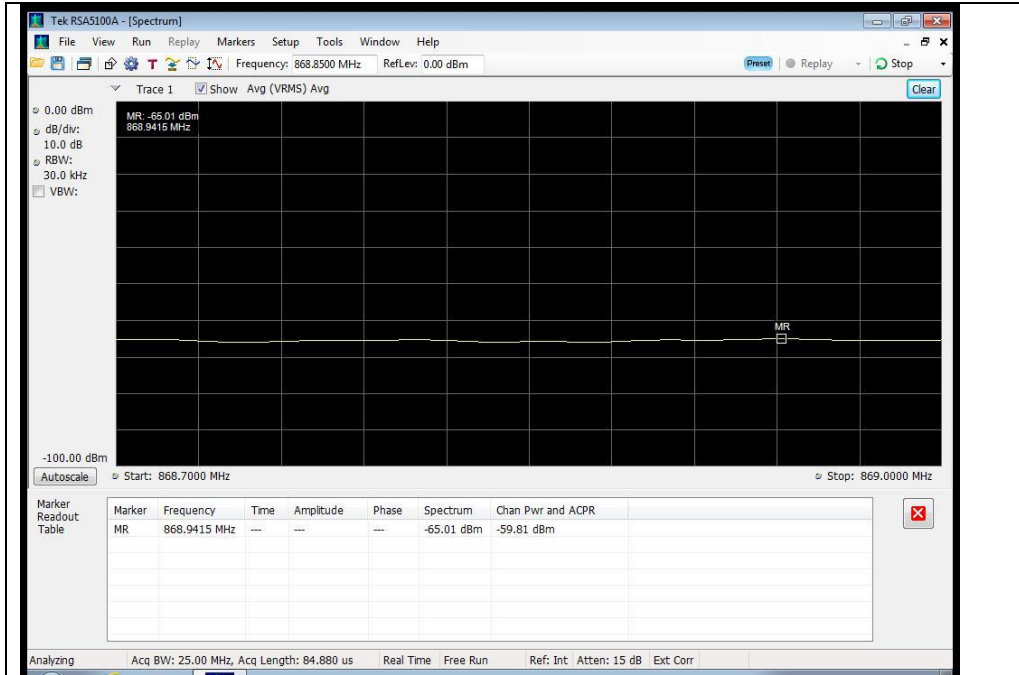


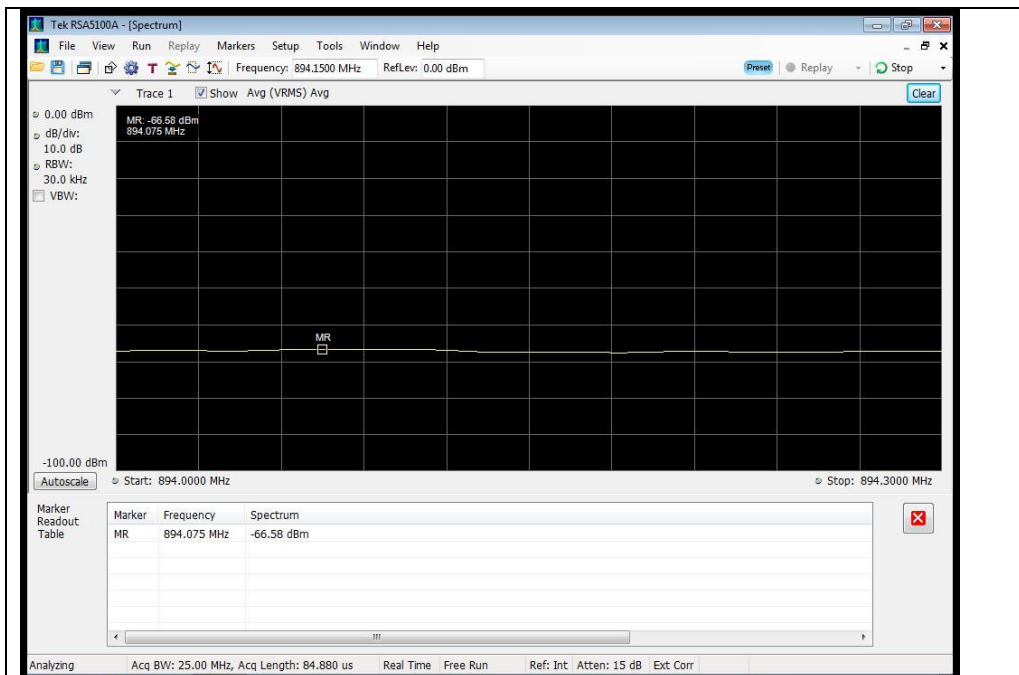
## CDMA Downlink Test Plots

### 869 - 894 MHz Band

#### Lower Band Edge

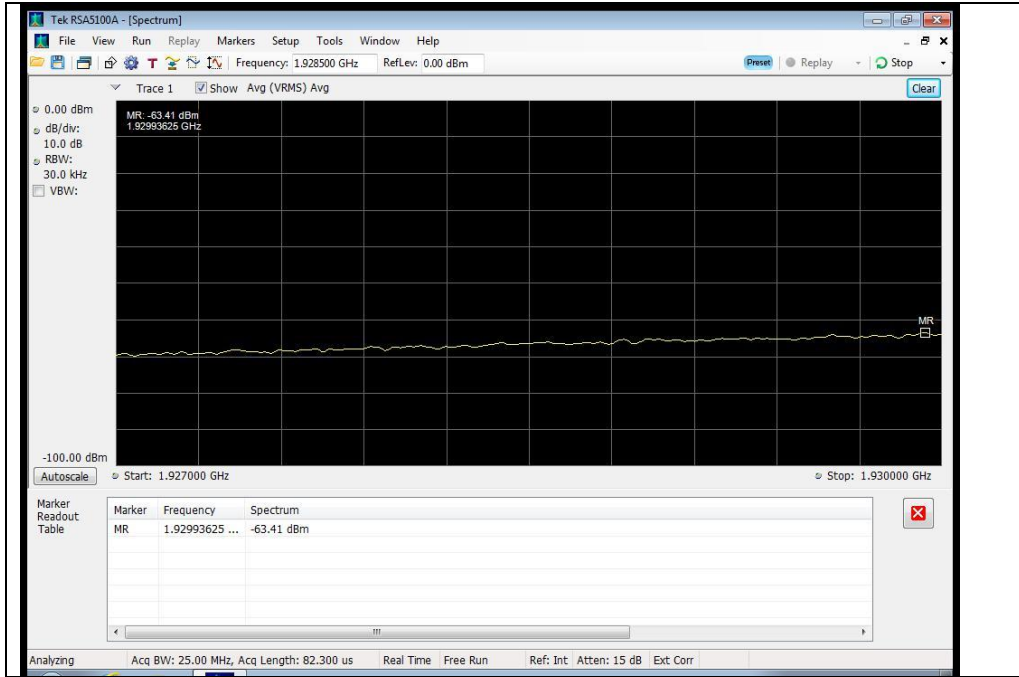


#### Upper Band Edge

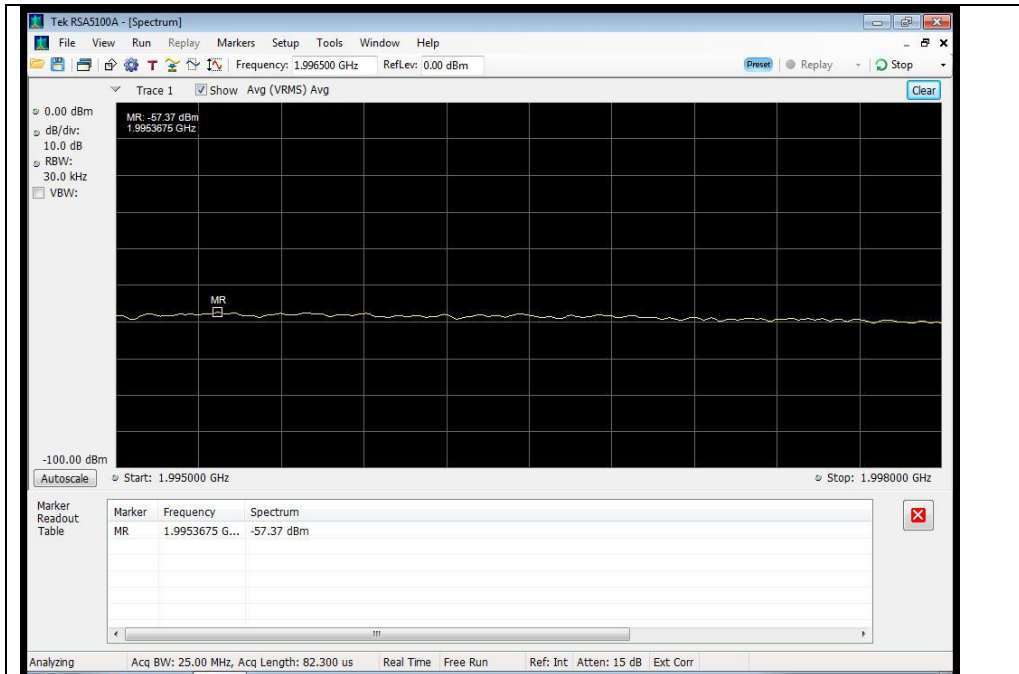


## 1930 - 1990 MHz Band

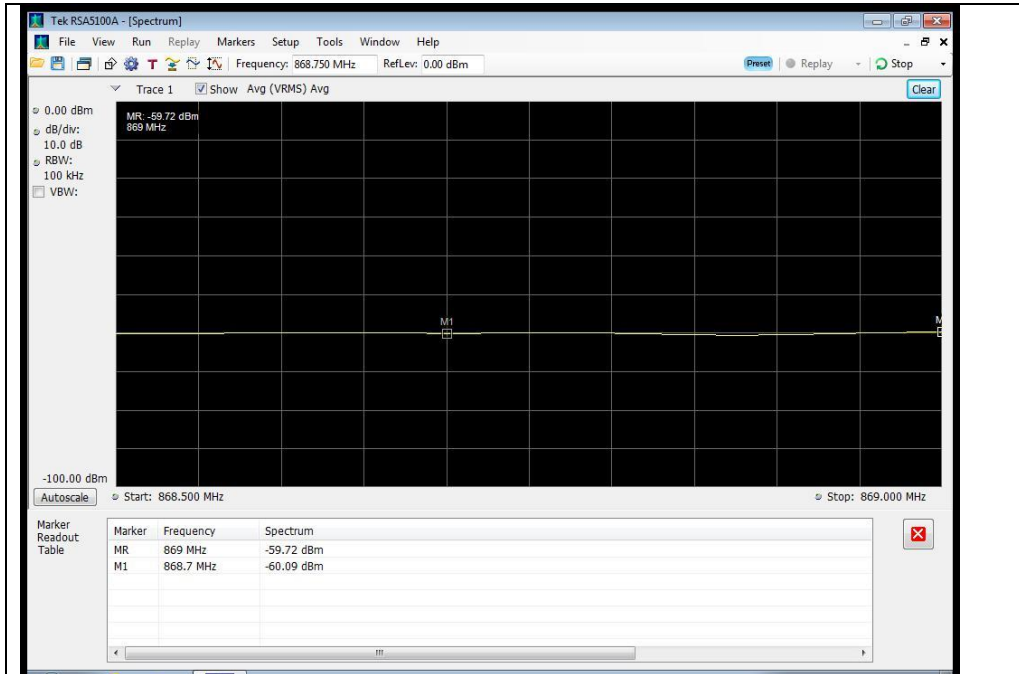
### Lower Band Edge



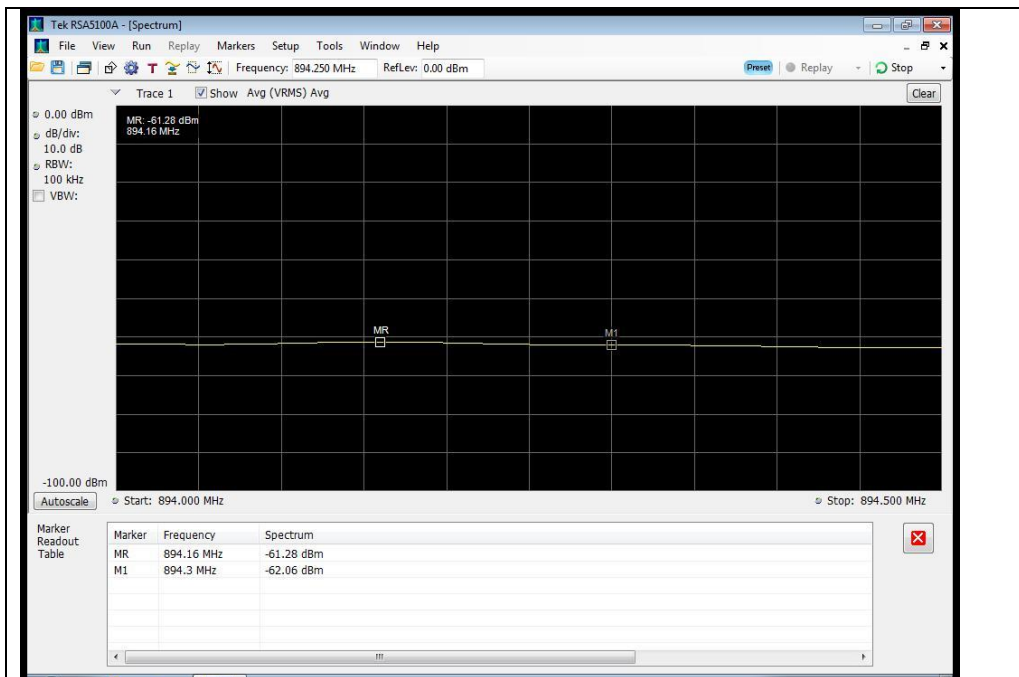
### Upper Band Edge



**WCDMA Downlink Test Plots**  
**869 - 894 MHz Band**  
**Lower Band Edge**

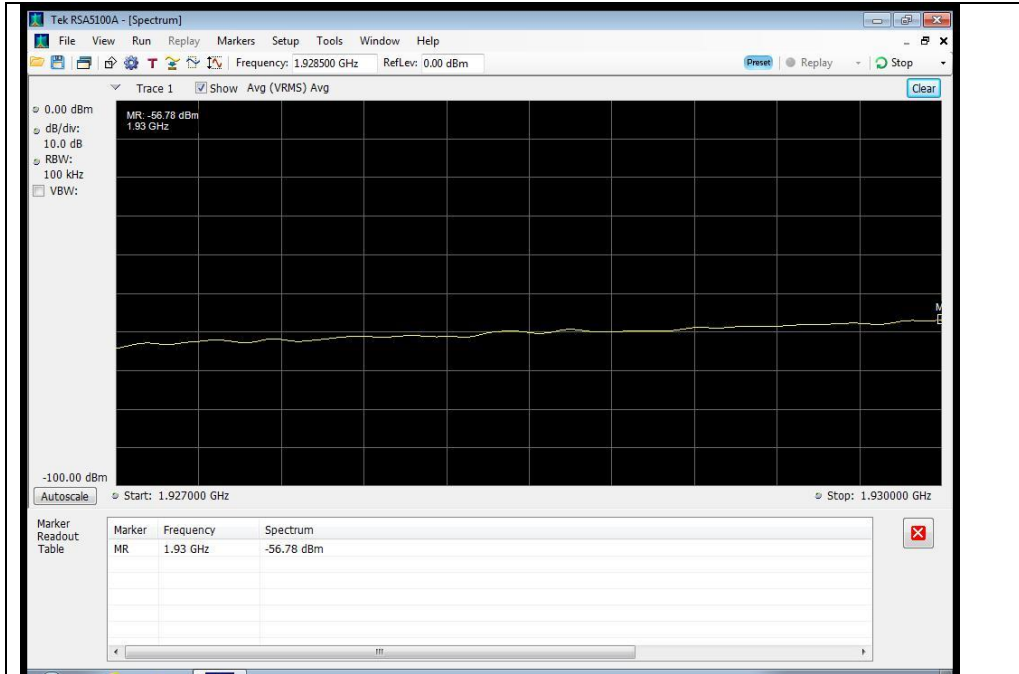


**Upper Band Edge**

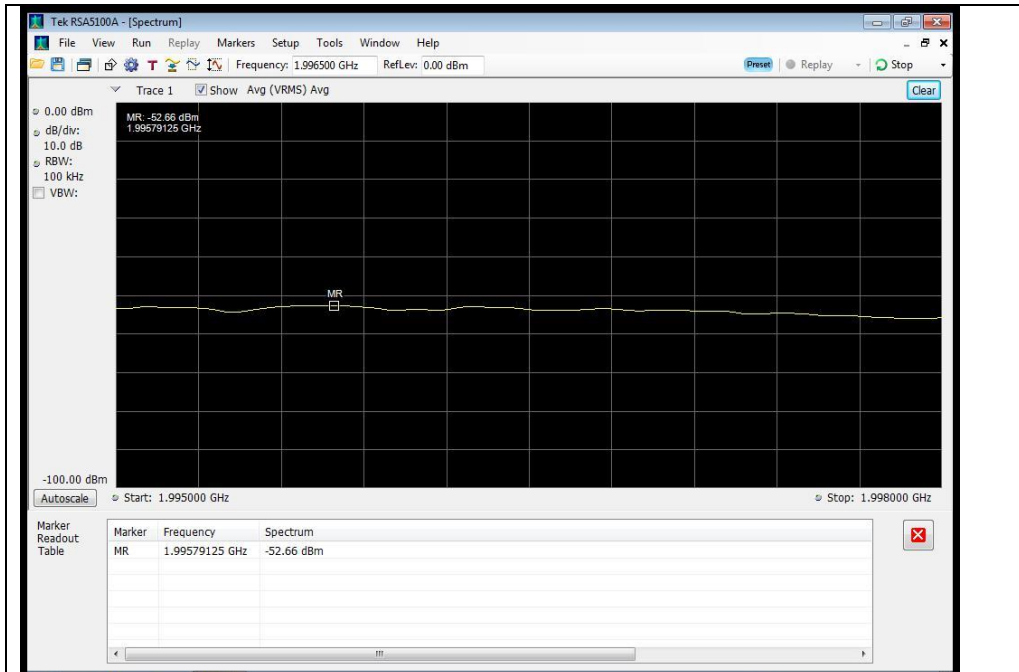


## 1930 - 1990 MHz Band

### Lower Band Edge



### Upper Band Edge



## Conducted Spurious Emissions

**Engineer:** Greg Corbin

**Test Date:** 8/15/2014

### Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator, with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as needed to ensure accurate readings. A signal generator was utilized to produce a 4.1 MHz AWGN signal operating at 0.2 dB below the AGC Threshold. The conducted spurious emissions from 9 kHz to 10 times the highest tunable frequency for each operational band were measured (excluding the band defined by the Out of band emissions test). The emissions were plotted and the highest level was recorded in the summary table.

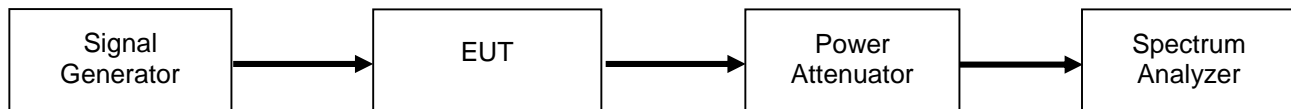
The following formulas are used for calculating the limits.

Conducted Spurious Emissions Limit =  $P1 - (43 + 10\text{Log}(P2)) = -13 \text{ dBm}$

P1 = power in dBm

P2 = power in Watts

### Test Setup



### Uplink Test Results

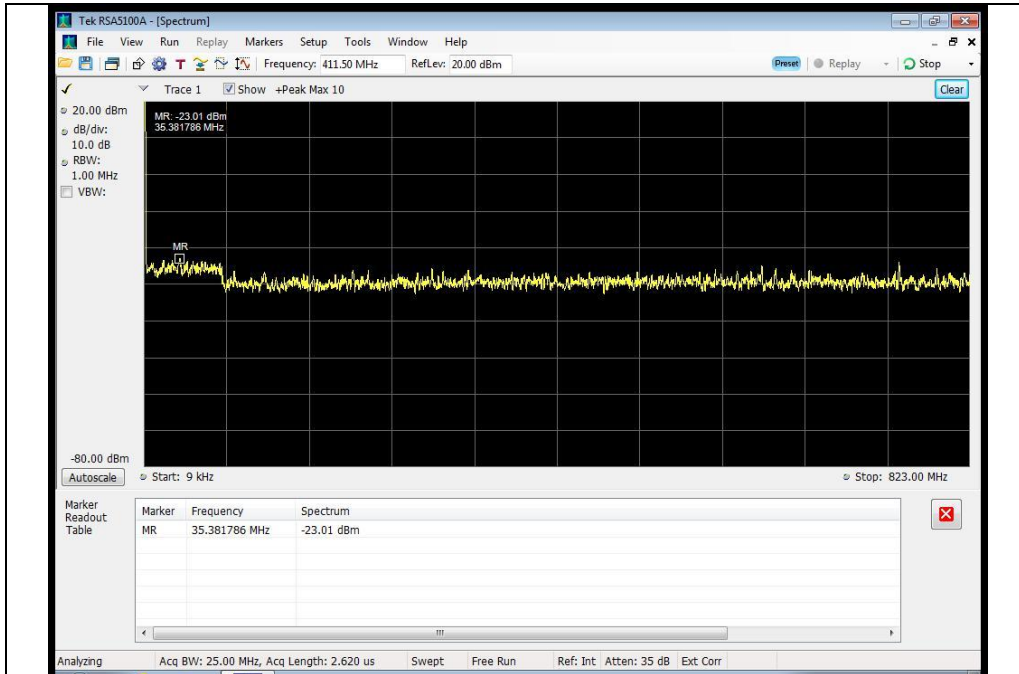
Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
824 - 849	6526.3	-22	-13	Pass
1850 - 1910	3761.5	-20.8	-13	Pass

### Downlink Test Results

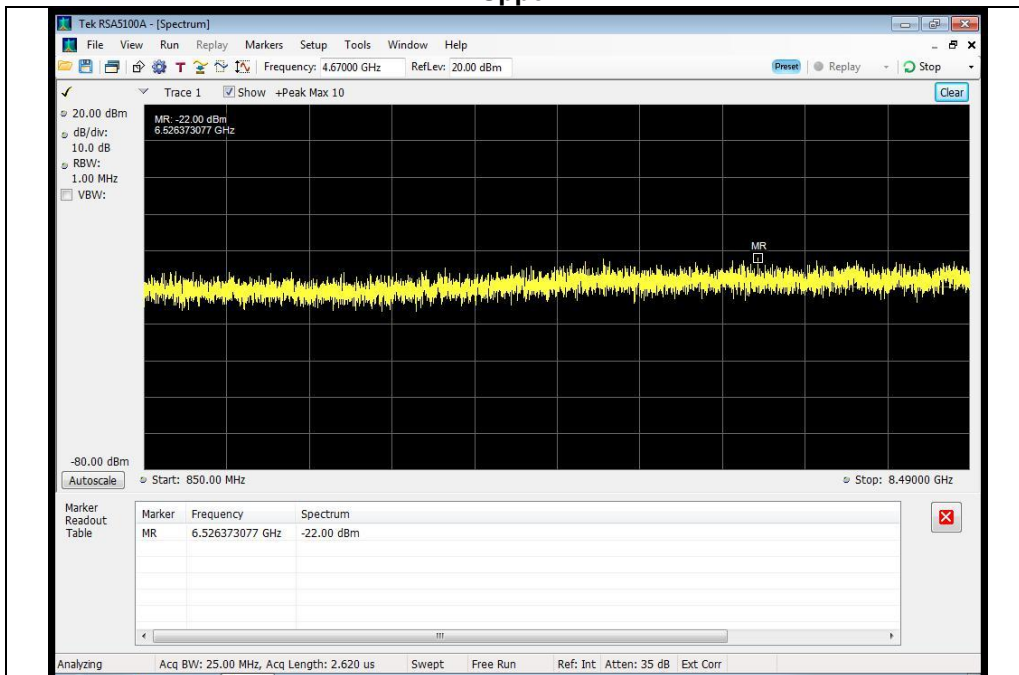
Frequency Band (MHz)	Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
869 - 894	1954.54	-30.2	-13	Pass
1930 - 1990	876.4	-37.4	-13	Pass

## Uplink Test Plots

### 824 - 849 MHz Band Lower

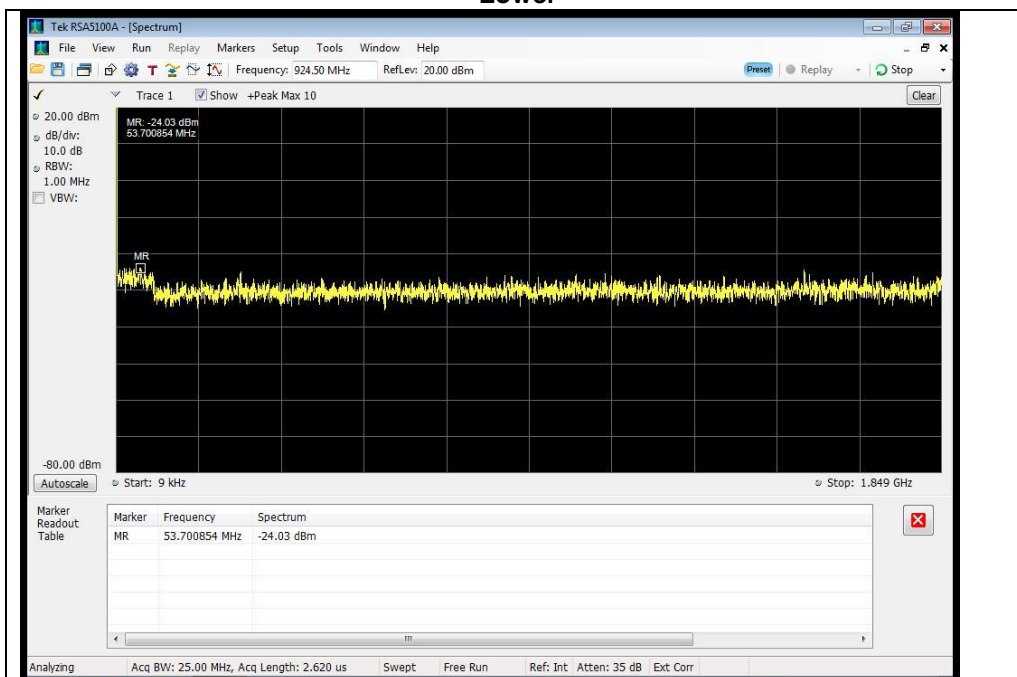


### Upper

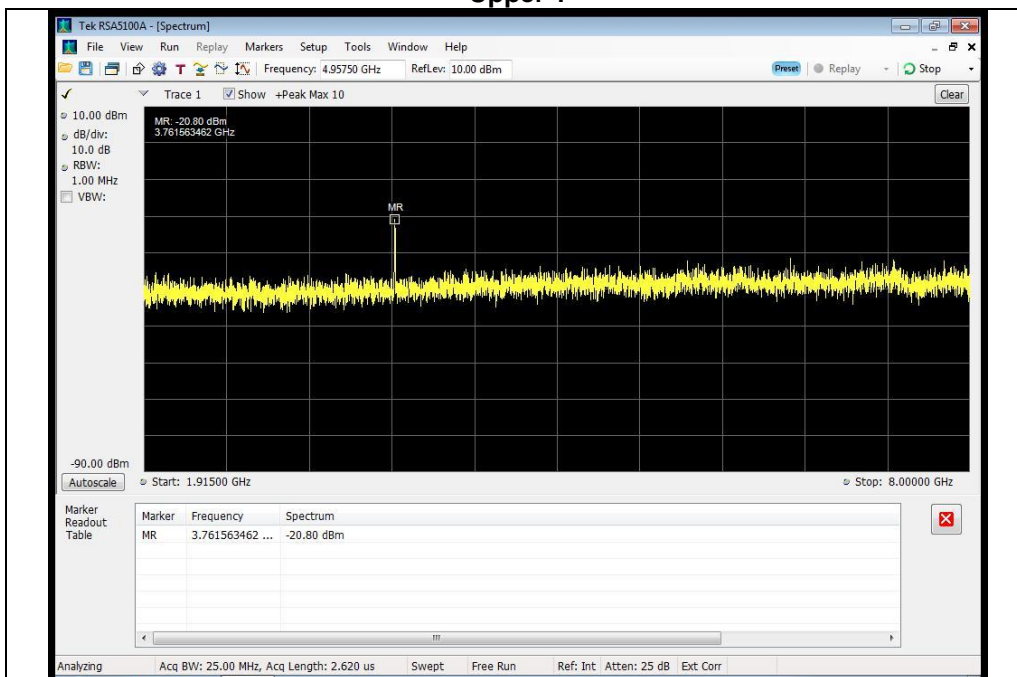




### 1850 - 1910 MHz Band Lower

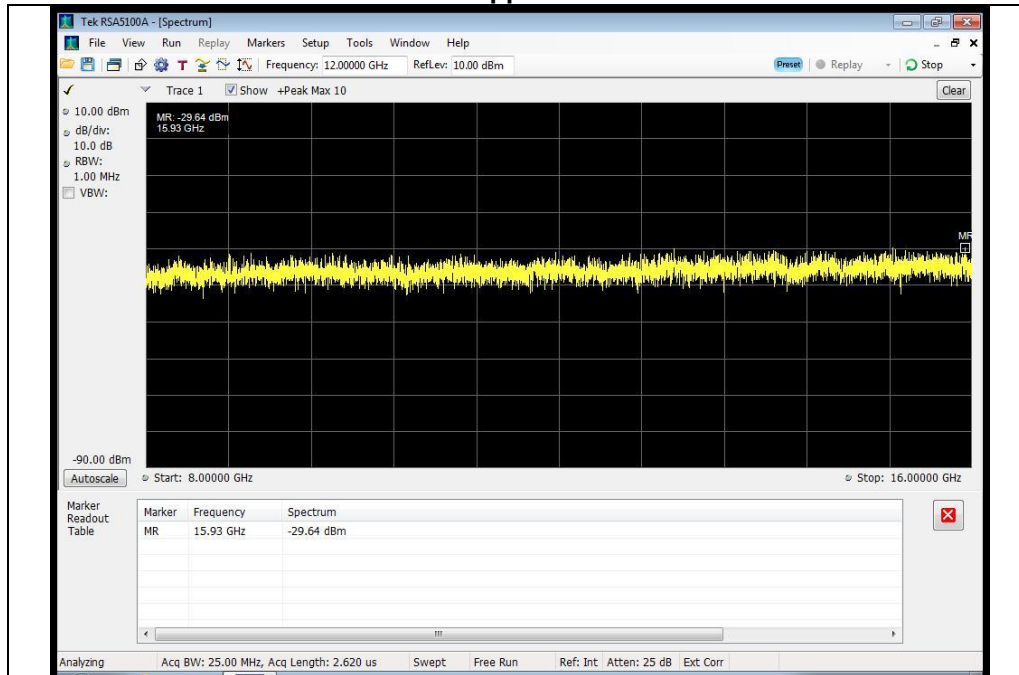


### Upper 1

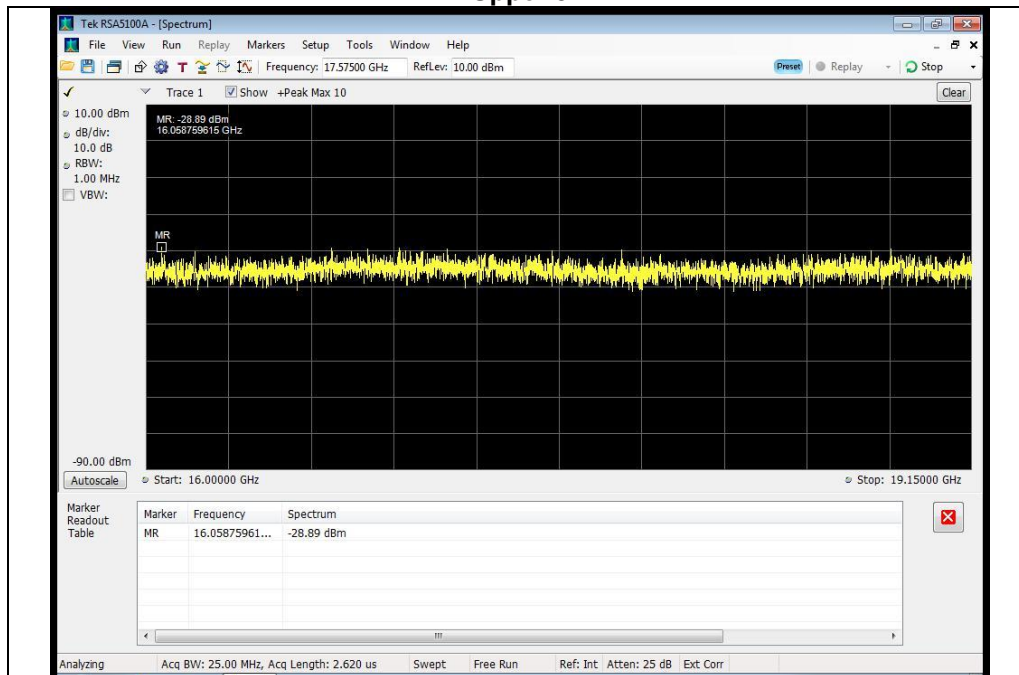


## 1850 - 1910 MHz Band (continued)

### Upper 2



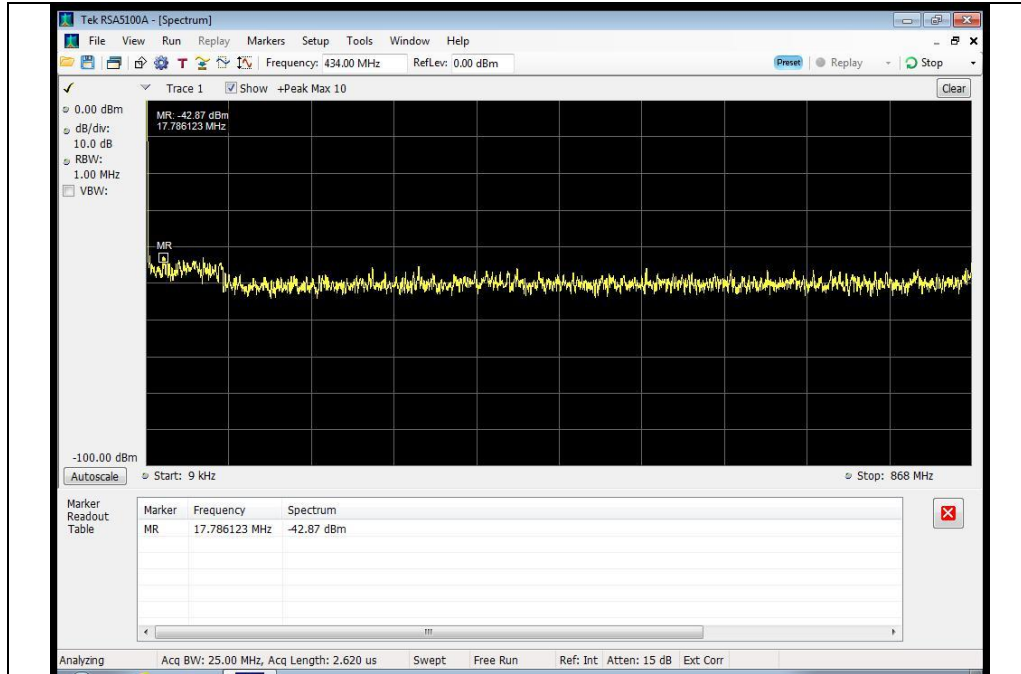
### Upper 3



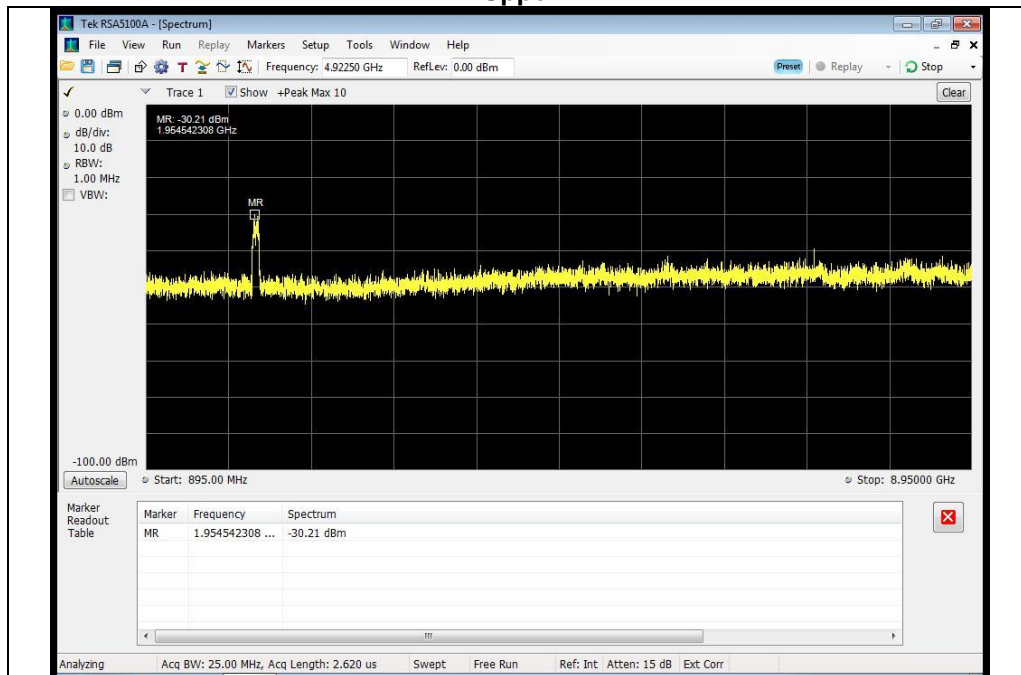


## Downlink Test Plots

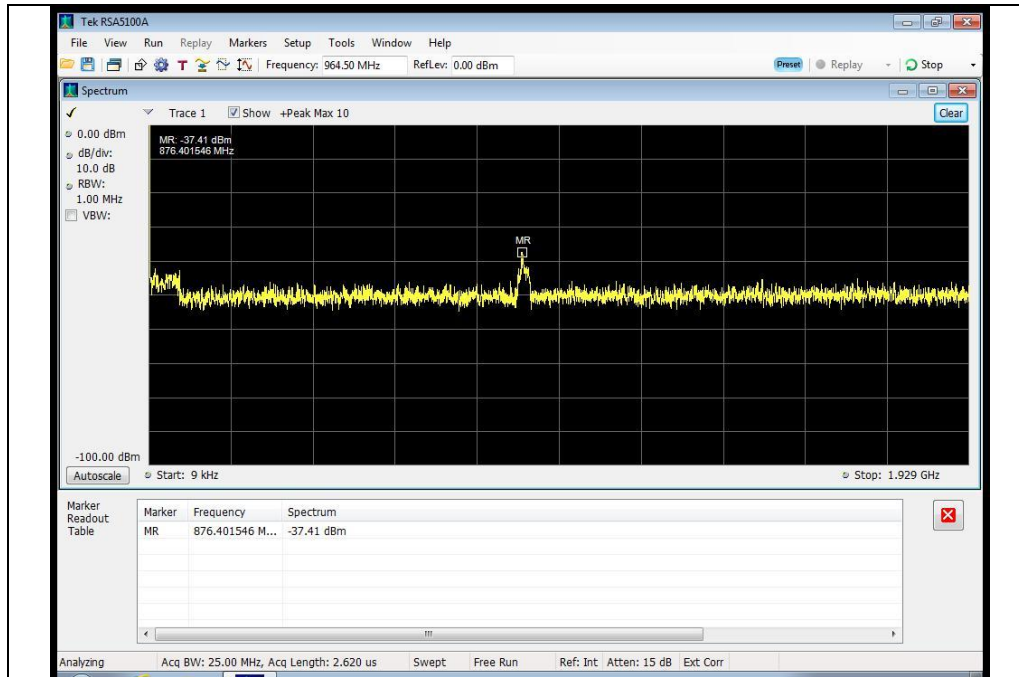
### 869 - 894 MHz Band Lower



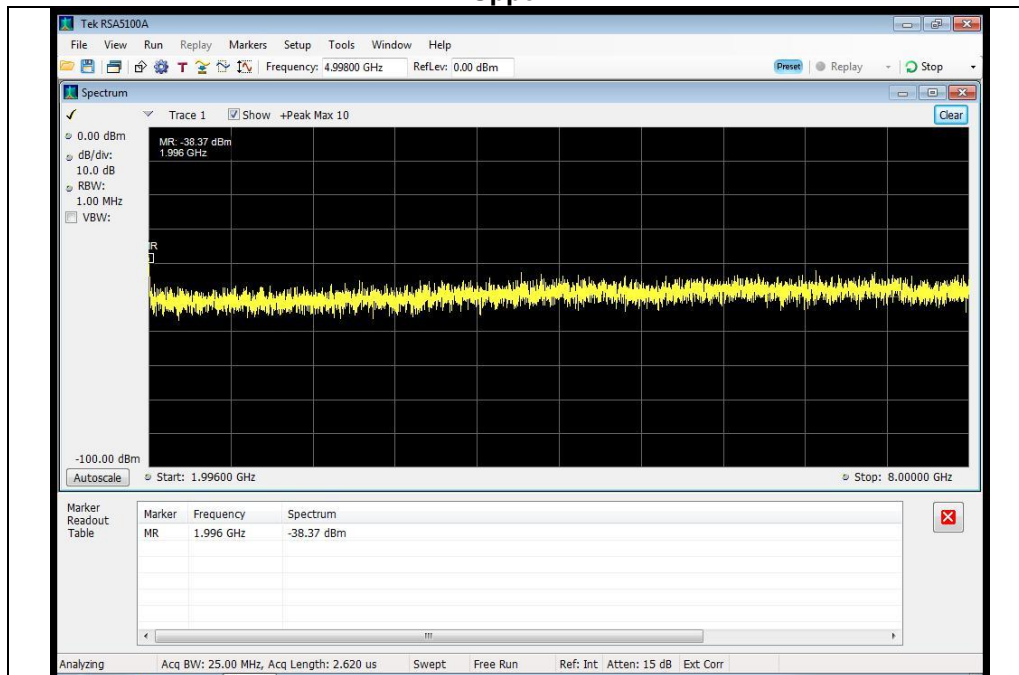
### Upper



### 1930 - 1990 MHz Band Lower

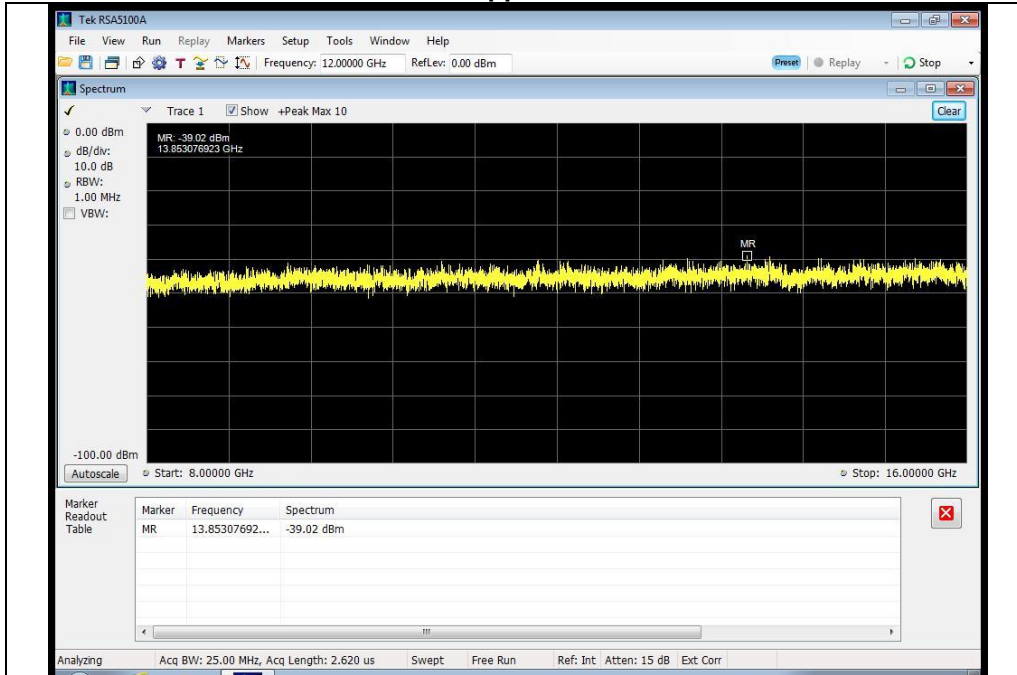


### Upper 1

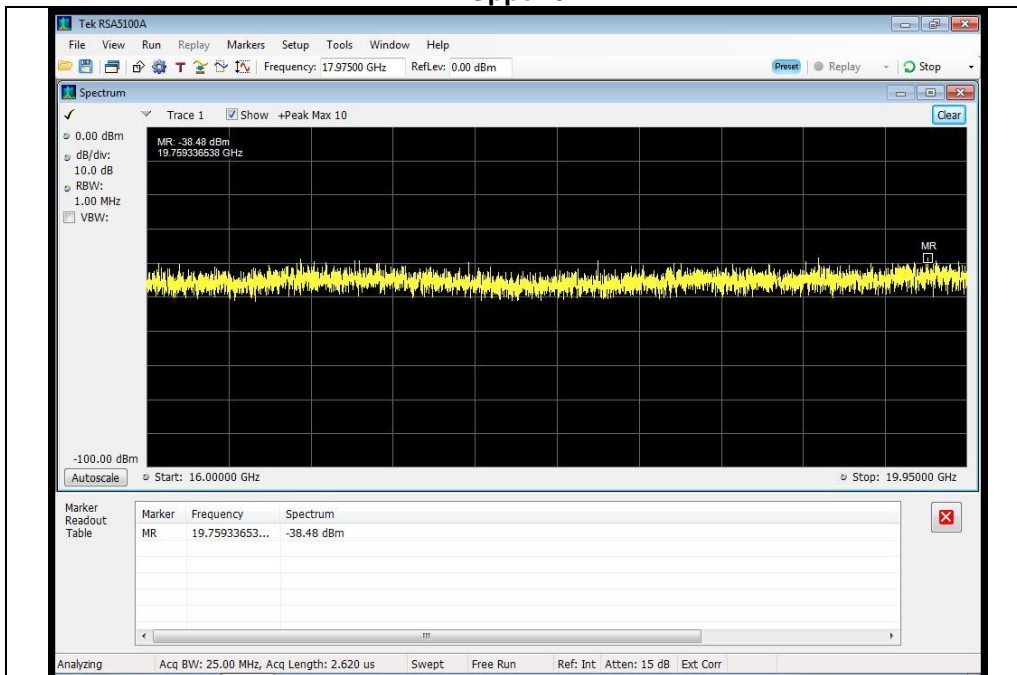


1930 - 1990 MHz Band (continued)

Upper 2



Upper 3



**Noise Limits**

**Engineer:** Greg Corbin

**Test Date:** 8/13/2014

**Test Procedure**

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as necessary to ensure that accurate readings were obtained. A series of three tests were performed: the maximum uplink and downlink noise, the variable noise for the uplink and downlink in the presence of a downlink signal, and the variable uplink noise timing. The detailed procedures from KDB 935210 D03 Wideband Consumer Signal Booster Measurement Guidance DR04-41516c were followed.

The Noise Limit is calculated using the following formula.

The following formulas are used for calculating the limits. Note – Downlink noise power limit is calculated with the center frequency of the associated uplink band.

$$\text{Noise Power} = -102.5 + \text{LOG}_{10}(\text{Band Center Frequency}) * 20$$

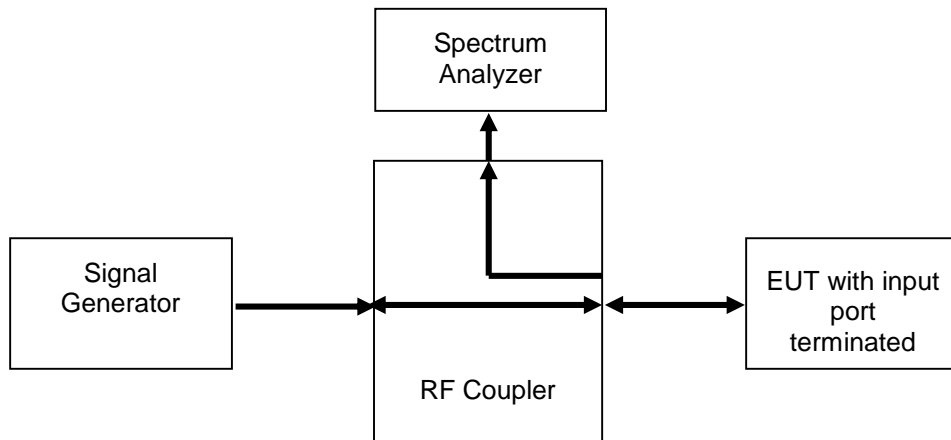
$$\text{Variable Noise} = -103 \text{ dBm/MHz-RSSI}$$

**Test Setup**

**Maximum Noise Power**



**Variable Uplink Noise Power and Timing**



**Variable Downlink Noise Power and Timing**



### Maximum Uplink Noise Test Results

Frequency Band (MHz)	Measured Noise (dBm)	Limit (dBm)	Margin (dB)	Result
824 - 849	-47.5	-44.1	-3.4	Pass
1850 - 1910	-38.3	-37.0	-1.3	Pass

### Maximum Downlink Noise Test Results

Frequency Band (MHz)	Measured Noise (dBm)	Limit (dBm)	Margin (dB)	Result
869 - 894	-46.6	-44.1	-2.5	Pass
1930 - 1990	-37.7	-37.0	-0.7	Pass

### Uplink Noise Timing Test Results

Frequency Band (MHz)	Measured Timing (Seconds)	Limit (Seconds)	Result
824 - 849	0.16	3.0	Pass
1850 - 1910	0.28	3.0	Pass

### Variable Uplink Noise Limit Test Results

#### 824 - 849 MHz

RSSI (dBm)	Noise Limit (dBm)	Measured Noise (dBm)	Margin (dB)
-83.0	-44.0	-46.9	-2.9
-82.0	-44.0	-46.9	-2.9
-81.0	-44.0	-46.9	-2.9
-69.0	-44.0	-46.9	-2.9
-55.0	-62.4	-7.4	-55.0
-56.0	-62.7	-6.7	-56.0

#### 1850 - 1910 MHz

RSSI (dBm)	Noise Limit (dBm)	Measured Noise (dBm)	Margin (dB)
-72.0	-37.0	-38.6	-1.6
-71.0	-37.0	-38.6	-1.6
-70.0	-37.0	-38.6	-1.6
-69.0	-37.0	-40	-3.0
-54.0	-49.0	-54.9	-5.9
-53.0	-50.0	-55.8	-5.8

### Variable Downlink Noise Limit Test Results

#### 869 - 894 MHz

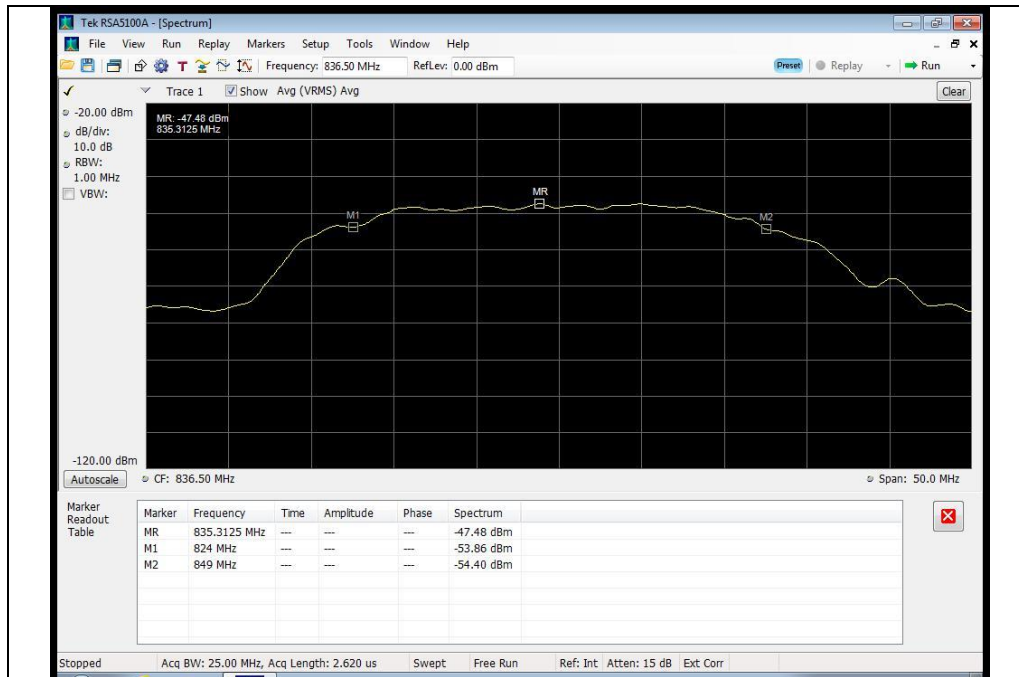
RSSI (dBm)	Noise Limit (dBm)	Measured Noise (dBm)	Margin (dB)
-76.0	-44.0	-45.5	-1.5
-75.0	-44.0	-45.5	-1.5
-74.0	-44.0	-45.5	-1.5
-73.0	-44.0	-45.5	-1.5
-50.0	-53.0	-63.3	-10.3
-49.0	-54.0	-63.2	-9.2

#### 1930 - 1990 MHz

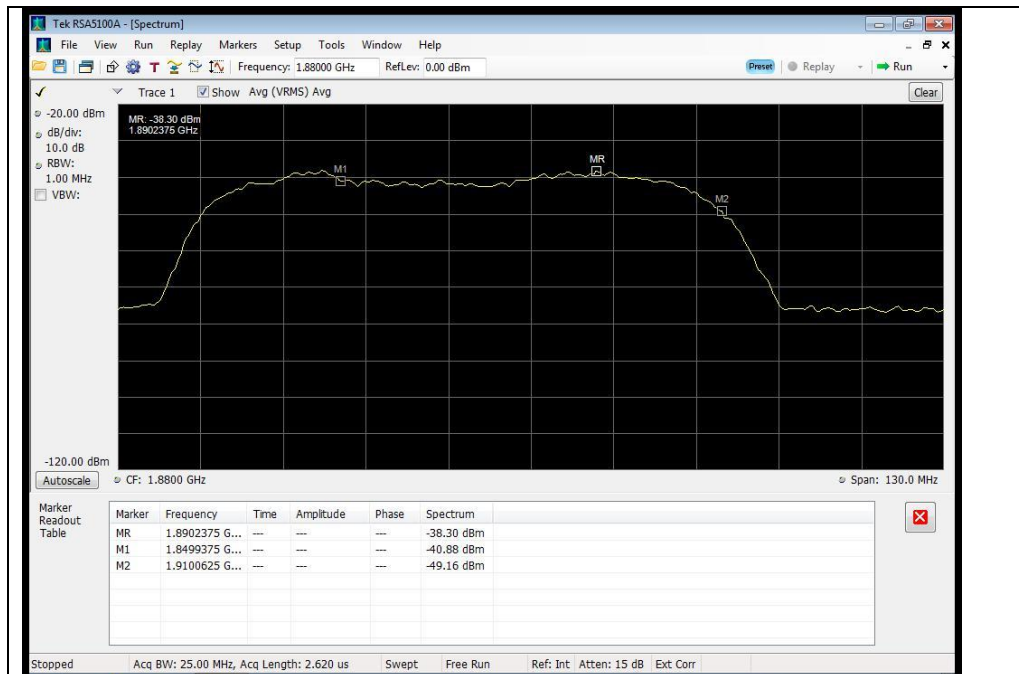
RSSI (dBm)	Noise Limit (dBm)	Measured Noise (dBm)	Margin (dB)
-82.0	-37.0	-37.5	-0.5
-81.0	-37.0	-37.5	-0.5
-80.0	-37.0	-37.5	-0.5
-79.0	-37.0	-38.3	-1.3
-57.0	-46.0	-56.5	-10.5
-56.0	-47.0	-57.2	-10.2

## Maximum Uplink Noise Test Plots

### 824 - 849 MHz Band



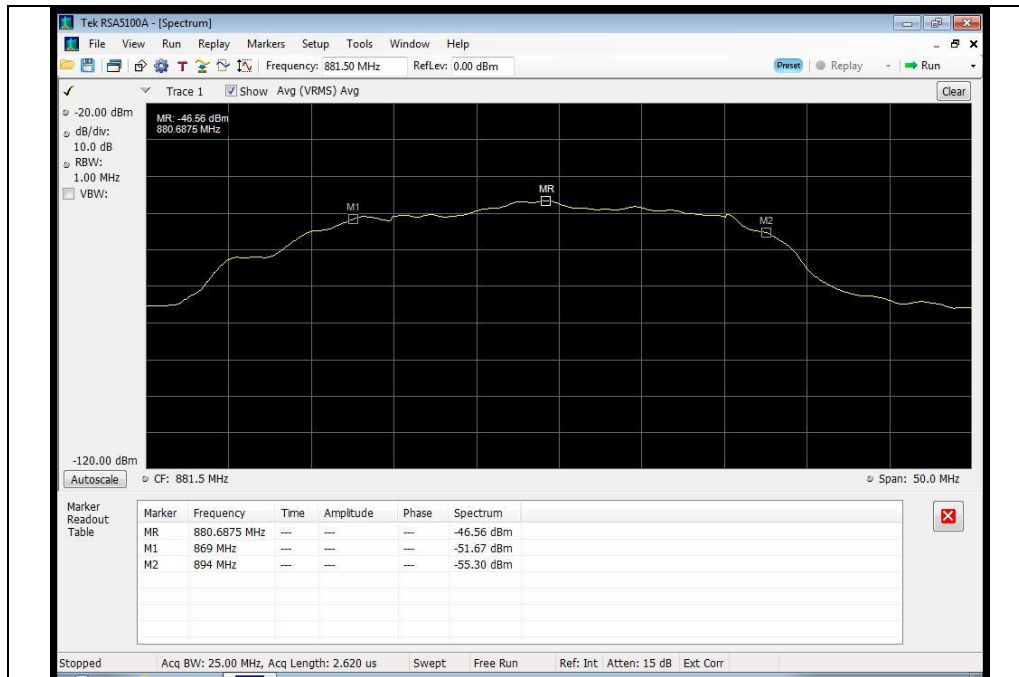
### 1850 - 1910 MHz Band



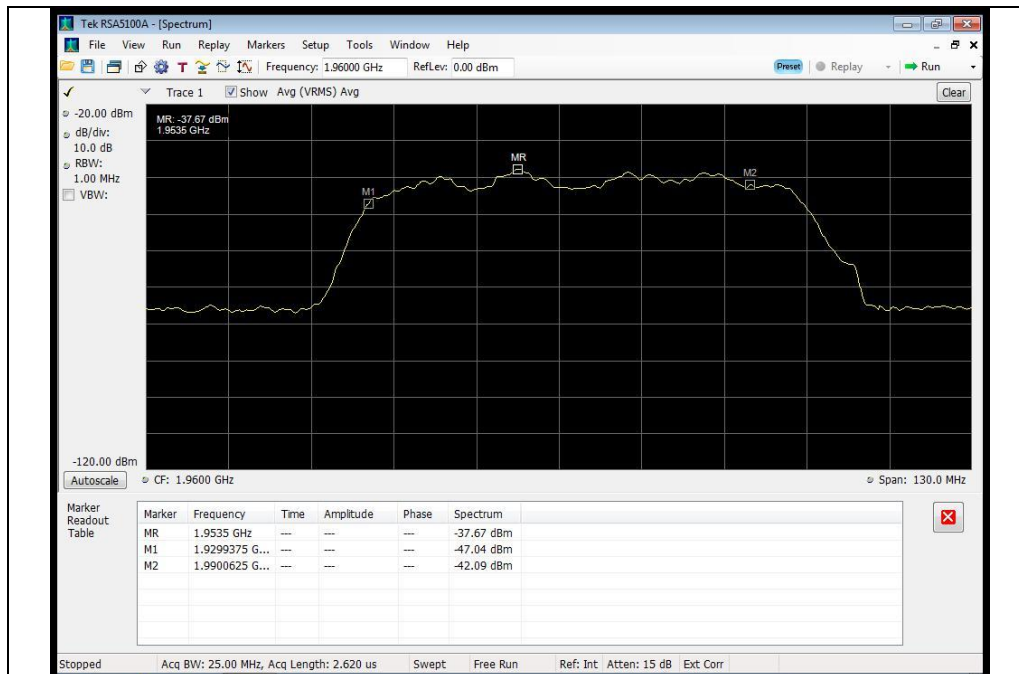


## Maximum Downlink Noise Test Plots

### 869 - 894 MHz Band

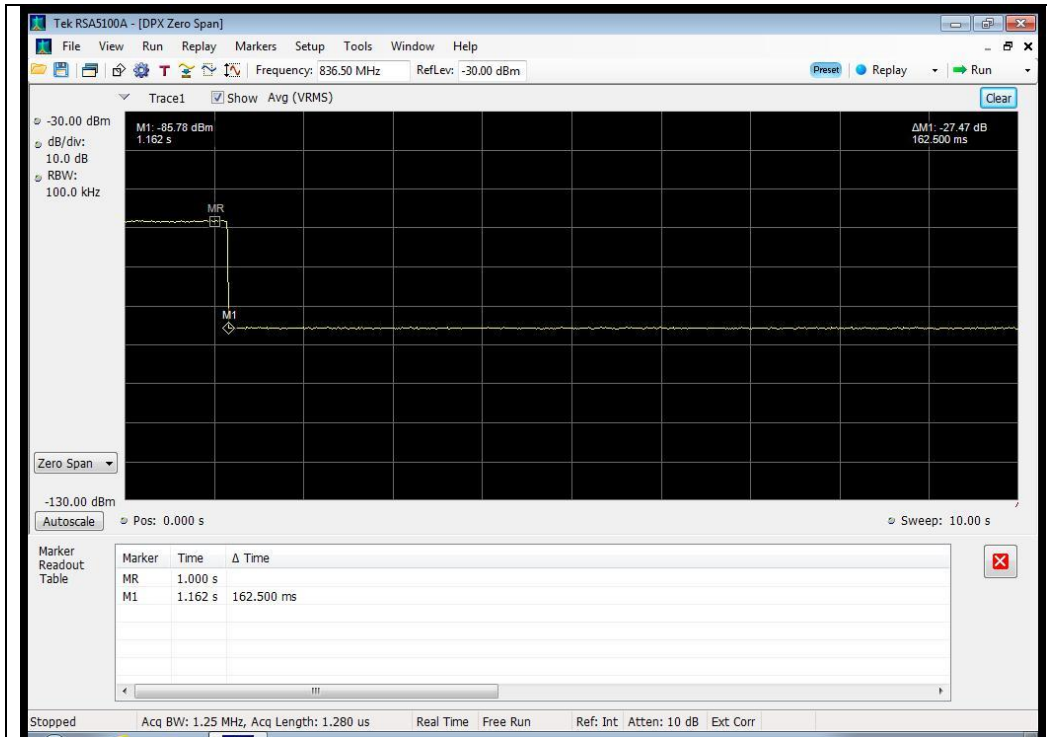


### 1930 - 1990 MHz Band

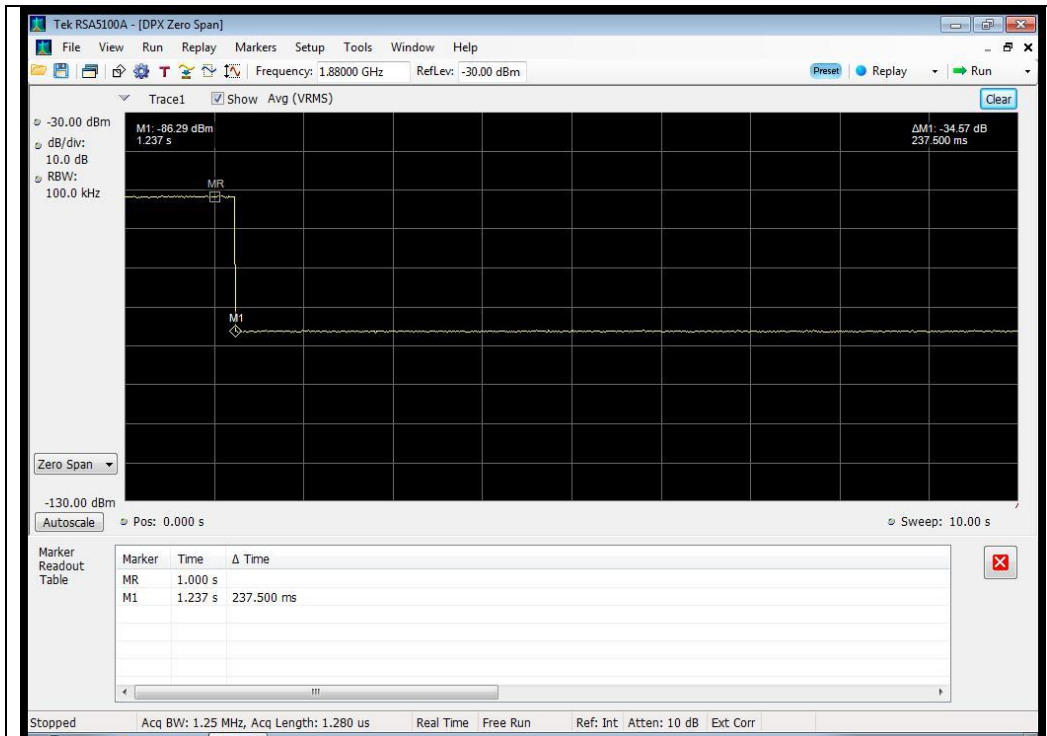


## Uplink Noise Timing Test Plots

### 824 - 849 MHz Band



### 1850 - 1910 MHz Band



## Uplink Inactivity

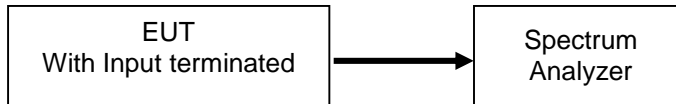
**Engineer:** Greg Corbin

**Test Date:** 8/15/2014

### Test Procedure

The EUT was connected directly to a spectrum analyzer set to operate in the center of the EUT operational uplink and downlink bands. The span was set to 0 Hz with a sweep time of 330 seconds and MAX HOLD operation. The EUT was powered on and the time for the uplink to return to an inactive state was measured using the DELTA MARKER method to ensure that it was less than 300 seconds. The noise level after the return to an inactive state was less than -70 dBm/MHz

### Test Setup

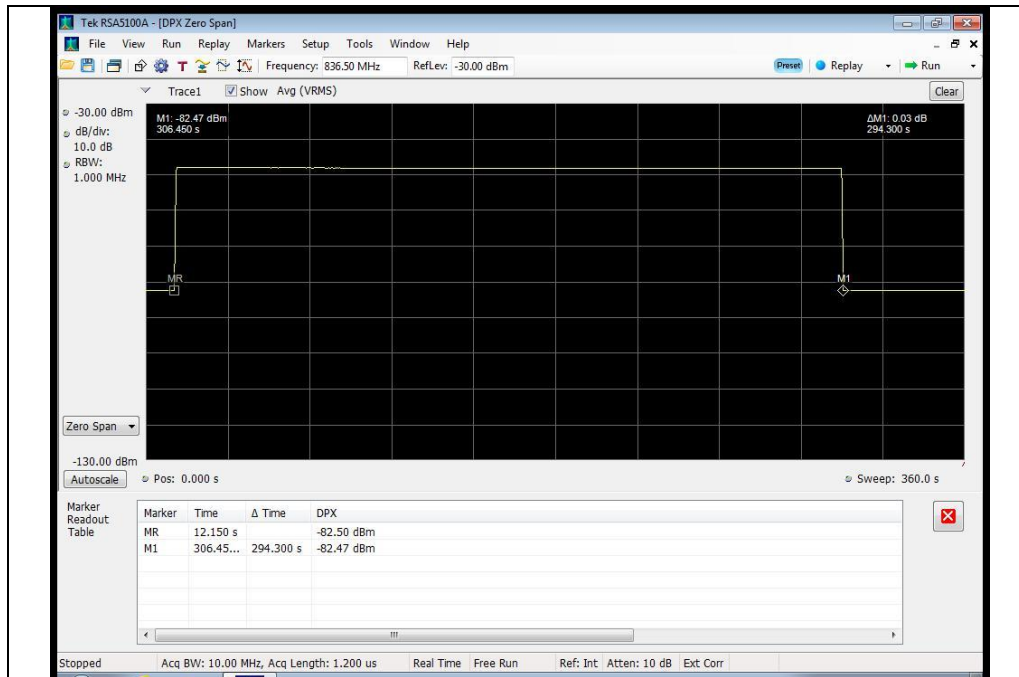


### Uplink Test Results

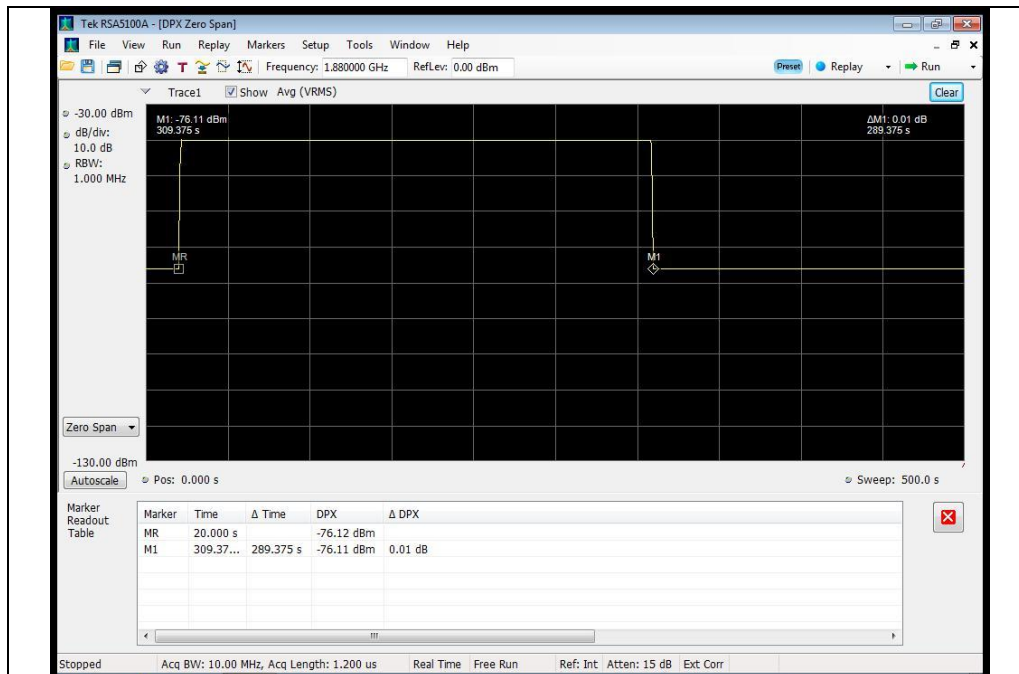
Frequency Band (MHz)	Measured Time (Seconds)	Limit (Seconds)	Result
824 - 849	294.3	300	Pass
1850 - 1910	289.4	300	Pass

## Uplink Inactivity Test Results

### 824 - 849 MHz



### 1850 - 1910 MHz



**Variable Gain**

**Engineer:** Greg Corbin

**Test Date:** 8/14/2014

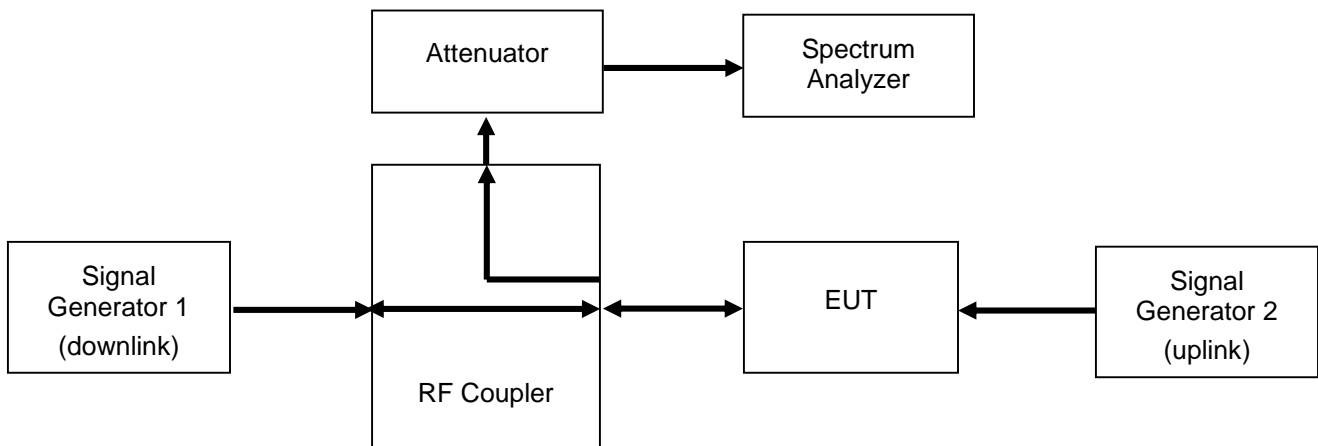
**Test Procedure**

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor in order to ensure accurate readings were obtained. The uplink gain in the presence of a downlink signal was measured for each operational uplink band using the detailed procedures from KDB 935210 D03 Wideband Consumer Signal Booster Measurement Guidance DR04-41516.

The following formula is used for calculating the limits:

$$\text{Variable Gain} = -34 \text{ dB} - \text{RSSI} + \text{MSCL}$$

**Test Setup**



### Uplink Test Results

#### 824 - 849 MHz

RSSI (dBm)	MSCL (dB)	Gain Limit (dBm)	P(in) (dBm)	P(out) (dBm)	Gain (dB)	Margin (dB)
-70.0	37.6	65.0	-45.8	15.5	61.3	-3.7
-69.0	37.6	65.0	-45.8	15.5	61.3	-3.7
-68.0	37.6	65.0	-45.8	15.0	60.8	-4.2
-67.0	37.6	65.0	-45.8	13.6	59.4	-5.6
-48	37.6	51.6	-45.8	-3.9	41.9	-9.7
-47	37.6	50.6	-45.8	-4.8	41.0	-9.6

#### 1850 - 1915 MHz

RSSI (dBm)	MSCL (dB)	Gain Limit (dBm)	P(in) (dBm)	P(out) (dBm)	Gain (dB)	Margin (dB)
-75.0	43.7	72.0	-56.4	12.7	69.1	-2.9
-74.0	43.7	72.0	-56.4	12.7	69.1	-2.9
-73.0	43.7	72.0	-56.4	12.7	69.1	-2.9
-69.0	43.7	72.0	-56.4	11.6	68.0	-4.0
-48	43.7	64.7	-56.4	-3.8	52.6	-12.1
-50	43.7	62.7	-56.4	-5.8	50.6	-12.1

### Uplink Gain Timing Test Results

Frequency Band (MHz)	Measured Timing (Seconds)	Limit (Seconds)	Result
824 - 849	0.30	3.0	Pass
1850 - 1910	0.35	3.0	Pass

**Occupied Bandwidth**

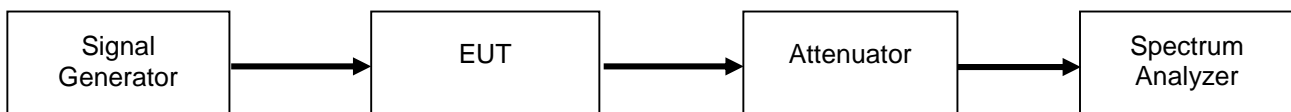
**Engineer:** Greg Corbin

**Test Date:** 8/15/2014

**Test Procedure**

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as required to ensure that accurate readings were obtained. A signal generator was utilized to produce the following signals: GSM, CDMA, and WCDMA. The signal generator was tuned to the center channel of each of the EUT operational uplink and downlink bands with the RF level set at a point just prior to the AGC being in control of the power. For each modulation type, the input and output signal was measured and plotted to ensure that the signals were similar.

**Test Setup**

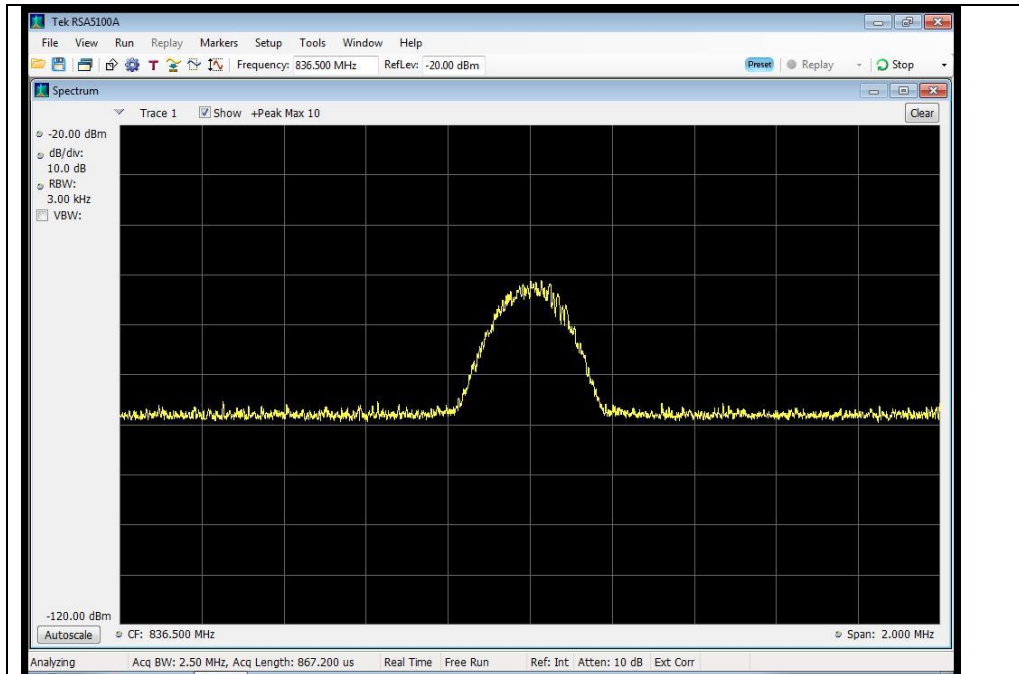




## GSM Uplink Test Plots

### 824 - 849 MHz Band

#### Input



#### Output

