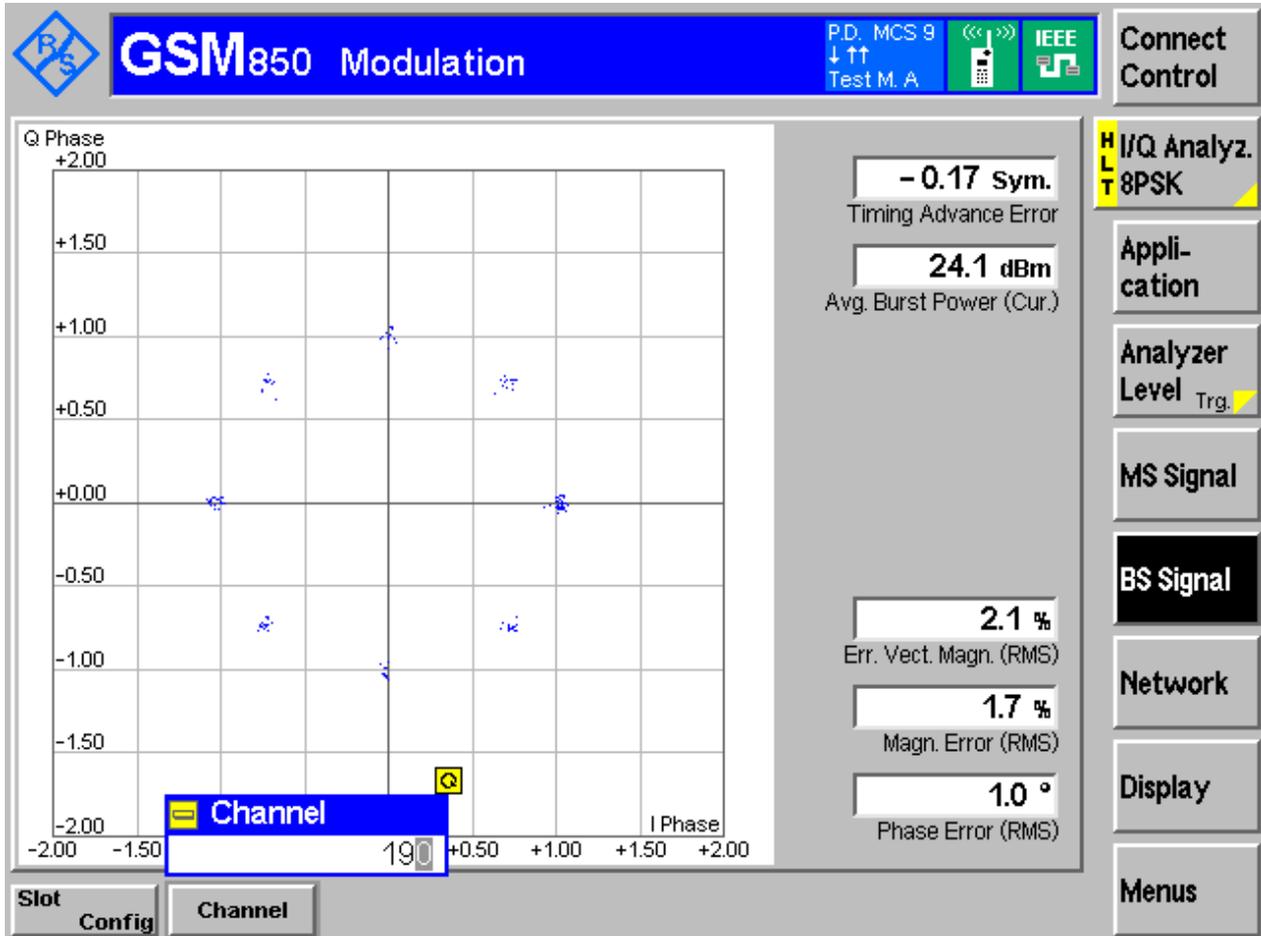
#### 3.1.1.1 Test Mode = GSM/TM1

#### 3.1.1.1.1 Test Channel = MCH



### 3.1.1.2 Test Mode = GSM/TM2

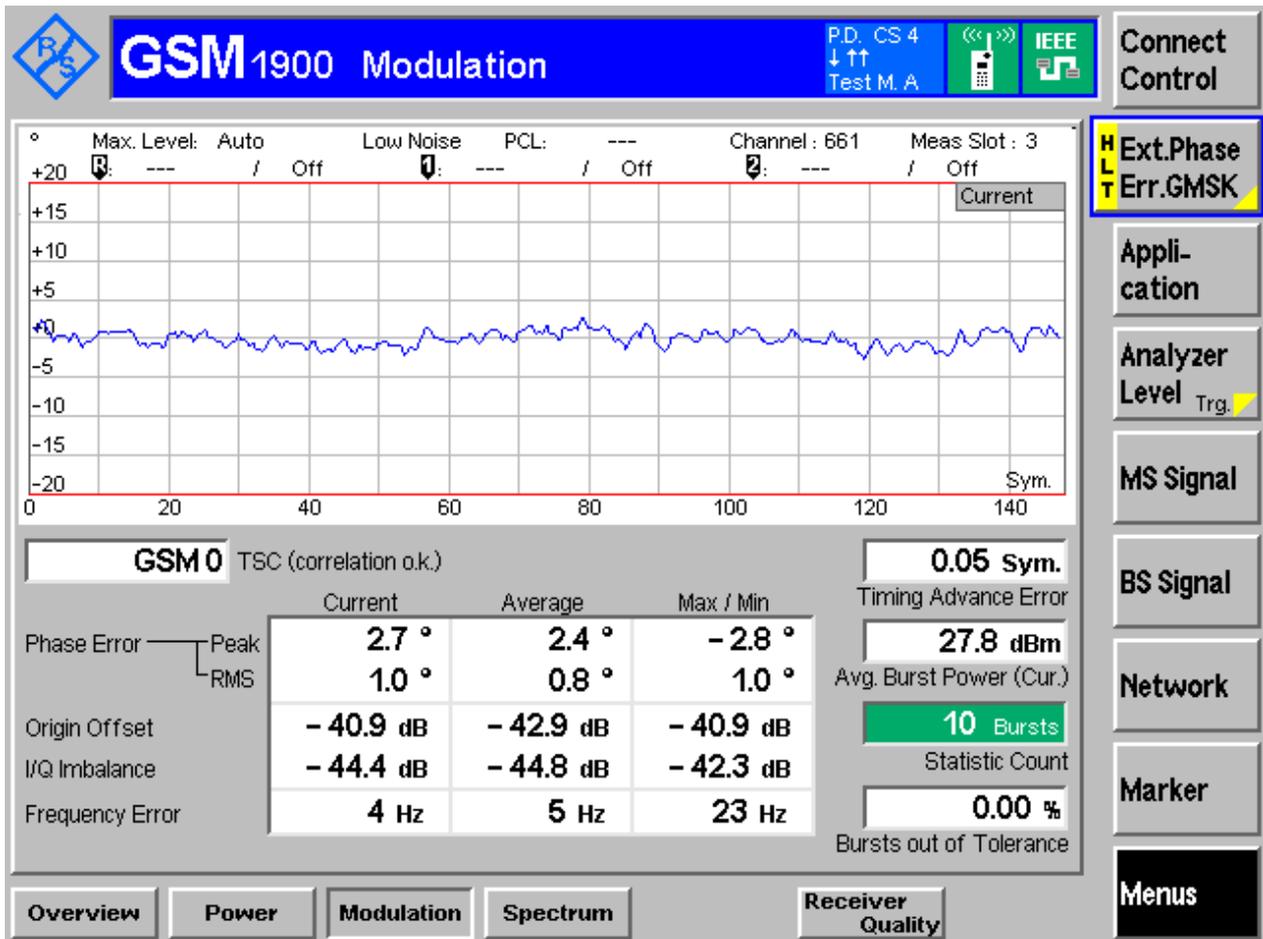
#### 3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

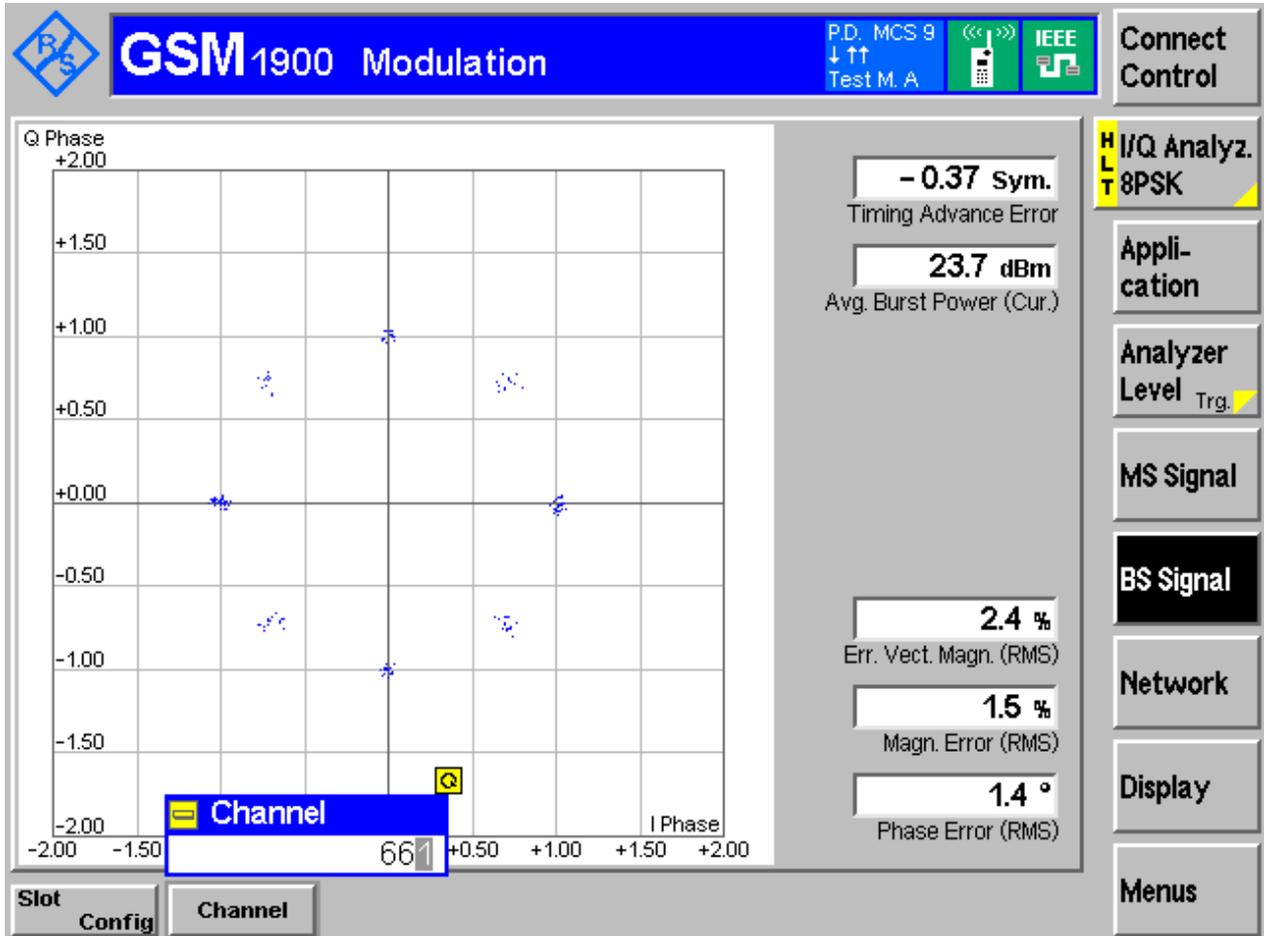
3.1.2.1 Test Mode = GSM/TM1

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	242.69	311.12	Pass
		MCH	243.18	306.76	Pass
		HCH	245.42	308.65	Pass
	GSM/TM2	LCH	252.76	321.74	Pass
		MCH	250.90	323.75	Pass
		HCH	251.44	324.42	Pass
GSM1900	GSM/TM1	LCH	243.63	315.94	Pass
		MCH	243.94	314.41	Pass
		HCH	246.53	321.24	Pass
	GSM/TM2	LCH	250.15	324.13	Pass
		MCH	250.79	317.88	Pass
		HCH	253.40	318.86	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





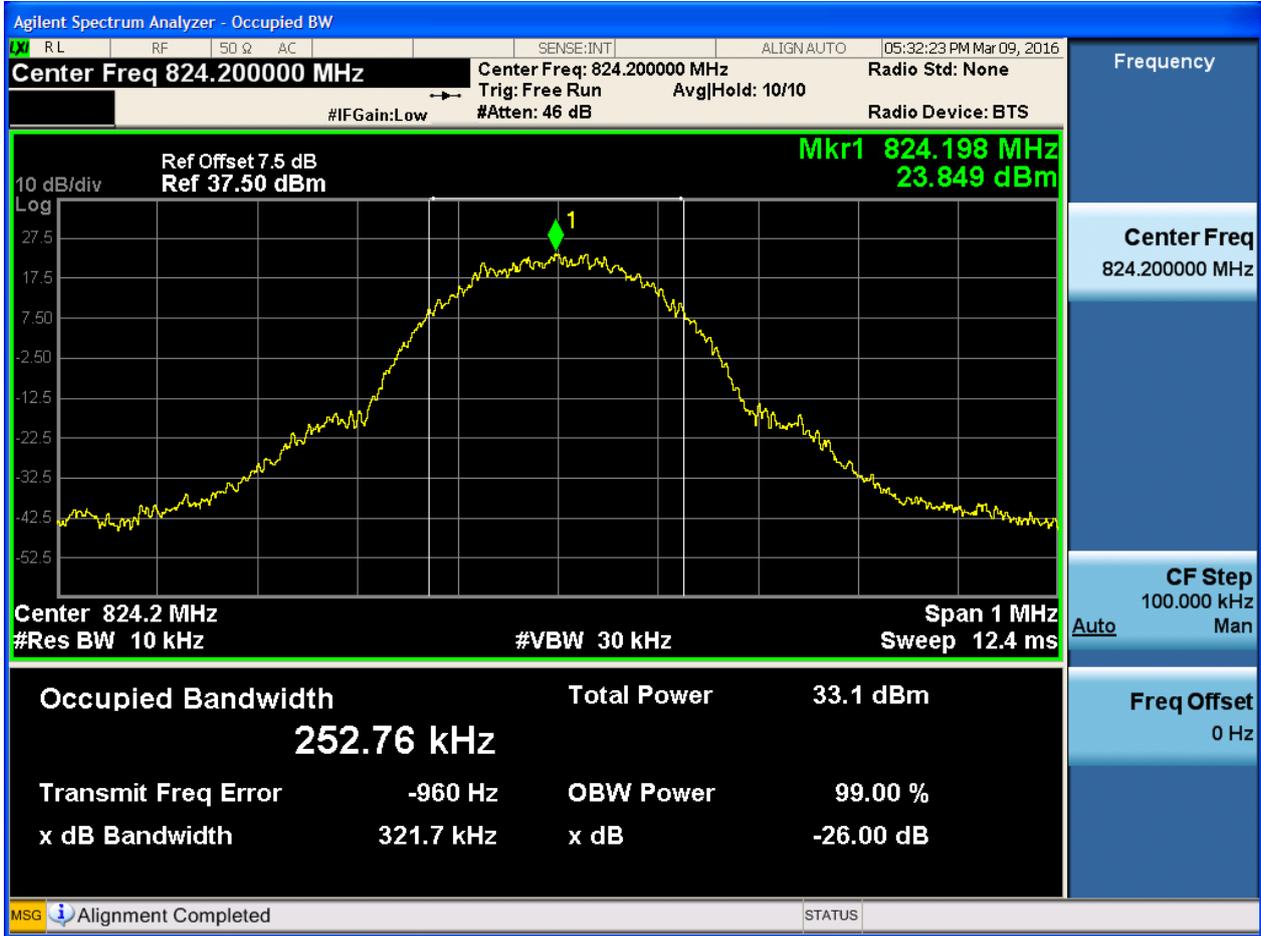
4.1.1.1.3 Test Channel = HCH





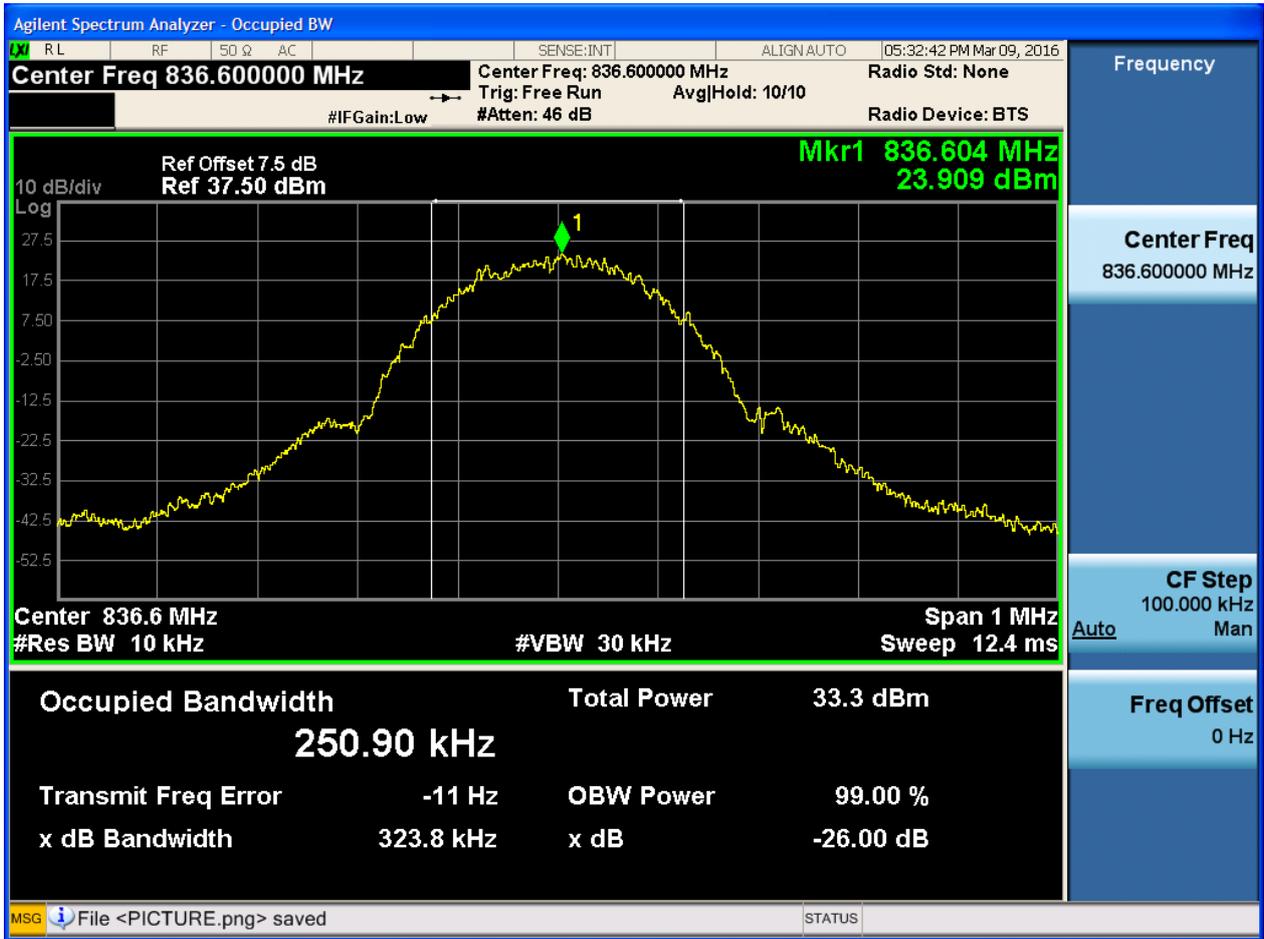
4.1.1.2 Test Mode = GSM/TM2

4.1.1.2.1 Test Channel = LCH



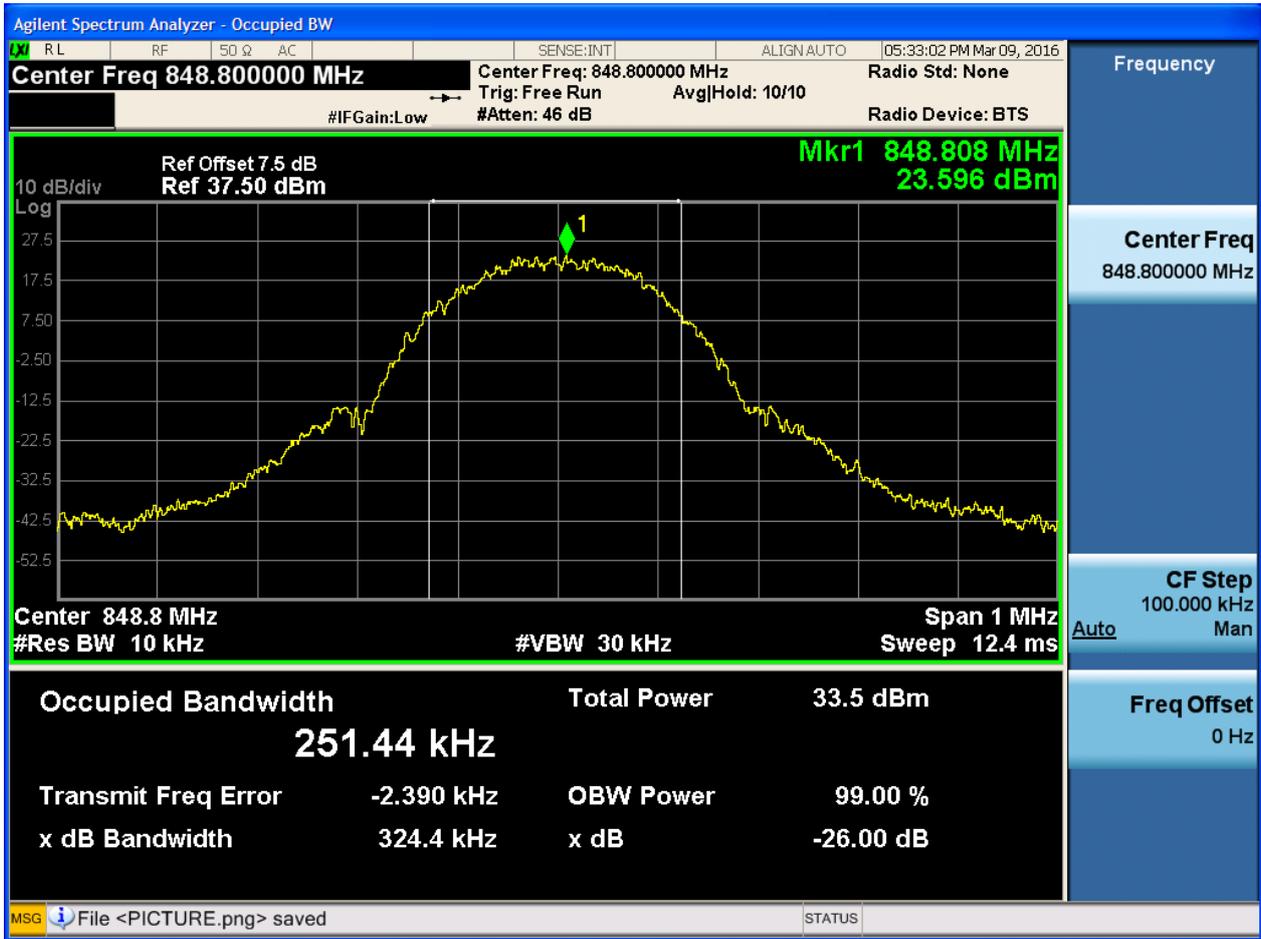


4.1.1.2.2 Test Channel = MCH





4.1.1.2.3 Test Channel = HCH





4.1.2 Test Band = GSM1900

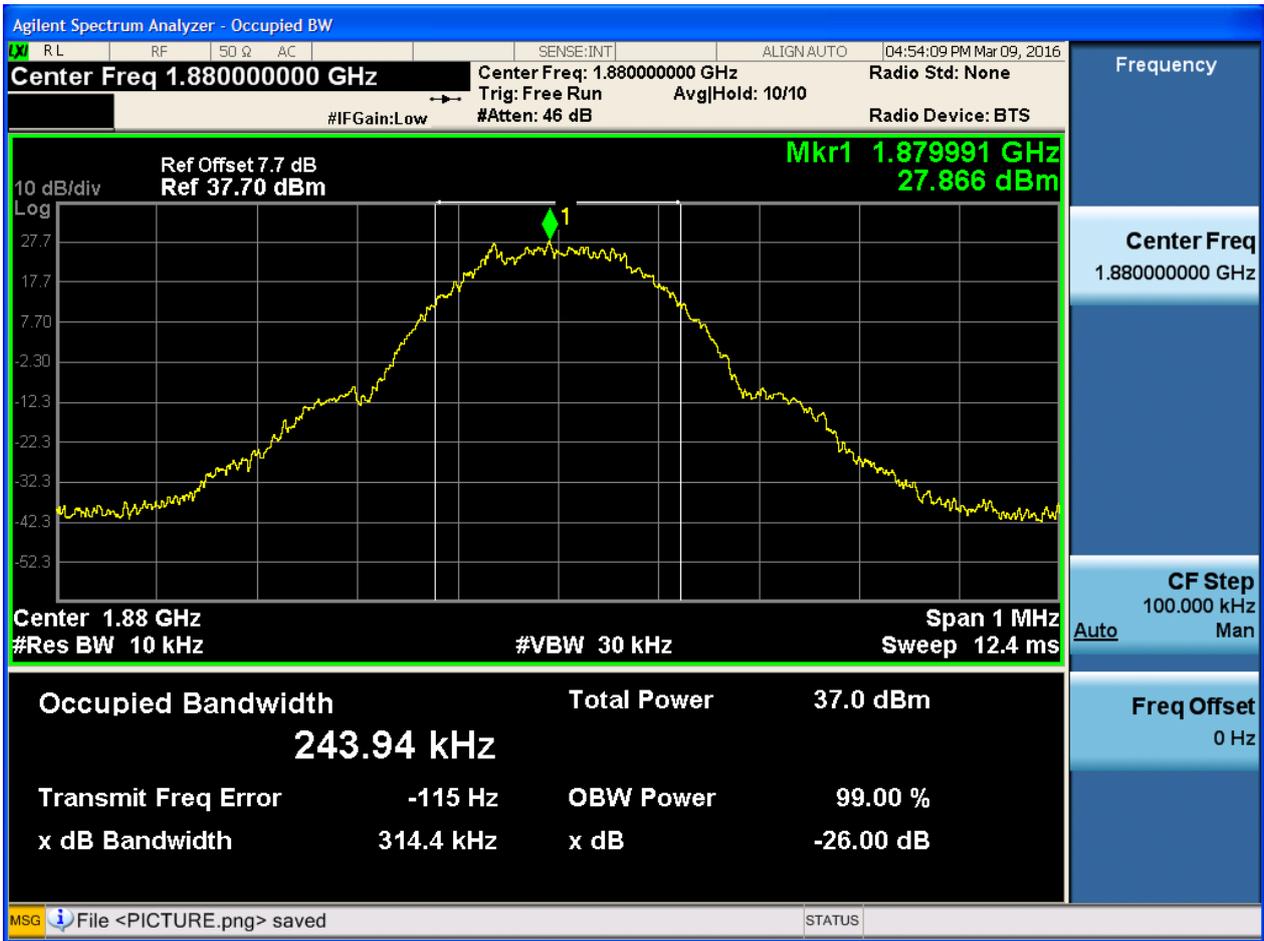
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH



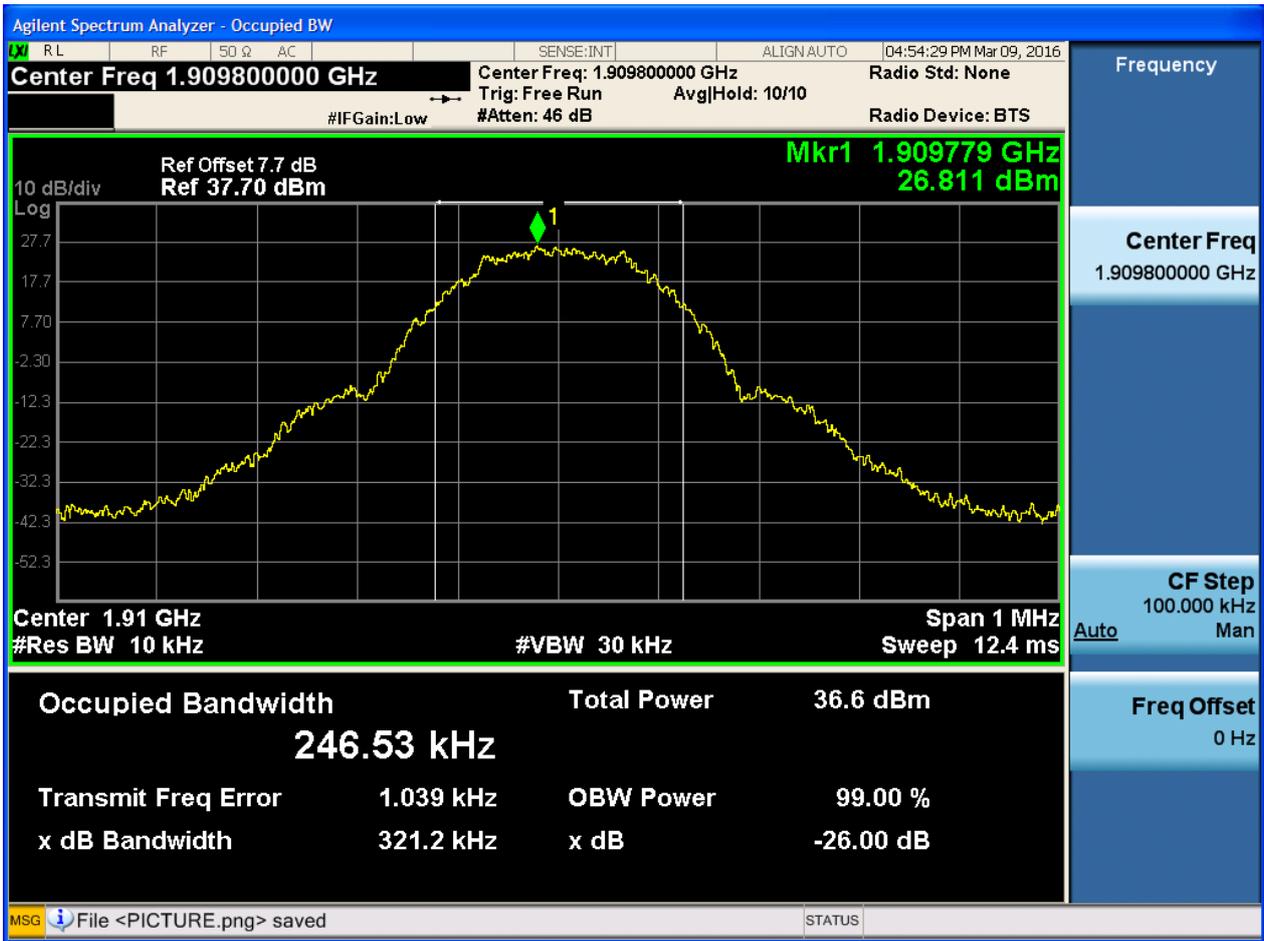


4.1.2.1.2 Test Channel = MCH





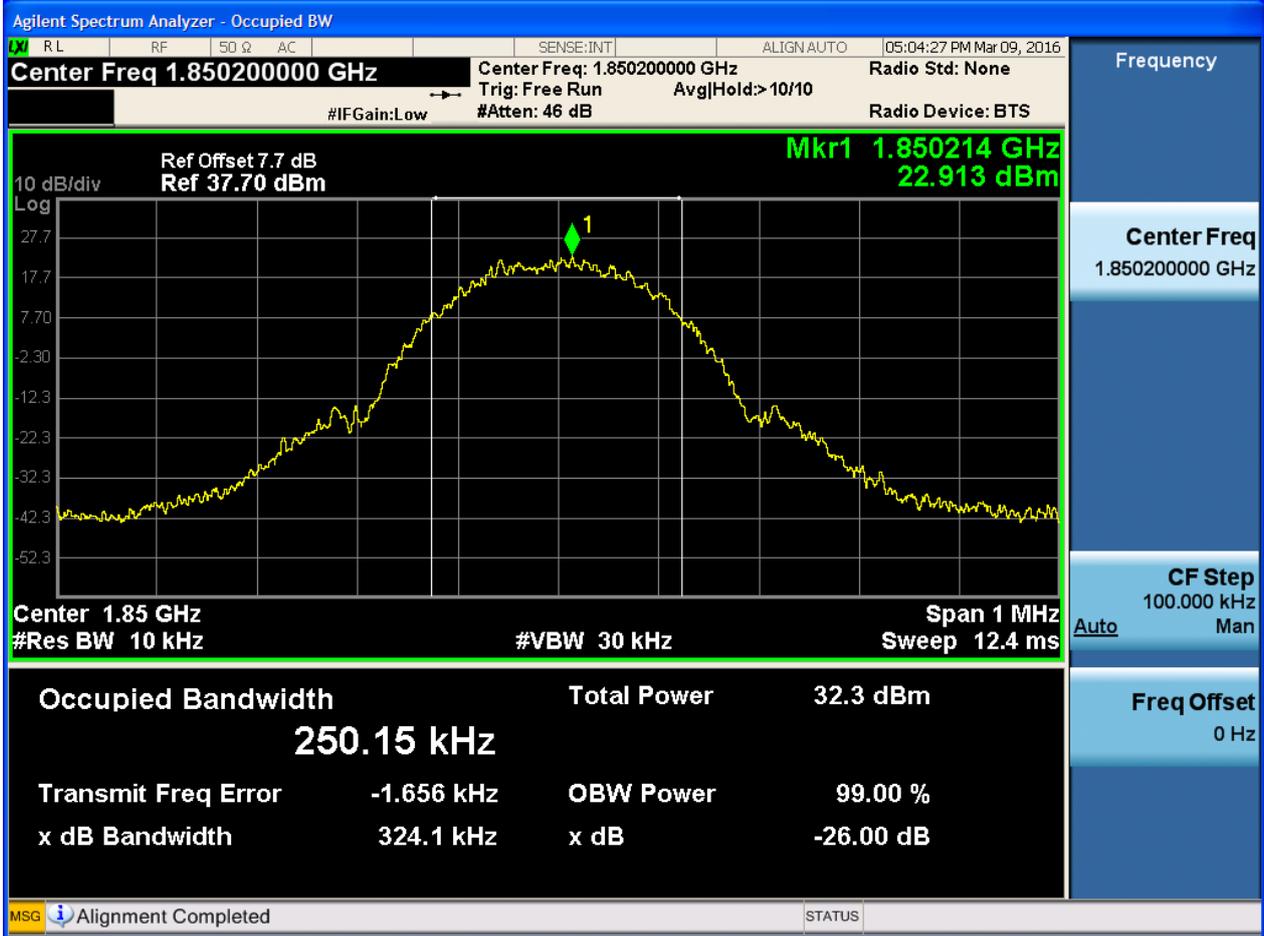
4.1.2.1.3 Test Channel = HCH





4.1.2.2 Test Mode = GSM/TM2

4.1.2.2.1 Test Channel = LCH



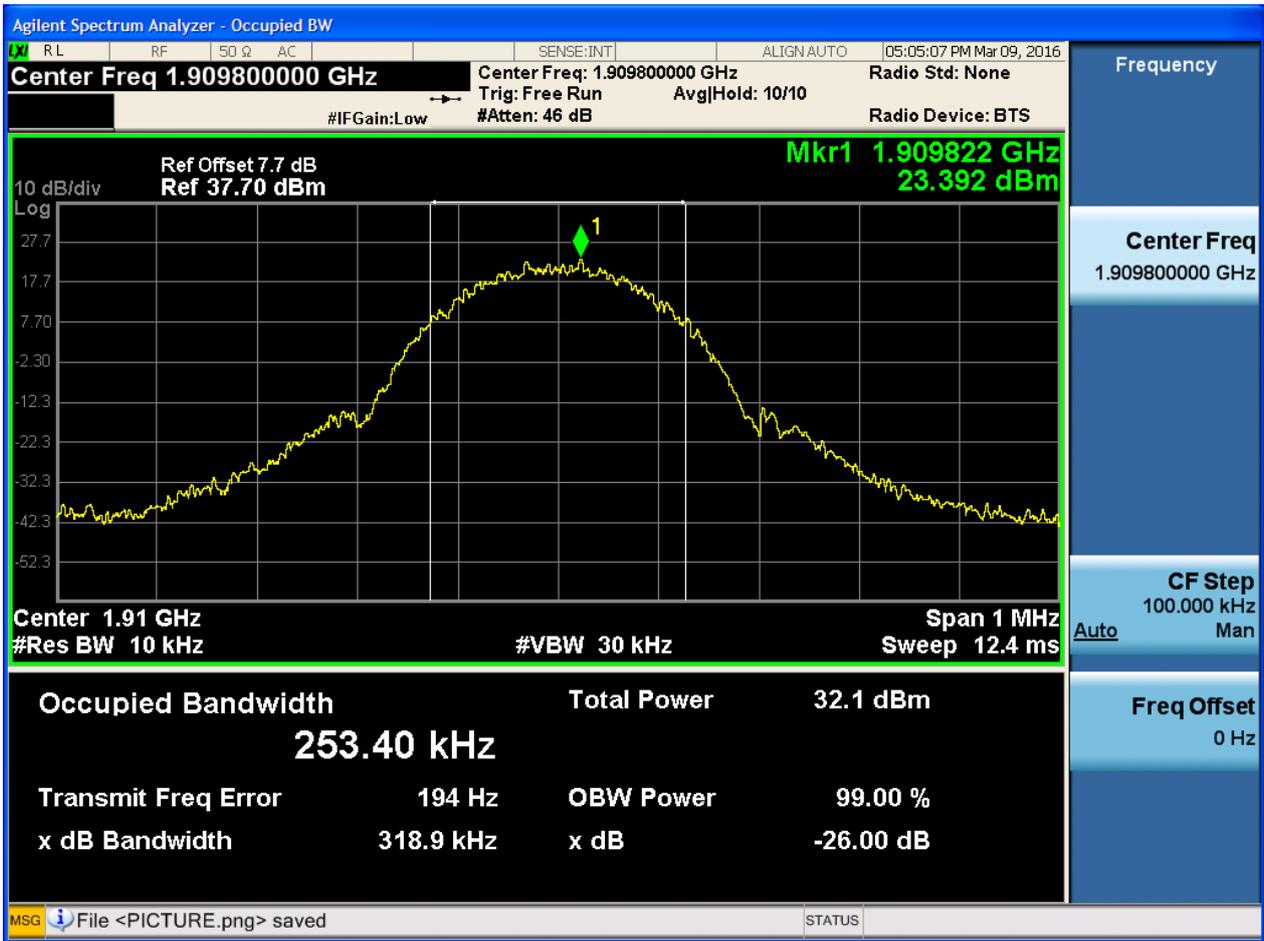


4.1.2.2.2 Test Channel = MCH





4.1.2.2.3 Test Channel = HCH





## 5Appendix\_E: Band Edges Compliance

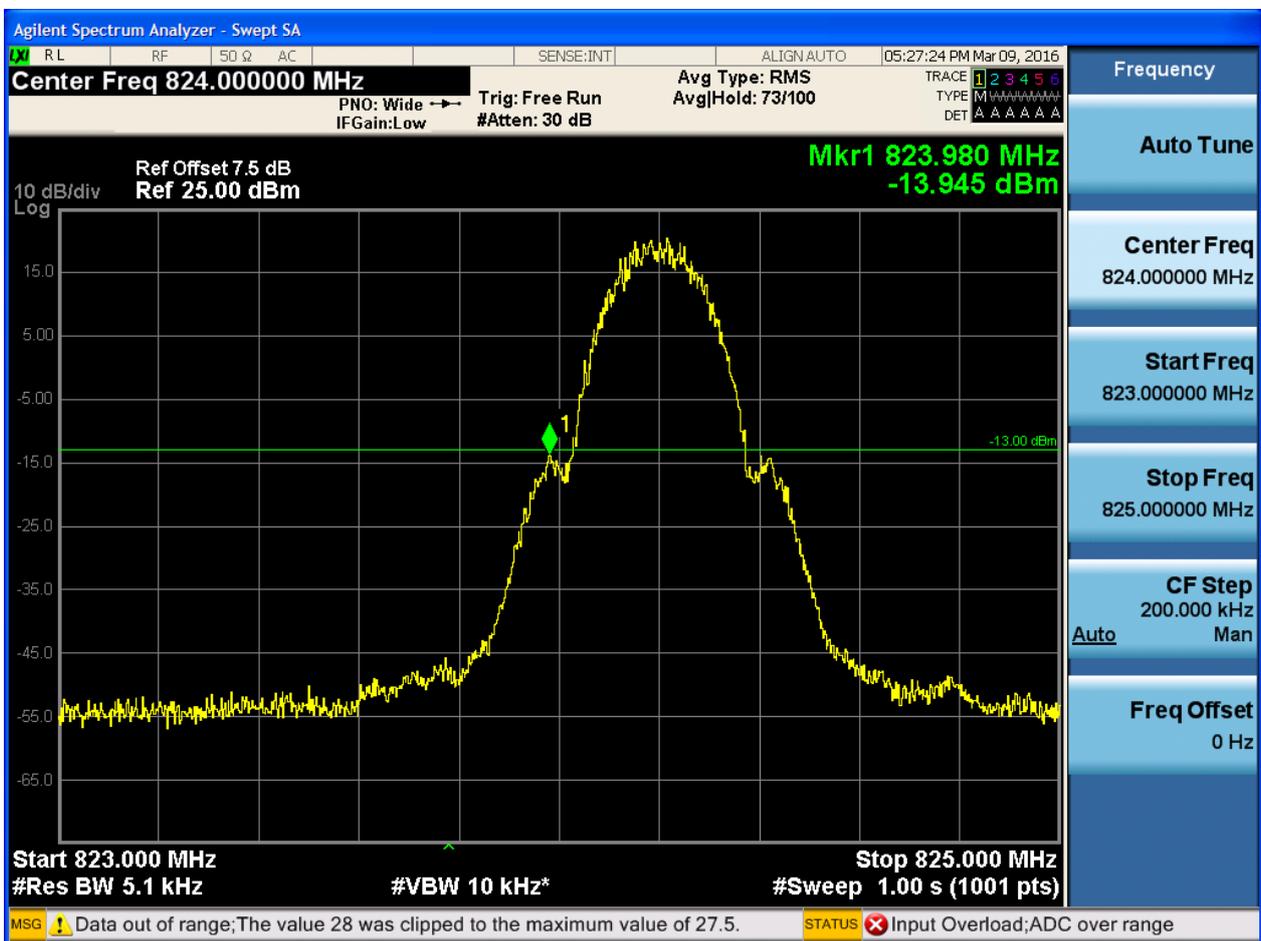
### Part I - Test Plots

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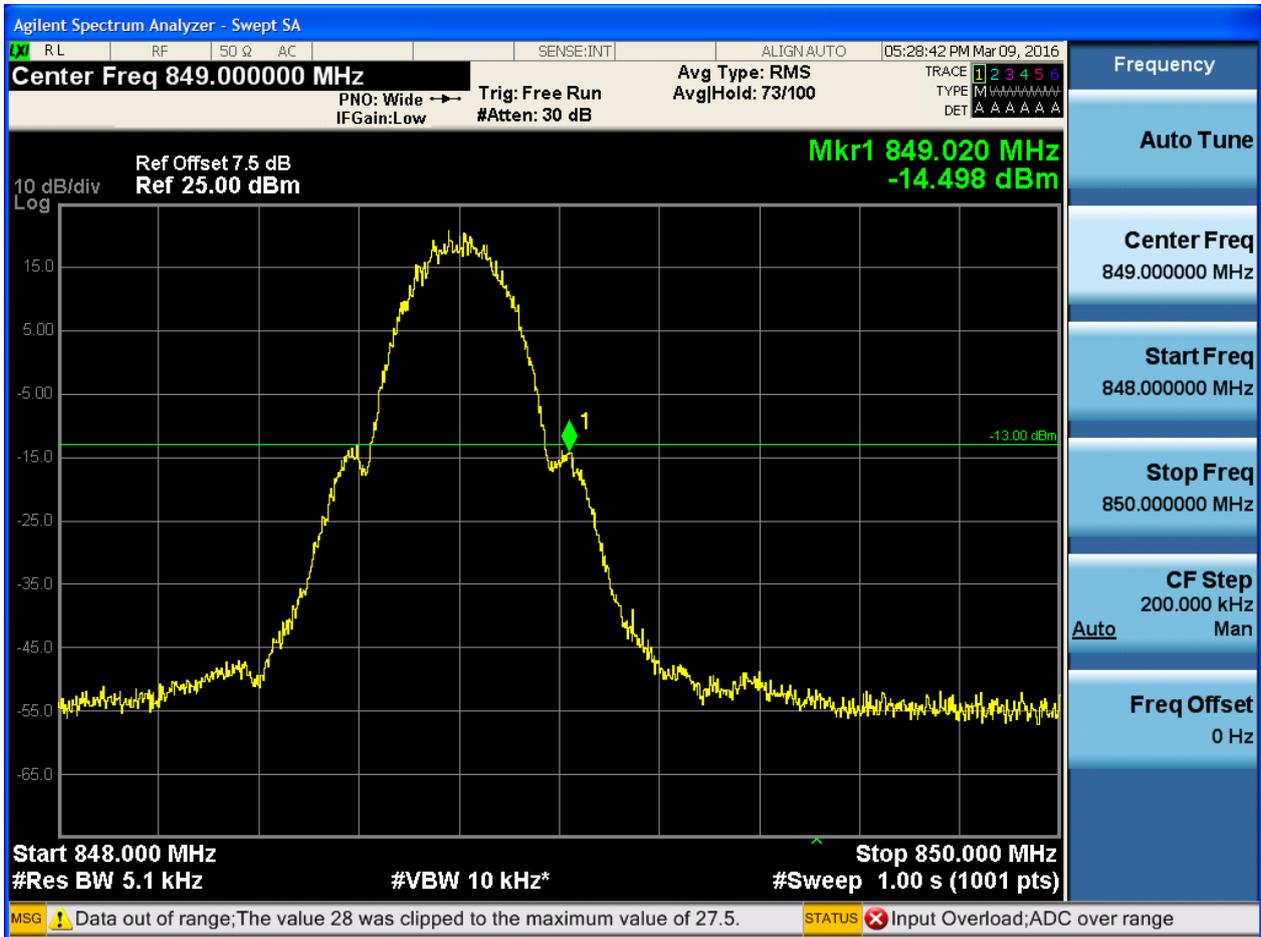
##### 5.1.1 Test Band = GSM850

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

##### 5.1.1.1.1 Test Channel = LCH



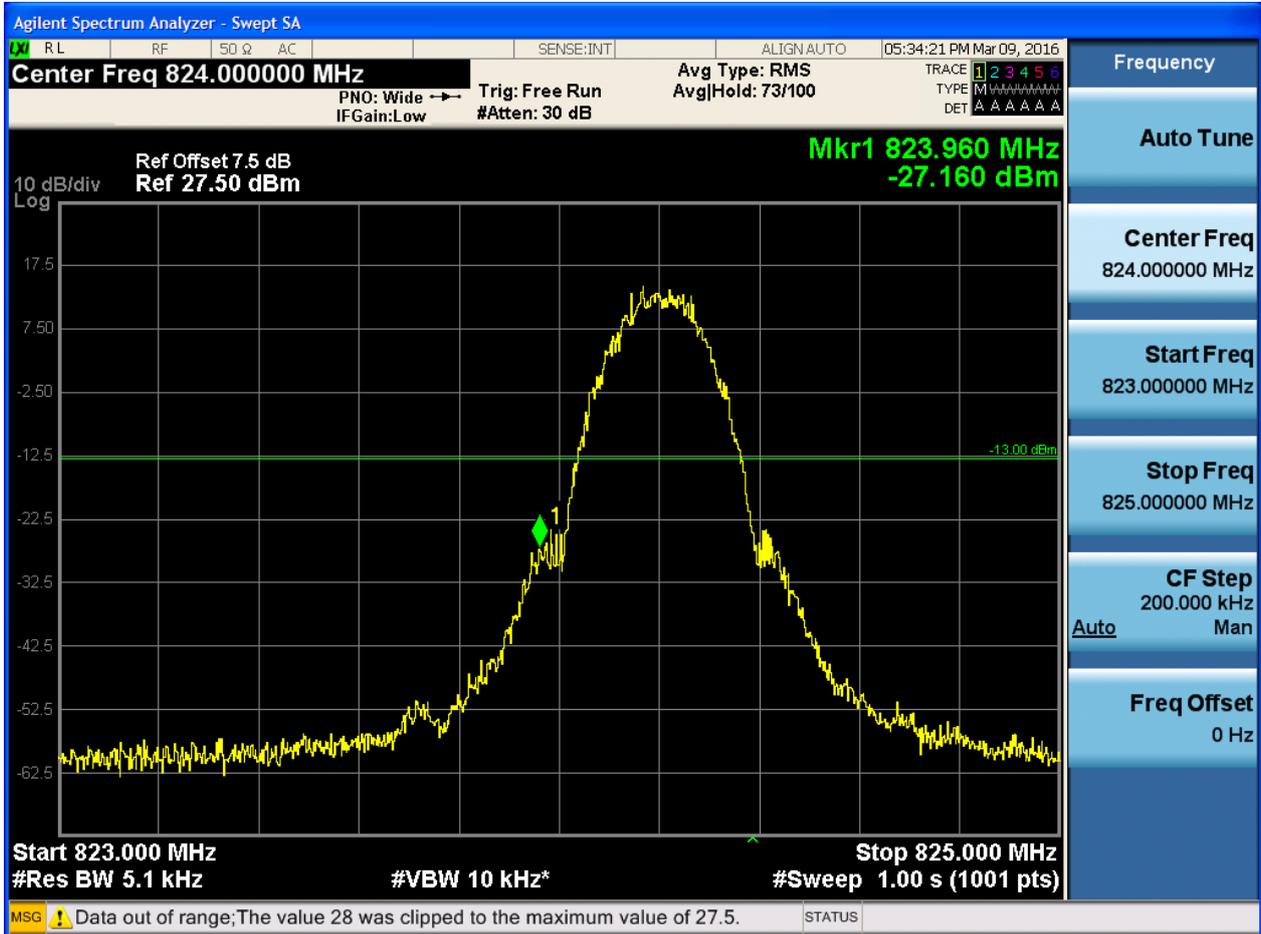
5.1.1.1.2 Test Channel = HCH



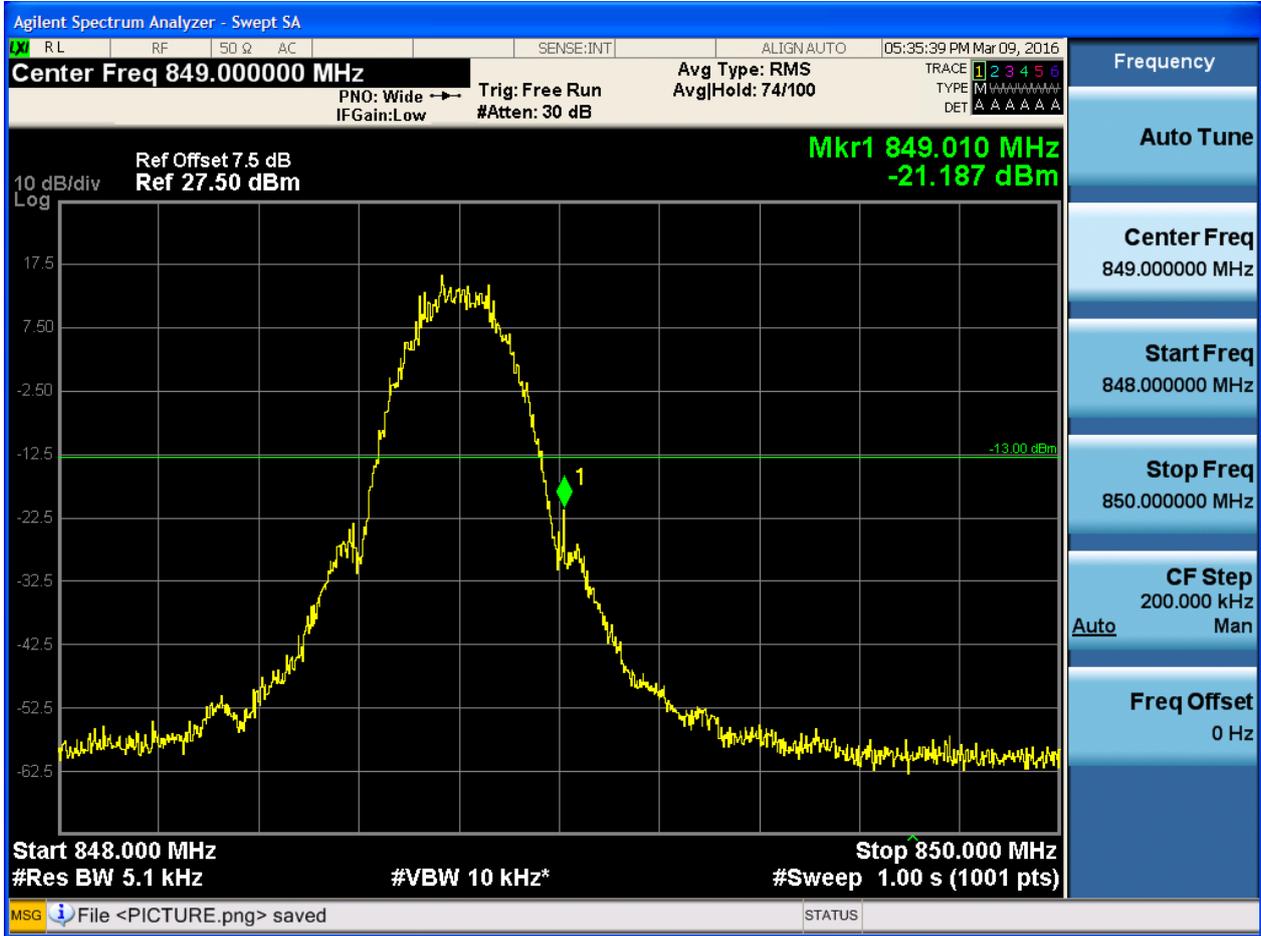


5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH



5.1.1.2.2 Test Channel = HCH

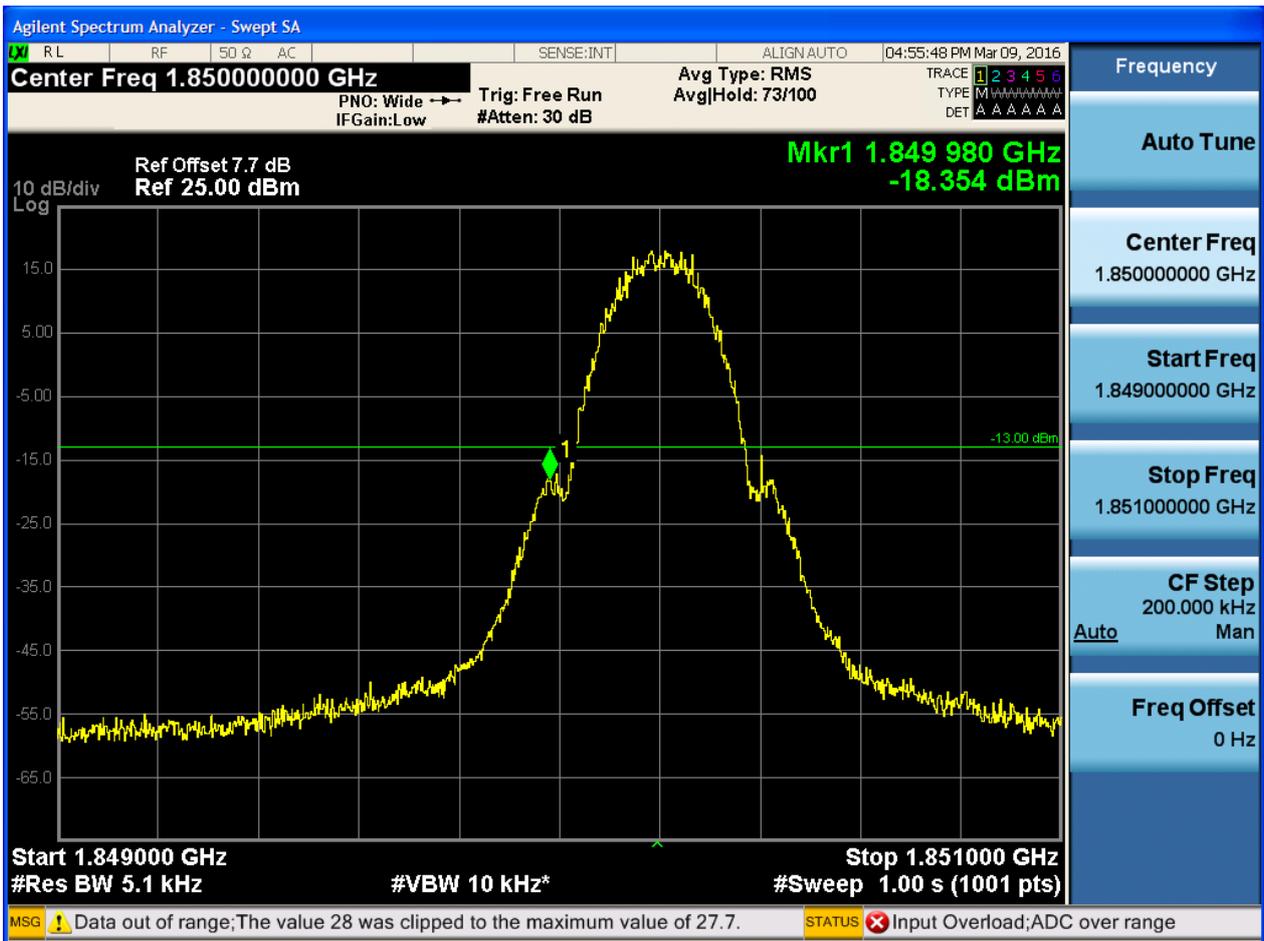




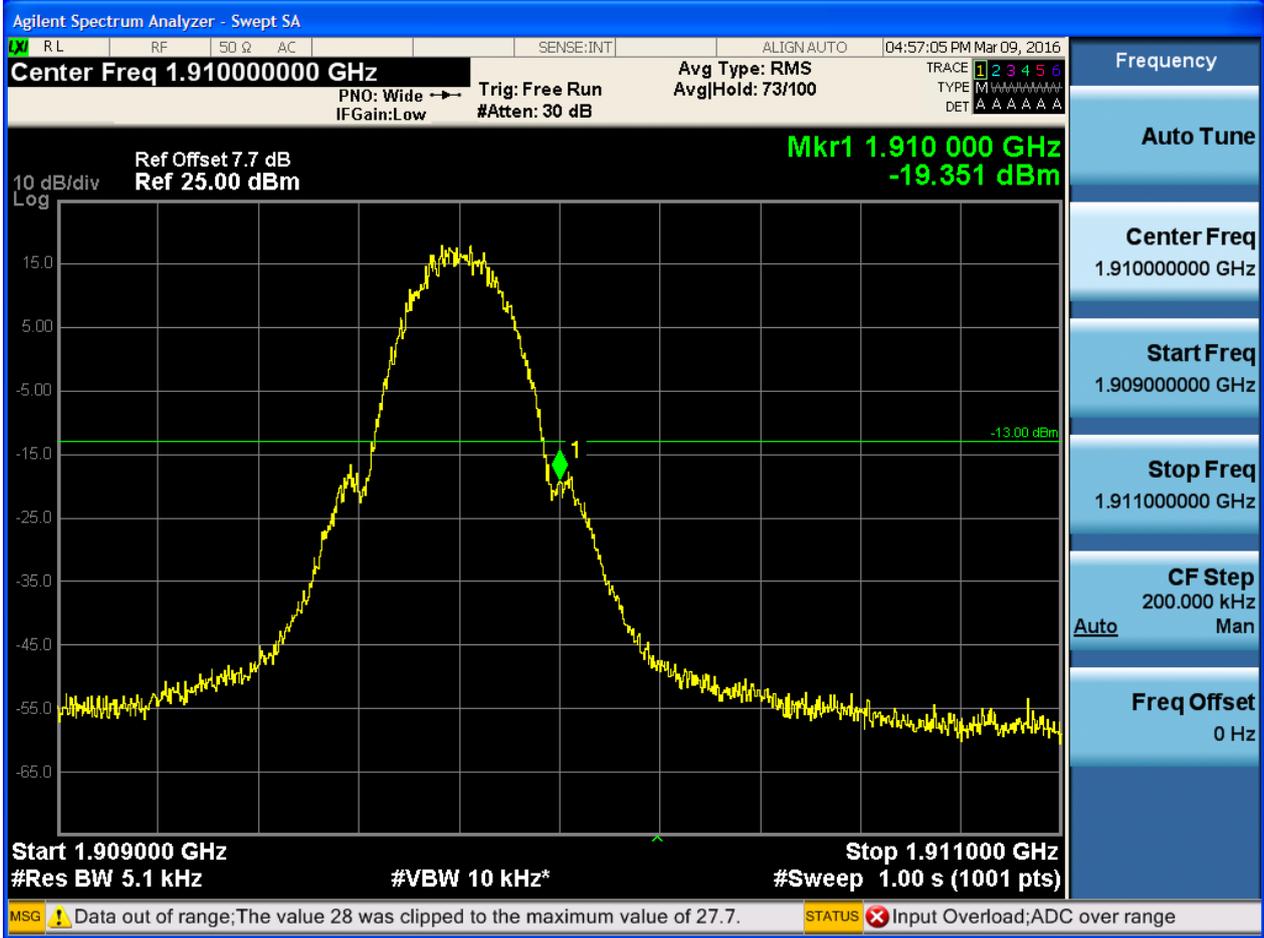
5.1.2 Test Band = GSM1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

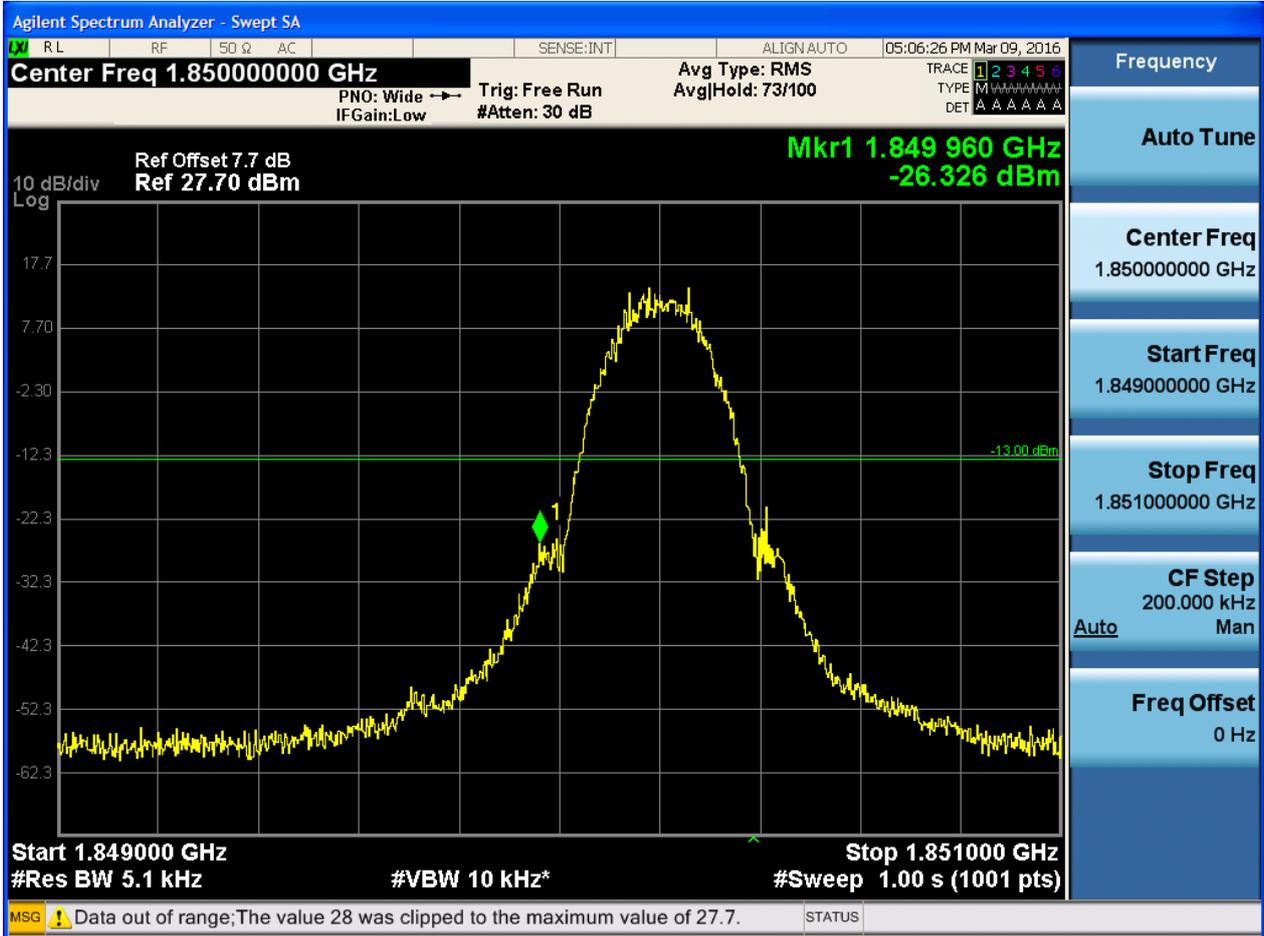


5.1.2.1.2 Test Channel = HCH

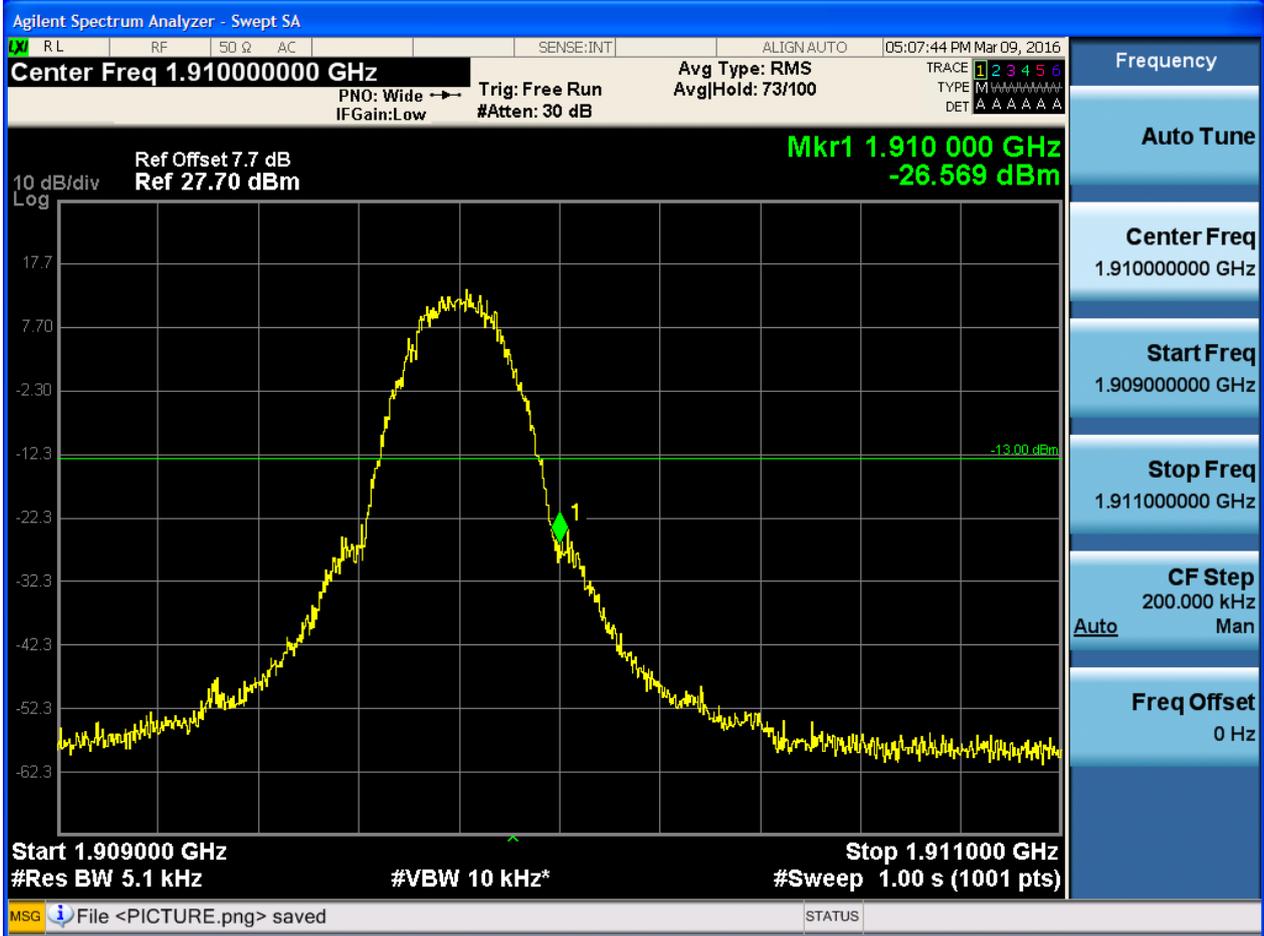


5.1.2.2 Test Mode = GSM/TM2

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.

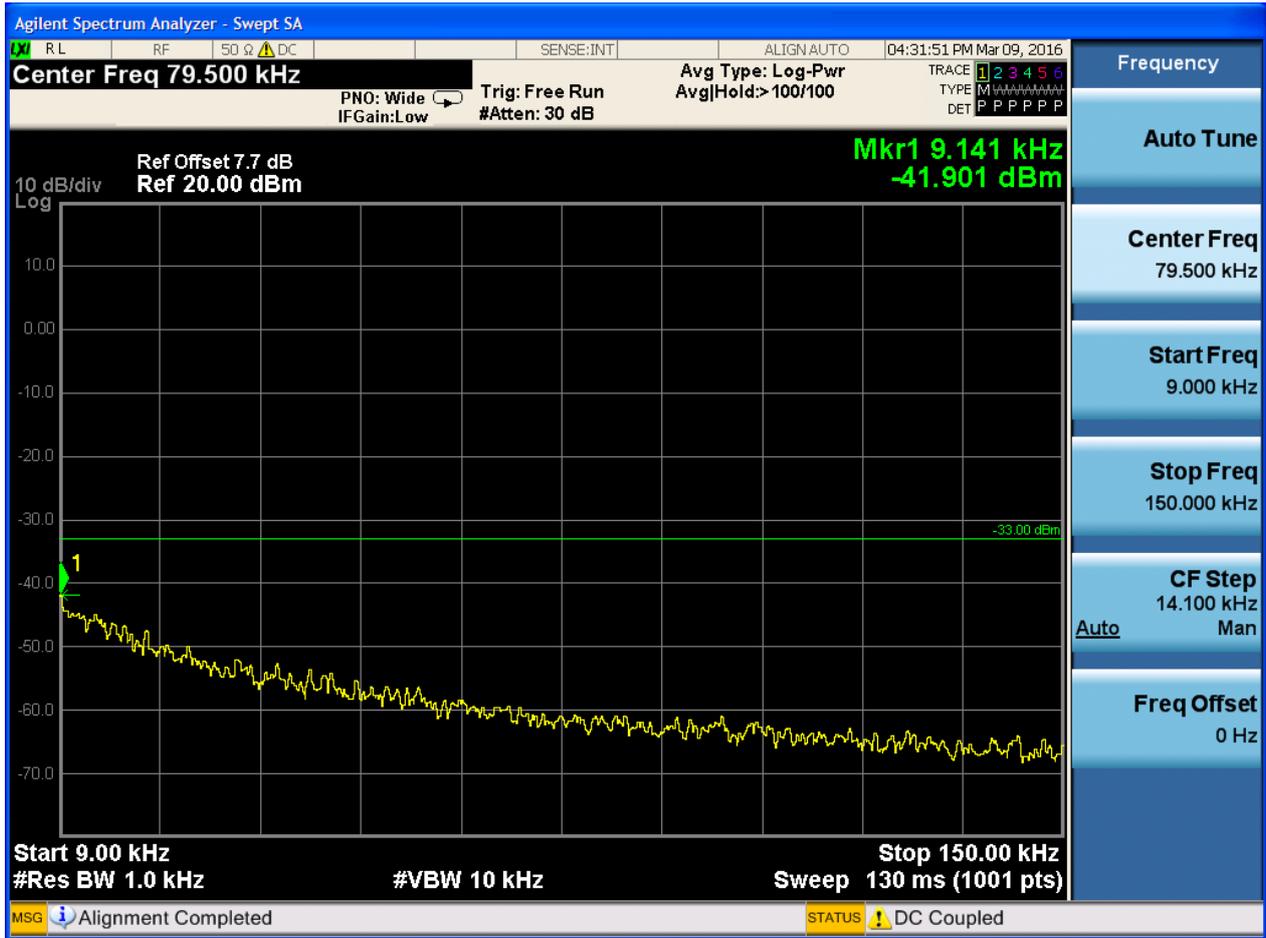
### Part I - Test Plots

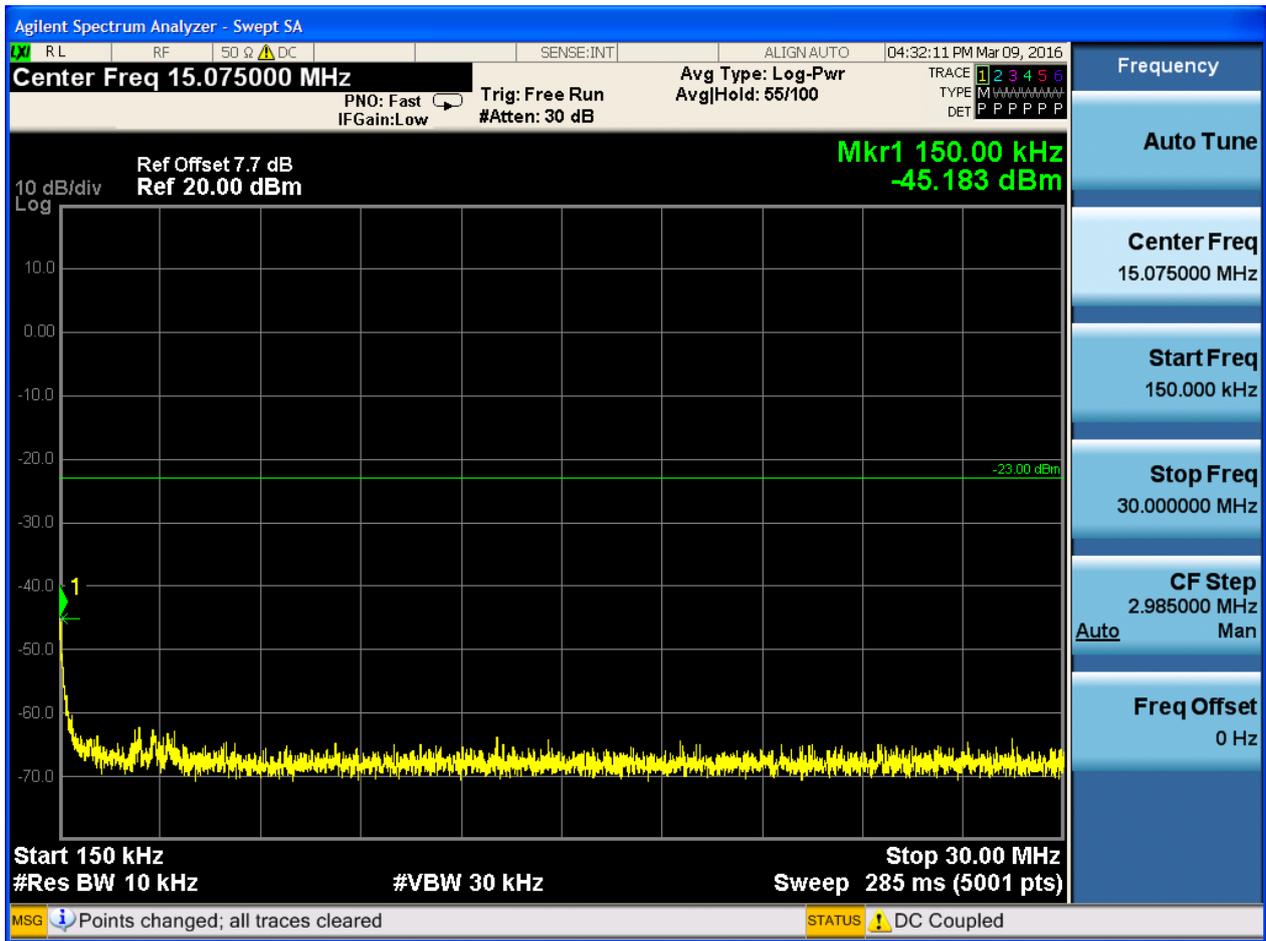
#### 6.1 For GSM

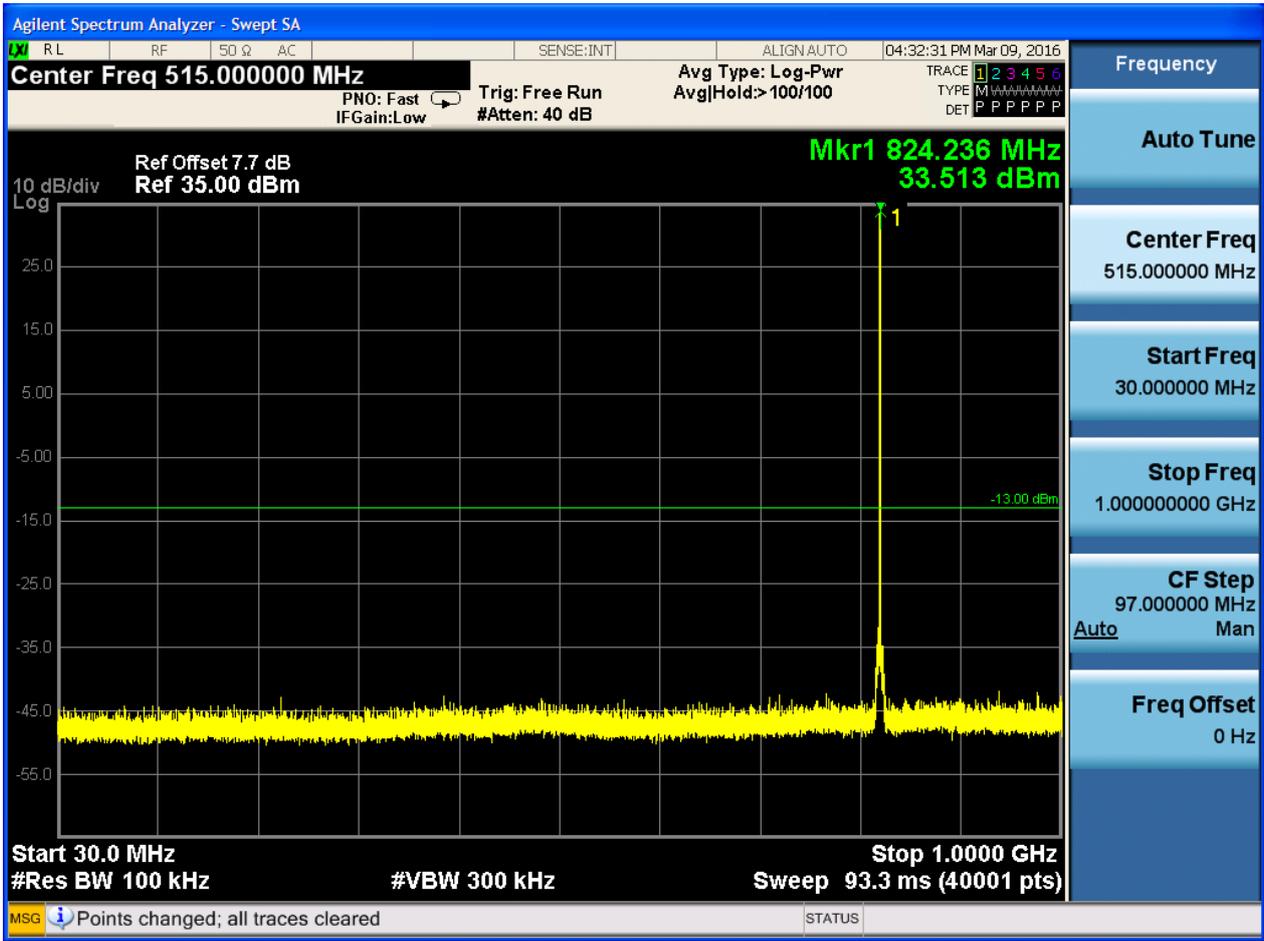
##### 6.1.1 Test Band = GSM850

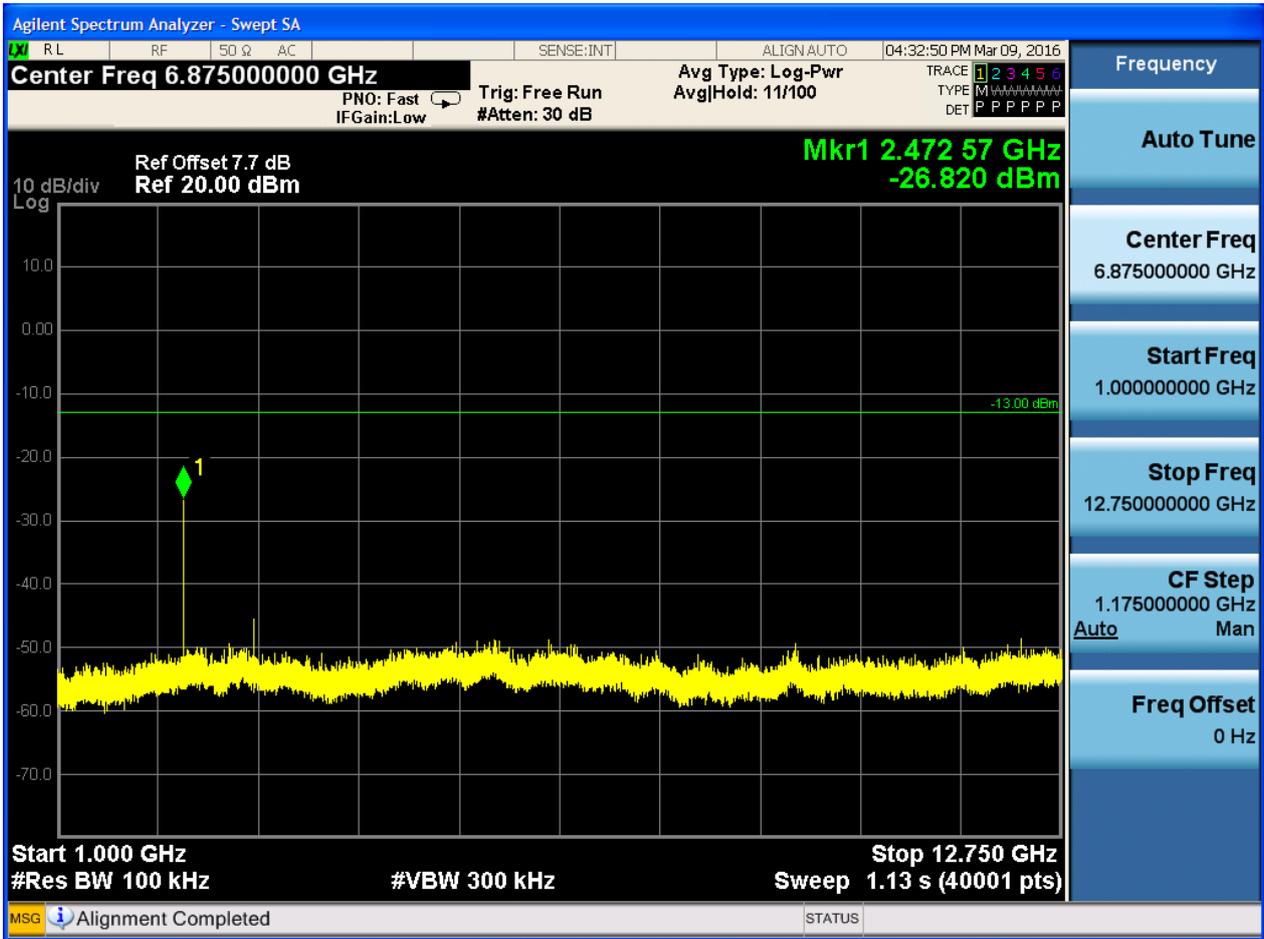
##### 6.1.1.1 Test Mode = GSM/TM1

##### 6.1.1.1.1 Test Channel = LCH

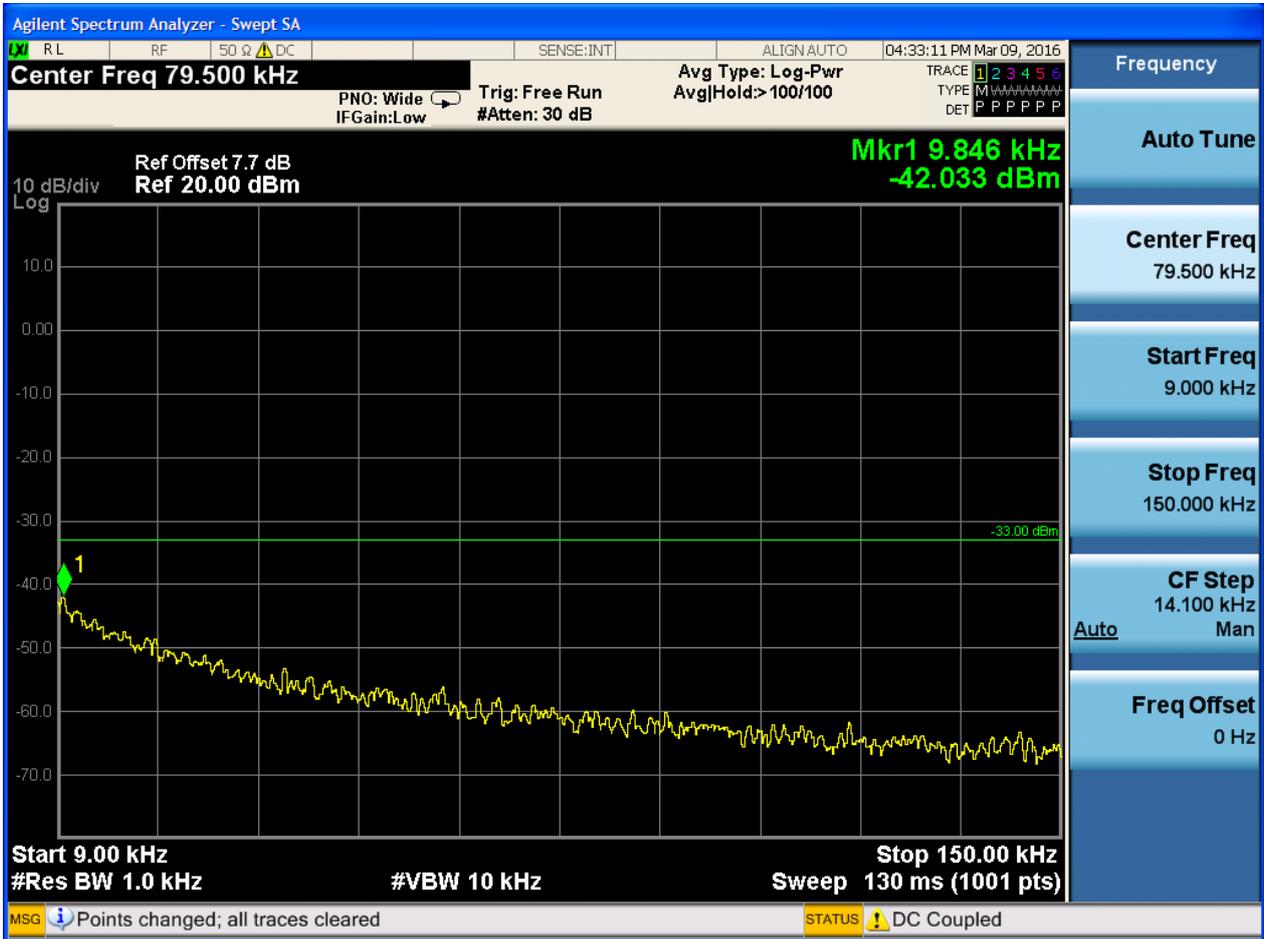


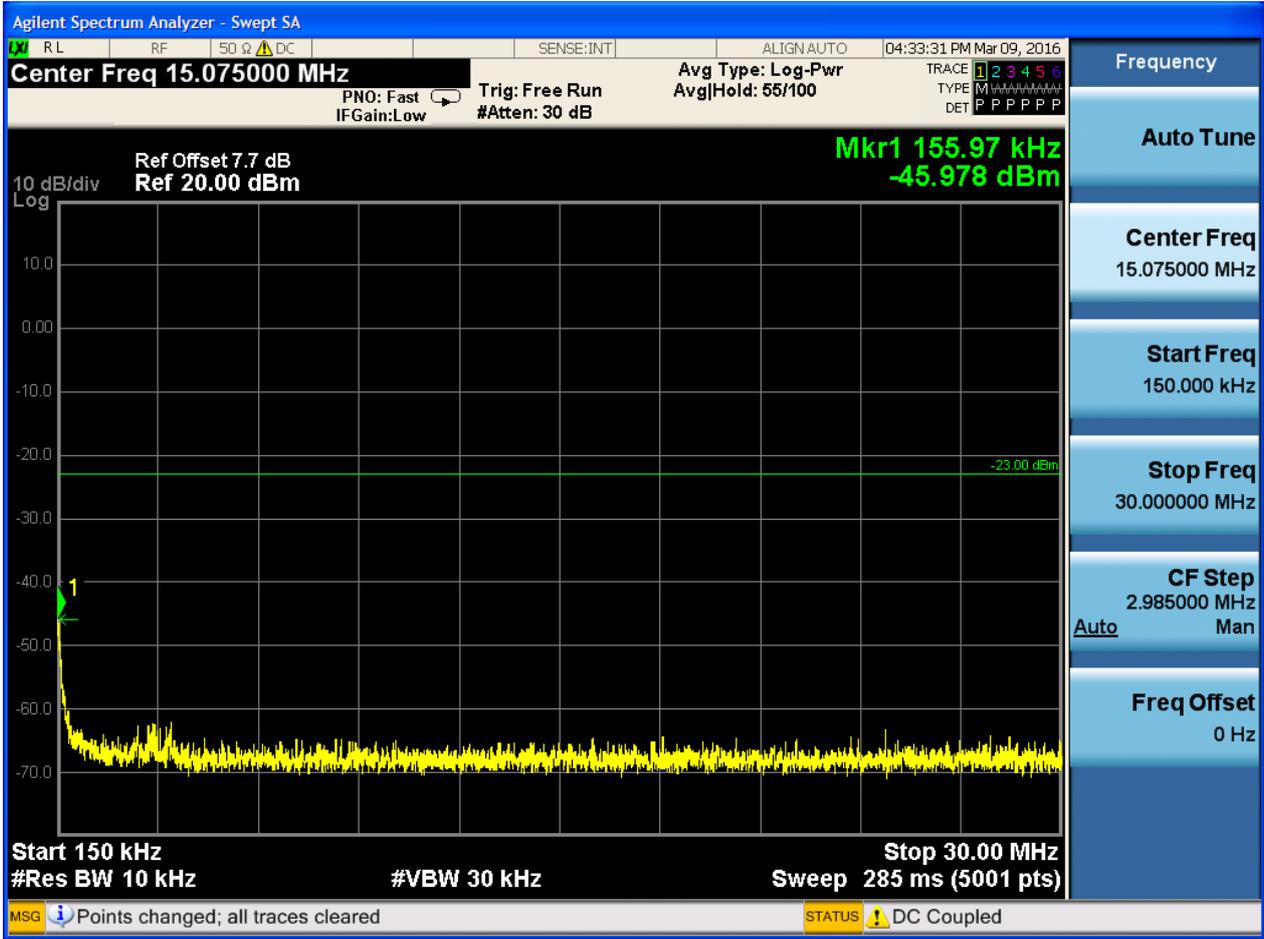


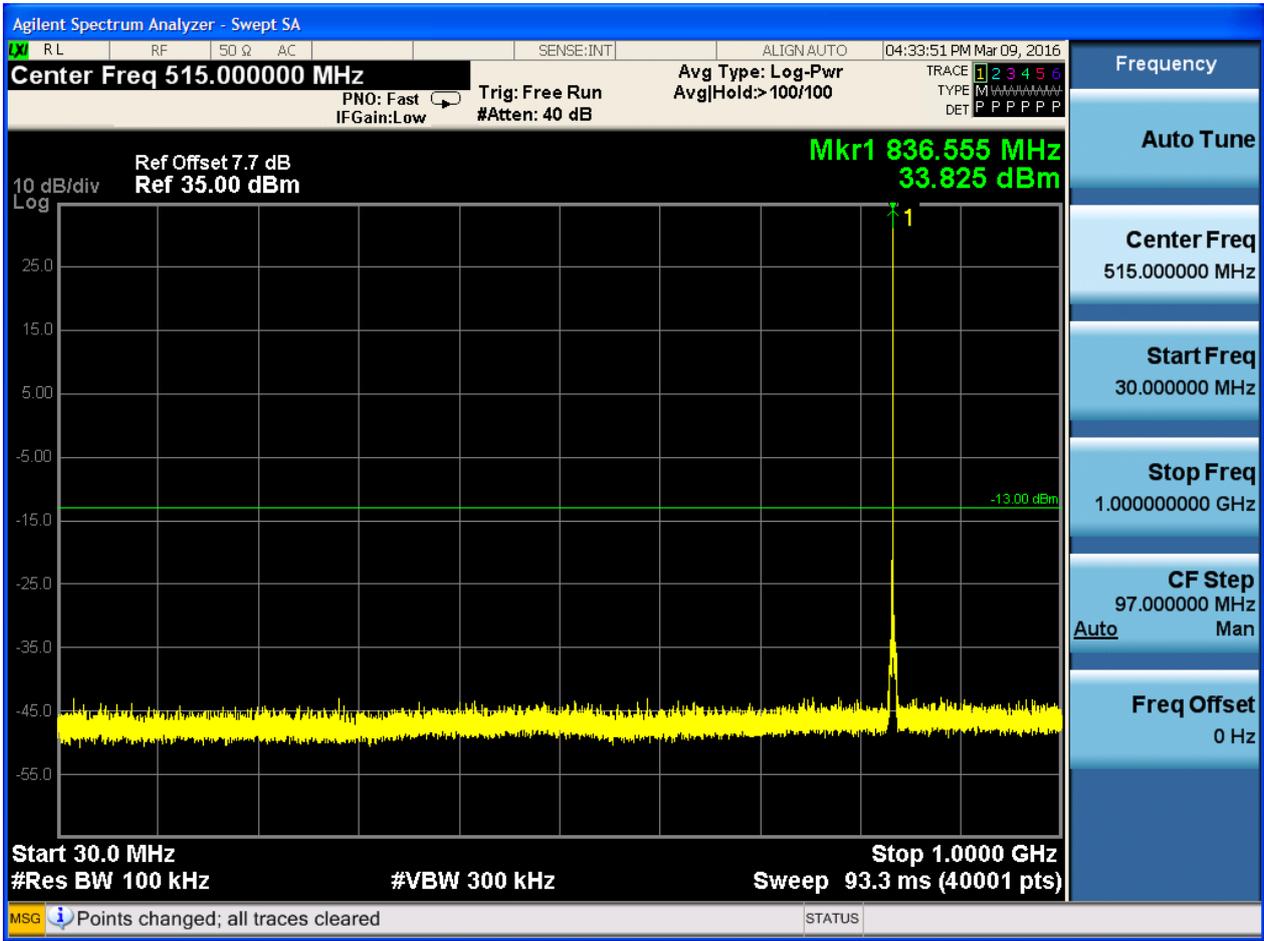


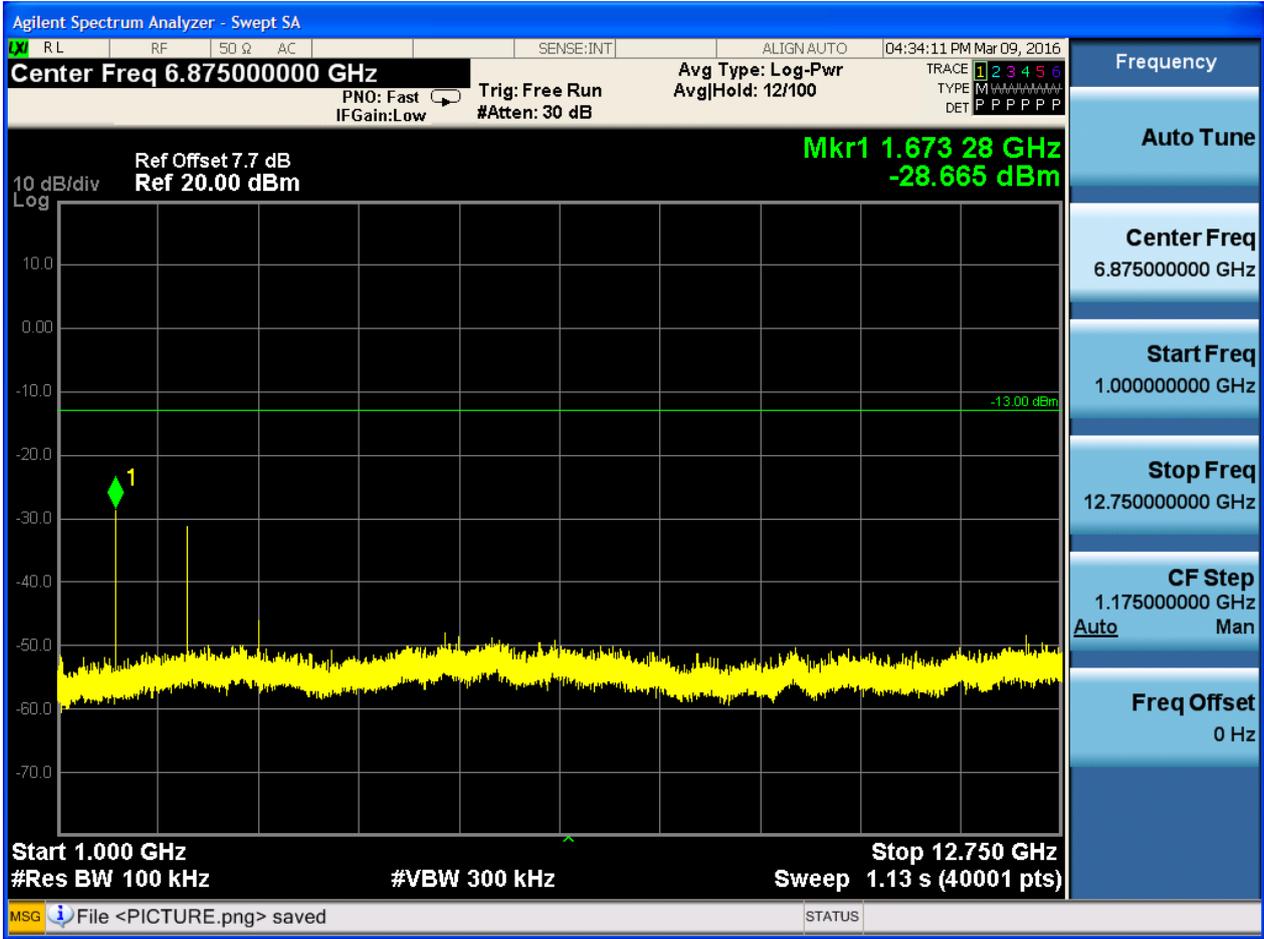


6.1.1.1.2 Test Channel = MCH

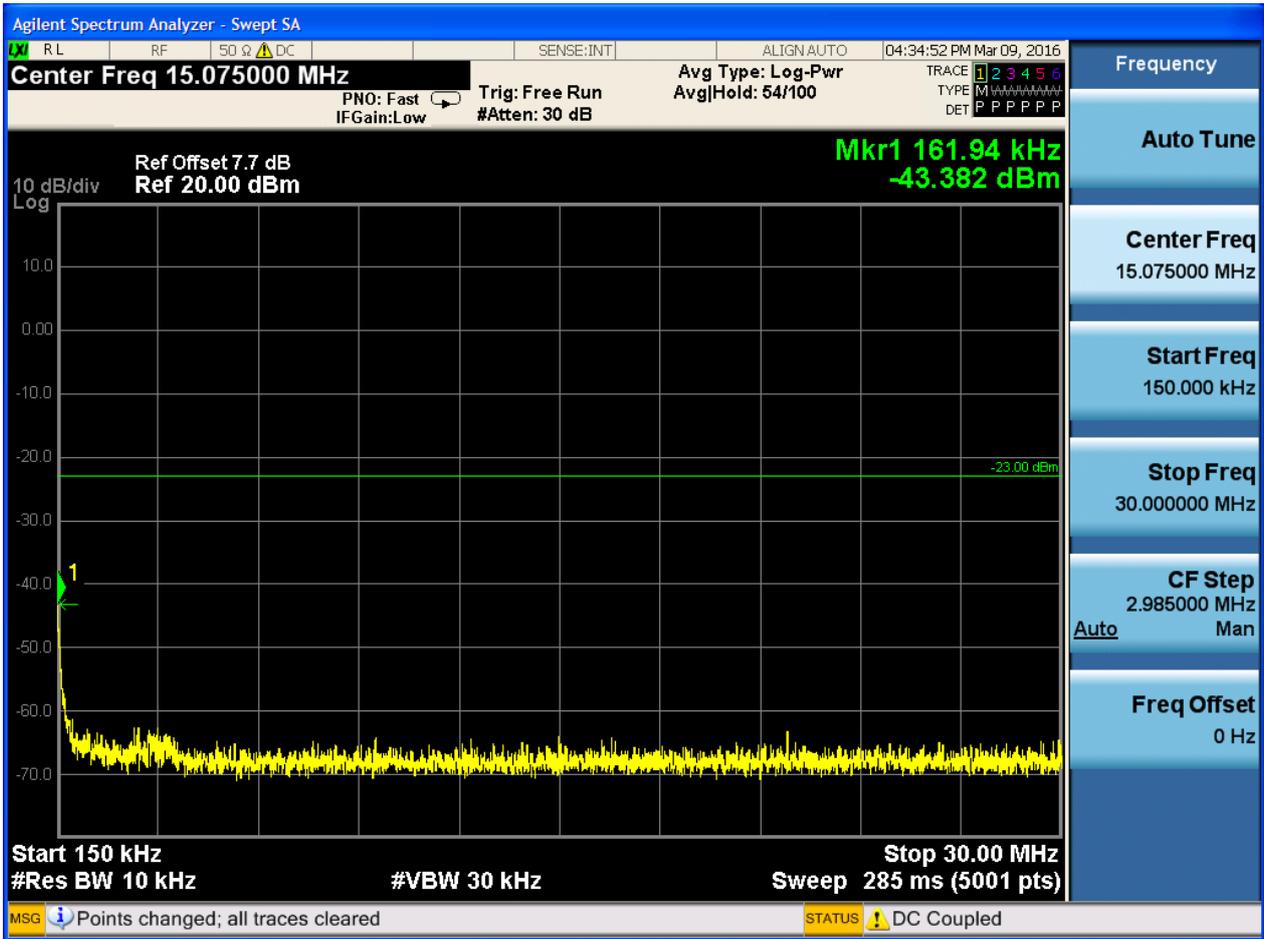




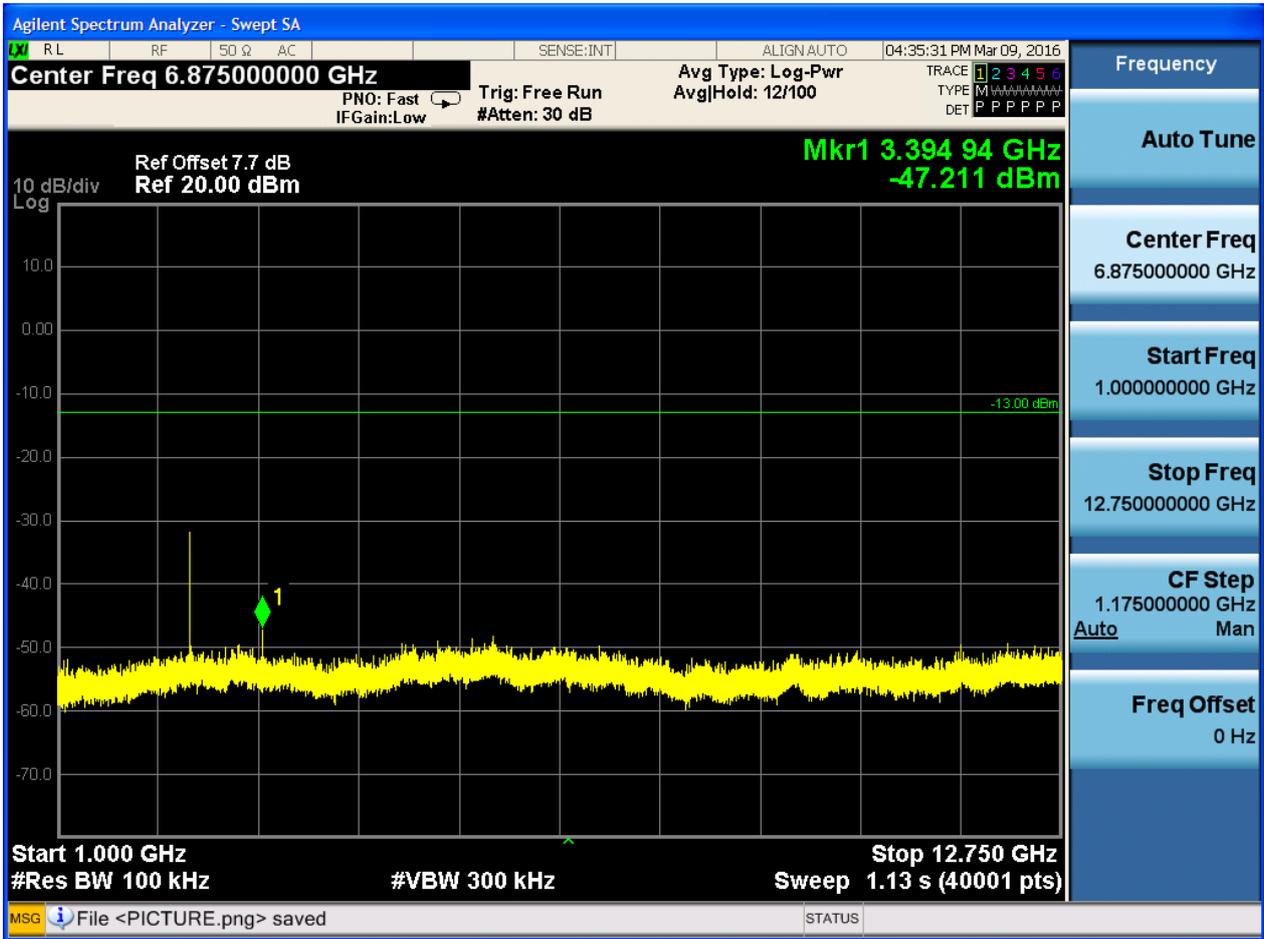








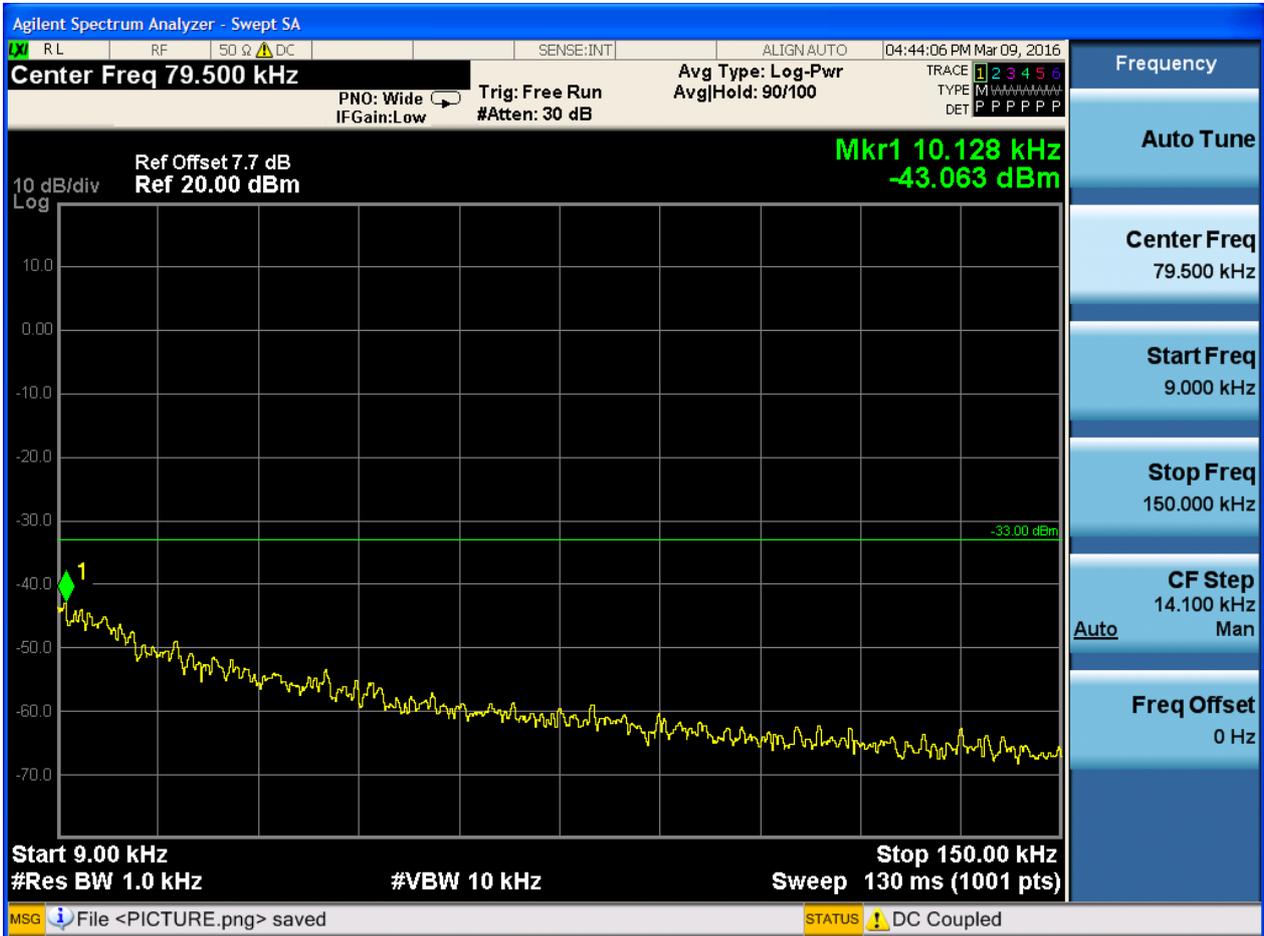


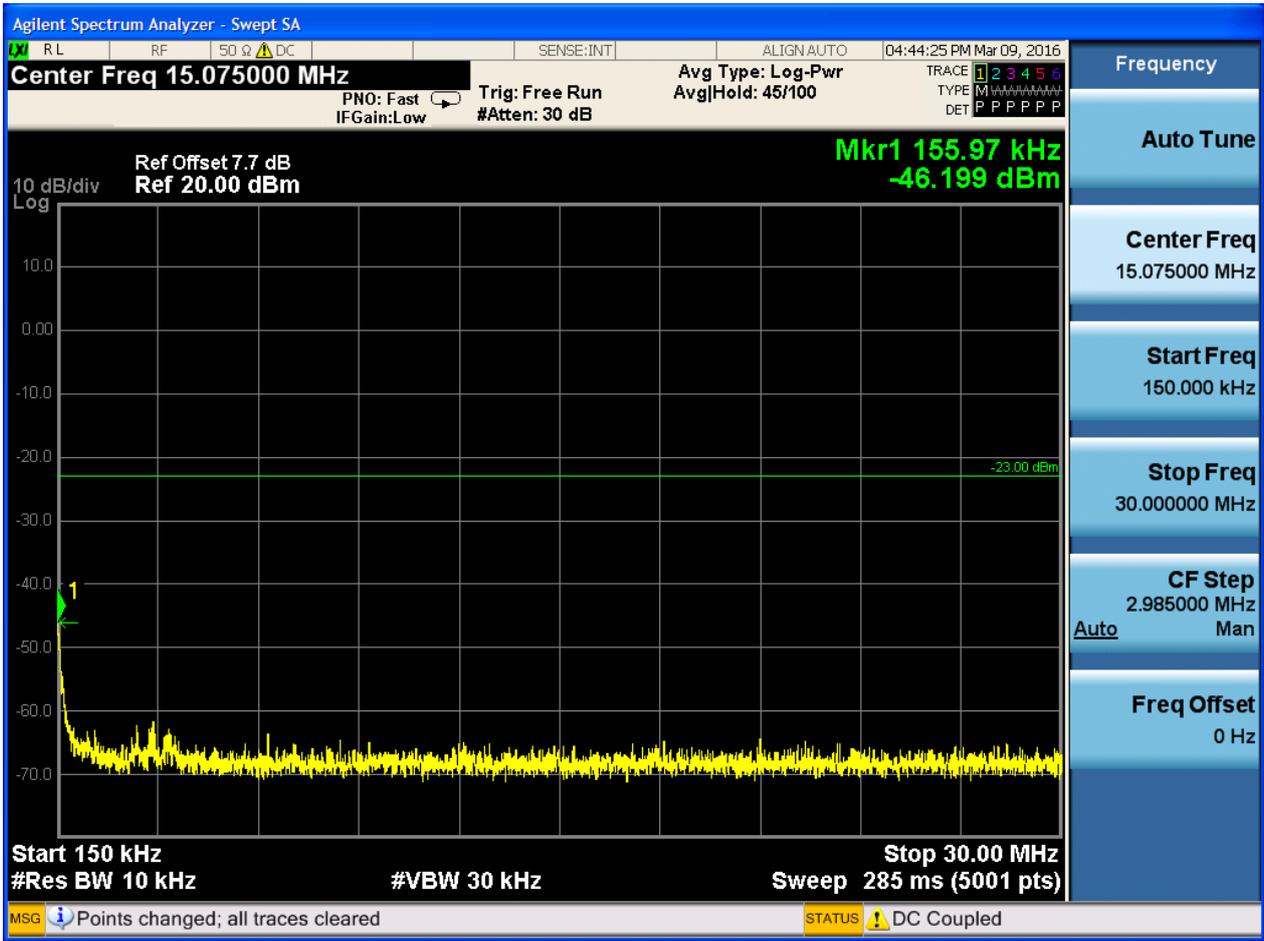


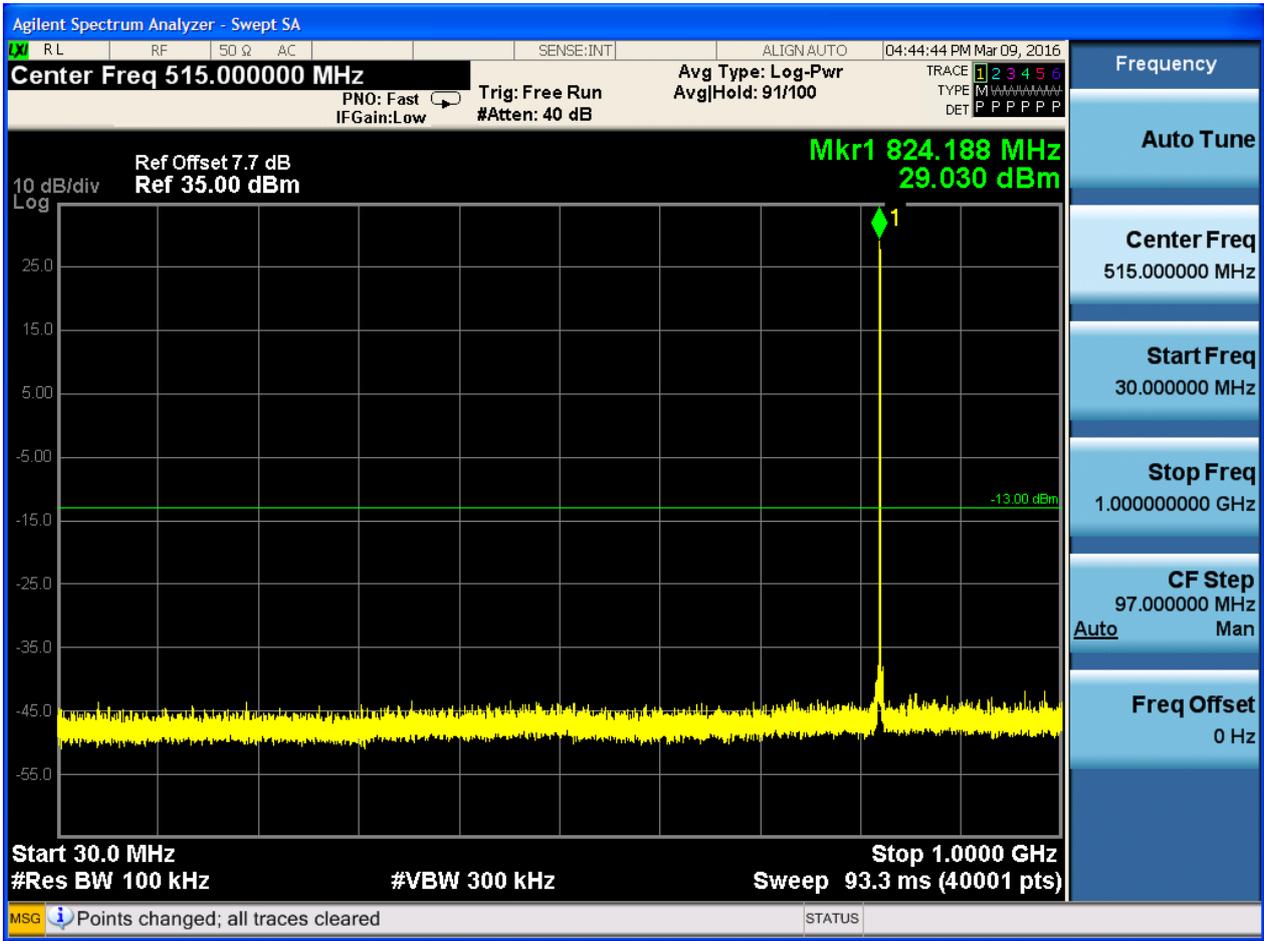


6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

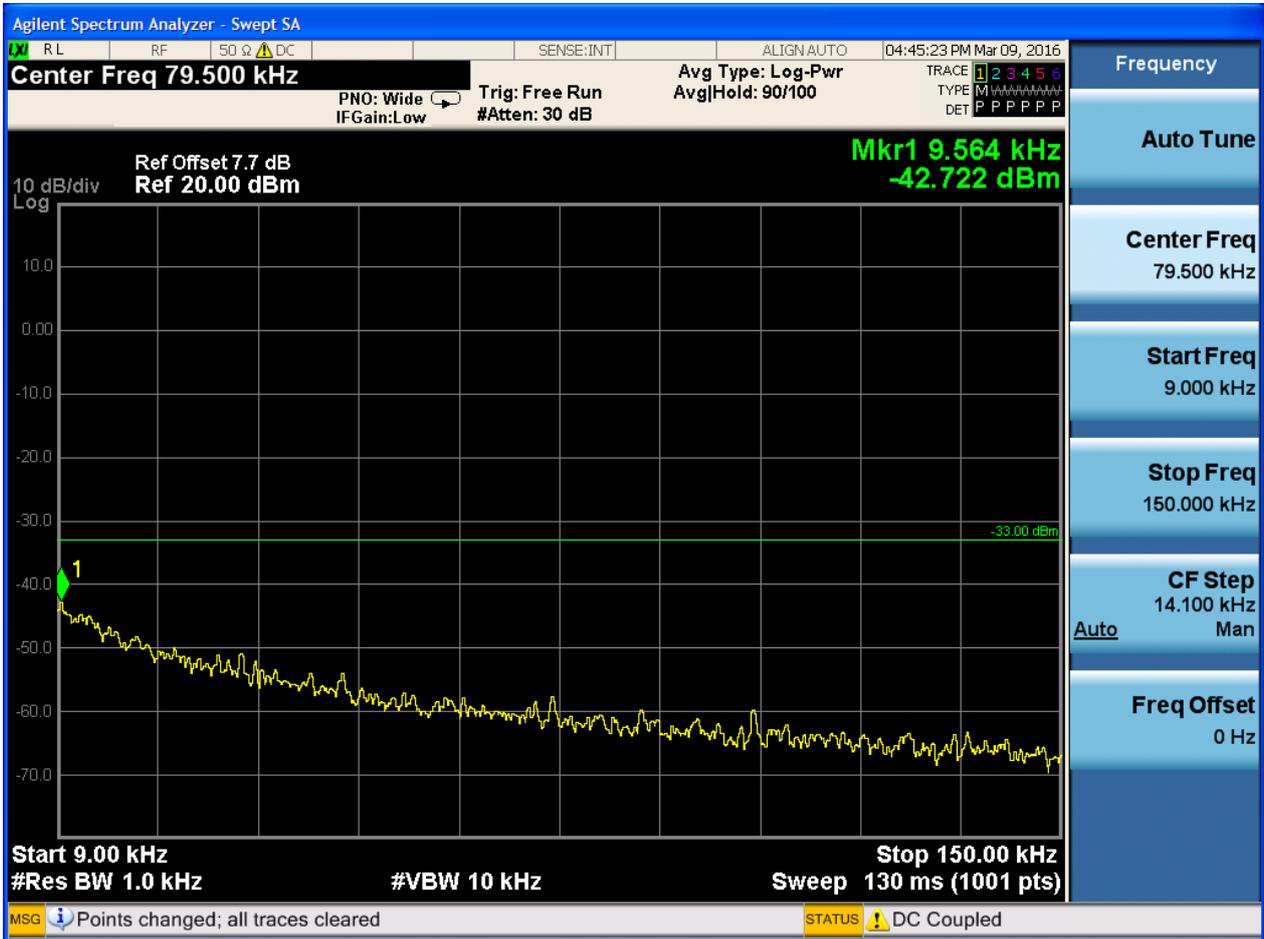


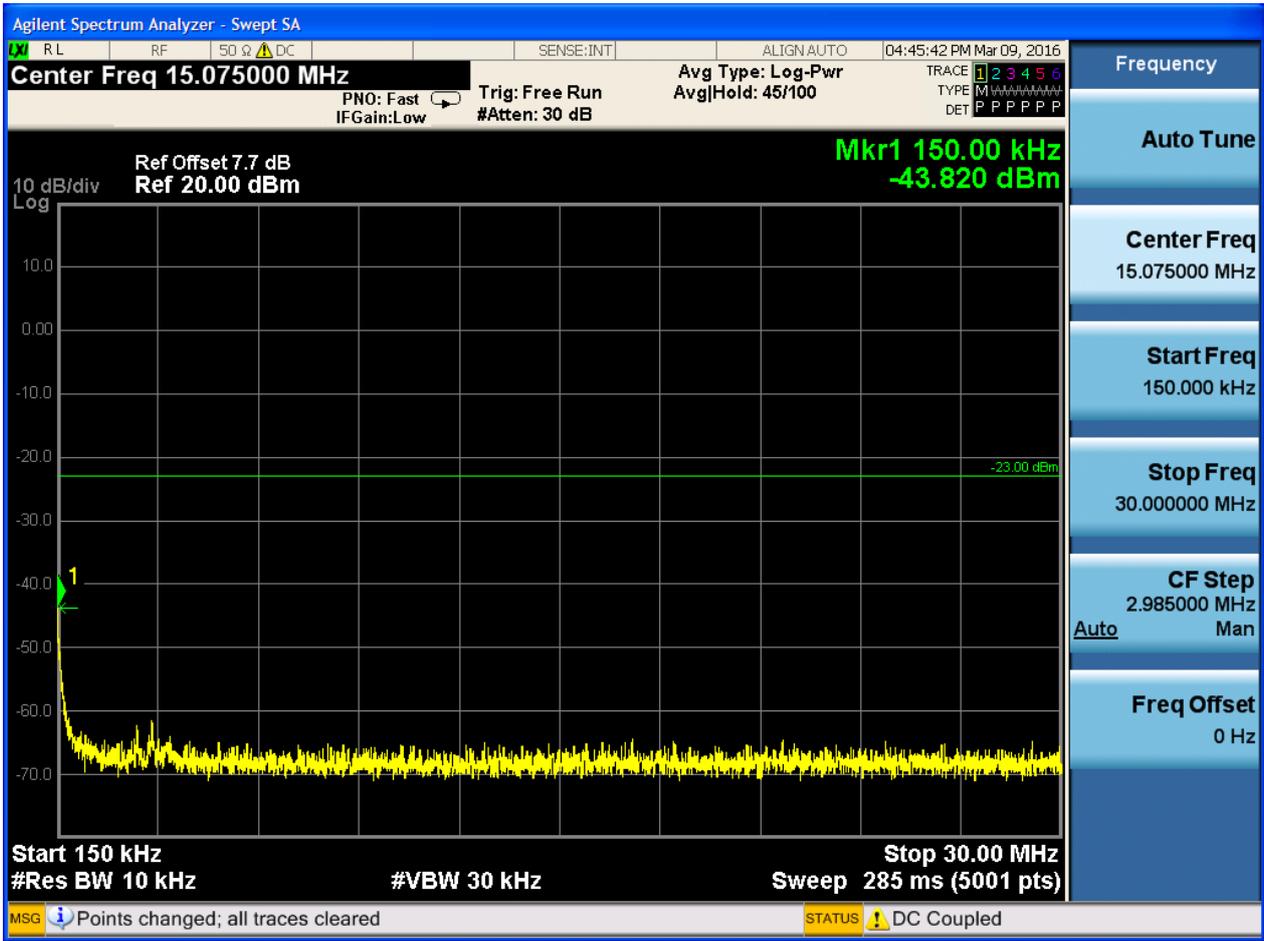


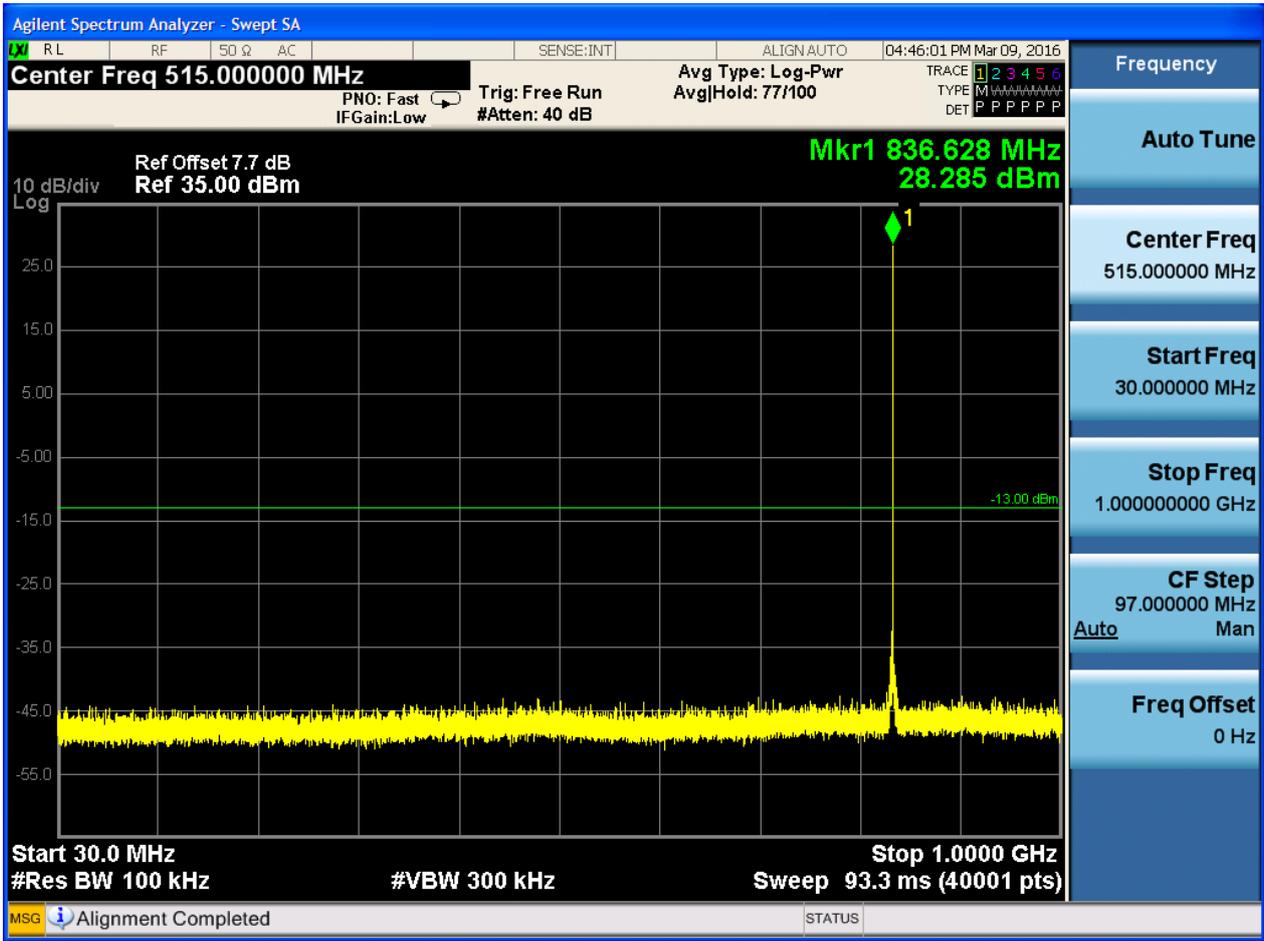


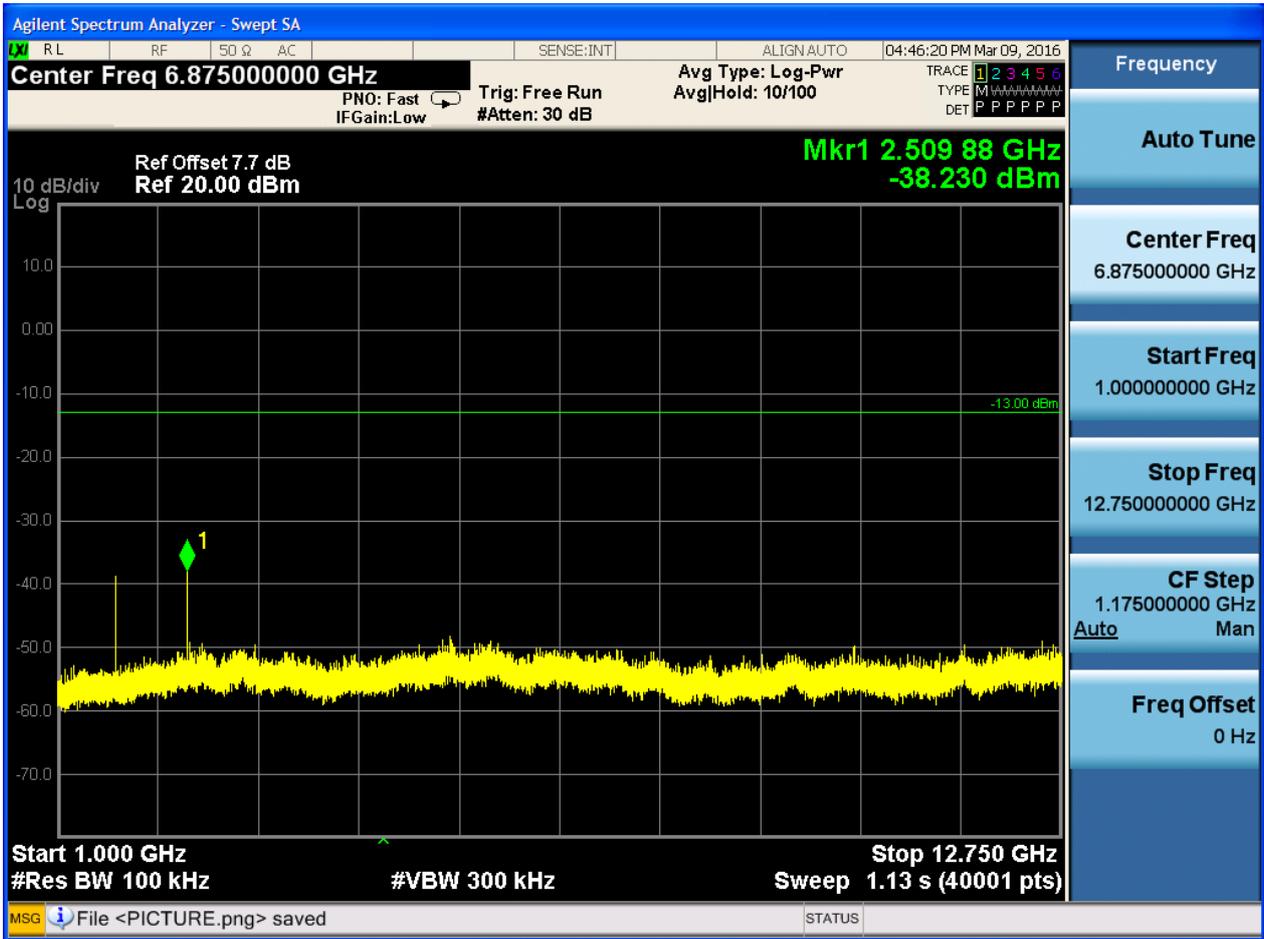


6.1.1.2.2 Test Channel = MCH

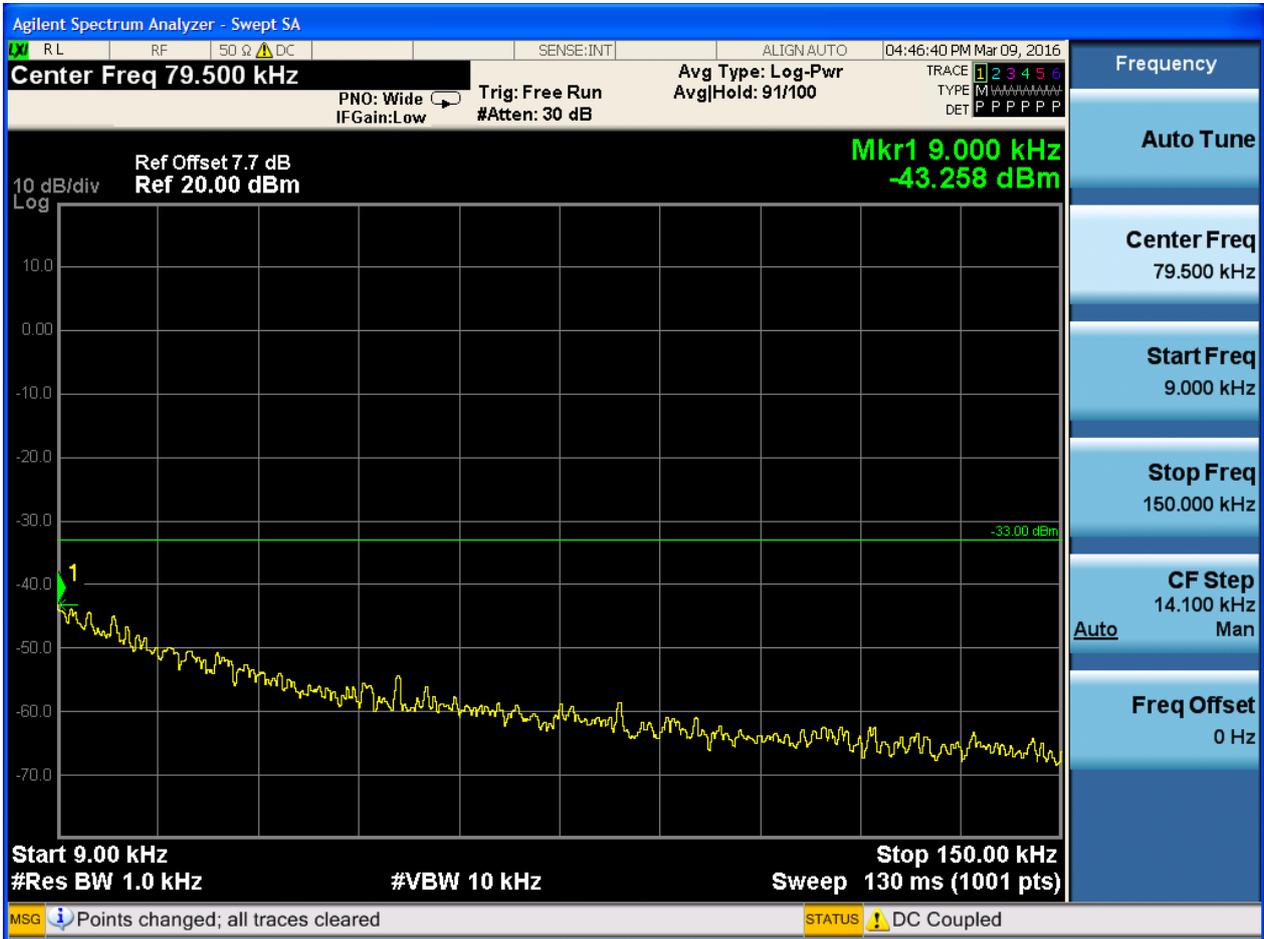


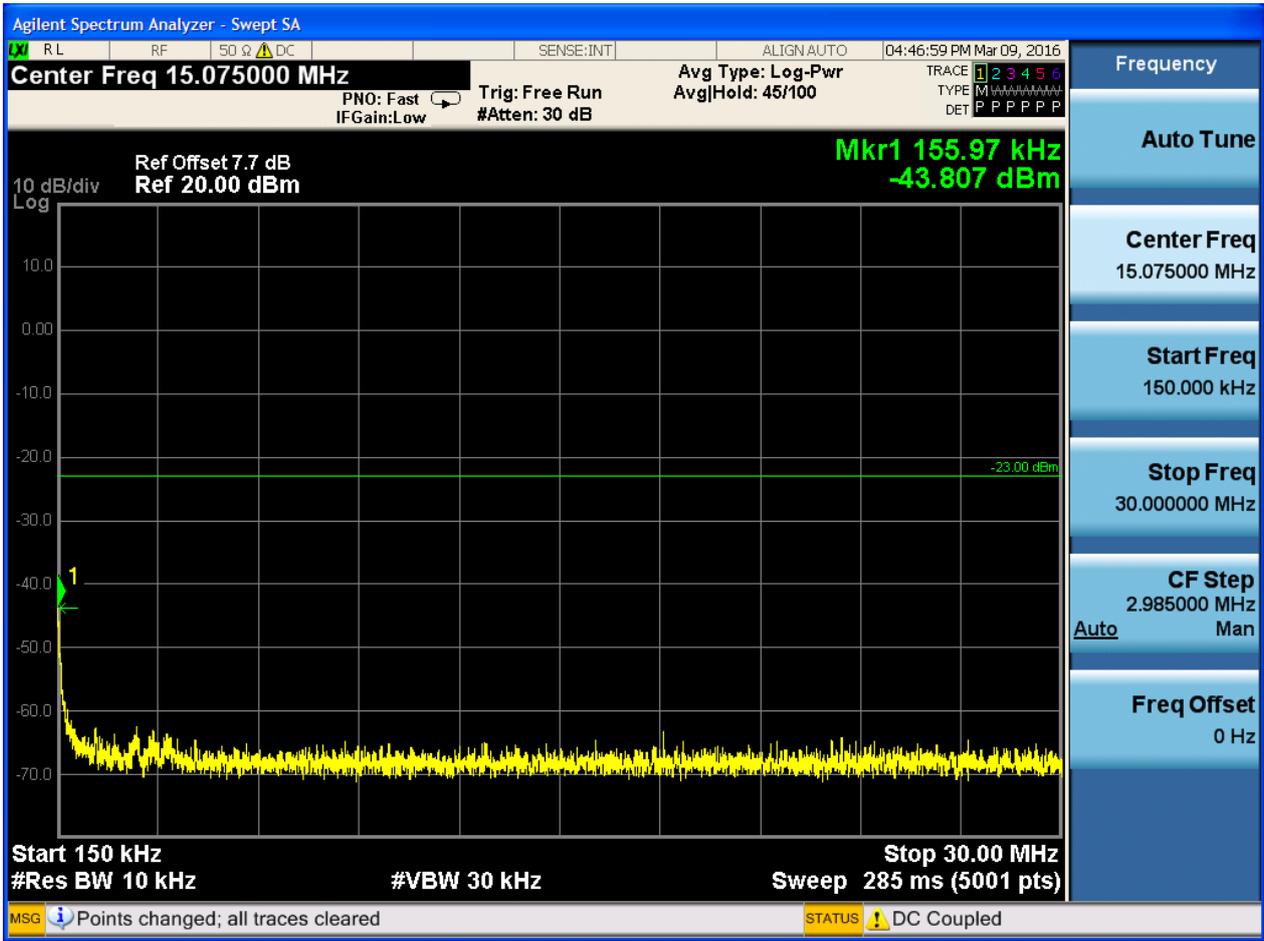


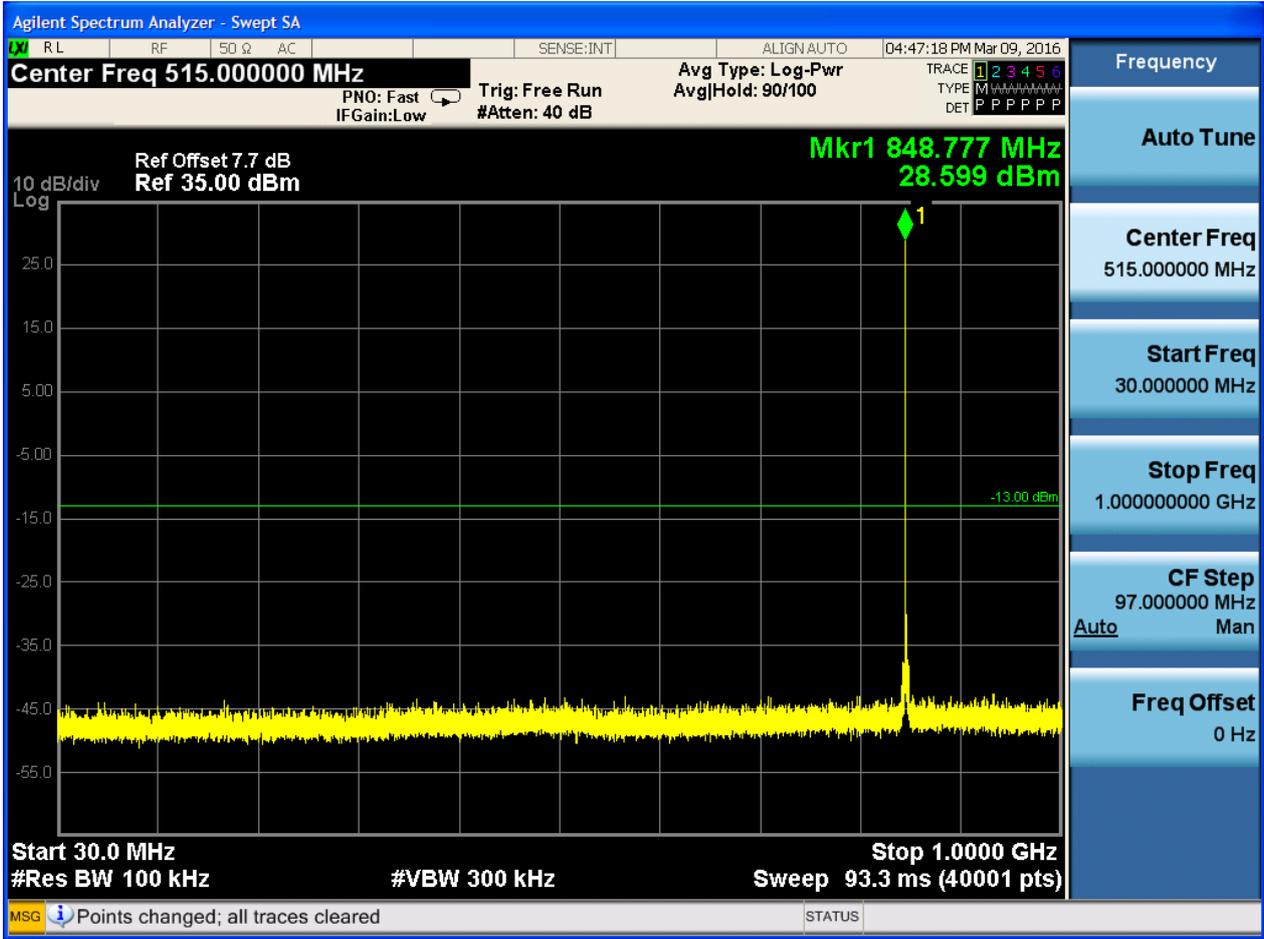


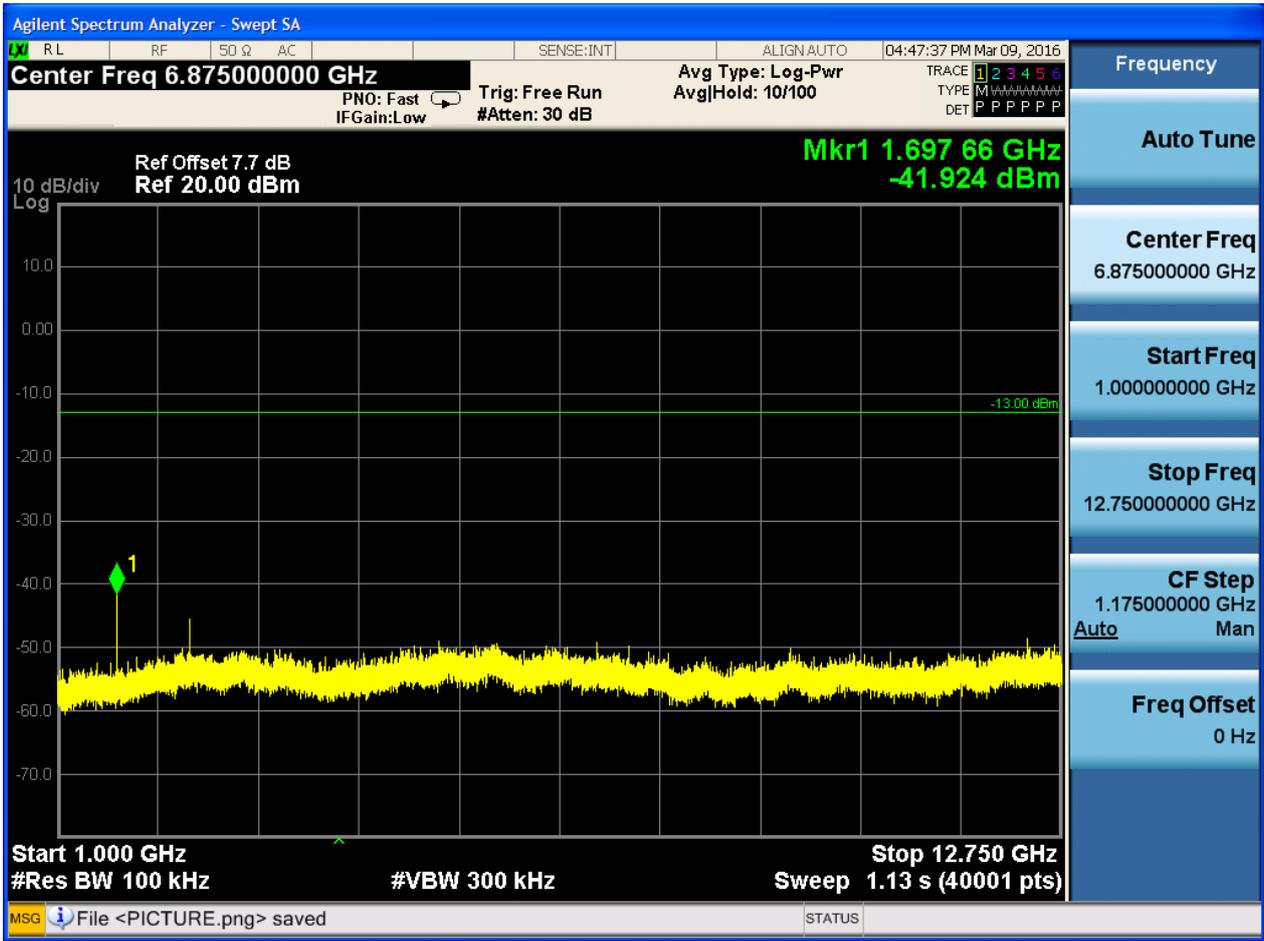


6.1.1.2.3 Test Channel = HCH







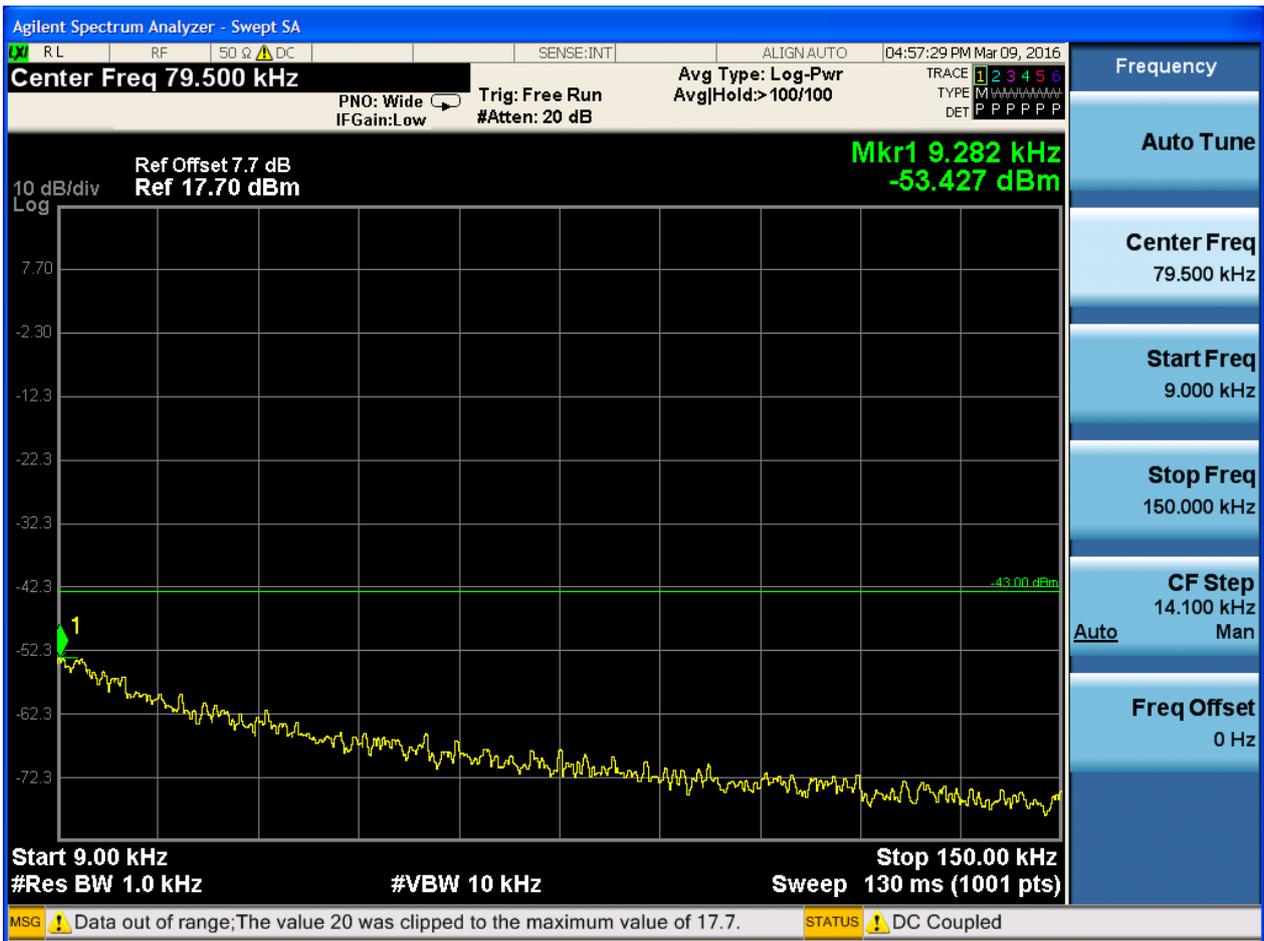


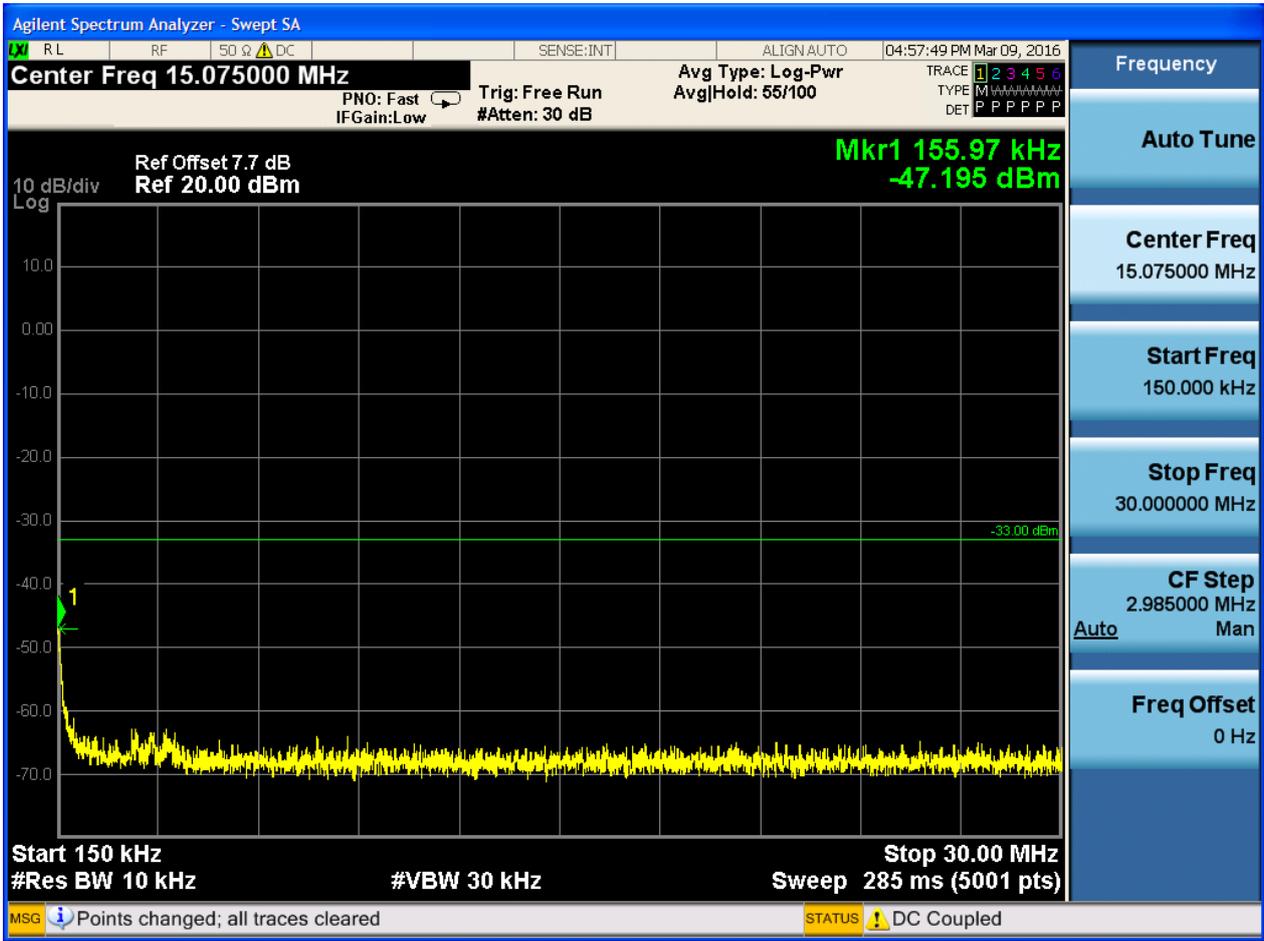


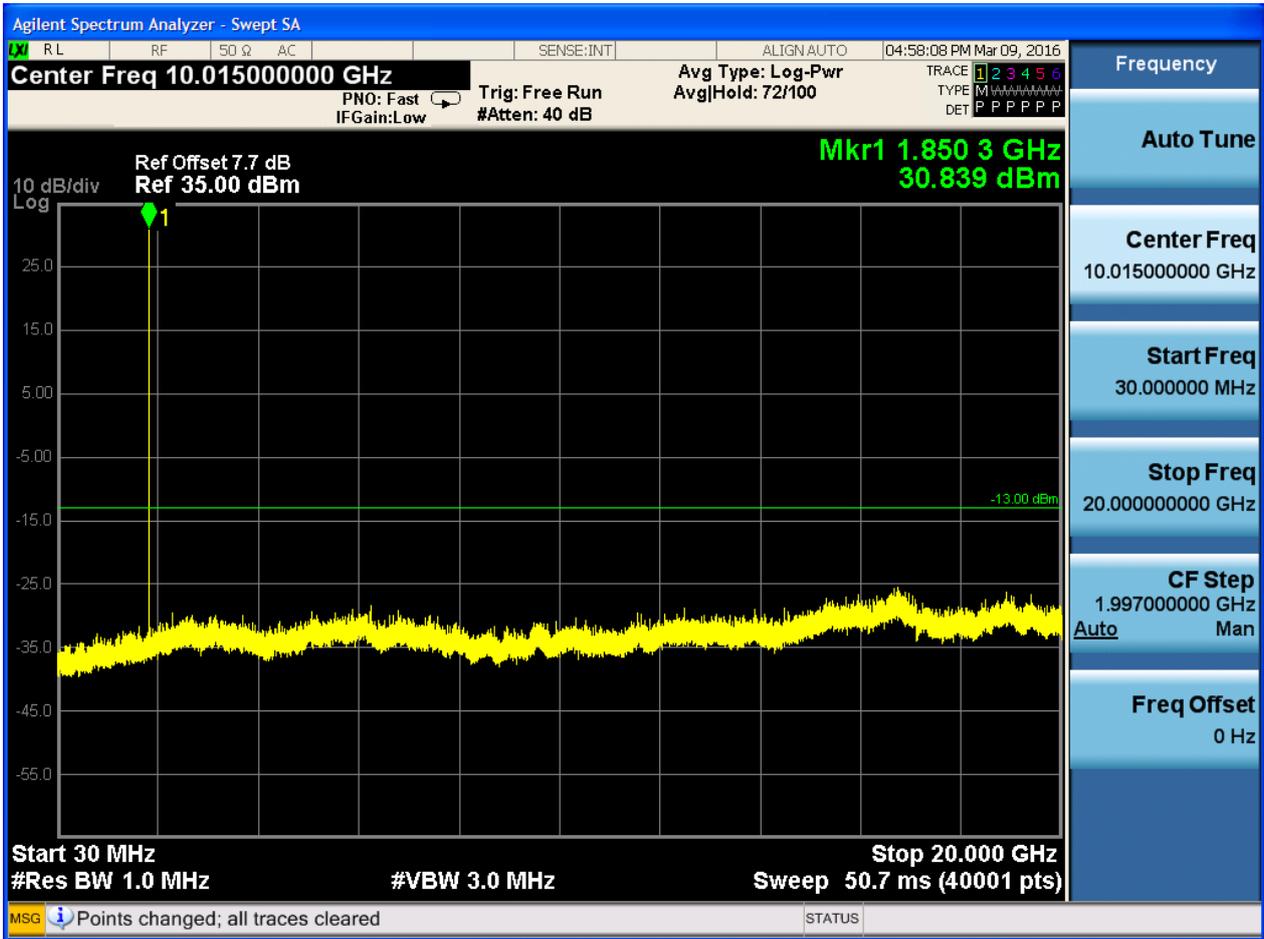
6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

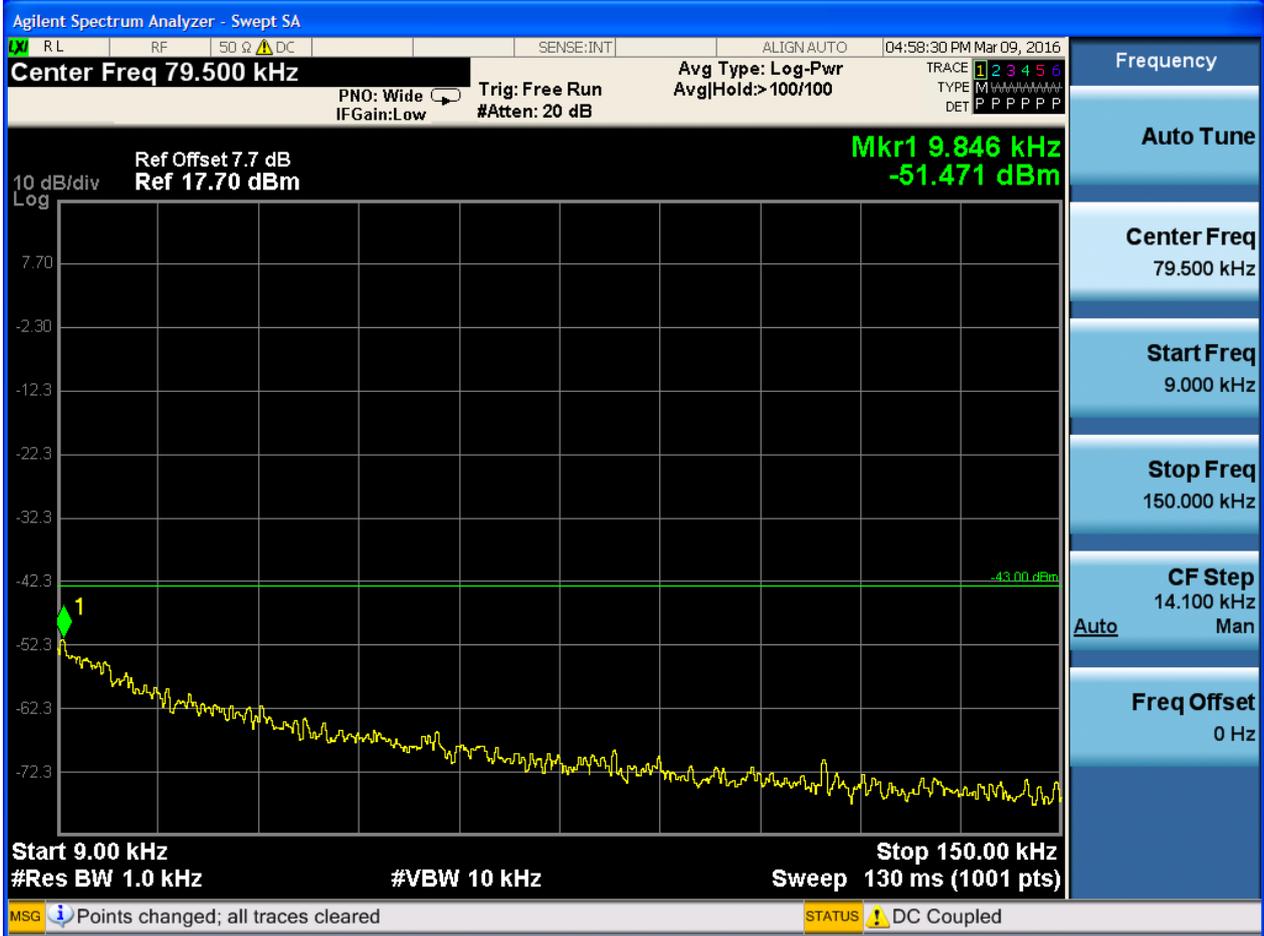
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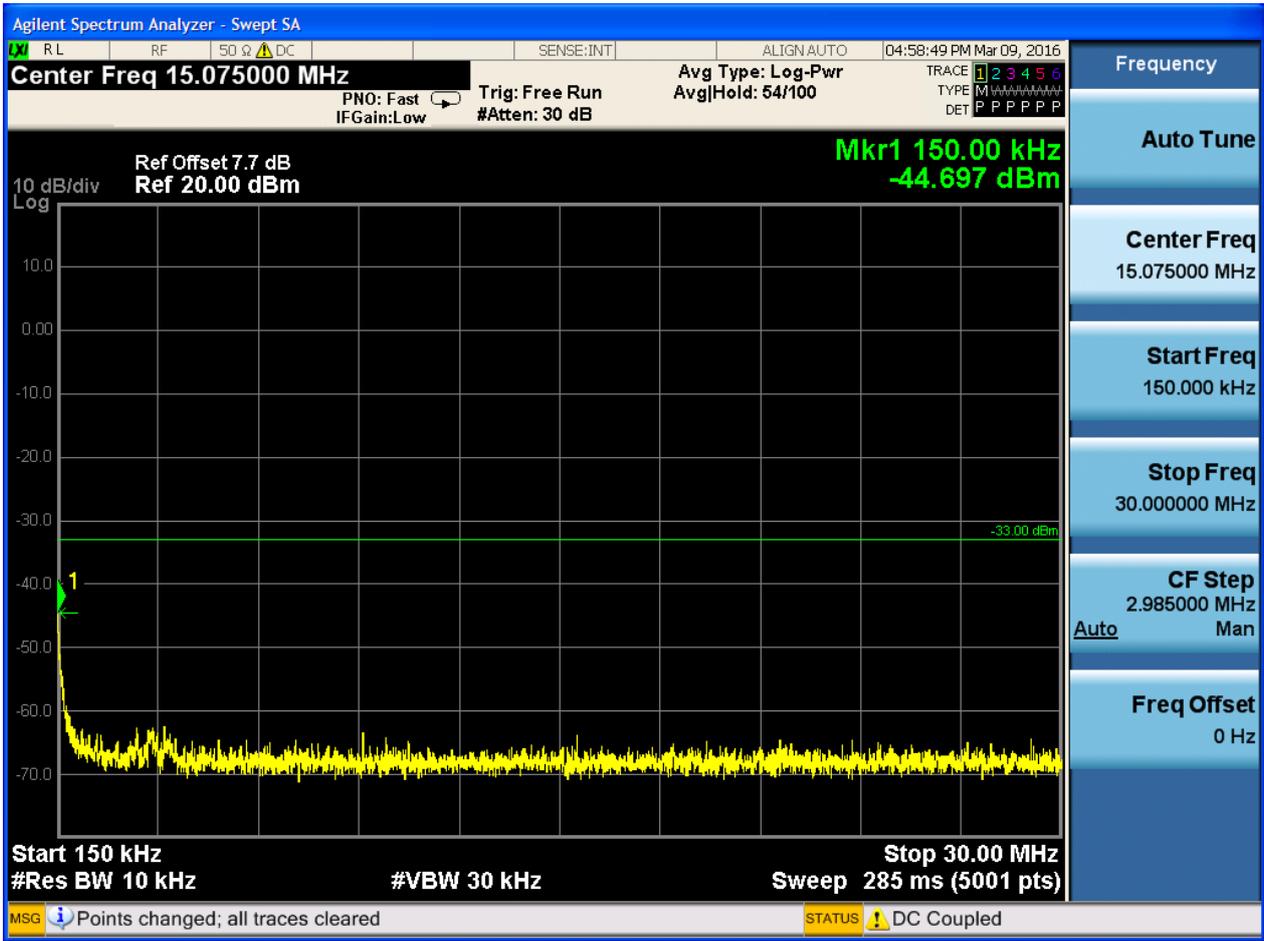


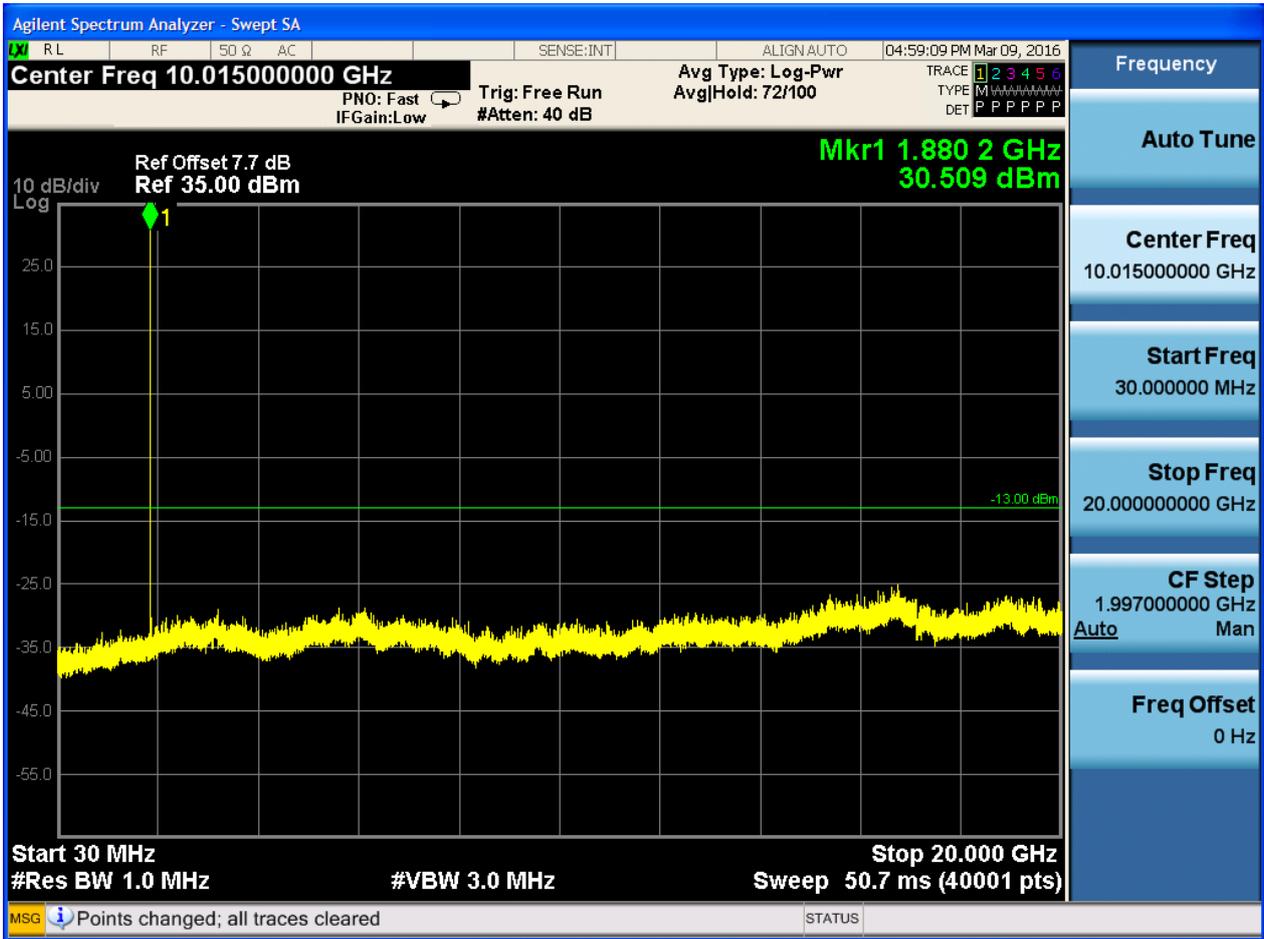




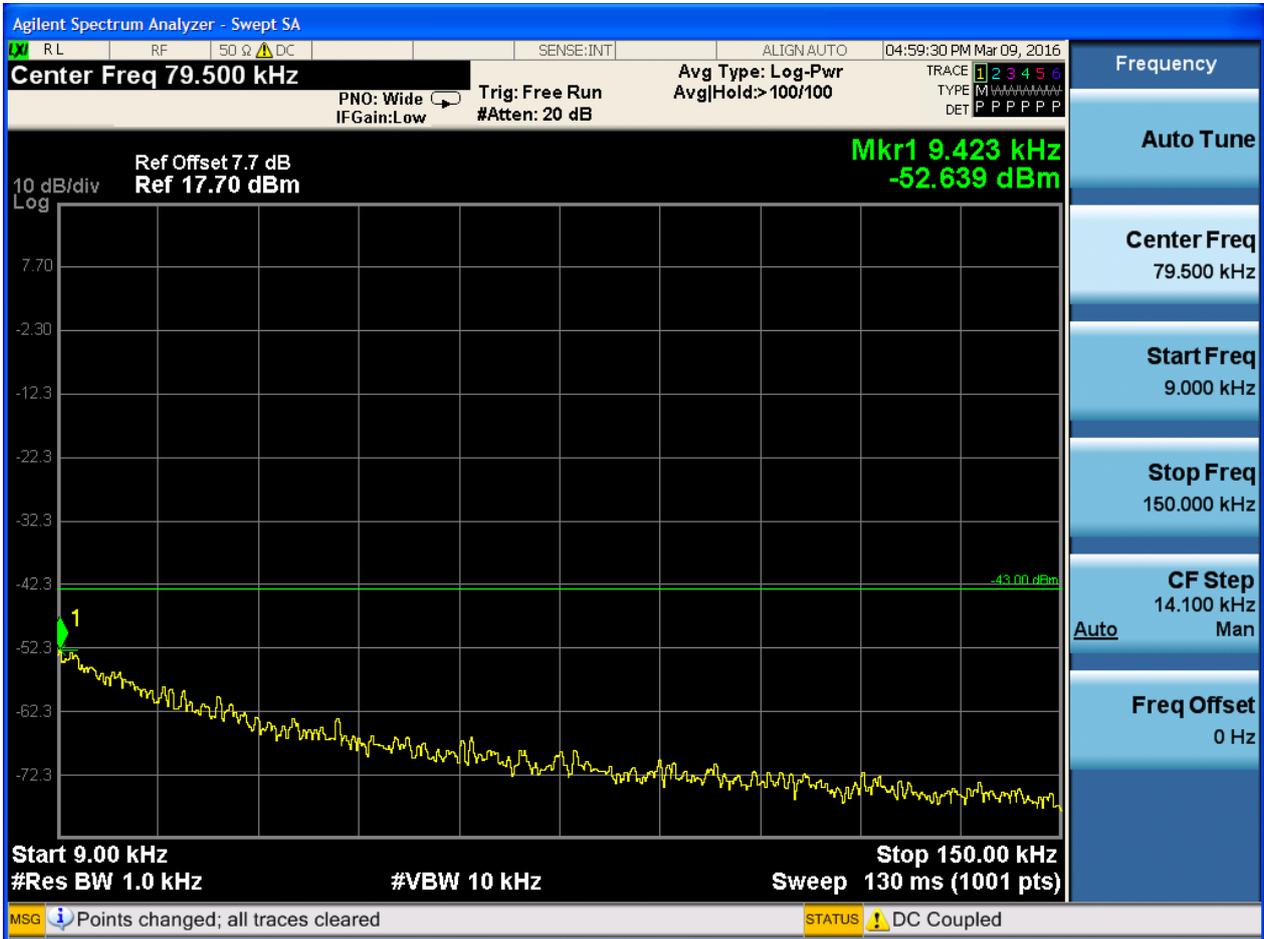
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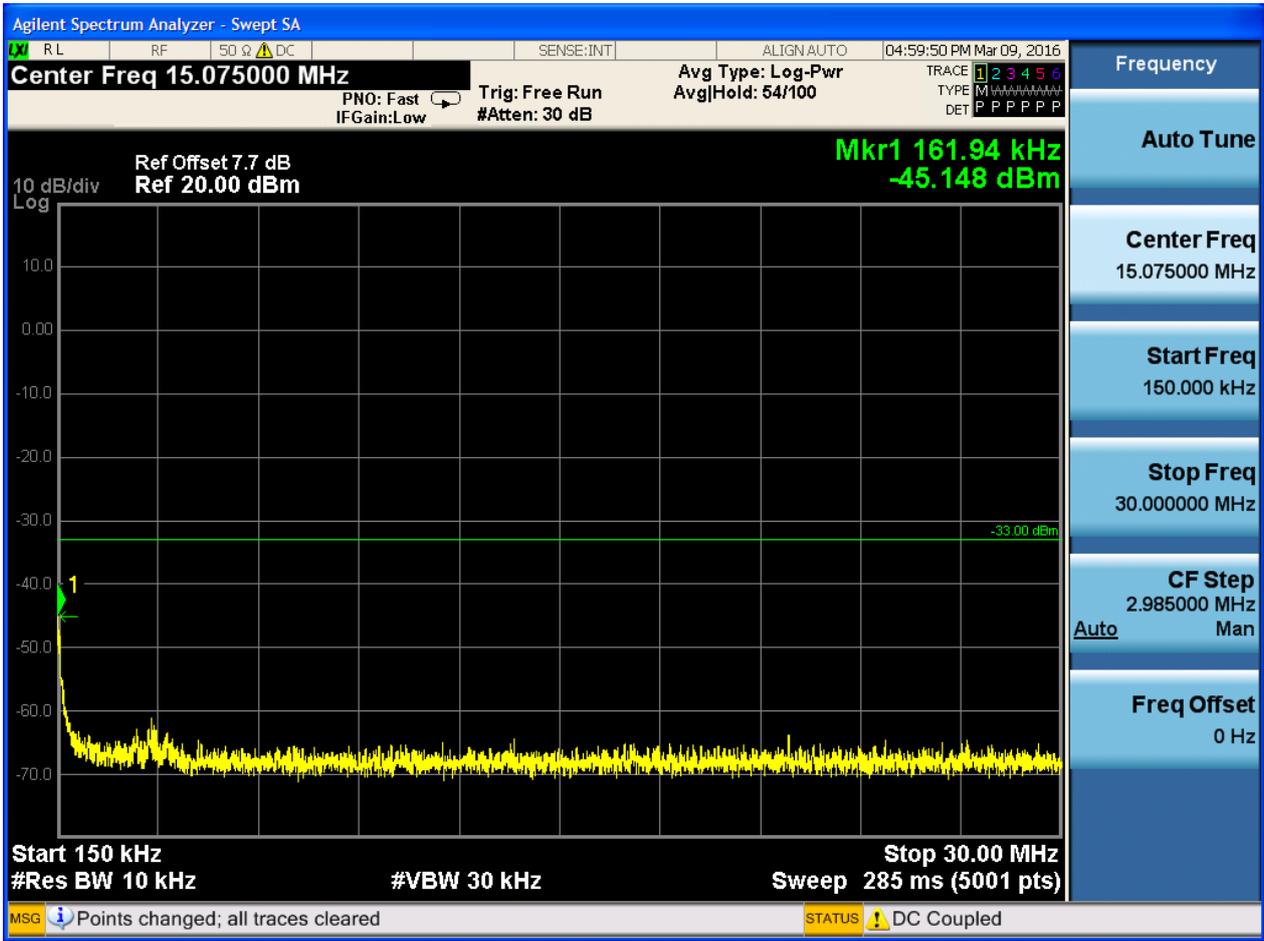


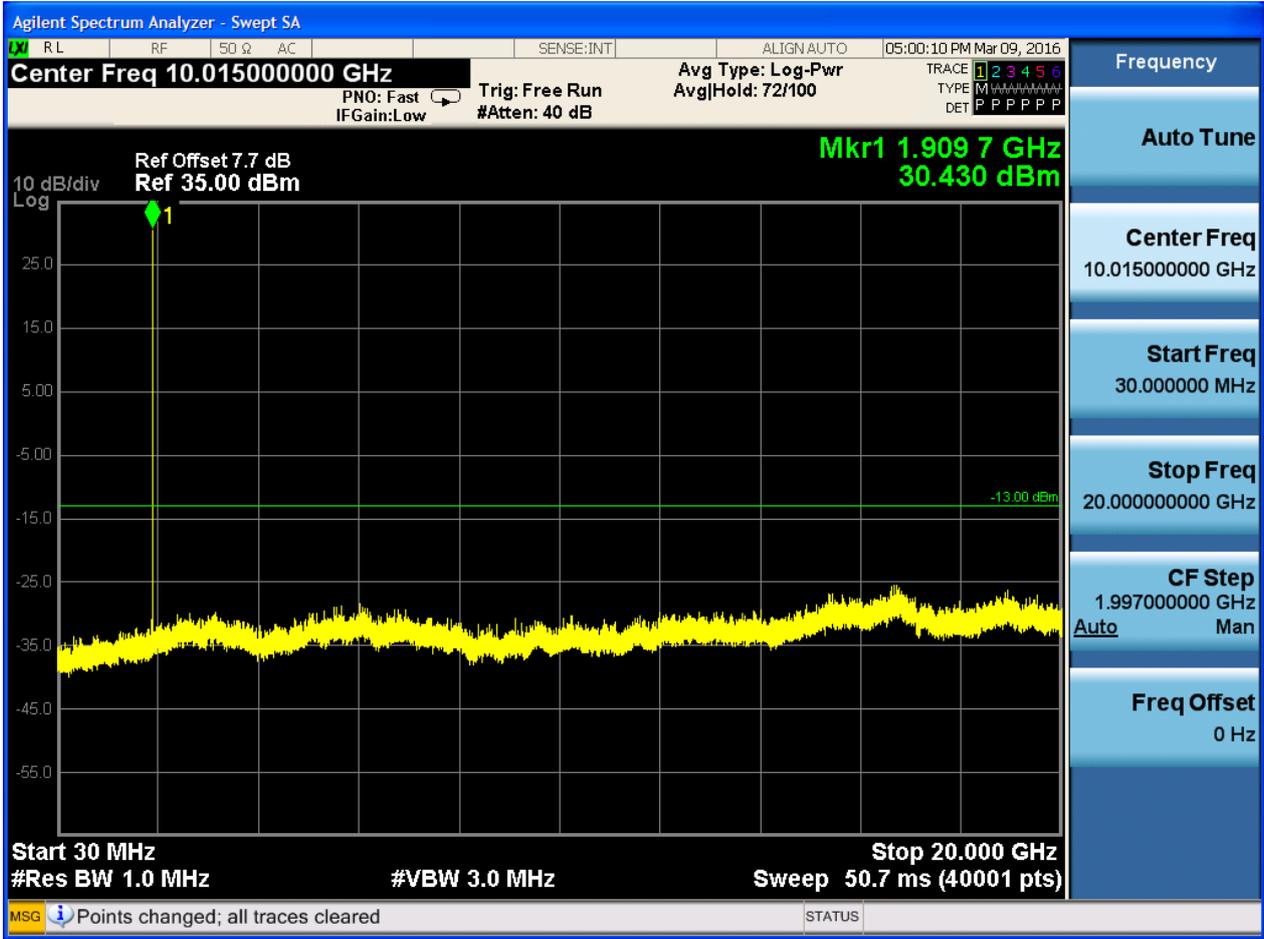




6.1.2.1.3 Test Channel = HCH



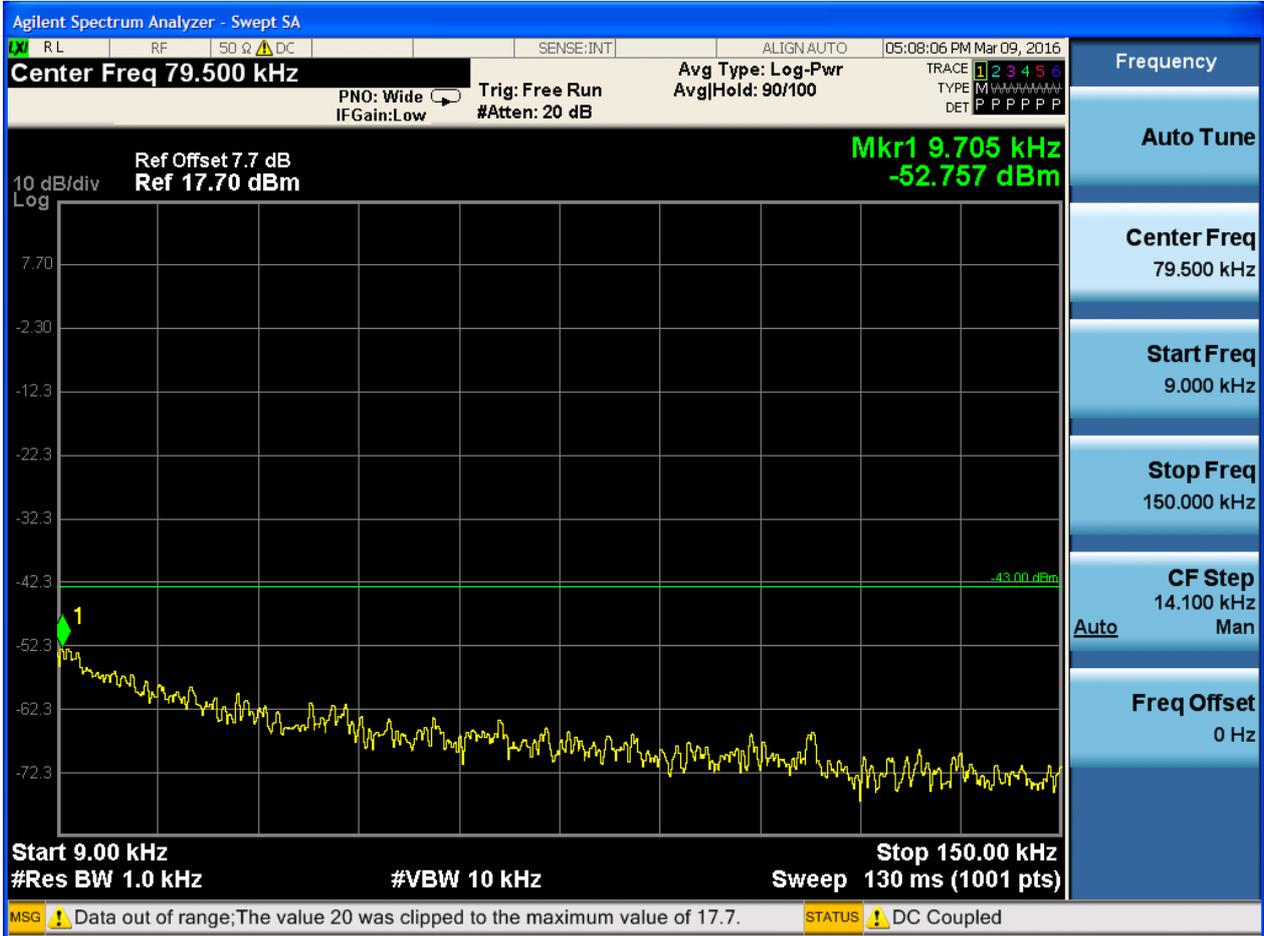


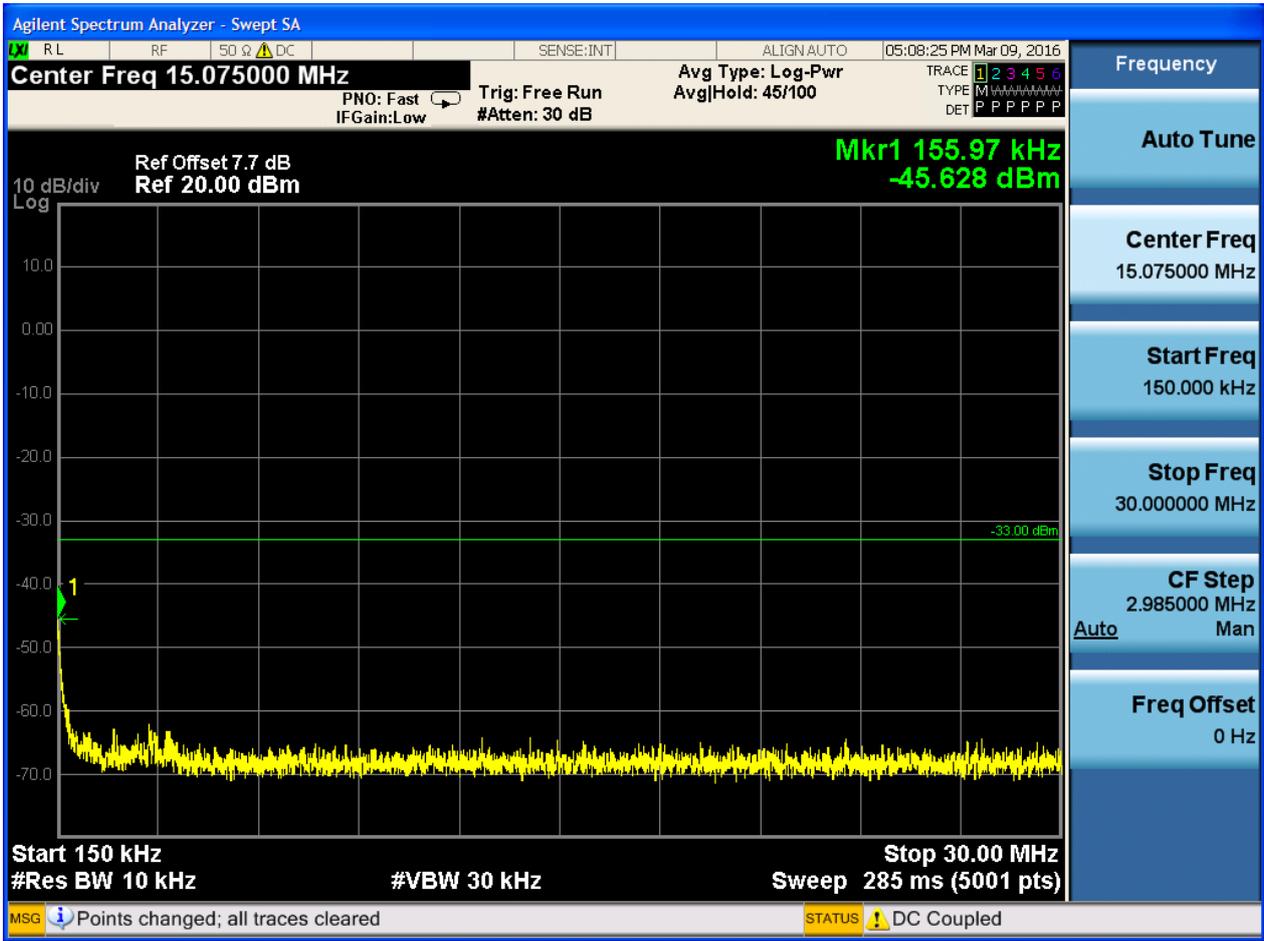


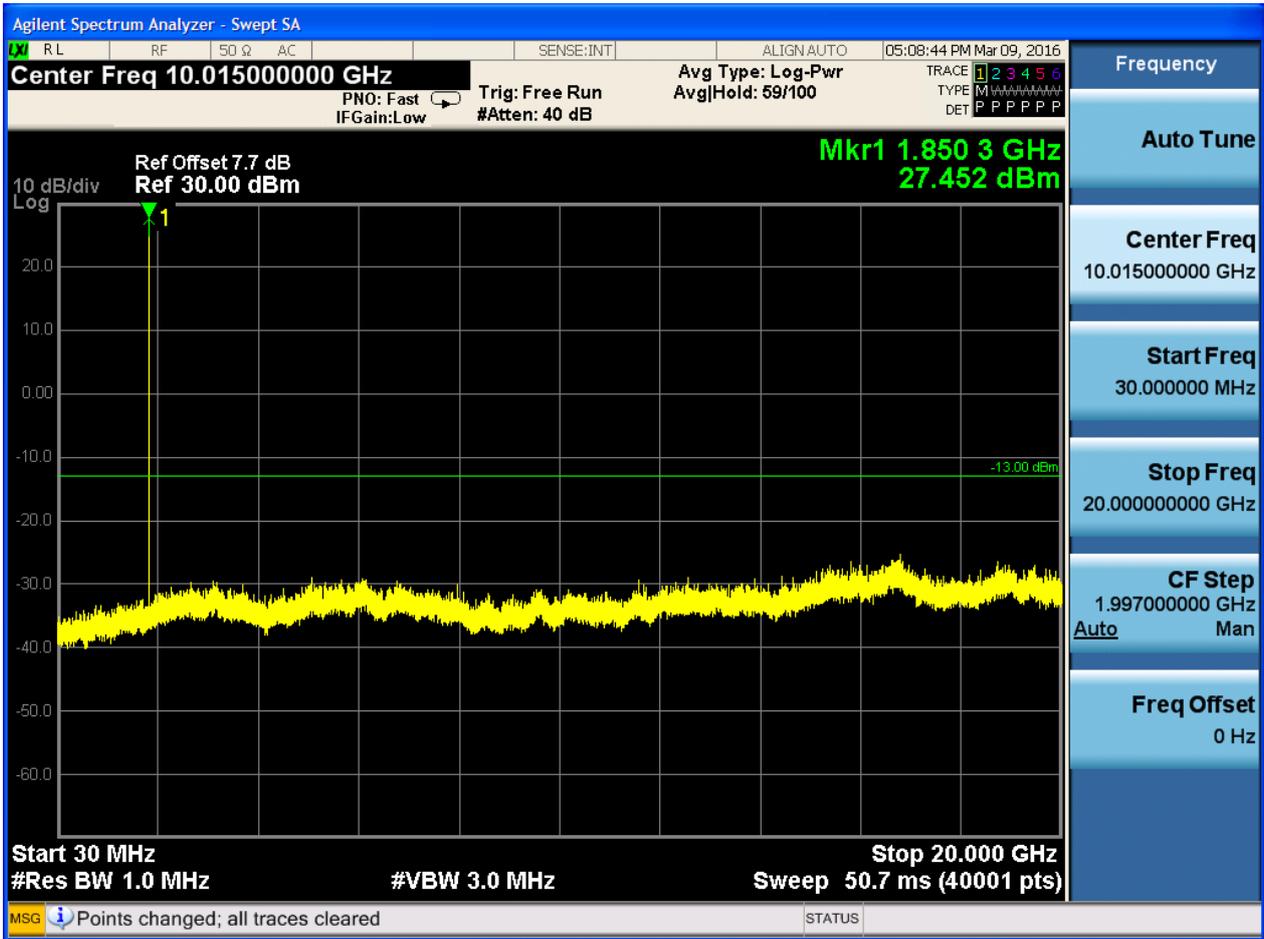


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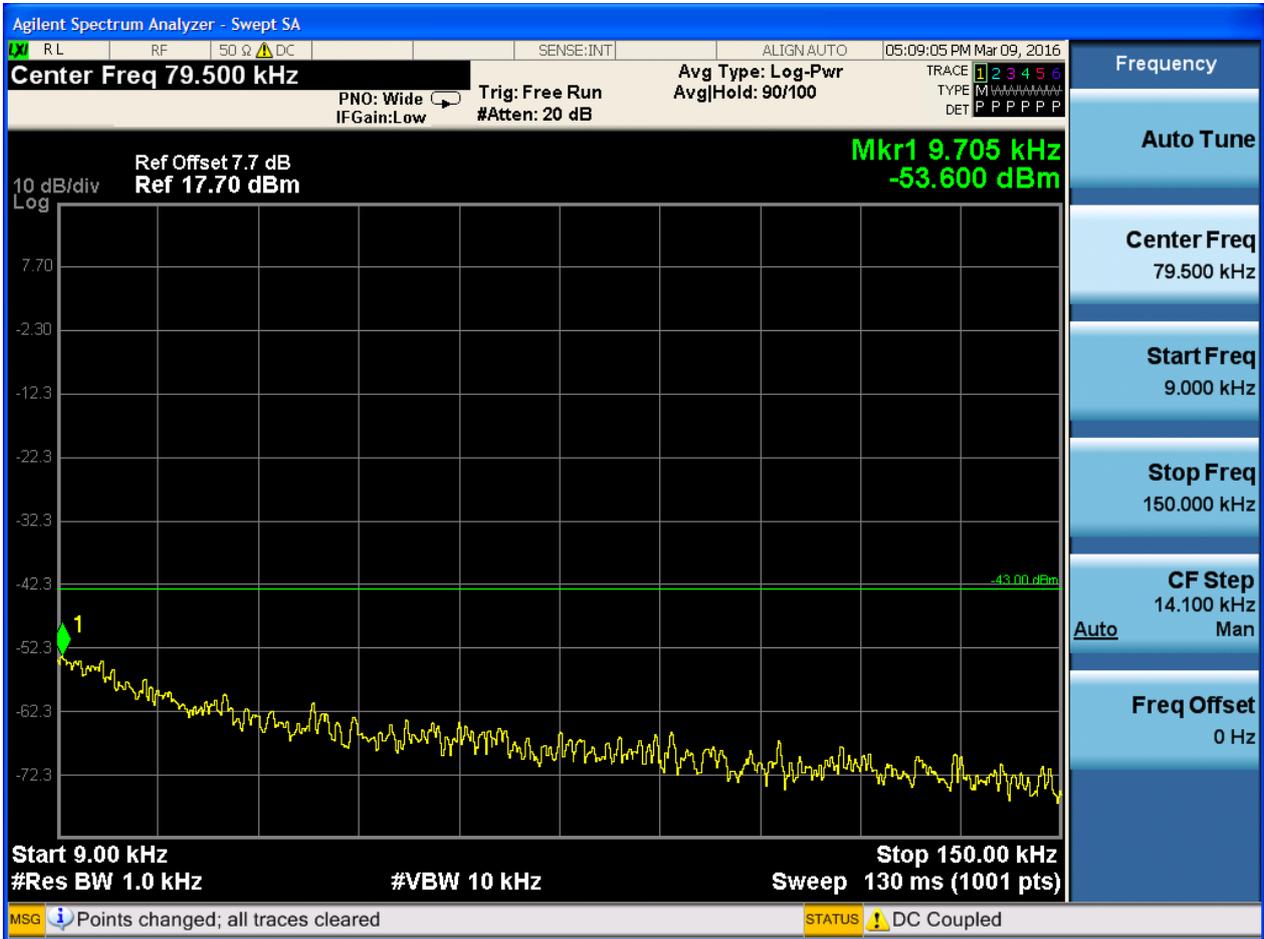
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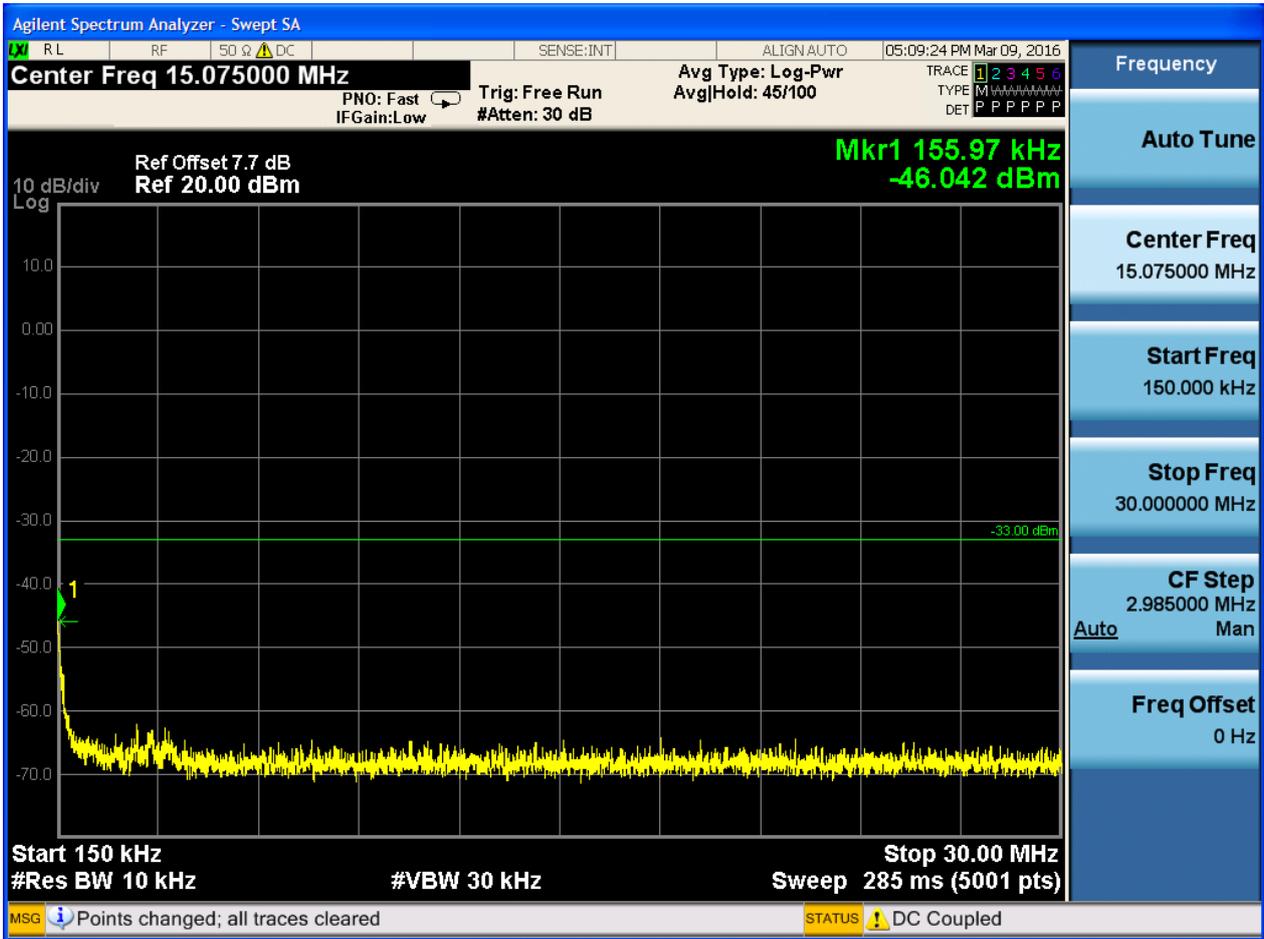


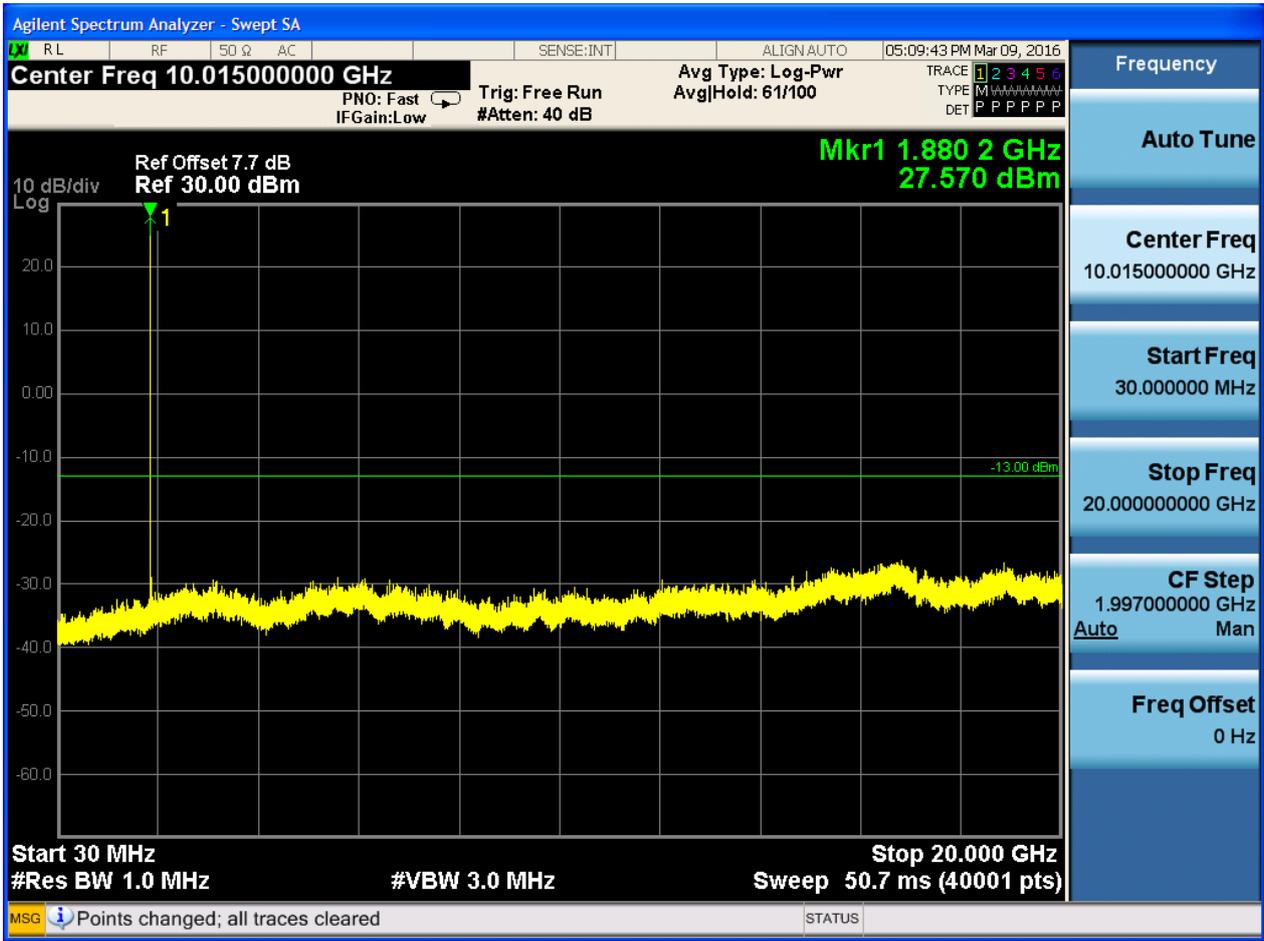




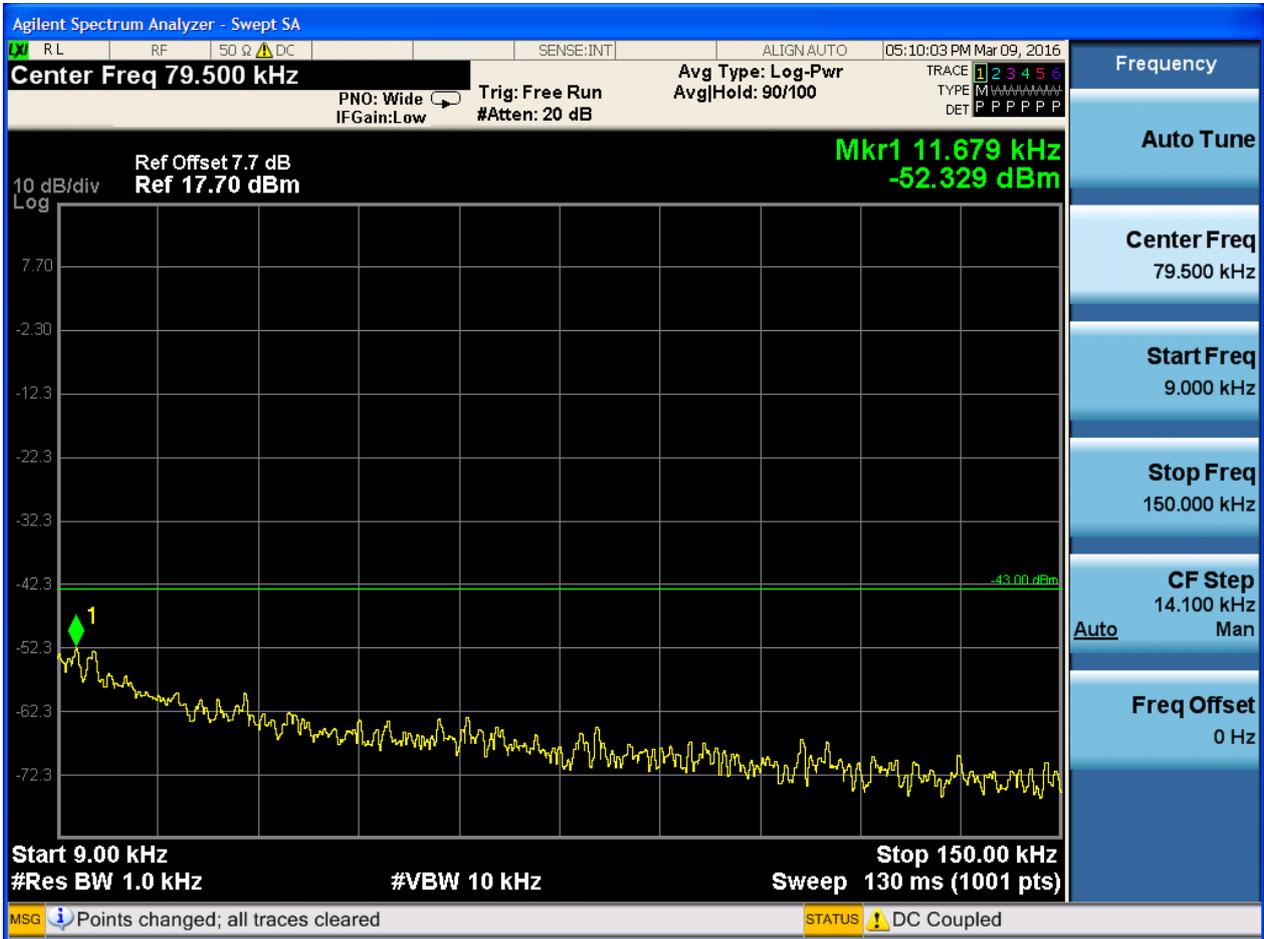
6.1.2.2.2 Test Channel = MCH

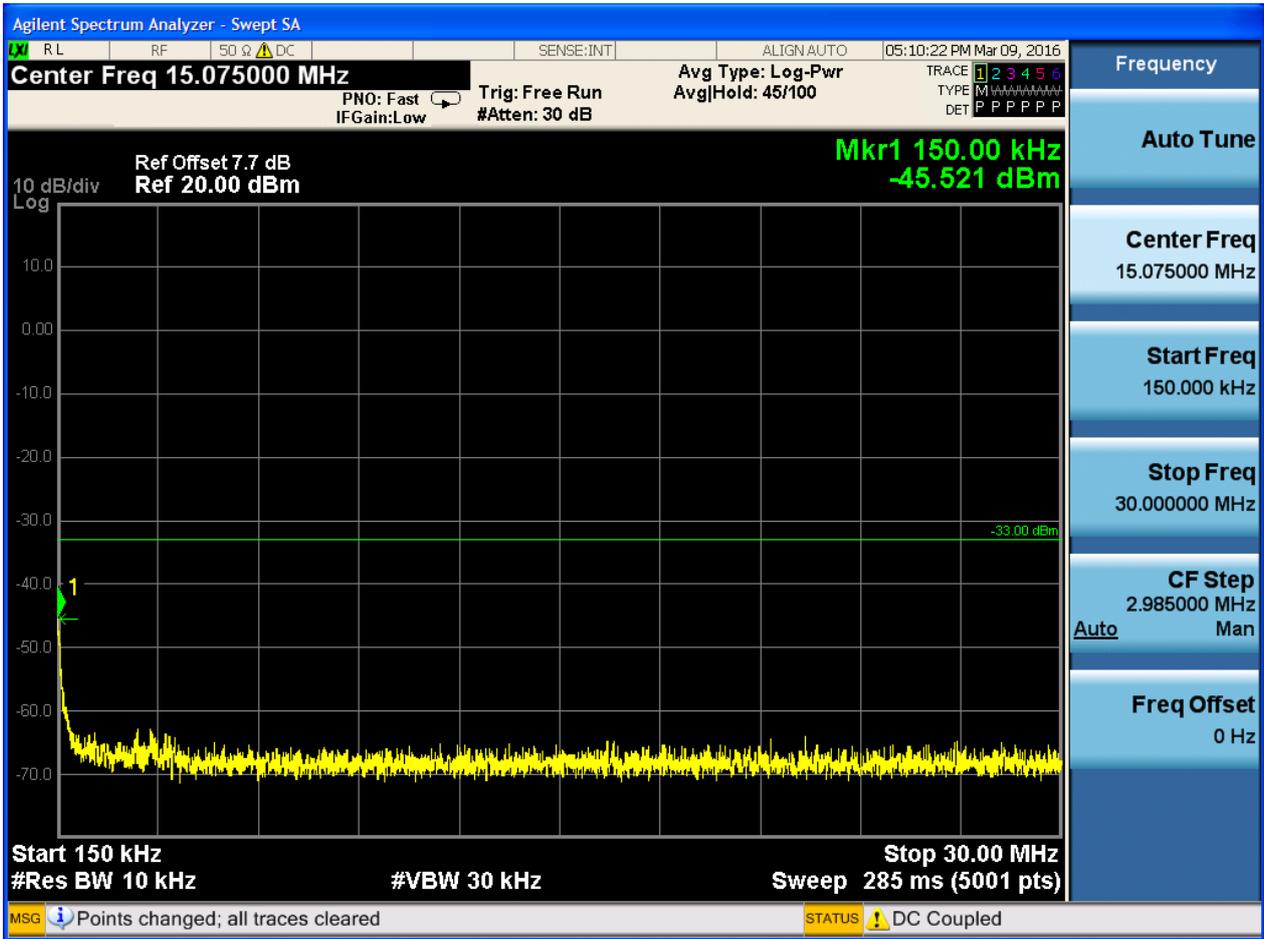


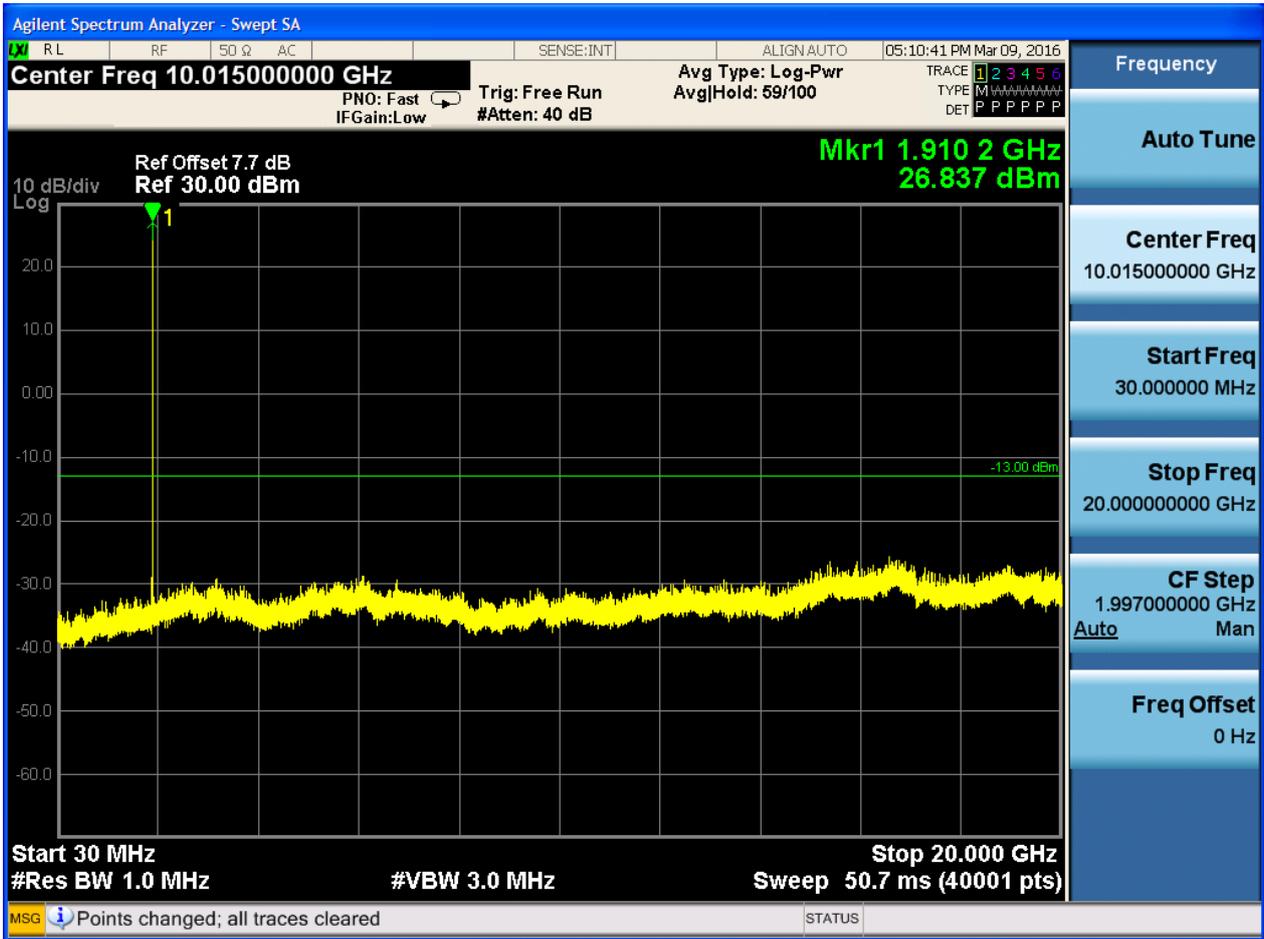




6.1.2.2.3 Test Channel = HCH







## 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
GSM850	GSM/TM1	LCH	TN	VL	-9.62	-0.01167	PASS
				VN	-9.81	-0.0119	PASS
				VH	-7.55	-0.00916	PASS
		MCH	TN	VL	-8.91	-0.01065	PASS
				VN	-7.04	-0.00842	PASS
				VH	-8.65	-0.01034	PASS
		HCH	TN	VL	-9.43	-0.01111	PASS
				VN	-6.72	-0.00792	PASS
				VH	-3.49	-0.00411	PASS
	GSM/TM2	LCH	TN	VL	-13.56	-0.01645	PASS
				VN	-2.42	-0.00294	PASS
				VH	-4.58	-0.00556	PASS
		MCH	TN	VL	-5.97	-0.00714	PASS
				VN	-17.01	-0.02033	PASS
				VH	-13.11	-0.01567	PASS
		HCH	TN	VL	-8.98	-0.01058	PASS
				VN	-6.01	-0.00708	PASS
				VH	-5.26	-0.0062	PASS
GSM1900	GSM/TM1	LCH	TN	VL	6.59	0.00356	PASS
				VN	2	0.00108	PASS
				VH	10.14	0.00548	PASS
		MCH	TN	VL	-0.97	-0.00052	PASS
				VN	-3.68	-0.00196	PASS
				VH	-6.52	-0.00347	PASS
		HCH	TN	VL	4.2	0.0022	PASS
				VN	-0.77	-0.0004	PASS
				VH	4.65	0.00243	PASS
	GSM/TM2	LCH	TN	VL	-23.05	-0.01246	PASS
				VN	-14.95	-0.00808	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
				VH	-11.36	-0.00614	PASS
		MCH	TN	VL	-23.28	-0.01238	PASS
				VN	-13.14	-0.00699	PASS
				VH	-34.22	-0.0182	PASS
		HCH	TN	VL	-3.07	-0.00161	PASS
				VN	-18.47	-0.00967	PASS
				VH	-10.85	-0.00568	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
GSM850	GSM/TM1	LCH	VN	-30	-6.33	-0.00768	PASS
				-20	-4.84	-0.00587	PASS
				-10	-7.43	-0.00901	PASS
				0	-8.39	-0.01018	PASS
				10	-10.78	-0.01308	PASS
				20	-10.65	-0.01292	PASS
				30	-9.23	-0.0112	PASS
				40	-7.75	-0.0094	PASS
				50	-10.14	-0.0123	PASS
		MCH	VN	-30	-5.94	-0.0071	PASS
				-20	-10.65	-0.01273	PASS
				-10	-10.59	-0.01266	PASS
				0	-7.88	-0.00942	PASS
				10	-4.39	-0.00525	PASS
				20	-10.27	-0.01228	PASS
				30	-8.46	-0.01011	PASS
				40	-11.24	-0.01344	PASS
				50	-8.2	-0.0098	PASS
		HCH	VN	-30	-7.17	-0.00845	PASS
				-20	-11.75	-0.01384	PASS
				-10	-6.91	-0.00814	PASS
				0	-3.16	-0.00372	PASS
				10	-7.55	-0.00889	PASS
				20	-9.75	-0.01149	PASS
	30			-12.27	-0.01446	PASS	
	40			-6.26	-0.00738	PASS	
	50			-9.81	-0.01156	PASS	
	GSM/TM2	LCH	VN	-30	-8.91	-0.01081	PASS
				-20	-8.81	-0.01069	PASS
				-10	-16.27	-0.01974	PASS
				0	-6.78	-0.00823	PASS
				10	-10.27	-0.01246	PASS
				20	-13.3	-0.01614	PASS
				30	-9.17	-0.01113	PASS
				40	-19.73	-0.02394	PASS
				50	-12.98	-0.01575	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
		MCH	VN	-30	-17.56	-0.02099	PASS
				-20	-7.68	-0.00918	PASS
				-10	-9.69	-0.01158	PASS
				0	-8.36	-0.00999	PASS
				10	-13.33	-0.01593	PASS
				20	-12.43	-0.01486	PASS
				30	-10.59	-0.01266	PASS
				40	-9.85	-0.01177	PASS
				50	-5.52	-0.0066	PASS
		HCH	VN	-30	-8.2	-0.00966	PASS
				-20	-10.17	-0.01198	PASS
				-10	-9.2	-0.01084	PASS
				0	-11.82	-0.01393	PASS
				10	-8.88	-0.01046	PASS
				20	-3.1	-0.00365	PASS
				30	-10.91	-0.01285	PASS
				40	-8.68	-0.01023	PASS
				50	-14.11	-0.01662	PASS
GSM1900	GSM/TM1	LCH	VN	-30	14.4	0.00778	PASS
				-20	15.88	0.00858	PASS
				-10	5.94	0.00321	PASS
				0	12.2	0.00659	PASS
				10	1.36	0.00074	PASS
				20	12.59	0.0068	PASS
				30	8.85	0.00478	PASS
				40	7.04	0.0038	PASS
				50	-3.03	-0.00164	PASS
		MCH	VN	-30	5.29	0.00281	PASS
				-20	-8.07	-0.00429	PASS
				-10	-3.49	-0.00186	PASS
				0	-4.91	-0.00261	PASS
				10	7.94	0.00422	PASS
				20	-13.56	-0.00721	PASS
				30	7.75	0.00412	PASS
				40	-4.13	-0.0022	PASS
				50	-0.84	-0.00045	PASS
		HCH	VN	-30	10.4	0.00545	PASS
				-20	0.97	0.00051	PASS
				-10	1.1	0.00058	PASS
				0	-6.78	-0.00355	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict		
				10	4.26	0.00223	PASS		
				20	-7.75	-0.00406	PASS		
				30	10.33	0.00541	PASS		
				40	2.52	0.00132	PASS		
				50	4.97	0.0026	PASS		
				LCH	VN	-30	-5.78	-0.00312	PASS
						-20	-3.16	-0.00171	PASS
						-10	-11.01	-0.00595	PASS
						0	-4.97	-0.00269	PASS
						10	-8.23	-0.00445	PASS
	20	-16.53	-0.00893			PASS			
	30	-8.72	-0.00471			PASS			
	40	-21.86	-0.01181			PASS			
	50	-15.17	-0.0082			PASS			
	MCH	VN	-30			-18.6	-0.00989	PASS	
			-20	-13.24	-0.00704	PASS			
			-10	-22.96	-0.01221	PASS			
			0	-14.14	-0.00752	PASS			
			10	-23.05	-0.01226	PASS			
			20	-25.25	-0.01343	PASS			
			30	-5.29	-0.00281	PASS			
			40	-14.43	-0.00768	PASS			
			50	-23.99	-0.01276	PASS			
			HCH	VN	-30	-8.01	-0.00419	PASS	
	-20	-18.92			-0.00991	PASS			
	-10	-3.39			-0.00178	PASS			
	0	-11.53			-0.00604	PASS			
	10	-17.95			-0.0094	PASS			
	20	-17.6			-0.00922	PASS			
	30	-16.53			-0.00866	PASS			
40	-5.39	-0.00282			PASS				
50	-16.53	-0.00866			PASS				

END