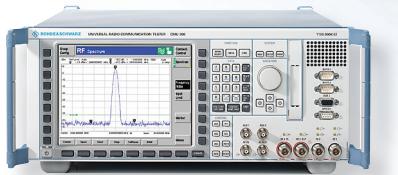


Selected products



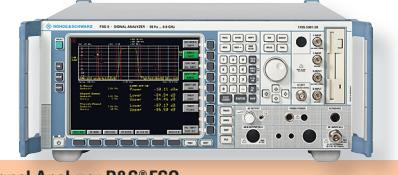
Universal Radio Communication Tester R&S®CMU 300

- ◆ HSDPA functionality with option R&S®CMU-K79
- ◆ Compact base station test platform
- ◆ High-speed testing in production and R&D (regression testing)
- ◆ Realtime layer 1 handling (coding / decoding) in R&D
- ◆ Comprehensive spectrum analyzer and signal generator



Universal Radio Communication Tester R&S®CMU 200

- ◆ HSDPA functionality with option R&S®CMU-K64
- ◆ Multiprotocol mobile station test platform supporting all major 2G/3G standards as well as *Bluetooth*®
- ◆ Only solution currently available that meets the requirements of acoustic measurements for 3GPP and 3GPP2
- ◆ Optimized for production and R&D; high-speed testing, excellent accuracy and extraordinary flexibility



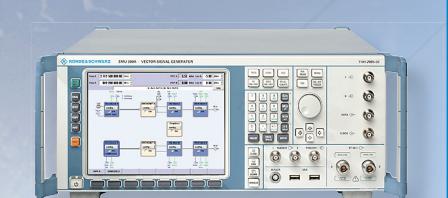
Signal Analyzer R&S®FSQ

- ◆ HSDPA functionality with option R&S®FS-K74
- ◆ Supports all 3G standards
- ◆ Multicarrier-capable code domain analyzer
- ◆ High-performance spectrum analyzer
- ◆ High-speed vector signal analyzer
- ◆ Excellent dynamic range



RF Test Systems R&S®TS 8950/52 GW

- ◆ Fully validated conformance test system
- ◆ Precertification solution (R&S®TS 8955 GW)
- ◆ 3GPP WCDMA FDD1 + FDD2
- ◆ GSM Quad Band GSM850, GSM900, GSM1800, GSM1900
- ◆ GSM Circuit Switched, GPRS, EGPRS, AMR
- ◆ Scalable solutions from benchtop setups to fully integrated high-accuracy test racks
- ◆ Further frequency bands possible



Vector Signal Generator R&S®SMU 200 A

- ◆ HSDPA functionality with option R&S®SMU-K43
- ◆ Up to two complete generators in one unit
- ◆ Unrivaled flexibility with four realtime code channels
- ◆ Very short frequency setting times
- ◆ Electronic attenuator up to 6 GHz
- ◆ Intuitive user interface with graphical display of signal flow
- ◆ Fading simulation with up to 40 paths



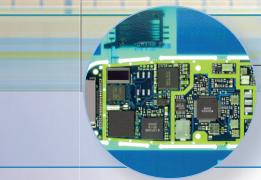
Vector Network Analyzer R&S®ZVB

- ◆ Network analyzer with up to four test ports for multiport and balanced measurements
- ◆ Frequency range from 300 kHz to 8 GHz
- ◆ High dynamic range (>123 dB) and fast sweep speed
- ◆ Fast data transfer and remote control, optimized for production applications
- ◆ Modern user interface with easy-to-use measurement and calibration wizards



Protocol Tester R&S®CRTU-W for WCDMA/HSDPA

- ◆ HSDPA functionality with option R&S®CRTU-WA02
- ◆ Protocol test system approved by the Global Certification Forum (GCF)
- ◆ Verification of protocol-stack implementation
- ◆ 2G/3G intersystem handover testing
- ◆ Radio resource management verification
- ◆ Application and data testing
- ◆ Flexible programming interface for user-specific and test case scenarios



Chipset and reference design

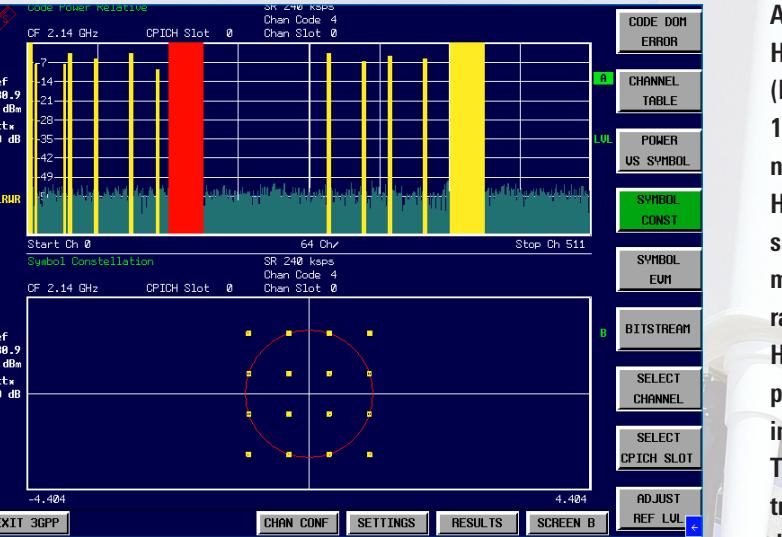
Chipset and reference design

Application	Highlights of our solutions	Recommended products
Development of TRX modules, amplifiers and RF components for Node B and UE	<ul style="list-style-type: none"> • Measurements of RF properties (code domain power, constellation diagram, modulation, etc) • High-performance base station conformance test • Multicarrier and multistandard testing • Easy test setup with two-path signal generator concept • Test model 5 for HSDPA base station testing • Automatic detection of 16QAM or QPSK modulation • Realtime signal generation with integrated noise and fading simulation • Provision of HS-SCCH and HS-(P)DSCH channels • Flexible uplink HS-DPCCH generation 	R&S®FSMU Base station tester (two-box solution) R&S®FSP General-purpose spectrum analyzer R&S®FSQ High-end vector signal analyzer R&S®FSU High-end spectrum analyzer R&S®NRP Power meter R&S®SMU 200 A High-end vector signal generator R&S®ZVB Fast vector network analyzer R&S®ZVR Vector network analyzer, intermodulation and mixer measurements
Layer 1 engine development and verification	<ul style="list-style-type: none"> • HSDPA performance test • Provision of HS-SCCH and HS-(P)DSCH channels • HSDPA fixed reference channels (H sets) • Parametrization of physical, transport and coded composite transport channels • Realtime signal generation with integrated noise and fading simulation • Throughput evaluation • Adaptive modulation and coding • Retransmission protocol evaluation (HARQ) • Compressed mode configuration • Support of TX diversity modes • Uplink transport channel logging 	R&S®CMU 200 Universal radio communication tester (UE) R&S®CMU 300 Universal radio communication tester (Node B) R&S®L1 Test Software R&S®SMU 200 A High-end vector signal generator R&S®TS 8952 W RF conformance test system for WCDMA receiver tests
Protocol stack development	<ul style="list-style-type: none"> • Verification and optimization of HSDPA protocol stack implementation • Official tree and tabular combined notation (ITCN) test cases and support • Customer-specific test scenarios • Example scenarios and reference test cases • Interoperability tests • Application testing • 2G/3G intersystem test 	R&S®CRTU-W/M WCDMA and HSDPA protocol tester R&S®CRTU-W/M and R&S®CRTU-G/S 2G/3G intersystem test solution R&S®Medium Level C++ Application programming interface R&S®RIT Reference in-house testing
Proof of design, quality assurance, validation, regression testing	<ul style="list-style-type: none"> • RF conformance tests • Measurements of RF properties • Protocol verification • RRM test 	R&S®CMU 200 Universal radio communication tester (UE) R&S®CMU 300 Universal radio communication tester (Node B) R&S®CRTU-RRM Radio resource management test system R&S®CRTU-W/M WCDMA and HSDPA protocol tester R&S®FSMU Base station tester (two-box solution) R&S®TS 8950 W RF conformance test system for WCDMA receiver tests R&S®TS 8952 W RF conformance test system for WCDMA receiver tests
Application testing	<ul style="list-style-type: none"> • Data end-to-end testing • IP application testing 	R&S®CRTU-W WCDMA and HSDPA protocol tester

UE and Node B development and verification

Application	Highlights of our solutions	Recommended products
Radiocommunications testing for UE	<ul style="list-style-type: none"> • Measurements of RF properties (code domain power, constellation diagram, modulation, etc) • HSDPA performance test • Provision of HS-SCCH and HS-(P)DSCH channels • HSDPA fixed reference channels (H sets) • Throughput evaluation • Adaptive modulation and coding • Retransmission protocol evaluation (HARQ) • Realtime signal generation with integrated noise and fading simulation 	R&S®CMU 200 Universal radio communication tester (UE) R&S®FSP General-purpose spectrum analyzer R&S®FSQ High-end vector signal analyzer R&S®FSU High-end spectrum analyzer R&S®SMU 200 A High-end vector signal generator
Radiocommunications testing for Node B	<ul style="list-style-type: none"> • Measurements of RF properties (code domain power, constellation diagram, modulation, etc.) • HSDPA performance test • Time-critical layer 1 signaling procedures • Verification of RF properties in realtime • High-performance base station conformance test • Realtime signal generation with integrated noise and fading simulation • Uplink HS-DPCCH detection 	R&S®CMU 300 Universal radio communication tester (Node B) R&S®FSMU Base station tester (two-box solution) R&S®FSP General-purpose spectrum analyzer R&S®FSQ High-end vector signal analyzer R&S®FSU High-end spectrum analyzer R&S®SMU 200 A High-end vector signal generator
Protocol testing	<ul style="list-style-type: none"> • Verification and optimization of HSDPA protocol stack implementation • Official tree and tabular combined notation (ITCN) test cases and support • Customer-specific test scenarios • Example scenarios and reference test cases • Interoperability tests • Application testing • 2G/3G intersystem test 	R&S®CRTU-W/M WCDMA and HSDPA protocol tester R&S®CRTU-W/M and R&S®CRTU-G/S 2G/3G intersystem test solution R&S®Medium Level C++ Application programming interface R&S®RIT Reference in-house testing
Proof of design, quality assurance, validation, regression testing	<ul style="list-style-type: none"> • RF conformance tests • Measurements of RF properties • Protocol verification • RRM test 	R&S®CMU 200 Universal radio communication tester (UE) R&S®CMU 300 Universal radio communication tester (Node B) R&S®CRTU-RRM Radio resource management test system R&S®CRTU-W/M WCDMA and HSDPA protocol tester R&S®FSMU Base station tester (two-box solution) R&S®TS 8950 W RF conformance test system for WCDMA receiver tests R&S®TS 8952 W RF conformance test system for WCDMA receiver tests
Application testing	<ul style="list-style-type: none"> • Data end-to-end testing • IP application testing 	R&S®CRTU-W WCDMA and HSDPA protocol tester

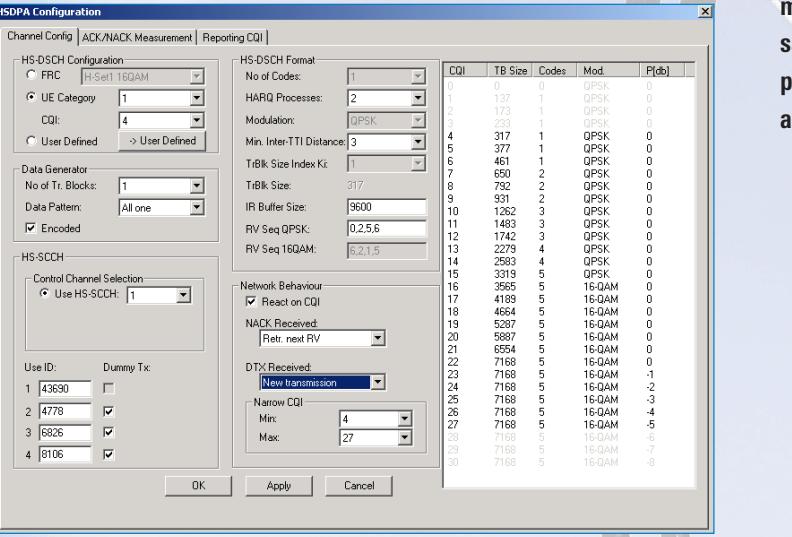
T&M solutions for 3GPP HSDPA



As a UMTS 3GPP release 5 feature, High Speed Downlink Packet Access (HSDPA) yields data rates up to 14 Mbps and boosts capacity in 3G networks.

HSDPA demands dedicated T&M solutions. Physical values must be measured with unprecedented accuracy and dynamic range, and the new HSDPA-specific layer 1 processes and protocol mechanisms must be verified in detail.

The Rohde & Schwarz product spectrum provides you with optimum tools during the development and validation of HSDPA-capable components, mobile phones and base stations. Our sales engineers will gladly help you put together a custom-tailored package that precisely meets your needs.



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Test and measurement solutions for 3GPP HSDPA

An application-oriented product guide for

- ◆ Chipset and reference design
- ◆ UE and Node B development and verification