

FAST – Fully Automated System Test for WCDMA

FAST System Overview

FAST is a product development test system which will save your organization time and money helping you bring complex 2G and 3G products through compliance and into manufacture much faster and with greater reliability.

FAST for WCDMA is a Test Platform for automatic verification of air interface performance of 3G products with reference to 3GPP specifications, TS 25.141 sections 6 & 7. Product development is shortened dramatically and products can be tested thoroughly prior to compliance testing. The system frees up engineers from hours of repetitive testing enabling more productive and creative work to be under-taken.



Product Features

Some of the key features of FAST are:

- Automated pre-compliance testing over frequency, supply voltage and temperature*
- Designed for easy interface to customer's UUT
- Optimised to minimise test sequence execution times
- Database for storage and post-processing of results
- Automatic document generation
- Results displayed in graphical and tabular form
- Drivers for all common test equipment
- Easy to setup with Benetel's integrated Test Set
- One test system adaptable to a range of wireless standards
 - UMTS (W-CDMA, HSPA, HSPA+)
 - CDMA2000 (1xEV-DO)
 - TD-SCDMA

WCDMA Test Cases Supported

The WCDMA version of FAST covers Section 6, Transmitter, and Section 7, Receiver characteristics of 3GPP TS 25.141 Base Station (BS) conformance testing (FDD).

Section 6 Transmitter

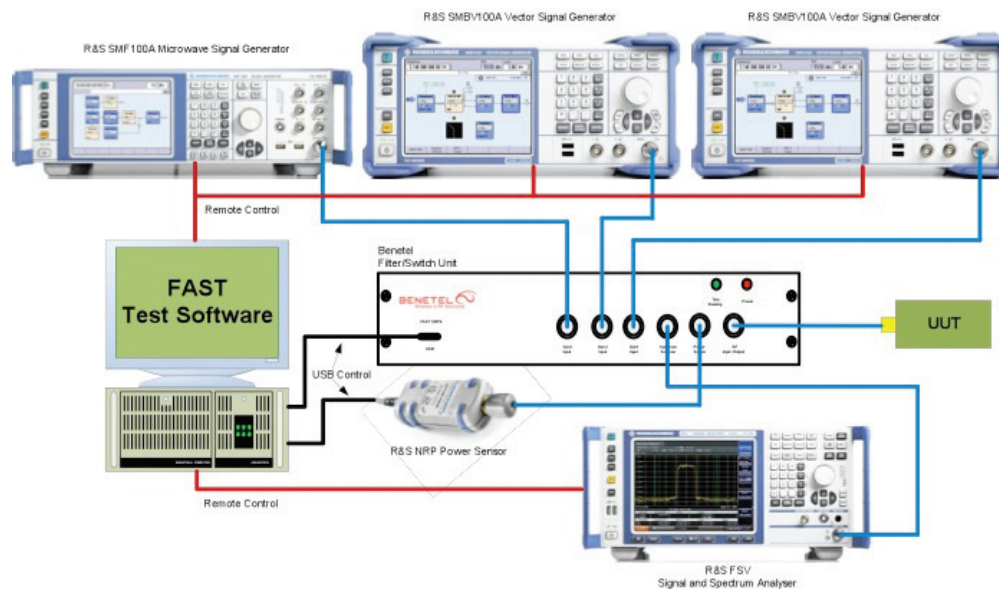
- 6.2 Base station output power
- 6.3 Frequency error
- 6.4 Output power dynamics
- 6.5 Output RF spectrum emissions
- 6.6 Transmit inter-modulation
- 6.7 Transmit modulation

Section 7 Receiver

- 7.2 Reference sensitivity level
- 7.3 Dynamic range
- 7.4 Adjacent Channel Selectivity (ACS)
- 7.5 Blocking tests
- 7.6 Inter-modulation characteristics
- 7.7 Spurious emissions

Test Configuration

The FAST system consists of test software, which controls the test instruments and provides test sequencing, and a FAST Test Set, BTL-FAST HW-001A, which has been designed to provide the necessary filtering for each test. The FAST Test Set contains a series of filter banks which are switched in and out of the RF chain as required enabling even blocking tests to be automated. A schematic of the test set-up is illustrated below.



The standard WCDMA FAST system can be configured by the end user to provide control of their product, while the reference system is configured to control a Femtocell reference design from PicoChip.

A typical FAST setup will control the following instruments:-

- 1 x RF Power Sensor
- 1 x Spectrum Analyzer
- 3 x Signal generators (wanted WCDMA, 2 interferer sources)
- Any PSU which is IVI compatible
- FAST Test Shelf
- Industrial PC

For a FAST system, Benetel will supply the following:

- FAST Test Set box, BTL-FAST HW-001A
- Industrial PC

Customer inputs required by Benetel are:

- List of equipment that customer wants to use in FAST set-up
- UUT interface requirements

Recommended Test Equipment

FAST is compatible with all major test instruments. Our standard recommendation utilises Rhode & Schwarz test equipment which offer industry leading test speeds and are future proofed being multi-standard test instruments. A full equipment spec. is available from R&S® and Benetel.



R&S®SMBV100A Vector Signal Generator



R&S®FSV signal and spectrum analyzer



R&S®SMF100A microwave signal generator



R&S®NRP-Z11 power sensor

Graphical User Interface

FAST has an intuitive GUI in which the user has control of the tests undertaken and the test limits.

The GUI is extremely flexible allowing the option of testing bands 1, 2 and 5 and between 1 and 5 defined test channels. For example, the user may choose to test one frequency and one test (e.g. ACP) or all 5 frequencies and all tests or any subset in between. Another useful way in which to employ the software is to change test limits from 3G limits to device verification test limits enabling FAST to be used for stress testing a product in development.

Results Database

FAST is also supplied with Benetel's FAST Database (BTL-DB-002), which allows easy analysis of all results for a single unit or multiple units. In addition, the results database has the ability to generate a "customer-defined" Test Report at the push of a button.

This report is structured to meet the needs of:

- Pre-Compliance test
- Quality audits e.g. ISO9001
- External Customer audits

In Summary - FAST Key Benefits

- Reduction in Design Verification Test times compared to manual test execution
- Increased Efficiency - Design Engineers can concentrate on problem solving activities rather than test execution and documentation
- Improved Product Quality:
 - More units tested and more tests executed.
 - More time to find and resolve issues during the design phase
 - Impact of new software releases
- Greater Use of Capital Equipment - FAST can run 24/7
- Test New Product Software Upgrades - new product software upgrades can be tested by FAST to ensure no degradation in performance
- Automatic Results Documentation
- Faster Product Time to Market
- One Test Platform for multiple standards

About Benetel

Benetel are wireless test experts with in-house RF and wireless design expertise. We follow emerging wireless standards and team up with technology innovators in order to supply test expertise for all stages of the product life cycle, from R&D to mass production. We aim to provide world beating RF test times in all that we do. Benetel has developed innovative test solutions in a variety of wireless application areas including:

3G Basestation	GSM
3G Mobile	Bluetooth
GPS Receivers	RF IC Design Evaluation
Antennas	Automotive Radar
Short Range Devices	Keyless Entry Systems

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BenetelTM
We know wireless