

# Expand your options

## Test solutions for WCDMA/HSPA

- | HSPA
- | LTE
- | WiMAX
- | MIMO



**75** Years of  
Driving  
Innovation



# WCDMA/HSPA

## New technical challenges

UMTS (Universal Mobile Telecommunication System) networks based on wideband code division multiple access (WCDMA) have been widely deployed worldwide. For further performance improvements, UMTS has mapped a clear evolution path to high speed packet access (HSPA). The combination of high speed downlink packet access (HSDPA) and high speed uplink packet access (HSUPA) provides data rates of up to 14 Mbit/s in the downlink and 5.76 Mbit/s in the uplink. HSPA also boosts capacity in UMTS networks and provides significant latency reductions.

To exploit the full potential of WCDMA 5 MHz operation, the performance of HSPA-based radio networks will be further enhanced in terms of spectrum efficiency, peak data rate, and latency. Further enhancements to HSPA are provided by HSPA+, including downlink MIMO operation, higher-order modulation (downlink 64QAM, uplink 16QAM), and protocol improvements. A high number of users that are "always on" can be supported in the network. HSPA+ enables peak data rates of 42 Mbit/s in the downlink and 11 Mbit/s in the uplink with round-trip times below 50 ms.

Rohde & Schwarz offers a complete portfolio of WCDMA/HSPA test and measurement solutions addressing infrastructure equipment, wireless devices, and their components such as power amplifiers. As pioneer in the market with the first one-box radio communication tester for HSPA, Rohde & Schwarz continued this success story by bringing the first signal generator solutions for HSPA+ to market. Signals generated by the R&S®SMU200A and R&S®AMU200A include MIMO precoding and 2x2 MIMO realtime fading, providing manufacturers with an excellent HSPA+ MIMO test solution using only one instrument.

Rohde & Schwarz is your single-source supplier for comprehensive test equipment covering any wireless standard. See brochures on CDMA2000® 1xRTT/1xEV-DO, EDGE, LTE, MIMO, WiMAX, Wireless Connectivity, etc.

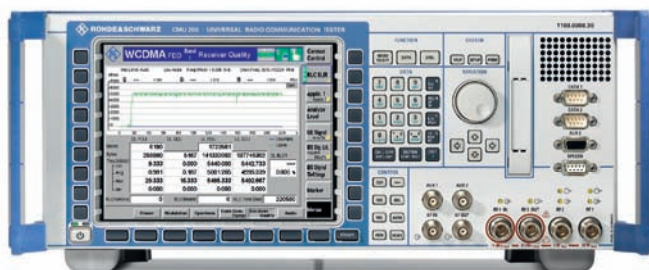
**For further information, please visit:**

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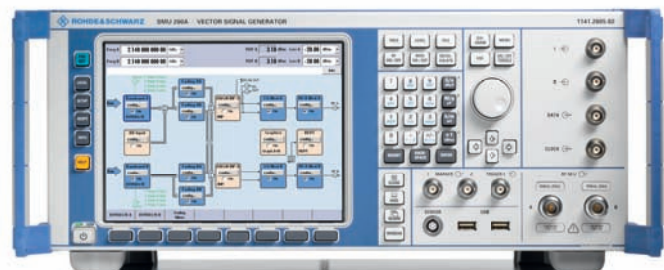
Application notes	
Description	Number
WCDMA/CDMA2000® Intermodulation Calibration for Zero IF Chipsets	1CM54
Synchronous Node B Testing with the R&S®CMU300	1CM58
Optimization of HSDPA Networks with the R&S®CMU300 Radio Communication Tester and R&S®ROMES Coverage Measurement System	1CM60
How to do Measurements with the R&S®CMU200 in Accordance with TS 34.121 in the Presence of the HS-DPCCH	1CM62
Measurement of Adjacent Channel Leakage Power on 3GPP WCDMA Signals with the R&S®FSP	1EF41
Spurious Emission Measurement on 3GPP Base Station Transmitters	1EF45
Tests on 3GPP WCDMA FDD Node Bs in Accordance with Standard TS 25.141	1MA67
Measurements on 3GPP WCDMA User Equipment in Accordance with Standard TS 34.121	1MA68
High Speed Downlink Packet Access (HSDPA) Test and Measurement Requirements	1MA82
HSDPA – Challenges for UE Power Amplifier Design	1MA84
Testing HSDPA UE RX Diversity	1MA87
High Speed Uplink Packet Access (HSUPA) White Paper	1MA94
Introduction to MIMO Systems	1MA102
HSPA+ Technology Introduction	1MA121

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R&S®CMU200



R&S®SMU200A



# Test and measurement solutions for WCDMA/HSPA

Product	Development of RF & baseband	Development of protocol stack	Verification & conformance tests	Production & service	Network deployment & optimization
<b>Wireless communications testers &amp; systems</b>					
R&S®CMU200 radio communication tester	●			●	
R&S®CMU300 radio communication tester for base stations	●			●	
R&S®CRTU protocol testers		●	●		
R&S®TS8991 OTA performance test system			●		
R&S®TS895xGW conformance test systems	●		●		
R&S®TS8996 RSE test system			●		
R&S®TS712x shielded RF test chambers	●			●	
R&S®TS7180 production test system				●	
<b>Spectrum &amp; signal analyzers</b>					
R&S®FSU spectrum analyzer	●		●	●	
R&S®FSQ signal analyzer	●		●	●	
R&S®FSMR measuring receiver	●		●		
R&S®FSUP signal source analyzer	●				
R&S®FMU36 baseband signal analyzer	●				
R&S®FSG spectrum analyzer	●		●	●	
R&S®FSV signal analyzer	●			●	●
R&S®FSP spectrum analyzer	●			●	●
R&S®FSL portable spectrum analyzer	●			●	●
R&S®FSH handheld spectrum analyzer					●
<b>Signal generators</b>					
R&S®SMU200A vector signal generator with optional fading simulator	●		●	●	●
R&S®SMATE200A vector signal generator	●			●	
R&S®SMJ100A vector signal generator	●			●	●
R&S®SMV03 vector signal generator	○			○	
R&S®SMA100A, R&S®SMB100A signal generators	○			○	
R&S®SMF100A microwave signal generator	○			○	
R&S®AMU200A baseband signal generator and fading simulator	●		●	●	
R&S®AFQ100A I/Q modulation generator	●			●	
R&S®AFQ100B I/Q modulation generator	●			●	
<b>Network analyzers</b>					
R&S®ZVx vector network analyzers	○			○	
<b>Drive test tools</b>					
R&S®TSMQ radio network analyzer					●
R&S®TSMU radio network analyzer					●
R&S®TSML radio network analyzer					●
R&S®ROMES coverage measurement software					●
<b>EMC &amp; field strength test solutions</b>					
R&S®TS9975 EMI test system			○		
R&S®TS9982 EMS test system			○		
R&S®IMS integrated measurement system			○		
<b>Power meters</b>					
R&S®NRP power meter	○			○	
R&S®NRP-Z power sensors	○			○	
<b>Audio analyzers</b>					
R&S®UPV audio analyzer	●		●	●	
<b>Modular instruments</b>					
R&S®CompactTSVP production test system				○	
<b>Power supplies</b>					
R&S®NGMO power supply	○			○	
R&S®NGPQ programmable power supply	○			○	

## About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radio-monitoring and radiolocation, as well as secure communications. Established 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

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## Regional contact

Europe, Africa, Middle East  
+49 1805 12 42 42\* or +49 89 4129 137 74  
customersupport@rohde-schwarz.com  
North America  
1-888-TEST-RSA (1-888-837-8772)  
customer.support@rsa.rohde-schwarz.com  
Latin America  
+1-410-910-7988  
customersupport.la@rohde-schwarz.com  
Asia/Pacific  
+65 65 13 04 88  
customersupport.asia@rohde-schwarz.com

## Rohde & Schwarz GmbH & Co. KG

Mühlendorfstraße 15 | 81671 München  
Phone +498941 290 | Fax +498941 29 121 64

[www.rohde-schwarz.com](http://www.rohde-schwarz.com)

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