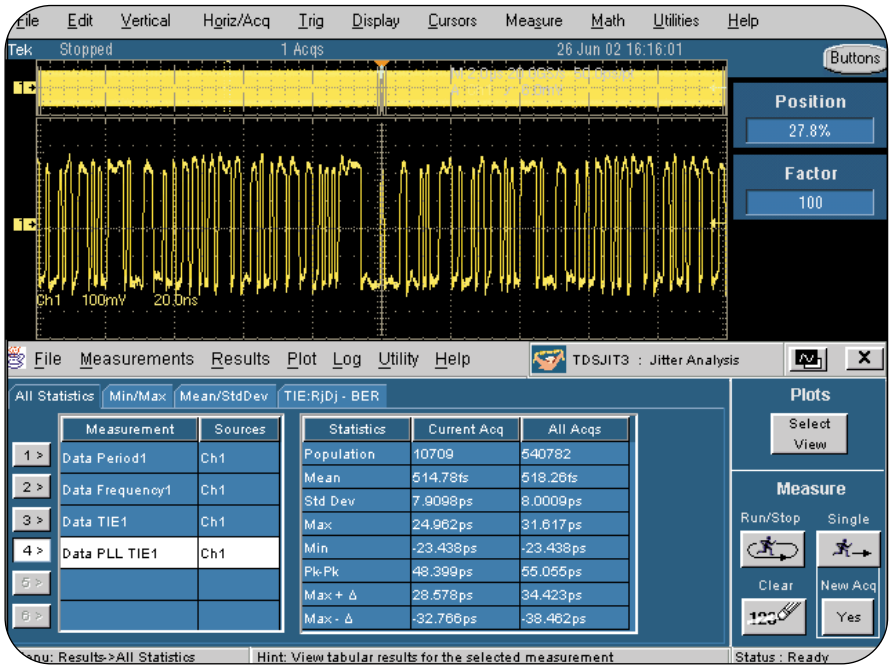
Jitter and Timing Analysis Software

TDSJIT3 and TDSJIT3 Essentials



User-installed, Oscilloscope-resident Timing Analysis Package

TDSJIT3 is the premiere jitter and timing analysis software package available for real-time oscilloscopes. Running within the Tektronix TDS5000, TDS6000, and TDS/CSA7000 Series oscilloscopes, TDSJIT3 provides the highest accuracy and lowest noise jitter measurements available. With comprehensive jitter analysis algorithms, TDSJIT3 simplifies discovering jitter and its related sources in today's high speed digital, communication, and system designs.

Applications

Characterize AC and Timing Performance of High-speed Parallel and Serial Designs and Systems

Characterize Clock to Data Timing and Jitter

Characterize Clock to Data Setup and Hold Timing and Jitter

Characterize PLL Dynamic Performance

Characterize Modulation of Spread Spectrum Clock Circuits

Characterize Clock Recovery Circuits

Characterize Jitter Generation, Transfer and Tolerance

Characterize Clock and Data Jitter in HyperTransport, PCI Express, Fibre Channel, SONET, Serial ATA, and other Electrical or Optical Physical Layer Circuits

Features & Benefits

Acquire, Capture, Store, and Analyze Worst Case Offenders

Analyze Cycle to Cycle Jitter of Every Valid Pulse in a Single-shot Acquisition and Multiple Acquisitions Over Contiguous Clock Cycles

View Comprehensive Statistics for Every Measurement

Characterize Jitter on Single-ended or Differential Inputs across Multiple Channels, and Channel-to-Channel Inputs, Math and Reference Waveforms

Qualify Jitter Measurements Using Channel Inputs, Cursors or Timing Details, Population Size, and Amplitude

Use OpenChoice to Perform Automated Measurements Internally or Externally (via USB, Serial, GPIB or LAN)

View and Analyze Jitter Spectrums, Jitter Histograms, and Jitter Trends

Analyze Random and Deterministic Jitter (Rj/Dj) and Estimate Bit Error Ratios (BER) to $1x10^{-15}$ (TDSJIT3 only)

0.7 ps_{RMS} Jitter Noise Floor (typical with TDS6604)

1.5 ps_{RMS} Jitter Accuracy (typical with TDS6604, TDS/CSA7404)

Ratios (BER) to $1x10^{-15}$ (TDSJIT3 only)

Utilize a "Golden PLL" (TDSJIT3 only)

Differential Crossover Voltage Measurements (TDSJIT3 only)

Tektronix
Enabling Innovation

Measurements

General Measurements

Rise and Fall Time, Positive Width, Negative Width, High Time, Low Time, Skew, Differential Crossover Voltage*[1]

Clock Measurements

Frequency, Period, Cycle-Cycle, N-Cycle, Positive Cy-Cy Duty, Negative Cy-Cy Duty, Positive Duty Cycle, Clock TIE, Clock PLL TIE*[1]

Data Measurements

Data Frequency, Data Period, Data TIE, Data PLL TIE*[1]

Clock to Data

Setup, Hold, Clock-out

Advanced Analysis*[1]

Rj, Dj, Pj, DCD, DDj, Tj, BER

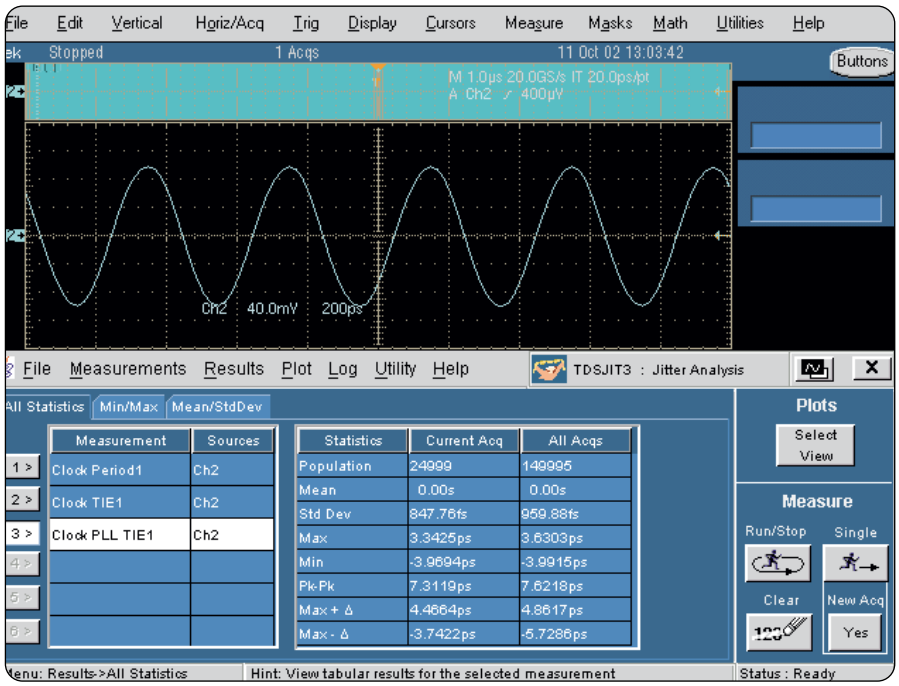
Plots

Histogram, Time Trend, Cycle Trend, Spectrum, Eye Diagram Statistics*[1] (BER CDF Curve)

Data Logging

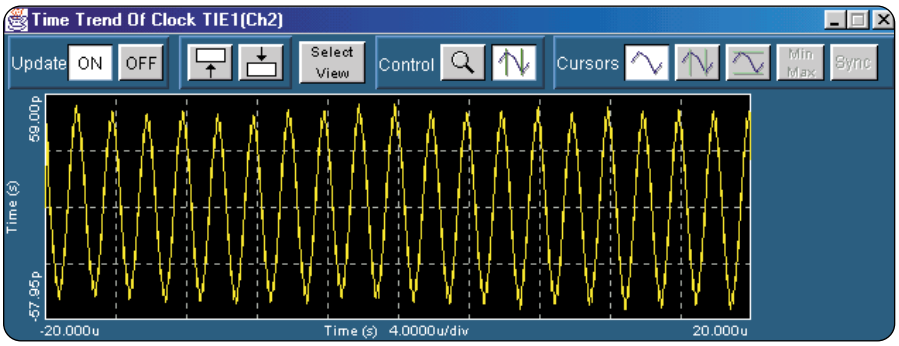
Statistics, Min/Max Wfm, Snapshot

*[1]Features are only available with TDSJIT3.

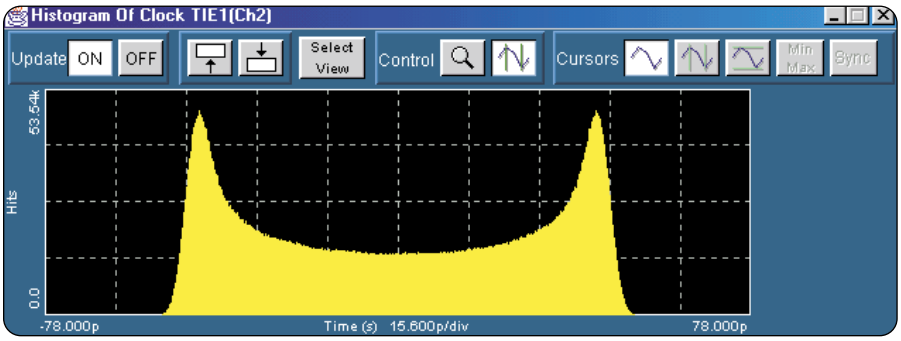


Digital, analog, communication, and systems engineers in the computer, semiconductor, and communications industries are facing new challenges as processor clock speeds race beyond 3 GHz and back-plane electrical data rates of 2.5 Gbps become commonplace. These increasing clock and data speeds mean reduced circuit tolerance, or margin, for jitter. By using tools to rapidly characterize and discover sources of jitter, designs can be brought to market faster and be made more robust to operate better in today's ultra high-speed environment.

The TDSJIT3 jitter analysis software extends Tektronix' real-time oscilloscopes capability, performing complex measurements on contiguous clock cycles or data edges single shot acquisitions. Providing jitter measurements for most key timing parameters required by today's interface standards, TDSJIT3 and TDSJIT3 Essentials are specifically designed to meet the jitter measurement needs of today's high-speed digital designers in the computer and communications industries. Measurements can be made on differential signals, between two separate inputs, or on multiple inputs simultaneously. Multiple measurements and plots can be displayed on the internal and external monitor. Trend analysis plots quickly show how timing parameters can change over time, like frequency drift, PLL startup or response to power supply changes. Spectrum analysis quickly shows the frequency of jitter and modulation sources for easier identification: adjacent oscillators and clocks, power supply noise, or signal crosstalk. Comprehensive statistics and histograms of timing parameters enhance the powerful analysis capabilities of TDSJIT3. Plot displays and data can be relocated to the second monitor, saved to disk, or exported for further analysis, and acquired waveforms and measurement data logs can be saved for later analysis. For the first time, you can quickly make accurate total jitter (Tj) estimates at levels down to $1x10^{-15}$ BER. You can control population size across single or multiple acquisitions; qualify what part of a signal is measured; correlate jitter trends and peaks to the original acquisition waveform; even share and analyze stored waveforms captured by colleagues.



▶ ***Figure 1.*** *Time Trend of Clock with Sinusoidal Jitter.*



▶ ***Figure 2.*** *Histogram of Clock with Sinusoidal Jitter.*

▶ Characteristics

TSD6000 and TDS/CSA7000 Series (Real-time)

Jitter Noise Floor – 0.7 ps_{RMS} (typical with TDS6604).

Jitter Measurement Accuracy – 1.5 ps_{RMS} (typical with TDS6604).

Δ Time Accuracy – 3.0 ps_{RMS} (20 GS/s, ≤10 nS measurement period).

Δ Time Accuracy Specification:

$[0.06/(sample\_rate) + 3.5\ ppm*|Measurement\_period|]_{RMS}$.

$\pm[0.30/(sample\_rate) + 3.5\ ppm*|Measurement\_period|]_{PEAK}$.

Physical Characteristics

Software supplied on compact disk media. Software application running on the TDS5000, TDS6000 and TDS/CSA7000 Series oscilloscopes.

▶ Ordering Information

TDSJIT3

To Have Pre-installed on a New TDS5000, TDS6000 or TDS/CSA7000 Series Oscilloscope – Oscilloscope Option JT3.

To Upgrade your Existing TDS5000, TDS6000 or TDS/CSA7000 Series Oscilloscope –

TDS5104, 5054 – Order: TDS5UP Option JT3.

TDS6000 Series – Order: TDS6UP Option JT3.

TDS7404, 7254, 7154, 7104, 7054 – Order: TDS7UP Option JT3.

CSA7404, 7154 – Order: CSA7UP Option JT3.

To Upgrade from TDSJIT2 to TDSJIT3 – Order:

TDS5104, 5054: TDS5UP Option J23.

TDS6604, 6404: TDS6UP Option J23.

TDS7404, 7254, 7154, 7104, 7054: TDS7UP Option J23.

CSA7404, 7154: CSA7UP Option J23.

TDSJIT3 Essentials

To Have Pre-installed on a New TDS5000, TDS6000 or TDS/CSA7000 Series Oscilloscope – Oscilloscope Option J3E.

To Upgrade your Existing TDS5000, TDS6000 or TDS/CSA7000 Series Oscilloscope –

TDS5104, 5054 – Order: TDS5UP Option J3E.

TDS6000 Series – Order: TDS6UP Option J3E.

TDS7404, 7254, 7154, 7104, 7054 – Order: TDS7UP Option J3E.

CSA7404, 7154 – Order: CSA7UP Option J3E.

To Upgrade from TDSJIT2 to TDSJIT3 Essentials – Order:

TDS5104, 5054: TDS5UP Option J2E.

TDS6604, 6404: TDS6UP Option J2E.

TDS7404, 7254, 7154, 7104, 7054: TDS7UP Option J2E.

CSA7404, 7154: CSA7UP Option J2E.

Includes: Software on CD, manual on CD.

Recommended Accessories

Arbitrary Waveform Generator – AWG710.

High-bandwidth Single-ended Probe – P7260 active probe, 6 GHz.

High-bandwidth Differential Probe – P7350 differential probe, 5 GHz.

Note: TDSJIT3 and TDSJIT3 Essentials are not compatible with the TDS5052 two-channel oscilloscope.

Contact Tektronix:

ASEAN / Australasia / Pakistan (65) 6356 3900

Austria +43 2236 8092 262

Belgium +32 (2) 715 89 70

Brazil & South America 55 (11) 3741-8360

Canada 1 (800) 661-5625

Central Europe & Greece +43 2236 8092 301

Denmark +45 44 850 700

Finland +358 (9) 4783 400

France & North Africa +33 (0) 1 69 86 80 34

Germany +49 (221) 94 77 400

Hong Kong (852) 2585-6688

India (91) 80-2275577

Italy +39 (02) 25086 1

Japan 81 (3) 3448-3010

Mexico, Central America & Caribbean 52 (55) 56666-333

The Netherlands +31 (0) 23 569 5555

Norway +47 22 07 07 00

People's Republic of China 86 (10) 6235 1230

Poland +48 (0) 22 521 53 40

Republic of Korea 82 (2) 528-5299

Russia, CIS & The Baltics +358 (9) 4783 400

South Africa +27 11 254 8360

Spain +34 (91) 372 6055

Sweden +46 8 477 6503/4

Taiwan 886 (2) 2722-9622

United Kingdom & Eire +44 (0) 1344 392400

USA 1 (800) 426-2200

USA (Export Sales) 1 (503) 627-1916

For other areas contact Tektronix, Inc. at: 1 (503) 627-7111

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Our most up-to-date product information is available at:
www.tektronix.com

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