



# Appendix A: Transmitter Output Power



## 1 Result Table

### 1.1 Channel Power (Total)

The output power of the EUT was measured at the antenna terminal. Since the EUT transmits on two antennas simultaneously in the same frequency with MIMO mode, using the Measure-and-sum approach, the output power at both antennas were tested, and the total output power were then summed.

EUT Conf.	Channel Power [dBm]	total[dBW]	Verdict
TX_1L_5M_B_TM1_ANTA& TX_1L_5M_B_TM1_ANTB	45.86&45.72	18.80	Pass
TX_1L_5M_M_TM1_ANTA& TX_1L_5M_M_TM1_ANTB	45.37&45.39	18.39	Pass
TX_1L_5M_T_TM1_ANTA& TX_1L_5M_T_TM1_ANTB	45.70&45.41	18.57	Pass
TX_1L_20M_B_TM1_ANTA& TX_1L_20M_B_TM1_ANTB	46.48&46.23	19.37	Pass
TX_1L_20M_M_TM1_ANTA& TX_1L_20M_M_TM1_ANTB	45.81&46.05	18.94	Pass
TX_1L_20M_T_TM1_ANTA& TX_1L_20M_T_TM1_ANTB	45.71&45.92	18.83	Pass
TX_2L_5M_B_TM1_ANTA& TX_2L_5M_B_TM1_ANTB	42.97\43.11& 43.17\43.33	19.17	Pass
TX_2L_5M_M_TM1_ANTA& TX_2L_5M_M_TM1_ANTB	42.62\43.46& 43.30\42.91	19.11	Pass
TX_2L_5M_T_TM1_ANTA& TX_2L_5M_T_TM1_ANTB	42.68\42.60& 43.48\43.11	19	Pass
TX_2L_20M_B_TM1_ANTA& TX_2L_20M_B_TM1_ANTB	42.99\42.74& 43.43\43.19	19.12	Pass
TX_2L_20M_M_TM1_ANTA& TX_2L_20M_M_TM1_ANTB	43.18\43.05& 43.35\42.94	19.15	Pass
TX_2L_20M_T_TM1_ANTA& TX_2L_20M_T_TM1_ANTB	42.89\42.89& 43.34\43.23	19.11	Pass



## 1.2 Power Spectral Density

The output power Spectral Density of the EUT was measured at the antenna terminal. Since the EUT transmits on two antennas simultaneously in the same frequency with MIMO mode, using the Measure-and-sum approach, the output power Spectral Density at both antennas were tested, and the total output power Spectral Density were then summed.

EUT Conf.	Power Spectral Density [dBm/100kHz]	total[W/100kHz]	Verdict
TX_1L_5M_B_TM1_ANTA& TX_1L_5M_B_TM1_ANTB	31.44&31.39	2.77	Pass
TX_1L_5M_M_TM1_ANTA& TX_1L_5M_M_TM1_ANTB	31.46&31.71	2.88	Pass
TX_1L_5M_T_TM1_ANTA& TX_1L_5M_T_TM1_ANTB	31.13&31.24	2.63	Pass
TX_1L_20M_B_TM1_ANTA& TX_1L_20M_B_TM1_ANTB	25.18&25.47	0.68	Pass
TX_1L_20M_M_TM1_ANTA& TX_1L_20M_M_TM1_ANTB	25.44&25.79	0.73	Pass
TX_1L_20M_T_TM1_ANTA& TX_1L_20M_T_TM1_ANTB	25.06&25.39	0.67	Pass

## 1.3 Peak-to-Average Ratio

EUT Conf.	Peak-to-Average Ratio [dB]	Verdict
TX_1L_5M_B_TM1_ANTA	6.82	Pass
TX_1L_5M_B_TM1_ANTB	6.57	Pass
TX_1L_5M_M_TM1_ANTA	6.75	Pass
TX_1L_5M_M_TM1_ANTB	6.53	Pass
TX_1L_5M_T_TM1_ANTA	6.75	Pass
TX_1L_5M_T_TM1_ANTB	6.75	Pass
TX_1L_20M_B_TM1_ANTA	7.14	Pass
TX_1L_20M_B_TM1_ANTB	6.74	Pass
TX_1L_20M_M_TM1_ANTA	6.56	Pass
TX_1L_20M_M_TM1_ANTB	6.35	Pass
TX_1L_20M_T_TM1_ANTA	6.85	Pass
TX_1L_20M_T_TM1_ANTB	6.34	Pass

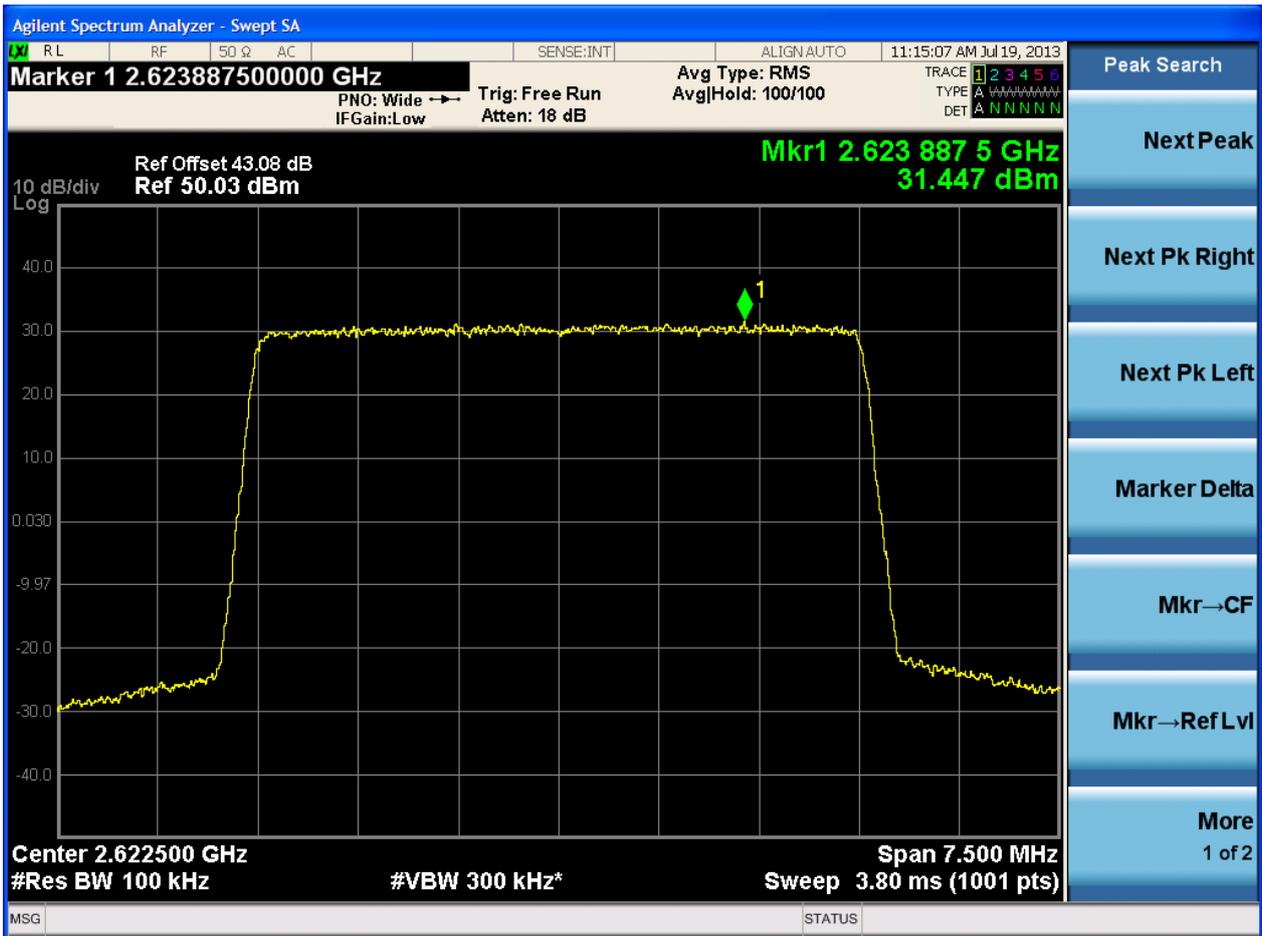


## 2 Test Plot

NOTE: Only the test plots for the measurements of Spectral Density and Peak-to-Average Ratio are supplied.

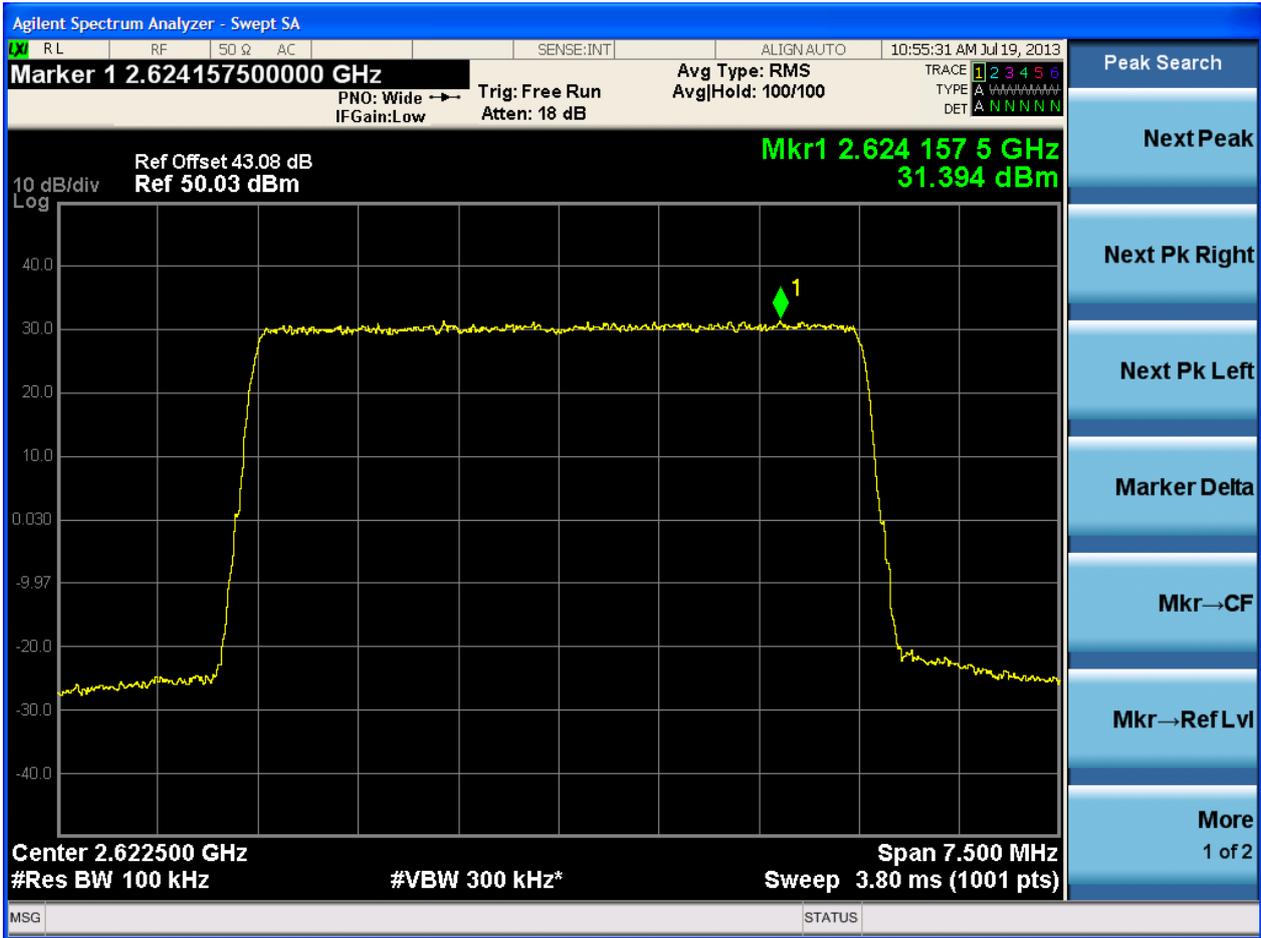
### 2.1 Power Spectral Density

#### 2.1.1 TX\_1L\_5M\_B\_TM1\_ANTA



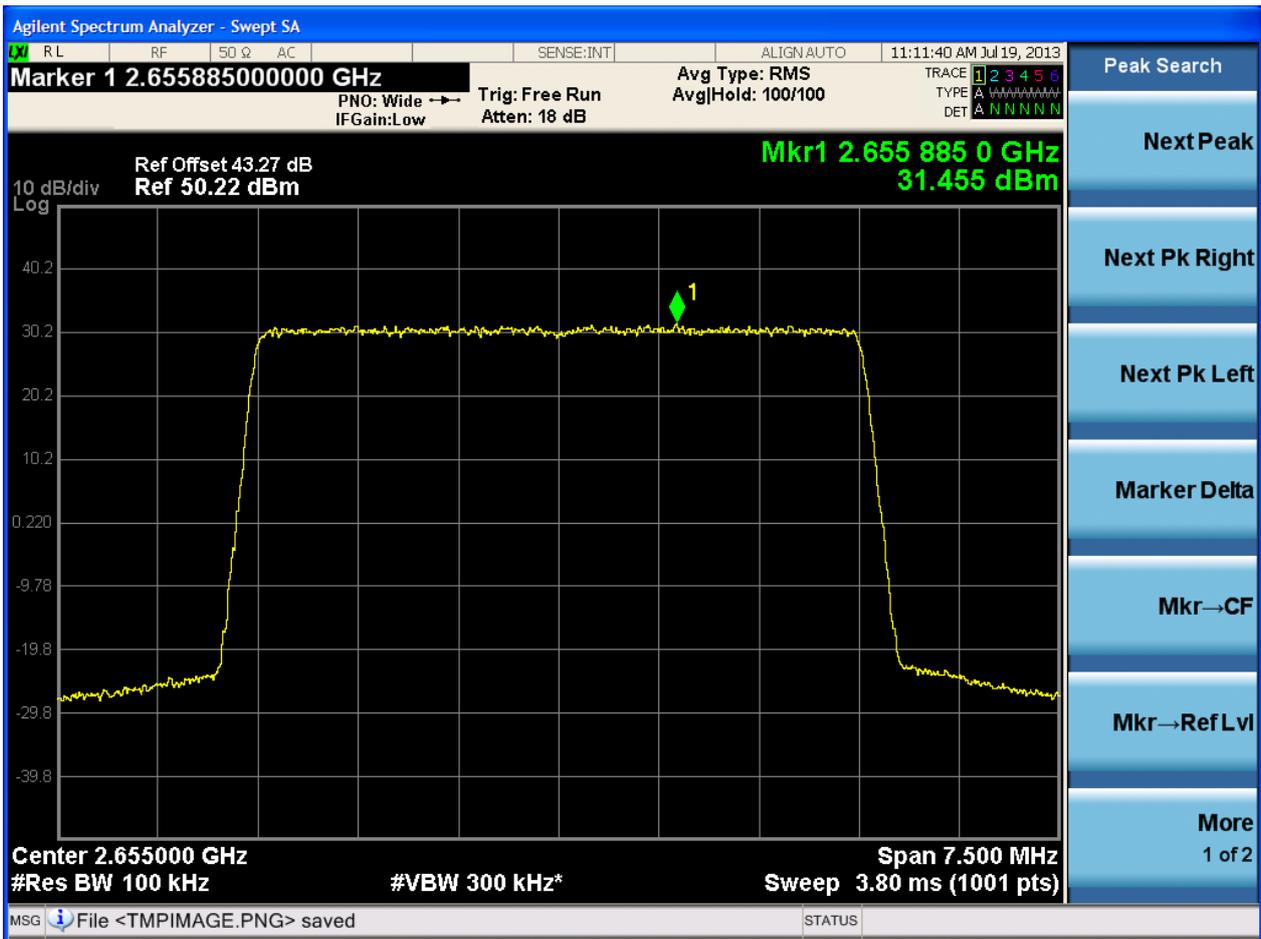


### 2.1.2 TX\_1L\_5M\_B\_TM1\_ANTB



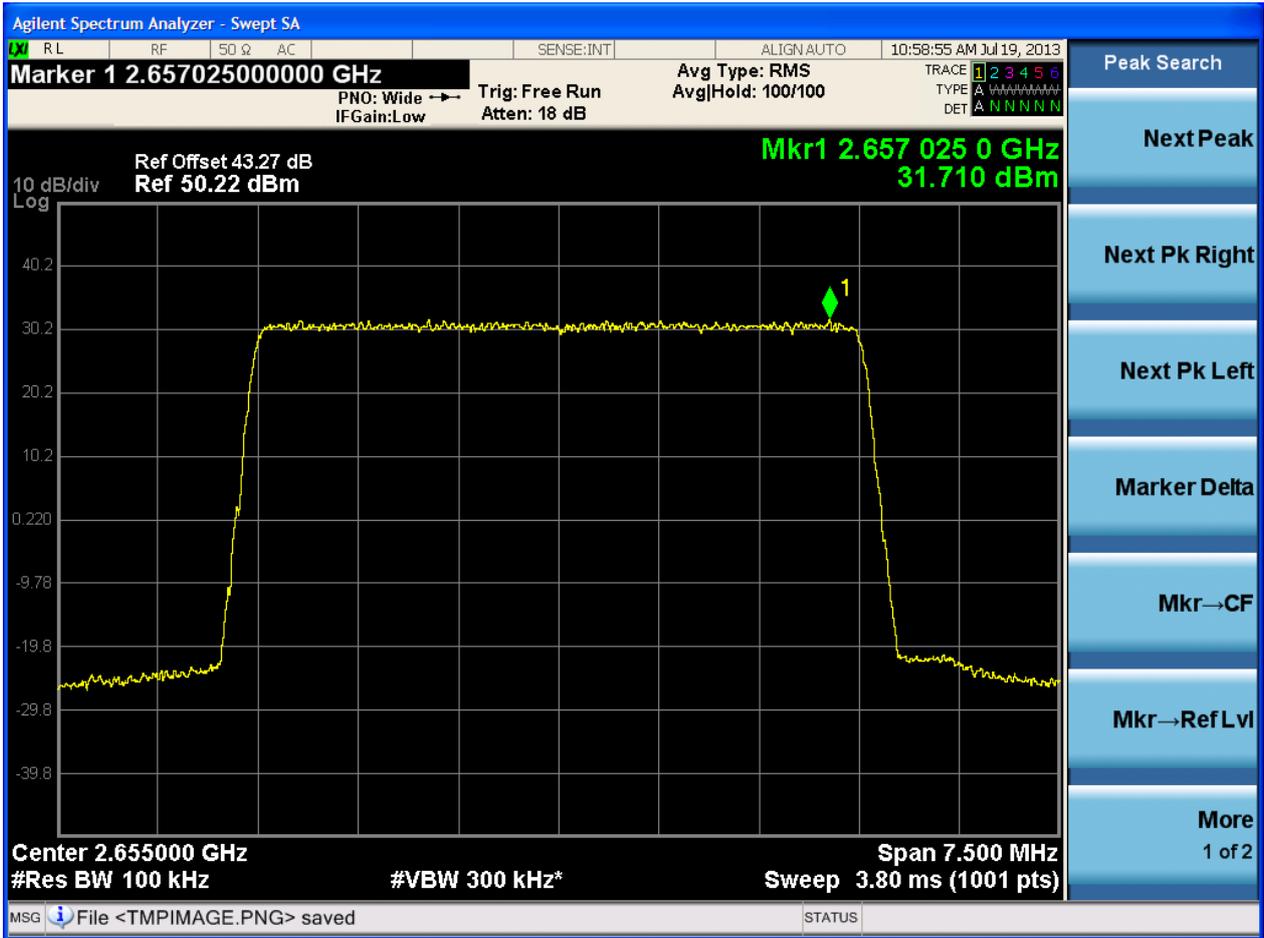


### 2.1.3 TX\_1L\_5M\_M\_TM1\_ANTA



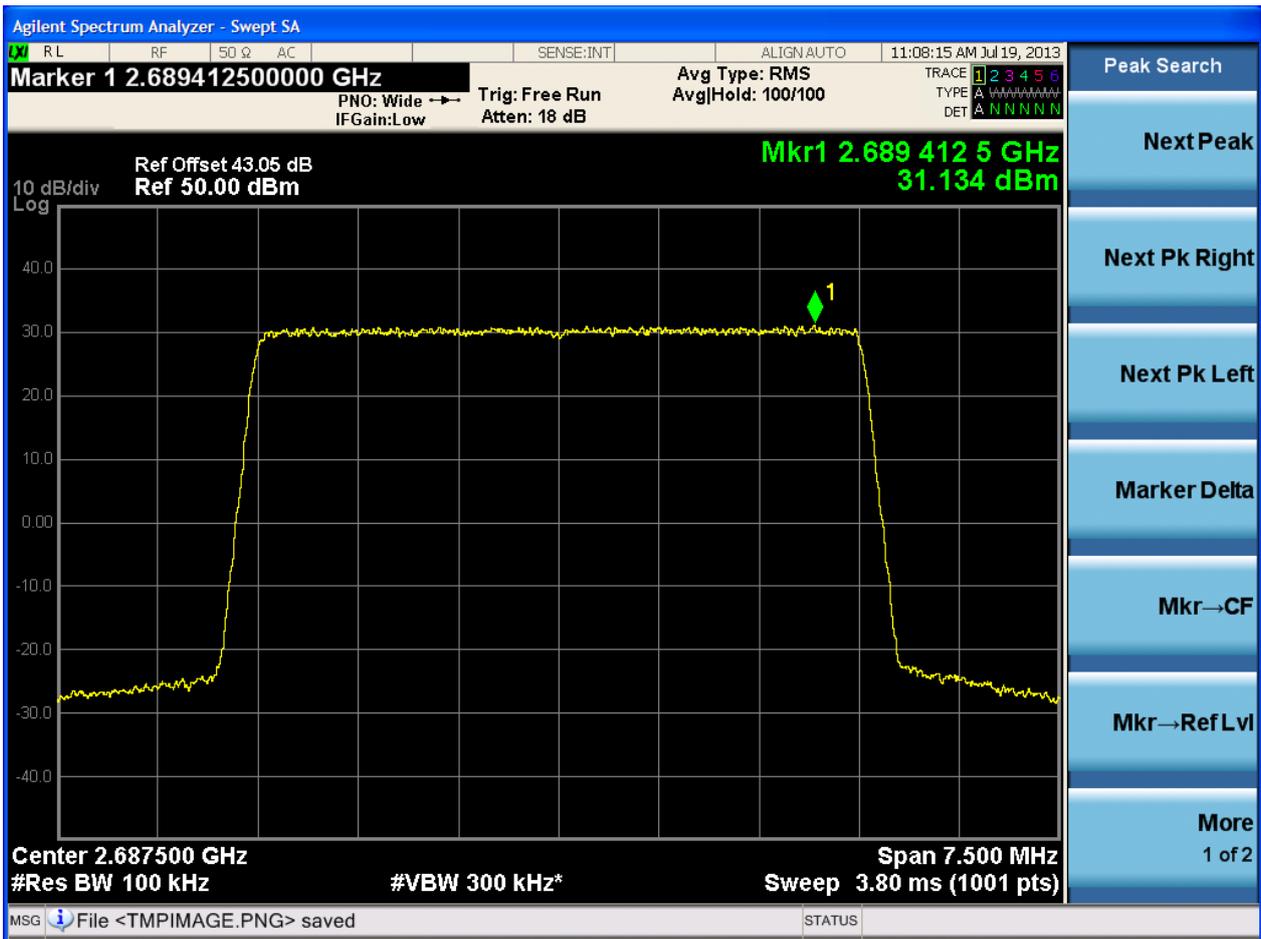


### 2.1.4 TX\_1L\_5M\_M\_TM1\_ANTB



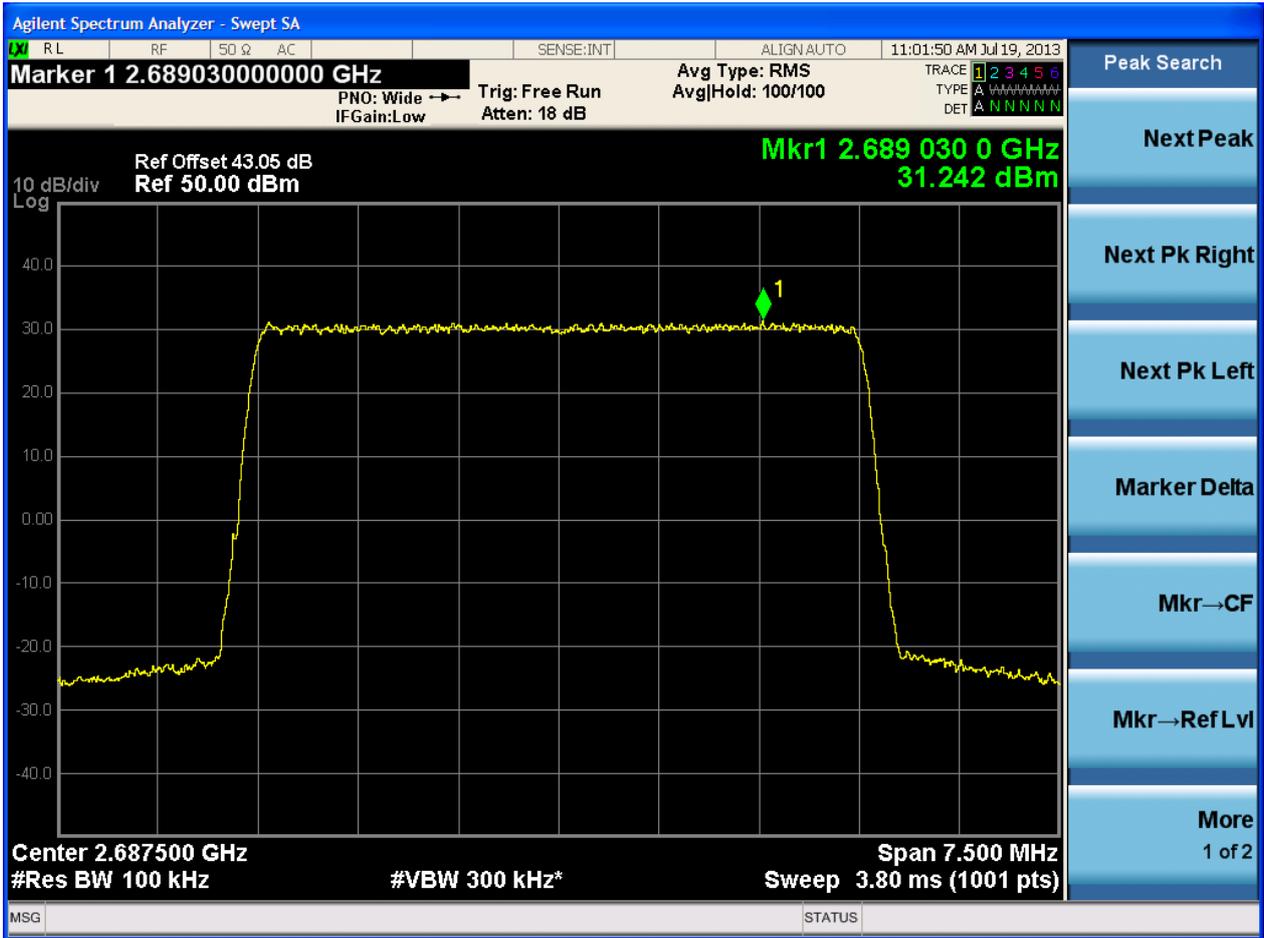


### 2.1.5 TX\_1L\_5M\_T\_TM1\_ANTA



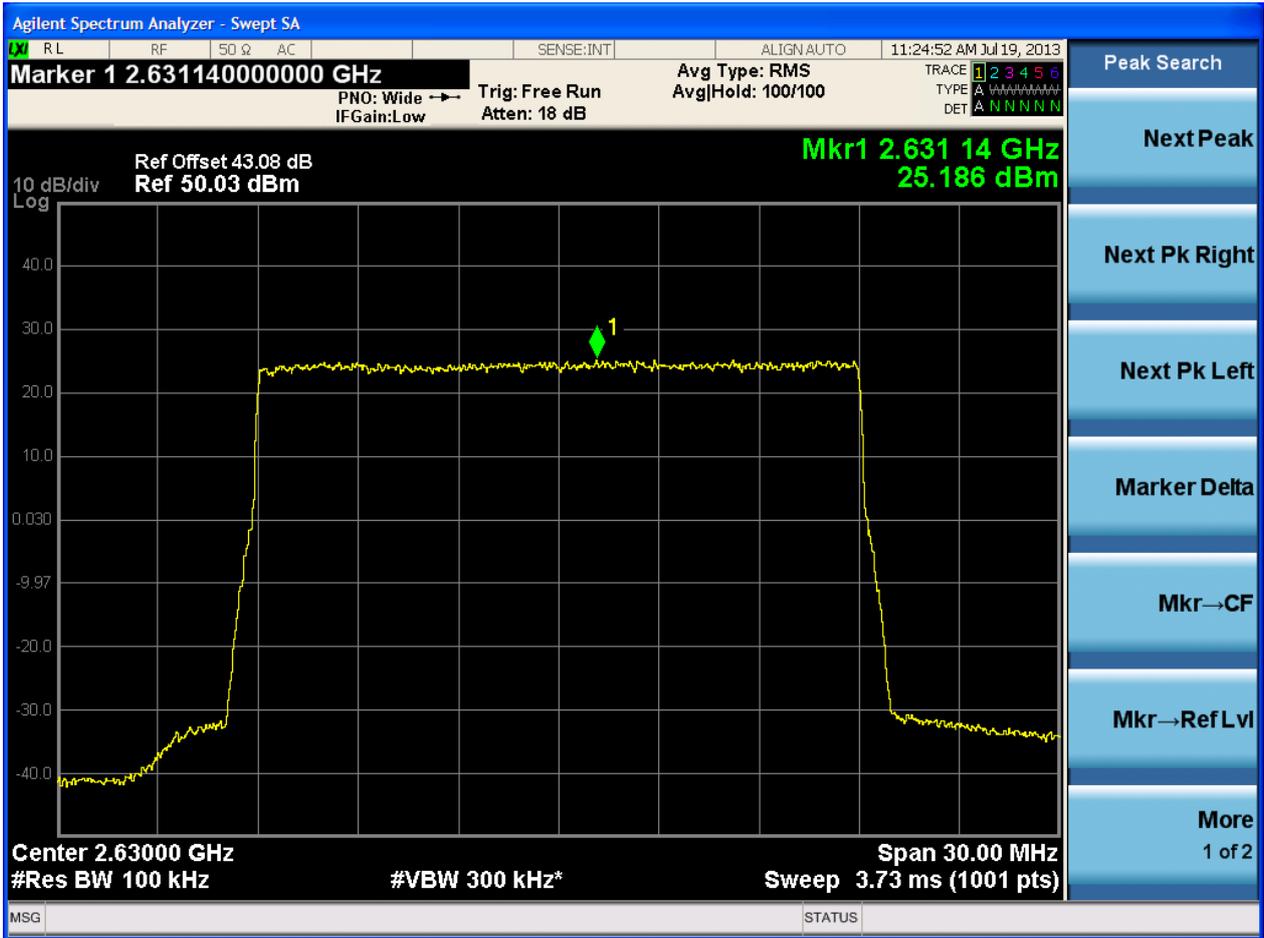


### 2.1.6 TX\_1L\_5M\_T\_TM1\_ANTB



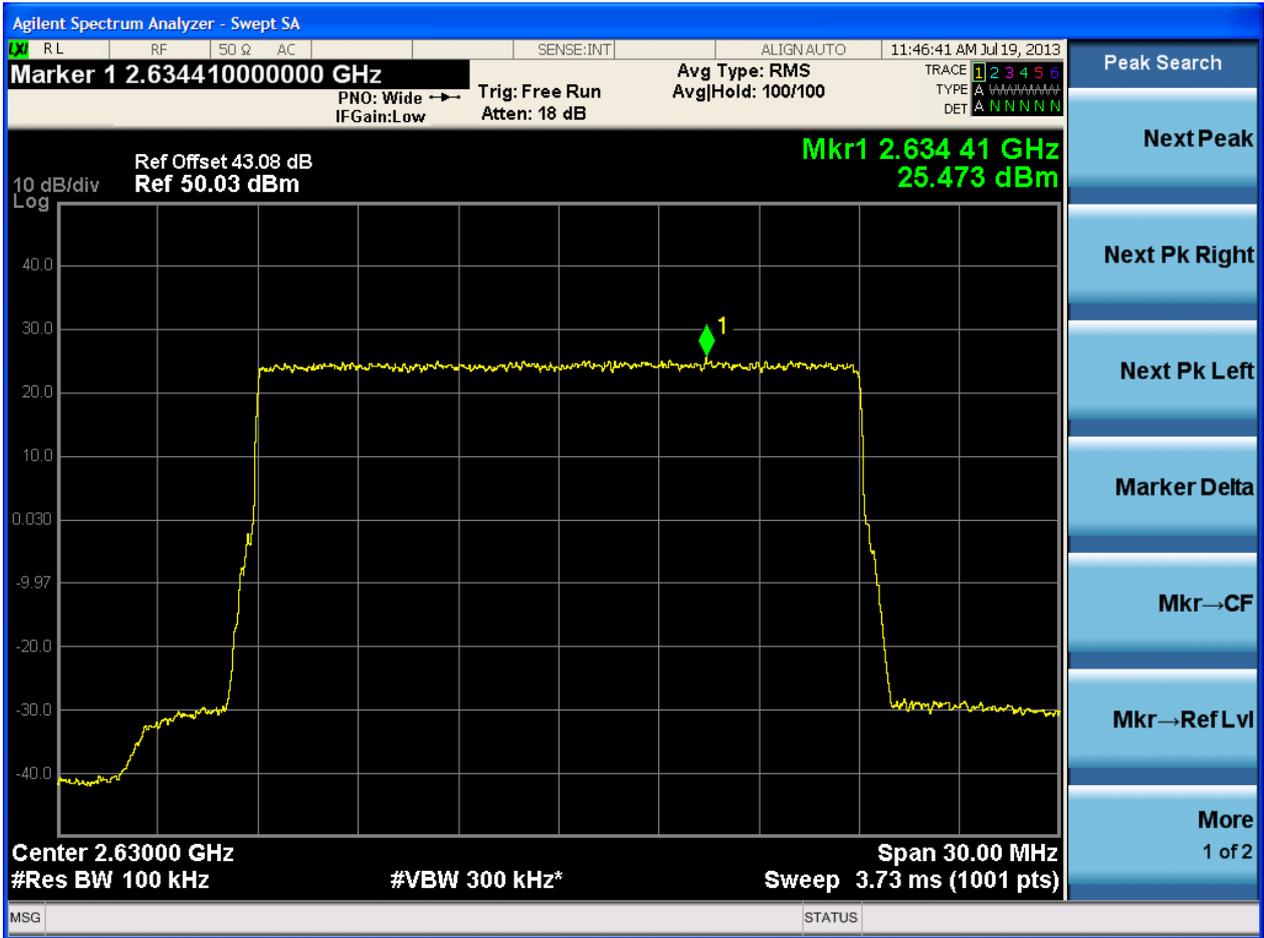


2.1.7 TX\_1L\_20M\_B\_TM1\_ANTA



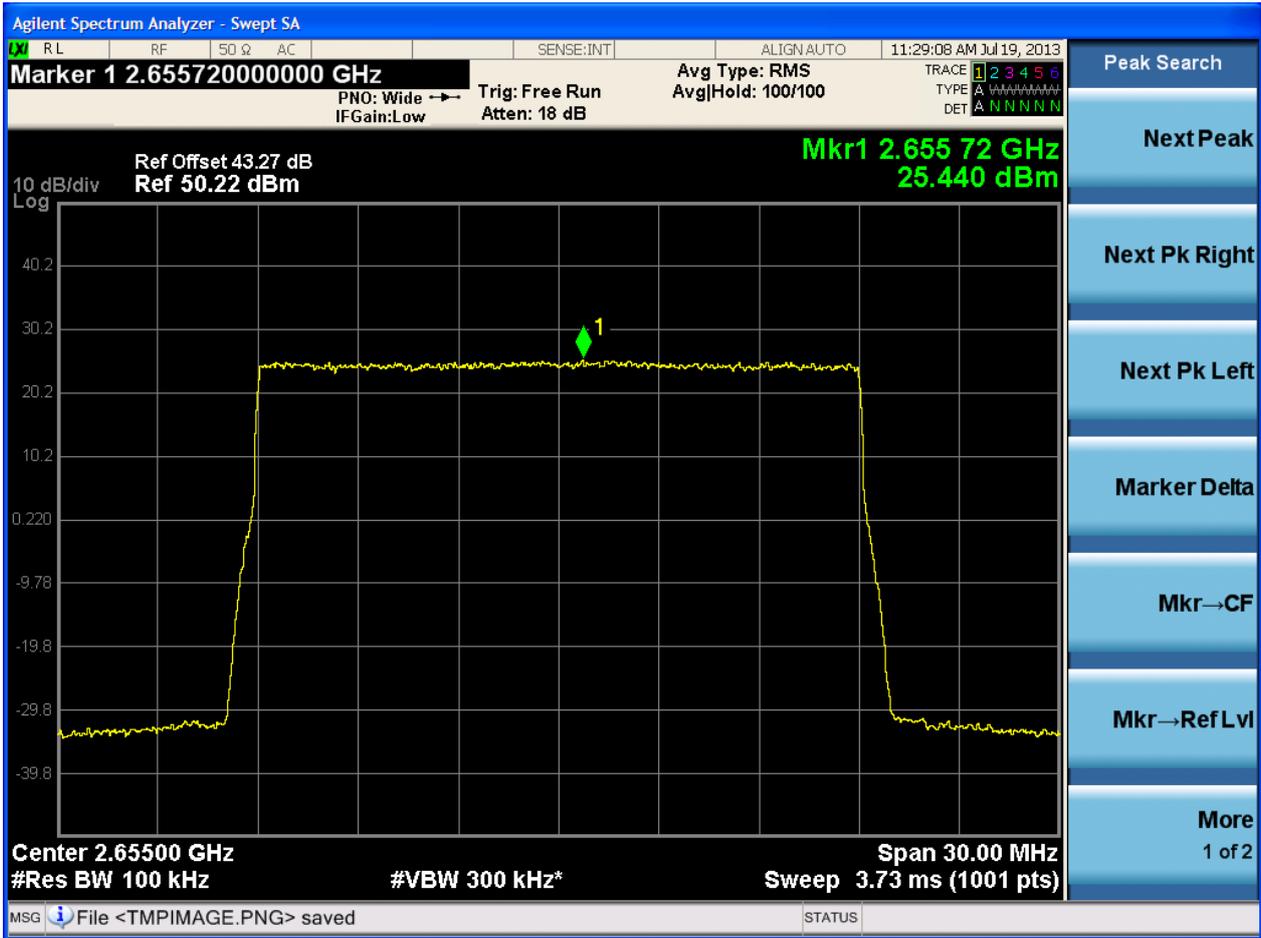


### 2.1.8 TX\_1L\_20M\_B\_TM1\_ANTB



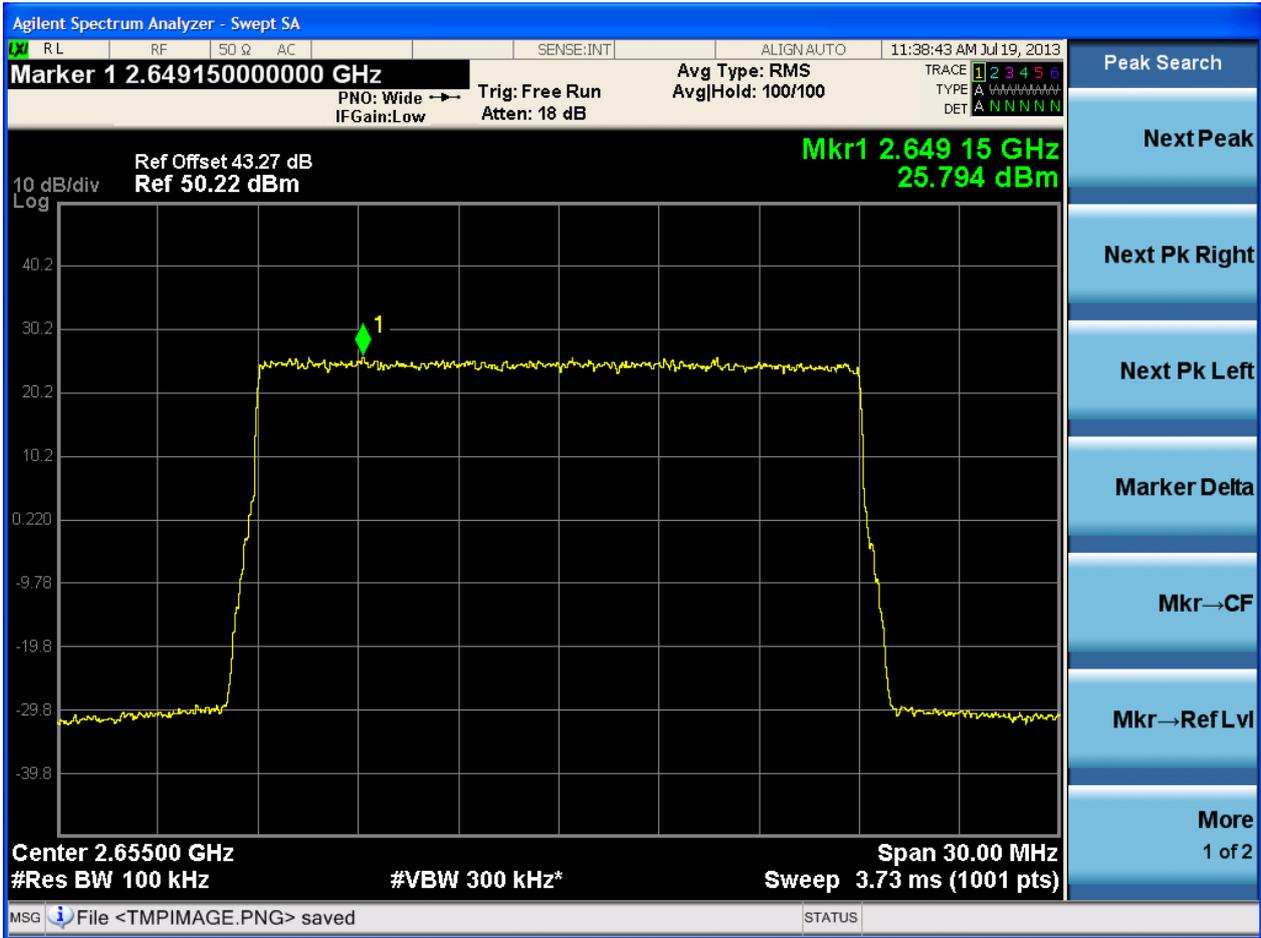


### 2.1.9 TX\_1L\_20M\_M\_TM1\_ANTA



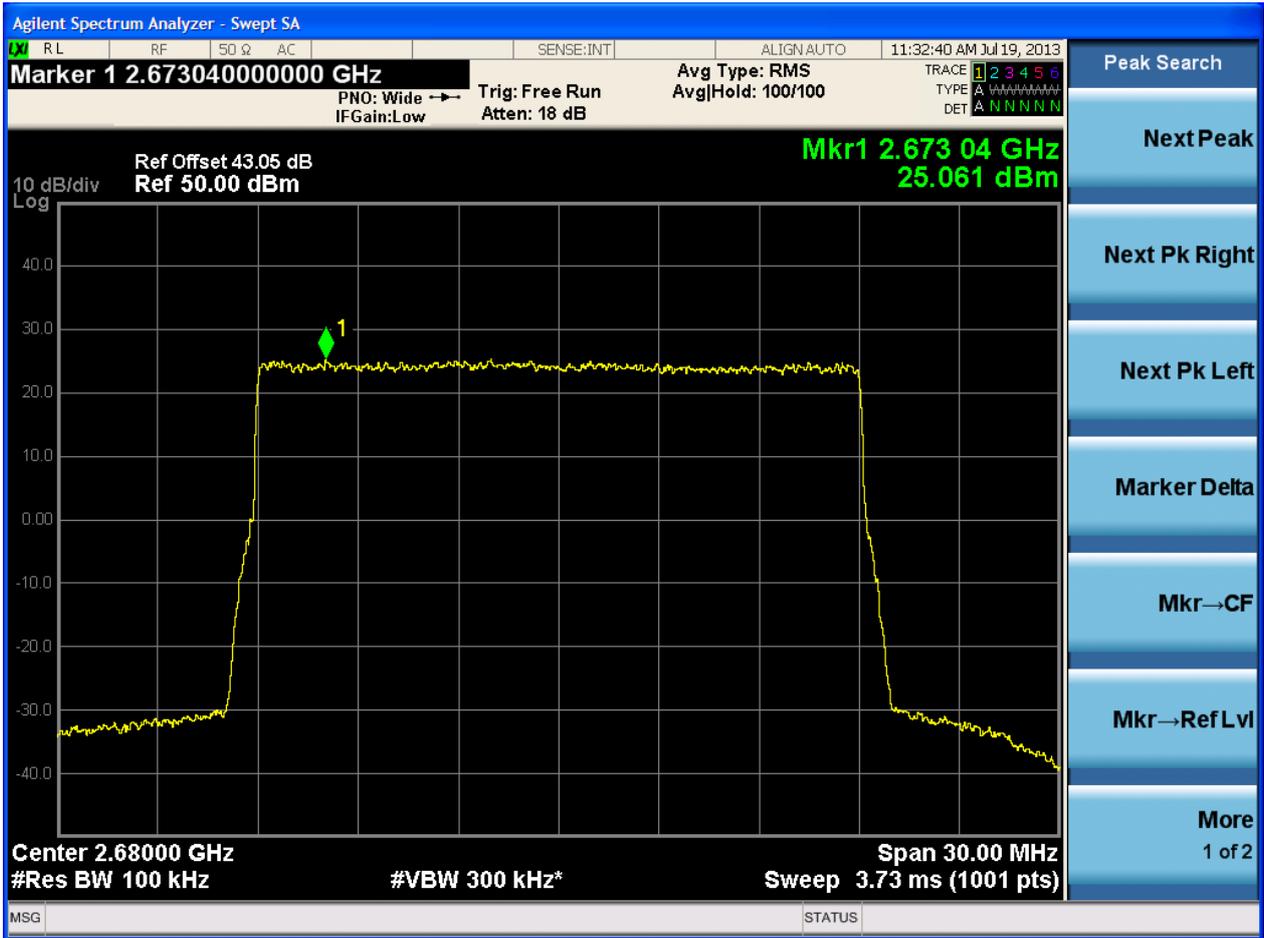


2.1.10 TX\_1L\_20M\_M\_TM1\_ANTB



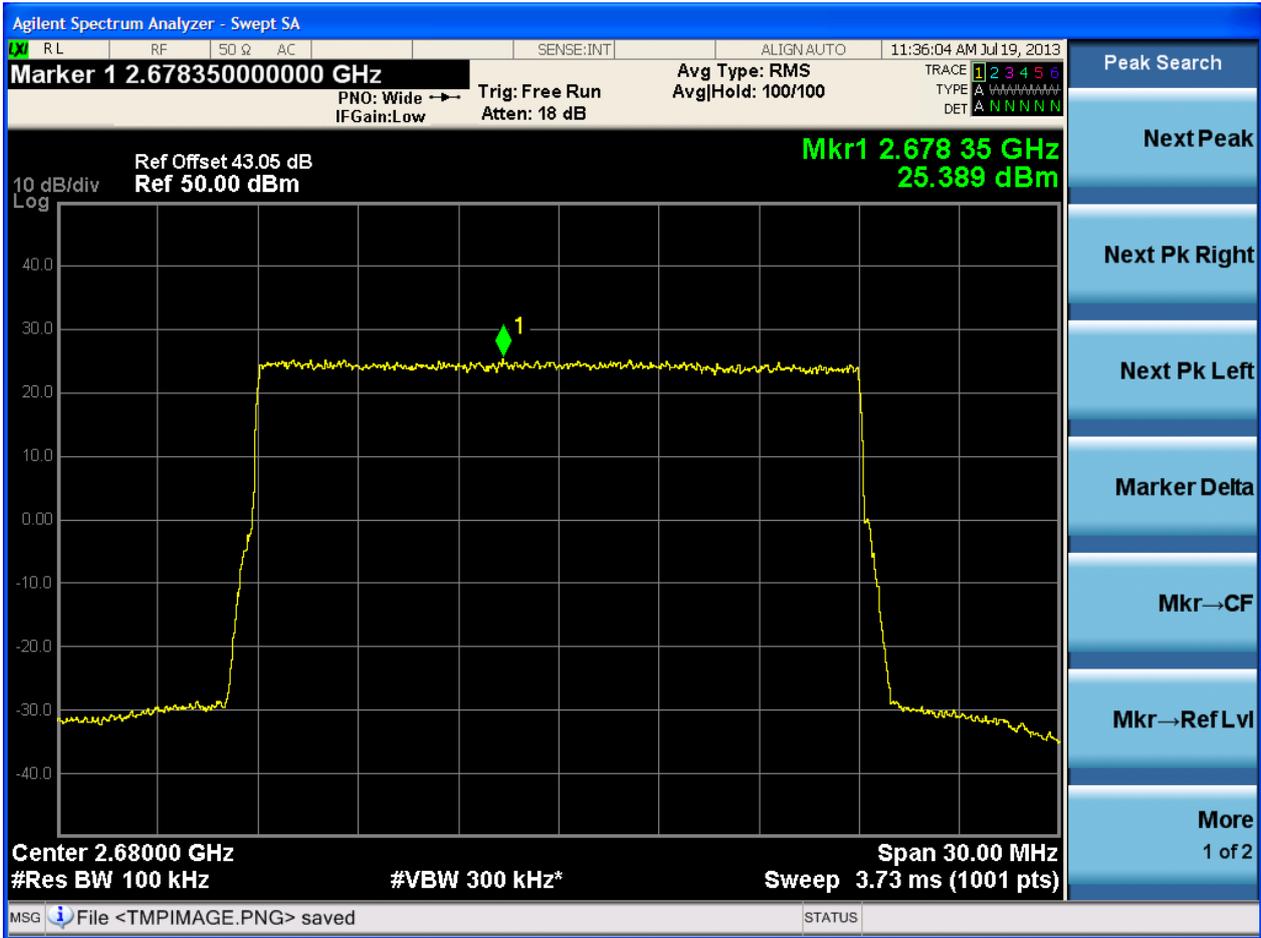


2.1.11 TX\_1L\_20M\_T\_TM1\_ANTA





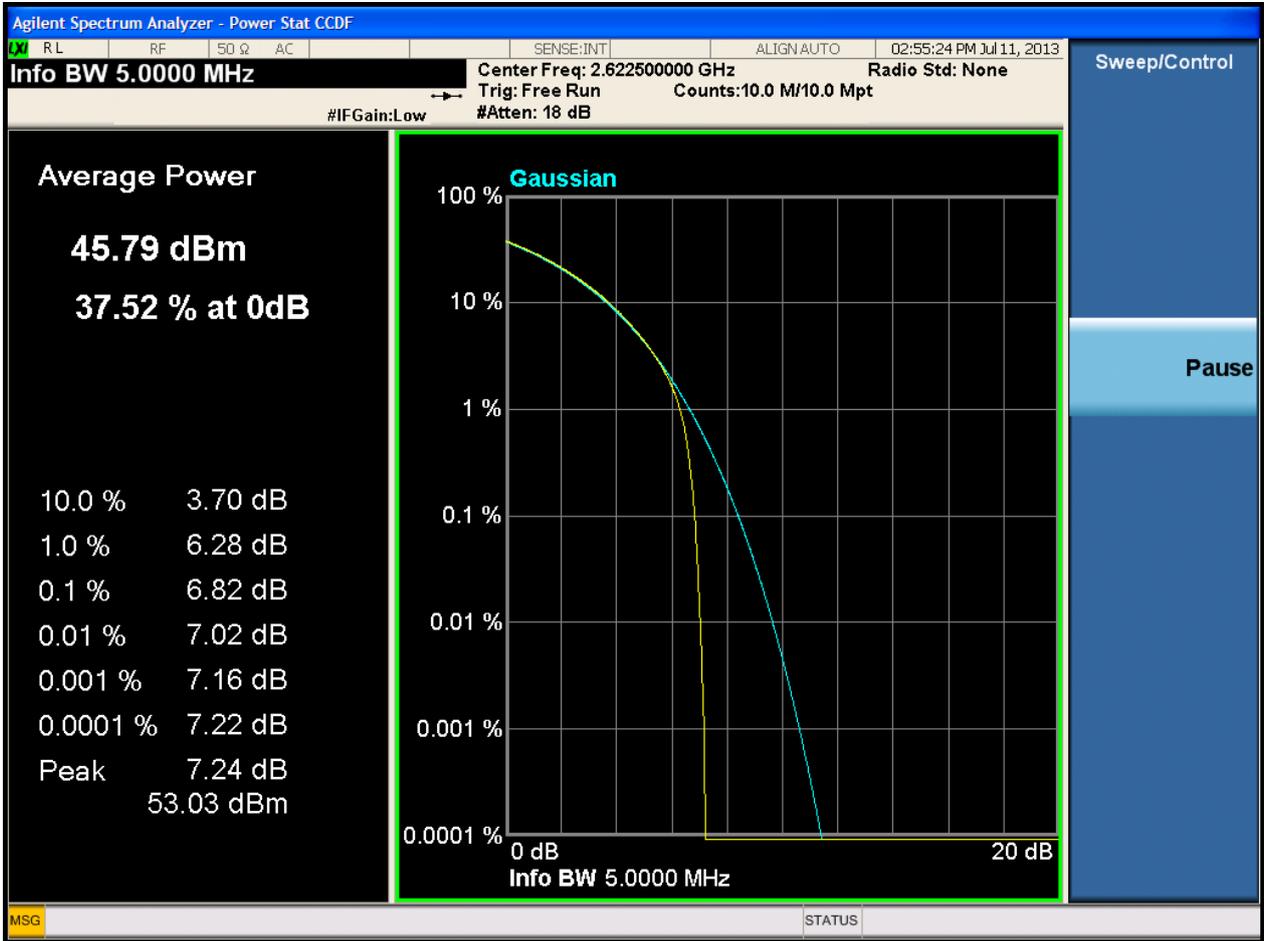
### 2.1.12 TX\_1L\_20M\_T\_TM1\_ANTB





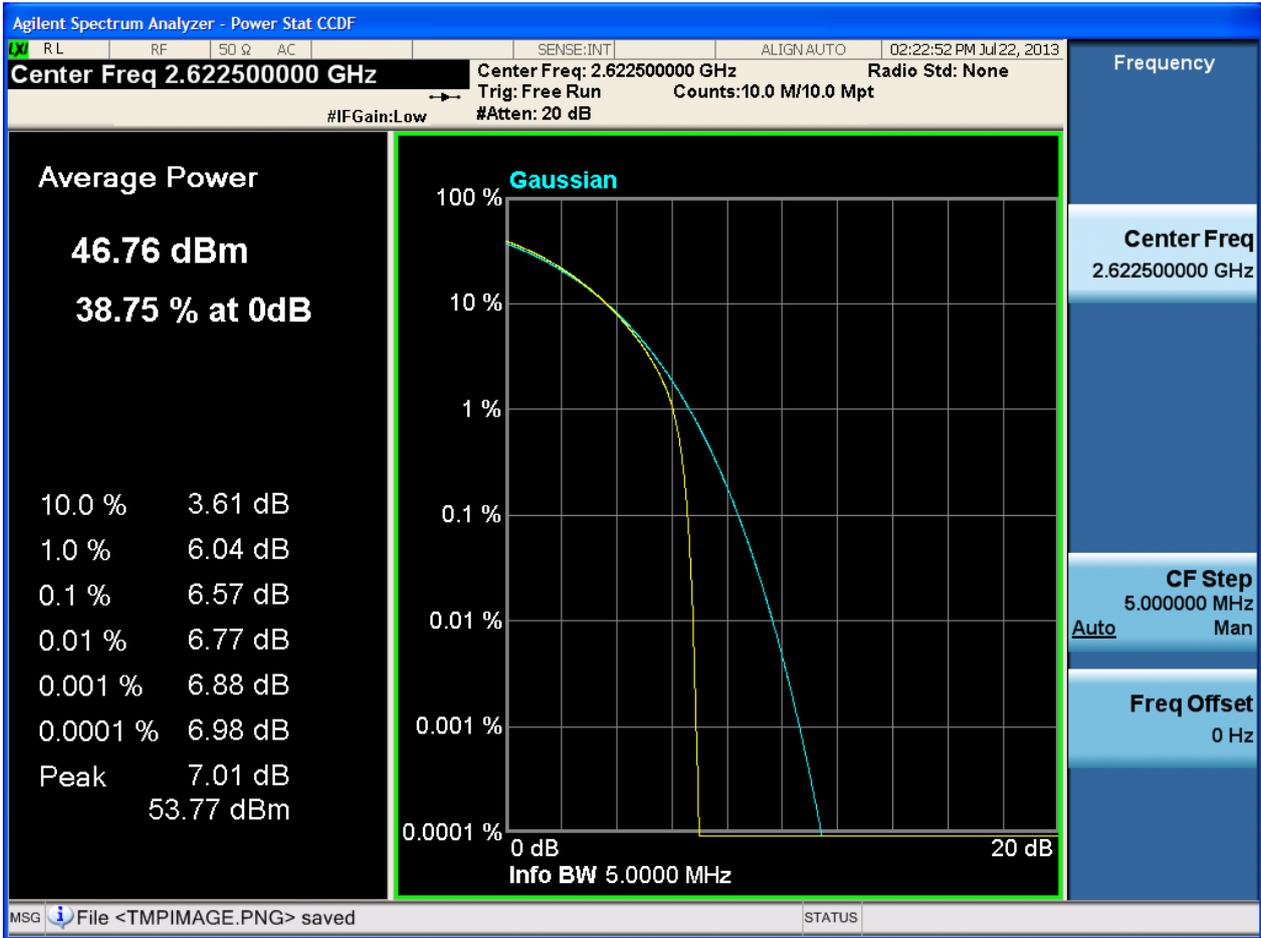
## 2.2 Peak-to-Average Ratio

### 2.2.1 TX\_1L\_5M\_B\_TM1\_ANTA



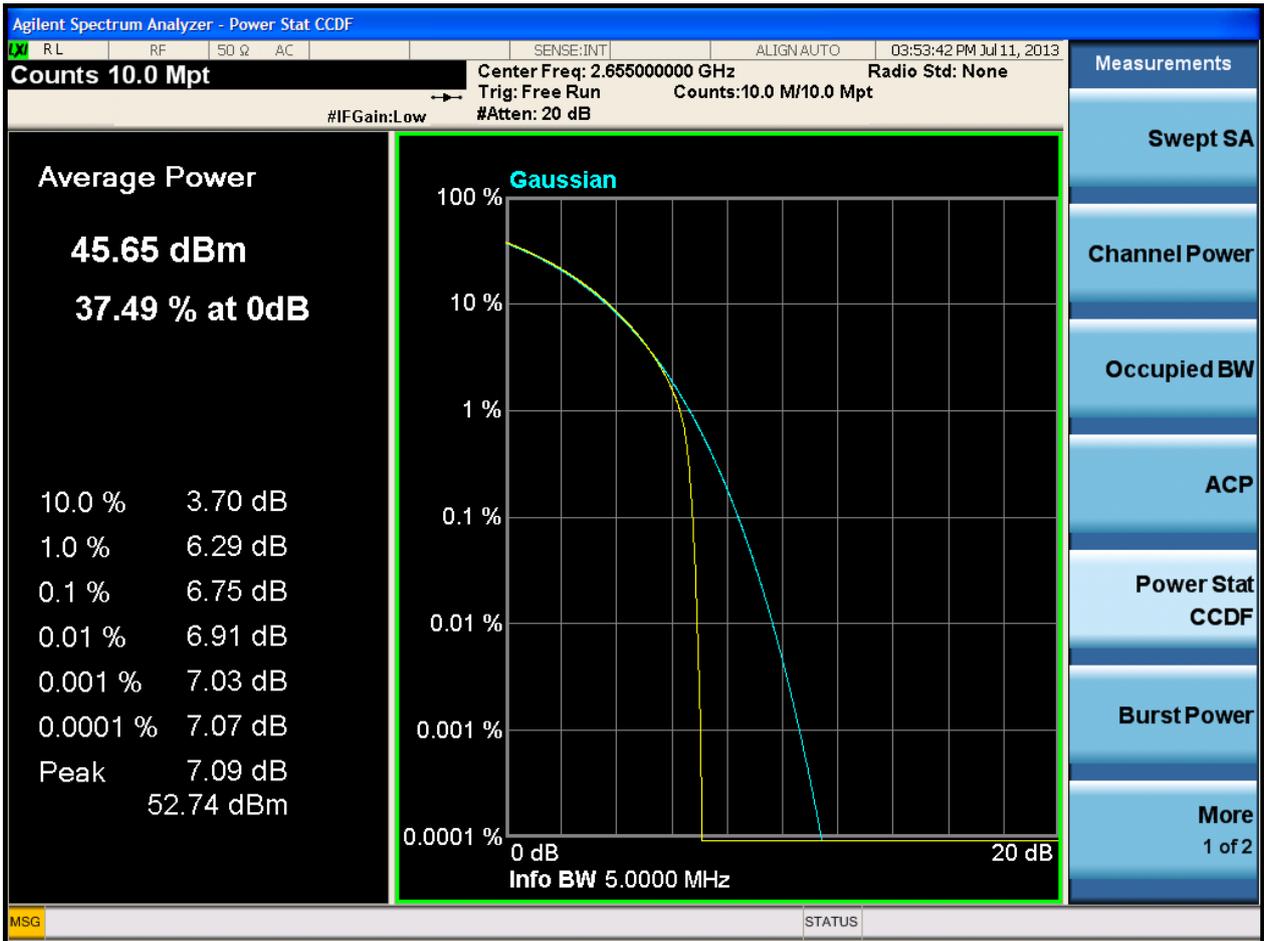


### 2.2.2 TX\_1L\_5M\_B\_TM1\_ANTB



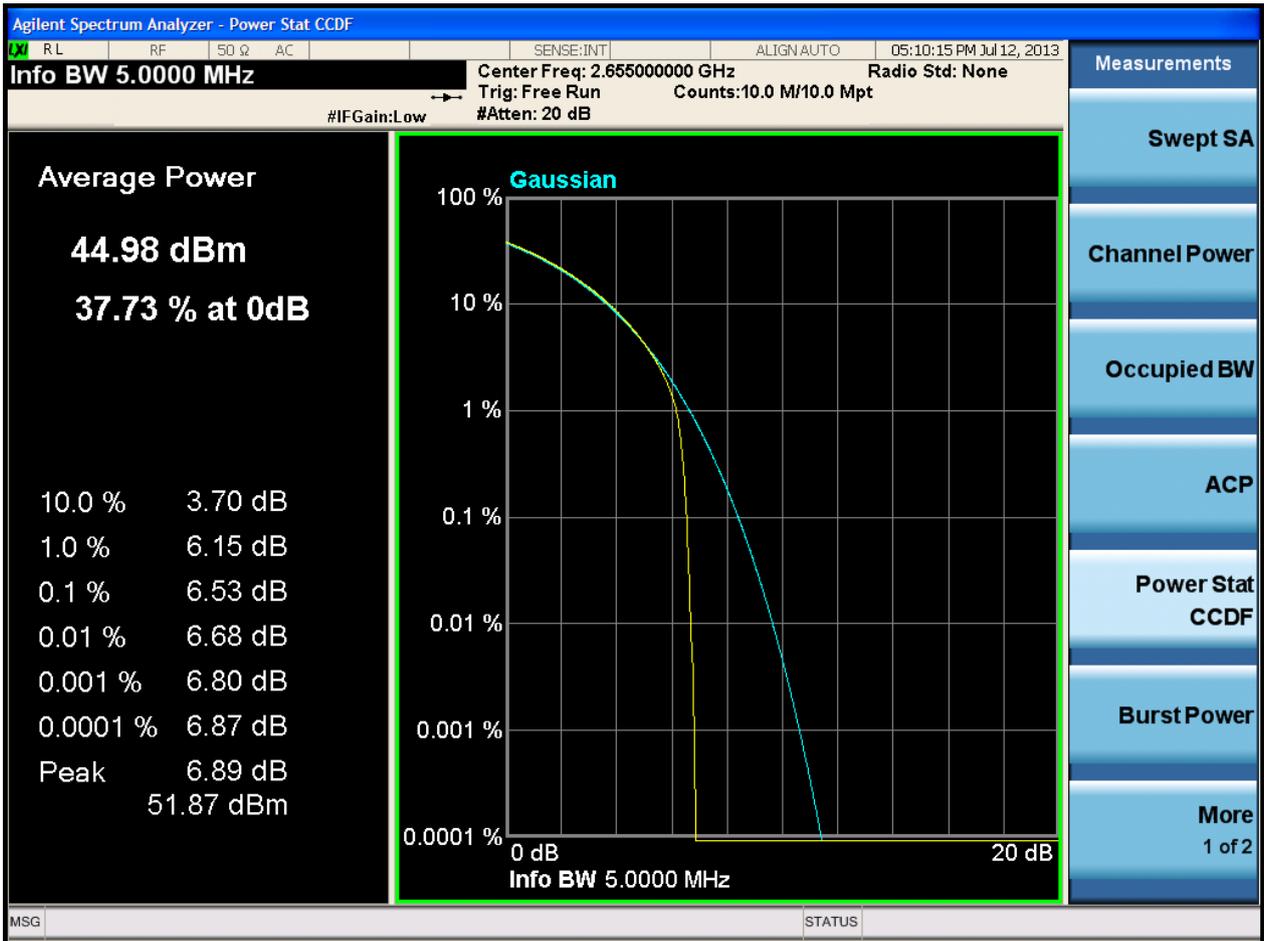


### 2.2.3 TX\_1L\_5M\_M\_TM1\_ANTA



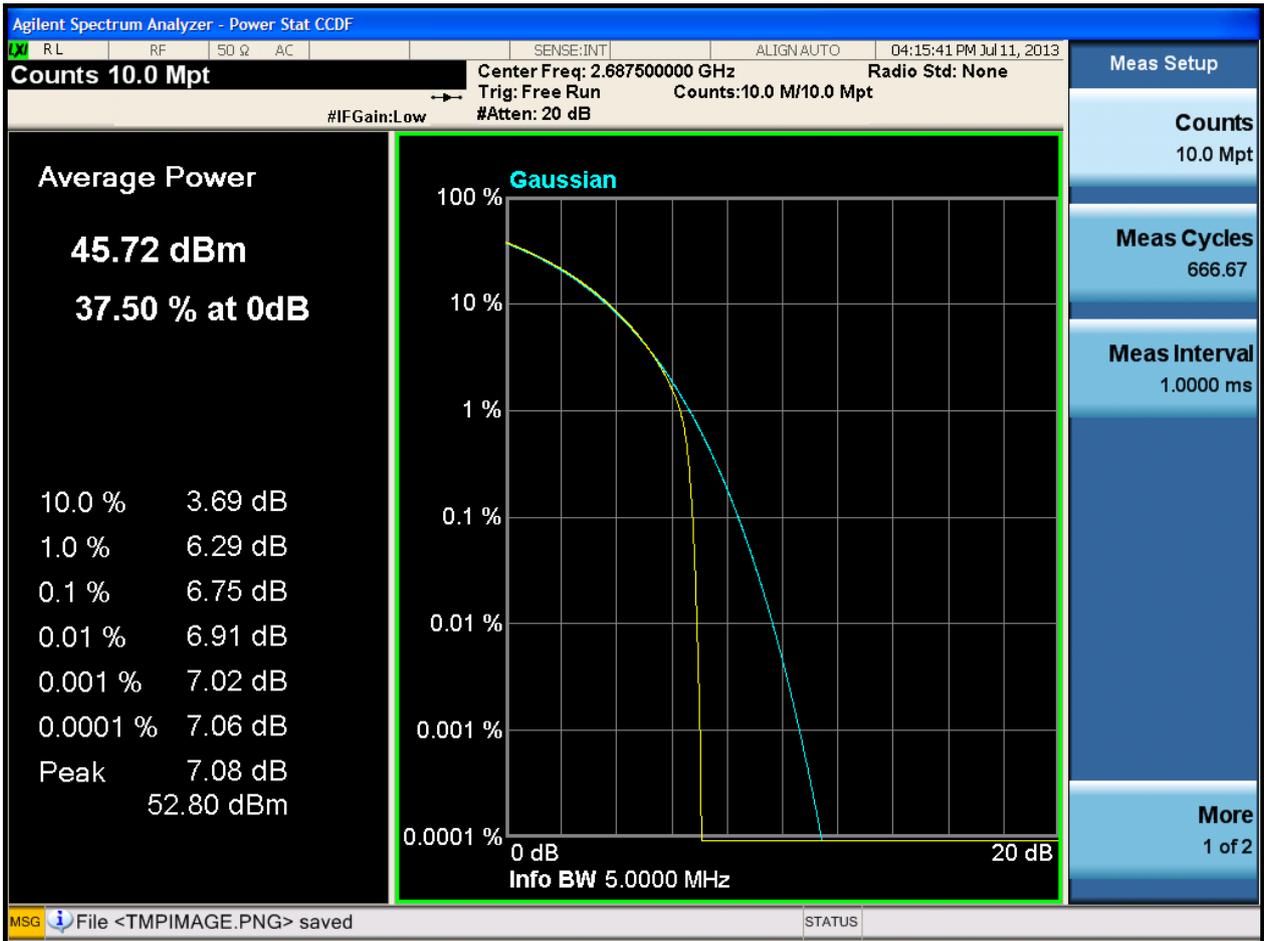


### 2.2.4 TX\_1L\_5M\_M\_TM1\_ANTB



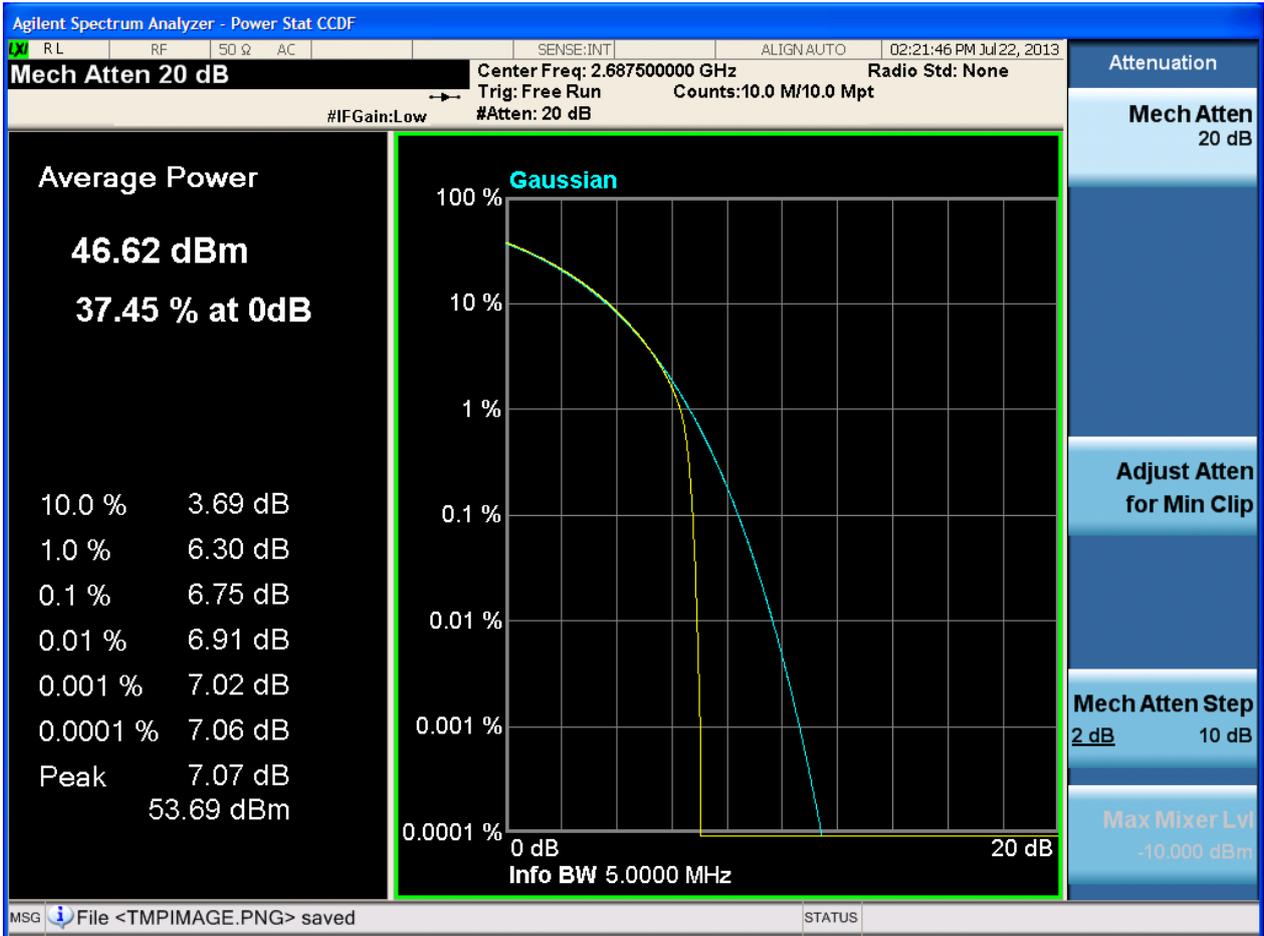


### 2.2.5 TX\_1L\_5M\_T\_TM1\_ANTA



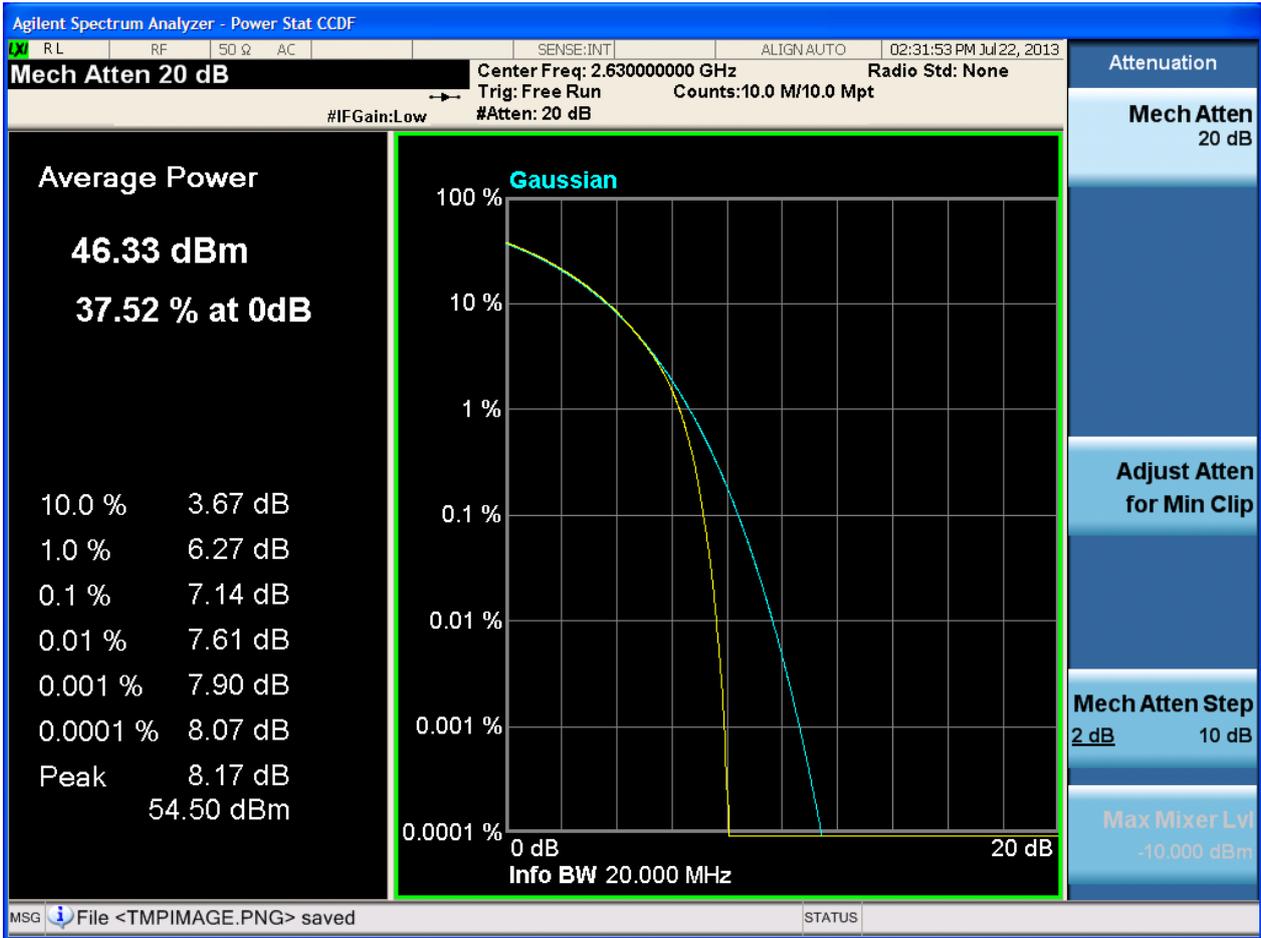


### 2.2.6 TX\_1L\_5M\_T\_TM1\_ANTB



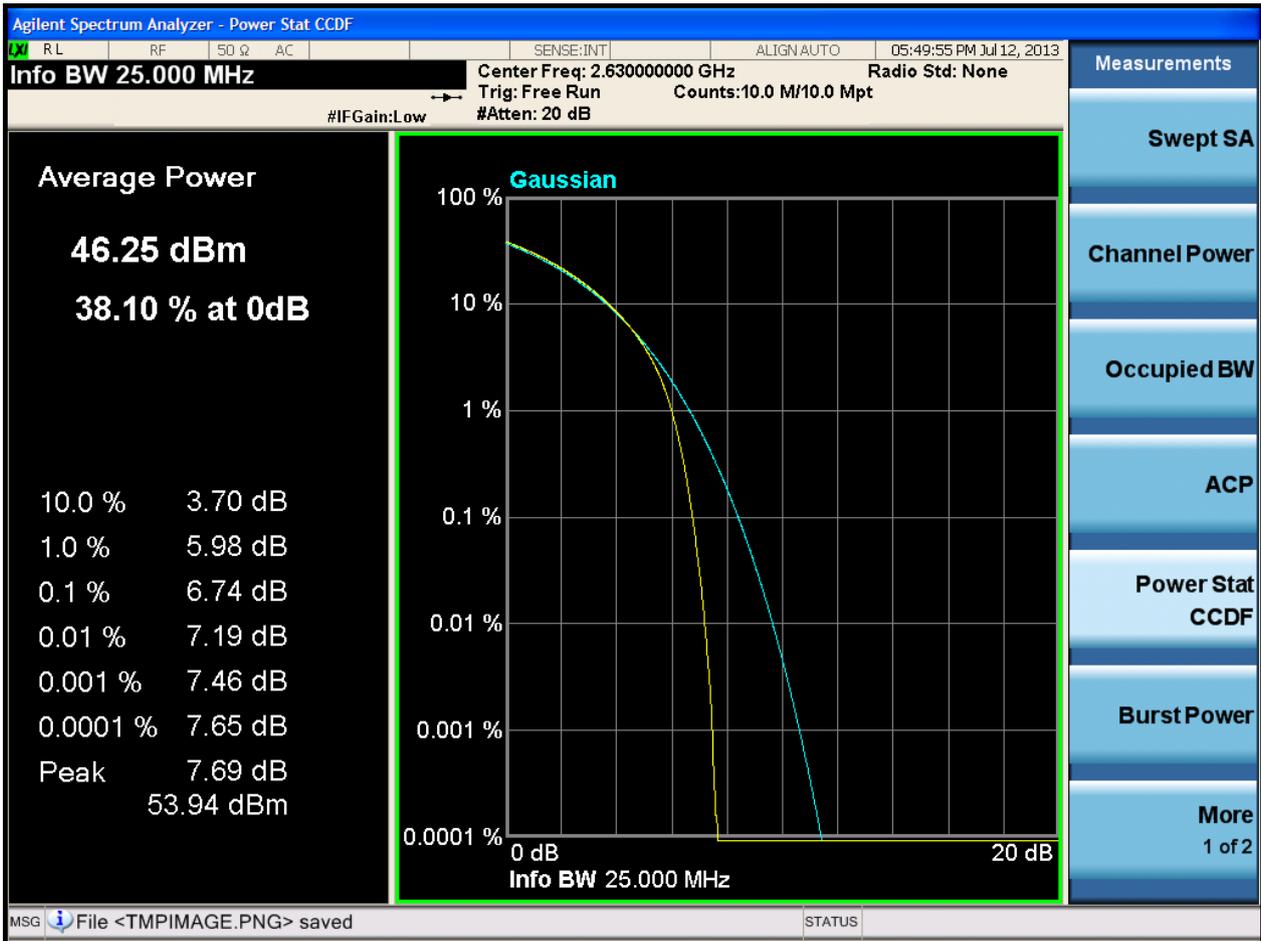


### 2.2.7 TX\_1L\_20M\_B\_TM1\_ANTA



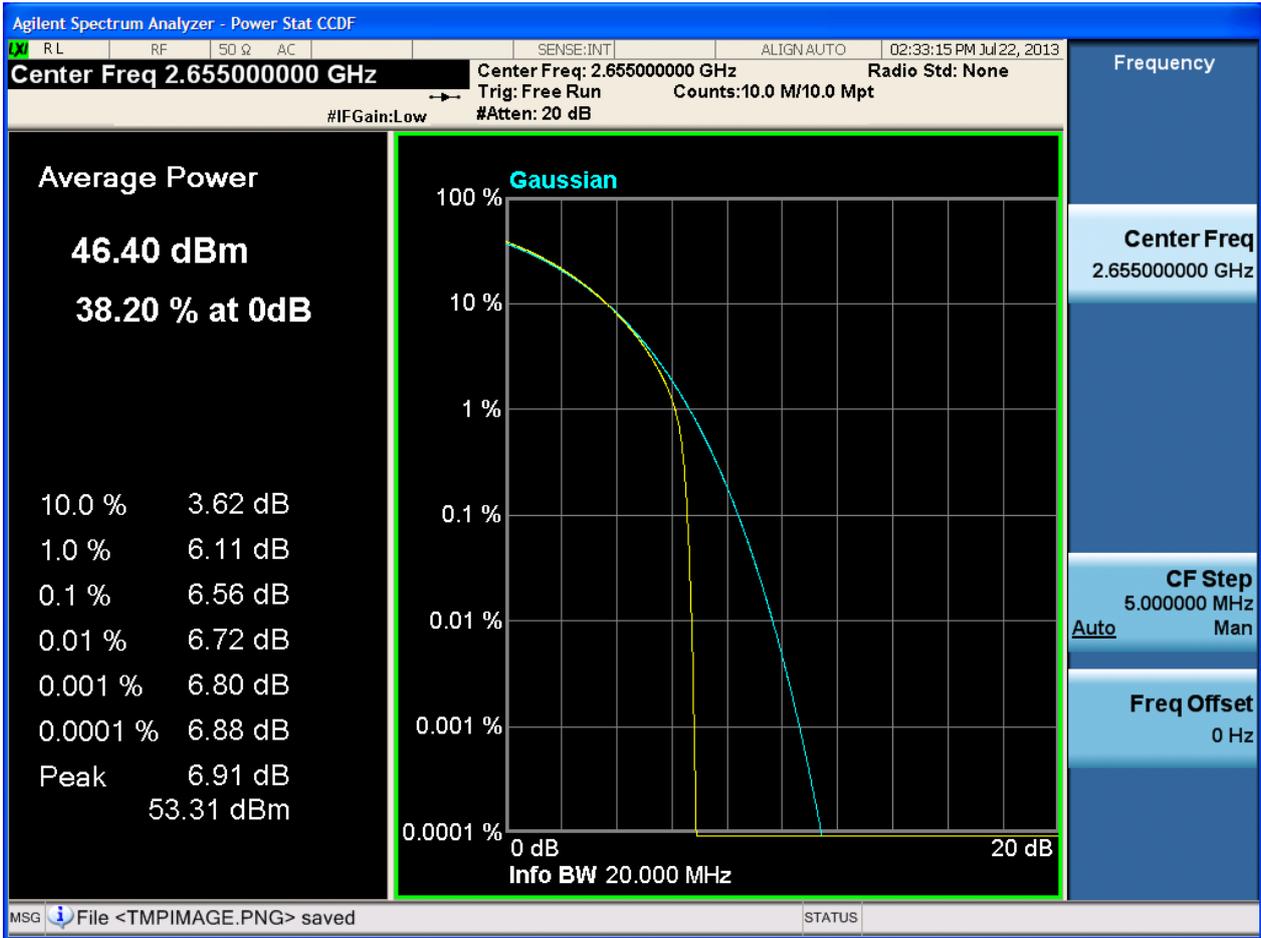


### 2.2.8 TX\_1L\_20M\_B\_TM1\_ANTB



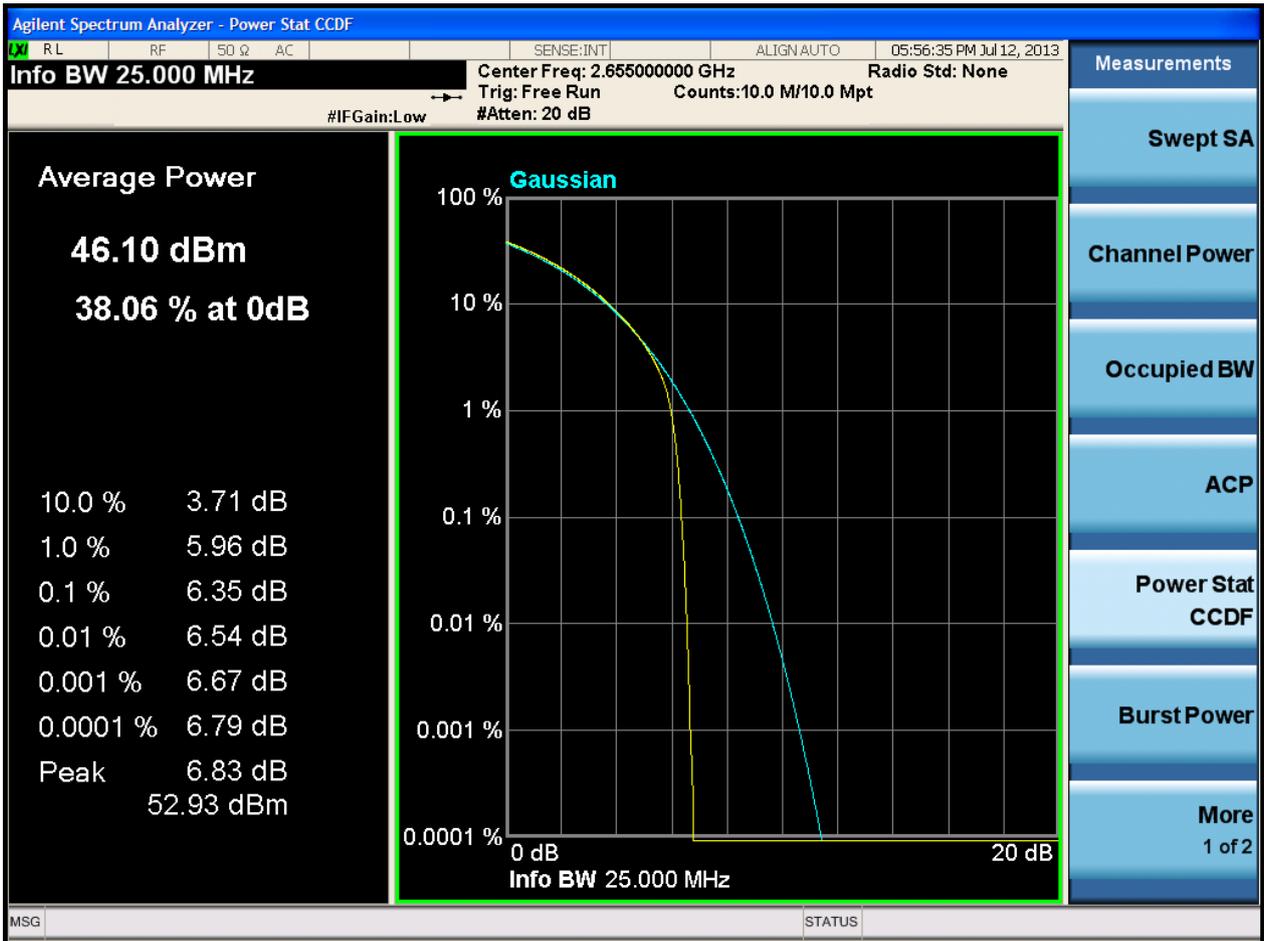


### 2.2.9 TX\_1L\_20M\_M\_TM1\_ANTA



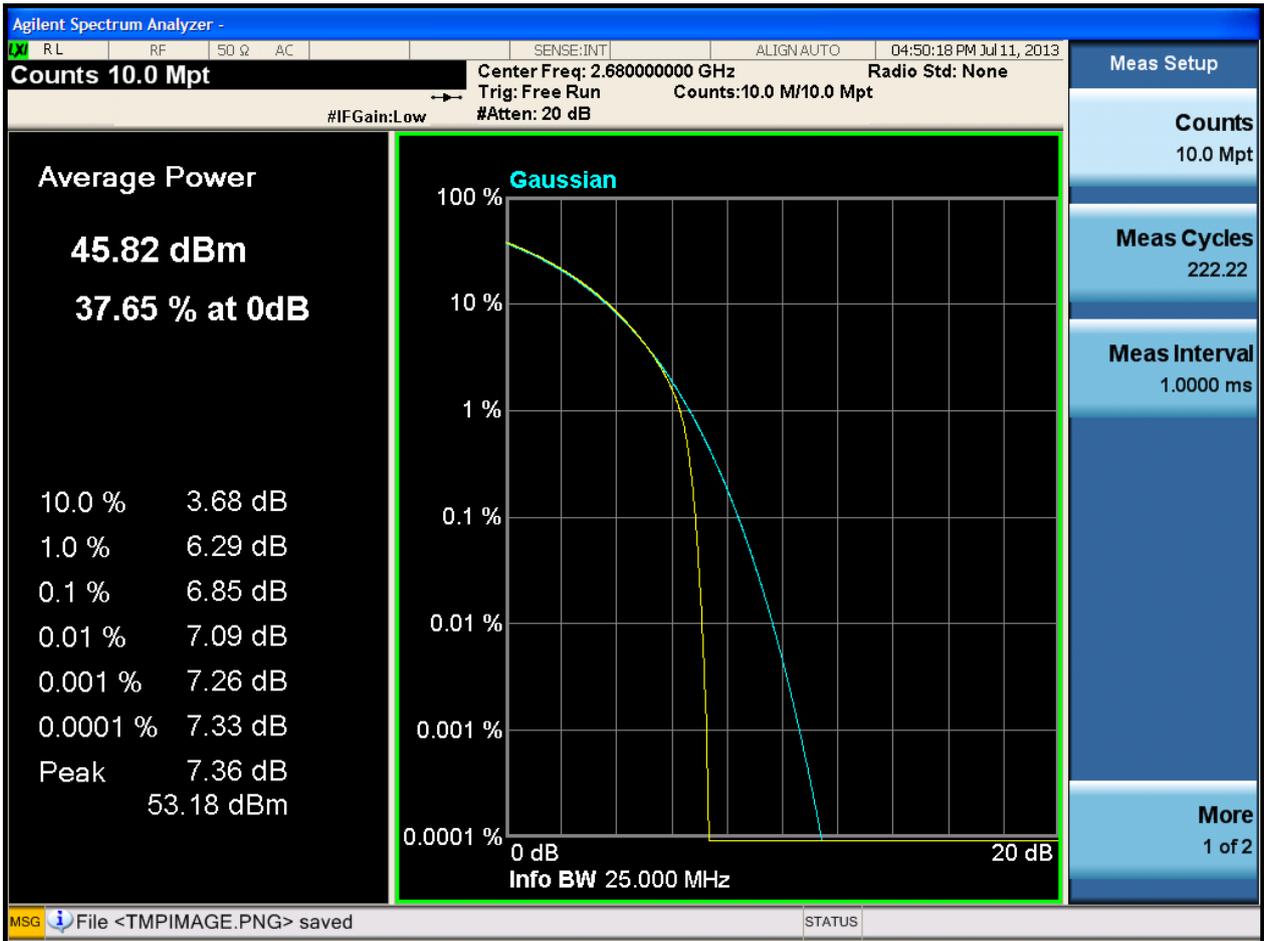


### 2.2.10 TX\_1L\_20M\_M\_TM1\_ANTB



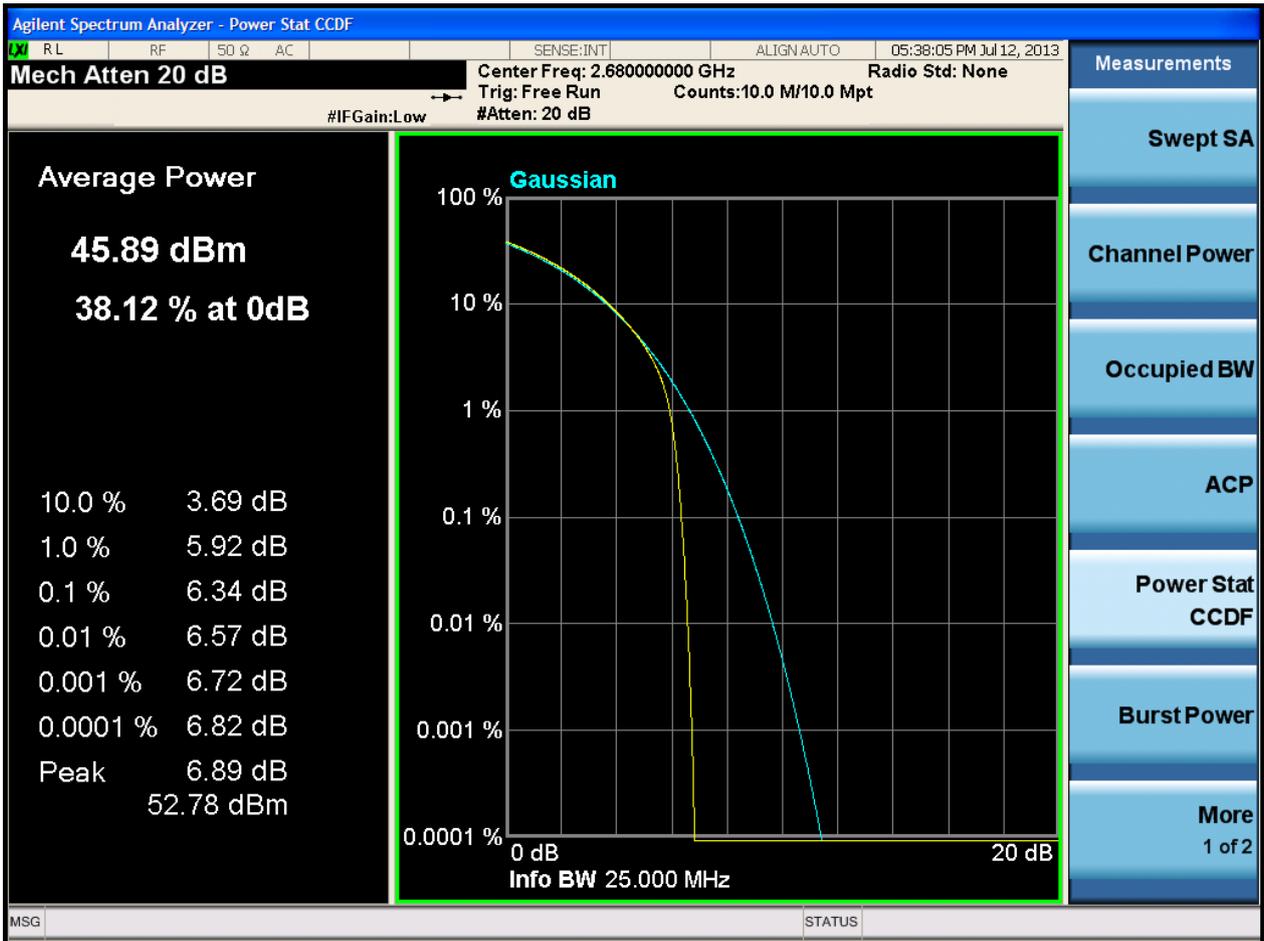


2.2.11 TX\_1L\_20M\_T\_TM1\_ANTA





### 2.2.12 TX\_1L\_20M\_T\_TM1\_ANTB





# Appendix B: Bandwidth



## 1 Result Table

### 1.1 Occupied Bandwidth

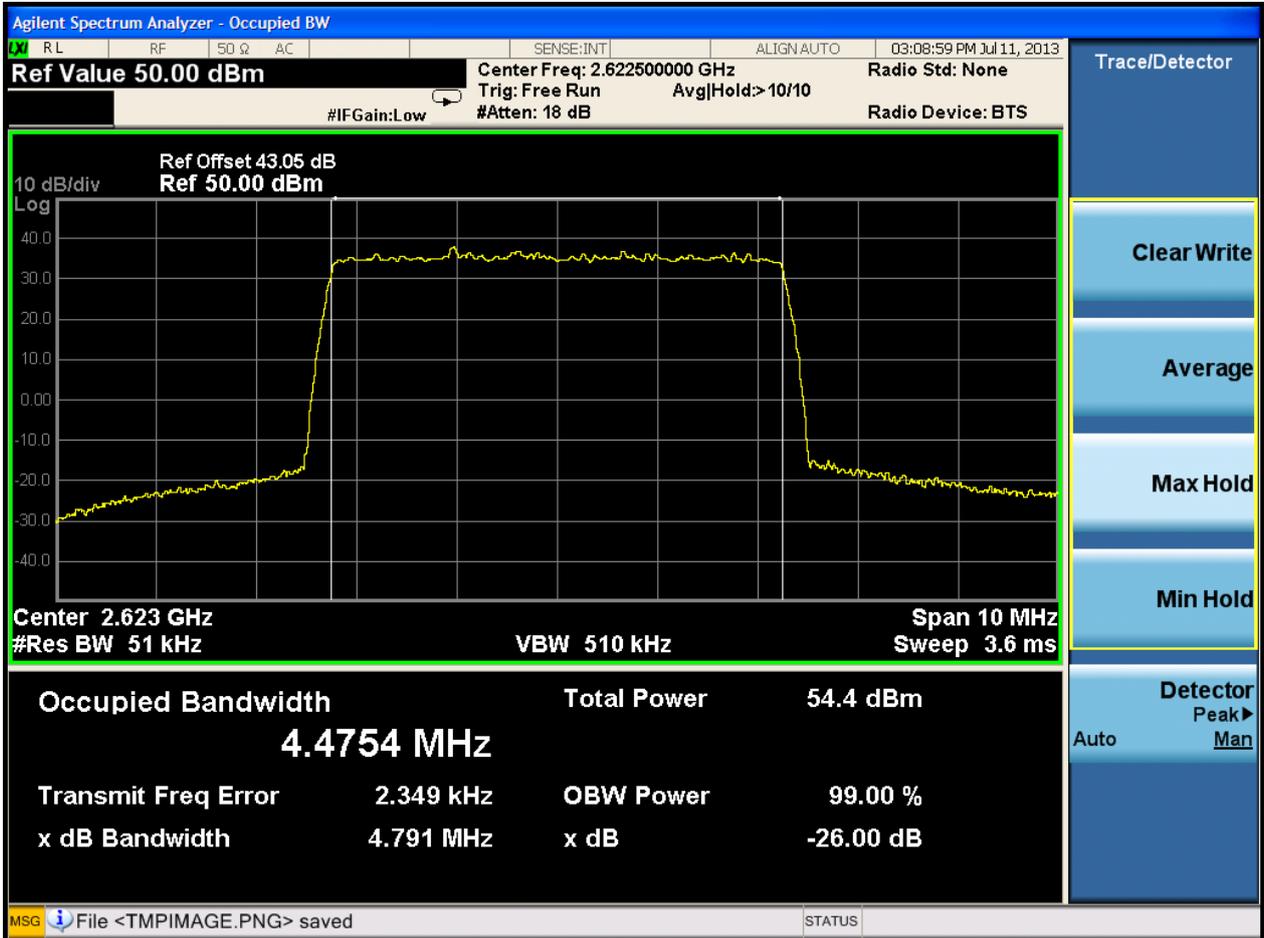
EUT Conf.	Occupied Bandwidth [MHz]	Verdict
TX_1L_5M_B_TM1_ANTA	4.4754	Pass
TX_1L_5M_B_TM1_ANTB	4.4505	Pass
TX_1L_5M_M_TM1_ANTA	4.4843	Pass
TX_1L_5M_M_TM1_ANTB	4.4727	Pass
TX_1L_5M_T_TM1_ANTA	4.4787	Pass
TX_1L_5M_T_TM1_ANTB	4.4710	Pass
TX_1L_10M_B_TM1_ANTA	8.9445	Pass
TX_1L_10M_B_TM1_ANTB	8.9498	Pass
TX_1L_10M_M_TM1_ANTA	8.9498	Pass
TX_1L_10M_M_TM1_ANTB	8.9417	Pass
TX_1L_10M_T_TM1_ANTA	8.9725	Pass
TX_1L_10M_T_TM1_ANTB	8.9539	Pass
TX_1L_15M_B_TM1_ANTA	13.402	Pass
TX_1L_15M_B_TM1_ANTB	13.410	Pass
TX_1L_15M_M_TM1_ANTA	13.428	Pass
TX_1L_15M_M_TM1_ANTB	13.472	Pass
TX_1L_15M_T_TM1_ANTA	13.411	Pass
TX_1L_15M_T_TM1_ANTB	13.425	Pass
TX_1L_20M_B_TM1_ANTA	17.901	Pass
TX_1L_20M_B_TM1_ANTB	17.878	Pass
TX_1L_20M_M_TM1_ANTA	17.910	Pass
TX_1L_20M_M_TM1_ANTB	17.879	Pass
TX_1L_20M_T_TM1_ANTA	17.896	Pass
TX_1L_20M_T_TM1_ANTB	17.851	Pass



## 2 Test Plot

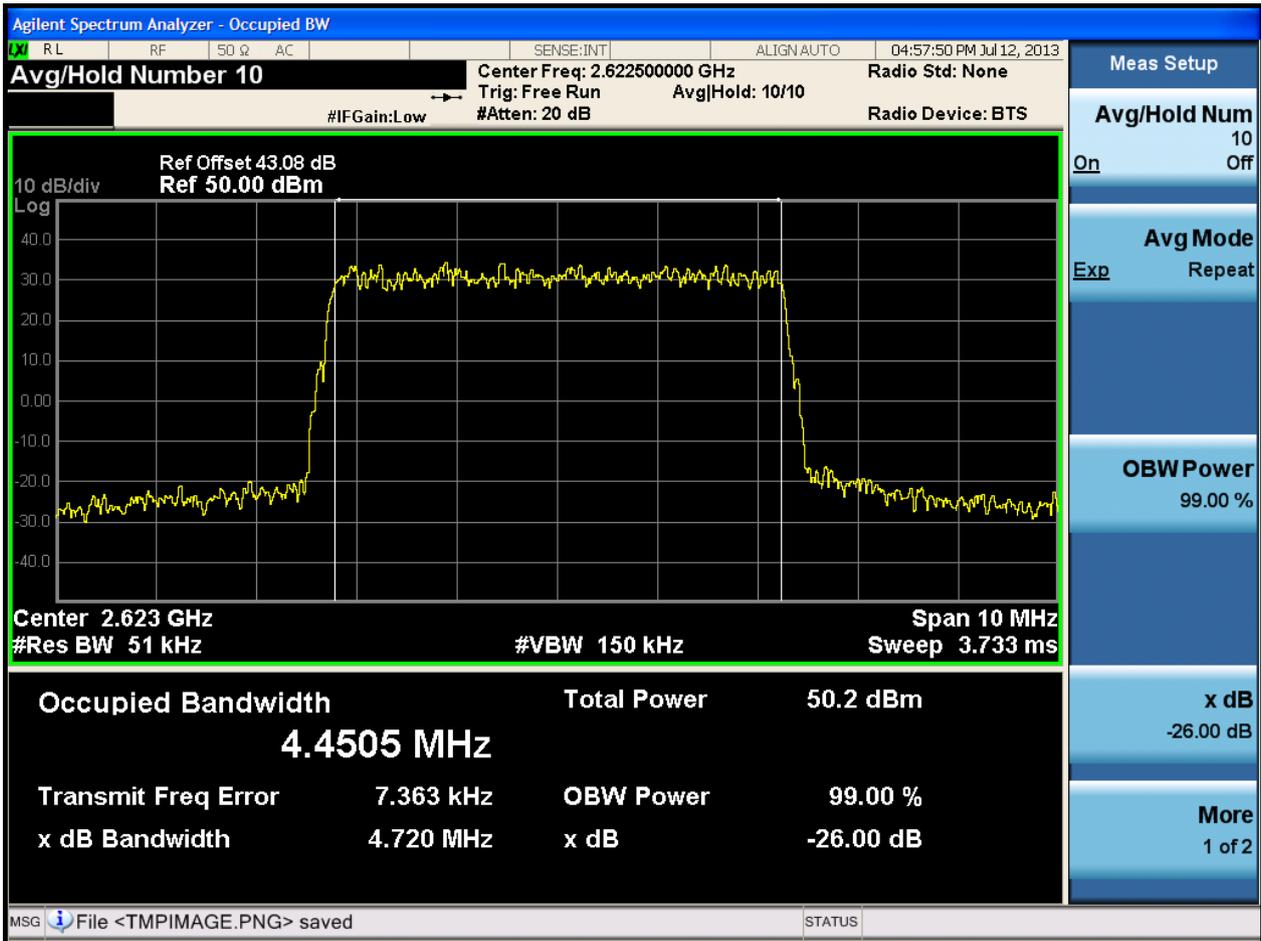
### 2.1 Occupied Bandwidth

#### 2.1.1 TX\_1L\_5M\_B\_TM1\_ANTA



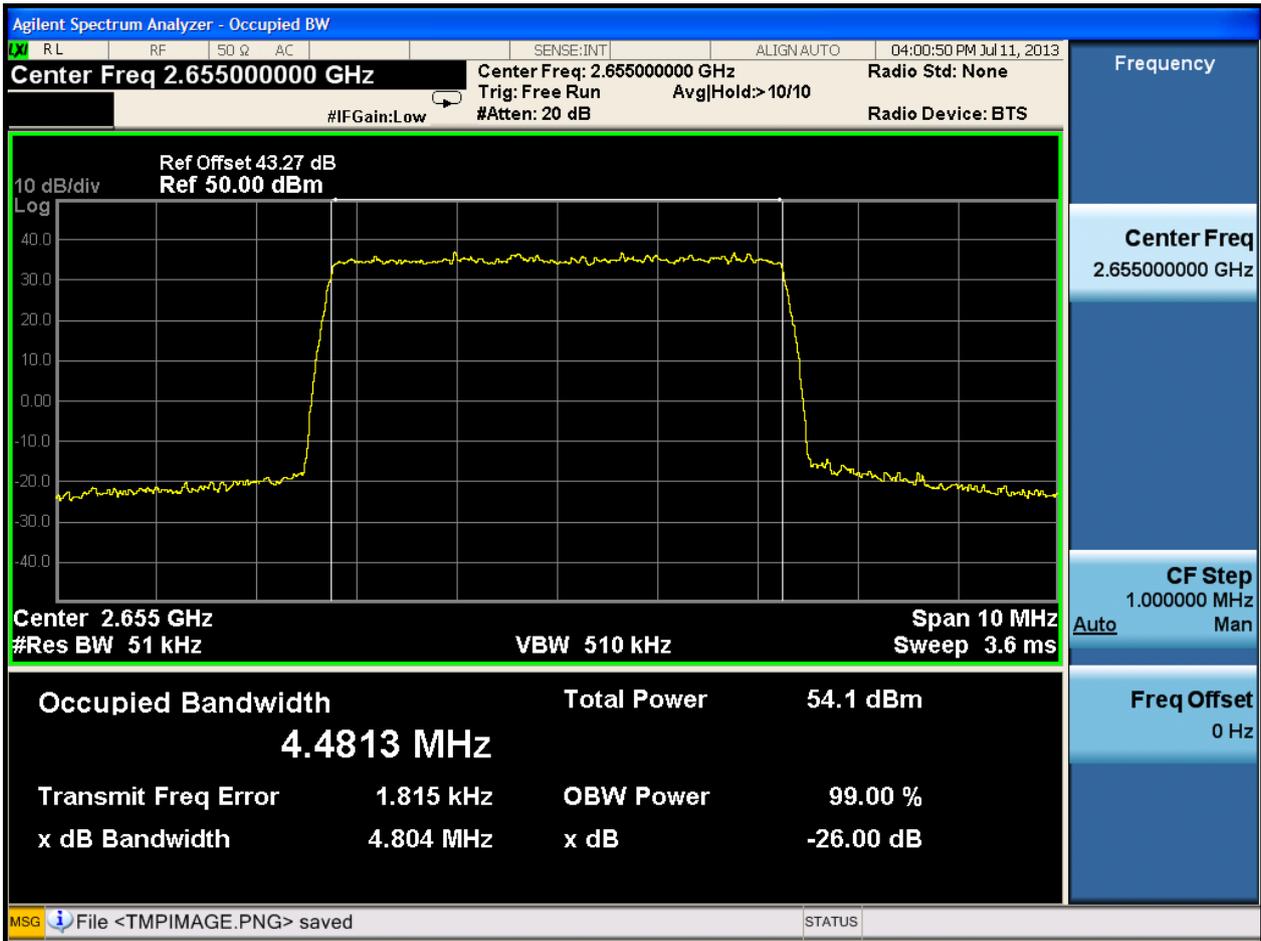


2.1.2 TX\_1L\_5M\_B\_TM1\_ANTB



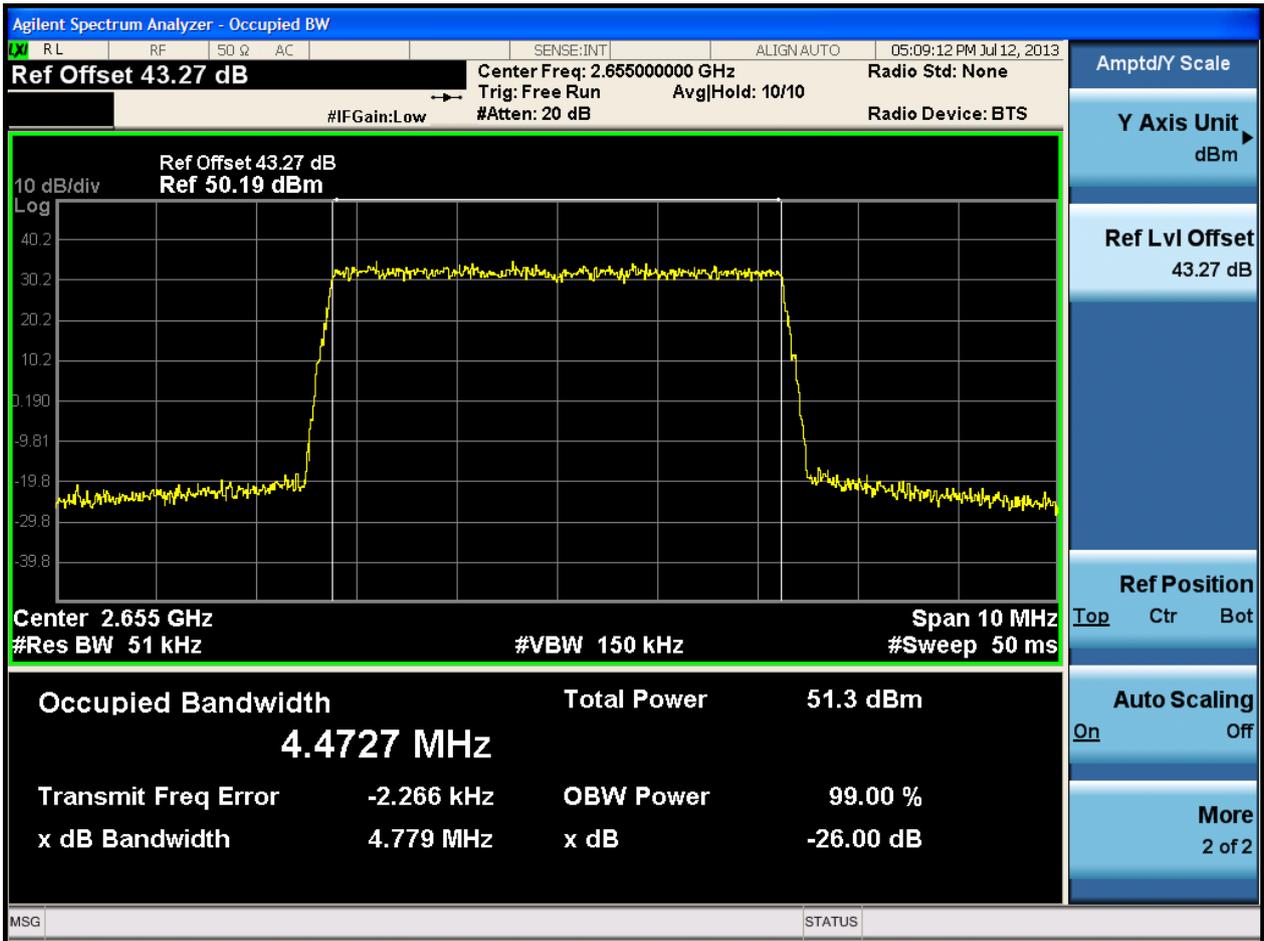


### 2.1.3 TX\_1L\_5M\_M\_TM1\_ANTA



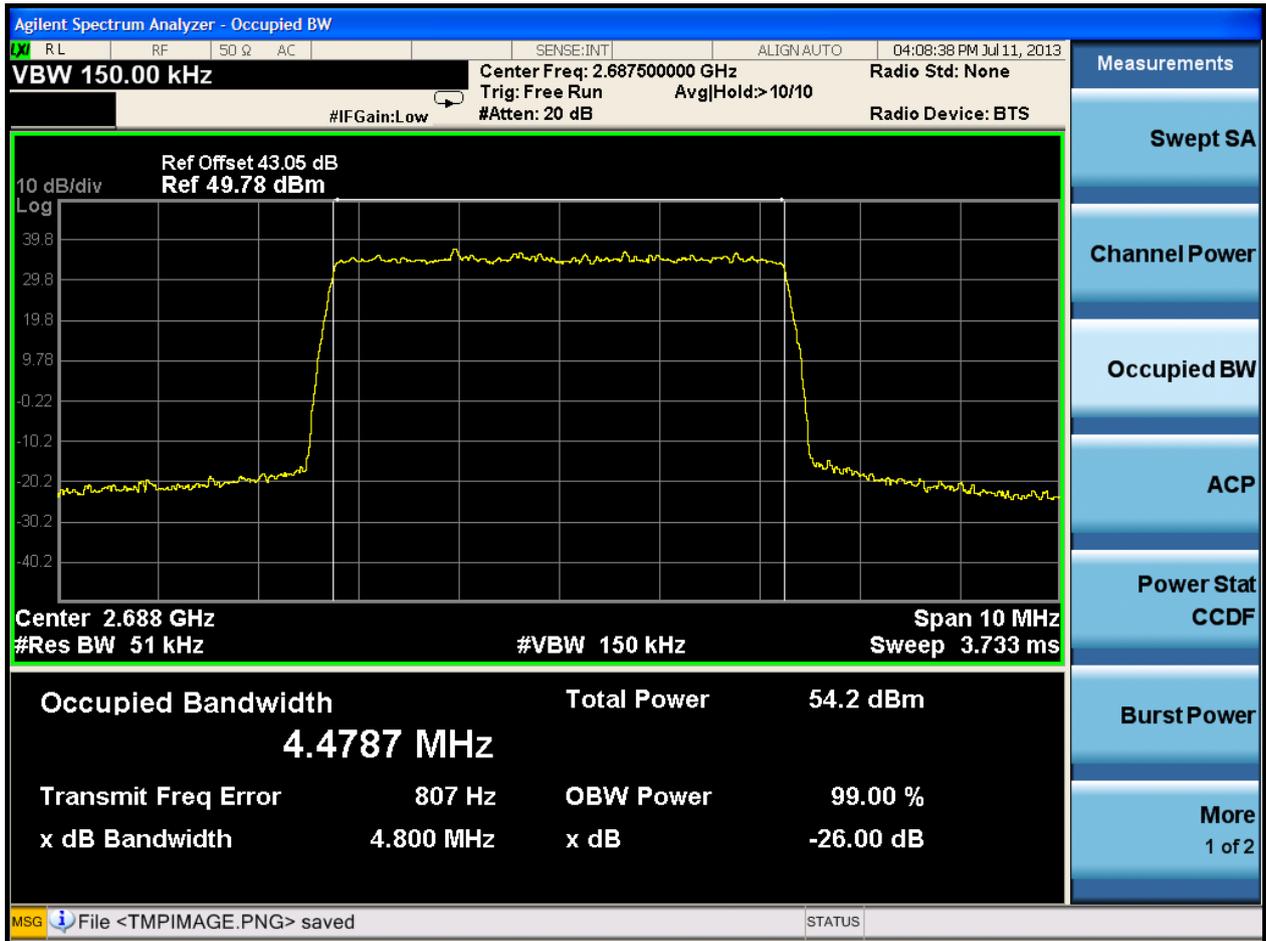


2.1.4 TX\_1L\_5M\_M\_TM1\_ANTB



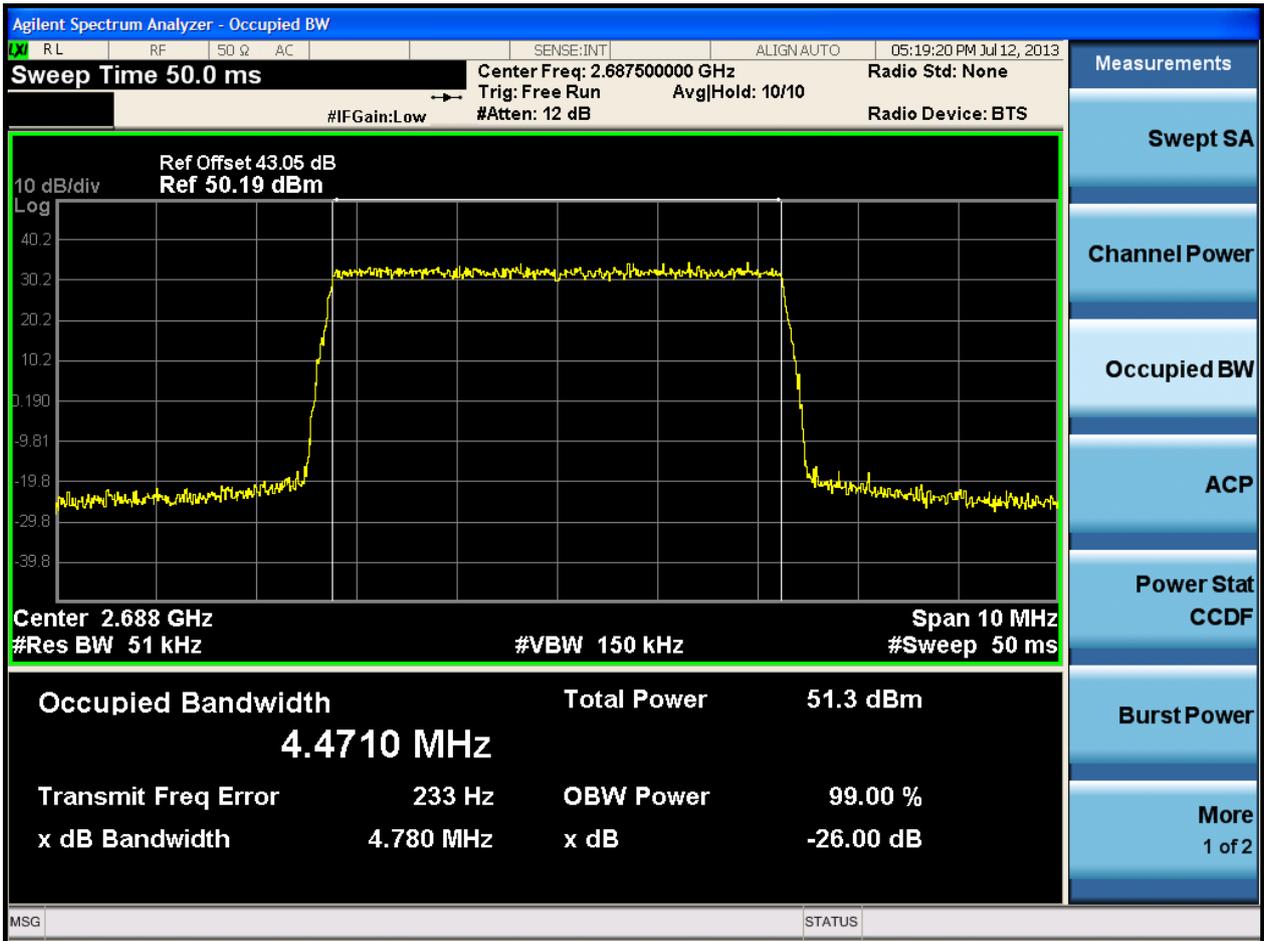


### 2.1.5 TX\_1L\_5M\_T\_TM1\_ANTA



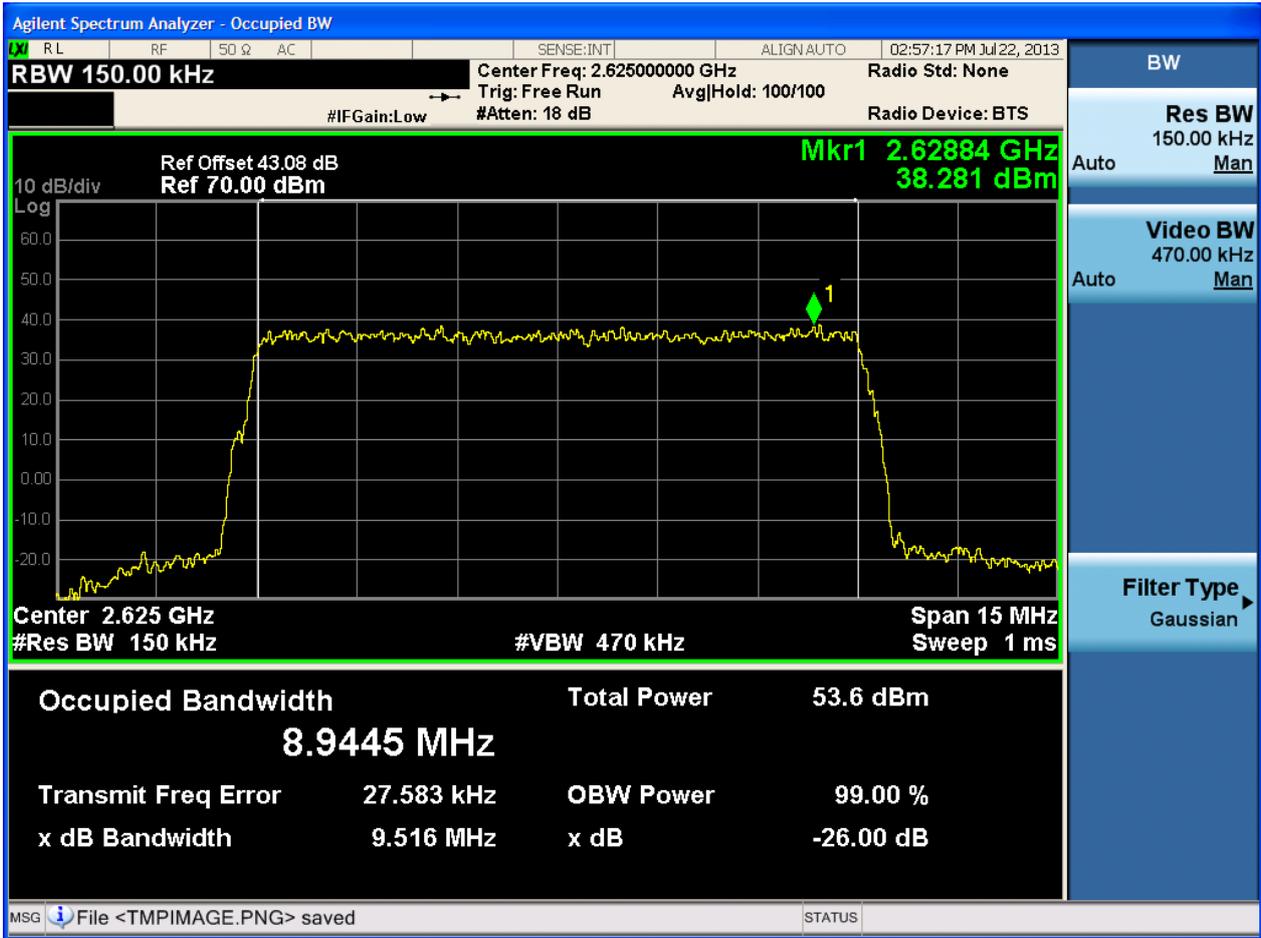


2.1.6 TX\_1L\_5M\_T\_TM1\_ANTB



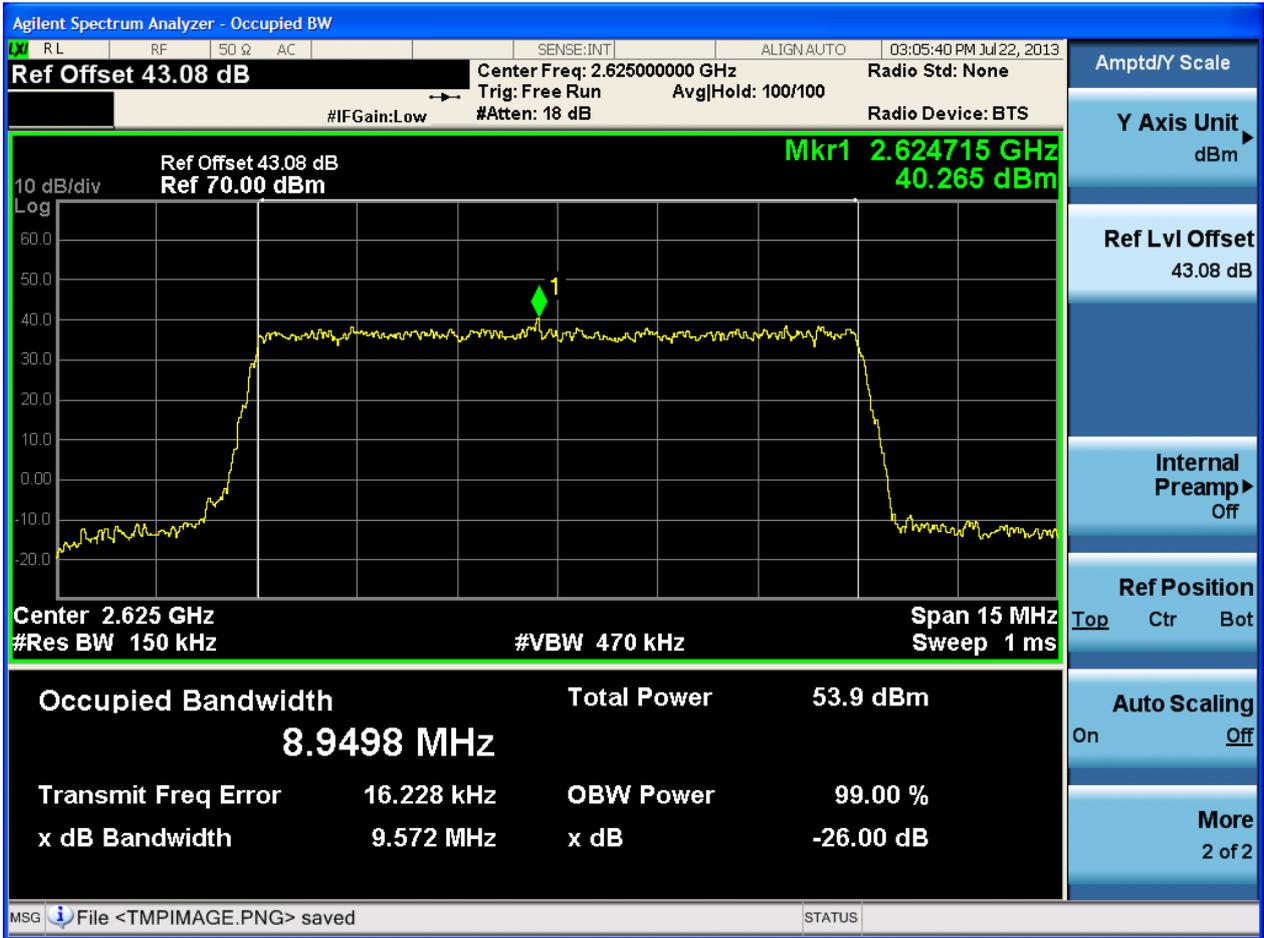


2.1.7 TX\_1L\_10M\_B\_TM1\_ANTA



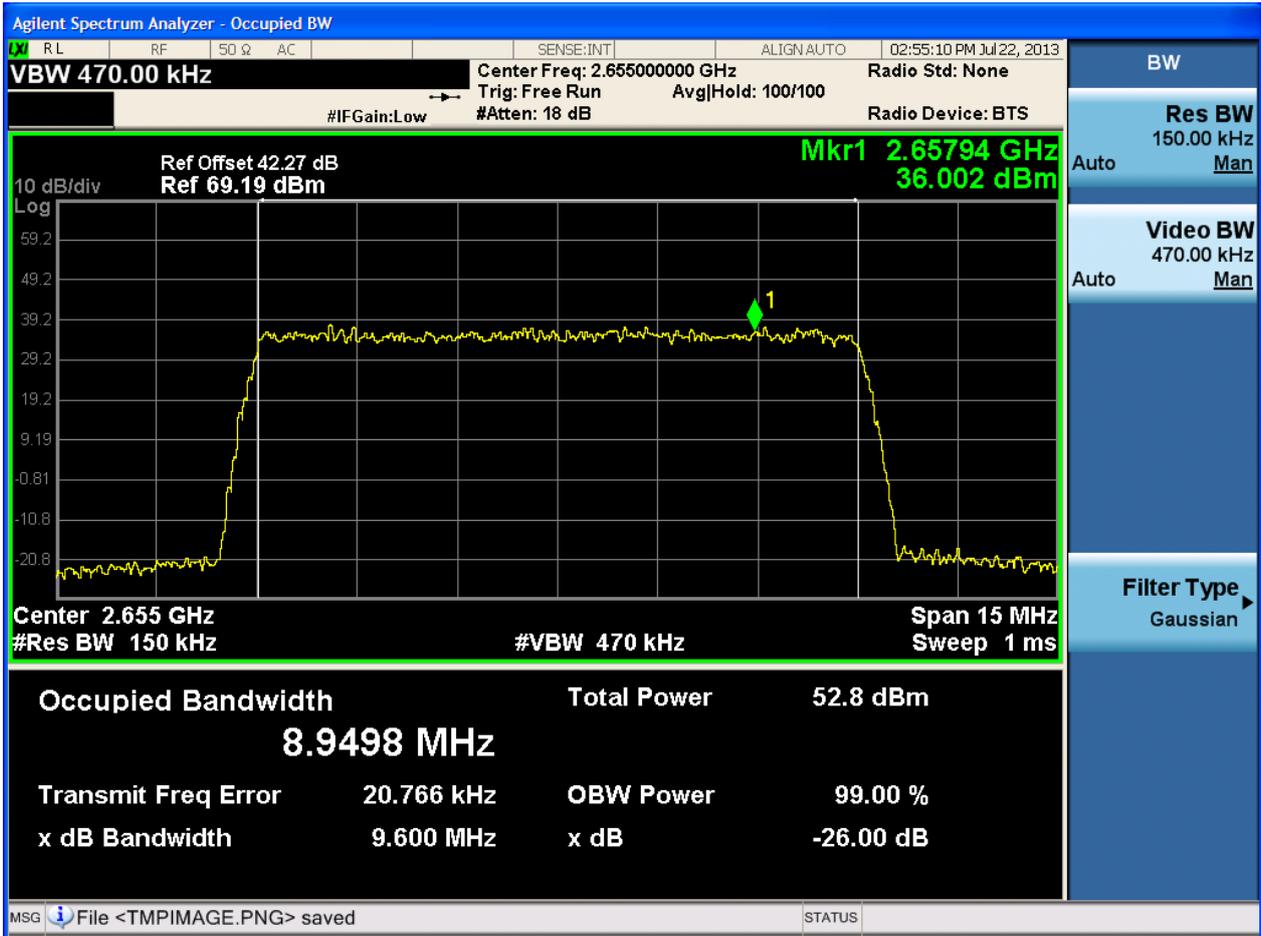


2.1.8 TX\_1L\_10M\_B\_TM1\_ANTB



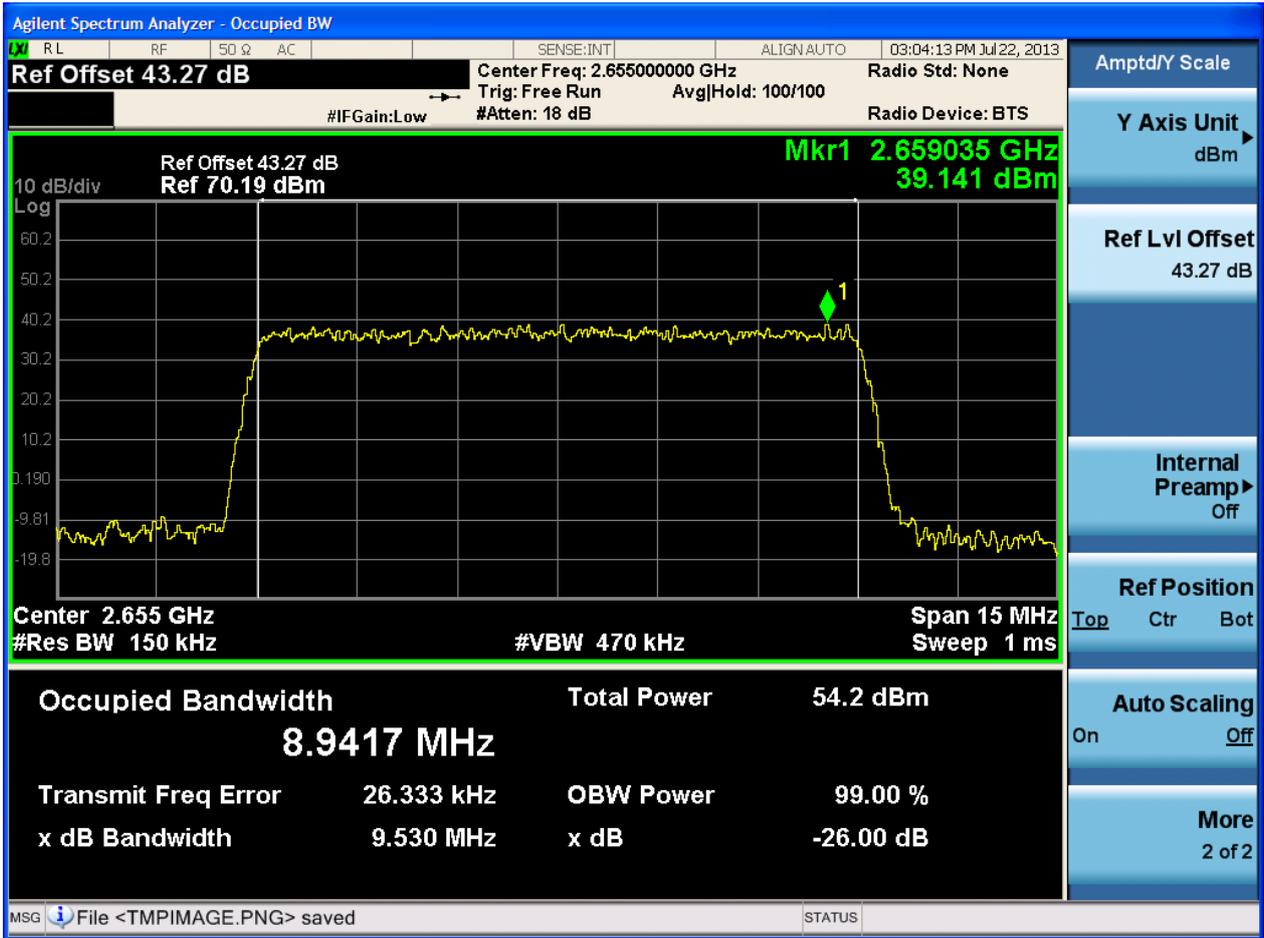


2.1.9 TX\_1L\_10M\_M\_TM1\_ANTA



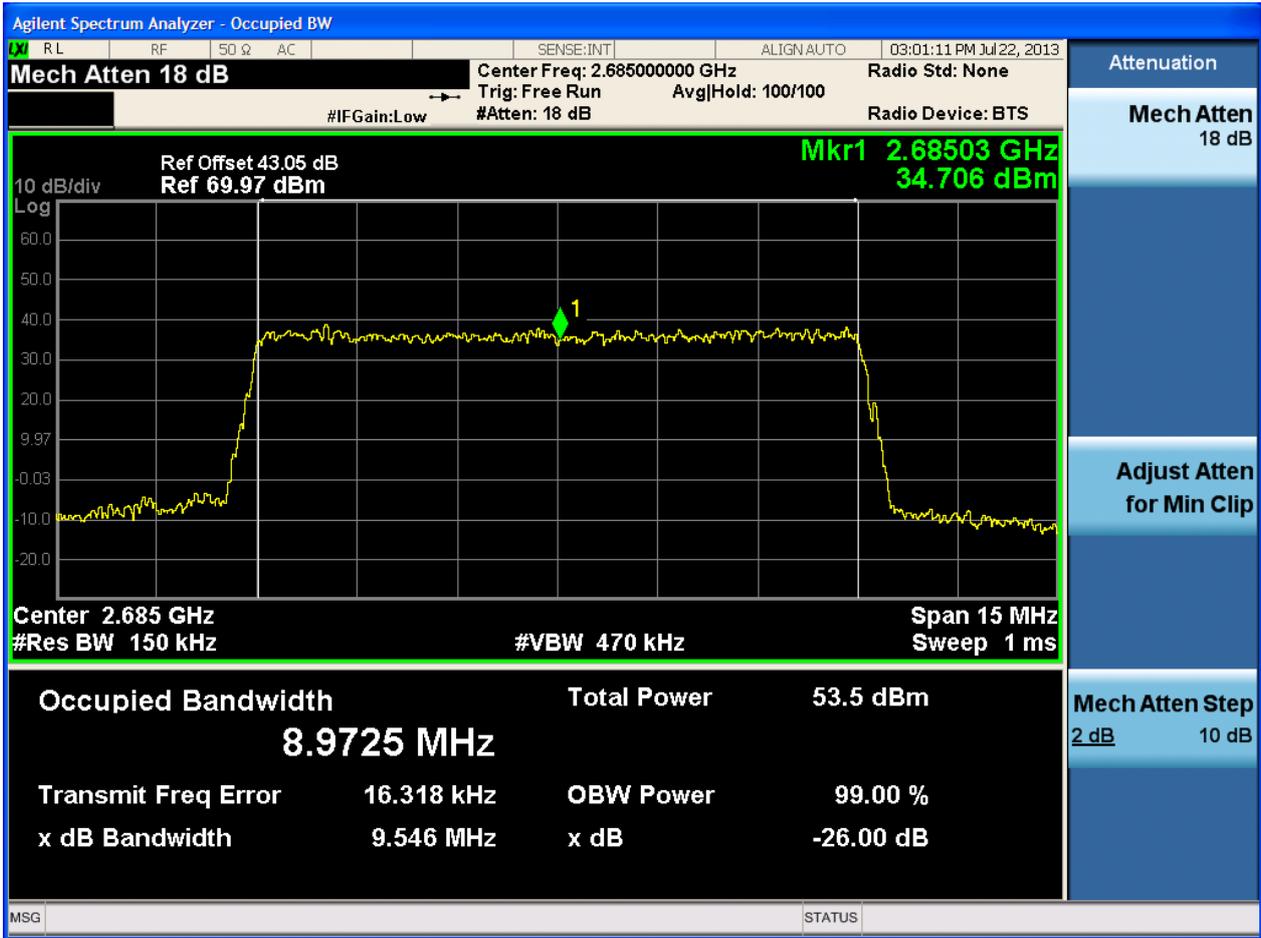


2.1.10 TX\_1L\_10M\_M\_TM1\_ANTB



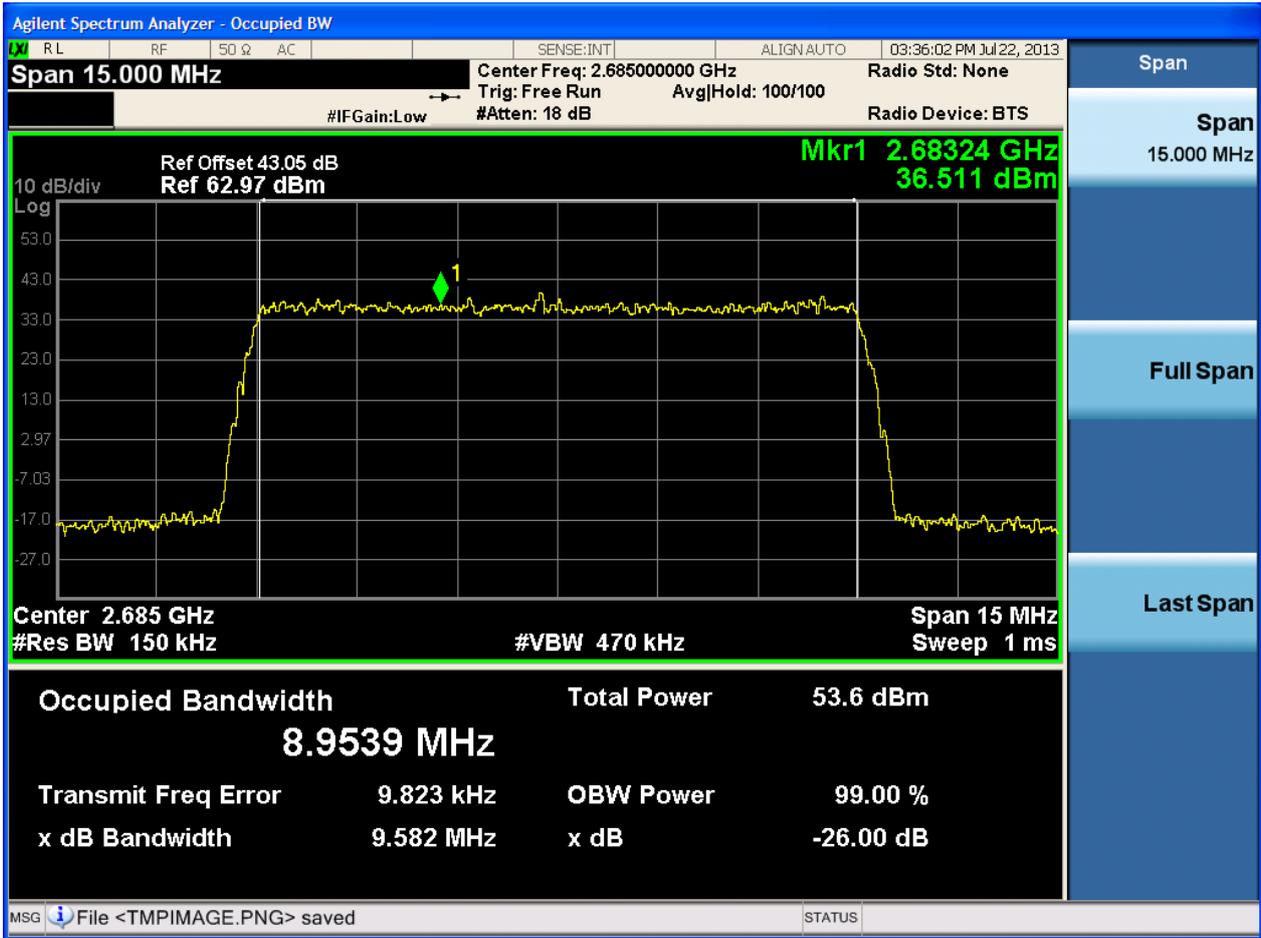


2.1.11 TX\_1L\_10M\_T\_TM1\_ANT1



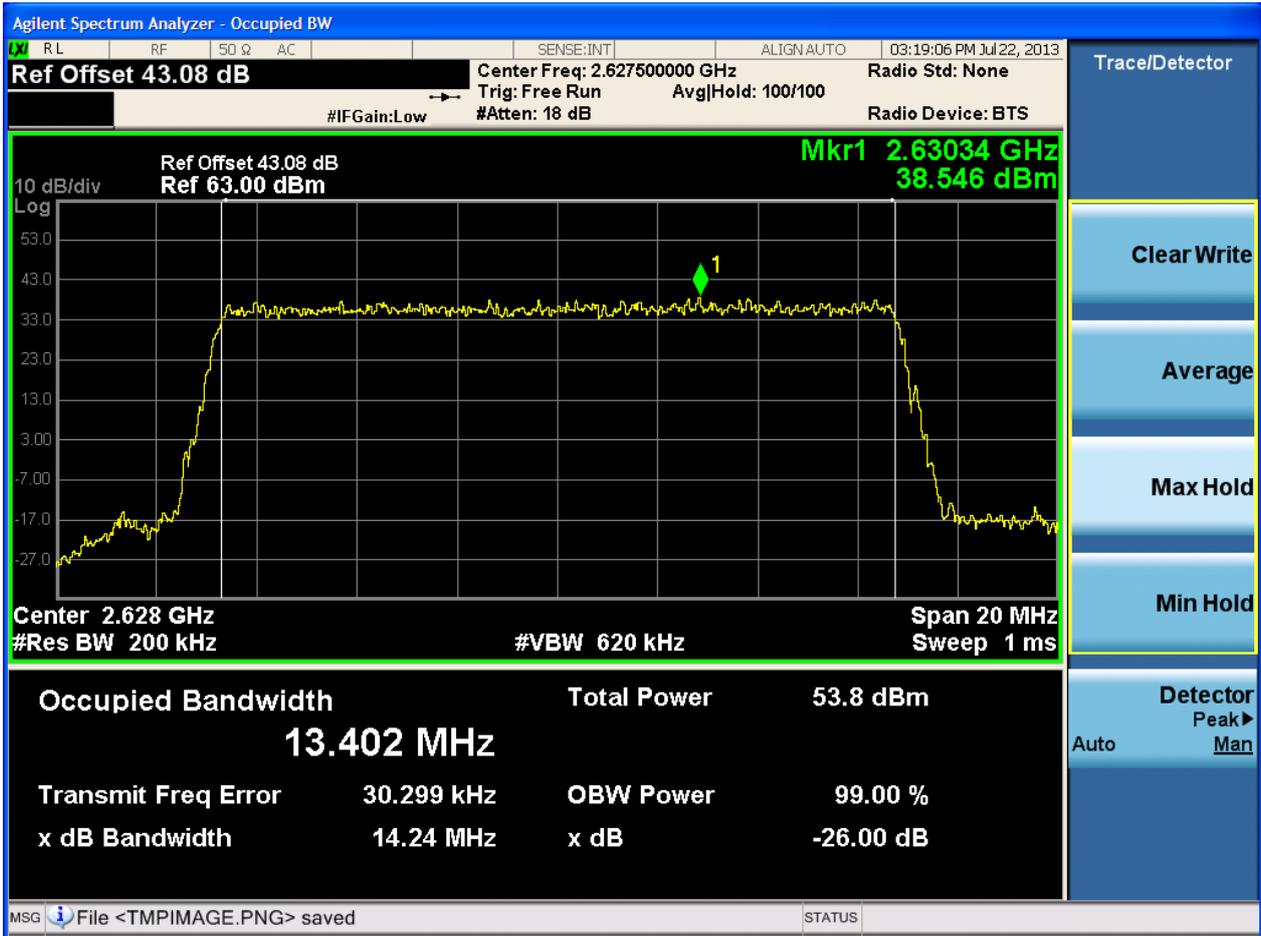


2.1.12 TX\_1L\_10M\_T\_TM1\_ANTB



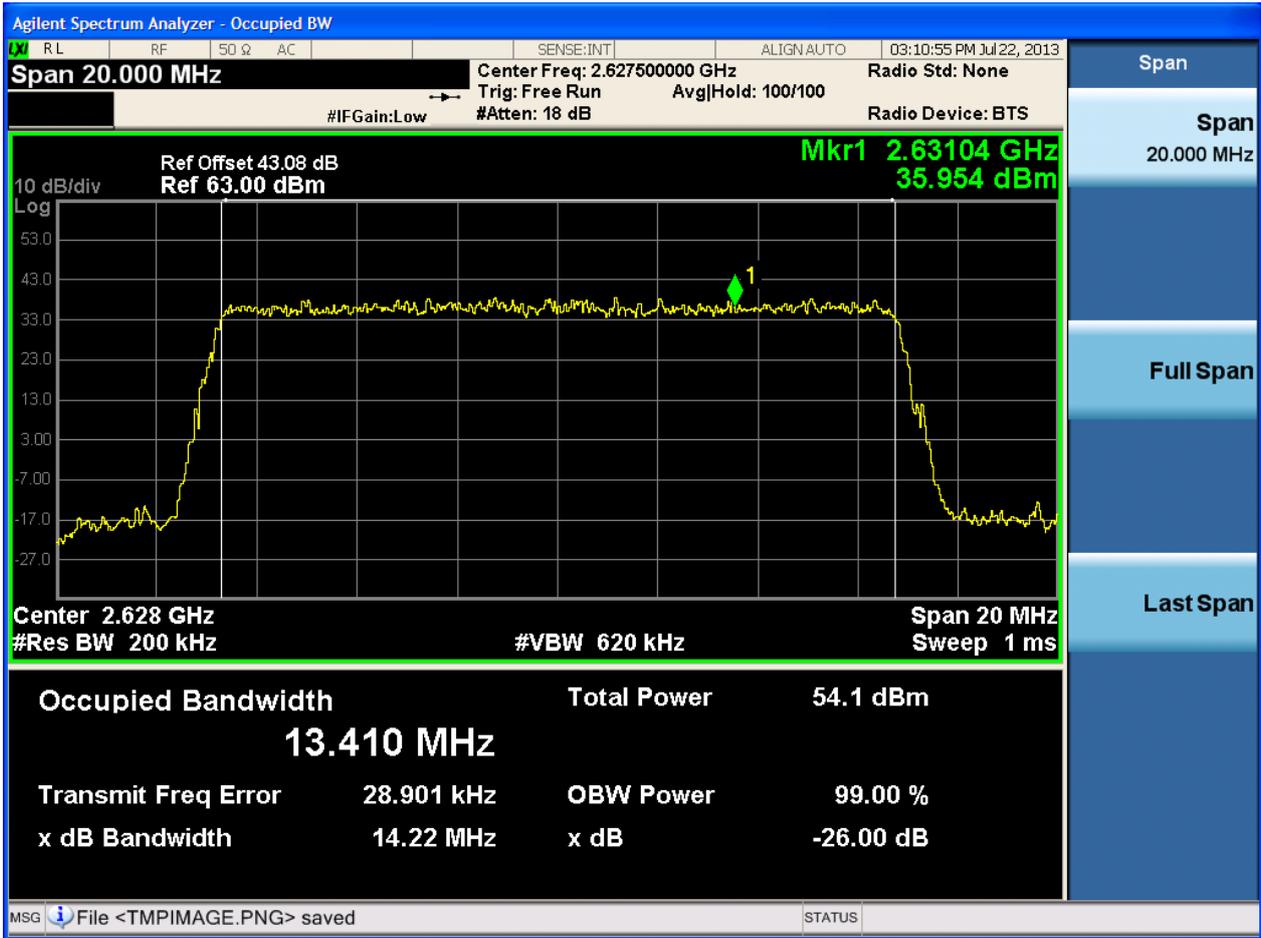


2.1.13 TX\_1L\_15M\_B\_TM1\_ANTA



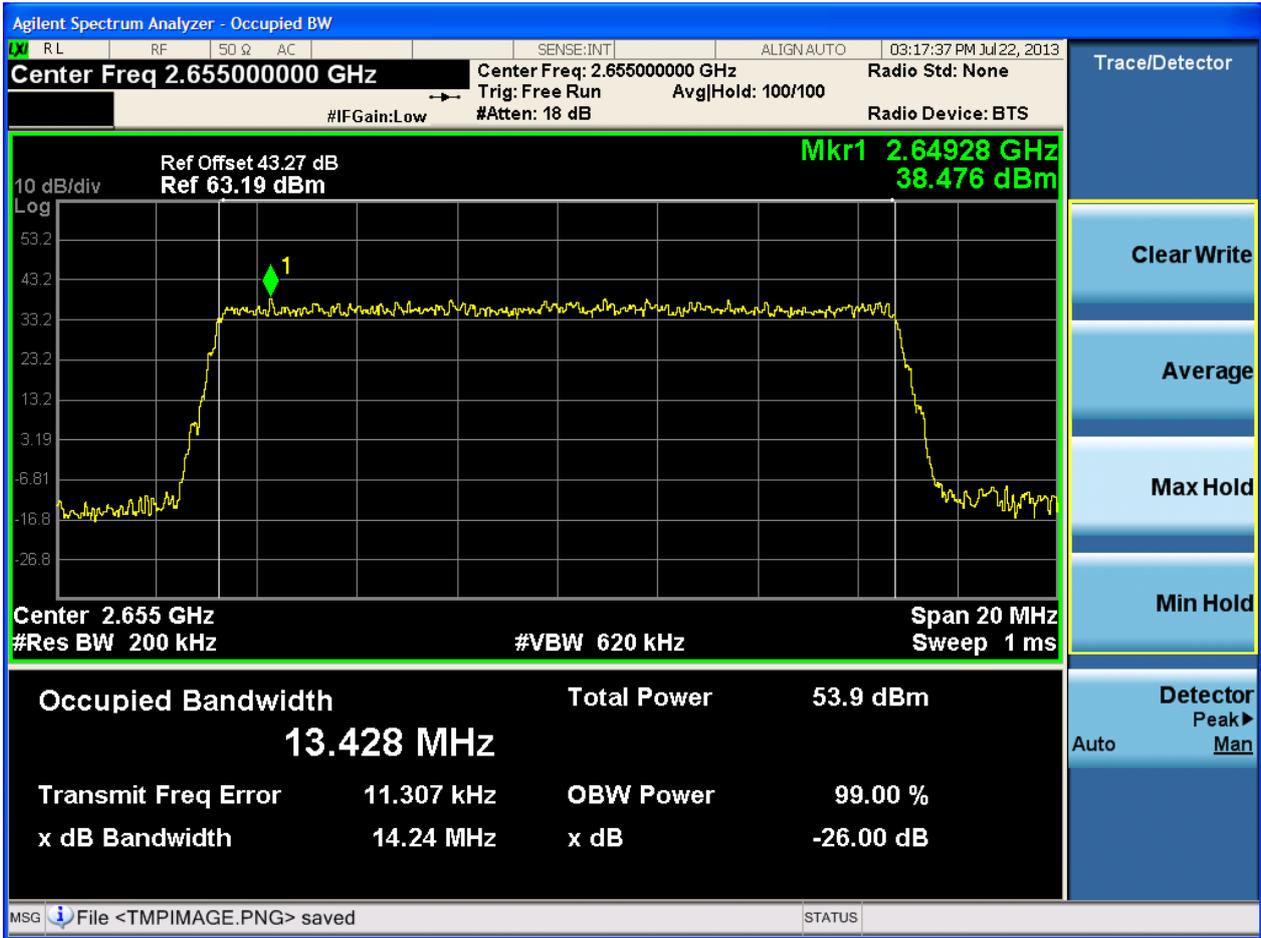


2.1.14 TX\_1L\_15M\_B\_TM1\_ANTB



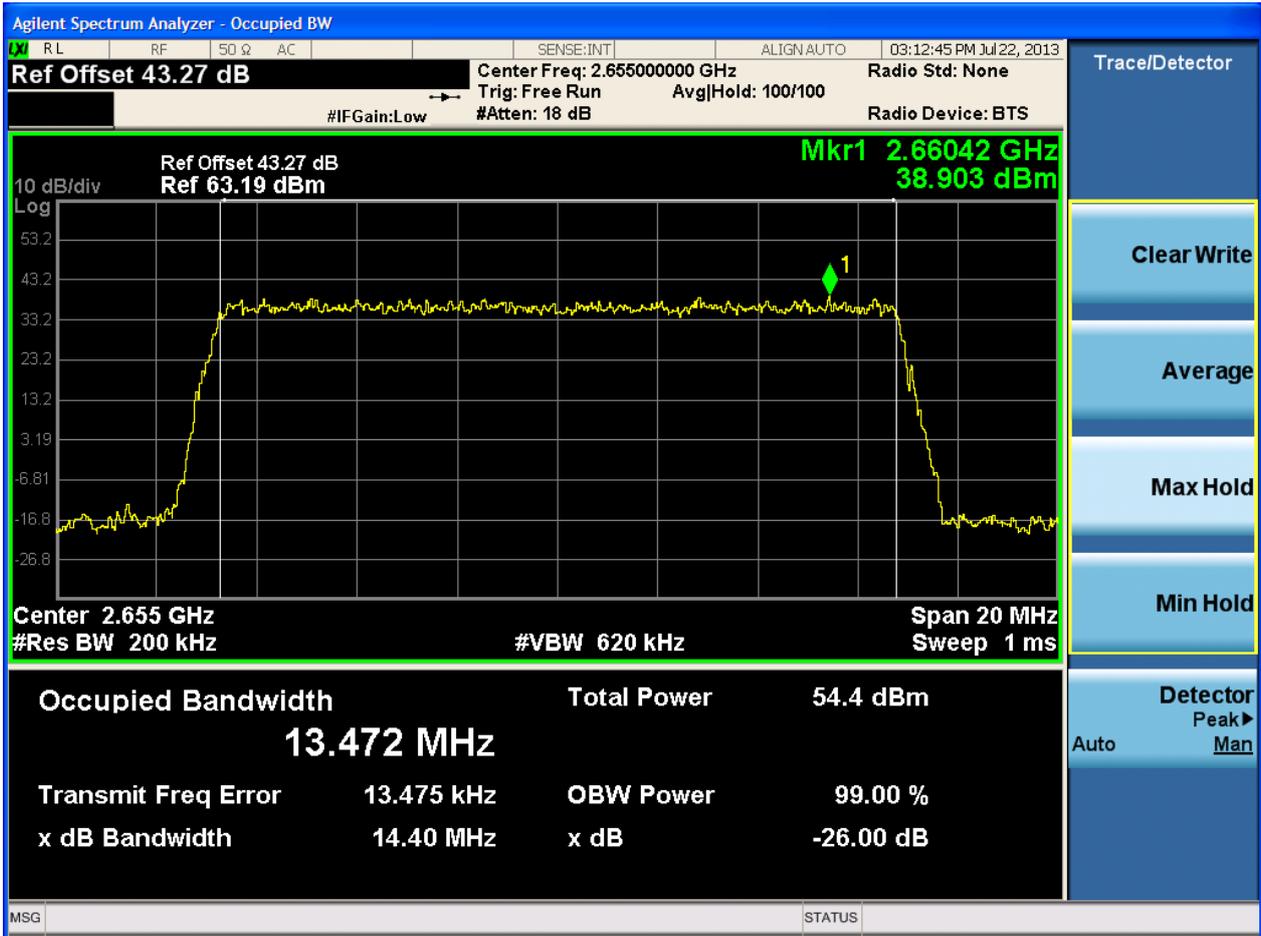


2.1.15 TX\_1L\_15M\_M\_TM1\_ANTA



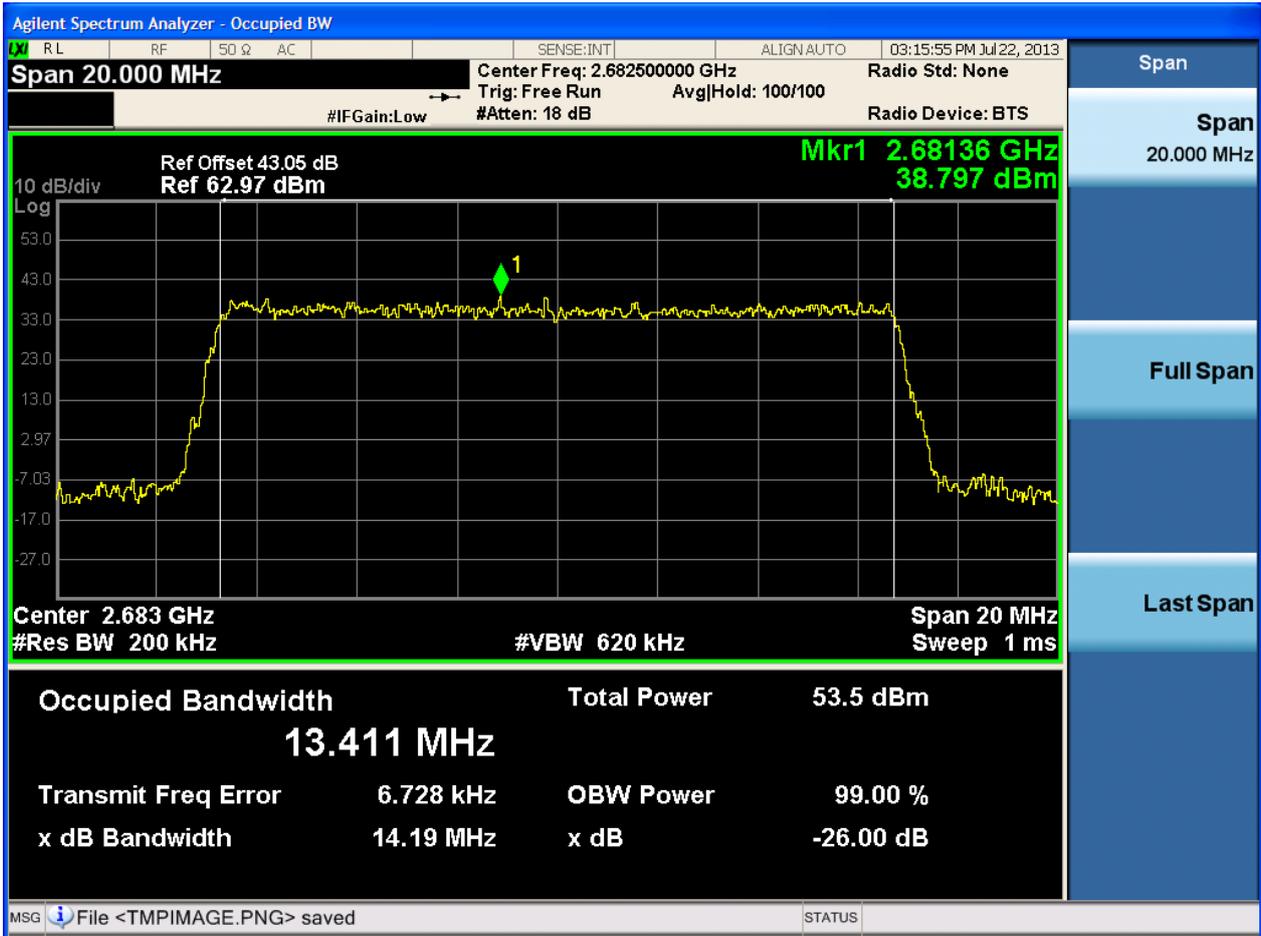


2.1.16 TX\_1L\_15M\_M\_TM1\_ANTB



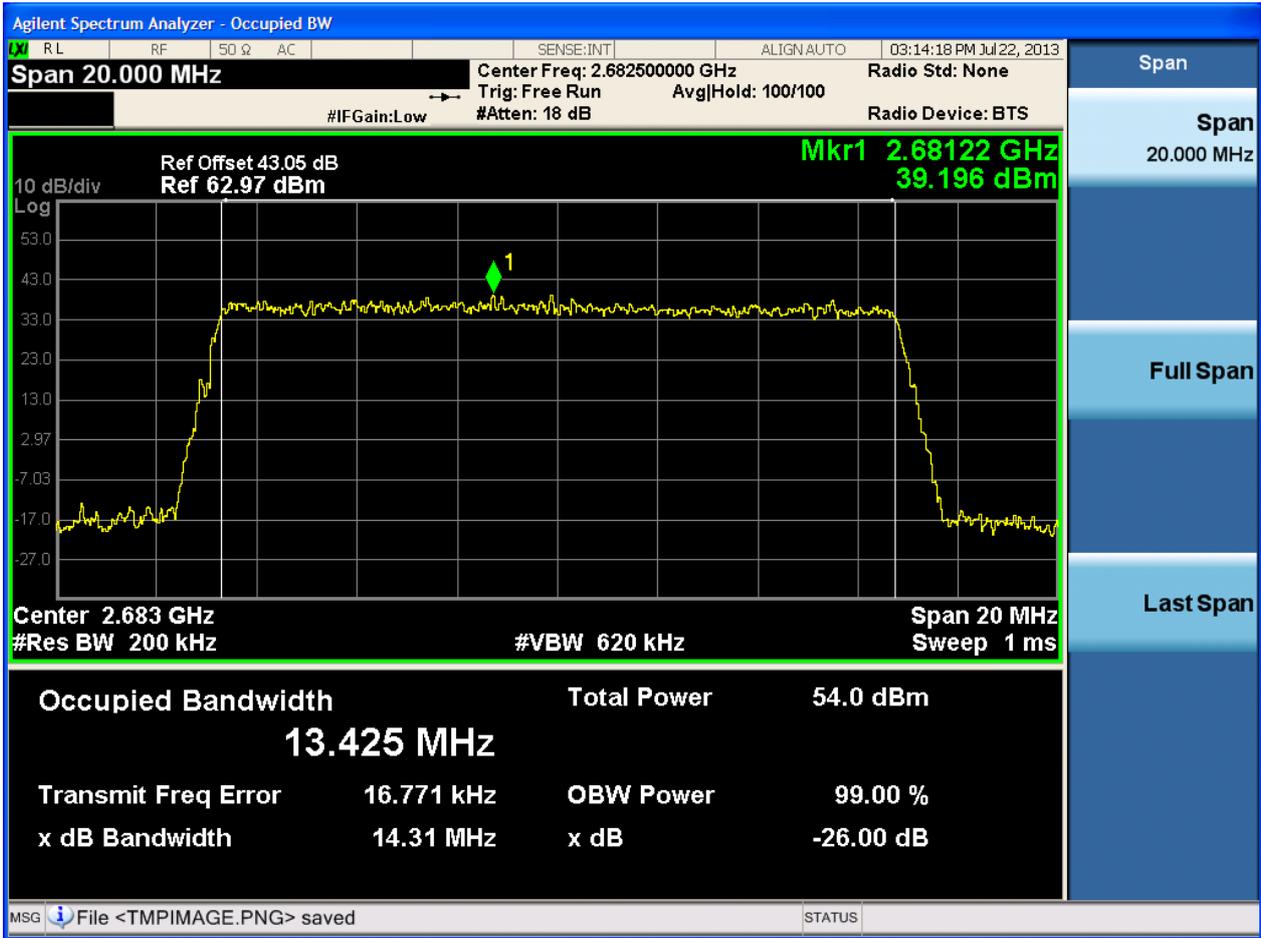


2.1.17 TX\_1L\_15M\_T\_TM1\_ANTA



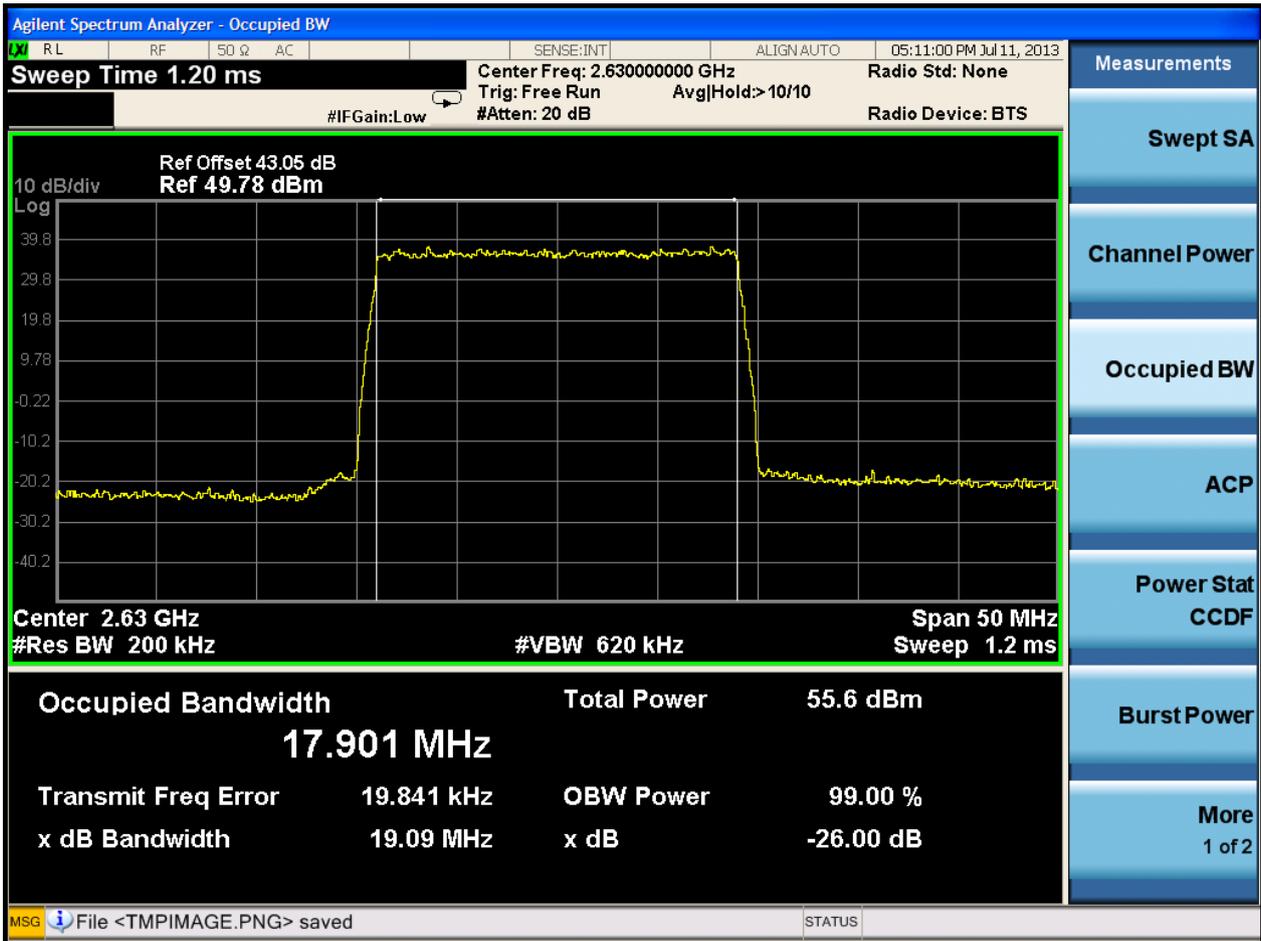


2.1.18 TX\_1L\_15M\_T\_TM1\_ANTB



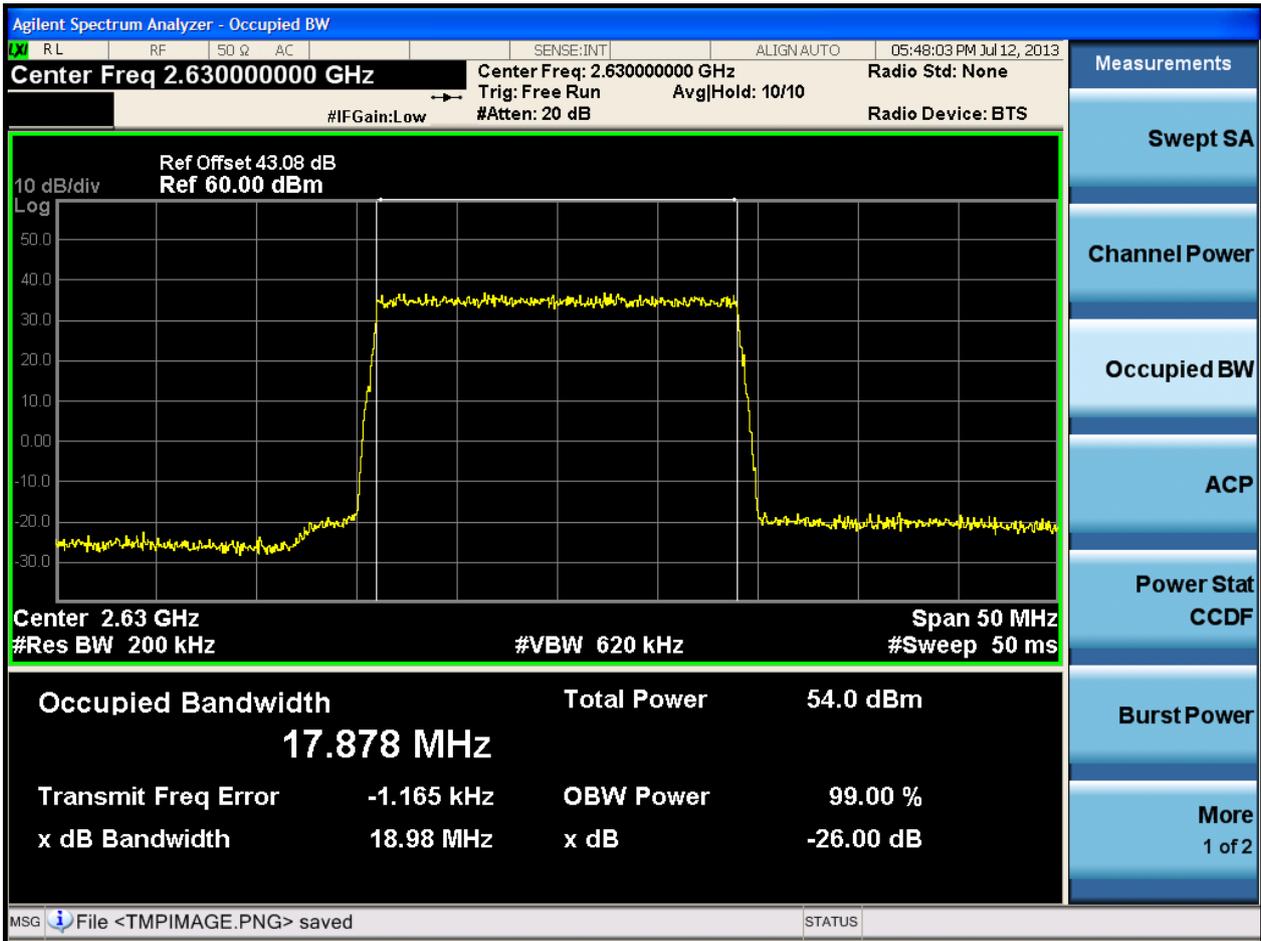


2.1.19 TX\_1L\_20M\_B\_TM1\_ANTA



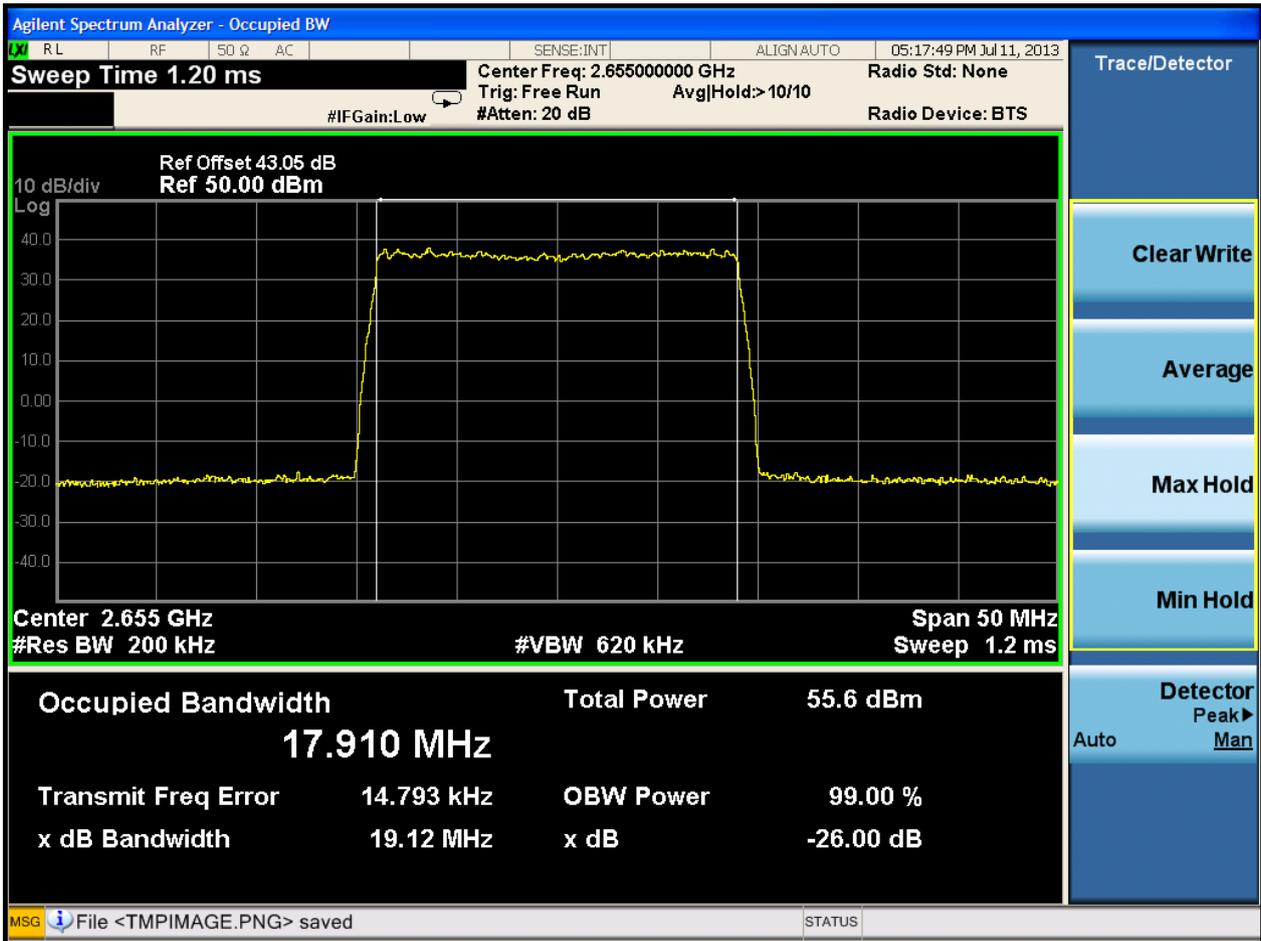


2.1.20 TX\_1L\_20M\_B\_TM1\_ANTB



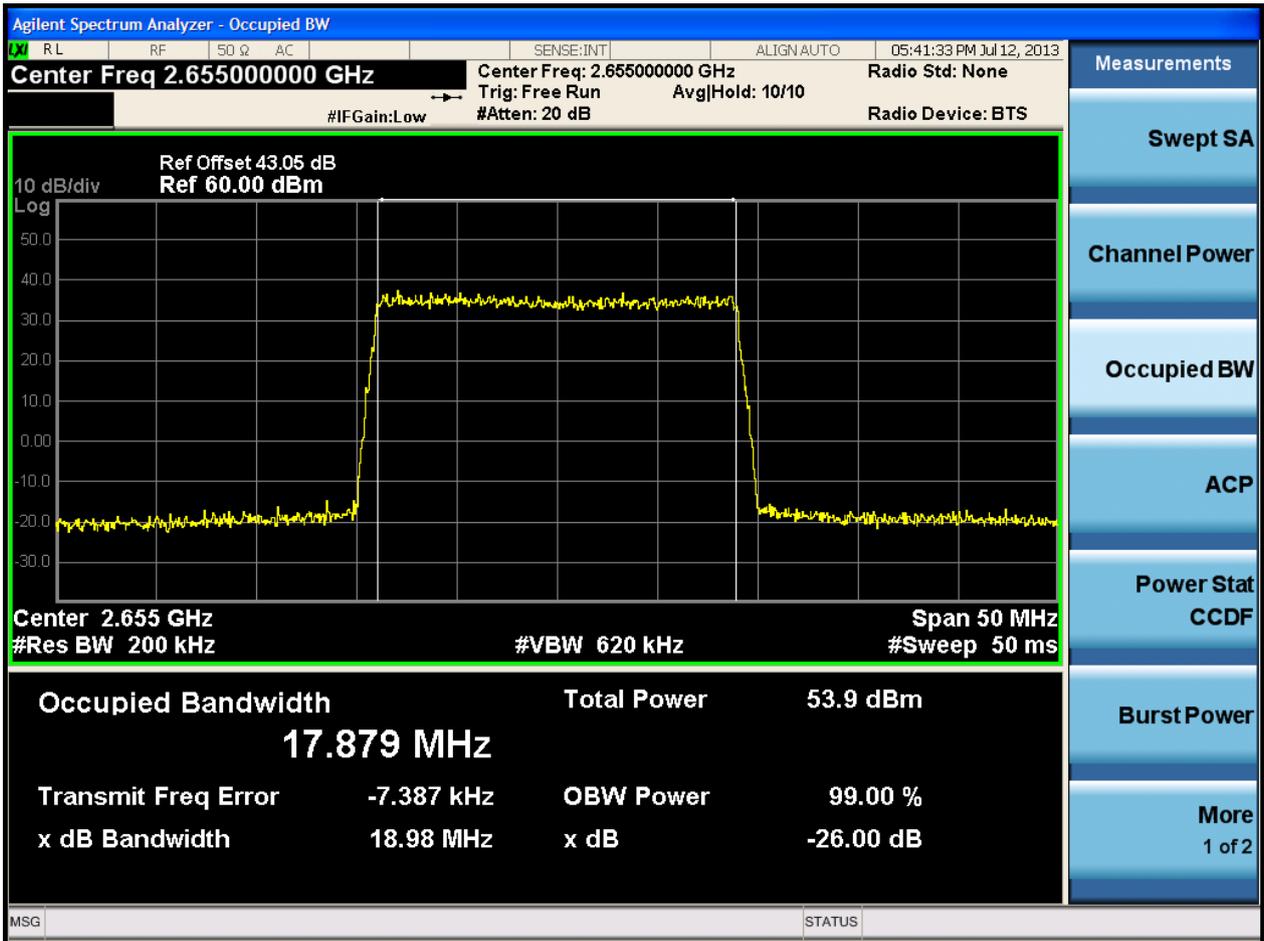


2.1.21 TX\_1L\_20M\_M\_TM1\_ANTA



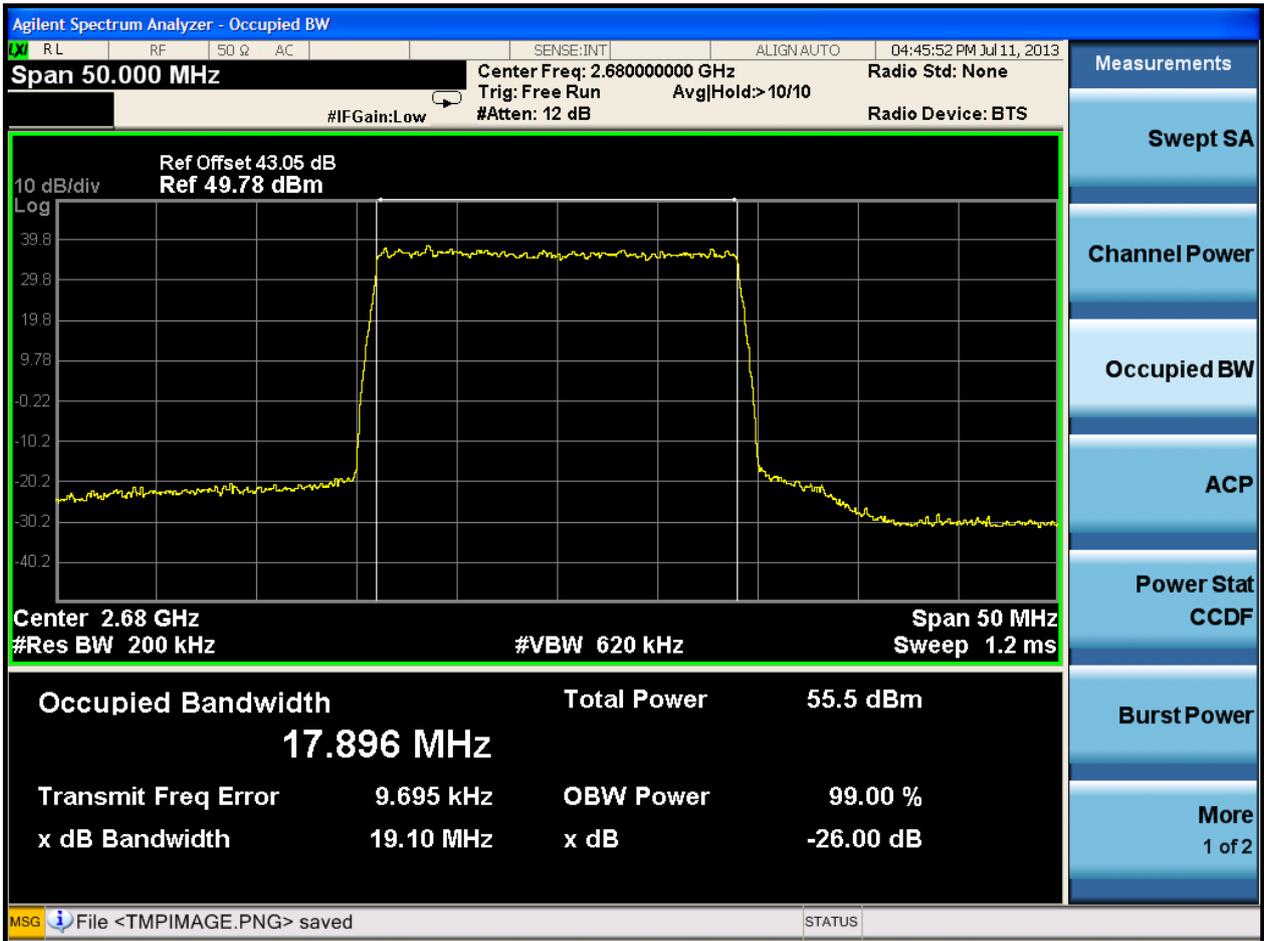


2.1.22 TX\_1L\_20M\_M\_TM1\_ANTB



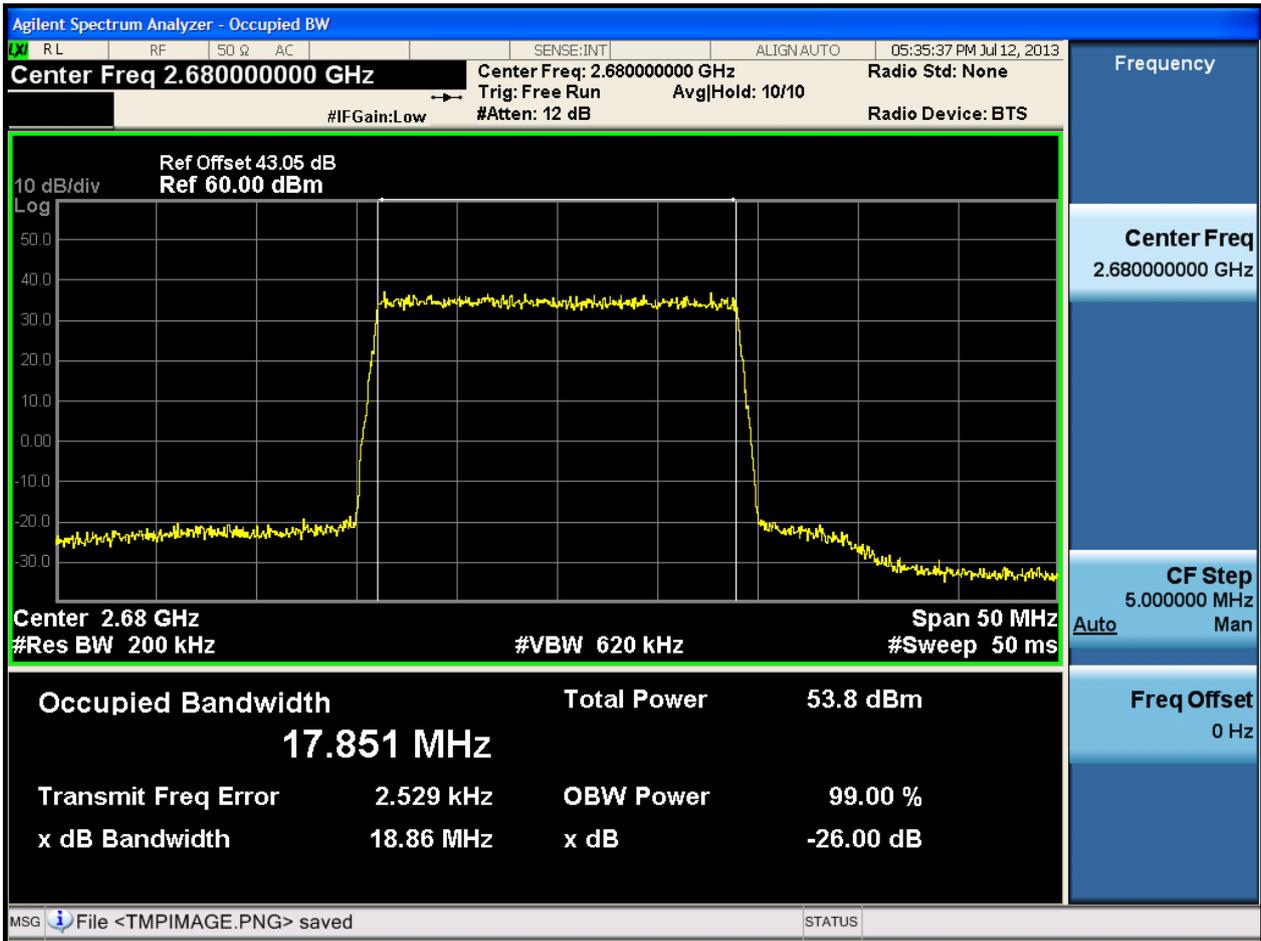


2.1.23 TX\_1L\_20M\_T\_TM1\_ANTA





2.1.24 TX\_1L\_20M\_T\_TM1\_ANTB





# Appendix C: Band Edges Compliance



## 1 Result Table

NOTE 1: The offset of measurement filter -3dB point may be considered when identifying the maximum emission for e.g. the CDMA, WCDMA, WiMAX, LTE systems.

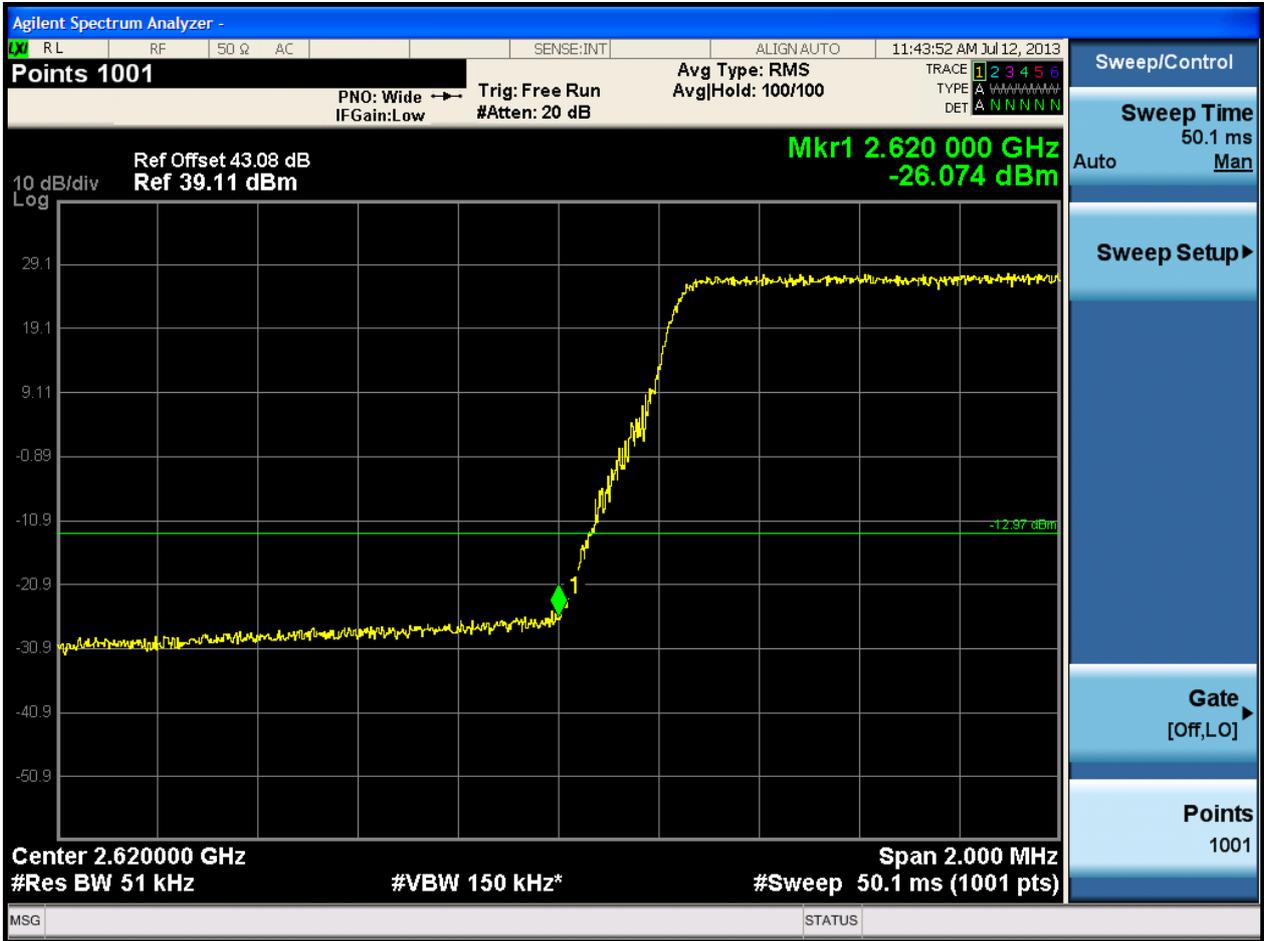
NOTE 2: Since the EUT transmits on two antennas simultaneously in the same frequency with MIMO mode, using the measure and minus  $10\log(N)$  technique, so the limits for spurious emissions at antenna terminal should be adjusted with a correction of  $10\log 2$ .

EUT Conf.	Maximum Emission [dBm]	Limit(dBm)	Verdict
TX_1L_5M_B_TM1_ANTA	-26.074	-16	Pass
TX_1L_5M_B_TM1_ANTB	-25.791	-16	Pass
TX_1L_5M_T_TM1_ANTA	-24.394	-16	Pass
TX_1L_5M_T_TM1_ANTB	-25.016	-16	Pass
TX_1L_20M_B_TM1_ANTA	-27.109	-16	Pass
TX_1L_20M_B_TM1_ANTB	-26.256	-16	Pass
TX_1L_20M_T_TM1_ANTA	-26.60	-16	Pass
TX_1L_20M_T_TM1_ANTB	-27.166	-16	Pass
TX_2L_5M_B_TM1_ANTA	-25.914	-16	Pass
TX_2L_5M_B_TM1_ANTB	-28.354	-16	Pass
TX_2L_5M_T_TM1_ANTA	-24.663	-16	Pass
TX_2L_5M_T_TM1_ANTB	-26.345	-16	Pass
TX_2L_20M_B_TM1_ANTA	-26.497	-16	Pass
TX_2L_20M_B_TM1_ANTB	-29.436	-16	Pass
TX_2L_20M_T_TM1_ANTA	-25.313	-16	Pass
TX_2L_20M_T_TM1_ANTB	-25.228	-16	Pass



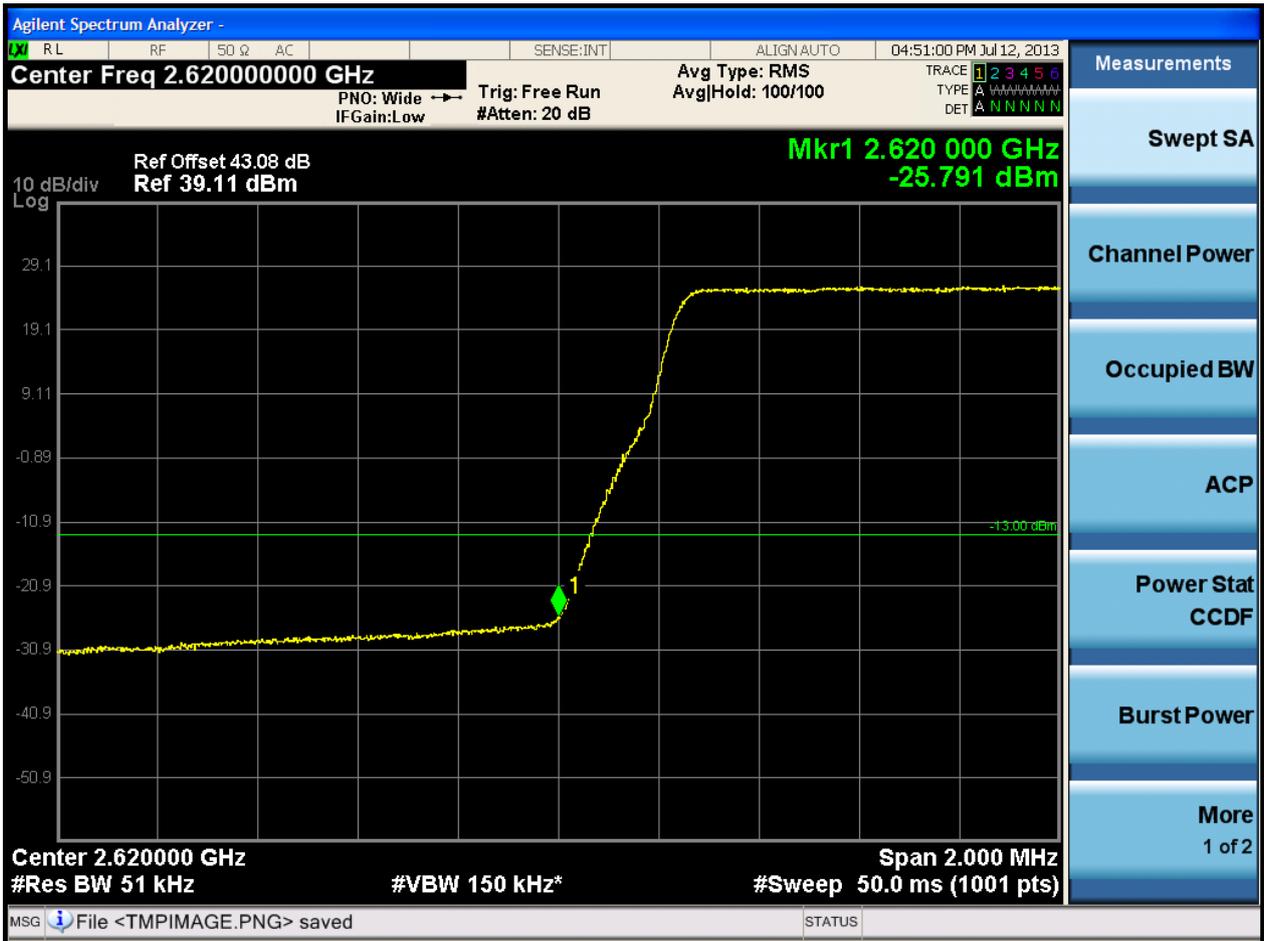
## 2 Test Plot

### 2.1 TX\_1L\_5M\_B\_TM1\_ANTA





## 2.2 TX\_1L\_5M\_B\_TM1\_ANTB





### 2.3 TX\_1L\_5M\_T\_TM1\_ANTA





## 2.4 TX\_1L\_5M\_T\_TM1\_ANTB



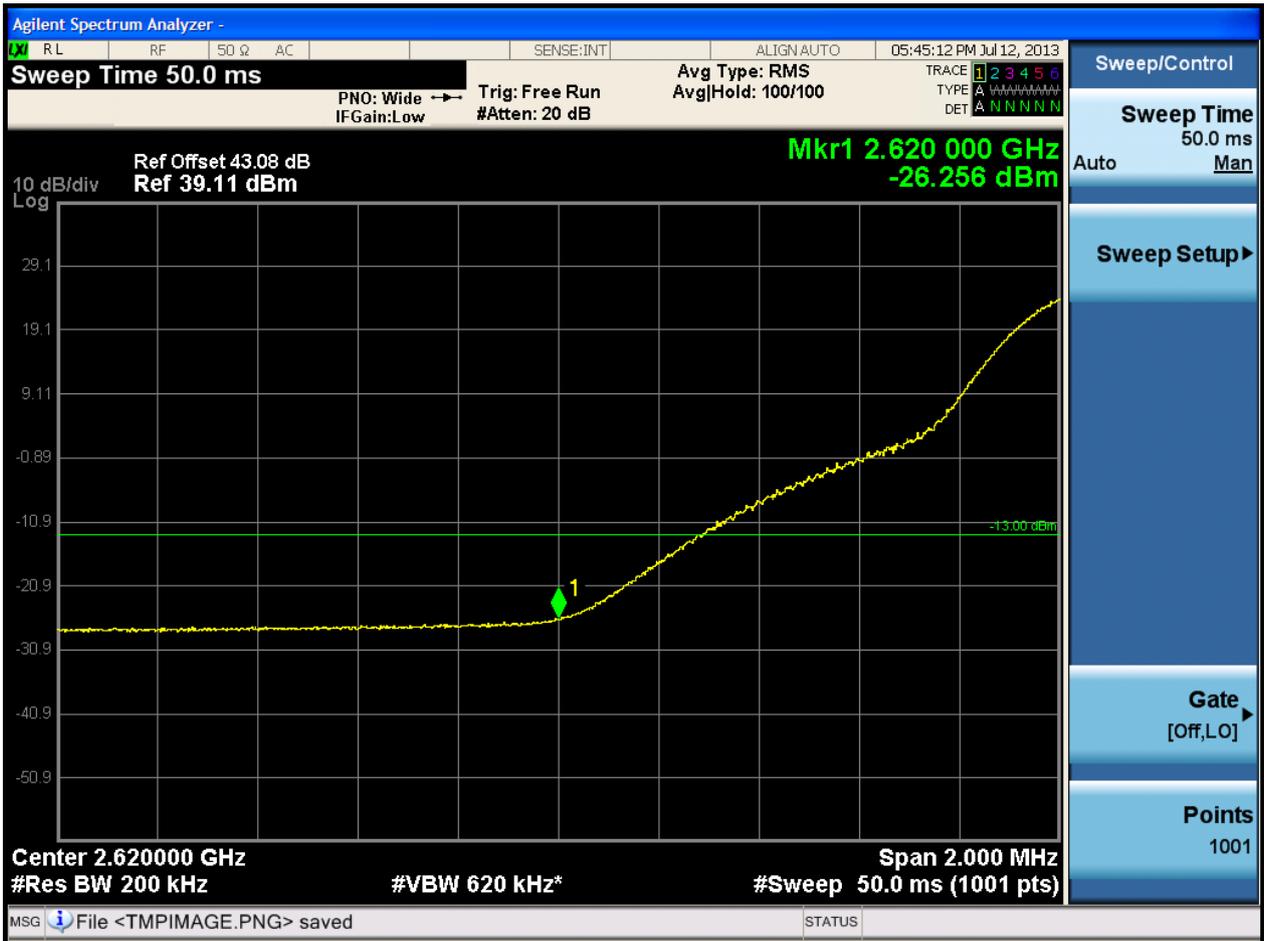


### 2.5 TX\_1L\_20M\_B\_TM1\_ANTA





### 2.6 TX\_1L\_20M\_B\_TM1\_ANTB





### 2.7 TX\_1L\_20M\_T\_TM1\_ANTA



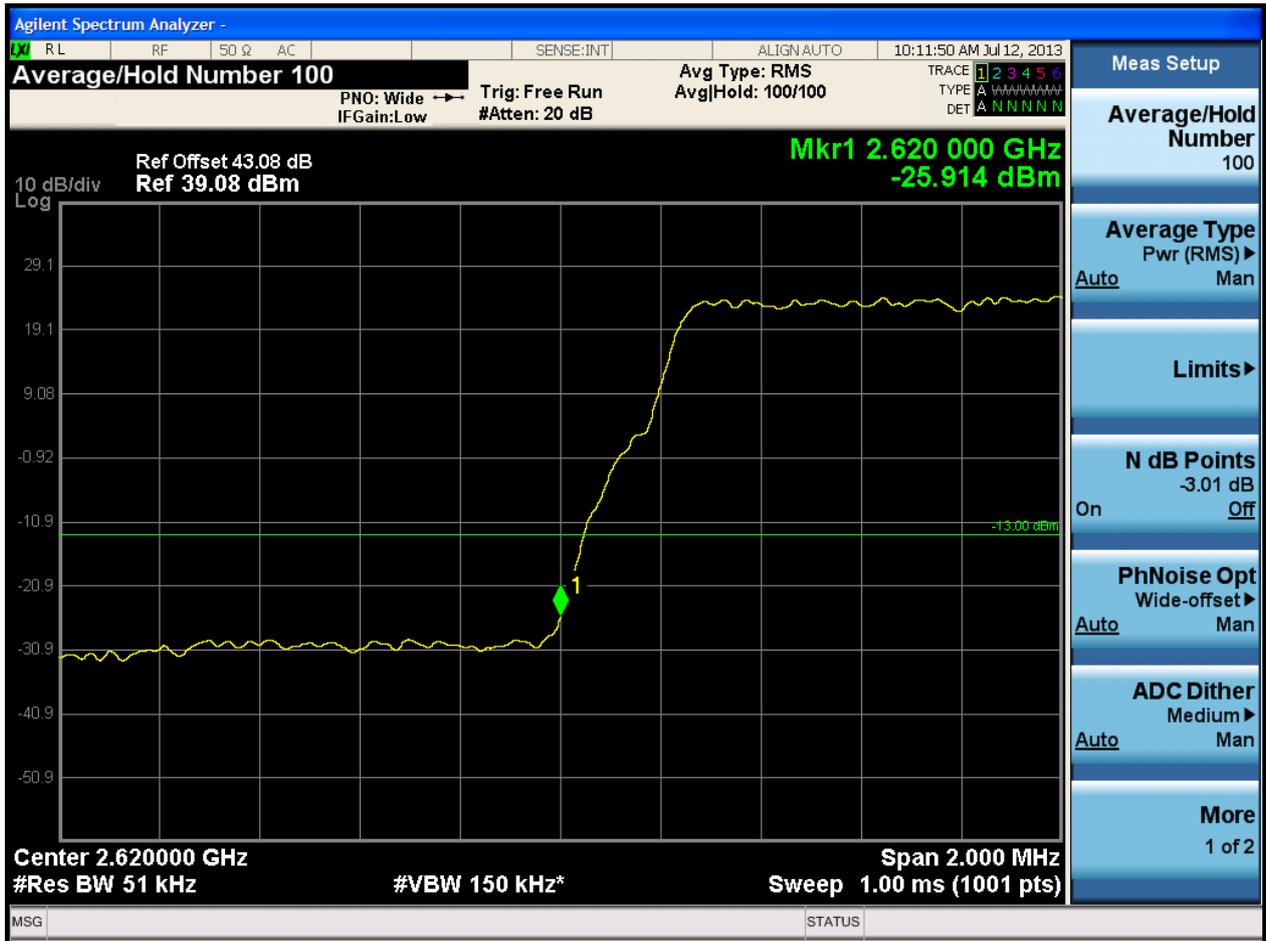


### 2.8 TX\_1L\_20M\_T\_TM1\_ANTB



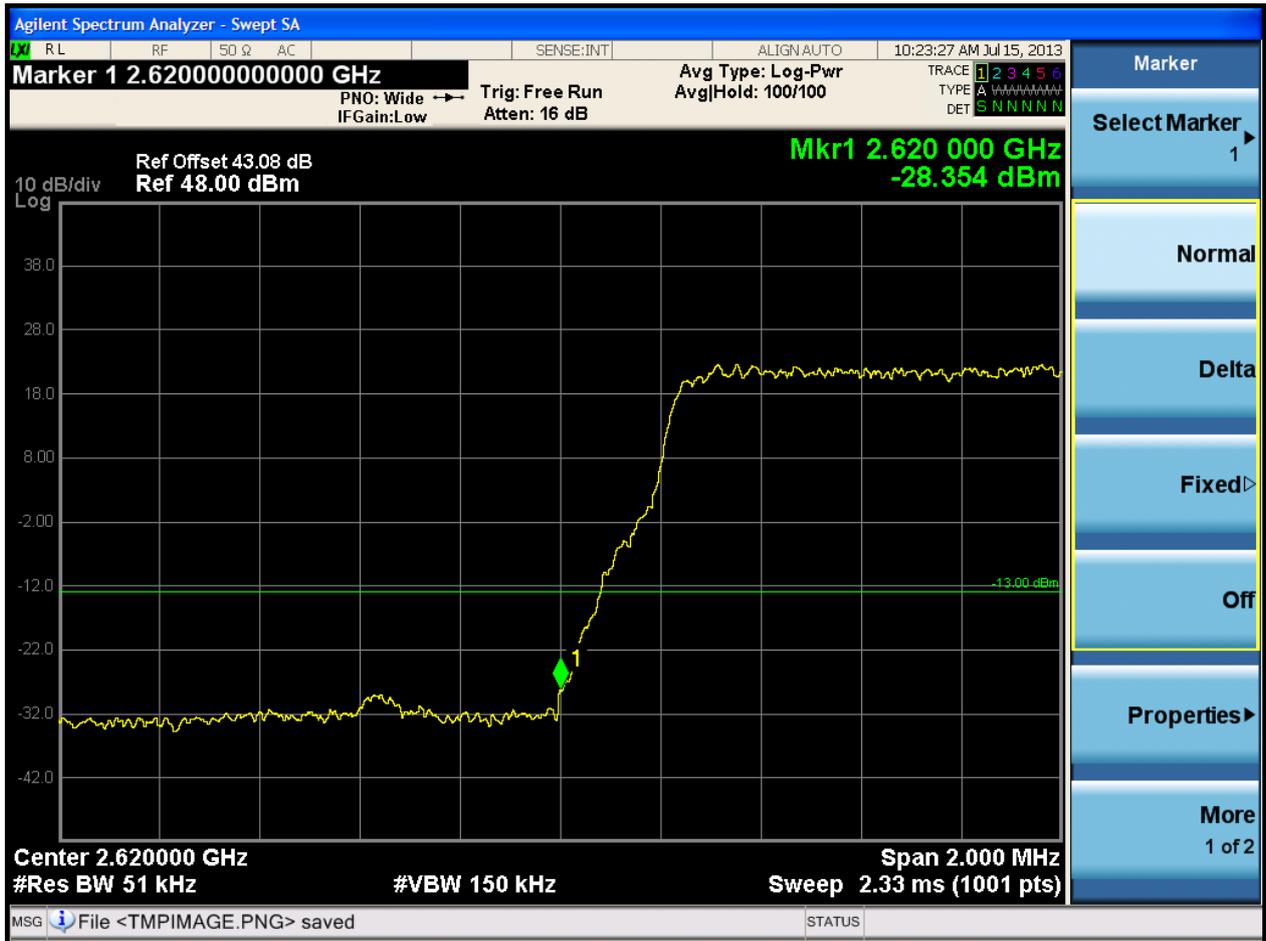


## 2.9 TX\_2L\_5M\_B\_TM1\_ANTA



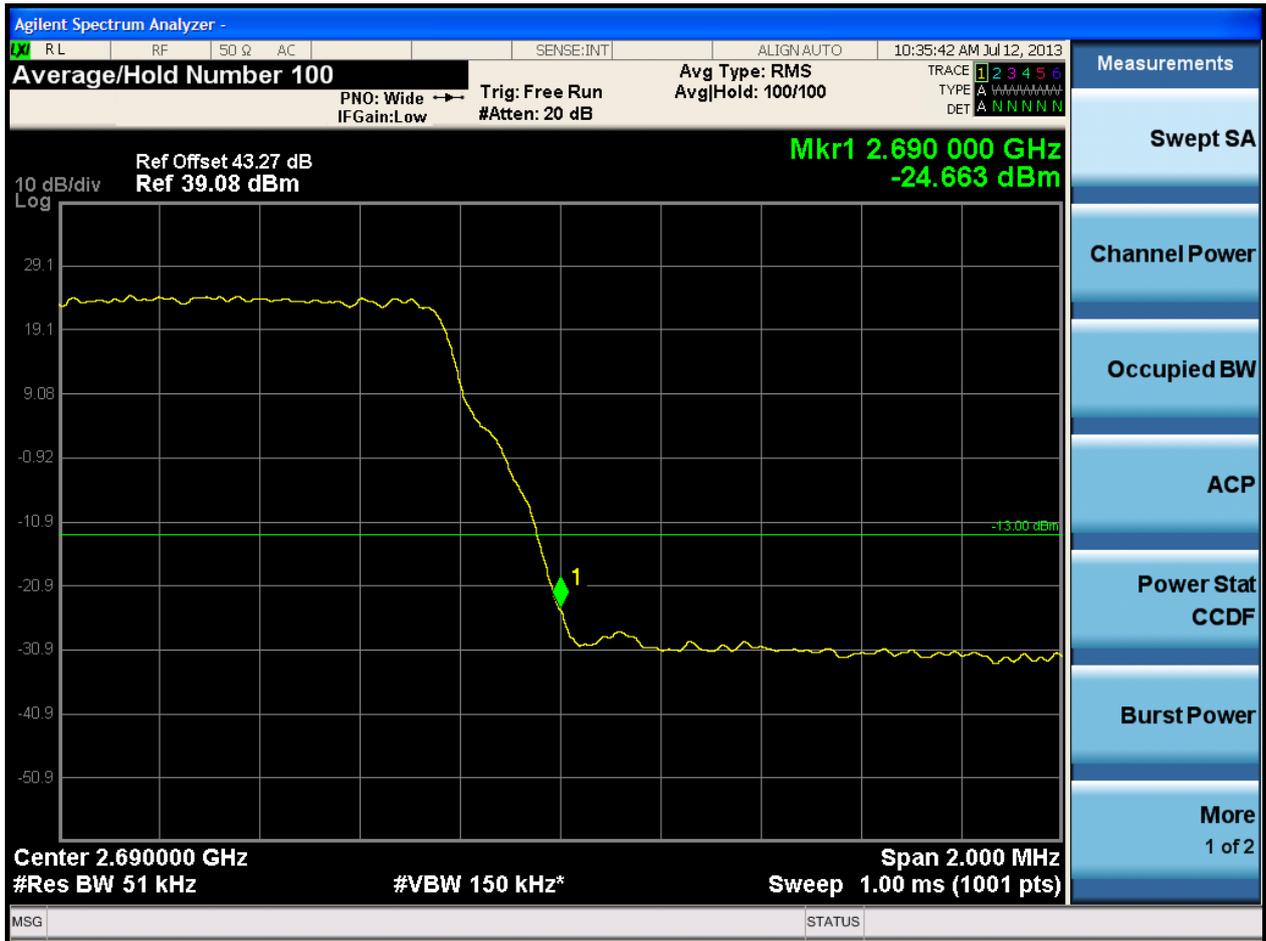


### 2.10 TX\_2L\_5M\_B\_TM1\_ANTB



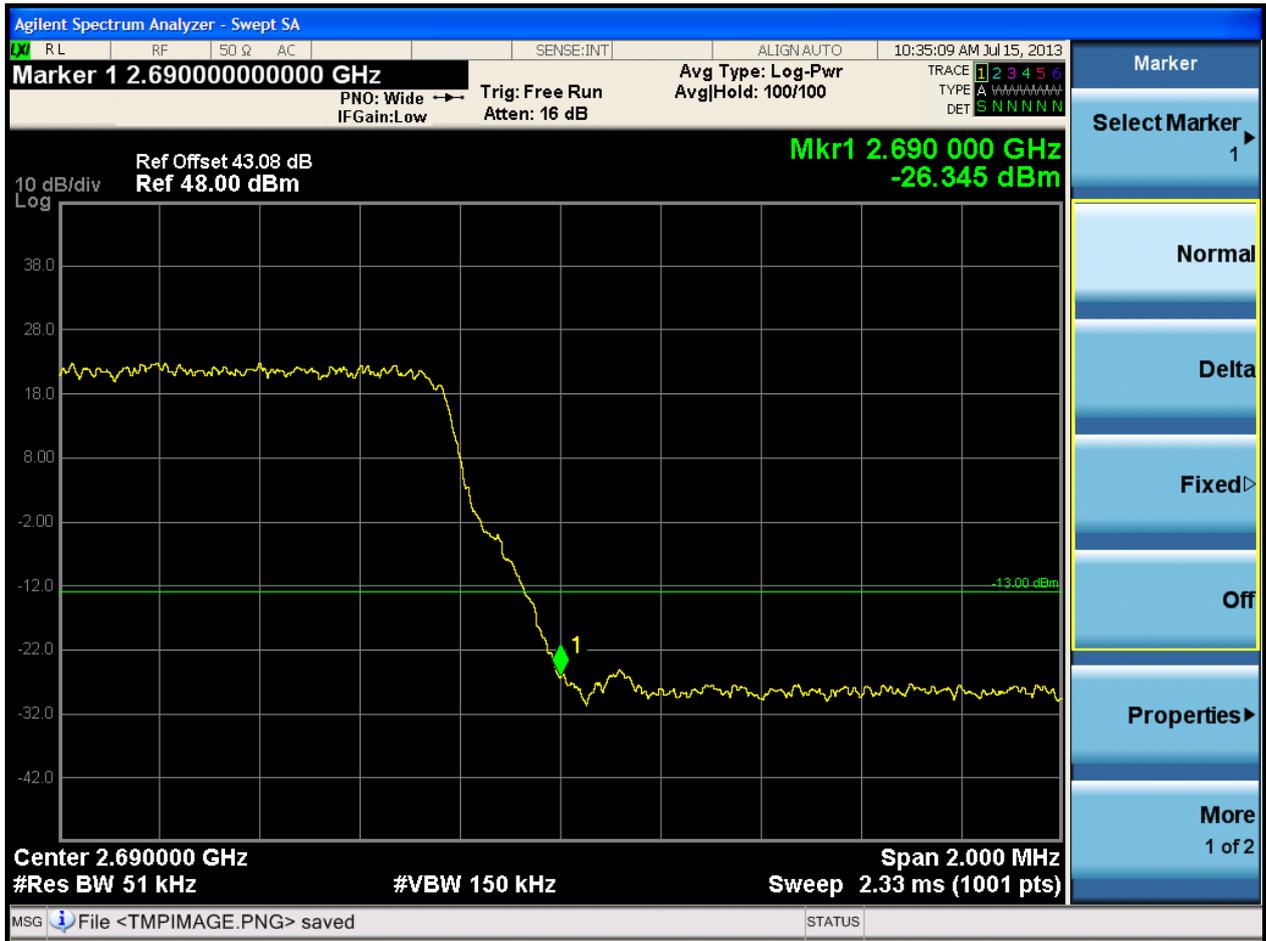


### 2.11 TX\_2L\_5M\_T\_TM1\_ANTA





### 2.12 TX\_2L\_5M\_T\_TM1\_ANTB





2.13 TX\_2L\_20M\_B\_TM1\_ANTA





2.14 TX\_2L\_20M\_B\_TM1\_ANTB





### 2.15 TX\_2L\_20M\_T\_TM1\_ANTA





2.16 TX\_2L\_20M\_T\_TM1\_ANTB





# Appendix D: Spurious Emission at Antenna Terminals



## 1 Result Table

NOTE1: 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.

NOTE 2: Since the EUT transmits on two antennas simultaneously in the same frequency with MIMO mode, using the measure and minus  $10\log(N)$  technique, so the limits for spurious emissions at antenna terminal should be adjusted with a correction of  $10\log 2$ .

NOTE 3: Since the highest available frequency for large power attenuator is about 18GHz up to now, the test above 18GHz is not significant. So the highest frequency in the test for conducted spurious emission is 18GHz.

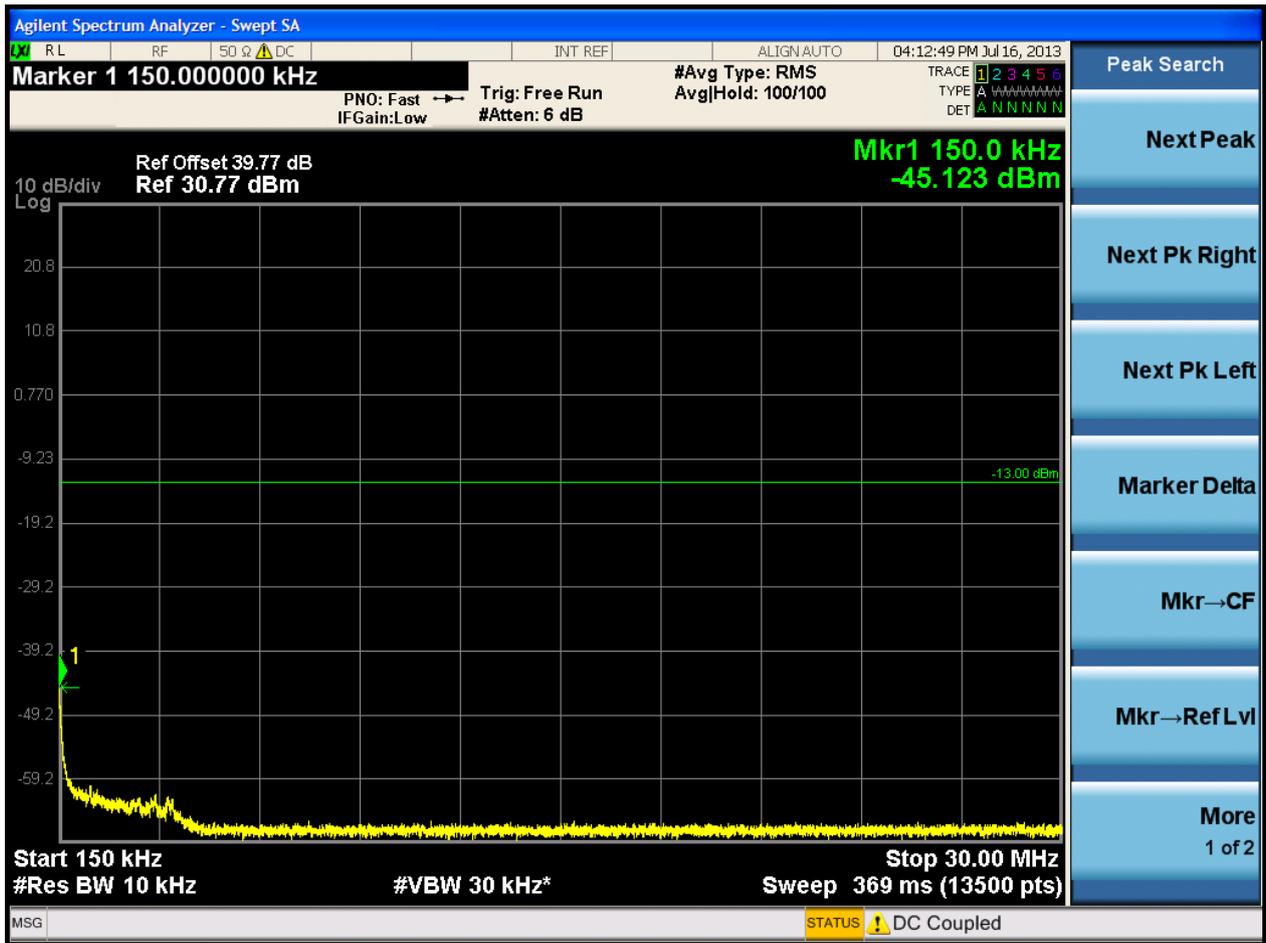
EUT Conf.	Maximum Emission [dBm]	Verdict
TX_1L_5M_B_TM1_ANTA	<-16	Pass
TX_1L_5M_B_TM1_ANTB	<-16	Pass
TX_1L_5M_M_TM1_ANTA	<-16	Pass
TX_1L_5M_M_TM1_ANTB	<-16	Pass
TX_1L_5M_T_TM1_ANTA	<-16	Pass
TX_1L_5M_T_TM1_ANTB	<-16	Pass
TX_2L_5M_B_TM1_ANTA	<-16	Pass
TX_2L_5M_B_TM1_ANTB	<-16	Pass
TX_2L_5M_M_TM1_ANTA	<-16	Pass
TX_2L_5M_M_TM1_ANTB	<-16	Pass
TX_2L_5M_T_TM1_ANTA	<-16	Pass
TX_2L_5M_T_TM1_ANTB	<-16	Pass

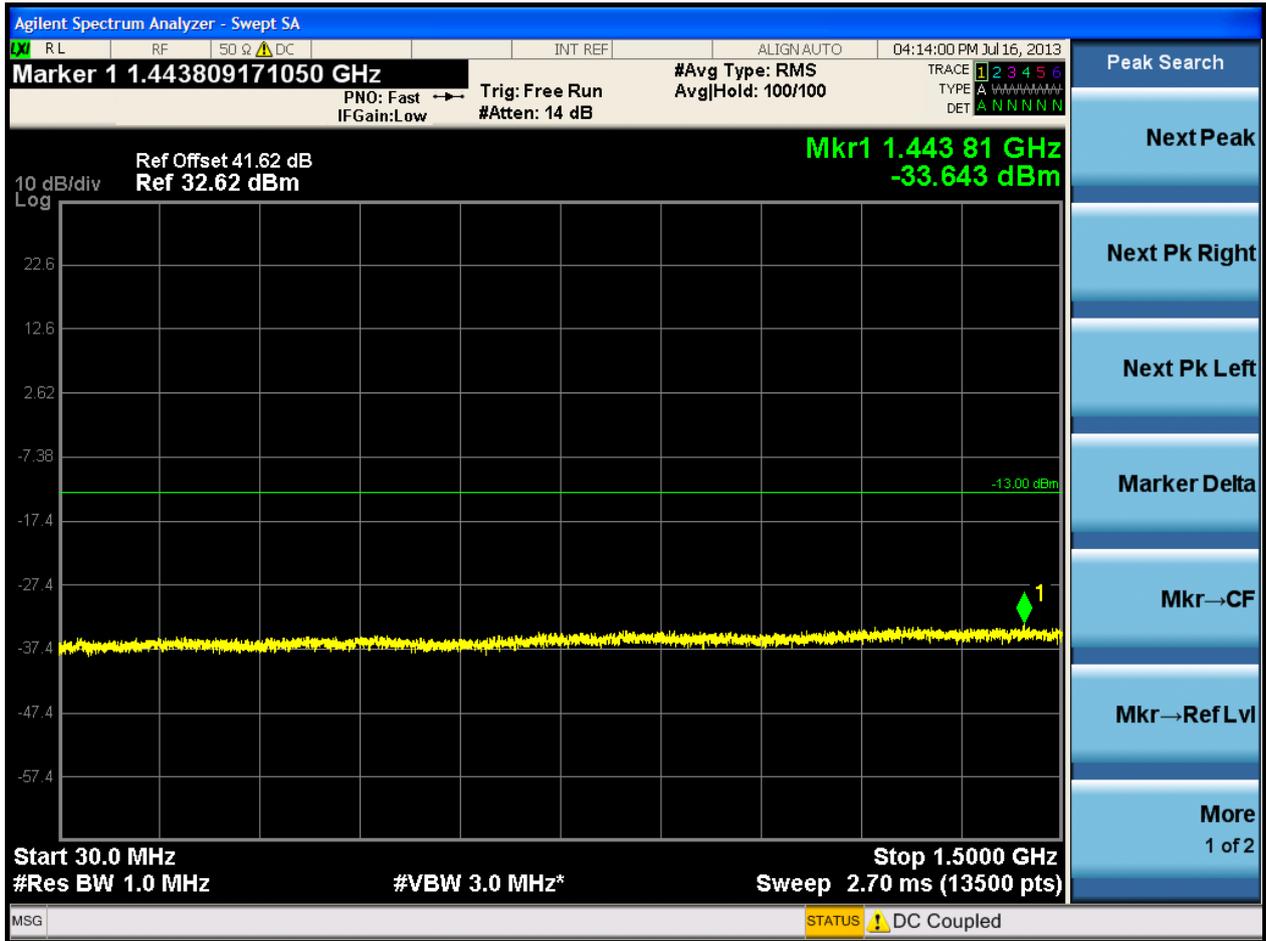


## 2 Test Plot

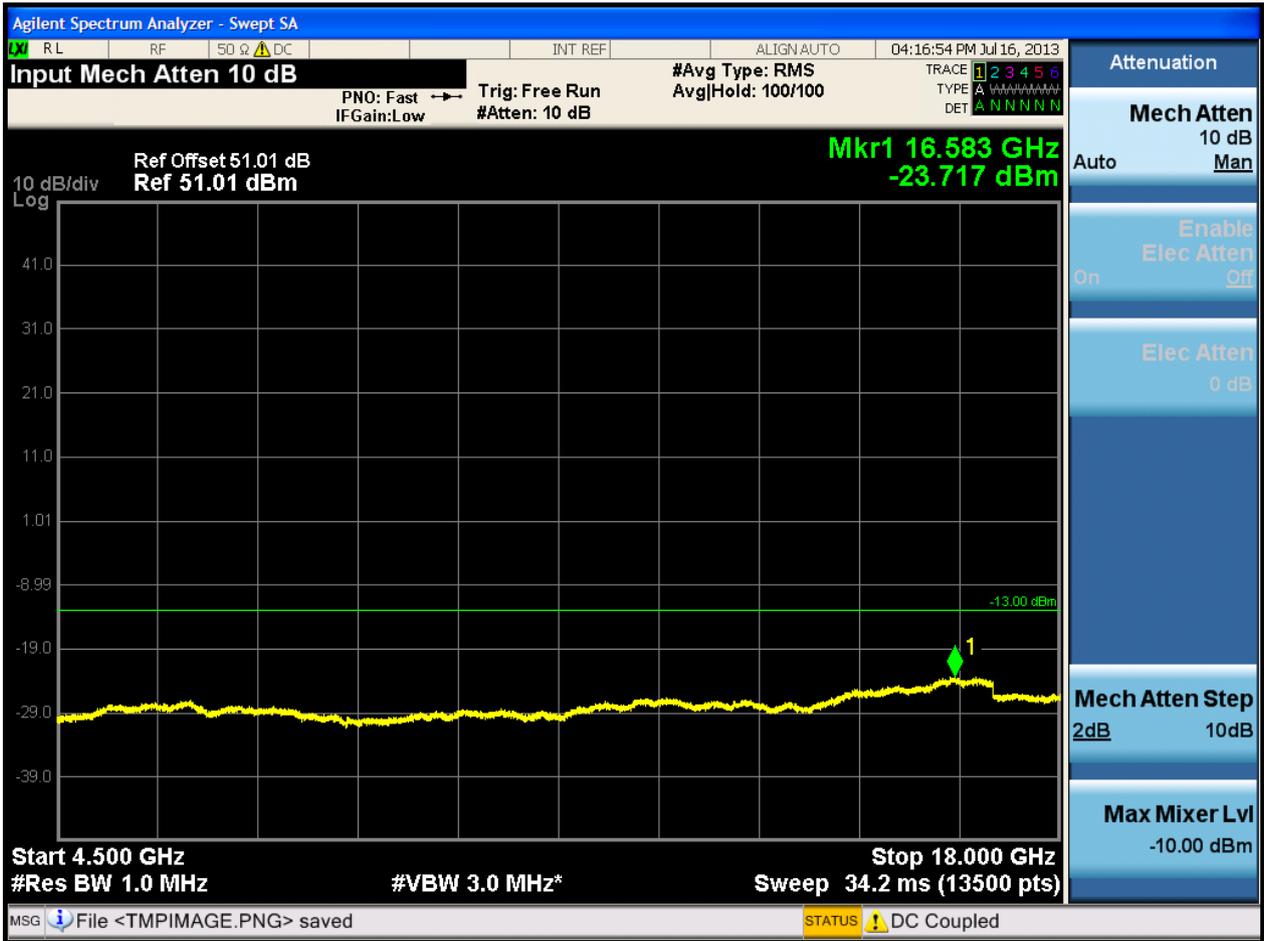
### 2.1 TX\_1L\_5M\_B\_TM1\_ANTA





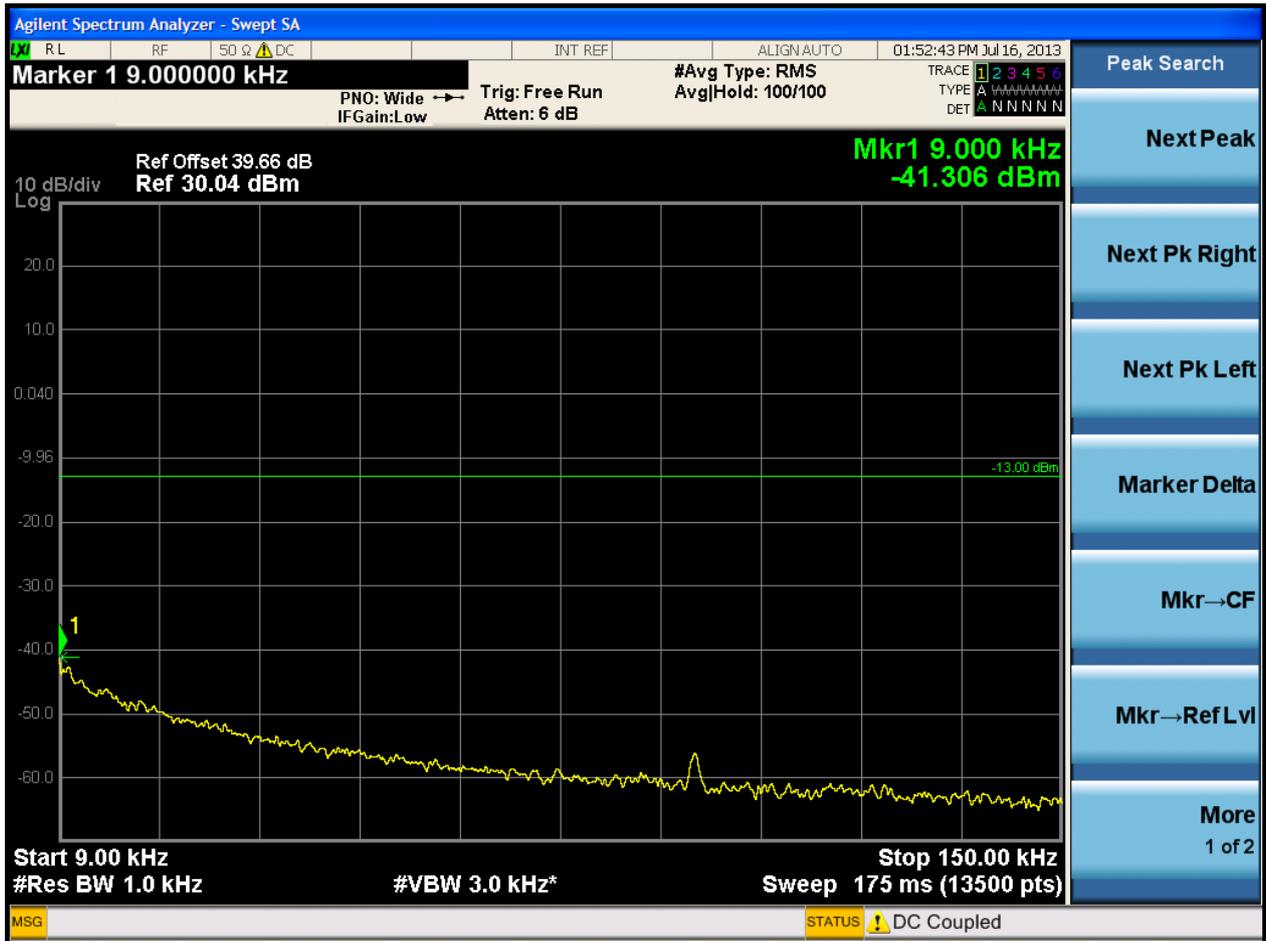




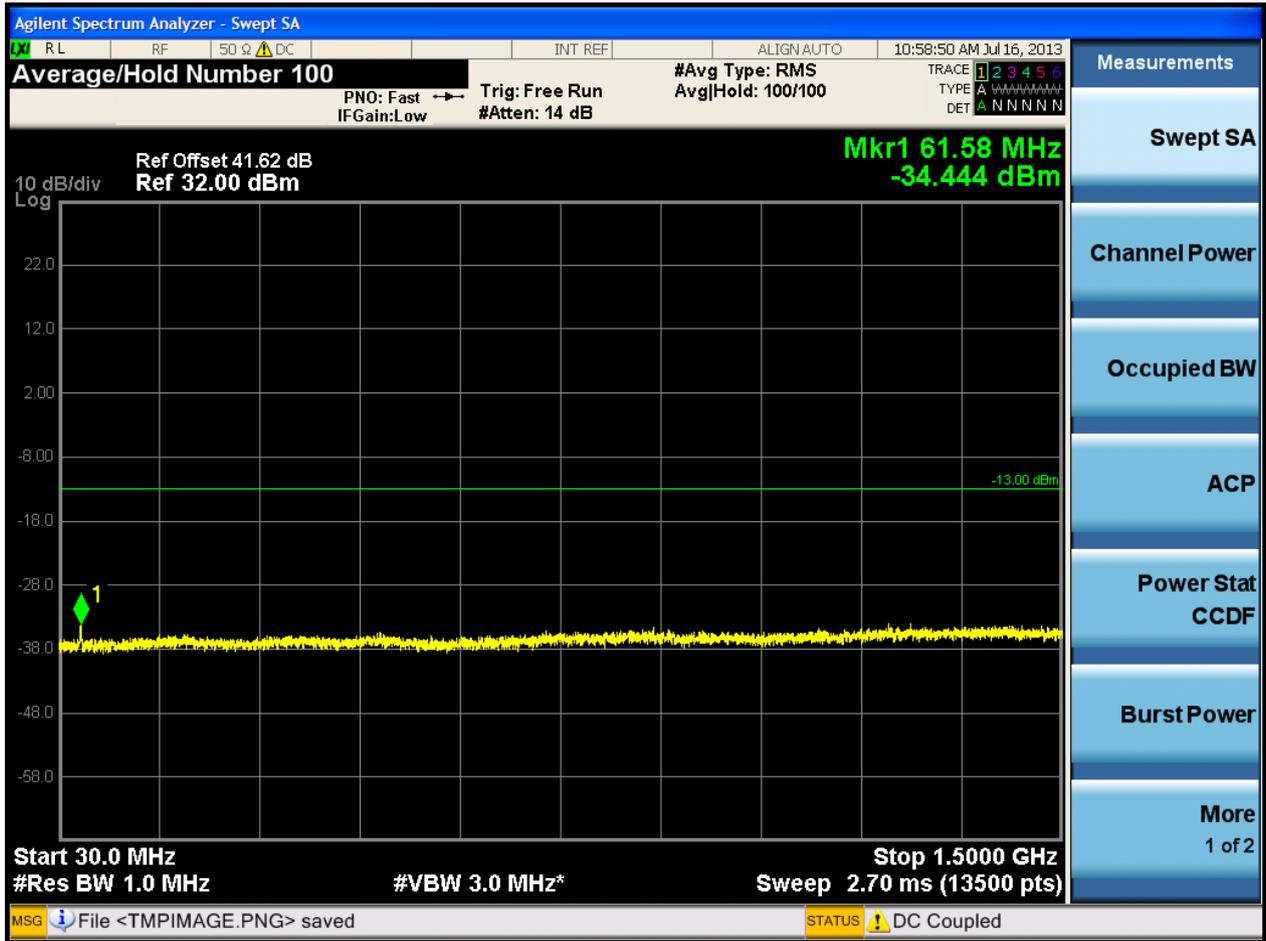


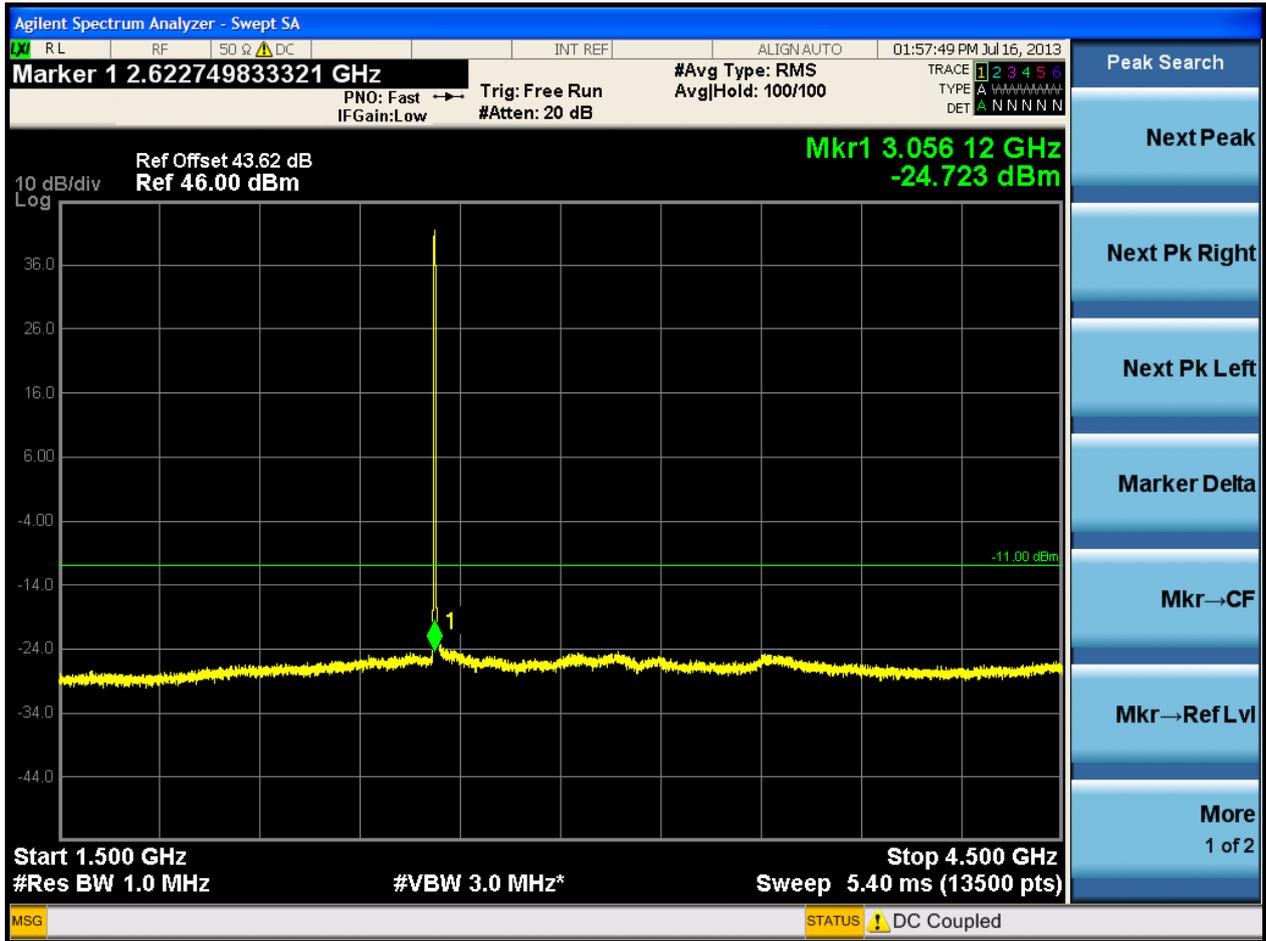


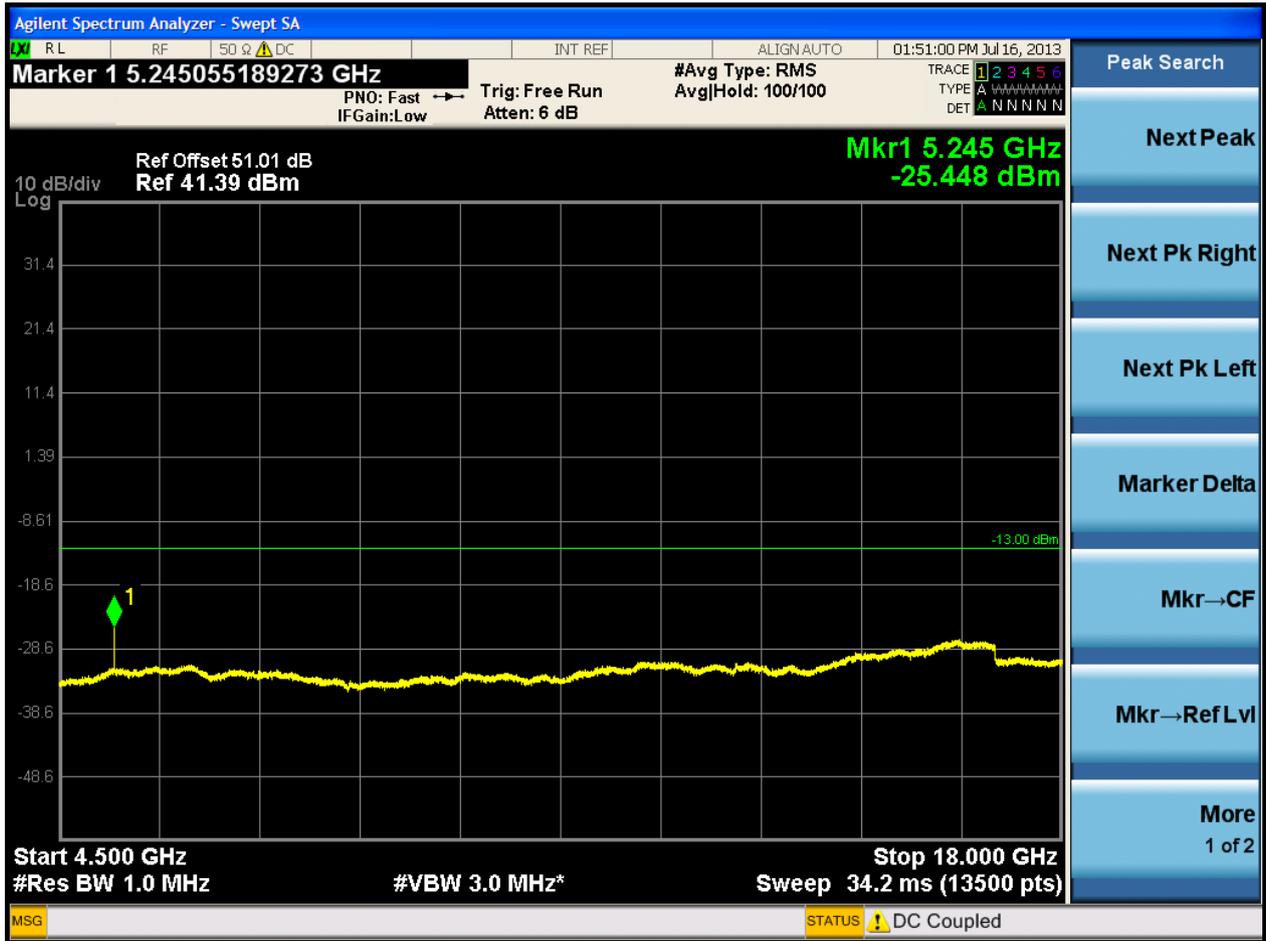
## 2.2 TX\_1L\_5M\_B\_TM1\_ANTB







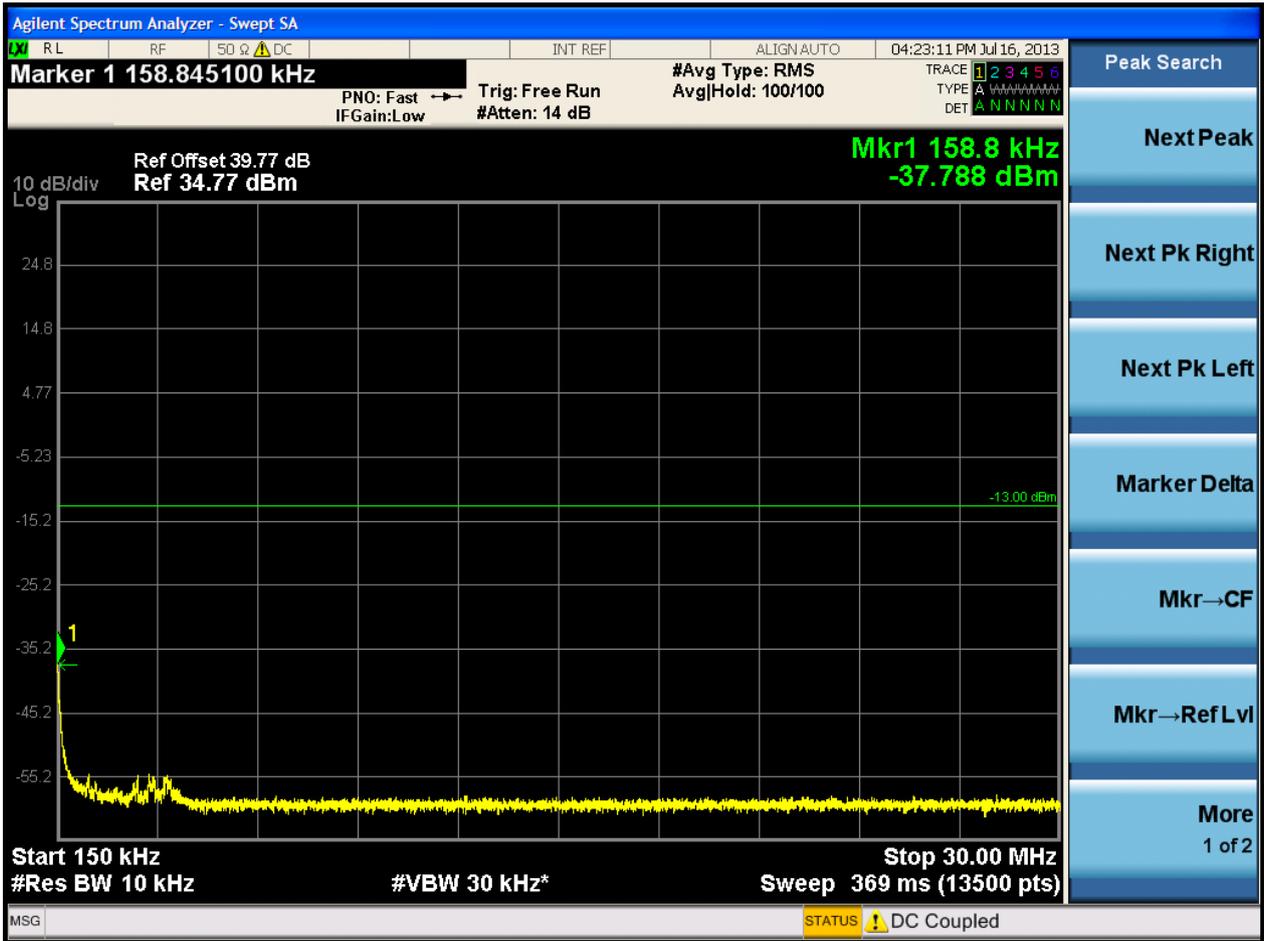


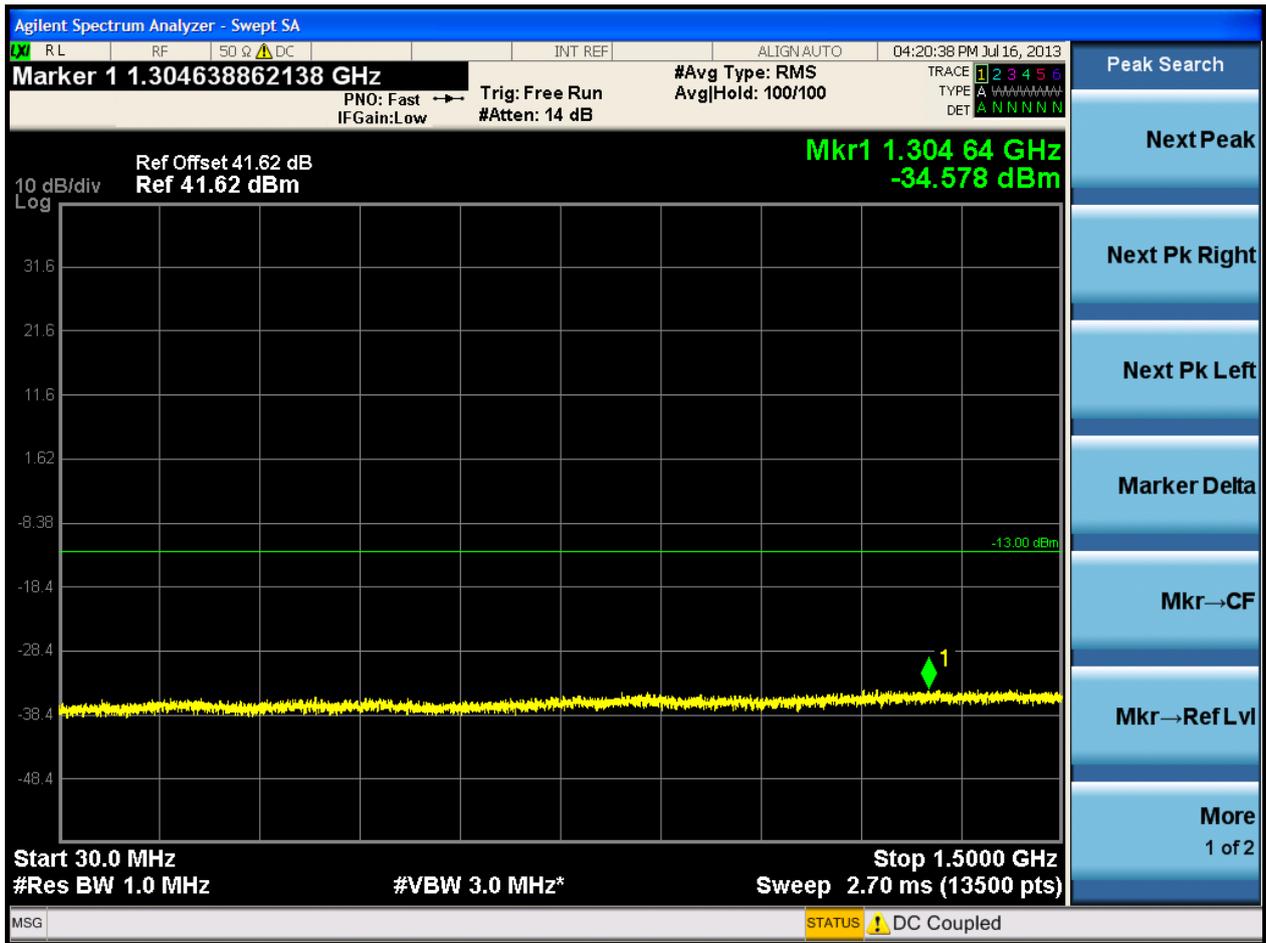


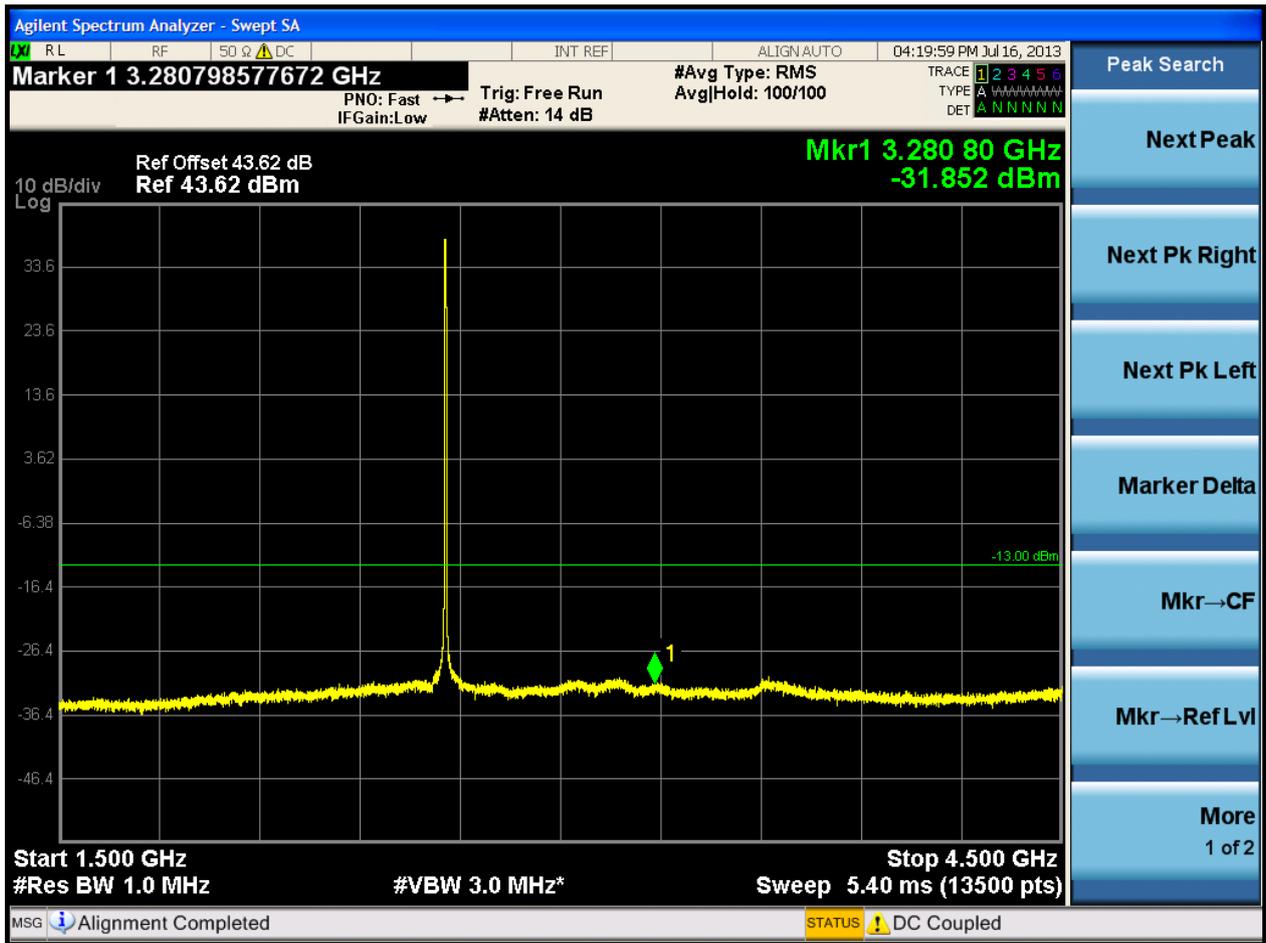


2.3 TX\_1L\_5M\_M\_TM1\_ANTA









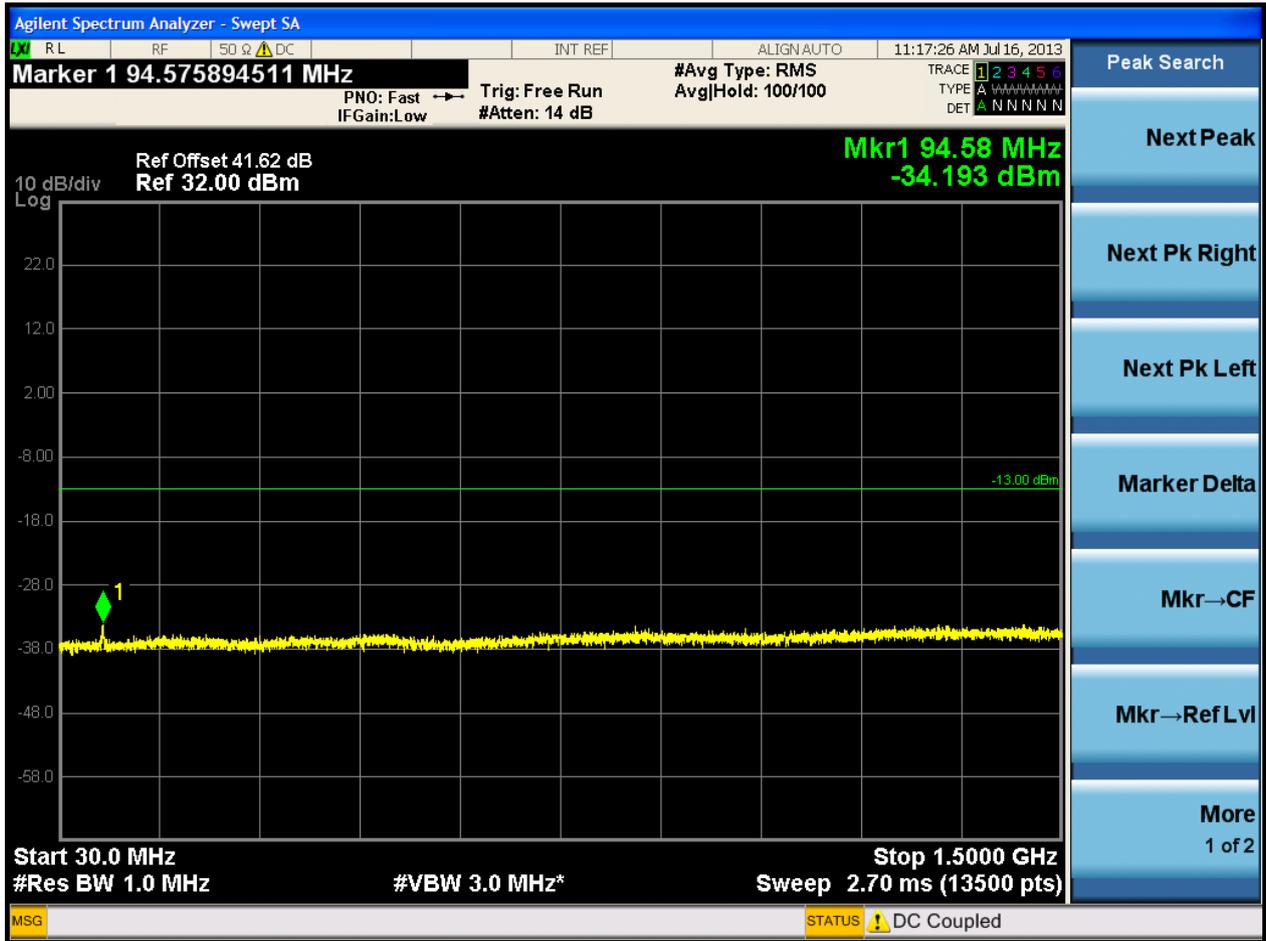


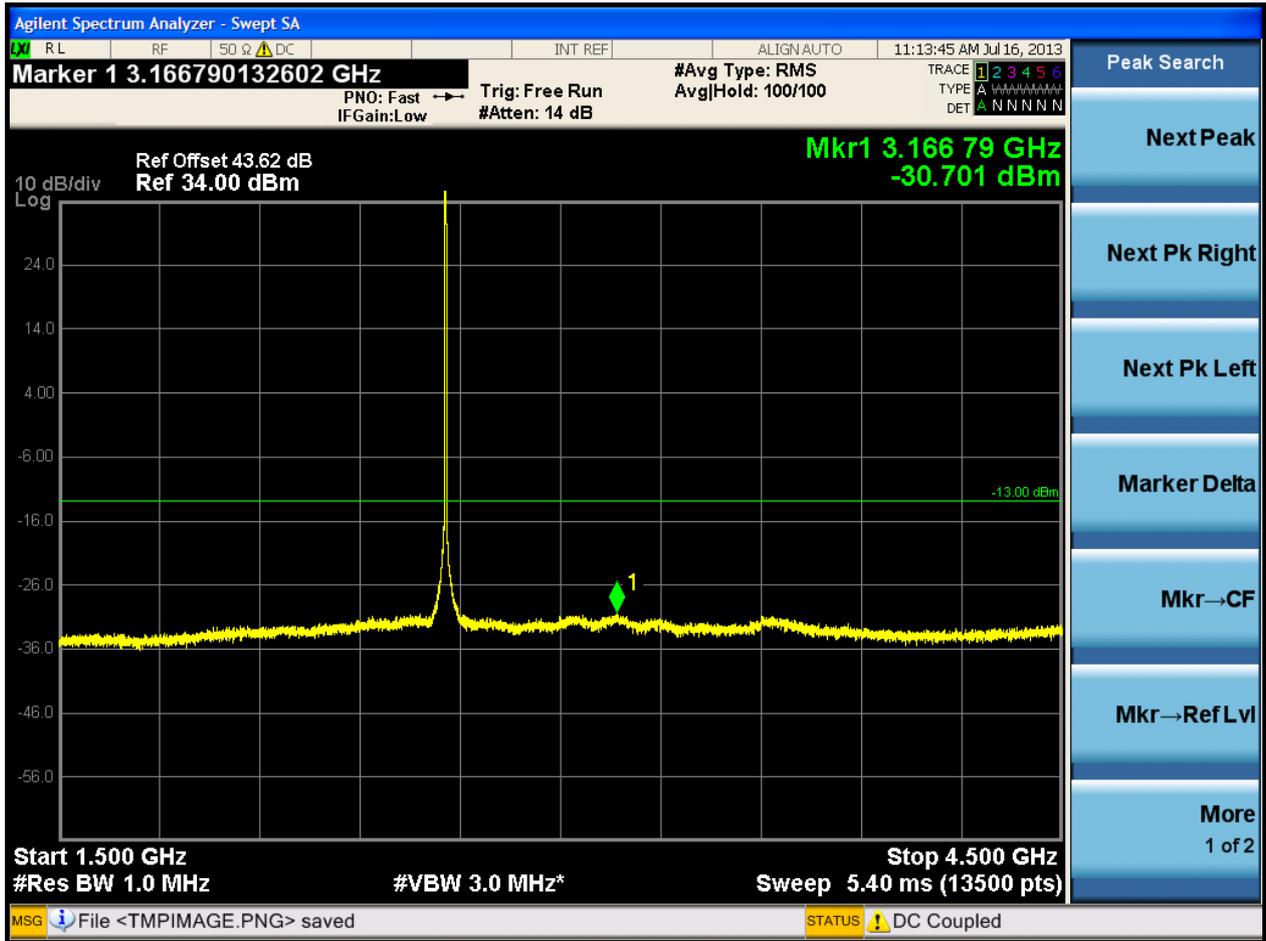


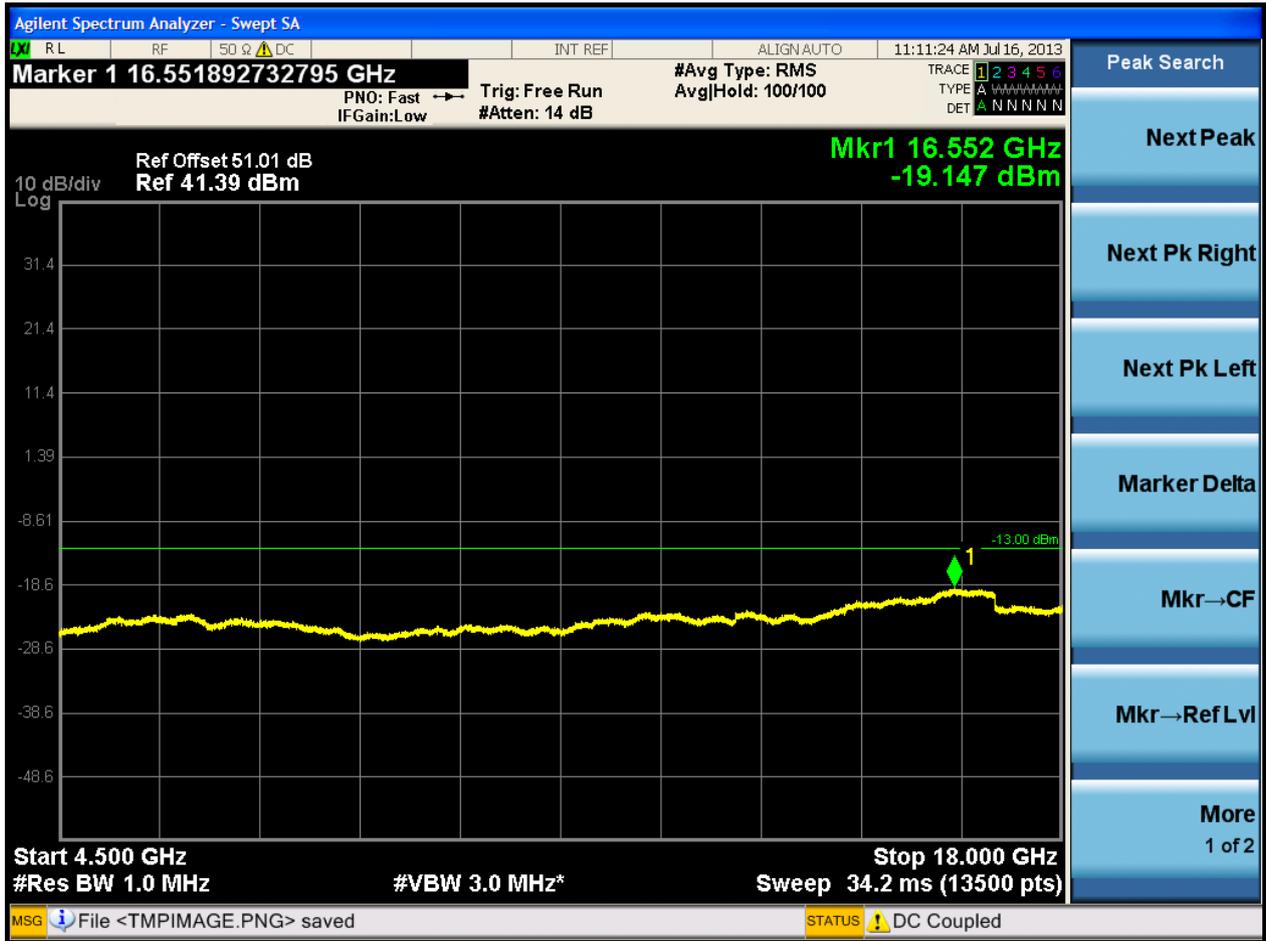
### 2.4 TX\_1L\_5M\_M\_TM1\_ANTB





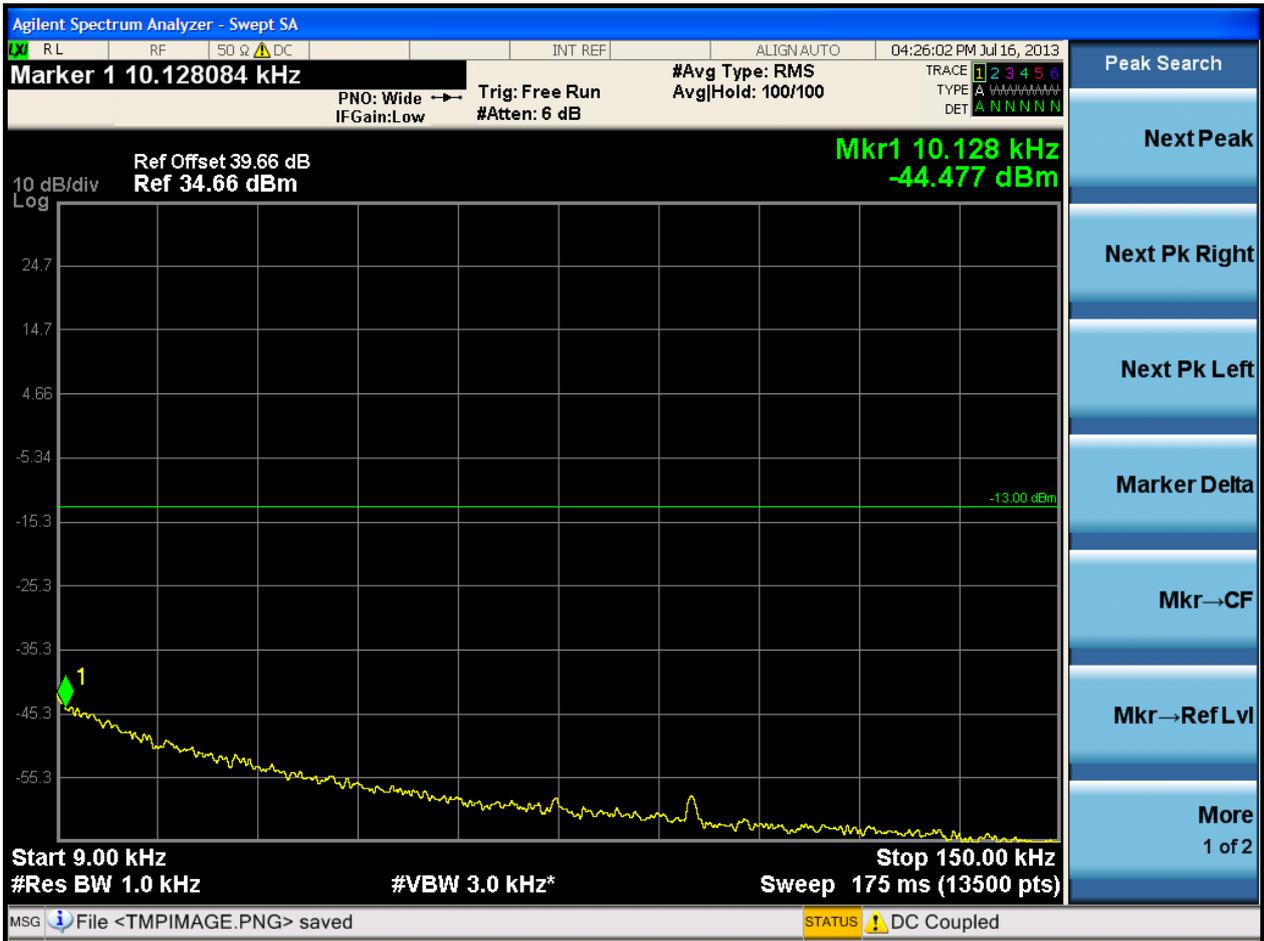




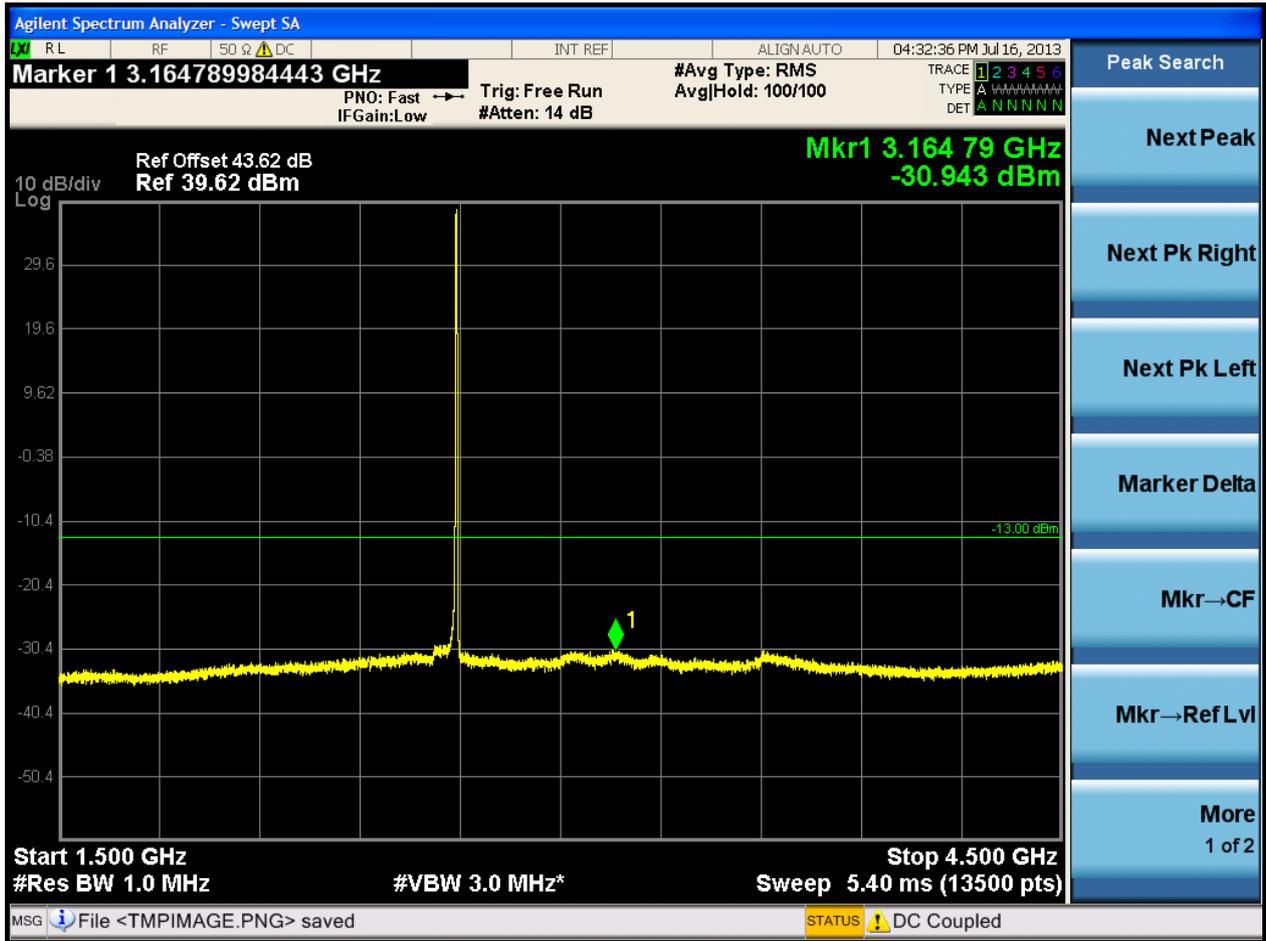


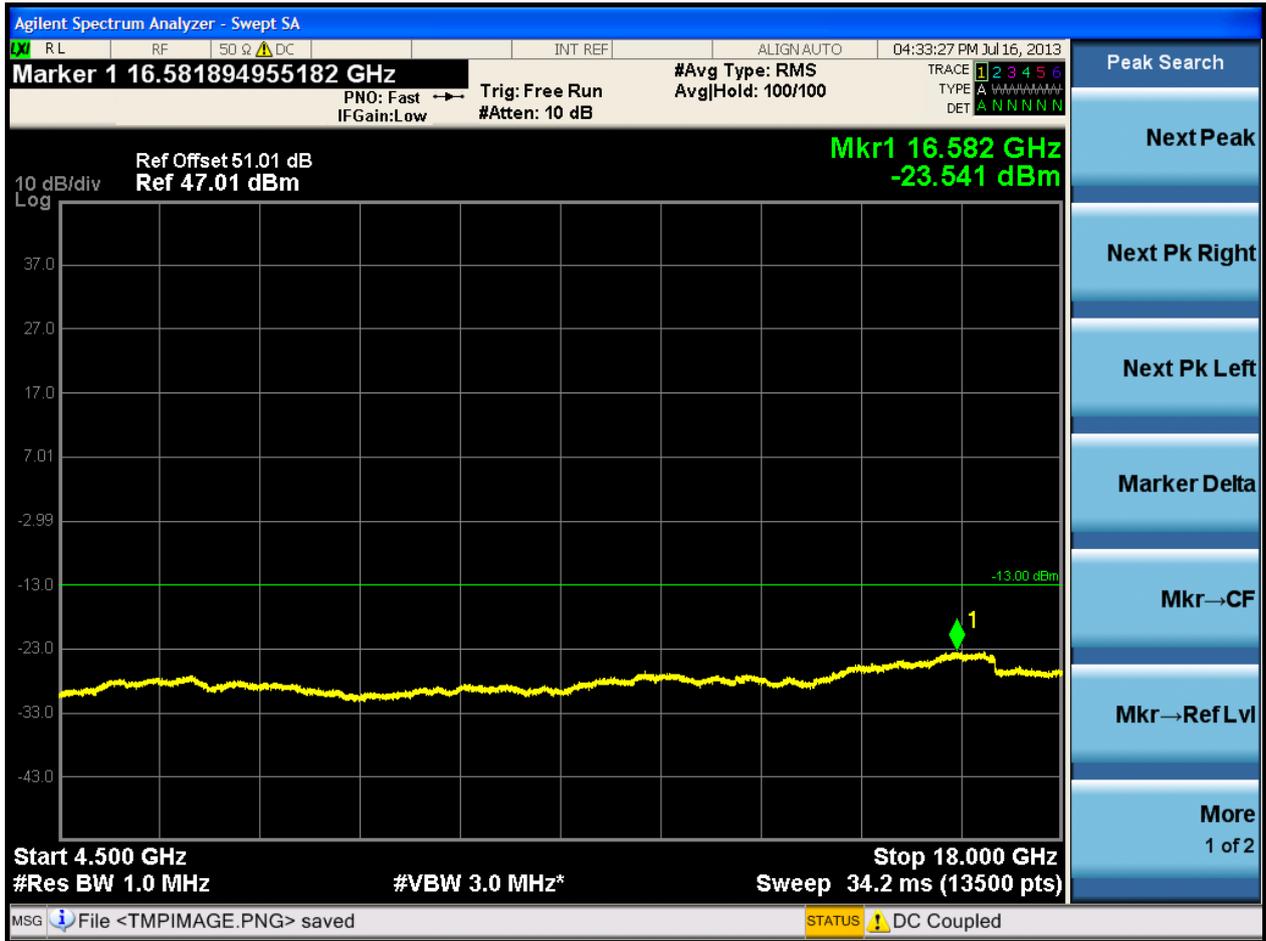


### 2.5 TX\_1L\_5M\_T\_TM1\_ANTA





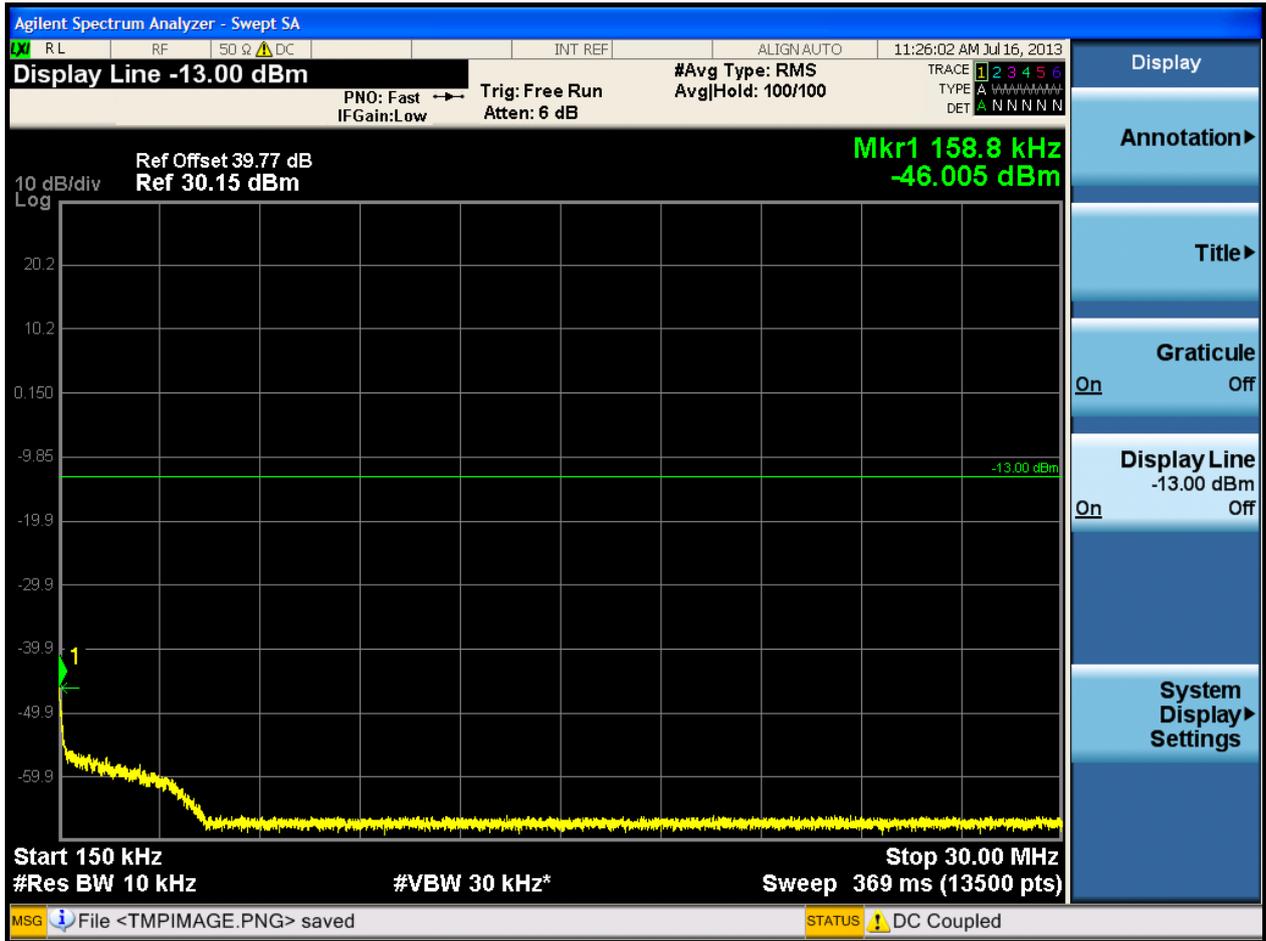


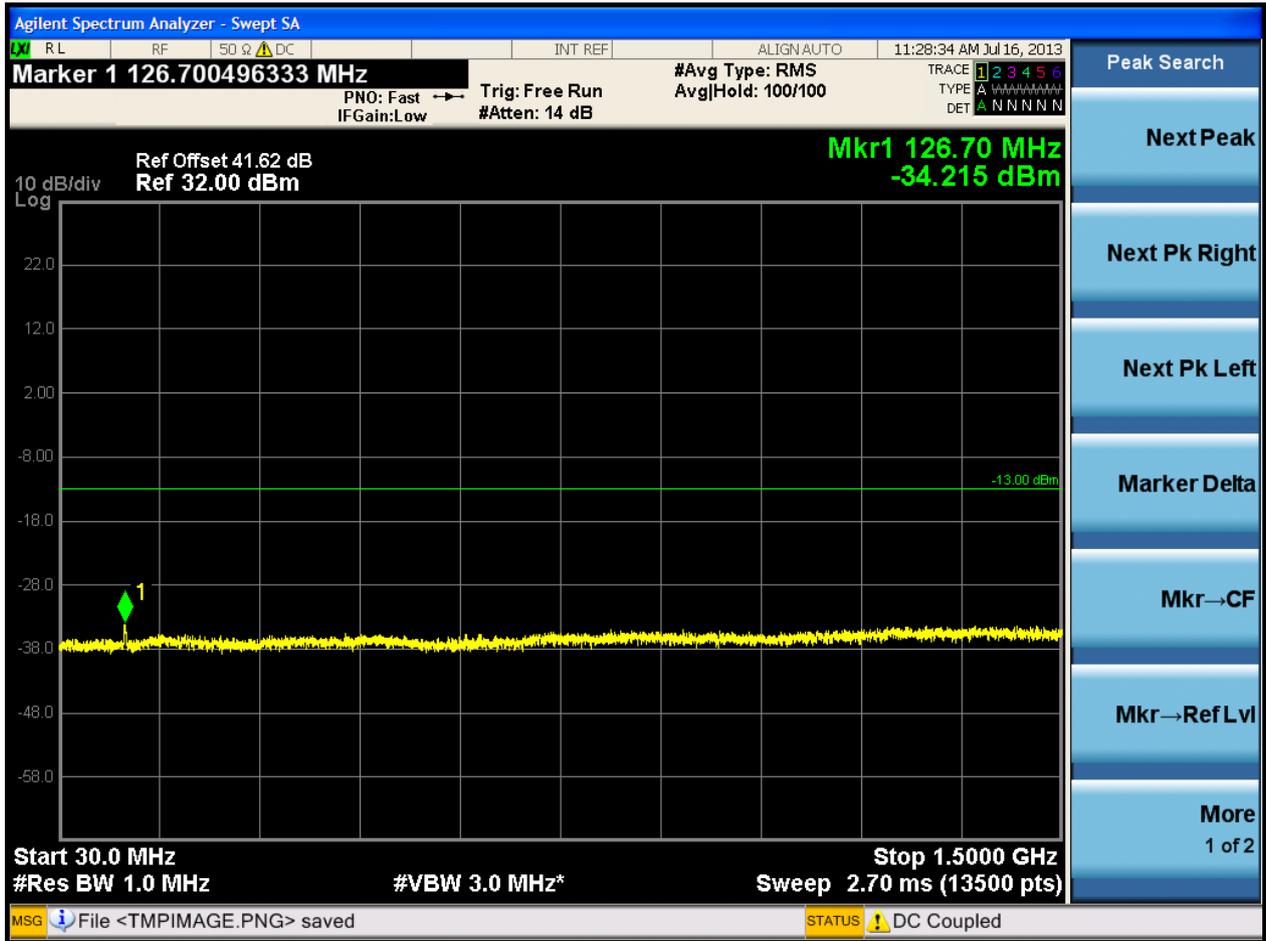


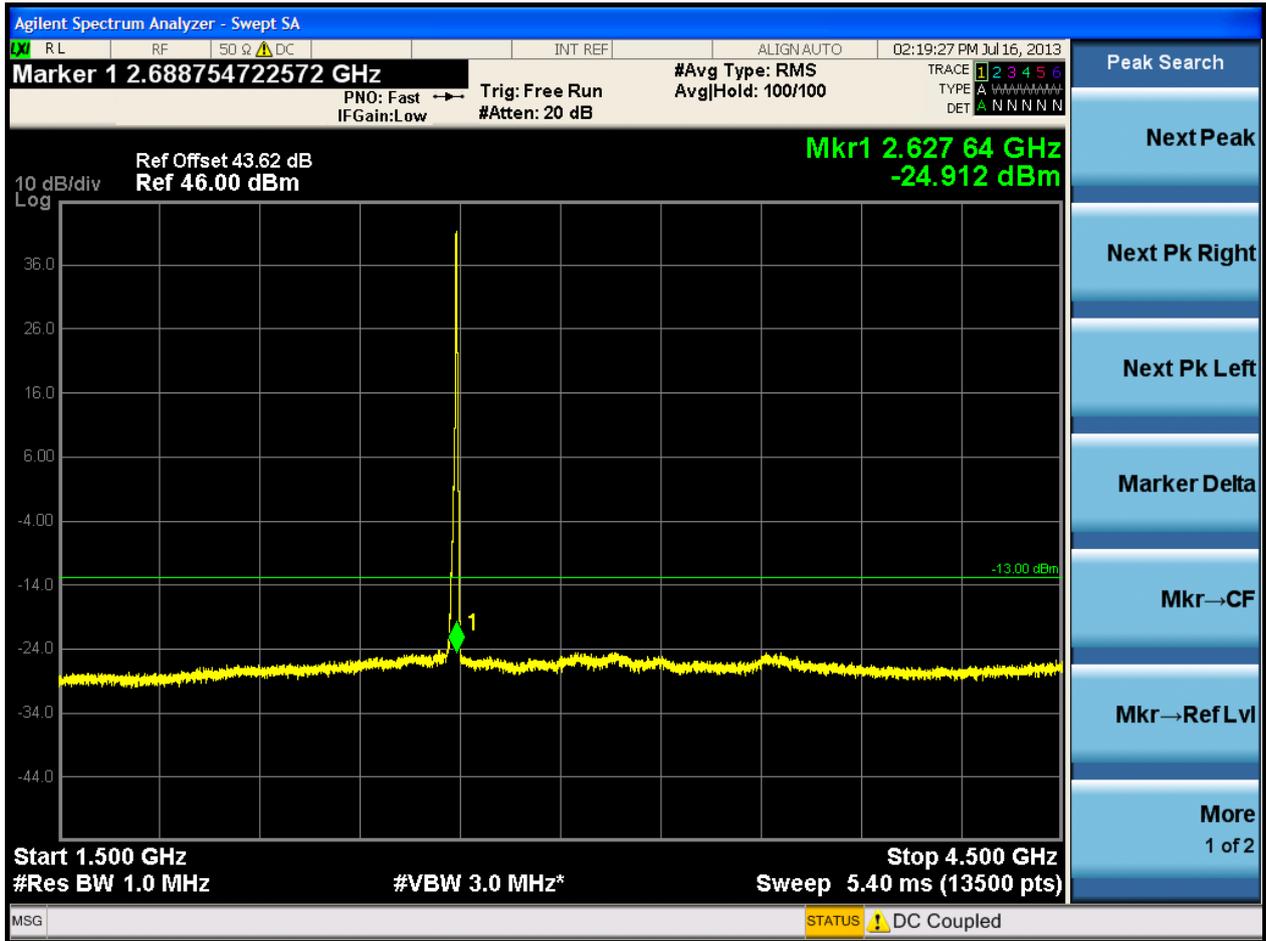


2.6 TX\_1L\_5M\_T\_TM1\_ANTB





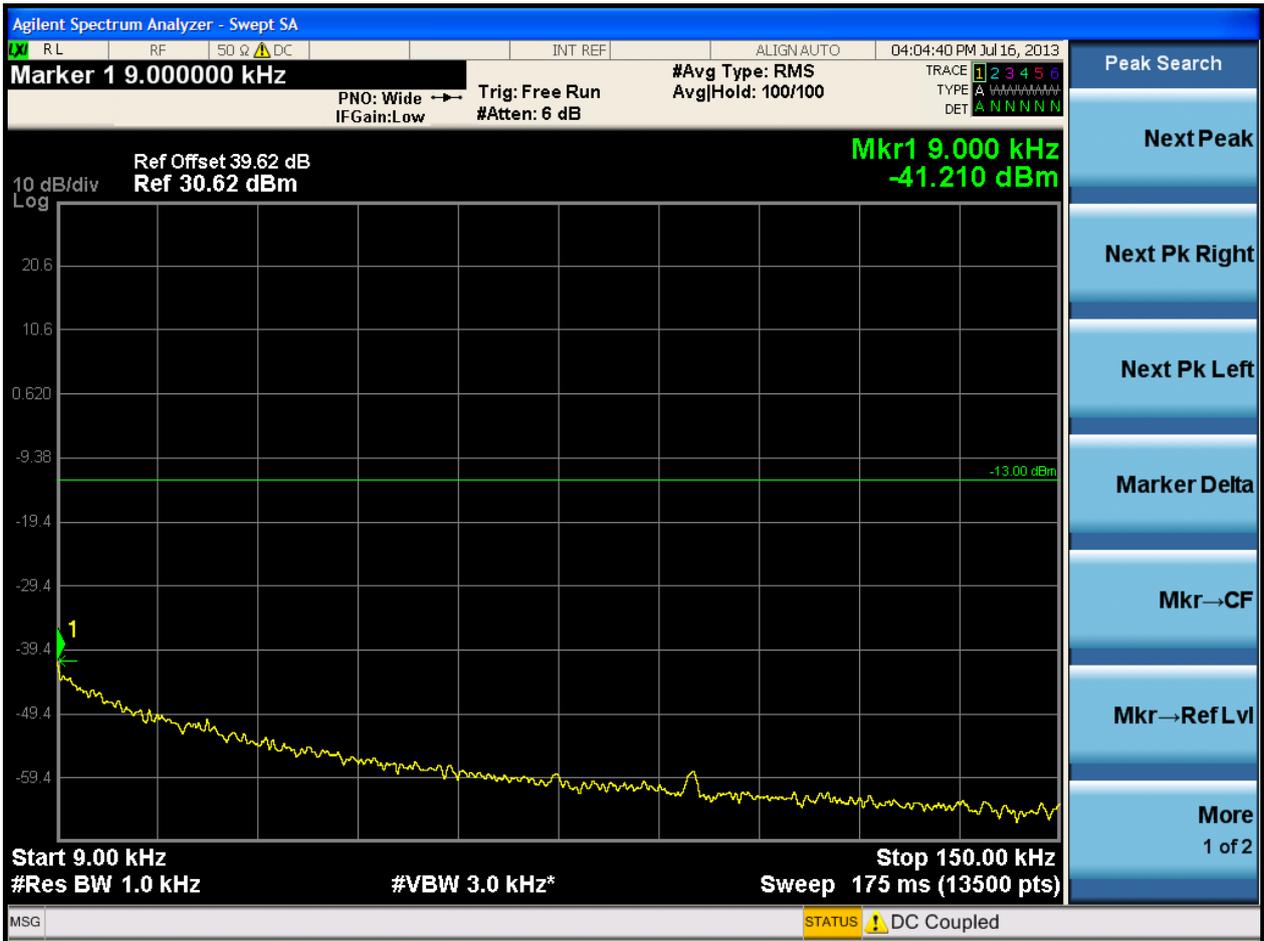


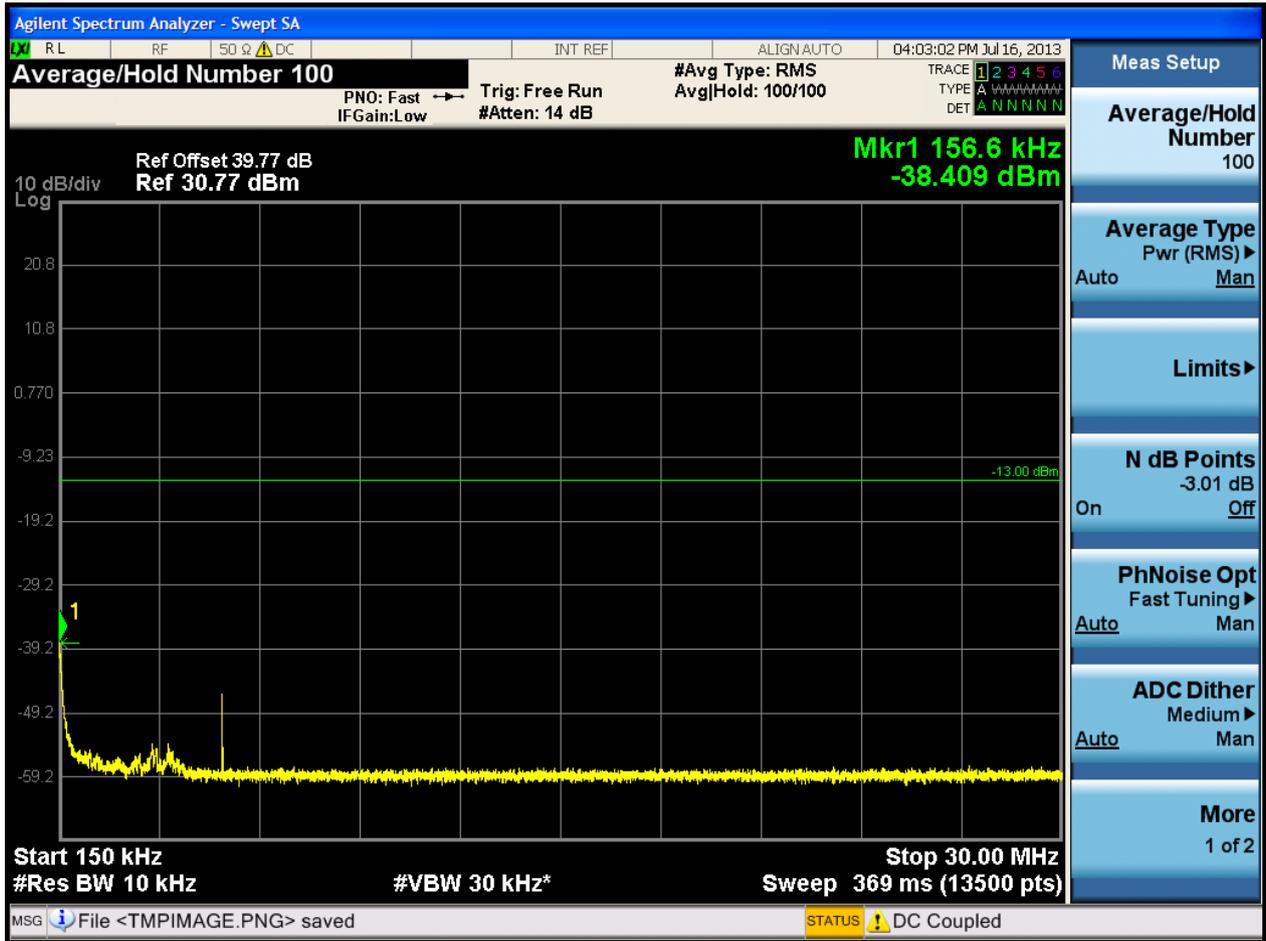


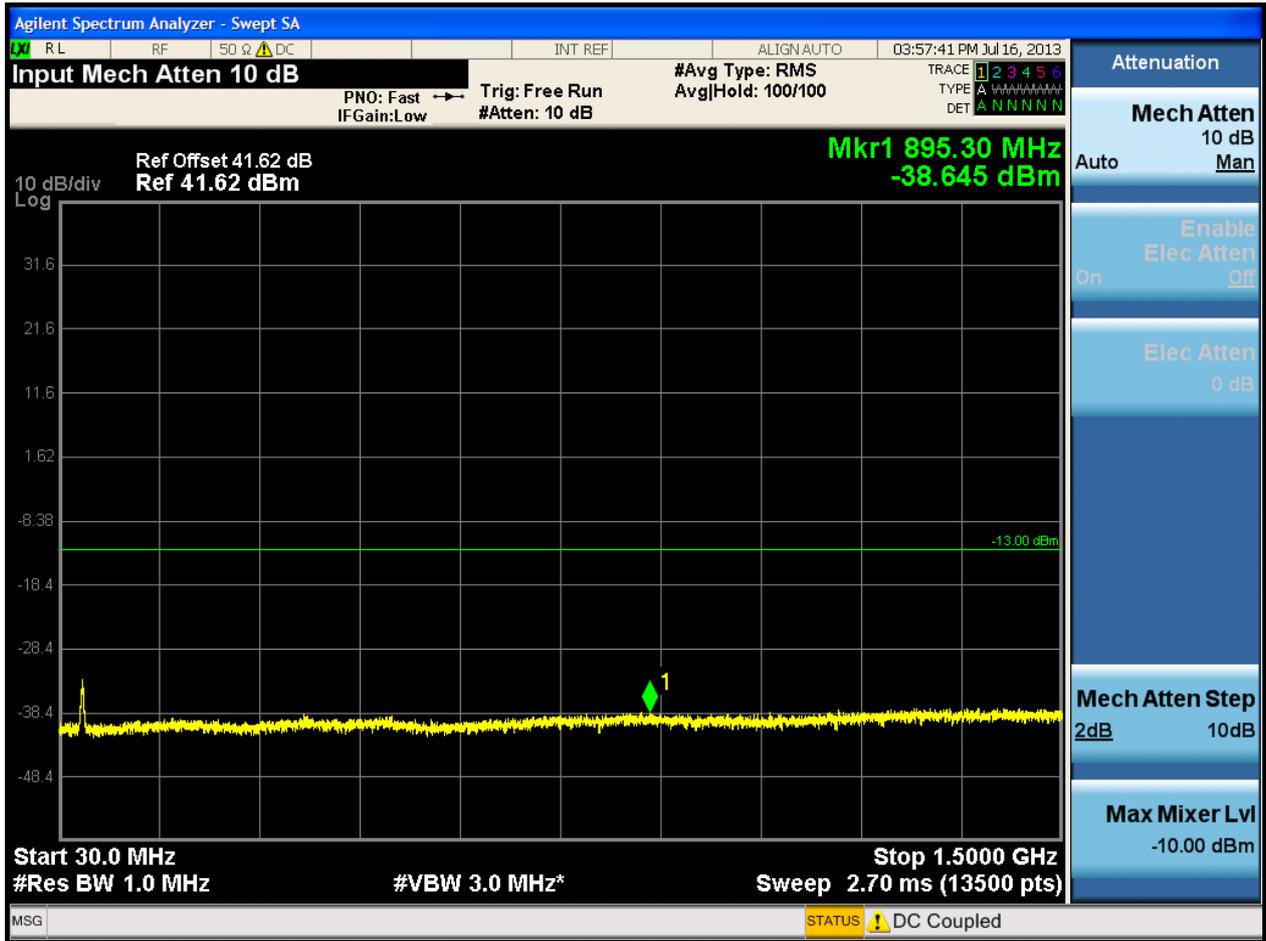


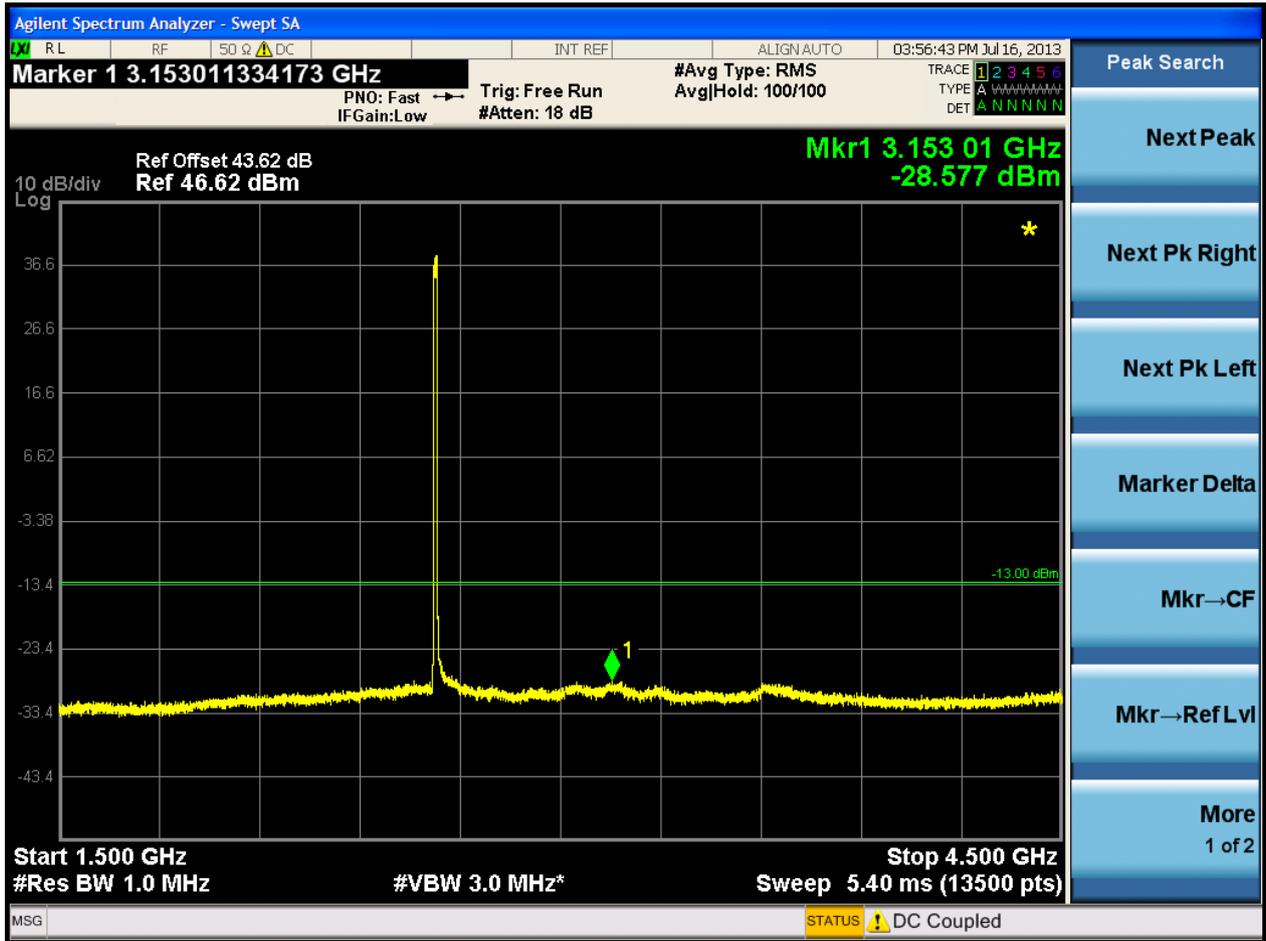


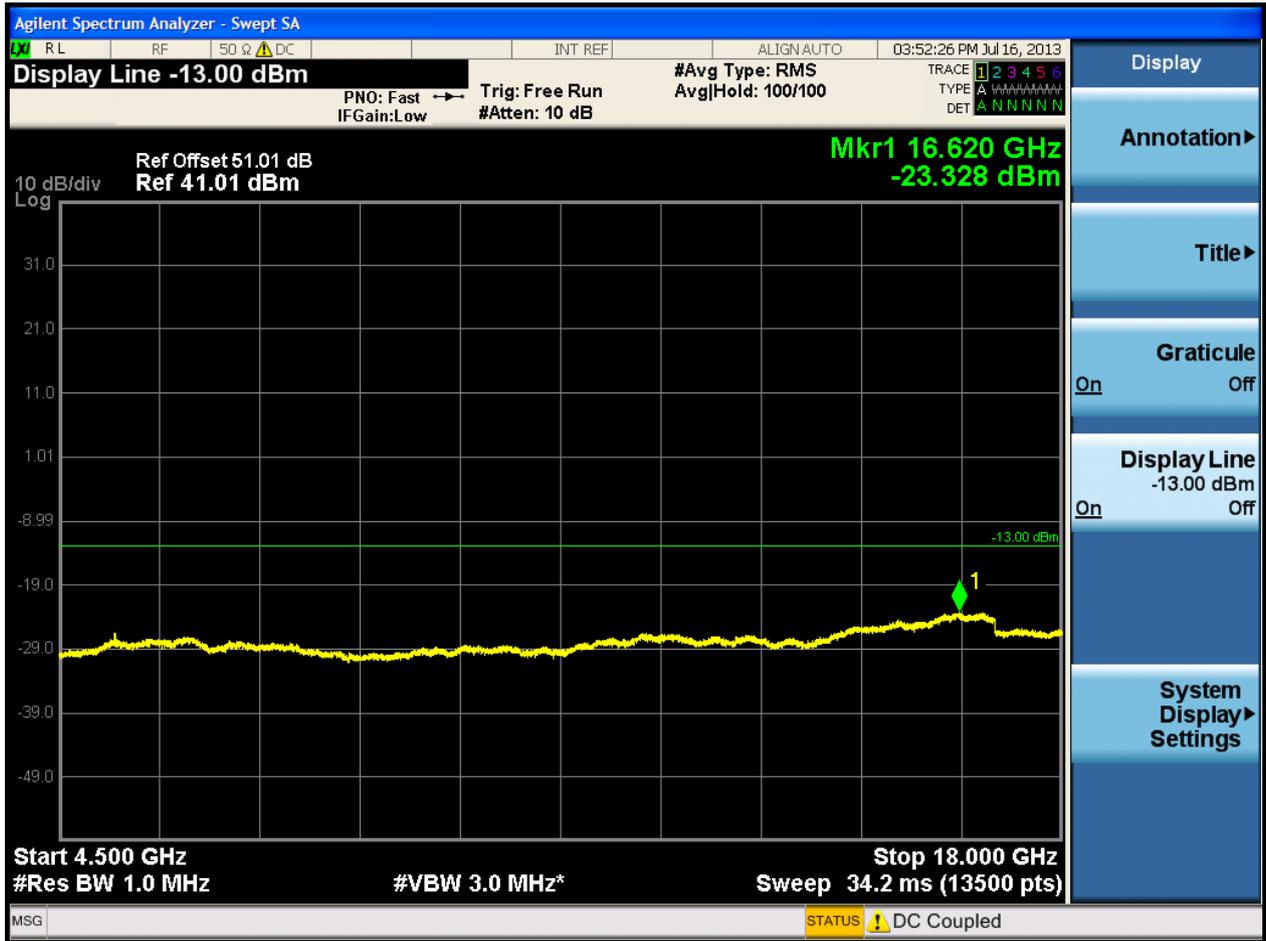
### 2.7 TX\_2L\_5M\_B\_TM1\_ANTA







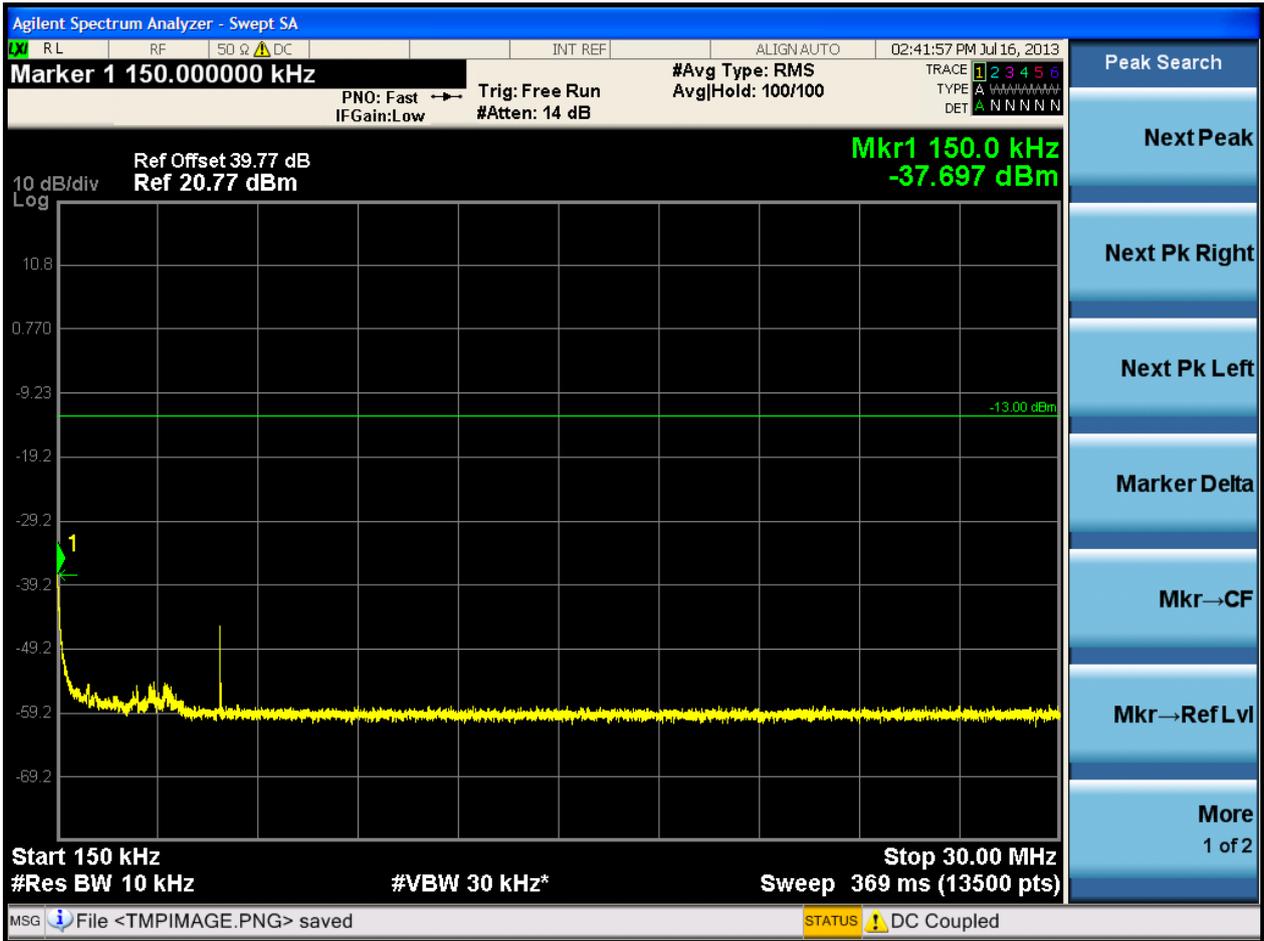


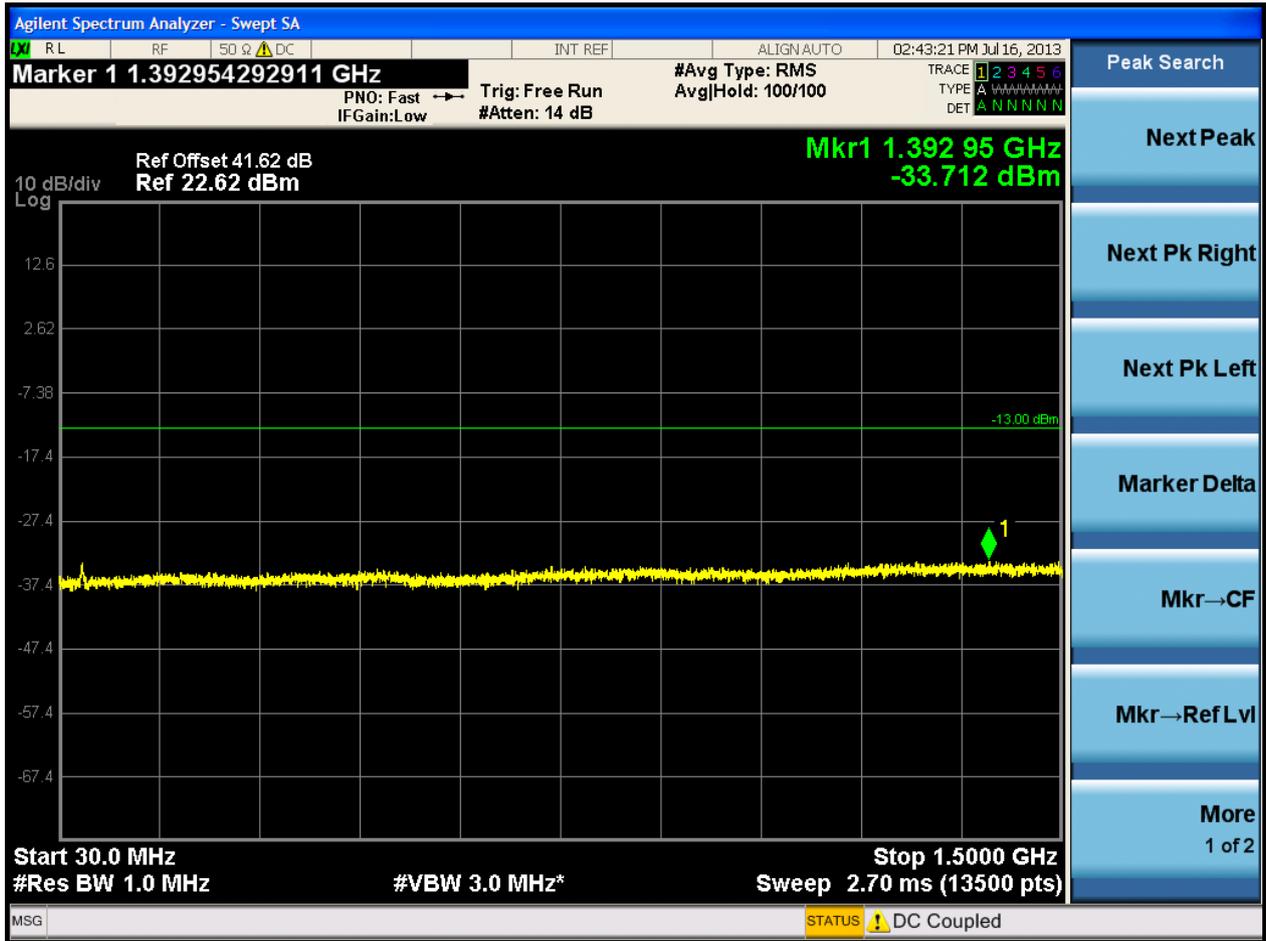


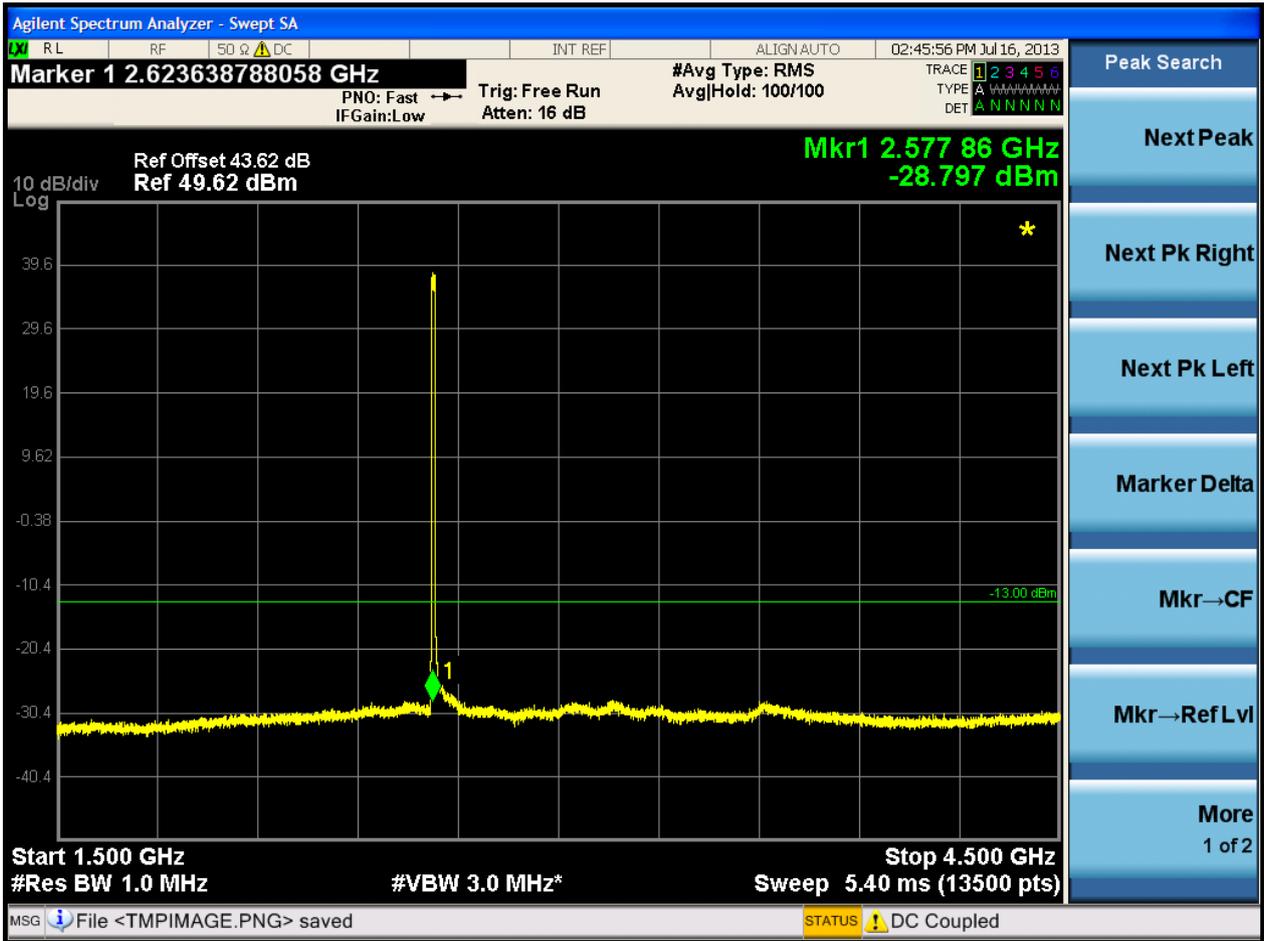


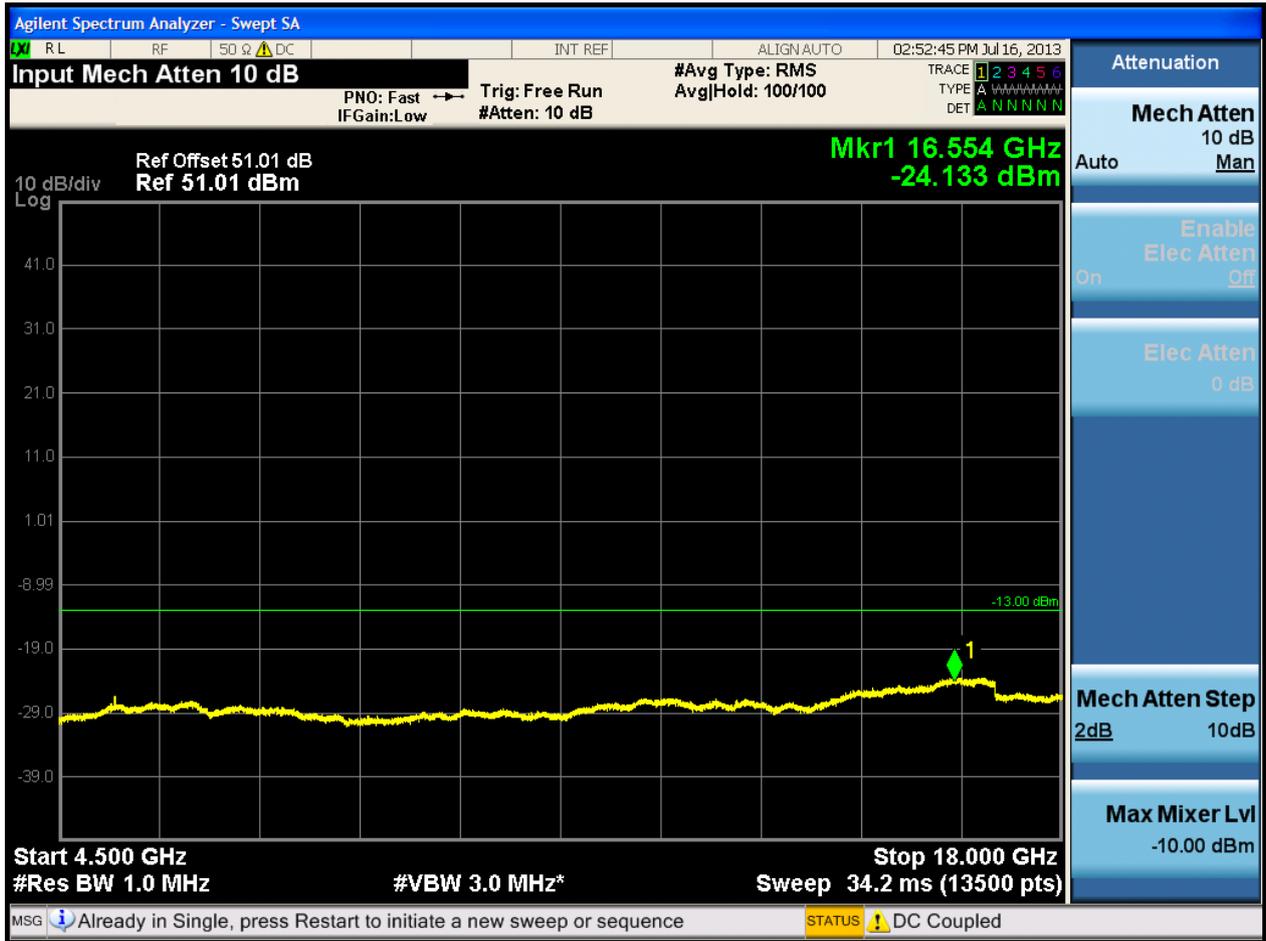
### 2.8 TX\_2L\_5M\_B\_TM1\_ANTB





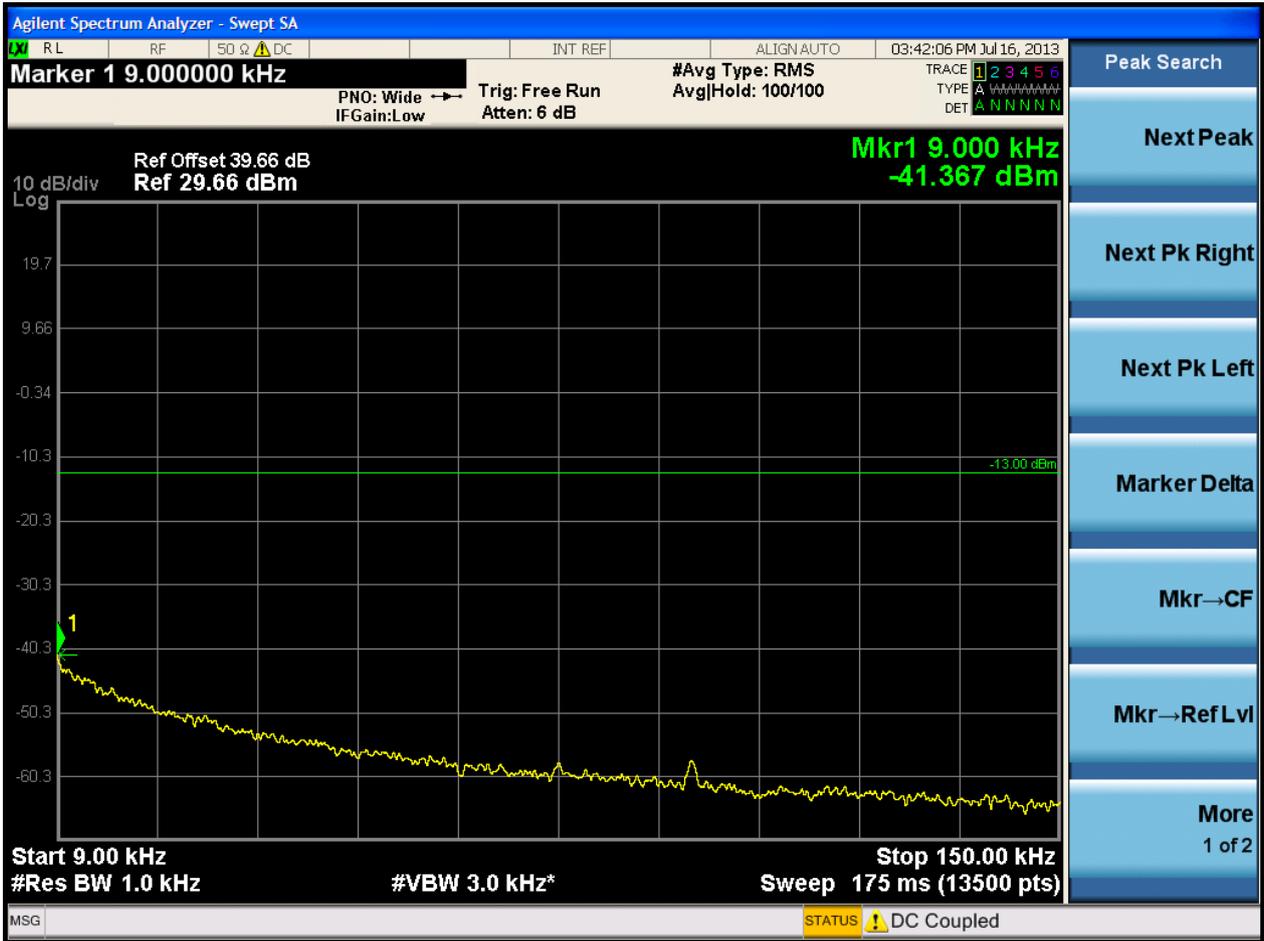


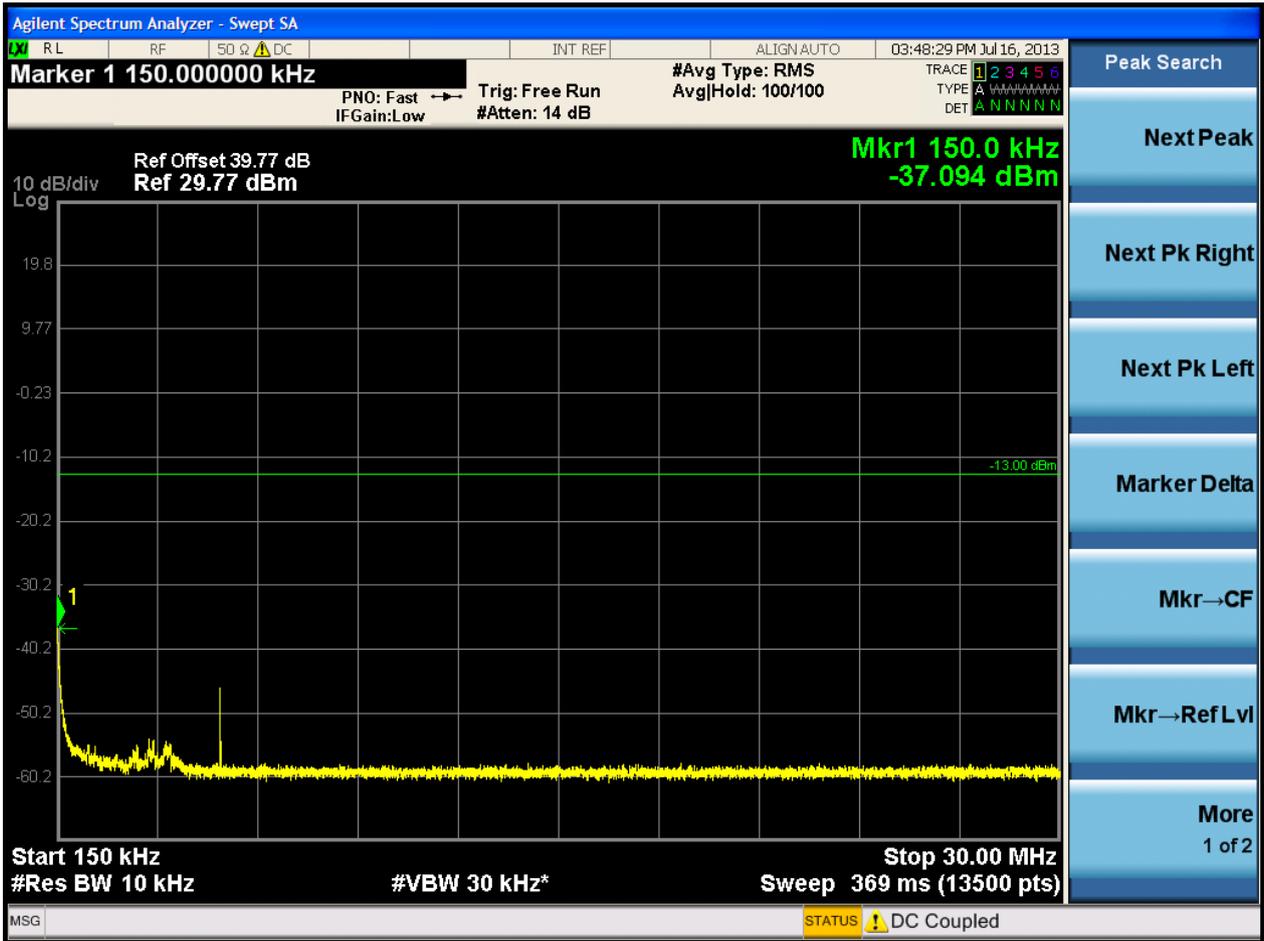


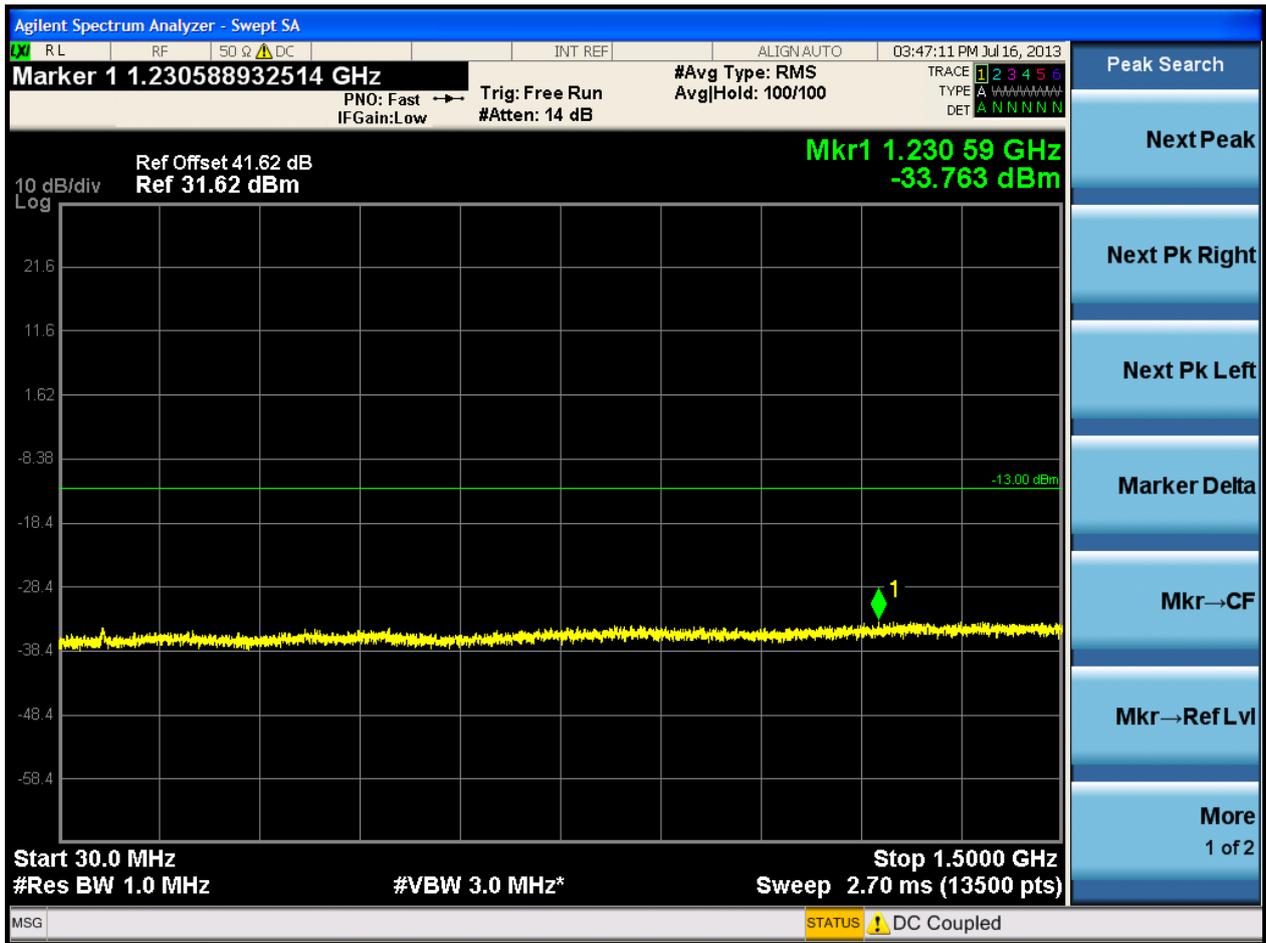


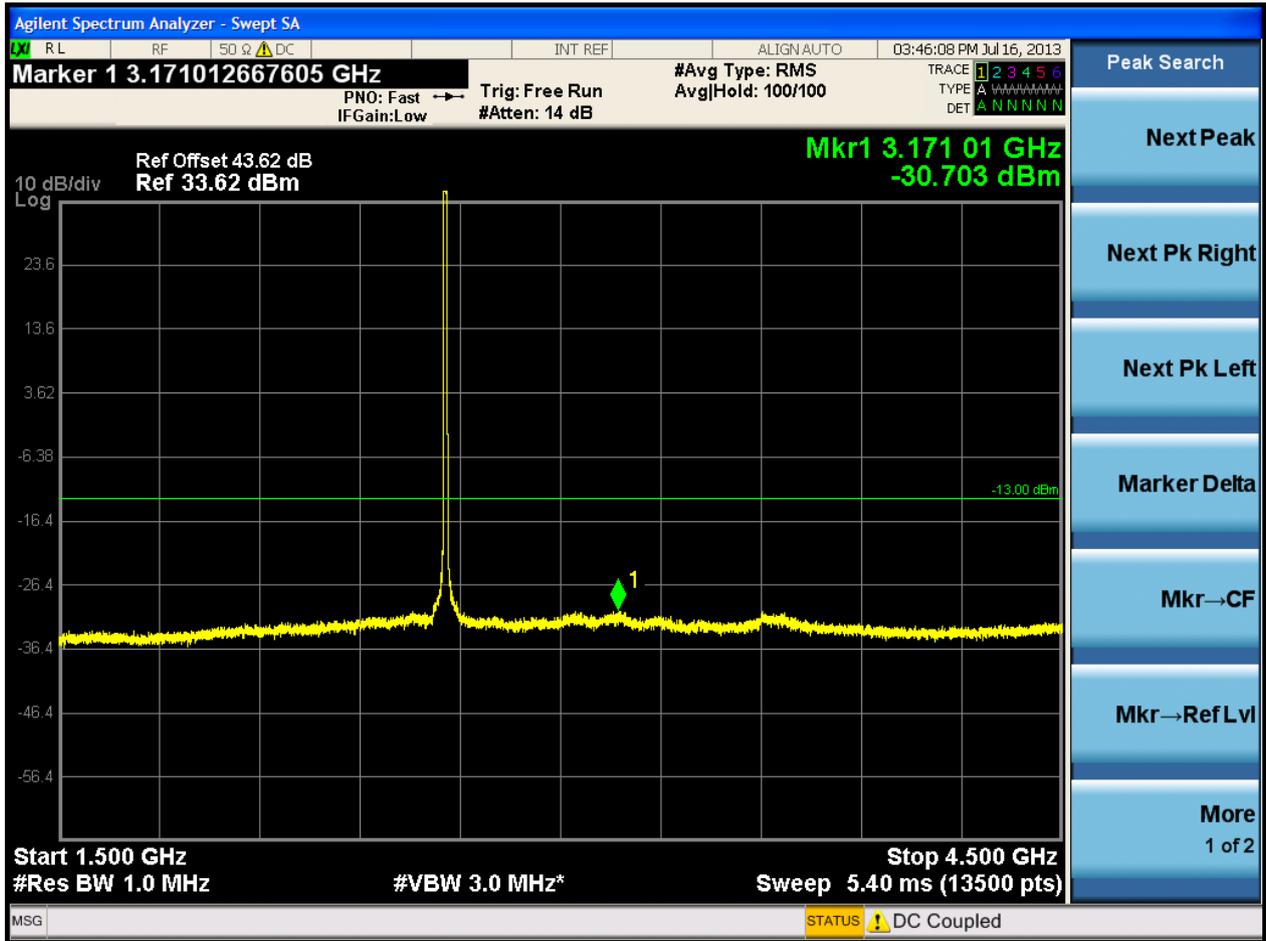


2.9 TX\_2L\_5M\_M\_TM1\_ANTA





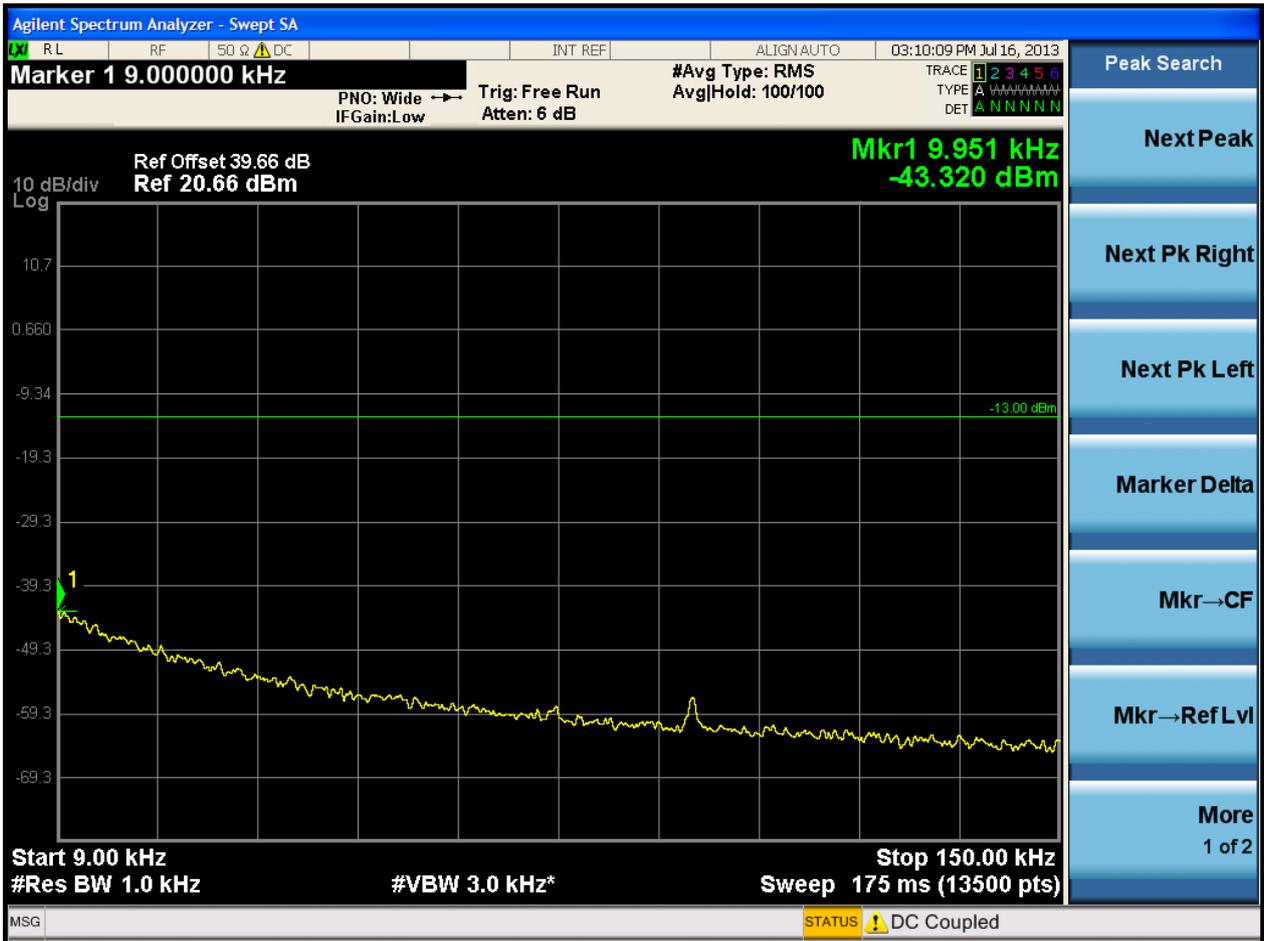


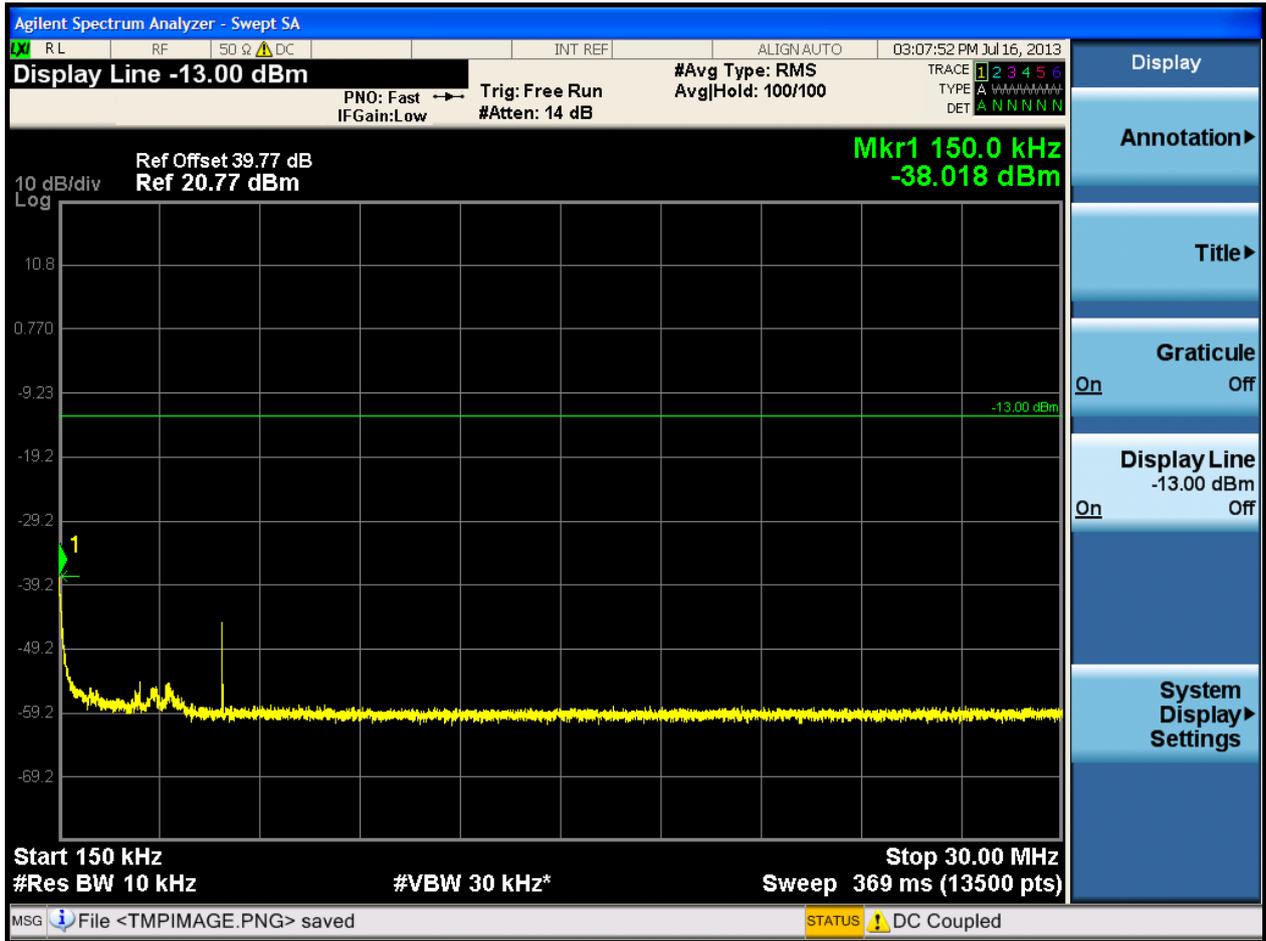


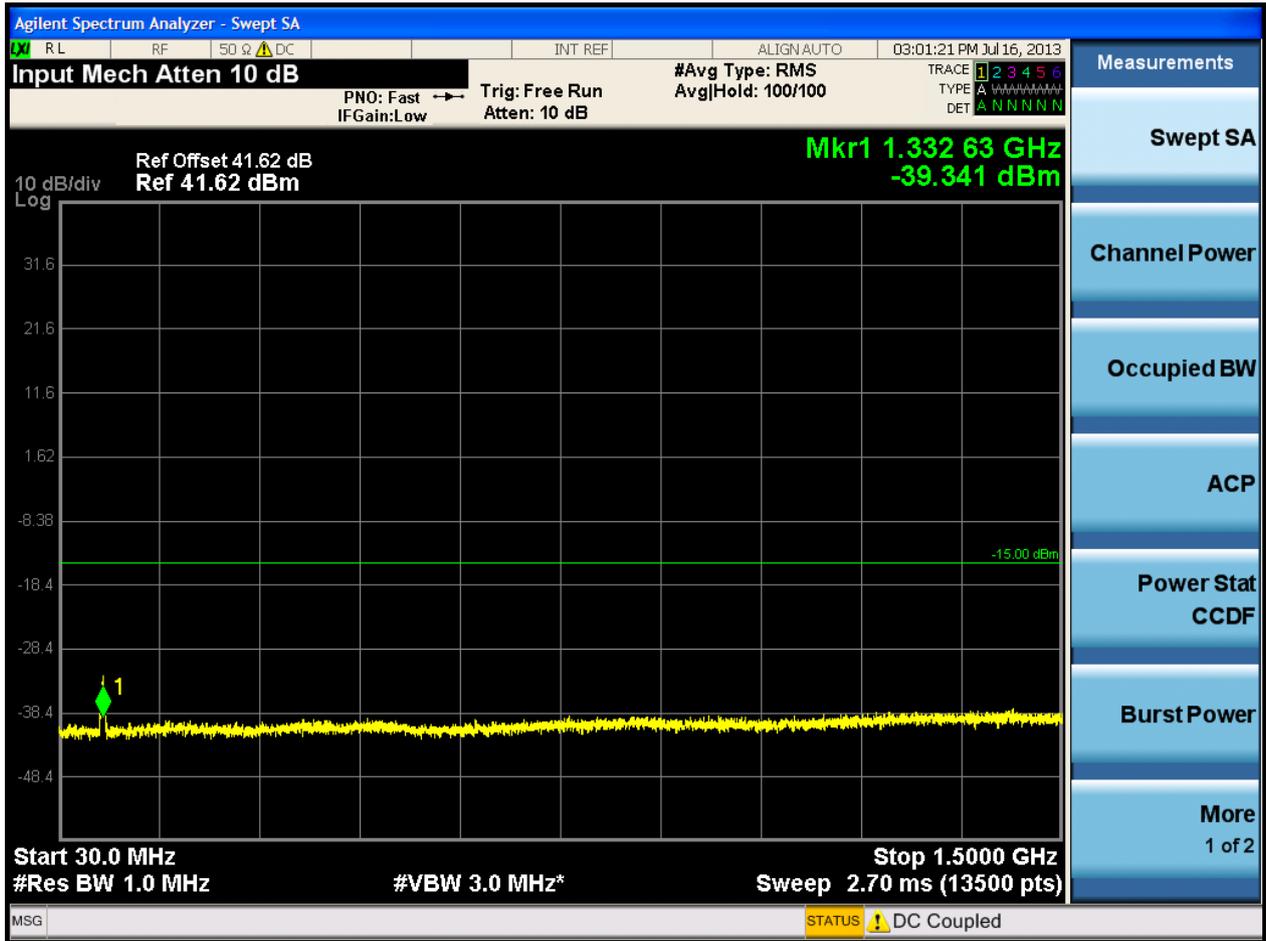


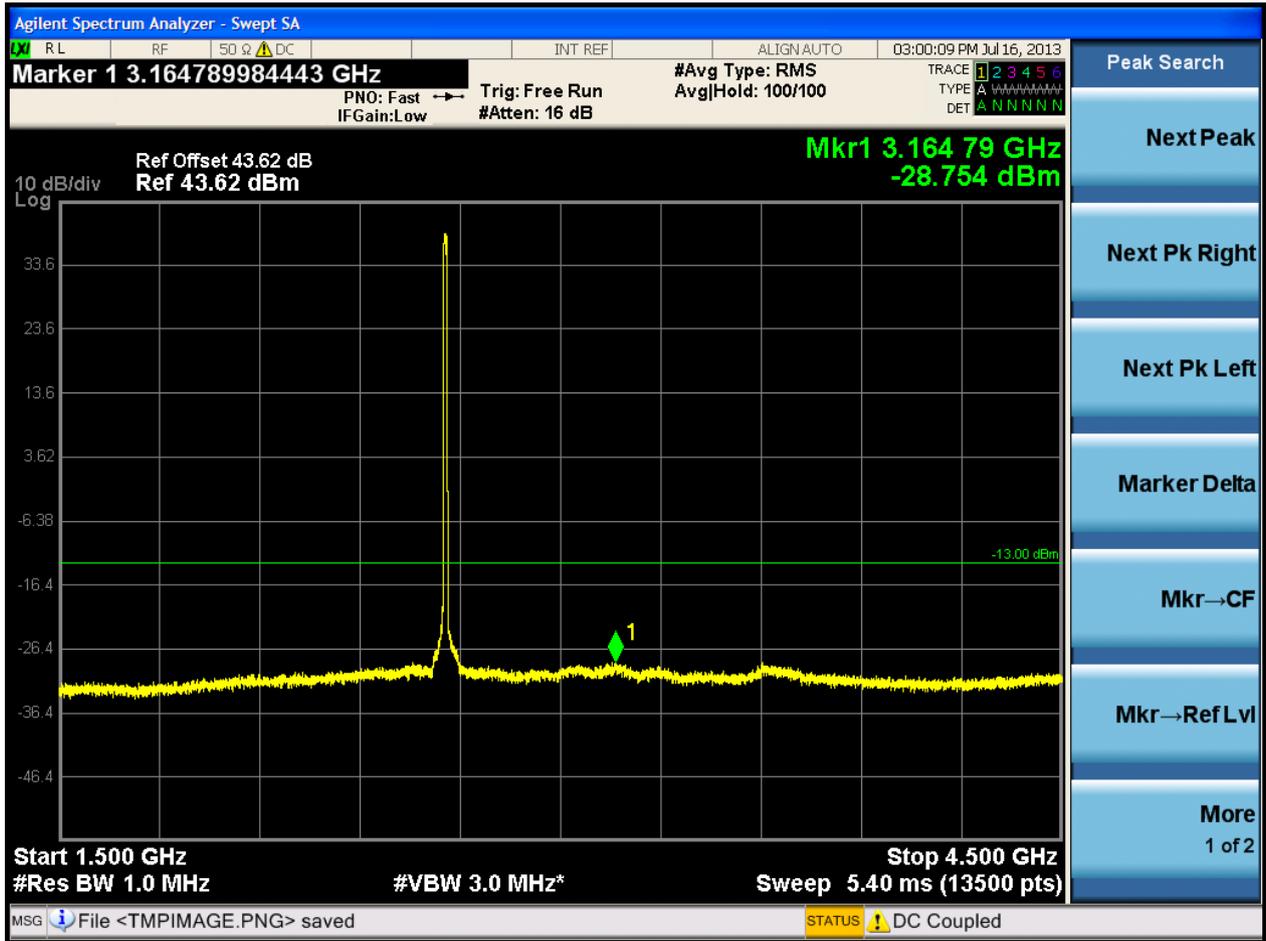


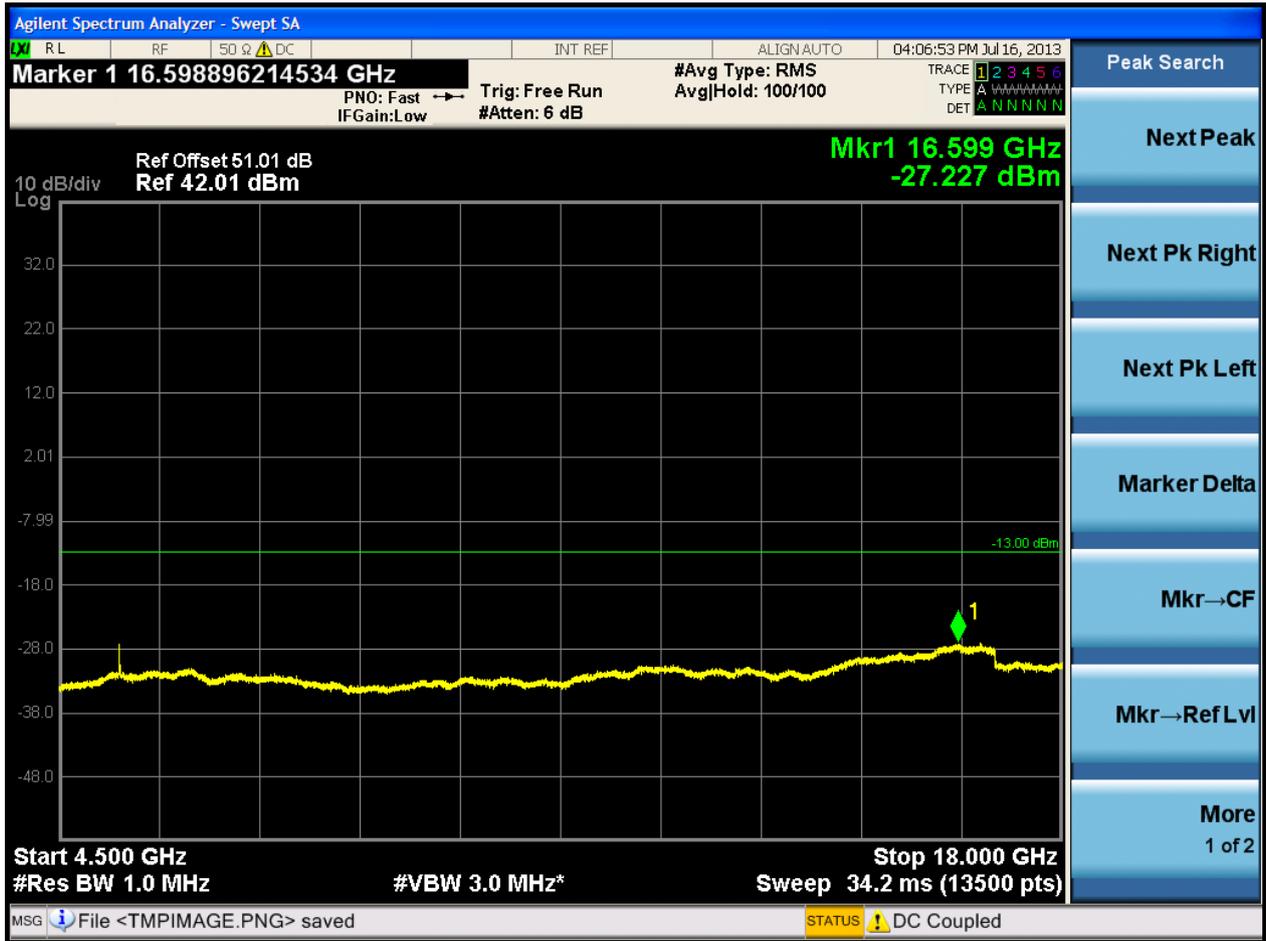
2.10 TX\_2L\_5M\_M\_TM1\_ANTB





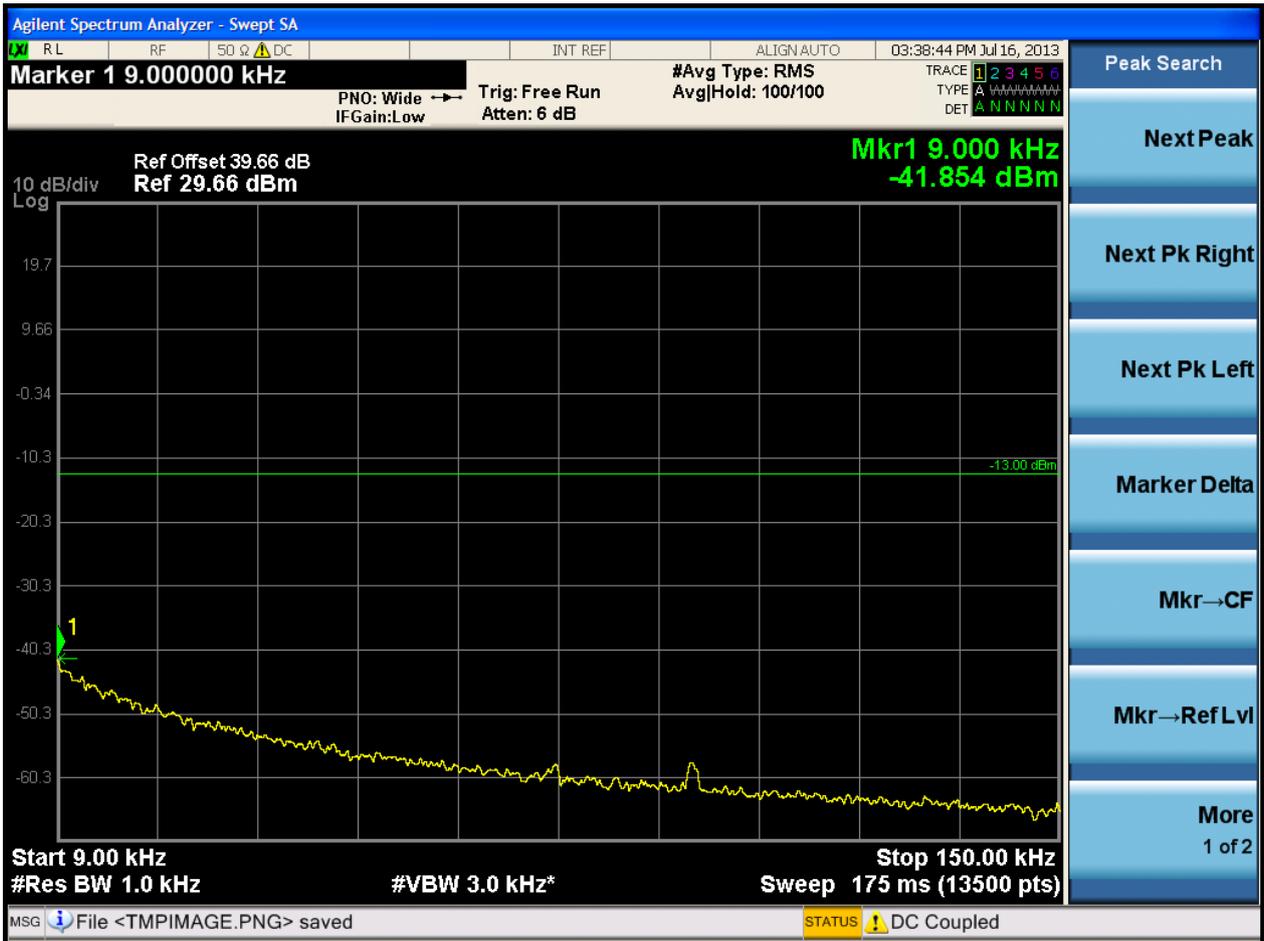




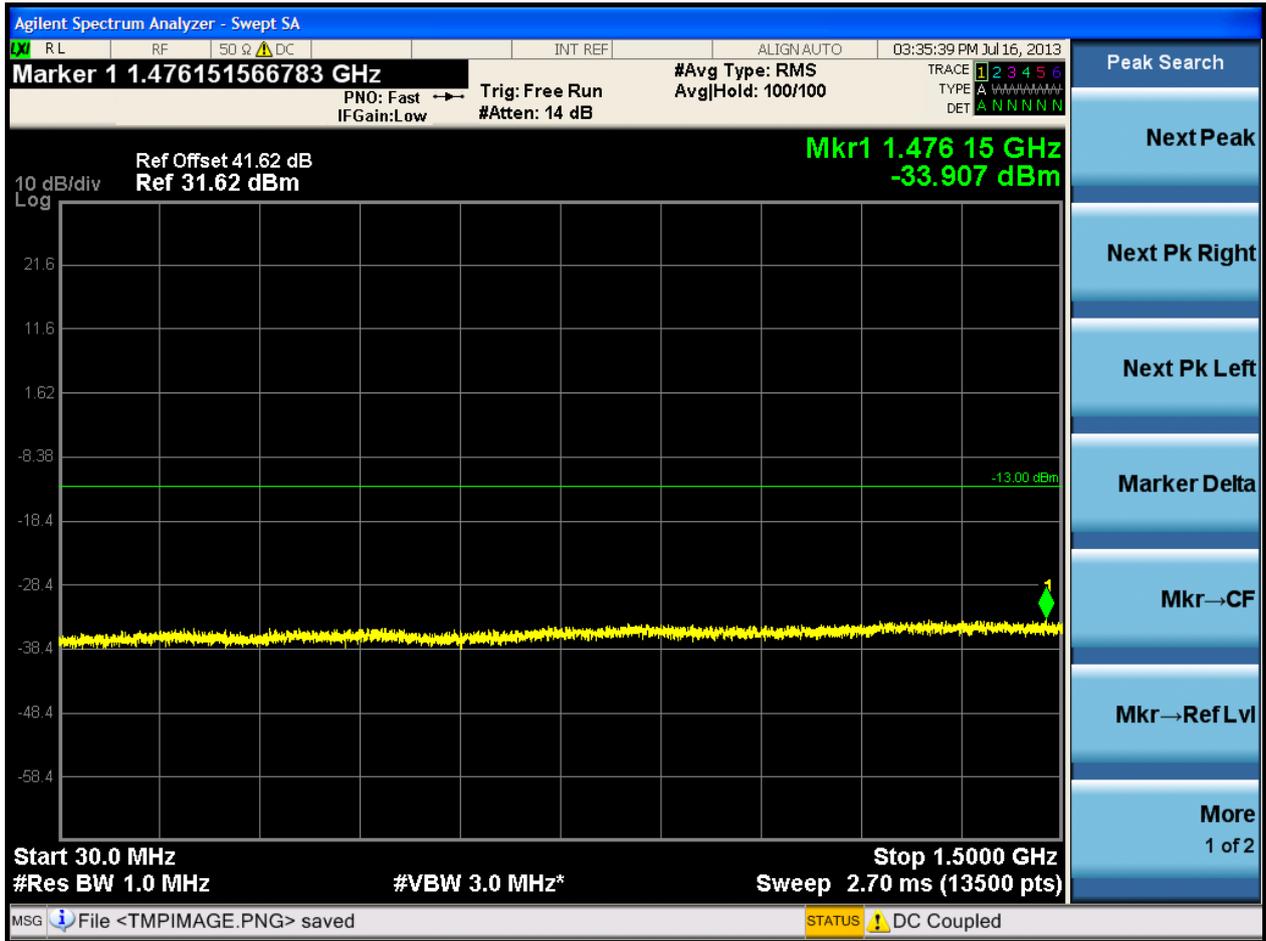


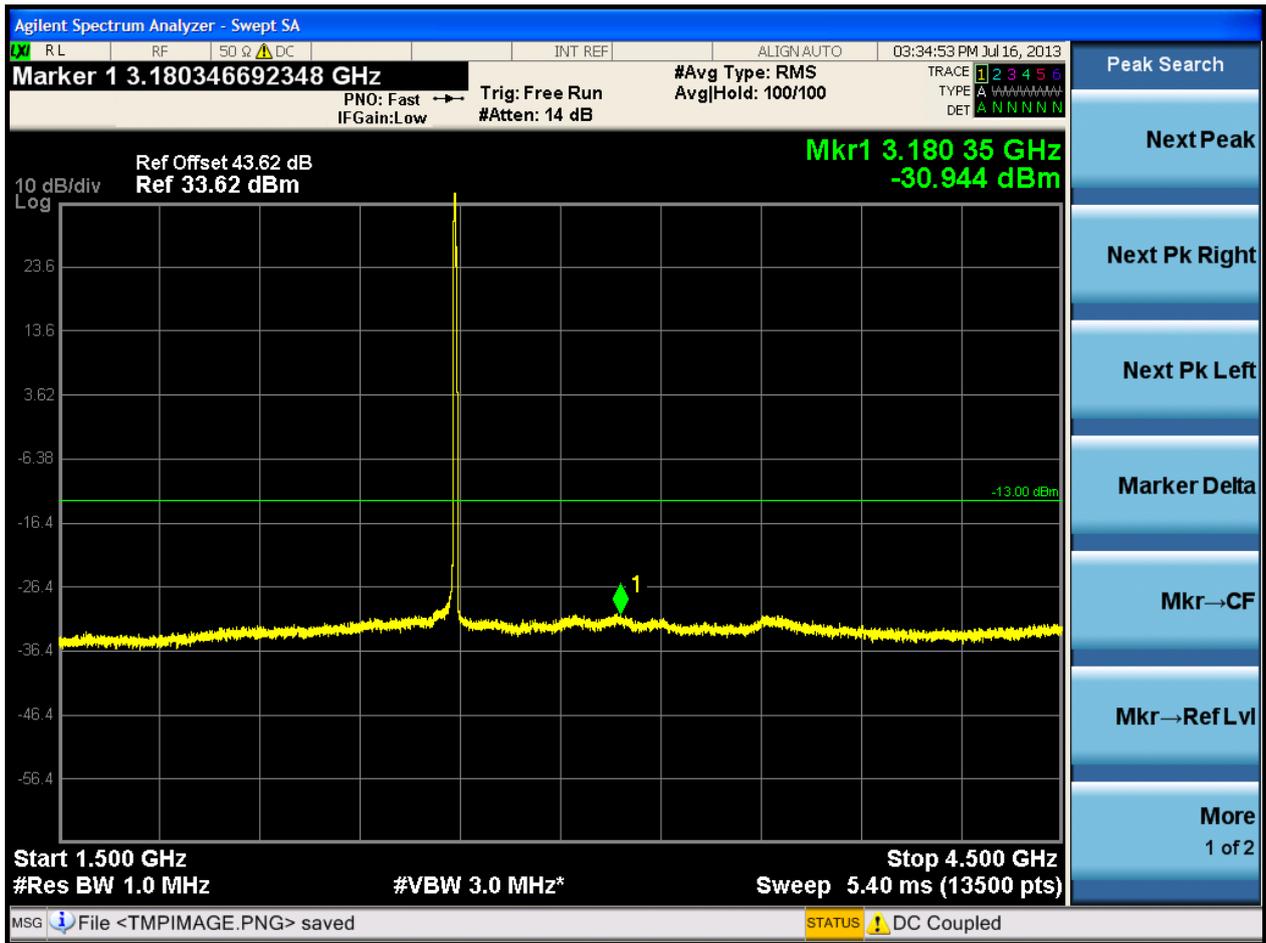


### 2.11 TX\_2L\_5M\_T\_TM1\_ANTA



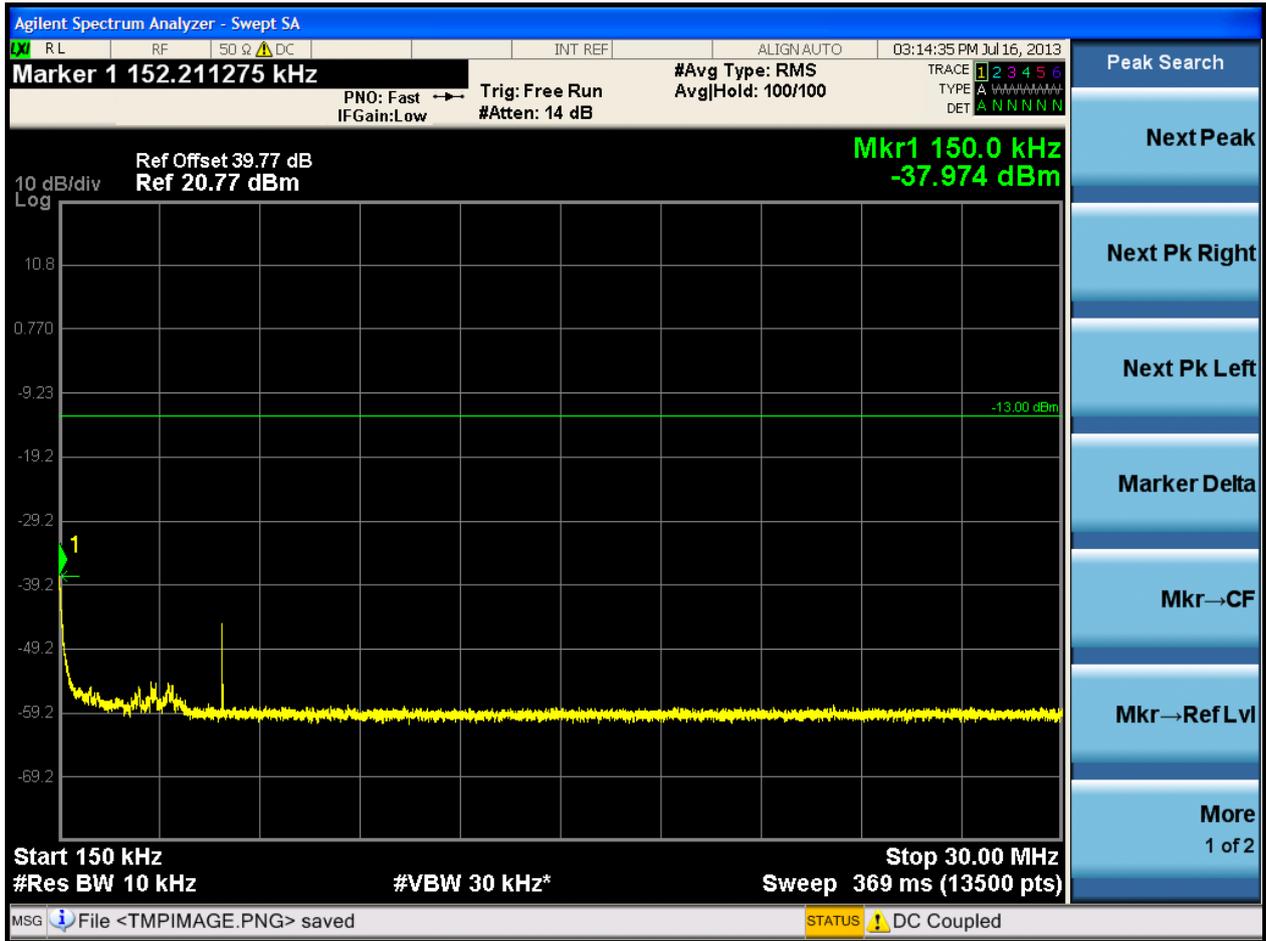


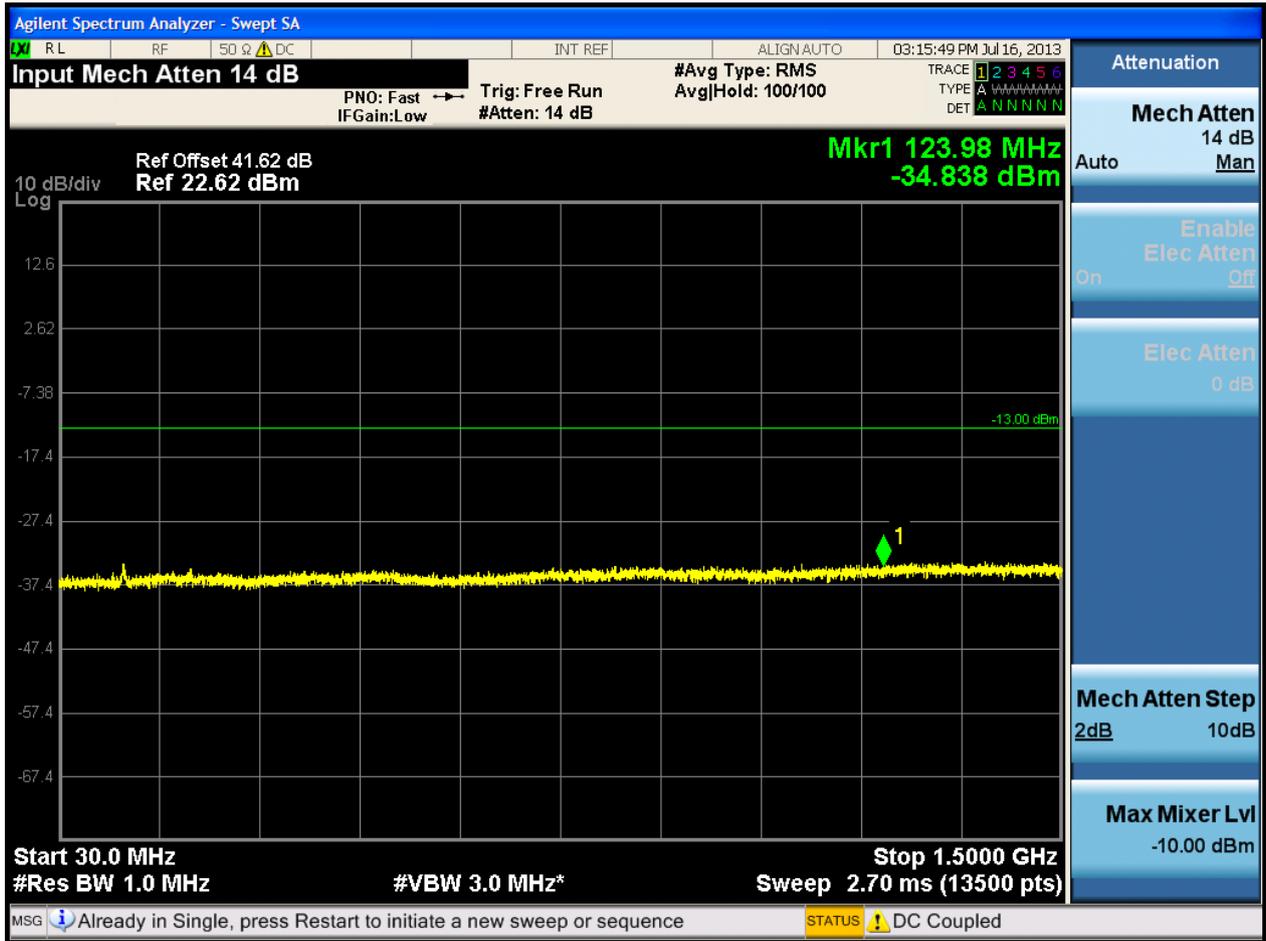


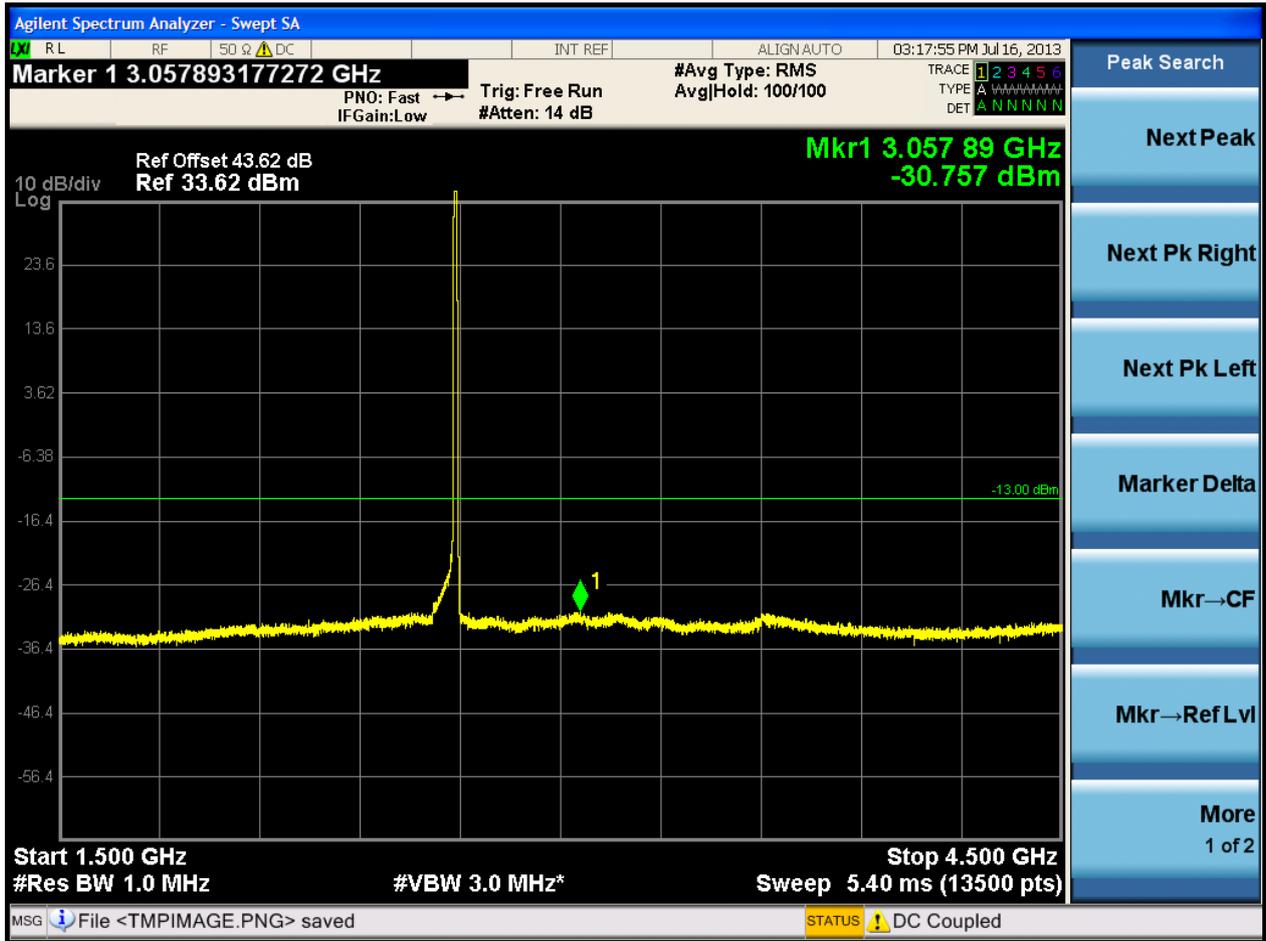
















# Appendix E: Field Strength of Spurious Radiation



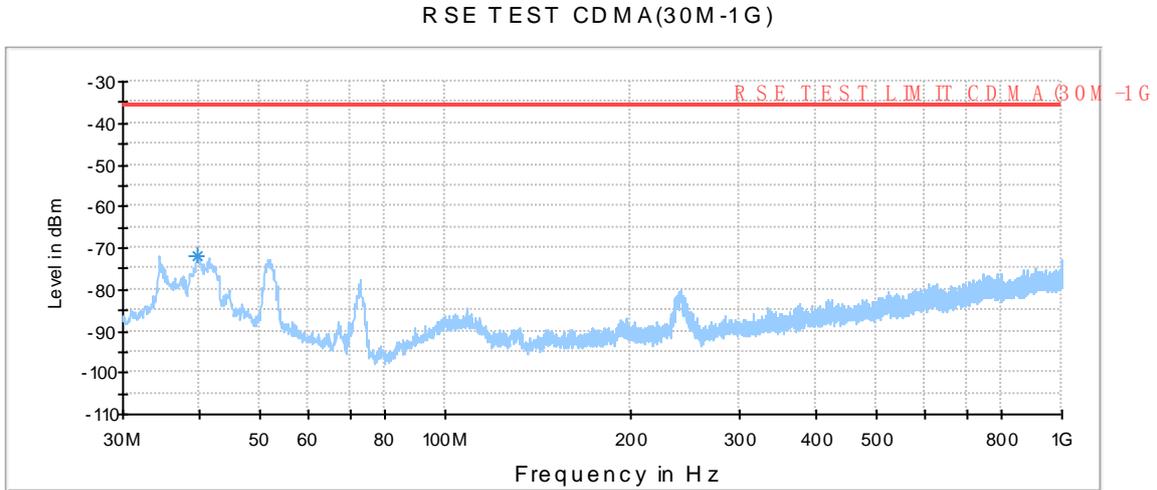
## 1 Result Table

EUT Conf.	Maximum Emission [dBm]	Verdict
RSE_2L_5M_M_TM1_ANTA& RSE_2L_5M_M_TM1_ANTB	<-13	Pass

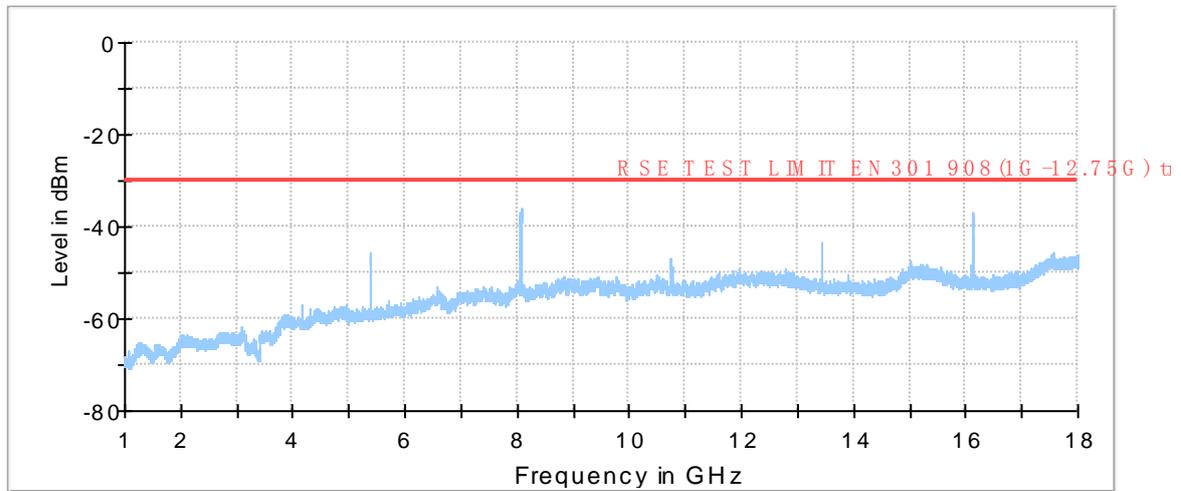
## 2 Test Plot

### 2.1 RSE\_2L\_5M\_M\_TM1\_ANTA&RSE\_2L\_5M\_M\_TM1\_ANTB

#### 2.1.1 30MHz~1GHz



#### 2.1.2 1GHz~18GHz





# Appendix F: Frequency Stability



## 1 Result Table

### 1.1 Frequency Error

(1) Frequency Error vs. Temperature:

EUT Conf.	Voltage	Temperature	Freq. Error [Hz]	Freq. vs. rated [ppm]	Freq. vs. 20 °C [ppm]	Verdict
TX_1L_5M_M_TM2_ANTA	100%	-30 °C	-1.9	-0.0007	-0.0007	Pass
	100%	-20 °C	9.9	0.0037	0.0037	Pass
	100%	-10 °C	-3.0	-0.0011	-0.0011	Pass
	100%	0 °C	-3.9	-0.0014	-0.0014	Pass
	100%	+10 °C	2.5	0.0009	0.0009	Pass
	100%	+20 °C	0.2	0.0001	---	Pass
	100%	+30 °C	-1.9	-0.0007	-0.0007	Pass
	100%	+40 °C	-1.8	-0.0007	-0.0007	Pass
	100%	+50 °C	1.2	0.0004	0.0004	Pass
TX_1L_5M_M_TM2_ANTB	100%	-30 °C	-6.0	-0.002	-0.002	Pass
	100%	-20 °C	2.2	0.0008	0.0008	Pass
	100%	-10 °C	-3.1	-0.0012	-0.0012	Pass
	100%	0 °C	-2.7	-0.001	-0.001	Pass
	100%	+10 °C	1.6	0.0006	0.0006	Pass
	100%	+20 °C	-7.7	-0.0029	---	Pass
	100%	+30 °C	2.5	0.0009	0.0009	Pass
	100%	+40 °C	0.2	0.0001	0.0001	Pass
	100%	+50 °C	0.2	0.0001	0.0001	Pass
TX_1L_5M_M_TM3_ANTA	100%	-30 °C	-0.7	-0.0003	-0.0003	Pass
	100%	-20 °C	3.3	0.0012	0.0012	Pass
	100%	-10 °C	-1.3	-0.0005	-0.0005	Pass
	100%	0 °C	-0.6	-0.0002	-0.0002	Pass
	100%	+10 °C	-1.9	-0.0007	-0.0007	Pass
	100%	+20 °C	-0.6	-0.0002	---	Pass
	100%	+30 °C	-0.11	0.00005	0.00005	Pass
	100%	+40 °C	-0.9	-0.0003	-0.0003	Pass
	100%	+50 °C	-0.7	-0.0003	-0.0003	Pass
TX_1L_5M_M_TM3_ANTB	100%	-30 °C	1.6	0.0006	0.0006	Pass
	100%	-20 °C	-2.2	-0.0008	-0.0008	Pass
	100%	-10 °C	-8.0	-0.003	-0.003	Pass
	100%	0 °C	-1.1	-0.0004	-0.0004	Pass
	100%	+10 °C	-3.6	-0.0013	-0.0013	Pass
	100%	+20 °C	-1.2	-0.0004	---	Pass
	100%	+30 °C	-1.6	-0.0006	-0.0006	Pass
	100%	+40 °C	-0.8	-0.0003	-0.0003	Pass



EUT Conf.	Voltage	Temperature	Freq. Error [Hz]	Freq. vs. rated [ppm]	Freq. vs. 20 °C [ppm]	Verdict
	100%	+50 °C	-0.7	-0.0003	-0.0003	Pass

(2) Frequency Error vs. Voltage:

EUT Conf.	Temperature	Voltage	Freq. Error [Hz]	Freq. vs. rated [ppm]	Freq. vs. 20 °C [ppm]	Verdict
TX_1L_5M_M_TM2_ANTA	+20 °C	85 %	4.2	0.0015	0.0015	Pass
	+20 °C	100 %	0.2	0.00007	---	Pass
	+20 °C	115 %	7.1	0.0026	0.0026	Pass
TX_1L_5M_M_TM2_ANTB	+20 °C	85 %	3.9	0.0014	0.0014	Pass
	+20 °C	100 %	-7.7	-0.0029	---	Pass
	+20 °C	115 %	1.4	0.0005	0.0005	Pass
TX_1L_5M_M_TM3_ANTA	+20 °C	85 %	0.7	0.0002	0.0002	Pass
	+20 °C	100 %	-0.6	-0.0002	---	Pass
	+20 °C	115 %	-1.2	-0.0004	-0.0004	Pass
TX_1L_5M_M_TM3_ANTB	+20 °C	85 %	-1.5	-0.0005	-0.0005	Pass
	+20 °C	100 %	-1.2	-0.0004	---	Pass
	+20 °C	115 %	-2.1	-0.0008	-0.0008	Pass



# Appendix G: Receiver Spurious Emissions



## 1 Result Table

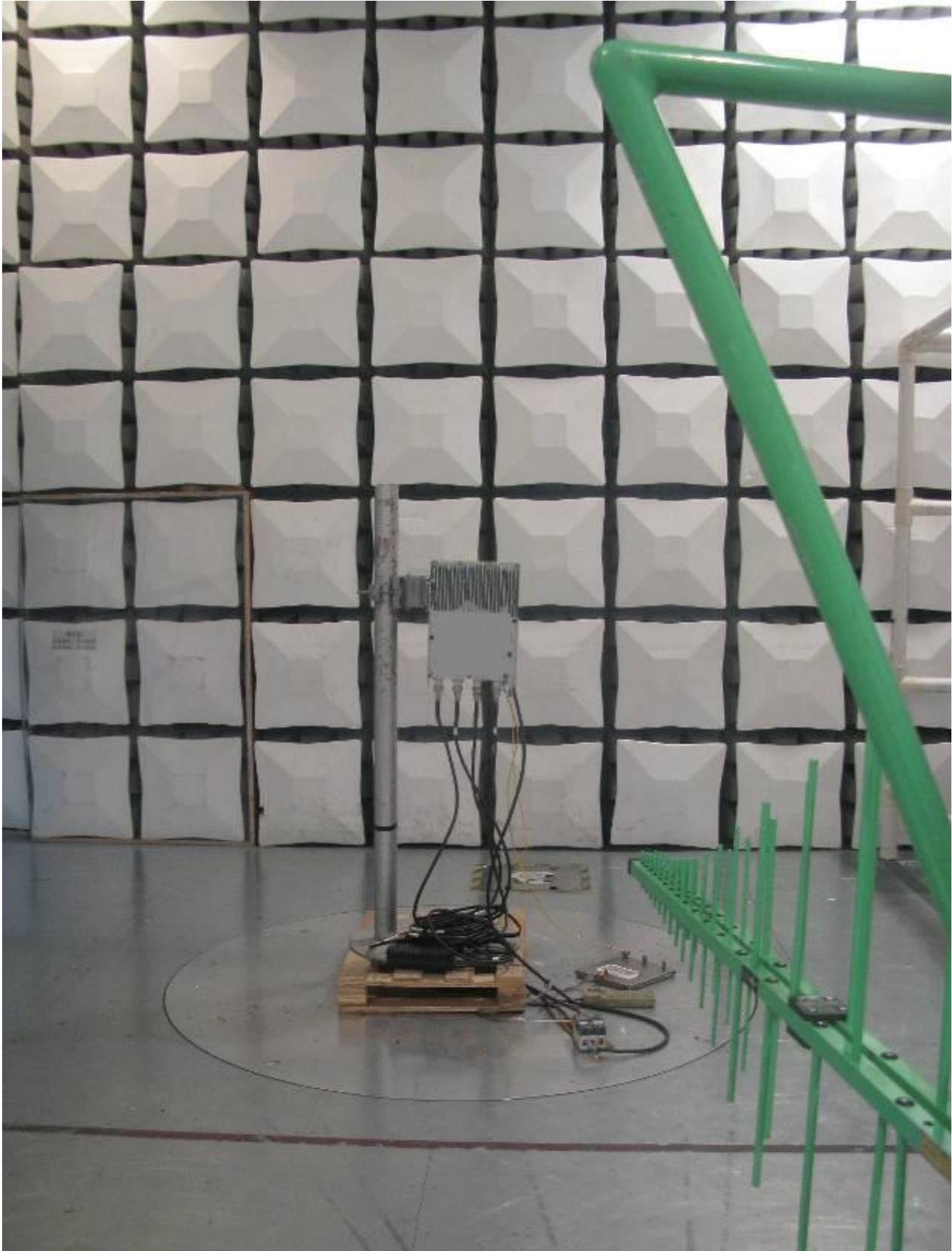
According to the RSS- GEN, the receiver is not classified Category I Equipment Receivers, so it need not to test.



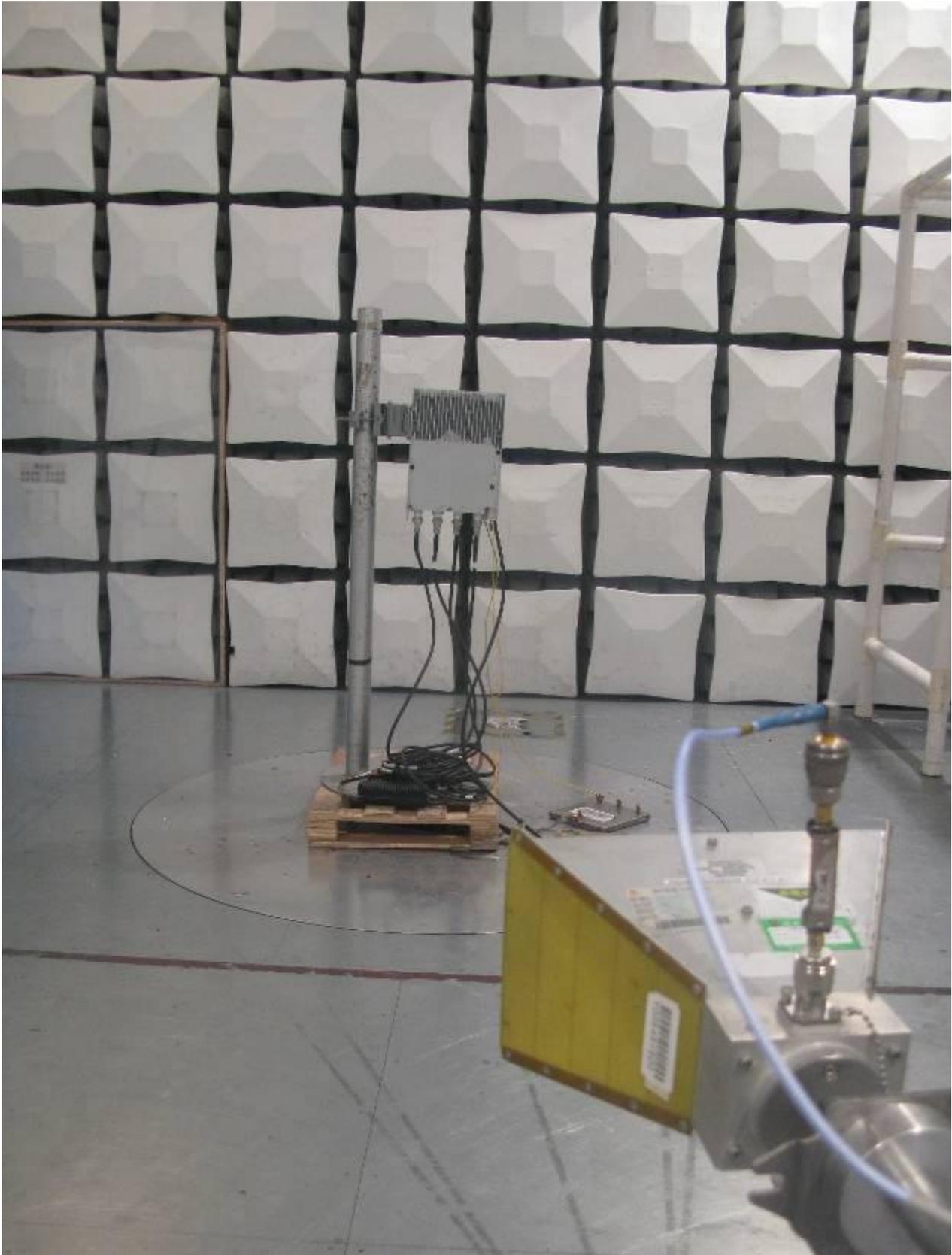
# Appendix H: Photos of Test Setups

## 1 Test Setup 3

### 1.1 Frequency range below 1 GHz



## 1.2 Frequency range above 1 GHz



END