



# 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 [dBm]	Limit [dBm]	Verdict
GSM850	GSM/TM1	LCH	33.61	30.06	38.5	PASS
		MCH	33.36	29.81	38.5	PASS
		HCH	33.52	29.97	38.5	PASS
	GSM/TM2	LCH	25.93	22.38	38.5	PASS
		MCH	26.6	23.05	38.5	PASS
		HCH	26.56	23.01	38.5	PASS
Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
PCS1900	GSM/TM1	LCH	30.49	30.19	33	PASS
		MCH	30.37	30.07	33	PASS
		HCH	30.23	29.93	33	PASS
	GSM/TM2	LCH	26.86	26.56	33	PASS
		MCH	26.74	26.44	33	PASS
		HCH	26.79	26.49	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 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	0.29	13	PASS
		MCH	0.28	13	PASS
		HCH	0.26	13	PASS
	GSM/TM2	LCH	3.29	13	PASS
		MCH	3.27	13	PASS
		HCH	3.28	13	PASS
GSM1900	GSM/TM1	LCH	0.47	13	PASS
		MCH	0.44	13	PASS
		HCH	0.44	13	PASS
	GSM/TM2	LCH	3.14	13	PASS
		MCH	3.17	13	PASS
		HCH	3.33	13	PASS

### 3Appendix\_C: Modulation Characteristics

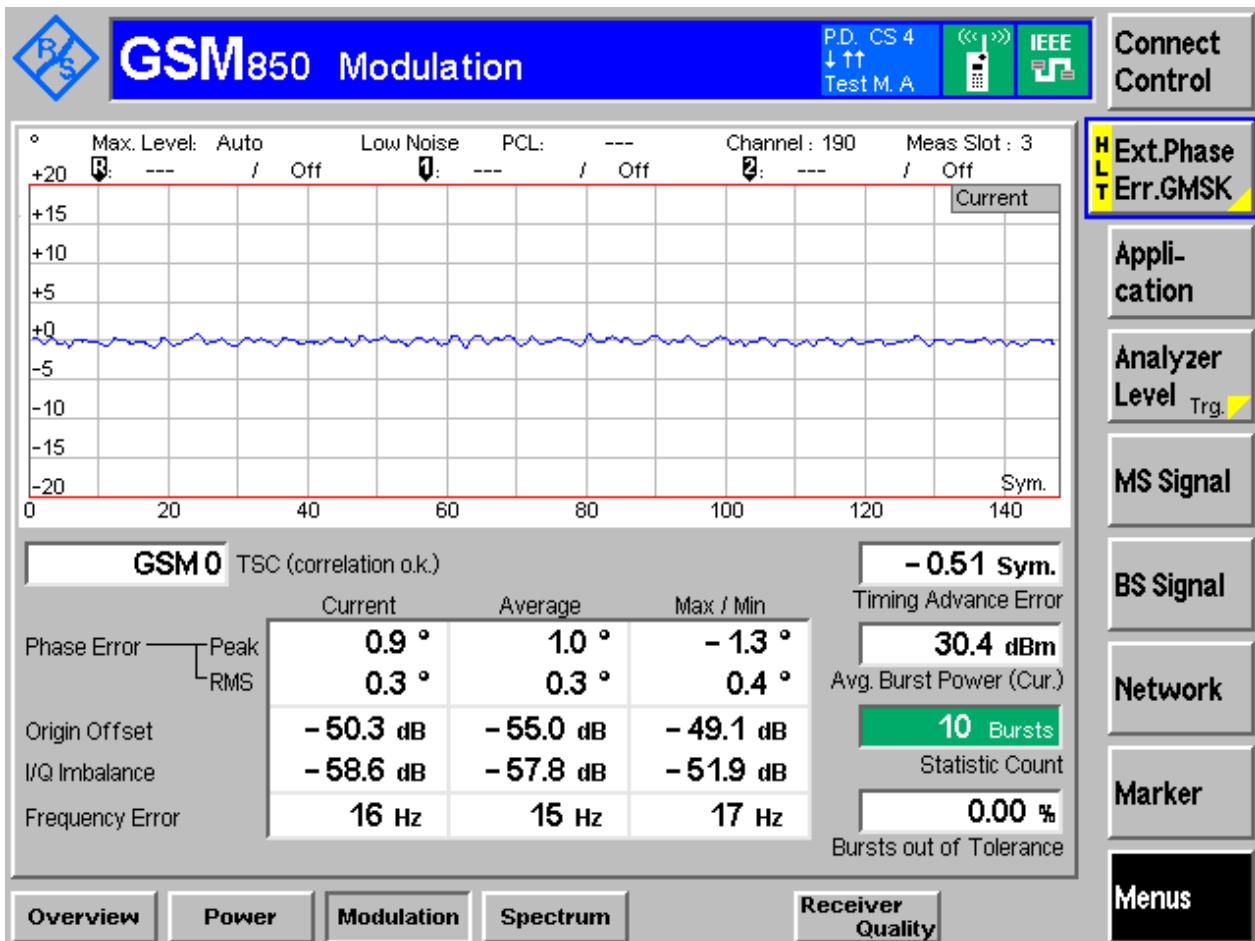
#### Part I - Test Plots

#### 3.1 For GSM

#### 3.1.1 Test Band = GSM850

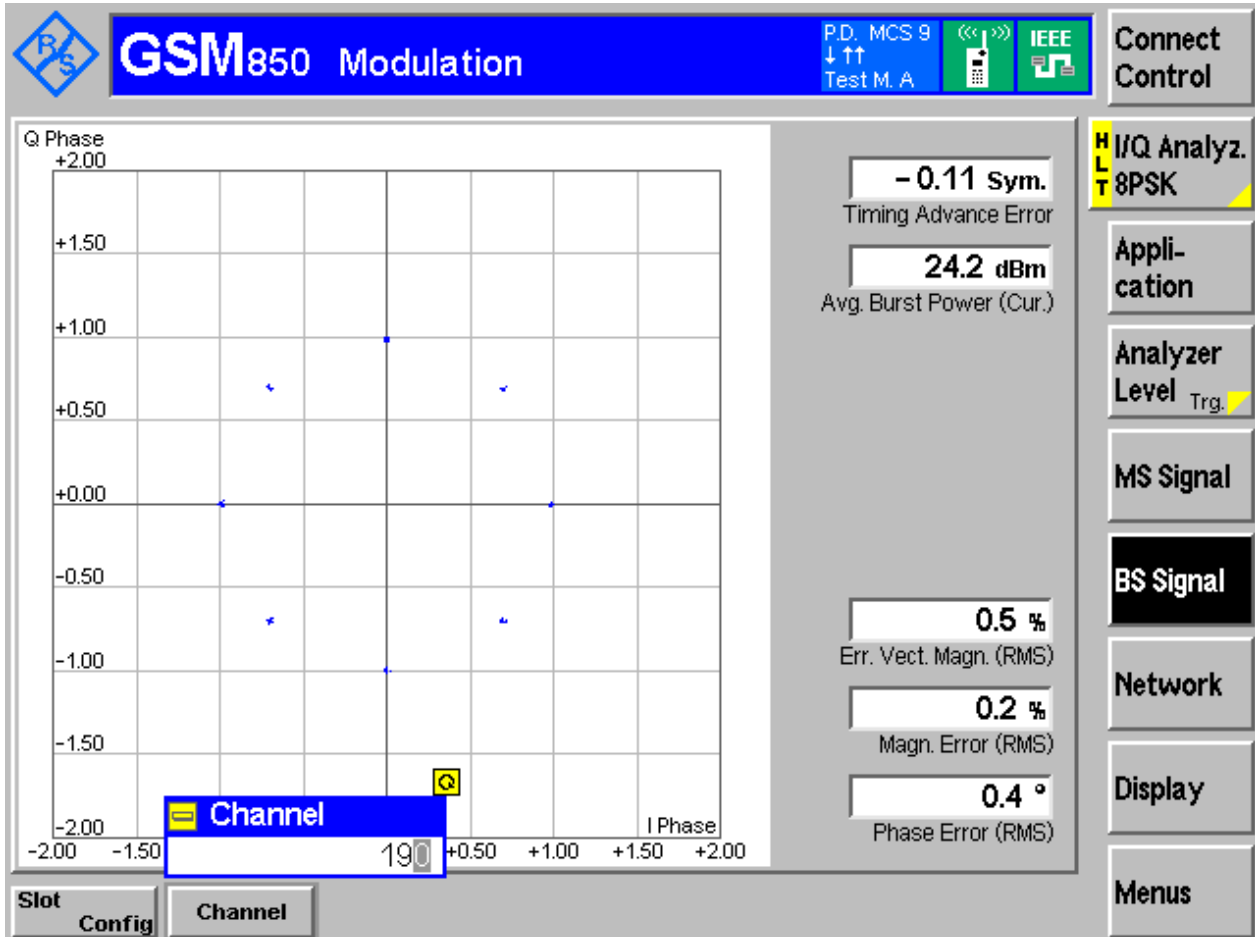
#### 3.1.1.1 Test Mode = GSM/TM1

#### 3.1.1.1.1 Test Channel = MCH



### 3.1.1.2 Test Mode = GSM/TM2

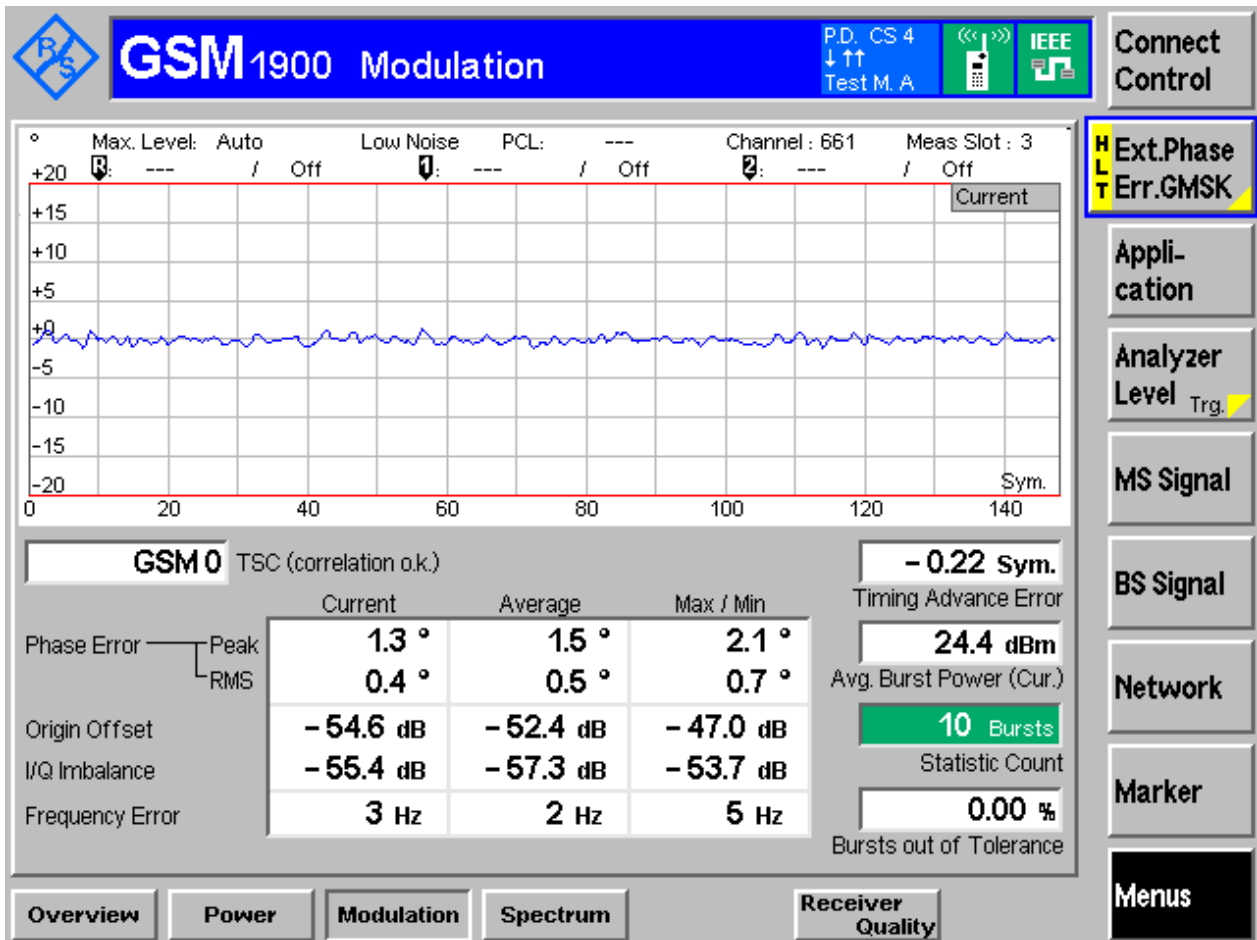
#### 3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

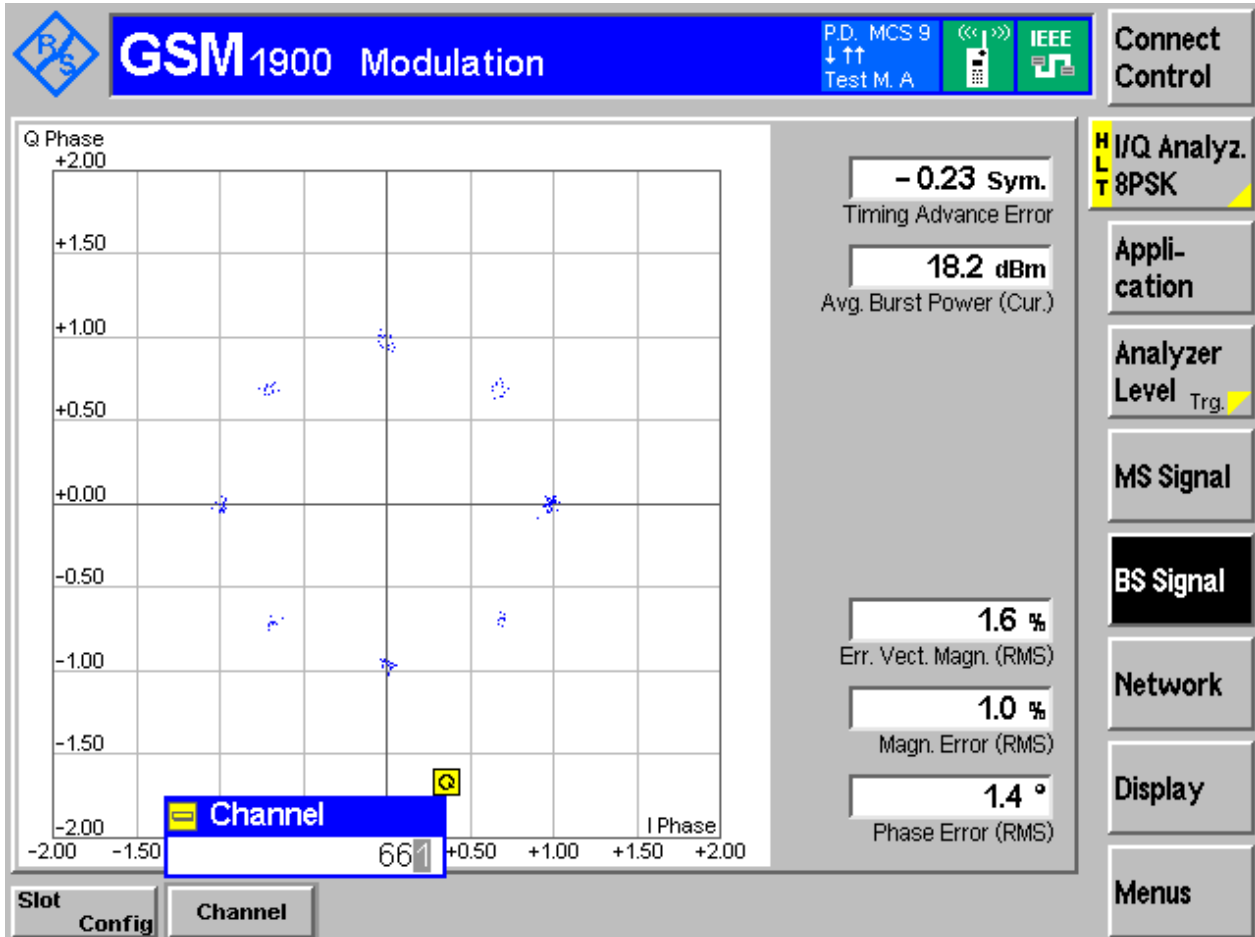
3.1.2.1 Test Mode = GSM/TM1

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	244.39	319.6	Pass
		MCH	243.21	318.2	Pass
		HCH	242.73	314.9	Pass
	GSM/TM2	LCH	244.39	319.6	Pass
		MCH	243.21	318.2	Pass
		HCH	242.73	314.9	Pass
PCS1900	GSM/TM1	LCH	242.38	301.8	Pass
		MCH	244.17	300.4	Pass
		HCH	241.17	304.8	Pass
	GSM/TM2	LCH	241.24	316.6	Pass
		MCH	243.00	318.5	Pass
		HCH	243.01	315.5	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 = PCS1900

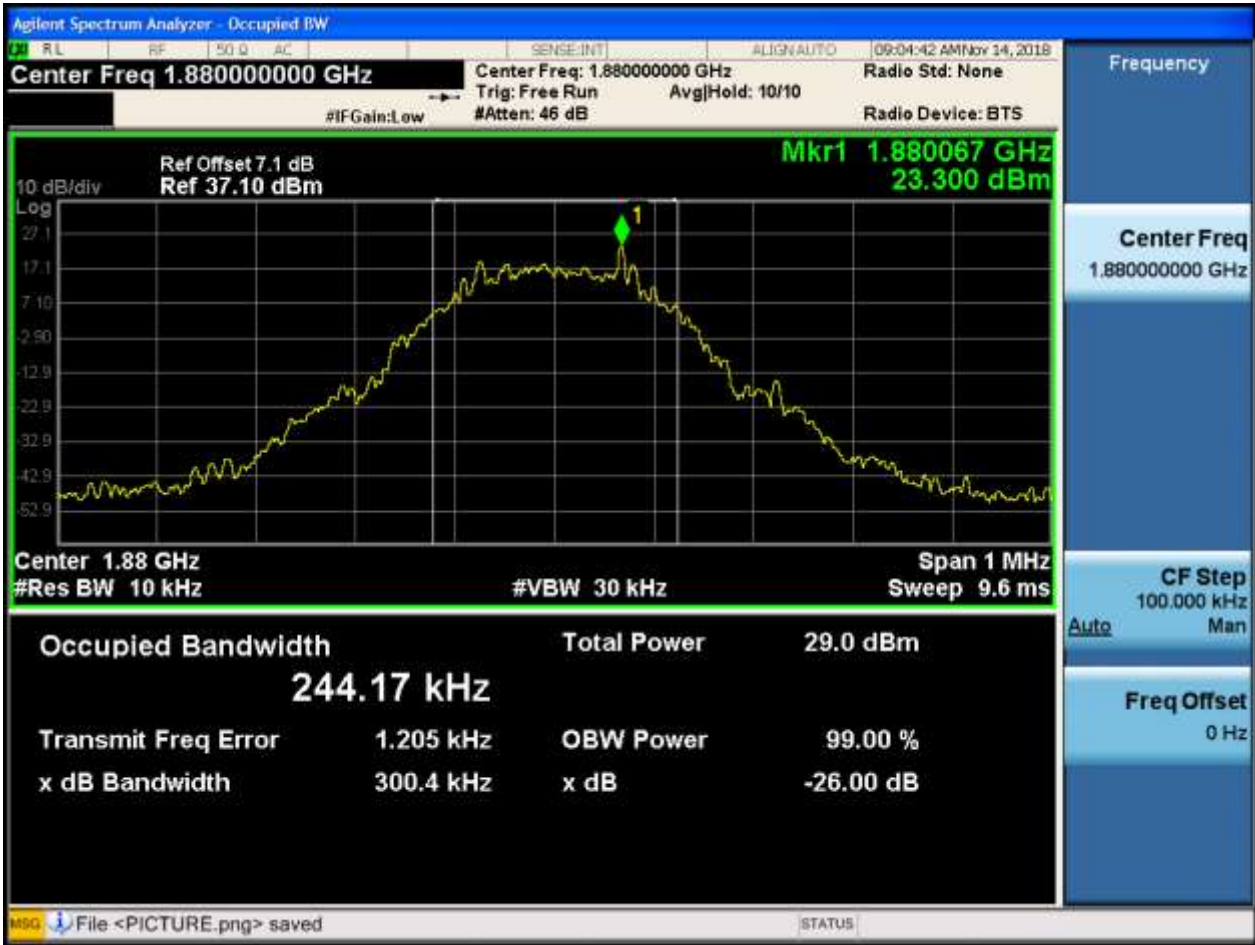
4.1.2.1 Test Mode = GSM/TM1

4.1.2.1.1 Test Channel = LCH

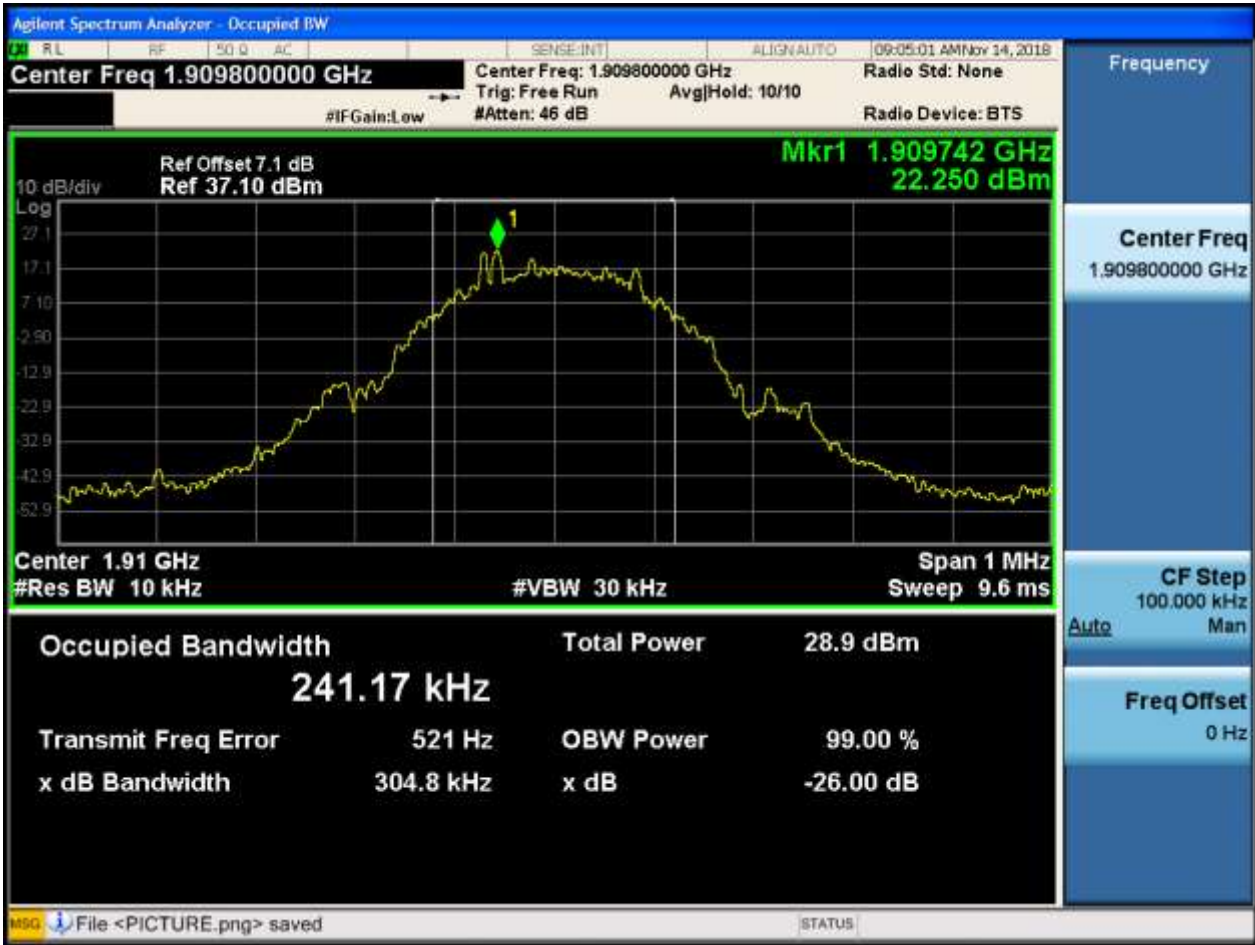




4.1.2.1.2 Test Channel = MCH

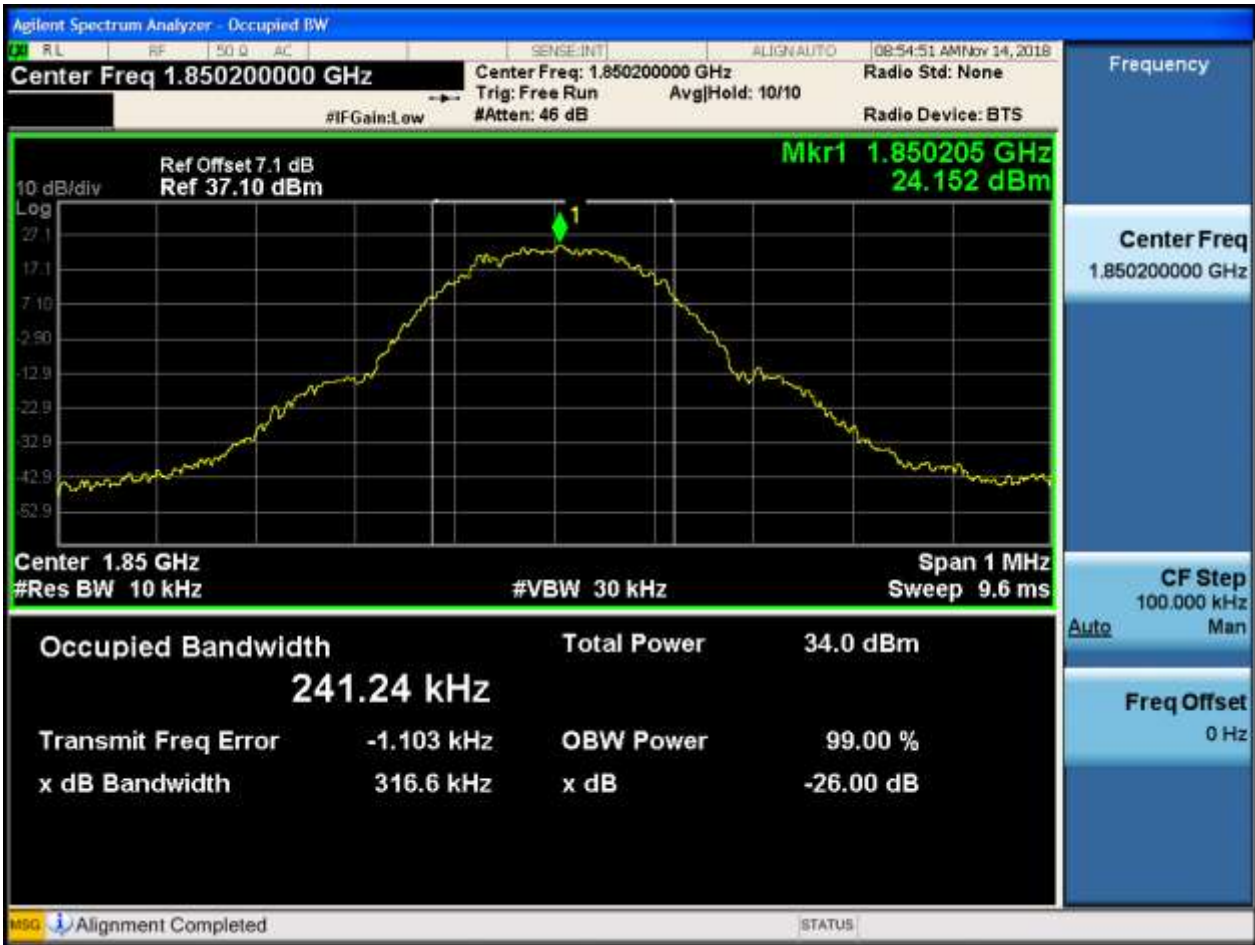


4.1.2.1.3 Test Channel = HCH



4.1.2.2 Test Mode = GSM/TM2

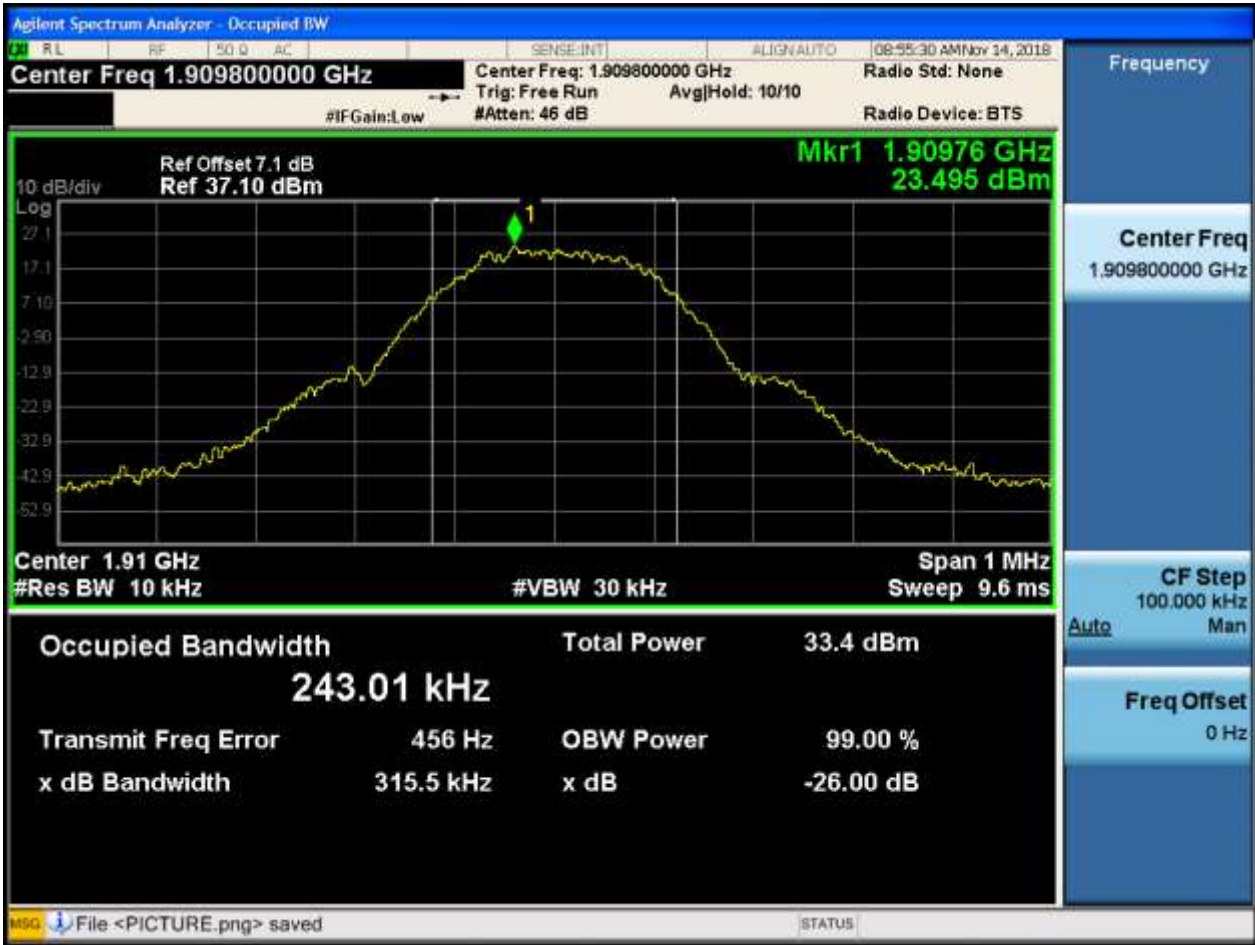
4.1.2.2.1 Test Channel = LCH



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

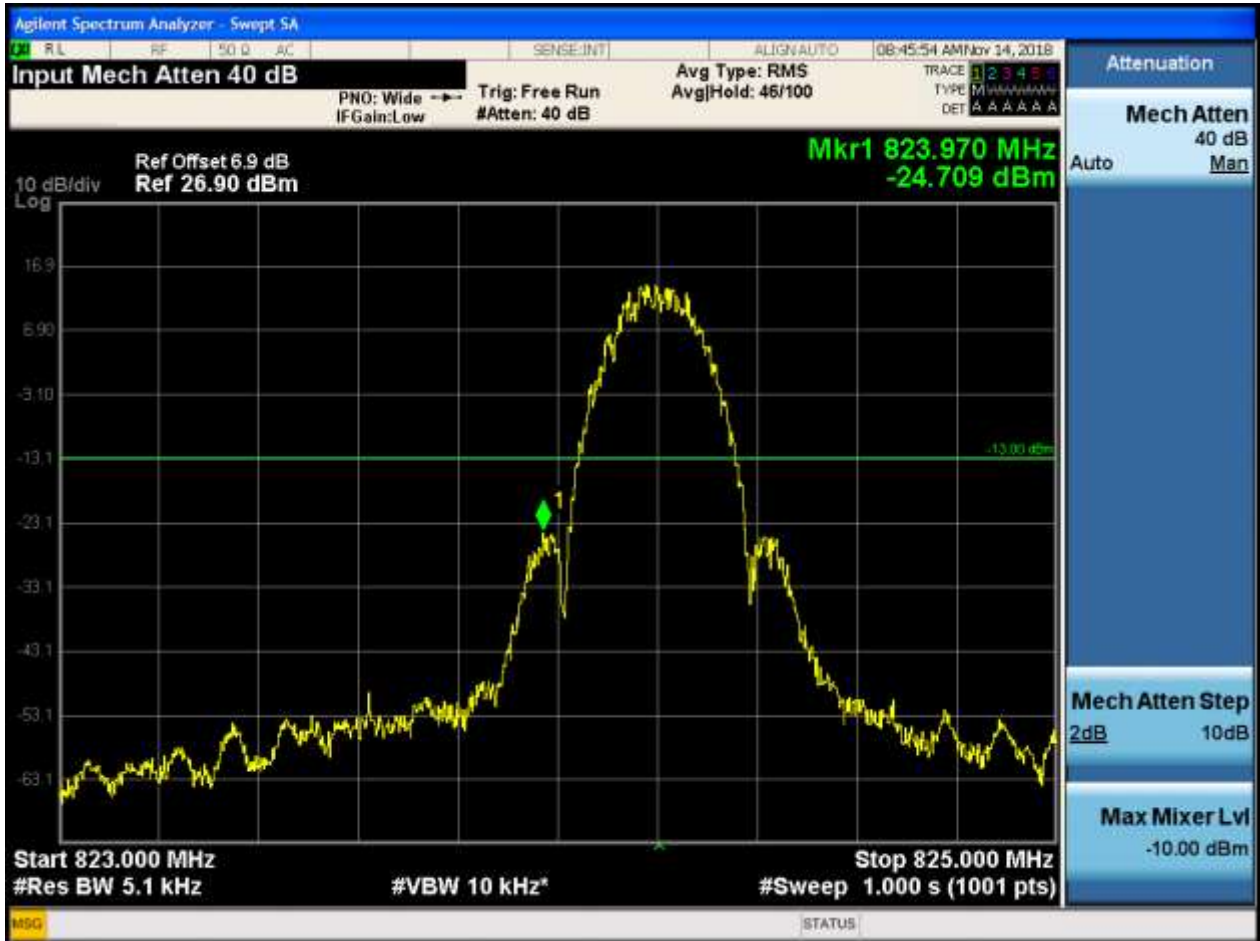


5.1.1.1.2 Test Channel = HCH



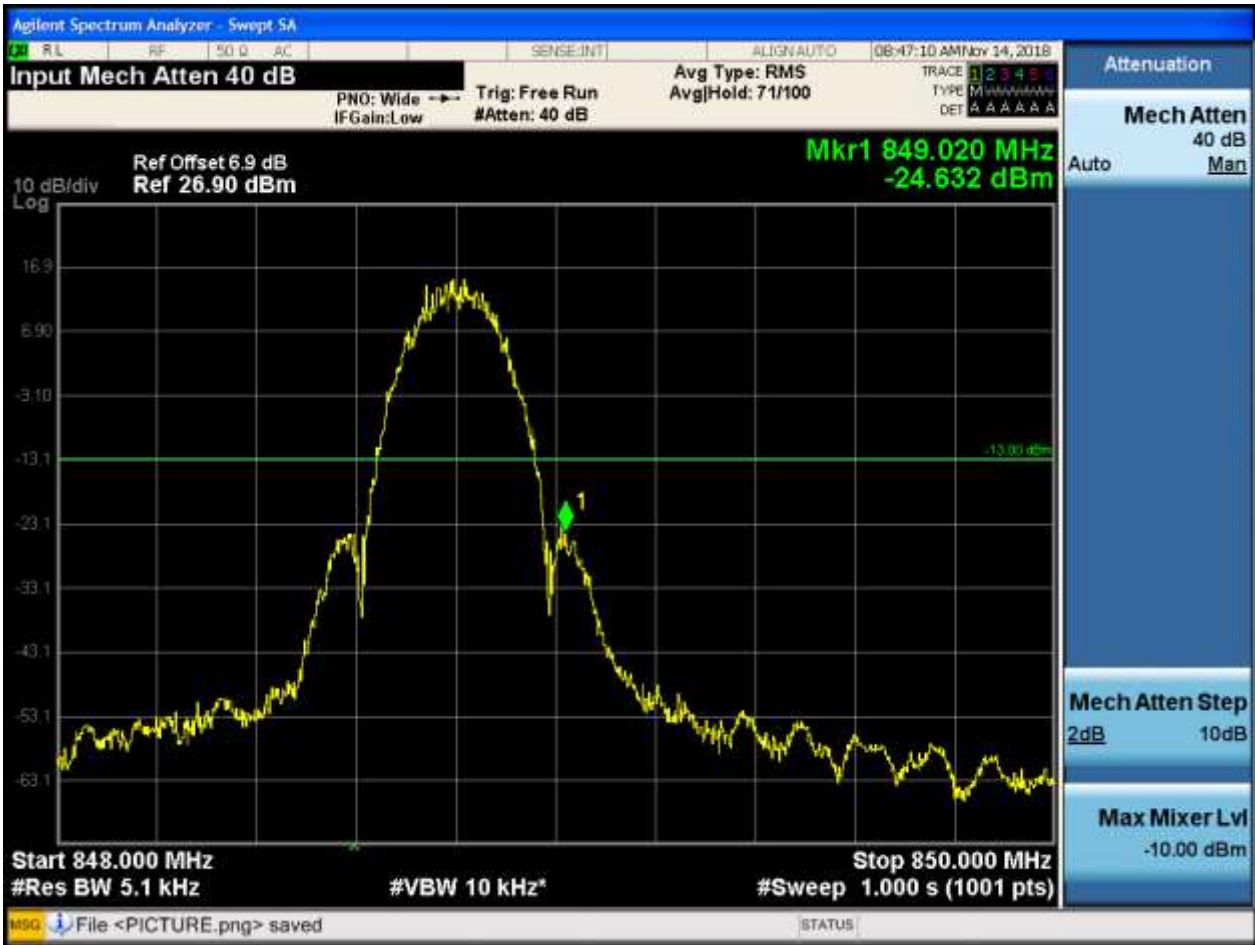
5.1.1.2 Test Mode = GSM/TM2

5.1.1.2.1 Test Channel = LCH





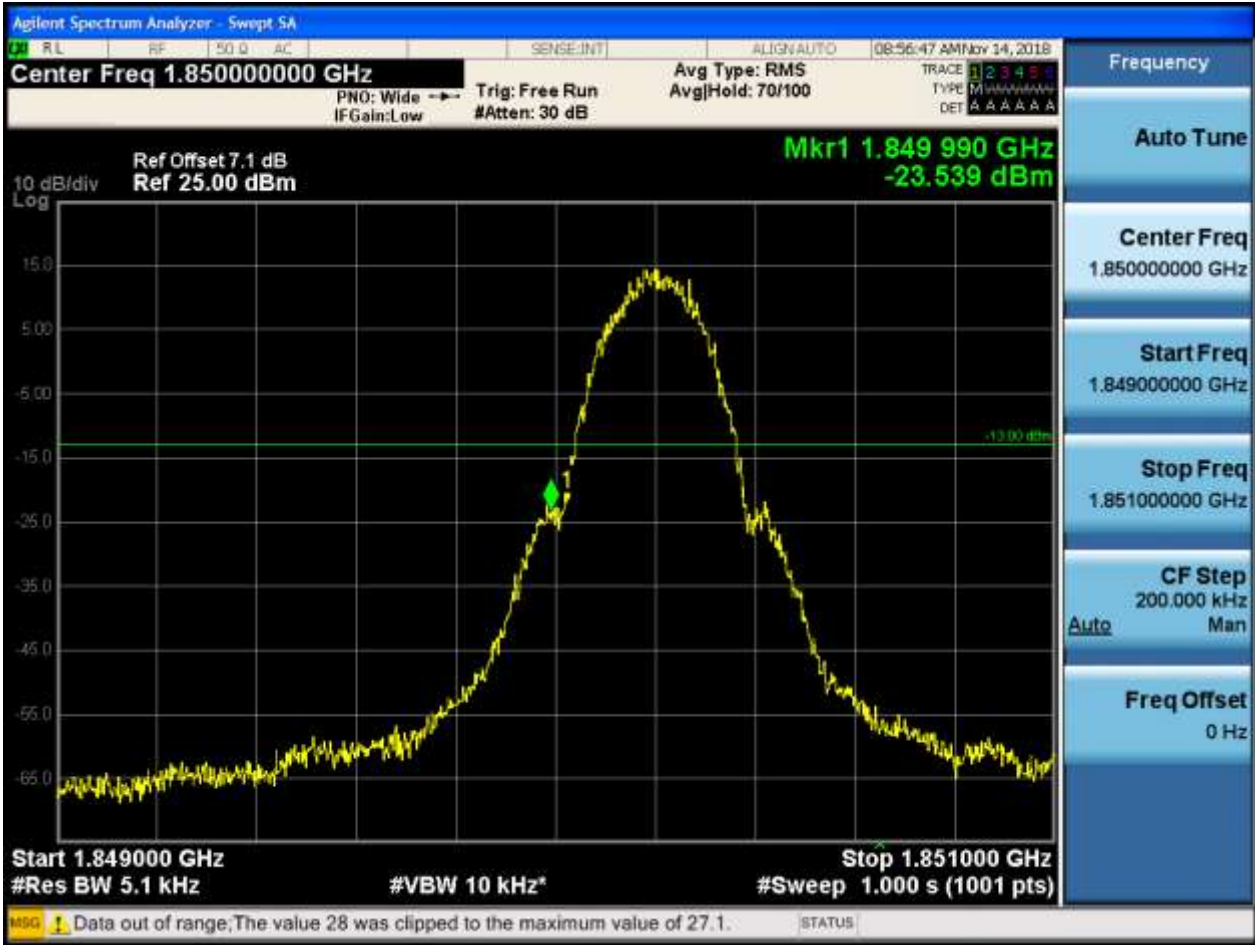
5.1.1.2.2 Test Channel = HCH



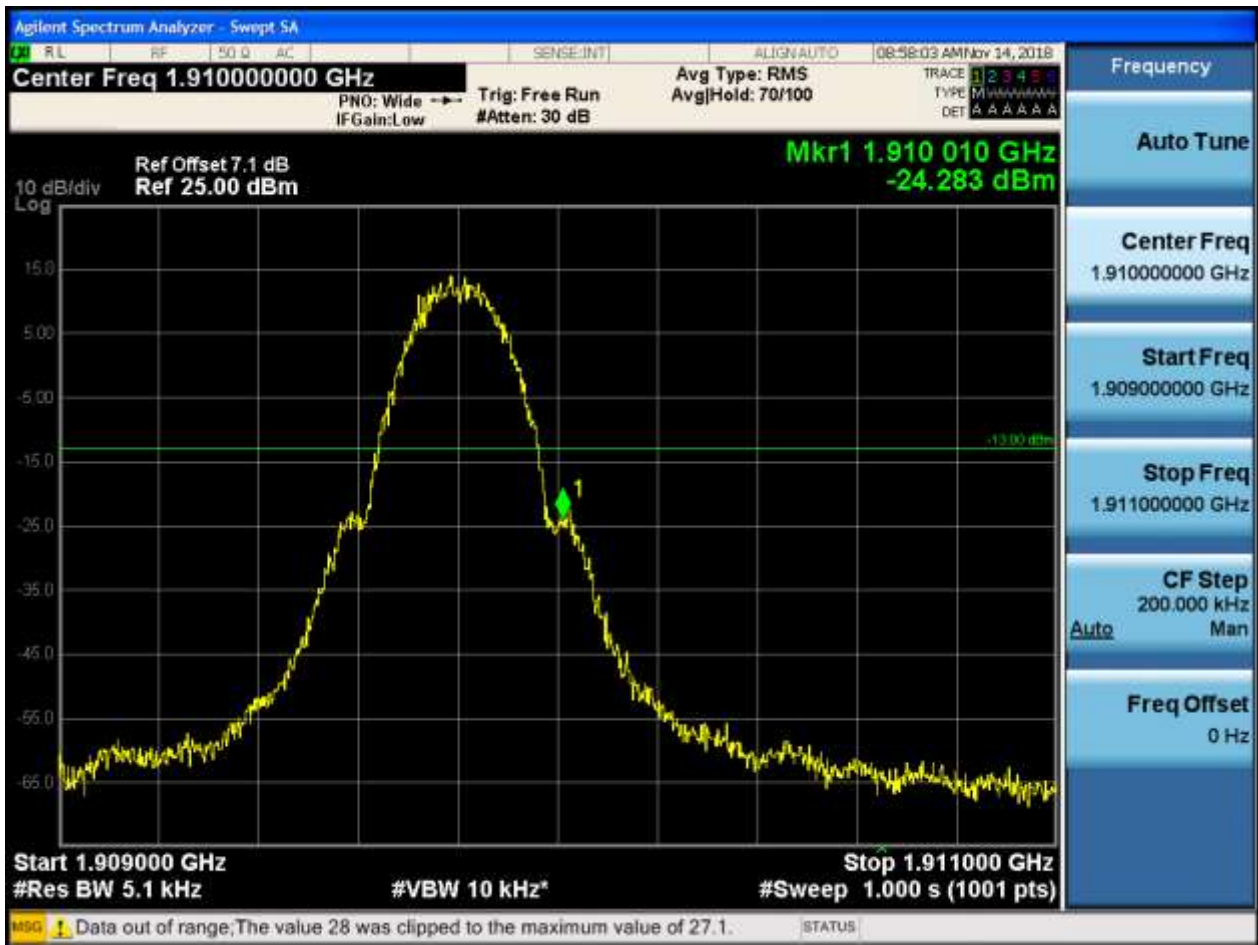
5.1.2 Test Band = PCS1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

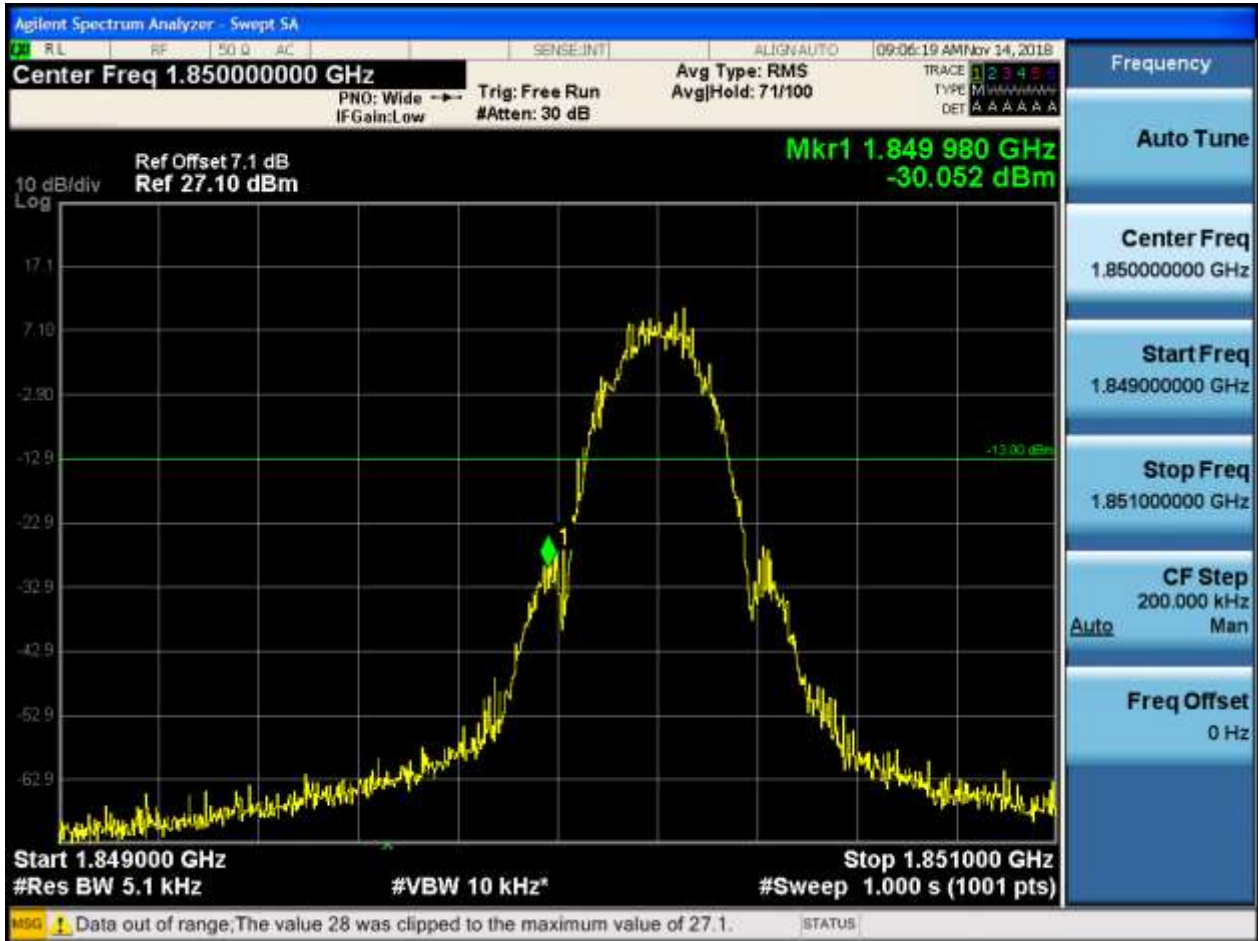


## 5.1.2.1.2 Test Channel = HCH



### 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

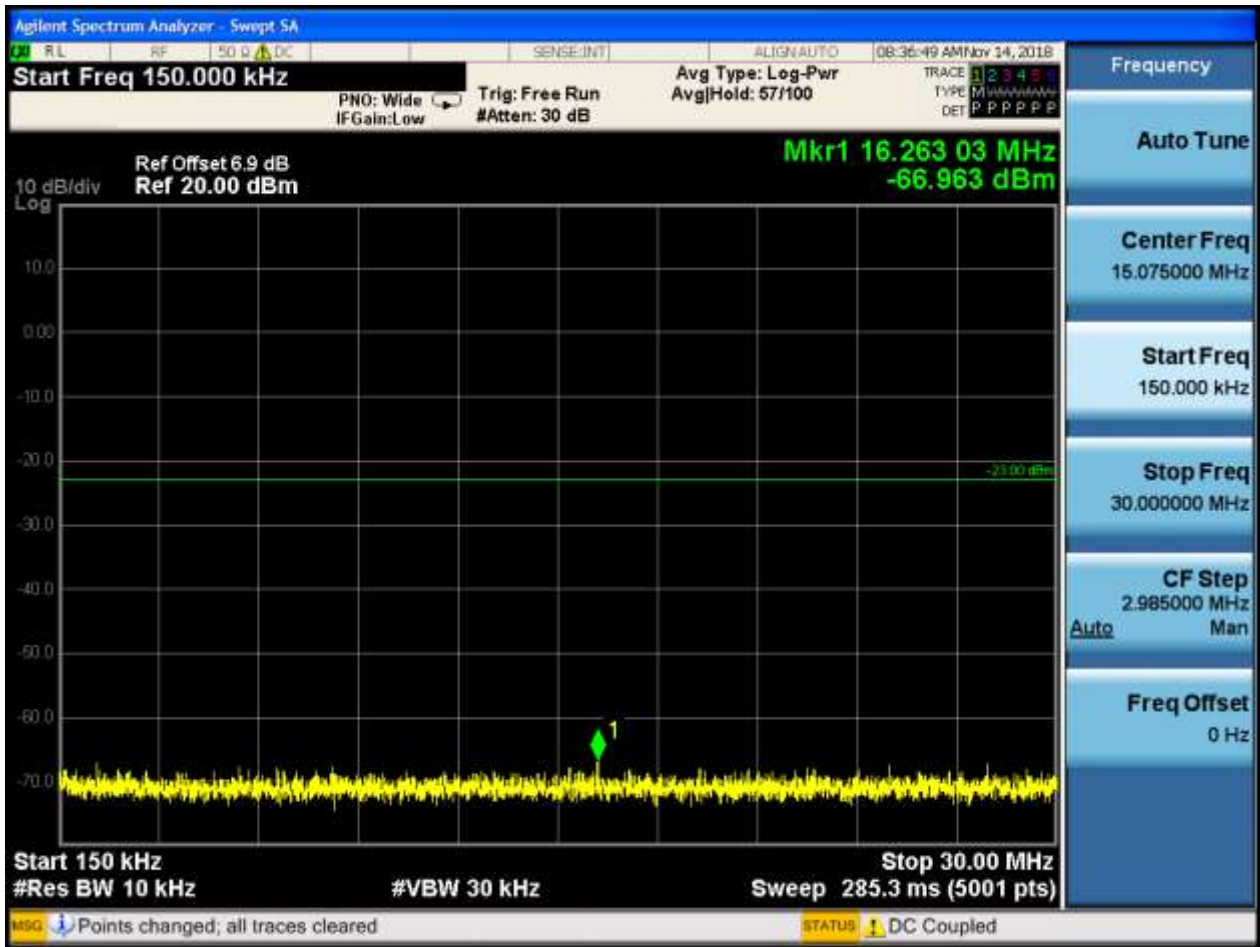
##### 6.1.1 Test Band = GSM850

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

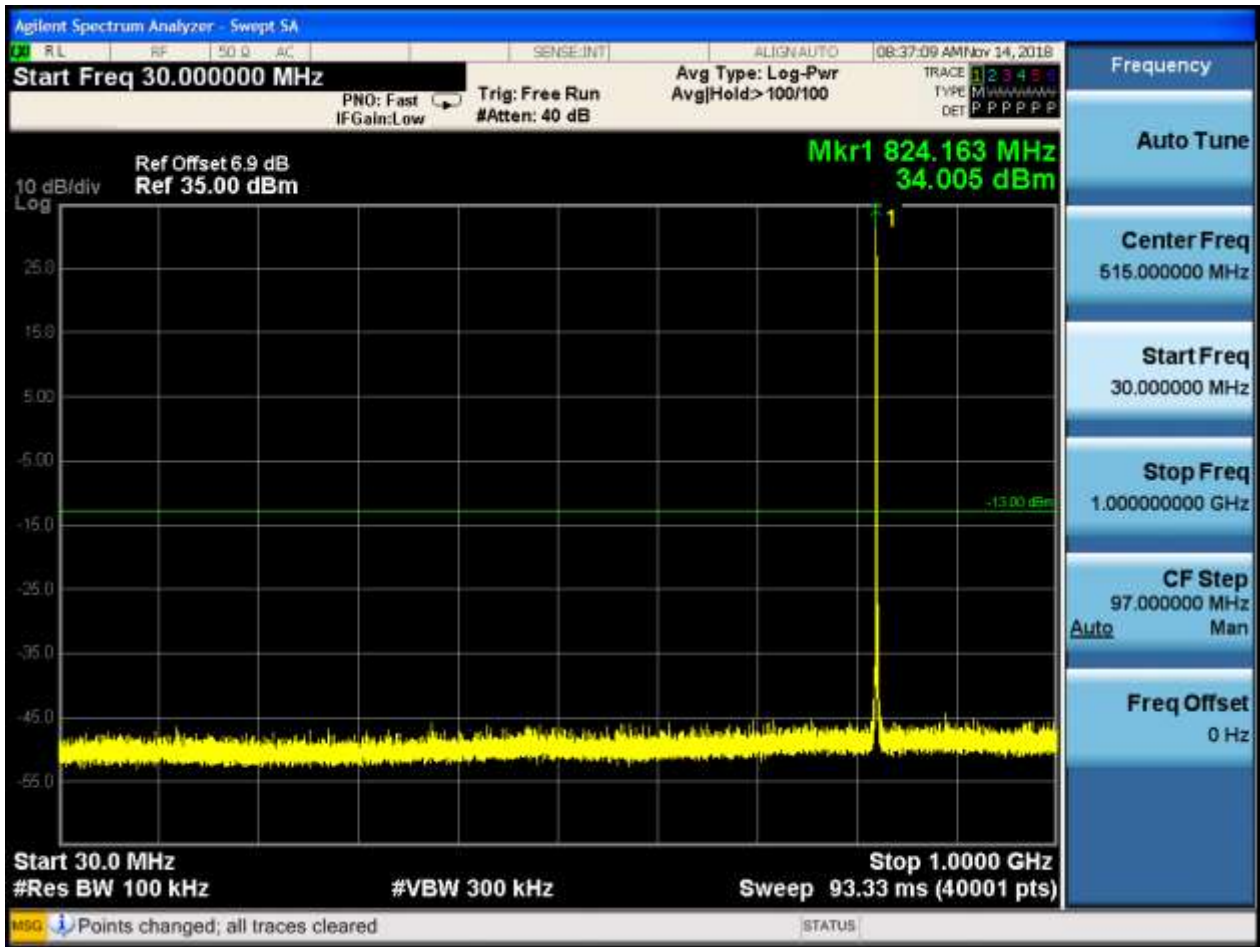


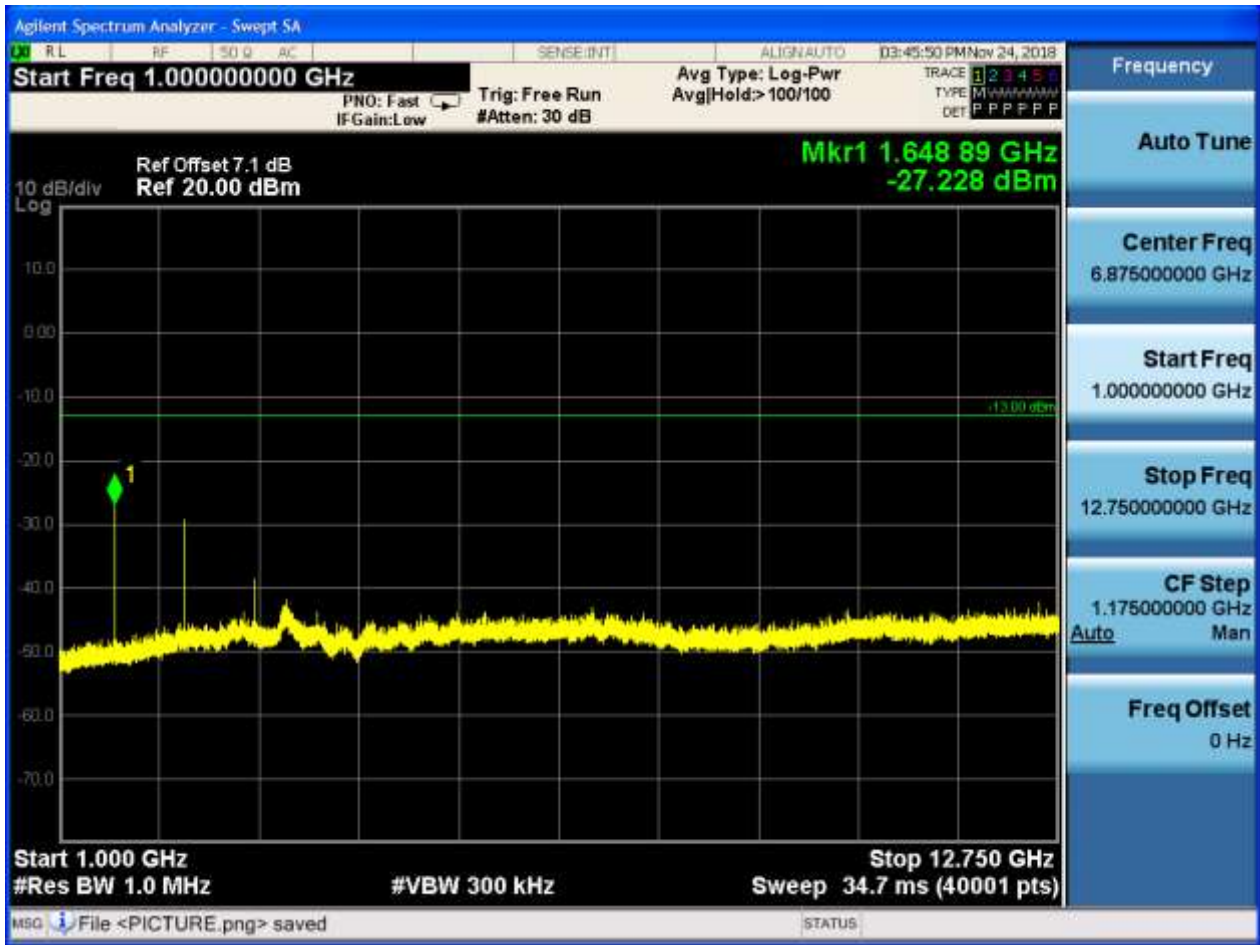
6.1.1.1.1 Test Channel = LCH





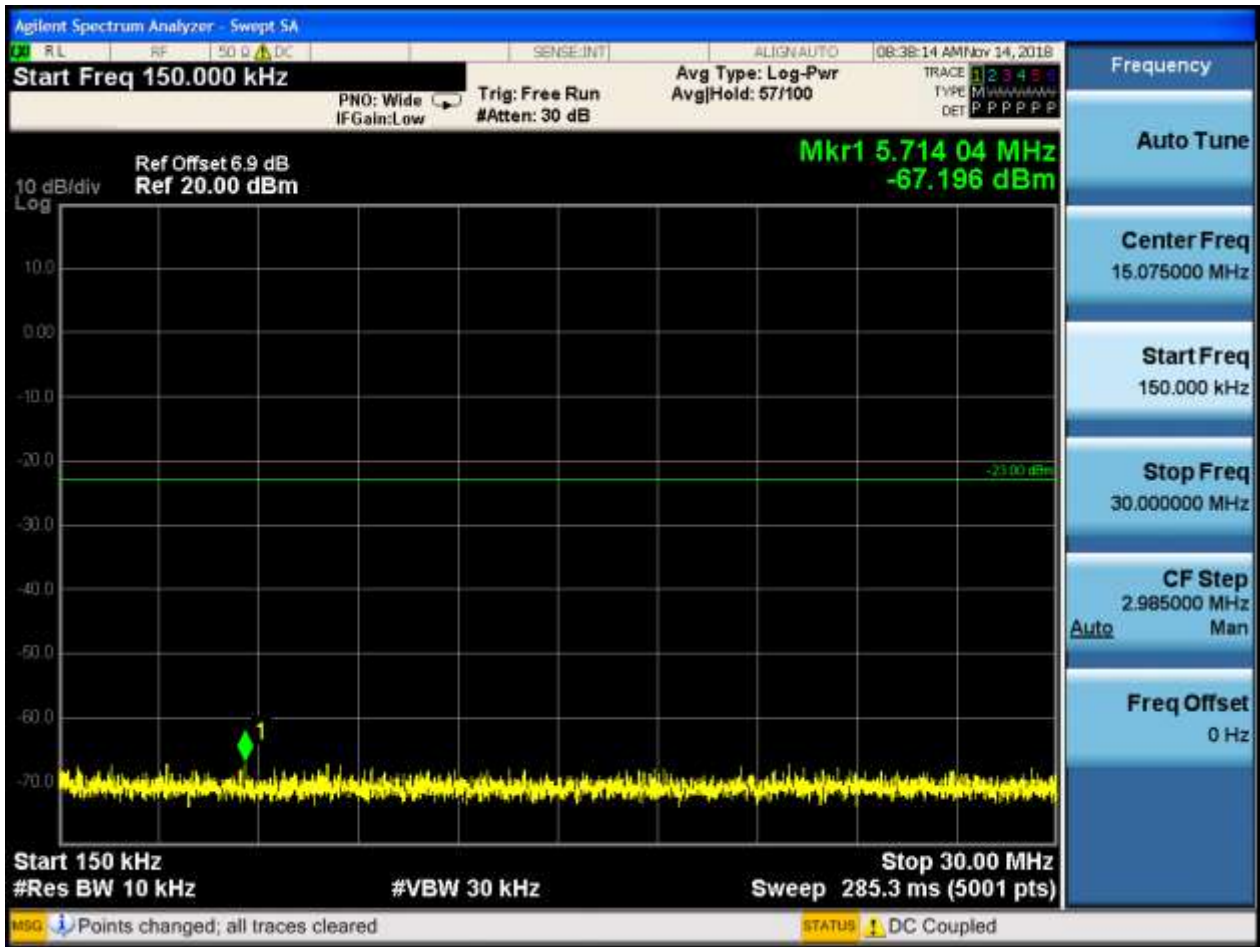


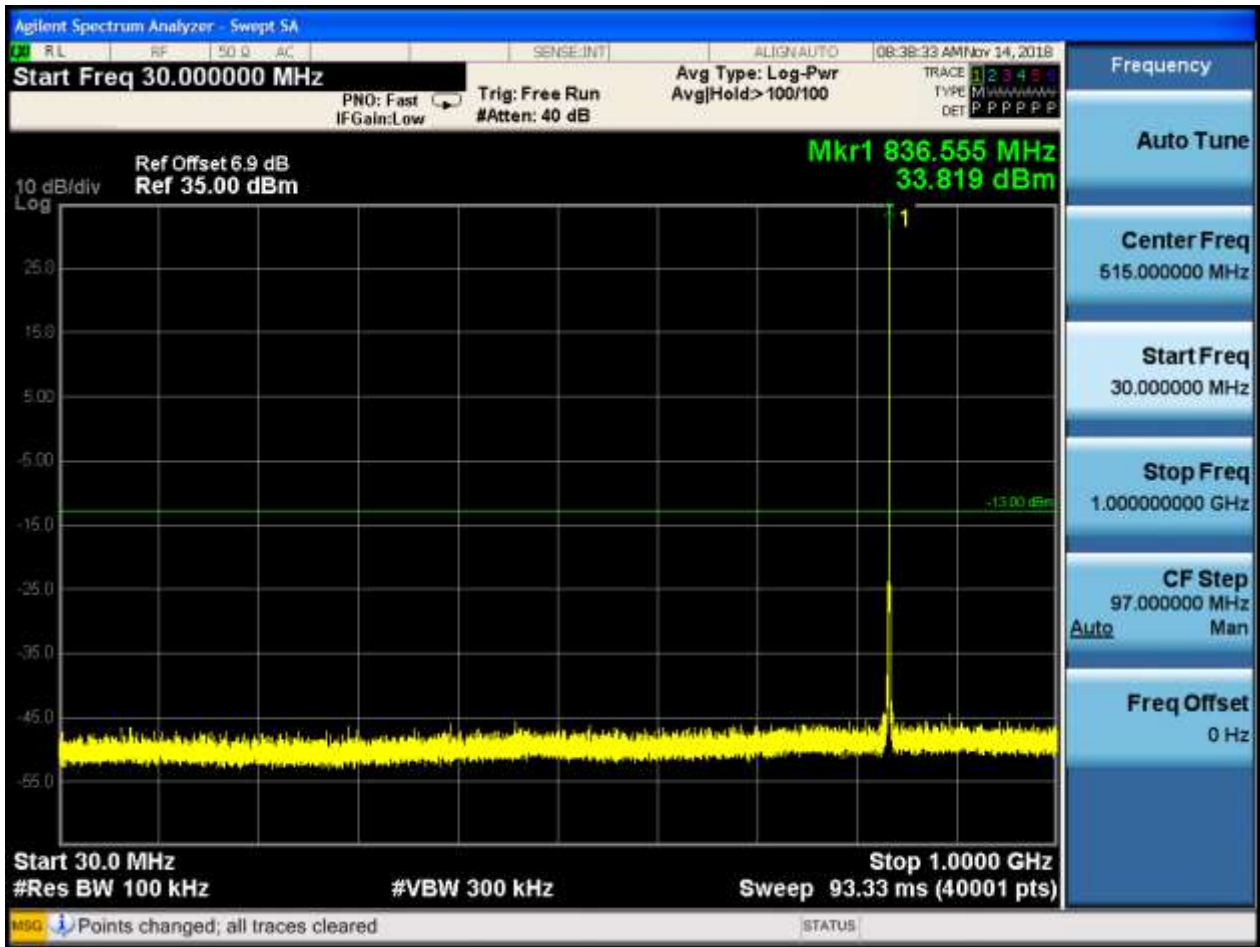




## 6.1.1.1.2 Test Channel = MCH



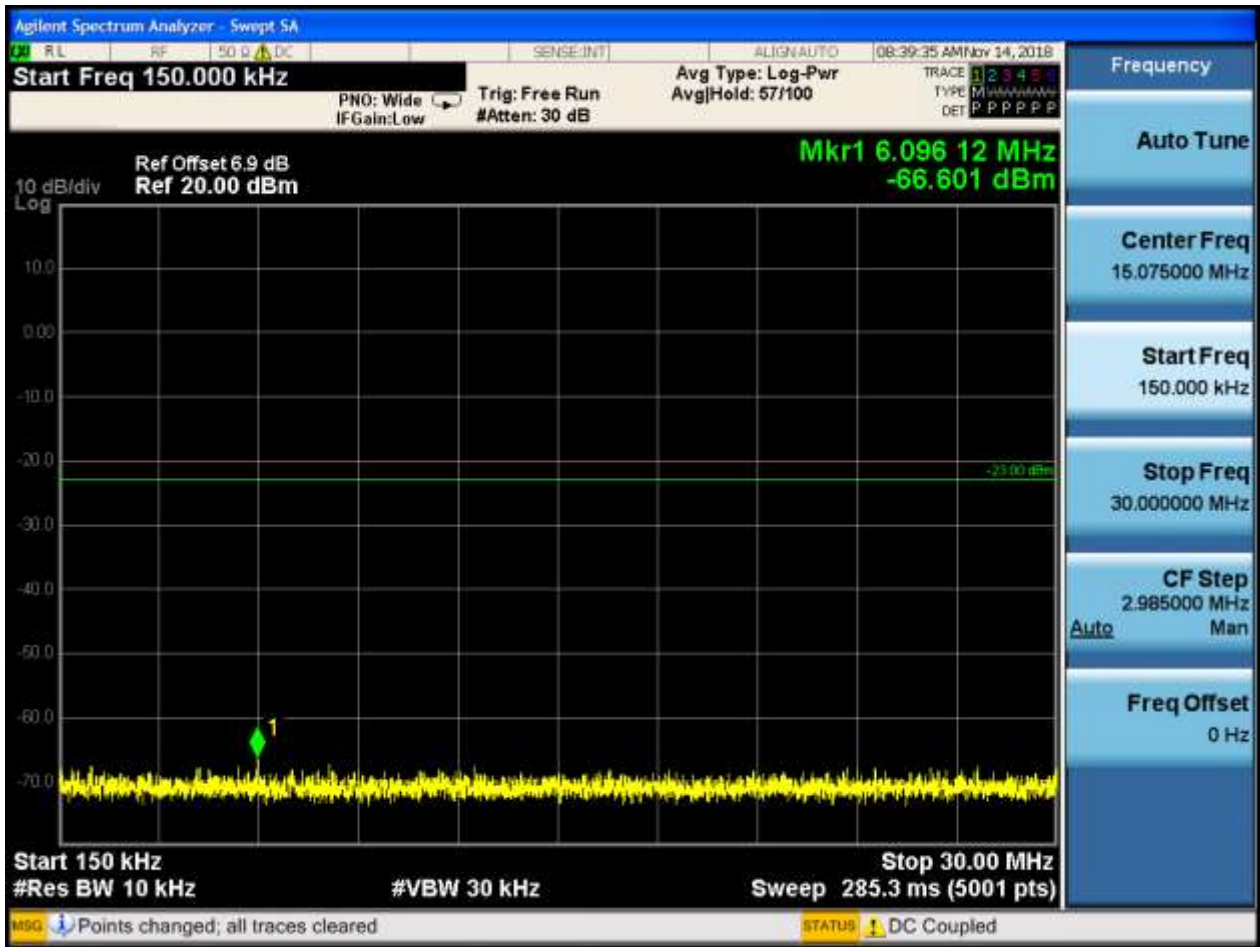




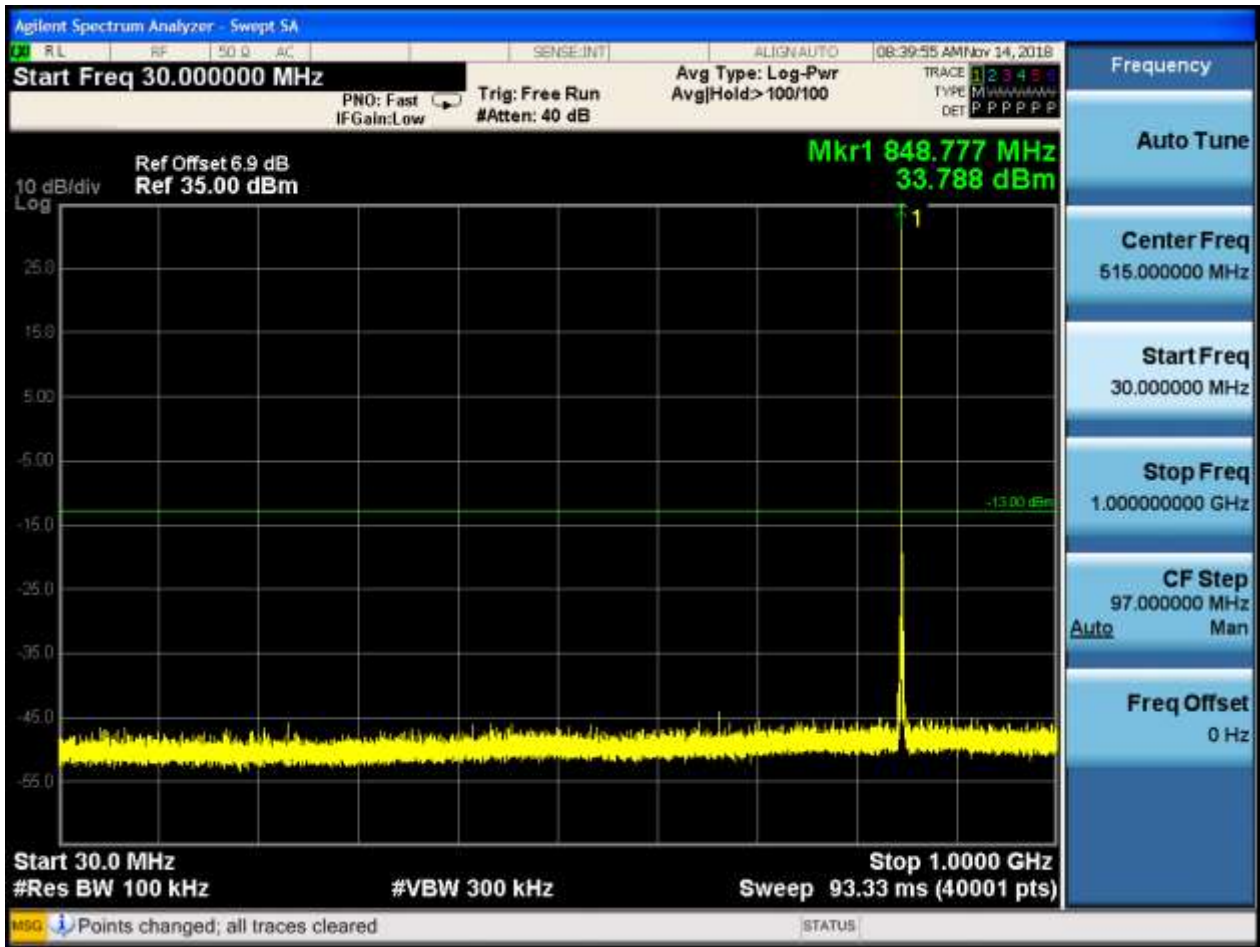


## 6.1.1.1.3 Test Channel = HCH







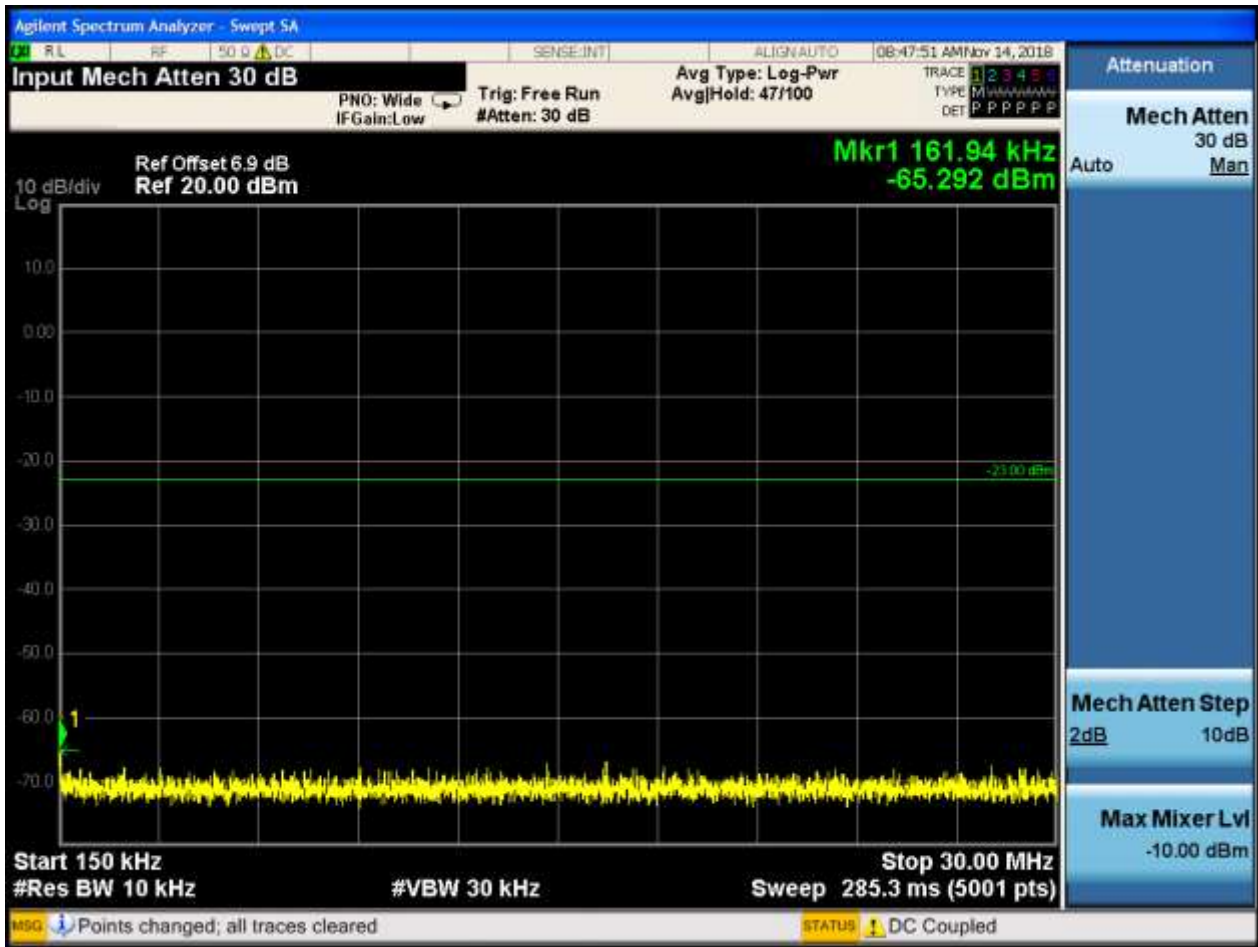


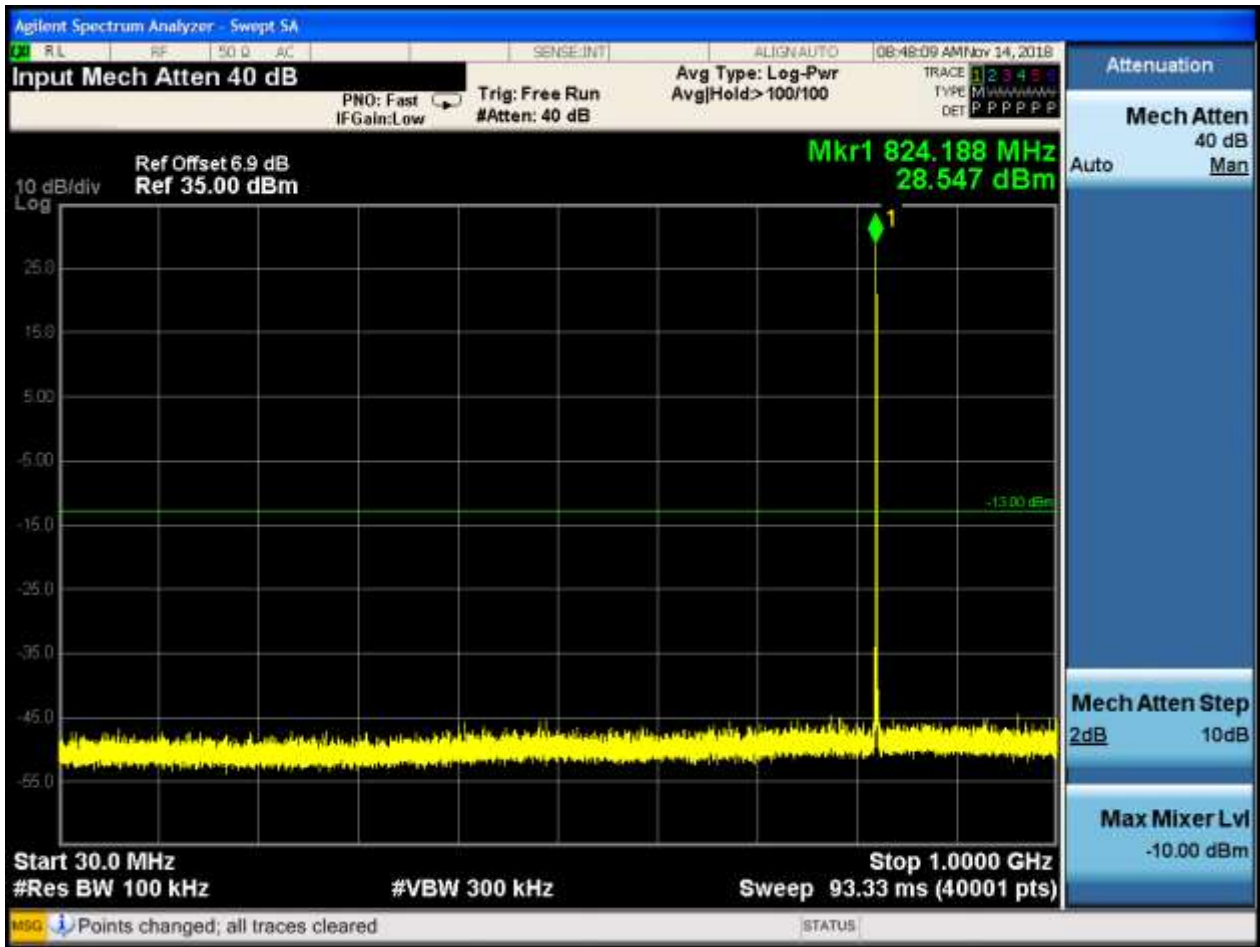


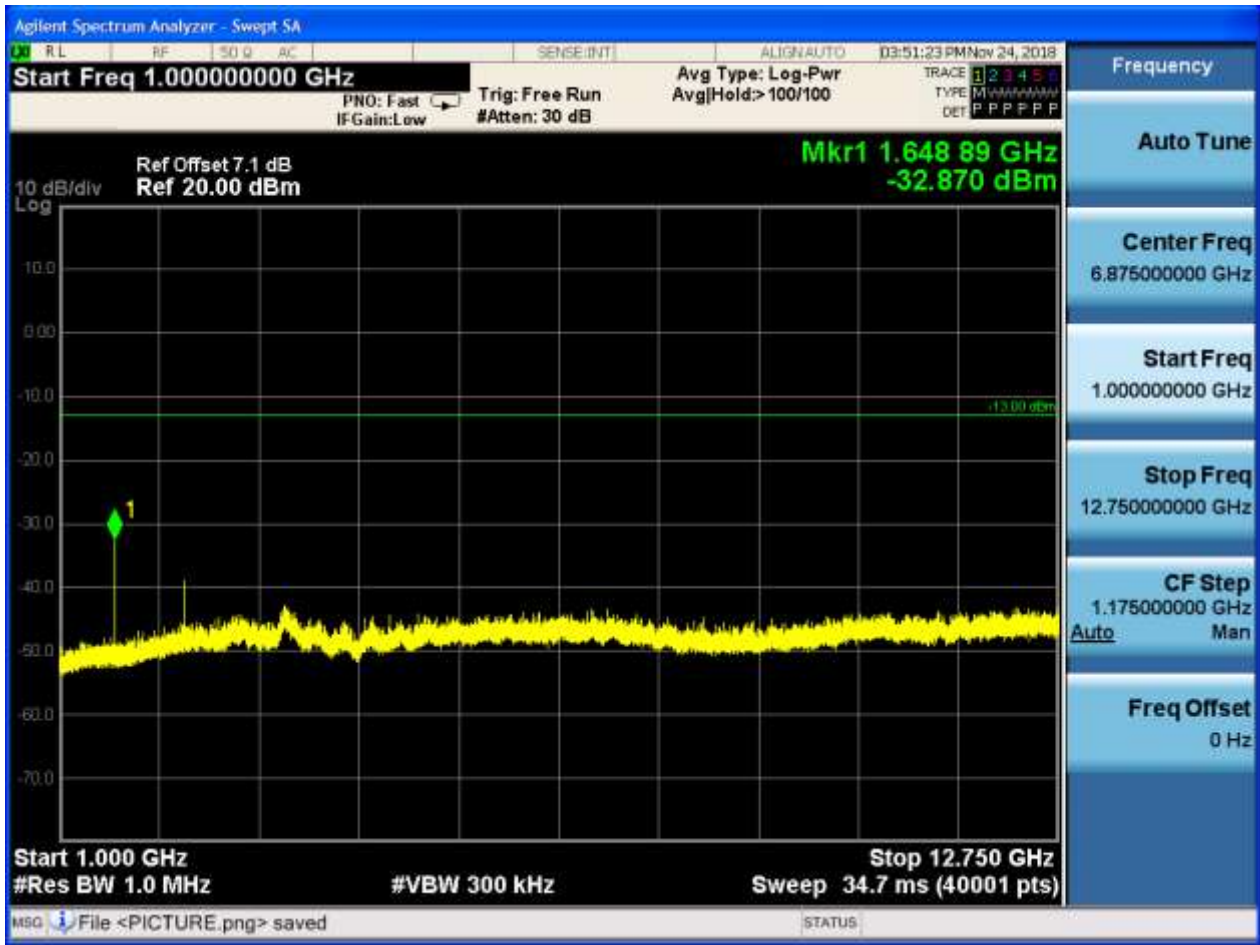
### 6.1.1.2 Test Mode = GSM/TM2

#### 6.1.1.2.1 Test Channel = LCH

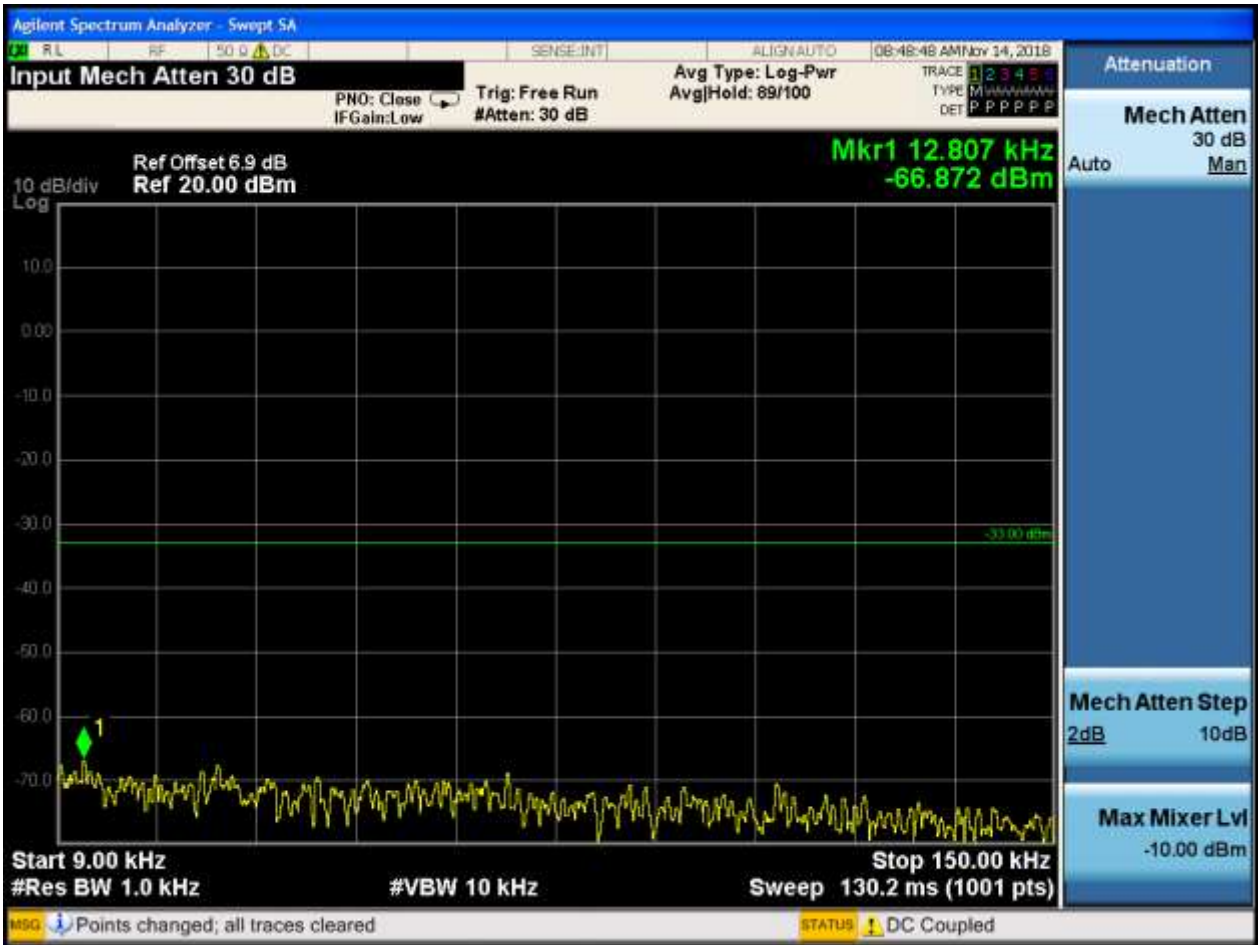


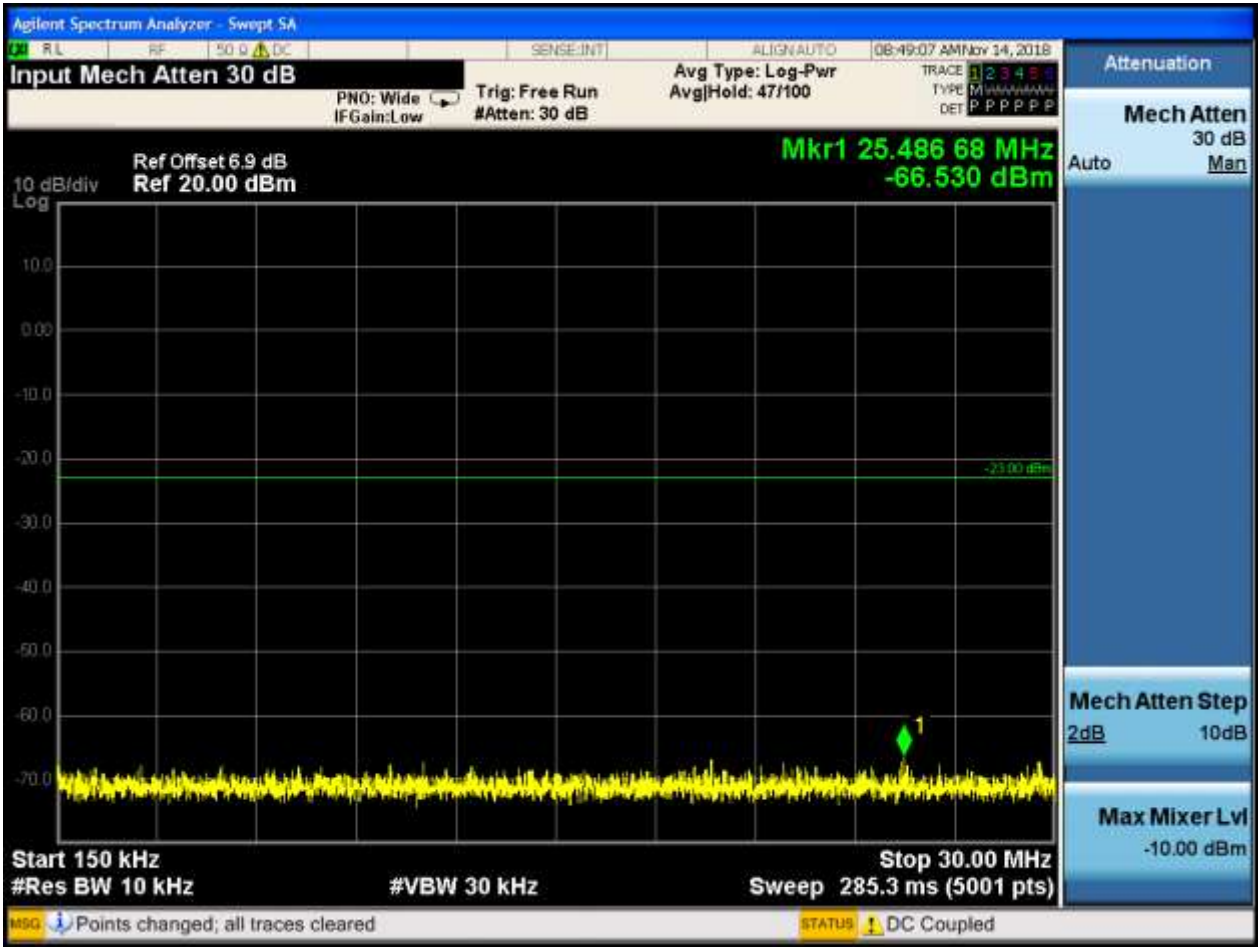




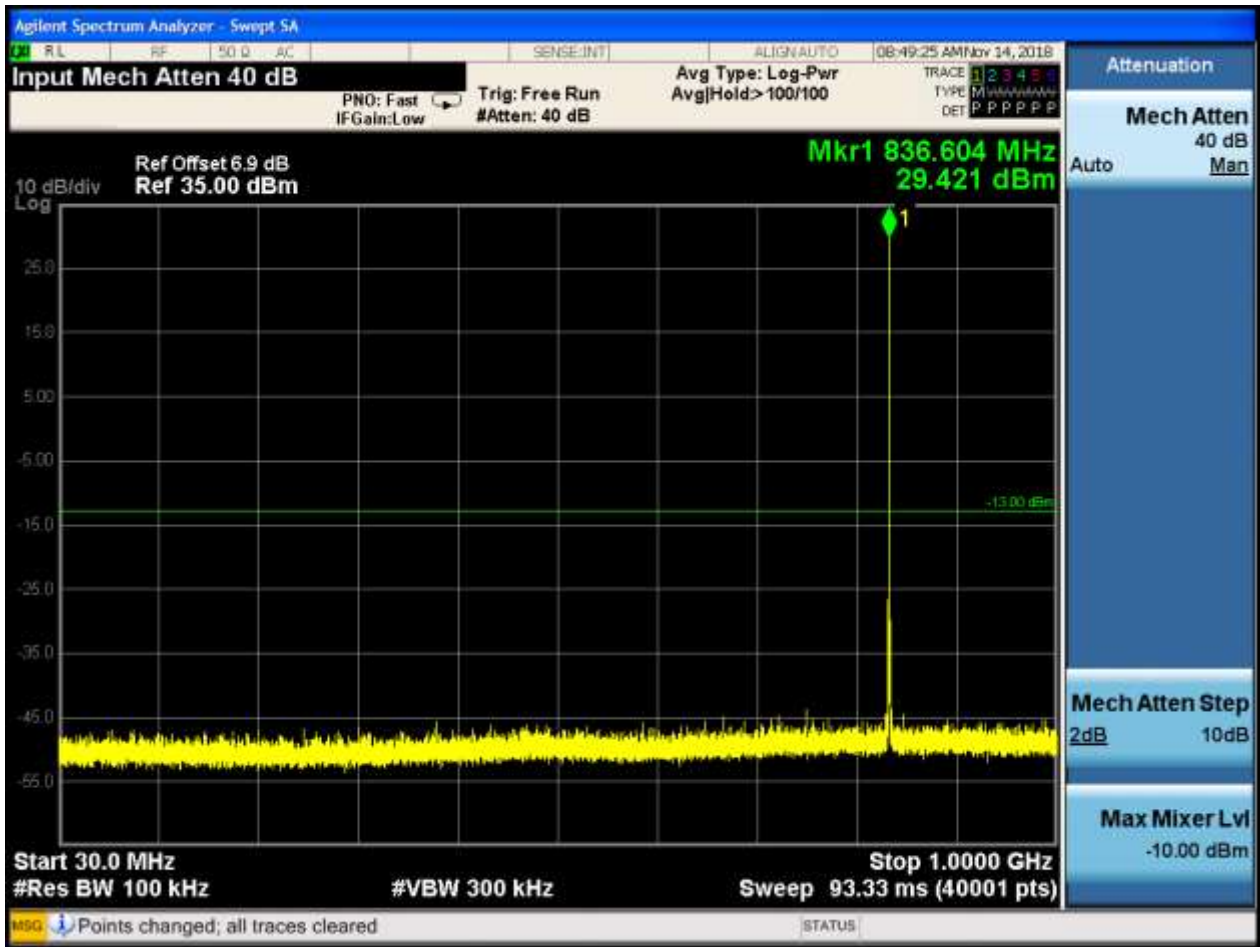


6.1.1.2.2 Test Channel = MCH



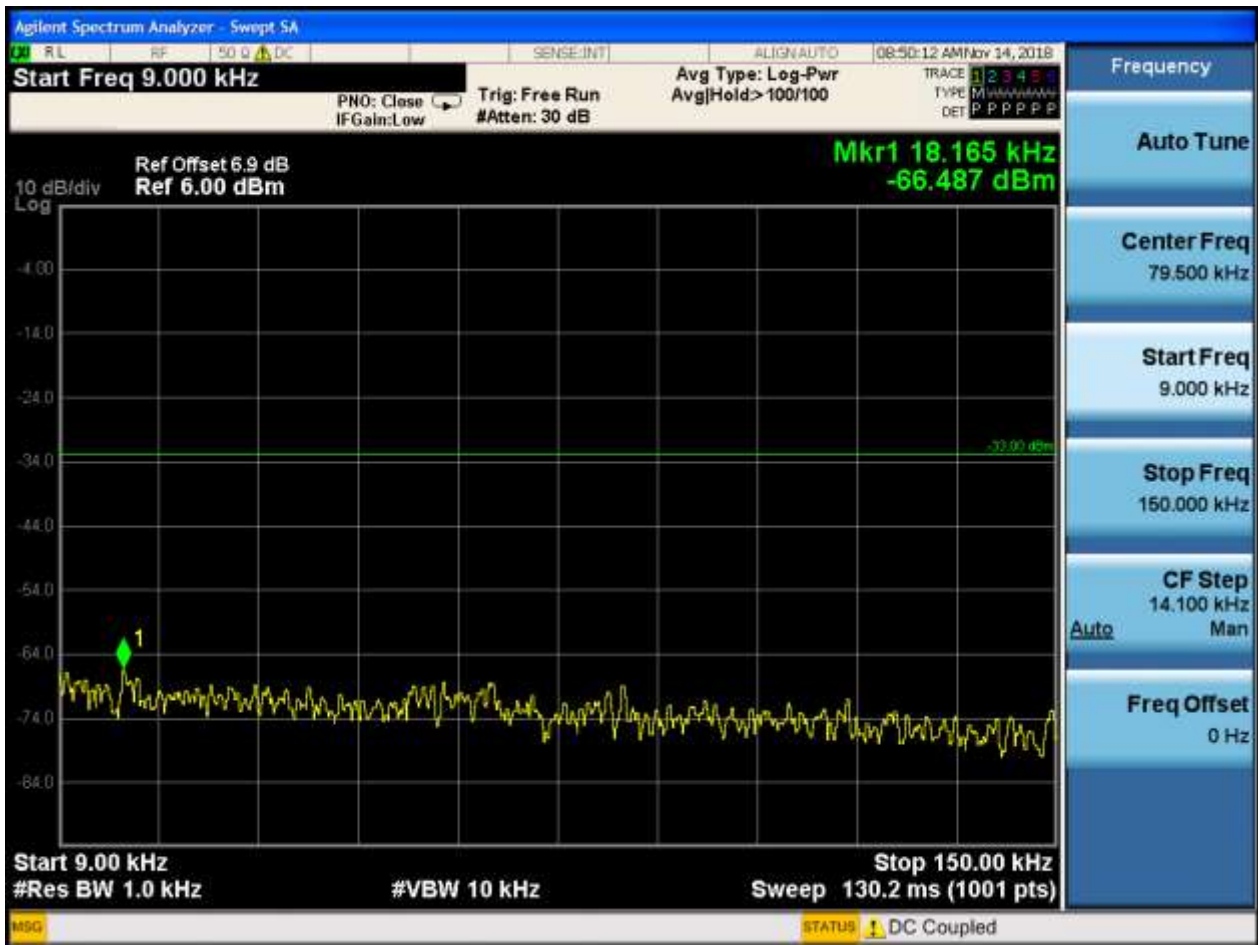


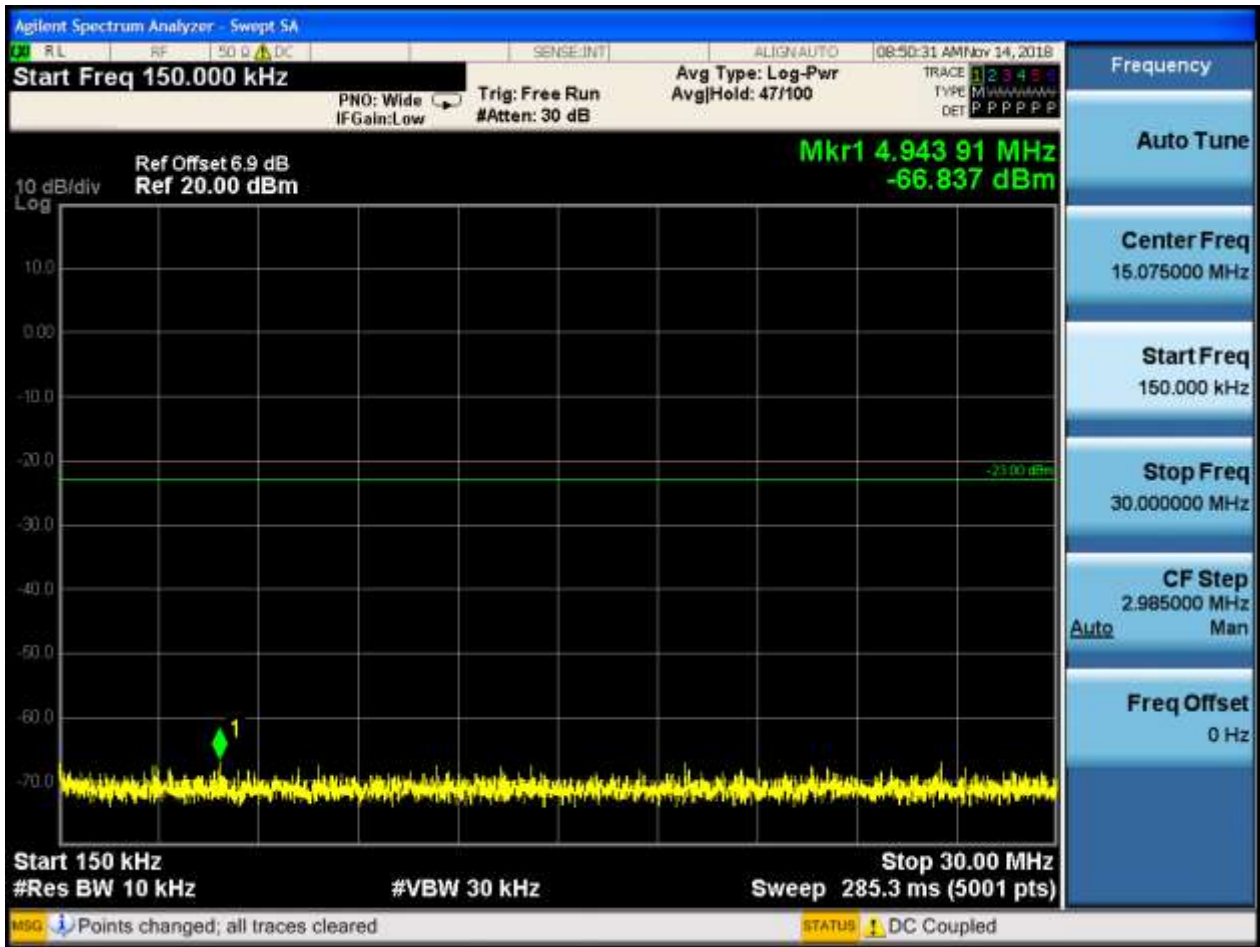


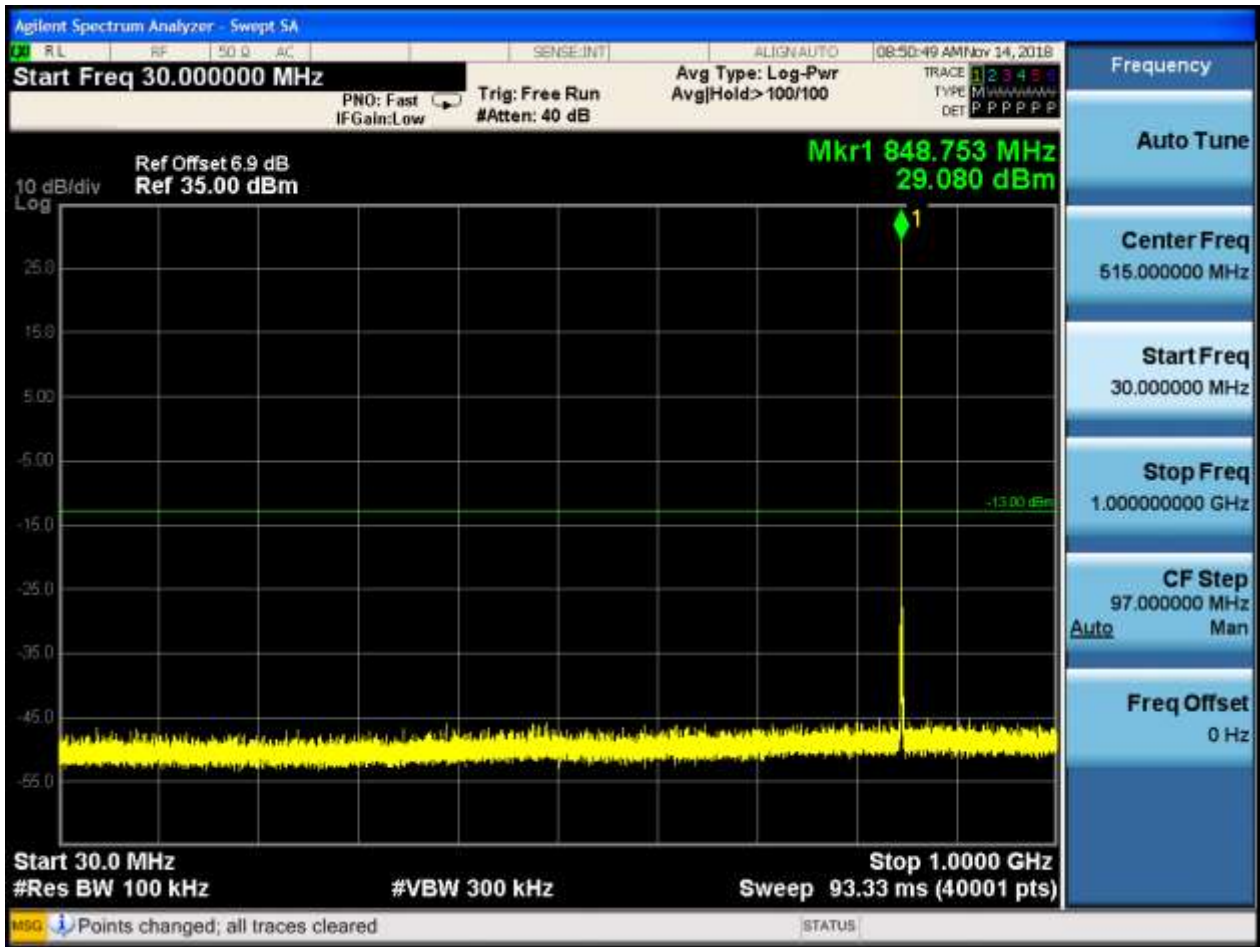




## 6.1.1.2.3 Test Channel = HCH





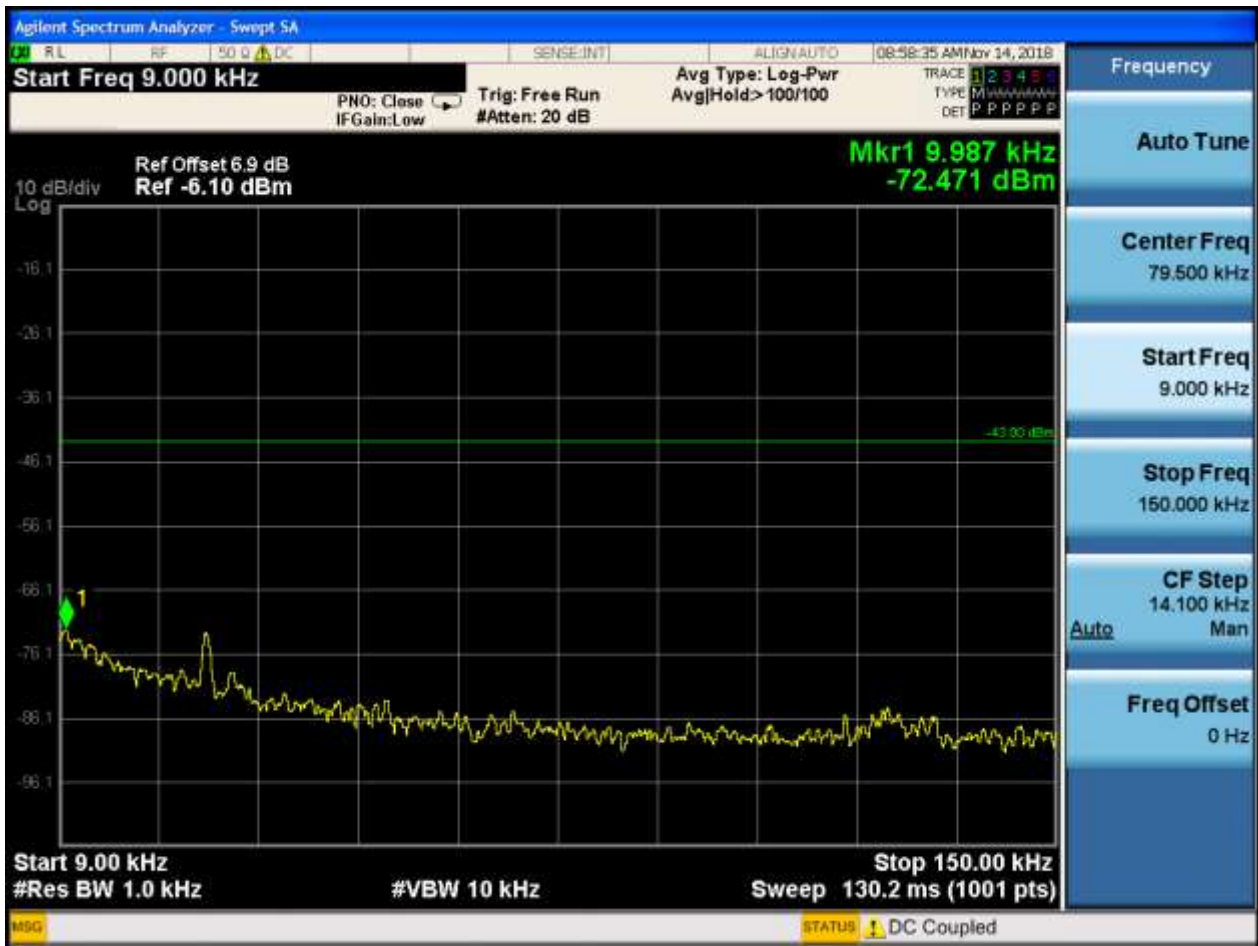


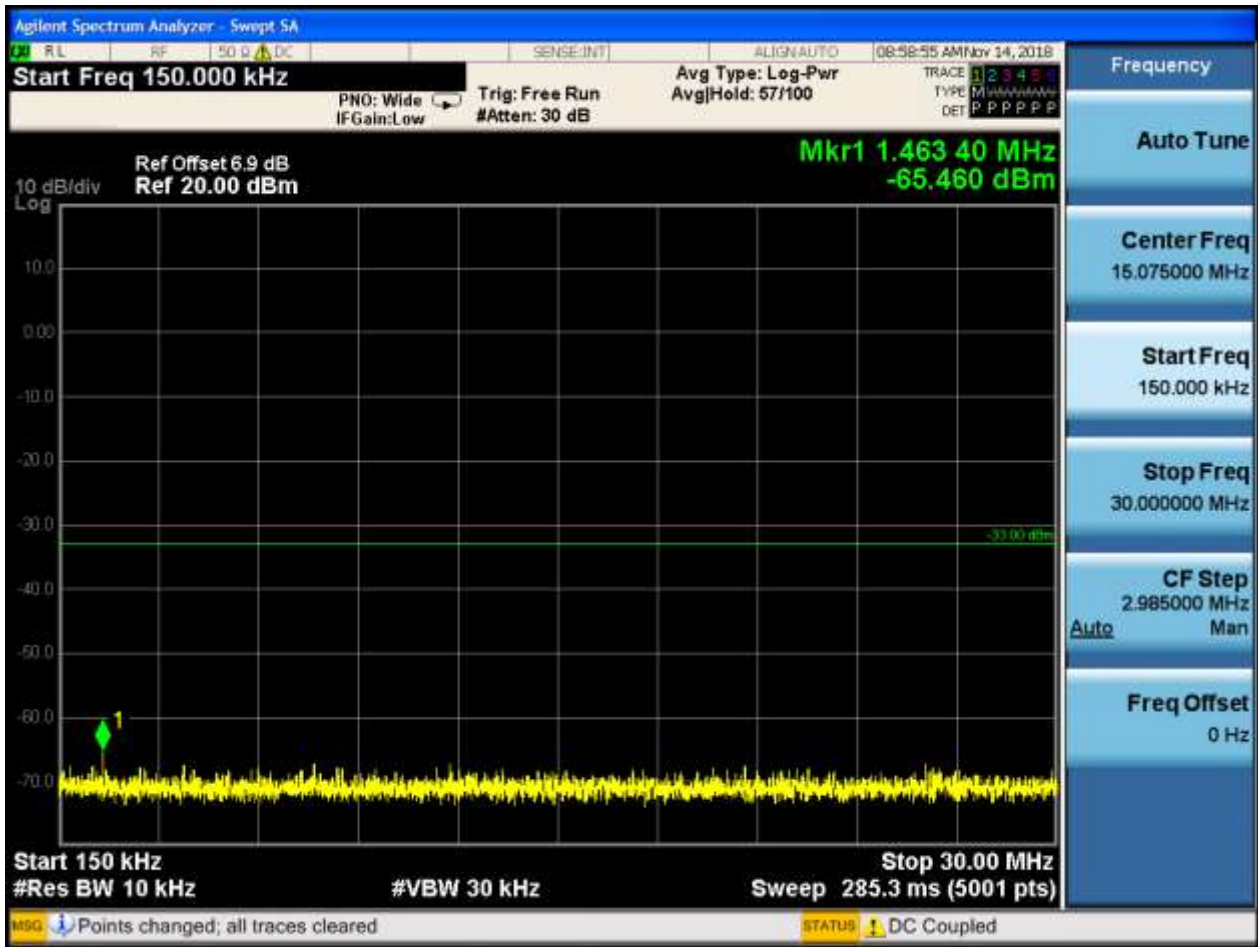


## 6.1.2 Test Band = PCS1900

### 6.1.2.1 Test Mode = GSM/TM1

#### 6.1.2.1.1 Test Channel = LCH



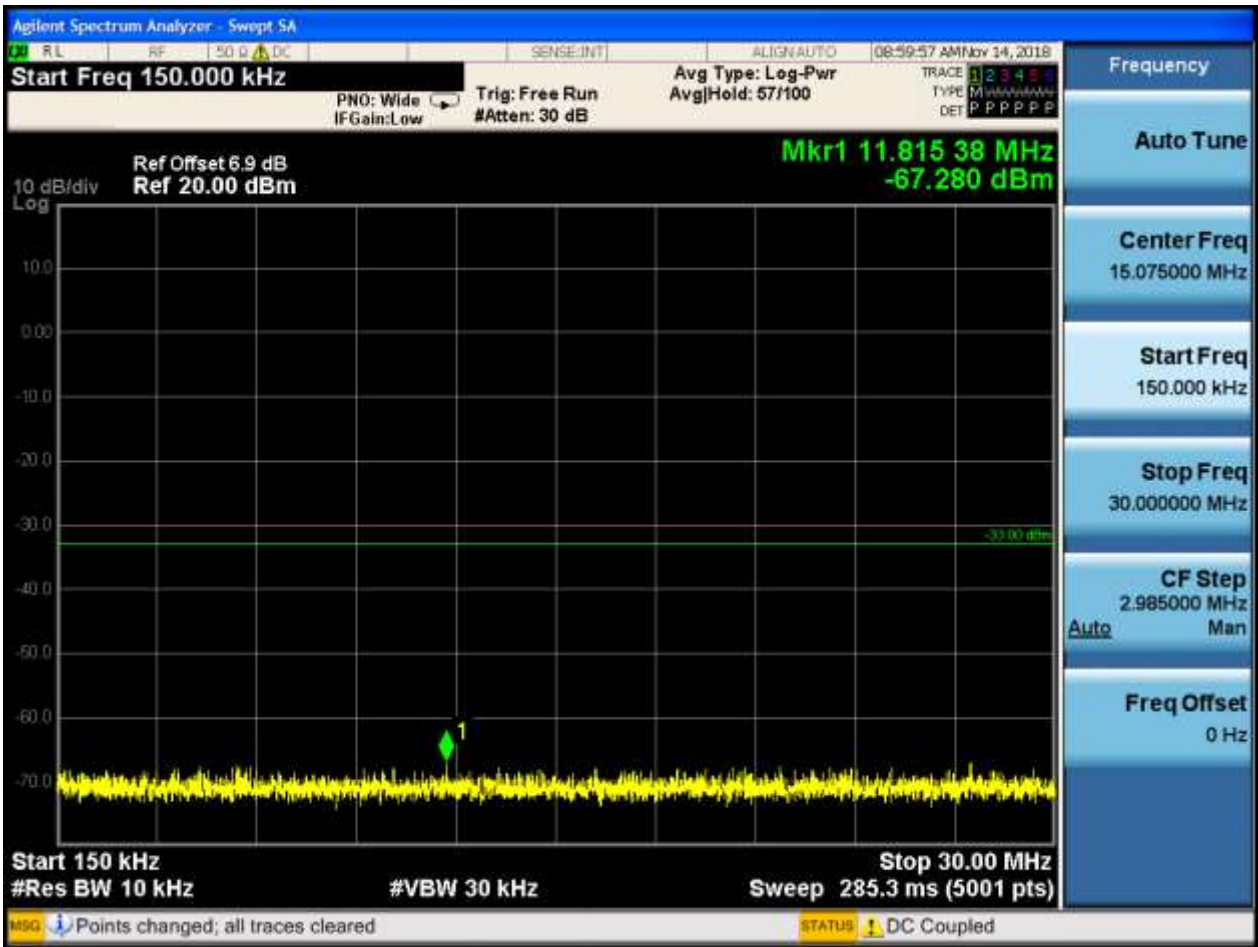






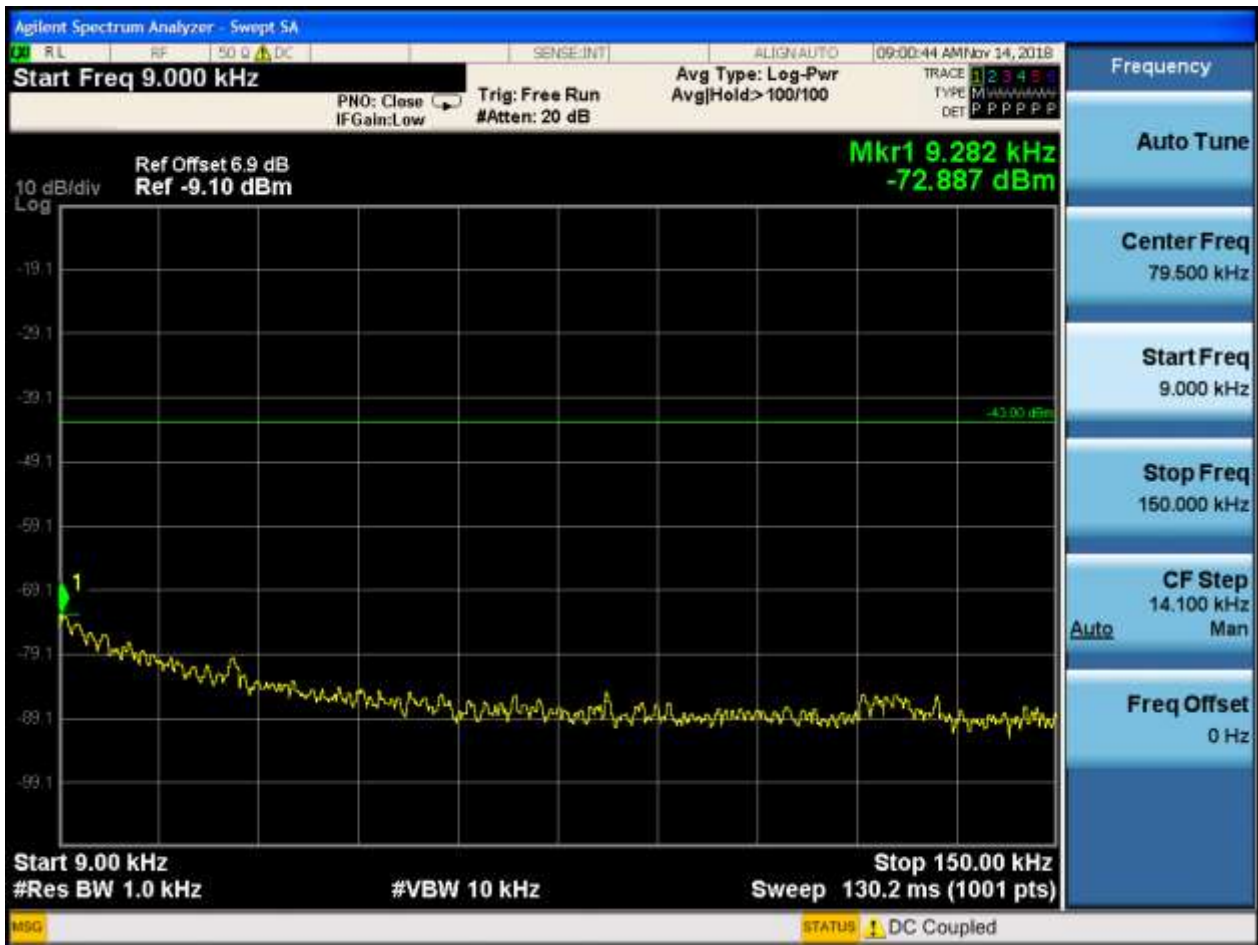
## 6.1.2.1.2 Test Channel = MCH

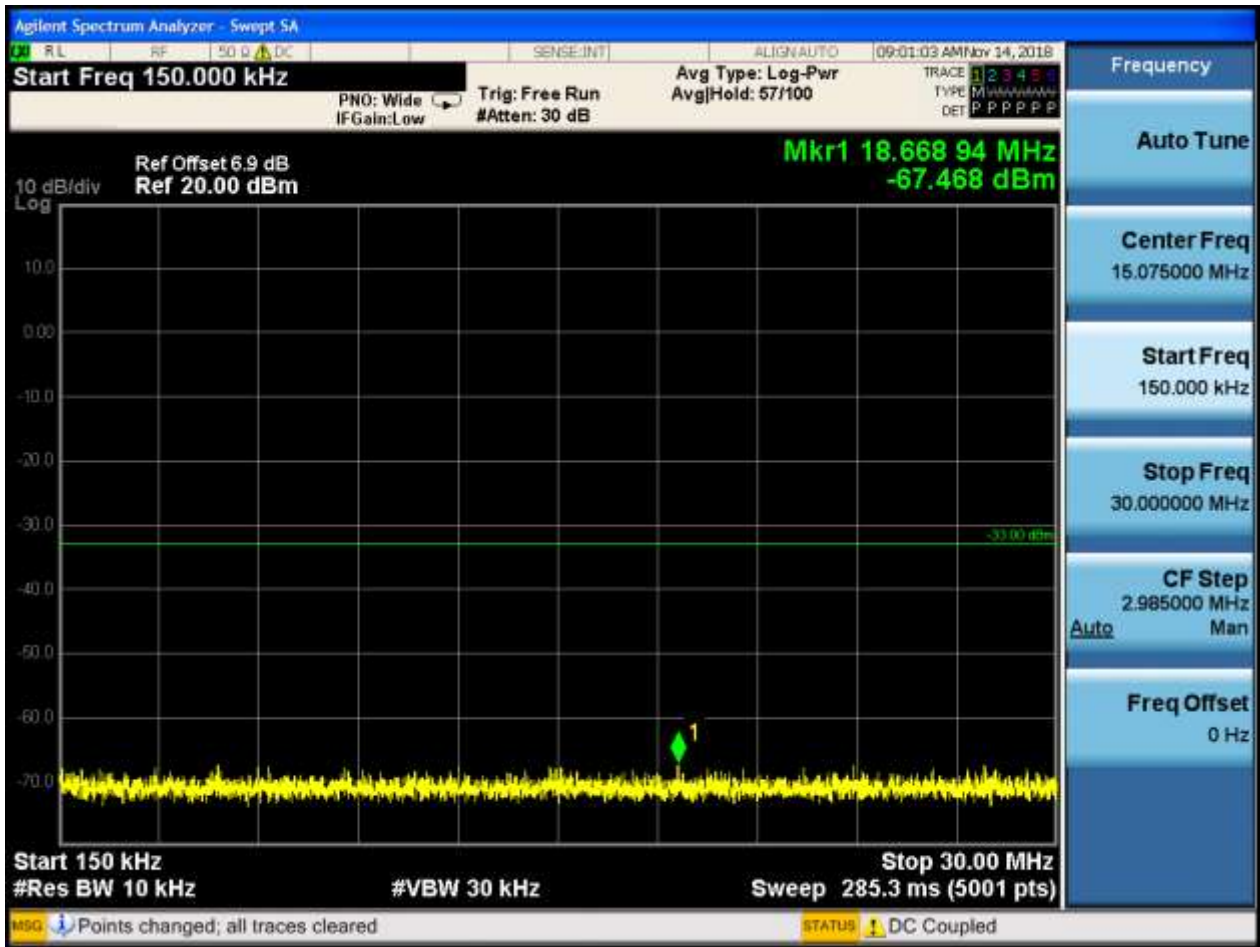






## 6.1.2.1.3 Test Channel = HCH

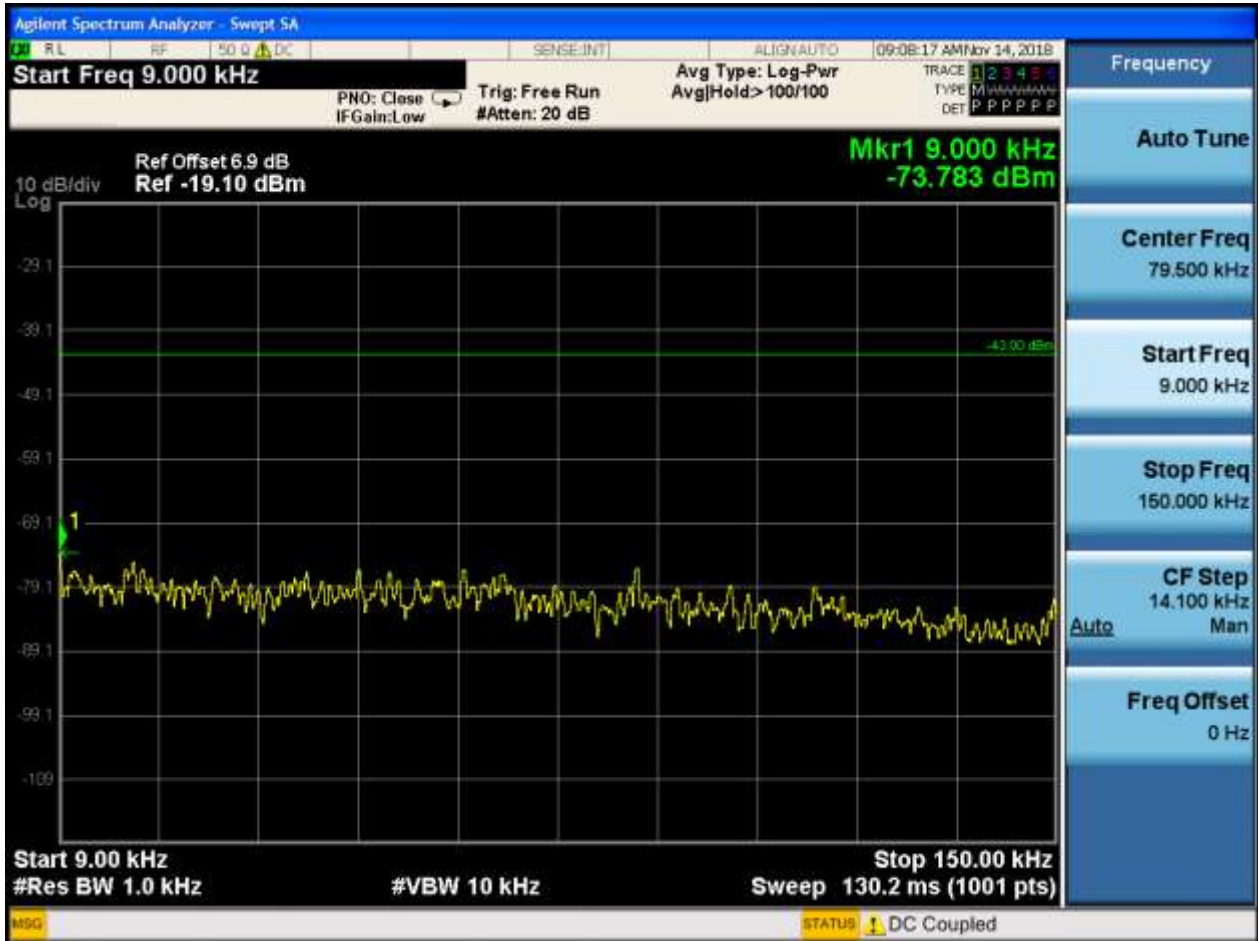




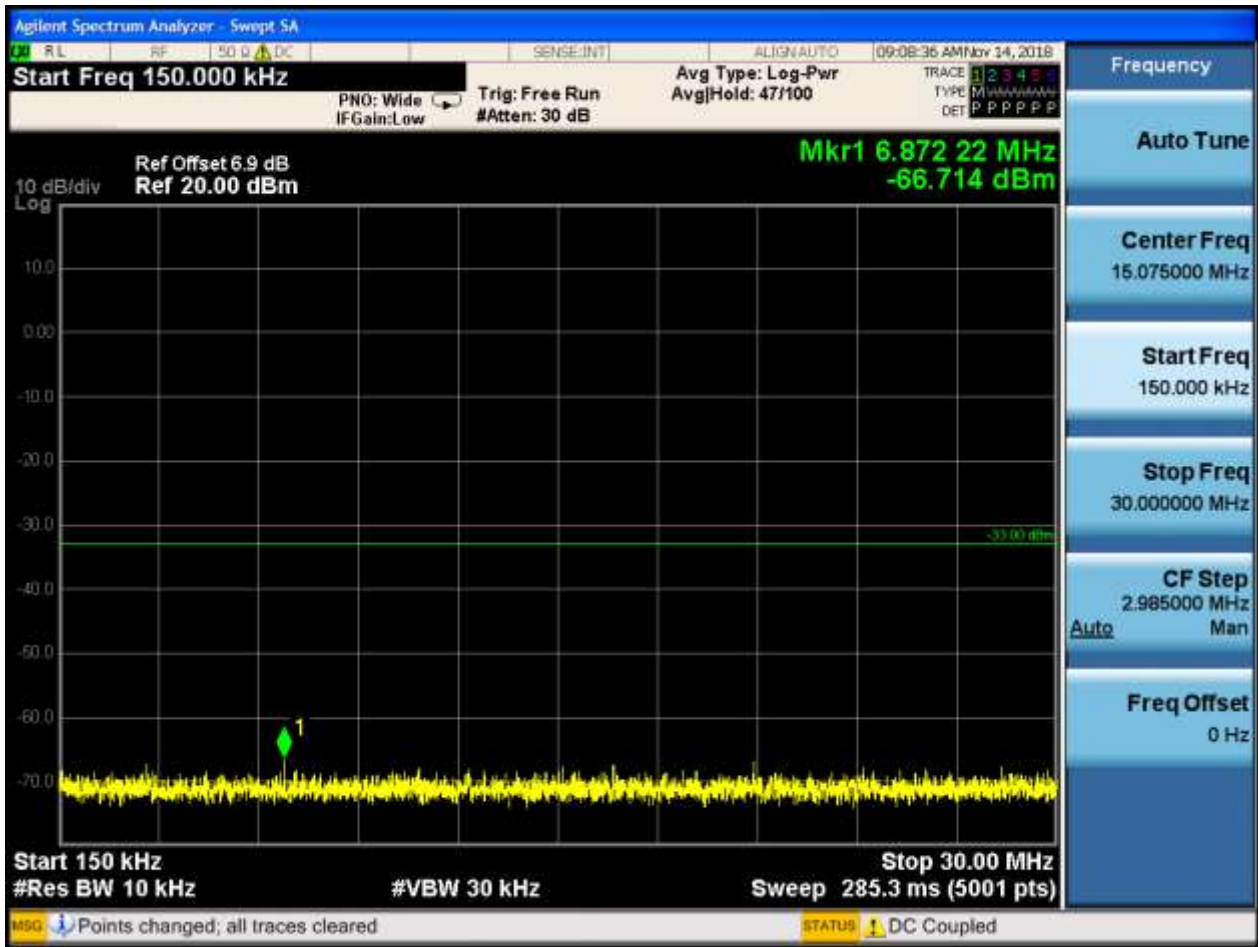


### 6.1.2.2 Test Mode = GSM/TM2

#### 6.1.2.2.1 Test Channel = LCH



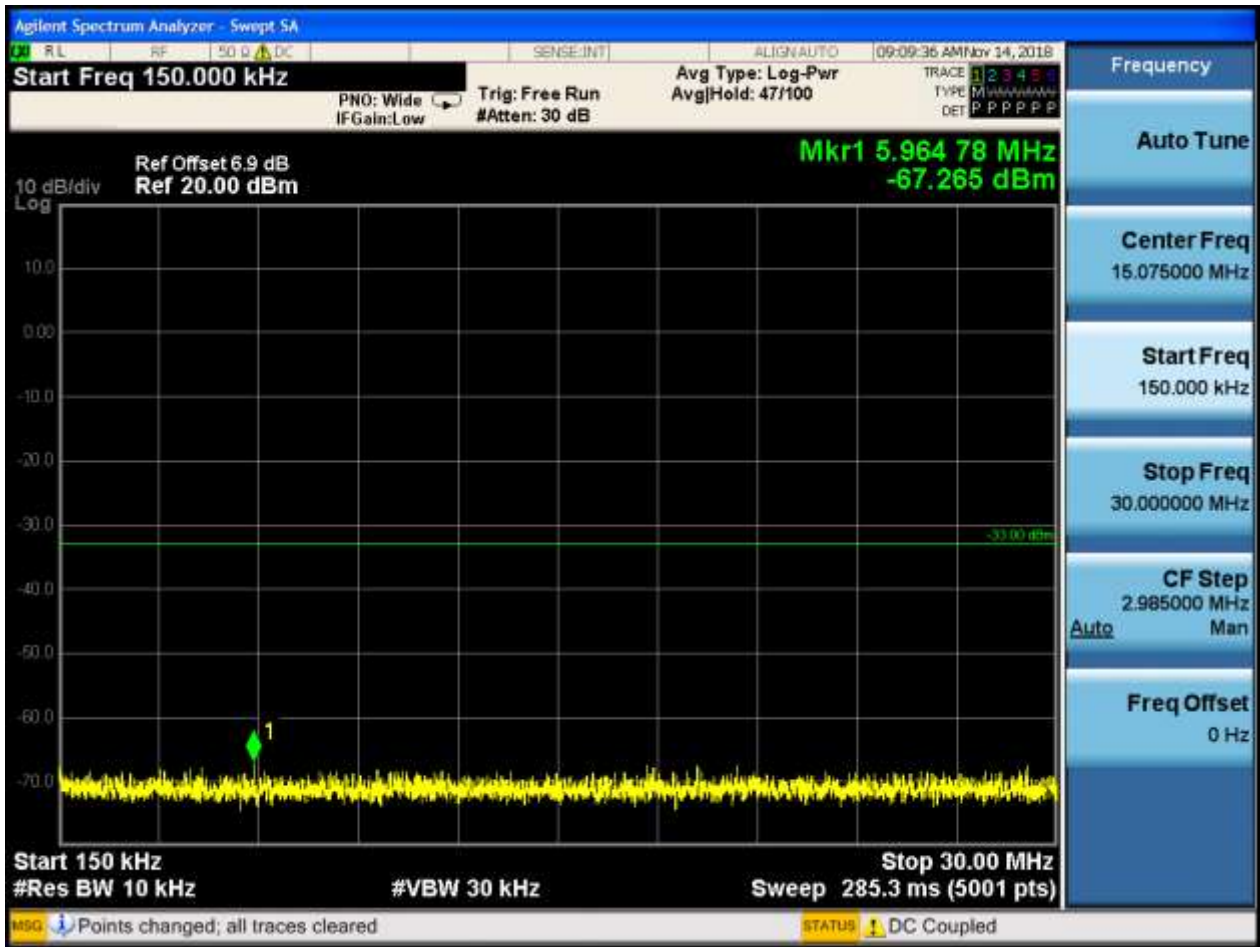






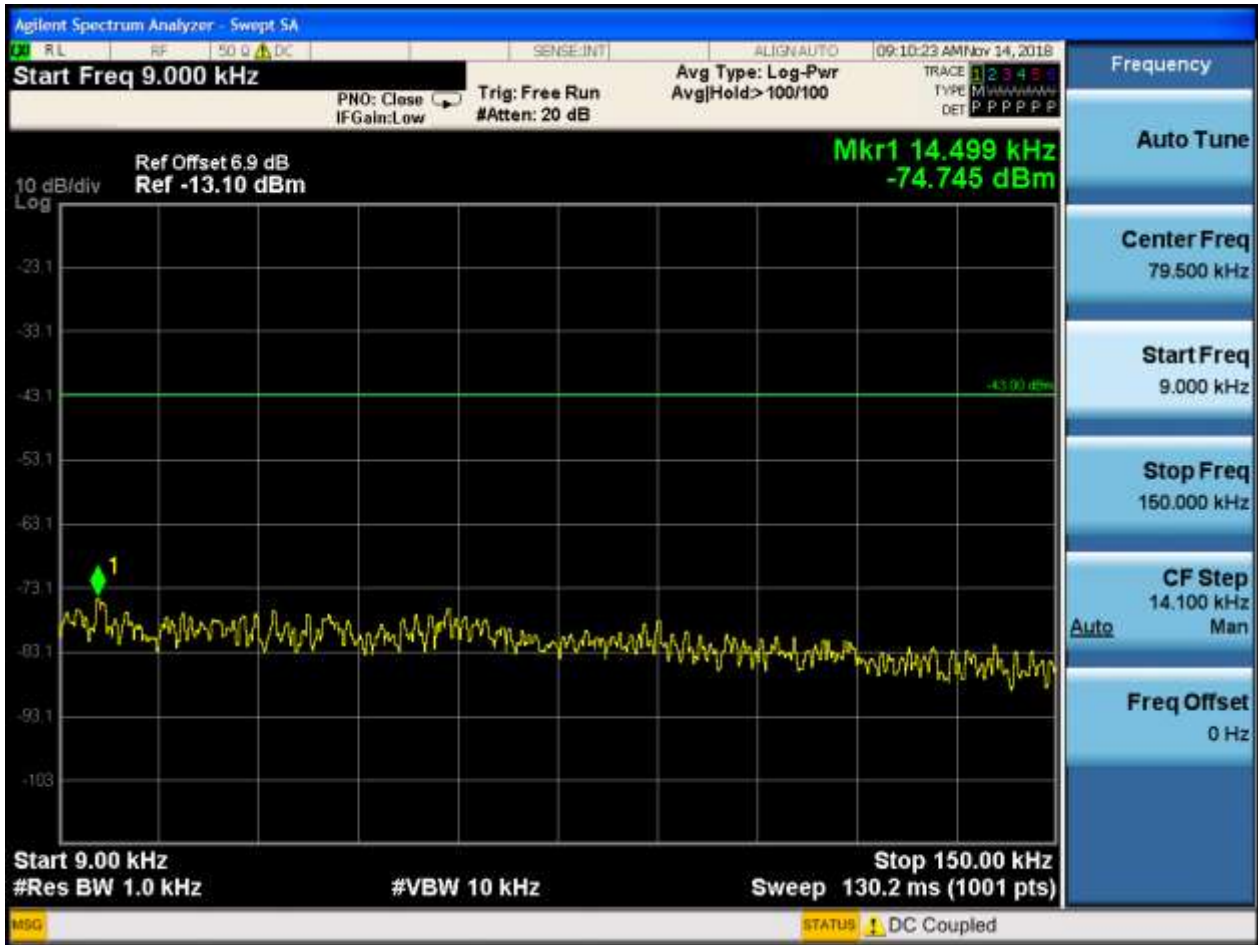
## 6.1.2.2.2 Test Channel = MCH

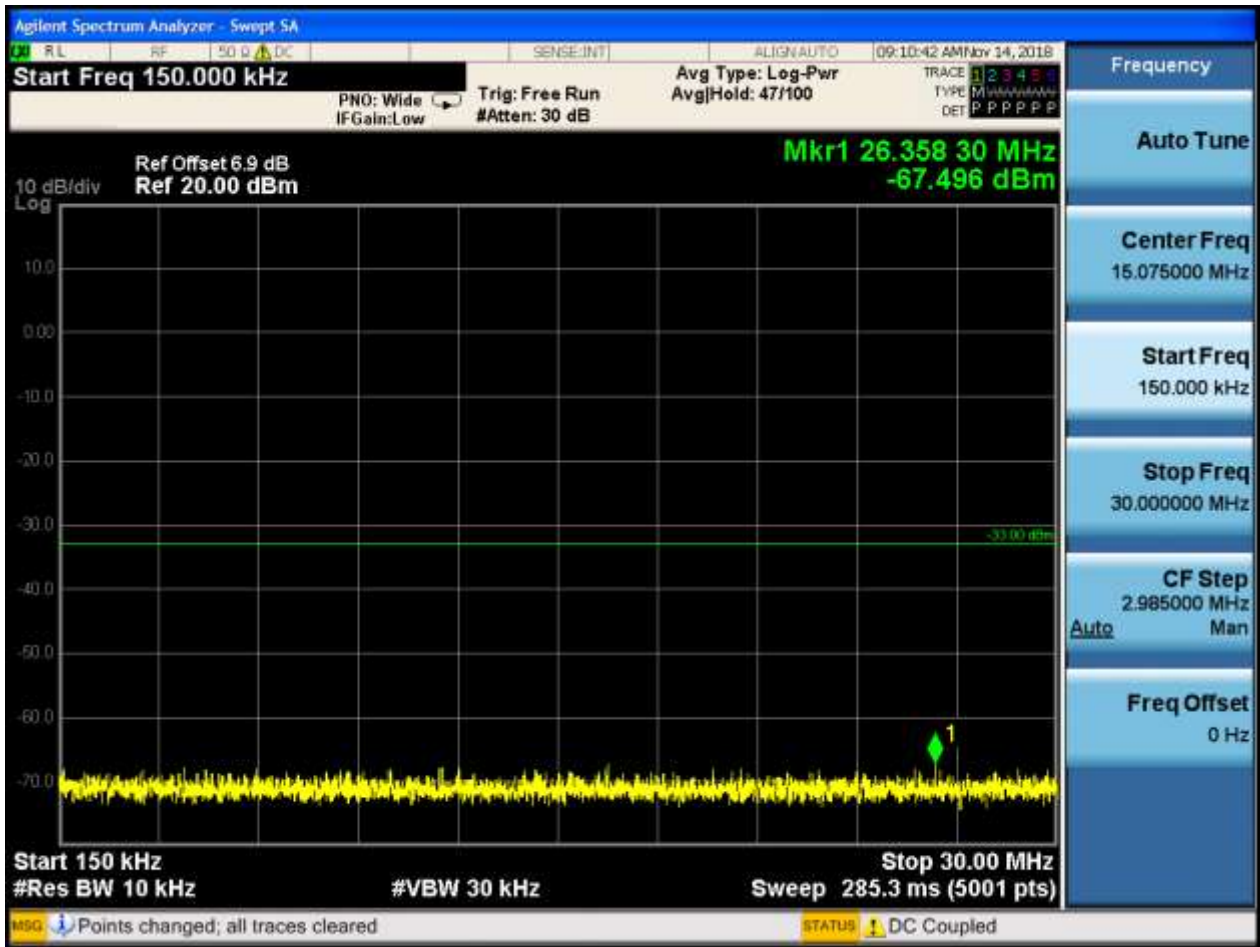






## 6.1.2.2.3 Test Channel = HCH









## 7Appendix\_H: 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	12.46	0.01512	PASS
				VN	10.4	0.01262	PASS
				VH	6.91	0.00838	PASS
		MCH	TN	VL	18.14	0.02168	PASS
				VN	14.08	0.01683	PASS
				VH	13.37	0.01598	PASS
		HCH	TN	VL	12.4	0.01461	PASS
				VN	10.27	0.0121	PASS
				VH	15.43	0.01818	PASS
GSM850	GSM/TM2	LCH	TN	VL	9.98	0.01211	PASS
				VN	11.98	0.01454	PASS
				VH	14.82	0.01798	PASS
		MCH	TN	VL	19.02	0.02273	PASS
				VN	12.04	0.01439	PASS
				VH	15.24	0.01822	PASS
		HCH	TN	VL	12.24	0.01442	PASS
				VN	15.85	0.01867	PASS
				VH	15.69	0.01848	PASS
GSM1900	GSM/TM1	LCH	TN	VL	6.07	0.00328	PASS
				VN	-26.47	-0.01431	PASS
				VH	-20.86	-0.01127	PASS
		MCH	TN	VL	-5.94	-0.00316	PASS
				VN	-5.68	-0.00302	PASS
				VH	-2.32	-0.00123	PASS
		HCH	TN	VL	-2.07	-0.00108	PASS
				VN	-5.42	-0.00284	PASS
				VH	-2.52	-0.00132	PASS
GSM1900	GSM/TM2	LCH	TN	VL	-10.72	-0.00579	PASS

		MCH	TN	VN	-3.81	-0.00206	PASS
				VH	-2.36	-0.00128	PASS
				VL	4.29	0.00228	PASS
		MCH	TN	VN	-1.26	-0.00067	PASS
				VH	-2.55	-0.00136	PASS
				VL	4.75	0.00249	PASS
		HCH	TN	VN	-1.58	-0.00083	PASS
				VH	0.61	0.00032	PASS
				VL	4.75	0.00249	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	13.69	0.01661	PASS
				-20	14.4	0.01747	PASS
				-10	15.3	0.01856	PASS
				0	8.39	0.01018	PASS
				10	15.11	0.01833	PASS
				20	12.98	0.01575	PASS
				30	10.14	0.0123	PASS
				40	14.08	0.01708	PASS
				50	15.56	0.01888	PASS
		MCH	VN	-30	12.66	0.01513	PASS
				-20	12.01	0.01436	PASS
				-10	16.85	0.02014	PASS
				0	14.4	0.01721	PASS
				10	13.43	0.01605	PASS
				20	11.3	0.01351	PASS
				30	15.3	0.01829	PASS
				40	15.69	0.01875	PASS
		HCH	VN	-30	11.36	0.01338	PASS
				-20	9.75	0.01149	PASS
				-10	16.27	0.01917	PASS
				0	7.68	0.00905	PASS
				10	11.69	0.01377	PASS
				20	11.36	0.01338	PASS
				30	13.04	0.01536	PASS
40	9.62			0.01133	PASS		

GSM850	GSM/TM2	LCH	VN	50	12.46	0.01468	PASS
				-30	14.56	0.01767	PASS
				-20	15.01	0.01821	PASS
				-10	15.88	0.01927	PASS
				0	13.3	0.01614	PASS
				10	14.72	0.01786	PASS
				20	15.3	0.01856	PASS
				30	16.21	0.01967	PASS
				40	18.05	0.0219	PASS
		50	15.24	0.01849	PASS		
		MCH	VN	-30	15.43	0.01844	PASS
				-20	15.27	0.01825	PASS
				-10	14.88	0.01779	PASS
				0	13.98	0.01671	PASS
				10	15.21	0.01818	PASS
				20	15.3	0.01829	PASS
				30	16.4	0.0196	PASS
				40	16.01	0.01914	PASS
				50	15.92	0.01903	PASS
		HCH	VN	-30	13.95	0.01643	PASS
				-20	15.72	0.01852	PASS
				-10	12.69	0.01495	PASS
				0	16.14	0.01902	PASS
				10	13.53	0.01594	PASS
				20	16.3	0.0192	PASS
				30	14.79	0.01742	PASS
				40	14.56	0.01715	PASS
50	15.14			0.01784	PASS		
GSM1900	GSM/TM1	LCH	VN	-30	-1.1	-0.00059	PASS
				-20	-0.65	-0.00035	PASS
				-10	-0.19	-0.0001	PASS
				0	0.84	0.00045	PASS
				10	-10.2	-0.00551	PASS
				20	-2.07	-0.00112	PASS
				30	-0.71	-0.00038	PASS
				40	-5.17	-0.00279	PASS
				50	-2.45	-0.00132	PASS
		MCH	VN	-30	4.33	0.0023	PASS
				-20	-4.2	-0.00223	PASS
				-10	1.36	0.00072	PASS

				0	-0.65	-0.00035	PASS						
				10	-3.55	-0.00189	PASS						
				20	1.36	0.00072	PASS						
				30	4.2	0.00223	PASS						
				40	1.36	0.00072	PASS						
				50	-1.61	-0.00086	PASS						
		HCH	VN			-30	-3.1	-0.00162	PASS				
						-20	-3.23	-0.00169	PASS				
						-10	-6.39	-0.00335	PASS				
						0	-3.1	-0.00162	PASS				
						10	2.71	0.00142	PASS				
						20	-5.55	-0.00291	PASS				
						30	-2.65	-0.00139	PASS				
						40	2.32	0.00121	PASS				
						50	-4.33	-0.00227	PASS				
						GSM1900	GSM/TM2	LCH	VN				
-30	-2.1	-0.00114	PASS										
-20	-0.06	-0.00003	PASS										
-10	-2.39	-0.00129	PASS										
0	5.81	0.00314	PASS										
10	-0.9	-0.00049	PASS										
20	-1.13	-0.00061	PASS										
30	-2.39	-0.00129	PASS										
40	-2.71	-0.00146	PASS										
50	2.84	0.00153	PASS										
MCH	VN												
										-30	3.16	0.00168	PASS
										-20	0.74	0.00039	PASS
										-10	0.77	0.00041	PASS
										0	-0.26	-0.00014	PASS
										10	3.55	0.00189	PASS
										20	0.97	0.00052	PASS
										30	-3.39	-0.0018	PASS
40	1.07	0.00057	PASS										
50	-1.81	-0.00096	PASS										
HCH	VN												
										-30	1.97	0.00103	PASS
										-20	3.26	0.00171	PASS
										-10	-2.2	-0.00115	PASS
						0	0.06			0.00003	PASS		
						10	-0.58			-0.0003	PASS		
						20	-4.2			-0.0022	PASS		
30	3.39	0.00178	PASS										



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				40	-2.97	-0.00156	PASS
				50	2.49	0.0013	PASS

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END