



Appendix for test report

1Appendix_A: Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band(LTE)	Test Mode	Test Bandwidth	Test Channel	Test RB	Measured [dBm]	EIRP [dBm]
BAND30	LTE/TM1	5	LCH	RB1#0	21.8	22.4
				RB1#13	21.79	22.39
				RB1#24	21.58	22.18
				RB12#0	20.51	21.11
				RB12#6	20.5	21.1
				RB12#13	20.47	21.07
			MCH	RB25#0	20.52	21.12
				RB1#0	21.59	22.19
				RB1#13	21.8	22.4
				RB1#24	21.64	22.24
				RB12#0	20.53	21.13
				RB12#6	20.65	21.25
				RB12#13	20.55	21.15

Test Band(LTE)	Test Mode	Test Bandwidth	Test Channel	Test RB	Measured [dBm]	EIRP [dBm]
			HCH	RB25#0	20.62	21.22
				RB1#0	21.82	22.42
				RB1#13	21.82	22.42
				RB1#24	21.65	22.25
				RB12#0	20.54	21.14
				RB12#6	20.73	21.33
				RB12#13	20.63	21.23
				RB25#0	20.67	21.27
		10	LCH/MCH /HCH	RB1#0	21.78	22.38
				RB1#25	21.62	22.22
				RB1#49	21.6	22.2
				RB25#0	20.67	21.27
				RB25#13	20.56	21.16
				RB25#25	20.53	21.13
				RB50#0	20.61	21.21
	LTE/TM2	5	LCH	RB1#0	20.8	21.4
				RB1#13	20.84	21.44

Test Band(LTE)	Test Mode	Test Bandwidth	Test Channel	Test RB	Measured [dBm]	EIRP [dBm]
				RB1#24	20.71	21.31
				RB12#0	19.55	20.15
				RB12#6	19.53	20.13
				RB12#13	19.43	20.03
				RB25#0	19.45	20.05
			MCH	RB1#0	20.92	21.52
				RB1#13	20.98	21.58
				RB1#24	20.97	21.57
				RB12#0	19.64	20.24
				RB12#6	19.65	20.25
				RB12#13	19.58	20.18
				RB25#0	19.58	20.18
			HCH	RB1#0	21.05	21.65
				RB1#13	21.24	21.84
				RB1#24	20.95	21.55
				RB12#0	19.63	20.23
				RB12#6	19.72	20.32

Test Band(LTE)	Test Mode	Test Bandwidth	Test Channel	Test RB	Measured [dBm]	EIRP [dBm]
				RB12#13	19.72	20.32
				RB25#0	19.67	20.27
		10	LCH/MCH /HCH	RB1#0	21.03	21.63
				RB1#25	21.06	21.66
				RB1#49	21.25	21.85
				RB25#0	19.69	20.29
				RB25#13	19.52	20.12
				RB25#25	19.53	20.13
				RB50#0	19.68	20.28

Test Band(LTE)	Test Mode	Test Bandwidth	Test Channel	Test RB	Measured[dBm/5MHz]	EIRP[dBm/5MHz]	Limit [dBm/5MHz]	Verdict
BAND 30	LTE/TM1	5	LCH	RB25#0	20.52	21.12	43	PASS
			MCH	RB25#0	20.62	21.22	43	PASS
			HCH	RB25#0	20.67	21.27	43	PASS
	LTE/TM2	10	LCH/MCH/HCH	RB50#0	20.61	21.21	43	PASS
		5	LCH	RB25#0	19.45	20.05	43	PASS
			MCH	RB25#0	19.58	20.18	43	PASS
			HCH	RB25#0	19.67	20.27	43	PASS
		10	LCH/MCH/HCH	RB50#0	19.68	20.28	43	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: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS

2Appendix_B: Peak-to-Average Ratio

Part I - Test Results

Test Band(For LTE)	Test Mode	Test Bandwidth (MHz)	Test Channel	Test RB	Measured[dB]	Limit [dB]	Verdict
BAND30	LTE/TM1	5	LCH	RB1#0	4.02	13	PASS
				RB1#13	3.99	13	PASS
				RB1#24	3.85	13	PASS
				RB12#0	4.93	13	PASS
				RB12#6	4.78	13	PASS
				RB12#13	4.85	13	PASS
				RB25#0	5.45	13	PASS
			MCH	RB1#0	3.92	13	PASS
				RB1#13	3.65	13	PASS
				RB1#24	3.51	13	PASS
				RB12#0	4.82	13	PASS
				RB12#6	4.54	13	PASS
				RB12#13	4.58	13	PASS
				RB25#0	5.23	13	PASS
			HCH	RB1#0	3.78	13	PASS
				RB1#13	3.37	13	PASS
				RB1#24	3.37	13	PASS
				RB12#0	4.6	13	PASS
				RB12#6	4.35	13	PASS
				RB12#13	4.38	13	PASS
				RB25#0	4.97	13	PASS
		10	LCH	RB1#0	4.11	13	PASS
				RB1#25	3.8	13	PASS
				RB1#49	3.44	13	PASS
				RB25#0	4.83	13	PASS
				RB25#13	4.67	13	PASS
				RB25#25	4.54	13	PASS
				RB50#0	4.84	13	PASS
	LTE/TM2	5	LCH	RB1#0	5.05	13	PASS
				RB1#13	4.88	13	PASS

Test Band(For LTE)	Test Mode	Test Bandwidth (MHz)	Test Channel	Test RB	Measured[dB]	Limit [dB]	Verdict
				RB1#24	4.79	13	PASS
				RB12#0	5.78	13	PASS
				RB12#6	5.72	13	PASS
				RB12#13	5.75	13	PASS
				RB25#0	6.38	13	PASS
			MCH	RB1#0	4.92	13	PASS
				RB1#13	4.52	13	PASS
				RB1#24	4.3	13	PASS
				RB12#0	5.62	13	PASS
				RB12#6	5.5	13	PASS
				RB12#13	5.47	13	PASS
				RB25#0	6.13	13	PASS
			HCH	RB1#0	4.56	13	PASS
				RB1#13	4	13	PASS
				RB1#24	4.08	13	PASS
				RB12#0	5.41	13	PASS
				RB12#6	5.24	13	PASS
				RB12#13	5.24	13	PASS
				RB25#0	6.02	13	PASS
		10	LCH	RB1#0	5.08	13	PASS
				RB1#25	4.9	13	PASS
				RB1#49	4.46	13	PASS
				RB25#0	5.83	13	PASS
				RB25#13	5.57	13	PASS
				RB25#25	5.52	13	PASS
				RB50#0	6.49	13	PASS

3Appendix_C: Modulation Characteristics

Part I - Test Plots

3.1 For LTE

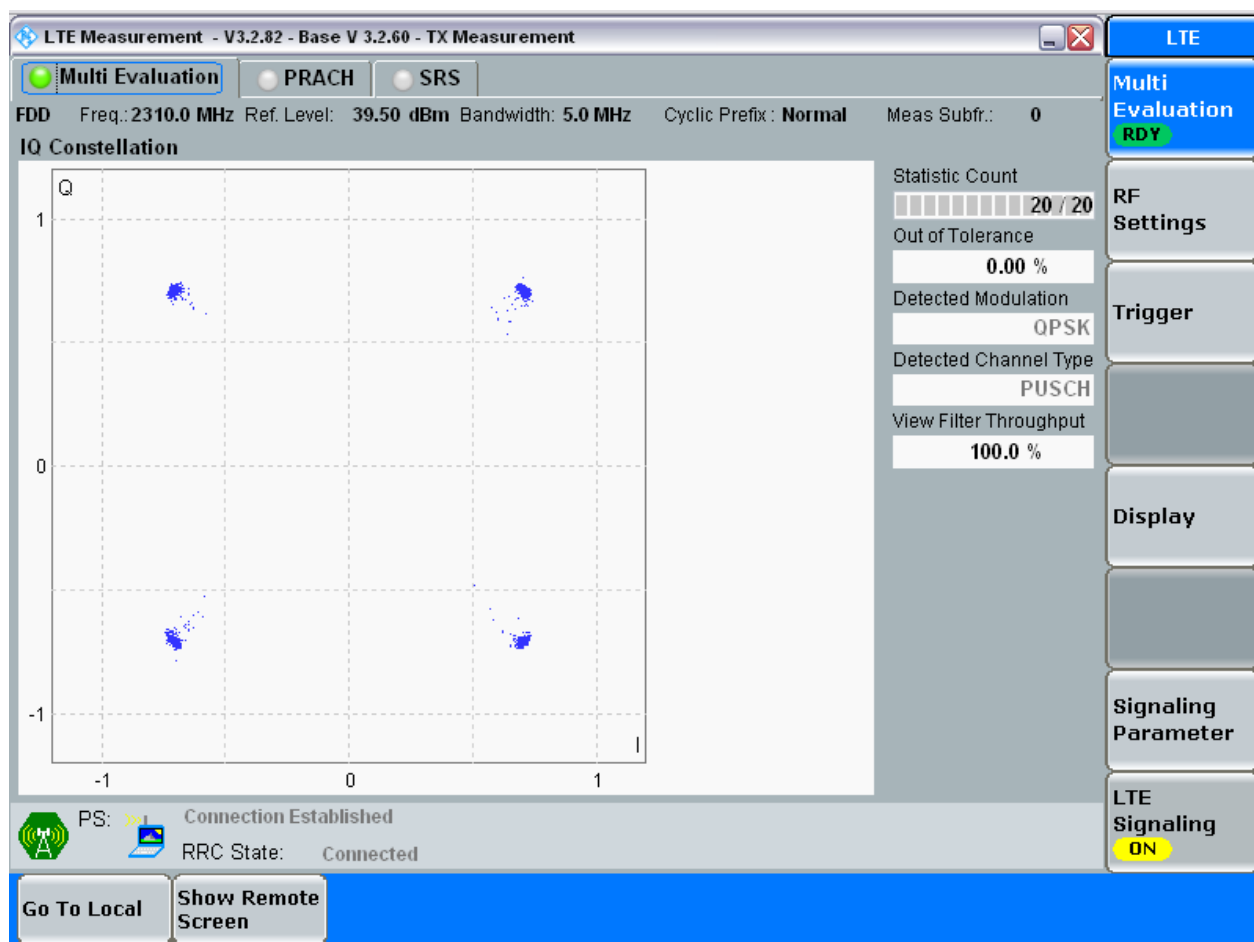
3.1.1 Test Band = BAND30

3.1.1.1 Test Mode = LTE/TM1

3.1.1.1.1 Test Bandwidth = 5

3.1.1.1.1.1 Test Channel = MCH

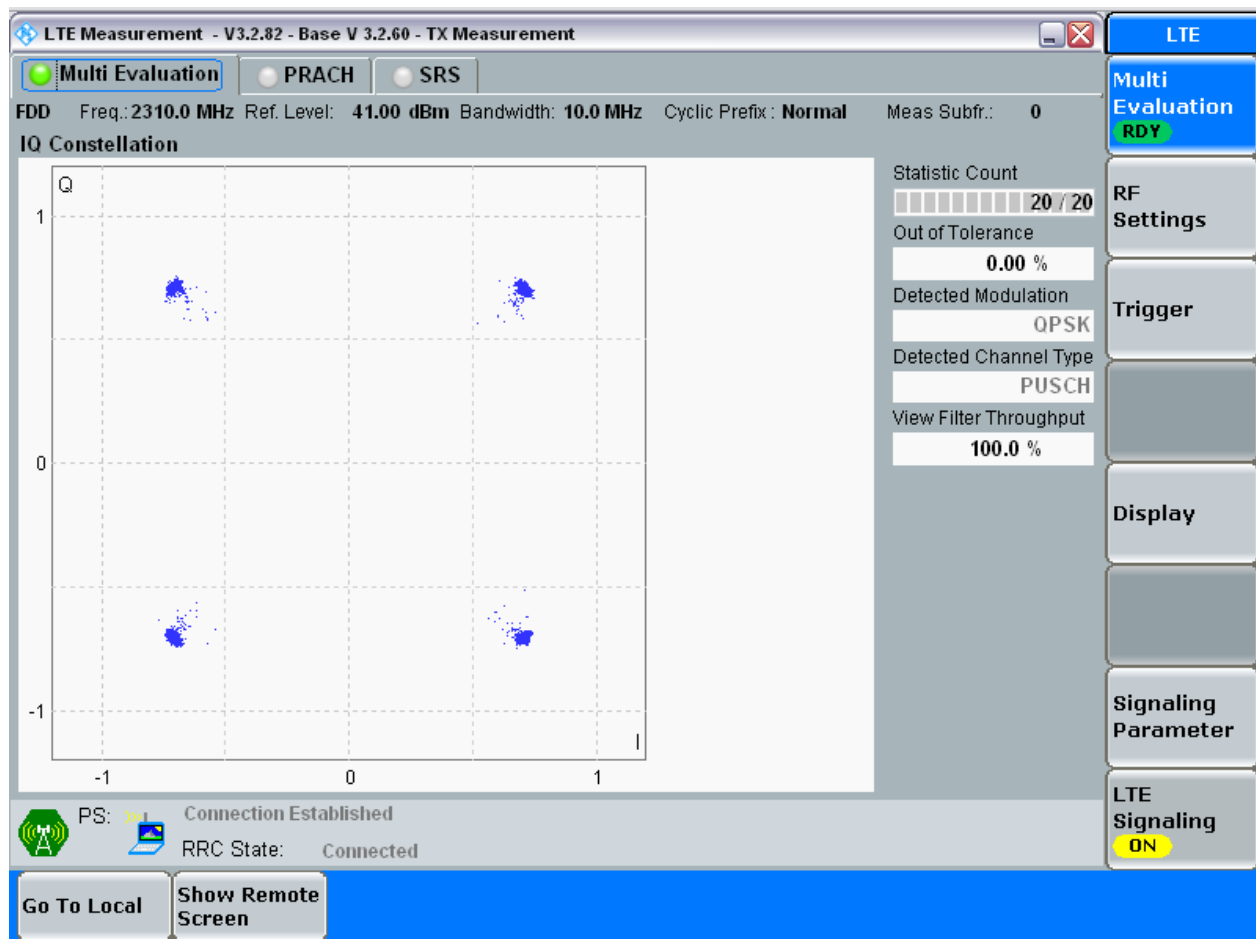
3.1.1.1.1.1.1 Test RB = RB25#0



3.1.1.1.2 Test Bandwidth = 10

3.1.1.1.2.1 Test Channel = MCH

3.1.1.1.2.1.1 Test RB = RB50#0

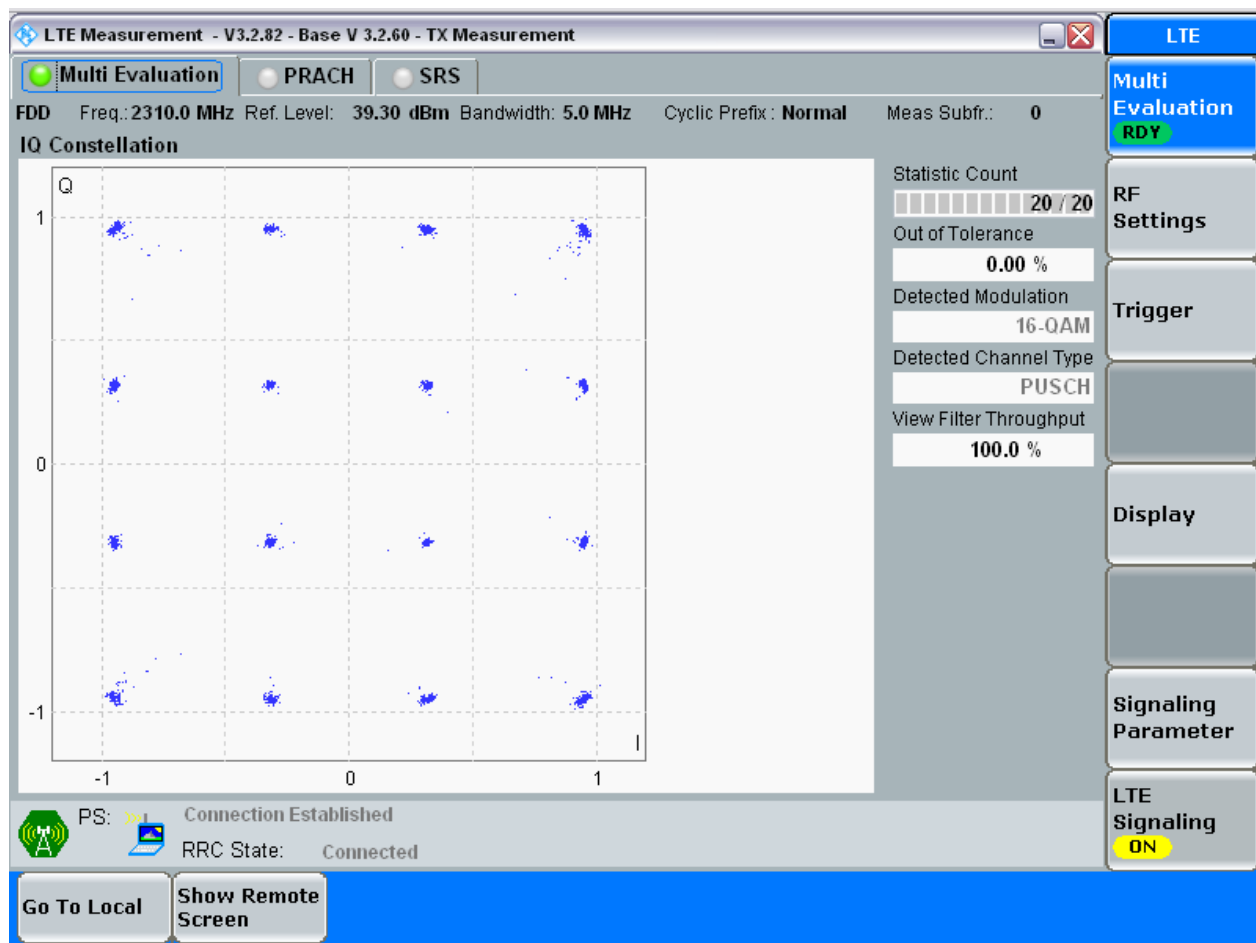


3.1.1.2 Test Mode = LTE/TM2

3.1.1.2.1 Test Bandwidth = 5

3.1.1.2.1.1 Test Channel = MCH

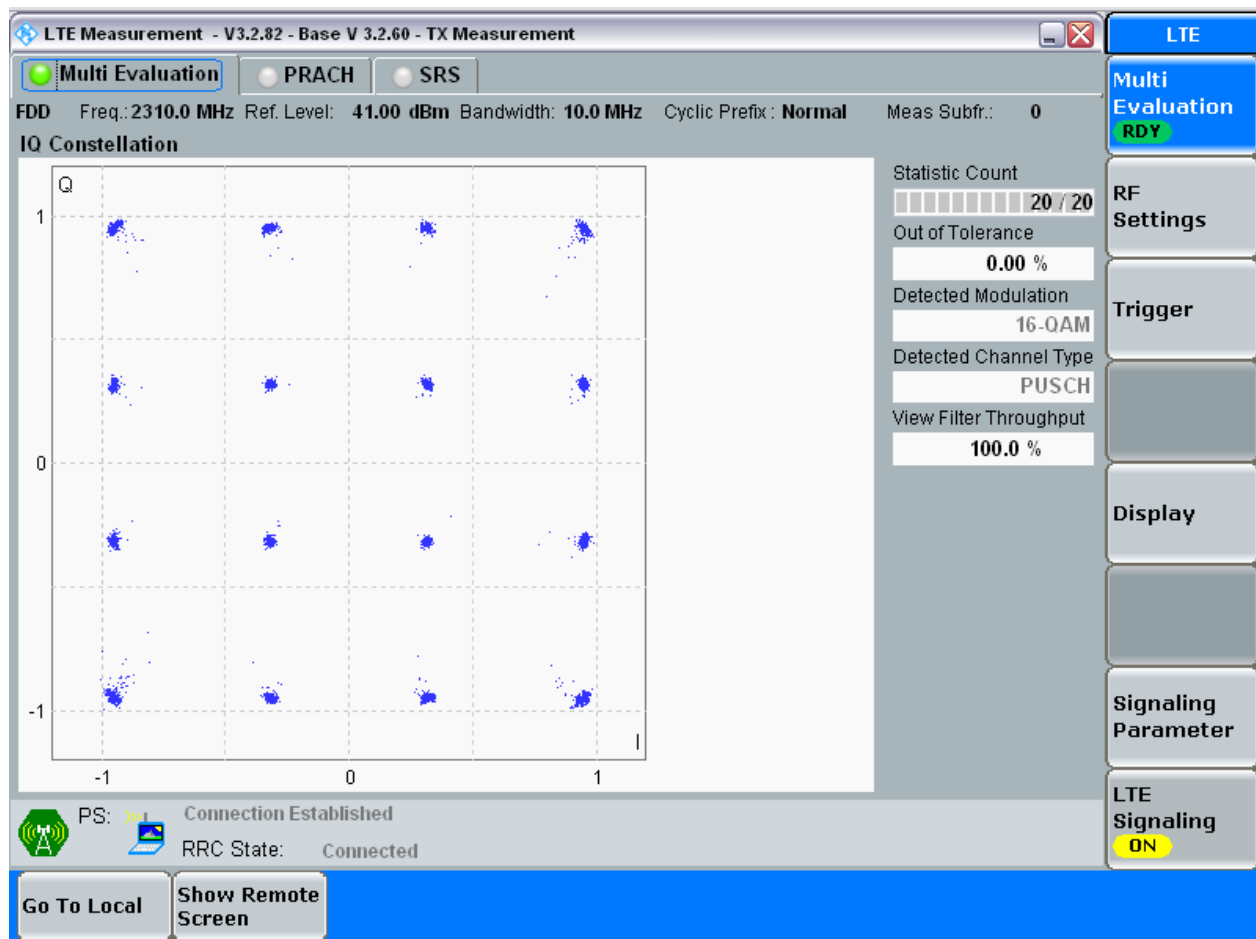
3.1.1.2.1.1.1 Test RB = RB25#0



3.1.1.2.2 Test Bandwidth = 10

3.1.1.2.2.1 Test Channel = MCH

3.1.1.2.2.1.1 Test RB = RB50#0



4Appendix_D: Bandwidth

Part I - Test Results

Test Band	Test Mode	Test Bandwidth	Test Channel	Test RB	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
BAND30	LTE/TM1	5	LCH	RB25#0	4.50	4.88	Pass
			MCH	RB25#0	4.50	4.84	Pass
			HCH	RB25#0	4.50	4.87	Pass
		10	LCH	RB50#0	8.96	9.57	Pass
			MCH	RB50#0	8.97	9.55	Pass
			HCH	RB50#0	8.97	9.55	Pass
	LTE/TM2	5	LCH	RB25#0	4.50	4.84	Pass
			MCH	RB25#0	4.50	4.85	Pass
			HCH	RB25#0	4.50	4.86	Pass
		10	LCH	RB50#0	8.96	9.58	Pass
			MCH	RB50#0	8.96	9.56	Pass
			HCH	RB50#0	8.96	9.58	Pass



Part II - Test Plots

4.1 For LTE

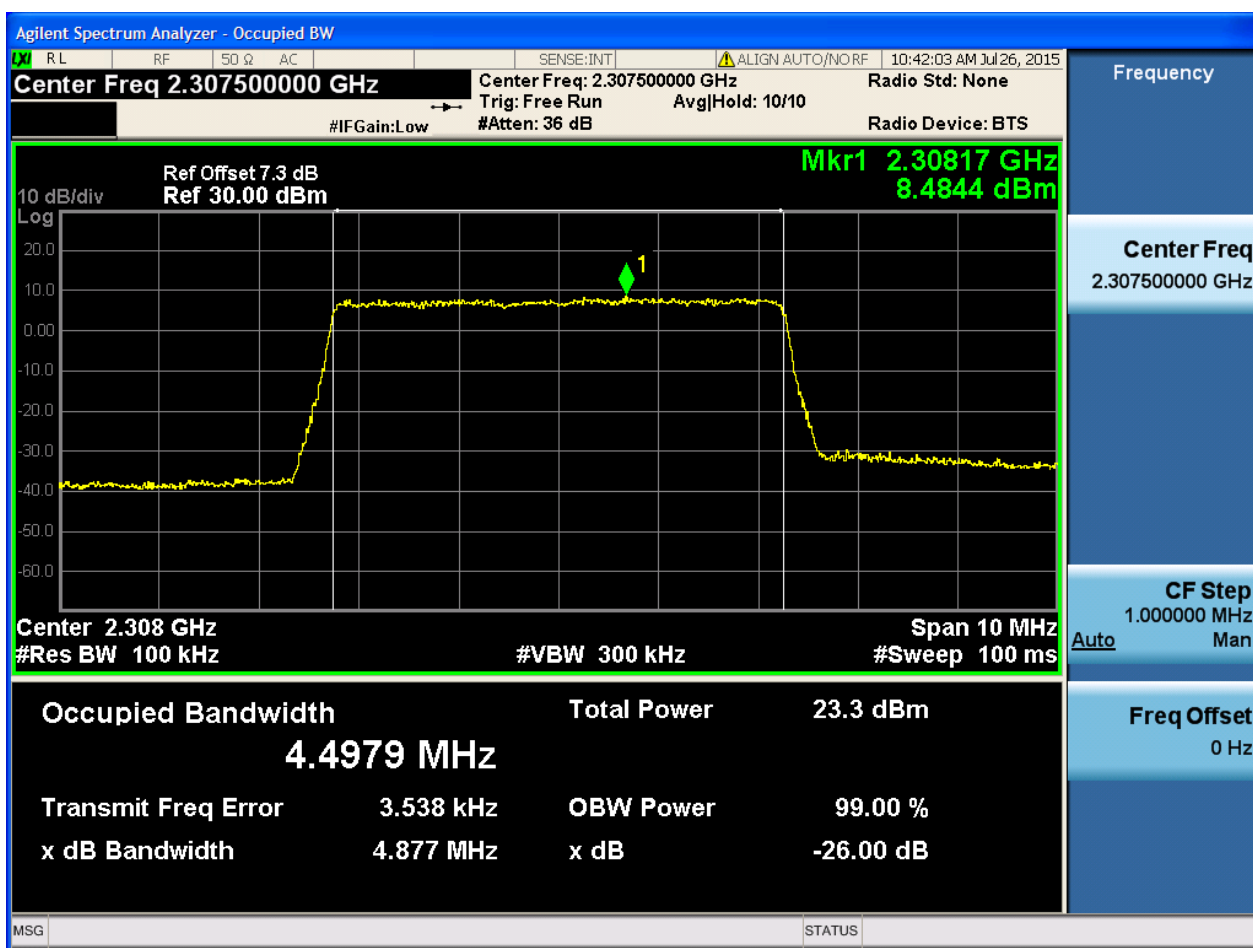
4.1.1 Test Band = BAND30

4.1.1.1 Test Mode = LTE/TM1

4.1.1.1.1 Test Bandwidth = 5

4.1.1.1.1.1 Test Channel = LCH

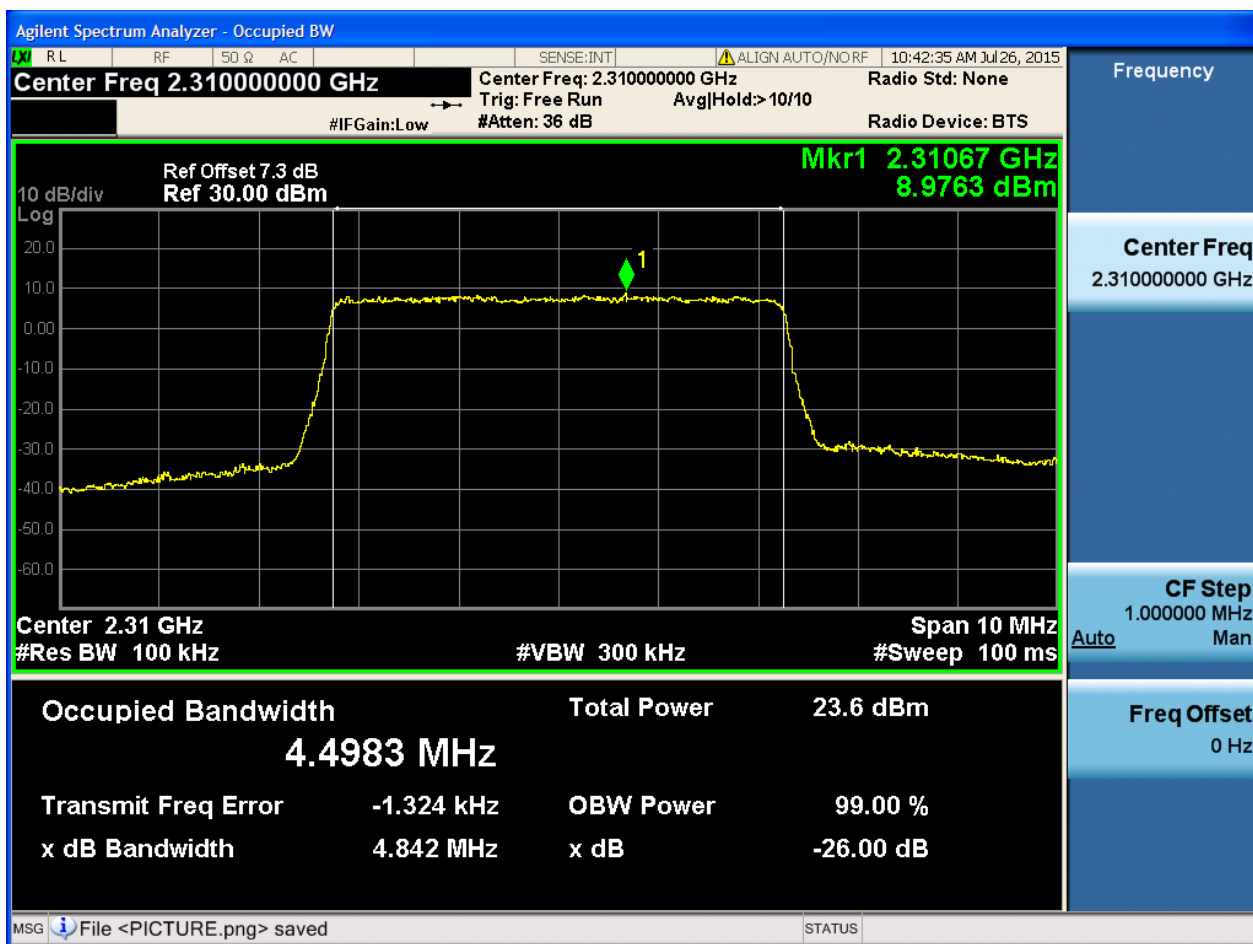
4.1.1.1.1.1.1 Test RB = RB25#0





4.1.1.1.1.2 Test Channel = MCH

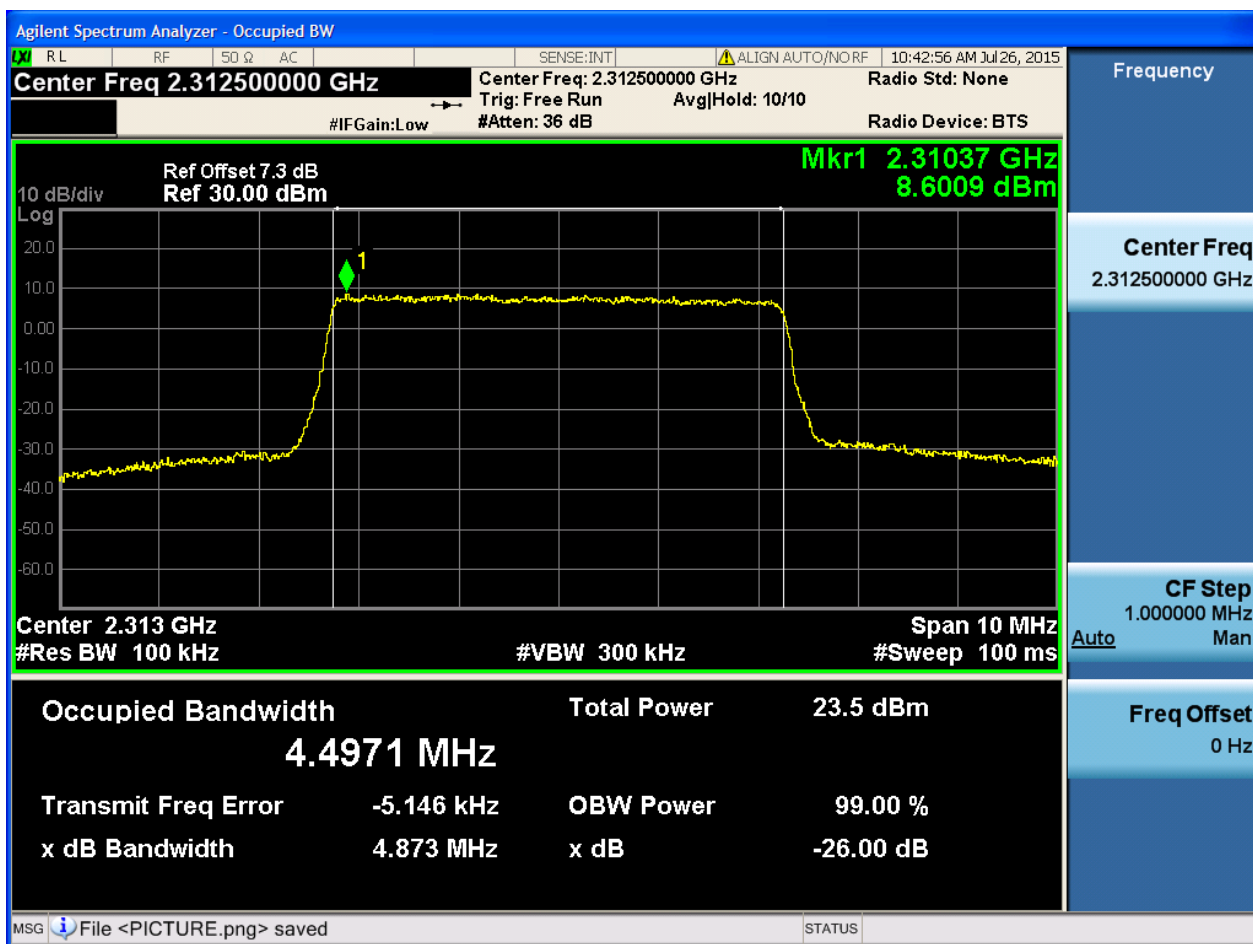
4.1.1.1.1.2.1 Test RB = RB25#0





4.1.1.1.1.3 Test Channel = HCH

4.1.1.1.1.3.1 Test RB = RB25#0

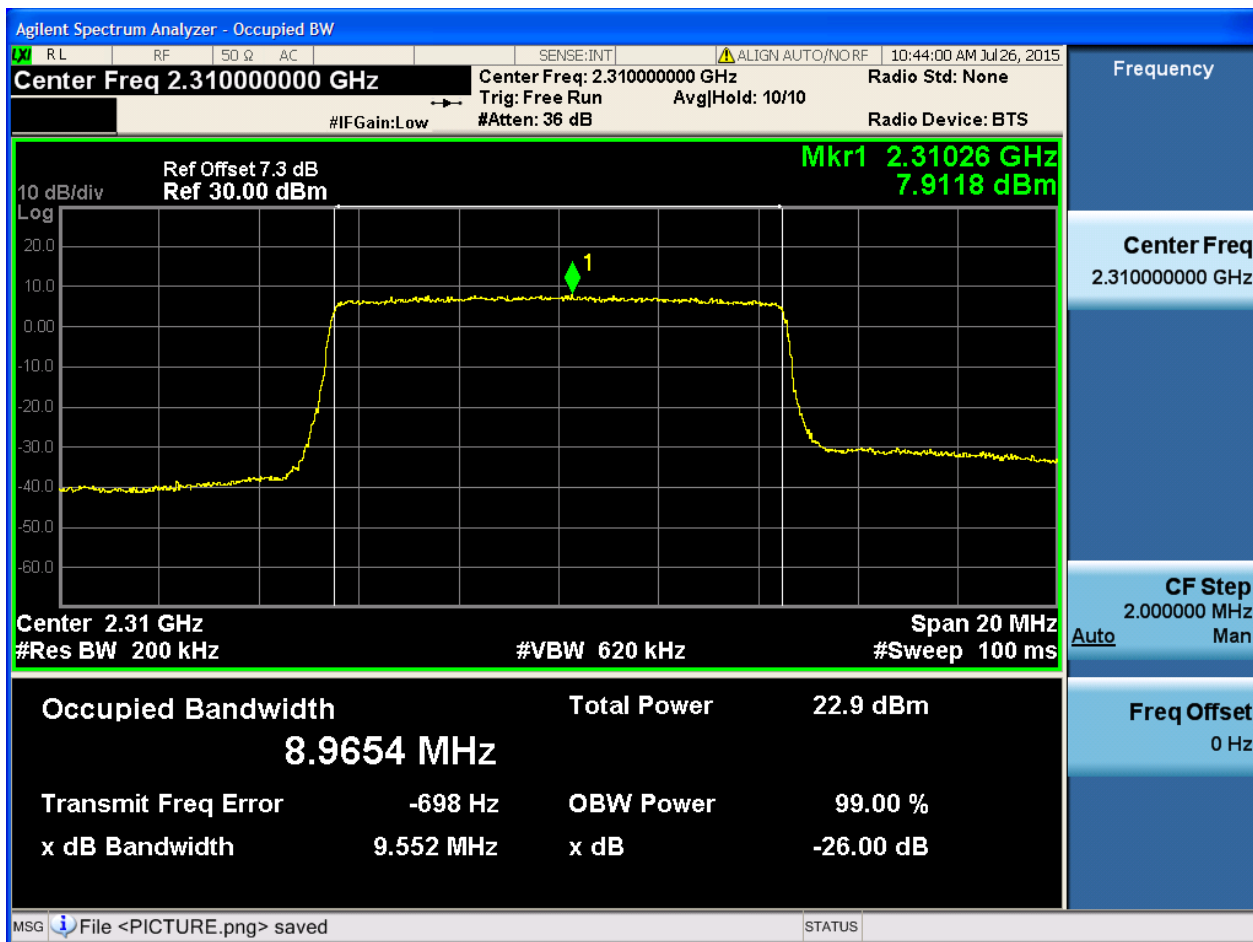




4.1.1.1.2 Test Bandwidth = 10

4.1.1.1.2.1 Test Channel = LCH

4.1.1.1.2.1.1 Test RB = RB50#0



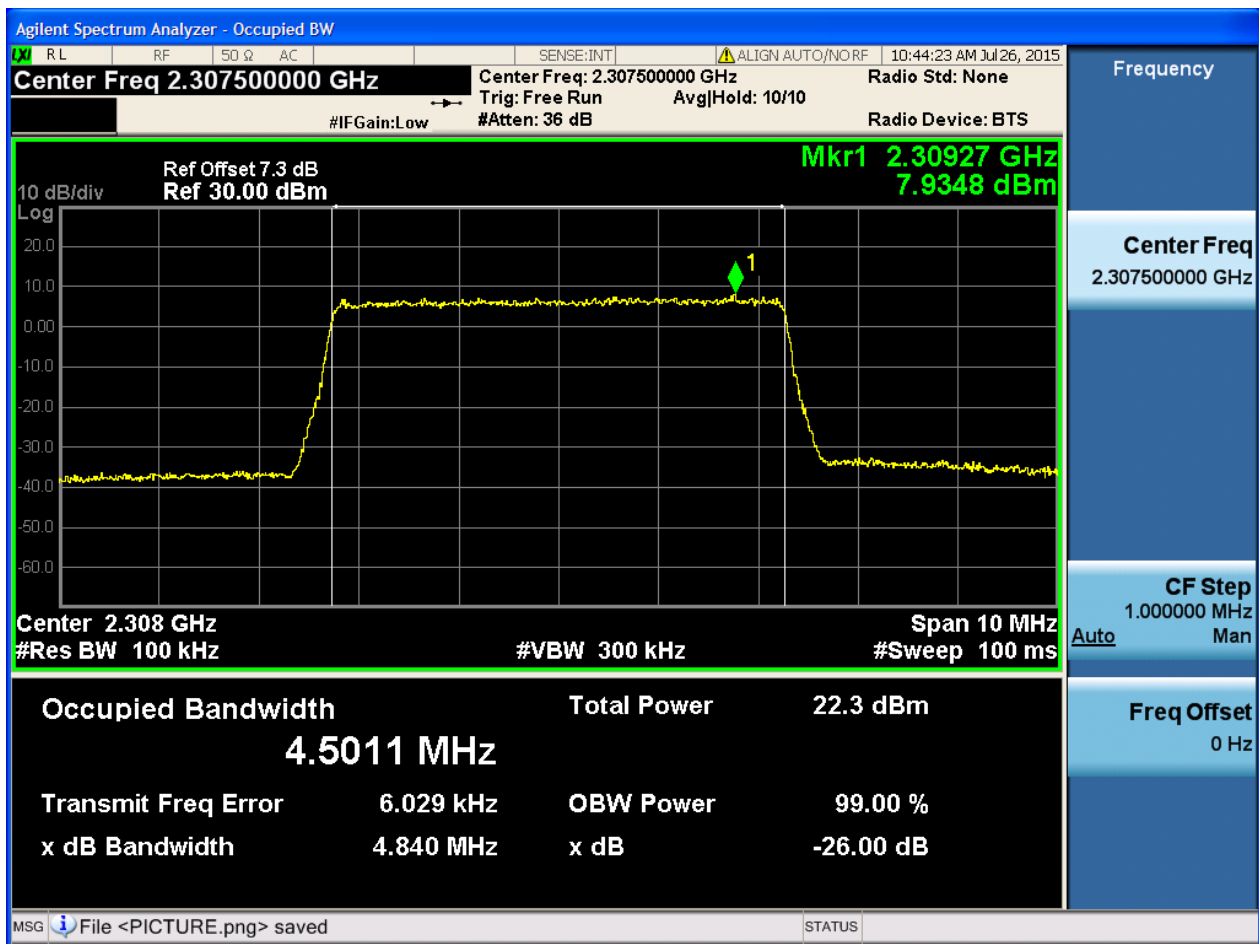


4.1.1.2 Test Mode = LTE/TM2

4.1.1.2.1 Test Bandwidth = 5

4.1.1.2.1.1 Test Channel = LCH

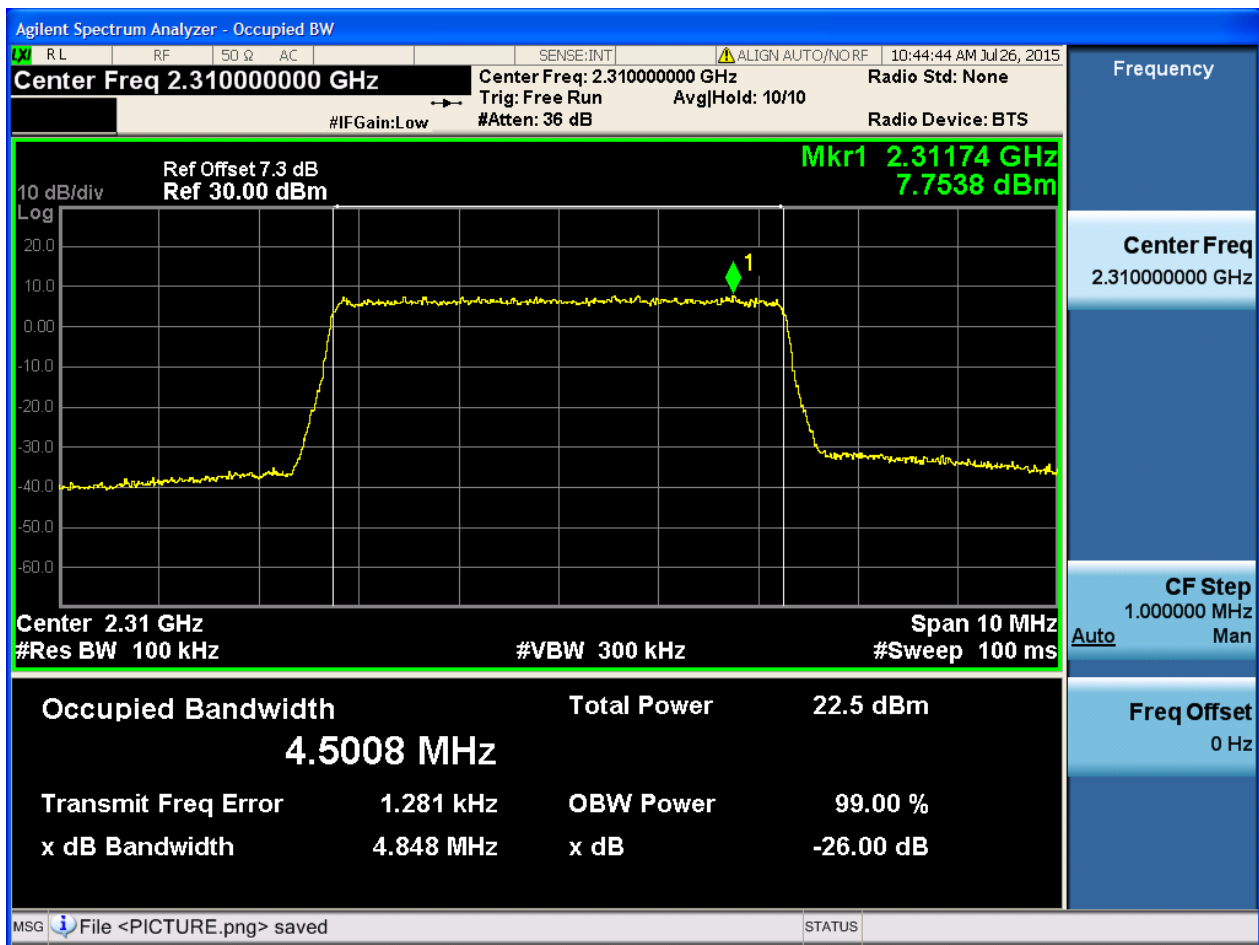
4.1.1.2.1.1.1 Test RB = RB25#0





4.1.1.2.1.2 Test Channel = MCH

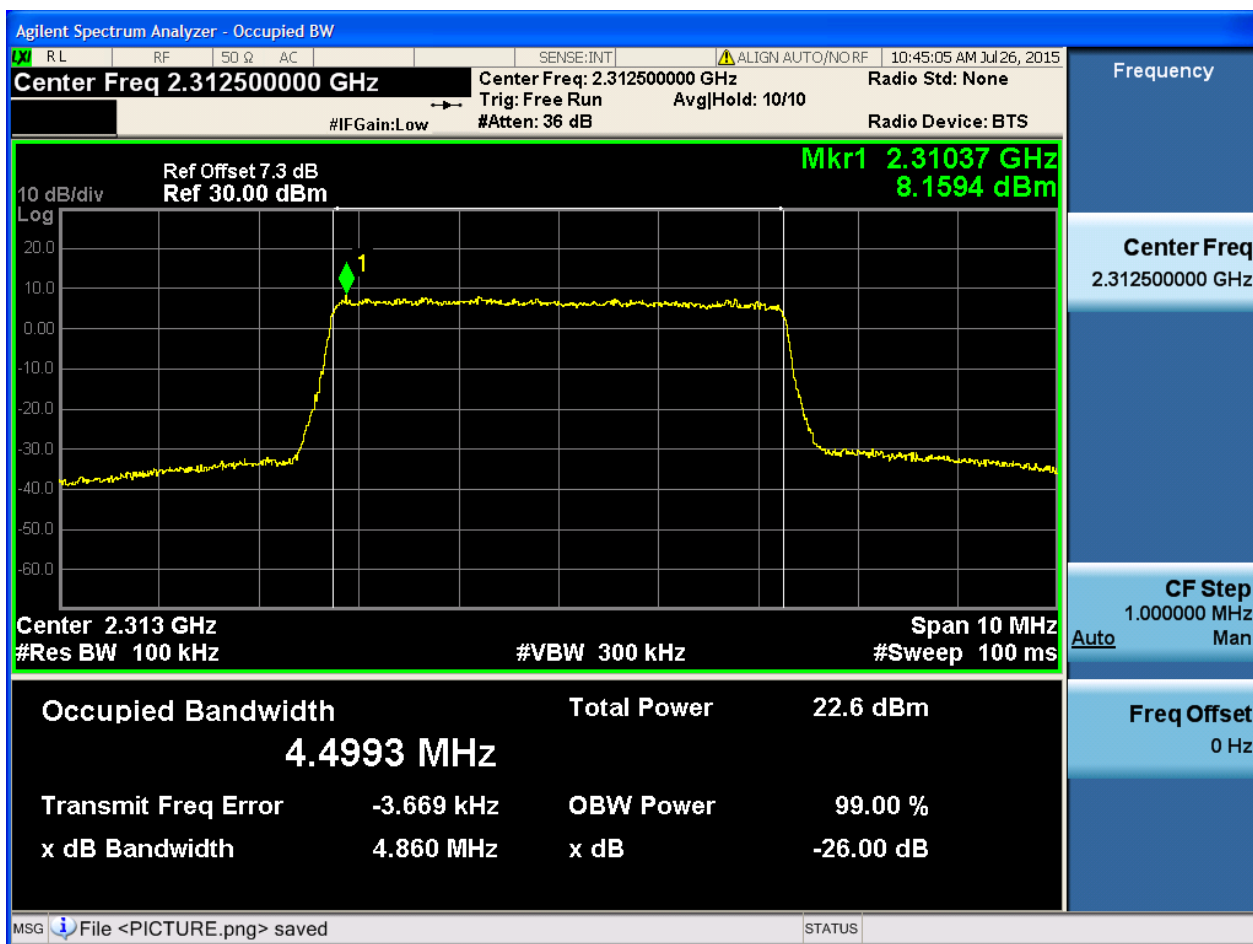
4.1.1.2.1.2.1 Test RB = RB25#0





4.1.1.2.1.3 Test Channel = HCH

4.1.1.2.1.3.1 Test RB = RB25#0

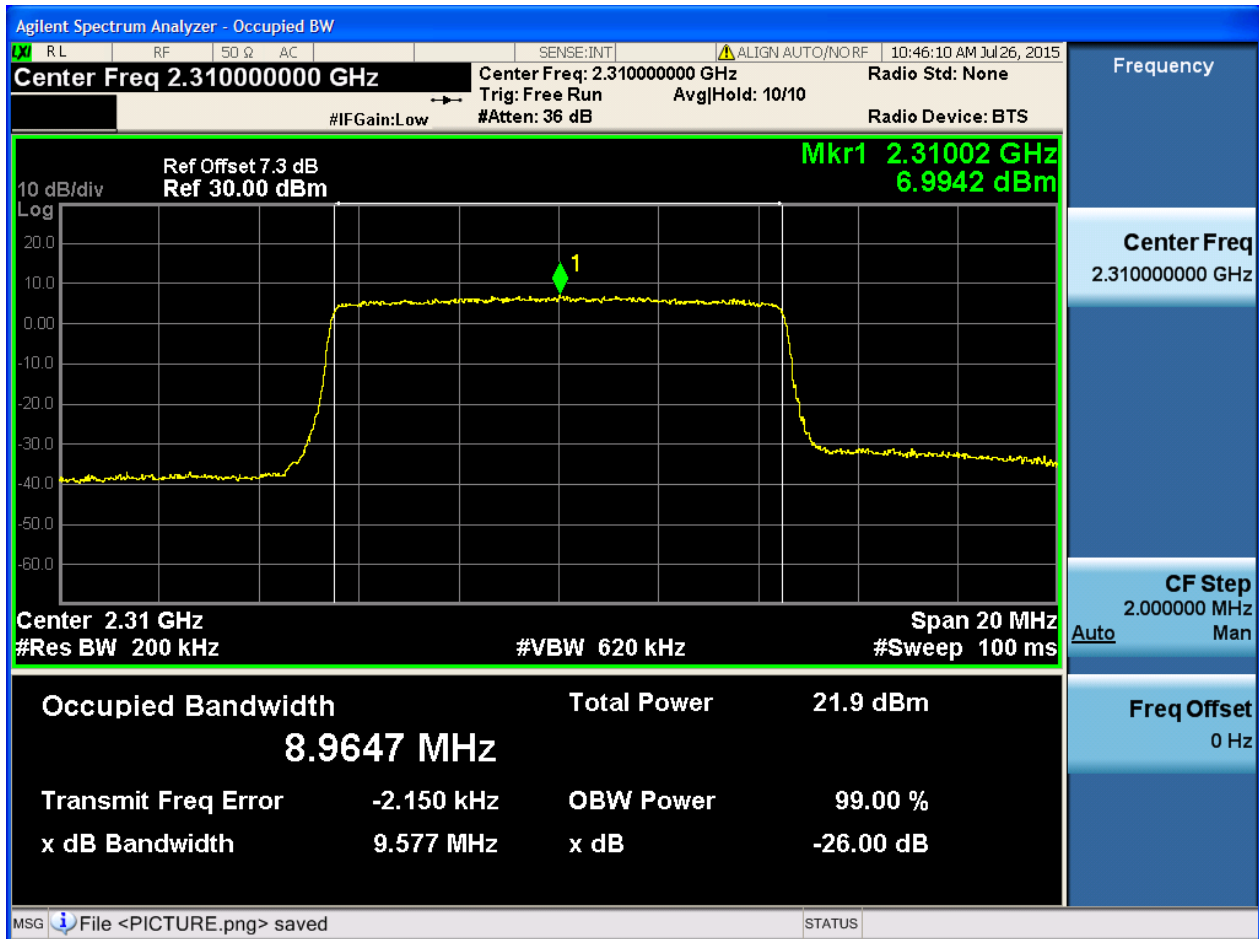




4.1.1.2.2 Test Bandwidth = 10

4.1.1.2.2.1 Test Channel = LCH//MCH/HCH

4.1.1.2.2.1.1 Test RB = RB50#0





5Appendix_E: Band Edges Compliance

Part I - Test Plots

5.1 For LTE

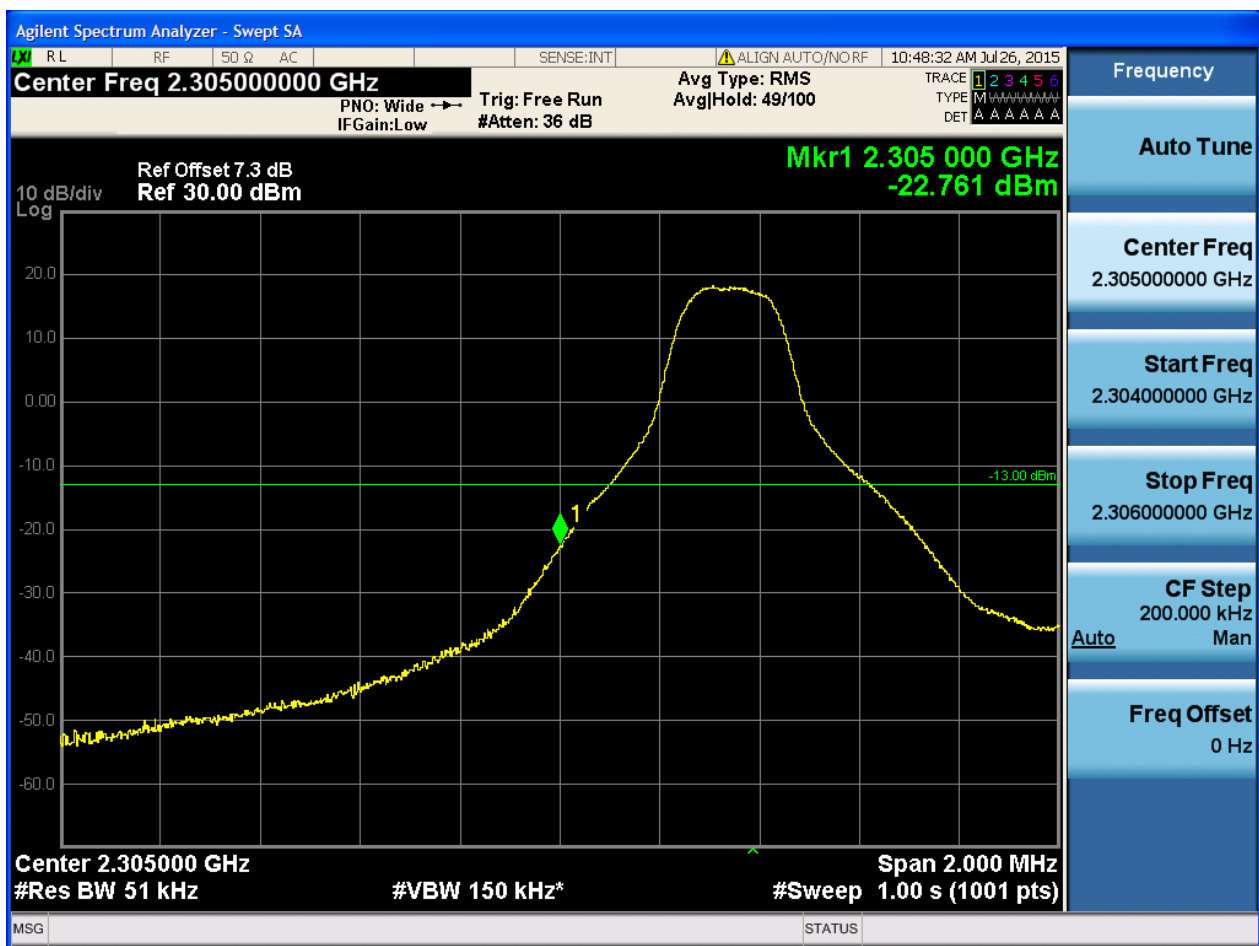
5.1.1 Test Band = BAND30

5.1.1.1 Test Mode = LTE/TM1

5.1.1.1.1 Test Bandwidth = 5

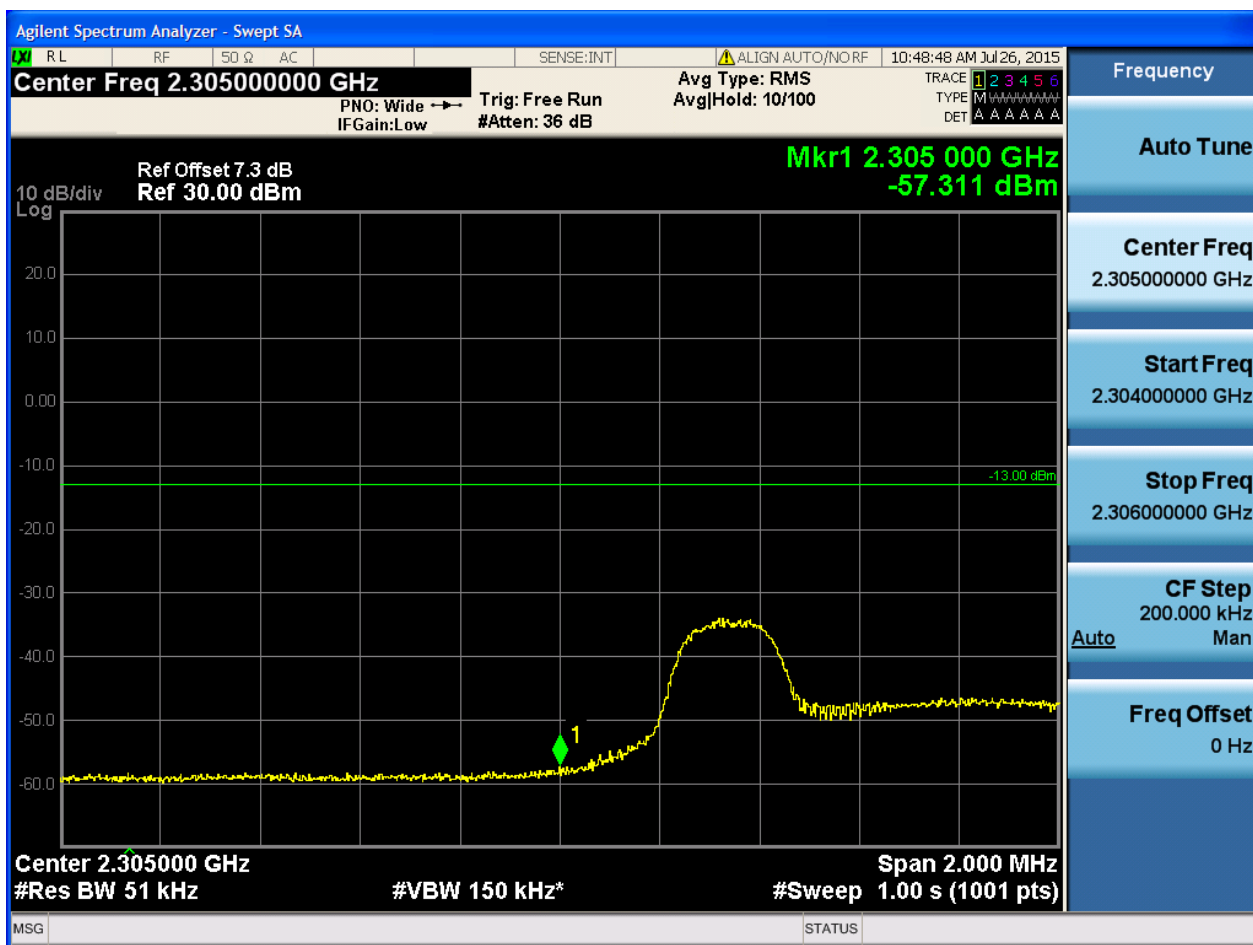
5.1.1.1.1.1 Test Channel = LCH

5.1.1.1.1.1.1 Test RB = RB1#0





5.1.1.1.1.2 Test RB = RB1#24





5.1.1.1.1.3 Test RB = RB12#6



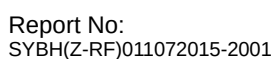


5.1.1.1.1.4 Test RB = RB25#0



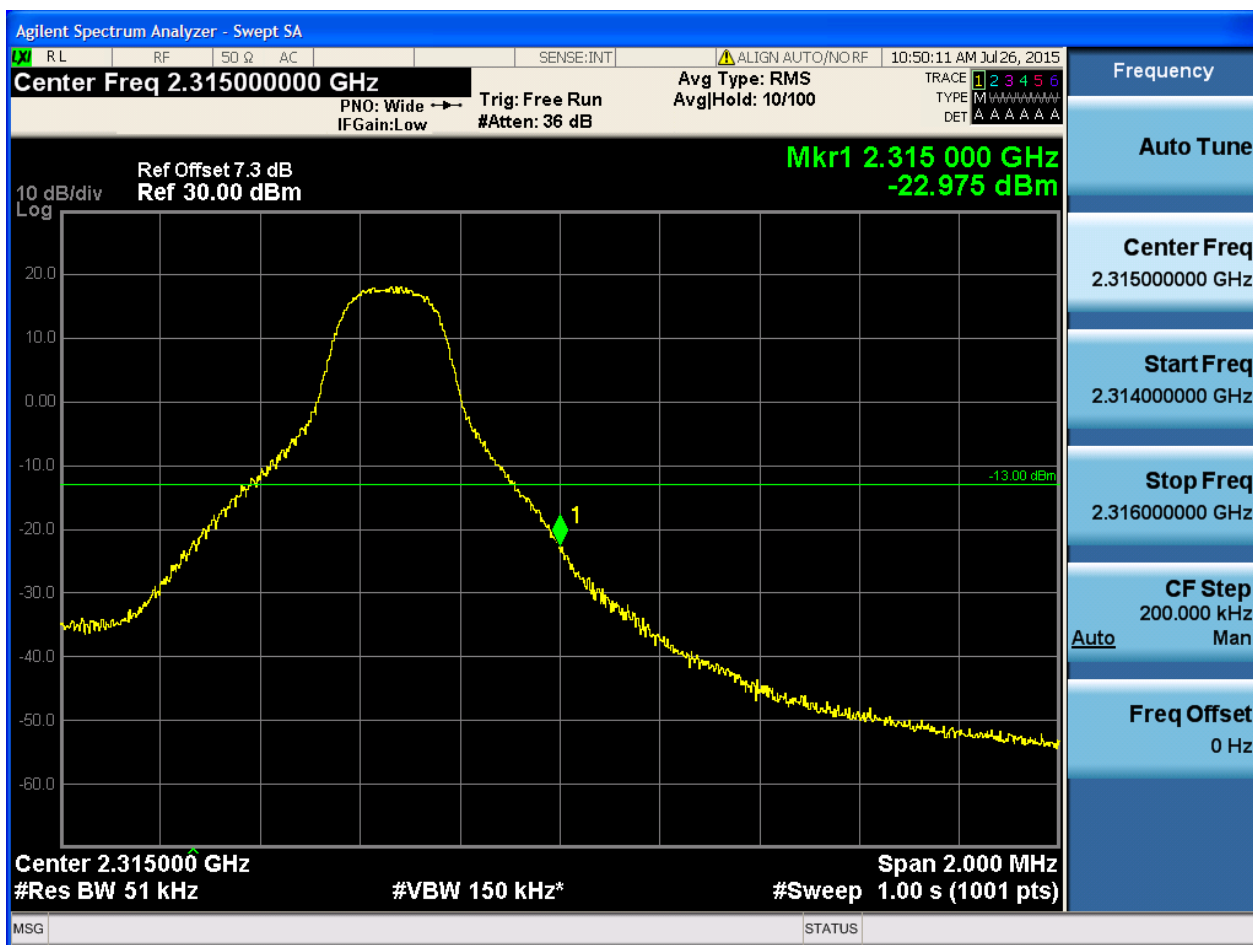


5.1.1.1.1.2.1 Test RB = RB1#0





5.1.1.1.2.2 Test RB = RB1#24





5.1.1.1.2.3 Test RB = RB12#6





5.1.1.1.2.4 Test RB = RB25#0

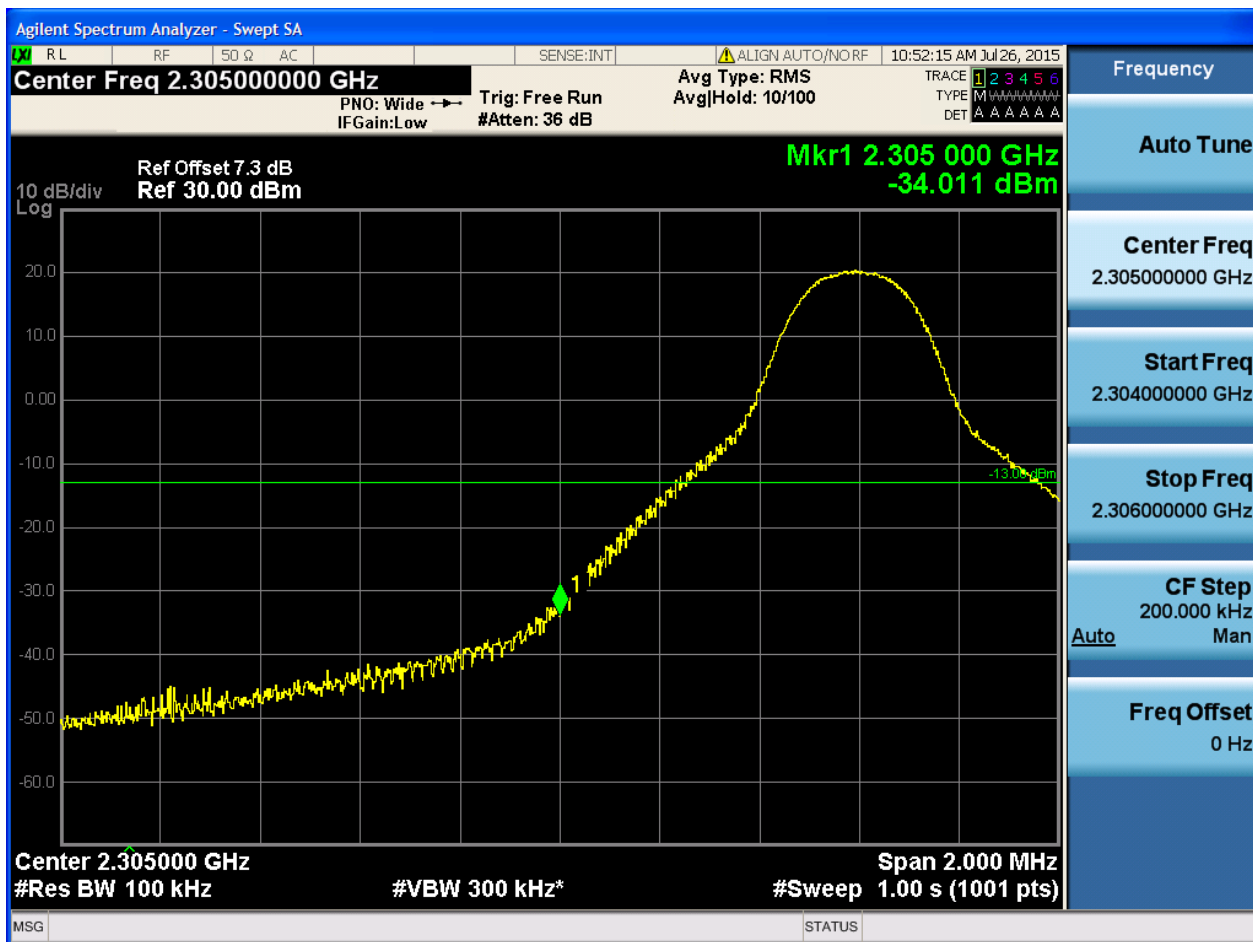




5.1.1.1.2 Test Bandwidth = 10

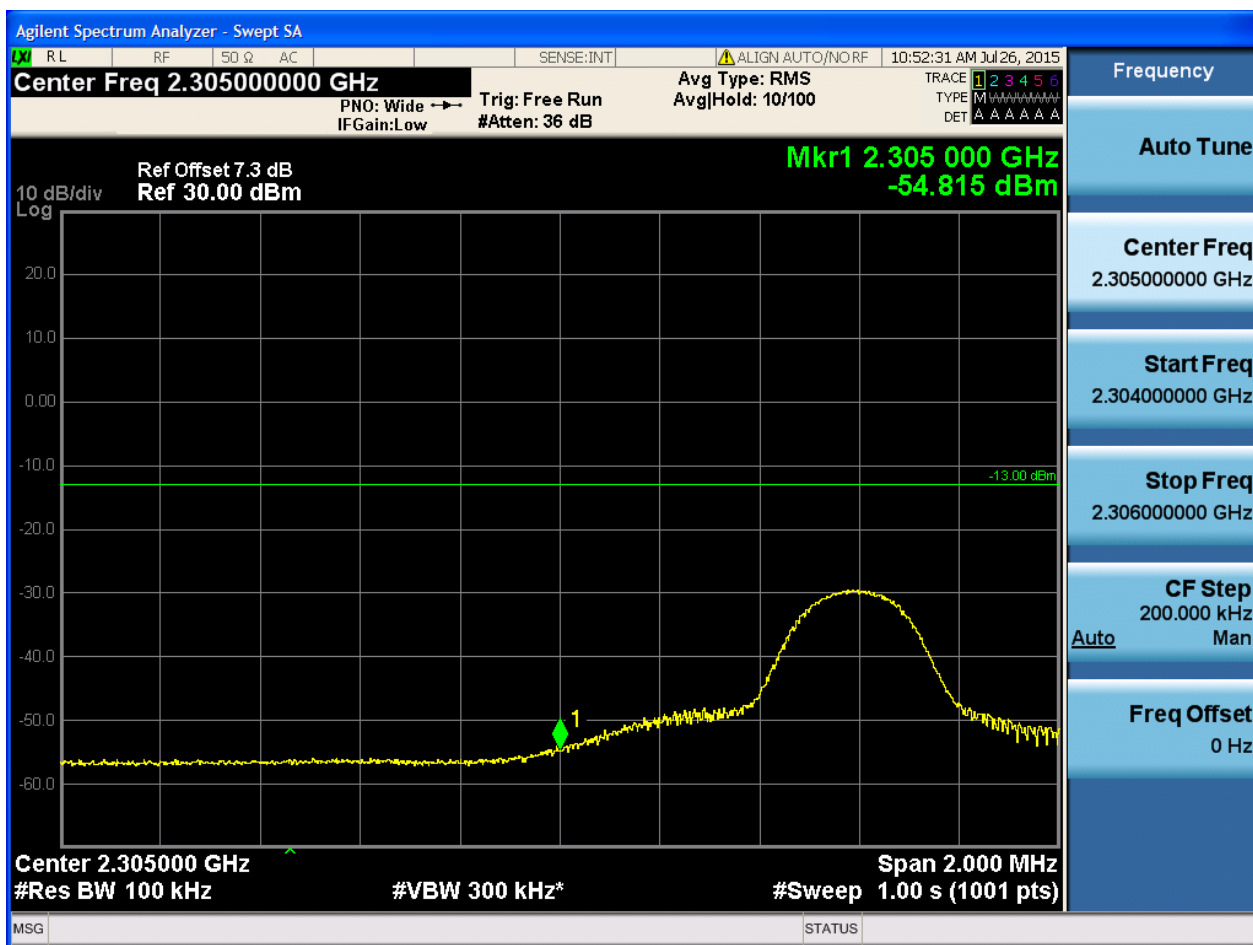
5.1.1.1.2.1 Test Channel = LCH

5.1.1.1.2.1.1 Test RB = RB1#0





5.1.1.1.2.1.2 Test RB = RB1#49





5.1.1.1.2.1.3 Test RB = RB25#13





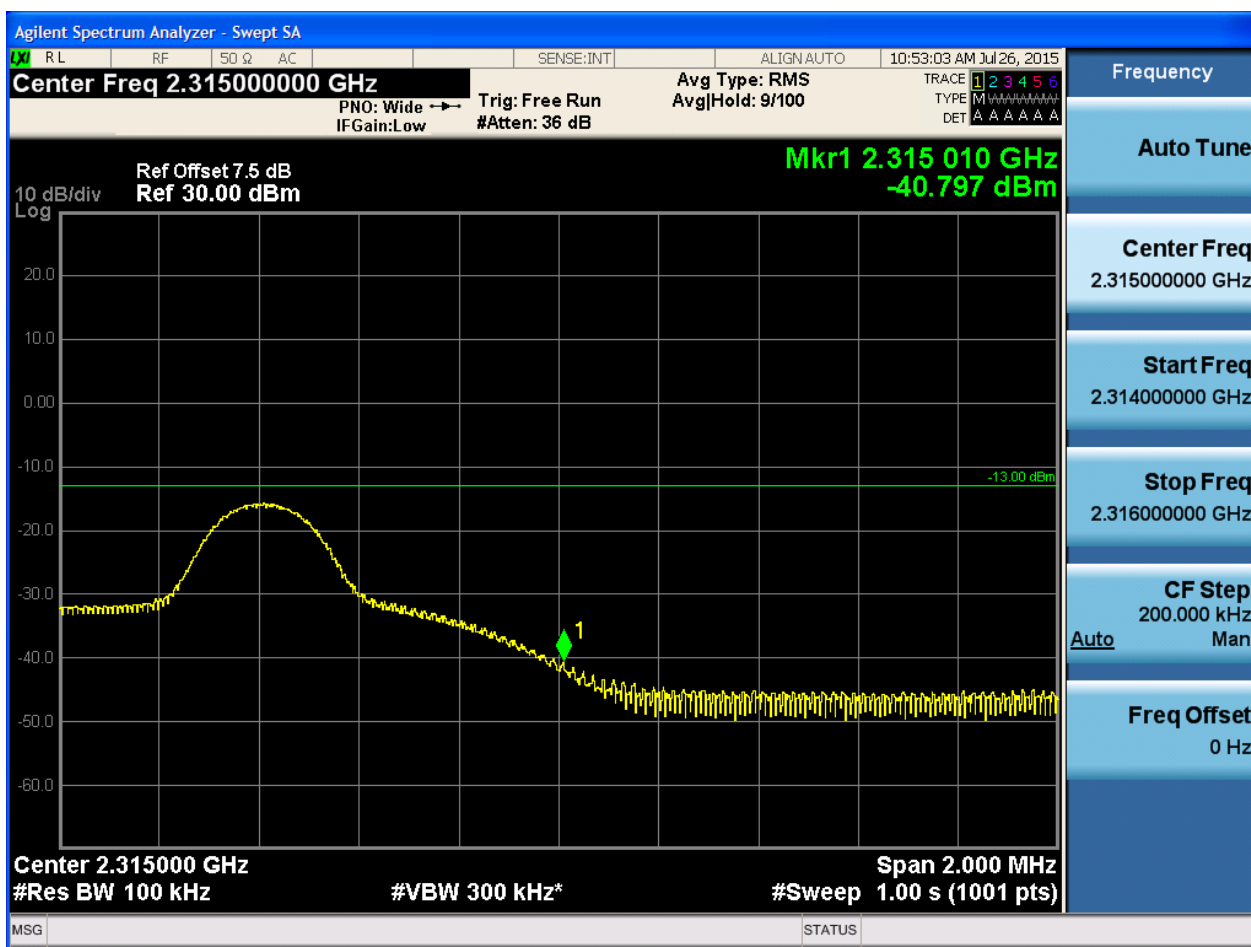
5.1.1.1.2.1.4 Test RB = RB50#0





5.1.1.1.2.2 Test Channel = HCH

5.1.1.1.2.2.1 Test RB = RB1#0



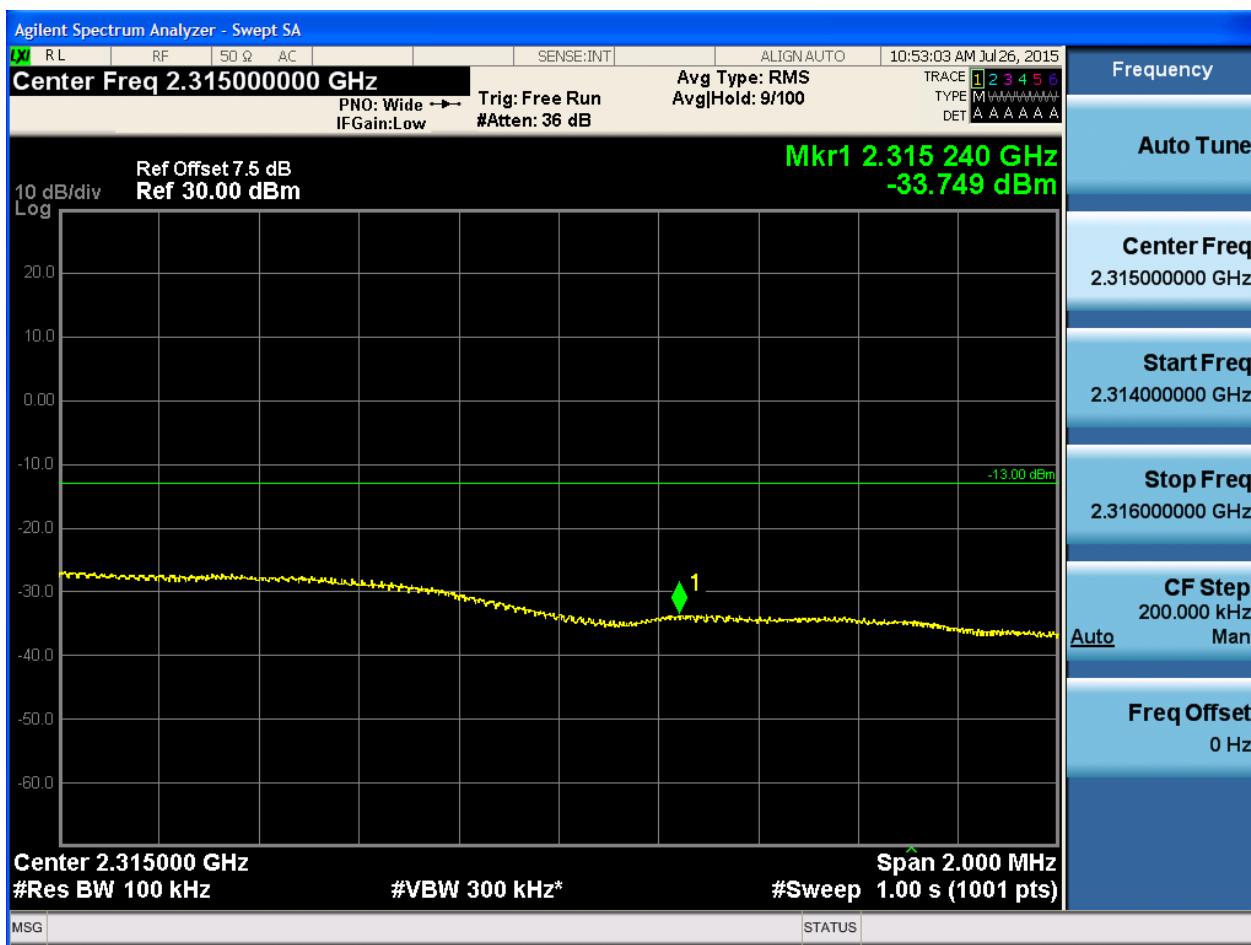


5.1.1.1.2.2.2 Test RB = RB1#49





5.1.1.1.2.2.3 Test RB = RB25#13





Agilent Spectrum Analyzer - Swept SA

Center Freq 2.31500000 GHz

Ref Offset 7.5 dB
Ref 30.00 dBm

10 dB/div
Log

Mkr1 2.315 010 GHz
-30.668 dBm

Center 2.315000 GHz
#Res BW 100 kHz
#VBW 300 kHz*
Span 2.000 MHz
#Sweep 1.00 s (1001 pts)

Auto Tune

Center Freq
2.31500000 GHz

Start Freq
2.314000000 GHz

Stop Freq
2.316000000 GHz

CF Step
200.000 kHz
Mar

Freq Offset
0 Hz

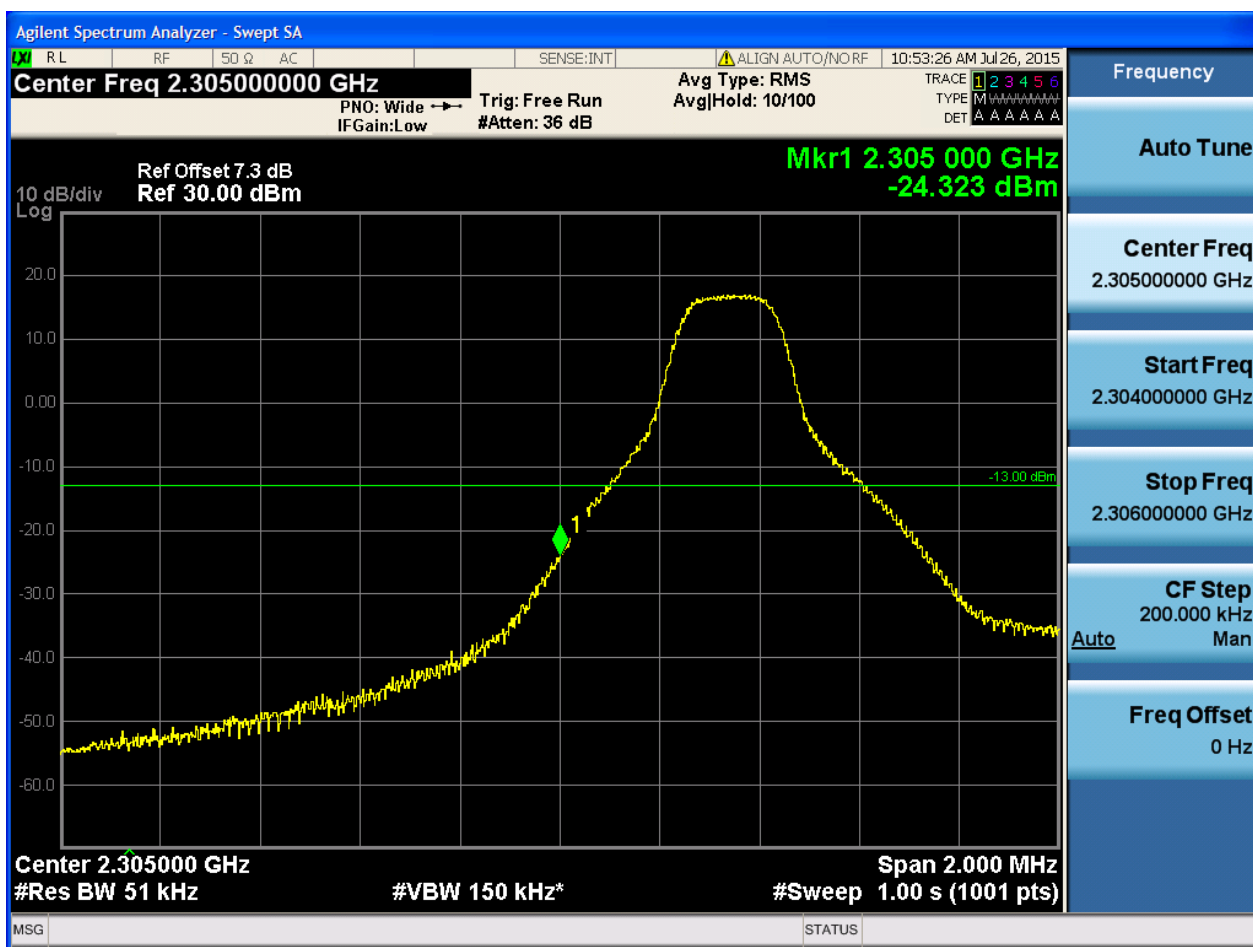


5.1.1.2 Test Mode = LTE/TM2

5.1.1.2.1 Test Bandwidth = 5

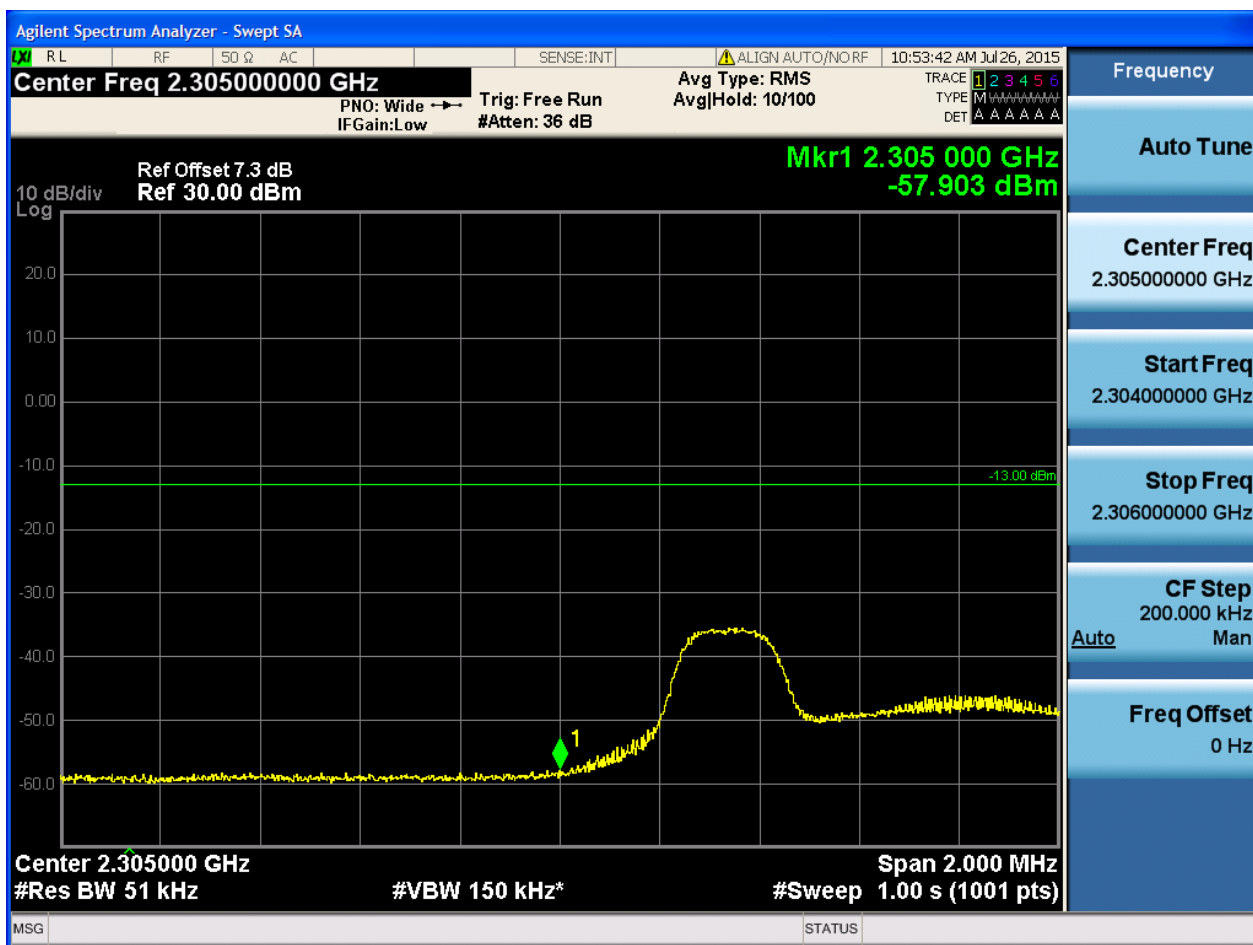
5.1.1.2.1.1 Test Channel = LCH

5.1.1.2.1.1.1 Test RB = RB1#0





5.1.1.2.1.1.2 Test RB = RB1#24





5.1.1.2.1.1.3 Test RB = RB12#6



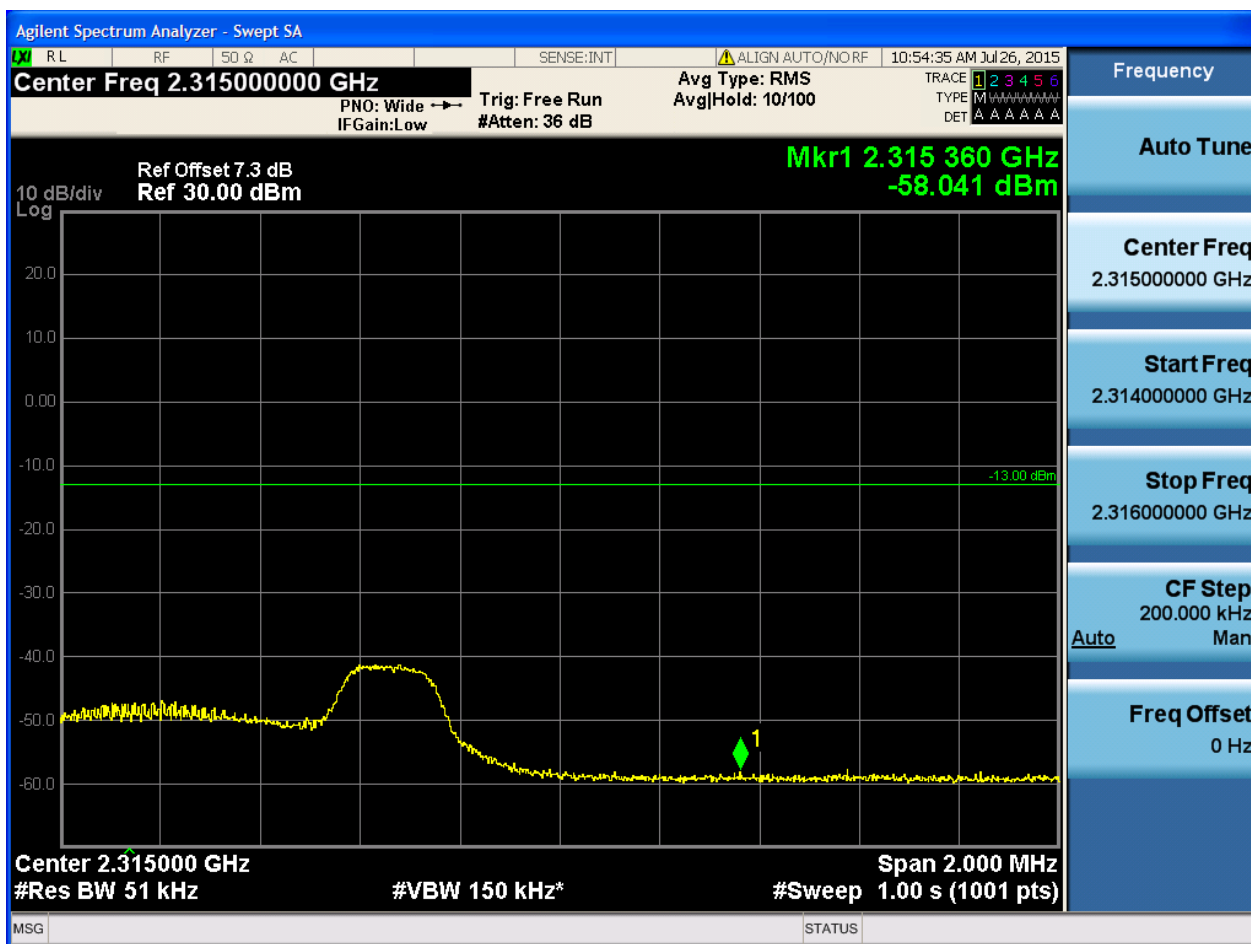


5.1.1.2.1.1.4 Test RB = RB25#0



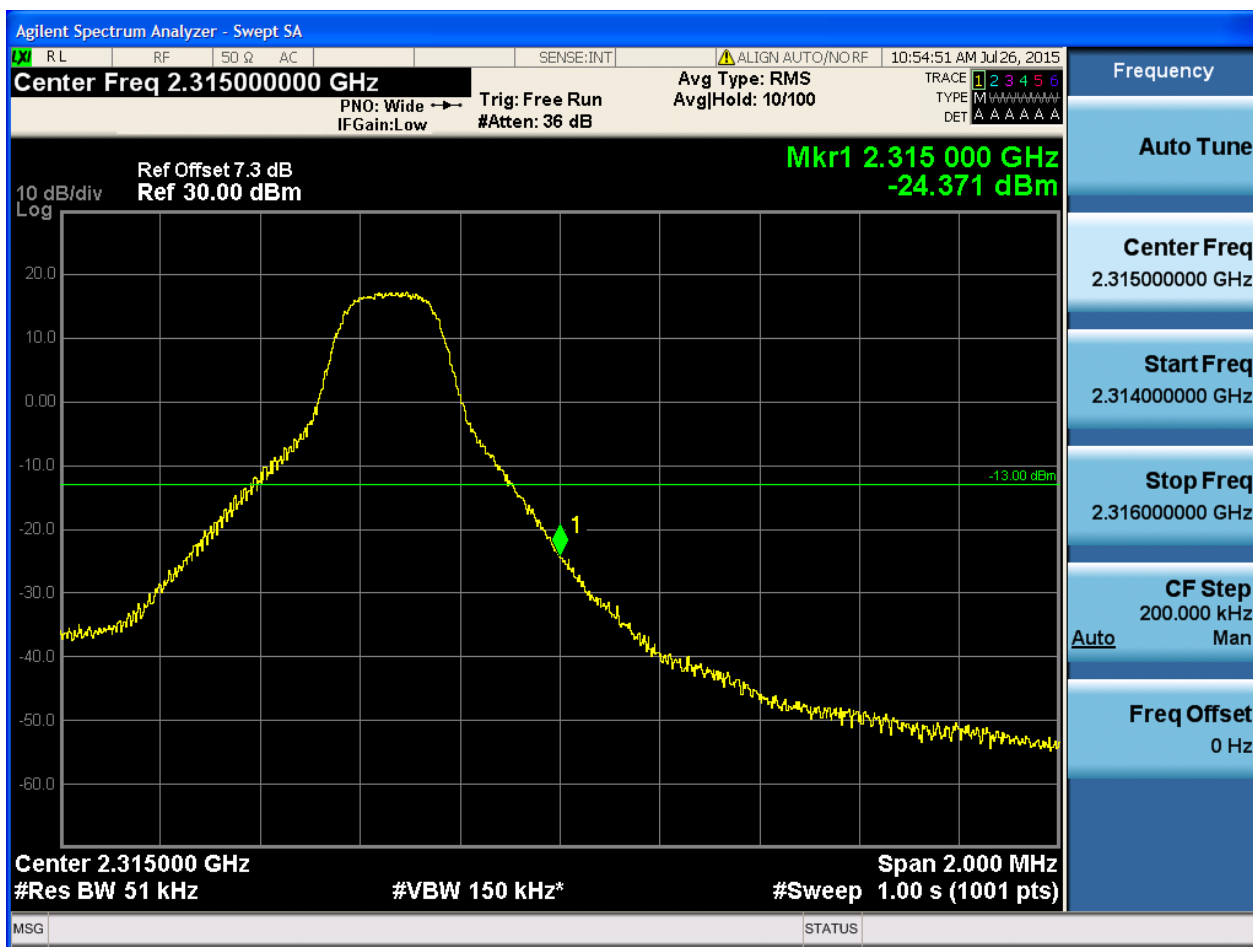
5.1.1.2.1.2 Test Channel = HCH

5.1.1.2.1.2.1 Test RB = RB1#0





5.1.1.2.1.2.2 Test RB = RB1#24





5.1.1.2.1.2.3 Test RB = RB12#6





5.1.1.2.1.2.4 Test RB = RB25#0

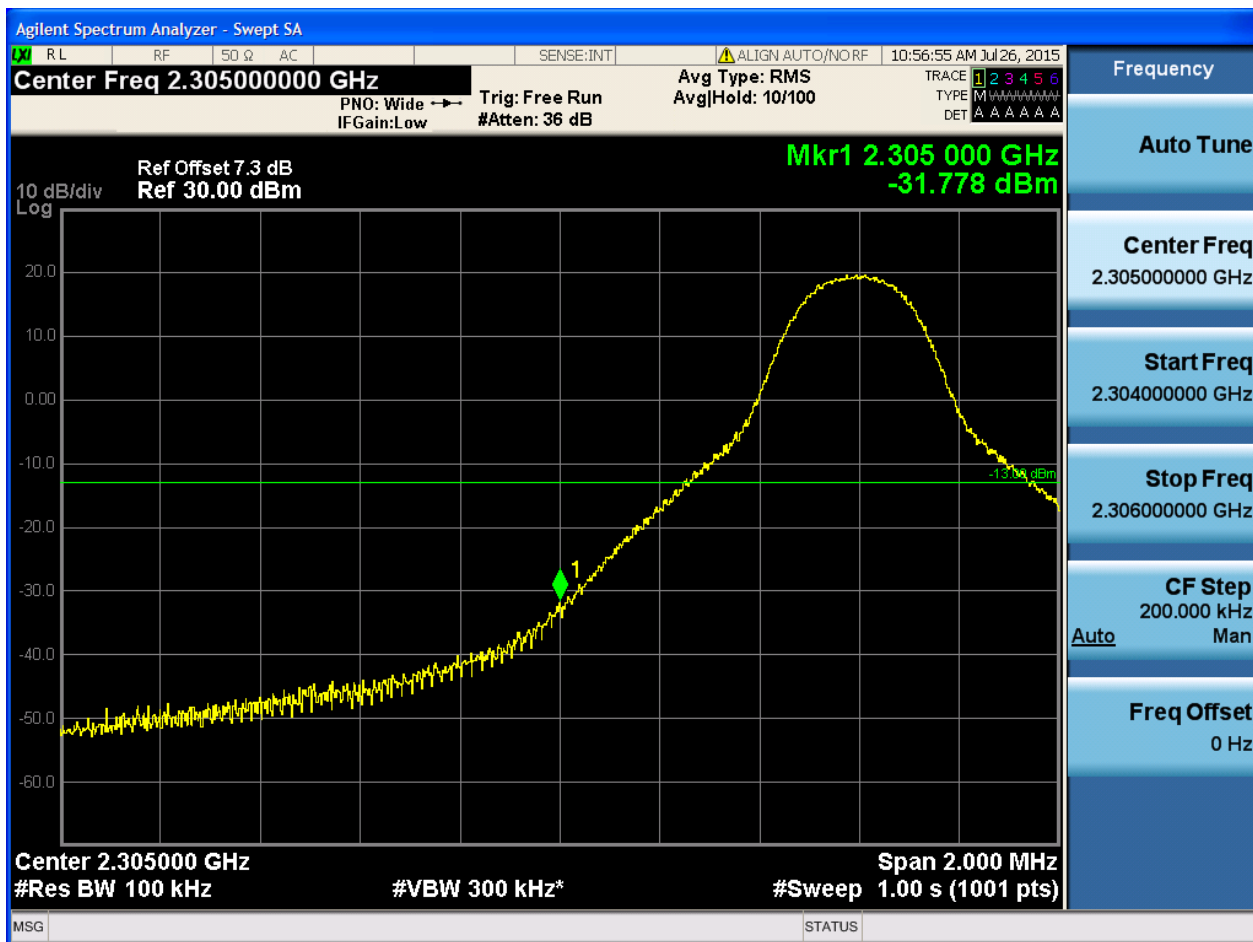




5.1.1.2.2 Test Bandwidth = 10

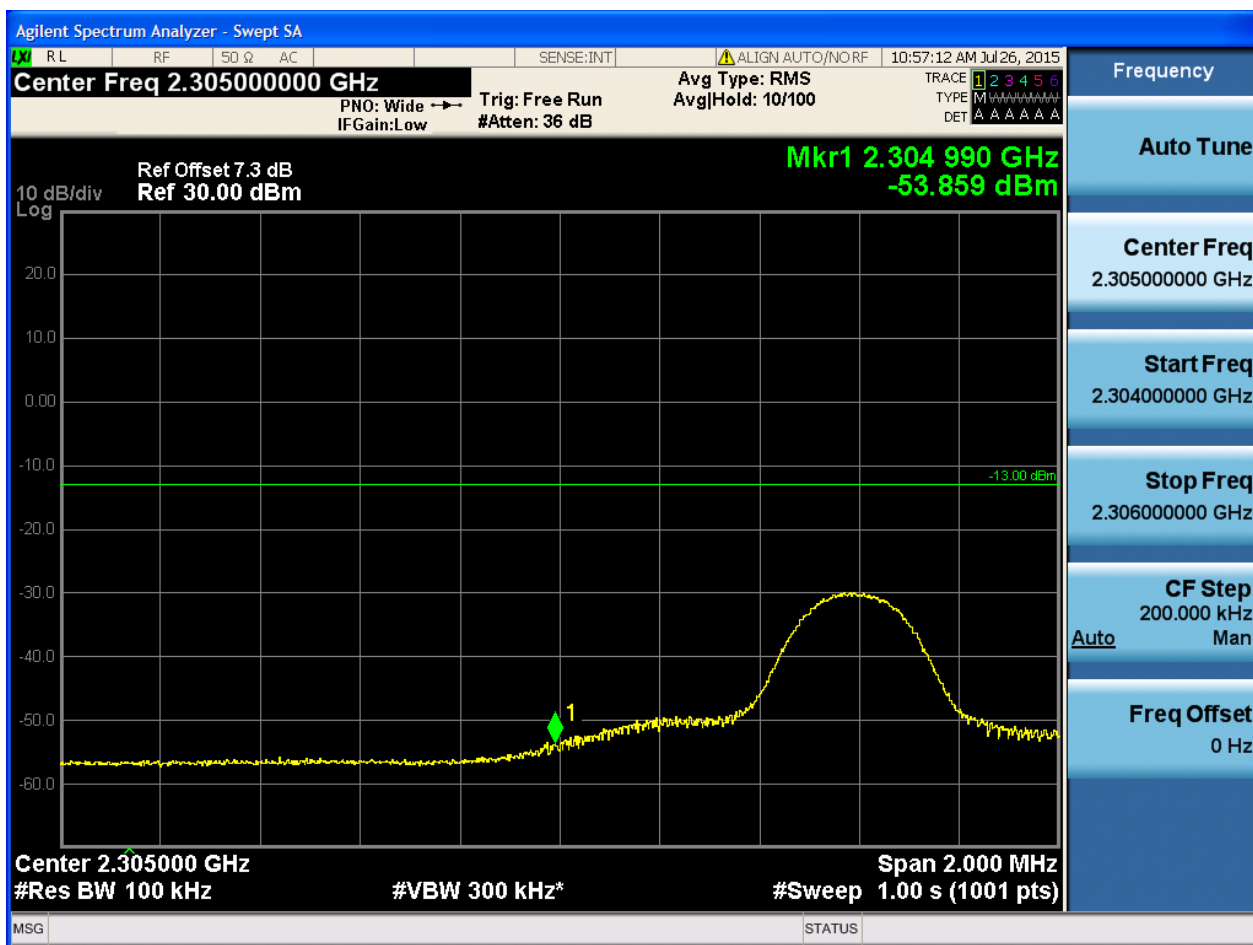
5.1.1.2.2.1 Test Channel = LCH

5.1.1.2.2.1.1 Test RB = RB1#0





5.1.1.2.2.1.2 Test RB = RB1#49





5.1.1.2.2.1.3 Test RB = RB25#13



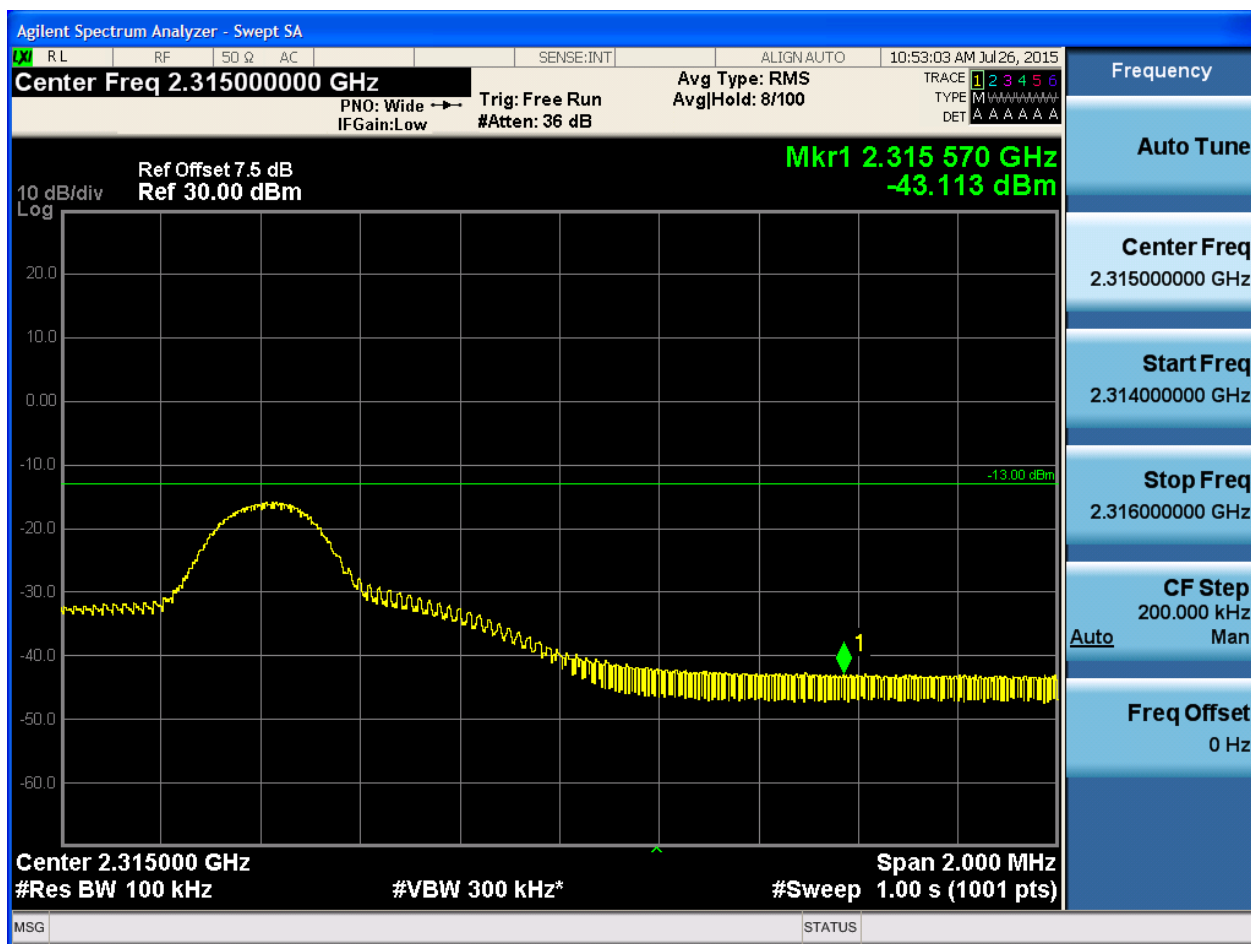


5.1.1.2.2.1.4 Test RB = RB50#0



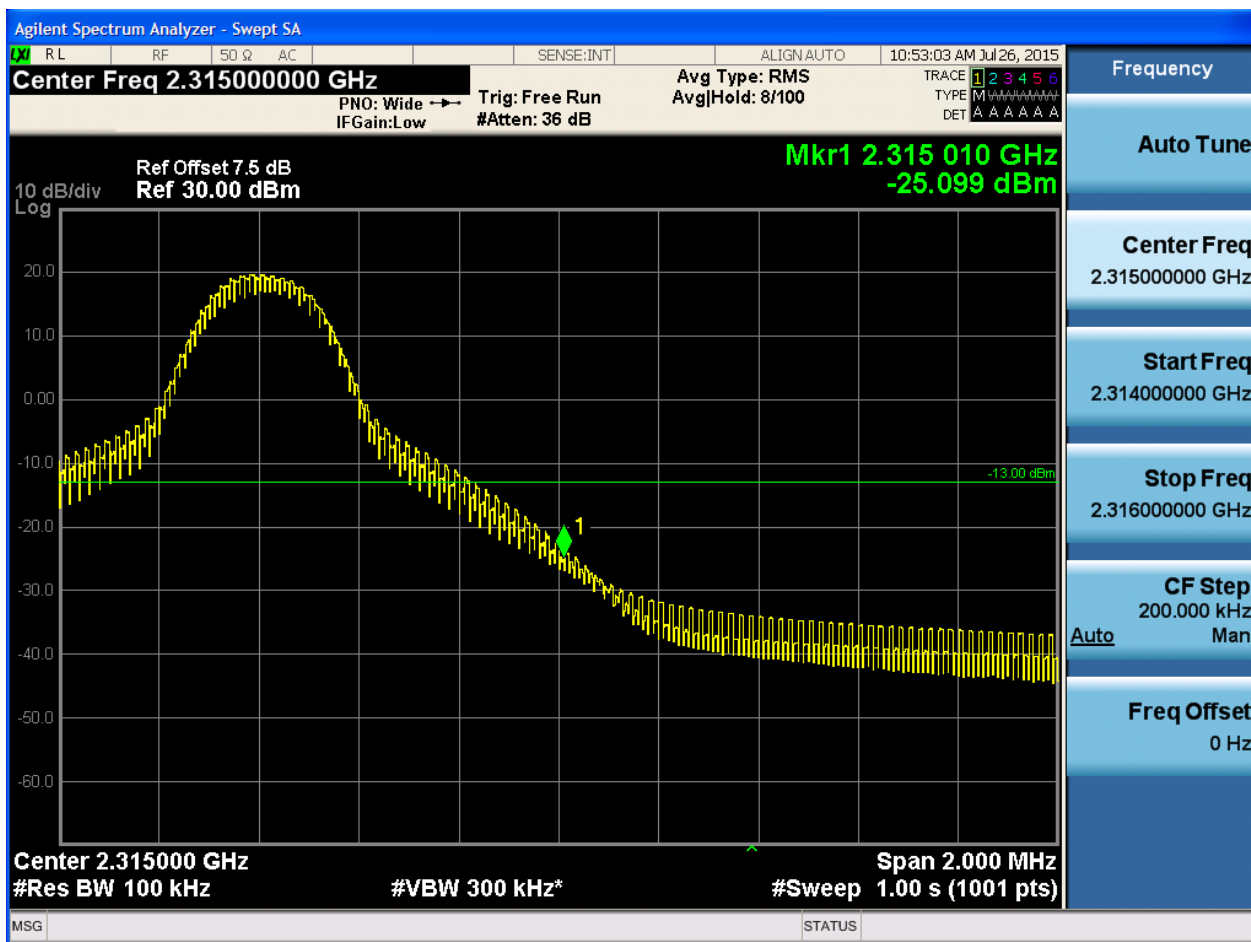
5.1.1.2.2.2 Test Channel = HCH

5.1.1.2.2.2.1 Test RB = RB1#0





5.1.1.2.2.2 Test RB = RB1#49





5.1.1.2.2.3 Test RB = RB25#13





5.1.1.2.2.4 Test RB = RB50#0



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

6.3 For LTE

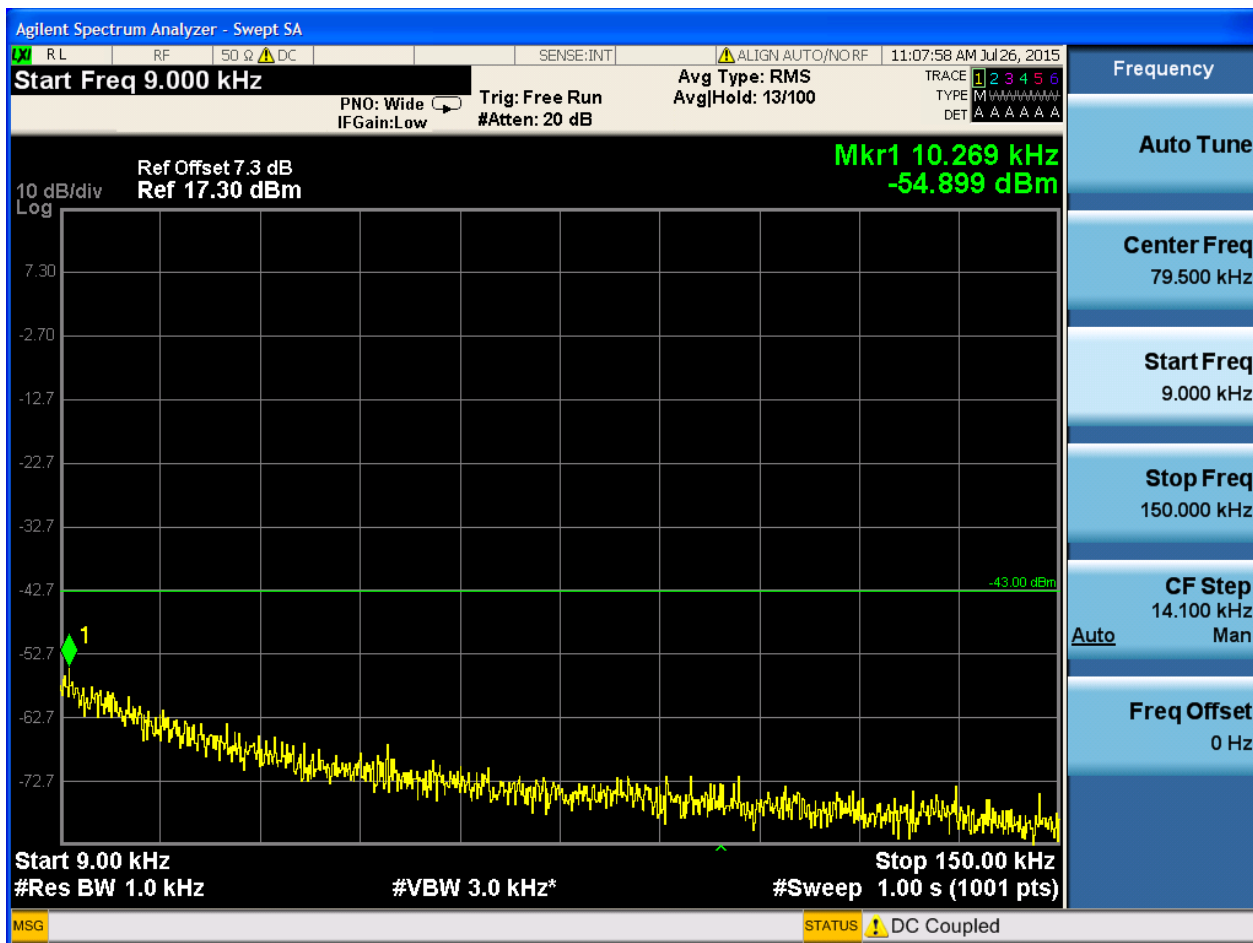
6.3.1 Test Band = BAND30

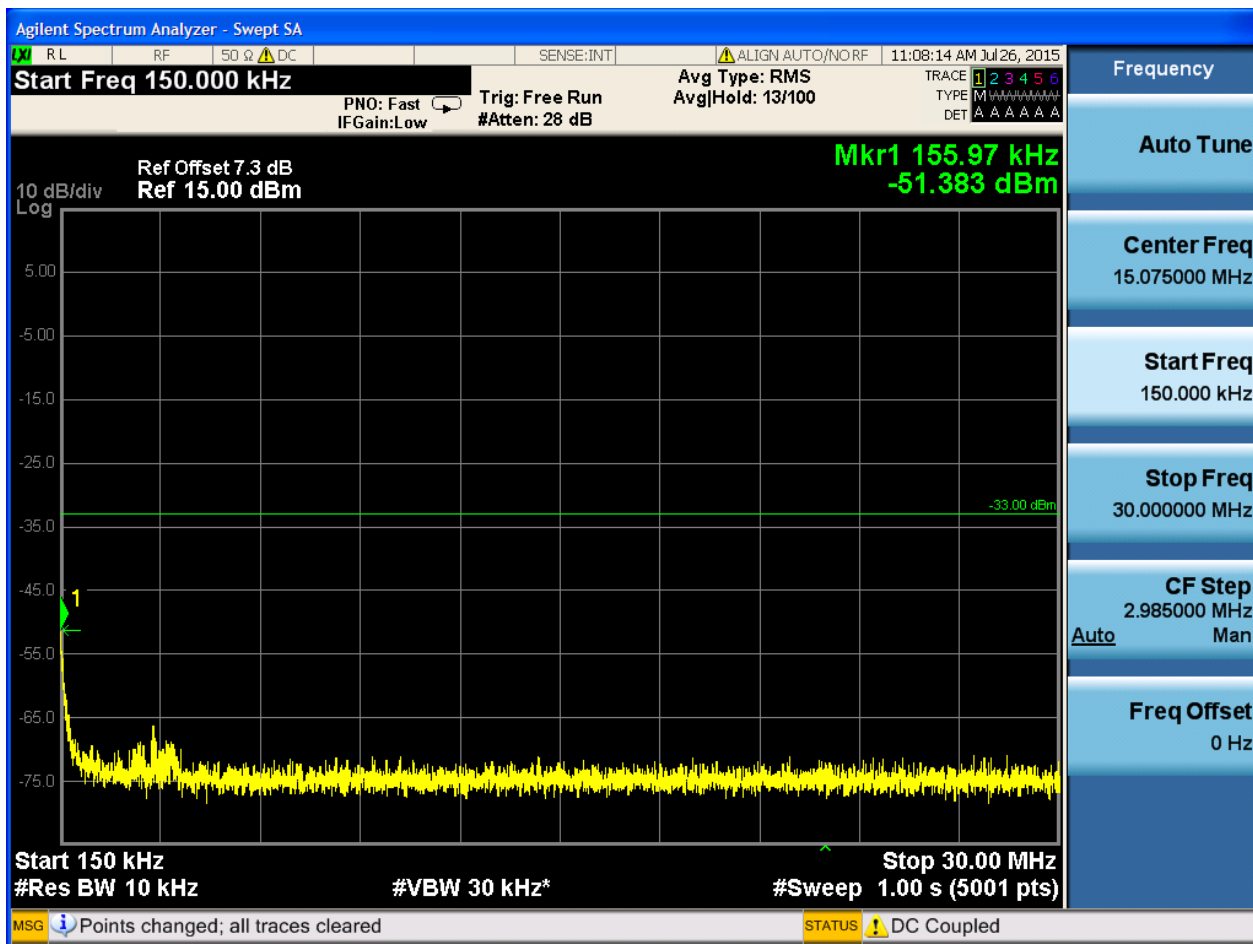
6.3.1.1 Test Mode = LTE/TM1

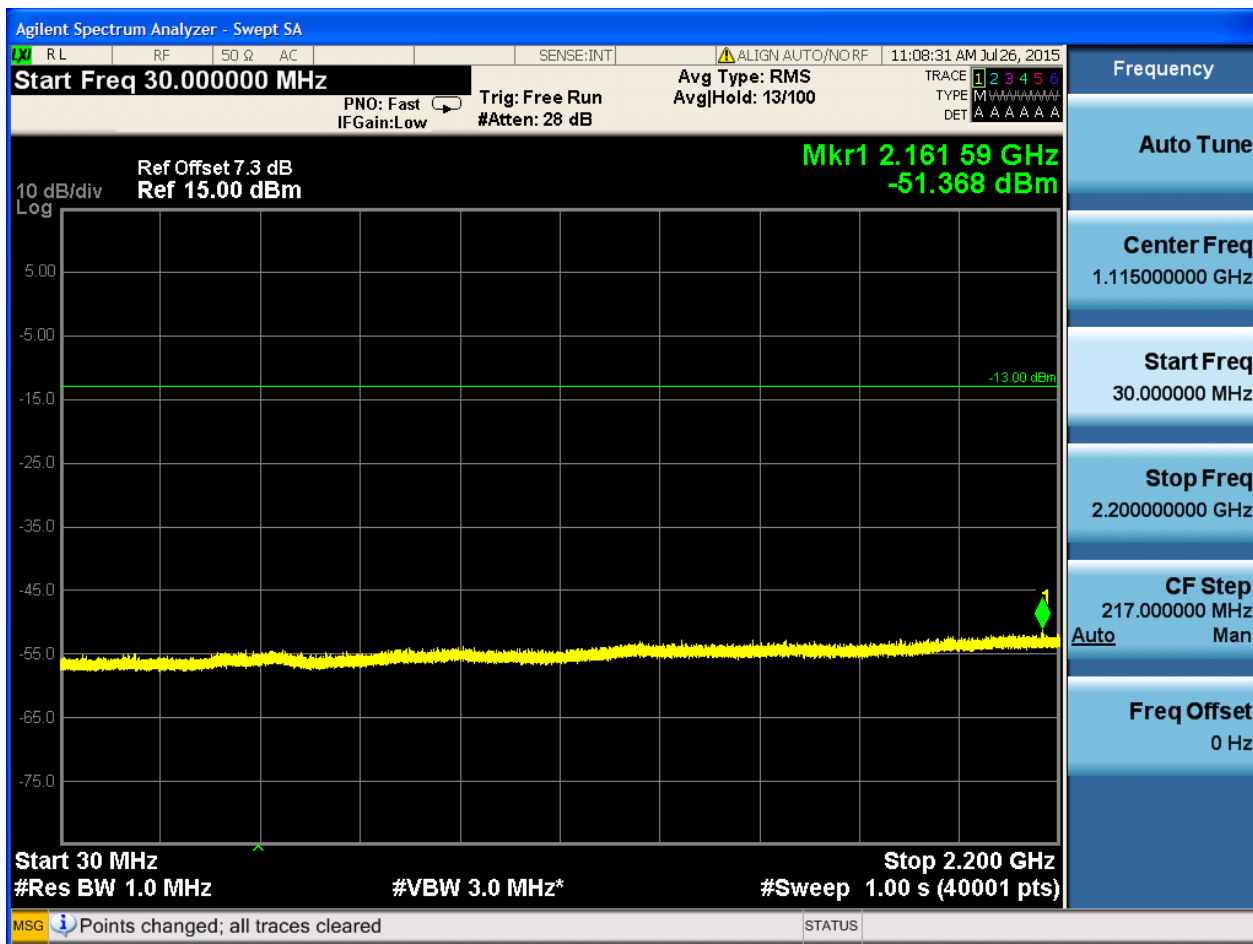
6.3.1.1.1 Test Bandwidth = 5

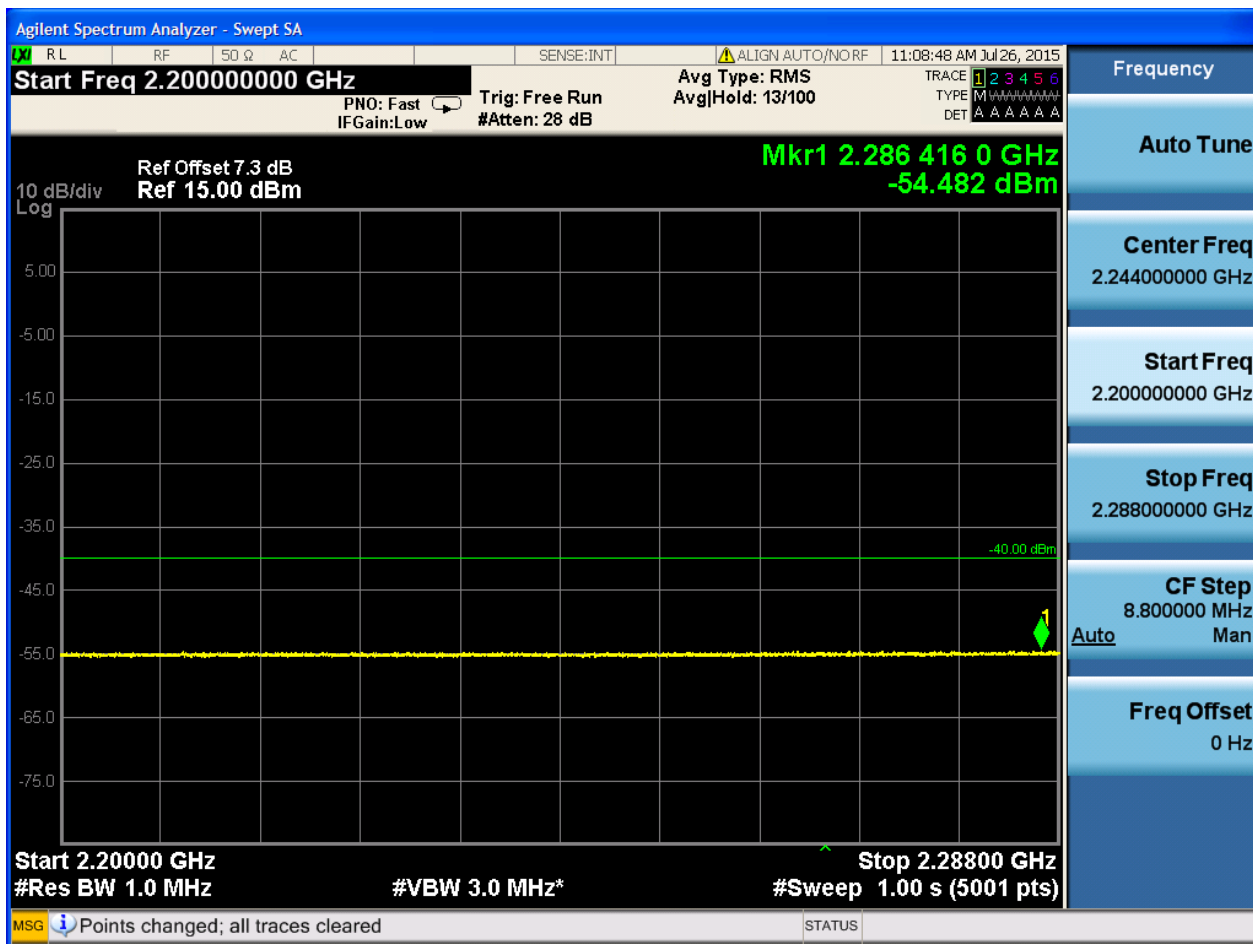
6.3.1.1.1.1 Test Channel = LCH

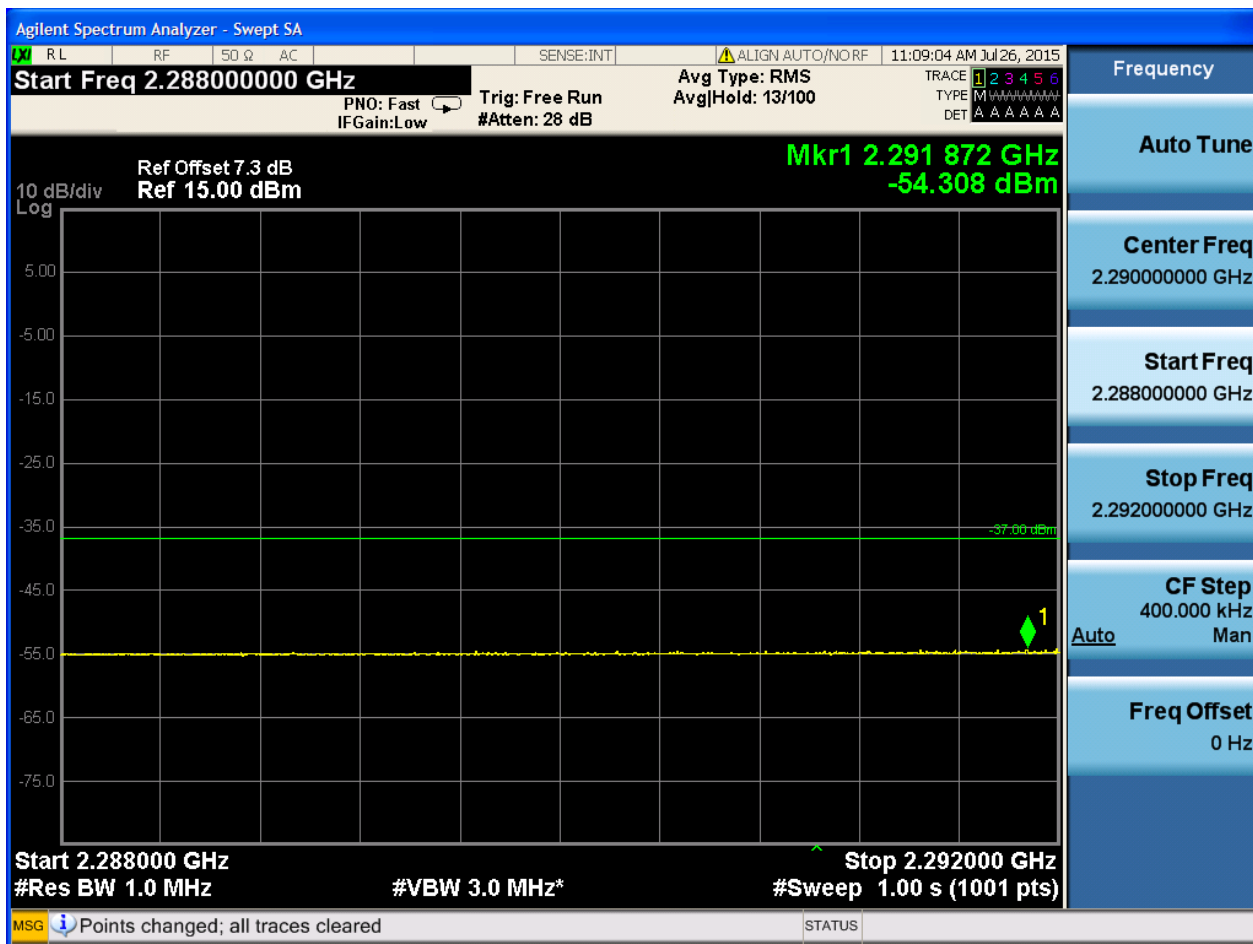
6.3.1.1.1.1.1 Test RB = RB1#0

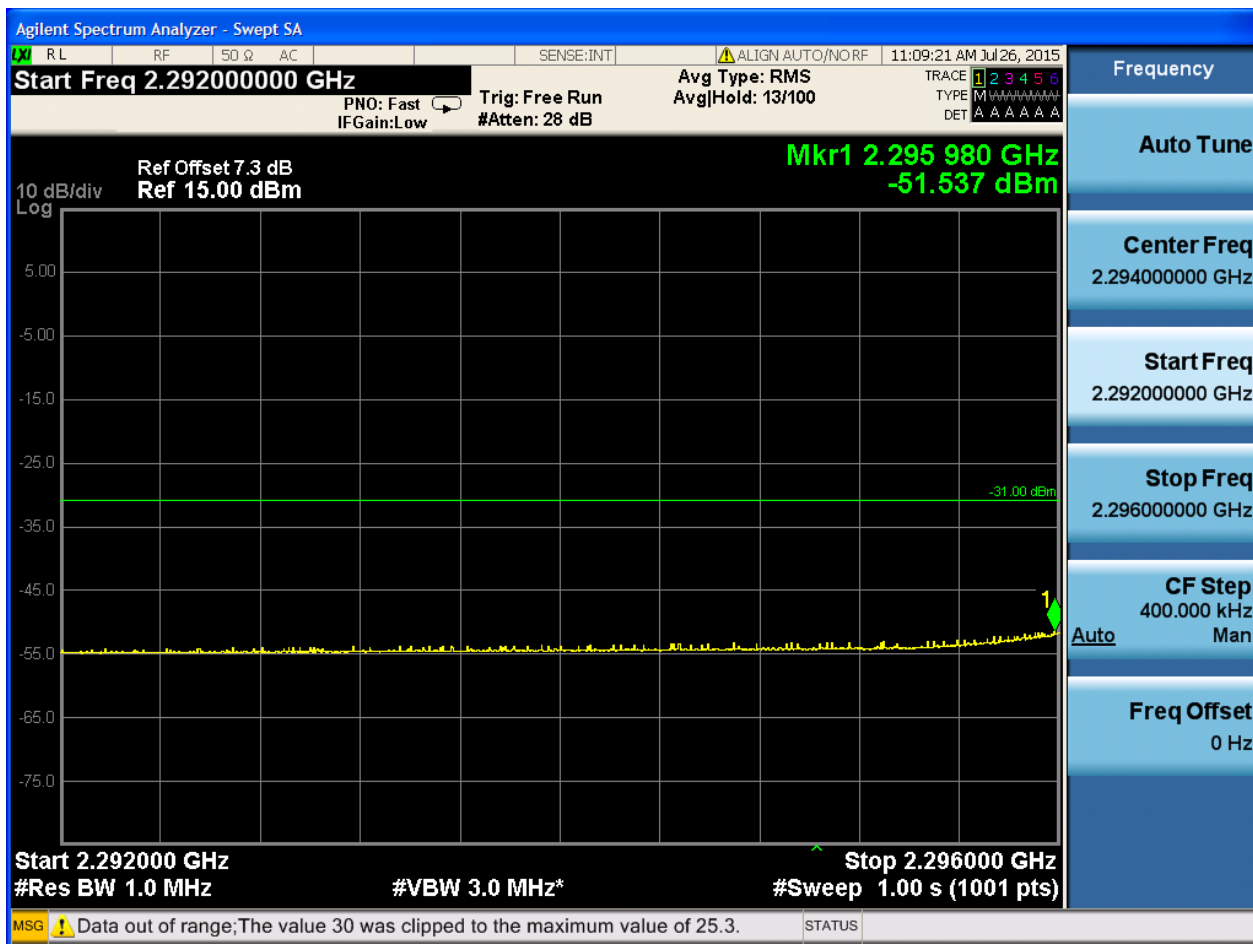




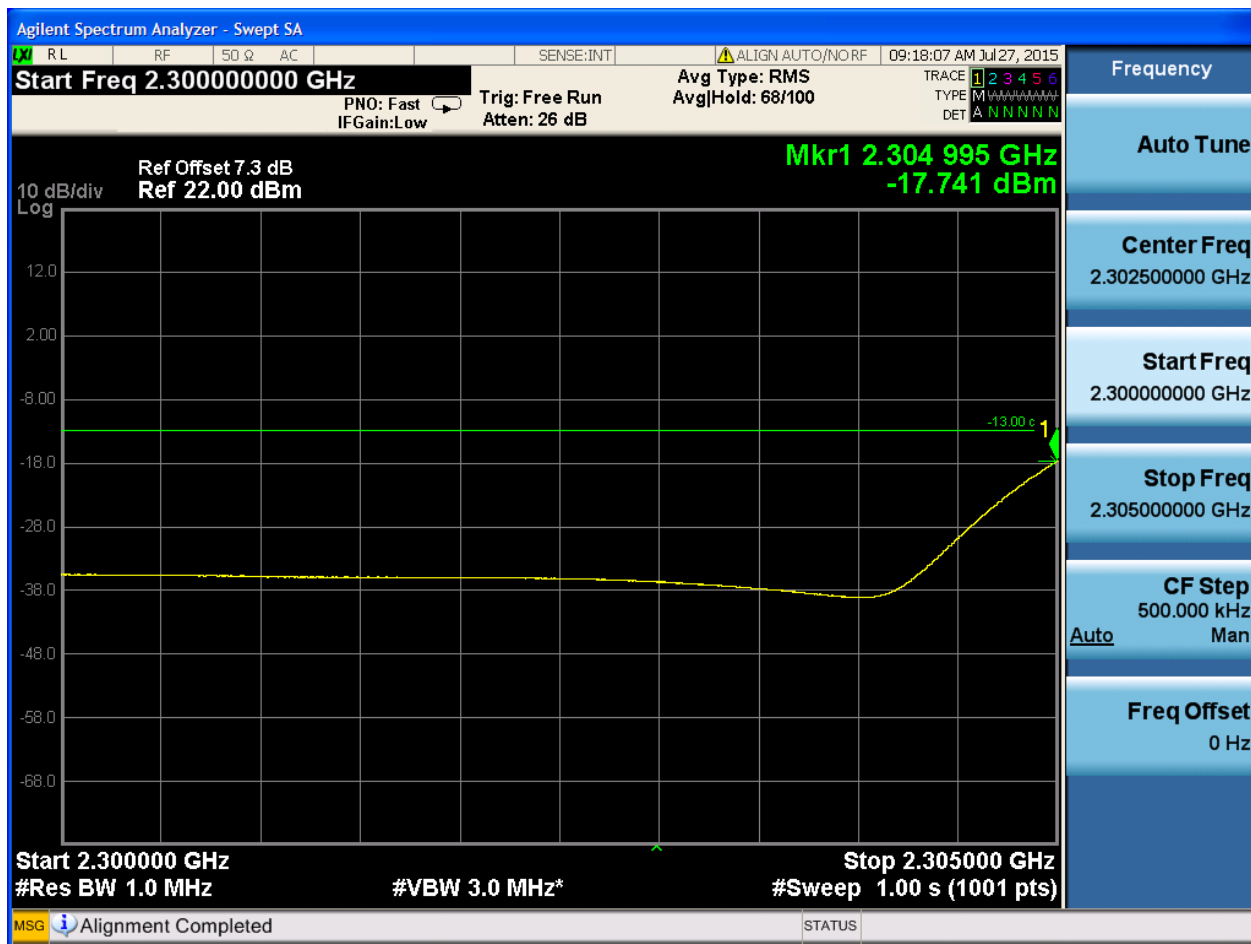


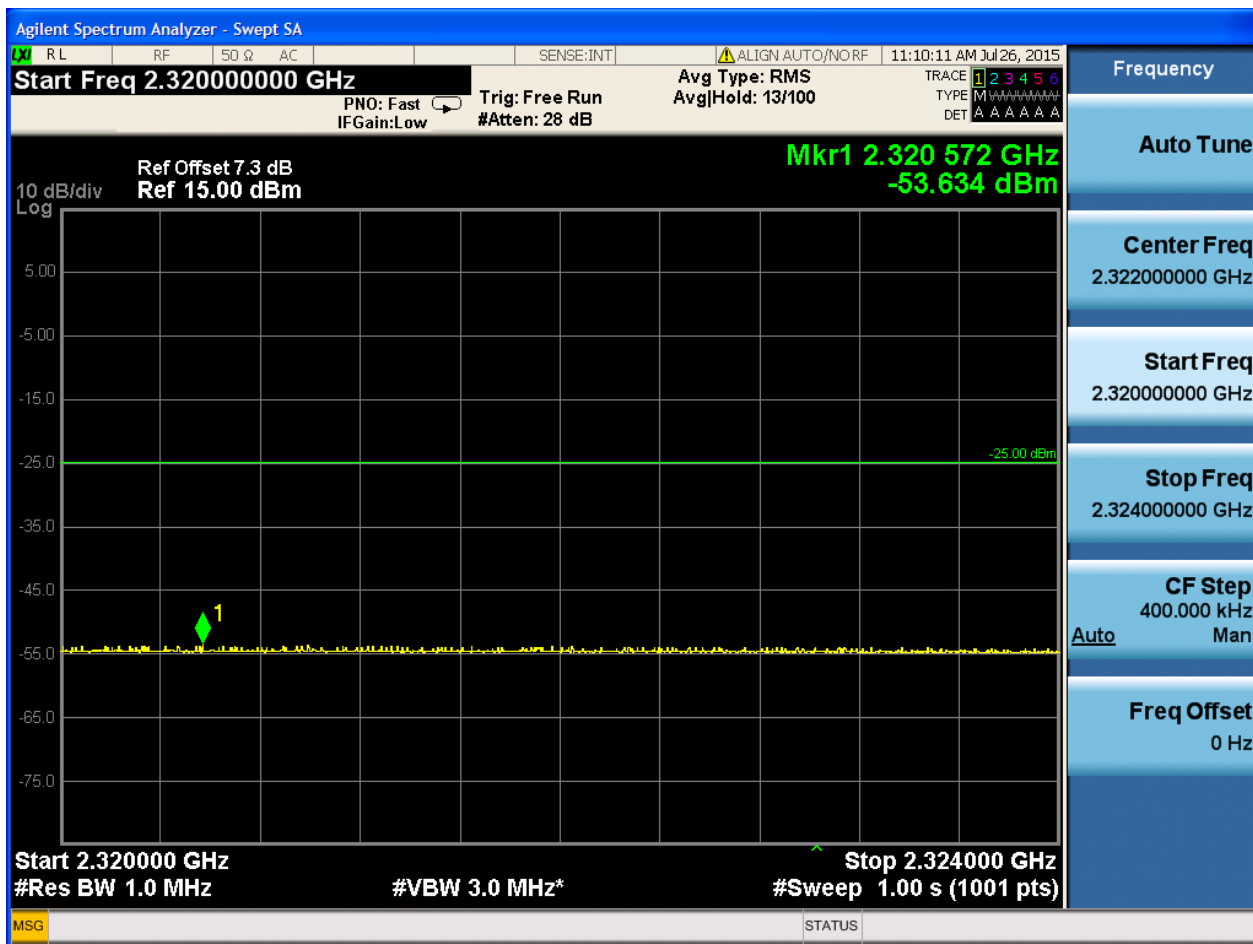


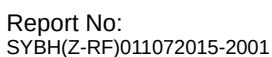




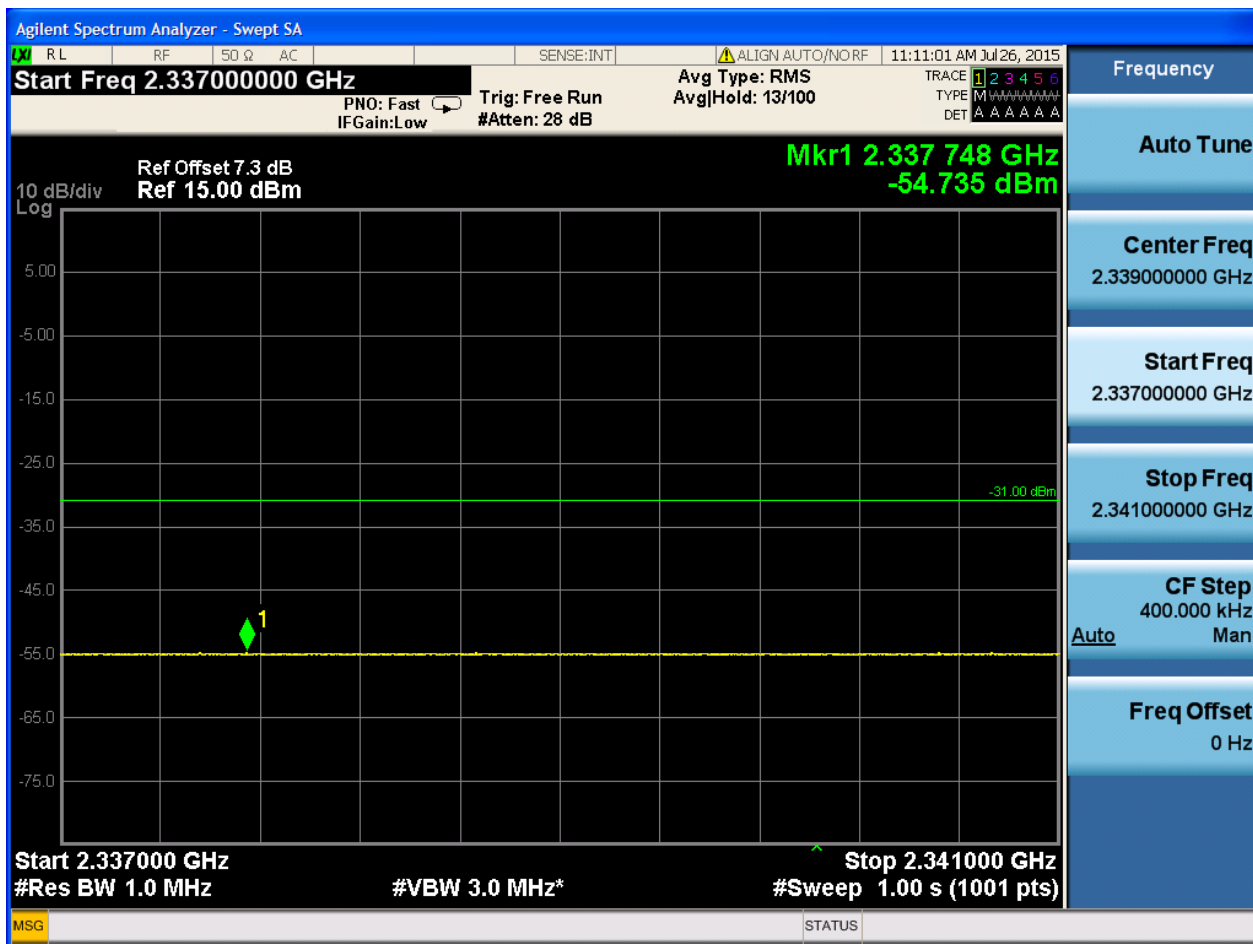


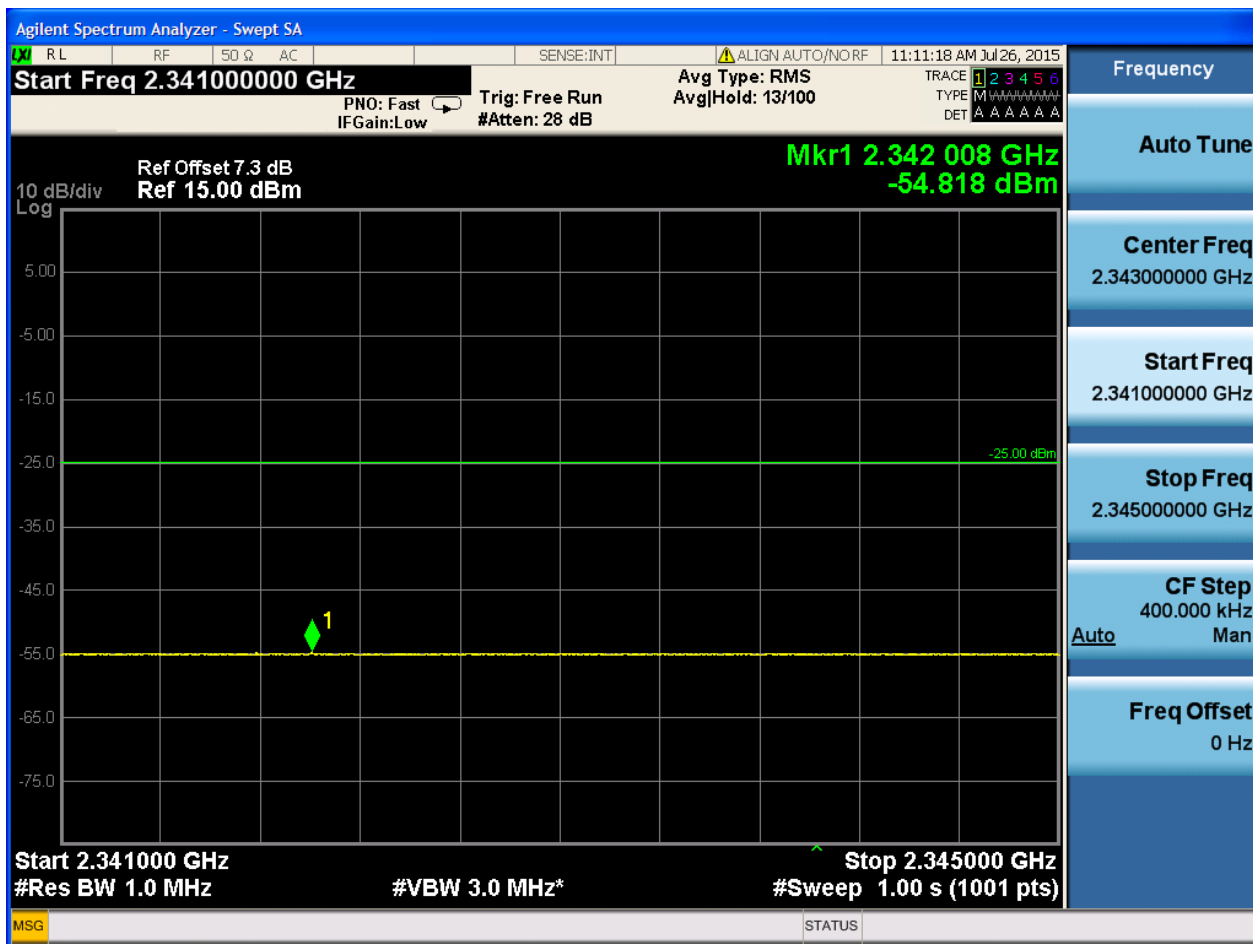


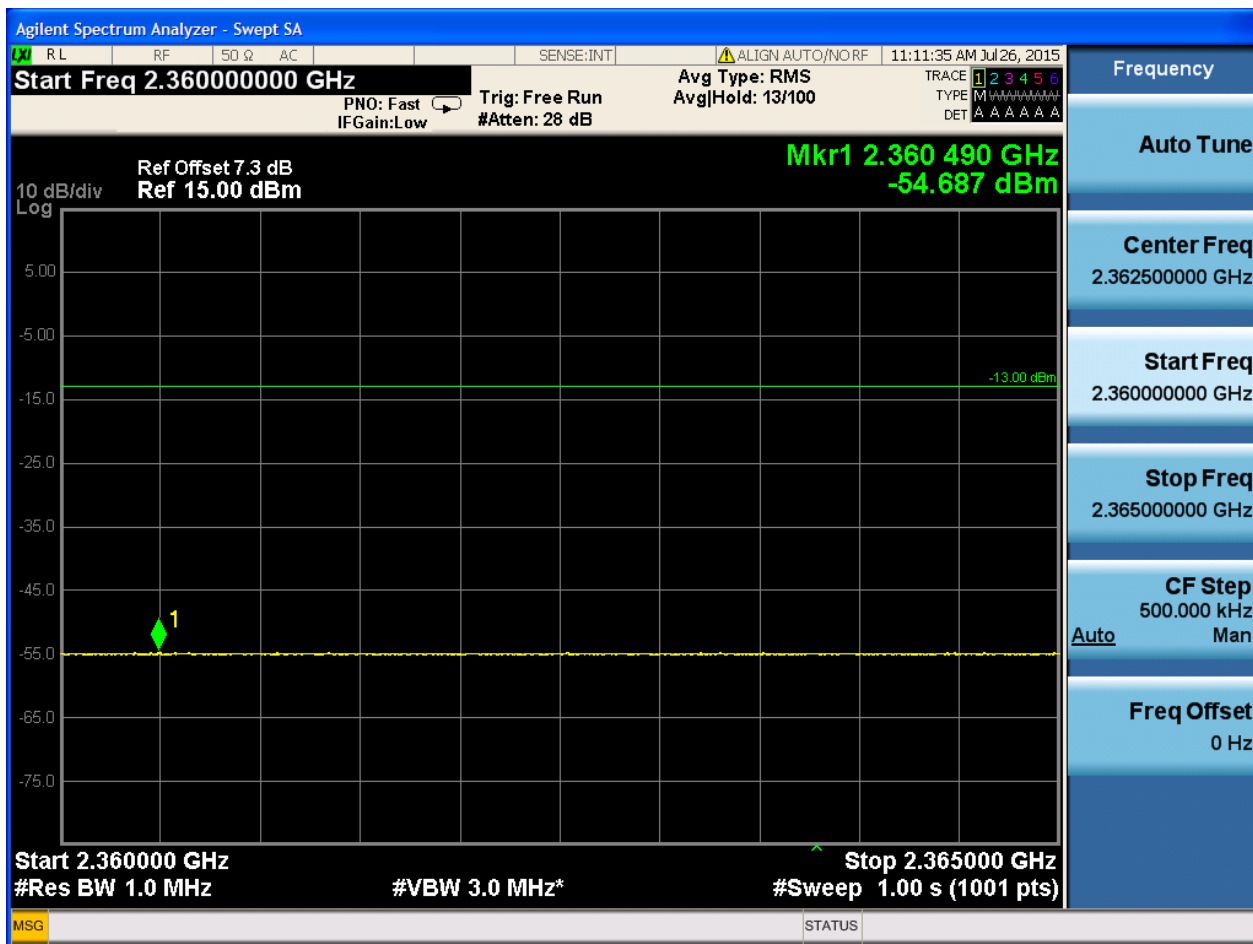




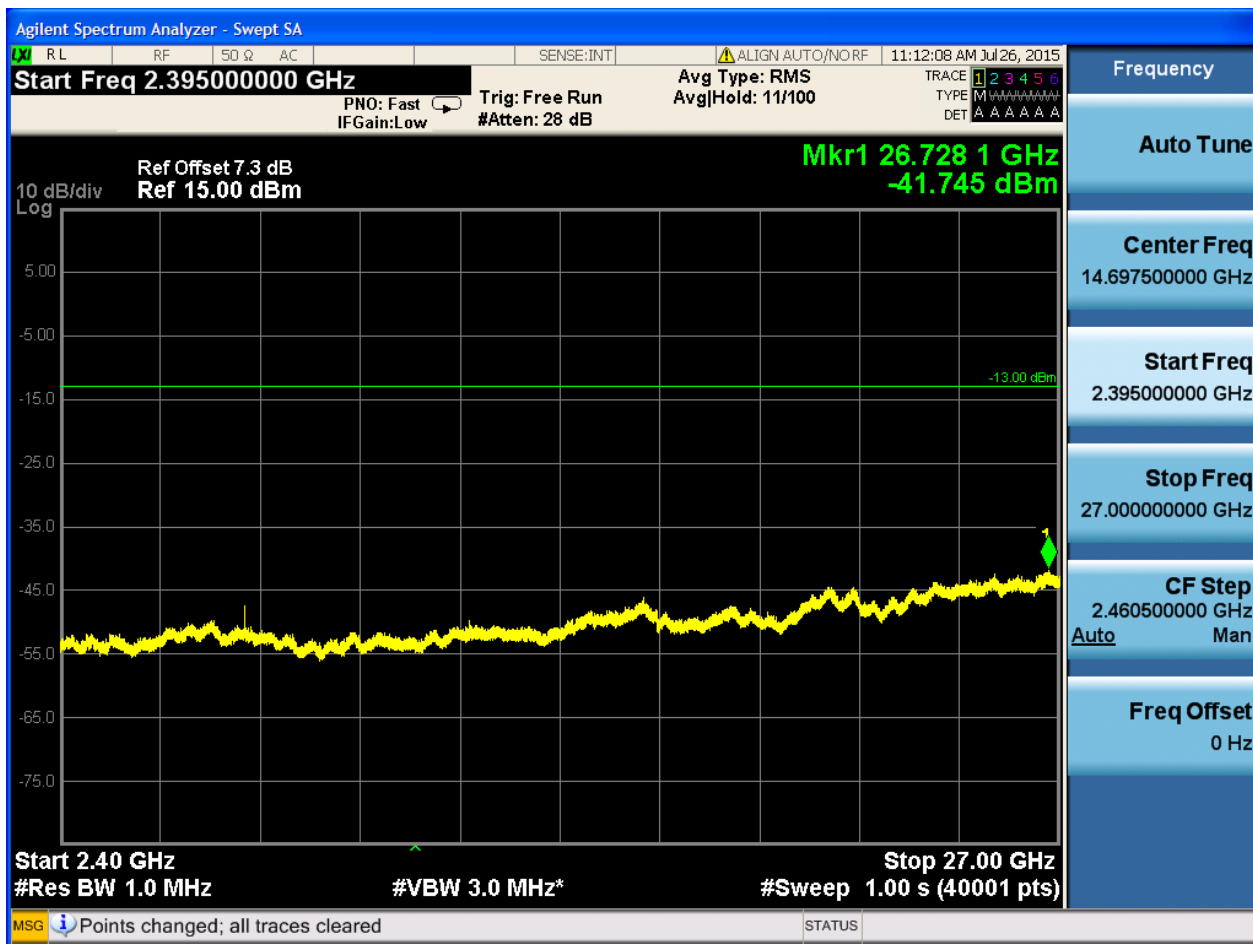






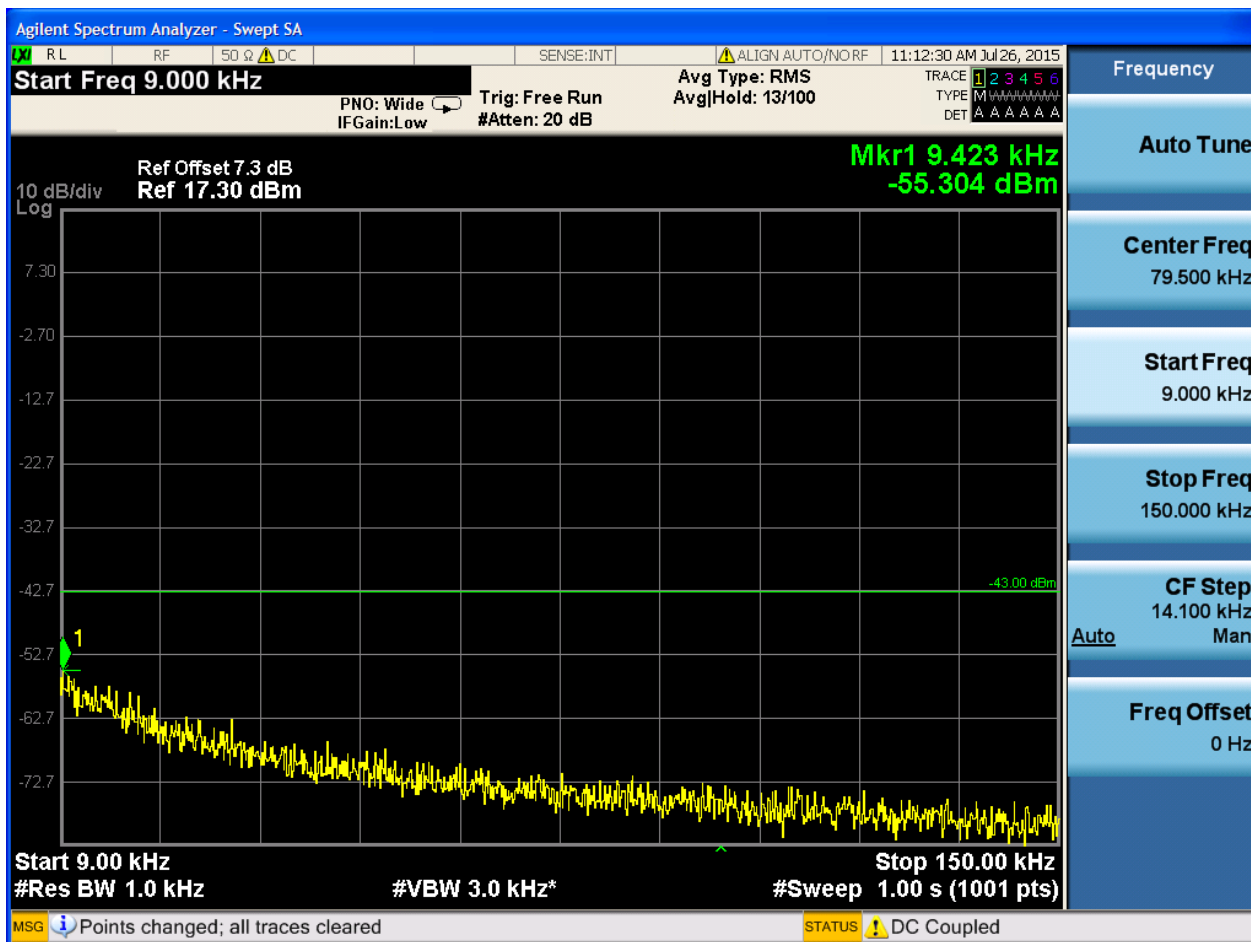


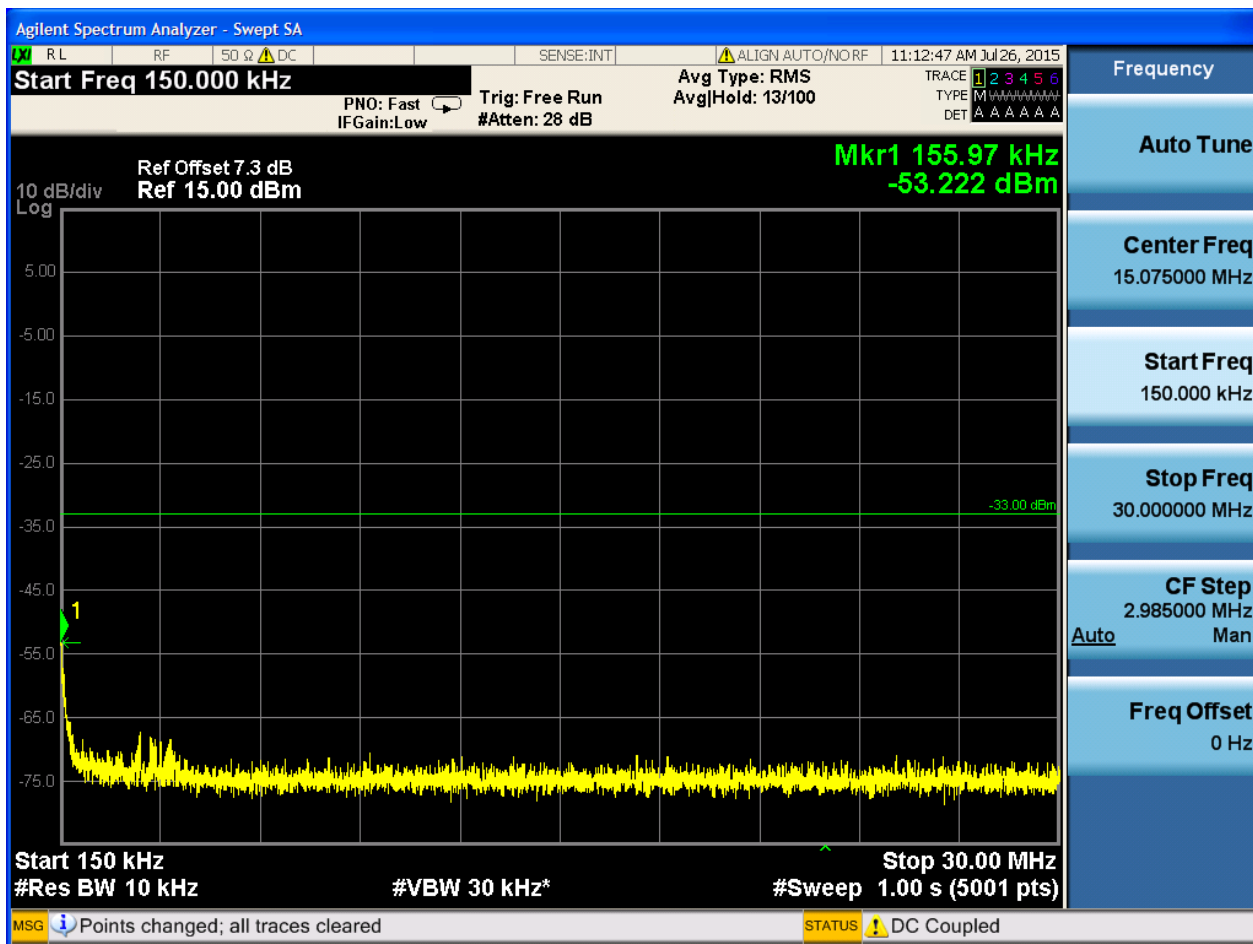


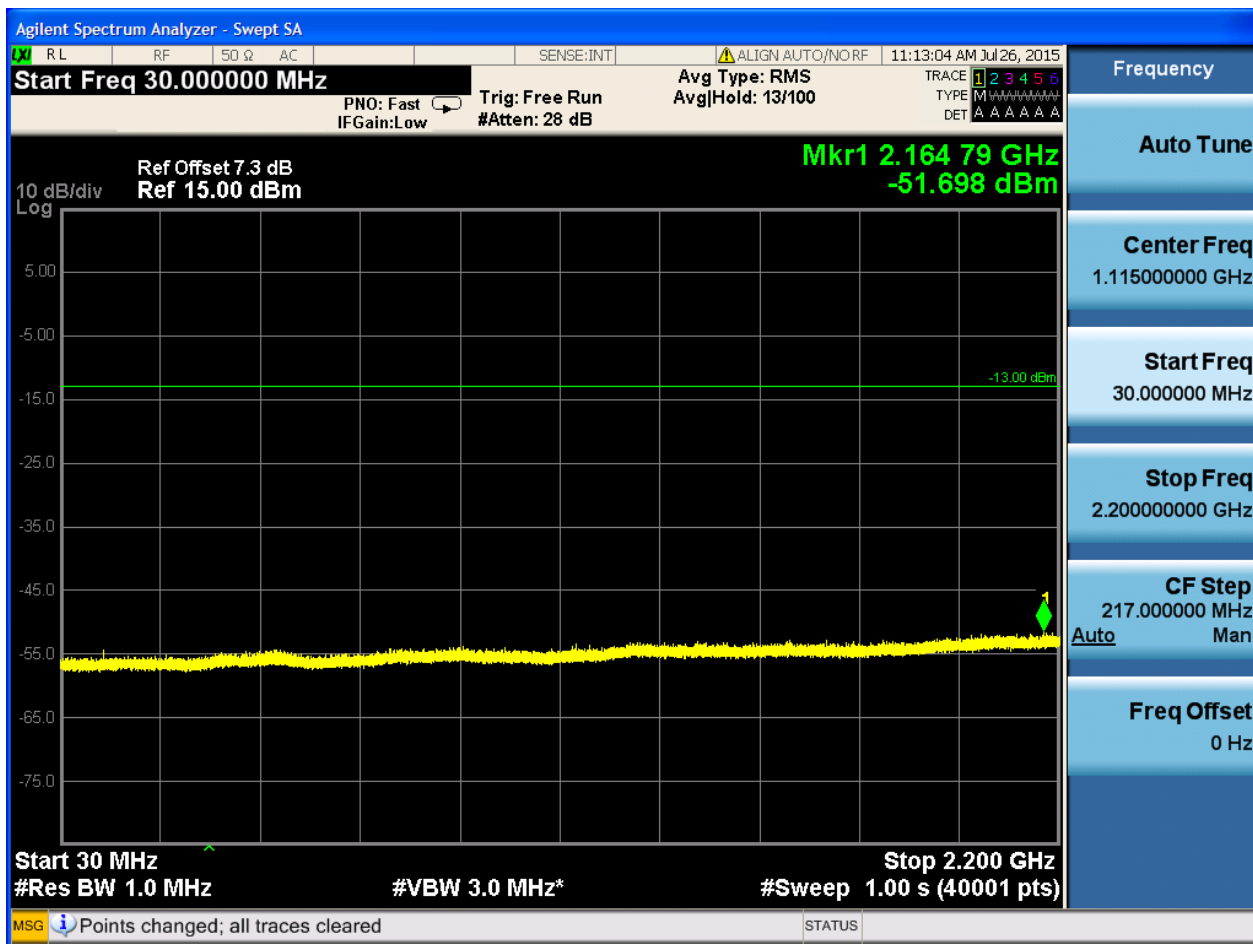


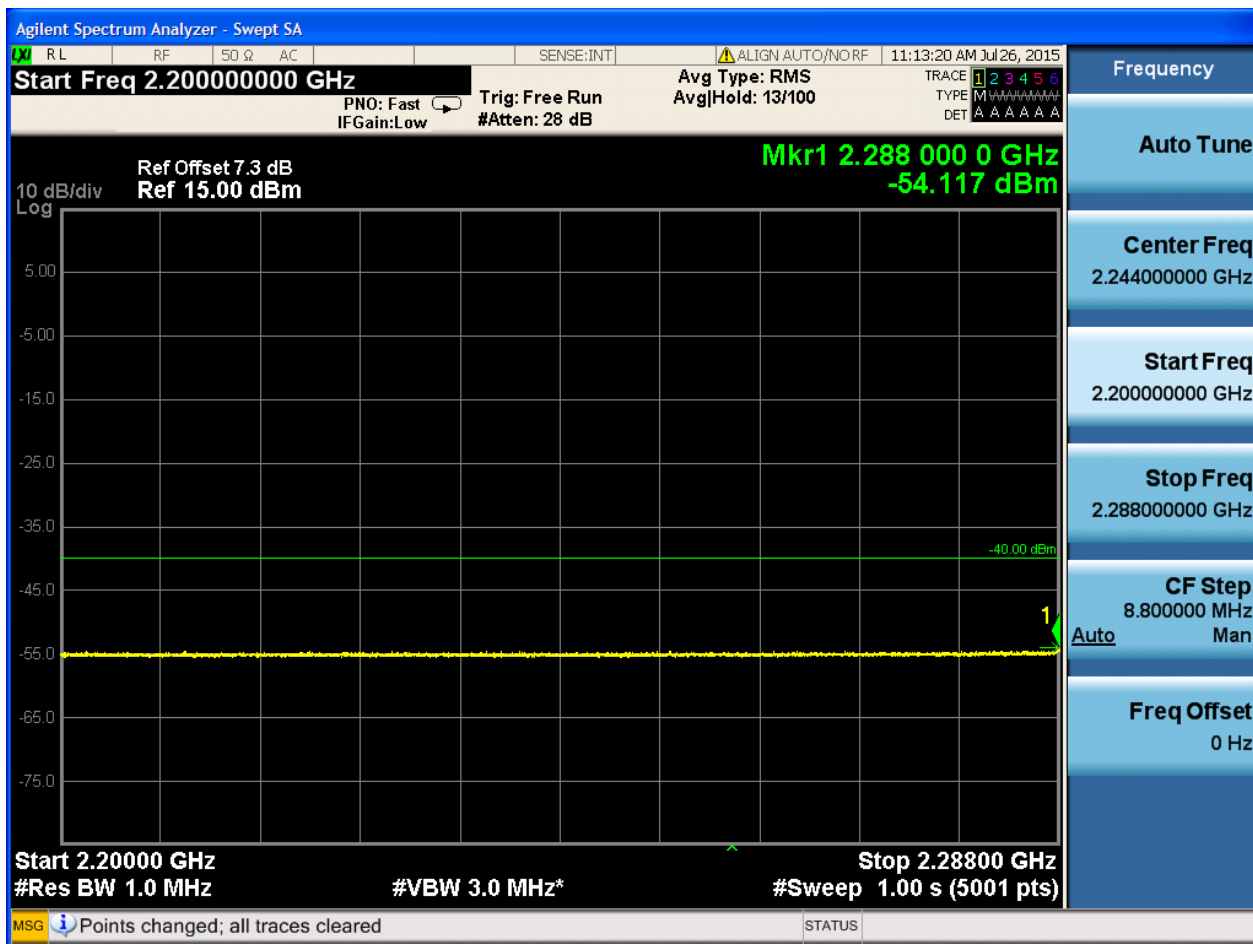
6.3.1.1.1.2 Test Channel = MCH

6.3.1.1.1.2.1 Test RB = RB1#0

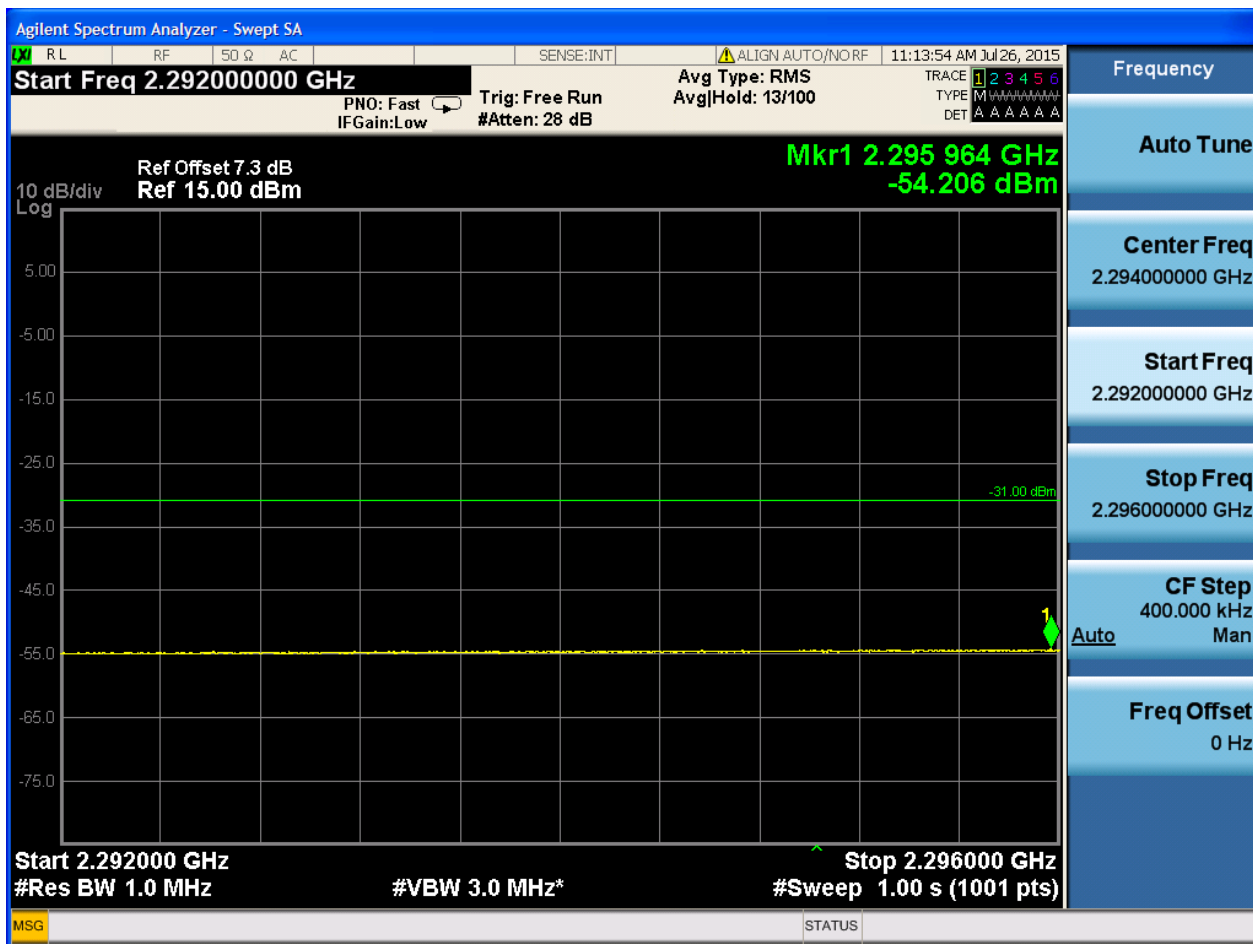




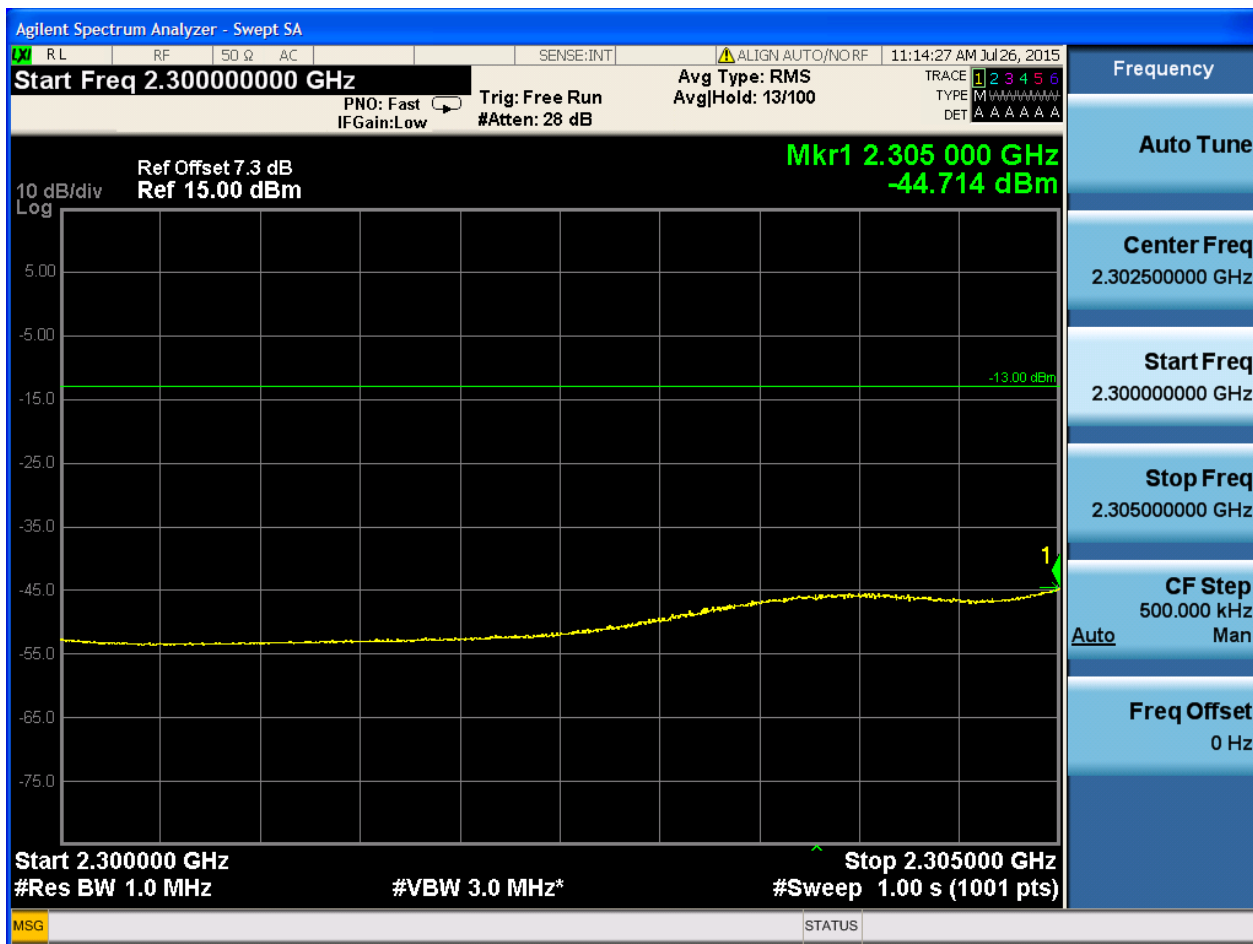


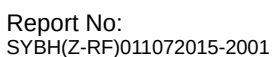


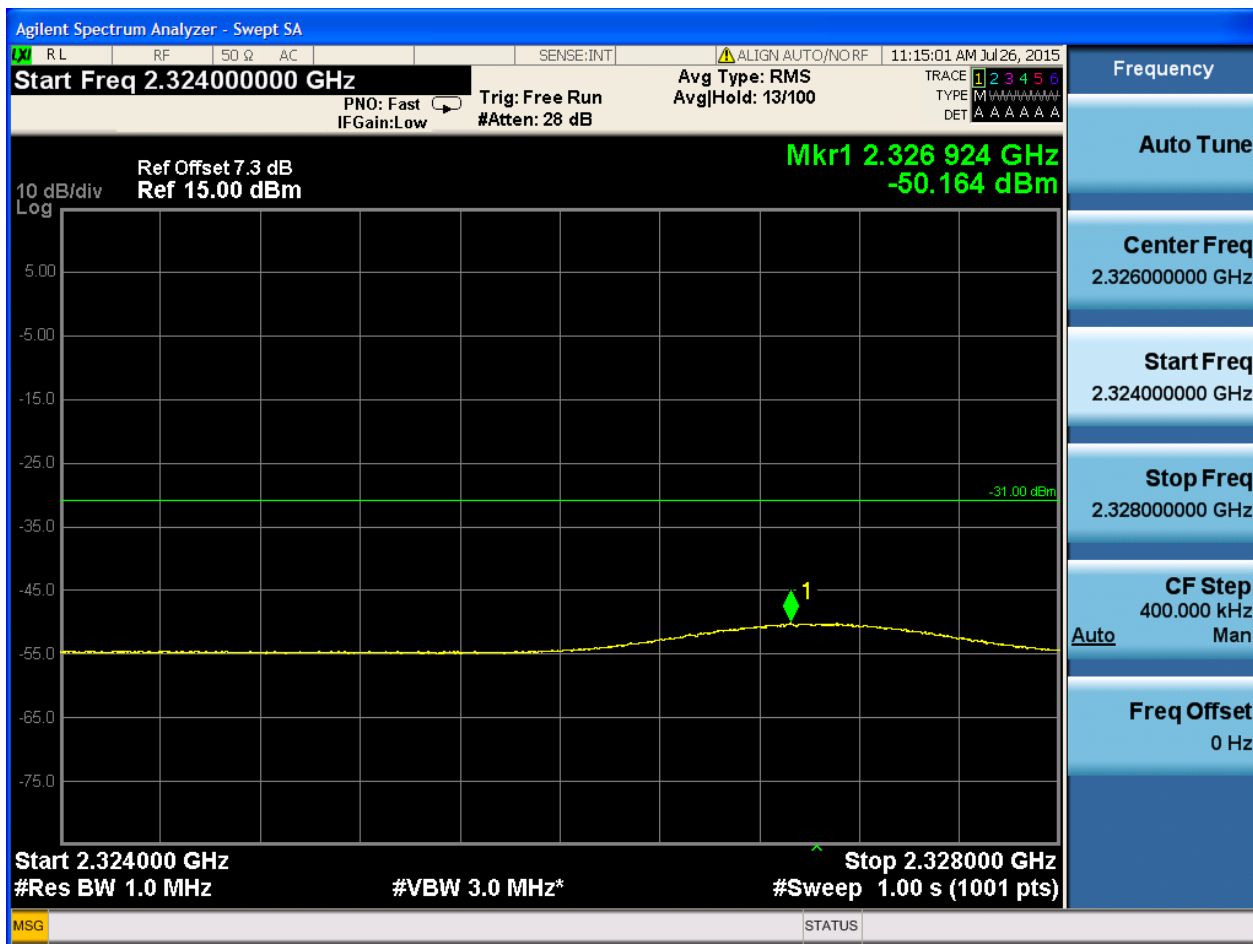


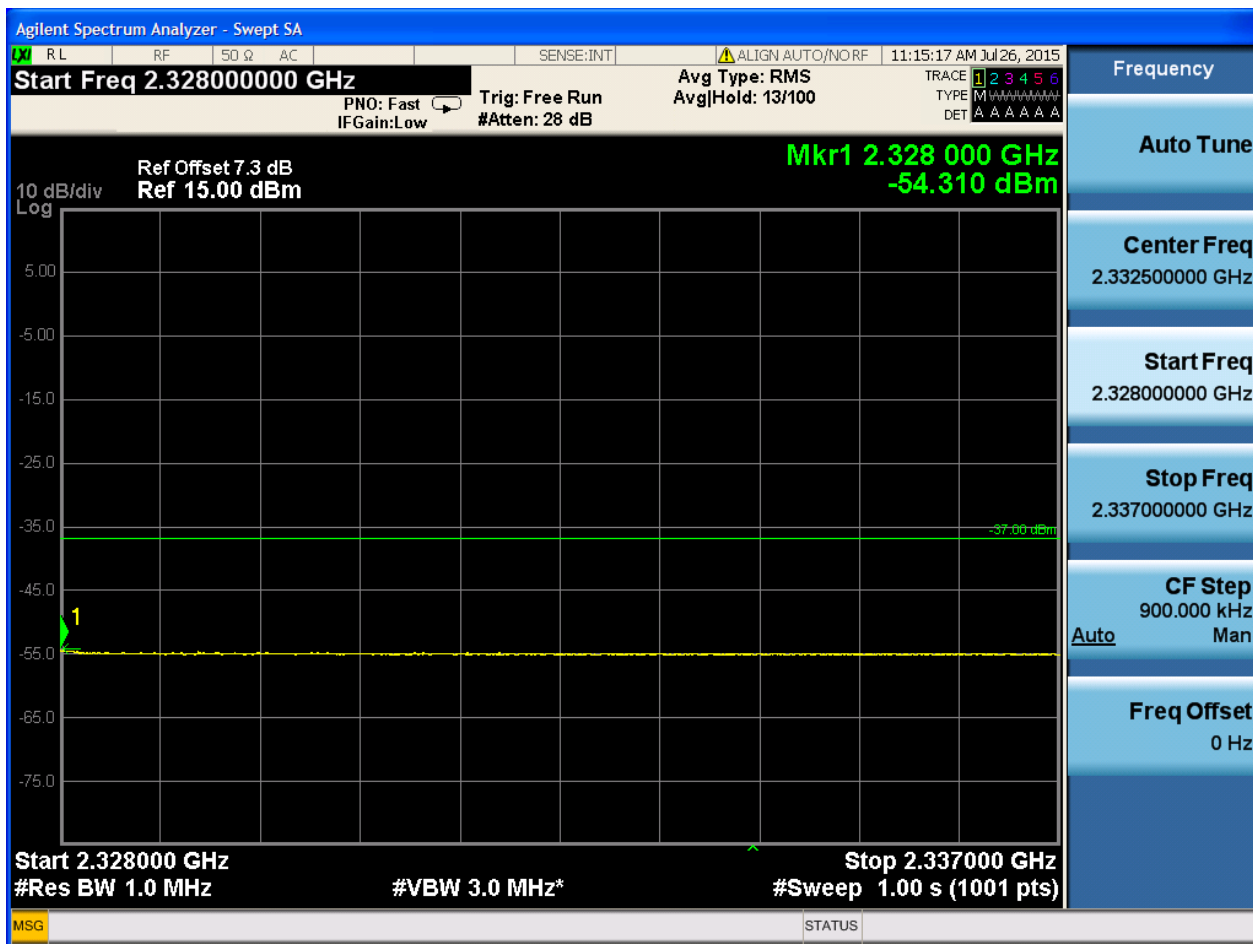


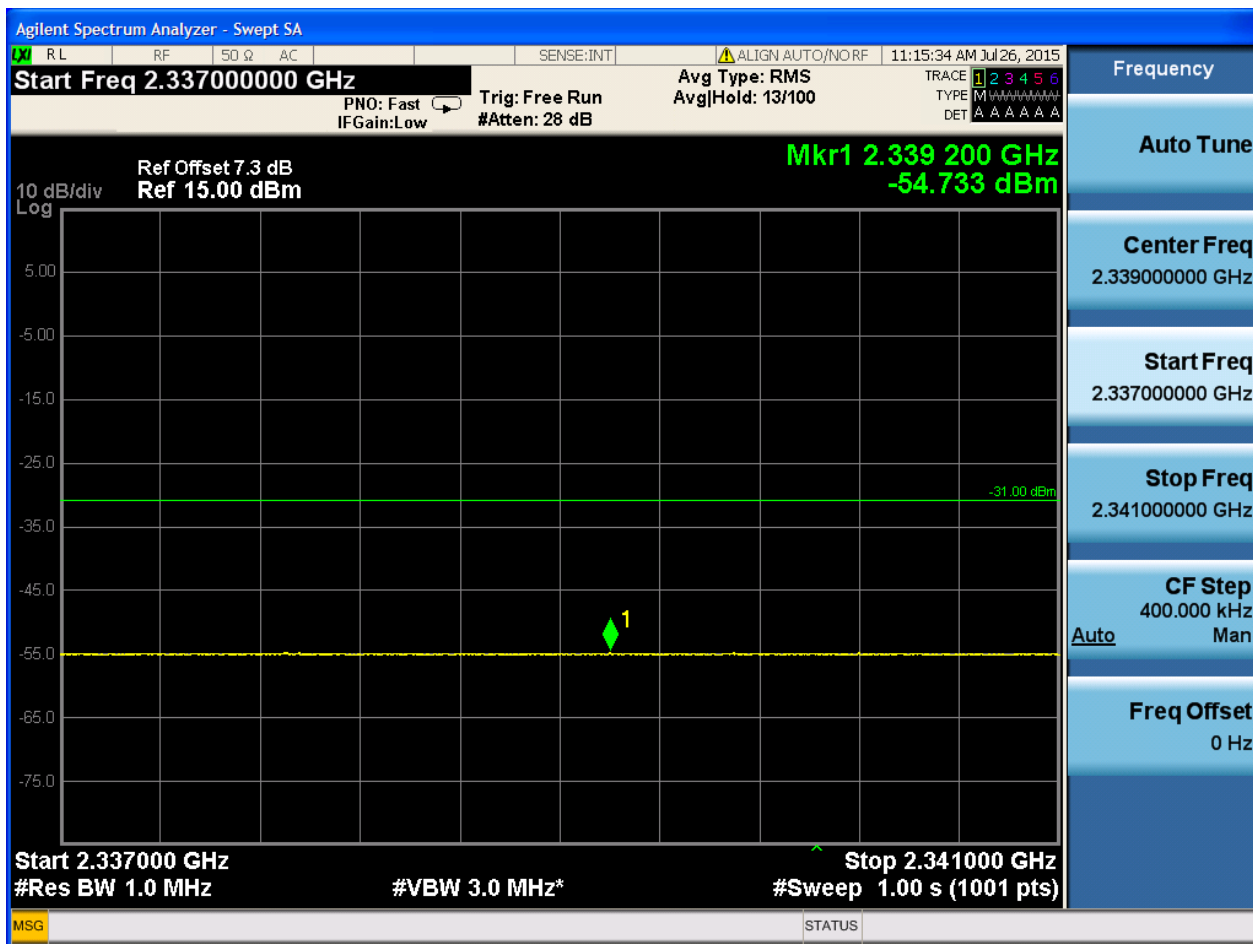


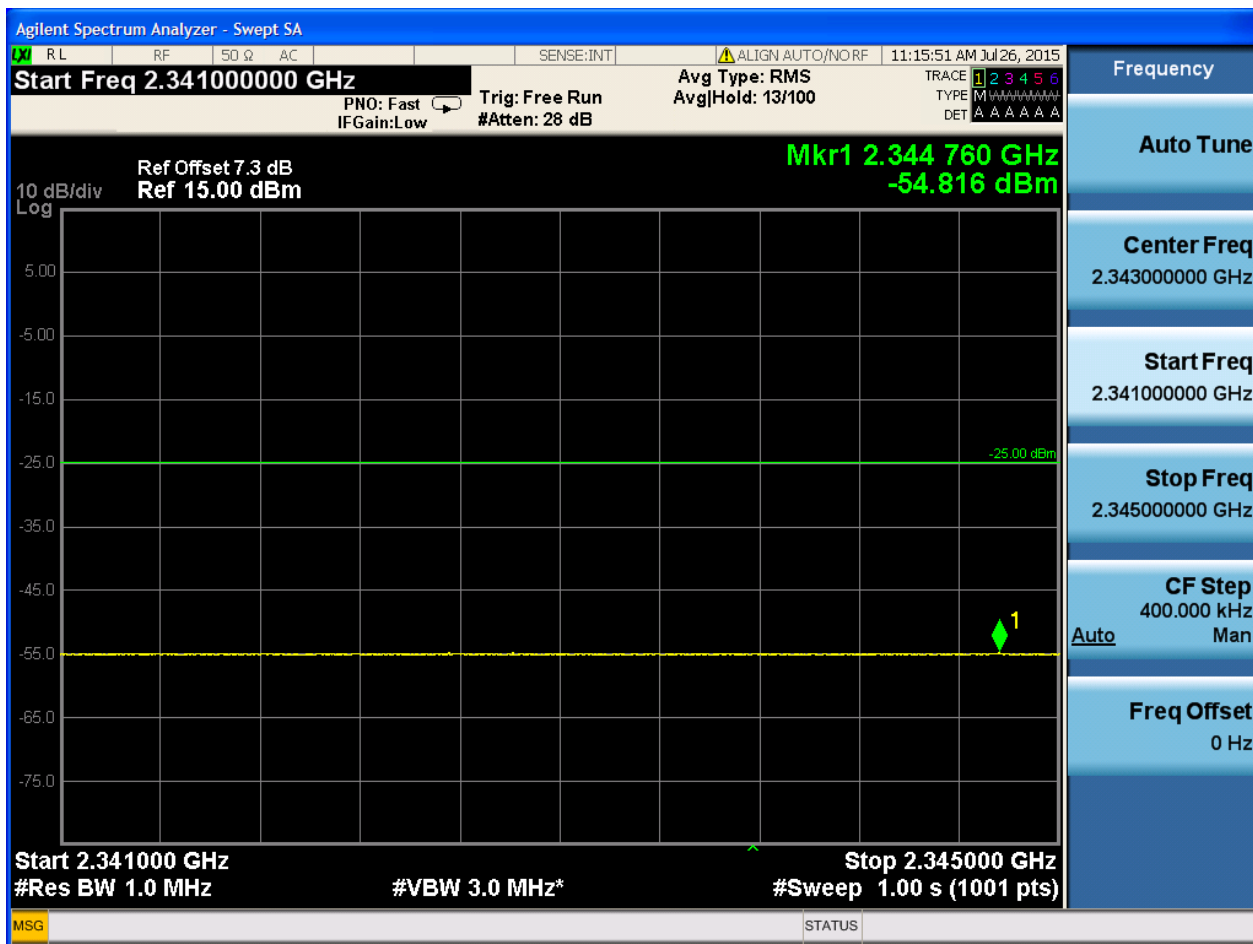


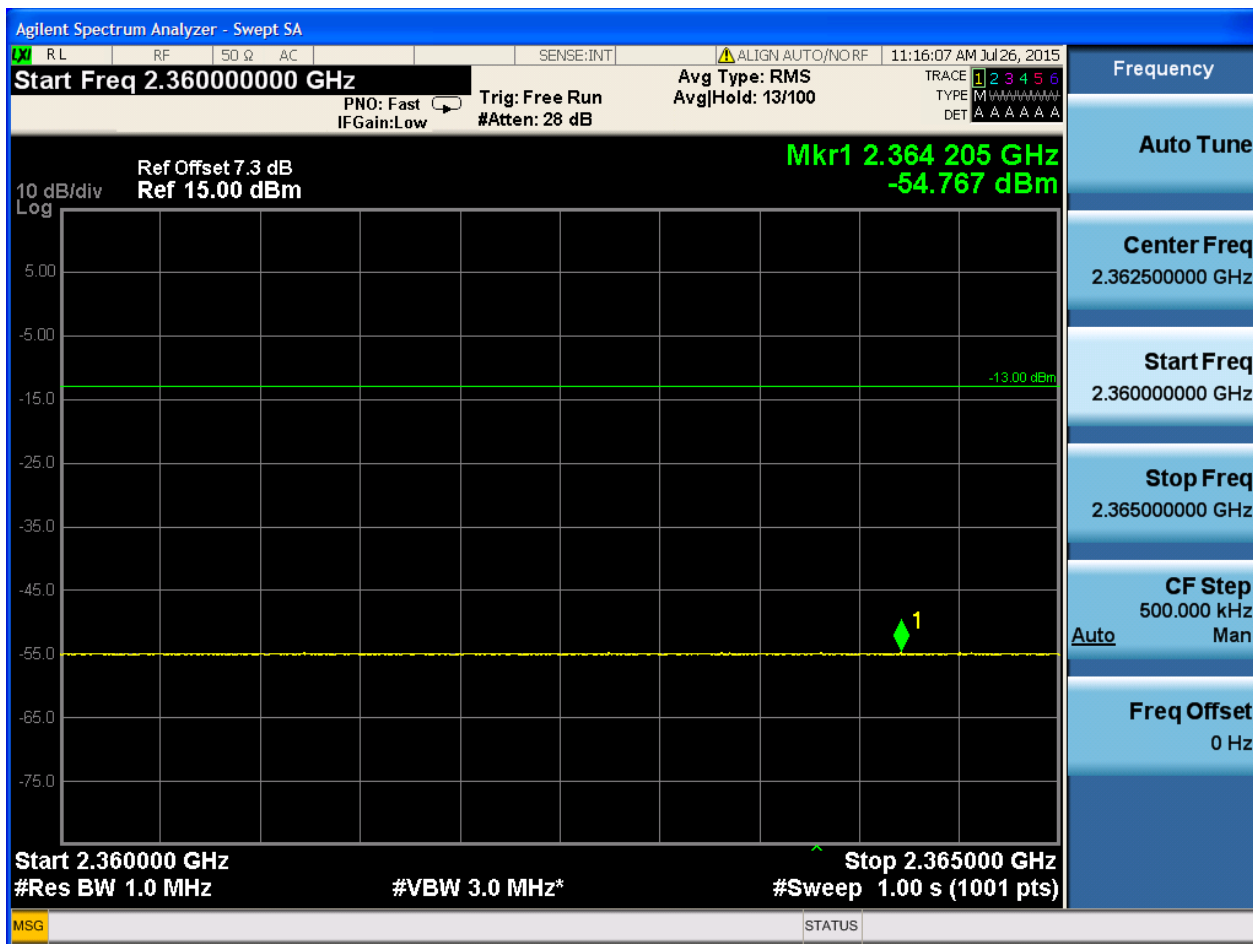


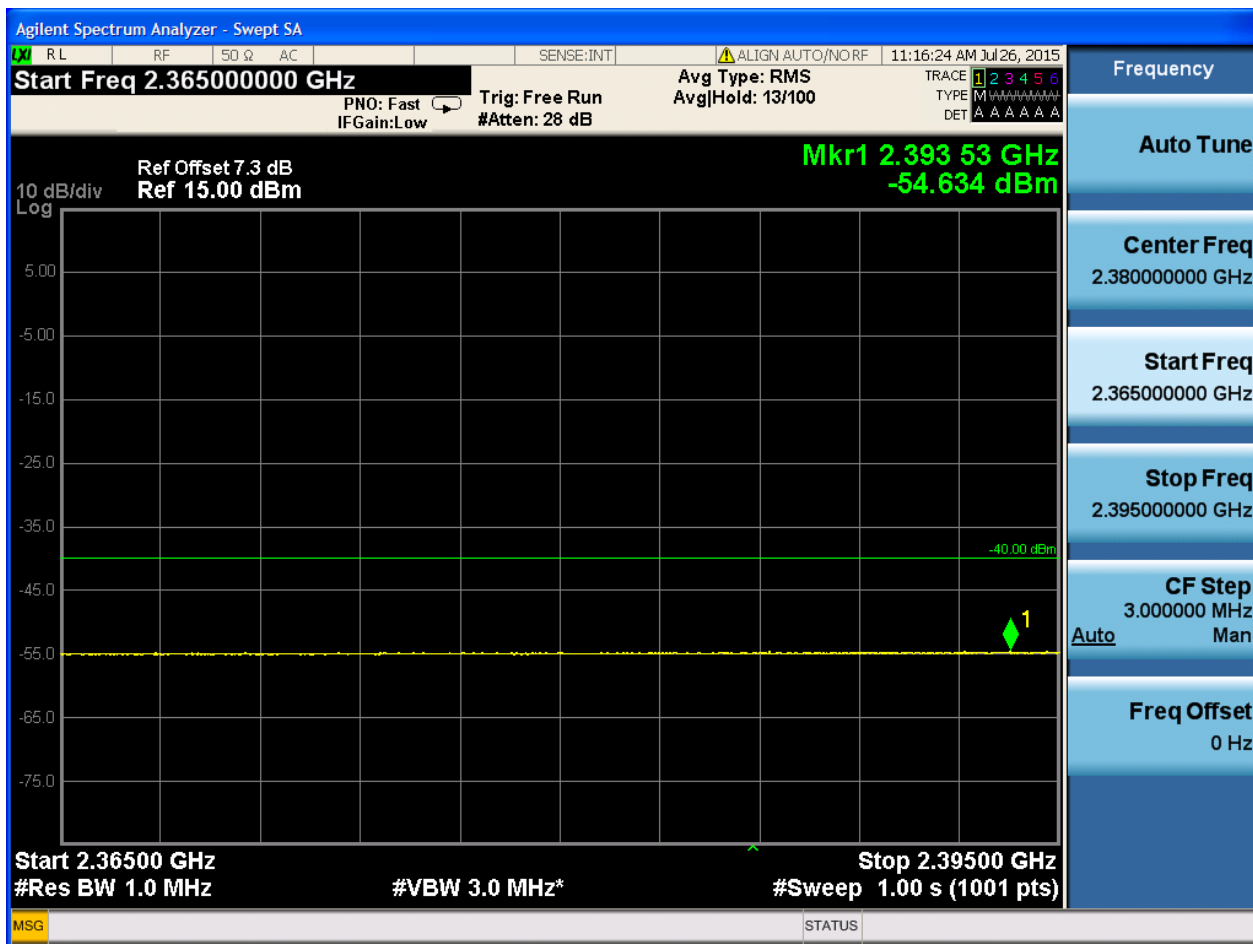


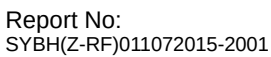








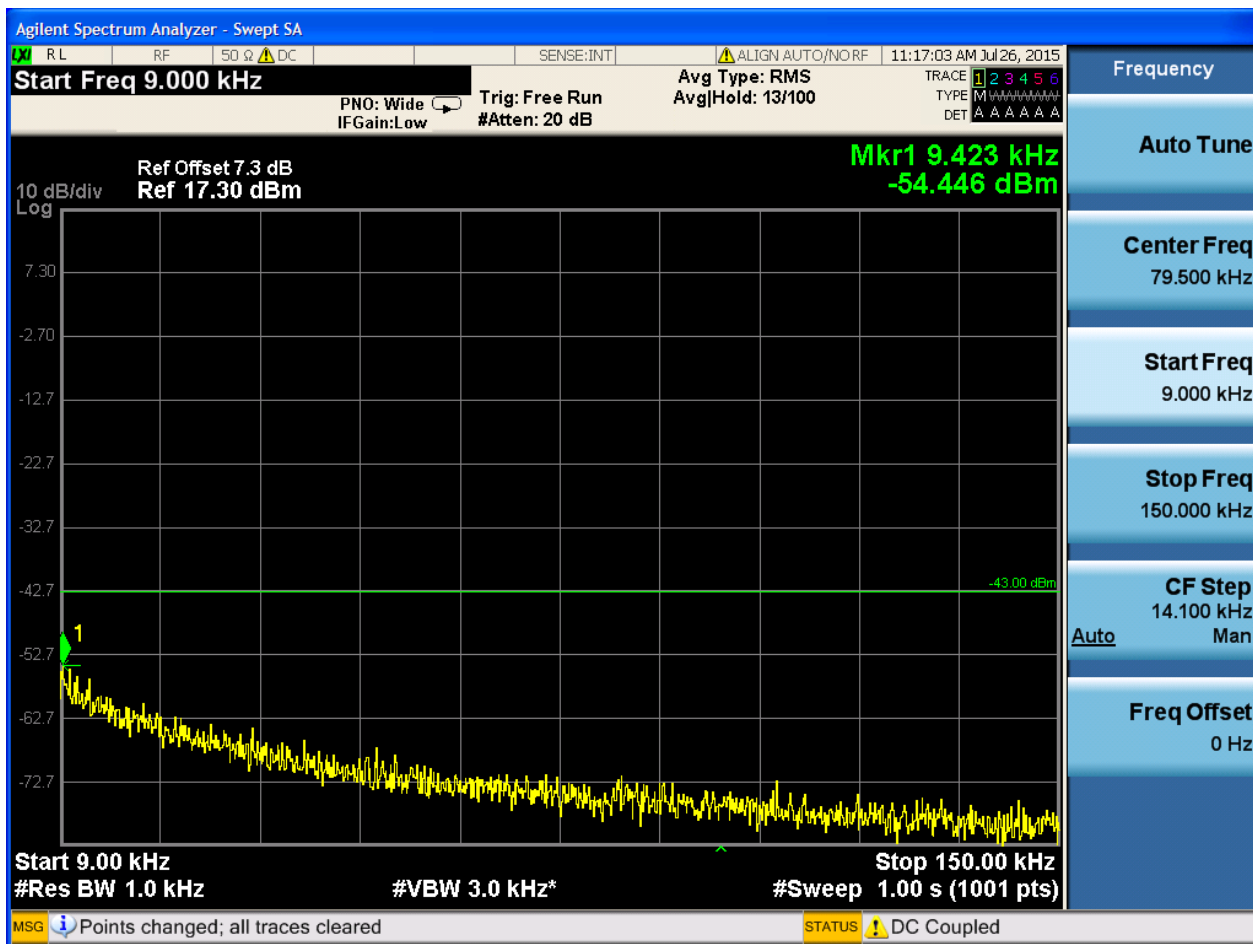


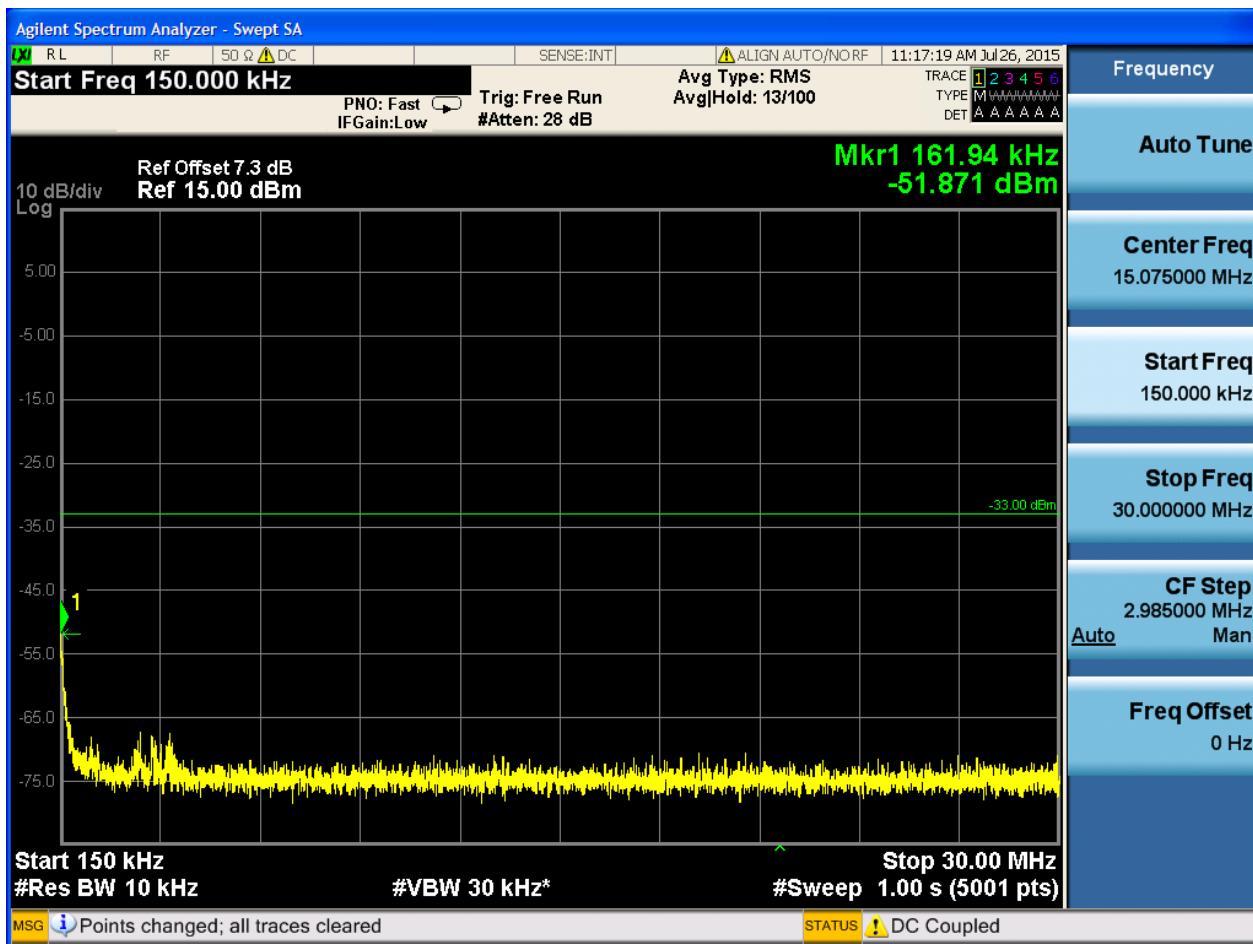


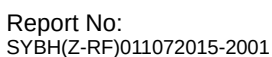


6.3.1.1.1.3 Test Channel = HCH

6.3.1.1.1.3.1 Test RB = RB1#0

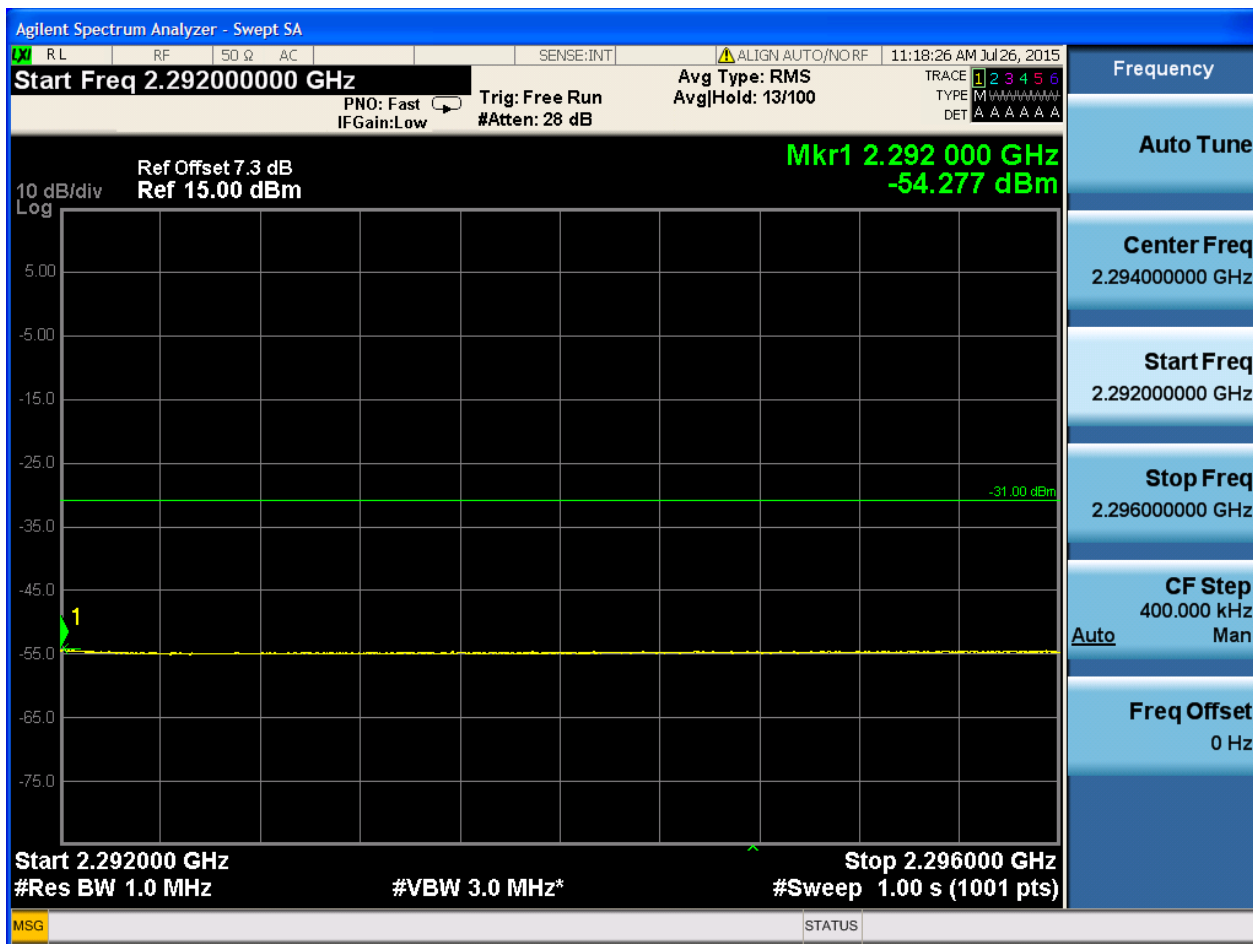


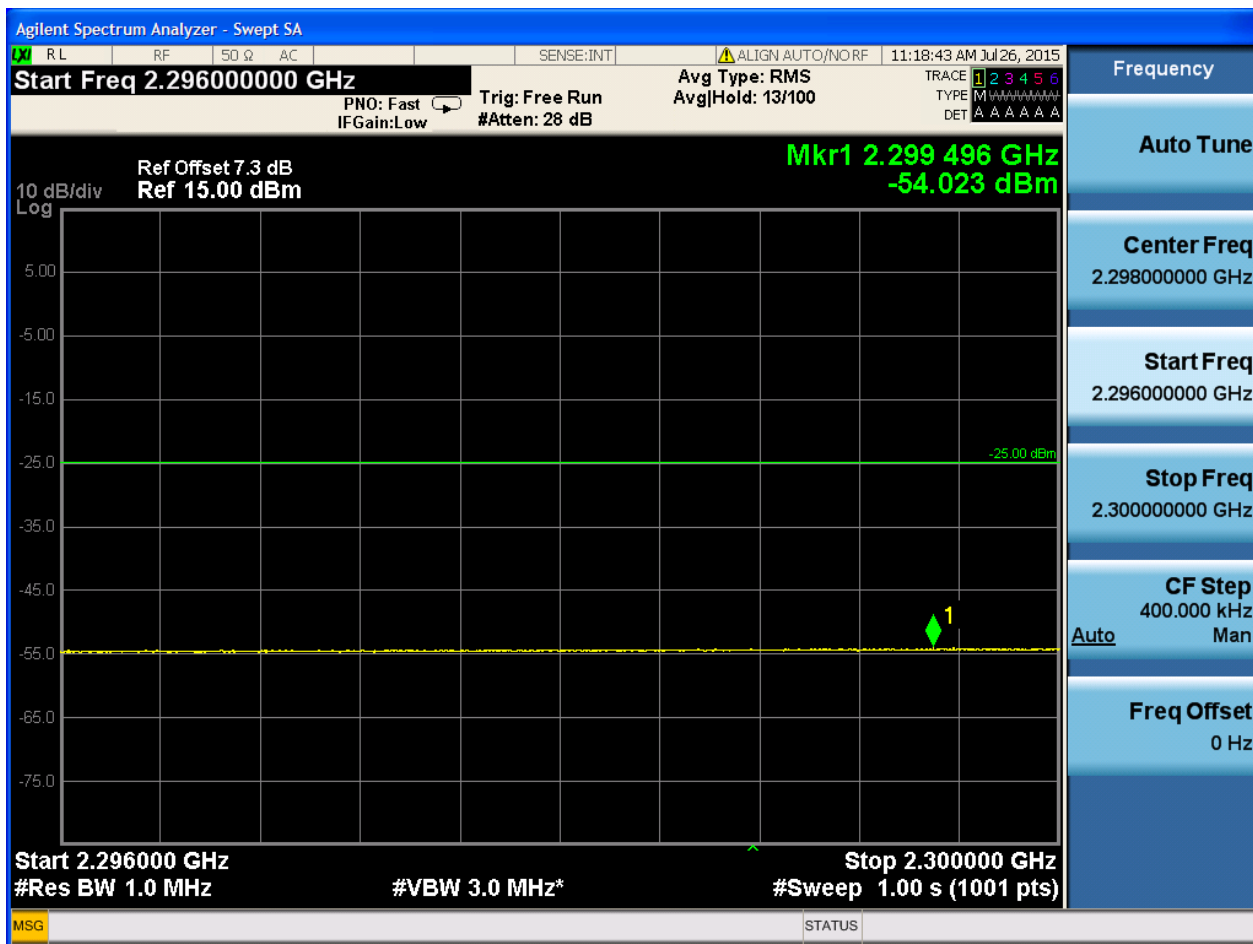


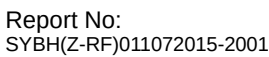


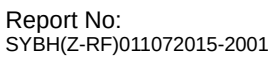


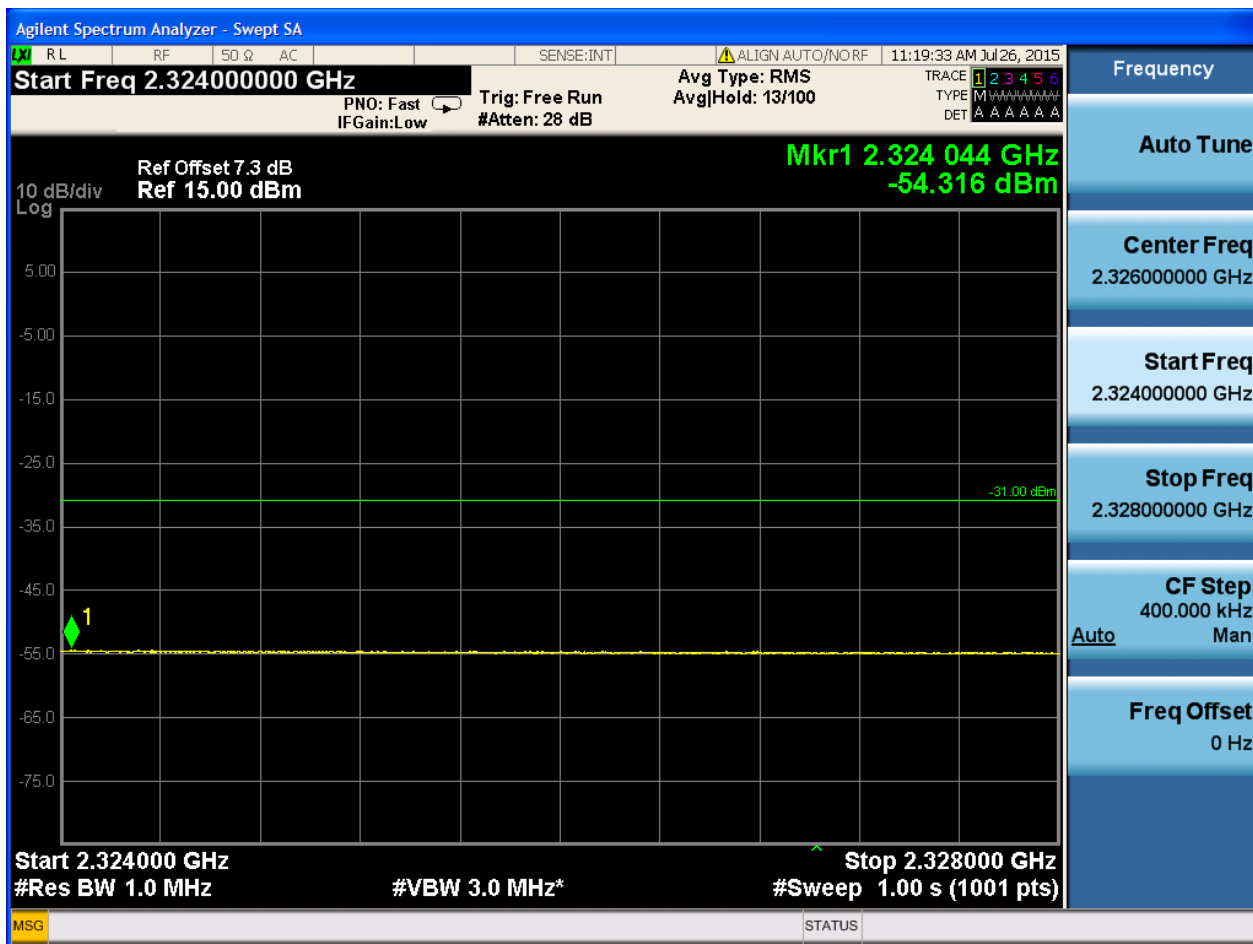




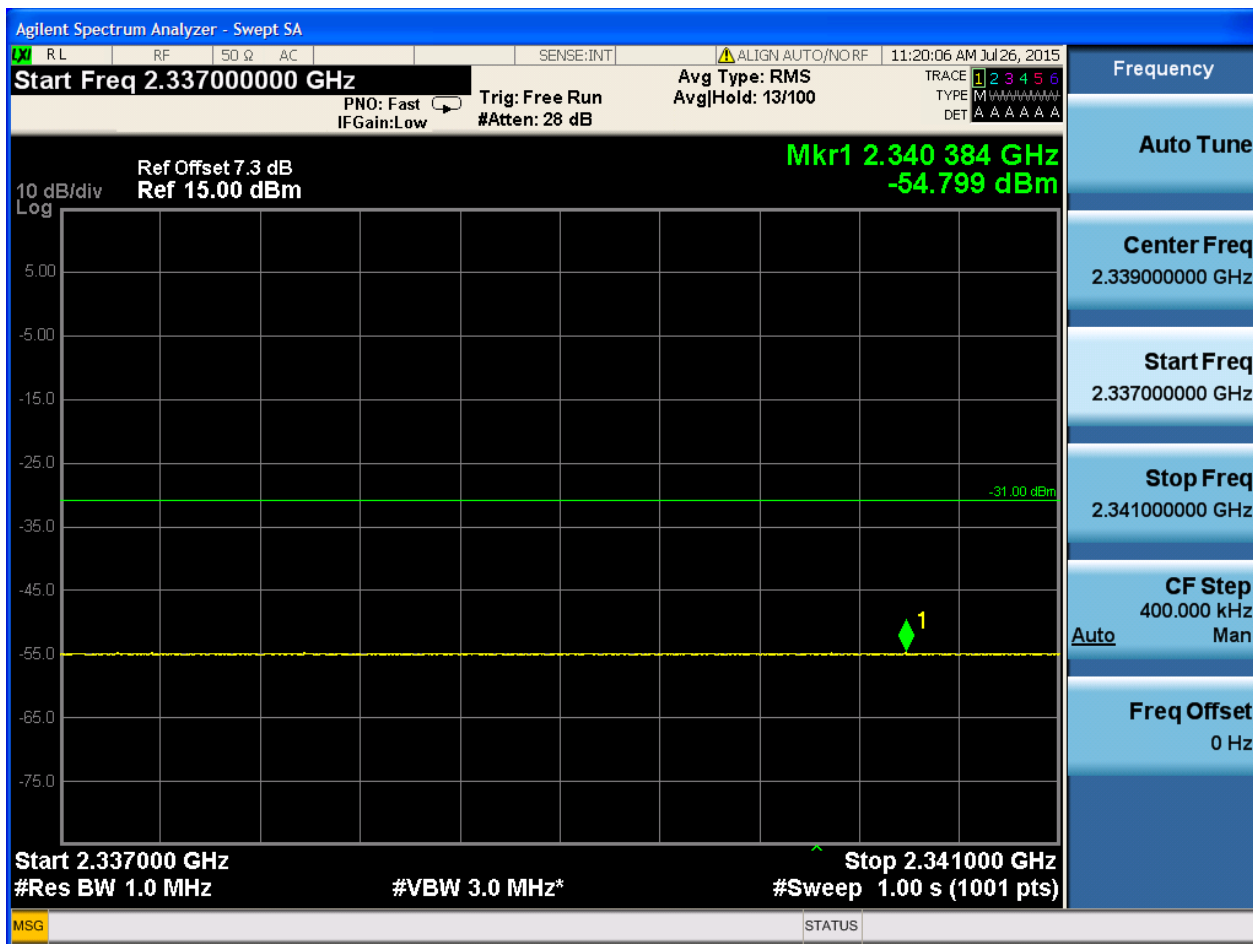


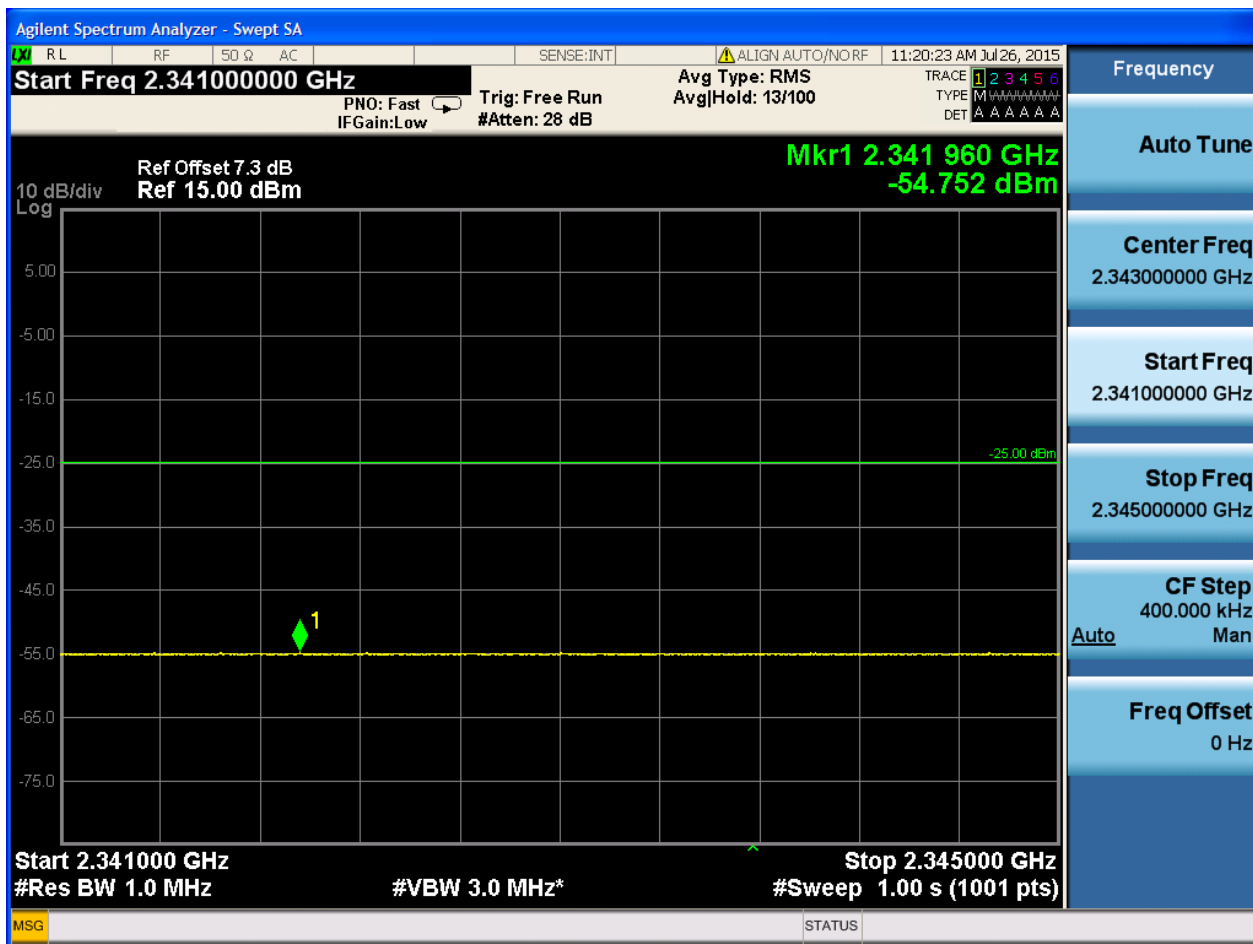


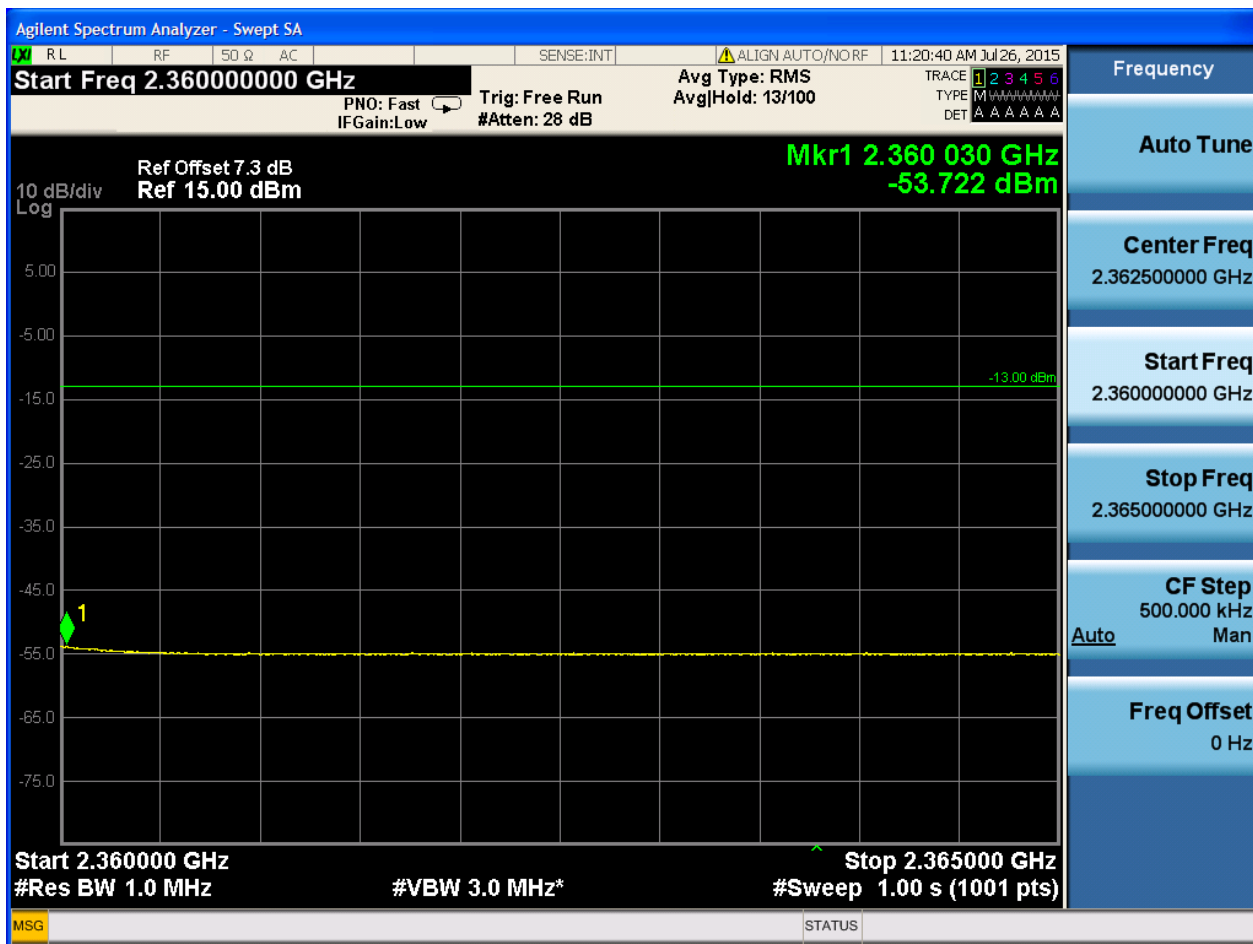


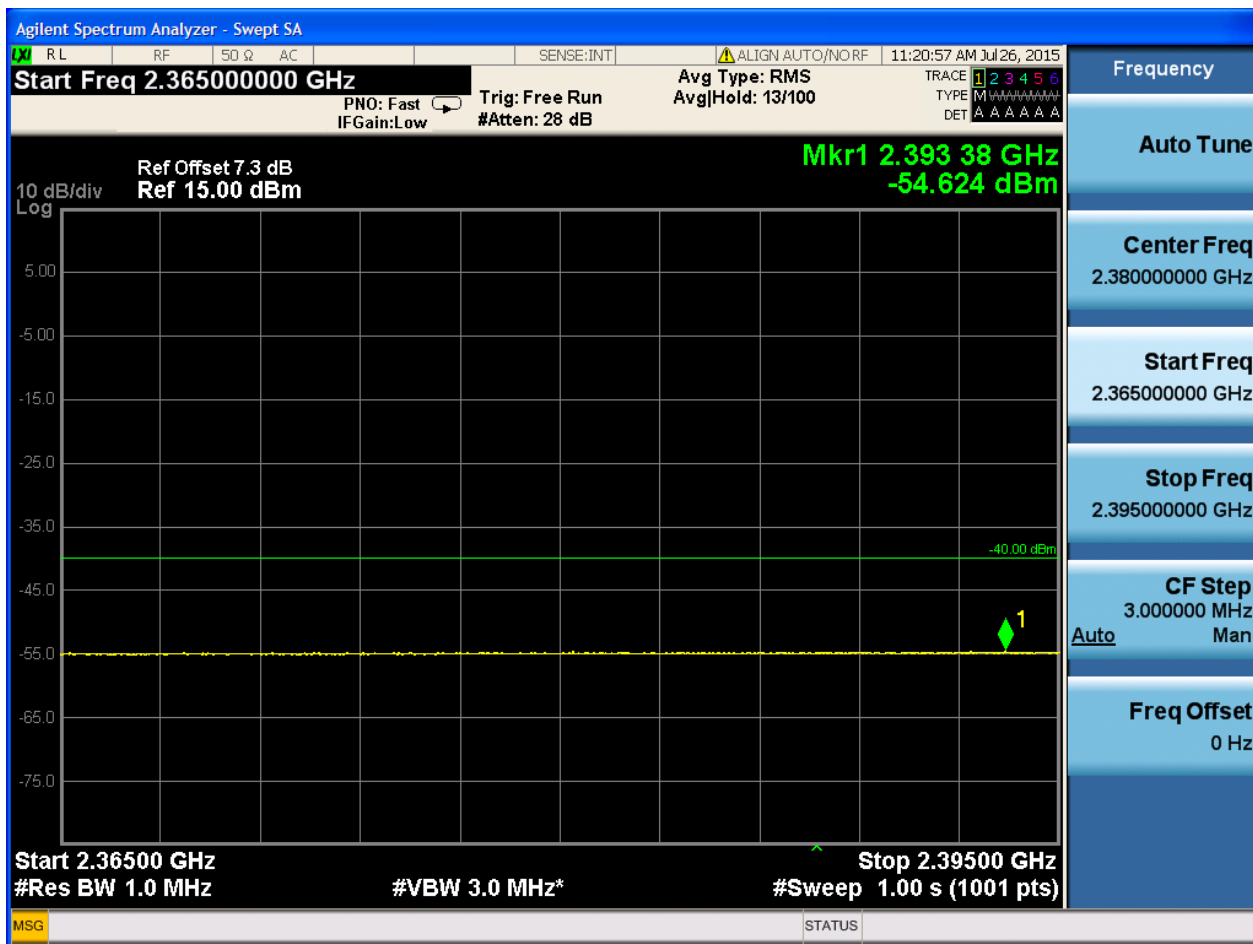


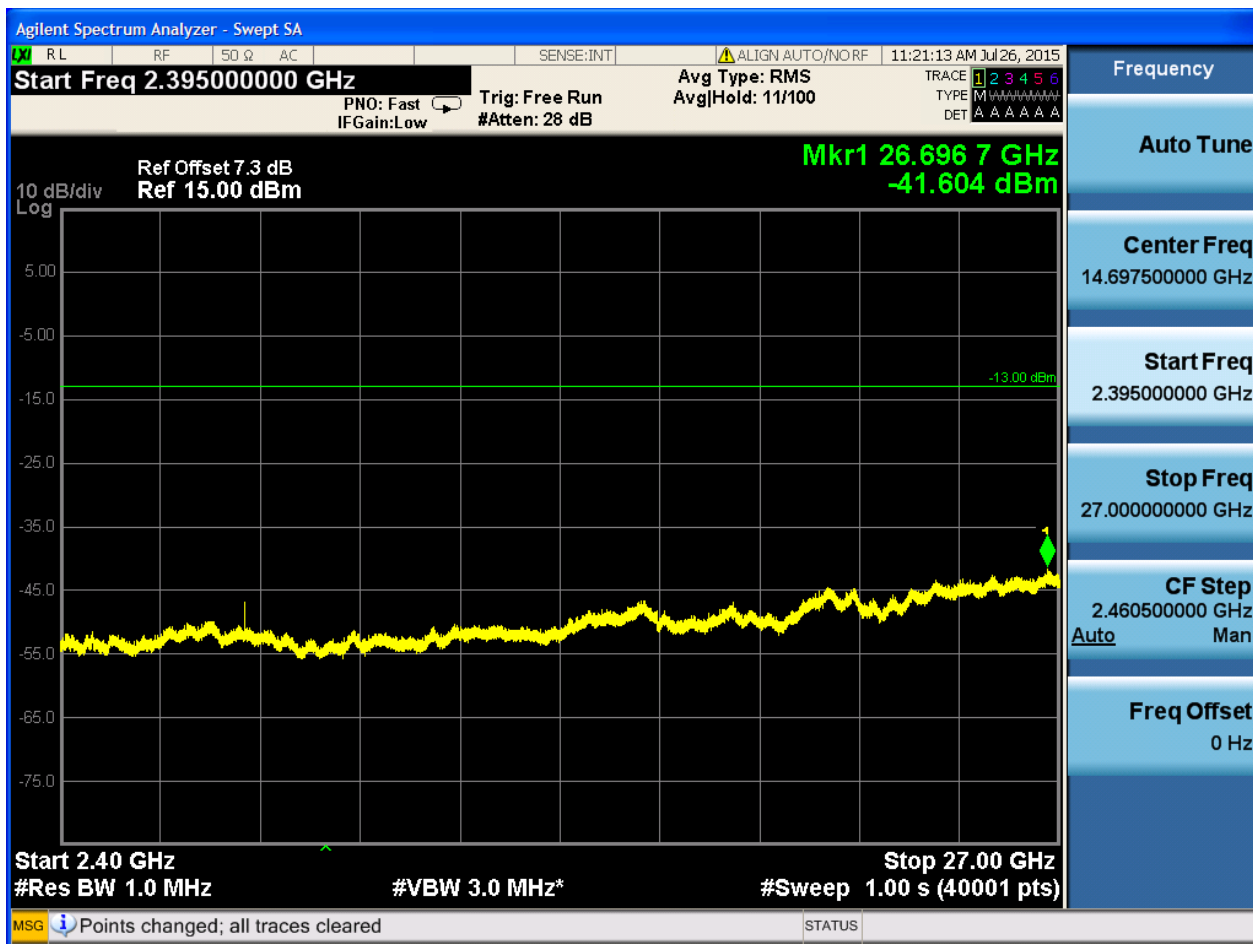










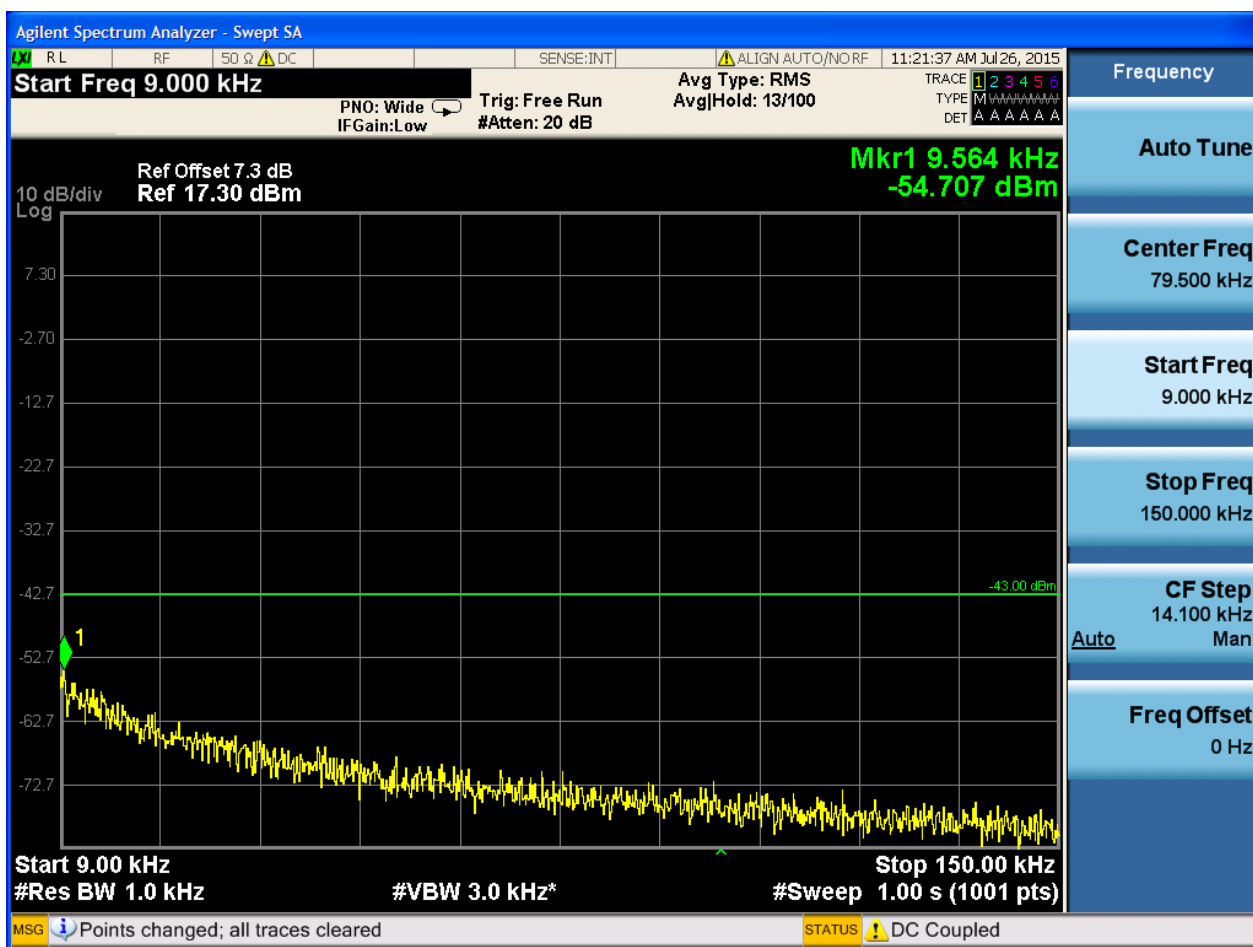


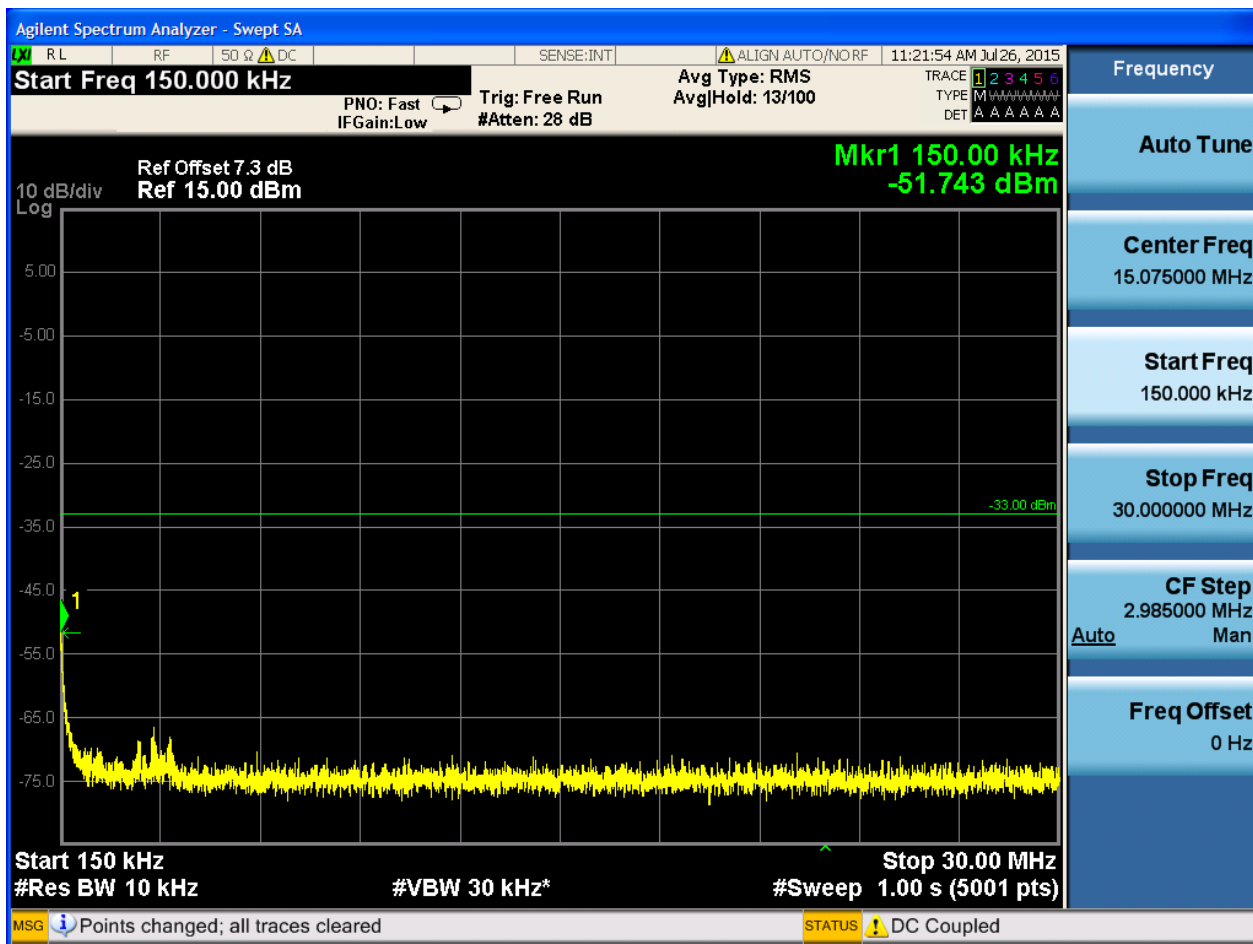


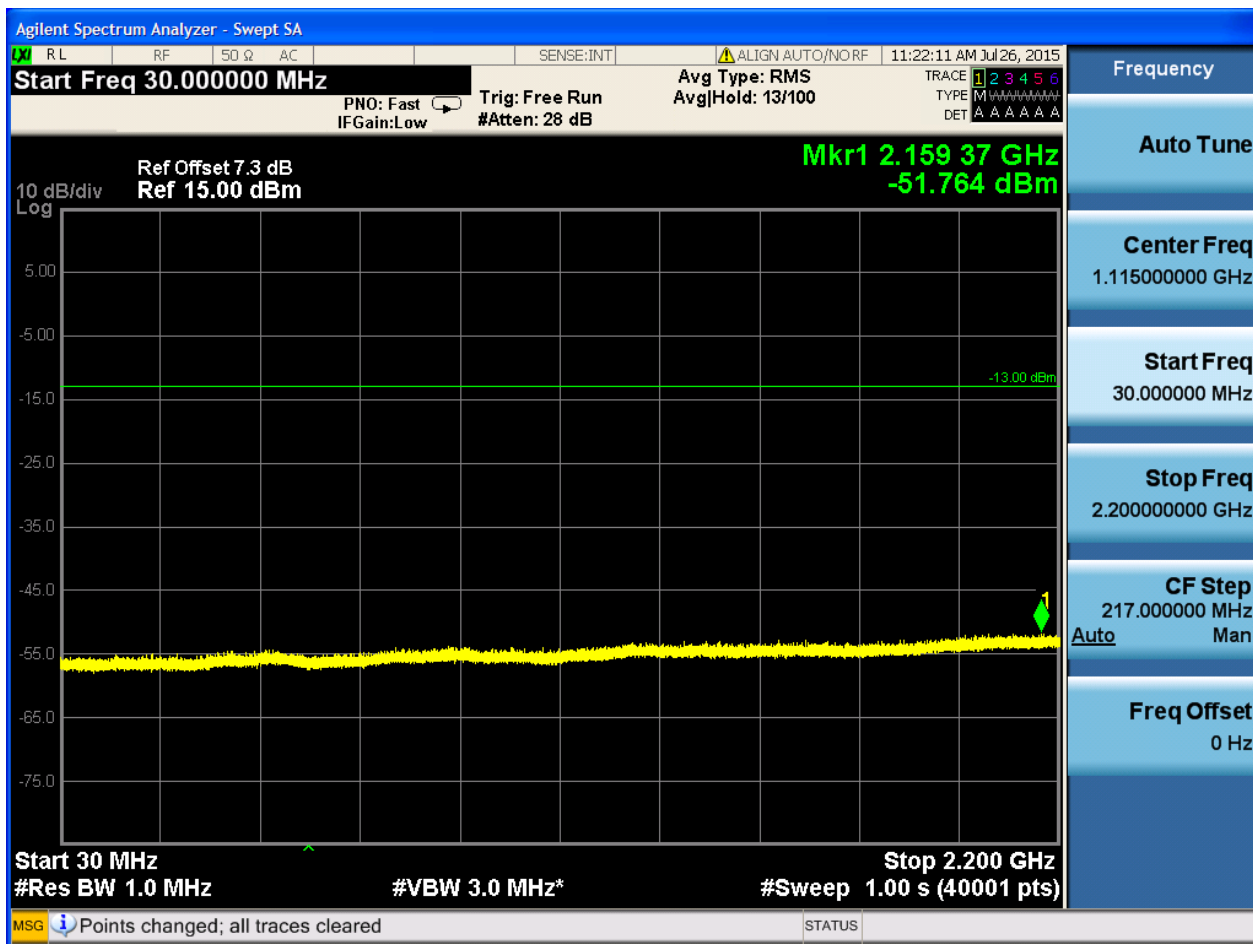
6.3.1.1.2 Test Bandwidth = 10

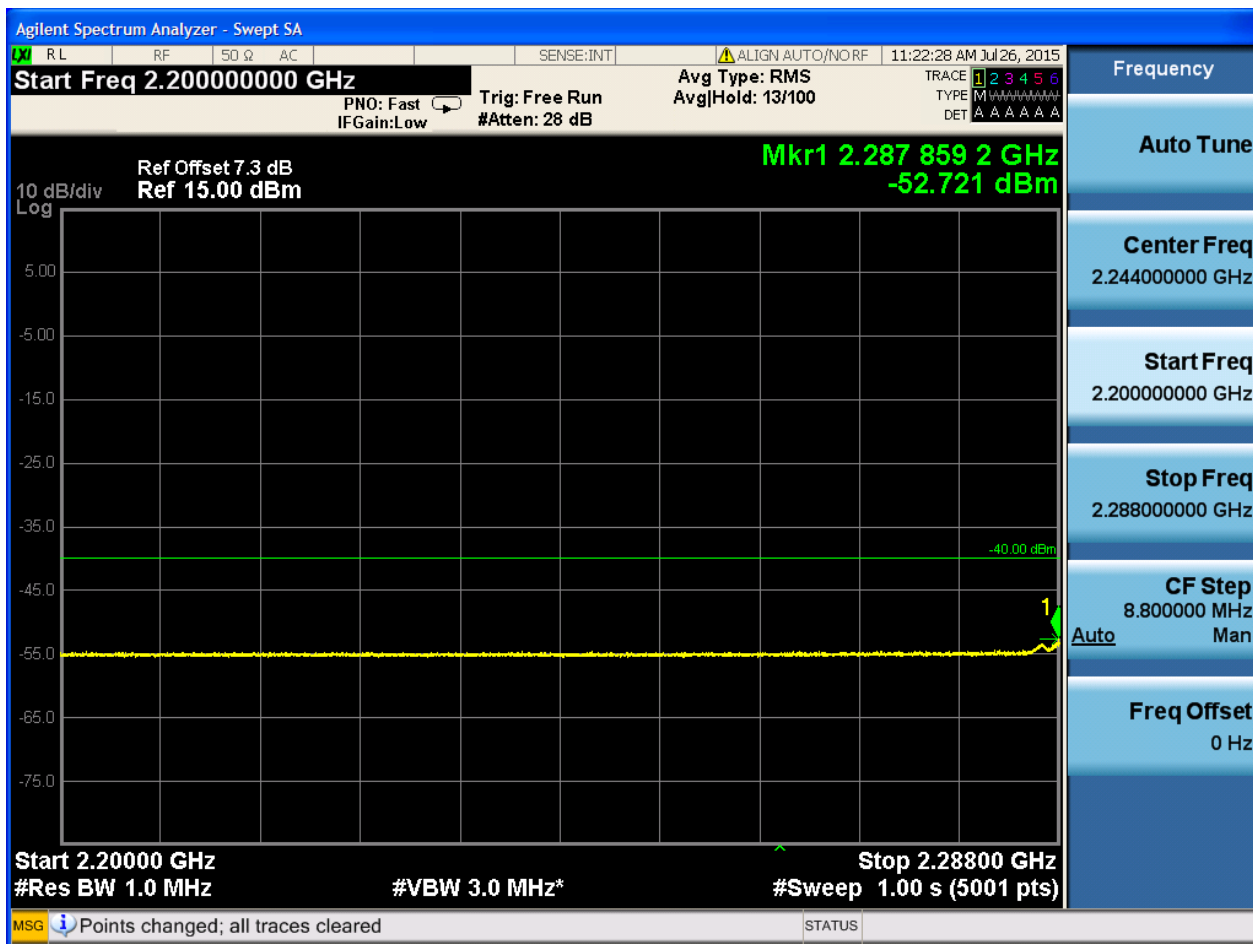
6.3.1.1.2.1 Test Channel = LCH/MCH/HCH

6.3.1.1.2.1.1 Test RB = RB1#0

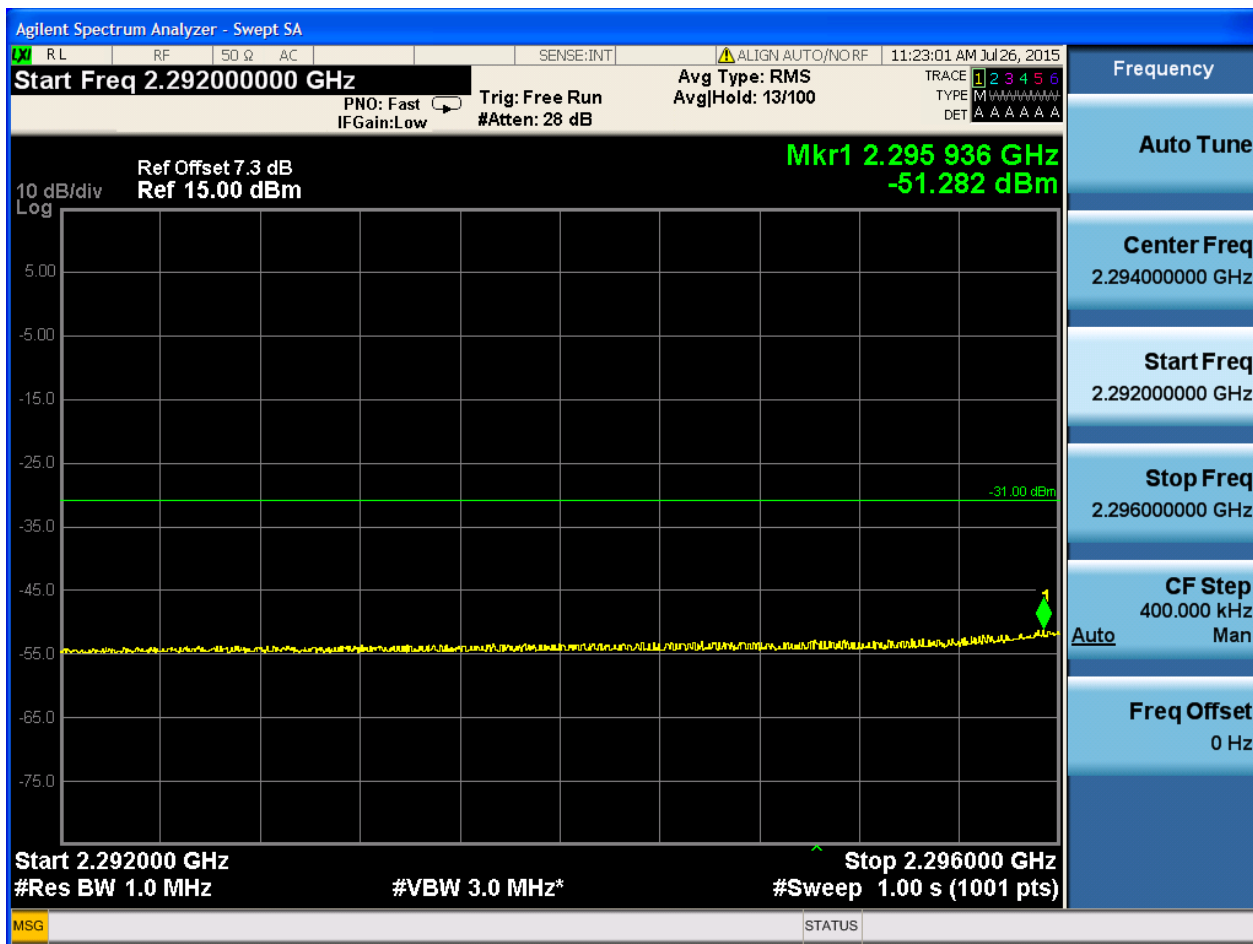


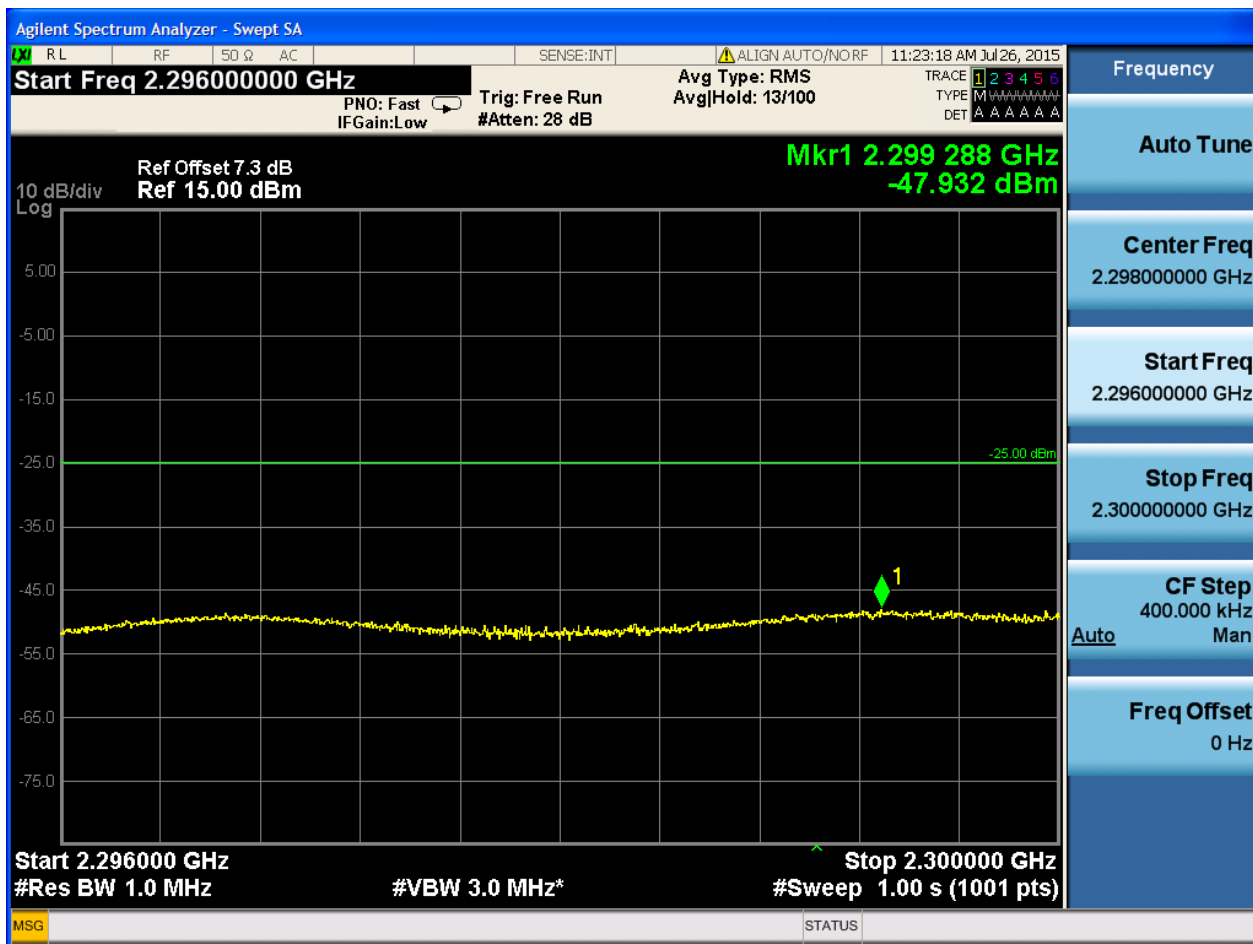


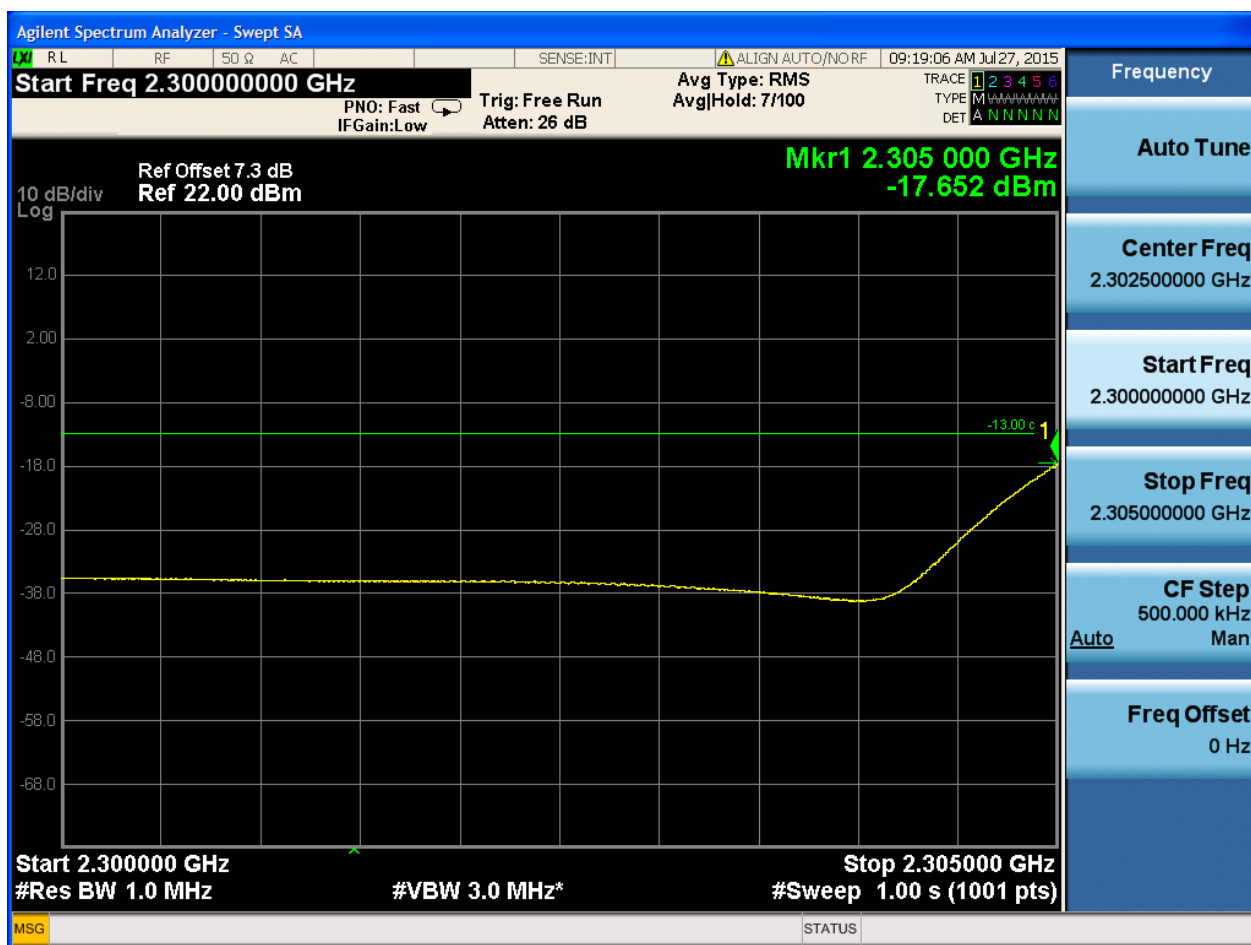


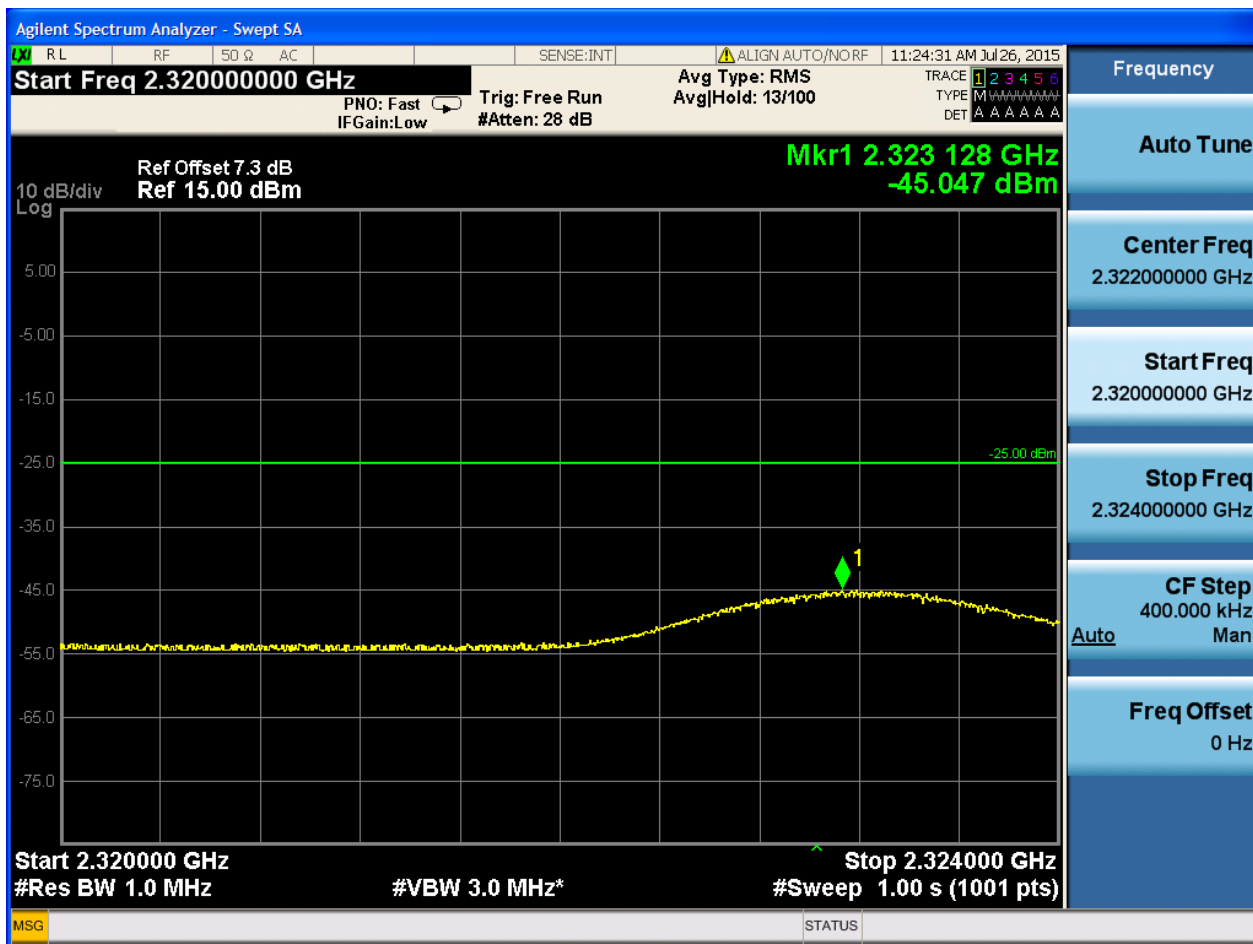








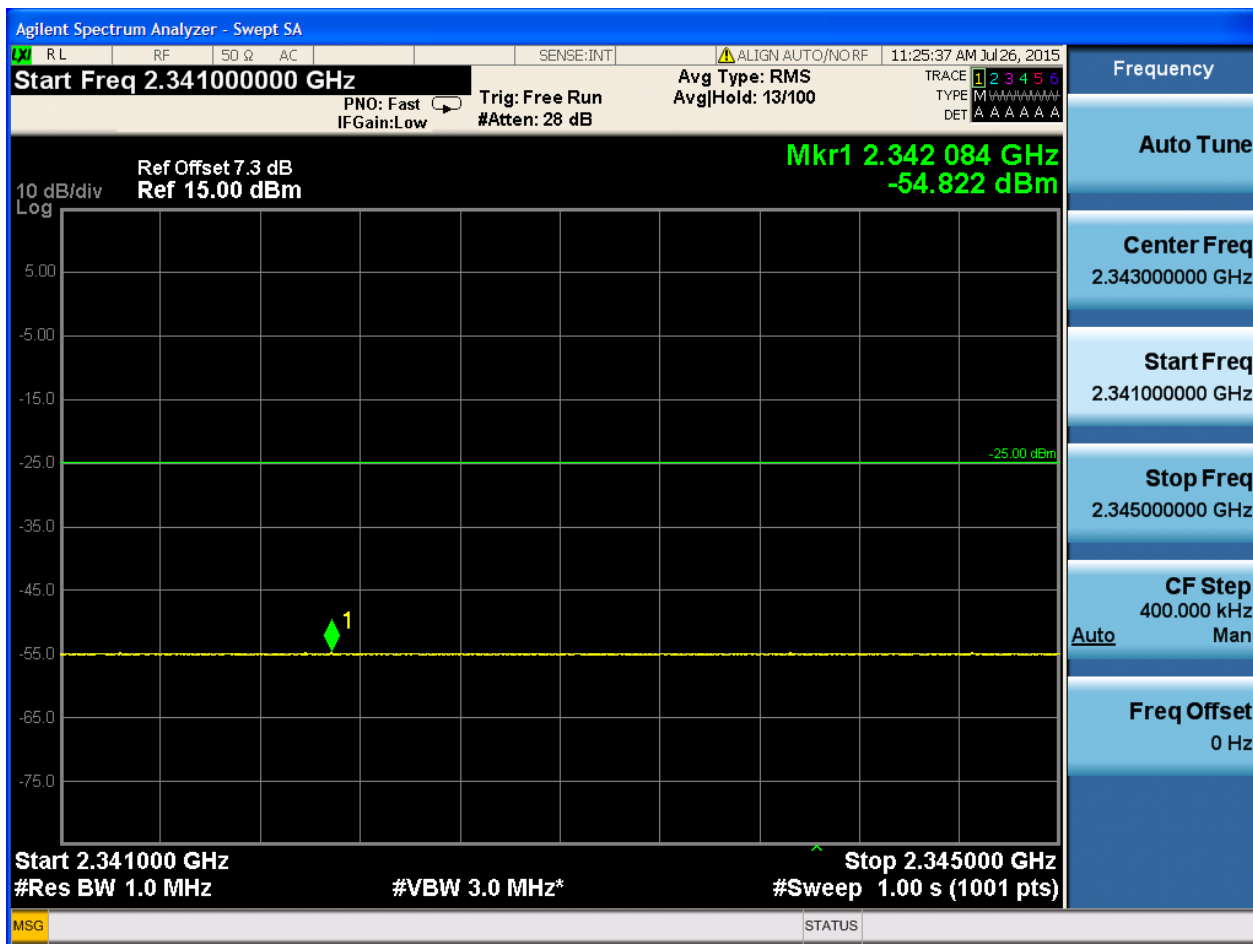


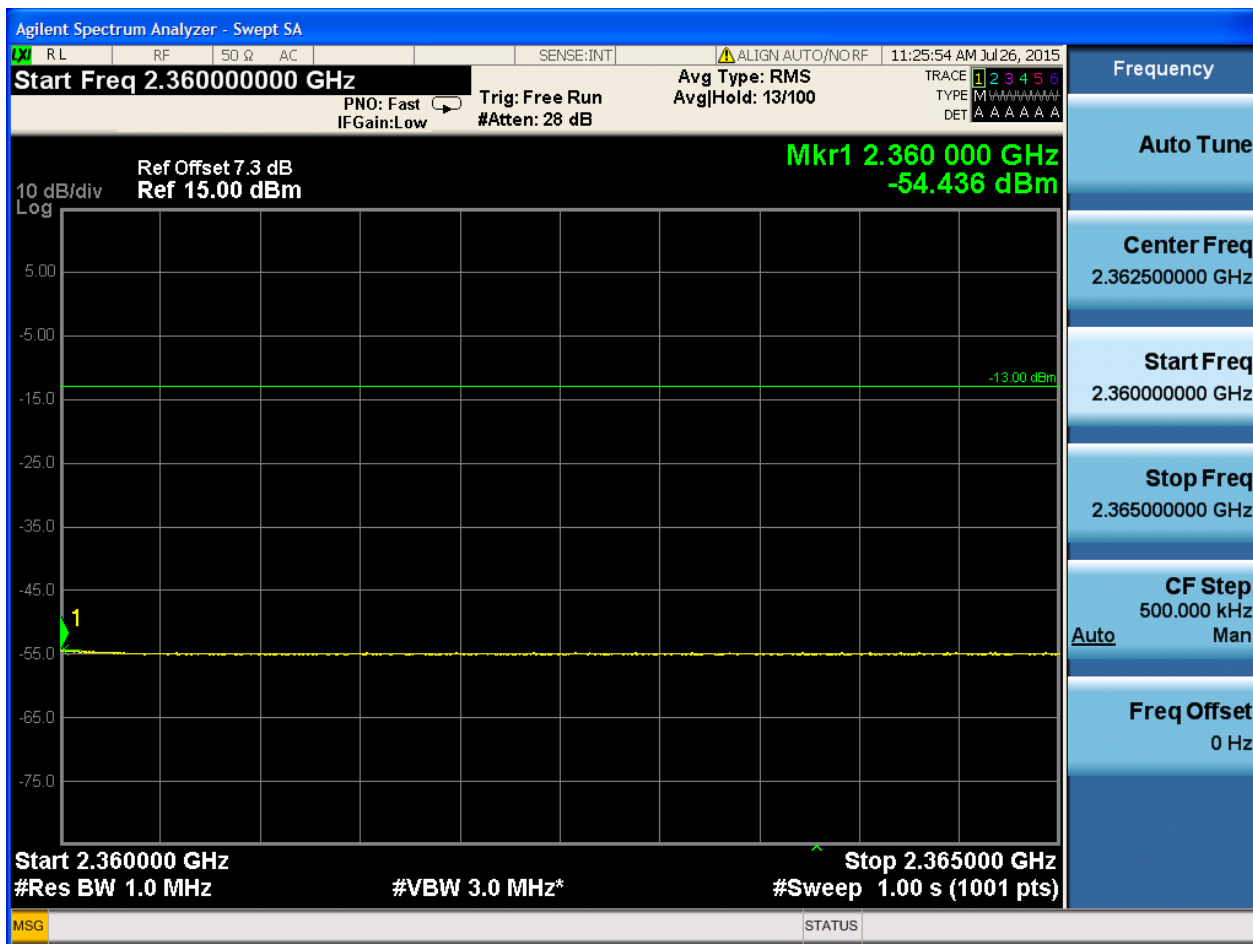


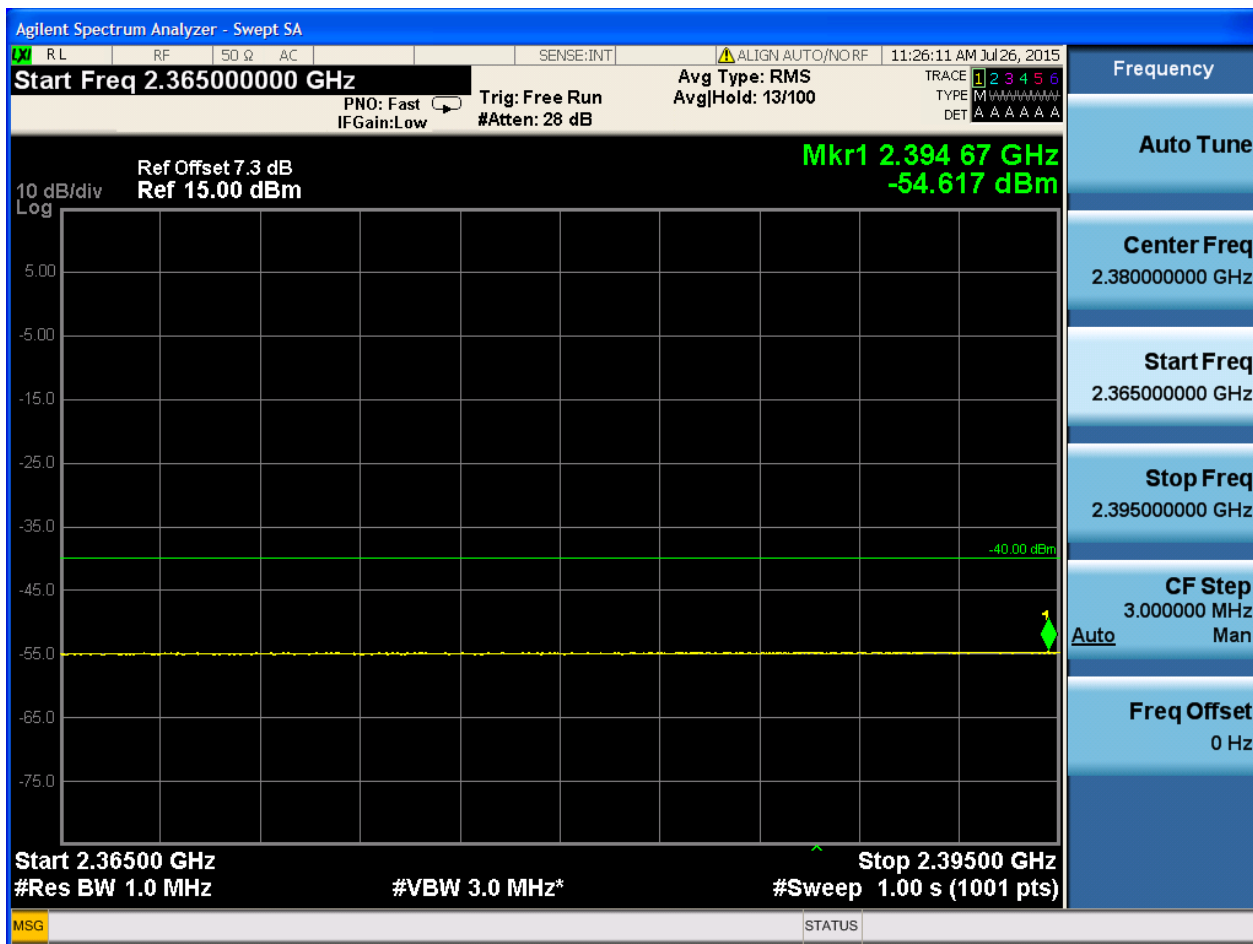


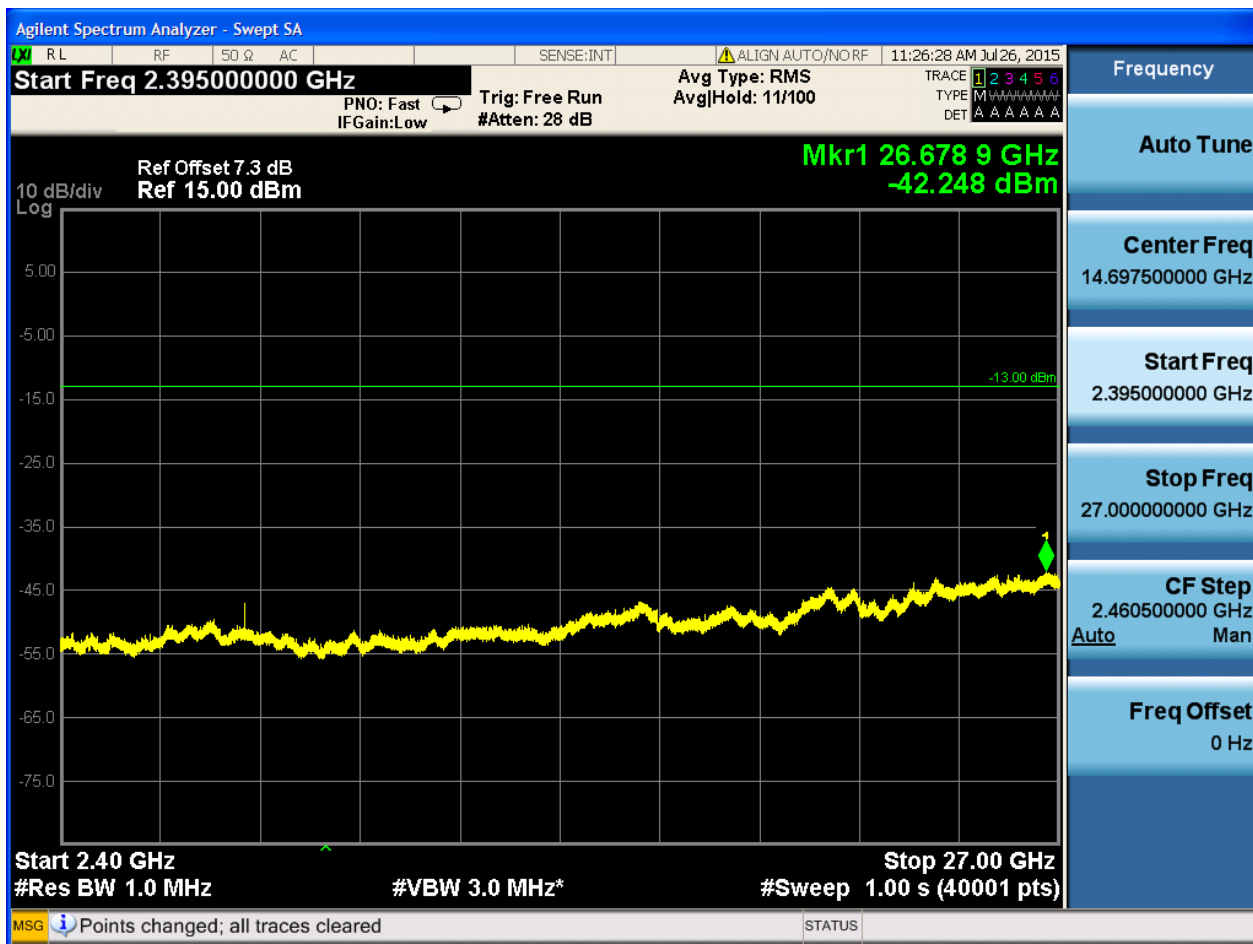












7Appendix_G: Field Strength of Spurious Radiation

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

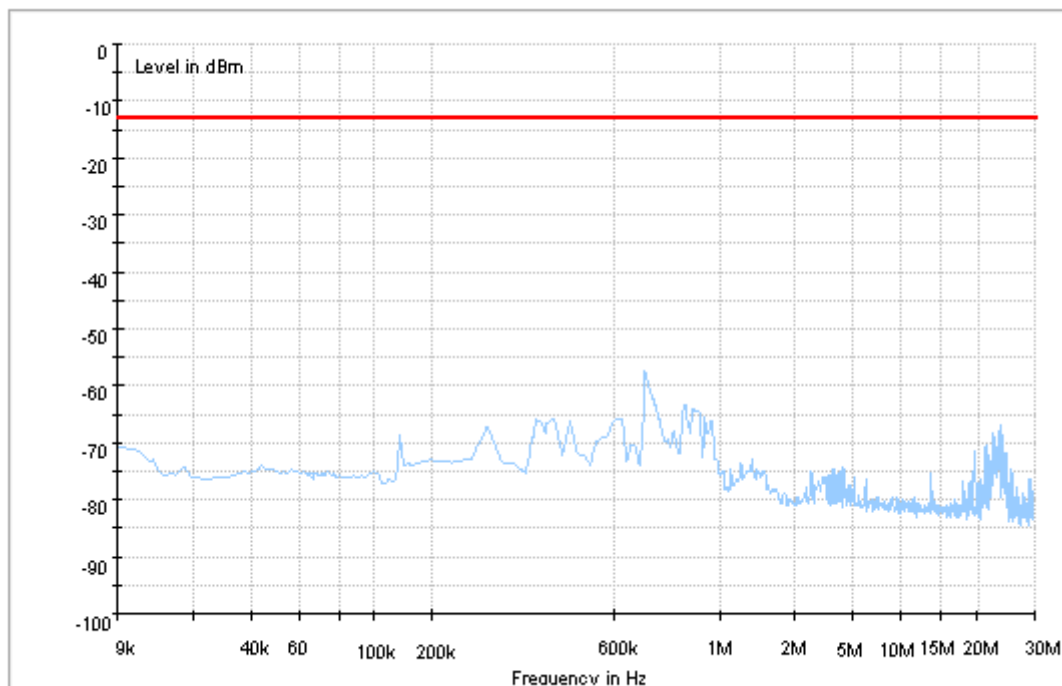
We tested all modes, but the data presented below is the worst case.

Part I - Test Plots

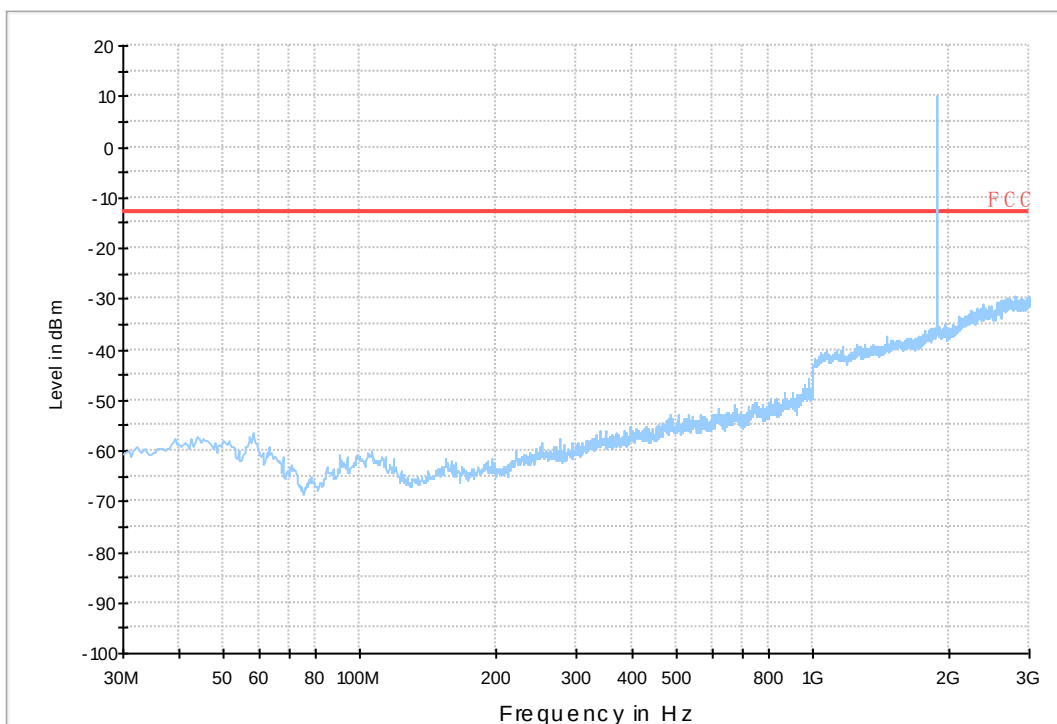
7.1 For LTE

7.1.1 Test Band = BAND40

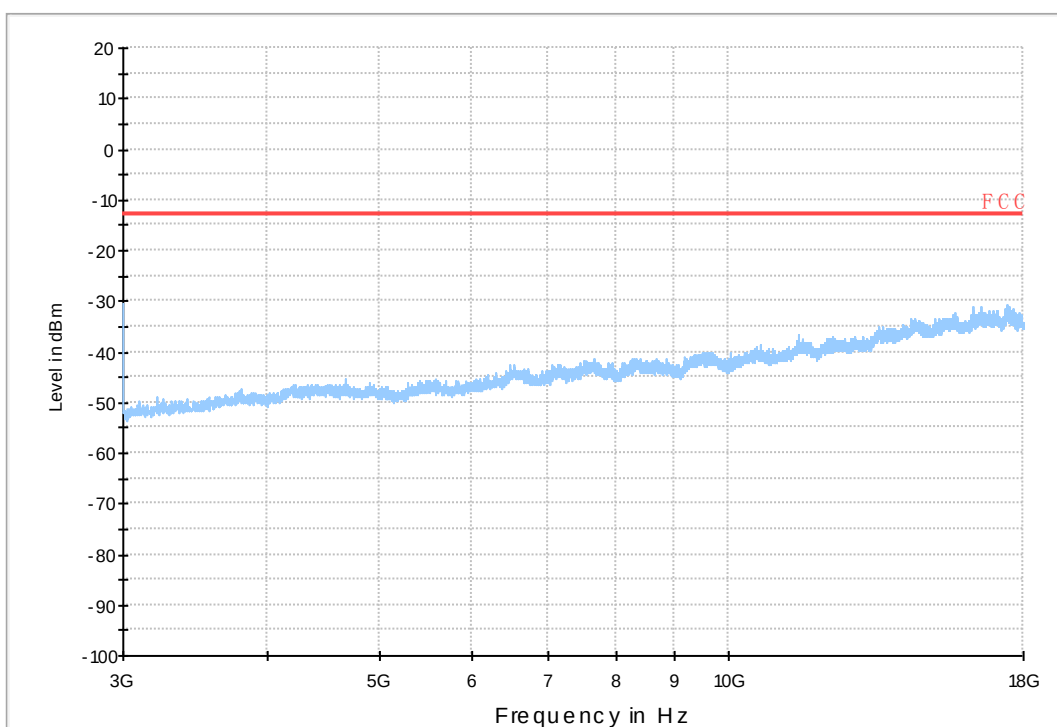
7.1.1.1 Test Bandwidth = 5

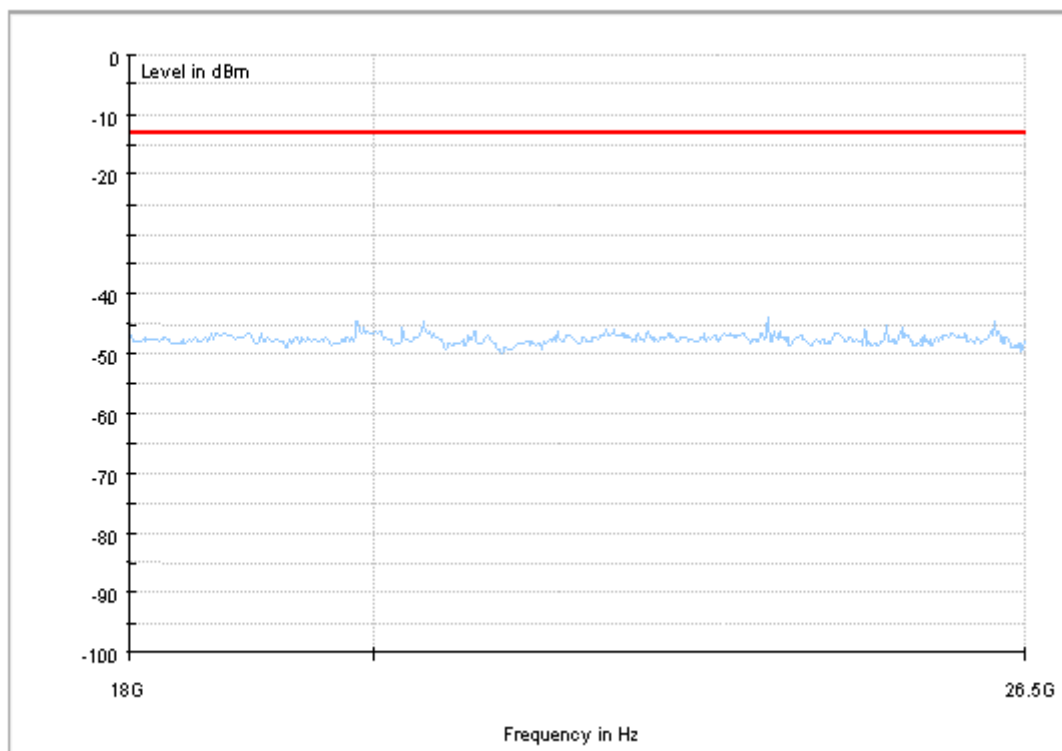


Copy of RSE-TX-DIRECTOR ABOVE 1.5G_L

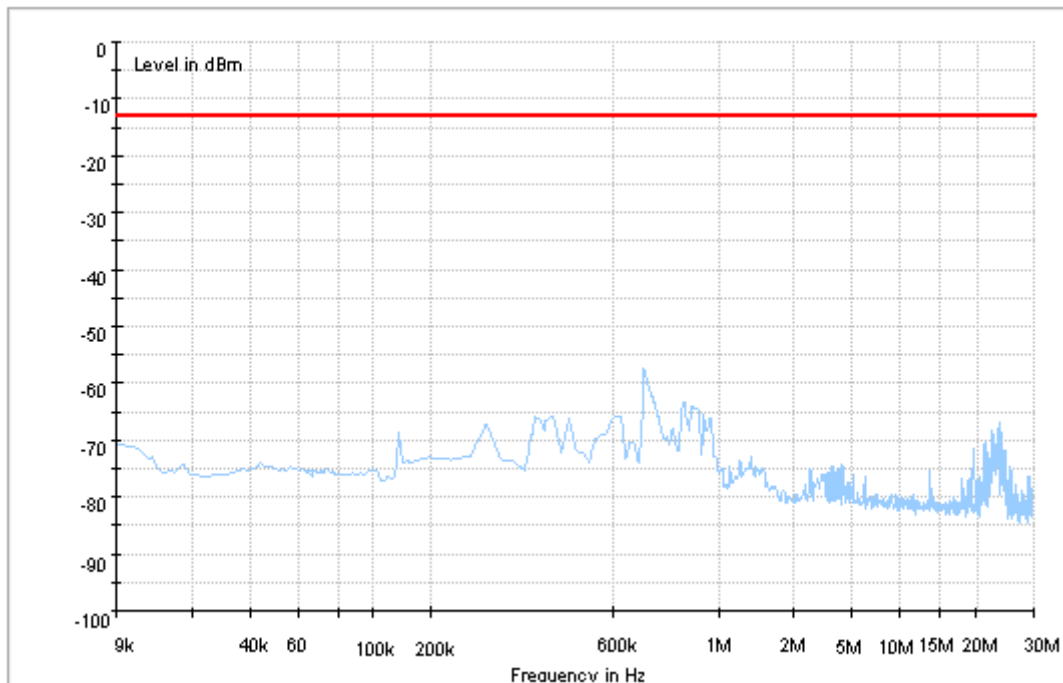


Copy of RSE-TX-DIRECTOR ABOVE 1.5G_H

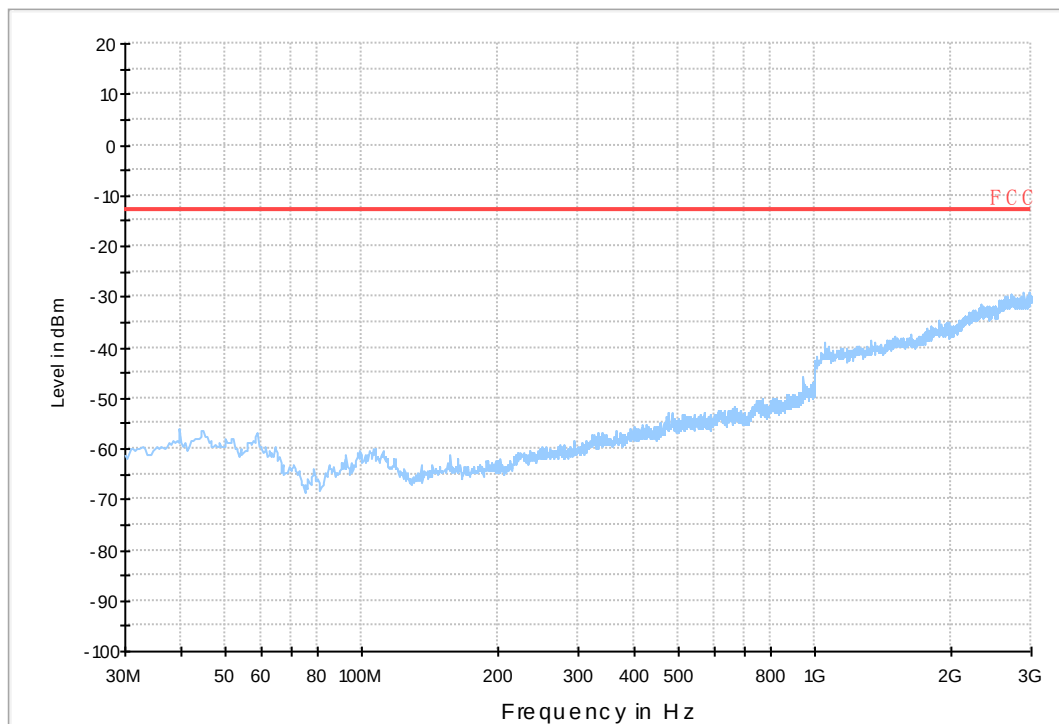




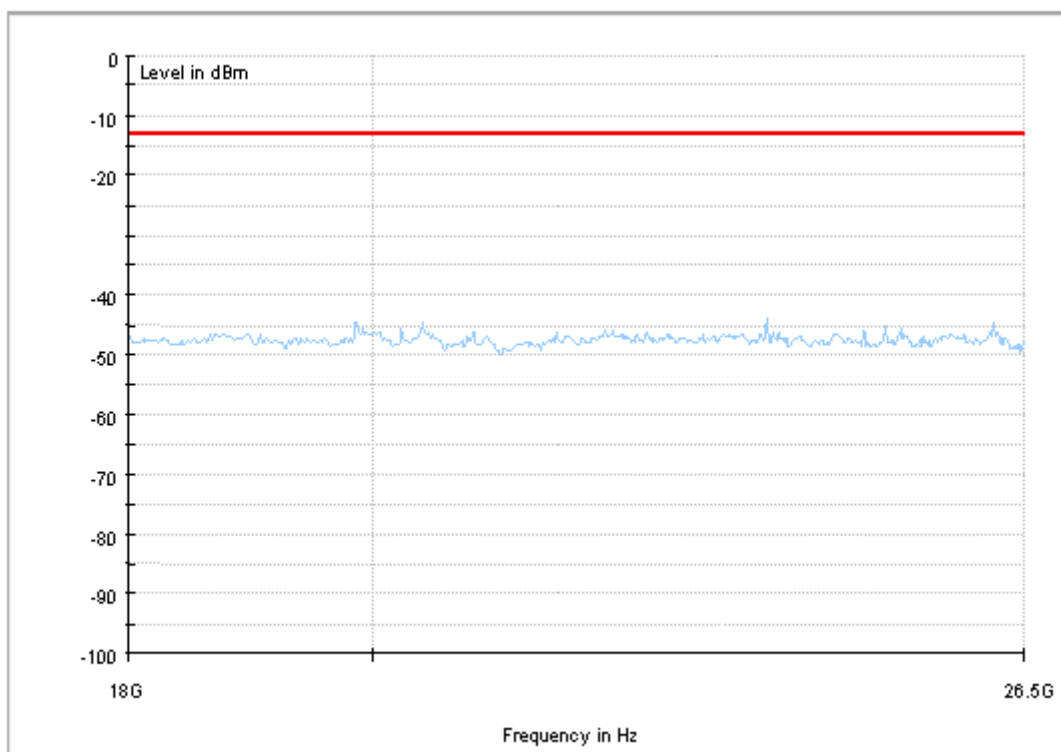
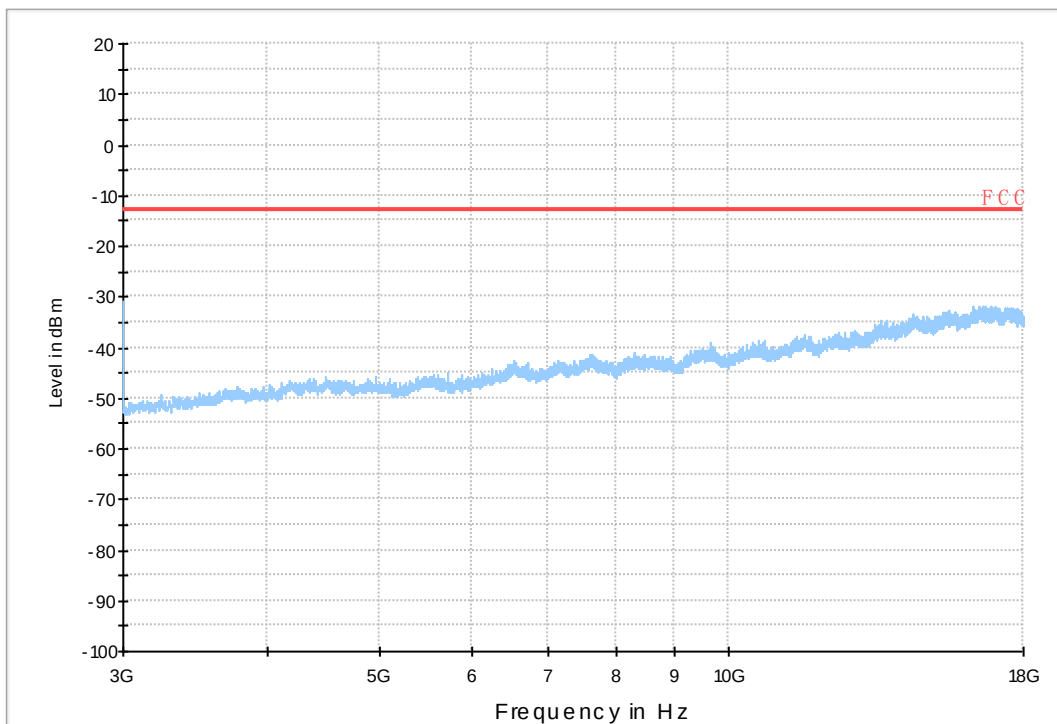
7.1.1.2 Test Bandwidth = 10



Copy of RSE-TX-DIRECTOR ABOVE 1.5G_L



Copy of RSE-TX-DIRECTOR ABOVE 1.5G_H





8Appendix_H: Frequency Stability

8.1 For LTE

8.1.1 Frequency Error vs. Voltage:

Test Band	Test Mode	Test Bandwidth (MHz)	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
BAND30	LTE/TM1	5	LCH	TN	VL	4.76	0.00206	PASS
					VN	5.21	0.00226	PASS
					VH	0.84	0.00036	PASS
			MCH	TN	VL	-3.1	-0.00134	PASS
					VN	-1.07	-0.00046	PASS
					VH	-4.08	-0.00177	PASS
			HCH	TN	VL	3.32	0.00144	PASS
					VN	2.45	0.00106	PASS
					VH	1.97	0.00085	PASS
		10	LCH/MCH /HCH	TN	VL	-3.76	-0.00163	PASS
					VN	0.17	0.00007	PASS
					VH	-1.7	-0.00074	PASS
	LTE/TM2	5	LCH	TN	VL	4.98	0.00216	PASS
					VN	4.18	0.00181	PASS
					VH	2.66	0.00115	PASS
			MCH	TN	VL	-2.05	-0.00089	PASS
					VN	-0.77	-0.00033	PASS
					VH	-1.27	-0.00055	PASS
			HCH	TN	VL	0.93	0.0004	PASS
					VN	-0.3	-0.00013	PASS
					VH	2.78	0.0012	PASS
		10	LCH/MCH /HCH	TN	VL	0.03	0.00001	PASS
					VN	-1.95	-0.00084	PASS
					VH	-4.11	-0.00178	PASS

8.1.2 Frequency Error vs. Temperature:

Test Band	Test Mode	Test Bandwidth (MHz)	Test Channel	Test Volt.	Test Temp .	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
BAND30	LTE/TM1	5	LCH	VN	-30	9.6	0.00416	PASS
					-20	6.11	0.00265	PASS
					-10	7.51	0.00325	PASS
					0	-0.07	-0.00003	PASS
					10	4.95	0.00215	PASS
					20	4.36	0.00189	PASS
					30	5.95	0.00258	PASS
					40	2.39	0.00104	PASS
					50	8.34	0.00361	PASS
			MCH	VN	-30	5.49	0.00238	PASS
					-20	7.45	0.00323	PASS
					-10	9.31	0.00403	PASS
					0	-1.9	-0.00082	PASS
					10	12.47	0.0054	PASS
					20	4.08	0.00177	PASS
					30	8.73	0.00378	PASS
					40	6.18	0.00268	PASS
					50	7.75	0.00335	PASS
			HCH	VN	-30	5.52	0.00239	PASS
					-20	-5.39	-0.00233	PASS
					-10	3.81	0.00165	PASS
					0	4.56	0.00197	PASS
					10	9.16	0.00396	PASS
					20	3.13	0.00135	PASS
					30	6.28	0.00272	PASS
					40	3.68	0.00159	PASS
					50	5.14	0.00222	PASS
		10	LCH/MCH /HCH	VN	-30	6.28	0.00272	PASS
					-20	6.49	0.00281	PASS
					-10	5.64	0.00244	PASS
					0	4.96	0.00215	PASS
					10	10.99	0.00476	PASS
					20	6.74	0.00292	PASS
					30	7.52	0.00326	PASS
					40	8.68	0.00376	PASS

Test Band	Test Mode	Test Bandwidth (MHz)	Test Channel	Test Volt.	Test Temp .	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
	LTE/TM2	5	LCH	VN	50	10.67	0.00462	PASS
					-30	4.08	0.00177	PASS
					-20	7.68	0.00333	PASS
					-10	5.99	0.0026	PASS
					0	7.25	0.00314	PASS
					10	5.14	0.00223	PASS
					20	4.94	0.00214	PASS
					30	2.63	0.00114	PASS
					40	6.04	0.00262	PASS
					50	-0.9	-0.00039	PASS
			MCH	VN	-30	7.75	0.00335	PASS
					-20	7.44	0.00322	PASS
					-10	10.27	0.00445	PASS
					0	1.56	0.00068	PASS
					10	5.91	0.00256	PASS
					20	9.87	0.00427	PASS
					30	1.76	0.00076	PASS
					40	7.7	0.00333	PASS
					50	9.18	0.00397	PASS
			HCH	VN	-30	9.37	0.00405	PASS
					-20	6.75	0.00292	PASS
					-10	4.51	0.00195	PASS
					0	12.83	0.00555	PASS
					10	5.16	0.00223	PASS
					20	6.19	0.00268	PASS
					30	7.18	0.0031	PASS
					40	8.25	0.00357	PASS
					50	6.01	0.0026	PASS
		10	LCH/MCH /HCH	VN	-30	5.56	0.00241	PASS
					-20	5.29	0.00229	PASS
					-10	6.65	0.00288	PASS
					0	4.48	0.00194	PASS
					10	5.94	0.00257	PASS
					20	5.29	0.00229	PASS
					30	8.41	0.00364	PASS
					40	8.84	0.00383	PASS
					50	8.55	0.0037	PASS

END