2012 Optical Interconnects Conference

Santa Fe, New Mexico, USA 20-23 May 2012



IEEE Catalog Number: CFP12HSD-PRT **ISBN:**

978-1-4577-1620-1

TABLE OF CONTENTS

Monday, May 21, 2012

PLE	Warehouse - Scale Computing	
PLE1	Photonic Technologies and Warehouse Scale Computing: What The Future Holds?	N/A
MA MA 1	Communications Systems and Integration	1
MA2	Comparisons between 28 Gb/s NRZ, PAM, CAP and optical OFDM systems for Datacommunication Applications	3
MA3	Enabling 850nm VCSELs for 100GbE Applications	5
MA4	Scaling Hybrid-Integration of Silicon Photonics in Freescale 130nm to TSMC 40nm-CMOS VLSI Drivers for Low Power Communications	7
MA5	Ge Quantum Well Electro-Absorption Modulatorwith 23 GHz Bandwidth	8
MB MB1	Hybrid Photonics Hybrid Silicon / III-V Sources for Optical Interconnects	10
MB2	Highly-Efficient, Low-Noise Si Hybrid Laser using Flip-Chip Bonded SOA	12
MB3	InP Membrane Based Broadband Regenerator for silicon-based Optical Interconnect Applications	14
MB4	1.3µm Hybrid Silicon Electroabsorption Modulator	16
MB5	Hybrid Chip-Scale Optical Interconnects Using Multiple Quantum Well Devices Bonded to Silicon	18
MB6	Compact High-Speed InP Microdisk Modulators Heterogeneously Integrated on a SOI Waveguide	20
MB7	Micro-Ring Resonator based Electro-Absorption Modulators on the Hybrid III-V on Silicon Platform	22
мс	Silicon Optics	
MC1	Silicon Photonics and Interconnects: Roadmap for Implementation	24
MC2	Low Loss Waveguide Integration within a Thin-SOI CMOS Foundry	25
MC3	Optical Interlayer Coupling Design for Optical Interconnects Based on Mirror Enhanced Grating Couplers	27
MC4	Monolithic Silicon Waveguides in Bulk Silicon	29

Tuesday, May 22, 2012

TuA	Large Computing Systems	
TuA1	Requirements for the DOE Exascale Program	N/A

TuA2	Optical Interconnects for High-Performance Computing Systems	31
TuB TuB1	Novel Devices Nanoneedle Lasers	N/A
TuB2	Modulation Speed Enhancement of DirectlyModulated Lasers Using a Micro-ring Resonator	32
TuB3	Improved Quantum Efficiency of GaInAsP/InP Top Air-Clad Lateral Current Injection Lasers	34
TuB4	Novel Nonlinear Photonic Functionalities in Silicon Nanowires	36
TuB5	Experimental Characterization of the Optical-Power Upper Boundin a Silicon Microring Modulator	38
TuC TuC1	Photonic Links and Devices I Low-Energy VCSEL Links	40
TuC2	Energy Efficient 850 nm VCSELs Operating Error-free at 25 Gb/s over Multimode Optical Fiber up to 600 m	42
TuC3	Energy-Efficient Passive and Active Photonic Devices for a Silicon Macrochip	N/A
TuC4	Lateral Versus Interdigitated Diode Design for 10 Gb/s Low-Voltage Low-Loss Silicon Ring Modulators	44
TuC5	Active Wavelength Control of Silicon Microphotonic Resonant Modulators	46
TuC6	Adiabatic Resonant Microring (ARM) Modulator	48
TuD TuD1	Photonic Links and Devices II Implementation of Light Peak Optical Interconnects for Portable Computing Systems	N/A
TuD2	A Metal Thermal Shunt Design for Hybrid Silicon Microring Laser	50
TuD3	Amorphous Silicon Grating-Type Layer-to-Layer Couplers for Intra-Chip Connection	52
TuD4	Silicon Based Double-layer 1x12 Multimode Interference Coupler for Three- dimensional Photonic Integration	54
TuD5	Recent Progress on 3-D Integrated Intra-Chip Free-Space Optical Interconnect	56
TuP TuP1	Poster Session Simulation for Efficient Germanium VCSEL for Optical Interconnects	58
TuP2	10 Gb/s Operation of GaInAs/InP Top Air-Clad. Lateral Junction Waveguide-type Photodiode	60
TuP3	Design of a Speculative Network Adapter for Shared Memory Communications in 45 nm CMOS	62
TuP4	Energy-Efficient Optical Broadcast for NanophotonicNetworks-on-Chip	64
TuP5	Measurement of Room Temperature Electroluminescence from Ge Quantum Well Waveguides	66

TuP6	Self-Consistent Opto-Thermal-Electronic Simulation of Micro-Rings for Photonic Macrochip Integration	68
TuP7	Energy Use in Optical Modulators	70
TuP8	Design of Uncooled High-Bandwidth Ultra-Low Energy per Bit Quantum Dot Laser Transmitters for Chip to Chip Optical Interconnects	72
TuP9	Integrated Free-Space Optical Interconnects: All Optical Communications On- and Off-chip	74
TuP10	Defect Enhanced Silicon-On-Insulator Microdisk Photodetector	76
TuP11	Semiconductor Optical Amplifier with Polarization Diversity for Optical Interconnect	78
TuP12	High-Capacity Optical Interconnects Using WDM Photonic Integrated Circuits in GaAs	80
TuP14	Through Silicon Via (TSV) Technology Creates Electro-Optical Interfaces	82
TuP15	Engineered Polymers for Optical Interconnects	84
TuP16	Scalable Non-Blocking Optical Routers for Photonic Networks-on-Chip	B#5
TuP17	Highly Alignment Tolerant Optical HD-SDI Interconnect	88
TuP19	Embedded Optical Waveguides in Silicon for inter and intra-chip data Optical Interconnects	90
TuP20	Direct Digital Drive Modulation for Optical Interconnects	92
TuP21	Optical Camera Link Cable for the Industrial Applications	94
TuP22	A Hybrid Plasmonic Directional Coupler for On-Chip Optical Interconnect	96
TuP23	Experimental Demonstration of DSP based Crosstalk Cancellation in WDM Optical Interconnects	98
TuP24	A Novel Low-Waveguide-Crossing Floorplan for Fat Tree Based Optical Networks-on-Chip	100
TuP25	Light-Induced Self-Written Polymeric Waveguides for Low-Cost Integration of Single-Mode Devices	102
TuP26	Non-Blocking Wavelength-Routed 4×4 Silicon Optical Router for On-Chip Photonics Networks	104
TuP27	Physical Layer Scalability of Energy-Efficient Heterogeneous Optical Space Switches	106
TuP28	Parameter Optimization for the Light Absorption of Plasmonics-Based High Responsivity Photo-Detectors	108
TuP29	Thermal Analysis for 3D Optical Network-on-Chip Based on a Novel Low-Cost 6x6 Optical Router	110

Wednesday, May 23, 2012

WA Photonic Interconnects and Circuits

WA1 High Performance Silicon Photonics Technology for Ubiquitous Communications: 112 Intrachip to Data Warehouses

WA2	Silicon Photonics for High Data Rate Optical Interconnect	113
WA3	Ultra Low-Power Receiver Design for Dense Optical Interconnects	115
WB	Photonic Networks	
WB1	Optical Interconnection Networks for Energy Efficient Processor-Memory Communications	N/A
WB2	Ultra-Low Power Optical Routers for Photonic Networks-on-Chip	B#5
WB3	Four-Port Broadband Optical Router Based on 1×3 Optical Switches	119
WB4	High-Bandwidth Optical Interconnect Technologies for Next-Generation Server Systems	121
WB5	Experimental Demonstration of Wavelength-Reconfigurable Optical Packet- and Circuit-Switched Platform for Data Center Networks	123
WC	Novel Packaging and Modulators	
WC1	Broadband Low-Loss Interconnects Enabled by Photonic Wire Bonding	125
WC2	Self-Organized Lightwave Network for Three-Dimensional Integrated Optical Interconnects	127
WC3	Compact Coupling and Packaging Concepts for Flexible and Stretchable Polymer Optical Interconnects	129
WC4	A 25 Gb/s 400 fJ/bit Silicon Traveling-Wave Modulator	131
WC5	Extremely Low Vp×L Slow Light Photonic Crystal Modulator with GHz Bandwidth	133
WC6	High Speed Travelling Wave Carrier Depletion Silicon Mach-Zehnder Modulator	135
WD	Interconnect Optics	
WD1	Compact Multi-Fiber Physical Contact Connector for Optical Fiber Interconnection	137
WD2	Manufacturing of Board Level Waveguide Bus Using Hard Mold	139