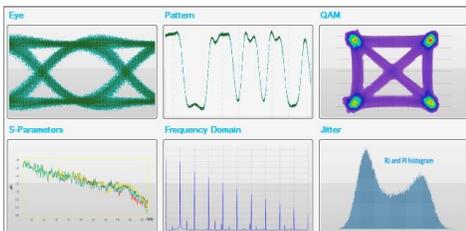


Marketing Datasheet

ML4025-ATE

4-Lane Sampling Scope

- Jitter Components Decomposition
- Eye Pattern Measurement
- Eye Mask Test
- Advanced Pattern Acquisition
- Pre- and Post-Emphasis Measurement



ML4025-ATE

4x32GHz DSO

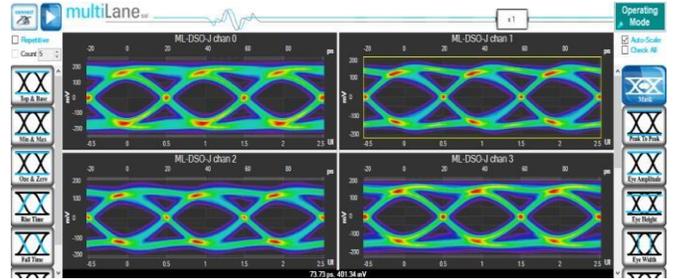
Summary

The **ML4025-ATE** is a state-of-the-art Digital Sampling Oscilloscope with CDR, which automatically performs accurate eye-diagram analysis at 32GHz. It serves to characterize the quality of transmitters and receivers, implementing a statistical under-sampling technique through comprehensive software libraries used for eye measurements, jitter analysis and the processing of NRZ/PAM4 data. It is designed for characterization as well as manufacturing.

Key Features

- Low cost quadruple 32GHz Digital Sampling Scope optimized for high speed data analysis.
- High Fidelity Signal Capture.
- Low intrinsic Jitter.
- ATE friendly interface, allows control of multiple modules through Fast Ethernet, User friendly GUI, high throughput APIs and libraries.
 - The software supports both Linux and Windows based ATE test systems.
- Supports external API calls from other software e.g. LabView.
- Repeatable performance and traceable to standards.
- External (MMPX) and Internal reference clock input.
- Single ended and differential electrical inputs for each of the four channels.
- Color graded persistence in eye and pattern capture modes.
- Ability to analyze and load data that you capture into the Simulator.
- Ability to save statistical measurement and data files for multiple DSOs.
- Full eye measurements can be attained in a number of milliseconds.

4-Channel Digital Sampling Oscilloscope providing SerDes testing & characterization for transmitters rates up to 32Gbps per lane



Applications

- Can be mounted on Automatic Test Equipment load boards, verified to fit into various ATE platforms such as the Teradyne (Catalyst, J750, UltraFlex), or the Verigy 93k.
- High-Speed SerDes Testing & Characterization.
 - Design/Verification of Telecom and Datacom Components and Systems.
- Electro-optical Transceiver Testing.
 - Handheld 10-25 G test equipment for field Installation and maintenance.
- Multi-port system testing of Line Cards.
- In-Situ testing of high port count systems.
 - Telecoms Equipment Test for Installation and Maintenance.
- Fiber Channel, Ethernet, PON, Parallel Optics, etc*.
- High port count burn-in test.

DSO Measurements

NRZ Mode

- Total Jitter & Jitter decomposition:
 - DJ, RJ
- Mask Margin, alternate Mask Margin rules available.

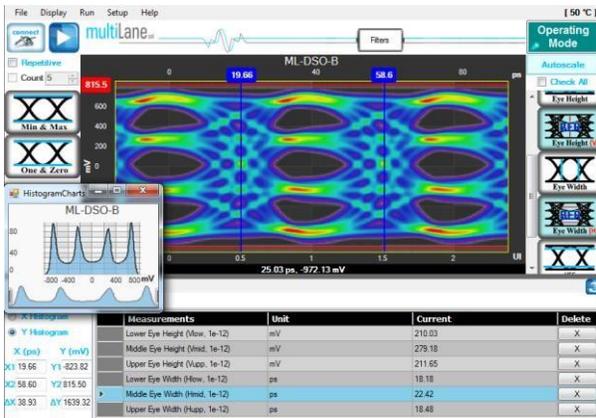
ML4025-ATE Marketing Datasheet rev. 1.1.6

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- The mask margin (positive or negative) can be extracted for a defined number of points that fail, thus allowing for DUT quality assessment, control and binning.
- Number of failing points for a region can be returned as well as the actual points that failed.
 - Eye opening, eye height and width, eye amplitude, top, base, max, min, peak to peak.
- Rise/fall time, single edge measurement in pattern capture.
- Statistics histograms and histogram measurements. EH and EW by BER
 - Crossing percentage.
- Pre-emphasis positive & negative (amplitude width).
- Advanced Pattern Measurements
 - Eye measurements on specific properties of the pattern.
- Zooming, markers, X and Y histograms, overlays, and multiple measurements, statistics.

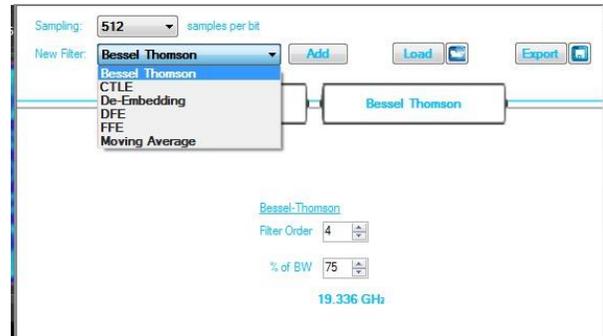
PAM4 Mode

PAM4 scope measurements are currently up to date with the latest OIF contribution.



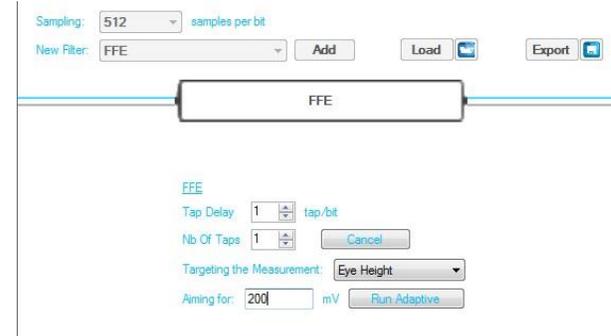
Applying Filters

Several filters including FFE, DFE, CTLE, BesselThomson, etc are available in NRZ as well as PAM mode. Concatenation of several filters is also possible and the effect of each filter is shown immediately on the eye or pattern.



One may also import s2p or s4p files to deem bed fixtures.

The adaptive equalization feature available in the DSO is a practical function in determining the ideal CTLE gain for a given trace or the FFE number of taps for a certain target amplitude.



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Measuring Insertion Loss

With a source such as ML BERT, the insertion loss (S21) of a device can be measured using the DSO. The available dynamic range is 70 dB. The user is guided through the process by a wizard.



DSO Specifications						
Parameter	Symbol	Condition	Min	Typical	Max	Unit
Input Bandwidth (programmable)					32 600/1200	GHz
Input Amplitude		S.E./Diff.				mVpp
Input Rise / Fall Time (20% to 80%)	t_{RT}, t_{FT}			14 for 32GHz		pS
Vertical Resolution				12		bits
Clock Input range (normal mode)			10KHz		550	MHz
Clock Input range (bypass mode)			10KHz		125	MHz
Clock Input Amplitude		SE			1000	mV
Input Impedance	Z			50		Ω
Intrinsic Jitter (excluding DDJ)		<i>Note</i> ¹			200fS	rms
Amplitude Error (rms)		<i>Note</i> ²		4		mV _{rms}
Data Format support				NRZ,PAM4		
PRBS Pattern Capture		<i>Note</i> ³			PRBS13	
Spurious-Free Dynamic Range (sine wave)	SFDR			-58 dBc at 10 GHz, 50 mVpp, 1 GS/s -53 dBc at 30 GHz, 50 mVpp, 1GS/s		
Memory depth				256k		Samples
Power rating				1.6A @12Vdc		
Return Loss		20 GHz			<-10	dB

1. Intrinsic Jitter is the additional jitter uncertainty of the DSO as the statistical sum of sampler, the timing generator and DSO interconnect.

2. Related to calibration time @600mV input over operating temperature range.

3. For all measurements that require pattern lock. For all other measurements the ML4025 supports up to PRBS 31.

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