DATA SHEET

D9010JITA / D9020JITA

EZJIT Complete Jitter and Vertical Noise Analysis and Phase Noise Analysis for Infiniium Oscilloscopes

The D9010JITA and D9020JITA software packages for Infiniium oscilloscopes offer advanced statistical analysis of high speed digital interfaces in the vertical (voltage) and horizontal (time) domains, as well as phase noise analysis. The result: the industry's most complete jitter and noise analysis software for real-time oscilloscopes.

KEYSIGHT TECHNOLOGIES

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Product Overview

With the faster edge speeds and shrinking data valid windows in today's high-speed digital designs, insight into the causes of signal jitter is critical for ensuring the reliability of your design. EZJIT Complete software for Infiniium oscilloscopes provides the advanced decomposition, analysis, and views of jitter necessary for fast and accurate insight into your signal. This EJZIT Complete package provides basic jitter analysis such as histograms and jitter trends, advanced level clock and data measurements such as time-interval error and UI measurements, and expert level analysis with complete jitter separation in timing and noise in over ten categories. Finally, EZJIT Complete will allow you to make phase noise measurements on clock signals. Another large measurement benefit of EZJIT Complete is that the oscilloscope will make applicable jitter measurements on all cycles of the waveform, including those not in the display window, instead of just one cycle.

Automated Setup Wizards

Infiniium offers setup wizards for all levels of jitter and phase noise measurements. The Measurement Analysis (EZJIT) Wizard helps you set up basic measurements such as histograms, measurement trends, and jitter spectrums. The EZJIT Complete Wizard gets you configured for easy jitter separation. The Phase Noise Wizard helps you easily set up phase noise analysis. All have detailed help guides to walk you through every option in the wizards.

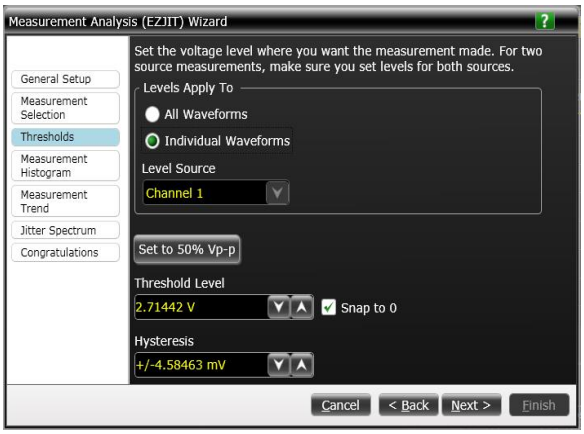

Figure 1. The measurement analysis wizard provides you instructions to help make the best decision of measurement options for the type of jitter you want to analyze.

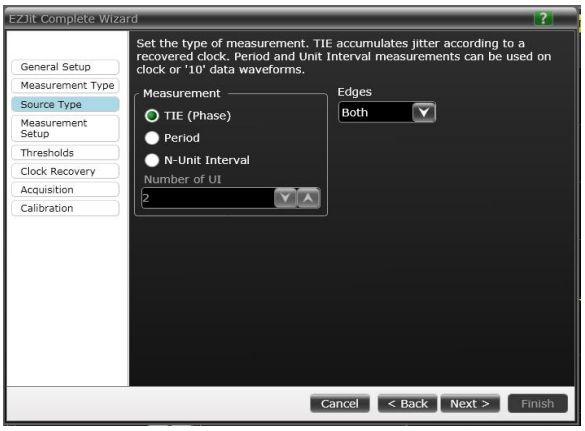

Figure 2. The EZJIT Complete wizard simplifies the process of configuring RJ and DJ analysis by stepping you through setup menus and choosing appropriate settings.

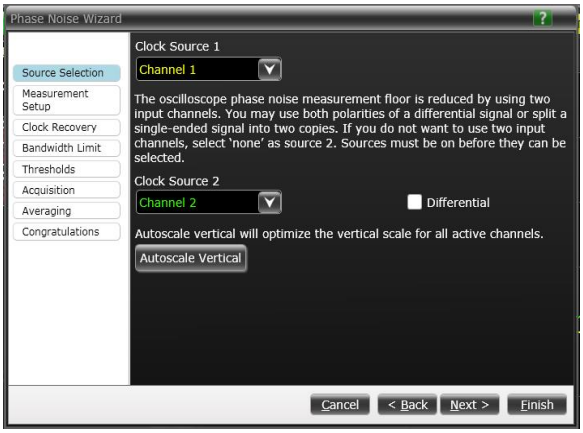

Figure 3. The phase noise wizard guides you through the steps to quickly set up phase noise analysis on a clock source.

Figure 4. Infiniium built-in help guides walk you through automatic wizards, as well as manual step-by-step setup of all jitter and phase noise measurements.

Analysis Measurements and Charts

Jitter basics

Starting with the basics, EZJIT Complete lets you quickly and easily view jitter in the form of a TIE histogram, trend, and spectrum. This can be accomplished with just a few clicks in the wizard.

Figure 5. Results of the measurement setup wizard show the jitter histogram, trend, and spectrum.

Timing jitter

EZJIT Complete also provides numerous charts to determine the correct settings in your jitter separation. While the wizard provides a quick way to separate jitter, there are times when parameters need to be changed to make the correct answer. The analysis charts provide detailed information needed to properly separate the jitter of your design. EZJIT Complete includes the following jitter charts to help you in your analysis:

- Composite TJ histogram
- Composite DDJ histogram
- TJ histogram
- RJ/PJ histogram
- DDJ histogram
- Jitter BER bathtub
- RJ/PJ threshold
- DDJ vs. bit
- RJ PJ spectrum

Figure 6. An adjustable grid of up to nine analysis charts gives you complete flexibility in the data you view.

Vertical noise

In addition to providing timing jitter separation, EZJIT Complete offers a comprehensive suite of vertical noise separation charts. These include:

- Noise BER bathtub
- Composite TI histogram
- TI histogram
- DDI histogram
- RN PI histogram
- RN PI threshold
- RN PI spectrum
- ISI vs. bit

Figure 7. An adjustable grid of up to fifteen analysis charts gives you complete flexibility in the data you view.

Phase noise

Available exclusively with D90x0JITA, Keysight is the first to offer a dedicated phase noise measurement application on Infiniium oscilloscopes. Phase noise is related to clock TIE, and is generally used to measure change in an oscillator's frequency, either in the long term or short term. When you look at the spectrum of an imperfect clock or oscillator, there will be energy radiated slightly off the nominal clock frequency (or carrier), called sidebands. Phase noise is generally measured as a ratio of the spectral power in the carrier vs. the phase noise in the sidebands, normalized to 1 Hz of bandwidth.

Analysis results are presented in a log frequency plot, where the amplitude units are dBc/Hz (decibels relative to the carrier power, normalized to a 1 Hz bandwidth). The X-axis is the frequency offset from the nominal signal, or "carrier" frequency. Resulting spurs can be normalized, omitted, or be represented separately to better show their energy levels.

Figure 8. Using default settings, spurs in the spectrum are normalized into the plot.

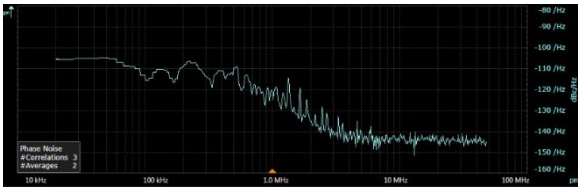

Figure 9. Spurs omitted.

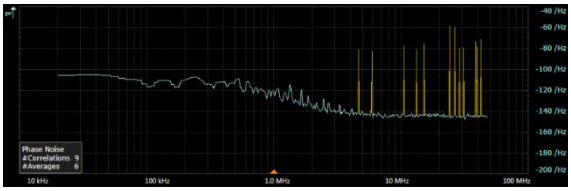

Figure 10. spurs in power.

Available Measurements

Base timing measurements (standard, D90x0JITA not required)			
Pulse width (+/-)	Duty cycle	Rise/fall time	Setup/hold time
Frequency/period	Phase		

EZJIT clock measurements			
Clock time-interval error (TIE)	Period-period jitter	Pulse width jitter	Duty cycle jitter

EZJIT data measurements			
Data TIE	Noise	Unit interval	N – UI
UI - UI	Data rate	Pattern length	Clock recovery rate
De-emphasis			

Jitter separation measurements			
Total jitter	Random jitter	Periodic jitter δ-δ	Periodic jitter RMS
Deterministic jitter delta-delta	Data dependent jitter	Duty cycle distortion	Intersymbol interference
Scope random jitter	Data dependent pulse width shrinkage	Even/odd jitter (F/2)	

Vertical noise measurements			
Total interference	Deterministic interference	Random noise	Scope random noise
Inter-symbol interference	Bounded uncorrelated interference	Periodic interference	Aperiodic bounded uncorrelated interference

Phase noise measurements

Ordering Information and Related Literature

Required hardware and software

D9010JITA is compatible with 9000 Series, S-Series, EXR-Series, and MXR-Series oscilloscopes, and D9020JITA is compatible with 90000 Series, V-Series, Z-Series and UXR Series. Both require software version 6.30 or greater.

Flexible Software Licensing and KeysightCare Software Support Subscriptions

Keysight offers a variety of flexible licensing options to fit your needs and budget. Choose your license term, license type, and KeysightCare software support subscription.

License Terms

Perpetual – Perpetual licenses can be used indefinitely.
Subscription – Subscription licenses can be used through the term of the license only (6, 12, 24, or 36 months).

License Types

Node-locked – License can be used on one specified instrument/computer.
Transportable – License can be used on one instrument/computer at a time but may be transferred to another using Keysight Software Manager (internet connection required).
USB Portable – License can be used on one instrument/computer at a time but may be transferred to another using a certified USB dongle (available for additional purchase with Keysight part number E8900-D10).
Floating (single site) – Networked instruments/computers can access a license from a server one at a time. Multiple licenses can be purchased for concurrent usage.

KeysightCare Software Support Subscriptions

Perpetual licenses are sold with a 12 (default), 24, 36, or 60-month software support subscription. Support subscriptions can be renewed for a fee after that.
Subscription licenses include a software support subscription through the term of the license.

KeysightCare Software Support Subscription provides peace of mind amid evolving technologies.

- Ensure your software is always current with the latest enhancements and measurement standards.
- Gain additional insight into your problems with live access to our team of technical experts.
- Stay on schedule with fast turnaround times and priority escalations when you need support.

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Selecting your license

Step 1. Choose your software product (eg. D9010JITA).
Step 2. Choose your license term: perpetual or subscription.
Step 3. Choose your license type: node-locked, transportable, USB portable, or floating.
Step 4. Depending on the license term, choose your support subscription duration.

Examples

If you selected:	Your quote will look like:	
D9010JITA node-locked perpetual license with a 12-month support subscription	**Part Number**	**Description**
	D9010JITA	EZJIT Complete - Jitter and Vertical Noise Analysis Software
	R-B5P-001-A	Node-locked perpetual license
	R-B6P-001-L	KeysightCare software support subscription, node-locked–12 months
D9010JITA transportable subscription 6-month license	**Part Number**	**Description**
	D9010JITA	EZJIT Complete - Jitter and Vertical Noise Analysis Software
	R-B4P-001-F	6-months, node-locked KeysightCare software support subscription

To configure your product and request a quote:
http://www.keysight.com/find/software
Contact your Keysight representative or authorized partner for more information or to place an order:
www.keysight.com/find/contactus

Related literature

Type	Description / URL
Brochure	Infiniium MXR-Series (500 MHz to 6 GHz real time oscilloscope)
Brochure	Infiniium V-Series (8 GHz to 33 GHz real time oscilloscope)
Data Sheet	Infiniium UXR Series (13 GHz to 110 GHz real time oscilloscope)
Brochure	30 Things Only Infiniium Oscilloscopes Can Do

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