

OIF

OIF PLL Interoperability Demo CEI-224G

ECOC 2022

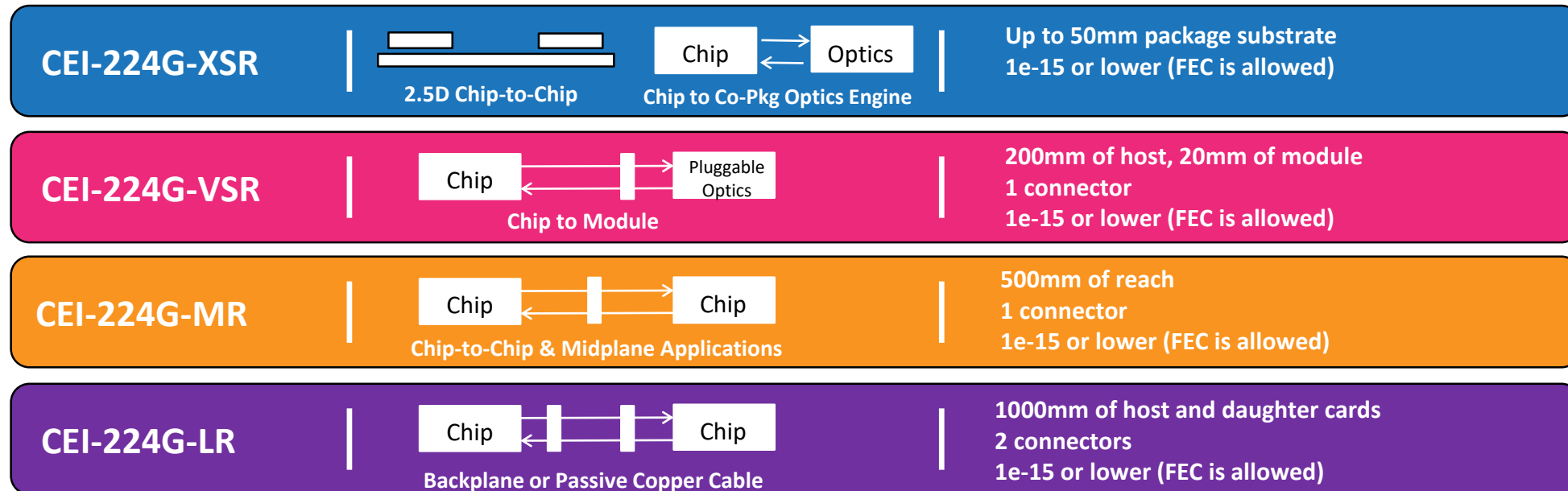
19-21 September 2022

Basel, Switzerland

OIF's Common Electrical I/O (CEI) Work Has Been a Significant Industry Contributor

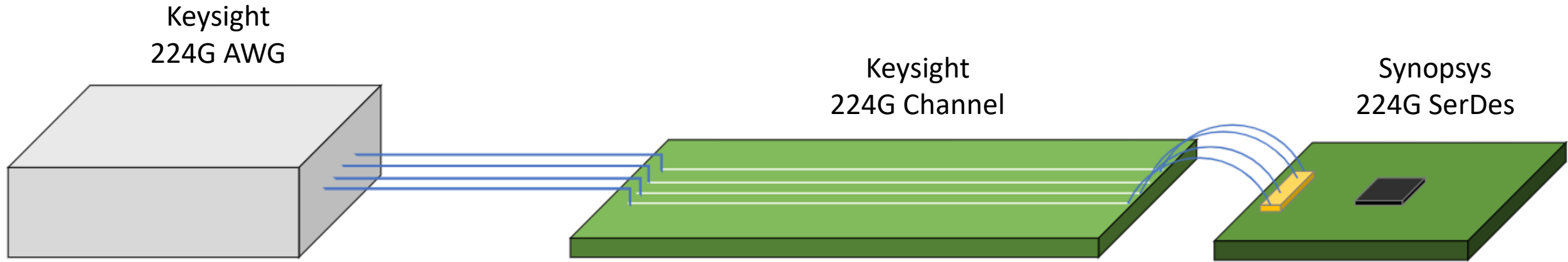
Name	Rate per pair	Year	Activities that Adopted, Adapted or were influenced by the OIF CEI
CEI-224G	224Gbps	202X	Several channel reach projects in progress, kicked off in 2022
CEI-112G	112Gbps	2022	Seven channel reach projects in progress, IEEE, InfiniBand, T11 (Fibre Channel), Interlaken, ITU.
CEI-56G	56Gbps	2017	IEEE, InfiniBand, T11 (Fibre Channel), Interlaken, ITU
CEI-28G	28 Gbps	2012	InfiniBand EDR, 32GFC, SATA 3.2, SAS-4, 10GBASE-KR4, CR4, CAUI4, Interlaken, ITU
CEI-11G	11 Gbps	2008	InfiniBand QDR, 10GBASE-KR, 10GFC, 16GFC, SAS-3, RapidIO v3, Interlaken, ITU
CEI-6G	6 Gbps	2004	4GFC, 8GFC, InfiniBand DDR, SATA 3.0, SAS-2, RapidIO v2, HyperTransport 3.1, Interlaken, ITU
SxI5	3.125 Gbps	2002-3	Interlaken, FC 2G, InfiniBand SDR, XAUI, 10GBASE-KX4, 10GBASE-CX4, SATA 2.0, SAS-1, RapidIO v1, ITU
SPI4, SFI4	1.6 Gbps	2001-2	SPI-4.2, HyperTransport 1.03

OIF CEI-224G New Project Starts



- New Projects started at OIF Q1 2022 meeting
- One SerDes core might not be able to cover multiple applications from XSR to LR
- For short reach applications, simpler and lower power equalizations are desired

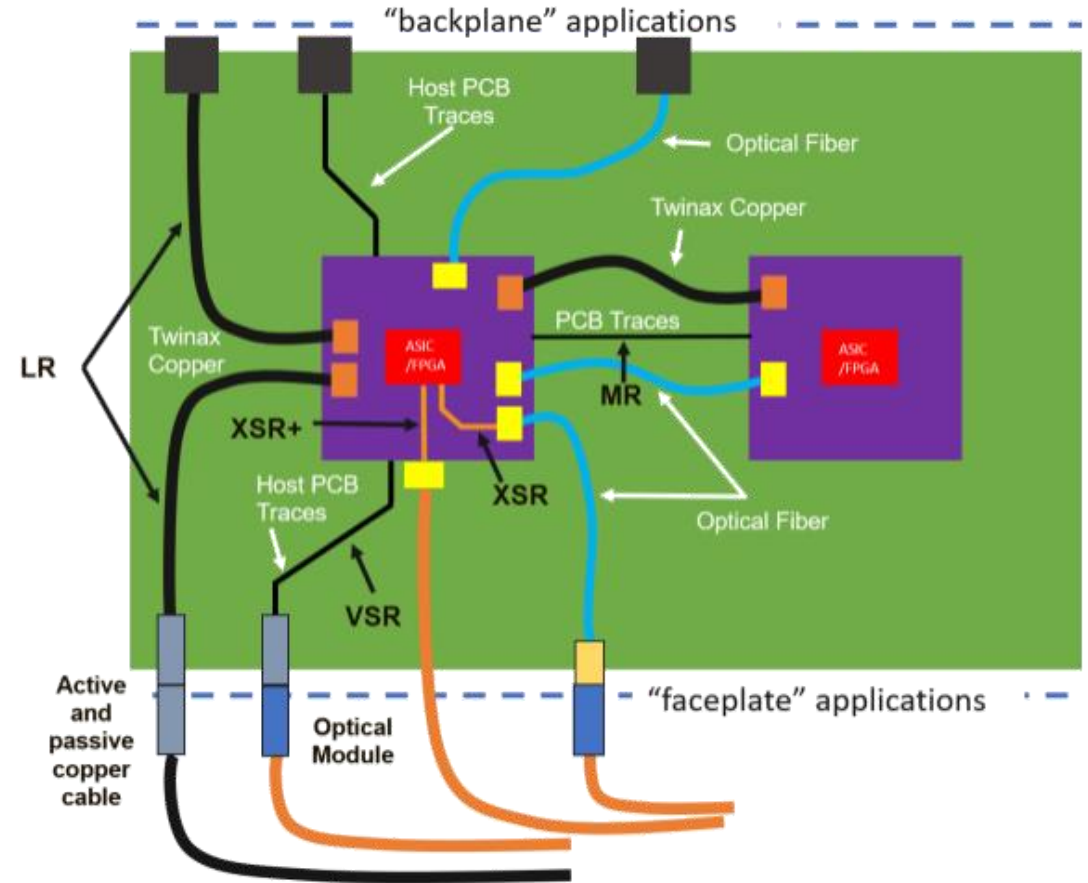
CEI-224G-LR at ECOC 2022



This demonstration is an industry first operational showcase of 224G LR PHY (112GBd PAM4) from Synopsys being driven by a Keysight M8199 Arbitrary Waveform Generator, through a high bandwidth (120GHz) 1mm based ISI board modeling package and channel losses.

OIF	
CONTENTS	
GLOSSARY*	5
1 EXECUTIVE SUMMARY	8
2 INTRODUCTION	9
2.1 Purpose	9
2.2 Motivation	10
2.3 Challenges and possible solution space	10
2.3.1 Challenges of cost, power and electrical link reach	11
2.3.2 Challenges of channel requirements and characteristics	15
2.3.3 Challenges of material characteristics, properties, fabrication and modeling	17
2.3.4 Challenges of modulation, equalization, target DER, and FEC/latency	19
2.3.5 Challenges of test and measurement	22
2.4 Summary	26
3 INTERCONNECT APPLICATIONS	28
3.1 Die to Die Interconnect Within a Package	28
3.2 Die to optical engine within a package	29
3.3 Chip to Nearby Optical Engine	29
3.4 Chip to Module	30
3.5 Chip to Chip within PCBA	31
3.6 PCBA to PCBA across a Backplane/Midplane or a copper cable	31
3.7 Chassis to Chassis within a Rack	32
3.8 Rack to Rack side-by-side	33
3.9 Longer links	33
3.10 Interconnect Application Summary	33
4 POINTS OF INTEROPERABILITY	34
5 OPPORTUNITIES FOR FUTURE WORK	36
6 RELATION TO OTHER STANDARDS	37
7 SUMMARY	38

- Summarizes the consensus findings and guidance for new OIF CEI-224G projects
- Identifies key technical challenges for next generation systems
 - Power, density, performance, reach and cost
- Defines electrical interconnection applications and discusses some of the interoperability test challenges
- Establishes baseline materials that will enable 1.6/3.2 Tbps rate architectures and lower cost, lower complexity 800G and 400G architectures



OIF-FD-CEI-224G-01.0 published in February 2022

CEI Participating Members!





www.oiforum.com