



Optoelectronics & Photonics

Product
Selection
Guide

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 in a wide range of applications. These span from long haul core networks to Cloud Data Center to FTTx access, to wireless infrastructure. 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 and PIN photodiodes, FP and DFB lasers, Silicon Photonics, and PAM4 PHYs. Each of these product families includes variants specifically tailored for the unique needs of data centers, enterprise networks, and telecom optical systems operating up to 800 Gbps and beyond. For FTTx, MACOM has the broadest portfolio of lasers, laser drivers, limiting amplifiers, photodiodes, and TIAs covering systems from GPON, EPON, XG-PON, and NG-PON.



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Enabling bandwidth density in optical networks

MACOM Products

- > CDRs
- > Gearbox
- > Lasers
- > Limiting Amplifiers
- > Silicon Photonics Components
- > MACsec
- > Modulator Drivers
- > OTN: Framer and Mapper
- > PAM4 PHY
- > Photodiodes
- > Physical Media Devices (PMDs)
- > TIAs

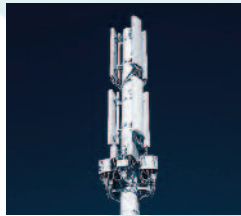
MACOM Technologies

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

MACOM Markets



FTTx/PON



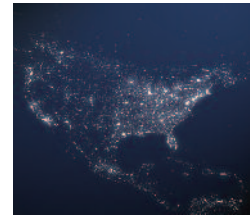
Wireless Fronthaul/
Backhaul



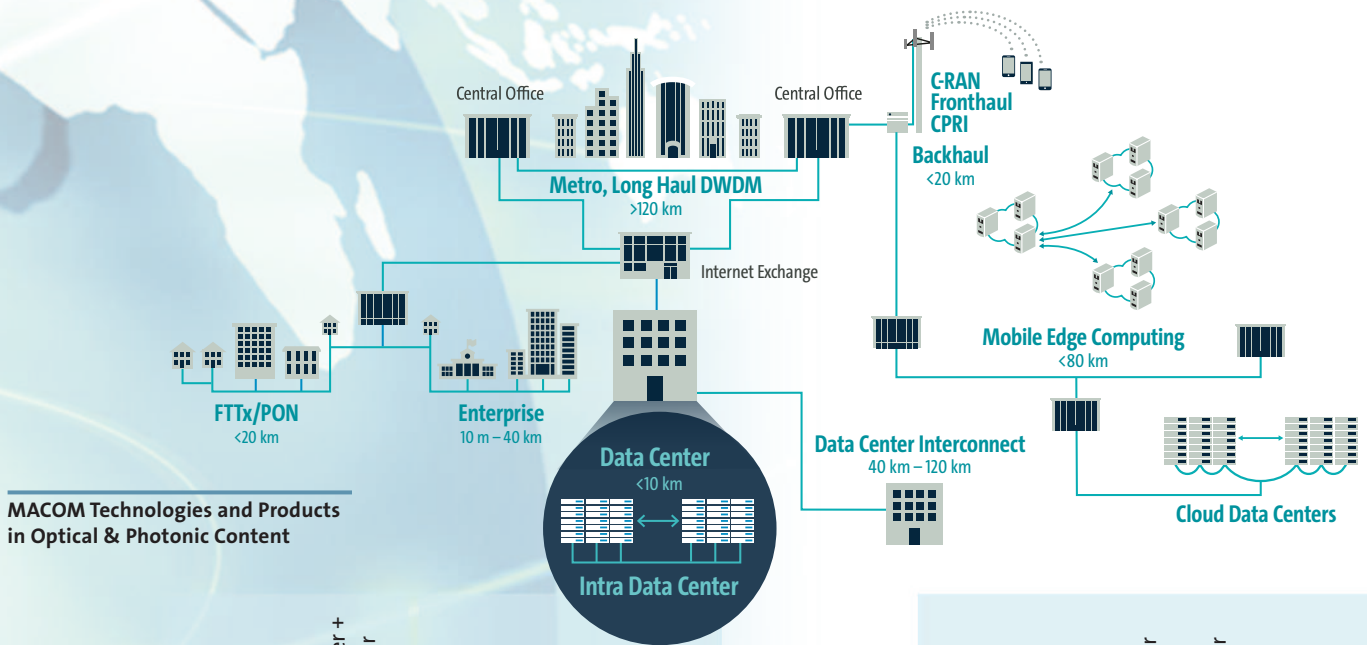
Cloud Data Center



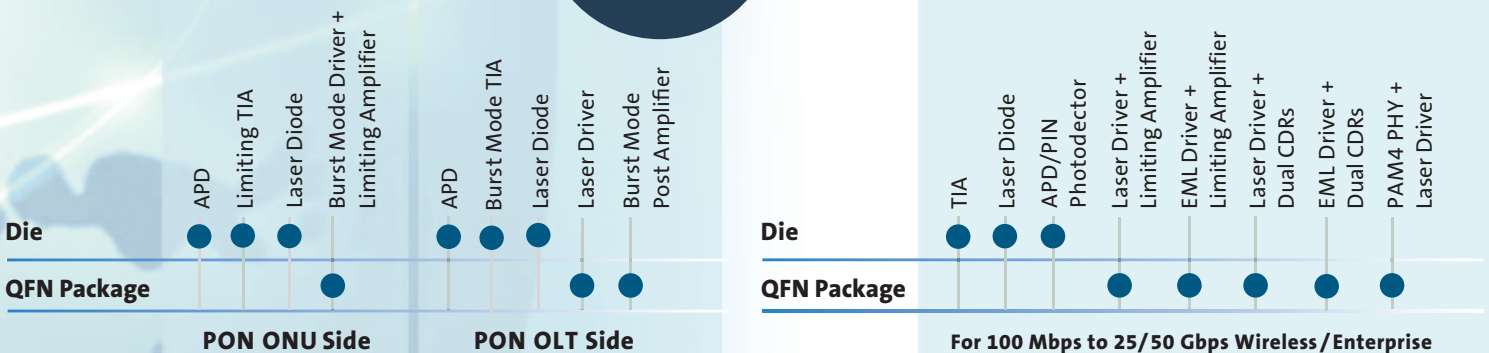
Metro



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, APD and PIN photodetectors, 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 high capacity, coherent systems in metro and data center interconnect applications.*

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, the chipsets are used in 100G CWDM4, and 100G, 200G, and 400G PAM4 Datacom applications.*

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 automated 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 to PLC multiplexers with lenses, then fixing the lenses in place with multiple epoxy steps, in the production of TOSA products. MACOM's L-PIC transmitters are shipped with lasers already attached to the silicon photonic circuit.



CMOS

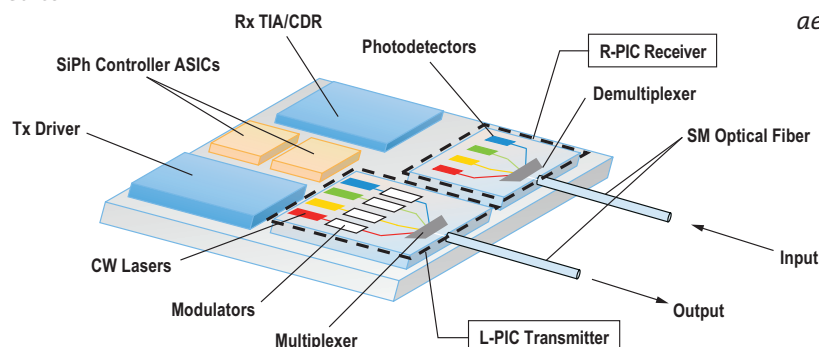
MACOM utilizes CMOS technology for design in a range of applications from wireless infrastructure basestations to aerospace and defense, and complex Ethernet PHY devices. CMOS allows for the seamless integration of high-speed data transmission and complex digital functionality. Ethernet devices used in optical networking include DSP PHYs as well as IEEE 802.1AE MACsec, which solves the security issues of Ethernet networks by providing confidentiality, authenticity and integrity of data. *Typical CMOS products and applications include PAM4 PHYs, MACsec, mobile phone chipsets, 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 Evaluation Modules (EVMs) and Reference Design Kits

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

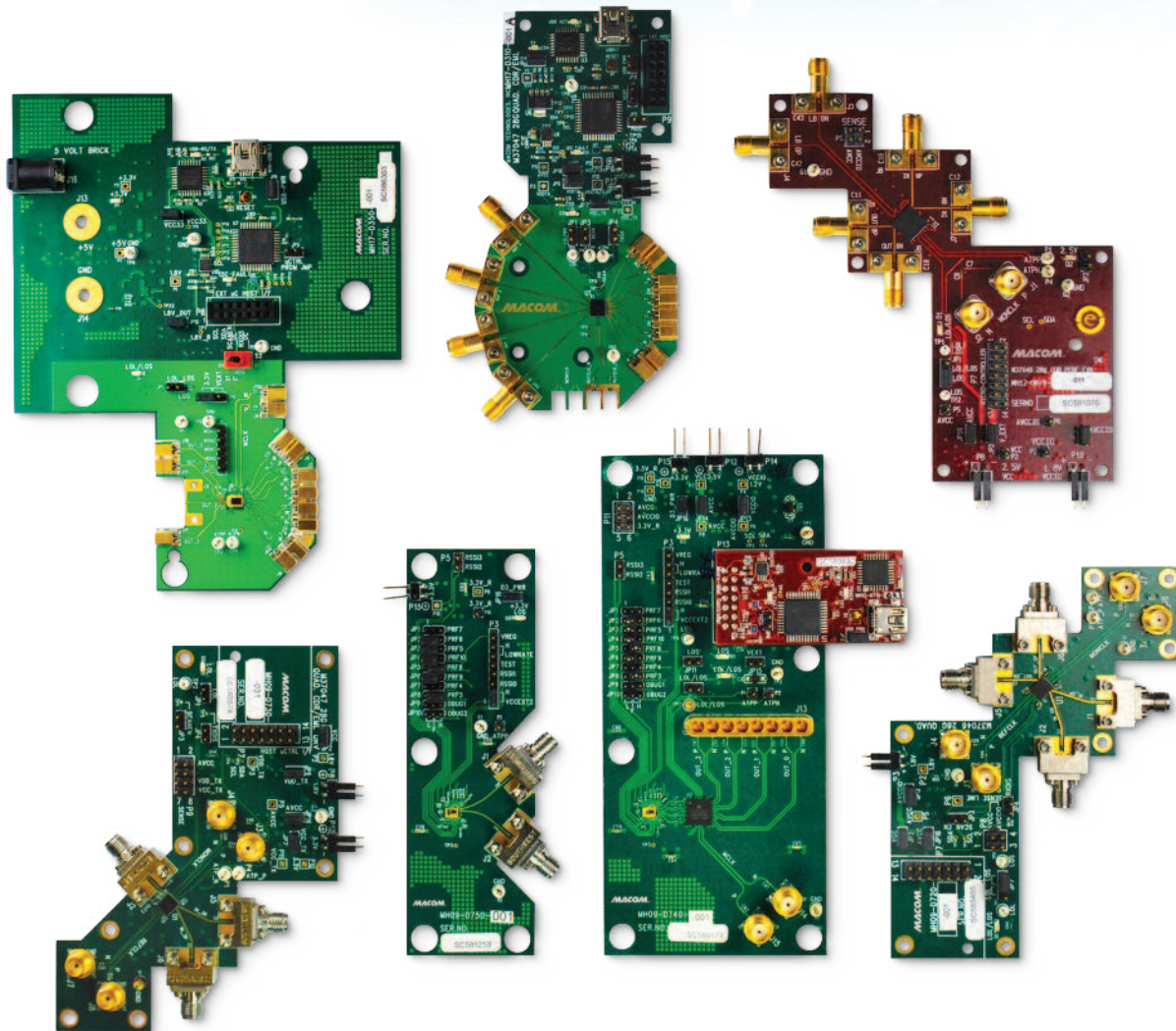
In addition to the support of our world-class application team, MACOM offers a number of custom reference design kits, Evaluation Modules (EVMs) and design guides which enhance the development of new products, reduce costs and optimize time-to-market.

MACOM EVMs provide customers with a vehicle to test product features, measure product performance, 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.

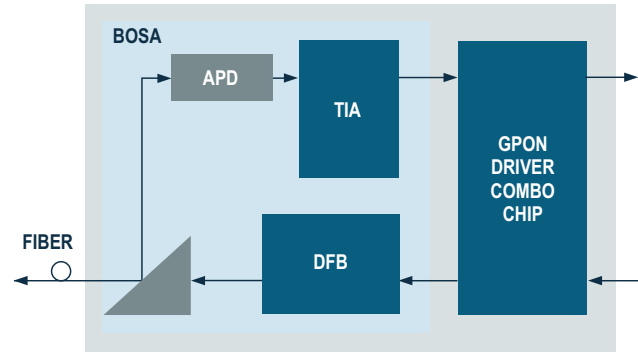
From low-speed solutions to those operating at 100G and above, MACOM offers hardware expertise and design support to enable innovative, next-generation optical products in a wide variety of markets.

Contact the MACOM sales team to learn more.

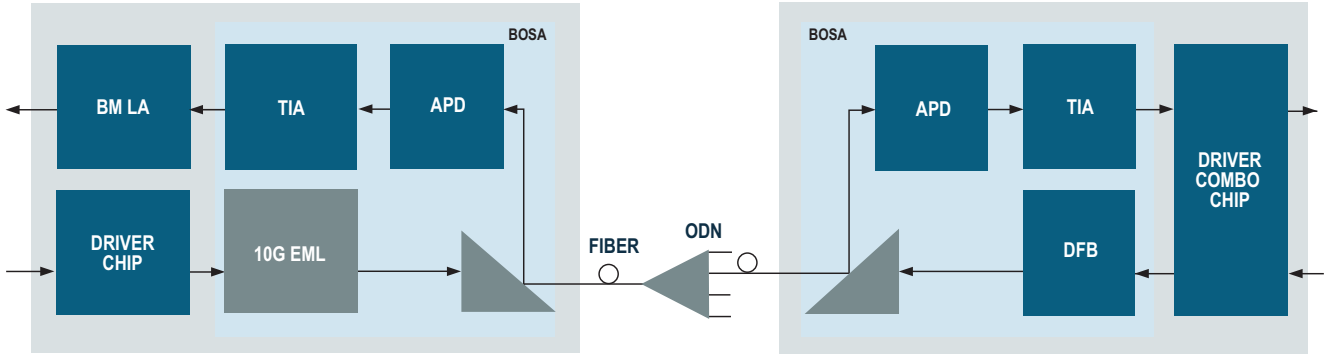


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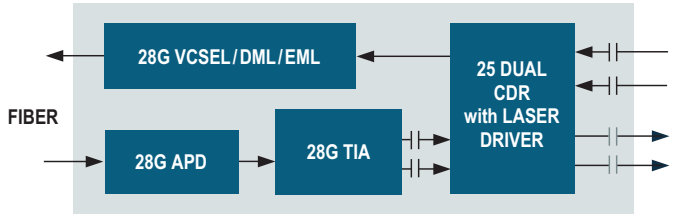
GPON ONU BOSA-on-Board A



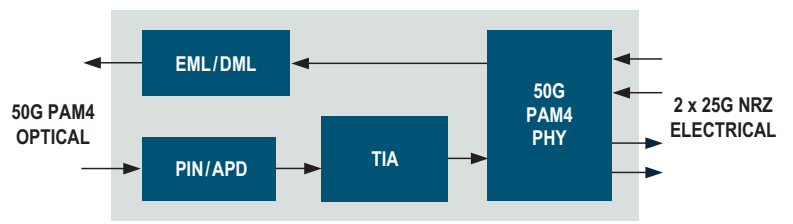
PON ONU/OLT B



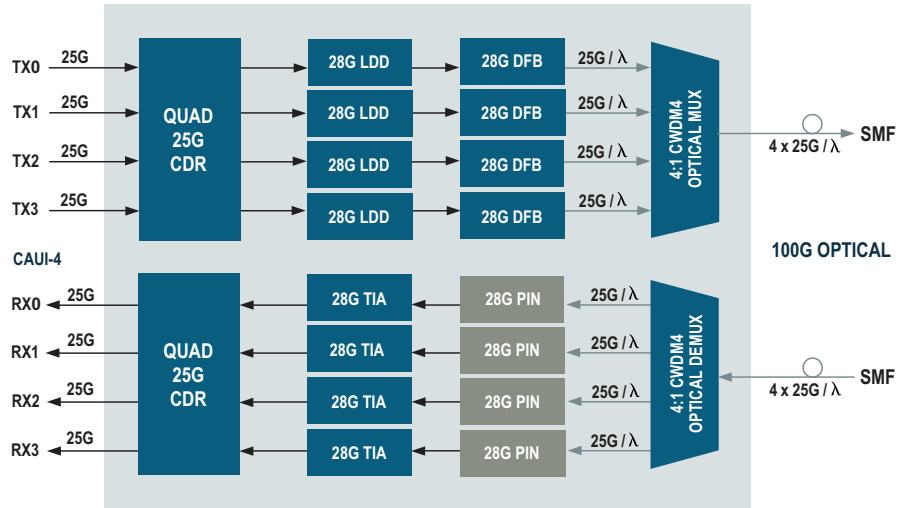
25G Chipset: SFP28 SR/LR/ER C



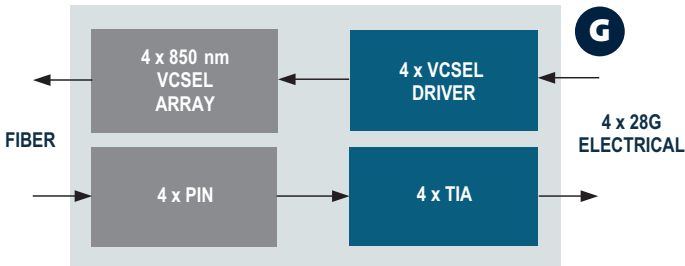
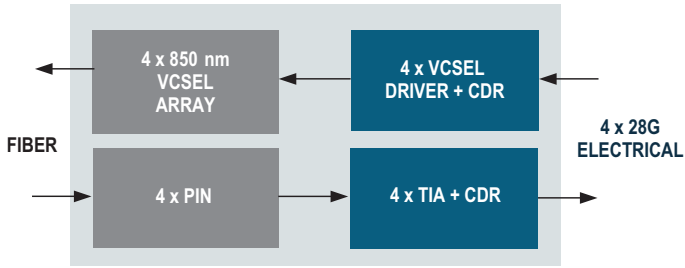
50 Gbps PAM4 FR/LR/ER E



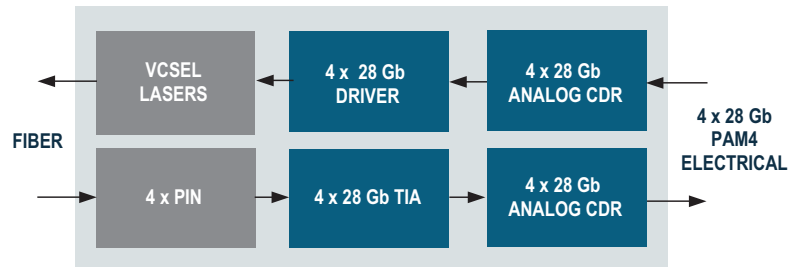
100G Chipset: CWDM4 Solution D



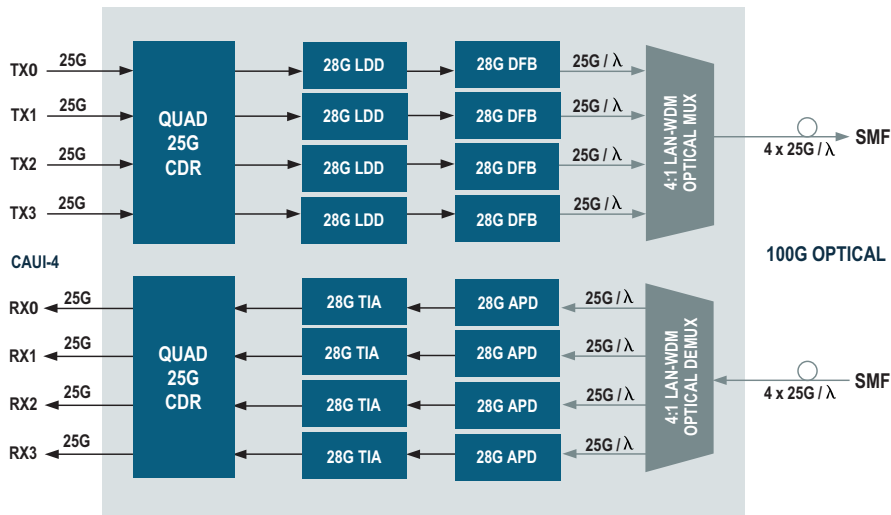
100G SR4 VCSEL Chipsets **F**



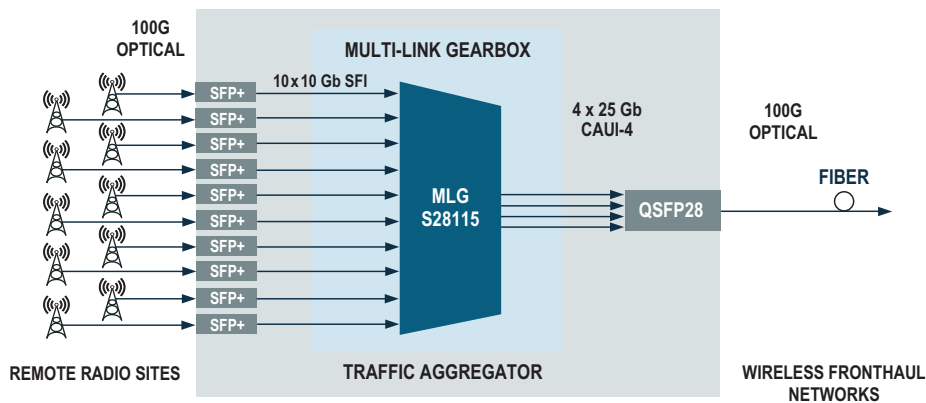
200/400G SR4 VCSEL Chipset **H**



100G BASE-LR4/ER4 (QSFP28) **I**



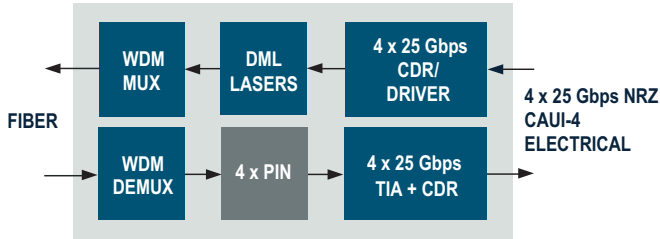
Wireless Fronthaul eCPRI Aggregation Solution **Q**



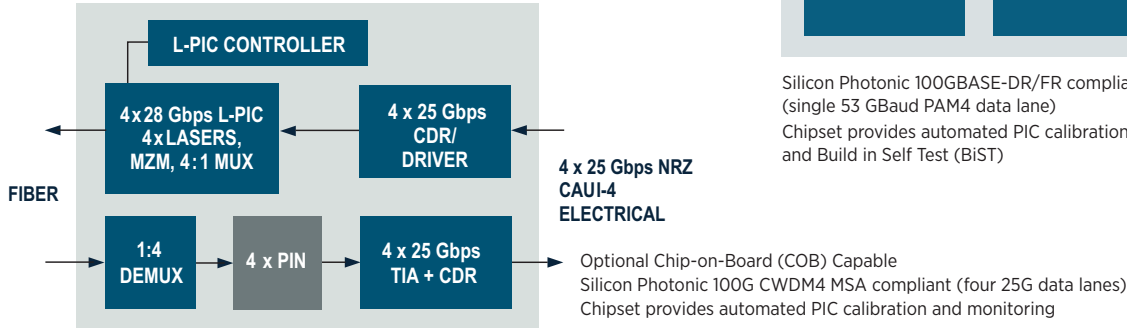
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J

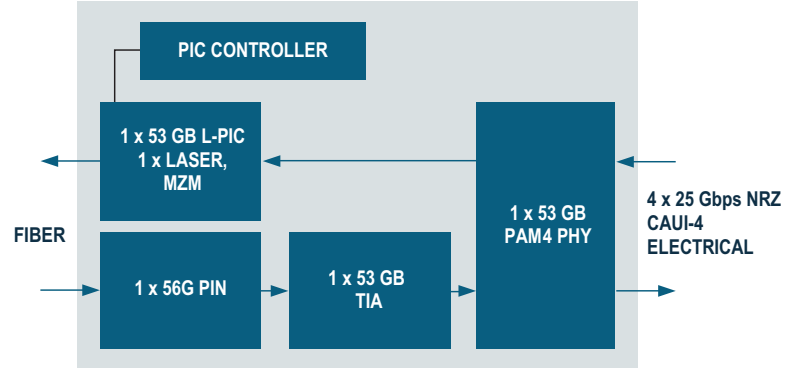
100 Gbps CWDM4 DML-based Chipset



100 Gbps CWDM4 SiPh-based Chipset



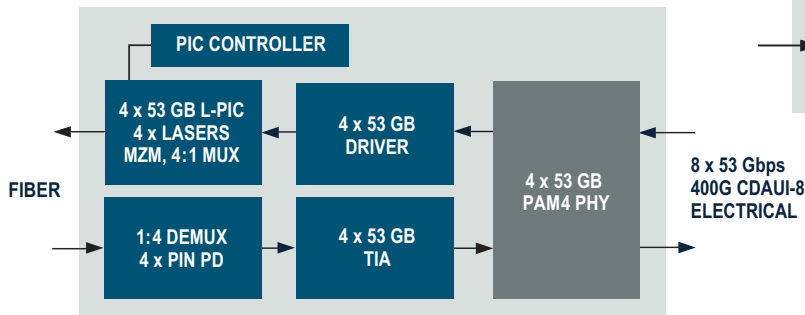
100G Single Lambda **K**



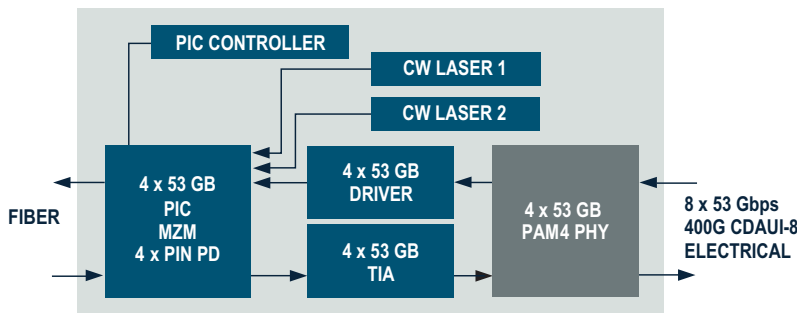
Silicon Photonic 100GBASE-DR/FR compliant (single 53 GBaud PAM4 data lane)
Chipset provides automated PIC calibration and monitoring and Build in Self Test (BiST)

MACOM Silicon Photonics-based Solution

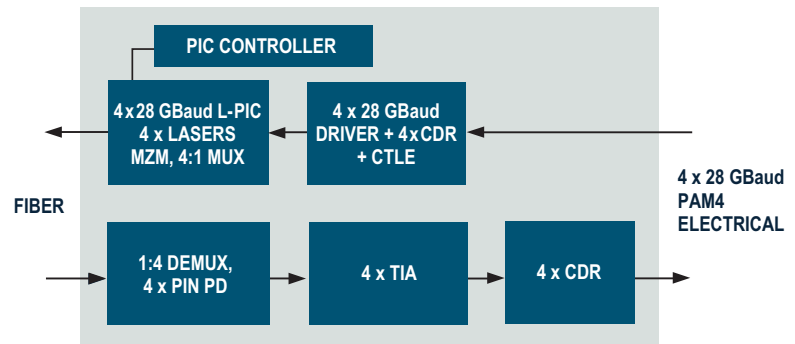
400GBASE-FR4/LR4 **L1**



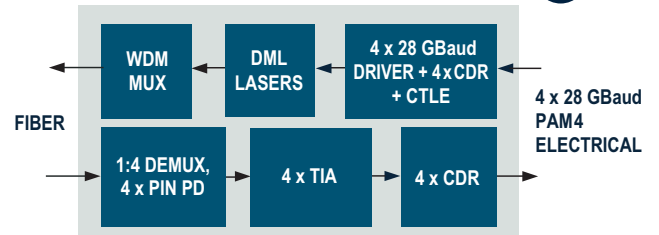
400GBASE-DR4 **L2**



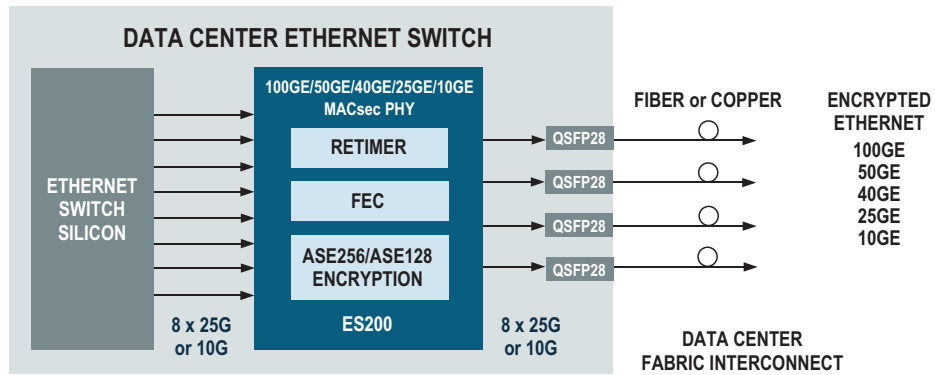
200 Gbps SMF Chipset **M1**



200 Gbps SMF DML-based Chipset **M2**

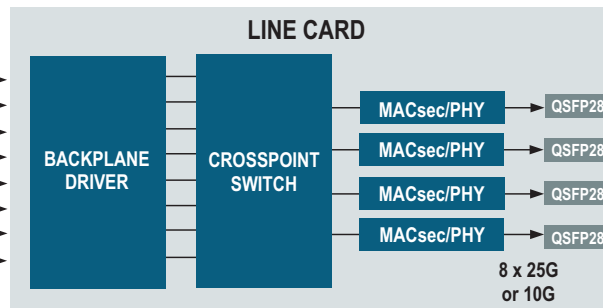
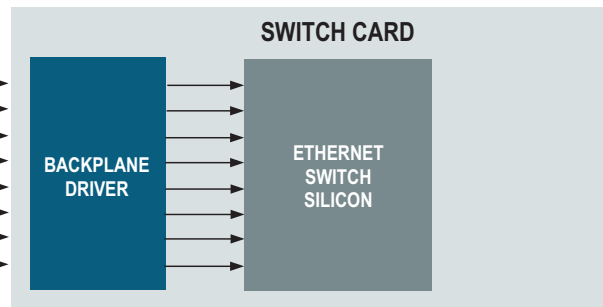


Data Center Switch Interconnect Security Solution **N**



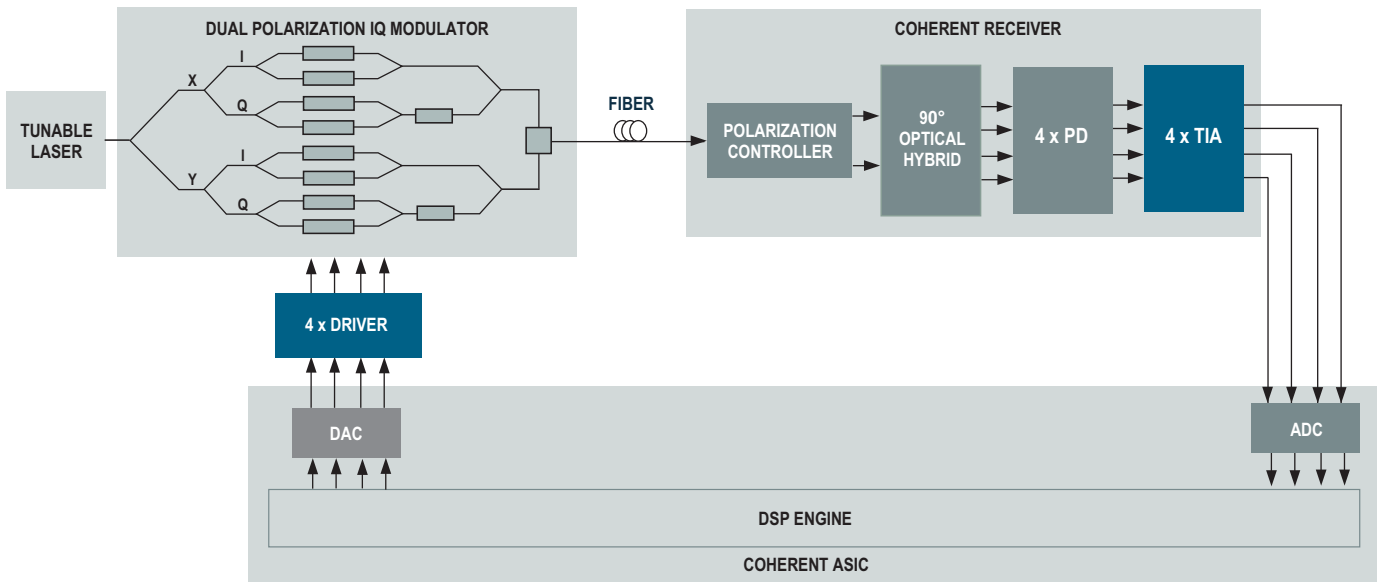
O

Backplane Drivers



P

100G – 800G Long Haul/Metro/DCI Application Solutions



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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	0.11	1	100	100	QFN
M02077	Laser Driver/Limiting Amplifier	A	3.1	3.3	0.20	1	100	100	4 mm QFN
M02090	2.5 Gbps, 3.3 V Burst Mode Laser Driver/Limiting Amplifier	A	2.5	3.3	0.48	1	100	80	5 mm QFN
M02095	1.25 Gbps, 3.3/5 V Laser Driver/Limiting Amp	A	1.25	3.3, 5	0.31	1	85	100	5 mm QFN
M02096	4.3 Gbps, 3.3/5 V Laser Driver/Limiting Amp	A	4.3	3.3, 5	0.22	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	2.67	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	0.22	1	100	100	4 mm QFN
M02100	Burst Mode Laser Driver/Limiting Amplifier + DDMI Controller and APD DC-DC Controller & Amplifier, EEPROM	A	3.1	3.3	0.22	1	100	100	4 mm QFN
M02172	11.3 Gbps EML Driver	—	11.3	3.3	0.28	1	2.5 (V)	180	5 mm QFN
M02180	Burst Mode Laser Driver/Limiting Amplifier + Rx CDR + DDMI Controller and APD DC-DC Controller & Amplifier; EEPROM	B	12.5	3.3	0.4	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	0.31	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-02103C	3.1 Gbps Low Power Dual Closed Loop Burst Mode Laser Driver with Integrated Limiting Amplifier	A	3.1	3.3	0.27	1	100	100	4 mm QFN
MALD-37030	26 Gbps Multi-rate Laser Driver with LIA/CDR	C	26.5	3.3	CONTACT MACOM	1	76	100	CONTACT MACOM
MALD-37031	28 Gbps Multi-rate Laser Driver with LIA/CDR	C	28.1	3.3	CONTACT MACOM	1	76	100	CONTACT MACOM
MALD-37345B	Quad 28G VCSEL Driver with Input Equalizer	F, G	28	1.8, 3.3	0.5	4	12.8	15	2 x 3 mm Die
MALD-02181	12.5G Burst Mode Laser and LIA+ DC-DC Controller, EEPROM and DDMI Controller	B	53	1.8, 3.3	0.44	4	12.8	15	4.5 mm QFN
MALD-02182	12.5G Burst Mode Laser and LIA+ DC-DC Controller and DDMI Controller	B	12.5	3.3	0.33	1	100	100	4.5 mm QFN
MALD-02183	12.5G Burst Mode Laser and LIA+ DC-DC Controller and DDMI Controller	B	12.5	3.3	0.33	1	100	100	4 mm QFN
MALD-02194	12.5G Burst Mode Laser and LIA+ DDMI Controller	—	12.5	3.3	0.33	1	100	100	4.5 mm QFN
MAOM-37032	Dual 28 Gbps CDR with integrated EML Driver	C	26.5	1.8, 3.3	CONTACT MACOM	1	CONTACT MACOM		
MALD-37045	Four Channel 25G/28G CDR with Integrated VCSEL Driver	F	28	1.8, 3.3	0.7	4	—	—	Die 3 x 2 mm
MALD-37845	Four Channel Transmit and Four Channel Receive 25G/28G CDR with Integrated VCSEL Drivers and TIAs	F	28.1	1.8, 3.3	1.5	4 Tx & 4 Rx	—	—	3.4 x 4 mm Die
MALD-38045	Quad 28 GBaud PAM4/NRZ VCSEL Driver with Integrated CDR	F	28	1.8, 3.3	1.1	4	—	—	Die 4 x 2 mm
MALD-38435	Quad 53G VCSEL Driver with Input Equalizer	H	28	1.8, 3.3	0.5	4	12.8	15	Die 2 x 3 mm
MALD-37145	Four Channel 25G/28G CDR with Integrated VCSEL Driver	F	28	1.8, 3.3	0.7	4	—	—	Die 3 x 2 mm

Lasers and Modulator Drivers (continued)

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)
MALD-02184A	Tx CDR + Modulator Driver with Dual-output Burst Mode Limiting Amplifier	B	11.3	3.3	0.66	1	—	—	5 mm QFN
MALD-02186A	Tx CDR + Modulator Driver and Burst Mode Limiting Amplifier	B	11.3	3.3	0.66	1	—	—	5 mm QFN

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-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-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-002322-DIE	Single Channel 28 Gbps Direct Modulated Laser Driver IC, Bare Die	D, I	28	1	600	—	3	Differential/Single-Ended	0.255/ch	1 x 1.4 mm Bare Die
MAOM-002311	Single Channel 28 Gbps Direct Modulated Laser Driver IC	D, E, I	28	1	800	—	3.3	Differential/Differential	0.33/ch	4 x 4 x 1.33 LGA
MAOM-002326	Single Channel 28 Gbps Direct Modulated Laser Driver IC	D, E, I	28	1	800	—	3.3	Differential/Differential	0.33/ch	4 x 4 x 1.33 LGA
MAOM-003119	Single Channel 28 GBaud Linear EML Driver	—	28	1	500	2	3.3	Differential/Single-Ended	0.46/ch	4 x 6 x 0.98 SMD
MAOM-005321	Single Channel 56 GBaud Linear EML Driver	—	53/56	1	1000 (max)	1.8	3	Differential/Single-Ended	0.4/ch	3 x 5 x 1.1 LGA
MAOM-005324	Single Channel 56 GBaud Linear DML/SiPh Driver	—	53/56	1	1000 (max)	3.6	3	Differential/Differential	0.4/ch	3 x 5 x 1.1 LGA
MAOM-005411	Quad Channel 56 GBaud Linear EML Driver	L1, L2	53/56	4	1000 (max)	1.8	3	Differential/Single-Ended	0.3/ch	7 x 7.2 x 1.3 SMD
MAOM-005421	Quad Channel 56 GBaud Linear EML Driver	L1, L2	53/56	4	1000 (max)	1.8	3	Differential/Single-Ended	0.4/ch	7 x 7.2 x 0.73 SMD
MAOM-005424	Quad Channel 56 GBaud Linear DML/SiPh Driver	L1, L2	53/56	4	1000 (max)	3.6	3	Differential/Differential	0.4/ch	5 x 7 x 1.11 SMD

Lasers and Modulator Drivers: Metro/Line Side

Part Number	Description	Block Diagram Key*	Max Baud Rate (Baud)	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 GBaud 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-003405	Quad Channel 32 GBaud Limiting MZ Modulator Driver	P	32	4	300 / 600 (max)	7	6.5	Differential/Single-ended	0.95/ch @5 Vout	13 x 19 x 2.46 SMD
MAOM-003407	Quad Channel 32 GBaud Limiting MZ Modulator Driver	P	32	4	300 (max)	6	6.5	Differential/Single-ended	1.6/ch	13 x 19 x 2.46 SMD
MAOM-03404A	4 x 32 GBaud Differential Limiting MZ Modulator Driver	P	32	4	300 (max)	5	3.3/4.5	Differential/Differential	0.75/ch	9.1 x 14 x 2.29
MAOM-03409B	32 GBaud Linear Differential Modulator Driver IC	P	32	4	300 (max)	4	3.6/4.5	Differential/Differential	0.75/ch	9.1 x 14 x 2.29 SMD

* Refer to Block Diagrams on pages 6-9

Optoelectronics & Photonics

Lasers and Modulator Drivers: Metro/Line Side (continued)

Part Number	Description	Block Diagram Key*	Max Baud Rate (Baud)	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-03409D	32 GBaud Linear Differential Modulator Driver IC	P	32	4	700 (max)	4	3.6/4.5	Differential/Single-ended	0.75/ch	9.1 x 14 x 2.29 SMD
MAOM-003417	Quad Channel 32 GBaud 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-03417B	Quad Channel 32 GBaud 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-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-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	1100 (max)	4.5	3.3/5	Differential/Single-ended	1.1/ch	14 x 9.1 x 2.85 SMD
MAOM-006418	Quad Channel 64 GBaud Linear Modulator Driver	P	64	4	1100 (max)	4.5	3.3/5	Differential/Single-ended	1.1/ch	14 x 9.1 x 2.85 SMD
MAOM-006408	Quad Channel 64 GBaud Linear Modulator Driver Die	P	64	4	800 (max)	3	3.3	Differential/Differential	0.4/ch	Die
MAOM-006409	Quad Channel 64 GBaud Linear Open Collector Modulator Driver Die	P	64	4	800 (max)	4	3.3	Differential/Differential	0.65/ch	Die
MAOM-009408	Quad Channel 96 GBaud Linear Open Collector Modulator Driver Die	P	96	4	800 (max)	3	3.3	Differential/Differential	0.54/ch	Die
MAOM-009409	Quad Channel 96 GBaud Linear Modulator Driver Die	P	96	4	800 (max)	4	3.3	Differential/Differential	1.0/ch	Die

Transimpedance Amplifiers (TIAs): Coherent

Part Number	Description	Block Diagram Key*	Max Baud Rate (Baud)	Differential Transimpedance Gain (kOhms)	Small Signal Bandwidth (GHz)	Input Overload Current (mA)	Input Referred Noise (IRN, RMS nA)	Output Swing Voltage (mV)	Power Dissipation (W)	Supply Voltage (V)
MATA-006806	64 GBaud Dual Channel Linear TIA for 400G and 600G Coherent Receivers	P	64	6	45	3	16	700	0.315/ch	3.3
MATA-006406	64 GBaud Quad Channel Linear TIA for 400G and 600G Coherent Receivers	P	64	6	45	3	16	700	0.33/ch	3.3
MATA-009806	96 GBaud Dual Channel Linear TIA for 400G, 600G, and 800G Coherent Receivers	P	96	6	60	3	18	700	0.400/ch	3.3
MATA-009406	96 GBaud Quad Channel Linear TIA for 400G, 600G, and 800G Coherent Receivers	P	96	6	60	4	18	700	0.400/ch	3.3

Transimpedance Amplifiers (TIAs): Client Side

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)	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
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
M02025	100 Mbps to 3.125 Gbps Multirate CMOS TIA with AGC	—	3.2	20	1.45	4	120	50	0.14	3.3
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
M03002	28 Gbps Transimpedance Amplifier	C, D, G, I	28	2.9	22	3.5	<i>CONTACT MACOM</i>			
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	1000	—	—	—
MATA-02239	1.25G/2.5G/10.3Gbps Burst Mode TIA with Rate Select	B	10.3	6	9	1.6	750	275	0.1	3.3
MATA-02240	10 Gbps AGC TIA for PON ONU Applications	B	11.3	5.5	8.5	1.6	750	264	0.1	3.3
MATA-03003	28 Gbps Quad Channel Transimpedance Amplifier	C, D, G, I	28	3.8	21	4	<i>CONTACT MACOM</i>			
MATA-03013	28 Gbps Quad Channel Transimpedance Amplifier	C, D, G, I	28	3.8	21	4	1400	—	—	—
MATA-03006	28G TIA with APD	I	28	3.8	21	4	<i>CONTACT MACOM</i>			
MATA-03106	28G TIA with APD	I	28	3.8	21	4	1400	<i>CONTACT MACOM</i>		

Power / Noise Optimized Family

Part Number	Description	Block Diagram Key*	Channels (#)	Wirebond or Flip Chip	Pad Spacing (um)	PIN or APD	Max Available Bandwidth (*) (nA)	Max Gain (dB/Ohms)	Noise at Gain (uA RMS)	Supply Current (mA @ 2.9V-3.3V)
MATA-03809	Power/Noise Optimized	E, K	1	Wirebond	N/A	PIN & APD	~19	~4500	1.5	71
MATA-05819	Power/Noise Optimized	E, K	1	Wirebond	N/A	PIN & APD	~35	~4500	1.5	71
MATA-38019	Bandwidth/Gain Optimized	E, K	1	Wirebond	750	PIN	~19	~4500	1.59	265
MATA-03819	Power/Noise Optimized	H, M1	4	Wirebond	750	PIN	~30	~4500	1.5	265
MATA-03820	Power/Noise Optimized	H, M1	4	Flip Chip	750	PIN	~30	~4500	1.5	265
MATA-03919	Power/Noise Optimized	H, M1	4	Wirebond	750	APD	~30	~4500	1.5	265
MATA-03920	Power/Noise Optimized	H, M1	4	Flip Chip	750	APD	~30	~4500	1.5	265
MATA-38134	Power/Noise Optimized	H, M1	4	Wirebond	500	PIN	~30	~4500	1.5	265
MATA-38434	Power/Noise Optimized	H	4	Wirebond	250	PIN	~30	~4500	1.5	265

Bandwidth/Gain Optimized Family

MATA-05817	Bandwidth/Gain Optimized	K	1	Wirebond	N/A	PIN & APD	~45	~5400	1.59	73
MATA-05827	Bandwidth/Gain Optimized	K	1	Flip Chip	N/A	PIN & APD	~45	~5400	1.59	73
MATA-03821	Bandwidth/Gain Optimized	H, M1	4	Wirebond	750	PIN	~40	~5400	1.59	274
MATA-03822	Bandwidth/Gain Optimized	H, M1	4	Flip Chip	750	PIN	~40	~5400	1.59	274

* 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	0.47	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
M37046	Quad 24G / 26G TIA / LA with integrated CDR	D, I	28	1.8	0.4	4	4 x 4.5 mm CSP
M37047	Four Channel 25G / 28G CDR with integrated EML Driver	F	28	1.8, 3.3	1.2	4	4 x 4.5 mm CSP
M37049	Four Channel 25G / 28G CDR with integrated Input Equalizer	F	28	1.8	0.4	4	4 x 4.5 mm CSP
MALD-37059	Four Channel 25G / 28G CDR with integrated DML Driver	D, F, I	28	1.8, 3.3	1.8	4	5.5 x 6.5 BGA
MALD-37045	Four Channel 25G / 28G CDR with integrated VCSEL Driver	D, F, I	28	1.8, 3.3	0.7	—	3 x 2 mm Die
MALD-37845	Four Channel Transmit and Four Channel Receive 25G/28G CDR with integrated VCSEL Drivers and TIAs	—	28.1	1.8, 3.3	1.5	4 Tx & 4 Rx	3.4 x 4 mm Die
MALD-38045	Quad 28 GBaud PAM4/NRZ VCSEL Driver with Integrated CDR	F	28	1.8, 3.3	1.1	4	Die 4 x 2 mm
MALD-38435	Quad 53G VCSEL Driver with Input Equalizer	D, F, I	28	1.8, 3.3	0.5	4	2 x 3 mm Die
MATA-37145	Four Channel 25G / 28G CDR with integrated VCSEL Driver	D, F, I	28	—	0.7	4	2 x 3 mm Die
MALD-37445	Quad 25G / 26G CDR / VCSEL Driver with Input Equalizer	F, G	28	1.8, 3.3	0.7	4	3 x 2 mm Die
MALD-37645	Multirate 28G VCSEL Driver / CDR with Input Equalizer	F, G	28	1.8	0.26	1	2.3 x 1.4 mm Die
MAOM-37051A	Quad 25G / 28G CDR with integrated Equalization and EML Driver	F, G	28	1.8	1.1	4	7 x 11 mm SMT
MAOM-037057	Quad 25G / 28G CDR with integrated Equalization and Amplifier, EML Driver	I	28	1.8	1.1	4	5.6 x 9.6 mm SMT
MAOM-37447	Quad 25G / 28G CDR with Adaptive Equalization and EML Driver	—	28	1.8	1.2	4	4 x 4.5 mm CSP
MAOM-38053	Quad 4 x 28 GBaud PAM4 (56 Gbit) Transmit CDR	—	56	1.8	0.4	4	5.2 mm QFN
MASC-38040	Quad 4 x 28 GBaud PAM4 (56 Gbit) Receiver CDR	—	56	1.8	0.4	4	5.2 mm QFN
MASC-37028	Multirate, Dual 28 Gbps CDR with integrated Laser Driver	—	26.5	1.8, 3.3	—	2	5 mm LGA
MASC-37029	Multirate, Dual 28 Gbps CDR with integrated Laser Driver	—	28.1	1.8, 3.3	—	2	5 mm LGA
MASC-37048	Four Channel 25G / 28G CDR	—	28	1.8	0.4	4	4 x 4.5 mm CSP

Clock & Data Recovery (continued)

Part Number	Description	Max Data Rate (Gbps)	Supply Voltage (V)	Power Consumption (W)	Channels (#)	Package Type and Size
MASC-37053	Quad 25G/28G CDR with Adaptive Equalization and PCML Driver	28	1.8, 3.3	—	4	4 x 4.5 mm CSP
MASC-37446	Four Channel 24G/25G CDR with integrated Limiting Amplifier	25	1.8	0.4	4	4 x 4.5 mm CSP
MASC-37448	Four Channel 24G/25G CDR with Input Equalizer	25	1.8	0.4	4	4 x 4.5 mm CSP
MATA-37044	Four Channel 25G/28G CDR with integrated TIA	28	1.8, 3.3	—	4	Die 3 x 2 mm
MATA-37144	Four Channel 25G/28G CDR with integrated TIA	28	—	—	4	Die 2 x 3 mm
MATA-37244	Four Channel 25G/28G CDR with integrated TIA/Limiting Amplifier	28	1.8, 3.3	—	4	Die 2 x 3 mm
MATA-37442	Quad 24G/26G TIA/LA with integrated CDR	26	1.8, 3.3	—	4	Die 3 x 2 mm
MATA-37444	Quad 24G/26G TIA/LA with integrated CDR	26	1.8, 3.3	—	4	Die 3 x 2 mm
MATA-37644	Multirate 28G CDR with TIA/LA integrated	28	1.8	0.26	1	Die 2.3 x 1.4 mm
MATA-38044	Quad 28 GBaud Linear TIA with Integrated CDR	28	1.8, 3.3	1.5	4	Die 4 x 2 mm

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
M02142	11.3 Gbps Limiting Amplifier	A	11.3	3.3	0.191	1	3	680	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→E projection displays	2A	4A	3	Yes	No	Yes	Yes
M08888	High-performance 2A RGB LED/Laser Driver for LCD/LCoS/TI DLP→E 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→E 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→E Displays	1.2A	1.2A	3	No	Yes	No	No
M09000	LED Driver and PMIC for TI DLP→E displays in QFN package	1.2A	1.2A	3	No	Yes	No	No
M09001	LED Driver and PMIC for TI DLP→E displays	1.2A	1.2A	3	No	Yes	No	No

* Refer to Block Diagrams on pages 6-9

Photonic Devices

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

25G Fabry-Perot Lasers

Part Number	Description	Block Diagram Key*	Max Data Rate (Gbps)	Wavelength (nm)	Temp Options (°C)	Package Type and Size (um)
MAOD-131F25IL1T0	1310 nm FP Laser, Die on Tape, 25 Gbps Applications: 5G Fronthaul LR-Lite	C	25	1310	-40 to 95	Die 250 x 250 x 100
MAOD-131F25I-T5R50	1310 nm FP Laser, TO-Can, 25 Gbps Applications: 5G Fronthaul LR-Lite	C	25	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: XG-PON	A, B	2.5	1270	-40 to 85 (FL+7.5 mm) in hermetic TO-56 package	Aspherical lens cap
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
MAOD-127D02IL1T0	1270 nm Edge Emitting Narrow Farfield High Reflection Tolerance DFB Laser Applications: XG-PON	A, B	2.5	1270	-40 to 95	Die 265 x 250 x 100

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-10I-VCT11-503	Die, 1270 nm Edge Emitting Narrow Farfield DFB Laser applications: XGS-PON	A, B	10	1270	-40 to 95	Die 265 x 250 x 100
127D-10I-VT5AC	TO, 1270 nm Edge Emitting Narrow Farfield DFB Laser Applications: XGS-PON	A, B	10	1270	-40 to 85 (FL+7.5 mm) in in hermetic TO-56	Aspherical lens cap
127D-10I-VT5CC	TO, 1270 nm Edge Emitting Narrow Farfield DFB Laser Applications: XGS-PON	A, B	10	1270	-40 to 85 (FL+10.1 mm) in hermetic TO-56	Aspherical lens cap
127D-10I-VCT11-504	10G Hi-BW 1270 nm CWDM DFB LD (WL -3.5/+2.5 nm) Applications: Data Center, 40G QSFP Module, Optical Ethernet, Fibre Channel, Fronthaul	B	10	1270	-40 to 95	Die 265 x 250 x 100
127D-10I-VT5AC-504	10G Hi-BW 1270 nm DFB LD TO-Can Applications: Mobile Fronthaul/Backhaul, Optical Ethernet	B	10	1270	-40 to 85	TO-Can TO-56

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)
129D-10I-VCT11-504	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	-40 to 95	Die 265 x 250 x 100
131D-10I-VCT11-504	10G Hi-BW 1310 nm CWDM DFB LD (WL -3.5/+2.5 nm) Applications: Data Center, 40G QSFP Module, Optical Ethernet, Fibre Channel, Fronthaul	B	10	1310	-40 to 95	Die 265 x 250 x 100
131D-10I-VT5RC-504	TO, Laser, 10G DFB NFF, 2 mm Ball Lens, WL= ±10 nm, Pinout Type C Applications: Optical Ethernet, Fibre Channel, SFP Module, Data Center, Fronthaul	B, Q	10	1310	-40 to 85	TO-Can TO-56
133D-10I-VCT11-504	Die, Laser, 10G DFB NFF, 1330 -3.5 nm/+2.5 nm, Chip on Tape Applications: Data Center, 40G QSFP Module, Optical Ethernet, Fibre Channel, Fronthaul	B, Q	10	1330	-40 to 95	Die 265 x 250 x 100
133D-10I-VT5AC-504	TO, Laser, 10G DFB NFF, 1330 ±10 nm, Asph Lens, Pinout Type C Applications: Mobile Fronthaul/Backhaul, Optical Ethernet	B, Q	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)
MAOD-xxxD25B-LCT7	Die, Laser, 25G DFB, 1295, 1300, 1305, 1309, Chip on Tape Applications: Data Center, 100G Base-LR4	C, I	25	1295, 1300, 1305, 1309	50	Die 200 x 250 x 100
MAOD-1xxD25E-LCT3	Die, Laser, 25G DFB, 1271, 1291, 1311, 1331, 1351, 1371 Applications: 5G Fronthaul CWDM6	—	25	1271, 1291, 1311, 1331, 1351, 1371	-40 to 95	Die 200 x 250 x 100
MAOD-1xxD25G-LCT2	Die, Laser, 25G DFB, 1271, 1291, 1311, 1331, 1351, 1371 Applications: 5G Fronthaul CWDM6, 100G CWDM4	J	25	1271, 1291, 1311, 1331, 1351, 1371	-5 to 85	Die 200 x 250 x 100
MAOD-xxxD25B-LCT0	Die, Laser, 25G DFB Applications: 5G Fronthaul MWDM12	—	25	1267.5, 1274.5, 1287.5, 1294.5, 1307.5, 1314.5, 1327.5, 1334.5, 1347.5, 1354.5, 1367.5, 1374.5	50	Die 200 x 250 x 100
MAOD-xxxD25B-LCT1	Die, Laser, 25G DFB Applications: 5G Fronthaul LWDM12	—	25	1290-1320	50	Die 200 x 250 x 100
MAOD-1xxD25E-LCT8	Die, Laser, 25G DFB, 1271, 1291, 1311, 1331 Applications: 5 Gbps PAM4, 200G FR/DR4	M2	56	1271, 1291, 1311, 1331	-20 to 95	Die 200 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
32444-01	10G APD, Backside Illuminated, Integrated Lens Option Standard and Enhanced Sensitivity, Die and Chip on Carrier Options Applications: 10G PON OLT/ONU	B	APD10B	12	1250-1650	0.8	-32^	105	Die
32447-01			APD10B/lens	12	1250-1650	0.8	-32^	105	Die
32445-01			APD10B/CoC	12	1250-1650	0.8	-32^	105	CoC
32448-01			APD10B/lens/CoC	12	1250-1650	0.8	-32^	105	CoC
32444-02			APD10B-ES	12	1250-1650	0.8	-30^	90	Die
32447-02			APD10B-ES/lens	12	1250-1650	0.8	-30^	90	Die
32445-02			APD10B-ES/CoC	12	1250-1650	0.8	-30^	90	CoC
32448-02			APD10B-ES/lens/CoC	12	1250-1650	0.8	-30^	90	CoC
MARP-FSAPD10A	10G APD, Frontside Illuminated Applications: 10G PON OLT/ONU	B	FSAPD10A	10	1250-1650	0.8	-30^	90	Die
MARP-FSAPD10B		B	FSAPD10B	10	1250-1650	0.8	-31^	90	Die

^ Sensitivity at extinction ratio of 6 dB for bit error rate of 10e-3

32391-03	25G APD, Backside Illuminated, Integrated Lens Option Die and Carrier Options Applications: 5G Fronthaul/ Midhaul/ Backhaul, 25G PON OLT/ONU, 200G/400G/800G Data Center	C, E, I	APD28A	20	1250-1650	0.8	-22	50	Die
32411-03			APD28A/CoC	20	1250-1650	0.8	-22	50	CoC
32411-04			APD28A/CoC2	20	1250-1650	0.8	-22	50	CoC
32392-03			APD28A/lens	20	1250-1650	0.8	-22	50	CoC
32412-03			APD28A/lens/CoC	20	1250-1650	0.8	-22	50	CoC
32412-04			APD28A/lens/CoC2	20	1250-1650	0.8	-22	50	CoC
32411-07			APD28A/QCoC	20	1250-1650	0.8	-22	50	CoC
32411-08			APD28A/QCoC2	20	1250-1650	0.8	-22	50	CoC
32411-05			APD28A/lens/QCoc	20	1250-1650	0.8	-22	50	CoC
32411-06			APD28A/lens/QCoc2	20	1250-1650	0.8	-22	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
32437-01	56G PIN, Backside Illuminated, Die and Carrier Options Applications: 100G PAM4, 200G/400G/800G Data Center	E, K, M	BSP56B/16/lens	35	1200-1650	0.88	—	50	Die
32439-01			BSP56B/16/lens/CoC	35	1200-1650	0.88	—	50	CoC
32439-06			BSP56B/16/lens/CoC2	35	1200-1650	0.88	—	50	CoC

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	28.0	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	42.5 mm 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	Dual 100G/50G/40G/50G/25G/MACsec PHY	N	26.56	8 x 8	1.8, 0.9	8	Yes	Yes	17 mm 256-pin HFCBGA

Ethernet PHY

MATP-05025	PRISM-50: 2 x 25G NRZ to 1 x 26 GBaud PAM4 PHY with Integrated Laser Driver	E	53.125	1 x 1	1.8, 1.0, 0.75	1	Yes	Yes	10 mm 177-pin HFCBGA
MATP-10025	PRISM: 4 x 25G NRZ to 1 x 53 GBaud PAM4 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
QT2025	10GE Serial to XAUI PHY for 10GBASE-LRM, LR, SR, 10GBASE-KR (SFP+ and Serial Backplane)	—	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 10GBASE-LRM, LR, SR, 10G BASE-KR (SFP+ and Serial Backplane)	—	10.52	2 x 2	1.8, 1.2	2	Yes	Yes	23 mm 484-pin BGA
S28115	100 Gbps Multi-Link Gearbox (MLG) Supporting 10 x 10GE	Q	28.0	10 x 10	2.5, 1.2, 0.9	10	Yes	Yes	19 mm 324-pin HFCBGA

Ethernet 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 RGMII	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,	3.65 W @ 1 GHz	2	9 x 19 WB-PBGA

* Refer to Block Diagrams on pages 6-9

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
11245-01-PPR	PT-28F/8XLMD/DC/FC/SM	IR Photodetector	30	1200 - 1650	—	0.75	95
11237-01P-PPR	PT-28F/10GDPPPO/DC/FC	XR Photodetector	30	1200 - 1650	—	0.75	95
11174-04	PT-40G/8LDGPPPO/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	—
MARP-PT28E-02-PPR	PT-28E/V2/12XLMD/AC/FC	IR Photodetector	25-35	1200 - 1650	-7	0.78	100 - 2700

Transmission Receivers

Part Number	Description	Type	Bandwidth (GHz)	Wavelength (nm)	Sensitivity (dBm)	Responsivity (A/W)	Gain (V/W)
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
MARP-AT12C-01-PPR	AT-12C/5MMLC/8FPC	APD ROSA	10	1200 - 1600	-28	0.8	28000

Photonics

Die



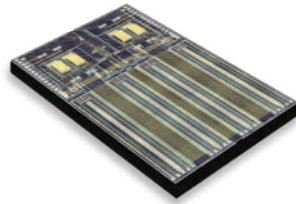
Detectors

Lasers

TO-Can TO56, TO46



L-PIC Silicon Photonic Die



Ethernet PHYs and OTN Framers

PQX



S28115



Yahara



QT2225



ES200



X240



MATP-10025/MATP-05025



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





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