

SimDE™ WAVEFORM

- Multi-Format Waveform Viewer with Analysis Capabilities,
Very Low Cost

A Daily-Use Utility Tool for SI and Design Engineers

V4.0



What's New in V4.0 Release 201202

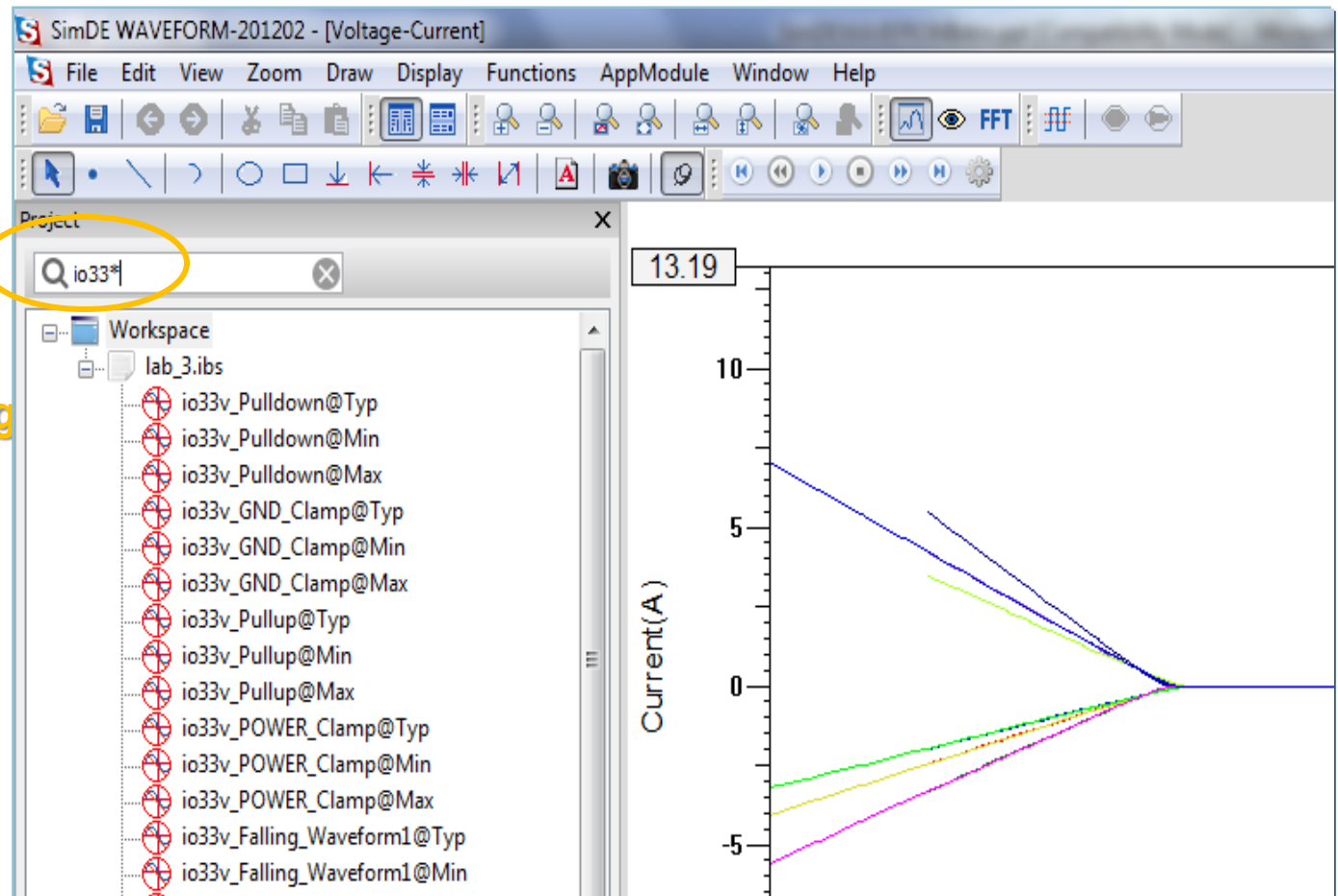
- Support both Linux and Windows OS for this low cost multi-format waveform viewer and analyzer
- New waveform filter functions for large number of waveforms sorting purpose
- It is very **high** performance and very **low** cost

Already in Release 201101

- Support Cadence Spectre (.tran) and TISpice3 (.prt) formats
- Support Eldo (chi) and LTSPICE (raw) file formats
- DDR2 Standard-Compliant Analysis Application Module
- All IBIS buffer model types supported in IBIS Application Module
- IBIS Application Module
- Many input and output waveform file formats supported
- Comprehensive Eye Mask/Aperture/Jitter Distribution View
- Waveform Comparison Capability
- Waveform Manipulation Capability
- Spice Stimulus Generator
- Slope Measurement
- Waveform Truncation Capability
- FFT with Modulus, Real/Imaginary and Angle views
- Basic Search and Report
- Full-functional Granularity Control
- Easy Grid Display Control Capability
- Tree Structure (Hierarchy) view for HSpice and TouchStone files
- Waveform Player
- Waveform reload function

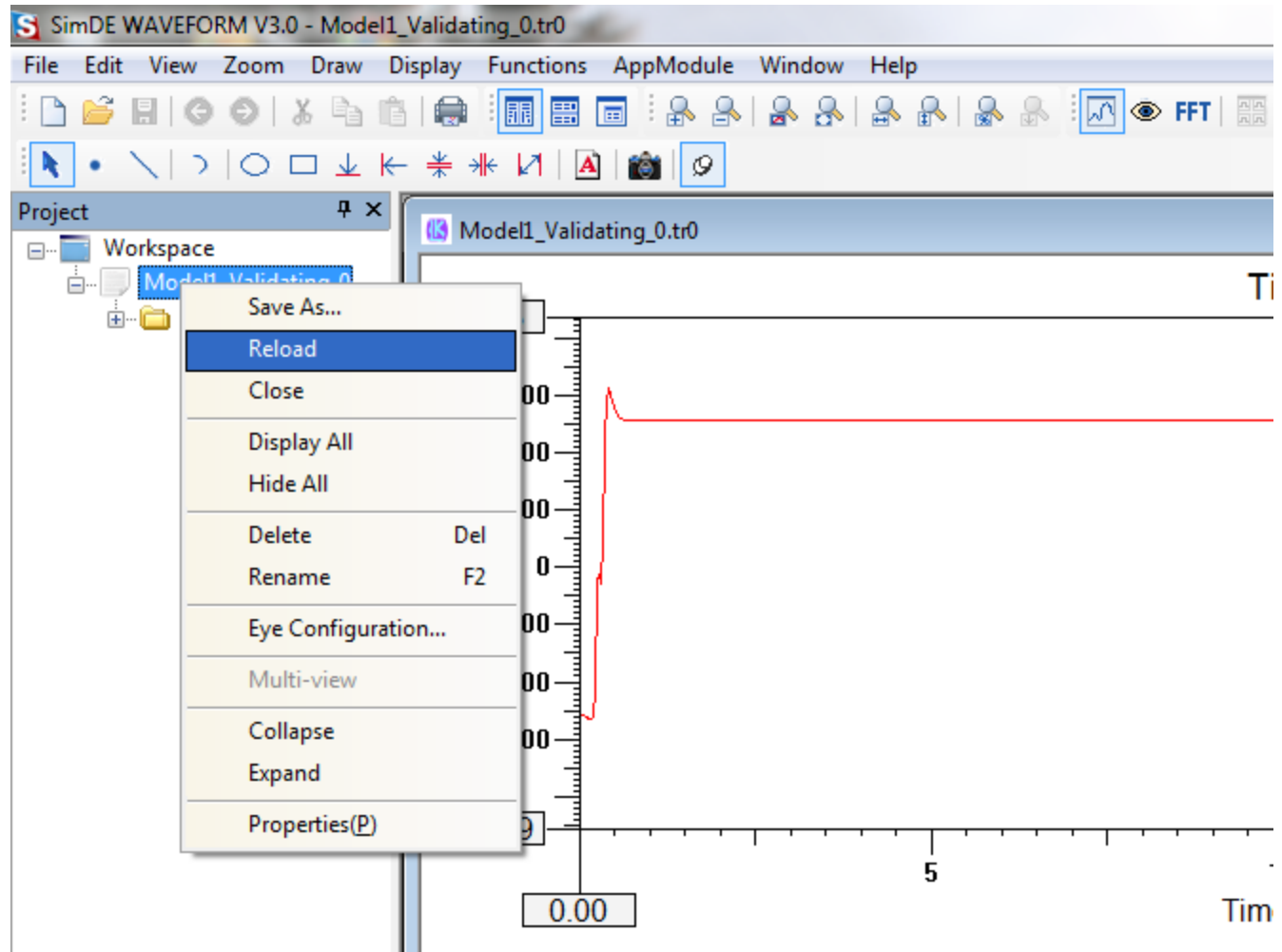
Waveform Filter Function

Filter function for
larger number of
waveforms sorting



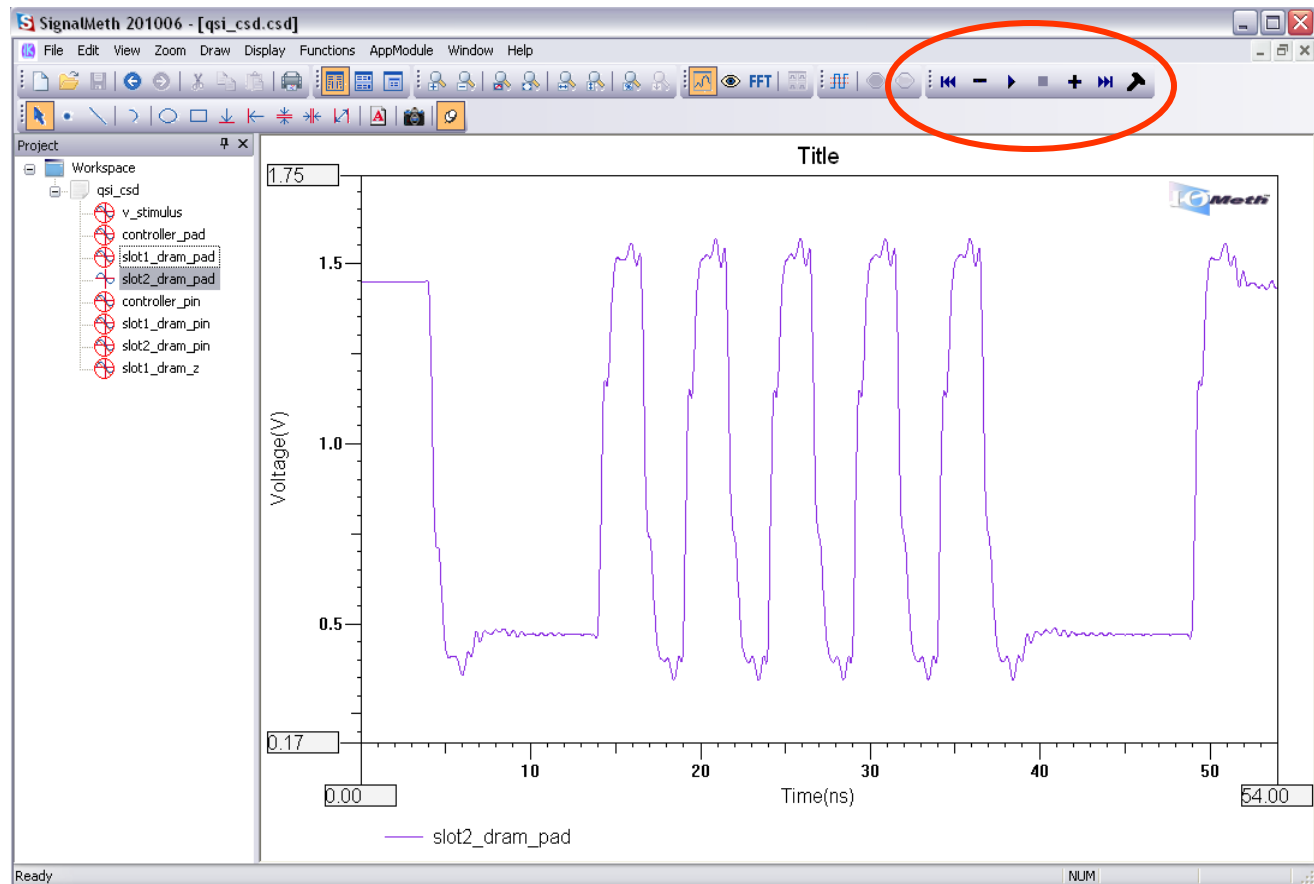
Waveform Reload Function

Reload
modified
waveforms
without exit
program

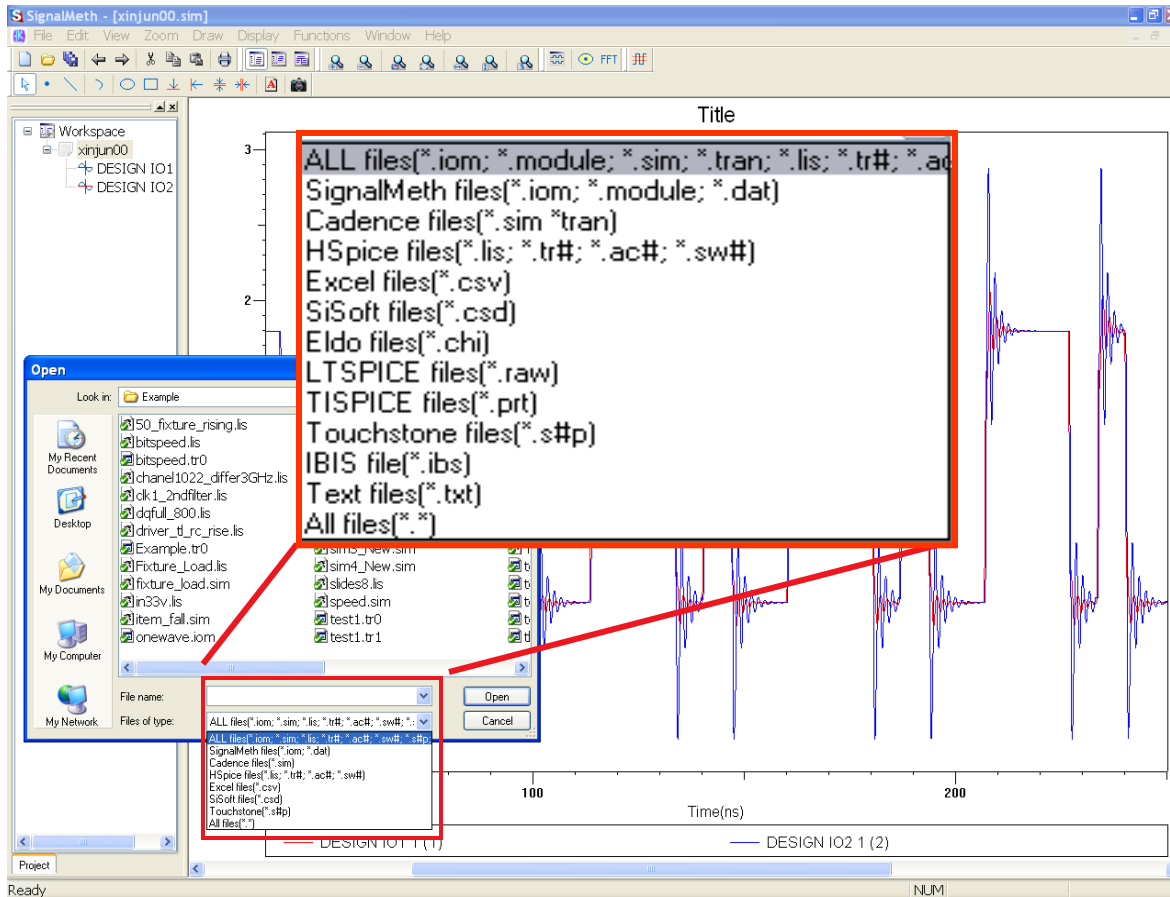


Waveform Player

Automatic
one-by-one
waveform
display



Multi-format Viewer



Input:

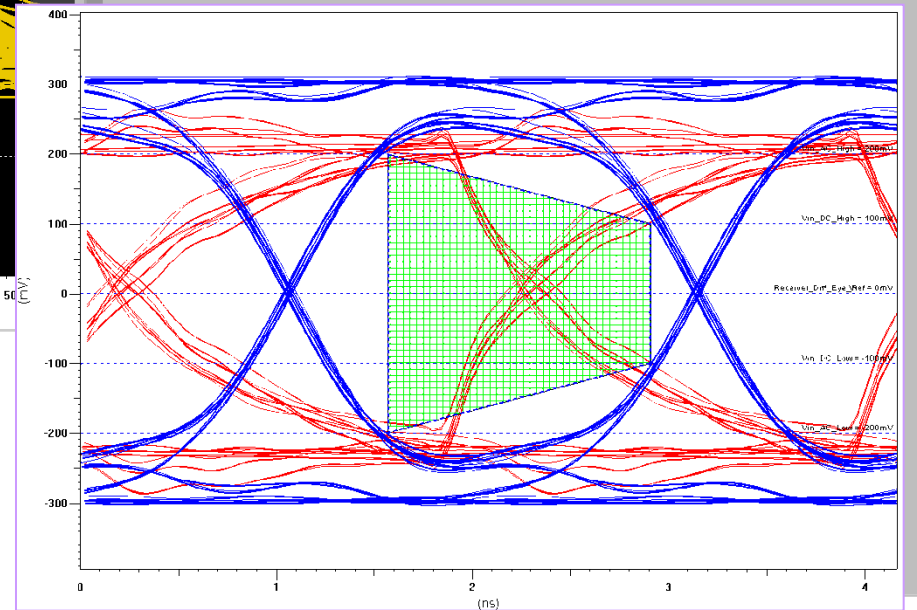
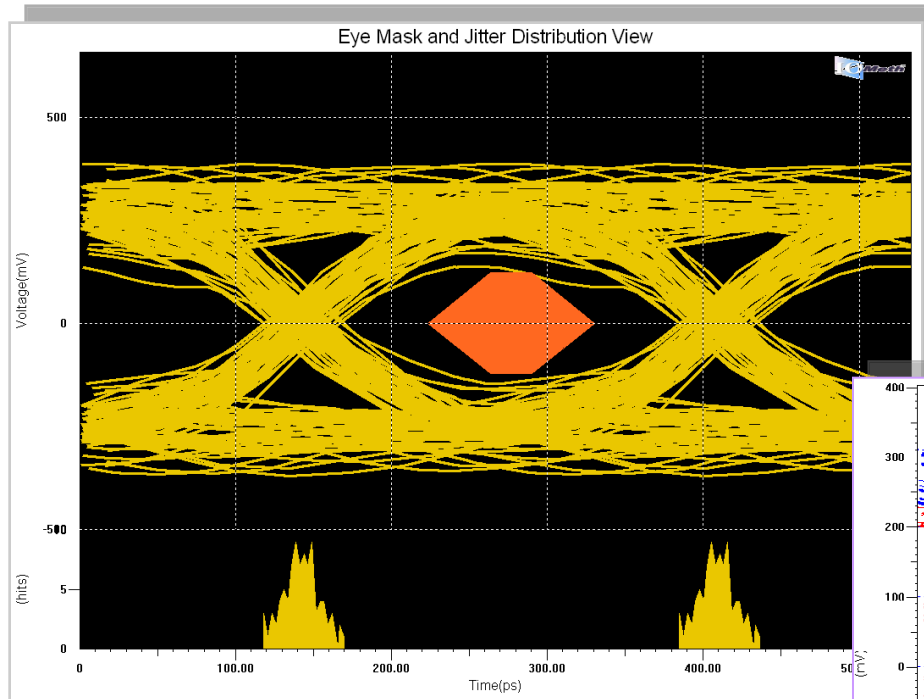
- ✓HSpice: .tr#, .lis, .ac#, .sw#
- ✓PCB SI: .sim
- ✓Quantum-SI: .csd
- ✓Hyperlynx: .csv
- ✓Scope&Excel: .csv, .txt, .dat
- ✓TouchStone: .s#p
- ✓IBIS: .ibs
- ✓Eldo: .chi
- ✓Spectre: .tran
- ✓TISpice3: .prt
- ✓LTSPICE: .raw
- ✓Agilent, Tektronics and LeCory Scope files: .txt,&.dat

Output:

- ✓PCB SI: .sim
- ✓MS Excel: .csv

A good replacement tool for other waveform viewers

Comprehensive Eye Mask / Aperture and Jitter Distribution view



One-place Setting for Eye Diagram Analysis

The image displays three overlapping screenshots of the 'Eye Setting' dialog box, illustrating the various configuration options available for eye diagram analysis.

Top Screenshot (Eye Mask Tab): This view shows the 'Eye Mask' configuration. The 'Unit Interval' is set to 3.75ghz. The 'Template' dropdown is set to 'pcie_375G'. A list of templates is shown, including 'default', 'pcie_375G', 'pcie_gen1_rx', 'pcie_gen2_rx', 'sata_gen1_rx', 'sata_gen2_rx', 'usb_tp6', 'xaul_rx', and 'xinjun'. The 'Show Eye Mask' checkbox is checked. The 'Overwrite individual' and 'Apply to all files' checkboxes are also present.

Bottom Left Screenshot (Eye Preference Tab): This view shows the 'Eye Preference' configuration. The 'Unit Interval' is set to 3.75ghz. The 'Eye Shift' is set to 0.000s, 'Time Start' is 0.000s, and 'Eye Reference' is 0.000V. The 'Overwrite individual' and 'Apply to all files' checkboxes are also present.

Bottom Right Screenshot (Aperture Mask Tab): This view shows the 'Aperture Mask' configuration. The 'Unit Interval' is set to 3.75ghz. The 'Template' dropdown is set to 'usb'. The 'Show Aperture Mask' checkbox is checked. The 'Overwrite individual' and 'Apply to all files' checkboxes are also present.

Aperture Mask Settings (Bottom Right Screenshot):

Parameter	Value
V _{oc}	0.500v
V _{in_AC_High}	0.200v
V _{in_DC_High}	0.100v
V _{ref}	0.000v
V _{in_DC_Low}	-0.100v
V _{in_AC_Low}	-0.200v

- Individual Waveform Settings
- Eye Mask and Aperture setting build-in
- Preset and Save capabilities

Eye Diagram Analysis

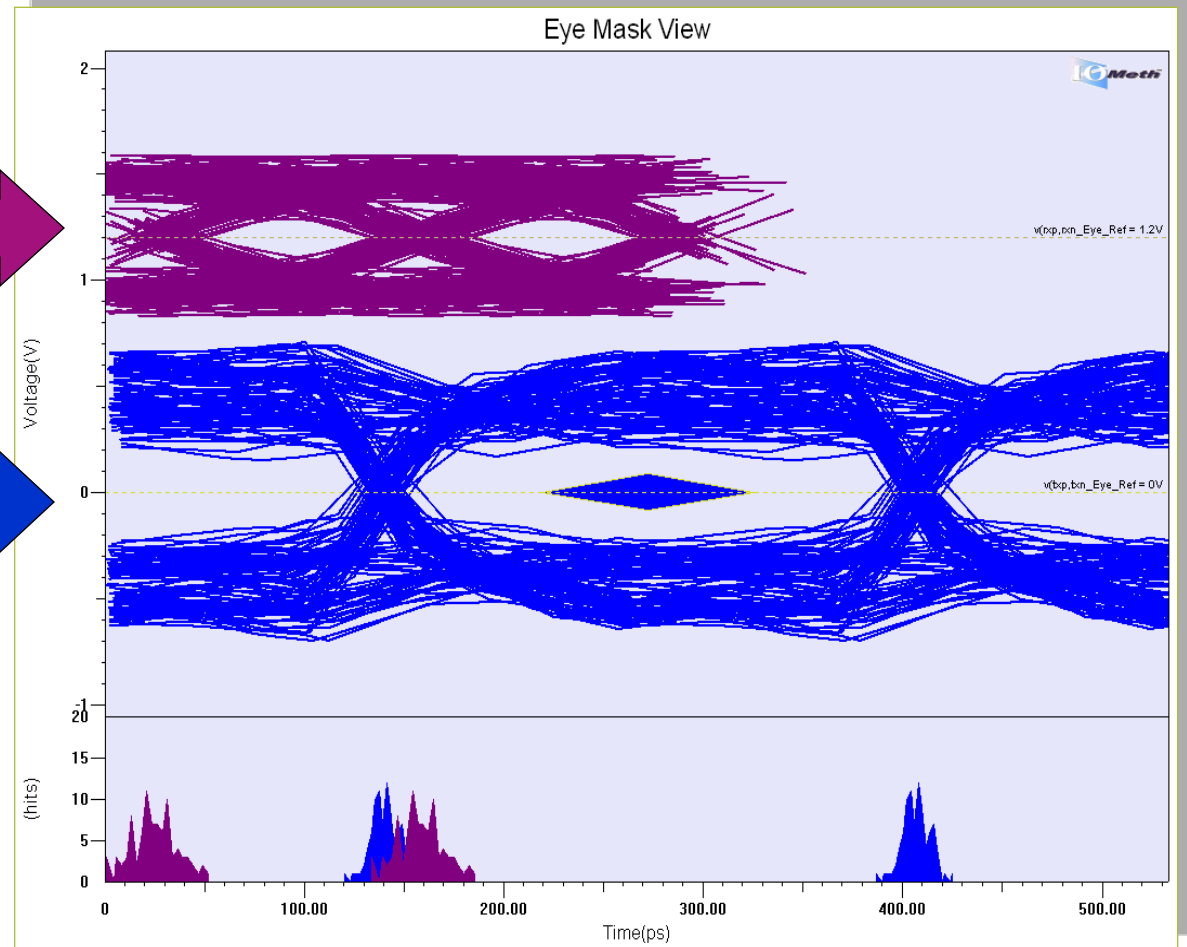
UI=133.3333ps



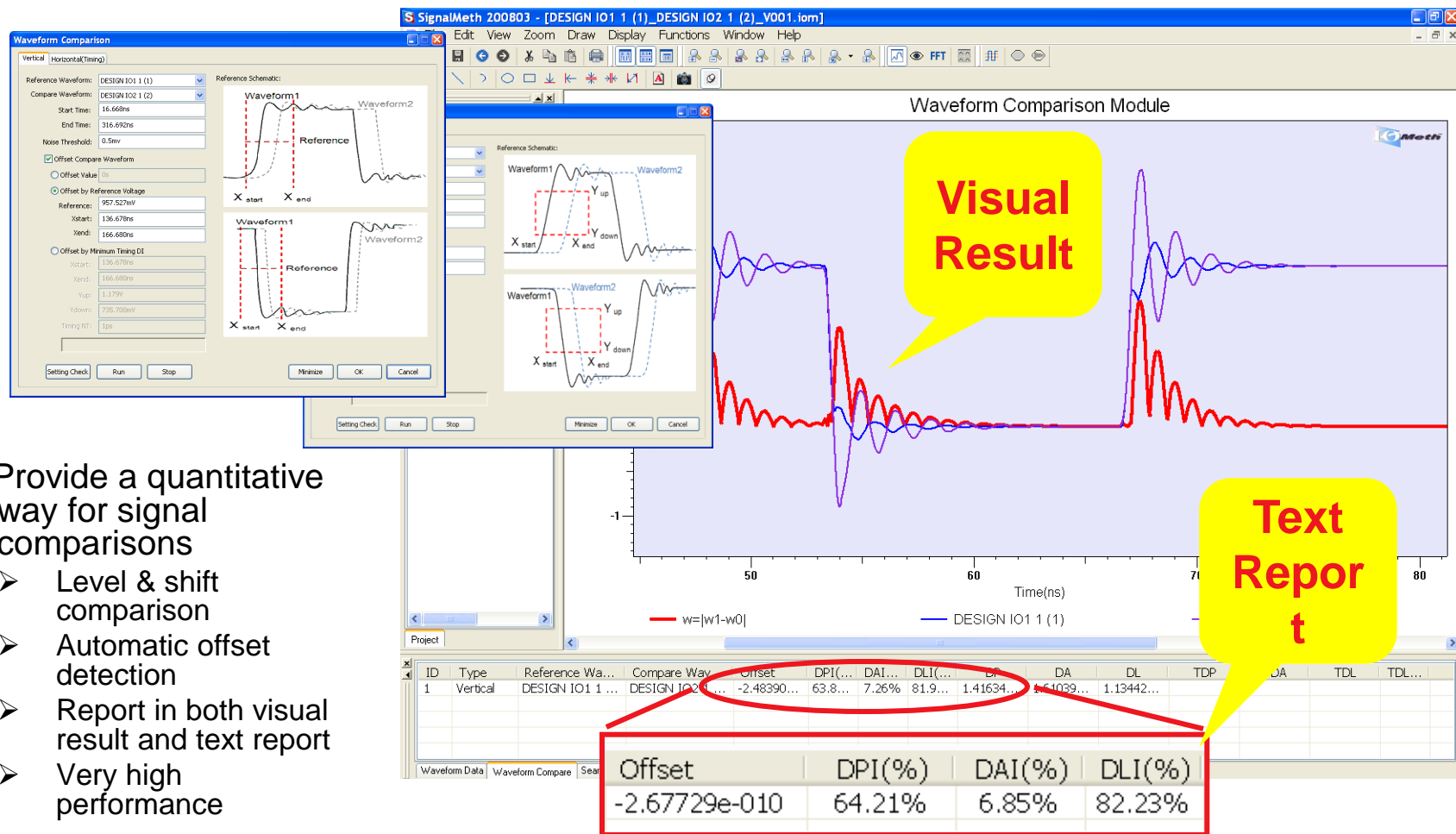
UI=266.6667ps



- Handles individual waveform setting for Eye diagram Analysis in the same window



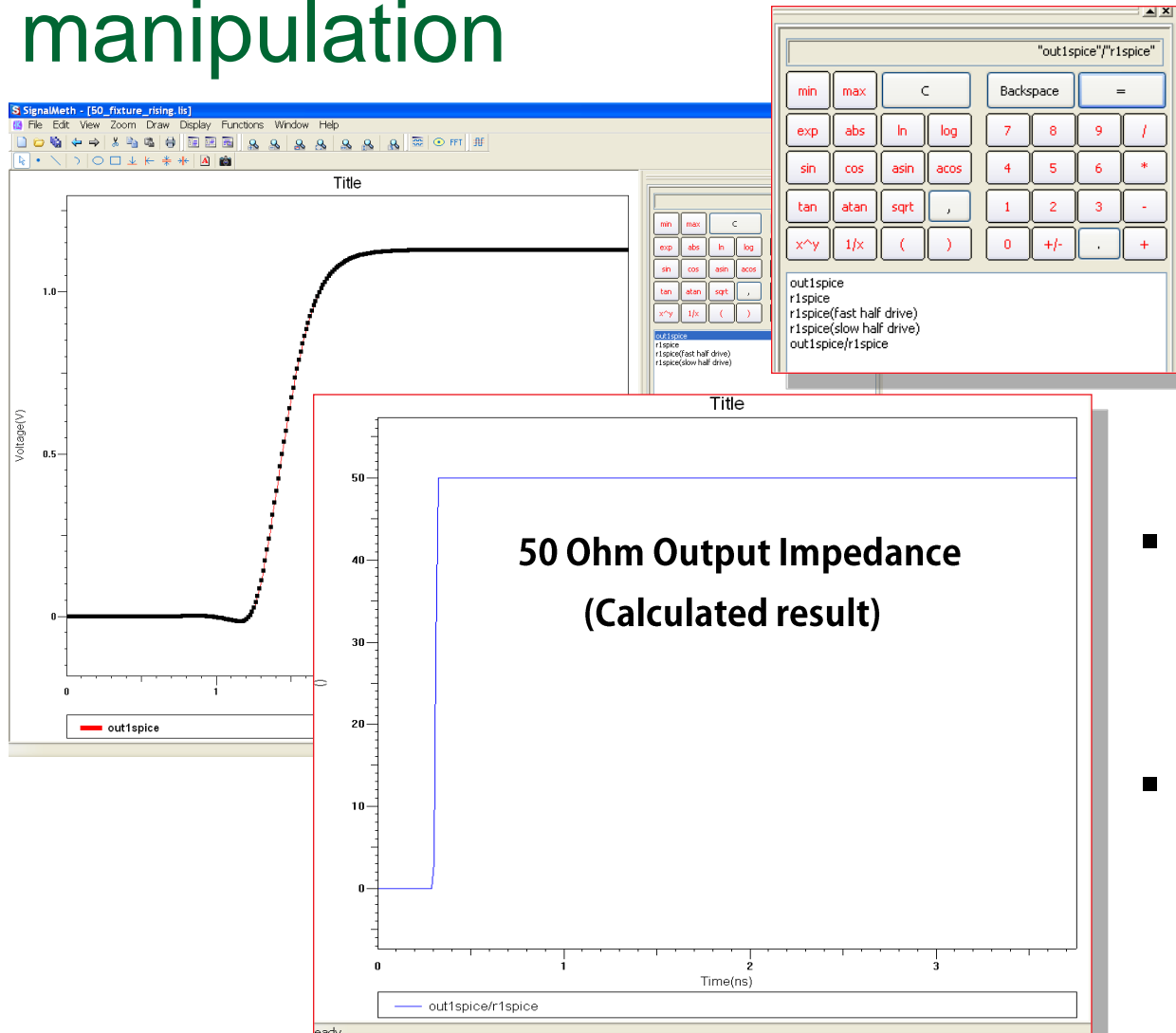
Unique Waveform Comparison functionality



Provide a quantitative way for signal comparisons

- Level & shift comparison
- Automatic offset detection
- Report in both visual result and text report
- Very high performance

Signal Mathematical calculation and manipulation



- Provides all sorts of mathematical functions for signal processing and manipulation
- Display the result waveform

Stimulus Generator

Pre-Coded:

- ✓ PRBS 4-31
- ✓ 8b/10b

Define:

- ✓ UI
- ✓ Edge
- ✓ Delay
- ✓ Bit Length
- ✓ Levels
- ✓ Jitter
- ✓ PRBS Seed
- ✓ Custom Bit Stream
- ✓ Spice file name
- ✓ Differential / Boost

Stimulus Generator

☐ PRBS18 ☐ 8b/10b ☒ Customized

☒ Differential ☒ Display

Unit Interval: 0.4ns Edge Time: 40ps Delay Time: 0s

Bits Length: 128 High Level: 1V Low Level: -1V

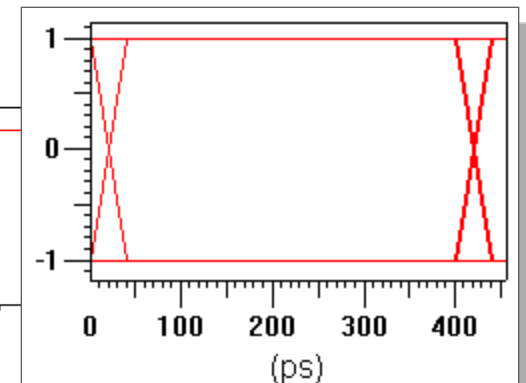
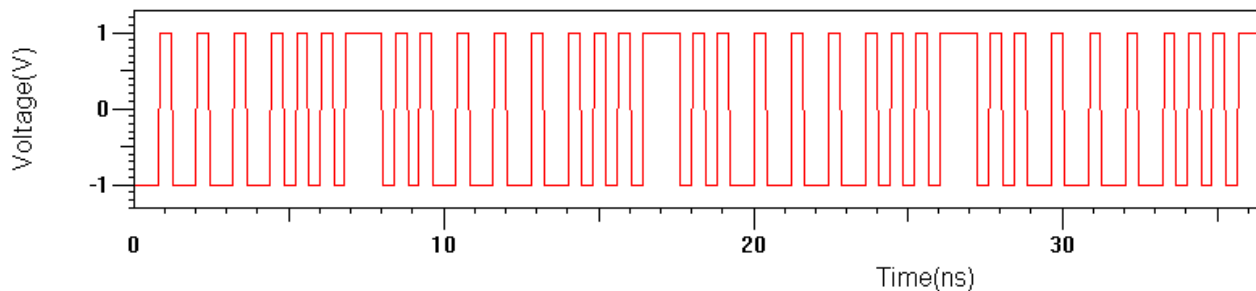
Jitter: 2ps PRBS Seed: 0

Customized Bits: 001001001001010101110101

Spice File: stimulus.inc

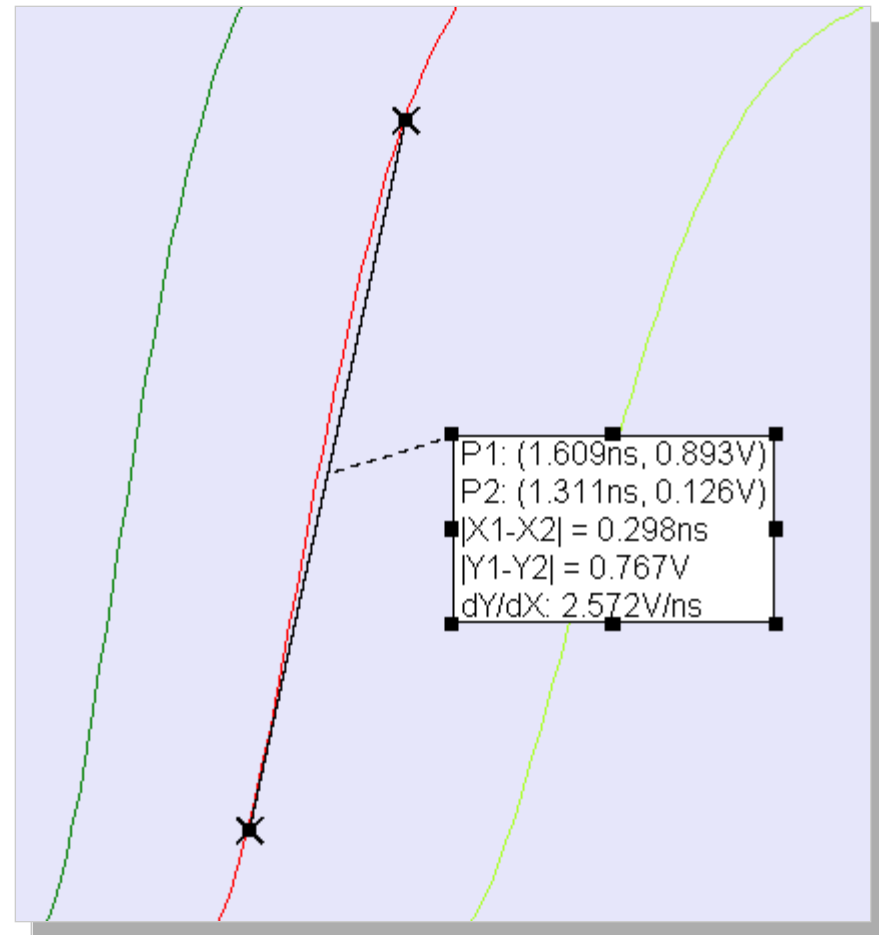
☒ include Boost Driver

OK Cancel



Slope Measurement

- ❖ Automatic slope measurement with
 - “Snap to waveform”
 - “Snap to Thresholds”



Basic Search Function

Search

Condition
Type: Crossing X

Value(Y): 100mv

Range: 0.000s To 53.333ns

☒ Rising Edge No.
2 To 6

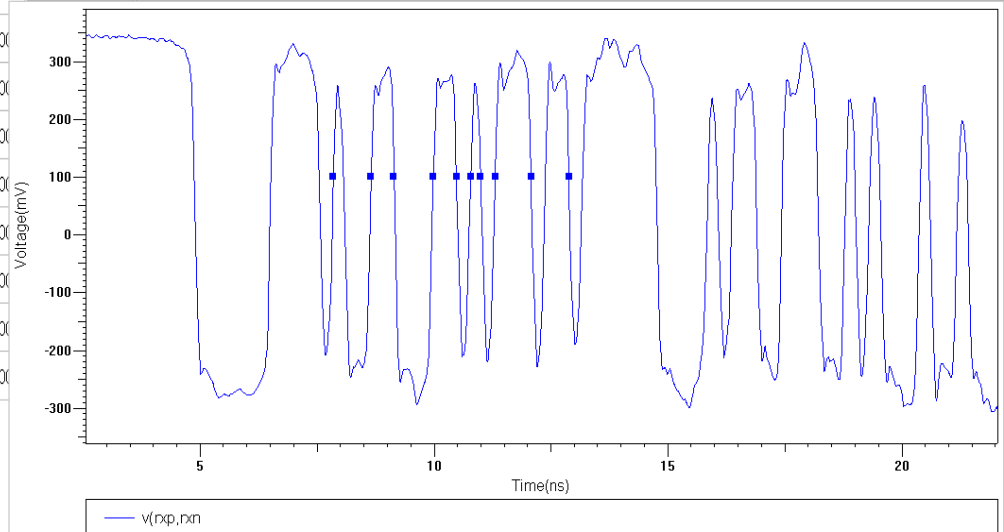
☒ Falling Edge No.
4 To 8

Search

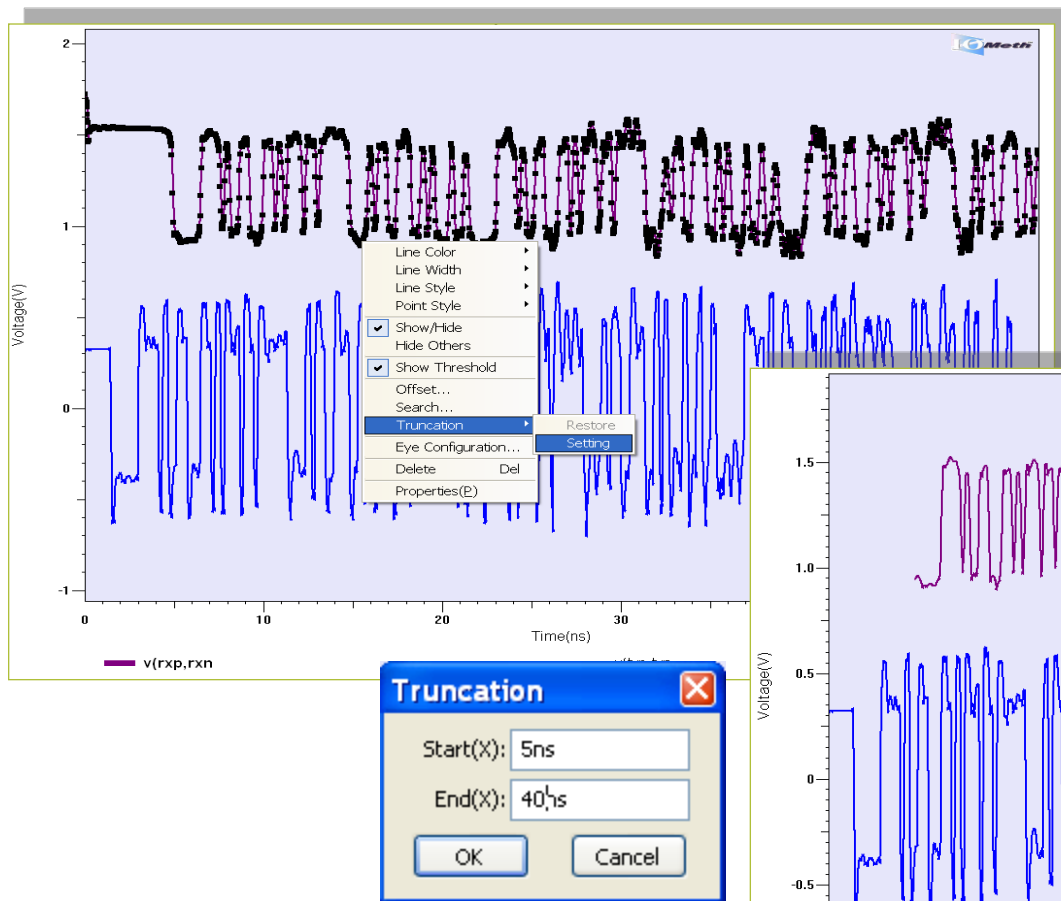
Exit

- ✓ Crossing X
- ✓ Crossing Y
- ✓ Rising Edge Number
- ✓ Falling Edge Number
- ✓ Maximum
- ✓ Minimum
- ✓ Support FFT and Eye Diagram View too

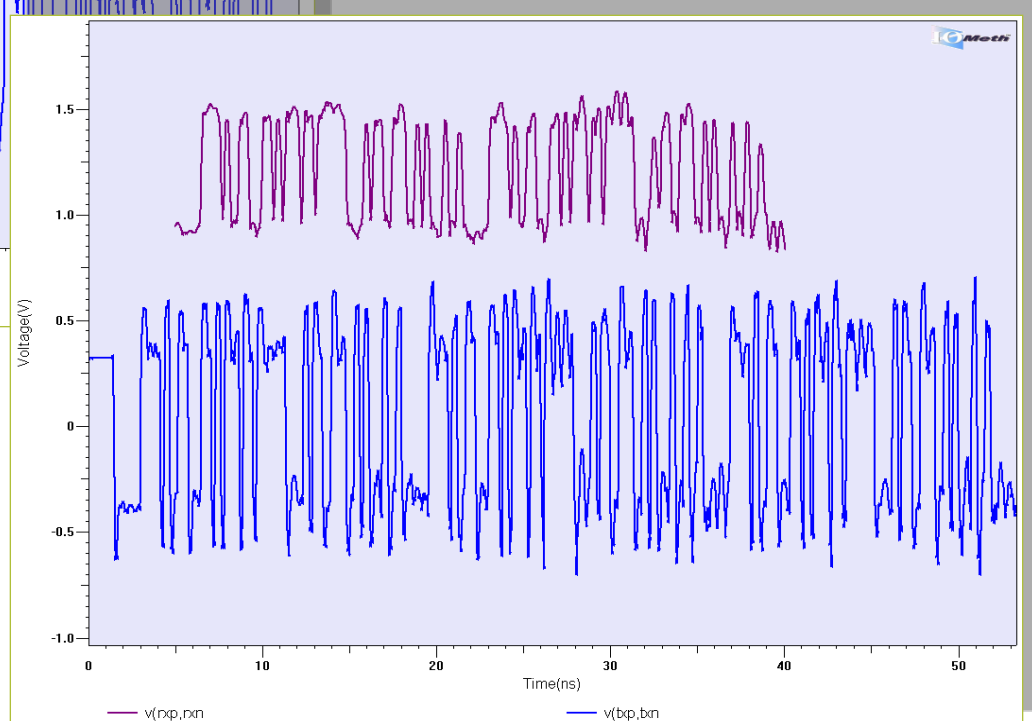
	X	Y
0	7.844587e-009	1.000000e-001
1	8.651526e-009	1.000000e-001
2	9.982195e-009	1.000000e-001
3	1.078170e-008	1.000000e-001
4	1.130645e-008	1.000000e-001
5	9.138598e-009	1.000000e-001
6	1.047667e-008	1.000000e-001
7	1.099096e-008	1.000000e-001
8	1.207237e-008	1.000000e-001



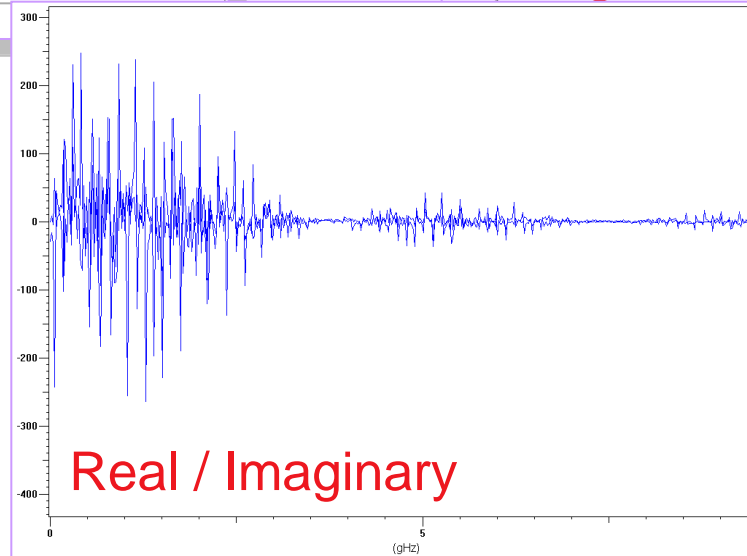
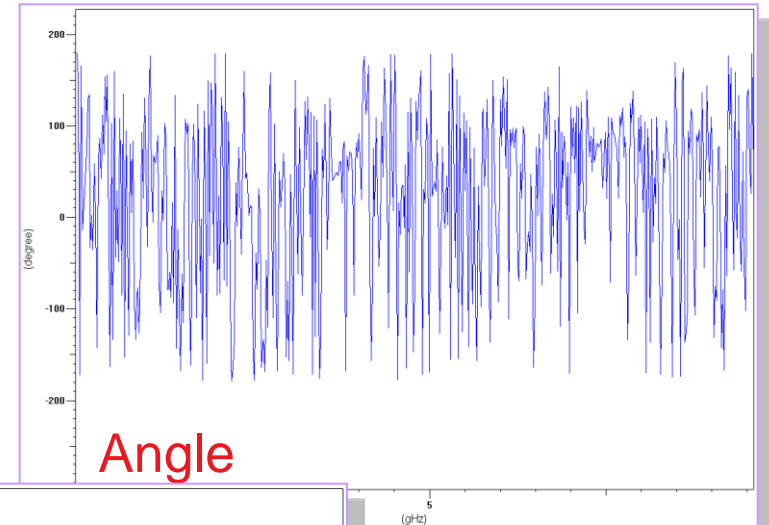
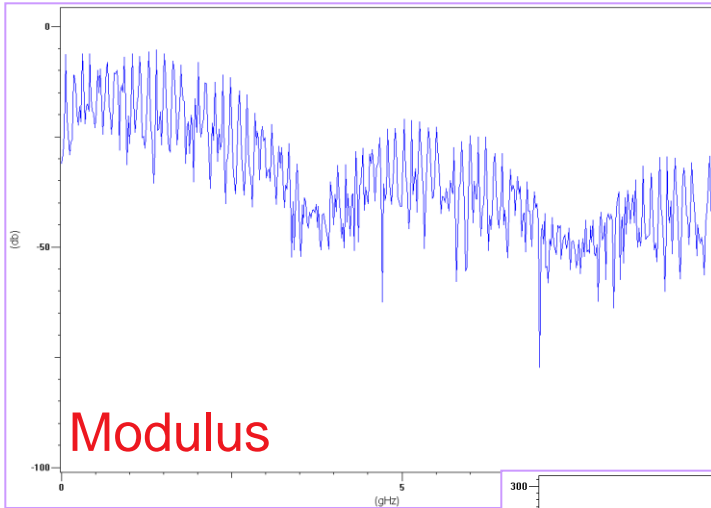
Waveform Truncation



Truncation and Save as capability

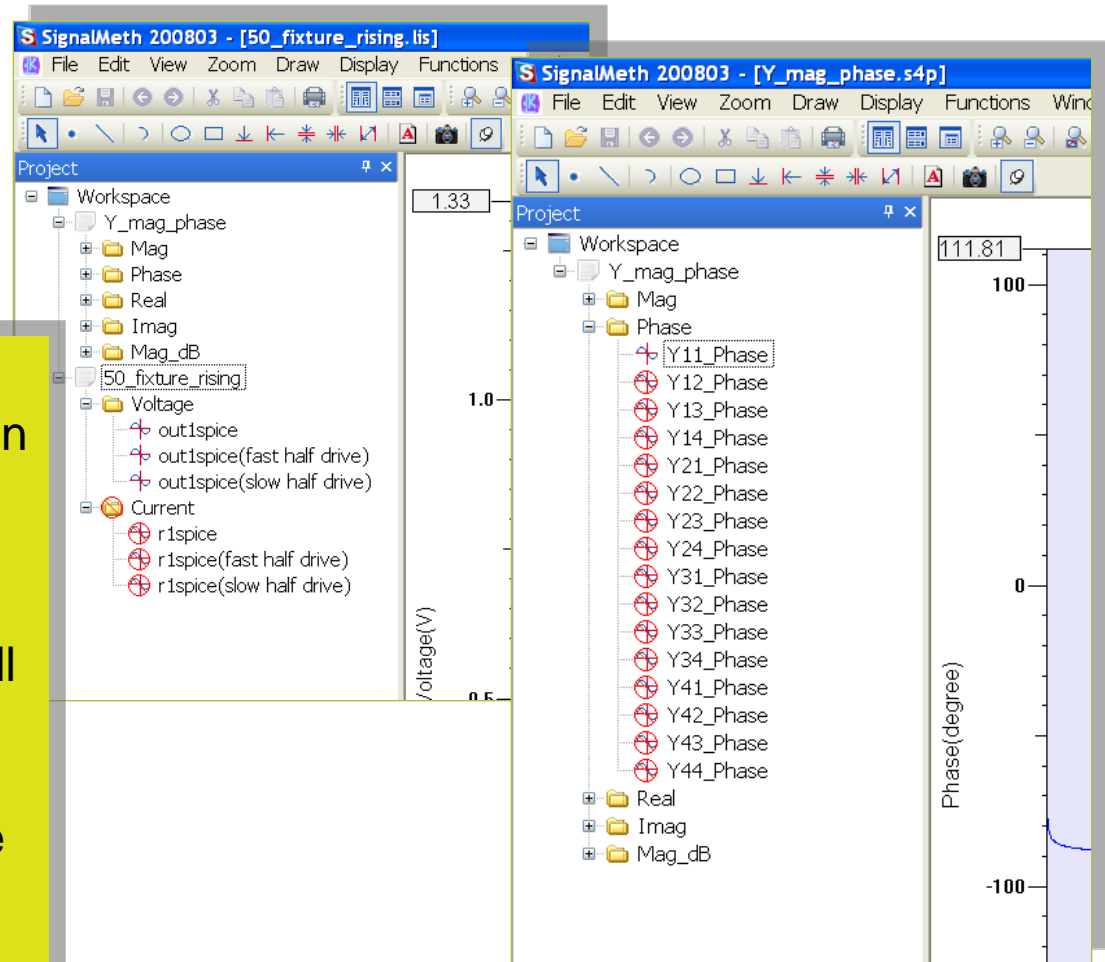


FFT Views



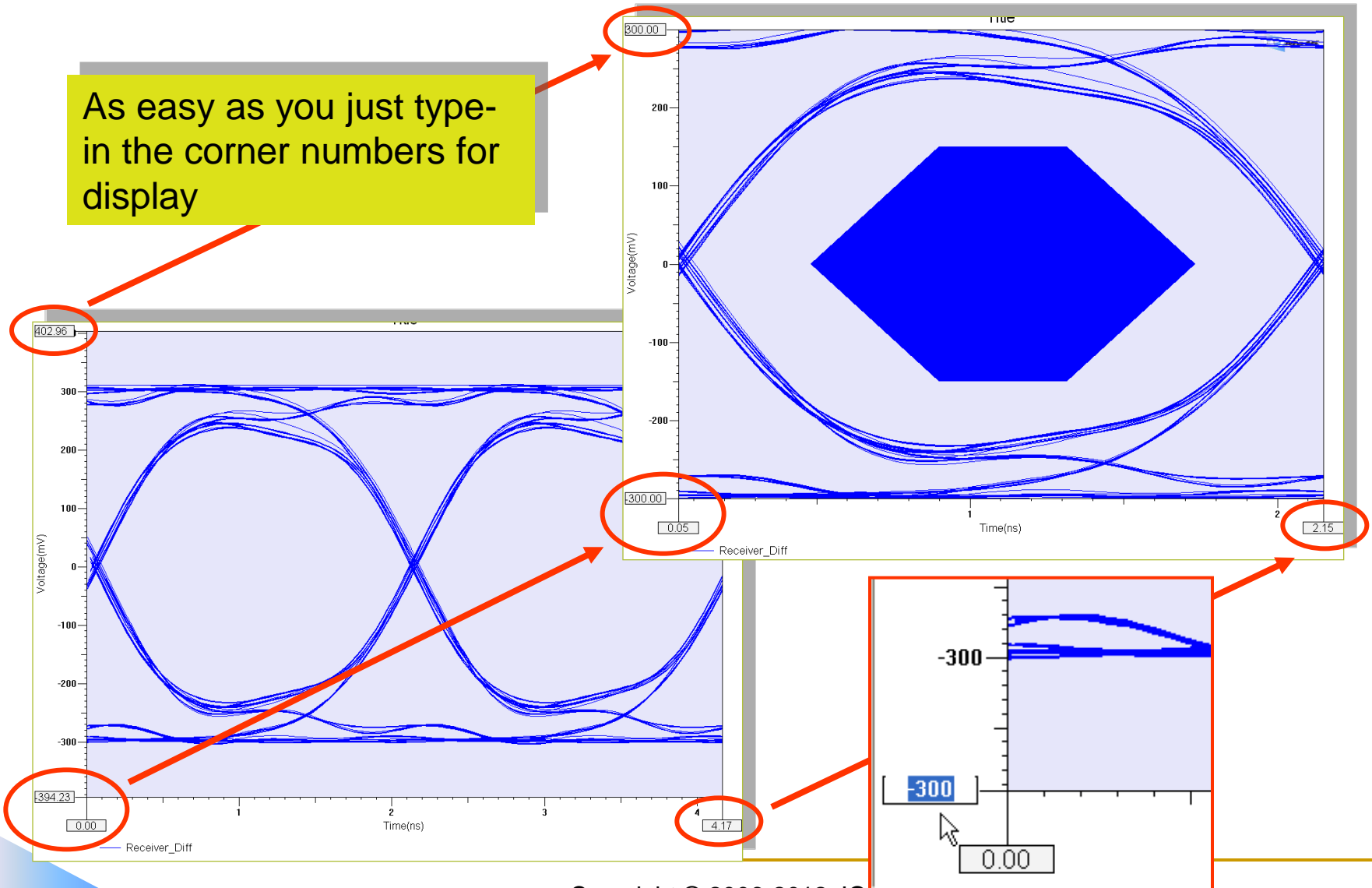
Tree Structure (Hierarchy) view for HSpice and TouchStone files

- Handles all 130 different combination categories for HSpice files as well as sweeping cases
- Capable to view all formats for TouchStone files (calculated from the original data in the file)



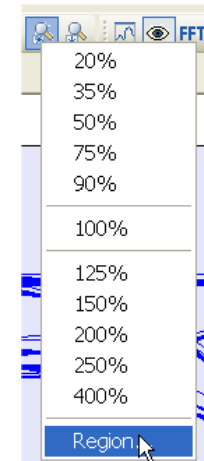
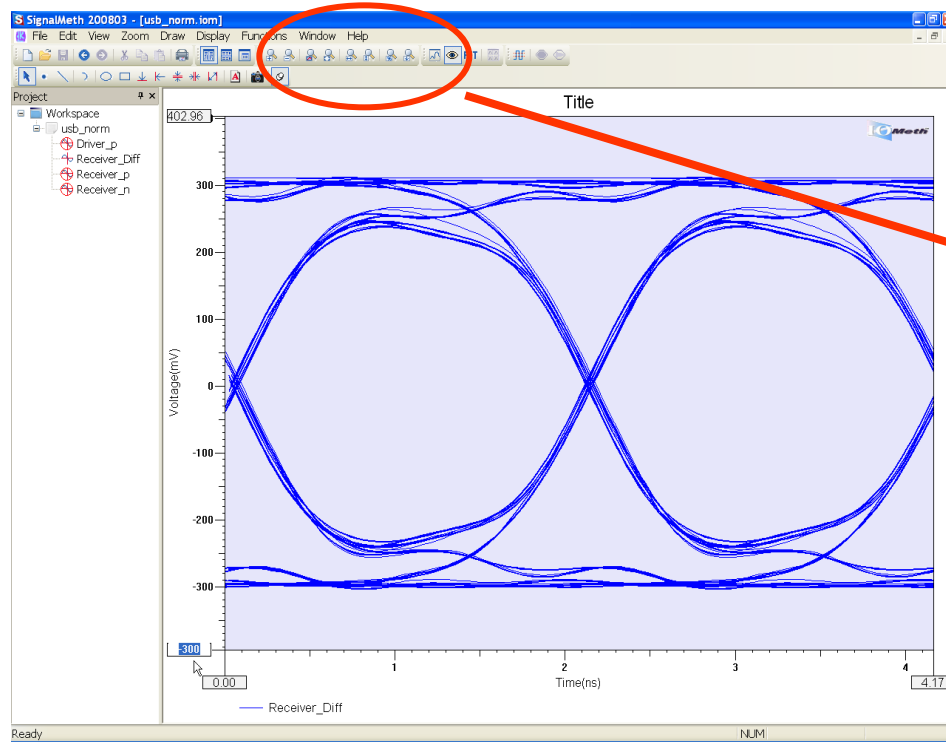
Full-Functional Granularity Control

As easy as you just type-in the corner numbers for display



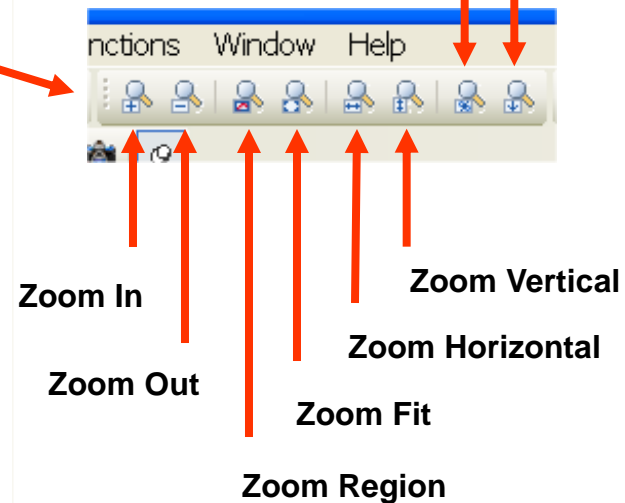
Full-Functional Granularity Control (Cont.)

Full Zooming Functions in a Button Click



Zoom in Proportion

Zoom Previous

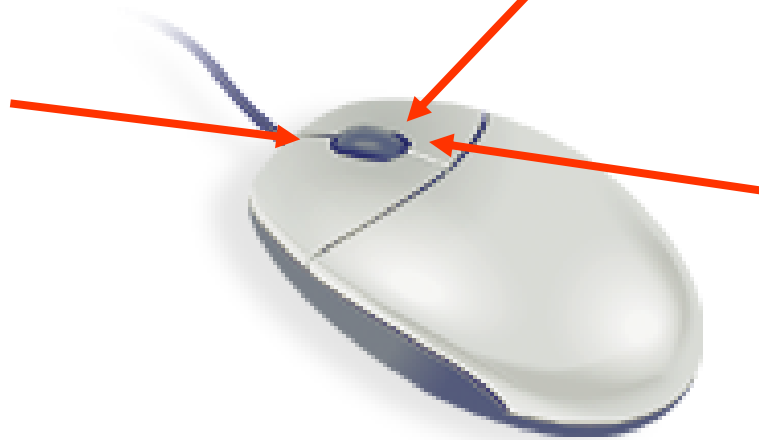


Full-Functional Granularity Control (Cont.)

Mouse middle-button and wheel actions

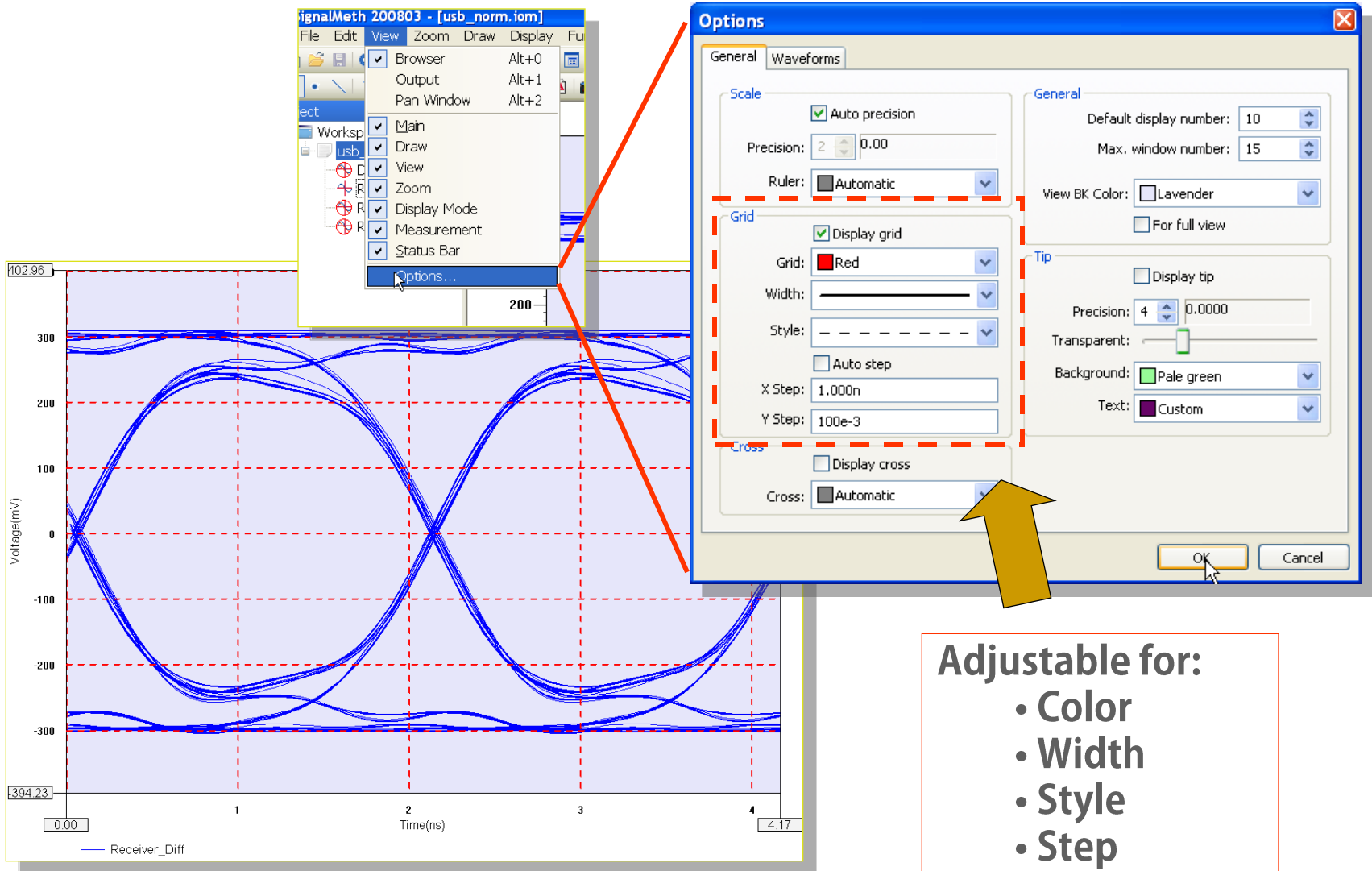
Press and hold middle-button or wheel for display region dragging

Click middle-button or wheel for region zooming function



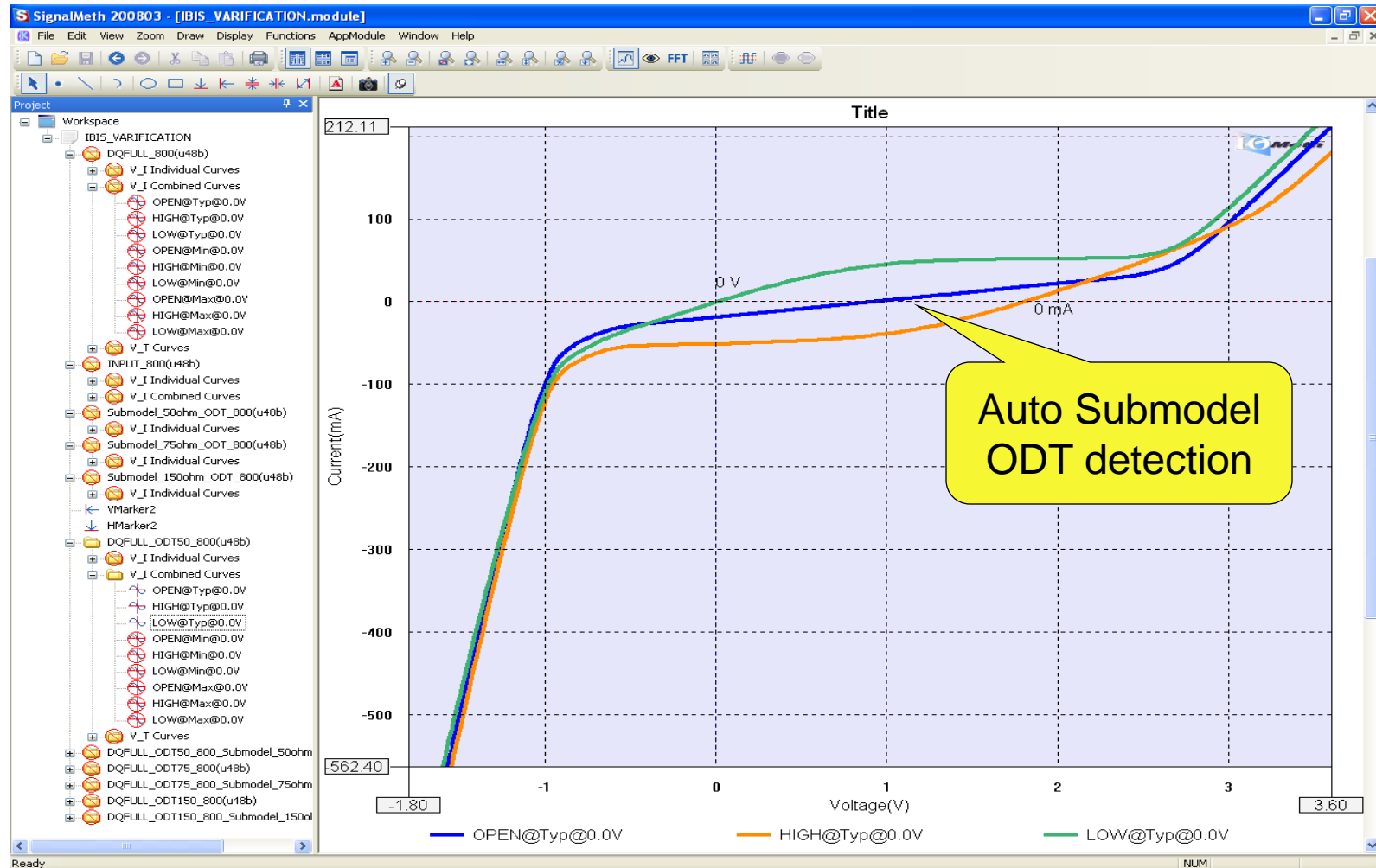
Wheel Spin for vertical moving

Easy Grid Display Control



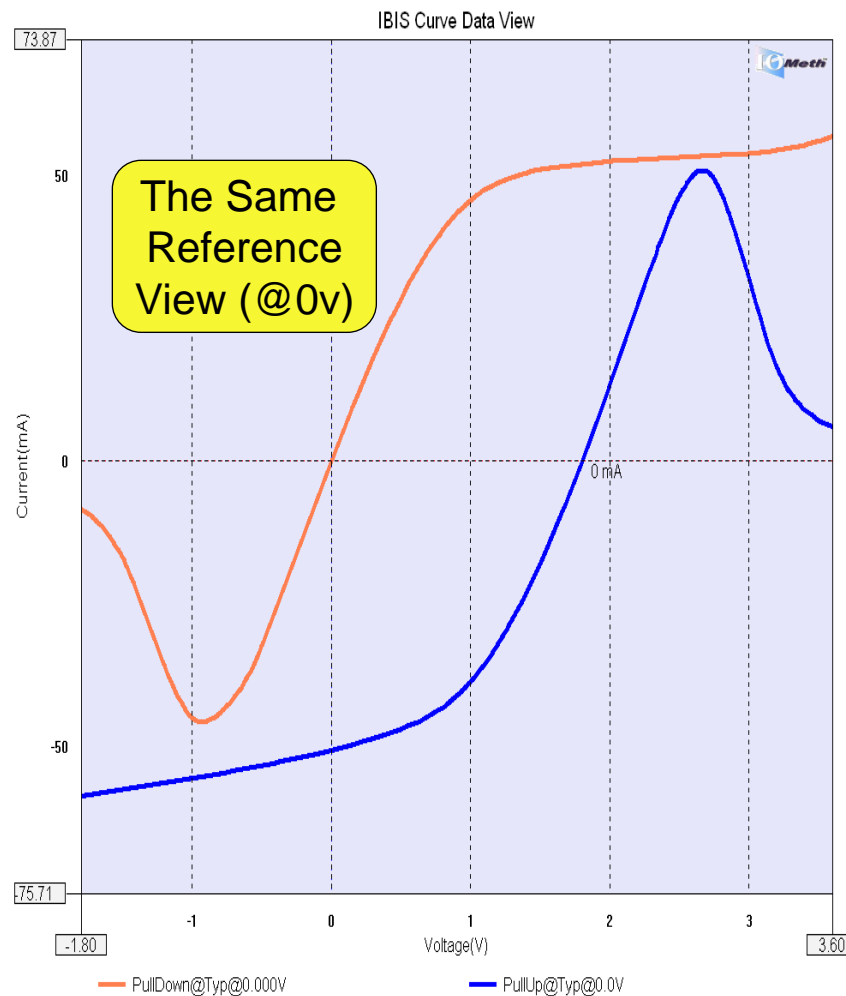
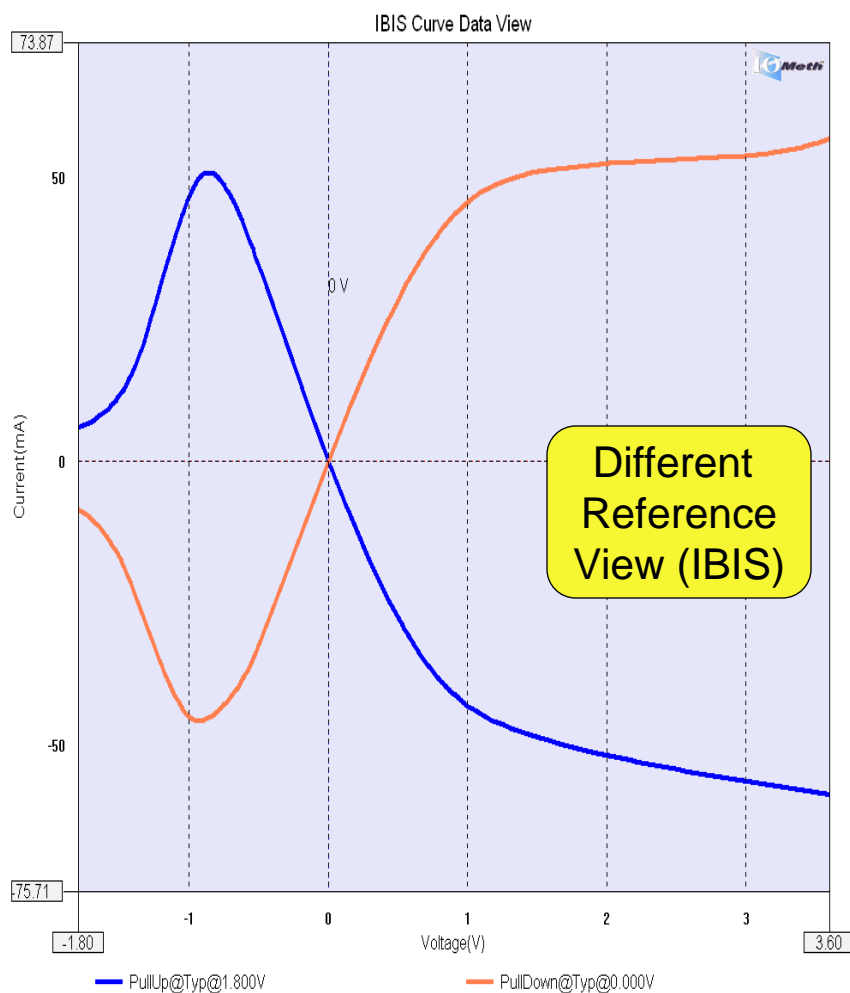
IBIS Application Module:

Fast Visual Inspection Mode (Low, High, Open states)

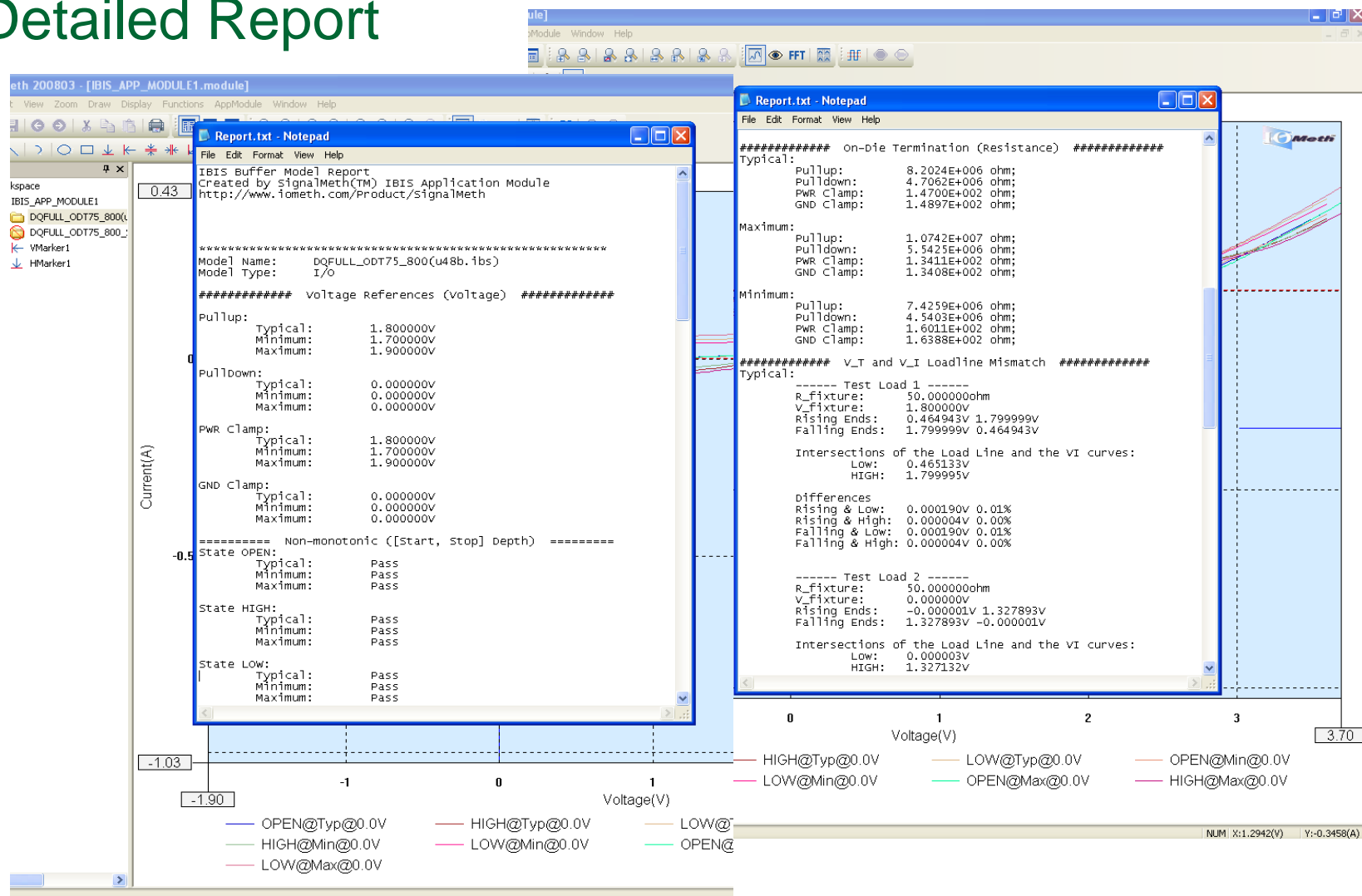


IBIS Application Module:

The same reference views



IBIS Application Module: Detailed Report



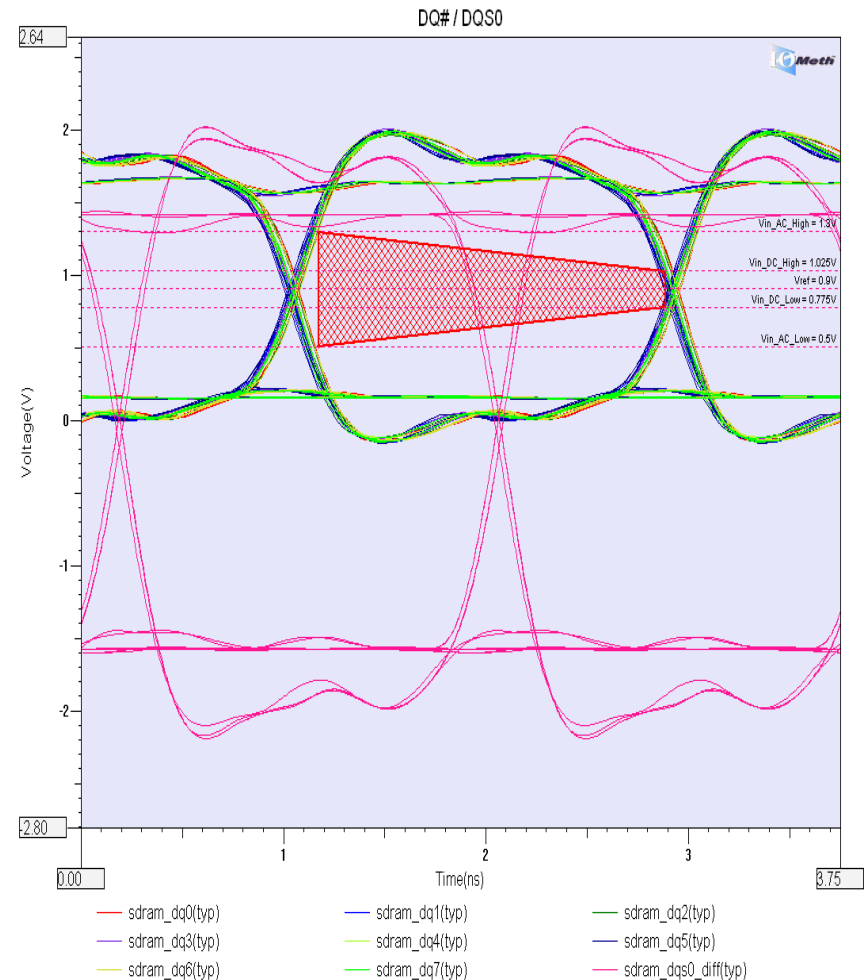
Introducing DDR2 Application Module (DDR2AM)

- **What is DDR2 Application Module?**
 - DDR2AM is a methodology application to allow you to do DDR2 standard-compliant analysis quickly and easily.
 - DDR2AM can be used for any waveforms / signals from scopes or/and simulations.
 - DDR2AM works not only for verifications but also for what-if analysis
- **No DDR2 standard-compliant analysis function in your simulator or scope? No problem! DDR2AM is right for you. And it is very high-performance and very low cost.**

DDR2 Application Module

Standard-Compliant Analysis

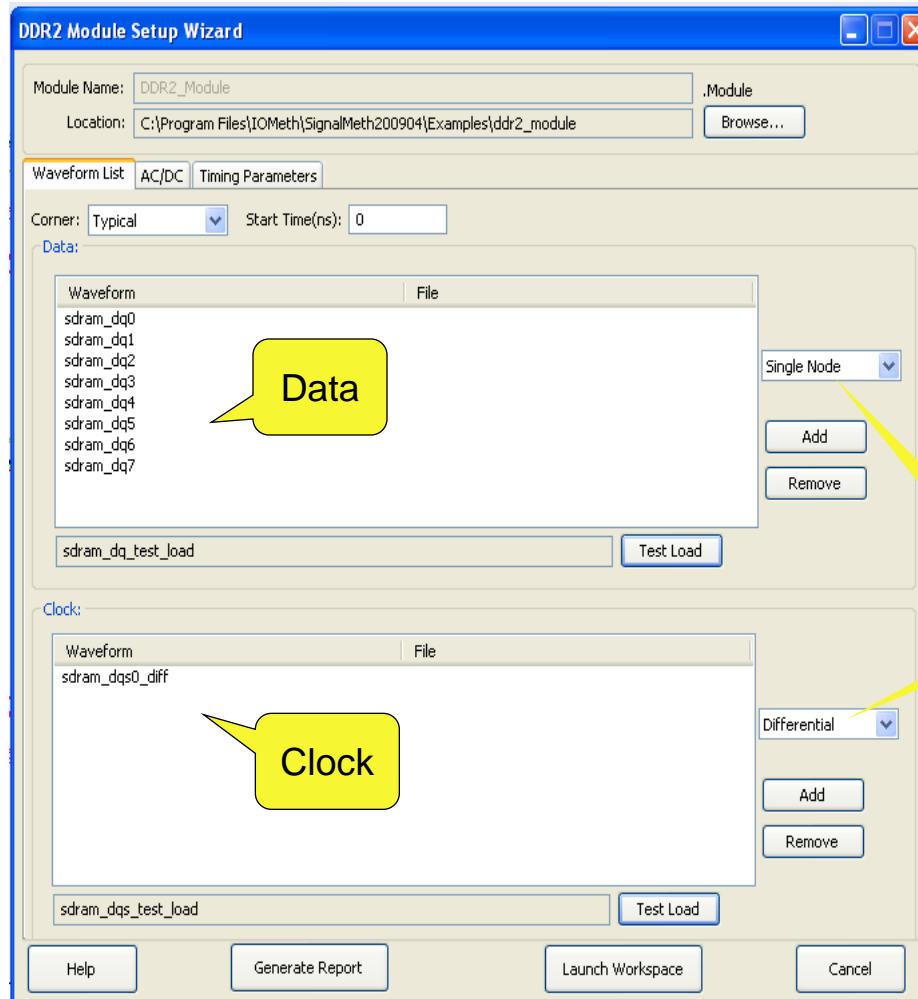
- JEDEC DDR2 Compliant Analysis & Validation
- Flexible source waveform / signal definitions
- Pre-definable Templates for different DDR2 designs
- Automatic Threshold / Aperture view visual inspections
- Comprehensive slew rate measurement with auto-derating calculations



DDR2 Application Module

Flexible waveform / signal definitions

- Support multi-format waveform / signal sources from scopes, simulators, etc.
- Single / differential signals with definable delay
- Reference Test Loads



DDR2 Application Module

AC/DC Specifications

- Template-based, Pre-definable and Savable
- All parameters in JEDEC DDR2 Specification

DDR2 Module Setup Wizard

Module Name: .Module
 Location: Browse...

Waveform List: AC/DC Timing Parameters

Data: Single-Ended Thresholds:

	Typical	Slow	Fast
Vcc:	1.8	1.7	1.9
Vih_AC:	1.15	1.1	1.2
Vih_DC:	1.025	0.975	1.075
Vref:	0.9	0.85	0.95
Vil_DC:	0.775	0.725	0.825
Vil_AC:	0.65	0.6	0.7
V_Meas:	0.9	0.85	0.95

Template: Save As...

Clock: Fast

Single-Ended Thresholds:

	Typical	Slow	Fast
Vcc:	1.8	1.7	1.9
Vih_AC:	1.15	1.1	1.2
Vih_DC:	1.025	0.975	1.075
Vref:	0.9	0.85	0.95
Vil_DC:	0.775	0.725	0.825
Vil_AC:	0.65	0.6	0.7
V_Meas:	0.9	0.85	0.95

Differential Thresholds:

	Typical	Slow	Fast
V_Diff_AC:			
V_Diff_DC:			
V_Diff:			
V_Diff_Meas:			

OverShoot Check:

	Typical	Slow	Fast
Overshoot_High:	2.3	2.2	2.4
Overshoot_Low:	-0.5	-0.5	-0.5
AC_Overshoot_High_Area:	0.28	0.28	0.28
AC_Overshoot_Low_Area:	0.28	0.28	0.28

Help Generate Report Launch Workspace Cancel

DDR2 Application Module

Timing Parameters

- Timing Analysis
 - Clock offset
 - Derating table calculation
 - Advanced slew rate measurement
 - Self-defined timing parameters

The screenshot shows the 'DDR2 Module Setup Wizard' dialog box. It has tabs for 'Waveform List', 'AC/DC', and 'Timing Parameters'. The 'Timing Parameters' tab is active. The 'Module Name' is 'DDR2_Module' and the 'Location' is 'C:\Program Files\IOMeth\SignalMeth200904\Examples\ddr2_module'. The 'Clock Edge' is set to 'Both', 'Data Unit Interval(UI)(ns)' is '1.875', and 'Template' is a dropdown menu. A yellow callout 'Self-define parameters' points to the 'Parameter' table. A yellow callout 'Timing Templates' points to the template list. The 'Data to Clock Offset' section has 'Minimum(ns): -1.337' and 'Maximum(ns): -0.538'. The 'Input Constraint' section has 'Setup Time(ns): 0.1' and 'Hold Time(ns): 0.225'. The 'Derating Data' section has two tables. A yellow callout 'Derating Table' points to the first table.

Parameter Table:

Symbol	Value(ns)	Description
abc	1	self-defined

Timing Templates List:

- DDR2_ADDCMD_CLK_400
- DDR2_ADDCMD_CLK_533
- DDR2_ADDCMD_CLK_667
- DDR2_ADDCMD_CLK_800
- DDR2_DQ_DQS_DIFF_400
- DDR2_DQ_DQS_DIFF_533
- DDR2_DQ_DQS_DIFF_667
- DDR2_DQ_DQS_DIFF_800
- DDR2_DQ_DQS_SE_400
- DDR2_DQ_DQS_SE_533

Derating Data Table 1:

Slew Rate(v/ns)	2.0	1.5	1.0	0.9	0.8	0.6
Setup Derating(ps)	125.0	83.0	0.0	-11.0	-25.0	-67.0
Hold Derating(ps)	-45.0	-21.0	0.0	14.0	31.0	83.0

Derating Data Table 2:

Slew Rate(v/ns)	4.0	2.0	1.8	1.6	1.4	1.2
Setup Derating(ps)	0.0	0.0	12.0	24.0	36.0	48.0
Hold Derating(ps)	0.0	0.0	-12.0	-24.0	-36.0	-48.0

DDR2 Application Module

Advanced Reports

- Excel Formatted Reports
 - Timing
 - Timing Edge to Edge
 - Flight Time
 - SI
 - Clock Characteristic

(ps)	120.0	83.0	0.0
(ps)	-45.0	-21.0	0.0
(ns)	4.0	2.0	1.8
(ps)	0.0	0.0	12.0
(ps)	0.0	0.0	-12.0
Generate Report			

Microsoft Excel - Report.xls

	A	B	C	D	E	F
1	Setup Margin(ns)	Hold Margin(ns)	Data Flight Time Min(ns)	Data Flight Time Max(ns)	Clock Flight Time Min(ns)	Clock Flight Time Max(ns)
2	0.267	0.138	0.515	0.818	0.646	0.66
3	0.302	0.102	0.478	0.783	0.646	0.66
4	0.272	0.134	0.51	0.812	0.646	0.66
5	0.295	0.111	0.487	0.789	0.646	0.66
6	0.291	0.118	0.494	0.794	0.646	0.66
7	0.311	0.094	0.47	0.774	0.646	0.66
8	0.269	0.137	0.513	0.815	0.646	0.66
9	0.29	0.119	0.495	0.795	0.646	0.66
10	0.312	0.126	0.509	0.792	0.666	0.66
11	0.35	0.093	0.476	0.754	0.666	0.66
12	0.321	0.118	0.5	0.784	0.666	0.66
13	0.338	0.1	0.482	0.767	0.666	0.66
14	0.334	0.107	0.489	0.77	0.666	0.66
15	0.357	0.093	0.475	0.747	0.666	0.66
16	0.315	0.124	0.506	0.79	0.666	0.66
17	0.337	0.109	0.492	0.768	0.666	0.66
18	0.253	0.112	0.507	0.87	0.685	0.70
19	0.292	0.075	0.47	0.831	0.685	0.70
20	0.259	0.106	0.502	0.864	0.685	0.70
21	0.288	0.08	0.476	0.834	0.685	0.70
22	0.28	0.088	0.483	0.843	0.685	0.70
23	0.298	0.069	0.464	0.825	0.685	0.70
24	0.255	0.109	0.504	0.867	0.685	0.70
25	0.282	0.091	0.487	0.84	0.685	0.70
26						

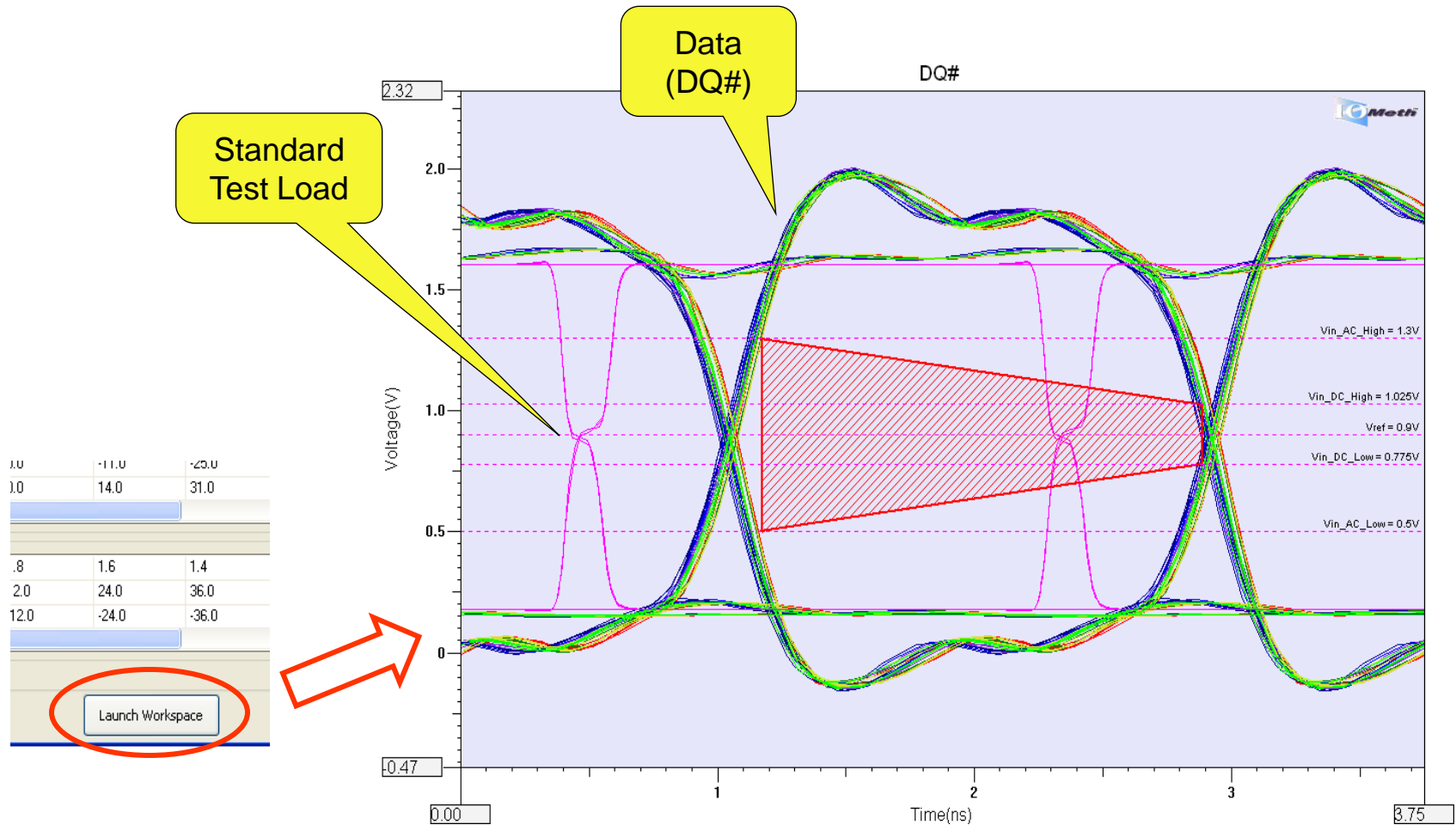
Timing / Timing Edge2Edge / Flight Time / SI / Clock_Characteristic /

							NUM
18	0.299	0.141	0.399	0.366	0.1	0.225	5
19	0.33	0.107	0.43	0.332	0.1	0.225	3
20	0.305	0.141	0.405	0.366	0.1	0.225	3
21	0.332	0.113	0.432	0.338	0.1	0.225	7
22	0.325	0.123	0.425	0.348	0.1	0.225	3
23	0.341	0.1	0.441	0.325	0.1	0.225	3
24	0.299	0.148	0.399	0.373	0.1	0.225	7
25	0.321	0.123	0.421	0.348	0.1	0.225	3
26							

Timing / Timing Edge2Edge / Flight Time / SI / Clock_Characteristic /

DDR2 Application Module

Advanced Eye Aperture View





<http://www.iometh.com>