

Innovation for the next generation

ML7064E-L-UMT

Universal Interconnect Tester | 64 total Channel | Replaceable 4 daughter cards with 2 slots in each | Equalization | Passive and Active Interconnect Testing | Long Reach BERT | Additional 3 or 9dB loss | Ethernet Rates | BER Testing



Summary

The ML7064E-L-UMT is a versatile, high-performance universal interconnect tester designed for quick and efficient testing of both active and passive interconnects. Featuring a long-reach Bit Error Rate Tester (BERT) with 64 channels, this tester supports a maximum data rate of up to 112G per lane. The ML7064E-L-UMT utilizes a modular design with replaceable daughter cards, enabling flexible and quick configuration suitable for production environments.

Equipped with advanced signal integrity analysis capabilities, the ML7064E-L-UMT includes Feed-Forward Equalization (FFE) in 3 or 7 taps mode on the transmitter (Tx) side, and Continuous-Time Linear Equalization (CTLE), Decision Feedback Equalization (DFE), reflection cancellation (RC), and Maximum Likelihood Sequence Detection (MLSD) on the receiver (Rx) side. These features ensure comprehensive testing and optimization of signal performance, making the ML7064E-L-UMT an ideal solution for rapid testing in production environments, ensuring the highest levels of interconnect quality and reliability.

ML7064E-L-UMT

64 x 64 GBaud PAM4 BERT

Introduction

The ML7064E-L-UMT is a fully featured 112G/lane Tester that can be configured for 64 channels, one system needs 4x daughter cards to be fully loaded, you can mix and match between the options figuring in order information

The transmitters support all standard test patterns mandated by IEEE802.3ck stress testing and OIF such as PRBS13Q, PRBS31Q, etc. Tx can also be programmed to output a user-defined pattern.

The ML7064E-L-UMT supports transmitter and receiver equalization up to 34dB to overcome signal integrity impairments due to channel losses or reflections.

The user can customize the daughter card on the platform based on the DUT form factor

Additionally, each daughter card adds either 3dB or 9dB loss on the system.

The ML7064E-L-UMT is designed for interconnect testing: active and passive cables, transceivers, LPO, backplane...

Key Features

Transmit

Data Rates: supporting ethernet rates from 25.78125Gb/s, 26.5625Gbaud, 28.125Gbaud, 50G, 51.625G, 53.125G, 56.25G

- DFE, CTLE, RC and MLSD Equalization
- Independent control of inner eye levels
- Up to 800 mVpp controllable Tx Amplitude swing
- Supports Gray coding
- Error injection
- 3-tap Pre- and Post-emphasis or 7-tap linear FFE

- Available patterns:
 - PRBS7Q, PRBS9Q, PRBS11Q, PRBS15Q, PRBS23Q, PRBS31Q and PRBS58Q, plus their inversions
 - Square wave
- Burst noise injection

Receive

- SNR monitoring over time
- PAM histogram monitor
- Error-detection on following patterns:
 - PRBS7(Q), PRBS9(Q), PRBS11(Q), PRBS15(Q), PRBS23(Q),
 - PRBS31(Q) and PRBS58 + their inversions
- Automatic pattern detection
- LOS indicators
- Up to 34dB Equalization Capabilities
- Additional 3dB or 9dB from each slot on each daughter card

General

- LabView driver and Python wrapper available
- Shallow Loopback testing
- API libraries with documentation

Target Applications

- Fast production testing with a pass/fail verdict
- RMA Tester for quick module validation
- Passive interconnect
- Active cables and transceivers

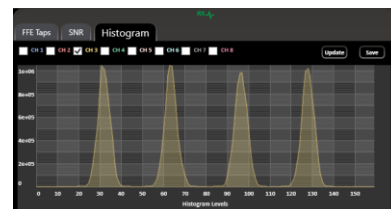


Figure 1: PAM4 Eye Histogram

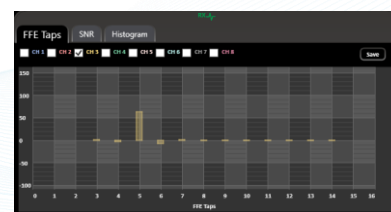


Figure 2: RX FFE Taps

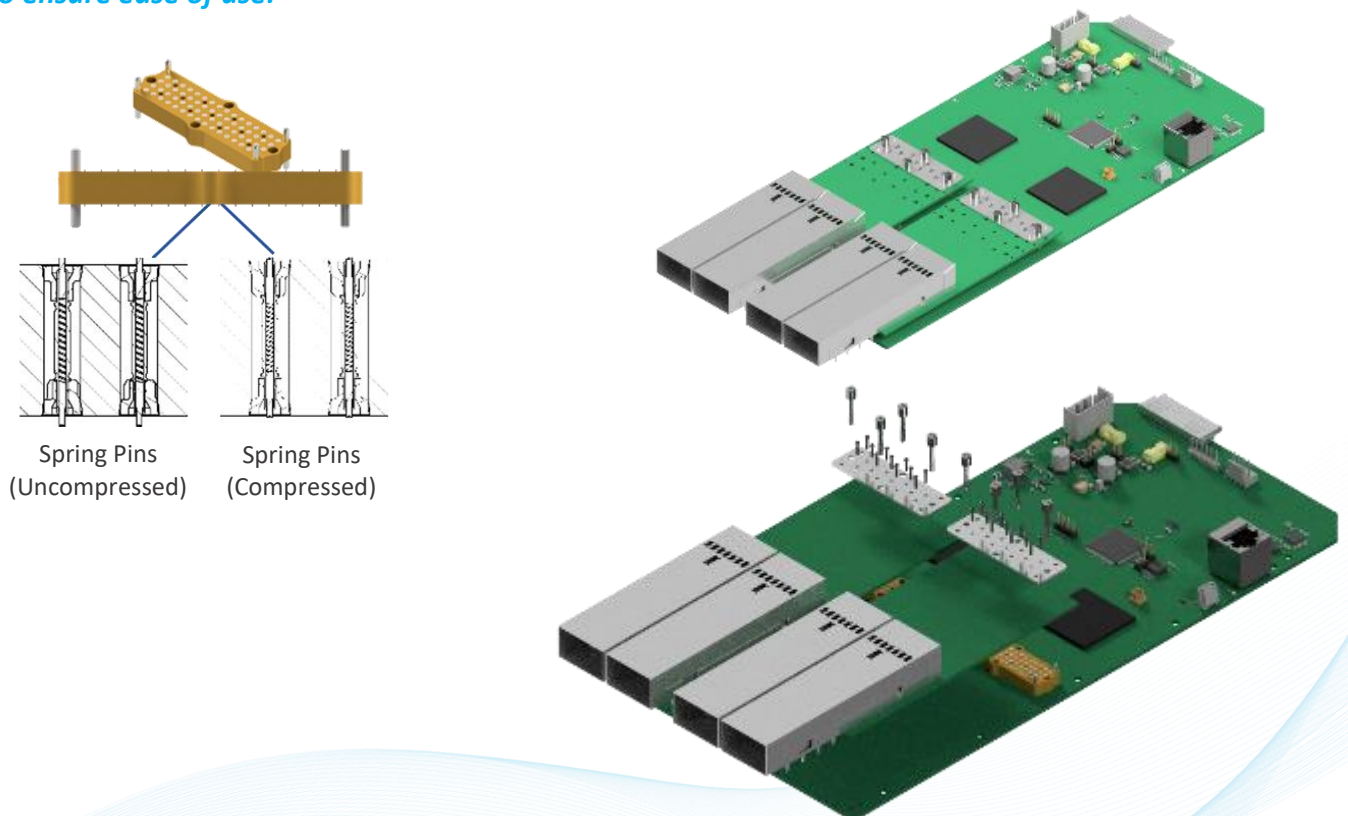
Mechanical Modularity Concept:

Our innovative design features fast and reliable daughter card replacement after a specific number of insertions, ensuring minimal maintenance interruptions. The daughter card is securely fixed to the main PCB using a robust board-to-board connection, enhanced by captive screws for secure attachment and easy removal. This setup is ideal for environments requiring continuous operation, facilitating quick component swaps, improving work efficiency, and reducing disruptions during the production phase.

Remove the L shaped cover and the cooling cage at once:



Unscrew the components of the daughter card, Screws are captive and reduced to a minimum number to ensure ease of use:



Specifications

Parameter	Specifications
Bit Rates	Up to 112G/lane including 25.78125G 26.5625G 28G 50G 53.125G
TX Amplitude Differential	0 – 800 mVpp
Patterns	Supports PRBS7(Q), PRBS9(Q), PRBS11(Q), PRBS15(Q), PRBS23(Q), PRBS31(Q) and PRBS58 plus their inversions
TX Amplitude Adjustment	Steps of 1 mV
Pre-emphasis resolution	1000 steps
Pre- / Post-emphasis	6 dB
Equalizing Filter Spacing	1 UI
Random Jitter RMS ¹	< 290 fs
Rise/ Fall Time (20–80%) ¹	< 10 ps
Coding	Gray coding supported
Output Return Loss up to 10 GHz	< -15 dB
Output Return Loss (16-25 GHz)	< -10 dB
Error Detector input range	50 – 800 mV differential
Clock Connection	Reference Clock: 156.25MHz or external clock
TX/RX connectors	Replaceable Daughter Cards in different form factors
Diff. Input Return Loss	Better than 10 dB
Eye monitor resolution	8 bits horizontal across 2 UI / 9 bits vertical
Clock Input Range	Up to 4.4 GHz
Clock Input Amplitude	800 – 1600 mV
Input Impedance	50 Ω
Ambient Temperature	0 – 75 °C
Power	Internal Power Supply 110 V, 1.4 A or 220 V, 0.9 A – 50/60 Hz

¹ With appropriate pre and post emphasis settings and 50 GHz scope. Trigger from adjacent data channel rate/8

Mechanical Dimensions

ML7064E-L-UMT can be used as a benchtop instrument or fit in a 1RU Rack
Different testers can be on top of each other's

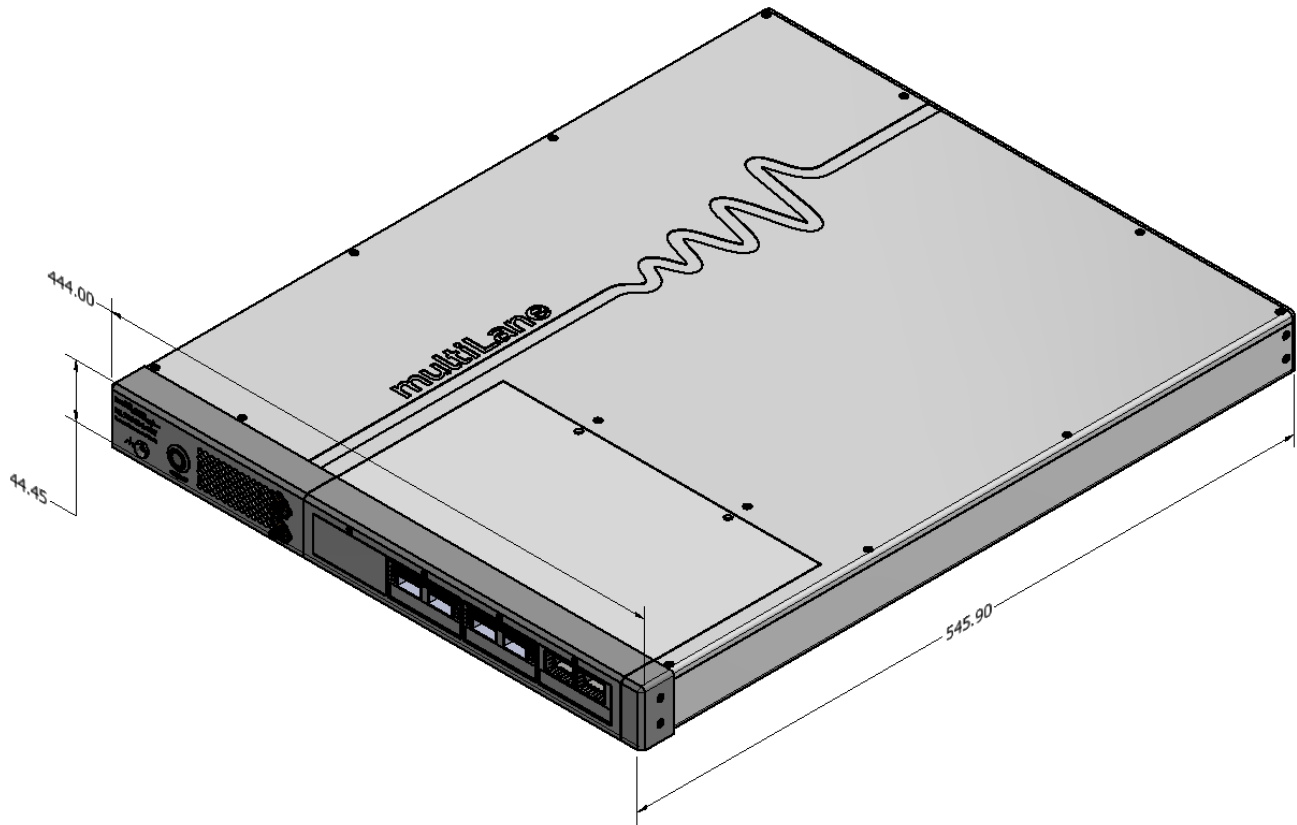


Figure 3: ML7064E-L-UMT Mechanical Dimensions

Ordering Information

Option	Description
ML7016E-QSFPDD-112-DC	QSFP-DD-112 Daughter Card, with 2x QSFP-DD-112 slots, one adds 3dB loss and the other is 9dB, mix and match between all available form factors – need a total of 4 daughter cards to fully load the system
ML7016E-OSFP-112-DC	OSFP-112 Daughter Card, with 2x OSFP-112 slots, one adds 3dB loss and the other is 9dB, mix and match between all available form factors - need a total of 4 daughter cards to fully load the system
Daughter Card Customization	Customize any form factor that has up to 64 channels
3YW	Total 3-year warranty
CAL	Single calibration
3YWC	Total 3-year warranty with 3 annual calibrations

Please contact us at sales@multilaneinc.com