tools

GigaView Clock Module

Clock Analysis Tool

Use the Clock Analysis Tool from within the SIA Signal Integrity Analysis Solution's GigaView™ Clock Module to perform complete clock analysis in seconds. Test more devices in less time and accelerate time-to-market for your latest innovations. The Clock Analysis Tool measures period, pulse width, cycle-to-cycle jitter, duty cycle distortion, propagation delay, rise/fall time and amplitude. It separates random (RJ) and deterministic (DJ) jitter, and quantifies the magnitude and frequency of periodic modulations.

Quantify Random and Deterministic Jitter Components

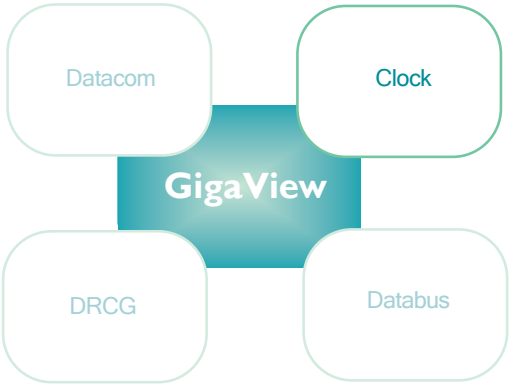
Period jitter provides information about system timing margins and short-cycle failures. The Clock Analysis Module characterizes the magnitude of jitter on a clock signal by asynchronously measuring a histogram of periods, ensuring a valid statistical data set. Consider the bimodal histogram of period measurements from a 200MHz clock. The non-Gaussian shape of the histogram indicates a deterministic component arising from crosstalk, EMI or power supply noise. Using Wavecrest's patented TailFit™ algorithm, you can quantify the DJ and RJ components regardless of the shape of the histogram. Further analysis can be done to identify the periodic jitter using modulation analysis.

Perform Modulation Analysis

The Clock Analysis Tool offers modulation analysis that make it easy to measure both the frequency and the amplitude of the DJ. The ability to isolate the root cause of jitter is vital for thorough device characterization. Common sources of DJ in clocks include crosstalk, reflections and EMI. The modulation analysis also provides advanced debug and characterization capabilities that offer a spectral view of jitter. Different views of the FFT plot enable you to see cumulative amplitude of the interfering signal or its short-term cycle-to-cycle impact. The modulation analysis also enables you to determine the precise frequency and magnitude of individual jitter components.

Analyze Jitter as a Function of Voltage and Temperature

All devices are designed to operate within a specific temperature and voltage range, requiring them to meet jitter specifications over the entire range. The Clock Analysis Tool includes a number of analysis plots that provide quantitative analysis and graphical views of the effects of a variable such as voltage or temperature. The Composite Plot, for example, simplifies viewing of voltage effects on period jitter. It allows the overlaying of multiple plots onto a single plot, which clearly indicates the effect of voltage on period jitter.



- Accurately determine device performance by quantifying Random JItter (RJ) and Deterministic Jitter (DJ)
- View spectral components over a bandwidth
- Obtain RMS Jitter over a bandwidth using user-definable filters
- Estimate of Total Jitter (TJ) for up to 1016 Clock cycles in seconds
- Test signal integrity on up to 10 devices
- View all the amplitude and timing parameters with one comprehensive tool

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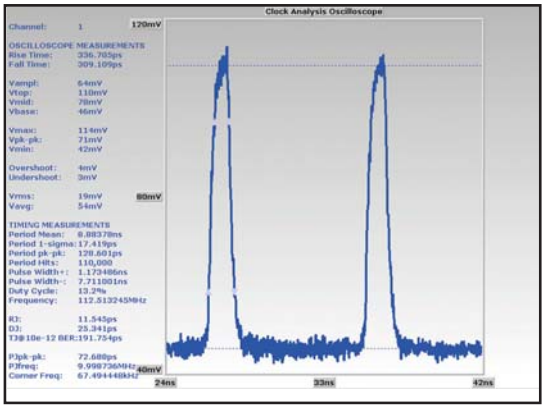
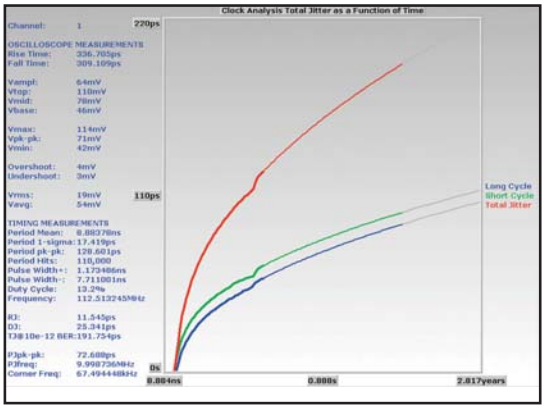
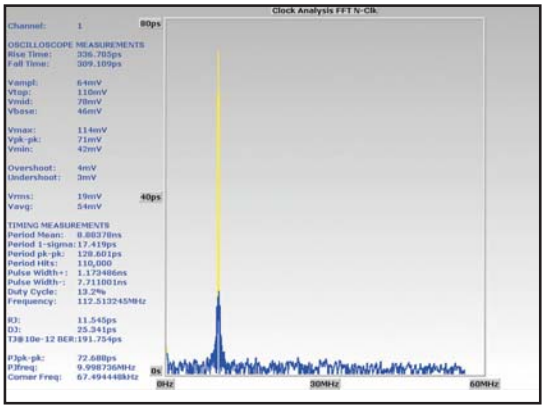
Multiple Views Provide Exceptional Flexibility



Oscilloscope view displays the signal



Plot displays Total Jitter pk-pk vs. Time



FFT plot displays Periodic Jitter Spectrum

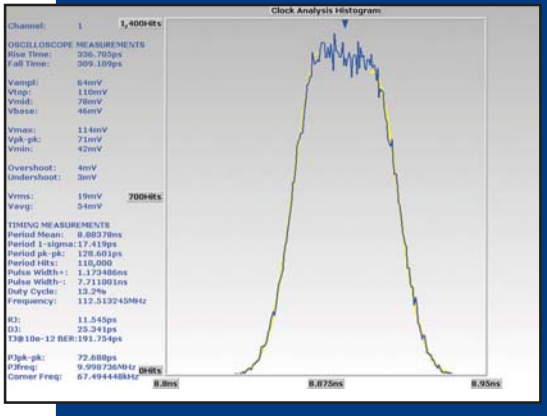
OSCILLOSCOPE MEASUREMENTS

Rise Time:	336.705ps
Fall Time:	309.109ps
% Basis	80/20
Vampl:	64mV
Vtop:	110mV
Vmid:	78mV
Vbase:	46mV
Vmax:	114mV
Vpk-pk:	71mV
Vmin:	42mV
Overshoot:	4mV
Undershoot:	3mV
Vrms:	19mV
Vavg:	54mV

TIMING MEASUREMENTS

Period Mean:	8.88378ns
Period 1-sigma:	17.419ps
Period pk-pk:	128.601ps
Period Hits:	110,000
Pulse Width+:	1.173486ns
Pulse Width-:	7.711001ns
Duty Cycle:	13.2%
Frequency:	112.513245MHz
RJ:	11.545ps
DJ:	25.341ps
TJ@10e-12 BER:	191.754ps
PJpk-pk:	72.688ps
PJfreq:	9.998736MHz
Corner Freq:	67.494448kHz

Example results show voltage measurements from Oscilloscope and time measurements from Timing circuits



Histogram plot displays Period Jitter

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