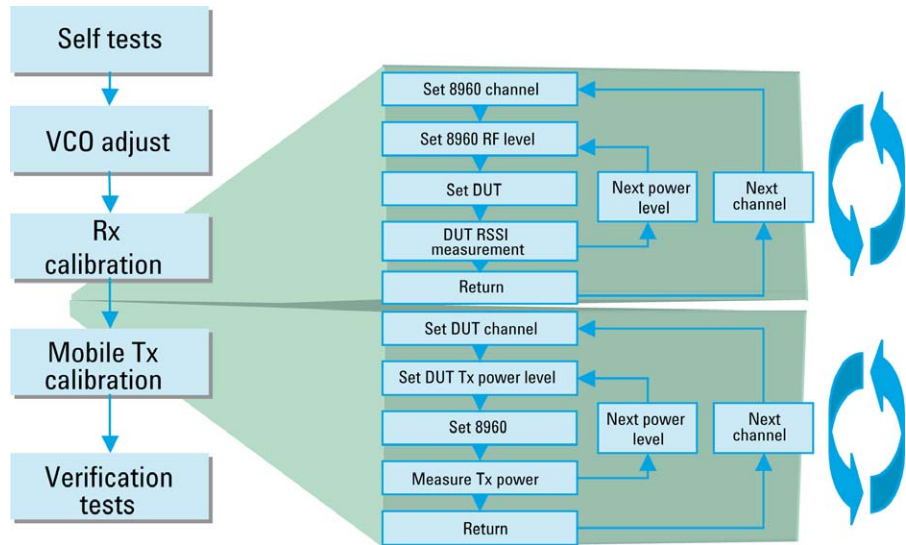


Agilent E1999A-202 Enhanced Fast Device Tune

For use with the 8960 Series 10 (E5515C)
Wireless Communications Test Set

Product Overview



Reduce wireless device calibration test time by an order of magnitude

If you've been searching for a faster calibration method to reduce the manufacturing test time of wireless devices and decrease the cost of test, consider this: the E1999A-201 and the E1999A-202 are software options for the E5515C test set, offering wireless device calibration test times that are an order of magnitude faster than traditional methods.

E1999A-201 is a companion application that augments Agilent's GSM/GPRS, W-CDMA, cdma2000®, and 1xEV-DO test applications and is designed to reduce manufacturing test times of wireless devices by minimizing calibration time, without compromising quality or measurement accuracy.

E1999A-202 is a superset of E1999A-201. It not only offers the equivalent capabilities of E1999A-201, but also further enhanced to reduce the calibration test times for the W-CDMA, cdma2000 and 1xEV-DO wireless devices with smaller step size supported (10 ms step size versus 20 ms step size). There is no change for the GSM/GPRS/EGPRS calibration.

For example, a typical W-CDMA device calibration using Fast Device Tune can be completed in 14~15 seconds with 20ms step size and in 8~9 seconds with 10ms step size.

The Fast Device Tune measurement allows the simultaneous calibration of wireless device's transmitter output power and receiver input level across level and frequency in a single sweep per frequency band. With a wireless device in test mode, the user forces the device to transmit a predefined series of power steps at various uplink frequencies, and forces the device to simultaneously tune its receiver to perform measurement, such as RSSI, of the test set's signal at various downlink frequencies and power levels.

Features and Benefits

- Multiple technologies available with one license
 - » Available for GSM/GPRS/EGPRS, W-CDMA, cdma2000, and 1xEV-DO
- Slashes calibration time
 - » Can reduce W-CDMA, cdma2000, or 1xEV-DO device calibration times by 10x (if using E1999A-201) or 18x (if using E1999A-202) typically, compared with "traditional" calibration methods
 - » Can reduce GSM/GPRS device calibration times by 6x typically compared with "traditional" calibration methods (there is no difference between E1999A-201 and E1999A-202 for GSM/GPRS/EGPRS)
- Reduces manufacturing costs per wireless device by reducing manufacturing test time
- Supports the leading chipsets/approved by leading chipset manufacturers

Measurement Overview

Fast Device Tune measurement is performed with the phone in test mode. This requires chipset support of the software to cause the phone to output and receive at a series of frequencies and levels.

W-CDMA, cdma2000, and 1xEV-DO Device Measurement

For W-CDMA, cdma2000, and 1xEV-DO wireless devices, Fast Device Tune functionality is based on up to 400 steps, of 20 ms or 10 ms duration per step. The power step level can span the entire range of the measurement's input (-61 dBm to +28 dBm). The levels can step up or down, but the power level change between any two adjacent power steps should be no more than 20 dB (for 20 ms duration) and no more than 10 dB (for 10 ms duration). Note that the first step in the sequence should provide a 20 dB rise to trigger the measurement. The device may transmit the same power sequence at up to 20 frequencies in a single sweep (one sweep per band).

The phone's receiver power step sequence must include the same number of power steps as the transmitter's power step sequence. These steps can be at any power level in the test set's cell power output range. While the test set is measuring the device's transmitter power sequence, it also transmits a power sequence for the device to measure (such as determining RSSI). The receive power step sequence does not have to be in the same frequency band as the transmitter power step sequence. No other measurement can be running on the test set when Fast Device Tune measurement is performed.

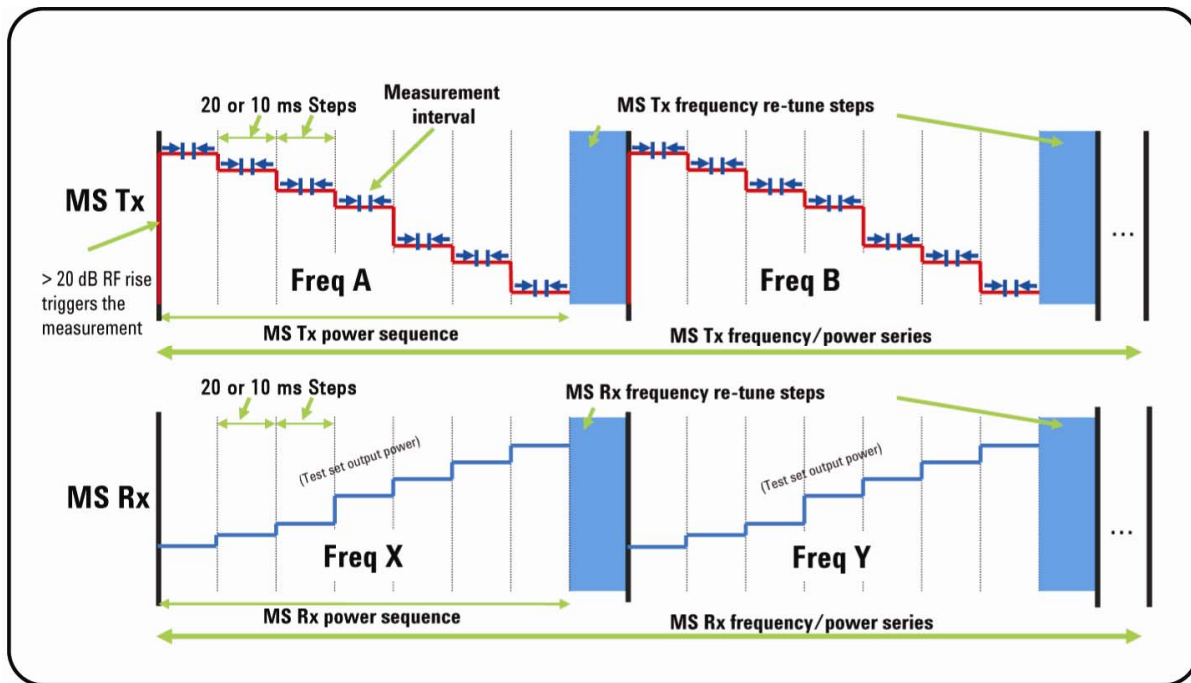


Figure 1: W-CDMA/cdma2000/1xEV-DO Fast Device Tune

GSM/GPRS/EGPRS Fast Device Tune

For GSM/GPRS/EGPRS, Fast Device Tune is based on GSM burst and frame structure.

For RX calibration, 6 timeslots can be used within a frame. These timeslots can be set to 4 different power levels. For receiver testing, the first several frames are used for synchronization (FCH for Frequency Synchronization, SCH for Time Synchronization), and subsequent timeslots are used to send different levels to the device. Each GSM frame can be retuned to a new frequency, and once the frequency and power profile are complete, it can be redone at a new band. For TX calibration, you can configure the mobile station to send up to 7 uplink bursts in one TDMA frame. The TXP measurement is able to simultaneously measure the 7 uplink bursts with a single capture on a TDMA frame. Both GMSK (GSM/GPRS) and 8PSK (EGPRS) signals can be measured.

GSM/GPRS/EGPRS Fast Device Tune uses test sequences, DTS (downlink Test Sequence) and UTS (uplink Test Sequence) to implement phone calibration. A DTS is comprised of a series of Downlink Sequence Steps (DSS) where each sequence step corresponds to one or more downlink TDMA frames. Many parameters, such as Frequency, number of active bursts, burst power level, burst type and repeat count number can be set to configure the DTS. The maximum number of steps per DTS is 50. The repeat count for any DSS can be up to 1000 times. Similarly, An UTS is comprised of a series of Uplink Sequence Steps (USS). Each sequence step corresponds to a measurement make over a number of TDMA frames. The mobile station must output the correct number of TDMA frames for each USS. The maximum number of active bursts in Fast Device Tune operating mode allowed per uplink TDMA frame is 7. The maximum number of steps per UTS is 50.

GSM/GPRS/EGPRS Fast Device Tune requires a chipset that can generate the expected waveform, and a test mode by the manufacturer to control the chipset as well as the 8960.

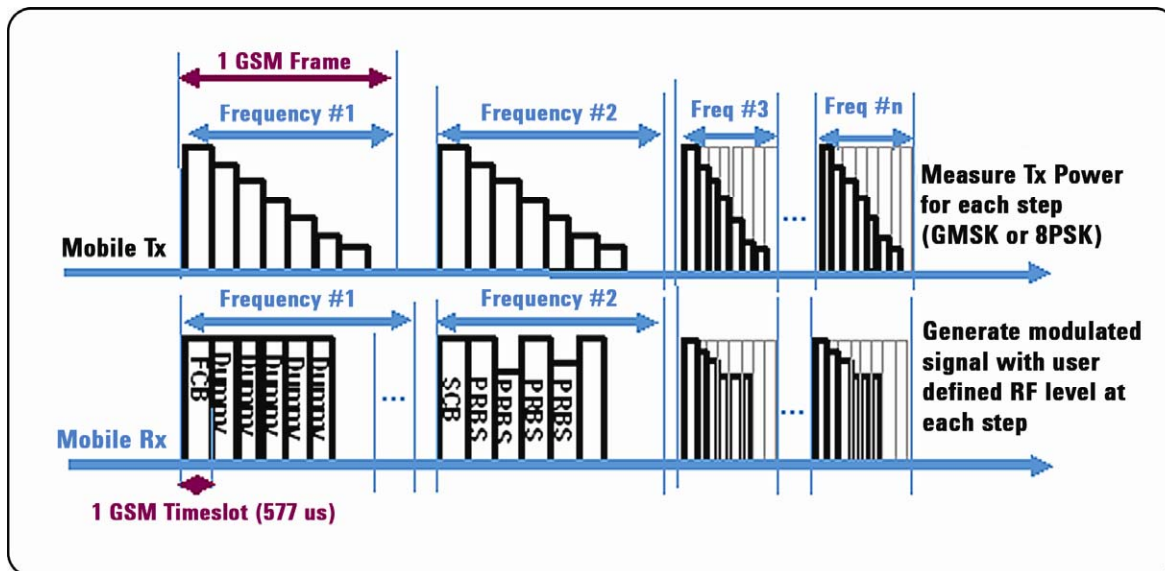


Figure 2: GSM/GPRS/EGPRS Fast Device Tune

Specifications

Fast Device Tune W-CDMA

Measurement bandwidth	5 MHz (RRC filter off)
Measurement interval	667 μ s
Measurement range	-61 to +28 dBm
Output power range	-109 to -15 dBm
Measurement accuracy	$<\pm 1.1$ dB for all bands
Frequency band support	Bands 1-11

Fast Device Tune cdma2000/1xEV-DO

Measurement bandwidth	1.23 MHz
Measurement interval	313 μ s
Measurement range	-61 to +30 dBm
Output power range	-109 to -15 dBm
Measurement accuracy	$<\pm 1.1$ dB for all bands
Frequency band support	US Cellular and PCS, Secondary 800, Japan CDMA, Korean PCS, IMT-2000, NMT-450, China Cellular and Cellular Upper 700 MHz

Fast Device Tune GSM/GPRS/EGPRS

Minimum input Level	-14 dBm for first burst, -25 dBm for 2 nd to 7 th burst
Measurement bandwidth	200K
Measurement interval	577us
Output power range	-110 to -13 dBm
Measurement accuracy	<0.87 dB for all bands
Frequency band support	All GSM bands

Ordering Information

Product	Description
8960 with W-CDMA and Fast Device Tune	
E5515C	Wireless communications test set
E5515C-002	Second RF source for GSM ¹
E5515C-003	CDMA radio link
E1963A	W-CDMA test application
E1999A-202	Enhanced Fast Device Tune measurement
8960 with cdma2000 and Fast Device Tune	
E5515C	Wireless communications test set
E5515C-002	Second RF source for GSM ²
E5515C-003	CDMA radio link
E1962B	cdma2000 test application
E1999A-202	Enhanced Fast Device Tune measurement
8960 with 1xEV-DO and Fast Device Tune	
E5515C	Wireless communications test set
E5515C-002	Second RF source for GSM ²
E5515C-003	CDMA radio link
E1966A	1xEV-DO test application
E1999A-202	Enhanced Fast Device Tune measurement
8960 with GSM/GPRS/EGPRS and Fast Device Tune	
E5515C	Wireless communications test set
E5515C-002	Second RF source for GSM ²
E1968A	GSM/GPRS/EGPRS test application
E1999A-202	Enhanced Fast Device Tune measurement

Licensing

E1999A-202 operates with implemented and newly-ordered GSM/GPRS, W-CDMA, cdma2000, and 1xEV-DO test applications and requires a separate license.

E1999A-202 Enhanced Fast Device Tune measurement

For More Information

Click on “New 8960 with Fast Device Tune Capability” at www.agilent.com/find/8960news

¹ The second RF source is recommended for future inclusion of GSM capability on the test set to meet full UMTS testing needs.

² The second RF source is recommended for future inclusion of UMTS capability on the test set for full multi-technology capability.



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Revised: July 17, 2008

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Printed in USA, July 25, 2008
5989-5064EN



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