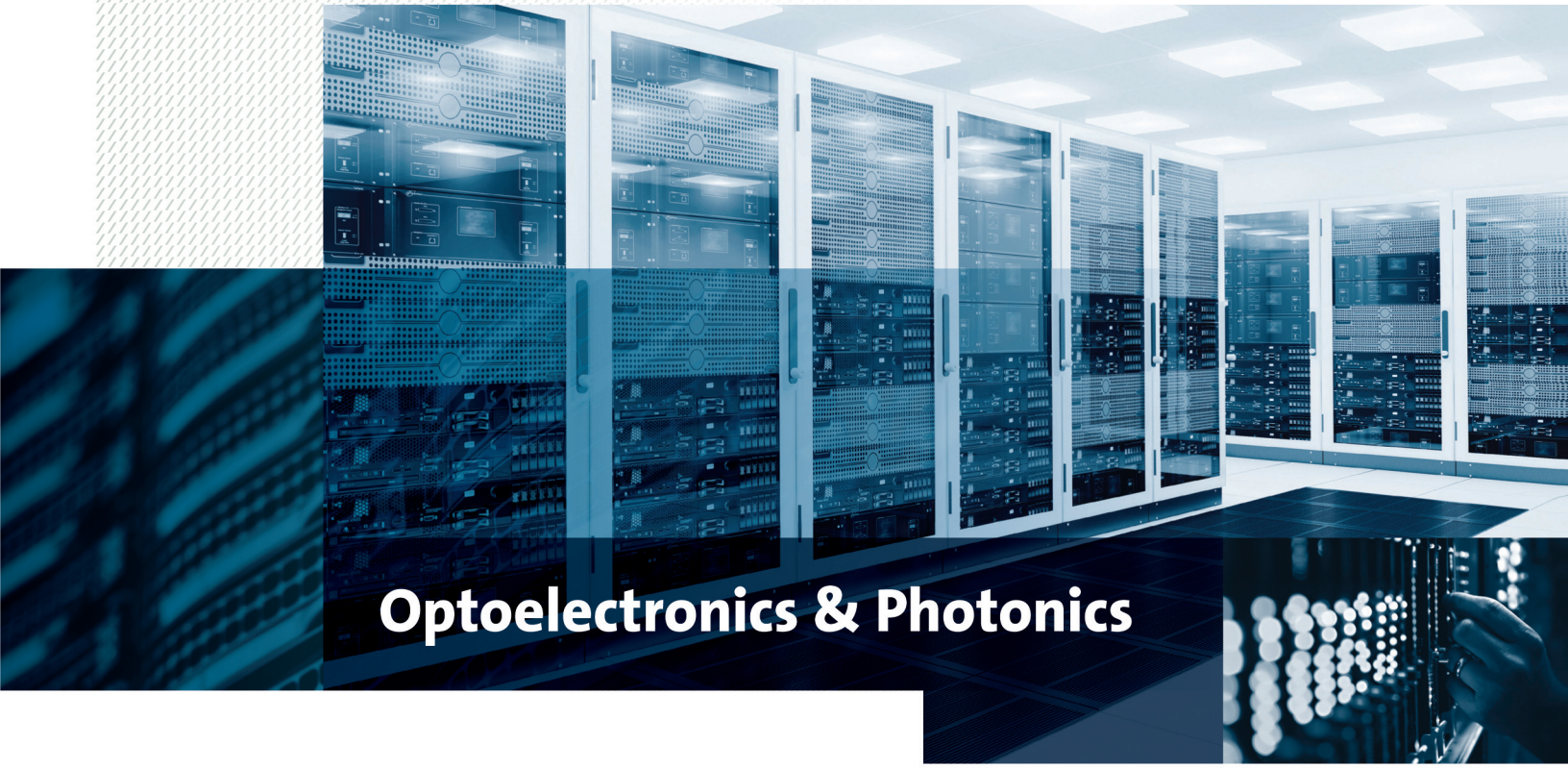
Product
Selection
Guide



Optoelectronics & Photonics

MACOM™
Partners from RF to Light

www.macom.com

Optoelectronics & Photonics

Products and Technology to meet the high bandwidth and low latency requirements of Cloud Data Centers and 5G Optical Networks

MACOM supports a large portfolio of electronic and lightwave components, lasers, and photodiodes for optical communications from long haul core networks to Cloud Data Center networks to FTTx access networks. The portfolio addresses the high performance analog interfaces between electrical and optical domains, providing solutions to meet the demanding size, power and signal integrity requirements of today's high speed networks—which are expanding to meet the continuously growing demand for data capacity. These products include high performance modulator drivers, transimpedance amplifiers, clock/data recovery circuits, APD, PIN photodiodes, FP and DFB lasers, Silicon Photonics, PAM-4 PHYs and TOSAs and ROSAs: for datacenter, enterprise, and telecom optical systems operating up to 400 Gbps and beyond. For FTTx, MACOM has the broadest portfolio of lasers, laser drivers, limiting amplifiers, APD, PIN photodiodes, and TIAs covering systems from GPON, EPON to XG-PON.

Optoelectronics & Photonics

Enabling bandwidth density in optical networks

MACOM Products

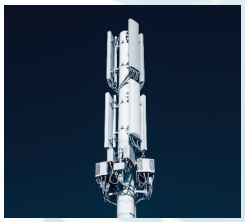
- CDRs
- Crosspoint Switches
- Gearbox
- Lasers
- Limiting Amplifiers
- L-PIC™ Silicon Photonics
- MACsec
- Modulator Drivers
- OTN–Framer and Mapper
- PAM-4 PHY
- Photodiodes
- Physical Media Devices
- PLC Mux/Demux
- PMDs
- TIAs
- TOSA/ROSA

MACOM Technologies

- SiPh
- InP
- SAEFT™
- CMOS
- GaAs
- SiGe

MACOM Markets

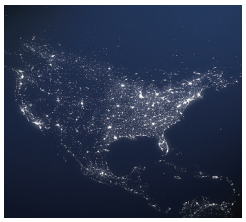
FTTx/PON



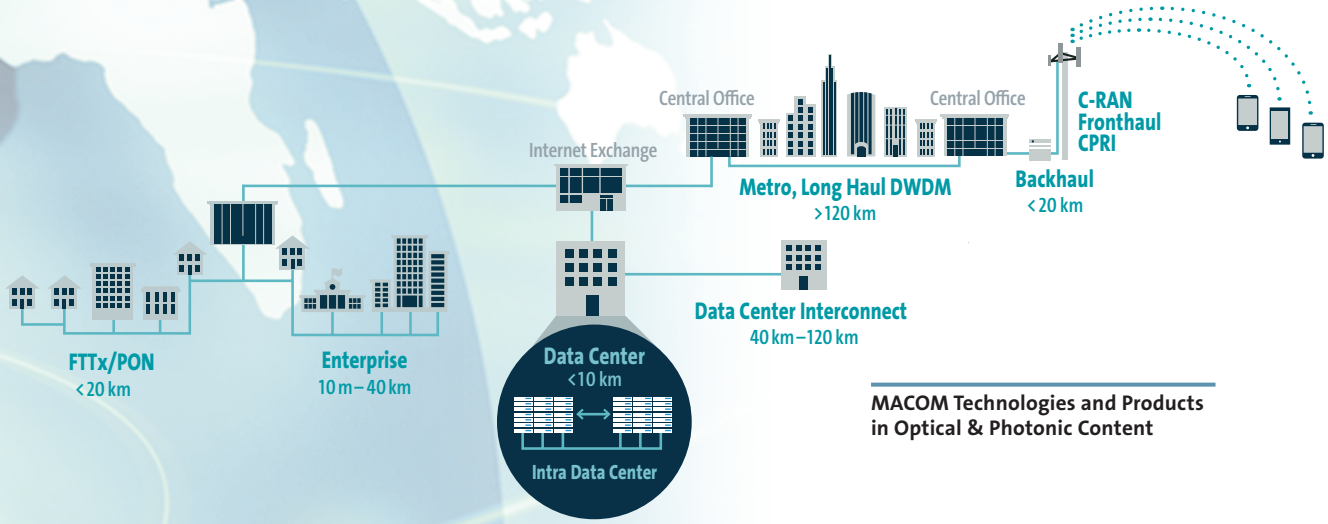
Wireless Fronthaul/ Backhaul

Cloud Data Center

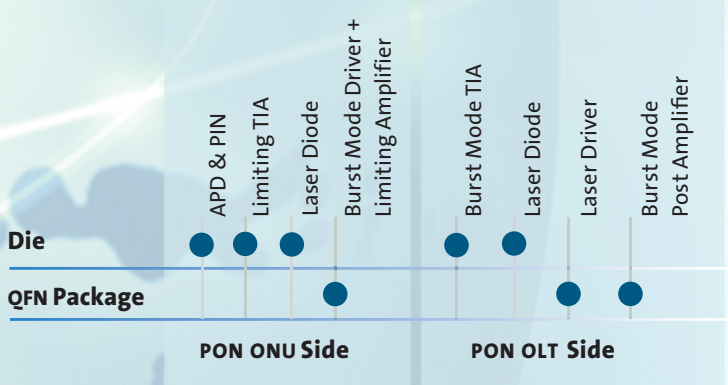
Metro

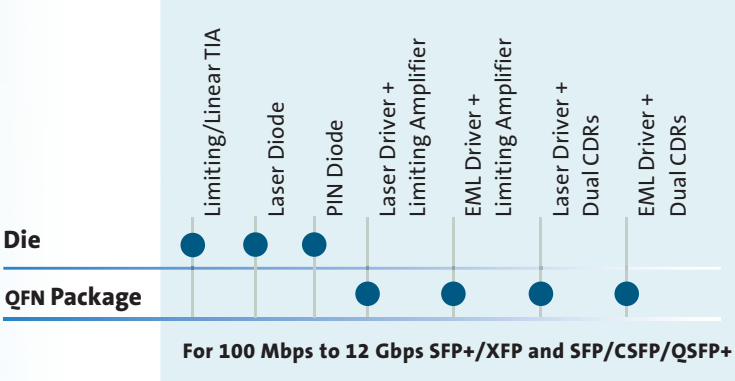


Long Haul



MACOM Technologies and Products in Optical & Photonic Content





MACOM Optoelectronic & Photonic Technologies

Creating innovative design solutions to solve complex challenges

Indium Phosphide (InP)

MACOM has assumed a key position in the market as a premier supplier of both photonic devices such as lasers, and optoelectronics products such as high speed modulator drivers, based on InP technology. *Key applications include laser diodes for silicon photonics, data centers, mobile backhaul, access networks and metro markets, and modulator drivers for 100G and 400G coherent networks, metro networks and data centers.*

Self-Aligning Etched Facet (SAEFT™)

MACOM's lasers are attached to the silicon PIC using MACOM's patented Self-Aligning Etched Facet (SAEFT™) technology for precision assembly and alignment of lasers to silicon photonic waveguides. This self-aligning laser attach technology is enabled by MACOM's patented etched facet lasers and completely eliminates the costly manufacturing steps of actively aligning lasers, photomonitor diodes, and lenses in the production of TOSA products. MACOM's L-PIC™ transmitters are shipped with lasers already attached to the silicon photonic circuit.

Silicon Photonics (SiPh)

Silicon-based Photonic Integrated Circuits (PICs) is an emerging technology that uses crystalline semiconductor wafers as the platform for the integration of active and passive photonic circuits to provide a complete TOSA or ROSA optical path on a single chip. MACOM's silicon PIC platform enables innovative solutions with the benefits of high-density, low-cost and performance scalability by integrating lasers, photodetectors, optical modulators, and multiplexers onto a single chip. Along with an optimized quad modulator driver and a PIC controller IC, 100G CWDM4 and 400G PAM-4 Datacom applications.

CMOS

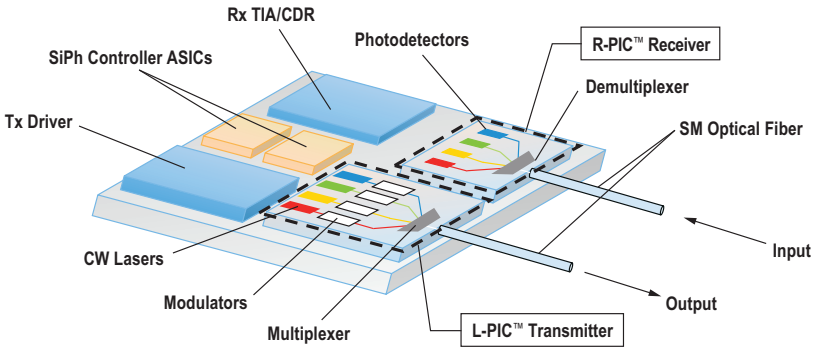
MACOM utilizes CMOS technology extensively for design in a range of applications from wireless infrastructure basestations to aerospace and defense, to include the IEEE 802.1AE MACsec Standard, which solves the security issues of Ethernet networks by providing confidentiality, authenticity and integrity of data. Enabling high-speed data transmission, typical products and applications include PAM-4 PHYs, MACsec, mobile phones, cellular basestations/wireless infrastructure, satellite radio, GPS and DAB, 2.4 GHz and 5.0 GHz WLAN, VSAT, CATV and broadband, commercial and military radar, and multi-market applications.

Silicon Germanium (SiGe)

Building upon a long history in designing integrated circuits and subsystems for radar and mmW markets, MACOM leads the way in applying SiGe BiCMOS technology to both commercial and military needs. We see SiGe as a high value, differentiating technology which we will continue to leverage in MACOM's core product segments. *Key applications include high-speed optical network transceivers, basestations, wired broadband communications, high speed crosspoint switches and global positioning systems.*

Gallium Arsenide (GaAs)

For over three decades, MACOM has been the world leader in the advancement of GaAs technology, producing state-of-the-art, high performance discrete devices, control components, mixed signal processing and converters, driver amplifiers, CATV amplifiers, LNAs and power amplifiers as single purpose and multi-function MMICs. *Key applications include wireless backhaul, industrial, scientific and medical, global positioning system, CATV and wired broadband, aerospace and defense, and satellite communications.*



MACOM EVMs and Reference Design Kits

Enhance new product development, reduce costs and optimize time-to-market

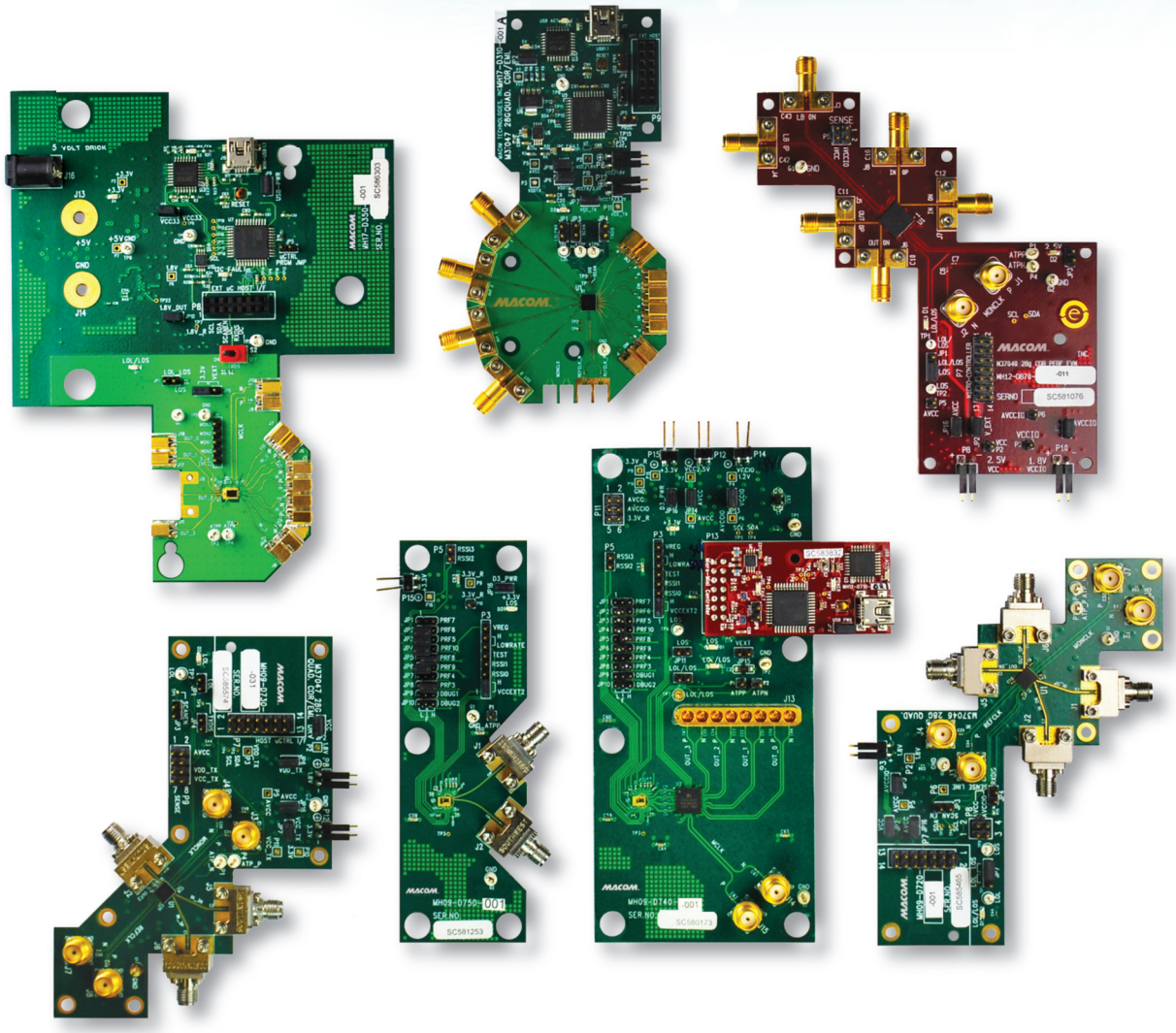
In addition to the support of our world-class application team, MACOM offers a number of custom reference design kits, EVM and design guides which enhance the development of new products, reduce costs and optimize time-to-market.

MACOM EVMs provide customers with a vehicle to test product features, measure product peformance, and help design the product into their application. From backplanes to line cards and optical modules, MACOM reference design kits and EVMs are built to ease the evaluation of our latest solutions into the application environments of our customers and partners.

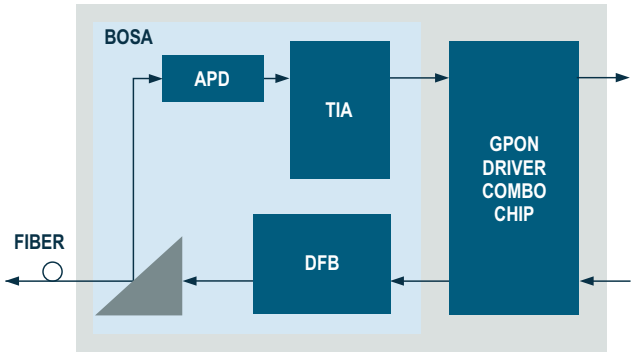
We package these offerings with our extensive GUI support as well. In addition to the EVM and the required software and user guide, schematics of circuit boards and modules, and supporting documents are provided.

From low-speed solutions to those operating at 100G and above, MACOM offers hardware expertise and design support to enable innovative, next-generation optical products in a wide variety of markets.

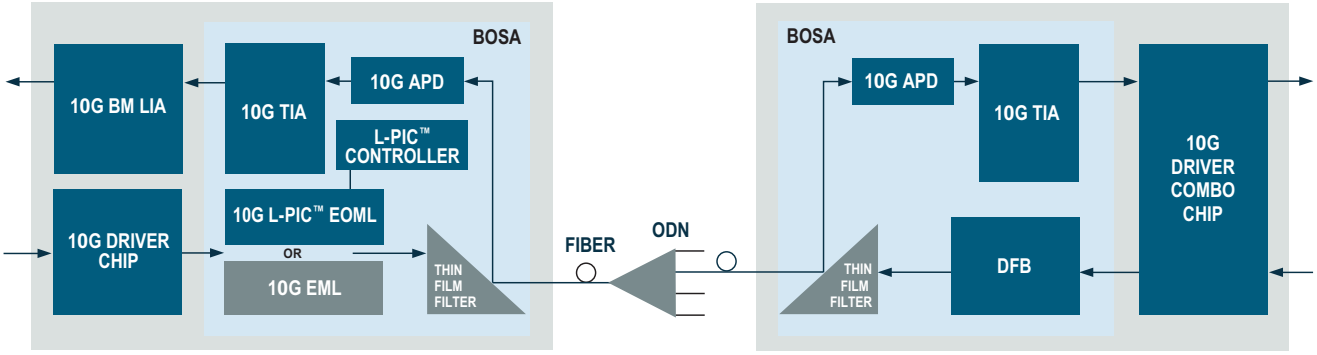
Contact the MACOM sales team to learn more.



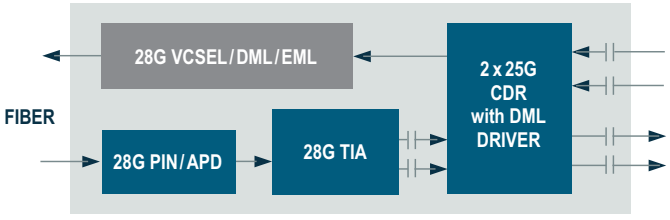
GPON ONU BOSA-on-Board A



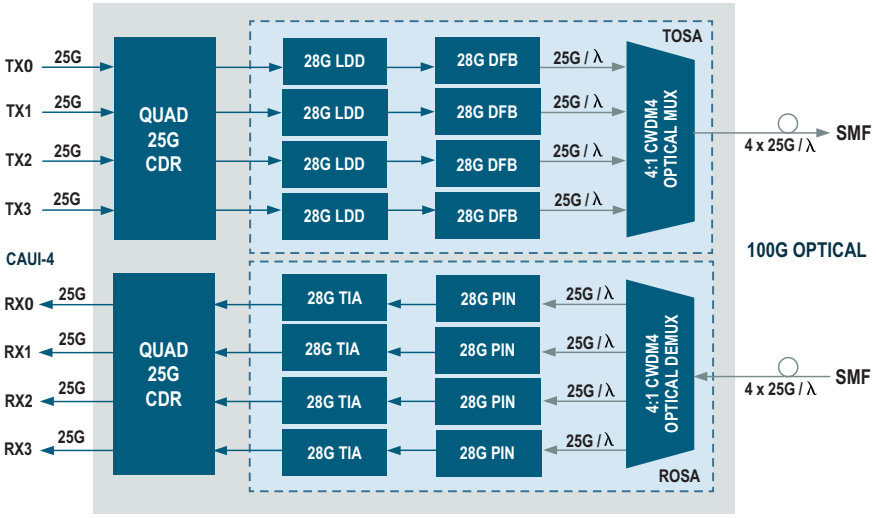
10 PON ONU/OLT B



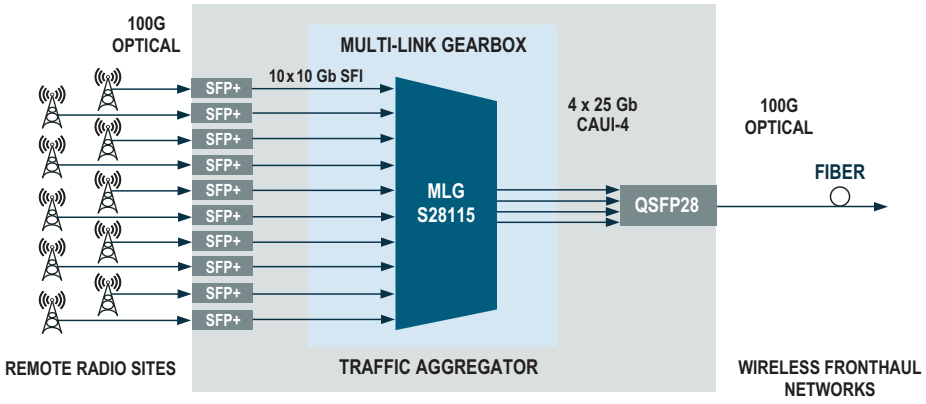
25G Chipset: SFP28 SR/LR/ER C



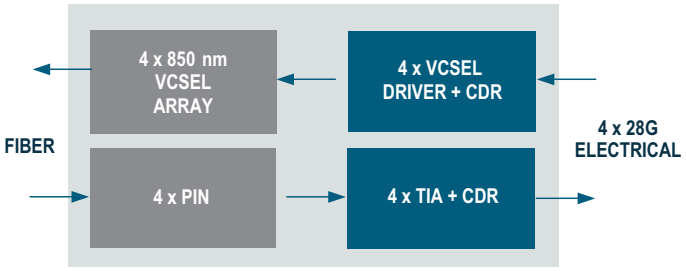
100G Chipset: CWDM4 Solution D



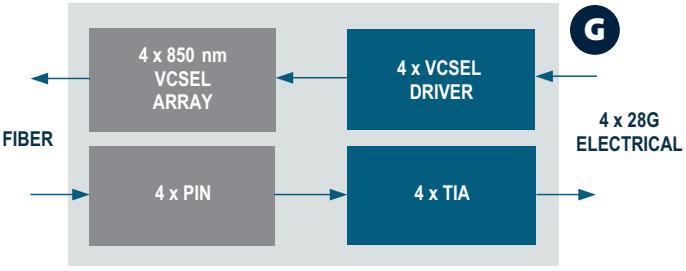
Wireless Fronthaul eCPRI Aggregation Solution E



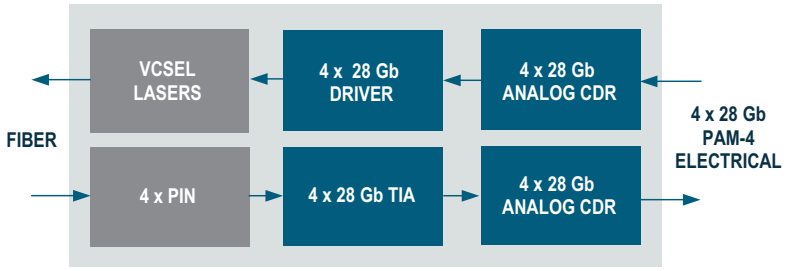
100G SR4 VCSEL Chipsets F



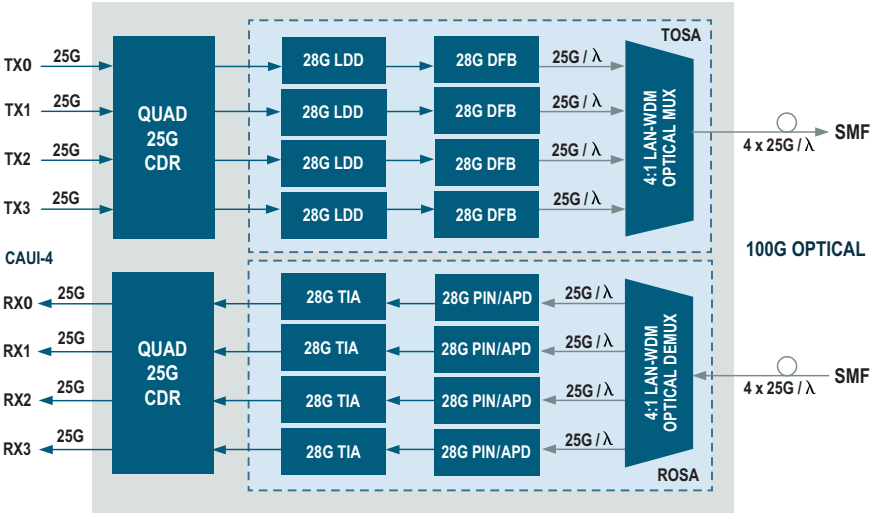
G



200/400G SR4 VCSEL Chipset H

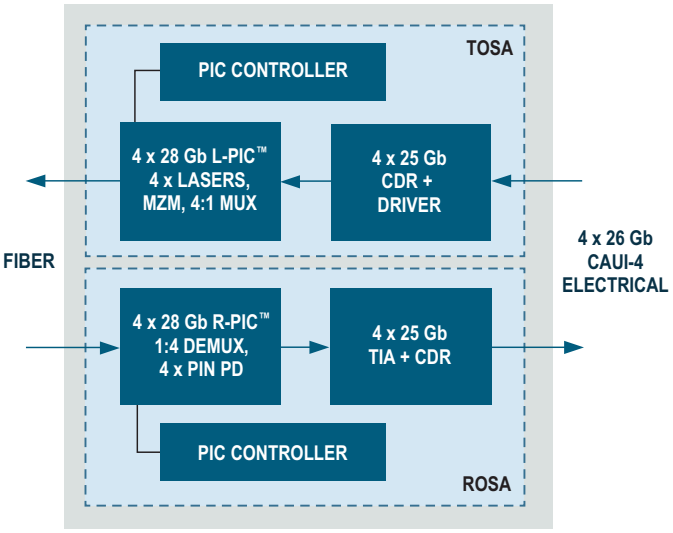


100G BASE-LR4/ER4 (QSFP28) I



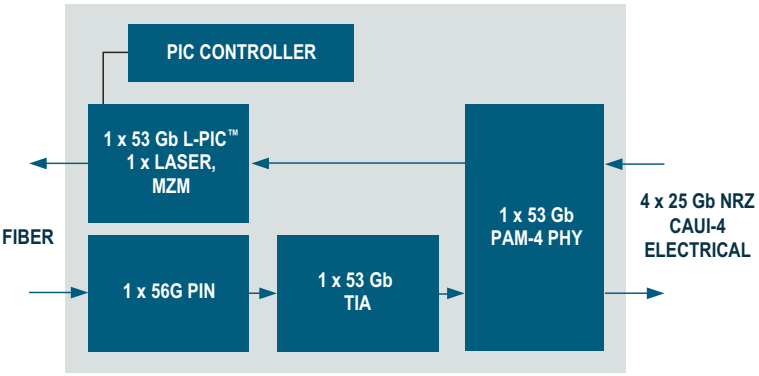
Optoelectronics & Photonics

100G CWDMA4 Silicon Photonics J



Optional Chip-on-Board (COB) Capable
Silicon Photonic 100G CWDM4 MSA compliant (four 25G data lanes)
Chipset provides automated PIC calibration and monitoring
and Build in Self Test (BiST)

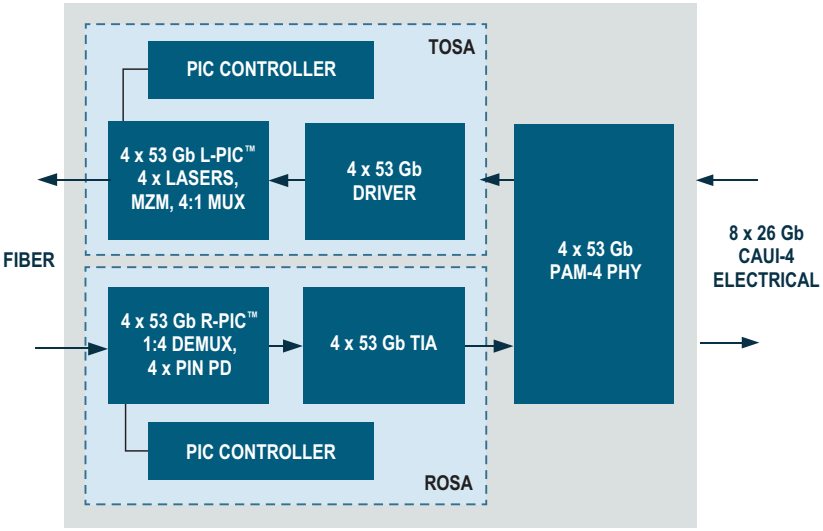
100G Single Lambda K



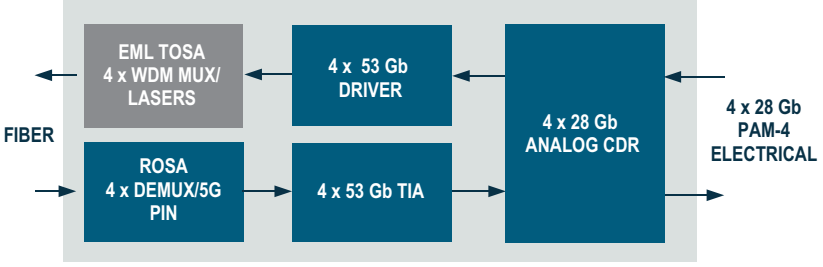
Silicon Photonic 100GBASE-DR/FR ompliant
(single 53 Gbaud PAM-4 data lane)
Chipset provides automated PIC calibration and monitoring
and Build in Self Test (BiST)

400GBASE-FR4/LR4

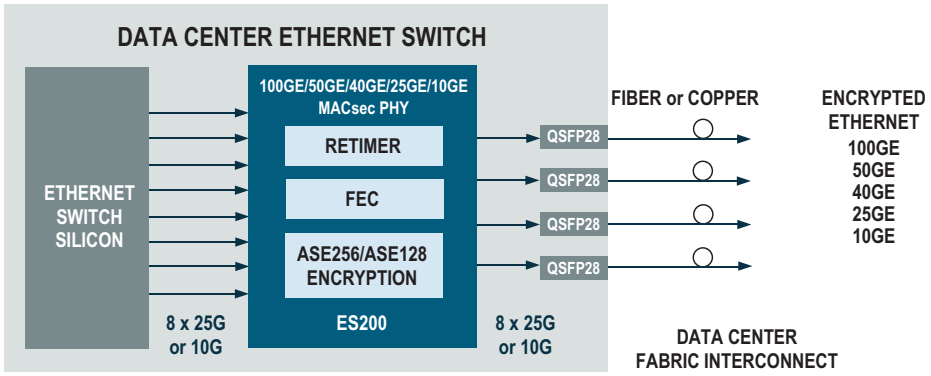
MACOM Silicon Photonics Based Solution L



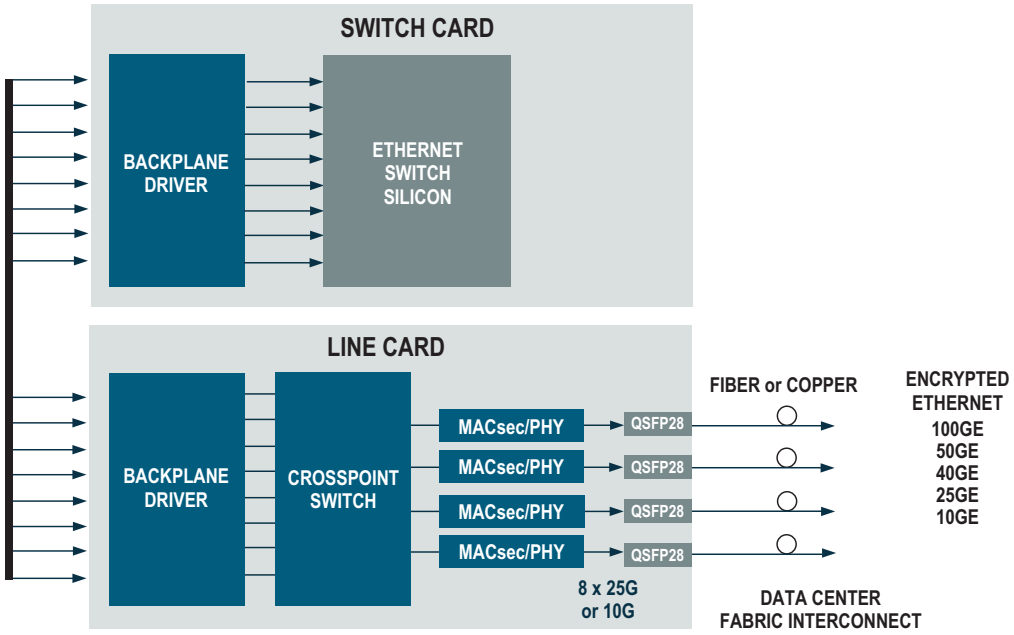
EML Based Solution M



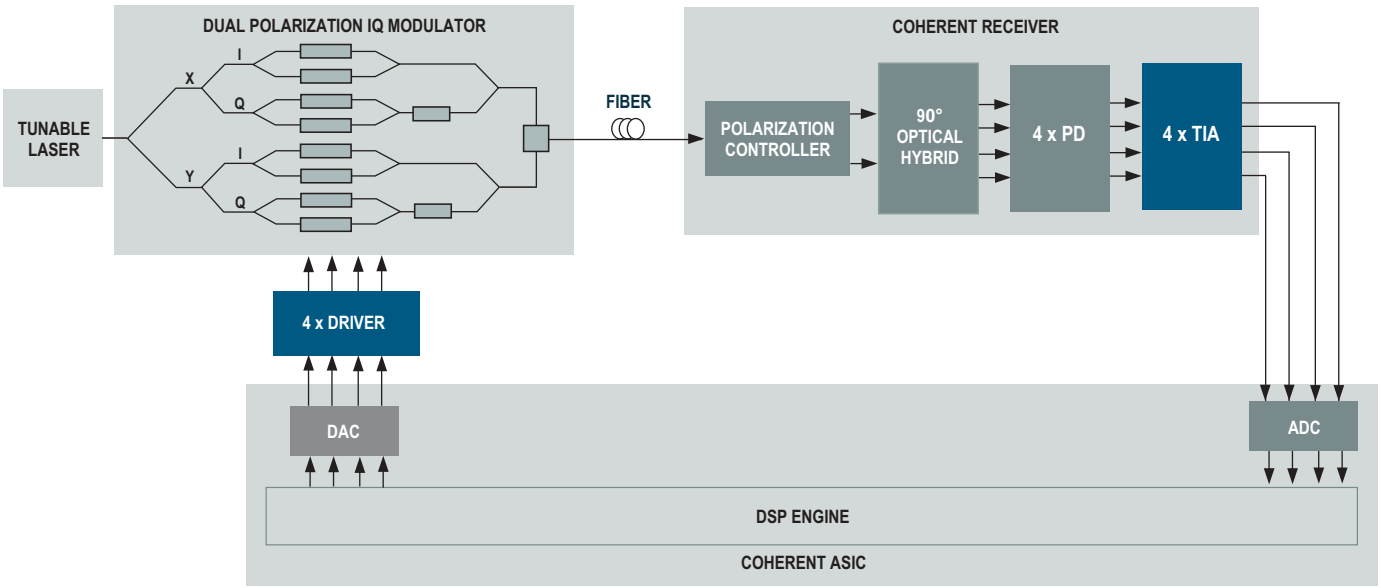
Data Center Switch Interconnect Security Solution N



O Crosspoint Switches and Backplane Drivers



100/200/400/600G Long Haul/Metro/DCI Application Solutions P



Optoelectronics & Photonics

Lasers and Modulator Drivers

Part Number	Description	Block Diagram Key*	Max Data Rate (Gbps)	Supply Voltage (V)	Power Consumption (W)	Channels (#)	Max Output Mod Current (mA)	Max Output Bias Current (mA)	Package Type and Size (mm)
M02061	4.3 Gbps, 3.3 or 5V Laser Driver	A	4.3	3.3, 5	0.115	1	2.5	100	QFN
M02066	Highly Integrated, Programmable Laser Driver for Short-reach SONET/SDH	A	2.5	3.3	0.19	1	85	100	BCC + 24L
M02067	2.1 Gbps, 3.3 V Laser Driver	A	2.1	3.3	0.17	1	85	100	QFN
M02068	Highly Integrated, Programmable Laser Driver for Telecom Applications up to 622 Mbps	A	1	3.3	0.14	1	85	100	BCC+24L
M02069	Highly Integrated, Programmable VCSEL Driver for SFP/SFF Modules to 4.3 Gbps	A	4.3	3.3, 5	0.095	1	45	50	QFN
M02076	Laser Driver/Limiting Amplifier + DDMI Controller and APD DC-DC Controller	A	3.1	3.3	0.205	1	100	100	4 mm QFN
M02077	Laser Driver/Limiting Amplifier	A	3.1	3.3	0.205	1	100	100	4 mm QFN
M02090	2.5 Gbps, 3.3 V Burst-Mode Laser Driver/ Limiting Amplifier	A	2.5	3.3	0.4785	1	100	80	QFN
M02094	Highly Integrated, Programmable VCSEL Driver for SFP/SFF Modules to 2.0 Gbps	A	2	3.3, 5	0.1155, 0.175	1	45	50	QFN
M02095	2.5 Gbps, 3.3/5 V Laser Driver/Limiting Amp	A	1.2	3.3, 5	0.31	1	85	100	5 mm QFN
M02096	2.5 Gbps, 3.3/5 V Laser Driver/Limiting Amp	A	4.3	3.3, 5	0.225	1	85	100	5 mm QFN
M02097	500 Mbps, 3.3/5 V LED Driver/Limiting Amp	A	0.5	3.3, 5	0.12	1	120	10	QFN
M02098	Burst Mode Laser Driver/Limiting Amplifier	A	2.5	3.3	0.28	1	100	80	5 mm QFN
M02099	Burst Mode Laser Driver/Limiting Amplifier + DDMI Controller and APD DC-DC Controller	A	3.1	3.3	0.225	1	100	100	4 mm QFN
M02100	Burst Mode Laser Driver/Limiting Amplifier + DDMI Controller and APD DC-DC Controller & amp, EEPROM	A	3.1	3.3	0.225	1	100	100	4 mm QFN
M02170	11.3 Gbps, 3.3 V Laser Driver	—	11.3	3.3	0.1914	1	100	180	5 mm QFN
M02171	11.3 Gbps Dual Loop VCSEL Driver	—	11.3	3.3	0.1782	1	25	25	QFN
M02172	11.3 Gbps EML Driver	—	11.3	3.3	0.2838	1	2.5 (V)	180	QFN
M02180	Burst Mode Laser Driver/Limiting Amplifier + Rx CDR + DDMI Controller and APD DC-DC Controller & Amplifier; EEPROM	B	12.5	3.3	0.584	1	100	100	4.5 mm QFN
M02193	12.5 Gbps Low Power Laser Driver and Limiting Amplifier with DC-DC Controller and EEPROM with Digital Diagnostics	—	12.5	3.3	0.314	1	100	100	4.5 mm QFN
MALD-02101	3.1 Gbps Low Power Dual Closed Loop Burst Mode Laser Driver with Integrated Limiting Amplifier	A	3.1	3.3	0.23	1	100	100	4 mm QFN
MALD-02102	3.1 Gbps Low Power Dual Closed Loop Burst Mode Laser Driver with Integrated Limiting Amplifier	A	3.1	3.3	0.23	1	100	100	4 mm QFN
MALD-37030	28 Gbps Multi-Rate Laser Driver with LIA/CDR	C	26.5	1.8, 3.3	0.689	1	76	100	5 x 6 mm LGA
MALD-37031	28 Gbps Multi-Rate Laser Driver with LIA/CDR	C	28.1	1.8, 3.3	0.689	1	76	100	5 x 6 mm LGA
MALD-37345B	Quad 28G VCSEL Driver with Input Equalizer	F, G	28	1.8, 3.3	0.5	4	0.1 ~ 12.8	4 ~ 15	Die
MALD-02181	12.5G Burst Mode Laser and LIA+ DC-DC Controller, EEPROM and DDMI Controller	B	12.5	3.3	0.327	1	100	100	4.5 mm QFN
MALD-02182	12.5G Burst Mode Laser and LIA+ DC-DC Controller and DDMI Controller	B	12.5	3.3	0.327	1	100	100	4.5 mm QFN
MALD-02194	12.5G Burst Mode Laser and LIA+ DDMI Controller	—	12.5	3.3	0.327	1	100	100	4.5 mm QFN
MALD-02195	12.5G DML Laser Driver and LIA+ DC-DC Controller and DDMI Controller	—	12.5	3.3	0.327	1	100	100	4.5 mm QFN

* Refer to Block Diagrams on pages 6-9

Lasers and Modulator Drivers: Client Side

Part Number	Description	Block Diagram Key*	Max Data Rate (Gbps)	Channels (#)	Min Input Voltage (mVpp)	Max Output Voltage (V)	Supply Voltage (V)	RF I/O Interface	Power Dissipation (W)	Package Type and Size (mm)
MAOM-001201	11.3 Gbps Limiting EML Driver	—	11.3	1	400	2.3	3.3	Differential/ Differential	0.45	3 x 3 QFN
MAOM-002200	28 Gbps Limiting EML Driver DC Coupled, Neg Supply	C	28	1	500	2.5	-5.2	Differential/ Single-ended	1.25	4 x 4 QFN
MAOM-002203	28 Gbps Limiting EML Driver Integrated Bias-T, Pos Supply	C	28	1	500	2.5	4.3	Differential/ Single-ended	0.75	4 x 4 x 3 QFN
MAOM-002207	28 Gbps Limiting EML Driver Die	C	28	1	500	2.5	4.3	Differential/ Single-ended	0.75	Bumped Die
MAOM-003115	28 Gbps Linear EA Modulator Driver IC	C, H, I	28	1	600	2	3.6	Differential/ Single-ended	0.75	4 x 4 x 2.3 QFN
MAOM-003419	Quad Channel 28 Gbaud Linear Modulator Driver	P	28	4	600 (max)	2	3.3	Differential/ Single-Ended	0.46/ch	6 x 9.1 x 1.33 SMD
MAOM-003401	Quad Channel 28 Gbps Limiting EML Driver, Low Power	I	28	4	700	2	3	Differential/ Single-ended	0.2/ch	10 x 10 x 1.4 SMD
MAOM-02204A	Quad Channel 28 Gbps Limiting EML Driver	—	28	4	500	2.5	4.3	Differential/ Single-ended	0.75/ch	14 x 8 SMD
MAOM-002301-DIE	Single Channel 28 Gbps Direct, Modulated Laser Driver IC, Die	C, D, I	28	1	700 ~ 1400	—	3	Differential/ Single-Ended	0.255	Die
MAOM-002304-DIE	Quad Channel 28 Gbps Direct Modulated Laser Driver IC, Die	D, I	28	4	700 ~ 1400	—	3	Differential/ Single-Ended	0.255/ch	Die
MAOM-005411	Quad Channel 56 Gbaud Linear EML Driver	M	53/56	4	1000 (max)	1.8	9	Differential/ Single-Ended	0.3/ch	7.2 x 7 x 1.4 SMD

Lasers and Modulator Drivers: Metro/Line Side

Part Number	Description	Block Diagram Key*	Max Data Rate (Gbps)	Channels (#)	Min Input Voltage (mVpp)	Max Output Voltage (V)	Supply Voltage (V)	RF I/O Interface	Power Dissipation (W)	Package Type and Size (mm)
MAOM-002105	32 Gbps Limiting MZ Modulator Driver	P	32	1	350	8	6	Single-ended/ Single-ended	1.8	14.4 x 7 x 2.3 SMD
MAOM-003107	Dual Channel 32 Gbps Limiting Modulator Driver IC	P	32	2	400	8.2	7	Single-Ended/ Single-ended	2.4/ch	16.1 x 10.6 x 3.4 SMD
MAOM-003108	Dual Channel 32 Gbps Linear Modulator Driver, Diff Input	P	32	2	200	6	6.5	Differential/ Single-ended	2/ch	10 x 10 x 2.29 SMD
MAOM-003405	Quad Channel 32 Gbps Limiting MZ Modulator Driver	P	32	4	300	7	6.5	Differential/ Single-ended	0.95/ch @5 Vout	13 x 19 x 2.46 SMD
MAOM-003407	Quad Channel 32 Gbps Limiting MZ Modulator Driver	P	32	4	300	6	6.5	Differential/ Single-ended	1.6/ch	13 x 19 x 2.46 SMD
MAOM-03409D	32 Gb/s Linear Differential Modulator Driver IC	P	32	4	700 (max)	4	3.6/4.5	Differential/ Single-ended	—	9.1 x 14 x 2.29 SMD
MAOM-003414	Quad Channel 32 Gbps Linear Modulator Driver	P	32	4	1000 (max)	6	6	Differential/ Single-ended	1.9/ch	27 x 29 x 6.4 GPPO/SMD
MAOM-003417	Quad Channel 32 Gbps Linear Modulator Driver	P	32	4	700 (max)	4.5	3.3/5	Differential/ Single-ended	1.13/ch	9.1 x 14 x 2.29 SMD
MAOM-003417B	Quad Channel 32 Gbps Linear Modulator Driver	P	32	4	500 (max)	4.5	3.3/5	Differential/ Single-ended	1.15/ch	9.1 x 14 x 2.85 SMD
MAOM-003427	Quad Channel 46 Gbaud Linear Modulator Driver	P	46	4	700 (max)	5	3.3/6	Differential/ Single-ended	1.8/ch	13 x 19 x 2.46 SMD
MAOM-006416	Quad Channel 64 Gbaud MZ Modulator Driver	P	64	4	300	4.5	3.3/4.5	Differential/ Single-ended	1 .1/ch	9.1 x 14 x 2.29 SMD

* Refer to Block Diagrams on pages 6-9

Lasers and Modulators: Metro/Line Side (continued)

Part Number	Description	Block Diagram Key*	Max Data Rate (Gbps)	Channels (#)	Min Input Voltage (mVpp)	Max Output Voltage (V)	Supply Voltage (V)	RF I/O Interface	Power Dissipation (W)	Package Type and Size (mm)
MAOM-006418	Quad Channel 64 Gbaud Linear Modulator Driver	P	64	4	300	4.5	3.3/4.5	Differential/ Single-ended	1 .1/ch	14 x 9.1 x 2.85 SMD
MAOM-03404A	4 x 32 Gbps Differential Limiting MZ Modulator Driver	P	32	4	300	5	3.3/4.5	Differential/ Differential	0.75/ch	9.1 x 14 x 2.29 SMD
MAOM-03409B	32 Gb/s Linear Differential Modulator Driver IC	P	32	4	300 (max)	4	3.6/4.5	Differential/ Differential	—	9.1 x 14 x 2.29 SMD
MAOM-03417L	Quad Channel Low Power Linear Modulator Driver	P	32	4	700 (max)	3.3	3.3	Differential/ Single-ended	0.6/ch	9.1 x 14 x 2.29 SMD
MAOM-006408	Quad Channel 64 Gbaud Linear Modulator Driver Die	P	64	4	500	3	—	Differential/ Differential	0.4/ch	Die
MAOM-006412	Quad Channel 64 Gbaud Linear Modulator Driver Die	P	64	4	500	4	—	Differential/ Differential	0.5/ch	Die
MAOM-010567	10 Gbps Limiting MZ Modulator Driver	—	10	1	250	8	5	Single-ended/ Single-ended	0.6/ch	11.4 x 8.9 SMD

Transimpedance Amplifiers (TIA)

Part Number	Description	Block Diagram Key*	Max Data Rate (Gbps)	Differential Transimpedance Gain (kOhms)	Small Signal Bandwidth (GHz)	Input Overload Current (mA)	Input Referred Noise (IRN, RMS nA) (nA)	Output Swing Voltage (mV)	Power Consumption (W)	Supply Voltage (V)
M02006	155 Mbps AGC Prep-Amplifier	—	0.2	260	0.1	2.2	8	300	0.15	5
M02007	Low-noise Transimpedance Amplifier with AGC	—	0.2	62	0.14	2.8	8	300	0.07	3.3
M02009	Low-noise Transimpedance Amplifier with AGC	—	0.6	36	0.4	4.5	70	400	0.1	3.3
M02011	622 Mbps AGC Pre-Amplifier	—	0.6	65	0.6	4	50	140	0.095	3.3
M02013	3.2 Gbps AGC Pre-Amplifier	—	3.1	10	24	4	475	140	0.14	3.3
M02014	Transimpedance Amplifier (TIA) with Automatic Gain Control	—	2.5	11	1.4	4	250	140	0.125	3.3
M02015	2.5 Gbps AGC Pre-Amplifier	—	2.5	9	1.4	4	290	140	0.096	3.3
M02016	1.25 Gbps AGC Pre-Amplifier	—	1.3	24	1	4	130	140	0.096	3.3
M02020	4 Gbps CMOS Transimpedance Amplifier with AGC	—	4.3	3.6	3.4	4	550	140	0.145	3.3
M02024	2 Gbps AGC Ultra-high Sensitivity Pre-Amplifier	—	2.5	51	1.27	4	180	110	0.13	3.3
M02025	100 Mbps to 3.125 Gbps Multirate CMOS TIA with AGC	—	3.2	20	1.45	4	120	50	0.14	3.3
M02026	1.25 Gbps CMOS TIA with AGC	—	1.2	112	1.05	4	120	210	0.13	3.3
M02027	100 Mbps to 3.1 Gbps Multirate CMOS TIA with AGC	—	3.1	42	1.5	4	91	—	—	—
M02028	100 Mbps to 1.25 Gbps Multirate CMOS TIA with AGC	—	1.2	24	0.13	4	80	50	0.14	3.3
M02029	100 Mbps to 1.25 Gbps Multirate CMOS TIA with AGC	—	3.1	10	1.85	4	1400	—	—	—
M02035	Burst Mode OLT TIA	B	2.5	3.6	1.7	1.5	250	—	—	—
M02036	2.5 Gbps Burst Mode GPON OLT TIA	B	1.3	3.8	0.8	2.5	170	—	—	—
M02038	1.3 Gbps Burst Mode CMOS TIA	B	1.2	8.5	0.85	4	350	275	0.082	3.3

* Refer to Block Diagrams on pages 6-9

Transimpedance Amplifiers (TIA) (continued)

Part Number	Description	Block Diagram Key*	Max Data Rate (Gbps)	Differential Transimpedance Gain (kOhms)	Small Signal Bandwidth (GHz)	Input Overload Current (mA)	Input Referred Noise (IRN, RMS nA) (nA)	Output Swing Voltage (mV)	Power Consumption (W)	Supply Voltage (V)
M02129	8.5 Gbps to 10.3 Gbps TIA with AGC	—	10.3	2	7.8	3	1200	200	0.115	3.3
M02139	1 Gbps to 10.3 Gbps TIA with AGC and Rate Select	—	10.3	2.5	7.5	2.5	1500	140	0.142	3.3
M03002	28 Gbps Transimpedance Amplifier (TIA)	C, D, G, I	28	2.9	22	3.5	1400	—	—	—
M03100	28 Gbps Quad Channel Transimpedance Amplifier	D, I	28	2.9	22	2.8	1400	—	—	—
M03101	28 Gbps Quad Channel Transimpedance Amplifier	D, I	28	—	21	—	—	—	—	—
M03102	28 Gbps Quad Channel Transimpedance Amplifier	D, I	28	—	21	—	—	—	—	—
MATA-003806	28 Gbps Quad Channel Linear TIA for DP-QPSK Advanced Receivers	P	32	10000	25	3	17	—	—	—
MATA-005817	56 Gbaud Single Channel Linear TIA	K	56	6	35	2	0	—	—	—
MATA-02135	8.5/10/11.3 Gbps Limiting TIA	A, B	11.3	3.4	8.2	3	850	—	—	—
MATA-02238	10G EPON Burst Mode TIA with Rate Select	B	10.3	6	9	1.6	1	—	—	—
MATA-03003	28 Gbps Quad Channel Transimpedance Amplifier	C, D, G, I	28	3.8	21	4	1400	—	—	—
MATA-03013	28 Gbps Quad Channel Transimpedance Amplifier	C, D, G, I	28	3.8	21	4	1400	—	—	—
MATA-03802A	Dual Channel Linear TIA	P	32	5	25	2	—	—	—	—
MATA-38434	Quad 4 x 28 Gbaud PAM-4 (56G) Linear TIA	H	28 / 56	4	25	2	2.4	*CONTACT MACOM*		
MATA-03006	28G TIA with APD	I	28	3.8	21	4	1400	*CONTACT MACOM*		
MATA-03819	Quad 4x 28 Gbaud PAM-4 (56Gbit) Linear TIA 750 um	H, M	28			*CONTACT MACOM*				
MATA-03919	Quad 4x28 Gbaud PAM-4 (56Gbith) Linear TIA 750 um	H, M	28			*CONTACT MACOM*				
MATA-03820	Quad 4x28 Gbaud PAM-4 (56G) Linear TIA	H, M	28			*CONTACT MACOM*				
MATA-03920	Quad 4x28 Gbaud PAM-4 (56G) Linear TIA	H, M	28			*CONTACT MACOM*				
MATA-38134	Quad 4x28 Gbaud PAM-4 (56Gbit) Linear TIA	H, M	28/53			*CONTACT MACOM*				
MATA-03103	28G Quad Channel TIA, 750um pitch for PIN	D, I	21			*CONTACT MACOM*				
MATA-03106	28G Quad Channel TIA, 750um pitch for APD	D, I	21			*CONTACT MACOM*				

* Refer to Block Diagrams on pages 6-9

Optoelectronics & Photonics

Clock & Data Recovery

Part Number	Description	Block Diagram Key*	Max Data Rate (Gbps)	Supply Voltage (V)	Power Consumption (W)	Channels (#)	Package Type and Size
M21012	42 Mbps to 3.2 Gbps Quad Multirate CDR	—	3.2	1.8 – 3.3	0.76	4 x 4	10 mm 72-pin QFN
M21050	High-Performance Duplex Quad (octal) Multirate Clock and Data Recovery	—	3.2	1.8 - 2.5	1	8 x 8	10 mm 72-pin QFN
M37045	Four Channel 25G / 28G CDR with Integrated Input Equalizer	D, I	24	3.3 and 1.8	—	4	3 x 2 mm Die
M37046	Quad 24G / 26G TIA / LA with Integrated CDR	D, I	28.1	1.8	0.1	4	4 x 4.5 mm CSP
M37047	Four Channel 25G / 28G CDR with Integrated EML Driver	F	28	1.8 & amp; 3.3	0.3	4	4 x 4.5 mm CSP
M37049	Four Channel 25G / 28G CDR with Integrated Input Equalizer	F	28	1.8	0.1	4	4 x 4.5 mm CSP
MALD-37059	Four Channel 25G / 28G CDR with Integrated DML Driver	D, F, I		Contact MACOM			
MALD-37045	Four Channel 25G / 28G CDR with Integrated VCSEL Driver	D, F, I	28.1	1.8 & amp; 3.3	—	4	Die 2 x 3 mm
MATA-37145	Four Channel 25G / 28G CDR with Integrated VCSEL Driver	D, F, I	28.1	—	—	—	Die 2 x 3 mm
MALD-37445	Quad 25G / 26G CDR / VCSEL Driver with Input Equalizer	D, F, I	24	3.3 and 1.8	—	4	Die 3 x 2 mm
MALD-37645	Multirate 28G VCSEL Driver / CDR with Input Equalizer	F, G	28	1.8	0.26	1	Die 2.3 x 1.4 mm
MAOM-37051A	Quad 25G / 28G CDR with Integrated Equalization and EML Driver	F, G	28	1.8	275	4	7 x 11 mm SMT
MAOM-03757	Quad 25G / 28G CDR with Integrated Equalization and Amplifier; EML Driver	F, G	28	4	600	2	—
MAOM-37447A	Quad 25G / 28G CDR with Adaptive Equalization and EML Driver	I	25.7	1.8	—	4	4 x 4.5 mm CSP
MAOM-38051	Quad 4 x 28 Gbaud PAM-4 (56 Gbit CDR) Die for wirebonding	I		Contact MACOM			Die
MAOM-38053	Quad 4 x 28 Gbaud PAM-4 (56 Gbit CDR) Die for wirebonding	I		Contact MACOM			Die
MASC-37028	Multirate, Dual 28 Gbps CDR with Integrated Laser Driver	C	28	1.8 / 3.3	—	2	5 mm LGA
MASC-37029	Multirate, Dual 28 Gbps CDR with Integrated Laser Driver	C	26.5	1.8 / 3.3	—	2	5 mm LGA
MASC-37048	Four Channel 25G / 28G CDR with Input Equalizer	D, I	28	1.8	0.1	4	4 x 4.5 mm CSP
MASC-37053A	Quad 25G / 28G CDR with Adaptive Equalization and PCML Driver	J	25.8	—	—	4	4 x 4.5 mm CSP
MASC-37446A	Four Channel 25G / 28G CDR with Integrated Limiting Amplifier	D, F, G, I	28.1	1.8	0.1	4	4 x 4.5 mm CSP
MASC-37448A	Four Channel 25G / 28G CDR with Input Equalizer	D, F, G, I	28	1.8	0.1	4	4 x 4.5 mm CSP
MATA-37044	Four Channel 25G / 28G CDR with Integrated TIA	D, J, F, G, I	28.1	1.8 & amp; 3.3	—	4	Die 2 x 3 mm
MATA-37144	Four Channel 25G / 28G CDR with Integrated TIA	D, J, F, G, I	28.1	—	—	—	Die 2 x 3 mm
MATA-37244	Four Channel 25G / 28G CDR with Integrated TIA / Limiting Amplifier	D, J, F, G, I	28	1.8 & amp; 3.3	—	4	Die 2 x 3 mm
MATA-37442	Quad 24G / 26G TIA / LA with Integrated CDR	FG	24	3.3 and 1.8	—	4	Die 3 x 2 mm
MATA-37444	Quad 24G / 26G TIA / LA with Integrated CDR	FG	24	3.3 and 1.8	—	4	Die 3 x 2 mm
MATA-37644	Multirate 28G CDR with TIA / LA Integrated	FG	28	1.8	0.26	1	Die 2.3 x 1.4 mm

* Refer to Block Diagrams on pages 6-9

Optical Post Amplifiers

Part Number	Description	Block Diagram Key*	Max Data Rate (Gbps)	Supply Voltage (V)	Power Consumption (W)	Channels (#)	Input Sensitivity (mVpp)(mV)	Output Swing Voltage (V)	Package Type and Size
M02040	2.1 Gbps, 3.3 or 5 V Post-Amplifier	—	2.1	3.3, 5	0.17	1	2	400	3 mm QFN
M02044	622 Mbps Post-Amplifier	—	0.6	3.3, 5	0.1	1	2.5	—	5 x 6.2 mm QSOP
M02046	1.25Gbps, 3.3 or 5 V Post-Amplifier	—	1.3	3.3, 5	0.2	1	2.8	800	5 x 6.2 mm QSOP
M02050	Integrated High-Gain Limiting Amplifier	A	2.5	3.3	0.18	1	3.5	800	3 mm QFN
M02140	12.5 Gbps Low Power 3.3 V Post-Amplifier	C	12.5	3.3	0.185	1	8	800	4 mm QFN
M02142	11.3 Gbps Limiting Amplifier	B, C	11.3	3.3	0.191	1	3	680	3 mm QFN
M02049	4.3 Gbps Limiting Amplifier	—	6.144	3.3, 5	0.09	1	2.6	400	3 mm QFN

LED/Laser Drivers for Display

Part Number	Description	Current Per Channel (A)	Max Current (A)	Channels (#)	Programmable Internal PWM Generator (Y/N)	Input Integrated PMIC (Y/N)	Automatic Power Control (Y/N)	Electronic Laser Despeckle (Y/N)
M08886	High-Performance RGB LED/Laser Driver with Despeckle Technology for LCD/LCoS/TI DLP¬Æ Projection Displays	2A	4A	3	Yes	No	Yes	Yes
M08888	High-Performance 2A RGB LED/Laser Driver for LCD/LCoS/TI DLP¬Æ Projection Displays	2A	6A	3	Yes	No	Yes	No
M08889	High-Performance 2A RGB LED/Laser Driver with Integrated Buck-Boost Converter for LCD/LCoS/TI DLP¬Æ Projection Displays	2A	2A	3	Yes	Yes	Yes	No
M08890	3-Channel 2A LED/Laser Driver for Panel Based Projectors	2A	6A	3	Yes	No	No	No
M08898	4-Channel 2A LED/Laser Driver for Panel Based Projectors	2A	8A	4	Yes	No	No	No
M08980	LED Driver and PMIC and Stepper Motor Driver for TI DLP¬Æ Displays	1.2A	1.2A	3	No	Yes	No	No
M09000	LED Driver and PMIC for TI DLP¬Æ Displays in QFN Package	1.2A	1.2A	3	No	Yes	No	No
M09001	LED Driver and PMIC for TI DLP¬Æ Displays	1.2A	1.2A	3	No	Yes	No	No

Silicon Photonics

Part Number	Description	Reach (Km)	Max Data Rate (Gbps)	Channels (#)	Temperature Range (°)	Package Type
MAOP-L284CN	100G CWDMA L-PIC™ with Integrated Laser, Modulators, and MUX	2	100	4x 28 Gbps	0 to 80	Die
* MAOP-R284CN	100G CWDM4 R-PIC™ Receiver with Monolithic Demux and Photodiodes	2	100	4 x 28 Gbps	0 to 80	Die
* MAOP-L561PP	100G Single Lambda L-PIC™ with Integrated Laser and Modulator	2	100	1 x 100 Gbps	0 to 80	Die
* MAOP-L564CP	400G CWDM4 PAM-4 L-PIC™ Integrated Laser, Modulators, and MUX	2	400	4 x 100 Gbps	0 to 80	Die
* MAOP-L101PN	10G XG-PON L-PIC™ with Integrated Laser and Modulator	20	10	1 x 10 Gbps	0 to 80	Die
* 157D-10G-xT6xx	10G XG-PON TOSA with MAOP-L101PN L-PIC™ and Micro-TEC in TO-Can coaxial package	20	10	1 x 10 Gbps	0 to 70	TO-Can

* In development, sampling late 2018

* Refer to Block Diagrams on pages 6-9

Photonic Devices

2.5G Fabry-Perot Lasers

Part Number	Description and Applications	Block Diagram Key*	Max Data Rate (Gbps)	Wavelength (nm)	Temp Options (°C)	Package Type and Size (um)
131F-02I-KCT11	Die, Laser, 2.5G FP NFF, Chip on Tape Applications: SDH, PON, Access, Optical Ethernet	A	2.5	1310	-40 to 85	Die 265 x 250 x 100
131F-02I-LCT11	Die, Laser, 2.5G FP, Chip on Tape Applications: PON, Access, Optical Ethernet	A	2.5	1310	-40 to 85	Die 250 x 250 x 100

10G Fabry-Perot Lasers

Part Number	Description	Block Diagram Key*	Max Data Rate (Gbps)	Wavelength (nm)	Temp Options (°C)	Package Type and Size (um)
131F-10I-LCT11-S	10G Hi-BW 1310 nm FP LD Applications: Optical Ethernet, Fibre Channel	A	10	1310	-40 to 85	Die 250 x 250 x 100
131F-10I-LT5K1C-S	10G Hi-BW 1310 nm FP TO-Can Applications: Telecom, Optical Ethernet, Wireless	A	10	1310	-40 to 85	TO-Can TO-56

2.5G Distributed Feedback Lasers

Part Number	Description and Applications	Block Diagram Key*	Max Data Rate (Gbps)	Wavelength (nm)	Temp Options (°C)	Package Type and Size (um)
127D-02I-VT5AB	1270 nm Edge Emitting Narrow Farfield DFB Laser Applications: NG-PON	A, B	2.5	1270	-40 to 85	Aspherical lens cap (FL+7.5 mm) in hermetic TO-56 package
127D-02I-VCT11	1270 nm Edge Emitting Narrow Farfield DFB Laser Applications: NG-PON	A, B	2.5	1270	-40 to 85	Die 265 x 250 x 100
131D-02E-VCT11-50x	Die, Laser, 2.5G DFB NFF, Small Size, Chip on Tape Applications: PON, Access, Optical Ethernet, SDH	A, B	2.5	1310	-20 to 85	Die 265 x 250 x 100
131D-02E-VT5TB-50x	TO, Laser, 2.5G DFB NFF, 2 mm Ball Lens (6.6 mm FL), Pinout Type B Applications: PON, Access, Optical Ethernet, SDH	A, B	2.5	1310	-20 to 85	TO-Can TO-56

10G Distributed Feedback Lasers

Part Number	Description and Applications	Block Diagram Key*	Max Data Rate (Gbps)	Wavelength (nm)	Temp Options (°C)	Package Type and Size (um)
127D-10G-LCT11-504	10G Hi-BW 1270 nm CWDM DFB LD (WL -3.5/+2.5nm) Applications: Data Center, 40G QSFP Module, Optical Ethernet, Fibre Channel	B	10	1270	-5 to 85	Die 250 x 300 x 100
127D-10G-LT5AC-S	10G Hi-BW 1270 nm DFB TO-Can Applications: Mobile Fronthaul/Backhaul, Optical Ethernet	B	10	1270	-5 to 85	TO-Can TO-56
127D-10I-LT5AC-504	TO, Laser, 10G DFB, 1270 ±10 nm, Asph Lens, Pinout Type C Applications: Mobile Fronthaul/Backhaul, Optical Ethernet	B, E	0	1270	-40 to 85	TO-Can TO-56
129D-10G-LCT11-504	Die, Laser, 10G DFB, 1290 -3.5 nm / +2.5 nm, Chip on Tape Applications: Data Center, 40G QSFP Module, Optical Ethernet, Fibre Channel	B	10	1290	-5 to 85	Die 250 x 300 x 100
131D-10G-LCT11-504	10G Hi-BW 1310 nm CWDM DFB LD (WL -3.5 / +2.5 nm) Applications: Data Center, 40G QSFP Module, Optical Ethernet, Fibre Channel	B	10	1310	-5 to 85	Die 250 x 300 x 100

* Refer to Block Diagrams on pages 6-9

10G Distributed Feedback Lasers (continued)

Part Number	Description and Applications	Block Diagram Key*	Max Data Rate (Gbps)	Wavelength (nm)	Temp Options (°C)	Package Type and Size (um)
131D-10G-LT5RC-S	TO, Laser, 10G DFB, 2 mm Ball Lens, WL= ±10 nm, Pinout Type C Applications: Optical Ethernet, Fibre Channel, SFP Module, Mobile (4G LTE), Data Center	B	10	1310	-5 to 85	TO-Can TO-56
131D-10I-LT5RC-504	TO, Laser, 10G DFB, 2 mm Ball Lens, WL= ±10 nm, Pinout Type C Applications: Optical Ethernet, Fibre Channel, SFP Module, Mobile (4G LTE), Data Center	B, E	10	1310	-40 to 85	Die 250 x 300 x 100
133D-10G-LCT11-504	Die, Laser, 10G DFB, 1330 -3.5 nm /+2.5 nm, Chip on Tape Applications: Data Center, 40G QSFP Module, Optical Ethernet, Fibre Channel	B	10	1330	-5 to 85	Die 250 x 300 x 100
133D-10G-LT5AC-S	10G Hi-BW 1330 nm DFB TO-Can Applications: Mobile Fronthaul/Backhaul, Optical Ethernet	B, E	10	1330	-5 to 85	TO-Can TO-56
133D-10I-LT5AC-504	TO, Laser, 10G DFB, 1330 ±10 nm, Asph Lens, Pinout Type C Applications: Mobile Fronthaul/Backhaul, Optical Ethernet	B, E	10	1330	-40 to 85	TO-Can TO-56

25G Distributed Feedback Lasers

Part Number	Description and Applications	Block Diagram Key*	Max Data Rate (Gbps)	Wavelength (nm)	Temp Options (°C)	Package Type and Size (um)
127D-25G-LCT11	CWDM Edge Emitting DFB Laser Applications: Optical Ethernet 25 Gbps/100 Gbps, Data Center, CWDM	C, D	25	1271	-5 to 85	Die 250 x 250 x 100
1295-25B-LCT11-S3	Die, laser, 25G DFB, 1300.05 ± 1 nm, Chip on Tape Applications: Data Center, 100G Base-LR4	C, I	25	1295	0 to 85	Die 250 x 250 x 100
129D-25G-LCT11	CWDM Edge Emitting DFB Laser Applications: Optical Ethernet 25 Gbps/100 Gbps, Data Center, CWDM	C, D	25	1291	-5 to 85	Die 250 x 250 x 100
1300-25B-LCT11-S3	Die, Laser, 25G DFB, 1300.05 ± 1 nm, Chip on Tape Applications: Data Center, 100G Base-LR4	C, I	25	1300	0 to 85	Die 250 x 250 x 100
1304-25B-LCT11-S3	Die, Laser, 25G DFB, 1304.58 ± 1 nm, Chip on Tape Applications: Data Center, 100G Base-LR4	C, I	25	1304	0 to 85	Die 250 x 250 x 100
1309-25B-LCT11-S3	Die, Laser, 25G DFB, 1309.14 ± 1 nm, Chip on Tape Applications: Data Center, 100G Base-LR4	C, I	25	1309	0 to 85	Die 250 x 250 x 100
131D-25G-LCT11	CWDM Edge Emitting DFB Laser Applications: Optical Ethernet 25 Gbps/100 Gbps, Data Center, CWDM	C, D	25	1311	-5 to 85	Die 250 x 250 x 100
131D-25G-LCT11-502	Laser, DE, 25G, DFB, 1310 nm, WL= +/-15 nm, CT Applications: Optical Ethernet 25 Gbps/100 Gbps, Data Center, CWDM	C, D	25	1310	-5 to 85	Die 250 x 250 x 100
131D-25G-LT5TC	1310 nm Edge Emitting DFB Laser in TO-56 Package 25 Gbps Applications: SFP28	C	25	1310	-5 to 85	TO-56 5.6 mm dia.
133D-25G-LCT11	CWDM Edge Emitting DFB Laser Applications: Optical Ethernet 25 Gbps/100 Gbps, Data Center, CWDM	C, D	25	1331	-5 to 85	Die 250 x 250 x 100

* Refer to Block Diagrams on pages 6-9

Photonic Devices

Photodiodes: APD

Part Number	Description and Applications	Block Diagram Key*	Model	Bandwidth (GHz)	Wavelength (nm)	Responsivity (A/W)	Sensitivity (dBm)	Capacitance (fF)	Package Type
32420-01	10G APD, Backside Illuminated Applications: NG-PON	B	APD10B	12	1250–1650	0.8	-28.5	105	CoC
32420-02			APD10B-ES	10	1250–1650	0.8	-29.5	90	CoC
32422-01FG			APD10B	12	1250–1650	0.8	-28.5	105	Die
32422-02FG			APD10B-ES	12	1250–1650	0.8	-28.5	90	Die
32391-03-PPR	28G APD, Backside Illuminated, integrated lens option Applications: 25G or 100G ER4	C, I	APD28A	20	1250–1650	0.8	-20	50	Die
32392-03-PPR			APD28A	20	1250–1650	0.8	-20	50	Die
32411-03-PPR			APD28A	20	1250–1650	0.8	-20	50	CoC
32411-04-PPR			APD28A	20	1250–1650	0.8	-20	50	CoC
32412-03-PPR			APD28A	20	1250–1650	0.8	-20	50	CoC

Photodiodes: PIN

Part Number	Description and Applications	Block Diagram Key*	Model	Bandwidth (GHz)	Wavelength (nm)	Responsivity (A/W)	Sensitivity (dBm)	Capacitance (fF)	Package Type
32436-04-PPR	28G PIN Backside Illuminated, integrated lens option Applications: 25G or 100G LR4	C, I	BSP28B	25	1200–1650	0.88	—	95	Die
32438-04-PPR			BSP28B	25	1200–1650	0.88	—	95	CoC
32436-01-PPR	56G PIN, Backside Illuminated, integrated lens option Applications: 100G PAM-4	K, L, M	BSP56B	30	1200–1650	0.8	—	50	Die
32438-01-PPR			BSP56B	30	1200–1650	0.8	—	50	CoC

Planar Lightwave Circuits: CWDM MUX/DEMUX

Part Number	Description and Applications	Block Diagram Key*	Channels (#)	Passband (PB) (nm)	Center Wavelength Accuracy (Δλ) (nm)	Channel Spacing (CS) (nm)	1 dB Bandwidth (nm)	Pitch (um)	Chip Size (mm)
A0410-DXX	4 X 10 Gbps CWDM AWG Chip DEMUX Applications: Datacom 40G CWDM4	D	4	+/-6.5	+/-1	20	13	250	2.5 x 10
A0410-MXX	4 X 10 Gbps CWDM AWG Chip MUX Applications: Datacom 40G CWDM4	D	4	—	+/-1	20	11	1100	4 x 10
A0425-DXX	4 X 25 Gbps CWDM AWG Chip DEMUX Applications: Datacom 100G CWDM4	D	4	+/- 6.5	+/-1	20	13	750	4 x 10
A0425-MXX	4 X 25 Gbps CWDM AWG Chip MUX Applications: Datacom 100G CWDM4	D	4	—	+/-1	20	11	1100	4 x 10

Planar Lightwave Circuits: LANWDM MUX/DEMUX

Part Number	Description and Applications	Block Diagram Key*	Channels (#)	Passband (PB)	Center Wavelength Accuracy (Δλ) (nm)	Channel Spacing (CS) (nm)	1 dB Bandwidth (nm)	Pitch (um)	Package Size (mm)
A0425-DLX	4 X 25 Gbps LANWDM AWG Chip DEMUX Applications: Datacom 100G LR4	I	4	+/-1	+/-0.5	4.5	2.8	750	4 x 10
A0425-MLX	4 X 25 Gbps LANWDM AWG Chip MUX Applications: Datacom 100G LR4	I	4	—	+/-0.5	4.5	2.2	1100	4 x 9.5

* Refer to Block Diagrams on pages 6-9

Network Connectivity

OTN: Framer/Mapper/FEC

Part Number	Description	Max Data Rate (Gbps)	Switch Matrix Size I/O Matrix	Supply Voltage (V)	Channels (#)	Embedded CDR (Y/N)	Embedded SerDes (Y/N)	Package Type and Size (mm)
S10123	10G OTN Framer/Mapper/FEC	11.3	1 x 1	2.5, 1.8, 1.2	1	Yes	Yes	19 mm 324-pin FCBGA
S10124	10G OTN Framer/Mapper/FEC	11.3	1 x 2	2.5, 1.8, 1.2	1	Yes	Yes	25 mm 576-pin FCBGA
S10126	10G OTN Framer/Mapper/FEC	11.3	1 x 1	2.5, 1.8, 1.2	1	Yes	Yes	19 mm 324-pin FCBGA
S12312	24 x 10G/40G/100G OTN & MACsec	11.2	24 x 24	1.8, 1.5, 1.2, 0.9	24	Yes	Yes	42.5 mm 1680-pin FCBGA
S12411	12 x 10G/40G/100G OTN & MACsec	28	12 x 12	1.8, 1.5, 1.2, 0.9	12	Yes	Yes	29 mm 783-pin FCBGA
S12412	24 x 10G/40G/100G OTN & MACsec	27.96	24 x 24	1.8, 1.5, 1.2, 0.9	24	Yes	Yes	42.5mm 1680-pin FCBGA
S20101	PQ20T: 2 x 10G OTN Framer/Mapper/FEC	11.19	2 x 2	2.5, 1.2, 0.9	4	Yes	Yes	35 mm 1155-pin FCBGA
S40101	PQ40T:4 x 10G/40G OTN Framer/Mapper/FEC	11.19	4 x 4	2.5, 1.2, 0.9	4	Yes	Yes	35 mm 1155-pin FCBGA
S50101	PQ50: 5 x 10G/40G OTN Framer/Mapper/FEC	11.19	5 x 5	2.5, 1.2, 0.9	5	Yes	Yes	35 mm 1155-pin FCBGA
S60101	PQ60T: 6 x 10G/40G OTN Framer/Mapper/FEC	11.19	6 x 6	2.5, 1.2, 0.9	6	Yes	Yes	35 mm 1155-pin FCBGA

Ethernet MACsec PHY

		Block Diagram Key*							
S12611	12 x 10G/40G/100G MACsec	N	27.96	12 x 12	1.8, 1.5, 1.2, 0.9	12	Yes	Yes	29 mm 783-pin FCBGA
S12612	12 x 10G/40G/100G OTN & MACsec	N	27.96	24 x 24	1.8, 1.5, 1.2, 0.9	24	Yes	Yes	42.5 mm 1680-pin FCBGA
S20020	100G/50G/40G/50G/25G/ 10G MACsec, 512SA	N	26.56	8 x 8	1.8, 0.9	8	Yes	Yes	17 mm 256-pin HFCBGA

Ethernet PHY

MATP-10025A	PRISM: 1 x 53 Gbaud PAM-4 PHY with FEC and Integrated Laser Driver	K	106.25	1 x 1	1.8, 1.0, 0.75	1	Yes	Yes	10 mm 177-pin HFCBGA
MATP-40050A	PRISM4: 4 x 53 GBaud PAM-4 PHY for 400G Optical Modules	L	106.25	4 x 4	1.8, 1.0, 0.75	4	Yes	Yes	11 mm 441-pin HFCBGA
QT2025	10GE Serial to XAUI PHY for 10GBASE-LRM, LR, SR, 10G BASE-KR	—	10.52	1 x 1	1.8, 1.2	1	Yes	Yes	13 mm 144-pin PBGA
QT2225	Dual 10GE Serial-to-XAUI PHY for SFP+ and Serial Backplane	—	10.52	2 x 2	1.8, 1.2	2	Yes	Yes	23 mm 484-pin BGA
S28010	100 Gbps Gearbox with CAUI-10 to CAUI-4	E	27.96	1 x 1	2.5, 1.2, 0.9	1	Yes	Yes	17 mm 248-pin HFCBGA
S28110	100 Gbps Gearbox with CAUI-10 Retimer Mode	E	27.96	10 x 10	2.5, 1.2, 0.9	10	Yes	Yes	19 mm 324-pin HFCBGA
S28115	100 Gbps Multi-Link Gearbox	E	25.78	10 x 10	2.5, 1.2, 0.9	10	Yes	Yes	19 mm 324-pin HFCBGA

Embedded Processors

Part Number	Description	Clock Frequency (GHz)	DDR3 + ECC	10/100/100 Ethernet	Typical Power (W)	USB 2.0 with PHY	Package Type and Size (mm)
APM86190	Single Core Power™ Processor	800 MHz–1.2 GHz	64b/32b	2 GbE: 2 RGMII	Single Core 5.49 W @ 1 GHz	3	27 x 27 FC-PBGA
APM86290	Dual Core Power™ Processor	800 MHz–1.2 GHz	64b/32b	2 GbE: 2 RGM11	Dual Core 7.06 W @ 1 GHz	3	27 x 27 FC-PBGA
APM86391	Single Core Power™ Processor	600 MHz–1 GHz	32b	2 GbE: 2 RGMII	Single Core 4.09 W @ 1 GHz	3	27 x 27 FC-PBGA
APM86392	Dual Core Power™ Processor	600 MHz–1 GHz	32b	2 GbE: 2 RGMII	Dual Core 5 W @ 1 GHz	3	27 x 27 FC-PBGA
APM86691	Single Core Power™ Processor	800 MHz–1.2 GHz	64b/32b	4 GbE: 2 RGMII, up to 4 SGMII	Single Core 5.49 W @ 1 GHz	3	27 x 27 FC-PBGA
APM86692	Dual Core Power™ Processor	800 MHz–1.2 GHz	64b/32b	4 GbE: 2 RGMII, up to 4 SGMII	Dual Core 7.06 W @ 1 GHz	3	27 x 27 FC-PBGA
APM86491	Single Core Power™ Processor	800 MHz–1 GHz	16b/32b	2 GbE: 2 RGMII	3.65 W @ 1 GHz	2 (USB 3.0)	19 x 19 WB-PBGA
APM86791	Single Core Power™ Processor	800 MHz–1 GHz	16b/32b	4 GbE: 2 RGMII, 2 SGMII	3.65 W @ 1 GHz	2	9 x 19 WB-PBGA

* Refer to Block Diagrams on pages 6-9

High Speed Optical Receivers

Test & Measurement Receivers

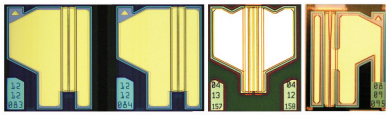
Part Number	Description	Type	Bandwidth (GHz)	Wavelength (nM)	Sensitivity (dBm)	Responsivity (A/W)	Gain (V/W)
11059-02	AD-40APDir-FC	APD Instrument	12	1250 – 1650	-27	—	3500
11058-02P	AD-40xr-FC	XR Instrument	12	700 – 1650	-19	—	400
11001-03	D-15-FC	VIS-ir Instrument	30	400 – 1700	—	0.2	—
11212-01P	D-32xr-FC	XR Instrument	28	800 -1650	—	0.77	—
11057-02	D-8ir-FC	IR Instrument	50	950 – 1650	—	0.7	—
11012-05P	DG-15ir-FC	IR Instrument	20	950 – 1650	—	0.6	—
11206-01	DG-32xr-FC	XR Instrument	28	800 – 1650	—	0.77	—
11204-01	DGM-32xr-FC	XR Photodetector	28	800 – 1600	—	0.77	—
11204-05	DGM-32xr-DMD	XR Photodetector	28	800 – 1600	—	0.77	—
11204-06	DGM-32xr-SC	XR Photodetector	28	800 – 1600	—	0.77	—
11069-02	P-18A/3K/Z50/FC	IR Photodetector	19	1200 – 1650	—	0.9	—
11112-04	P-40HPA/8V/Z50/AC/SC	IR Photodetector	40	1200 – 1650	—	0.65	—
11113-04	P-40HPA/8V/Z50/DC/SC	IR Photodetector	40	1200 – 1650	—	0.65	—
11113-05	P-40HPA/8V/Z50/DC/FC	IR Photodetector	40	1200 – 1650	—	0.65	—
11088-05	P-50A/8V/Z50/DC/FC	IR Photodetector	50	1200 – 1650	—	0.5	—
11238-01	P-50C/8V/Z50/DC/FC	IR Photodetector	50	1200 – 1650	—	0.7	—
11241-01P	P-70A/8V/Z50/FC	IR Photodetector	70	1200 – 1650	—	0.5	—
11104-05	PT-10SFA/17LP/DC/SC	IR Photodetector	8.5	1200 – 1650	-20	1	700
11044-16	PT-12B/8SMA/TDC/FC	XR Photodetector	9.5	750 – 1650	-20	0.55	450
11232-01	PT-28E/12XLMD/AC/FC	IR Photodetector	30	1200 - 1650	—	0.78	1900
11245-01-PPR	PT-28F/8XLMD/DC/FC/SM	IR Photodetector	30	1200 - 1650	—	0.75	95
11237-01P-PPR	PT-28F/10GDPPO/DC/FC	XR Photodetector	30	1200 - 1650	—	0.75	95
11174-04	PT-40G/8LDGPPO/AC/LC/B1	IR Photodetector	35	1200 – 1650	-11	0.65	4200
11174-05	PT-40G/8XLMD/AC/LC	IR Photodetector	35	1200 – 1650	-11	0.65	4200
11174-06	PT-40G/8XLMD/AC/FC/B1	IR Photodetector	35	1200 – 1650	-11	0.65	4200
11174-07	PT-40G/8XLMD/AC/FC	IR Photodetector	35	1200 – 1650	-11	0.65	4200
11243-01	PT-50A/8V/DC/FC	IR Photodetector	50	1200 – 1650	—	0.55	105
11000-03	PX-D7-FC	VIS-ir Instrument	60	400 – 900	—	0.03	—

Transmission Receivers

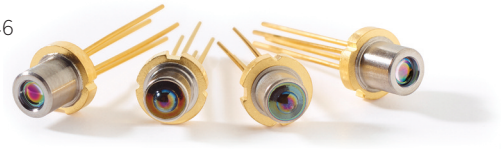
Part Number	Description	Type	Bandwidth (GHz)	Wavelength (nM)	Sensitivity (dBm)	Responsivity (A/W)	Gain (V/W)
11218-02	AT-10D/5MMLC/8FPC	APD ROSA	8.5	1200 – 1600	-28.5	0.8	25000
11153-02	AT-10SFA/17LP/AC/MM/FCs	APD Receiver	8.5	1250 – 1650	-28	0.8	1240
11233-01	AT-10SFH/17LP/AC/MM/FC	APD Receiver	10.5	1250 – 1650	-28.5	0.7	12000
11219-03	AT-2.5A/5MMLC/8FPC	APD ROSA	2	1200 – 1600	-35	0.7	—
11215-01P	AT-2.5SFB/17LP/AC/MM/FC	APD Receiver	1.7	1250 – 1650	-33	0.7	7100
11226-01	AT-2.5SFB/ER/17LP/AC/MM/FC	APD Receiver	1.7	1250 – 1650	-3.4	0.7	14000
11132-03	PT-15SFA/17LP/AC/LC	PIN Receiver	12.5	1200 – 1650	-16.5	0.75	700

Photonics

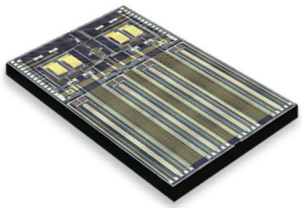
Die



TO-Can TO56, TO46



L-PIC™ Silicon Photonic Die



Ethernet PHYs and OTN Framers

PQX

S28010

Yahara

S28110

ES200

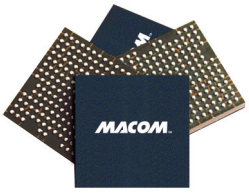
S28115

X240

QT2225

MATP-10025/6
MATP-40050/1

QT2025

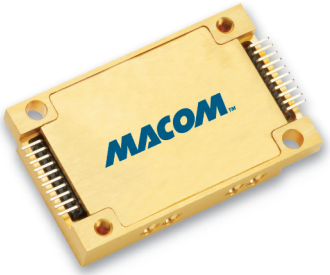


Optoelectronics

4 x 4.5 mm CSP
3 mm QFN
4 mm QFN
5 mm QFN
10 mm 72-pin QFN

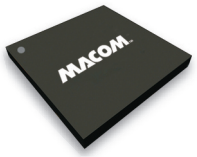
Surface Mount Devices (SMD)

Modules



Crosspoint Switches

3 mm QFN
4 mm 24-pin QFN
6 mm 10-pin QFN
10 mm 72-pin QFN
12 mm 88-pin QFN



17 mm 252-pin BGA
19 mm 324-pin BGA
21 mm 484-pin/1924-pin BGA
23 mm 484-pin /1924-pin BGA
23 mm 404-pin PBGA
27 mm 676-pin BGA
34 mm PBGA
35 mm 1156-pin BGA
35 mm 676-pin TEPBGA
35 mm 1936-pin FCBGA
50 mm 2389-pin BGA

ROSA & TOSA (Optical Sub Assemblies)

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