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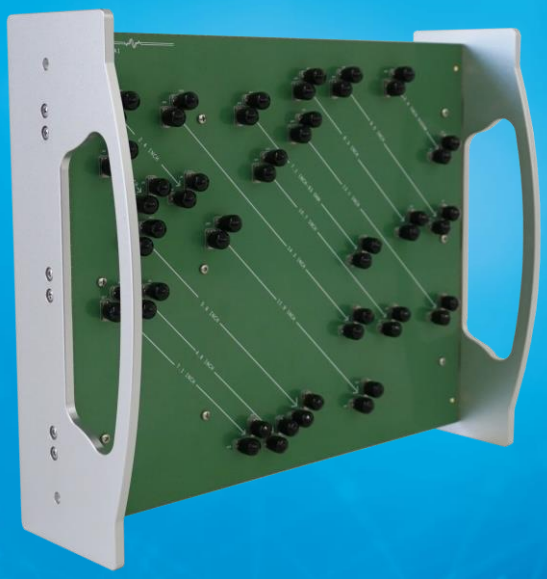
DATASHEET

Innovation for the next generation



ML4067-112-24

Channel Emulation Board

2 to 24 dB loss @ 26 GHz | Differential channels |
Channel Emulation of OIF-CEI-56/112 and 802.3bs/ck |
Designed for 56 GBaud PAM4 (112 Gbps)

Summary

The transition to 400G is in full swing with volumes of 400G system ports and pluggables increasing significantly. However, even as 400G becomes more commonplace, the insatiable demand for bandwidth means the next technological advancement is already in the making. 800G is around the corner and, at 112G per channel, brings with it a myriad of unique test challenges.

The 112G HSIO ecosystem compels semiconductor and system vendors to rely on new techniques and technologies to validate their designs. Novel equalization methods carry the major responsibility of recovering lossy signals and must be characterized in realistic environments.

The MultiLane ML4067-112-24 112G channel board is an ideal tool for this purpose. Featuring a variety of carefully designed differential test traces, this passive test accessory adds precise ISI (inter-symbol interference) in order to calibrate or stress test DSPs, modules, gearboxes or other relevant systems in real-life environments.

ML4067-112-24

Channel Emulation Board

Introduction

The ML4067-112-24 Channel Emulation board contains 13 trace paths with lengths ranging from 1.2 to 14.3 inches, and target losses which range from 2 to 24 dB at the target Nyquist frequency of 26 GHz. The ML4067-112-24 is an easy to use, compact and portable design. All traces are terminated by 2.4 mm connectors.

Key Features

The ML4067-112-24 has an extensive set of features:

- 13 trace paths: 11 traces of 100 Ohm and 2 traces of 93 Ohm
- Loss from 2 dB to 24 dB with a 2 dB increment
- 6 dB trace is not available
- Trace length range from 1.2 to 14.3 inches
- Target Nyquist frequency of 26 GHz
- Individual test report and s-parameter files will be provided for each channel board

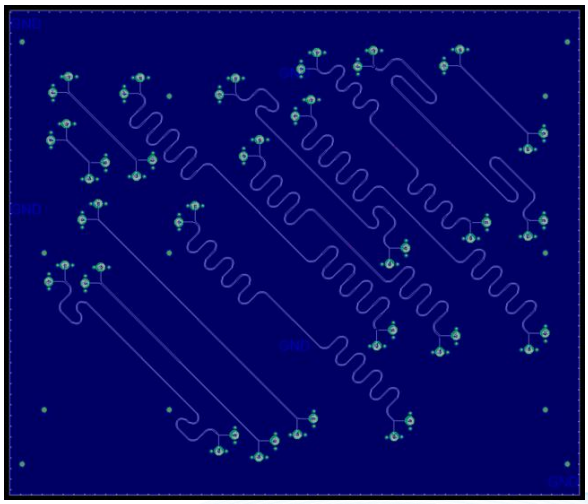


Figure 1: Schematics of the ML4067-112-24

Typical Applications

- IC validation
- Receiver stress testing
- Rx equalization verification
- Channel emulation of OIF-CEI-56/112G and relevant IEEE 802.3 standards such as bs, ck, etc.

Figure 2: Design of the ML4067-112-24

Specifications

Insertion Loss Target (dB)	Channel length (inch)	Insertion Loss Delta (dB)* [measured]
	100 Ohm	
2	1.2	0.15
4	2.4	0.13
8	4.8	-0.28
10	5.9	-0.58
12	7.1	-0.72
14	8.3	-0.77
16	9.5	-0.97
18	10.7	-1.09
20	11.9	-1.34
22	13.1	-1.4
24	14.3	-1.56
	93 Ohm	
4	2.4	0.13
12	7.1	-0.73

* Insertion Loss Delta = Measured Insertion Loss – Insertion Loss Target

Disclaimer: Measured performance will slightly vary from board to board; however, each individual channel board comes with a unique set of actual measured S-parameters which can be shared in advance upon request.

Parameter	Specifications
Return loss	> 12 dB, up to 45 GHz
Impedance, differential	100 Ohm +/- 5% (typical)
Impedance, differential	93 Ohm +/- 5% (typical)

Test Results

The graphs for insertion loss and return loss are shown below. The impedance profile graphs are also displayed at 1.2, 8.3, and 14.3 inches for 100 Ohm channels and 2.4 inches at 93 Ohm.

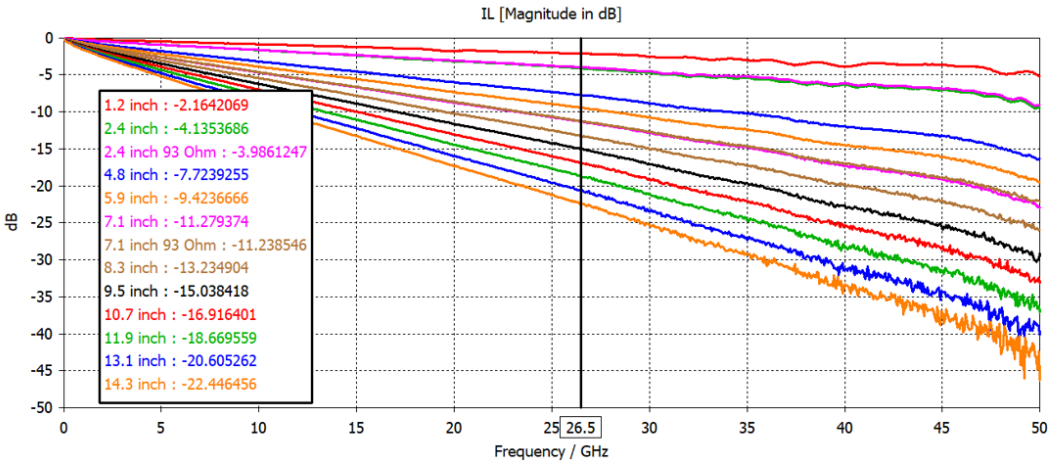


Figure 3: Insertion loss

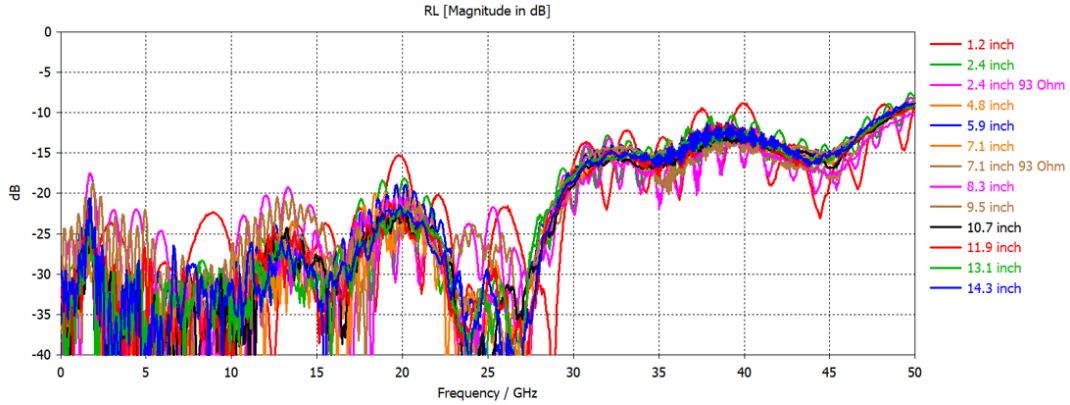


Figure 4: Return loss

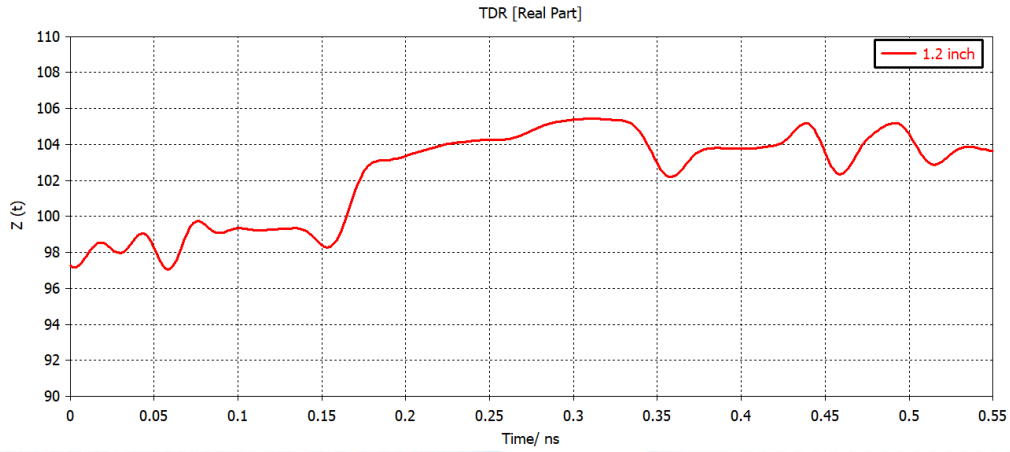


Figure 5: Impedance profile 1.2 inch channel

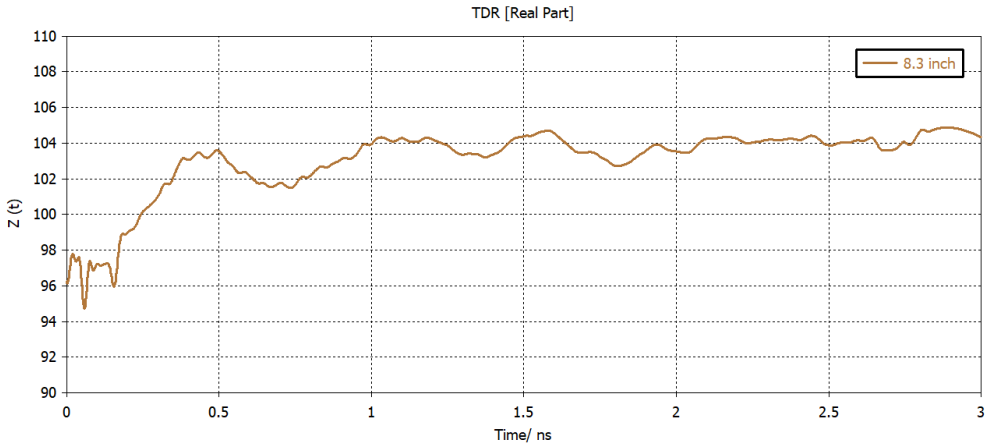


Figure 6: Impedance profile 8.3 inch channel

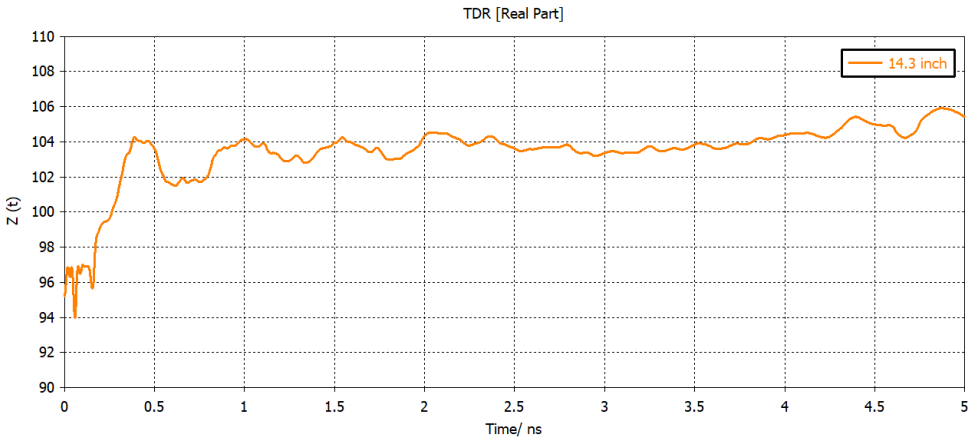


Figure 7: Impedance profile 14.3 inch channel

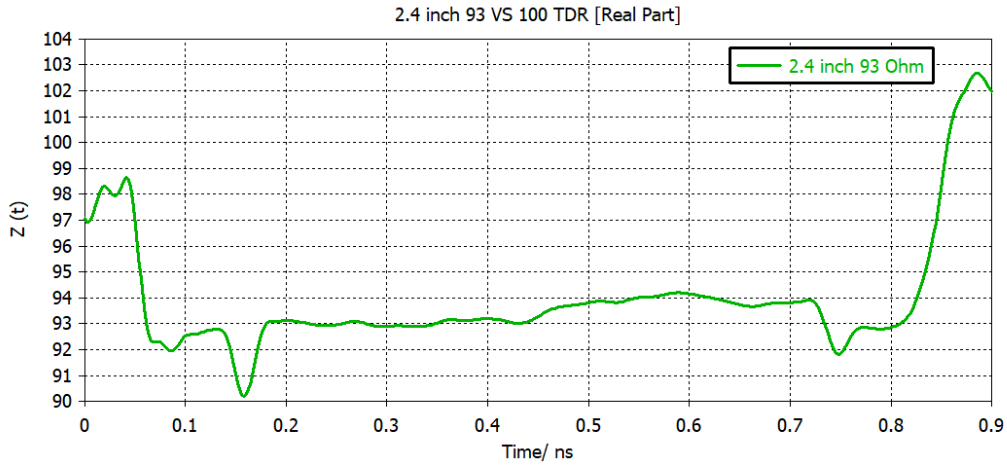


Figure 5: Impedance profile at 93 Ohm for 2.4 inch trace

Mechanical Dimensions

The ML4067-112-24 has the following dimensions: length x width: 10.7 x 9.1 inches.

The ML4067-112-24's ergonomic design and multi-functional handles enable convenient benchtop usage.

Ordering Information

Part Number	Description
ML4067-112-24	112 Gbps Channel Emulation Board with 2.4 mm connectors, 2 – 24 dB insertion loss, with 2 dB increments (except for 6 dB)

Recommended Accessories

Instruments	Recommended cables	Comments
ML4067-112-24	2x MLCBPM-2.4-60	2.4 mm connector 2x2 channel, 60 cm

Please contact us at sales@multilaneinc.com.

North America
48521 Warm Springs Blvd. Suite 310
Fremont, CA 94539
USA
+1 510 573 6388

Worldwide
Houmal Technology Park
Askarieh Main Road
Houmal, Lebanon
+961 81 794 455

Asia
14F-5/ Rm.5, 14F., No 295
Sec.2, Guangfu Rd. East Dist.,
Hsinchu City 300, Taiwan (R.O.C)
+886 3 5744 591