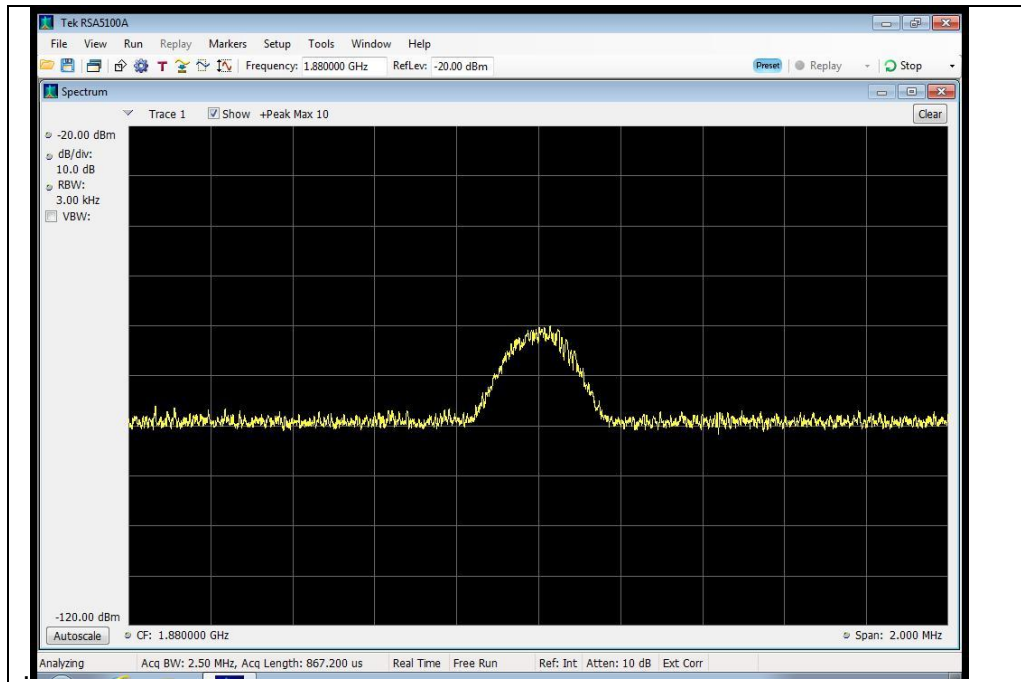
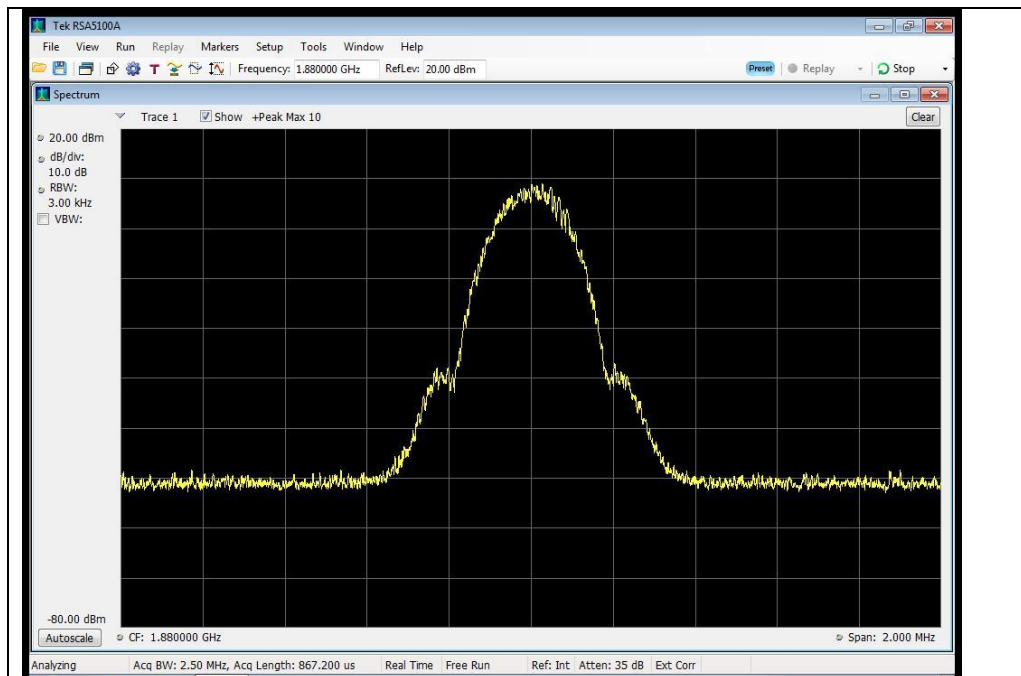


1850 - 1910 MHz Band

Input



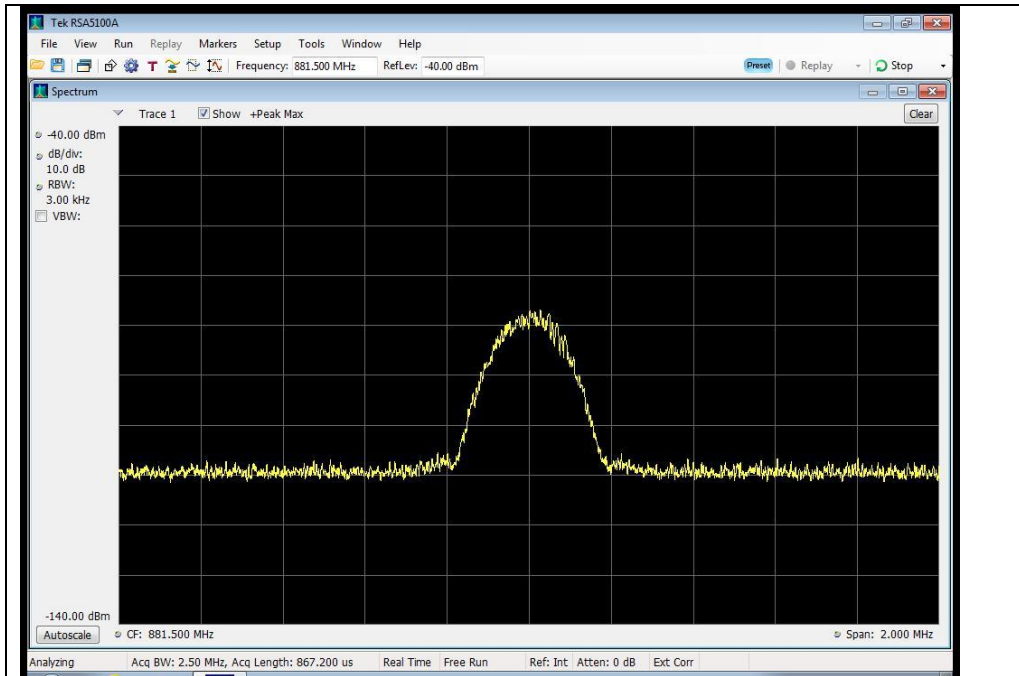
Output



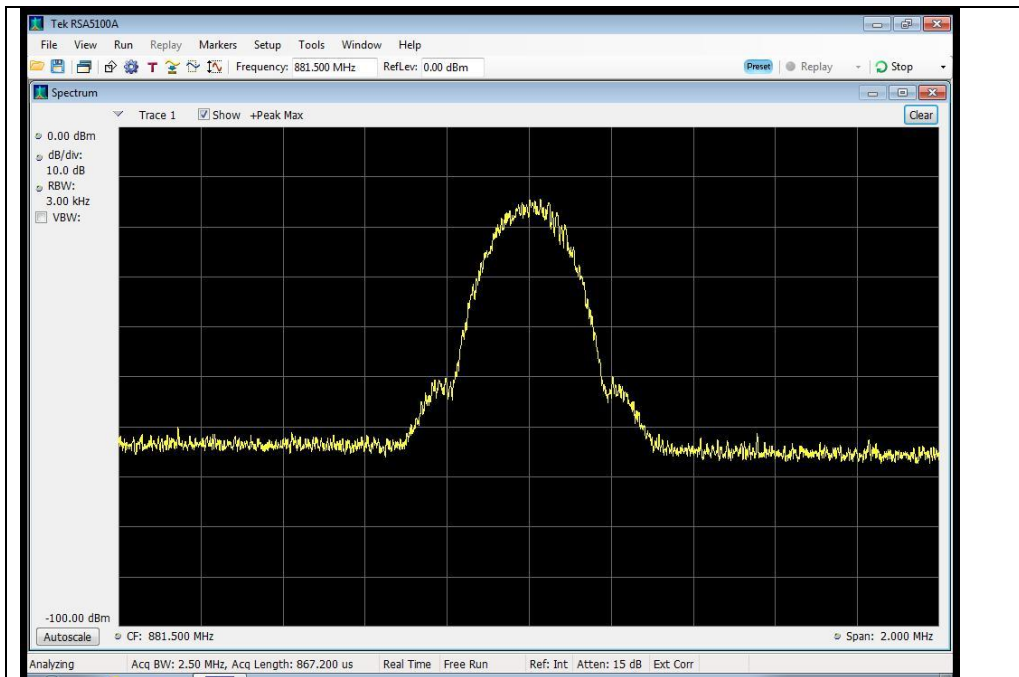
GSM Downlink Test Plots

869 - 894 MHz Band

Input

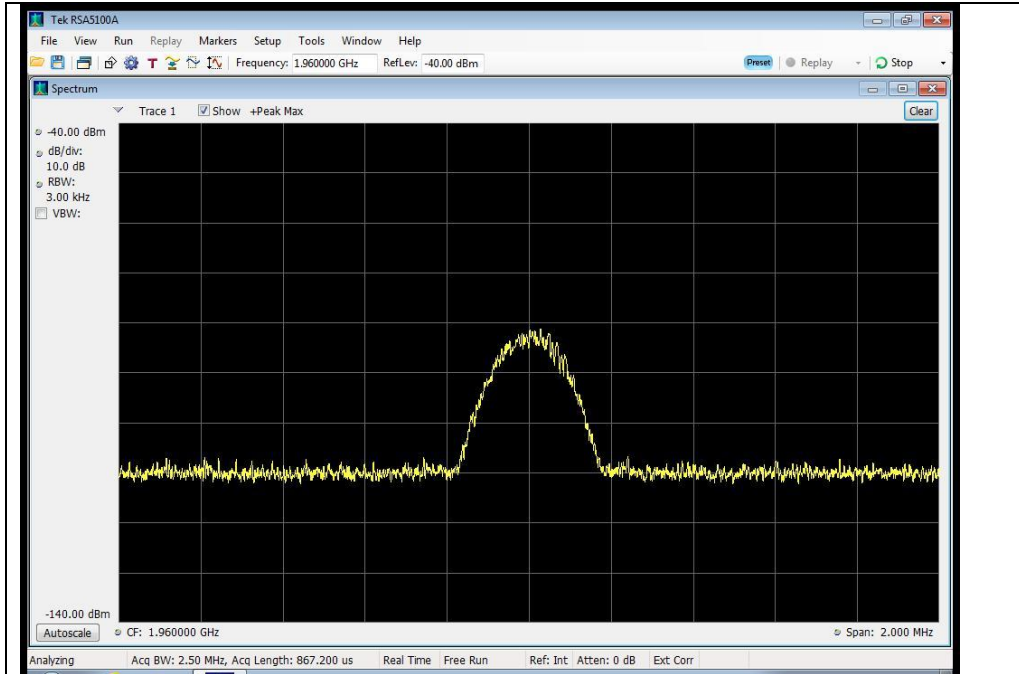


Output

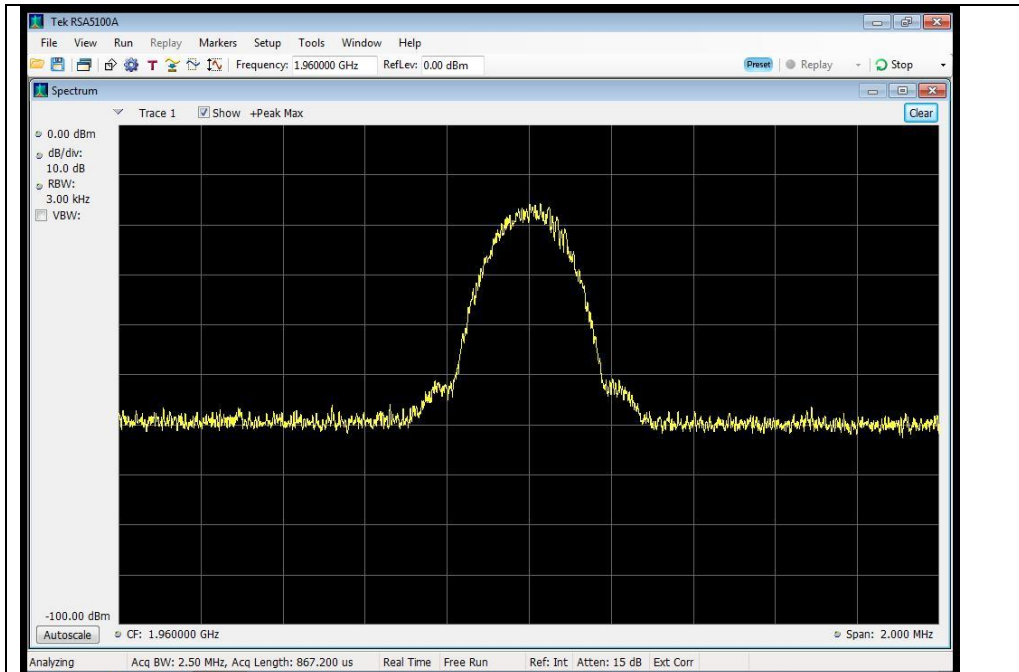


1930 - 1990 MHz Band

Input



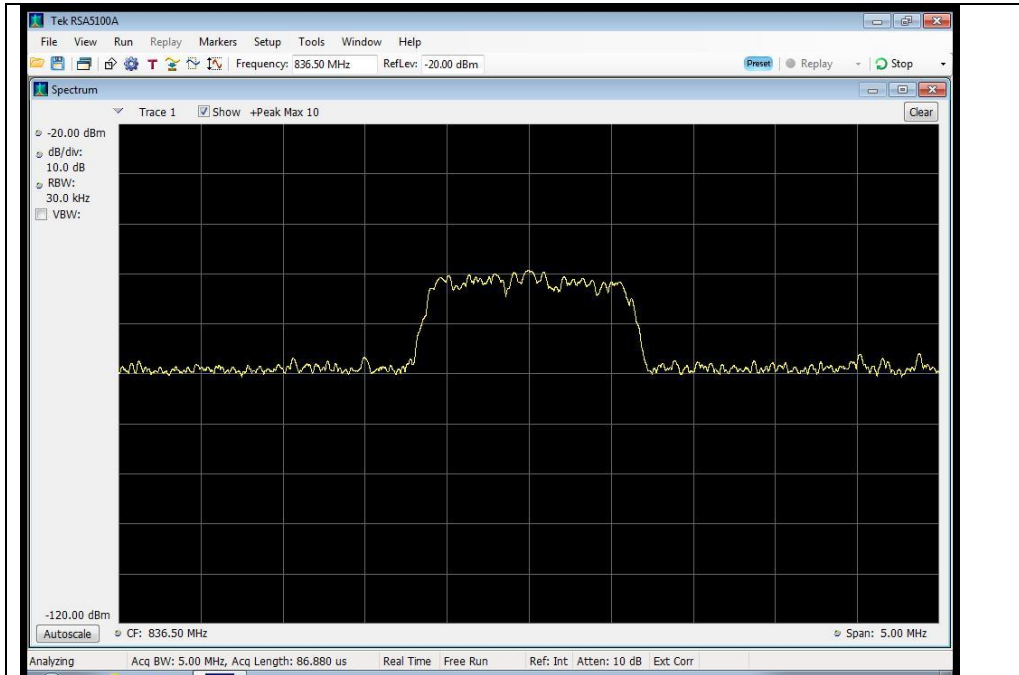
Output



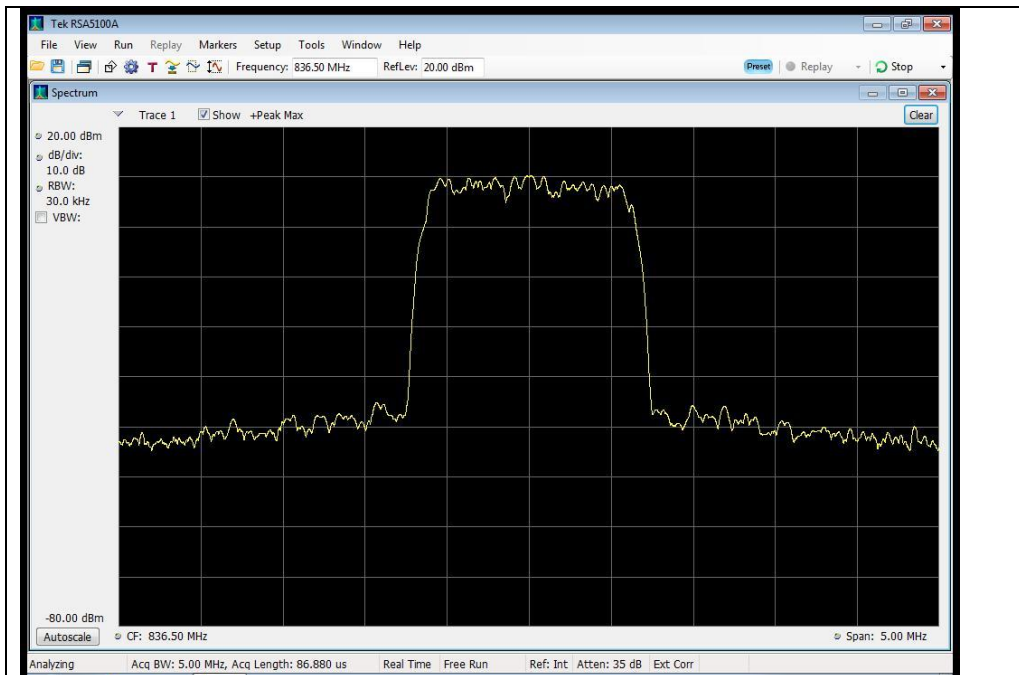
CDMA Uplink Test Plots

824 - 849 MHz Band

Input

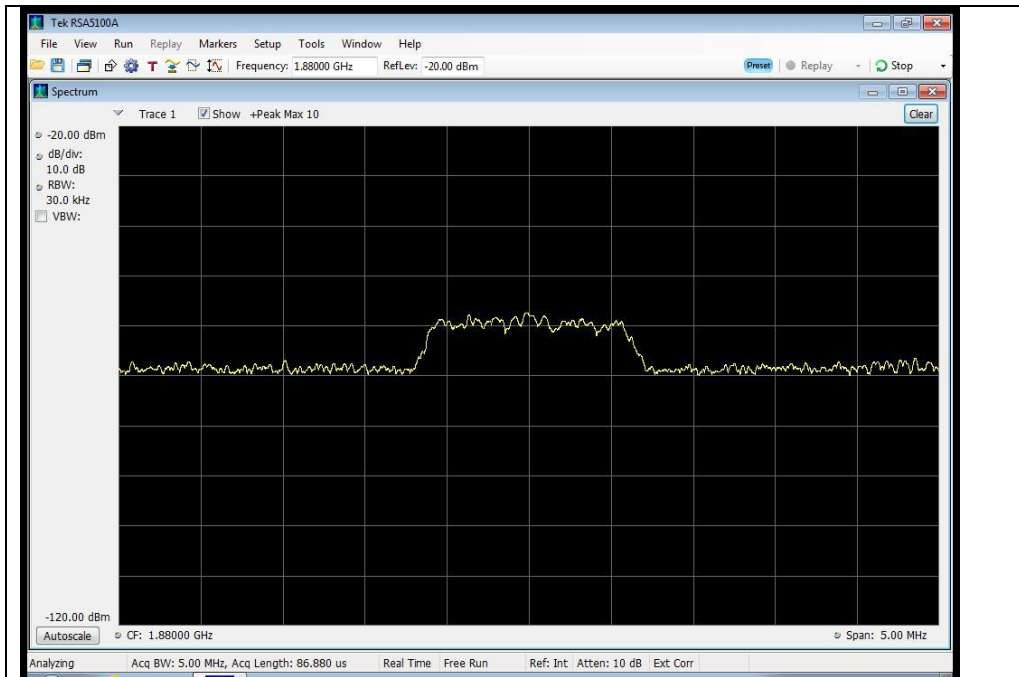


Output

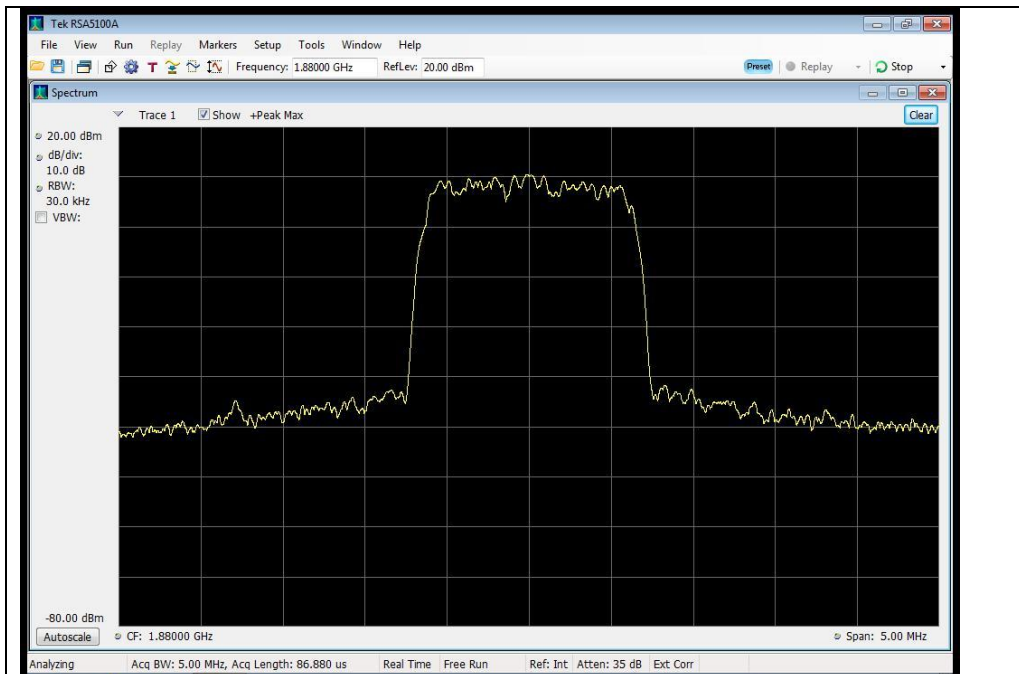


1850 - 1910 MHz Band

Input



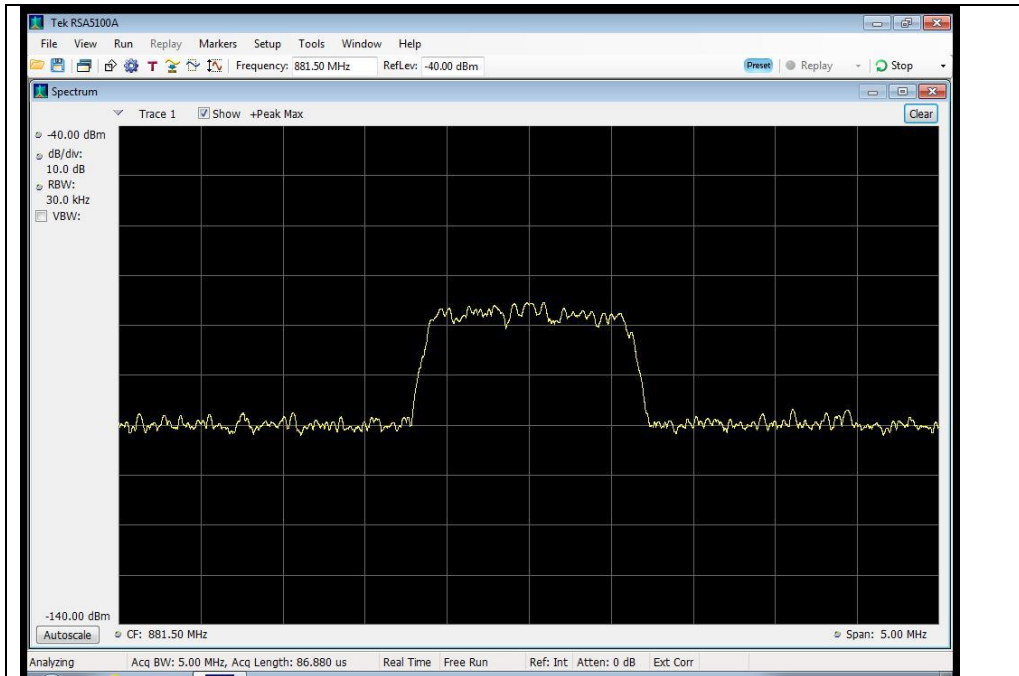
Output



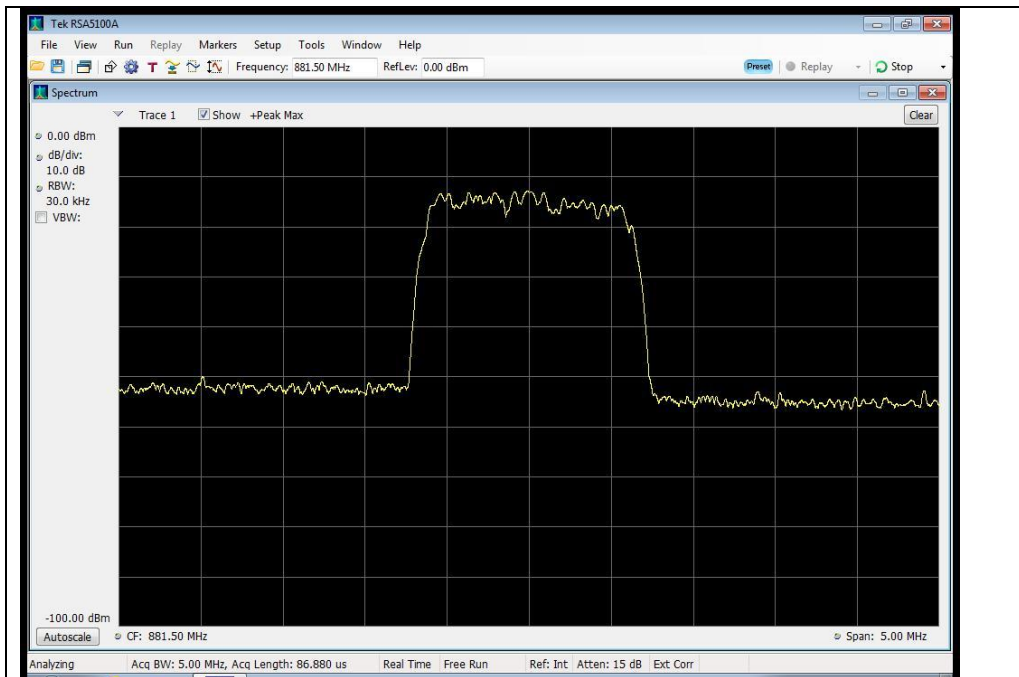
CDMA Downlink Test Plots

869 - 894 MHz Band

Input

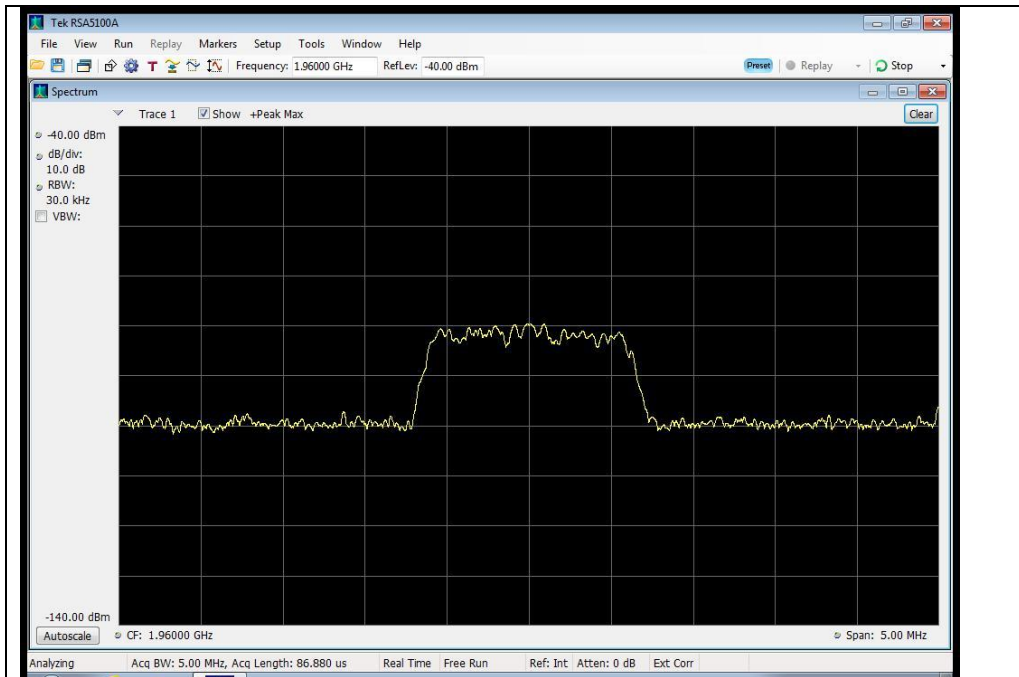


Output

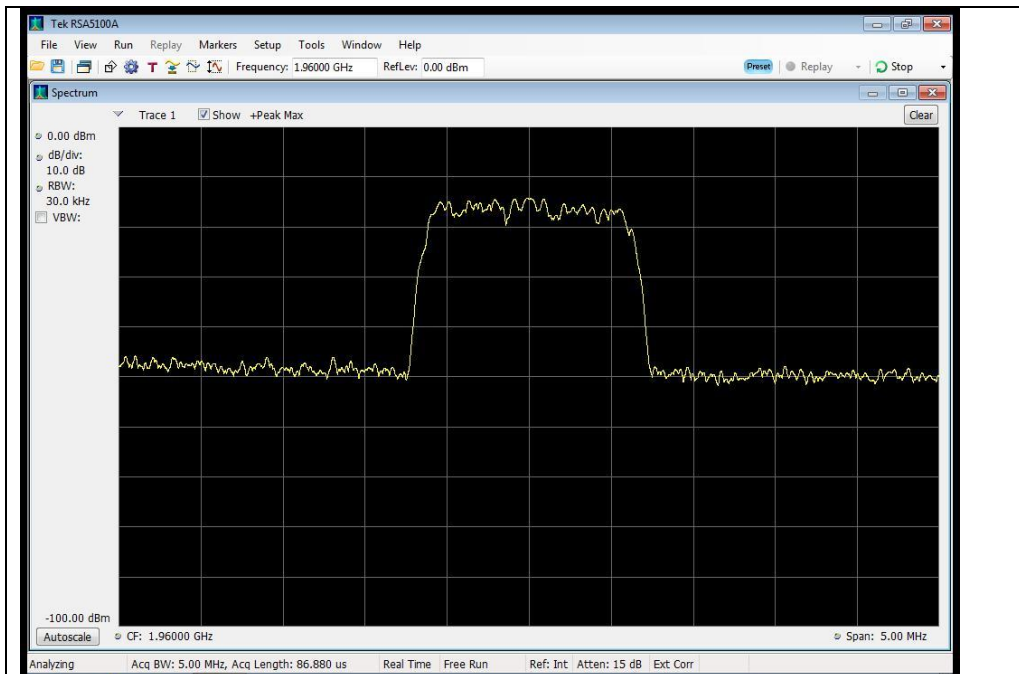


1930 - 1990 MHz Band

Input



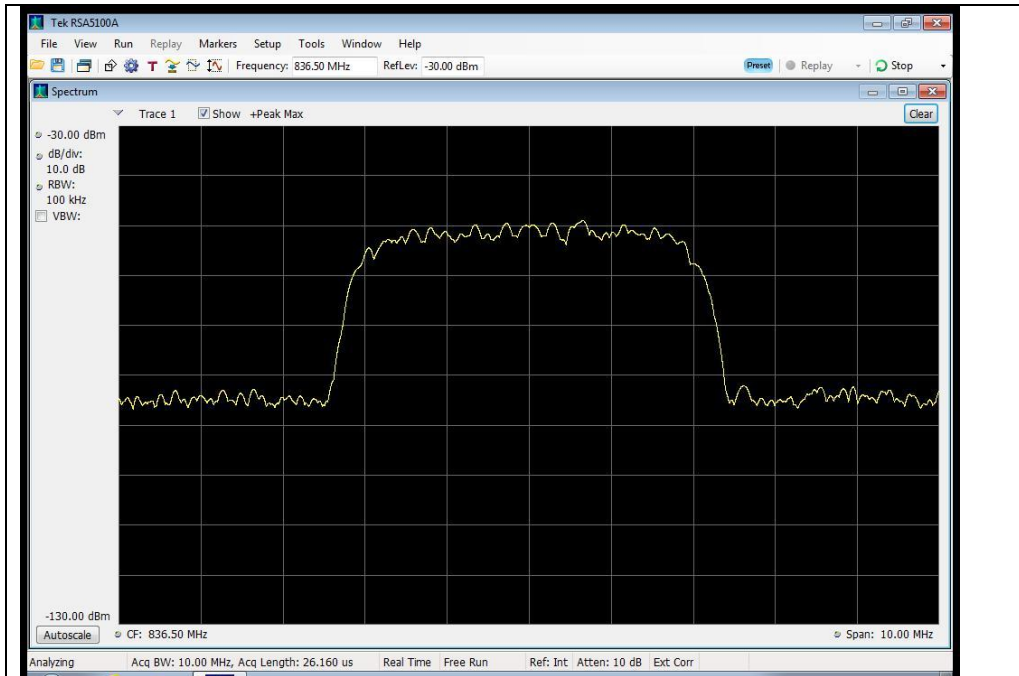
Output



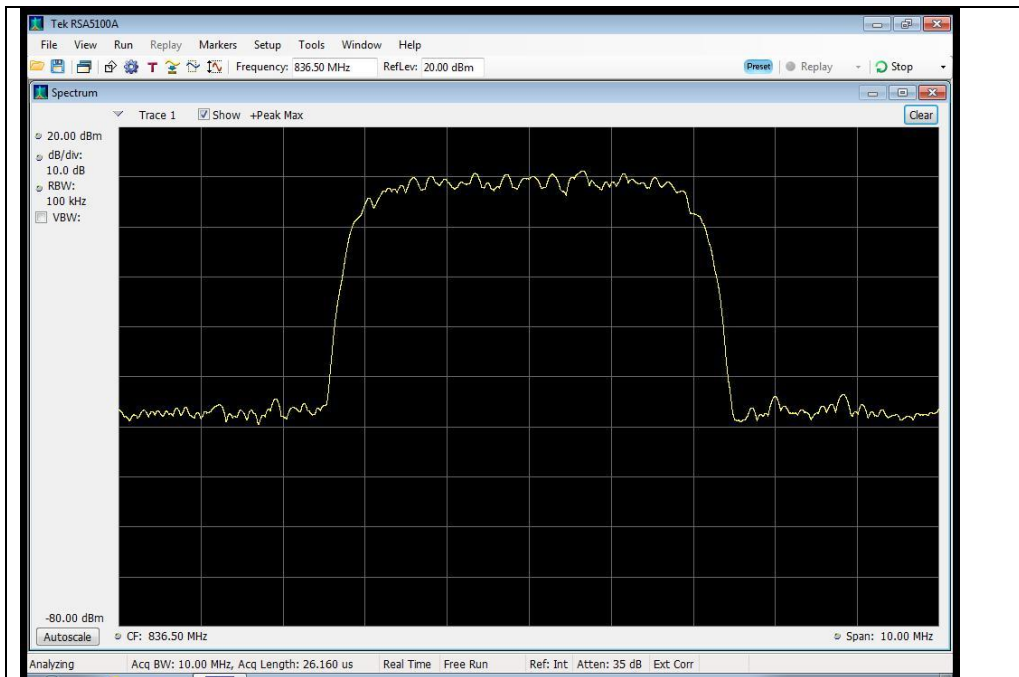
WCDMA Uplink Test Plots

824 - 849 MHz Band

Input

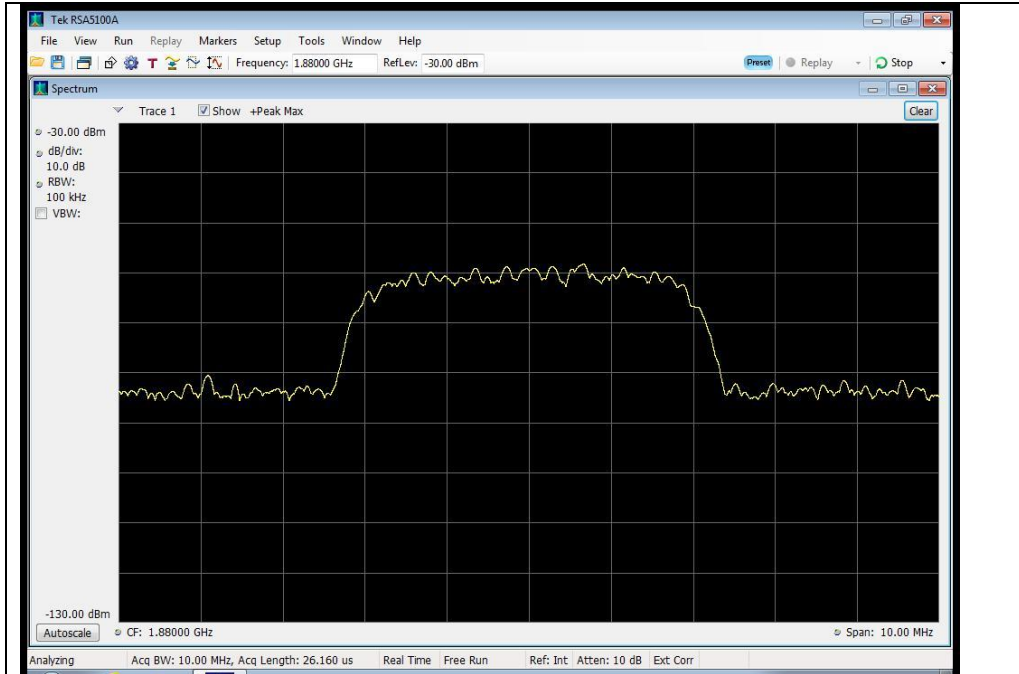


Output

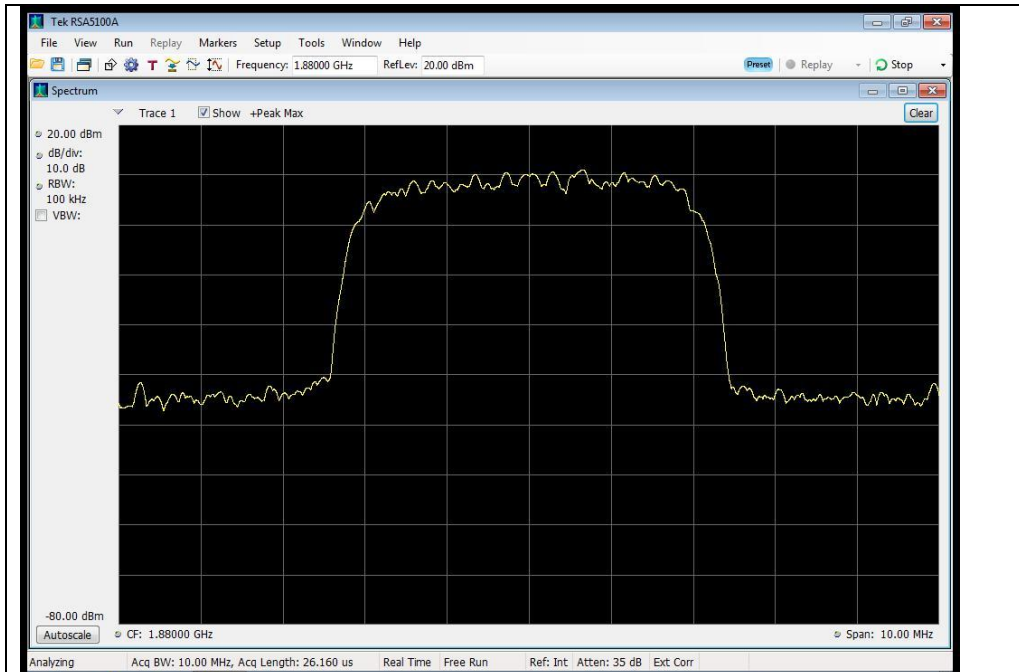


1850 - 1910 MHz Band

Input



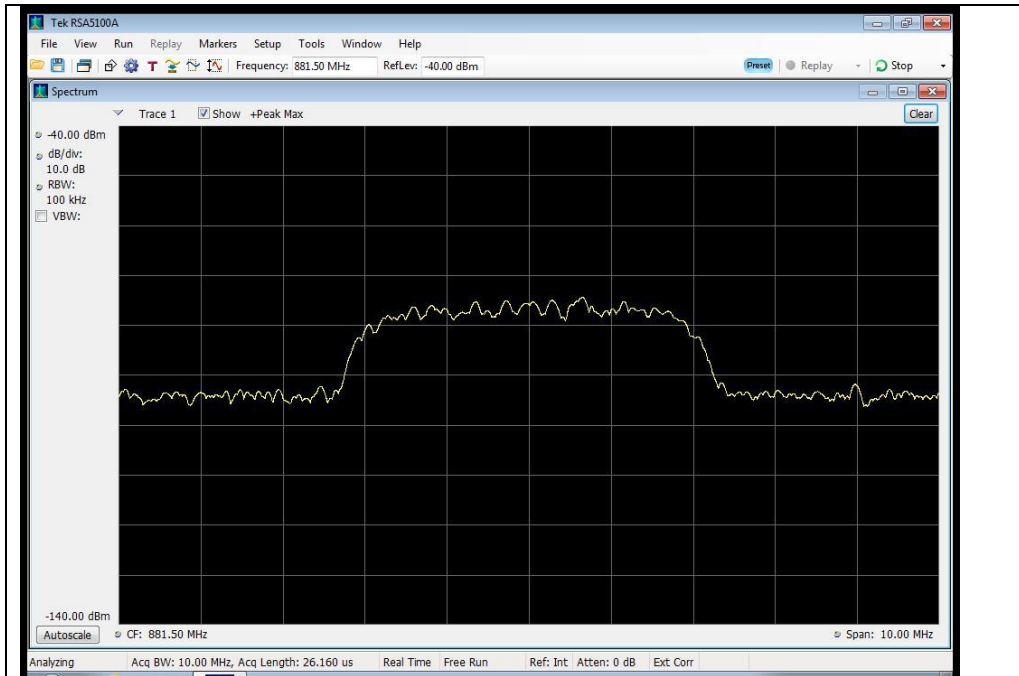
Output



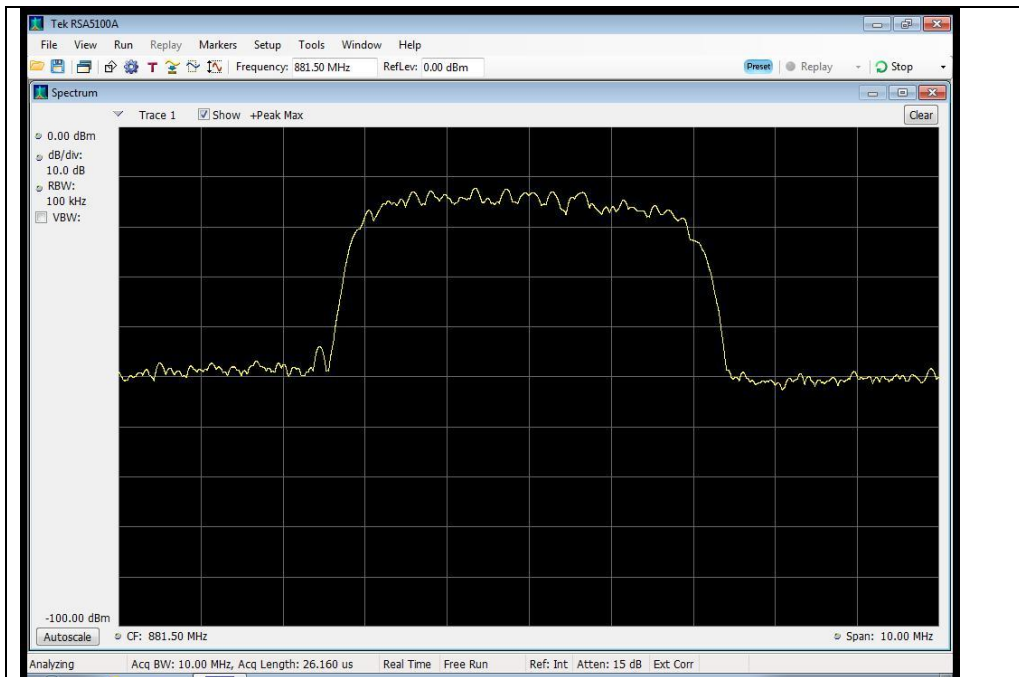
WCDMA Downlink Test Plots

869 - 894 MHz Band

Input

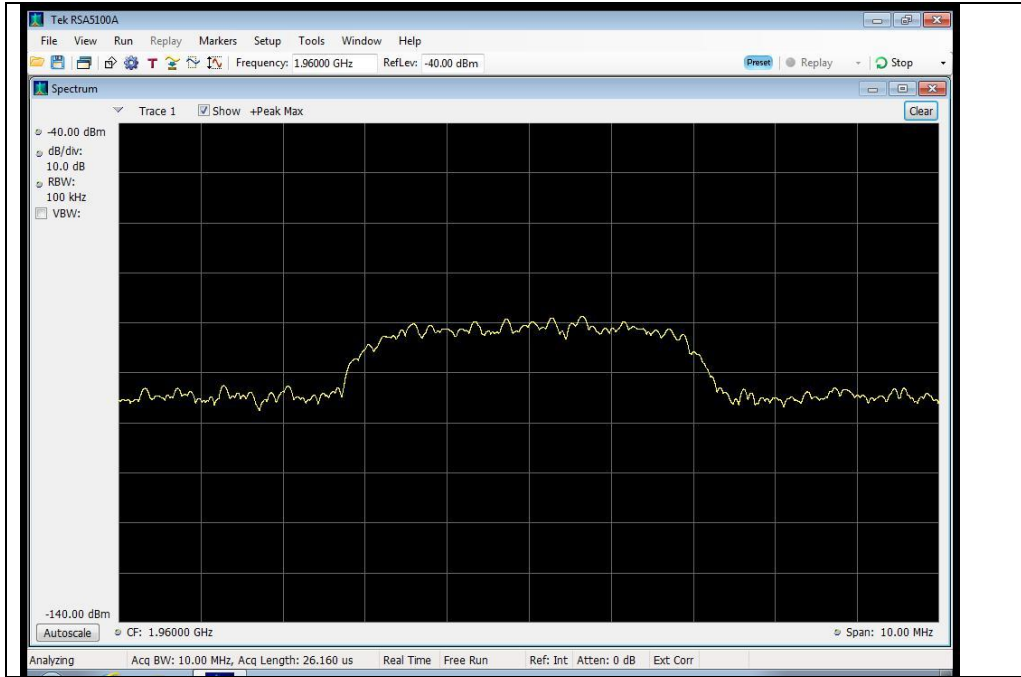


Output

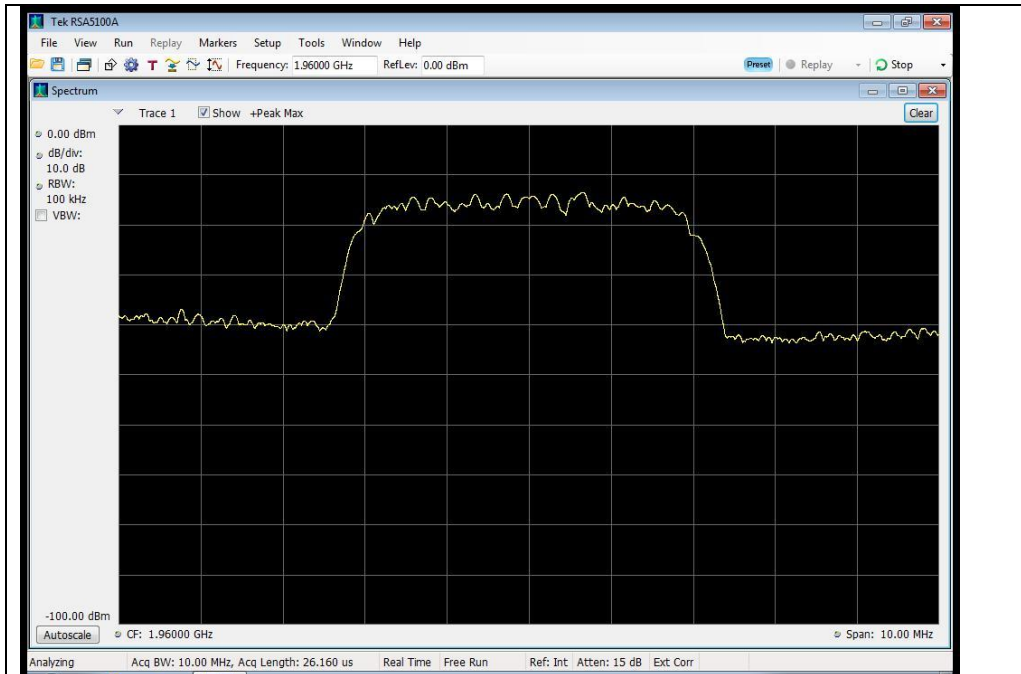


1930 - 1990 MHz Band

Input



Output



Oscillation Detection

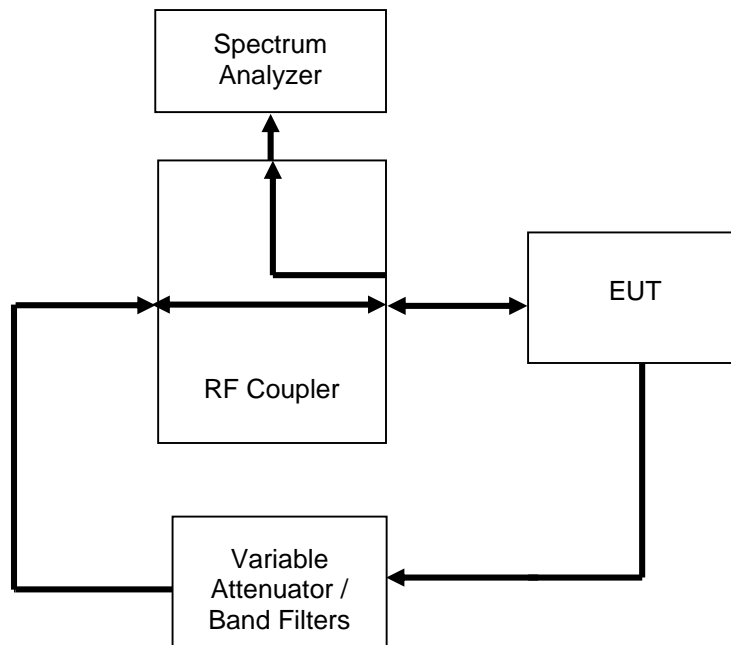
Engineer: Greg Corbin

Test Date: 8/18/2014

Test Procedure

The EUT was connected to a spectrum analyzer set for 0 Hz operation. The EUT uplink and downlink were fed back upon each other through a selectable band pass filter and variable attenuator. The EUT uplink and downlink were tested to ensure that the presence of oscillation was detected and that the EUT output turned off within 300 mS for the Uplink and 1 second for the Downlink and remained off for 1 minute. A EUT with test software was utilized to ensure that the EUT only had a maximum of 5 attempts at restart from oscillation before permanently shutting off.

Test Setup



Uplink Detection Time Test Results

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
824 - 849	286.25	300	Pass
1850 - 1910	277.5	300	Pass

Downlink Detection Time Test Results

Frequency Band (MHz)	Measured Time (mS)	Limit (mS)	Result
869 - 894	272.5	1000	Pass
1930 - 1990	322.5	1000	Pass

Uplink Restart Time Test Results

Frequency Band (MHz)	Measured Time (S)	Limit (S)	Result
824 - 849	62.5	≥60	Pass
1850 - 1910	63	≥60	Pass

Downlink Restart Time Test Results

Frequency Band (MHz)	Measured Time (S)	Limit (S)	Result
869 - 894	67.13	≥60	Pass
1930 - 1990	64.13	≥60	Pass

Uplink Restart Count Test Results

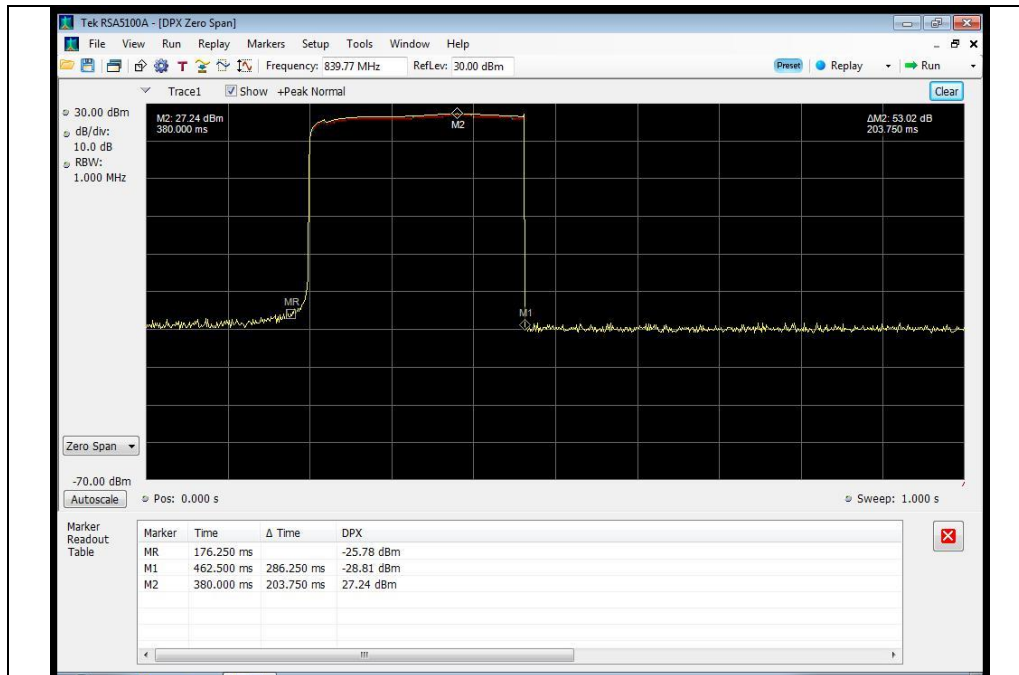
Frequency Band (MHz)	Restarts	Limit	Result
824 - 849	4	≤5	Pass
1850 - 1910	4	≤5	Pass

Downlink Restart Count Test Results

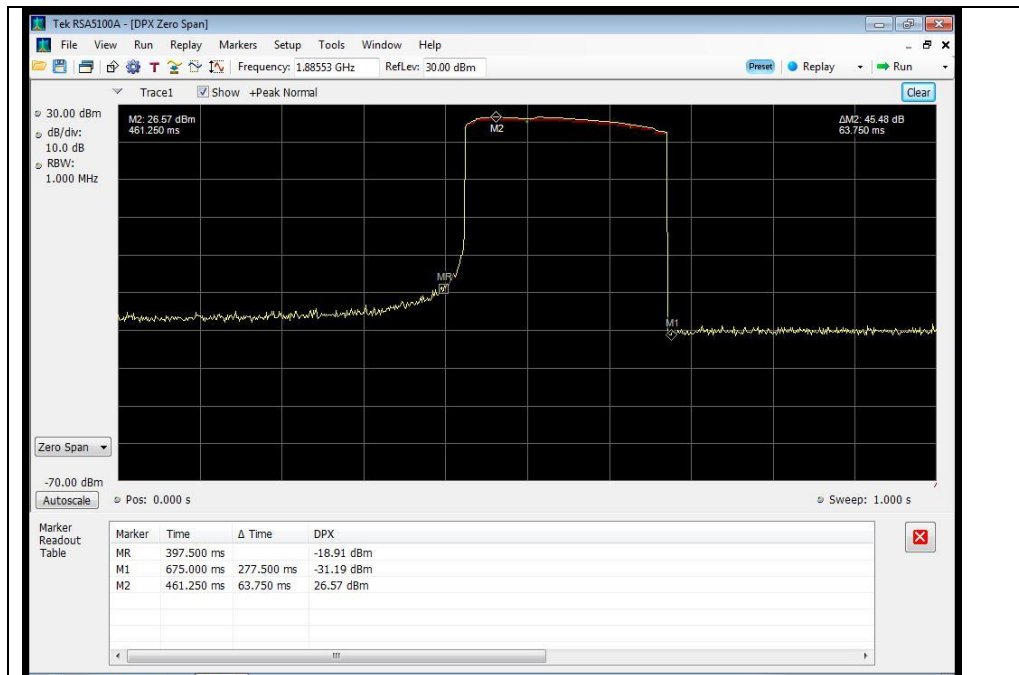
Frequency Band (MHz)	Restarts	Limit	Result
869 - 894	4	≤5	Pass
1930 - 1995	4	≤5	Pass

Uplink Detection Time Test Results

824 - 849 MHz Band

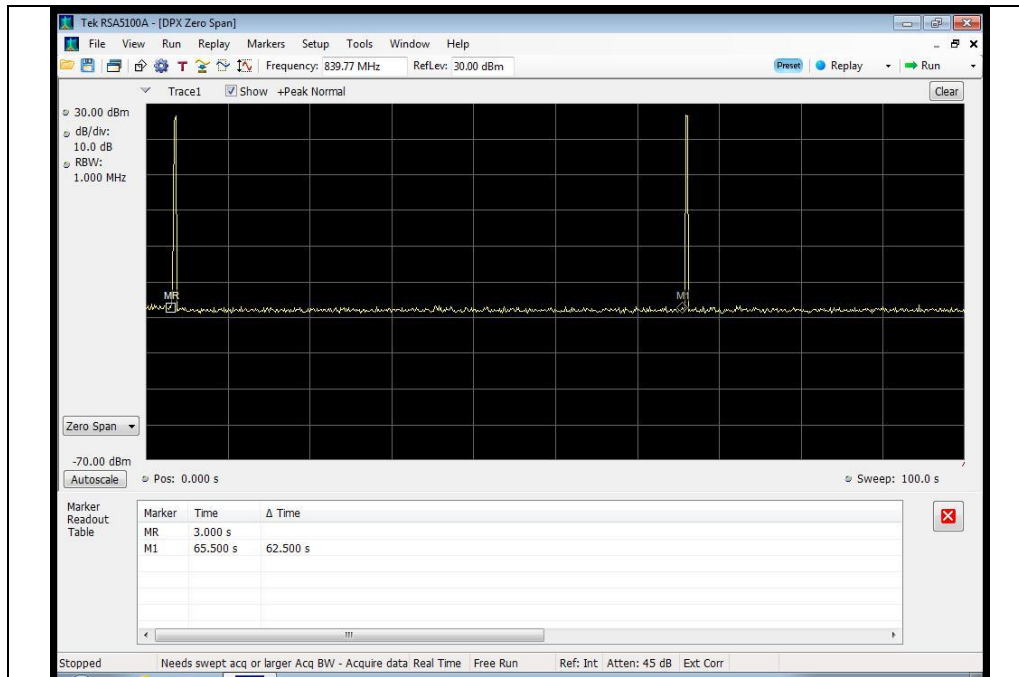


1850 - 1910 MHz Band

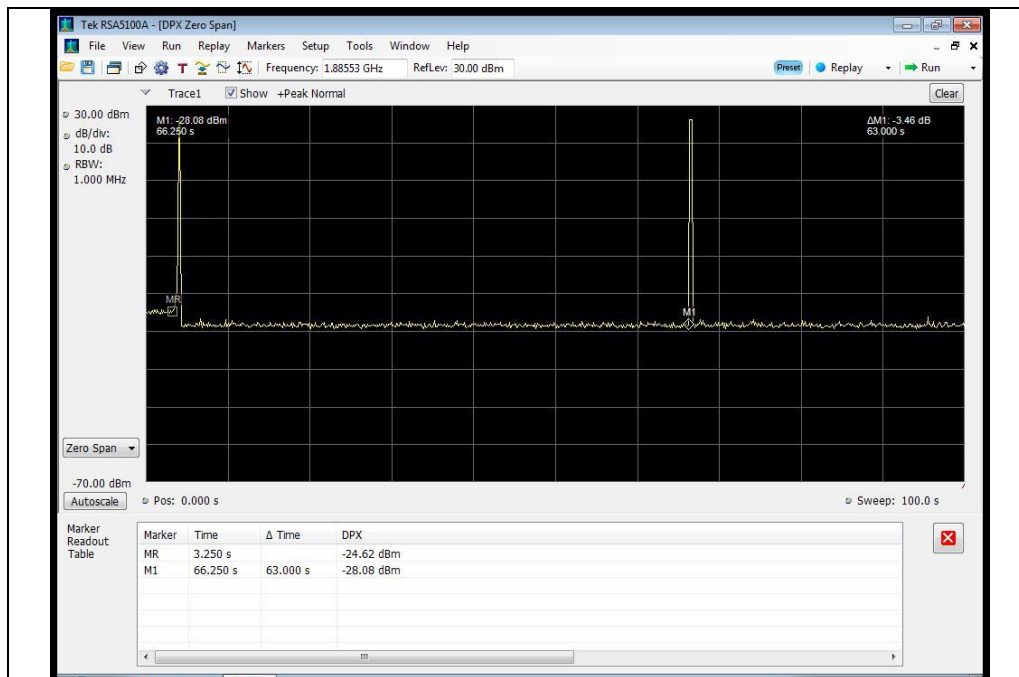


Uplink Restart Time Test Results

824 - 849 MHz Band

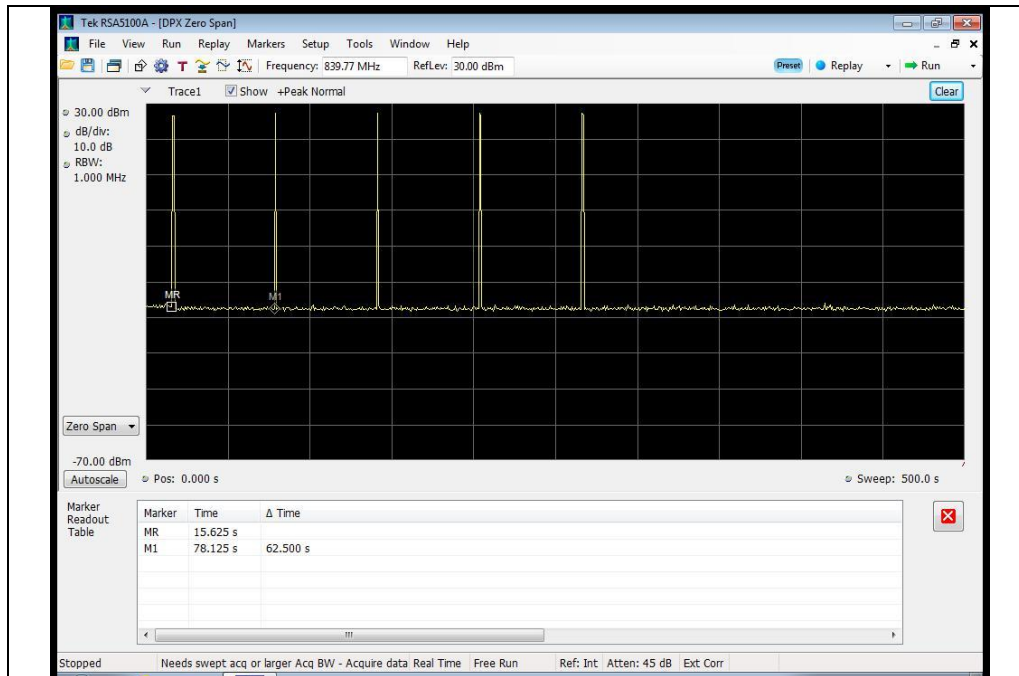


1850 - 1910 MHz Band

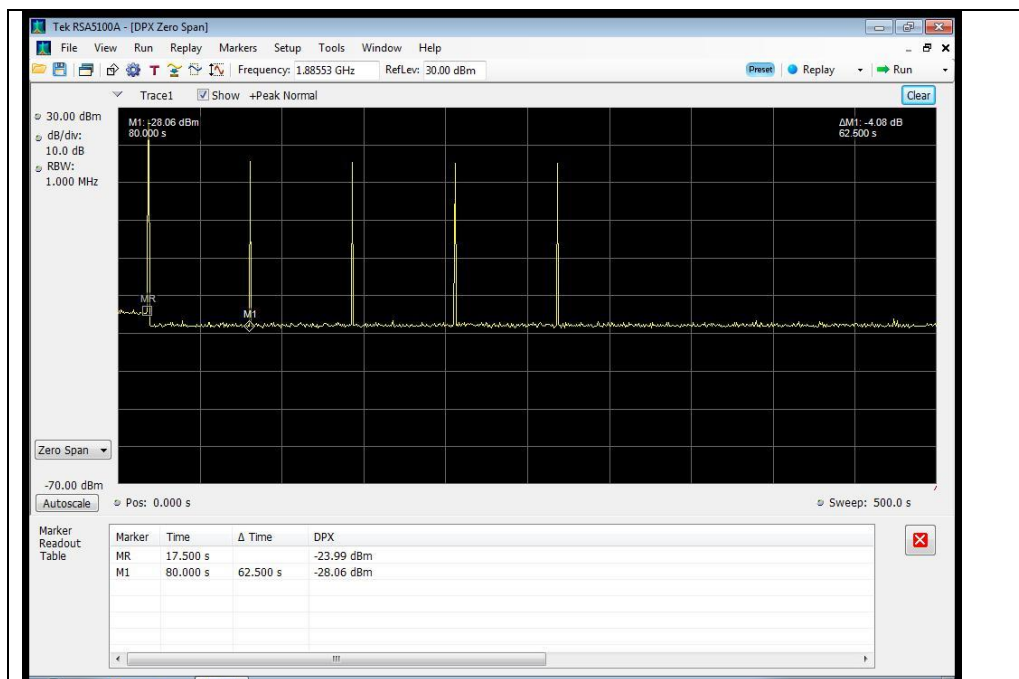


Uplink Restart Count Test Results

824 - 849 MHz Band

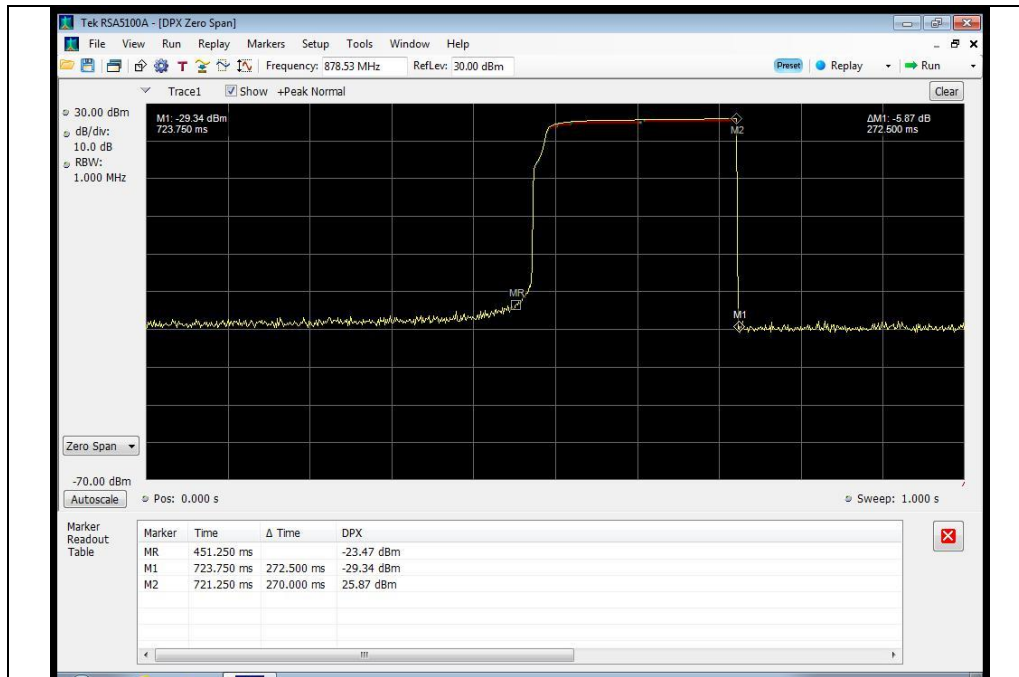


1850 - 1910 MHz Band

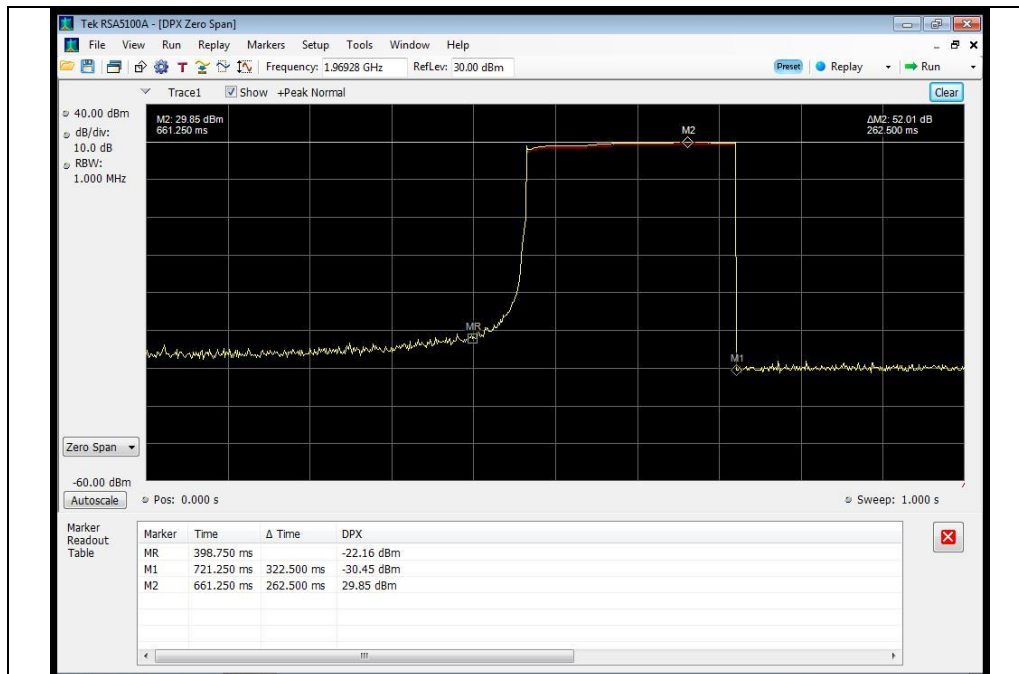


Downlink Detection Time Test Results

869 - 894 MHz Band

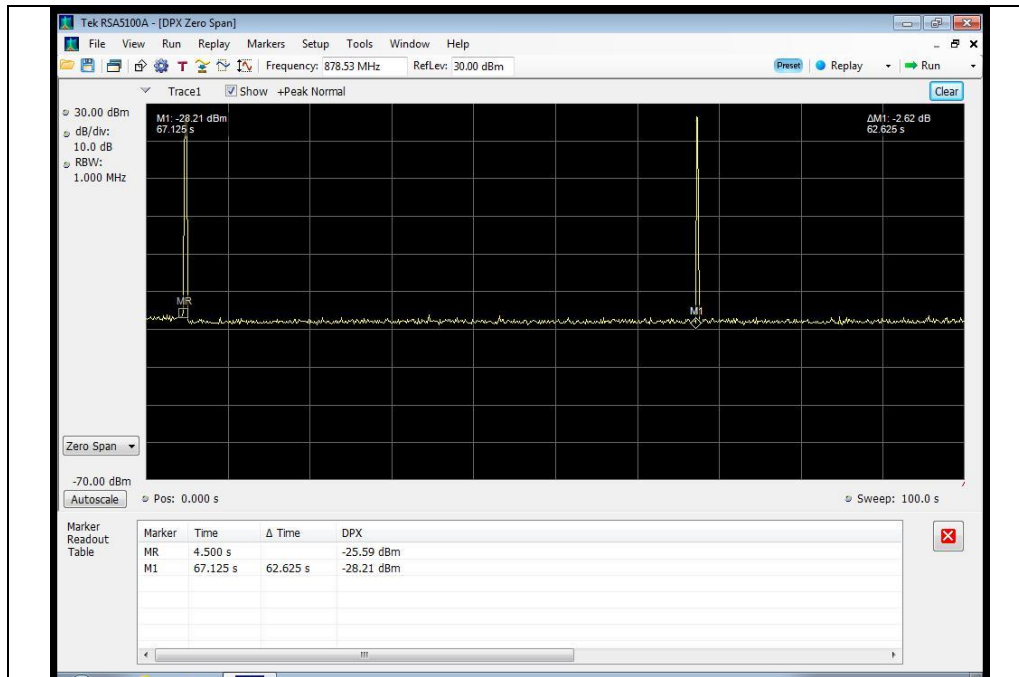


1930 - 1990 MHz Band

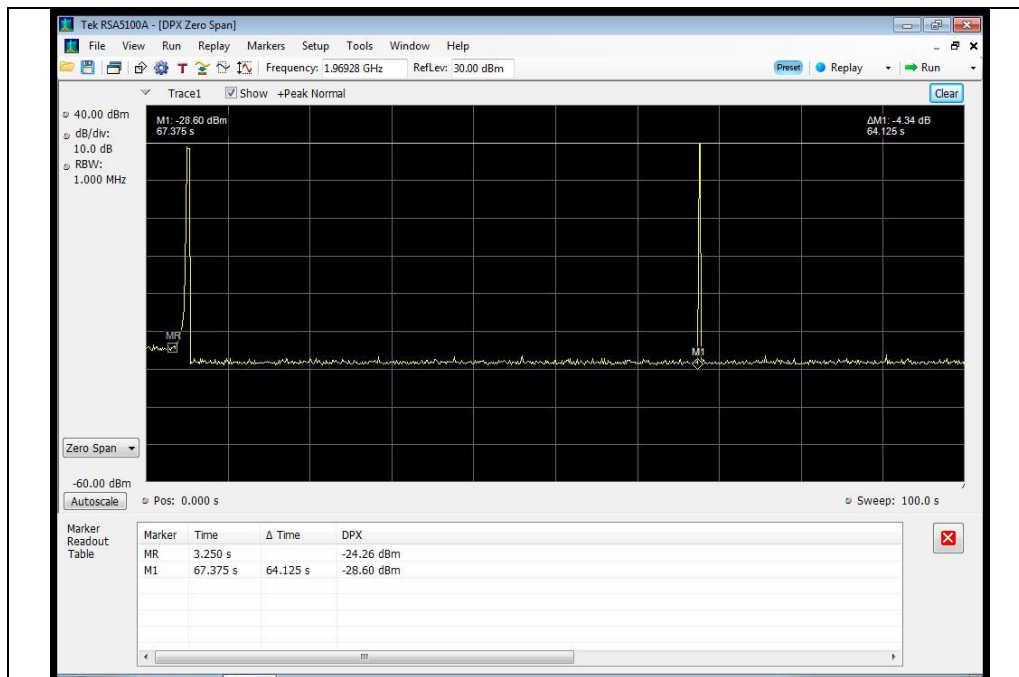


Downlink Restart Time Test Results

869 - 894 MHz Band

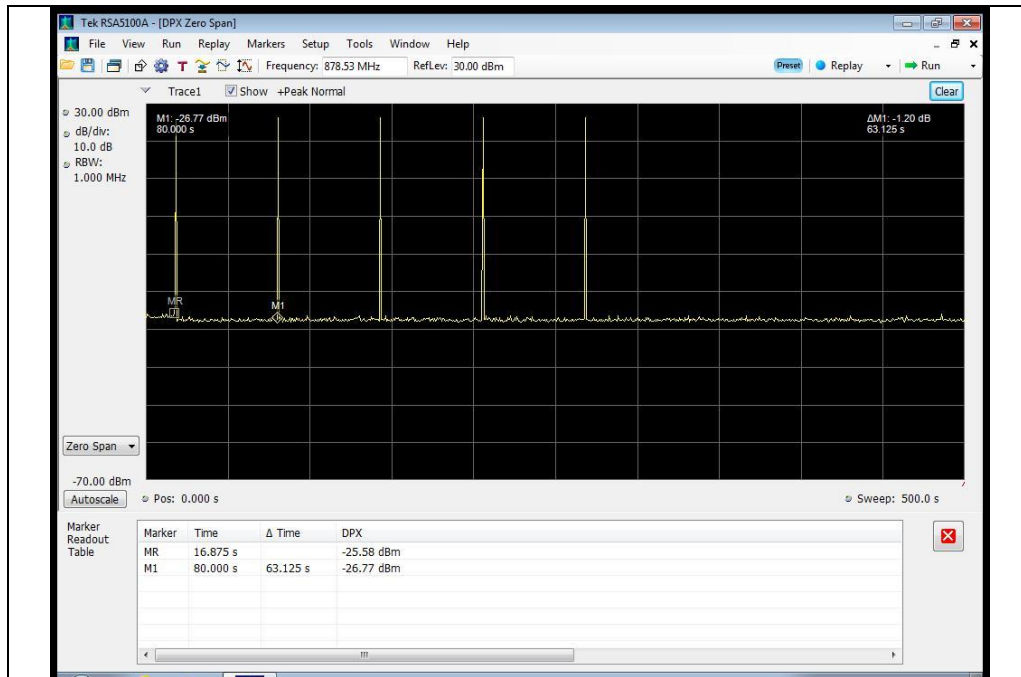


1930 - 1990 MHz Band

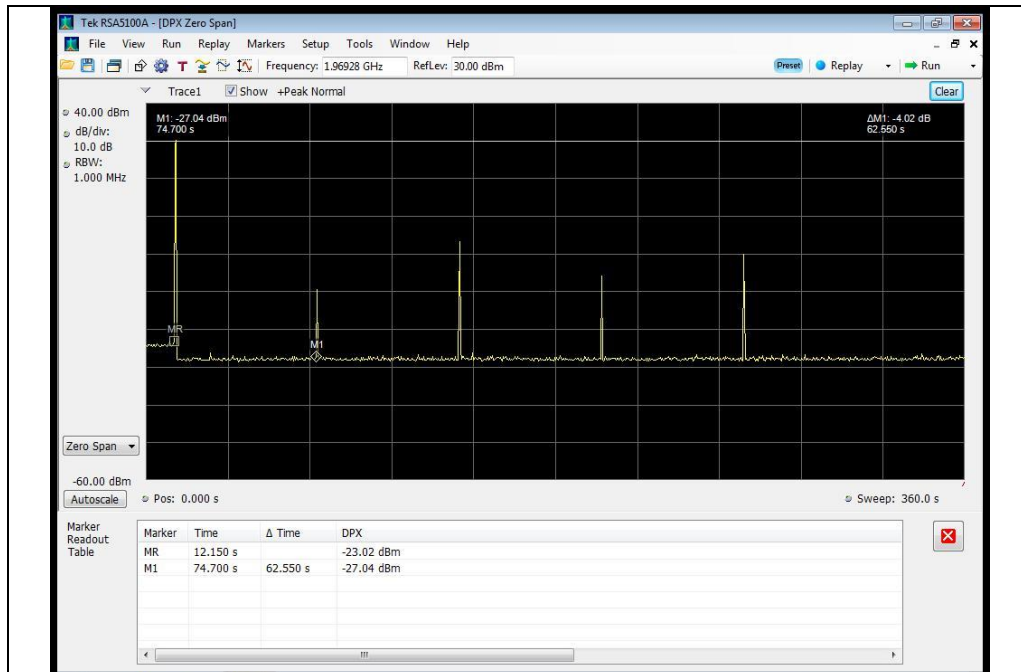


Downlink Restart Count Test Results

869 - 894 MHz Band



1930 - 1990 MHz Band



Radiated Spurious

Engineer: Greg Corbin

Test Date: 8/18/2014

Test Procedure

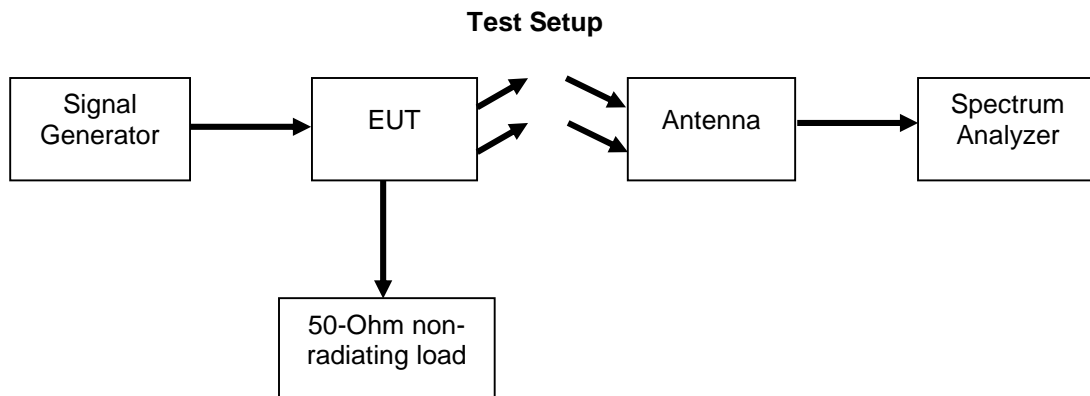
The EUT was tested in a semi-anechoic chamber with the turntable set 3m from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Emissions. The EUT was tested by rotating it 360 degrees with the antenna in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure that the signal levels were maximized. All cable and antenna correction factors were input into the spectrum analyzer ensuring an accurate measurement in ERP/EIRP with the resultant power in dBm. A signal generator was used to provide a CW signal centered in each operational uplink and downlink band. The EUT output was terminated into a 50 Ohm non-radiating load.

The following formula was used for calculating the limits:

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

P1 = power in dBm

P2 = power in Watts



Uplink Test Results

824 - 849 MHz Band 836.5 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
1673	-52.5	-13	Pass
2509.5	-49	-13	Pass
3346	-43	-13	Pass

1850 - 1910 MHz Band 1880 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
3760	-44.1	-13	Pass
5640	-39.5	-13	Pass
7520	-39.8	-13	Pass

Downlink Test Results

869 - 894 MHz Band 881.5 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
1763	-52	-13	Pass
2644.5	-48.4	-13	Pass

1930 - 1990 MHz Band 1960 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
3920	-45.01	-13	Pass
5880	-37.97	-13	Pass
7840	-33.5	-13	Pass

No other emissions were detected. All emissions were lower than -13 dBm.
 All emissions were system noise floor.

Test Equipment Utilized

Description	Manufacturer	Model #	CT Asset #	Last Cal Date	Cal Due Date
Horn Antenna	EMCO	3115	i00103	12/11/12	12/11/14
Bilog Antenna	Schaffner	CBL6111C	i00267	2/24/14	2/24/15
Humidity / Temp Meter	Newport	IBTHX-W-5	i00282	3/24/14	3/24/15
Voltmeter	Fluke	75III	i00320	3/24/14	3/24/15
EMI Analyzer	Agilent	E7405A	i00379	1/14/14	1/14/15
Spectrum Analyzer	Tektronix	RSA5126A	i00424	9/22/13	9/22/14
Signal Generator	Rohde & Schwarz	SMU200A	i00405	12/11/13	12/11/14

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT

Test Setup Photos
FCC ID: OWWF20E-CP

RF Conducted #1



RF Conducted #2

