

Marketing Datasheet

ML4039

**4-Lane 8.5-15 & 21-30 Gbps/lane
Bit Error Rate Tester**

Vertical & Horizontal Eye Closure

Bathtub Curve Measurement

Eye Contour Measurement

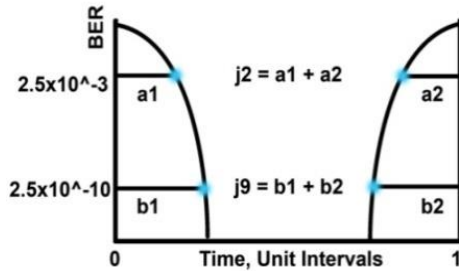
Receiver Sensitivity

Jitter Tolerance



ML4039

4 Channel 30Gbps BERT



Summary

The ML4039 series is a state of the art 4 Lane Pulse Pattern Generator and Error Detector with Jitter Generator & Equalizer up to 30 Gbps. That is fully featured for lab and production testing of systems, components, and Electro-Optical Modules, O-optical modules. The instrument is offered in 4 different variants:

Key Features

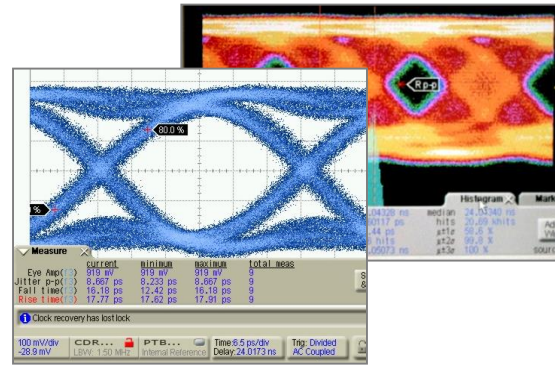
- Available in ATE and cPCI form factors
- 8.5-15 and 21-30 Gbps data rate
- Low intrinsic jitter
- Automated J2/J9 measurement
- Integrated synthesizer
- Eye contour measurement
- Bathtub measurement
- Intuitive comprehensive GUI
- Window and Linux API functions
- Repeatable traceable measurement

RX Tolerance Measurement

- BER measurement
- Receiver mask tolerance

Software Capabilities

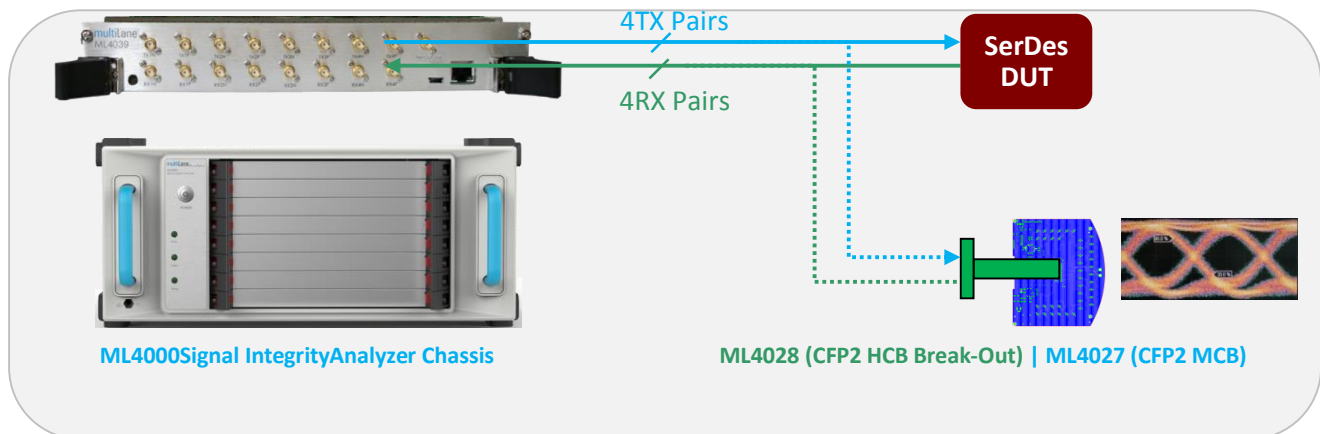
- Provide LabVIEW drivers
- Multiple modules can be controlled via Fast Ethernet 100 BASE-TX



Target Applications

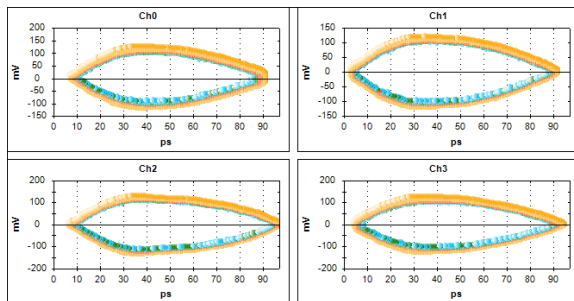
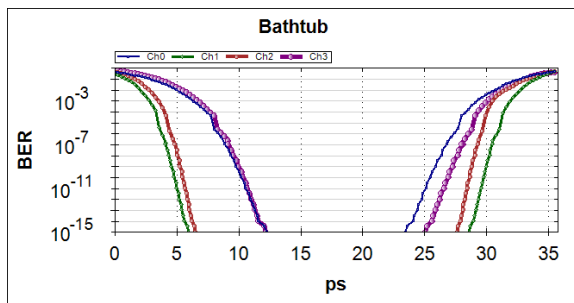
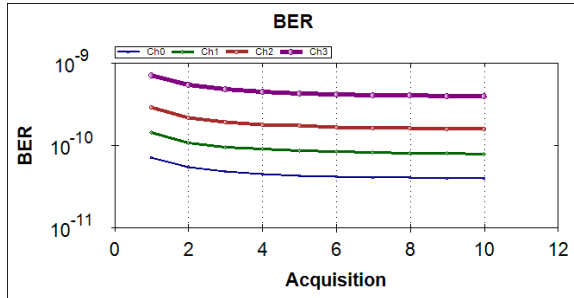
- Interconnect testing CFP2, CFP4, QSFP28
- Backplane testing
- Interference and crosstalk testing
- Receiver sensitivity testing
- Electro-Optical module testing
- Electrical testing for 100 Gbps Ethernet, MLD/CAUI application, OIF CEI-28G-VSR, CPPI-4, CAUI-4, 32G Fiber Channel chip to module

SerDes & CFP2 Test Application



ML BERT GUI

- Test 4-channel BER test at the same time
- Support BER curve
- Provide multiple and single layouts of bathtub and eye contour



The screenshot shows the MLBERT GUI software interface. The main window displays the configuration for a 4-channel BER test. The configuration table is as follows:

Ch	TX Pattern	RX Pattern	Amplitude	Pre-Emph	Post-Emph	Error-Insr	CTLE
Ch 0	PN31	PN31	270	0	10	Running	4.02
Ch 1	PN31	PN31	270	0	10	Running	Auto-ada
Ch 2	PN31	PN31	270	0	10	Running	Auto-ada
Ch 3	PN31	PN31	270	0	10	Running	Auto-ada

The interface also shows the current configuration for the Eye Contour and Bathtub plots, including the graph type, layout type, and various parameters. The Eye Contour plot shows the signal waveform and the eye contour for Ch0, and the Bathtub plot shows the BER performance over time for Ch0.

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Advance Product information subject to change. Multilane SAL reserves the right to make changes to its product specifications at any time without notice. The information furnished herein is believed to be accurate; however, no responsibility is assumed for its use.

Electrical Specification	
	ML4039
Bit Rate	8.5-15 & 21-30Gbps
Bit Rate Accuracy	Better than ± 20 ppm ¹
Data Format	NRZ
Pattern	PRBS 7, 9, 15, 23, 31, and User Defined Pattern 16 bits@10G & 40 bits@25G
TX Amplitude Differential	200-800mV ²
TX Amplitude Adjustment	200 mV/step
Pre-Emphasis	6dB
Pre-Emphasis Resolution	20 steps
Equalizing Filter Spacing	-
Total Jitter pk-pk @10G	10 ps (typical)
Total Jitter pk-pk @25G	12 ps (typical)
Rise/Fall Time (20–80%) @25G	< 14 ps ³
Sinusoidal Phase Modulation	-
Sinusoidal Jitter Frequency	-
Random Jitter in Phase Modulation	-
Output Return Loss up to 10GHz	-15 dB
Output Return Loss (16-25GHz)	-8dB
TX Skew Control Range	-
Lane to Lane Skew Resolution	-
Error Detector Phase Margin	5ps
Error Detector Input Amplitude	110-1050 mVpp @11G, 1200 mVpp @25G
Error Detector Maximum Input	1200mV Diff
Error Detector Input Sensitivity	30 mVpp @ 10.3125G / 50 mVpp @ 28G
Phase Scan Resolution	7 bits
Vertical Scan Resolution	8 bits
Input CTLE Dynamic Range	10dB
Reference Clock Output	Rate/32 for 8.5-15G and Rate/80 for 21-30G
Reference Clock Output Amplitude	550-850 mVpp
Reference Clock Input	Rate/32 for 8.5-15G and Rate/80 for 21-30G
Reference Clock Input Amplitude	300-1900 mVpp
Clock Data Recovery	Rate/N (user selectable from 8 and 16)
TX/RX and Clock Connectors in cPCI	2.92mm K connector
TX/RX and Clock Connectors in ATE	SMPM-RA
cPCI Form Factor Slot Height	2
Power Requirement	21.5 Watt

Order Information	
Order No.	Description
ML4039	4 Channels 30 Gbps BERT
ML4039-3W	3-Year Warranty
ML4000-4	Signal Integrity Analyzer Main Chassis, 4 slots
ML4000-8B	Signal Integrity Analyzer Main Chassis, 8 slots with optional switch function
<ul style="list-style-type: none"> • Please select cPCI form factor or ATE (5" x 6.5") form factor. • Standard Warranty - 1 Year 	
For more information on this or other products, contact Multilane sales team by email at sales@multilaneinc.com	

¹ At bit rates between 19 and 30 Gbps

² Output amplitude setting error: ± 50 mV $\pm 17\%$ of setting amplitude

³ Test condition is differential, PRBS7, 70GHz-bandwidth sampling scope with a 80cm phase-matched K(2.92mm) cable pair.

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