



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	33.13	29.58	38.5	PASS
		MCH	32.94	29.39	38.5	PASS
		HCH	32.97	29.42	38.5	PASS
	GSM/TM2	LCH	26.59	23.04	38.5	PASS
		MCH	26.62	23.07	38.5	PASS
		HCH	26.61	23.06	38.5	PASS
Test Band	Test Mode	Test Channel	Measured[dBm]	EIRP [dBm]	Limit [dBm]	Verdict
PCS1900	GSM/TM1	LCH	31.04	30.74	33	PASS
		MCH	30.68	30.38	33	PASS
		HCH	30.68	30.38	33	PASS
	GSM/TM2	LCH	26.31	26.01	33	PASS
		MCH	26.31	26.01	33	PASS
		HCH	26.33	26.03	33	PASS

Note1:

a, For getting the ERP (Efficient Radiated Power) or EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

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

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

b, SGP = Signal Generator Level

Note2:

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

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

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

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	0.23	13	PASS
		MCH	0.22	13	PASS
		HCH	0.24	13	PASS
	GSM/TM2	LCH	3.19	13	PASS
		MCH	3.16	13	PASS
		HCH	3.15	13	PASS
GSM1900	GSM/TM1	LCH	0.29	13	PASS
		MCH	0.29	13	PASS
		HCH	0.31	13	PASS
	GSM/TM2	LCH	3.13	13	PASS
		MCH	3.17	13	PASS
		HCH	3.17	13	PASS

3Appendix_C: Modulation Characteristics

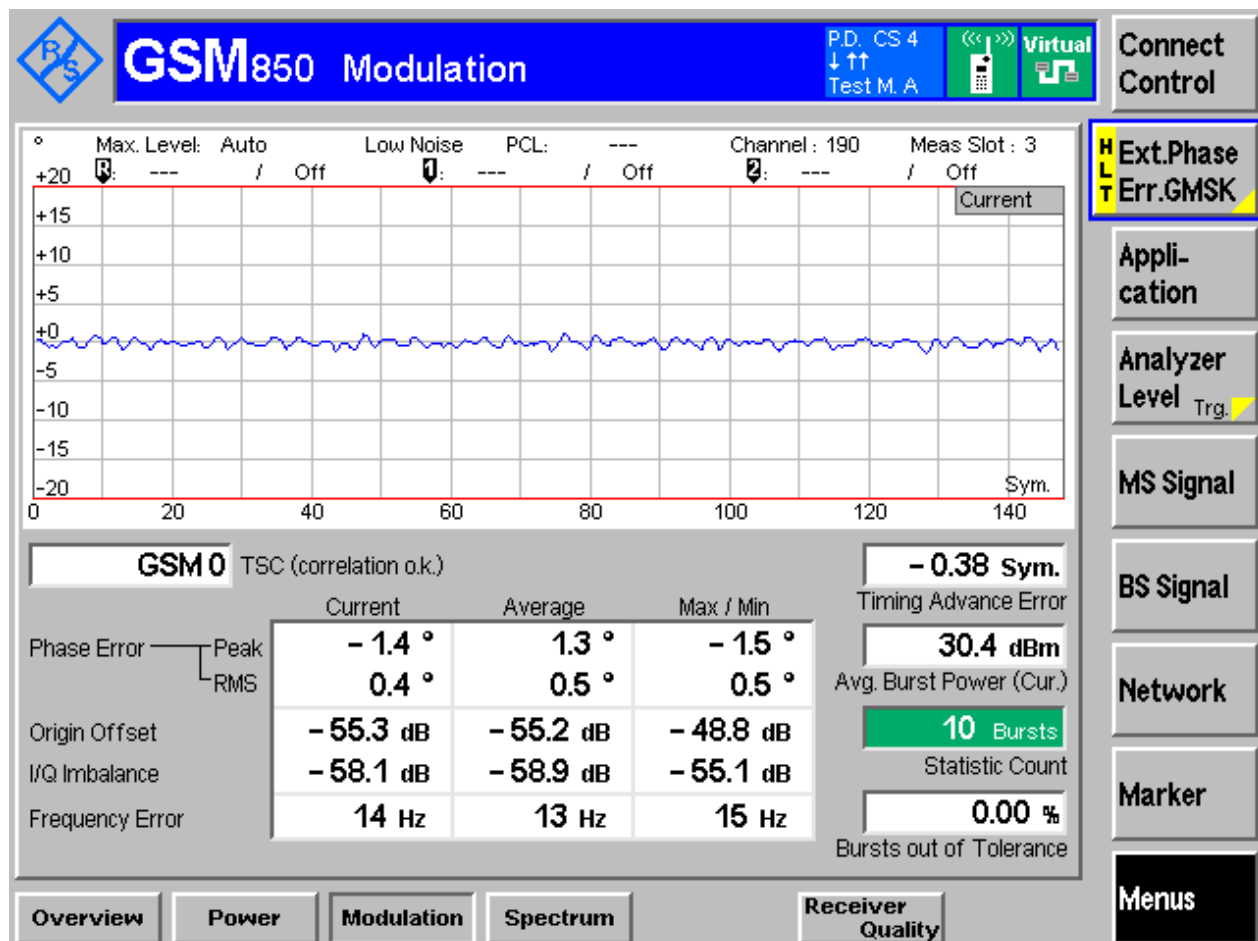
Part I - Test Plots

3.1 For GSM

3.1.1 Test Band = GSM850

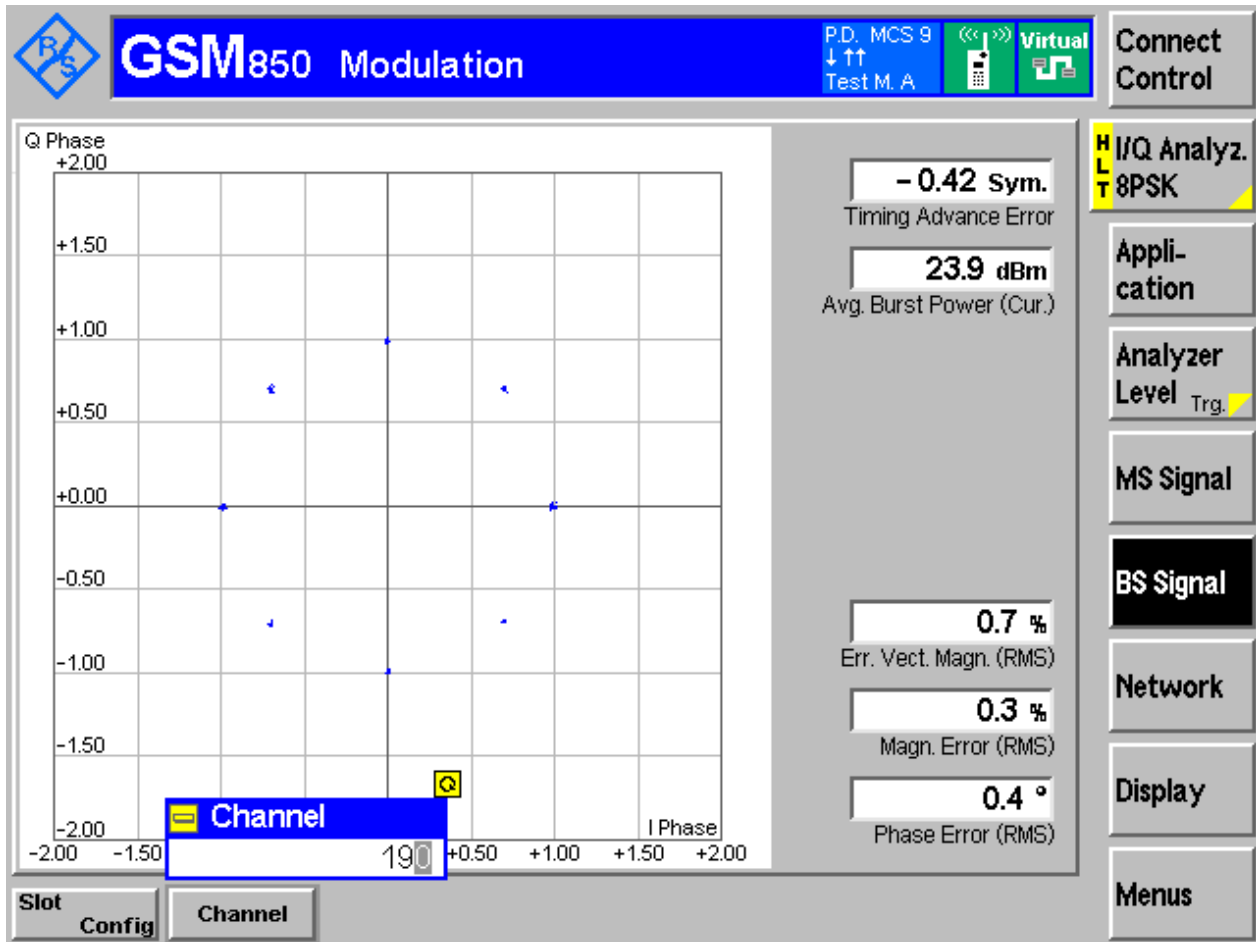
3.1.1.1 Test Mode = GSM/TM1

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = GSM/TM2

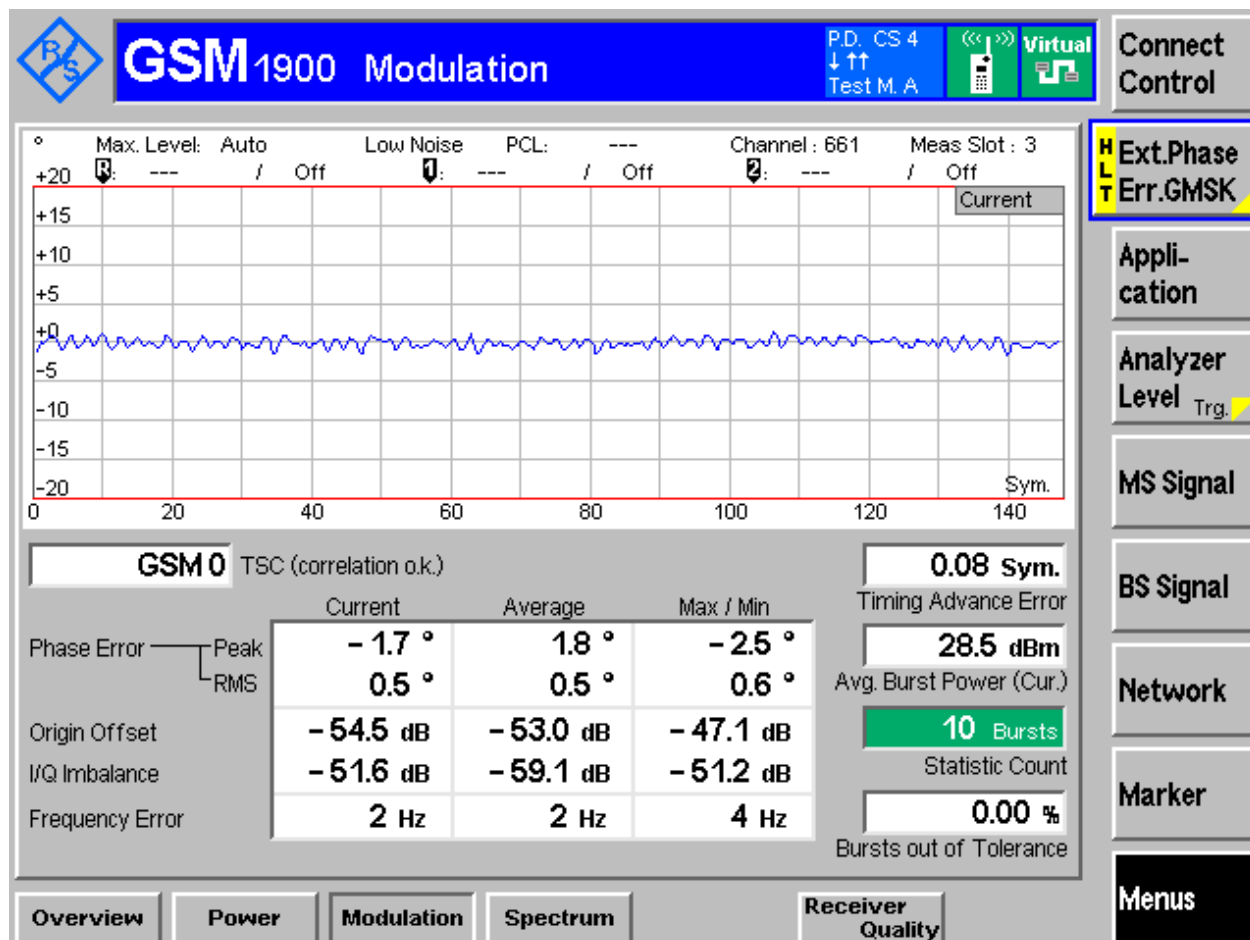
3.1.1.2.1 Test Channel = MCH



3.1.2 Test Band = GSM1900

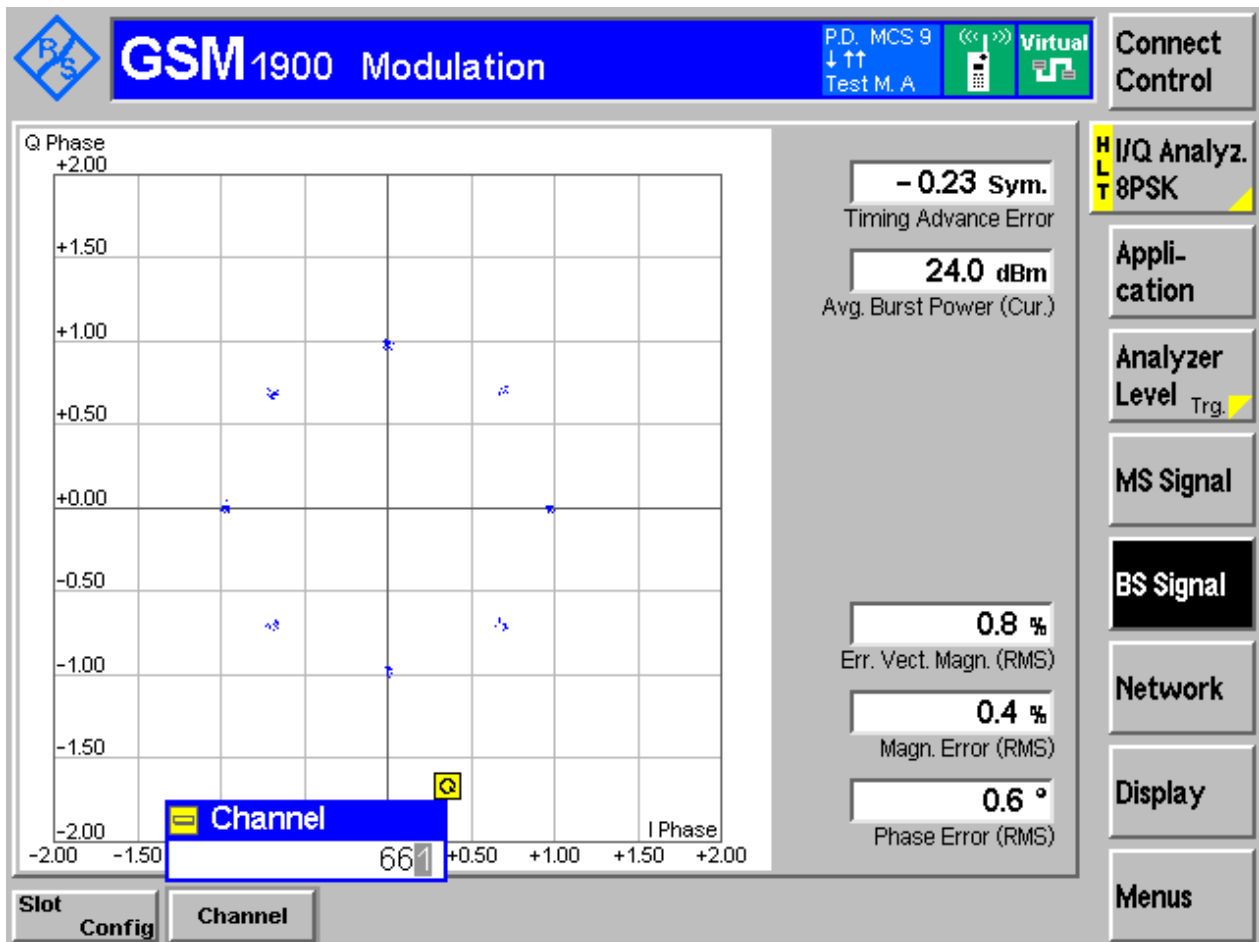
3.1.2.1 Test Mode = GSM/TM1

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	243.04	313.0	Pass
		MCH	244.22	308.5	Pass
		HCH	245.51	320.6	Pass
	GSM/TM2	LCH	242.29	316.8	Pass
		MCH	243.24	309.9	Pass
		HCH	245.99	309.4	Pass
PCS1900	GSM/TM1	LCH	242.96	320.9	Pass
		MCH	246.32	319.6	Pass
		HCH	241.06	314.2	Pass
	GSM/TM2	LCH	240.74	313.3	Pass
		MCH	247.20	315.3	Pass
		HCH	247.20	311.1	Pass

Part II - Test Plots

1.1 For GSM

1.1.1 Test Band = GSM850

1.1.1.1 Test Mode = GSM/TM1

1.1.1.1.1 Test Channel = LCH



1.1.1.1.2 Test Channel = MCH



1.1.1.1.3 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



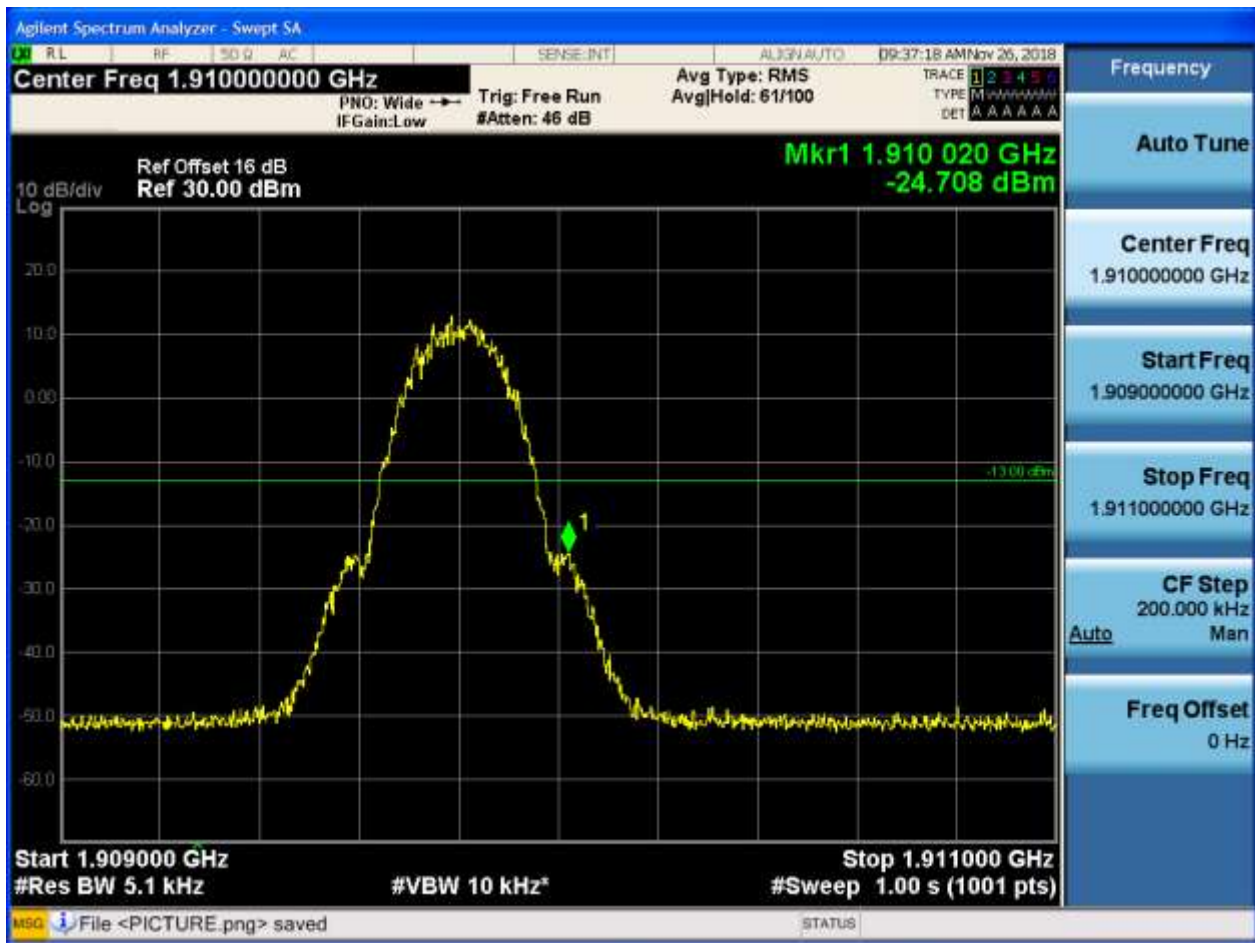
5.1.2 Test Band = PCS1900

5.1.2.1 Test Mode = GSM/TM1

5.1.2.1.1 Test Channel = LCH

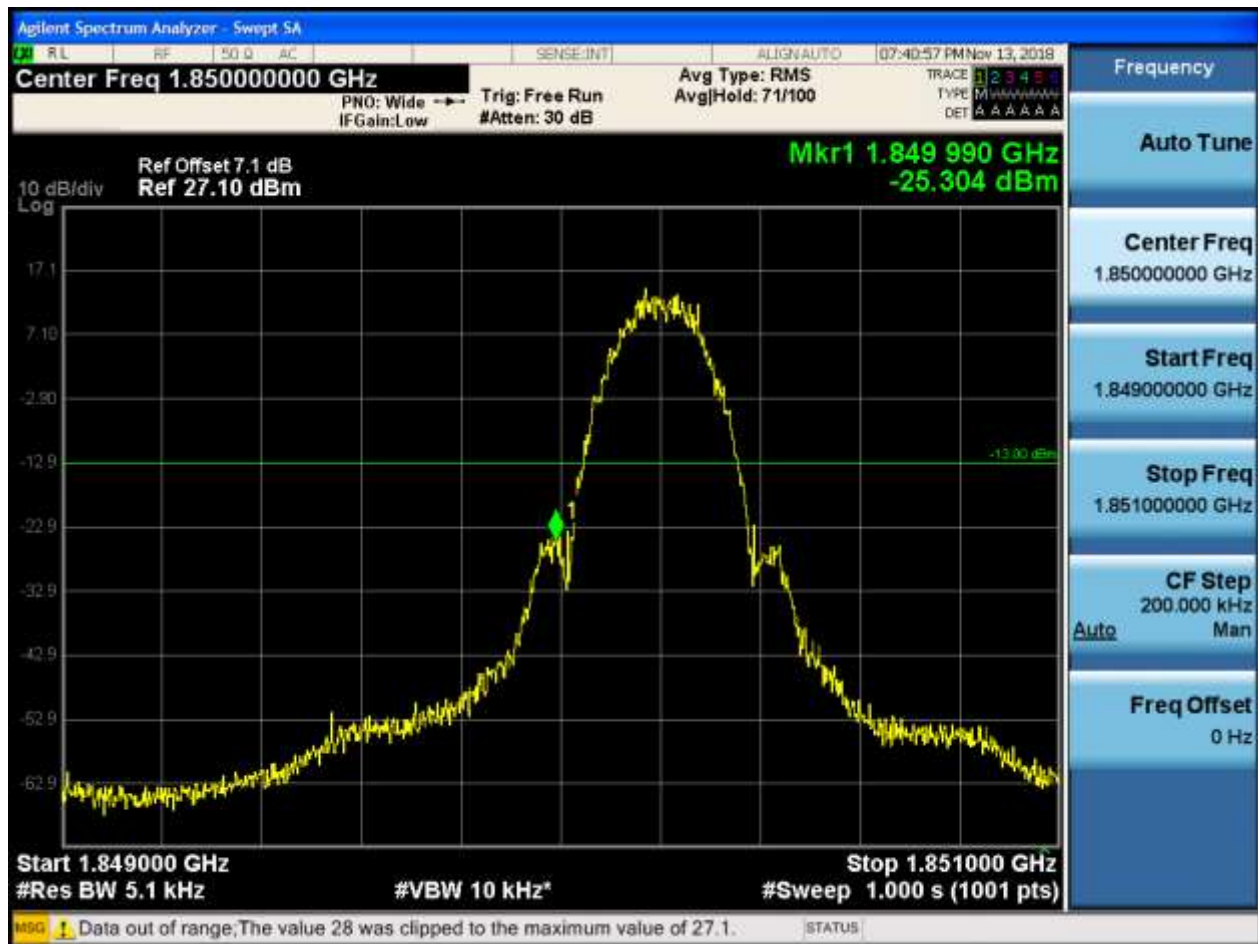


5.1.2.1.2 Test Channel = HCH

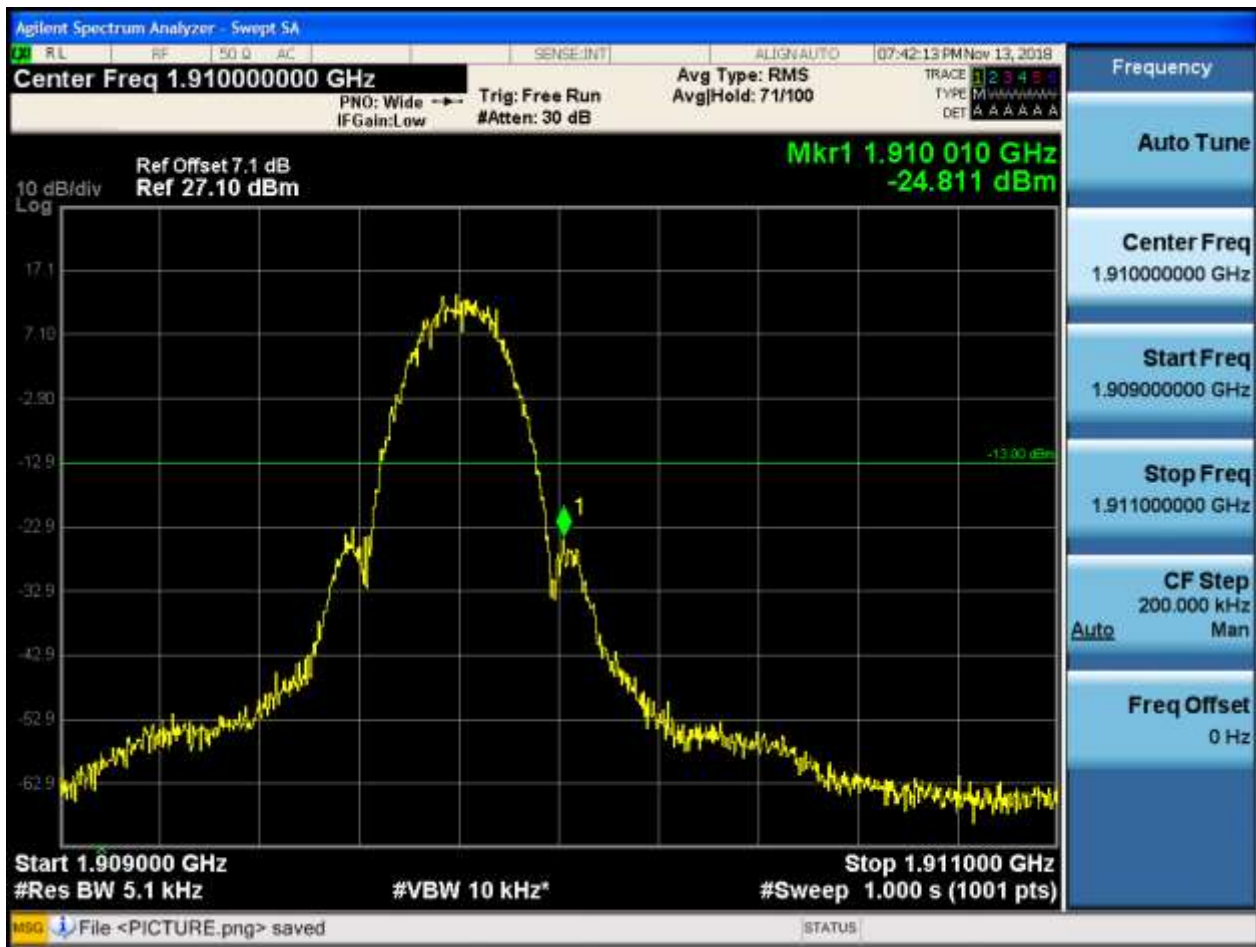


5.1.2.2 Test Mode = GSM/TM2

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 $< \text{RBW}/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (\text{Span} / \text{RBW})$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

Part I - Test Plots

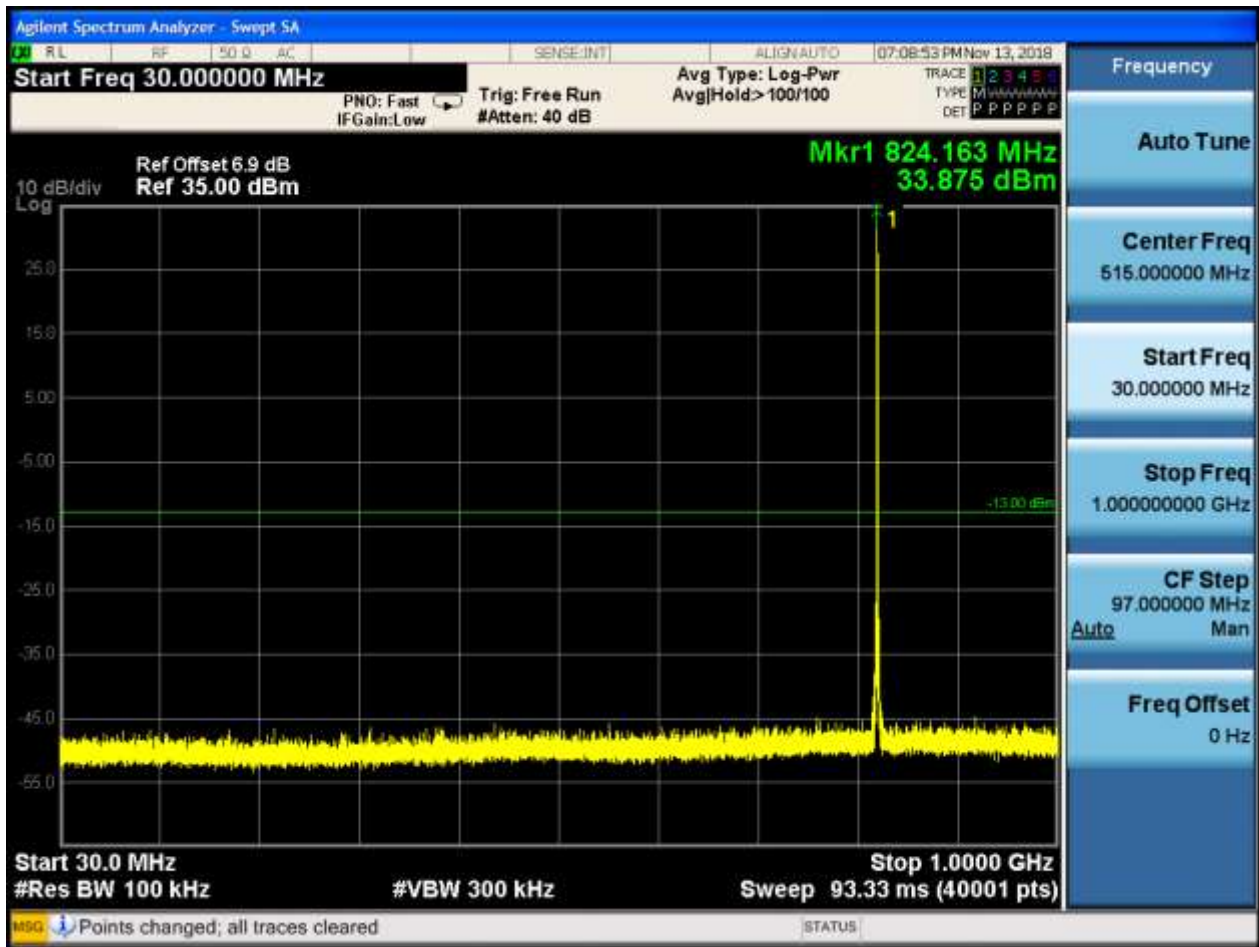
6.1 For GSM

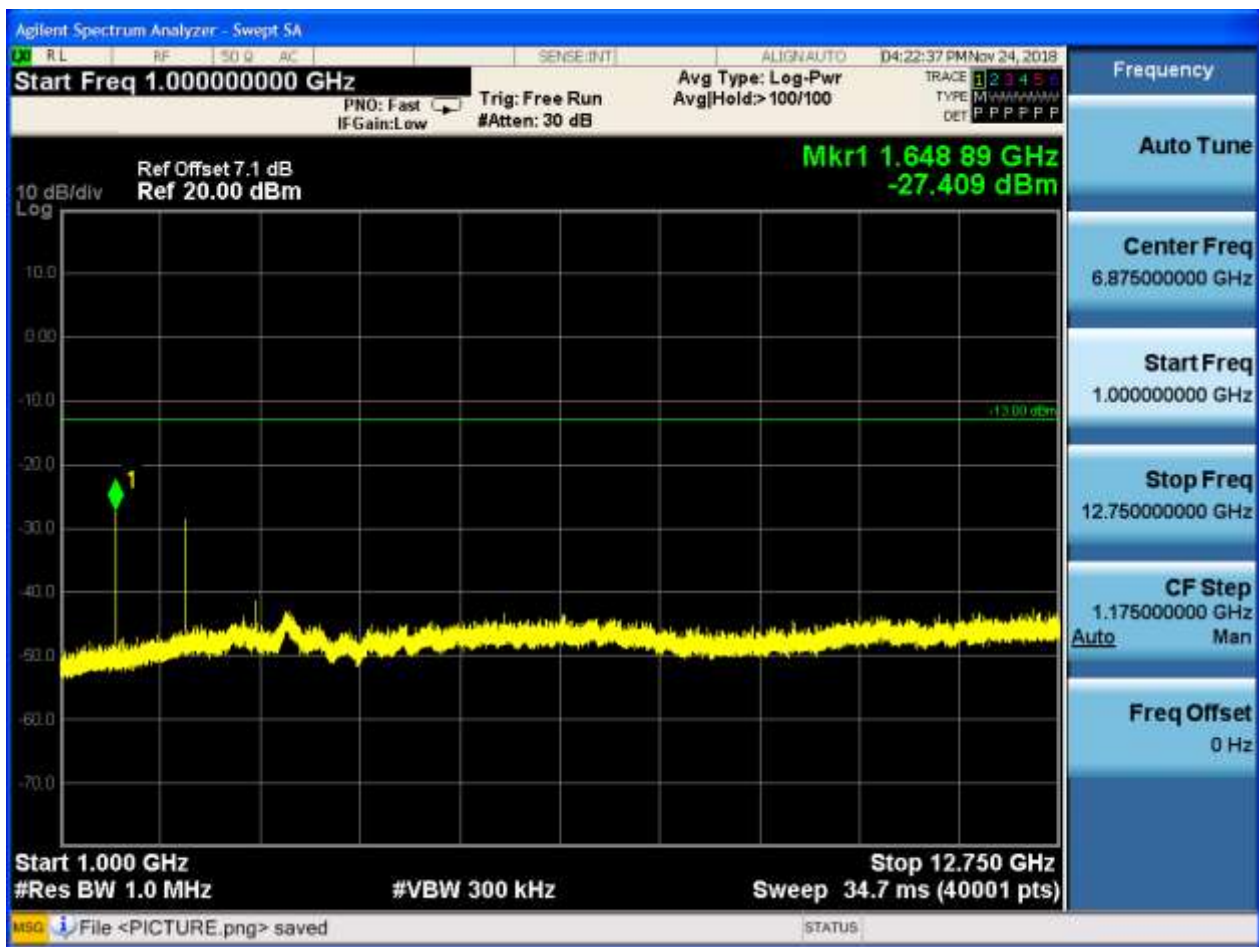
6.1.1 Test Band = GSM850

6.1.1.1 Test Mode = GSM/TM1

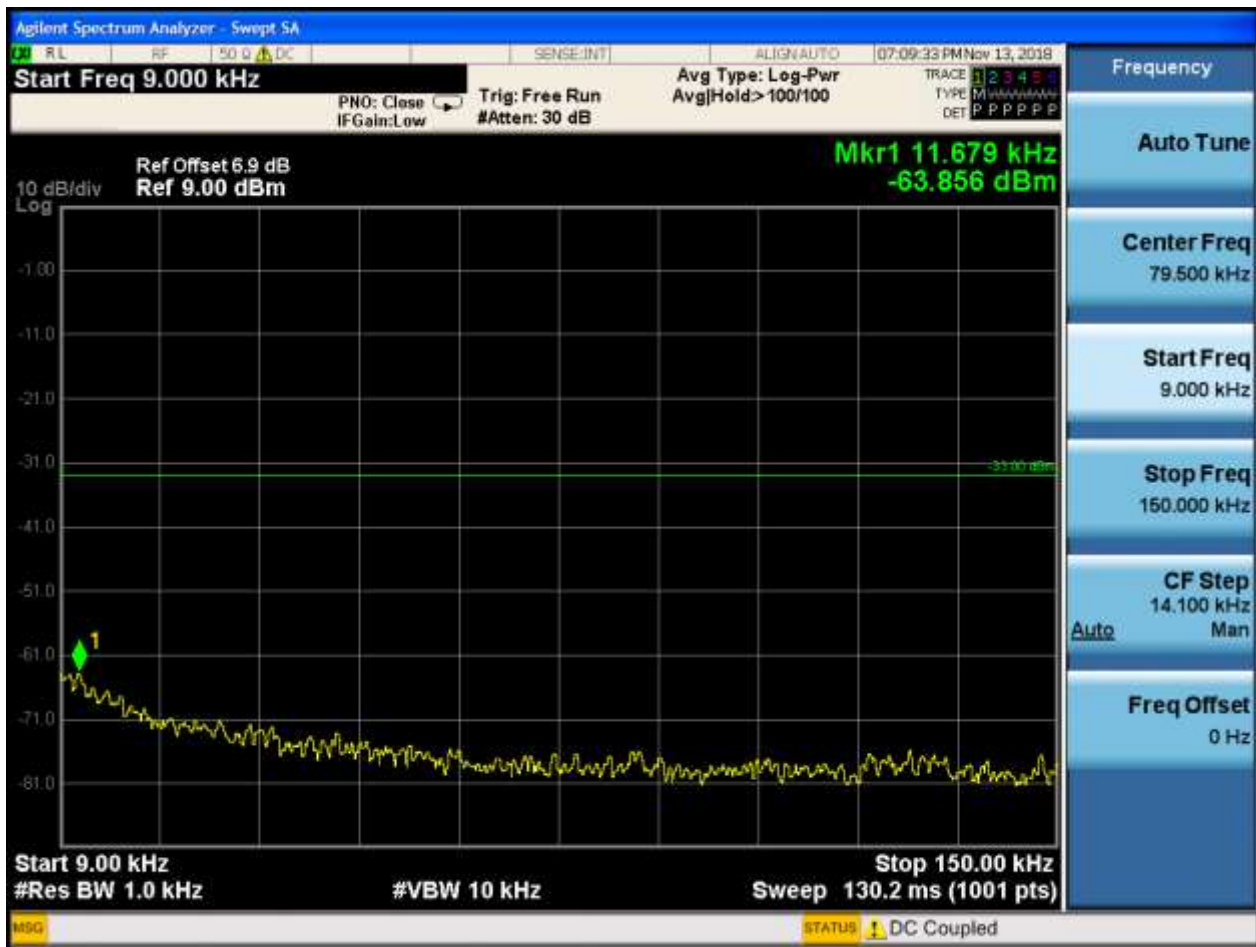
6.1.1.1.1 Test Channel = LCH

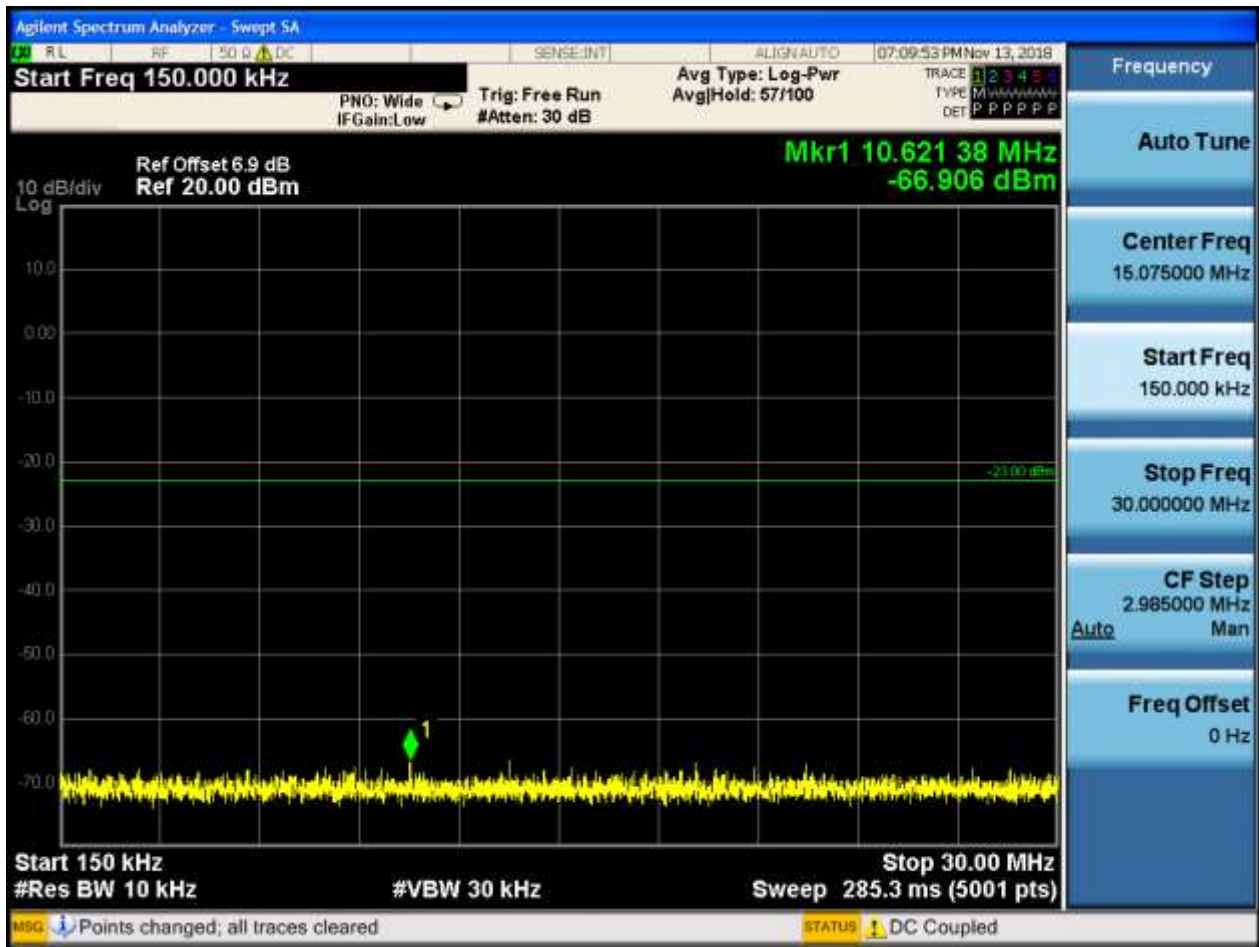


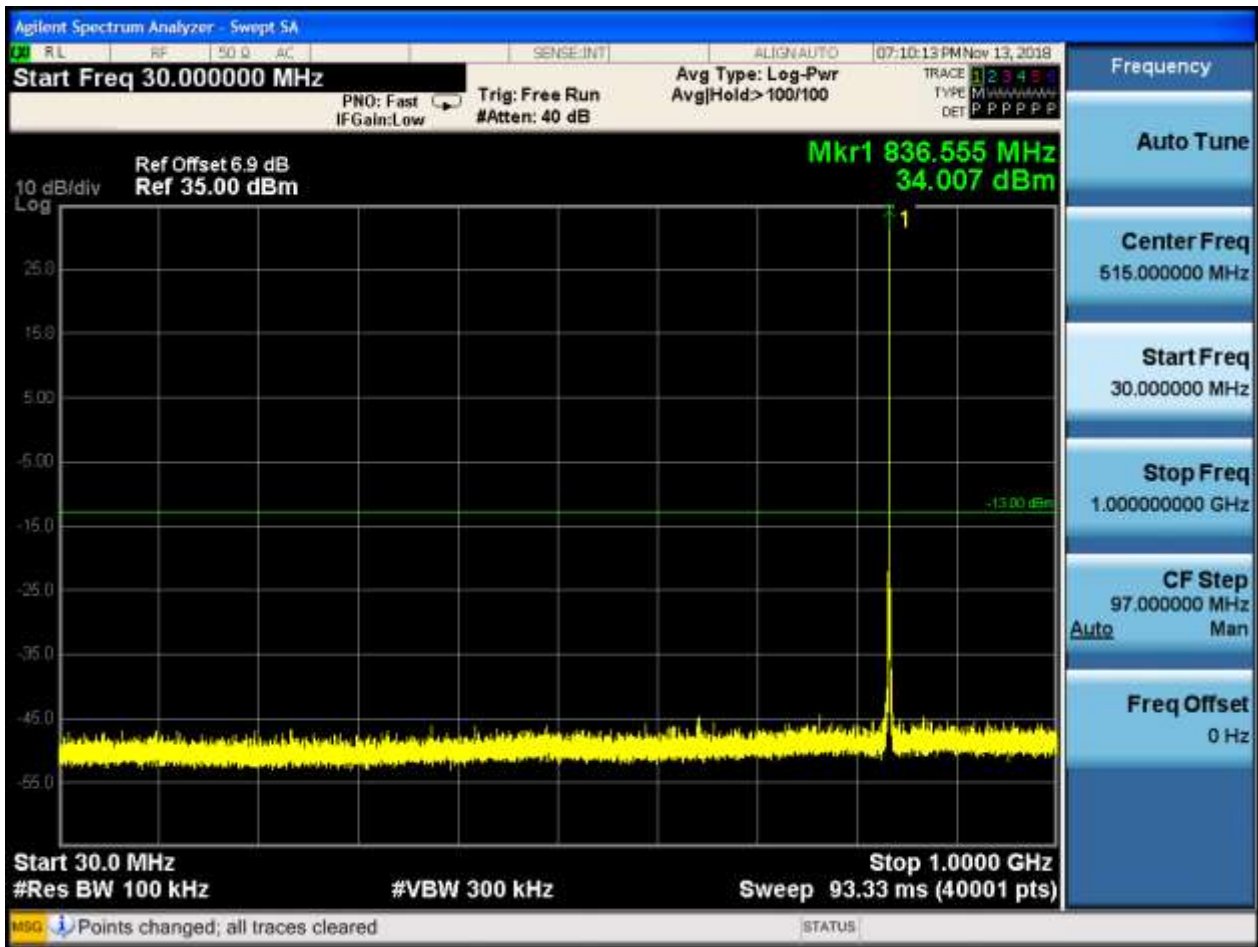




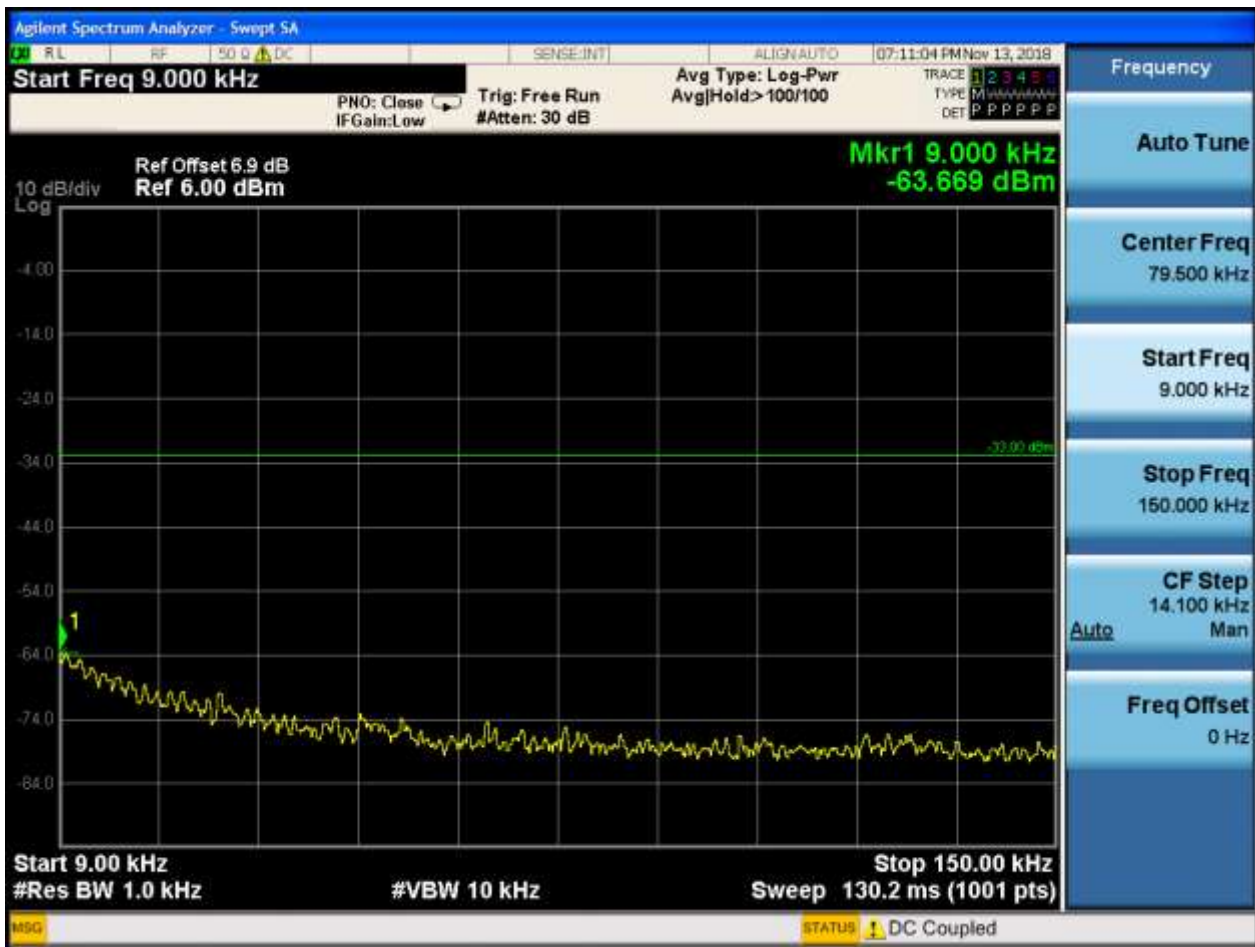
6.1.1.1.2 Test Channel = MCH

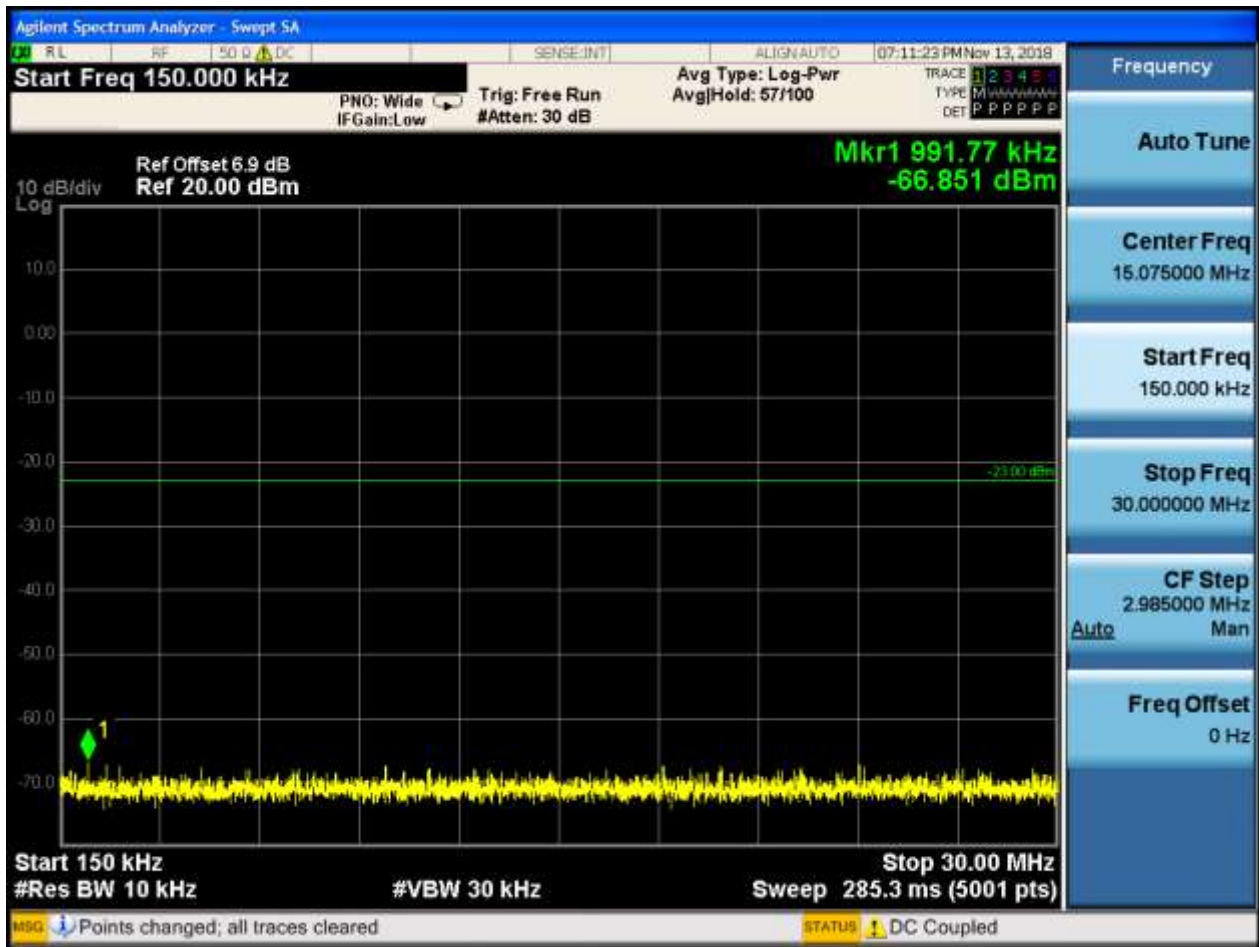


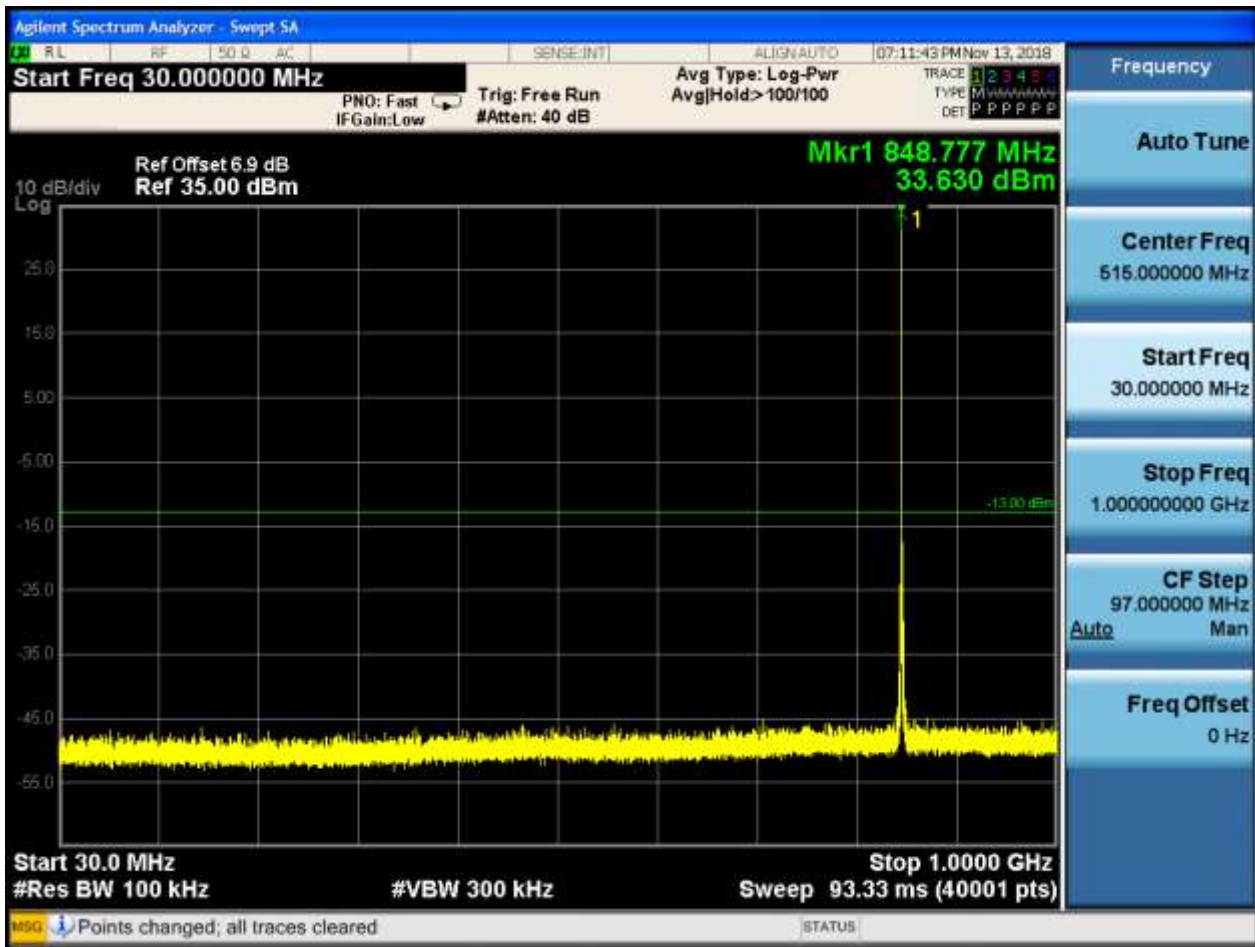


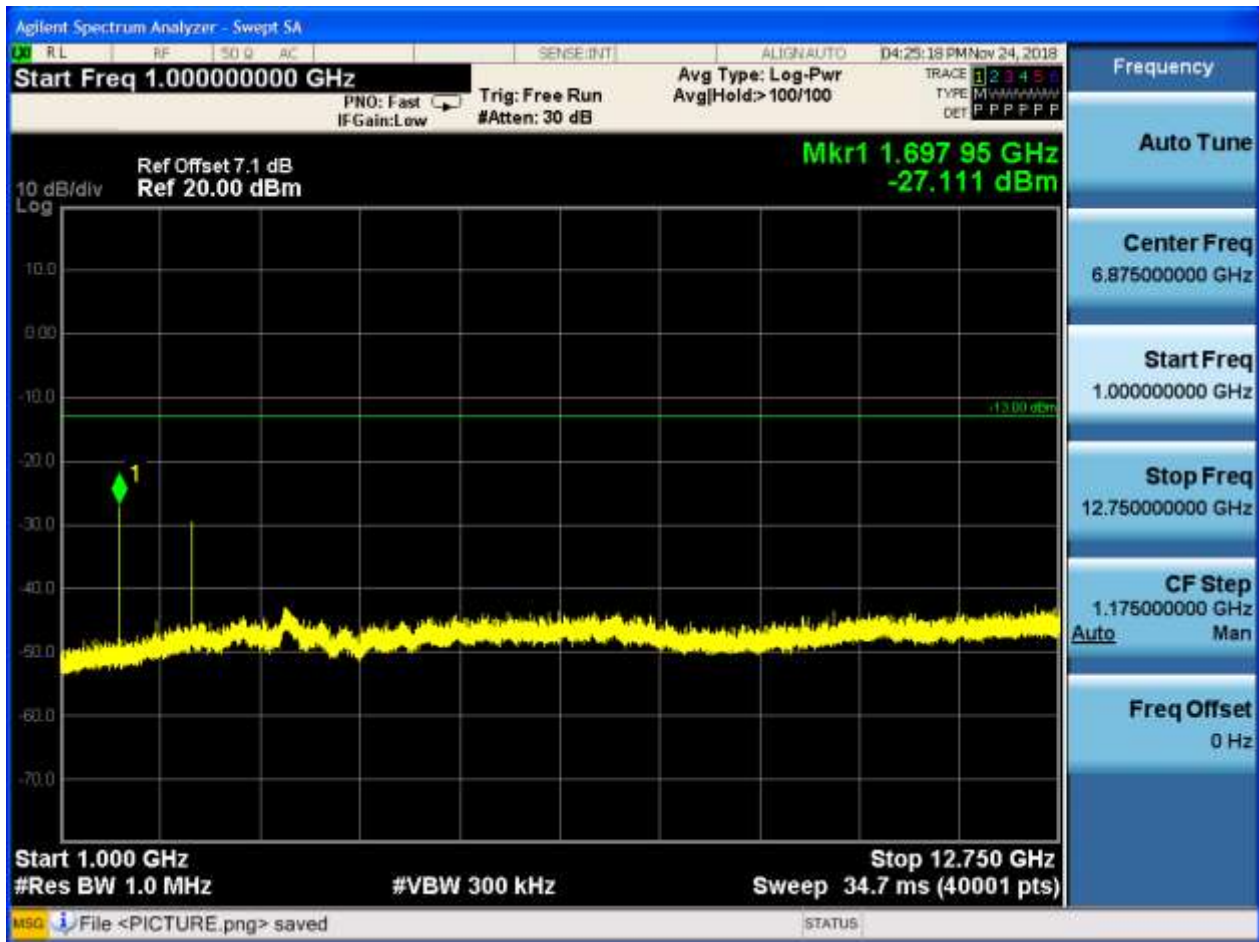


6.1.1.1.3 Test Channel = HCH



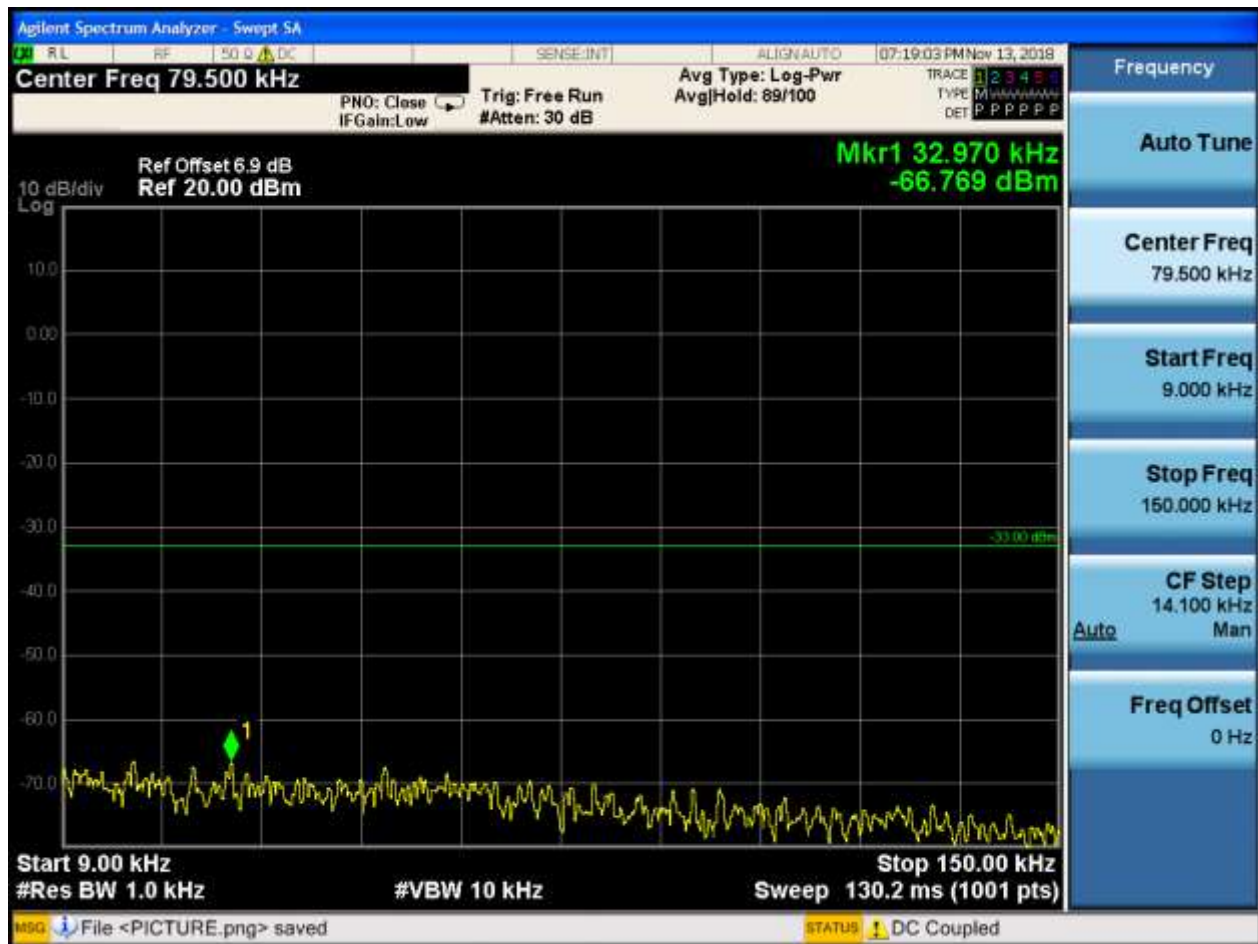


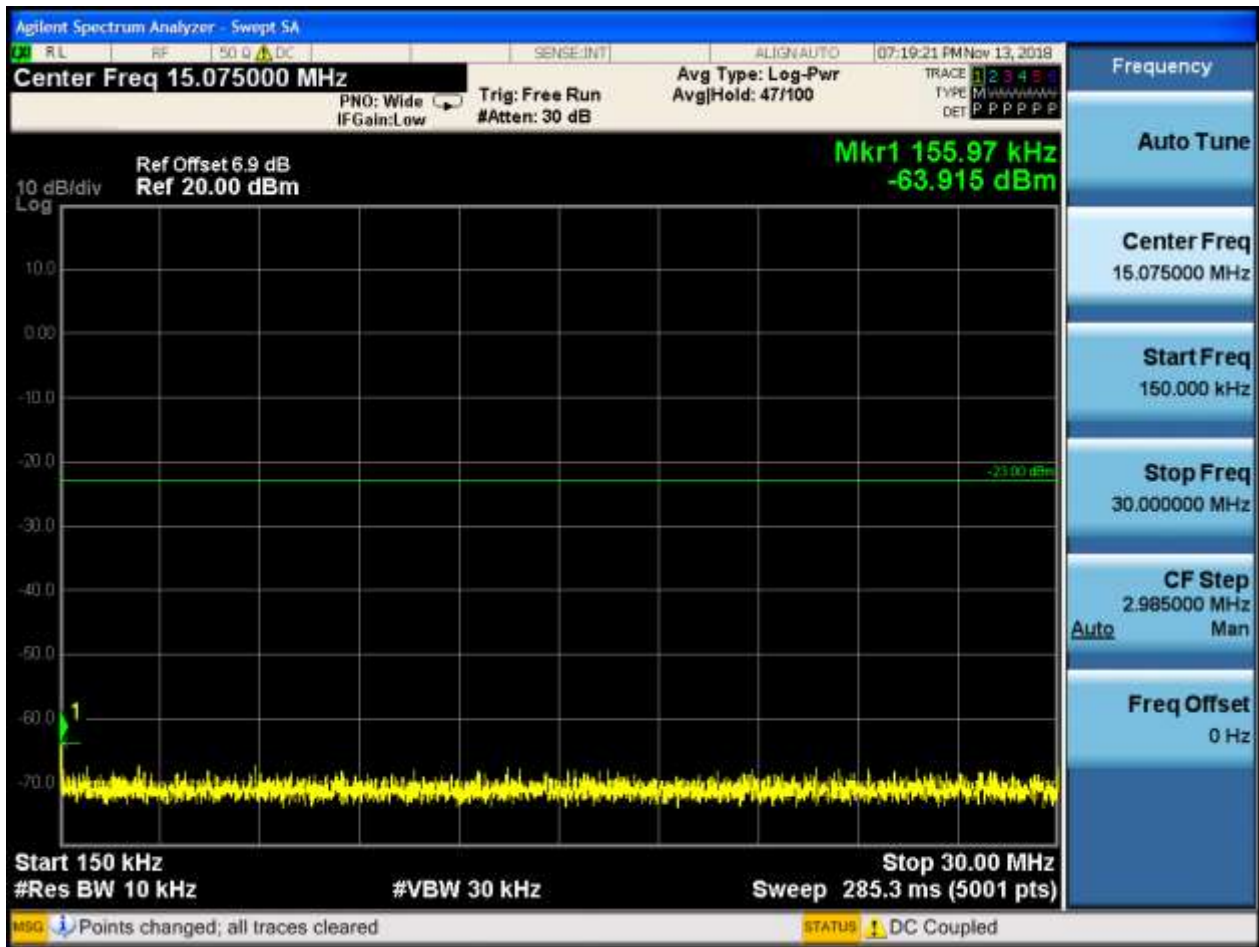


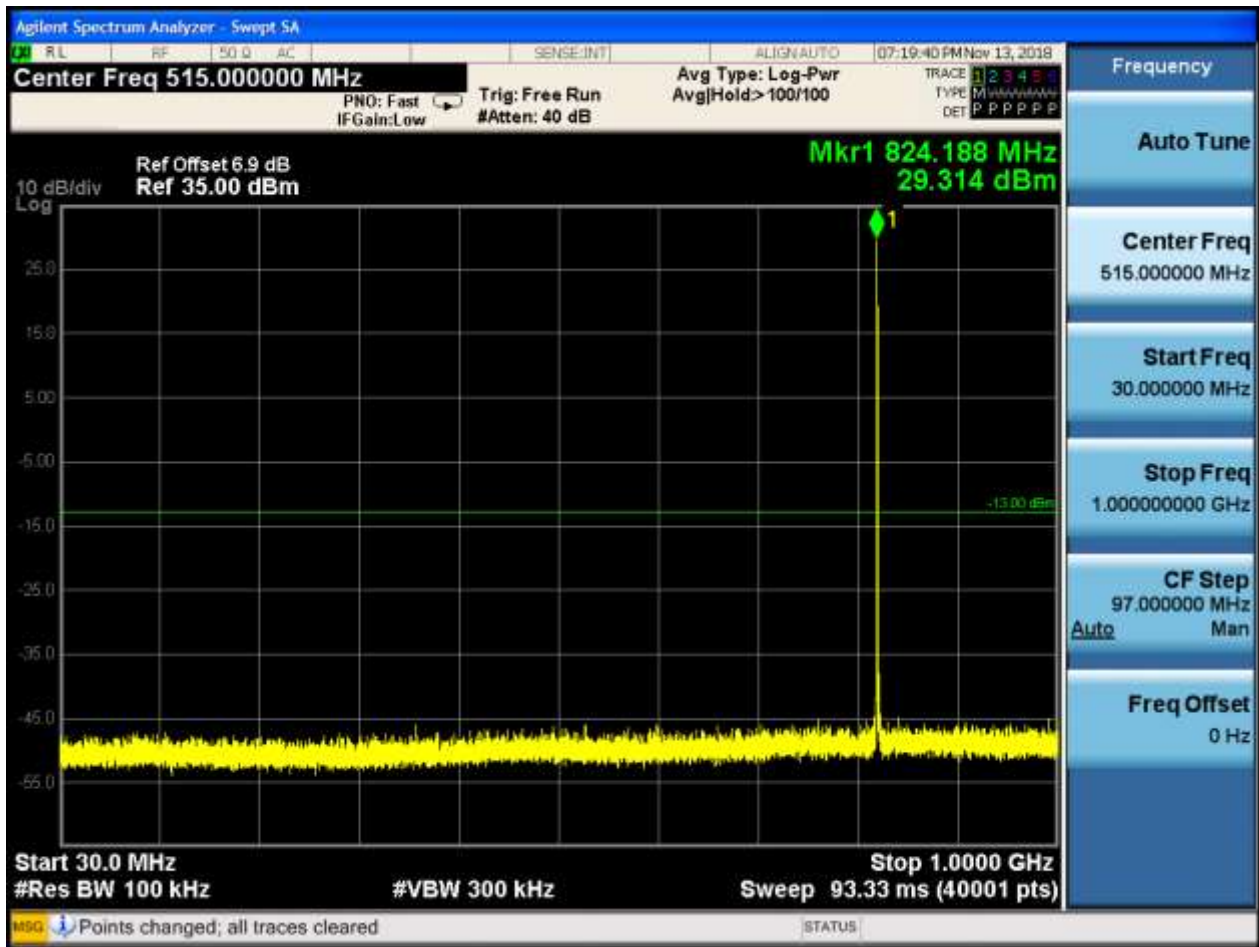


6.1.1.2 Test Mode = GSM/TM2

6.1.1.2.1 Test Channel = LCH

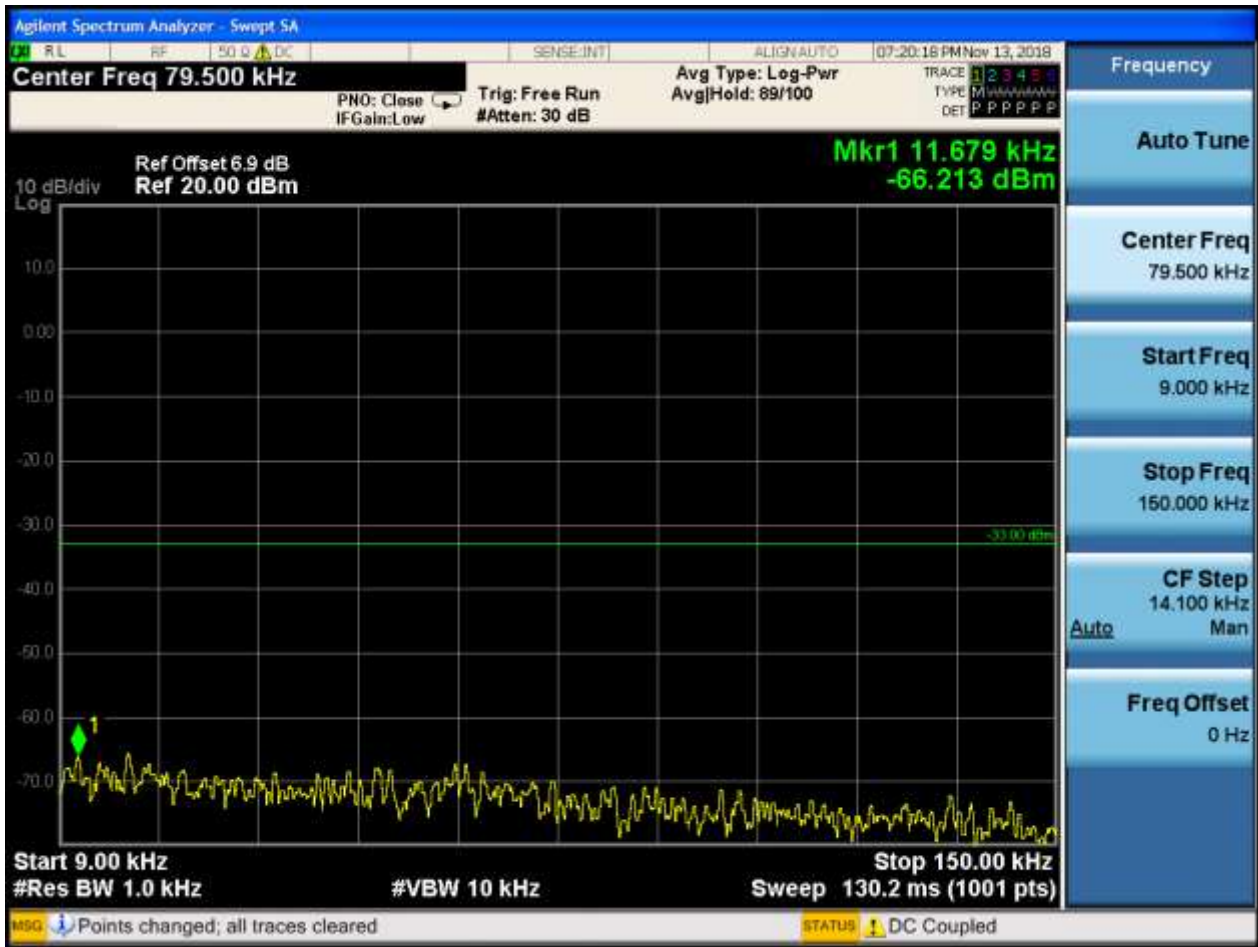


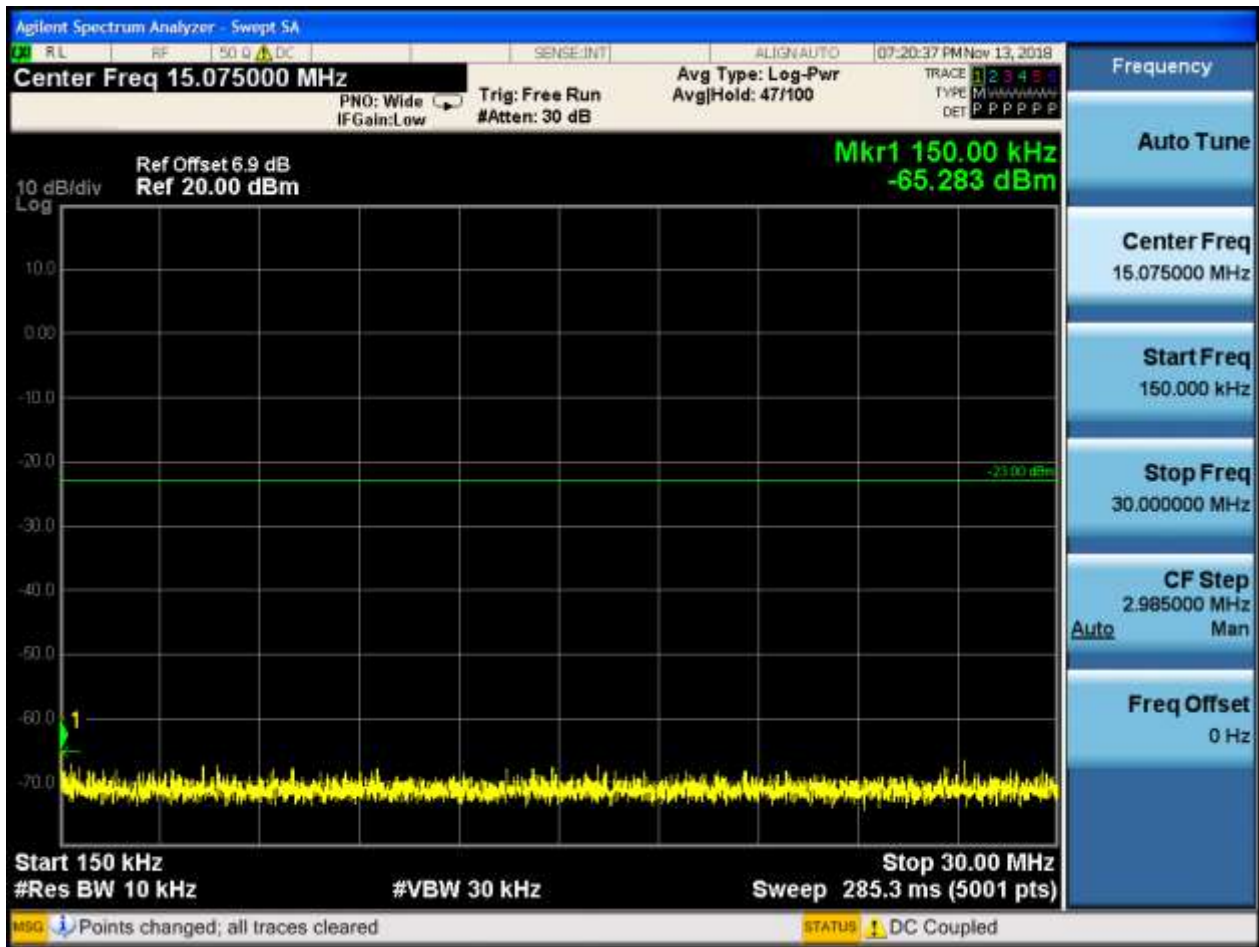


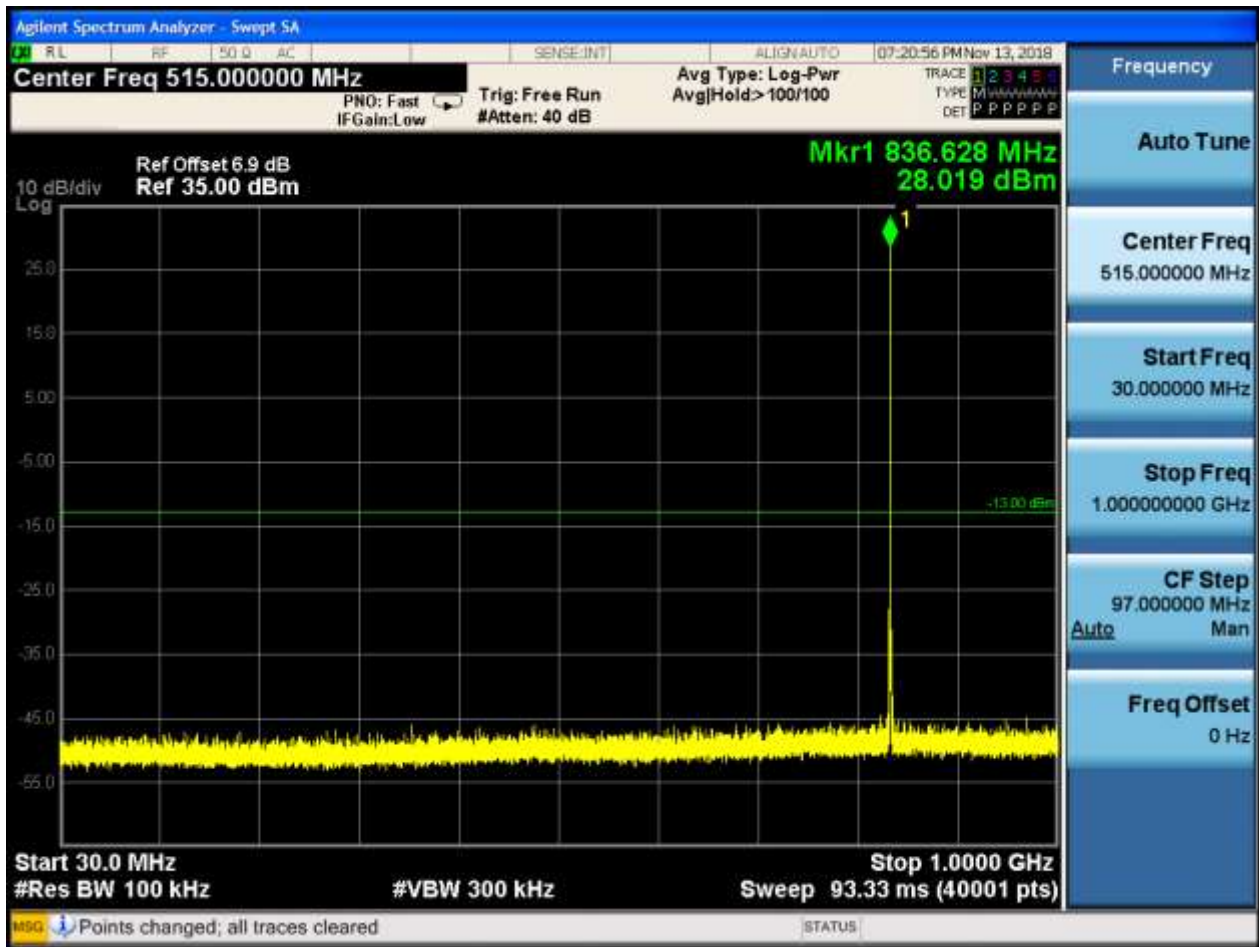


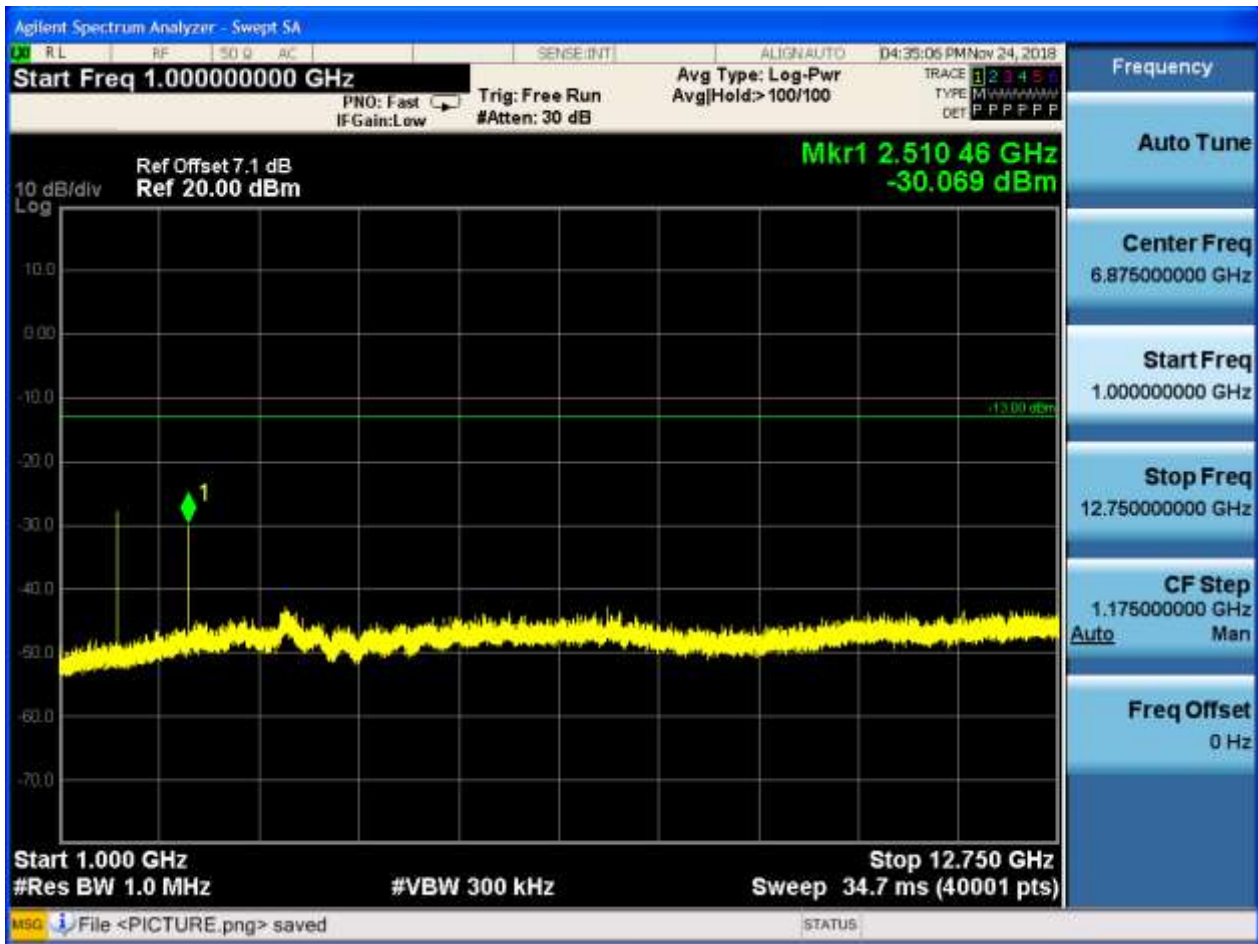


6.1.1.2.2 Test Channel = MCH

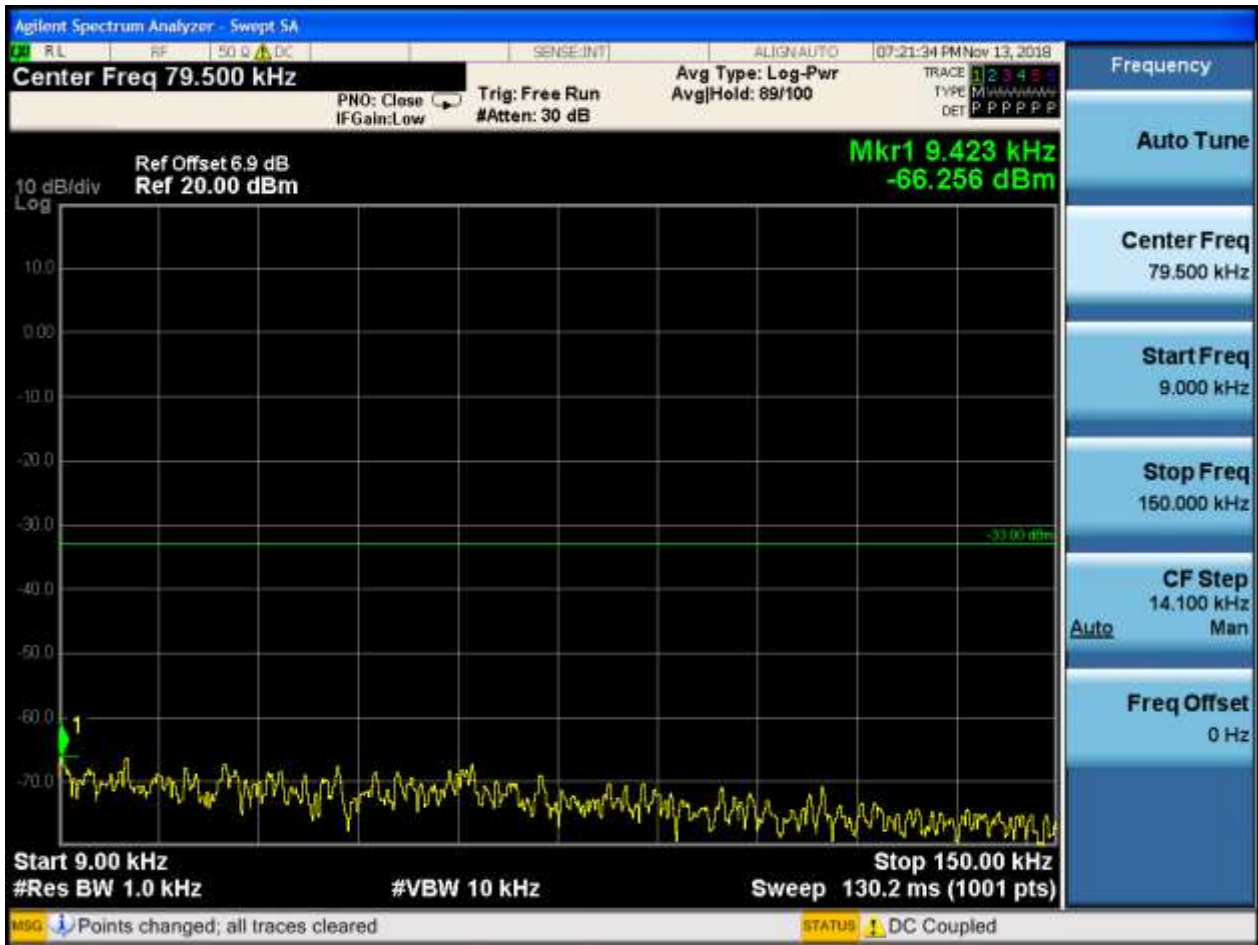


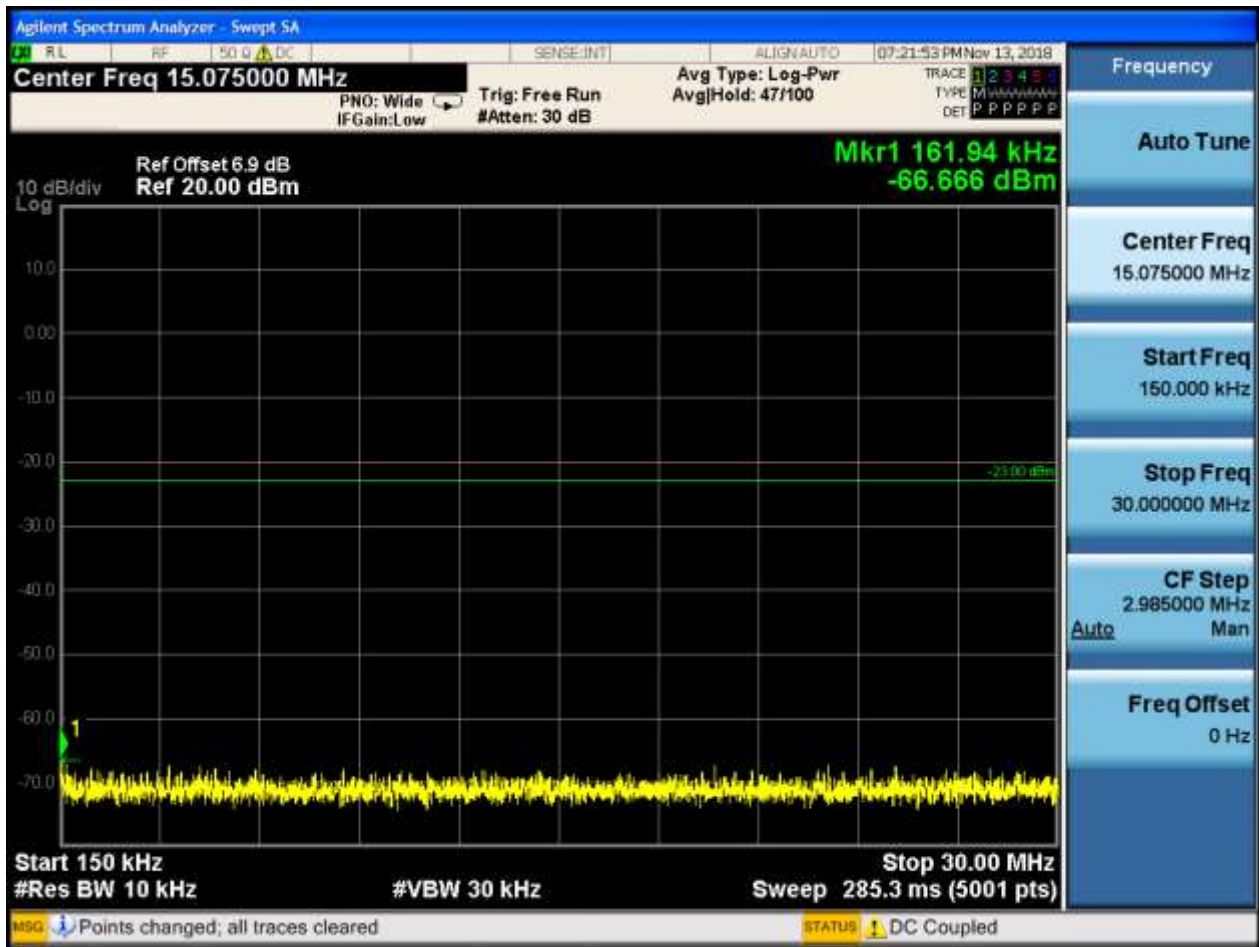


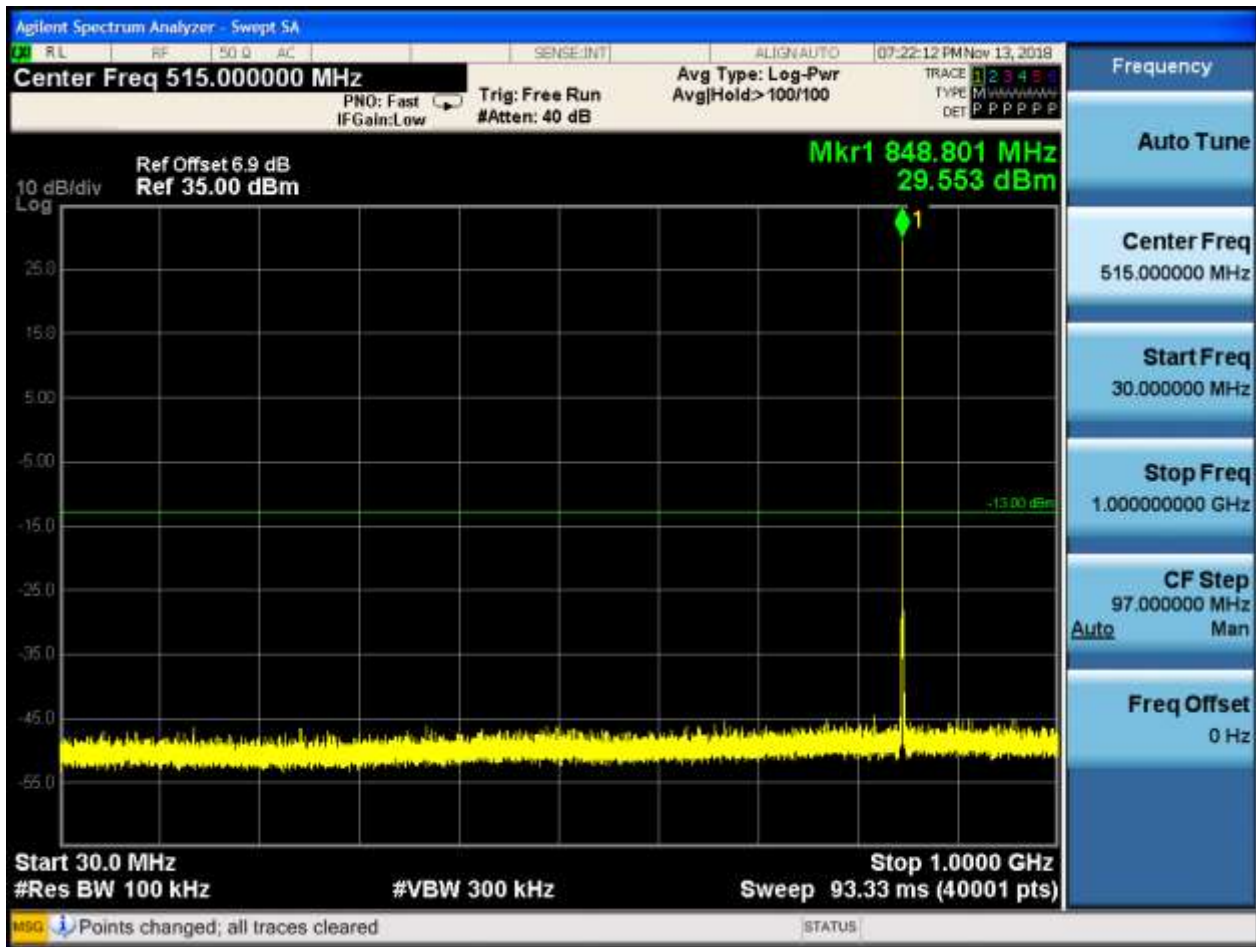


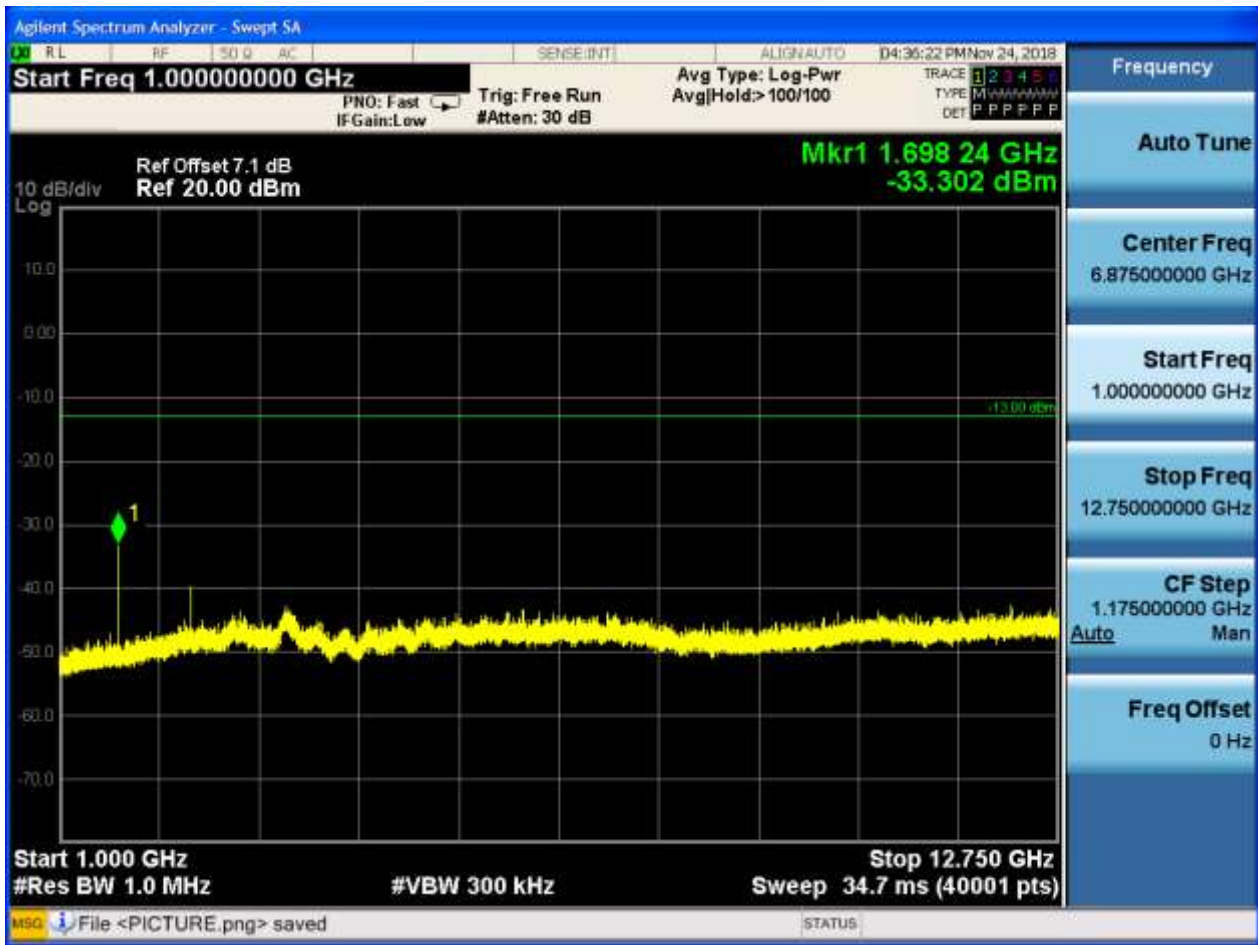


6.1.1.2.3 Test Channel = HCH





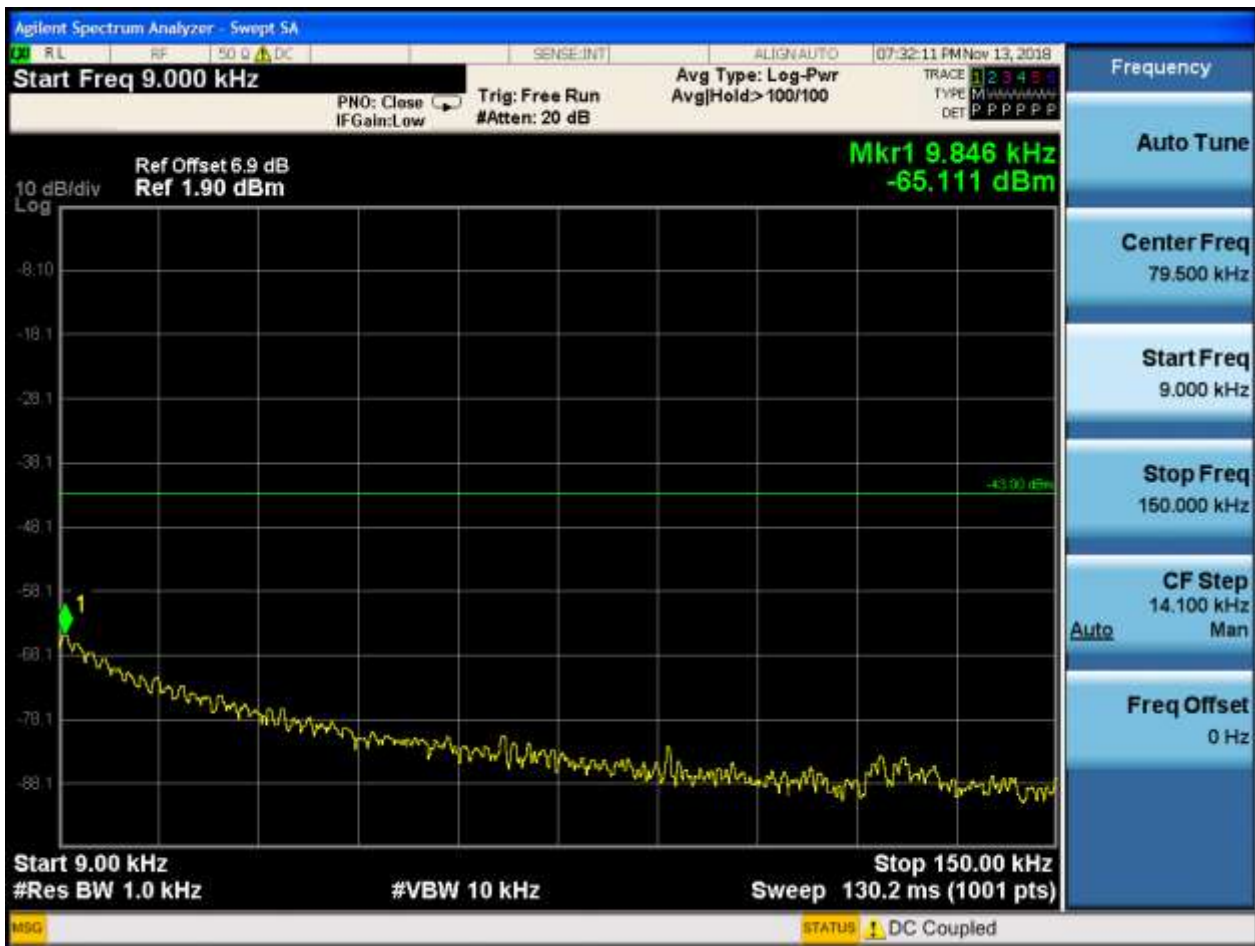


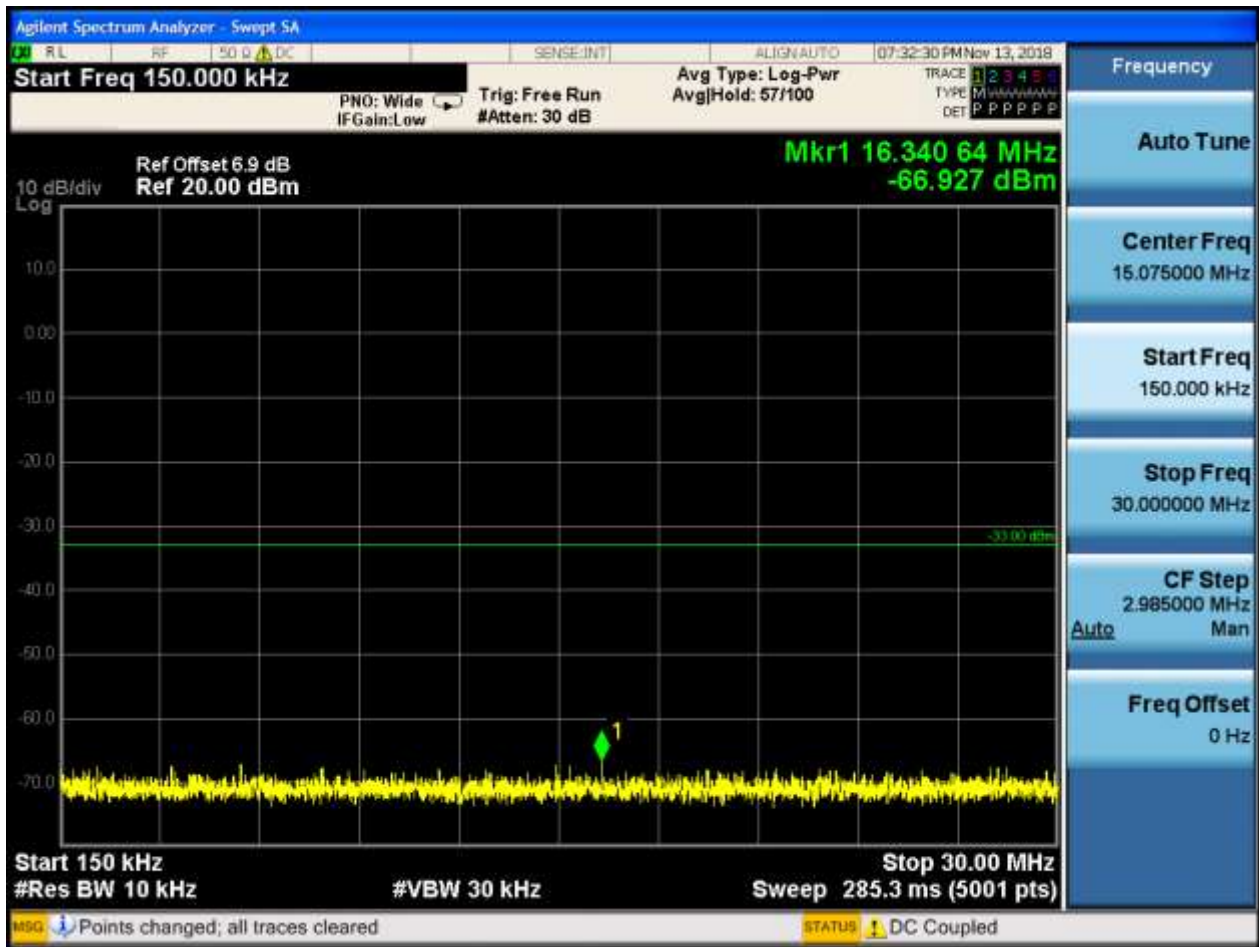


6.1.2 Test Band = GSM1900

6.1.2.1 Test Mode = GSM/TM1

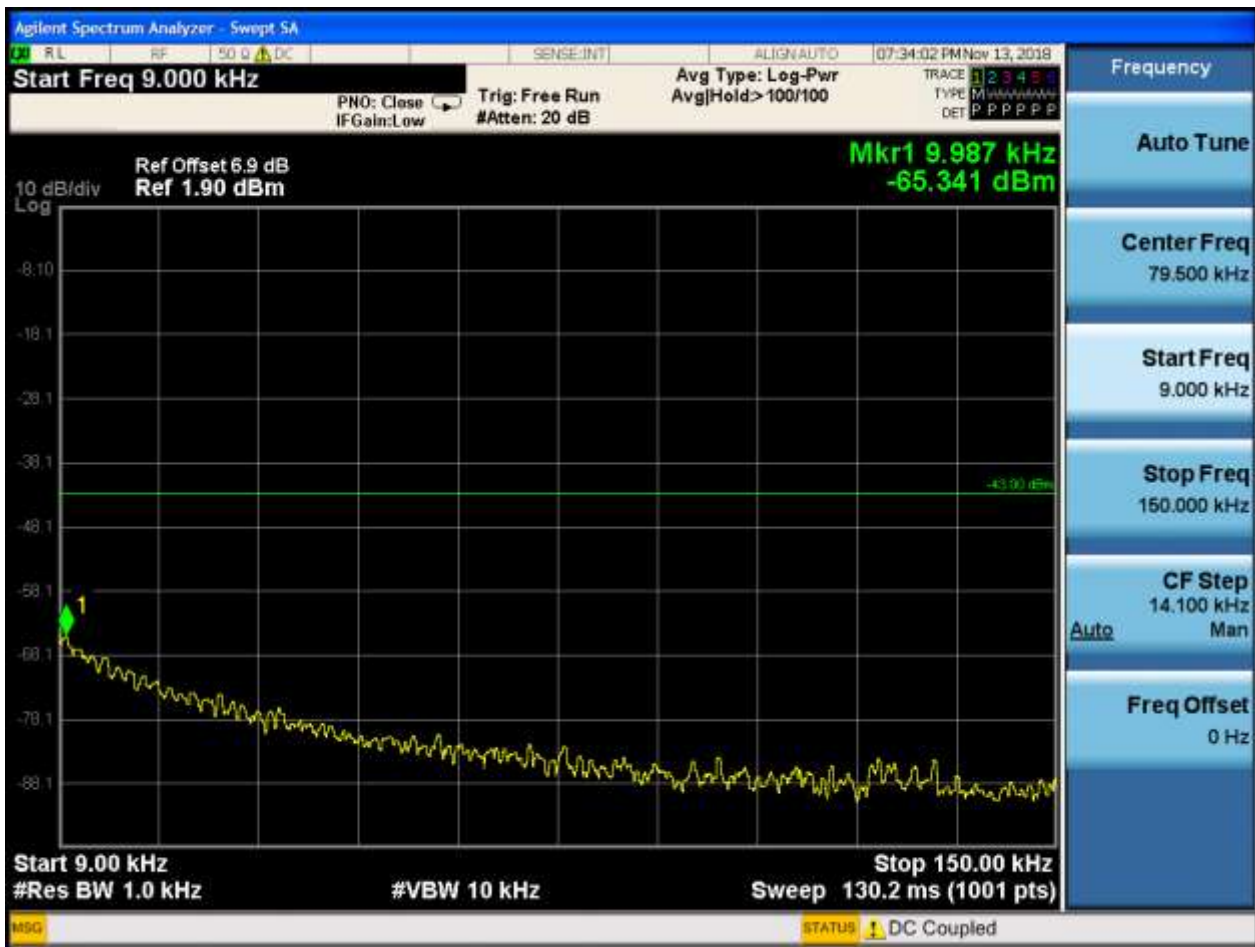
6.1.2.1.1 Test Channel = LCH

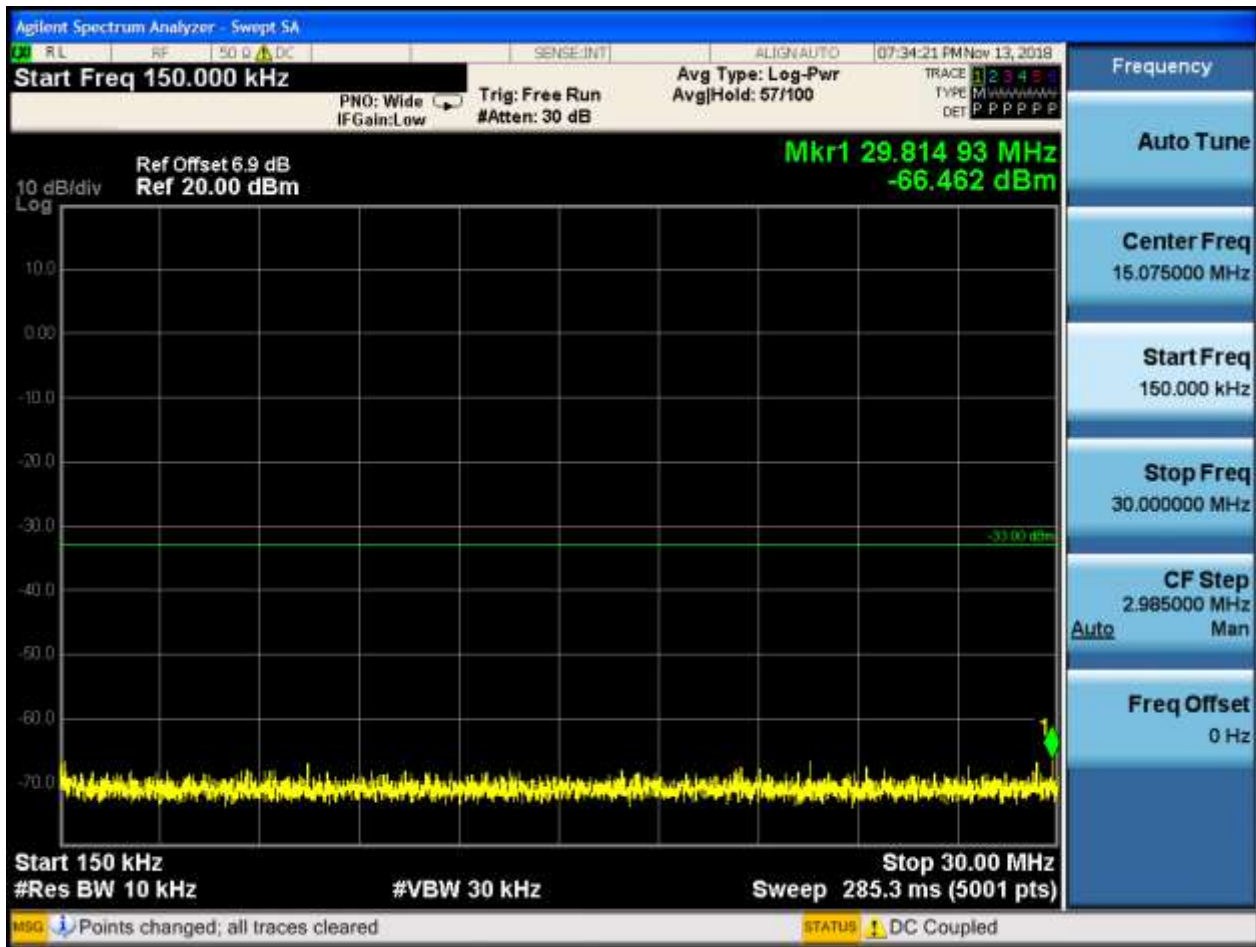






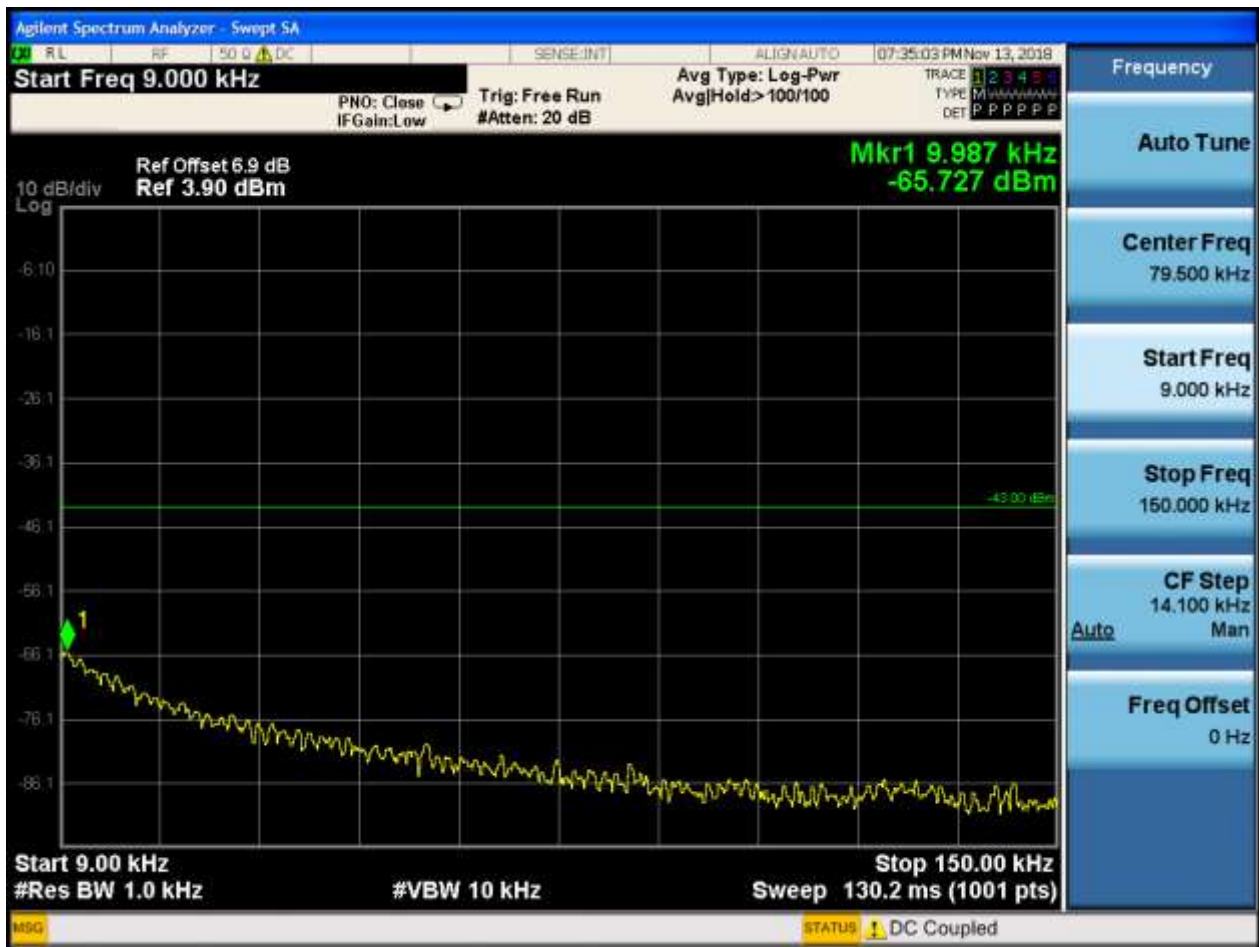
6.1.2.1.2 Test Channel = MCH

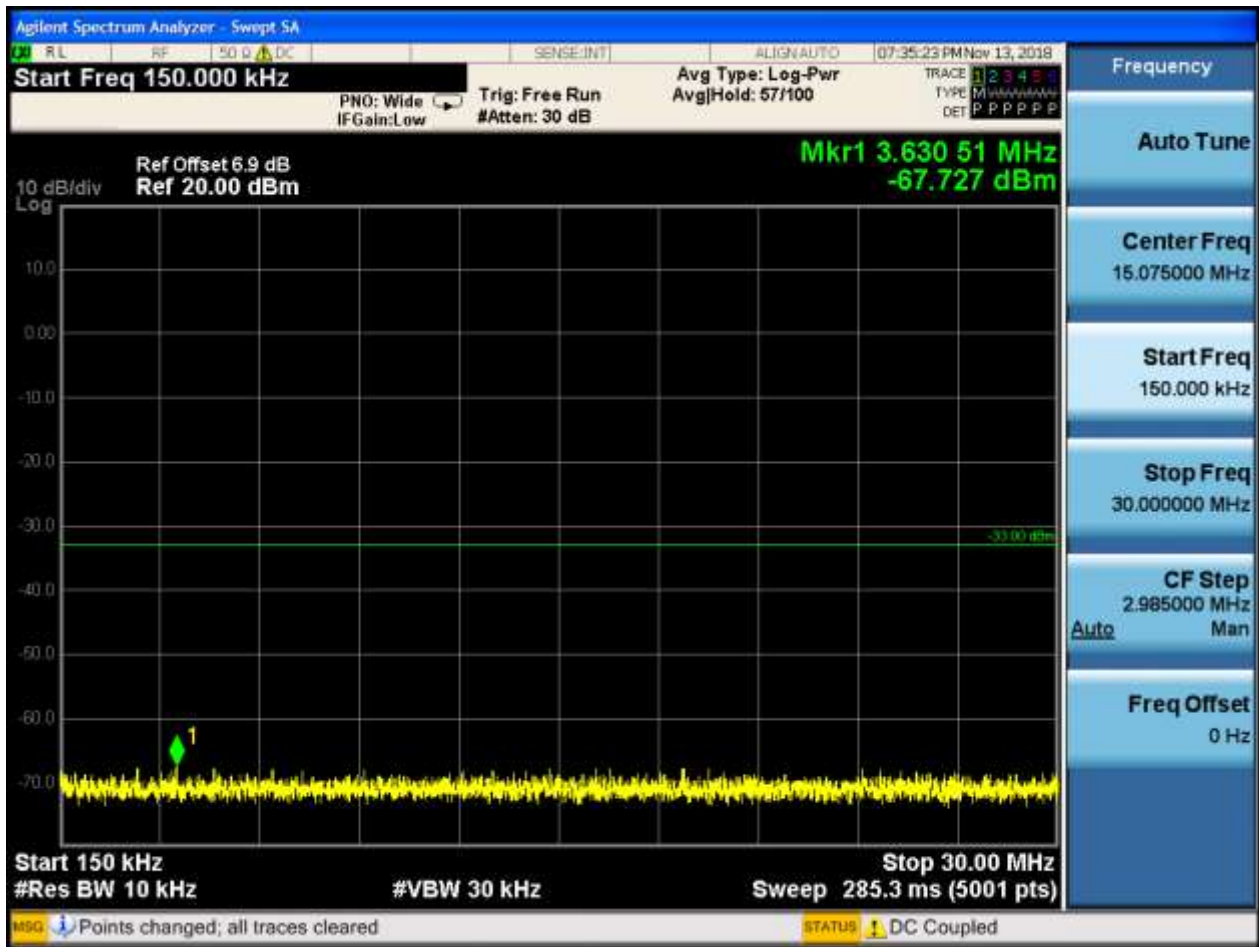






6.1.2.1.3 Test Channel = HCH



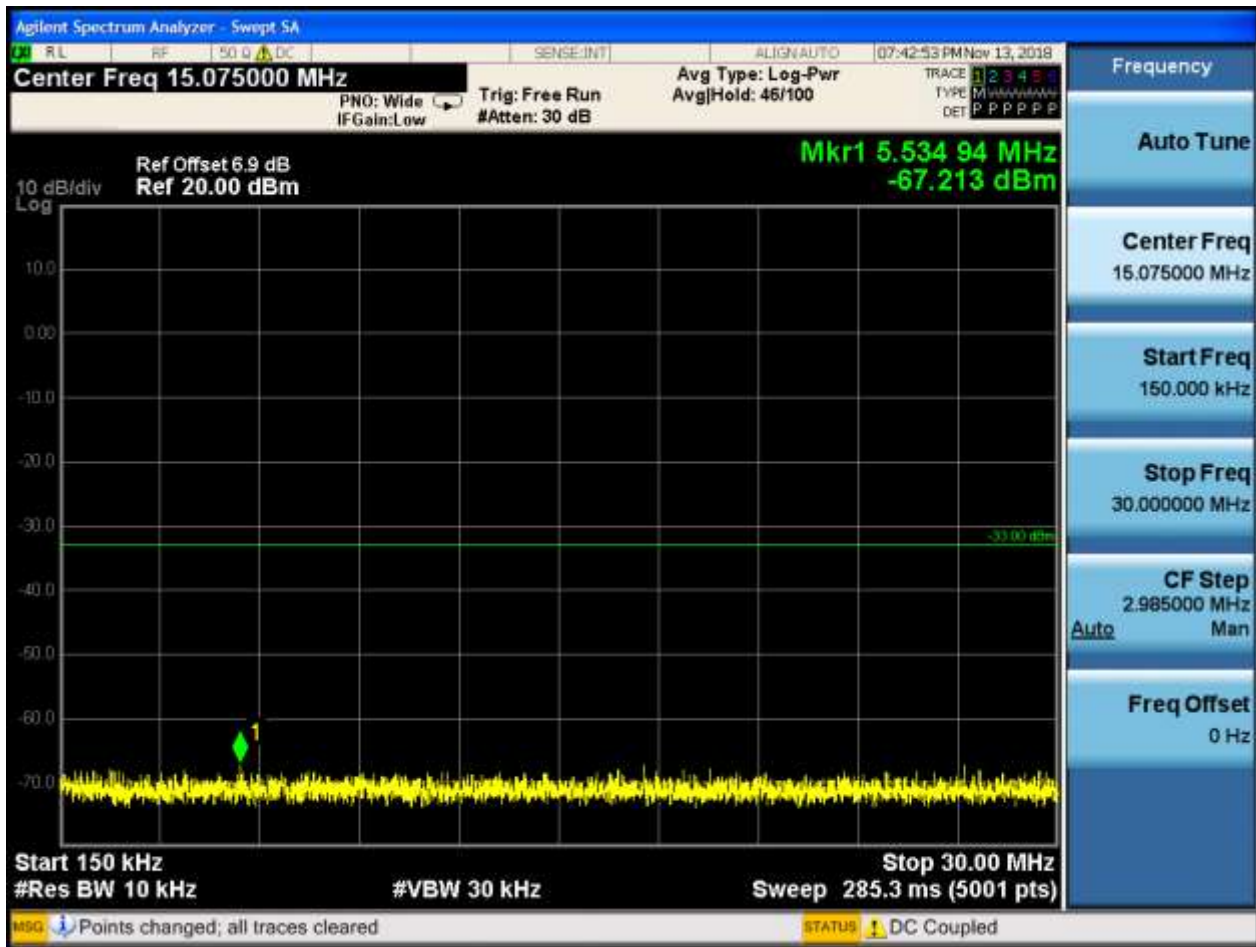




6.1.2.2 Test Mode = GSM/TM2

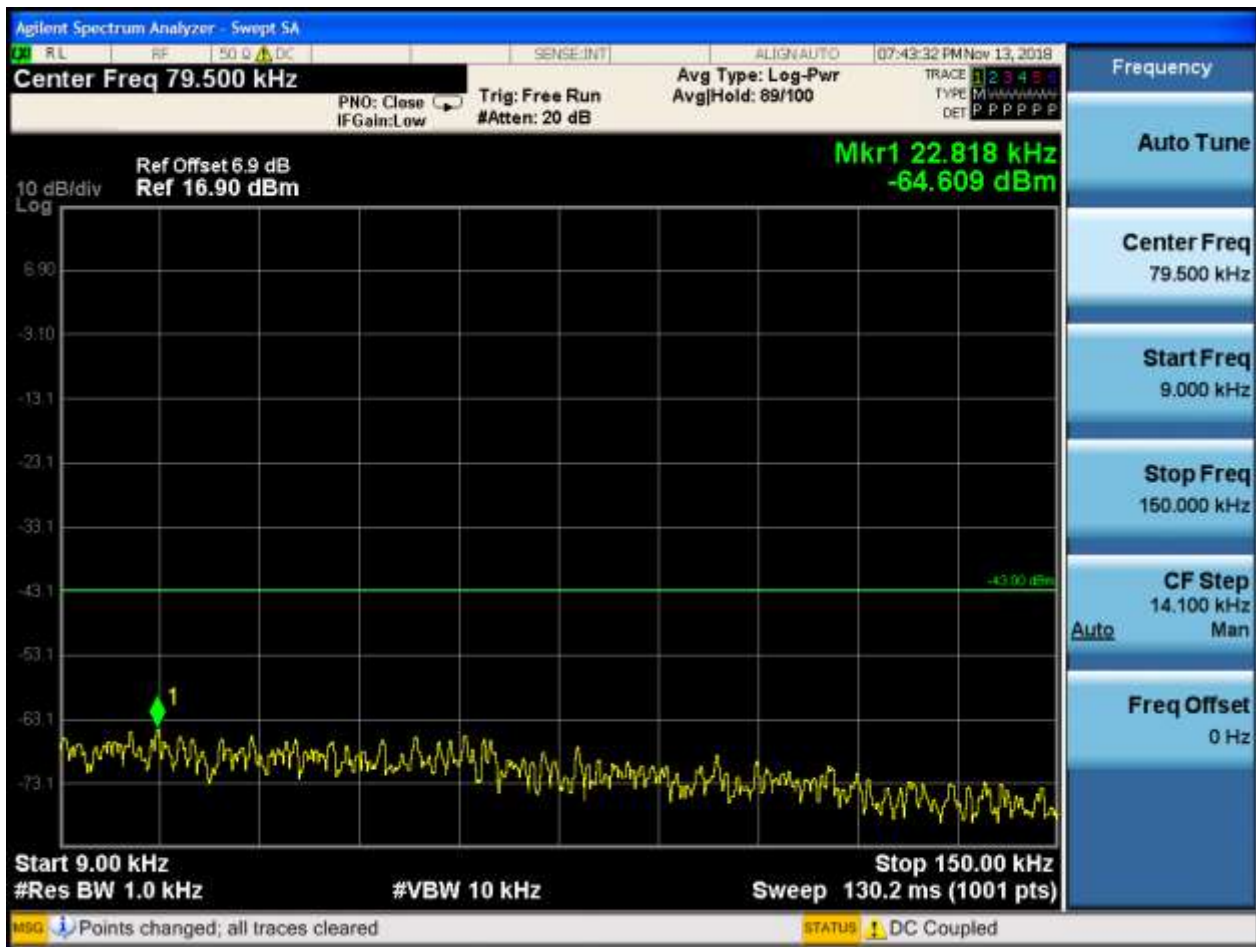
6.1.2.2.1 Test Channel = LCH

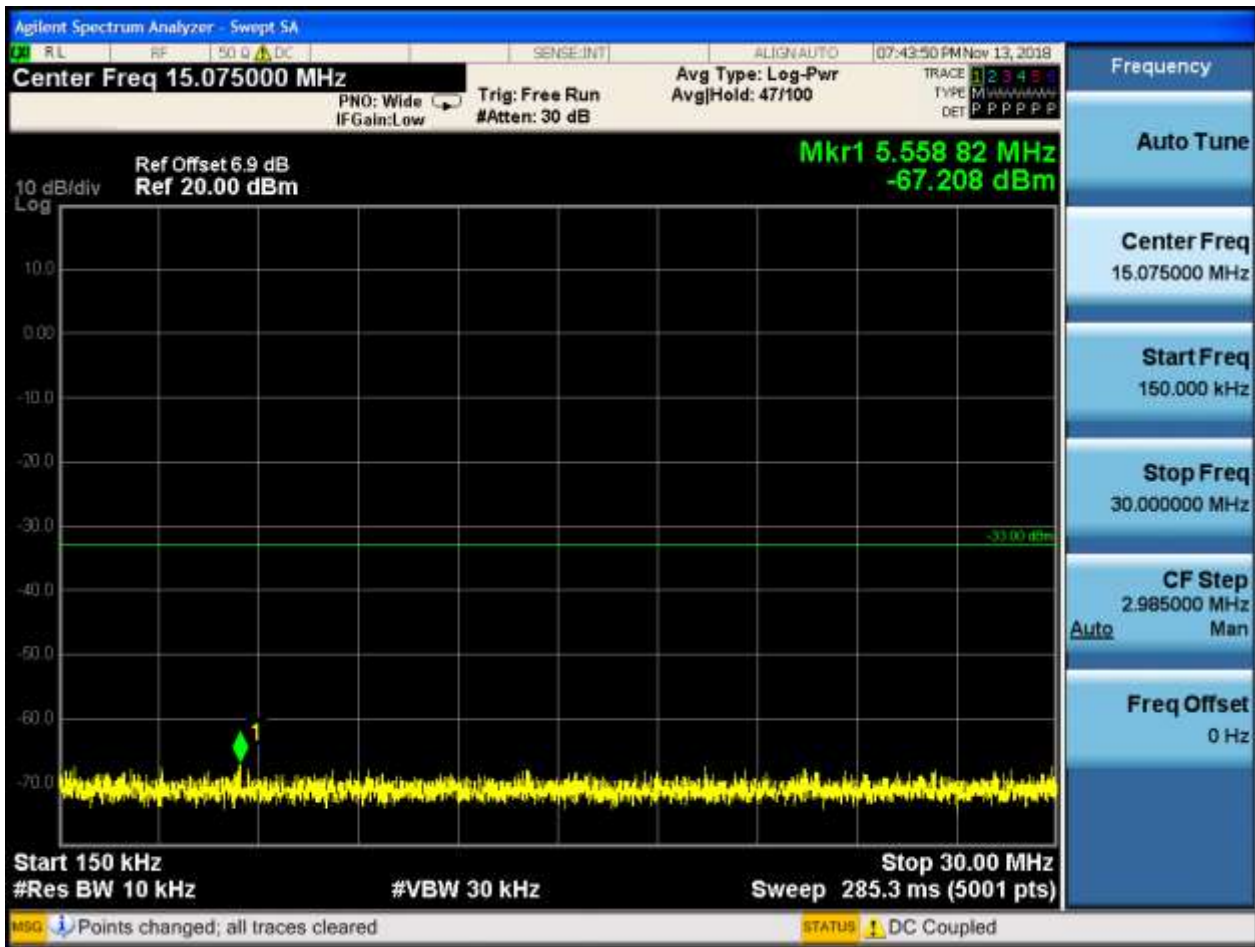






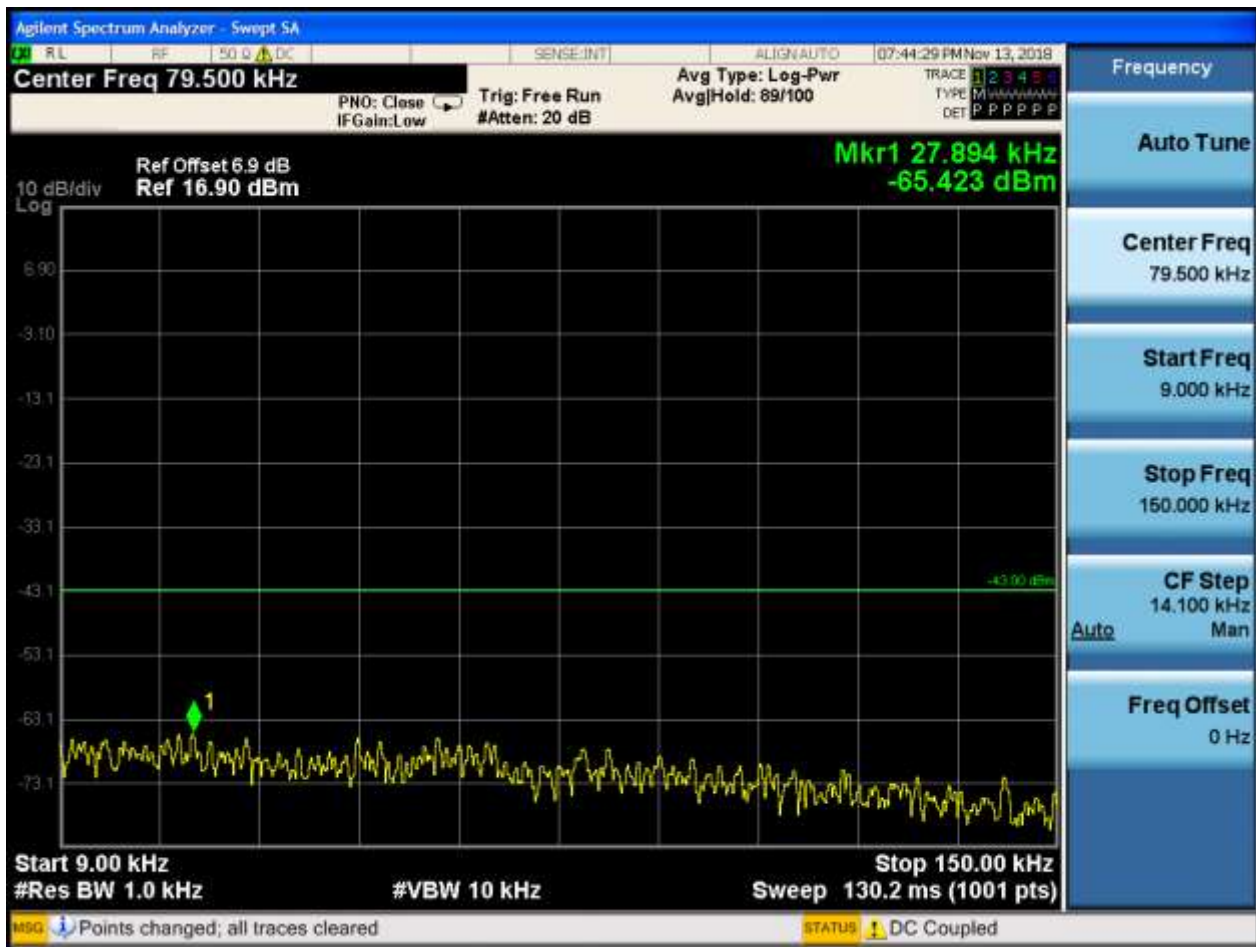
6.1.2.2.2 Test Channel = MCH

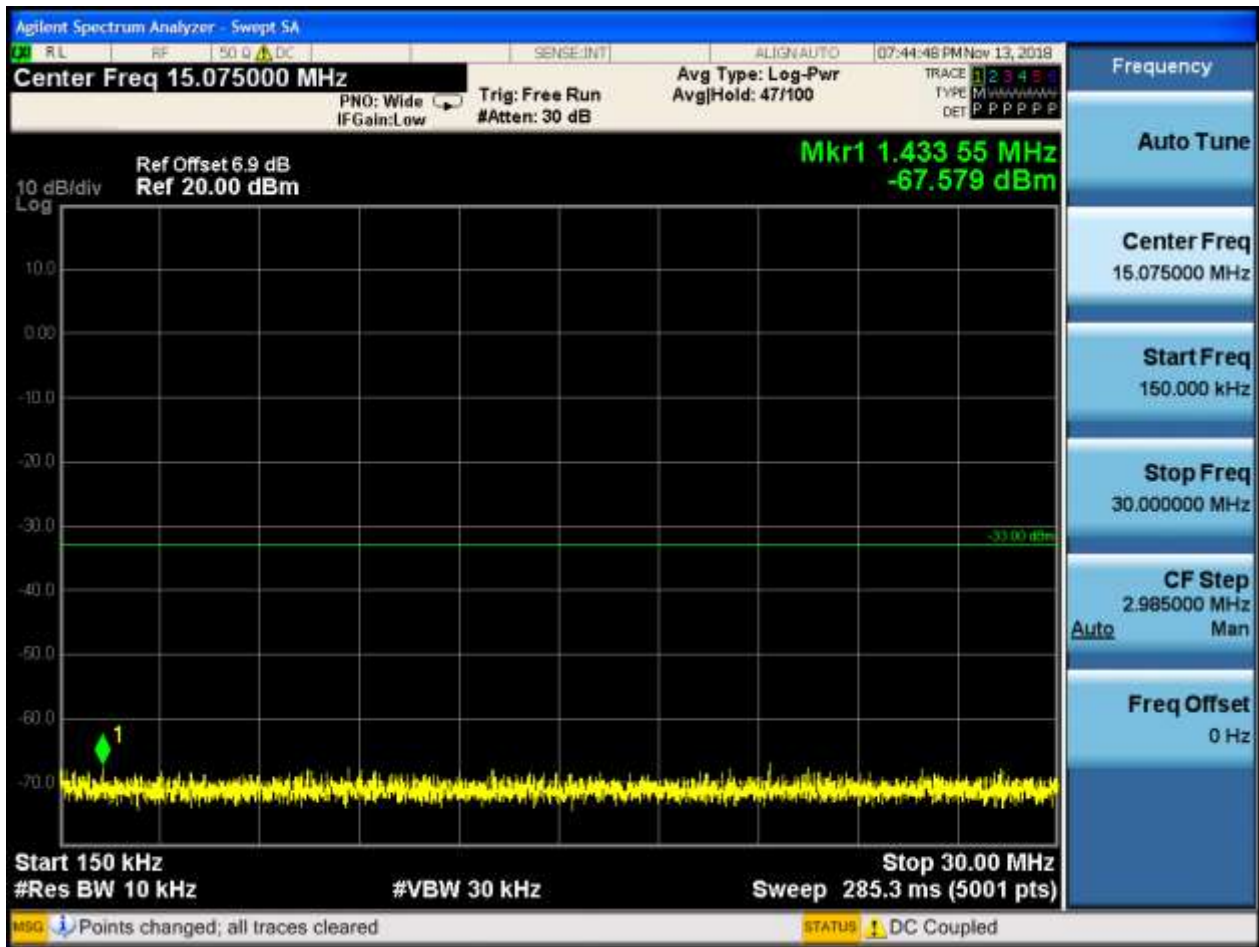






6.1.2.2.3 Test Channel = HCH







7Appendix_G: Field Strength of Spurious Radiation

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

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

150kHz~30MHz, RBW = 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_ANT1

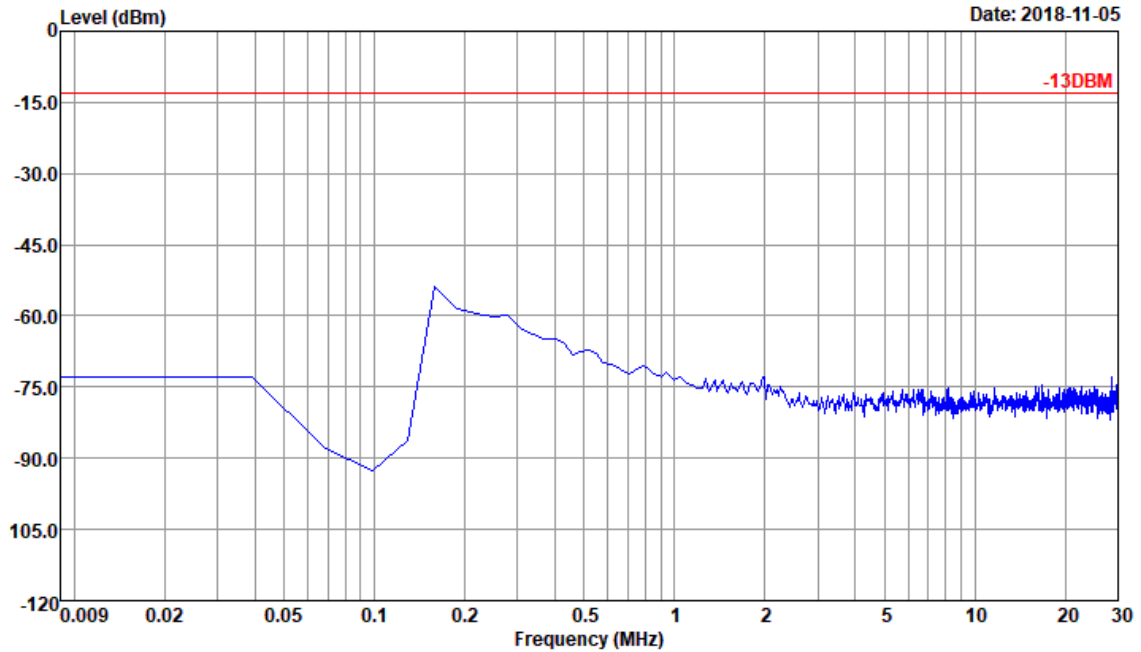
7.1.1 Test Band = GSM850

7.1.1.1 Test Mode = GSM/TM1



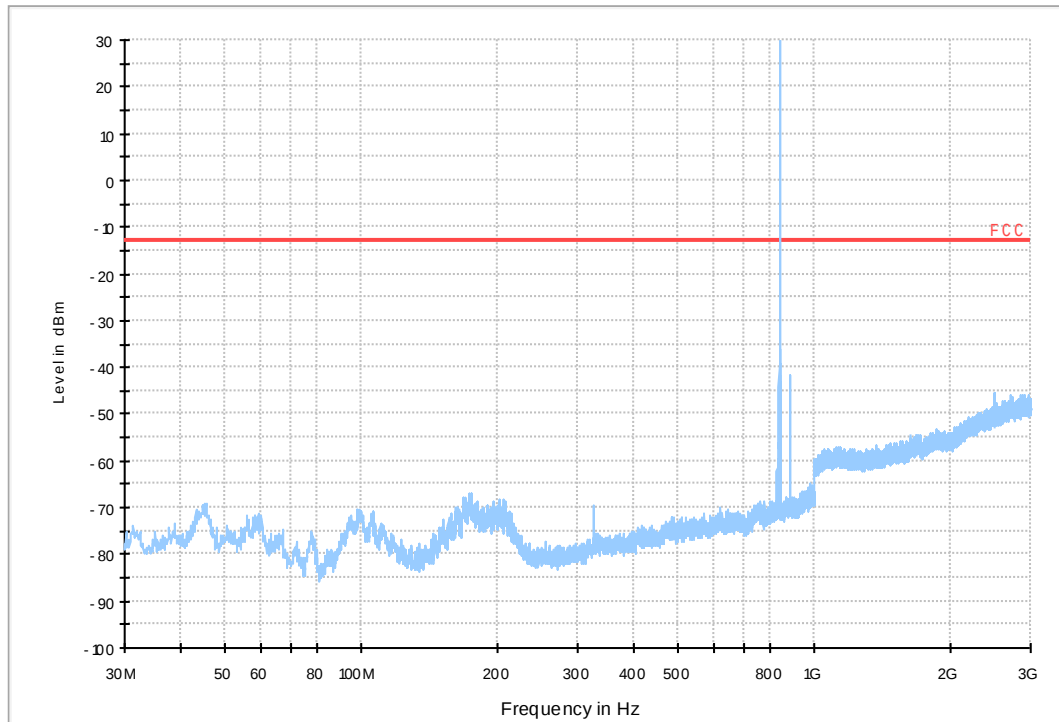
Data: 34

Date: 2018-11-05

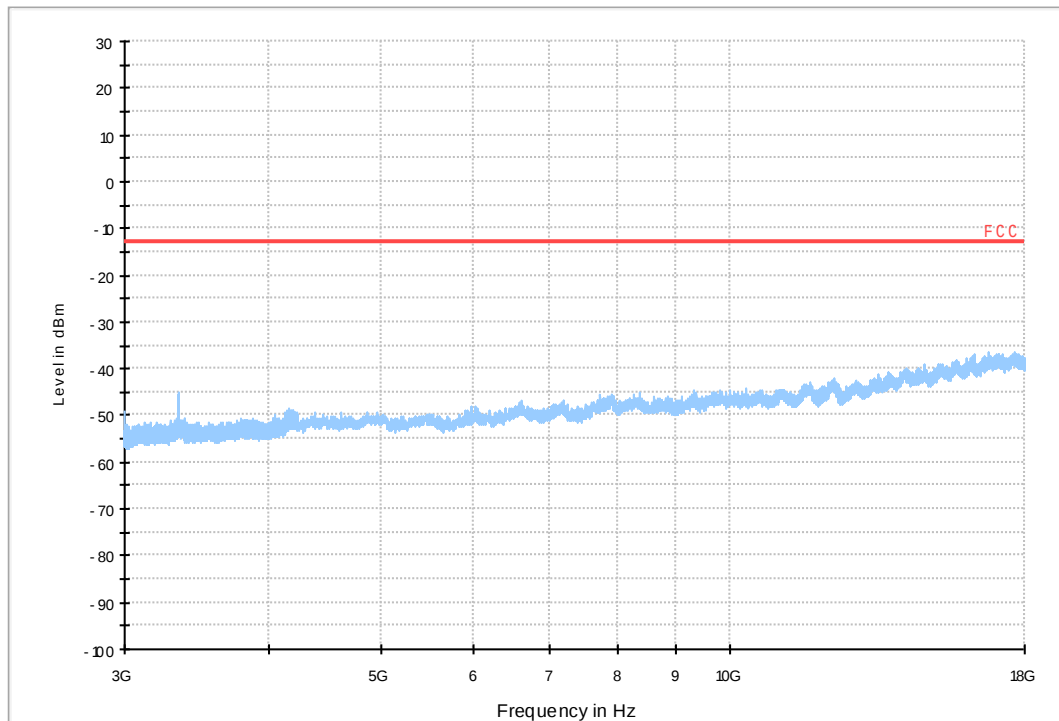


Site : 03CH01-SZ
Condition : -13DBM 9K-30M AMP NEUTRAL
: RBW:0.200KHz VBW:0.600KHz
: DUB-LX1#6 GSM

04 FCC PART 22 GSM850_L



03 FCC PART 22 GSM850_H



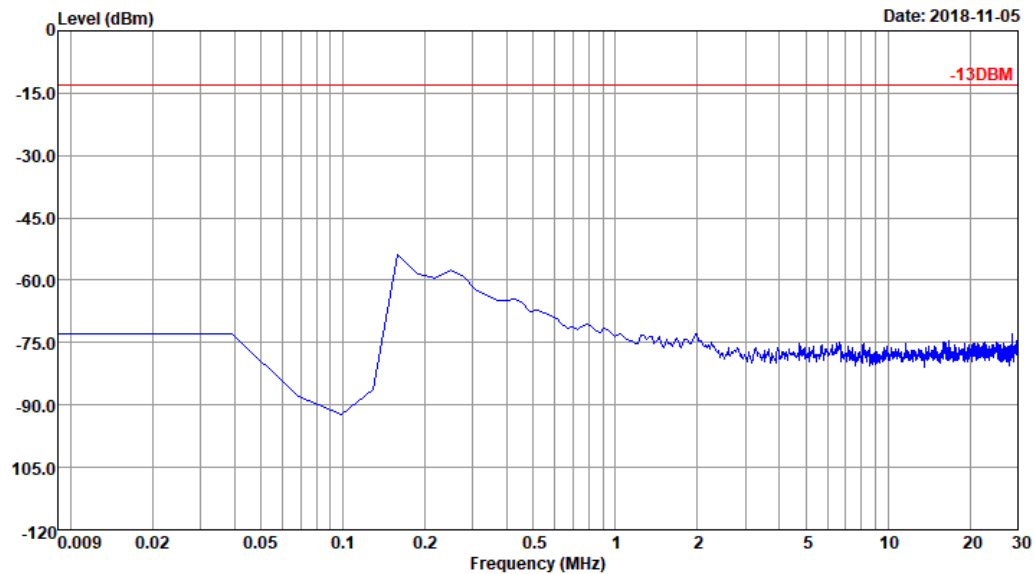
7.1.2 Test Band = PCS1900

7.1.2.1 Test Mode = GSM/TM1



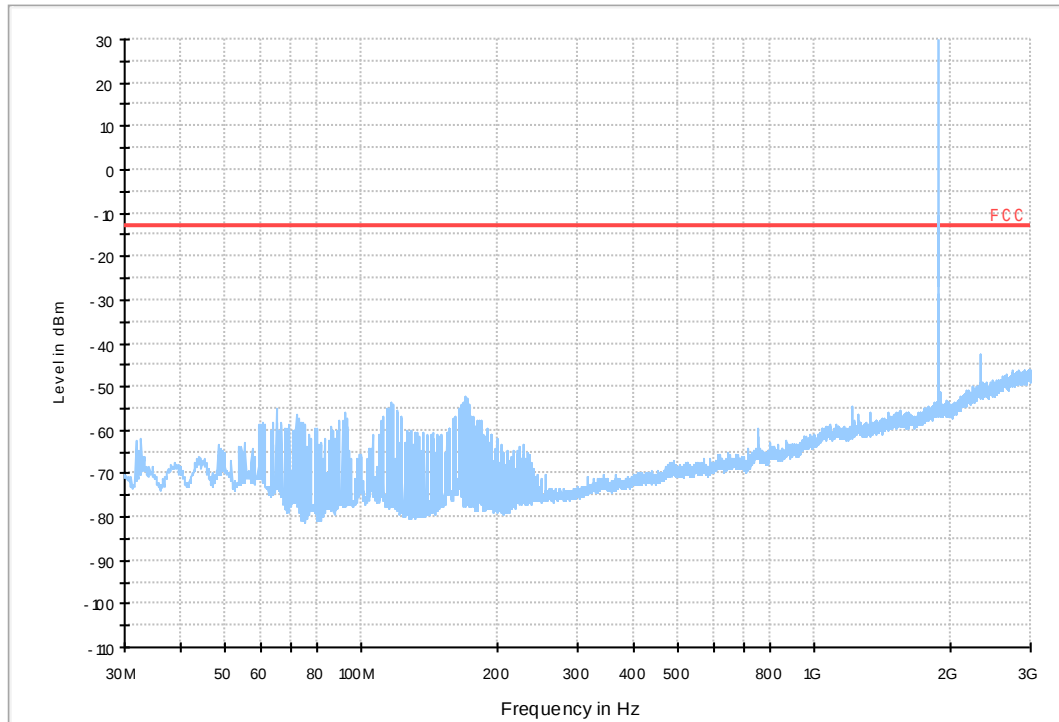
Data: 36

Date: 2018-11-05

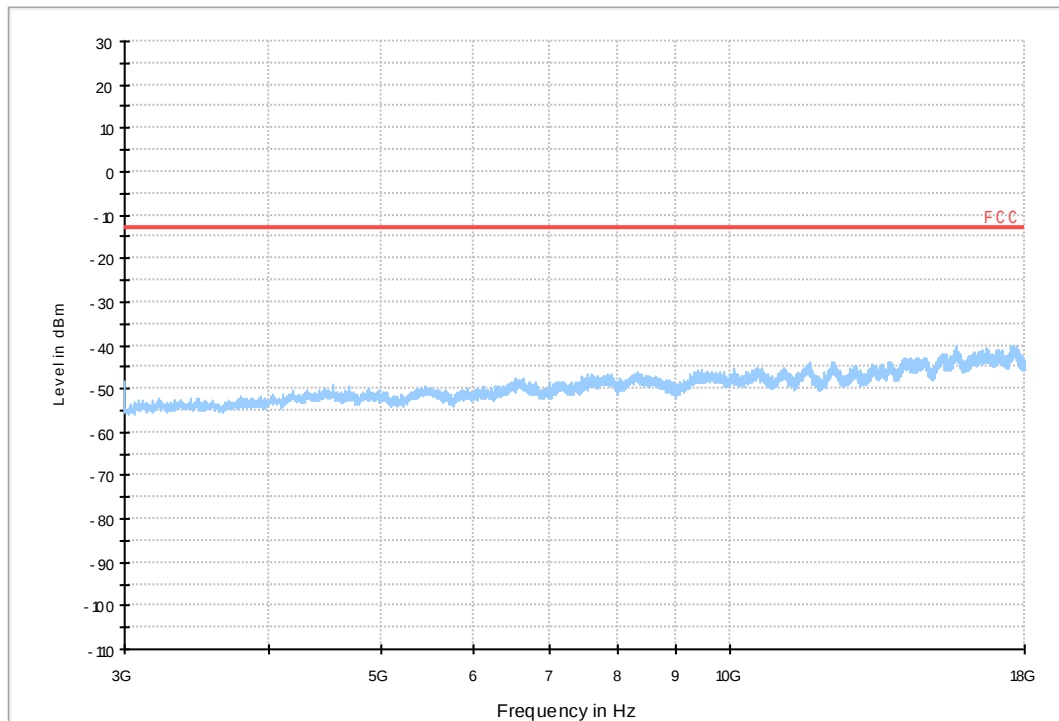


Site : 03CH01-SZ
Condition : -13DBM 9K-30M AMP NEUTRAL
: RBW:0.200KHz VBW:0.600KHz
: DUB-LX1#6 GSM

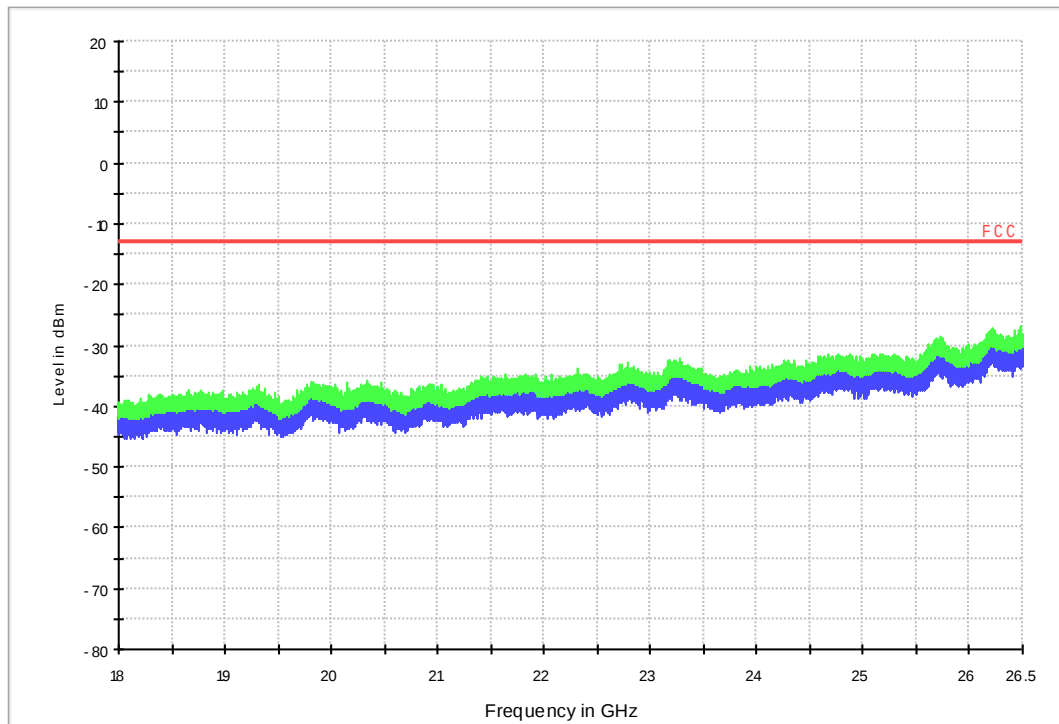
10 FCC PART 24 GSM1900_L



09 FCC PART 24 GSM1900_H



18G~26.5G R SE-TX-DIRECT OR ABOVE 1.5G PK



8Appendix_H: Frequency Stability

8.1 For GSM

8.1.1Frequency Error vs. Voltage:

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
GSM850	GSM/TM1	LCH	TN	VL	5.1	0.00619	PASS
				VN	13.04	0.01582	PASS
				VH	10.65	0.01292	PASS
		MCH	TN	VL	7.88	0.00942	PASS
				VN	10.53	0.01259	PASS
				VH	10.98	0.01312	PASS
		HCH	TN	VL	15.63	0.01841	PASS
				VN	14.14	0.01666	PASS
				VH	13.75	0.0162	PASS
GSM850	GSM/TM2	LCH	TN	VL	4.16	0.00505	PASS
				VN	18.89	0.02292	PASS
				VH	19.63	0.02382	PASS
		MCH	TN	VL	21.05	0.02516	PASS
				VN	16.85	0.02014	PASS
				VH	19.89	0.02377	PASS
		HCH	TN	VL	10.85	0.01278	PASS
				VN	18.31	0.02157	PASS
				VH	20.5	0.02415	PASS
GSM1900	GSM/TM1	LCH	TN	VL	-9.69	-0.00524	PASS
				VN	-21.31	-0.01152	PASS
				VH	-8.52	-0.0046	PASS
		MCH	TN	VL	-0.26	-0.00014	PASS
				VN	5.17	0.00275	PASS
				VH	-2.97	-0.00158	PASS
		HCH	TN	VL	-3.36	-0.00176	PASS
				VN	-3.36	-0.00176	PASS
				VH	-2.97	-0.00156	PASS
GSM1900	GSM/TM2	LCH	TN	VL	-23.25	-0.01257	PASS
				VN	-5.94	-0.00321	PASS
				VH	-3.29	-0.00178	PASS
		MCH	TN	VL	1.29	0.00069	PASS

				VN	7.52	0.004	PASS
				VH	-3.07	-0.00163	PASS
		HCH	TN	VL	1.19	0.00062	PASS
				VN	0.52	0.00027	PASS
				VH	-2.87	-0.0015	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	12.14	0.01473	PASS
				-20	12.33	0.01496	PASS
				-10	12.01	0.01457	PASS
				0	11.95	0.0145	PASS
				10	13.69	0.01661	PASS
				20	14.21	0.01724	PASS
				30	8.72	0.01058	PASS
				40	15.05	0.01826	PASS
				50	11.04	0.01339	PASS
		MCH	VN	-30	16.27	0.01945	PASS
				-20	6.84	0.00818	PASS
				-10	12.27	0.01467	PASS
				0	9.94	0.01188	PASS
				10	10.91	0.01304	PASS
				20	10.72	0.01281	PASS
				30	16.85	0.02014	PASS
				40	8.78	0.01049	PASS
				50	9.94	0.01188	PASS
		HCH	VN	-30	13.17	0.01552	PASS
				-20	13.24	0.0156	PASS
				-10	12.33	0.01453	PASS
				0	12.98	0.01529	PASS
				10	14.66	0.01727	PASS
				20	11.95	0.01408	PASS
				30	16.98	0.02	PASS
				40	12.85	0.01514	PASS
				50	14.79	0.01742	PASS
GSM850	GSM/TM2	LCH	VN	-30	18.34	0.02225	PASS
				-20	14.82	0.01798	PASS
				-10	16.34	0.01983	PASS
				0	16.3	0.01978	PASS

				10	13.95	0.01693	PASS
				20	16.98	0.0206	PASS
				30	13.75	0.01668	PASS
				40	11.46	0.0139	PASS
				50	16.85	0.02044	PASS
		MCH	VN	-30	14.98	0.01791	PASS
				-20	17.01	0.02033	PASS
				-10	18.63	0.02227	PASS
				0	18.53	0.02215	PASS
				10	16.89	0.02019	PASS
				20	19.11	0.02284	PASS
				30	10.04	0.012	PASS
				40	19.73	0.02358	PASS
				50	13.75	0.01644	PASS
		HCH	VN	-30	14.4	0.01697	PASS
				-20	15.4	0.01814	PASS
				-10	12.33	0.01453	PASS
				0	11.07	0.01304	PASS
				10	18.18	0.02142	PASS
				20	13.01	0.01533	PASS
				30	15.92	0.01876	PASS
				40	14.82	0.01746	PASS
				50	10.72	0.01263	PASS
GSM1900	GSM/TM1	LCH	VN	-30	-4.58	-0.00248	PASS
				-20	0.58	0.00031	PASS
				-10	3.75	0.00203	PASS
				0	-4.13	-0.00223	PASS
				10	7.17	0.00388	PASS
				20	-3.75	-0.00203	PASS
				30	0.45	0.00024	PASS
				40	2.91	0.00157	PASS
				50	-8.72	-0.00471	PASS
		MCH	VN	-30	0.13	0.00007	PASS
				-20	-6.39	-0.0034	PASS
				-10	5.29	0.00281	PASS
				0	7.1	0.00378	PASS
				10	0.13	0.00007	PASS
				20	-0.13	-0.00007	PASS
				30	3.81	0.00203	PASS
				40	3.1	0.00165	PASS
				50	4.91	0.00261	PASS

		HCH	VN	-30	-1.87	-0.00098	PASS
				-20	-5.88	-0.00308	PASS
				-10	-3.1	-0.00162	PASS
				0	-4.78	-0.0025	PASS
				10	-5.88	-0.00308	PASS
				20	-5.55	-0.00291	PASS
				30	-8.72	-0.00457	PASS
				40	-2.71	-0.00142	PASS
				50	-3.87	-0.00203	PASS
GSM1900	GSM/TM2	LCH	VN	-30	4.81	0.0026	PASS
				-20	8.43	0.00456	PASS
				-10	-2.26	-0.00122	PASS
				0	0.48	0.00026	PASS
				10	-11.27	-0.00609	PASS
				20	3.87	0.00209	PASS
				30	-6.88	-0.00372	PASS
				40	1.71	0.00092	PASS
				50	-4.16	-0.00225	PASS
		MCH	VN	-30	5.17	0.00275	PASS
				-20	1.16	0.00062	PASS
				-10	-1.32	-0.0007	PASS
				0	1.49	0.00079	PASS
				10	-0.06	-0.00003	PASS
				20	1.55	0.00082	PASS
				30	-6.07	-0.00323	PASS
				40	2.16	0.00115	PASS
				50	0.39	0.00021	PASS
		HCH	VN	-30	-2.91	-0.00152	PASS
				-20	4.81	0.00252	PASS
				-10	-6.26	-0.00328	PASS
				0	-3.36	-0.00176	PASS
				10	-4.33	-0.00227	PASS
				20	-3.49	-0.00183	PASS
				30	-11.66	-0.00611	PASS
				40	-5.68	-0.00297	PASS
				50	-2.58	-0.00135	PASS

END