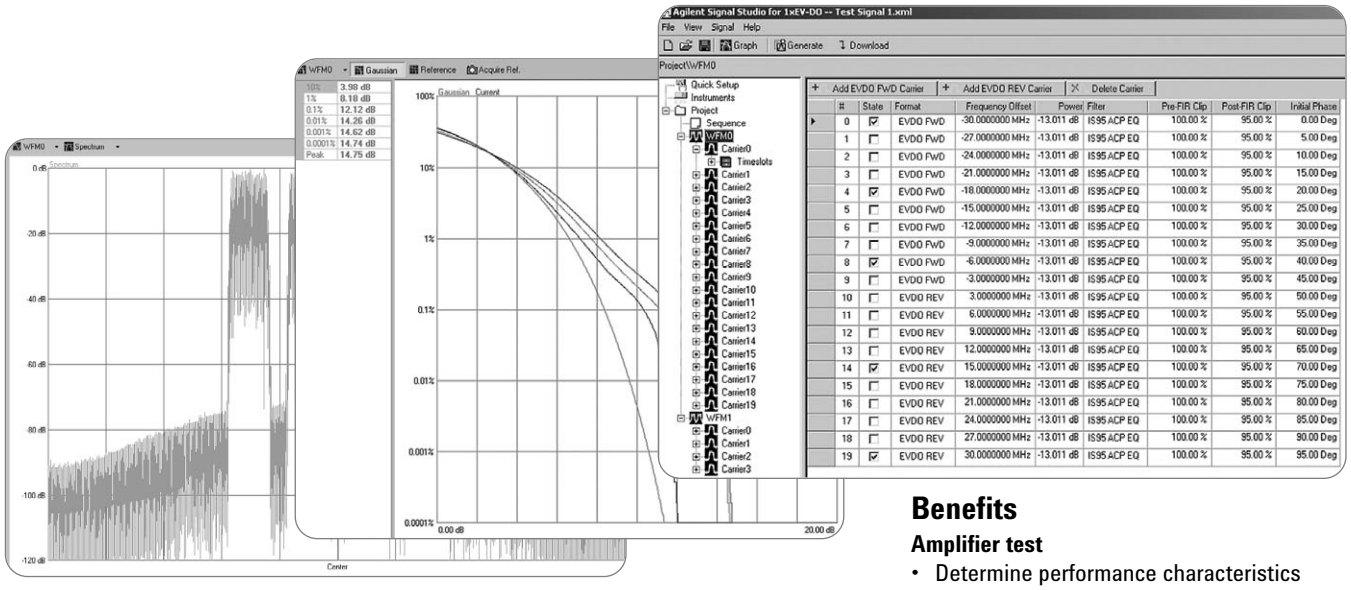
Discontinuance: July 1, 2007

Supported for 1 year after discontinuance date. Download a free replacement, N7601B Signal Studio for 3GPP2 CDMA, from **www.agilent.com/find/signalstudio**.

Agilent Signal Studio for 1xEV-DO E4438C ESG Vector Signal Generator

Option 404
Technical Overview



Test 1xEV-DO Components and Receivers

Signal Studio for 1xEV-DO is a flexible Windows®-based software application for creating single and multicarrier waveforms for use with the E4438C ESG vector signal generator's baseband generator. Two different types of waveforms can be created with this software application: waveforms optimized to test multicarrier power amplifiers (MCPAs) with up to 20 carriers and single-carrier forward link factory test mode (FTM) waveforms. FTM waveforms are fully coded, which enables bit error rate (BER) and packet error rate (PER) tests to be performed.

Build both forward and reverse link I/Q waveforms quickly with Signal Studio's easy-to-use graphical interface. The configured I/Q waveform is downloaded into the E4438C ESG, which automatically begins generating the modulated RF signal.

Main features

- Create up to 20 carriers over a 60 MHz bandwidth to test MCPAs
- Test receivers with fully coded test signals
- Customize waveforms by adjusting various signal parameters from the flexible user interface
- Compare peak-to-average power statistics of signal configurations by plotting up to five different complementary cumulative distribution function (CCDF) curves on one graph
- Reduce the crest factors of individual carriers with pre- or post-FIR filter clipping
- Simulate realistic frame traffic using the built-in sequencing capability
- Select a pre-defined waveform setup or create a customized waveform setup
- Connect and serially download waveforms to up to 10 licensed ESGs via LAN or GPIB

Benefits

Amplifier test

- Determine performance characteristics of 1xEV-DO amplifiers
- Adequately stress components using signals with various power statistics

Receiver test

- Test receivers with fully coded forward link FTM signals that enable PER and BER testing
- Verify receiver sensitivity and demodulation accuracy
- Customize channel configurations in each timeslot to test boundary conditions
- Confirm basic link capability using continuous pilot mode

Try before you buy!

Go to **www.agilent.com/find/signalstudio** and download Signal Studio for 1xEV-DO to your PC to evaluate the waveform creation capabilities by navigating the user interface prior to purchase. Use the built-in Help file to view the user's guide, application information and examples. Each E4438C ESG vector signal generator must be licensed separately in order to generate the signals created by the software.

Agilent Technologies

Signal Studio for 1xEV-DO Features [1]

Forward link	
Pilot channel	Selectable mode: continuous or bursted
MAC channels	
Reverse activity	Data: 0 or 1 Gain relative to pilot: –30 to +30 dB
Reverse power control	Data: 0 or 1 Gain relative to pilot: –30 to +30 dB
Traffic channel	Data bitstream: 0s, 1s, 01s, 10s, PN9, PN15, user file Modulation type: QPSK, 8-PSK, 16-QAM
Idle slot gain	Noise level relative to pilot: 0 to –80 dB
Filter types	None, IS-95 standard, IS-95 std EQ, IS-95 ACP, IS-95 ACP EQ, IS-95-EVM EQ
Oversampling ratio	Valid range: 1, 4, 8, 16, 32, 64
Reverse link	
Pilot channel	Automatically set by software; not adjustable
Reverse rate indicator channel	Data: 0 to 7 Octal
Data rate control channel	Data: 0 to 15 Walsh cover index: 0 to 7 Gain relative to pilot: -30 to +30 dB
Data channel	Data bitstream: 0s, 1s, 01s, 10s, PN9, PN15, user file Data rate: 9.6, 19.2, 38.4, 76.8, 153.6 kbps Encoding rate: 1/4 rate @ 9.6, 19.2, 38.4, 76.8 kbps 1/2 rate @ 153.6 kbps Modulation type: BPSK
I & Q mask (42-bit)	Valid range: 00000000000 to 3FFFFFFFFF
Filter types	None, IS-95 standard, IS-95 std EQ, IS-95 ACP, IS-95 ACP EQ, IS-95-EVM EQ
Oversampling ratio	Valid range: 1, 4, 8, 16, 32, 64
Forward link FTM (factory test mode)	
Pilot channel	PN offset index: 0 to 511
MAC channels	I/Q data: all zeroes
Traffic channels	Number of packets: 1 to 32 Preamble MAC index: 5 to 63 Packet payload: 0s, 1s, 01s, 10s, PN9, PN15, user file Data rate: 38.4, 76.8, 153.6, 307.2, 614.4, 921.6, 1228.8, 1843.2, 2457.6 kbps Encoding rate: 1/5 or 1/3 (automatically set) Modulation types: QPSK, 8-PSK, 16-QAM
Control channel	Data rate: 38.4 and 76.8 kbps
Filter types	Rectangular, root Nyquist, Nyquist, Gaussian, IS-95 standard, IS-95 std EQ, IS-95 ACP, IS-95 ACP EQ, IS-95 EVM EQ
Oversampling ratio	Valid range: 1, 4, 8, 16, 32, 64
Multicarrier configuration for forward and reverse link	
Number of carriers	Range: 1 to 20 carriers
Frequency offset	–30 to 30 MHz, 100 Hz steps
Initial phase offset	0 to 360°, 0.01° steps
Relative power	–40 to 0 dB, 0.01 dB steps
Pre/post FIR filter clipping	10 to 100%, 0.01% steps

1. Features subject to change.

Spurious Emissions Typical Performance

Measurement conditions:

- Amplitude levels are ≤ −5 dBm standard, ≤ −3 dBm for Option 506, and ≤ 0 dBm for Option UNB.
- Filter type is IS-95 ACP EQ.
- Continuous non-idle slots are transmitted per Case 1 (Continuous Data Mode) in section 3.1.2.4.1.2 of standard C.S0032.

Band class 0, carrier frequencies at 870, 871.25, 872.5, and 873.75 MHz

Frequency offsets	Resolution bandwidth	Single carrier emissions [dBc]	Two carrier emissions [dBc]	Three carrier emissions [dBc]	Four carrier emissions [dBc]
750 to 780 kHz	30 kHz	−74	−74	−73	−70
780 kHz to 1.98 MHz	30 kHz	−75	−74	−72	−70
1.98 to 4.00 MHz	30 kHz	−85	−80	−77	−73

Band class 6, carrier frequencies at 2120, 2121.25, 2122.5, and 2123.75 MHz

Frequency offsets	Resolution bandwidth	Single carrier emissions [dBc]	Two carrier emissions [dBc]	Three carrier emissions [dBc]	Four carrier emissions [dBc]
885 kHz to 1.25 MHz	30 kHz	−76	−75	−72	−70
1.25 to 1.98 MHz	30 kHz	−82	−77	−72	−71
1.98 to 2.25 Mhz	30 kHz	−87	−81	−77	−74
2.25 to 4.00 Mhz	1 MHz	−71	−66	−62	−60

Ordering Information

Signal Studio for 1xEV-DO is Option E4438C-404 for the Agilent E4438C ESG vector signal generator.

The Signal Studio software requires that the ESG is equipped with the optional internal baseband generator (E4438C-001, -002, -601, or -602).

Upgrade Kits

If you currently own an E4438C ESG vector signal generator and are interested in obtaining an upgrade kit only (license key), order: E4438CK-404.

Related Literature

E4438C ESG Vector Signal Generator
Data Sheet, 5988-4039EN

Forward Link Measurements for 1xEV-DO Access Networks,
Application Note 1398, 5988-6125EN

Understanding Measurement of 1xEV-DO Access Terminals,
Application Note 1414, 5988-7694EN

Web Addresses

For more information, go to:
www.agilent.com
www.agilent.com/find/esg
www.agilent.com/find/signalstudio

References

Third Generation Partnership Project 2 (3GPP2). Recommended Minimum Performance Standards for cdma2000 High Rate Packet Data Access Network. C.S0032-0 v1.0. December 2001.

Agilent Email Updates

www.agilent.com/find/emailupdates
Get the latest information on the products and applications you select

www.agilent.com

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at:

www.agilent.com/find/contactus

Americas

Canada	(877) 894-4414
Latin America	305 269 7500
United States	(800) 829-4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	81 426 56 7832
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Thailand	1 800 226 008

Europe

Austria	0820 87 44 11
Belgium	32 (0)2 404 93 40
Denmark	45 70 13 15 15
Finland	358 (0)10 855 2100
France	0825 010 700
Germany	01805 24 6333*
	*0.14€/minute
Ireland	1890 924 204
Italy	39 02 92 60 8484
Netherlands	31 (0)20 547 2111
Spain	34 (91)631 3300
Sweden	0200-88 22 55
Switzerland (French)	41 (21)8113811(Opt 2)
Switzerland (German)	0800 80 53 53 (Opt 1)
United Kingdom	44 (0)118 9276201

Other European Countries:
www.agilent.com/find/contactus

Revised: May 7, 2007

Product specifications and descriptions in this document subject to change without notice.

Printed in USA, June 12, 2007
5988-5459EN

Agilent Technologies