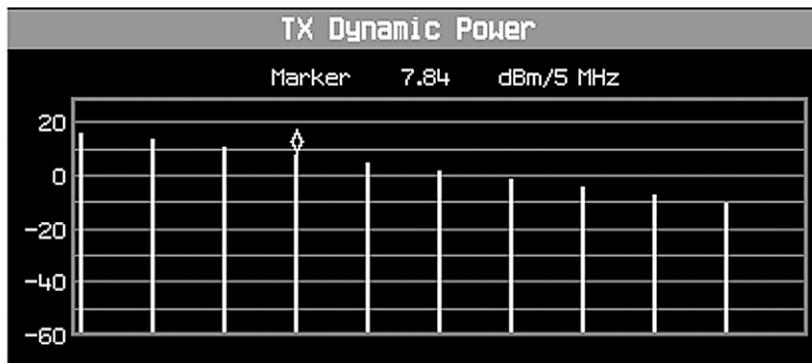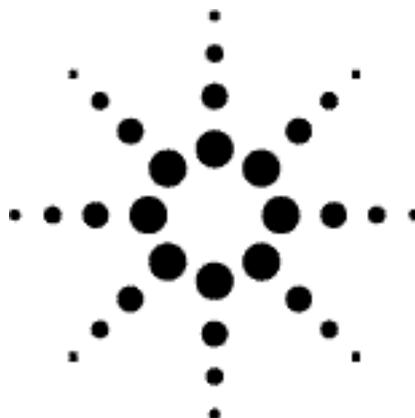# Performing W-CDMA Tx Dynamic Power Measurements Using the Agilent 8960 Wireless Communications Test Set

Product Note

TX Dynamic Power

Marker   7.84   dBm/5 MHz

Introduction

This paper illustrates how to use the Tx dynamic power measurement in the Agilent 8960 to measure user equipment (UE) power sequences quickly and accurately.

Agilent Technologies

Tx Dynamic Power Measurement Overview

The Tx dynamic power measurement allows you to measure UE output power sequences that step down in power with a fixed step size (–90 to –0.1 dB) and duration (20, 40, or 80 ms.) The UE's output power sequence may span some or all of the measurement's input range of –61 to +28 dBm, in up to 99 steps.

To use the measurement, you must first set **Measurement Frequency** to the expected UE transmitter frequency. You must also set **Power Control** to **Manual** and set **Manual Power** to the initial transmit power of the UE's power sequence to properly range the test set's receiver.

You must specify the **Power Step Size, Power Step Time**, and **Number of Power Steps** in the UE's power sequence.

The UE must trigger the measurement with a positive change in power from 20 dB below the initial transmit power. To ensure successful triggering, it is recommended that you first order the UE to transmit continuously at the initial transmit power level, initiate the measurement, then order the UE to drop and then raise its output power by more than 20 dB to create the RF rise trigger. See Figure 1.
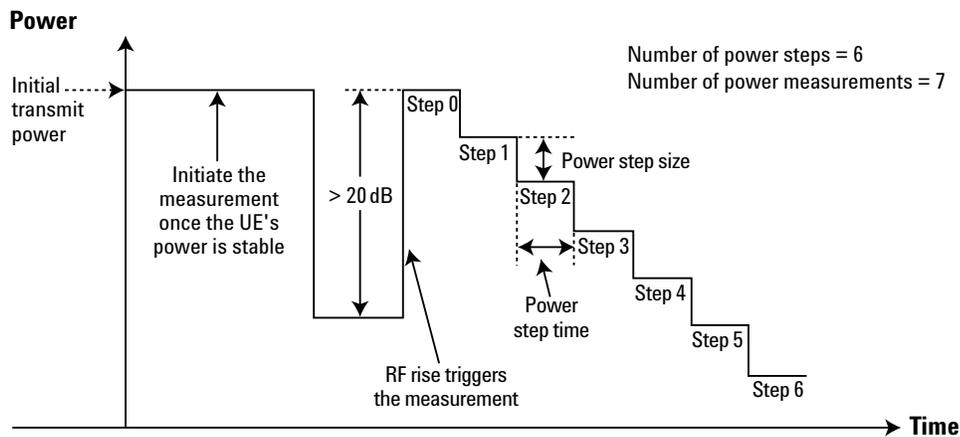

Figure 1. Tx dynamic power triggering

Once triggered, the Tx dynamic power measurement performs a series of channel power measurements; one at each step of the power sequence. Before measuring the power level of step 0, the test set tunes its receiver according to the **Manual Power** setting. The test set then tunes its receiver to the proper level before performing each subsequent channel power measurement based on the **Power Step Size** setting and the measured power of the prior step. (This allows the measurement to track UEs that do not correctly decrease power according to the **Power Step Size** setting.) The UE must step its power down and then hold its power constant for each step in the test sequence. (The step duration is determined by **Power Step Time**.) After completing a measurement at each of the requested power steps (based on the **Number of Power Steps** setting), the test set returns power results for the initial UE transmit power (step 0), and for each of the steps. See Figure 1.

Tx Dynamic Power Measurement Example

This section illustrates how to configure the Tx dynamic power measurement to measure the example power sequence pictured in Figure 2.

Test set settings
Measurement Timeout = 10 s
Power Control = Manual
Manual Power = 12 dBm
Measurement Frequency = 1900 MHz
Power Step Size = –3 dB
Number of Power Steps = 9
Power Step Time = 20 ms

Remote commands
```
SETup:WTDPower:TIMeout 10
RFANalyzer:CONTrol:POWer:AUTO OFF
RFANalyzer:MANual:POWer 12
RFANalyzer:MANual:MEAS 1900 MHZ
SETup:WTDPower:STEP –3
SETup:WTDPower:STEP:COUNt 9
SETup:WTDPower:STEP:TIME MS20
INITiate:WTDPower
  "Command the UE to trigger
   the measurement"
  "and begin its step down
   power sequence"
FETCh:WTDPower:COUNt?
FETCh:WTDPower?
```
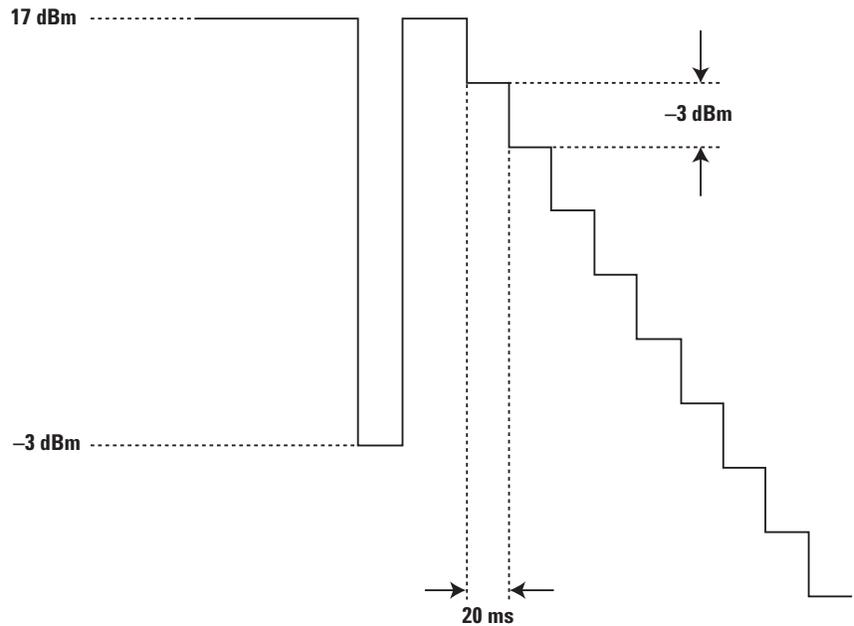
Figure 2. Example UE power sequence
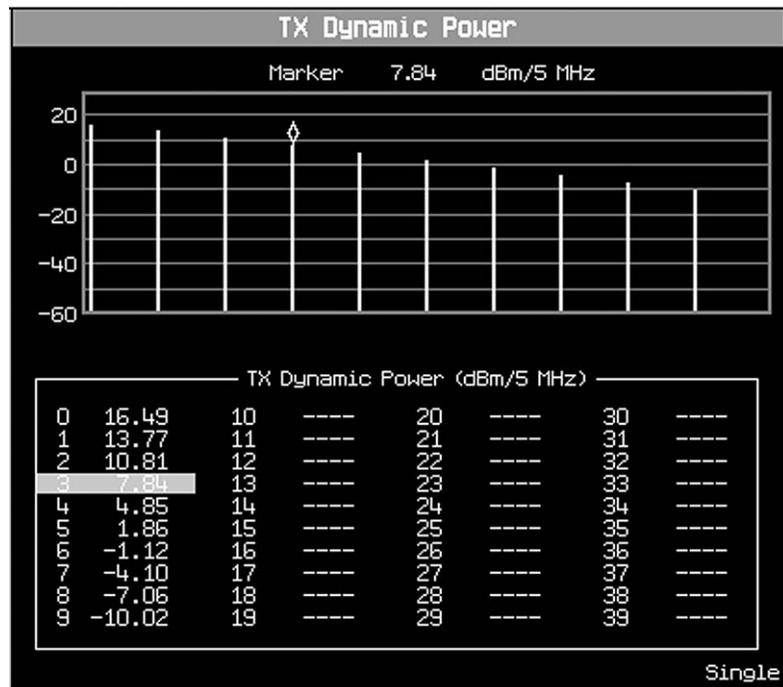
Figure 3. Tx dynamic power measurement result

Operating Considerations

The Tx dynamic power measurement must re-range and re-trigger for every step in the UE's power sequence. To ensure that this process is not interrupted by other operations, it is recommended that you not send any GPIB commands to the test set or press any front panel keys until the measurement has completed. If the measurement misses a trigger, it aborts and returns integrity indicator 30: **Missed Trigger.**

The Tx dynamic power measurement is available in all operating modes. However, it is assumed that the call status is idle as the UE must be operating in a test mode to transmit the required power sequence.

The number of power results returned by the measurement is always 1 + **Number of Power Steps**.

Conclusion

The Tx dynamic power measurement in the 8960 provides fast and accurate power measurements over a wide dynamic range to aid in the calibration of your UE.

For additional information on the Tx dynamic power measurement, see **http://wireless.agilent.com/rfcomms/refdocs/wcdma/wcdma_meas_wtdpower_desc.php**

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