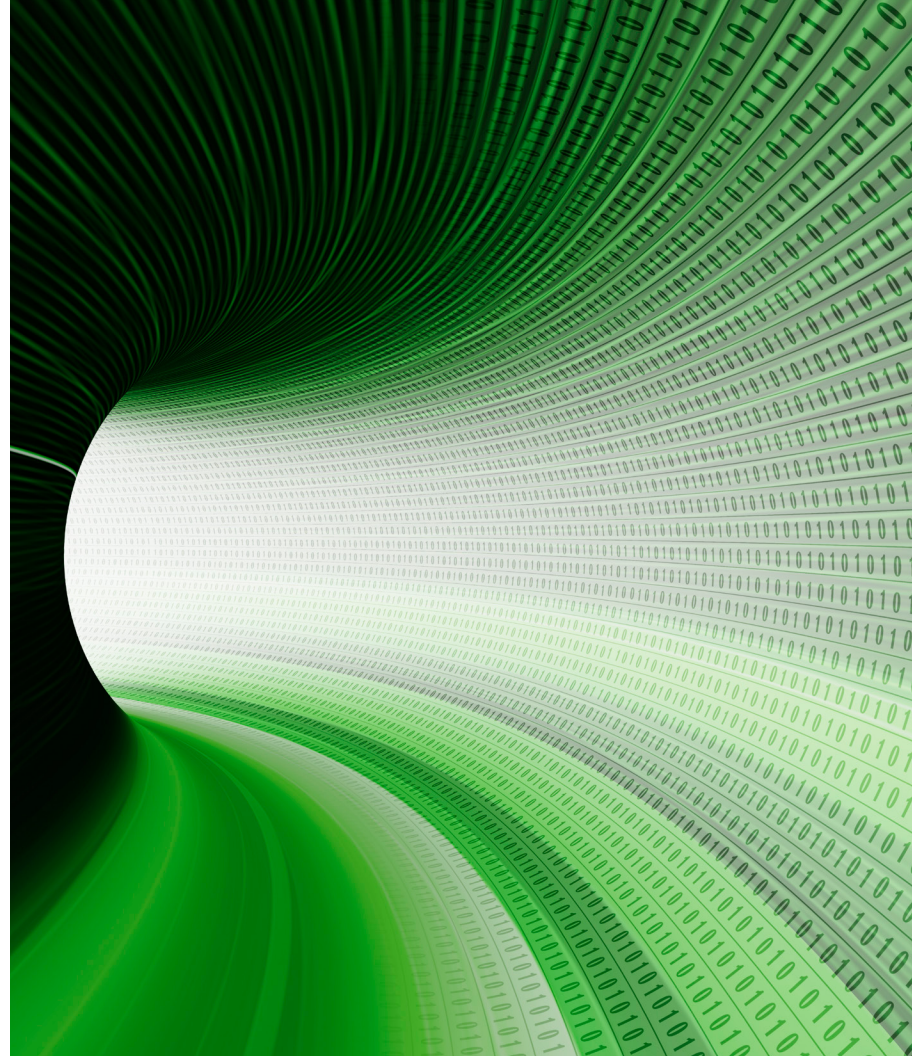
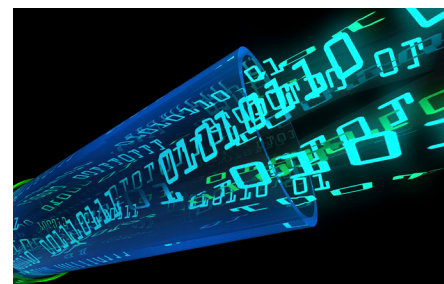
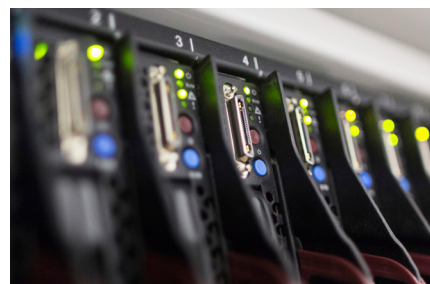




optical



FEATURING 2016 High Performance Portfolio

Optical & IC Selector Guide

- TIAs
- Laser & Modulator Drivers
- Single-Lane CDRs
- Dual-Lane CDRs
- Quad-Lane CDRs
- Multi-Lane Signal Conditioners
- ROSAs
- Limiting Amplifiers
- Transceiver ICs
- Optical Reference Design Kits

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SEMTECH

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High Performance Optical and Copper Products

Semtech designs the industry's most innovative optical, analog and mixed signal semiconductor solutions to serve the rising global demand for high-speed data transmission products.

Shipping more than 500 million Optical ICs, Semtech is an active contributor to networking standards development. This combination of real-world experience and industry leadership enables us to deliver the most complex solutions to our customers' designs.

Semtech also offers one of the industry's most comprehensive portfolios of optical transceiver IC products ranging from 100Mb/s-100Gbps supporting such key industry standards as Fibre Channel, InfiniBand®, Ethernet, CPRI, PON, SONET and PCI Express®. Semtech is also investing in leading edge technologies to enable communication systems at 400Gbps and beyond.

For optical component suppliers, this highly differentiated set of products provides a unique roadmap that improves performance and reliability, simplifies design, lowers costs and speeds time-to-market.

For systems designers and manufacturers working on the next generation of high-speed networks, Semtech's multi-lane and multi-rate 10Gbps-100Gbps backplane solutions provide cost-effective, low power, high performance products to enable next-generation networks.



Enabling High Performance, High-Speed

- Class leading IC solutions for 100G applications in QSFP28, CFP4, CFP2 and CFP
- Receive Optical Sub-Assembly (ROSA) based on Semtech's Rchip technology
- Full portfolio of integrated solutions to address all SFP+ and XFP modules
- Dual-lane CDRs (Tx/Rx) with integrated DML or EML driver
- Low power, reference-free CDRs
- Limiting amplifiers (LA) that provide wideband, low noise post-amplification
- Transimpedance amplifiers (TIAs) that exceed the IEEE 10GbE Stressed Receiver Sensitivity (SRS) specifications
- High performance, low power laser drivers
- Full portfolio of integrated solutions for all PON applications including complete reference designs
- Industry's first single-chip 10G PON transceivers for symmetric and asymmetric applications
- Industry's first quad 10Gbps CDR, enabling long reach Infiniband® QDR, 40GbE and 100GbE applications
- Protocol-independent repeaters/redrivers
- SFP+ reference design kits for optical modules to decrease design time

Building the Future Together

As networking requirements continue to evolve, so will we, working with customers to provide solutions for tomorrow's networking challenges. One thing that won't change, however, is Semtech's commitment to being a reliable partner and providing innovative approaches that deliver unrivaled performance for the most sophisticated applications.

Technology Leadership for the Future of Optical Communications

TECHNOLOGIES

CDRs

Market leader in CDRs

Reference-Free operation

Integrated solutions enable best performance and lowest power

ROSAs

Best-in-class sensitivity, based on our patented Rchip technology

TIAs

Industry leading performance and proved reliability with over 300 million sold

LASER DRIVERS & LIMITING AMPS

High performance integrated solutions for single and multi-channel applications

MARKETS

100G ETHERNET

Solutions for QSFP28, CFPx and SFP28 modules

16G FIBRE CHANNEL

Industry's first complete integrated IC solution for 16G Fibre Channel

10G

Complete portfolio of module IC and backplane solutions

Solutions for XFP, SFP+, QSFP+ modules

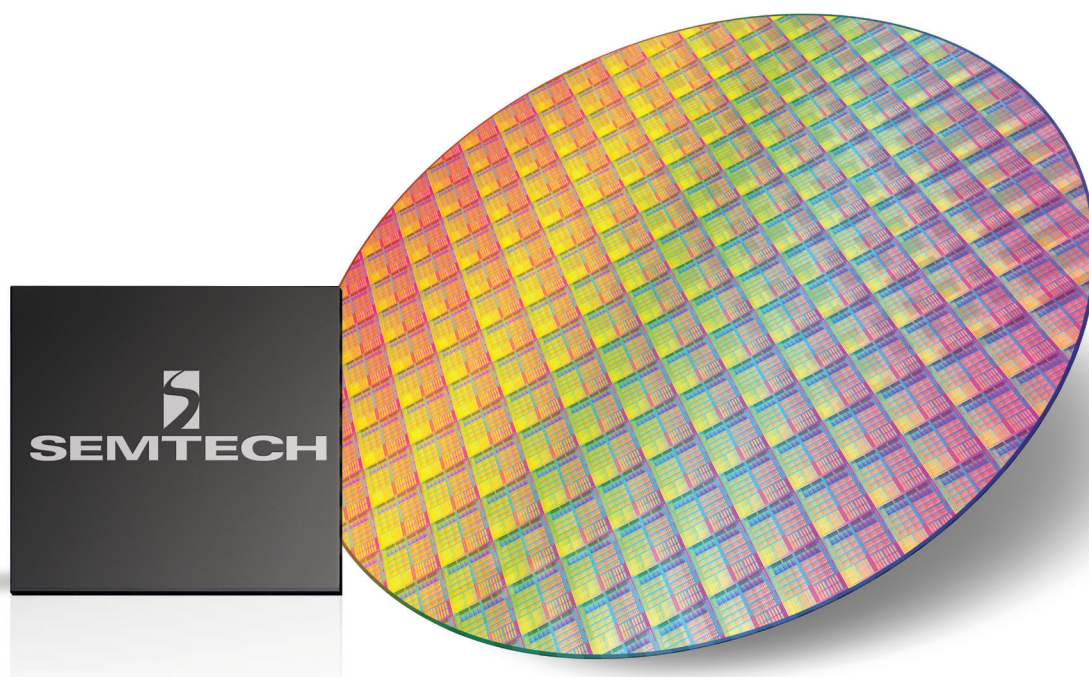
PON/FTTH

Industry's first fully integrated 10G PON solutions

Highly integrated chipset solutions for EPON & GPON ONU/OLT

25G ETHERNET

Market leading module IC and ROSA solutions for SFP28





New Products

GN2104S Low-Power Quad-CDR 25-28Gbps for optical modules

- Low power dissipation (340mW typical)
- Compact footprint ideal for QSFP28 and CFP4 modules

GN2104 Low-Power Quad-CDR 25-28Gbps for optical modules

- Low power dissipation (370mW typical)
- Provides reference-free signal conditioning for CFP4 and QSFP28 modules

GN2106A Low-Power Quad-CDR with integrated EML drivers 25-28Gbps

- Fully monolithically integrated quad EML driver and CDRs
- Provides reference-free signal conditioning for CFP4 and QSFP28 modules

GN2504 Low-Power Quad-CDR 25-28Gbps Reference Free Repeater

- Provides reference-free signal conditioning on backplanes and linecards
- Low power dissipation (600mW typical)

GN1185 High Performance Quad 28Gbps DML Laser Driver

- Quad low power driver for active TOSA
- Max modulation/bias currents 55mA/70mA
- Advanced eye-shaping features

GN1081, GN1084 & GN1085 Low Power 28Gbps TIAs

- Single (GN1081 and GN1084) and Quad (GN1085) versions
- 20GHz Bandwidth
- 105mW (typ) power dissipation per channel

GN2108 Quad 25Gbps Transmitter Array for SR-4

- Integrated reference-free CDR and VCSEL array driver
- Enable extended reach up to 300m on OM4, and 150m on OM3

GN2109 Quad 25Gbps Receiver Array for SR-4

- Integrated TIA array and reference-free CDR
- 250um channel pitch

GN3357 High Gain 11.3Gbps Linear APD ROSA

- High gain linear AGC TIA optimized for DWDM
- Low power dissipation, excellent sensitivity

GN3358 High Gain 11.3Gbps Limiting APD ROSA

- High output swing with pre-emphasis ideal for non-retimed applications
- Low power dissipation, best in class sensitivity
- Available with threshold adjust

GN3270 28Gbps Limiting PIN ROSA

- Low power dissipation (92mW)
- For 25GbE SFP28 applications

GN25L96 ONU Transceiver IC

- 3.1Gbps combo SFP & PON BoB
- Dual Loop Tx with EYEMAX

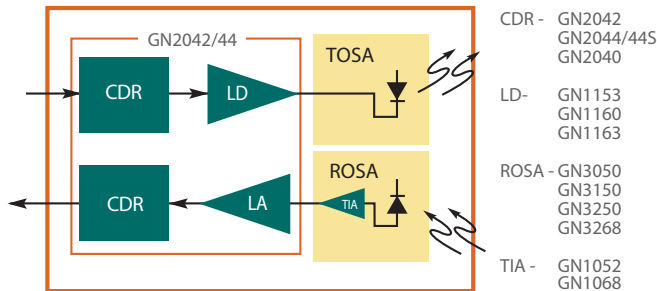
GN25L98 ONU Transceiver IC

- PON Combo IC with integrated APD bias controller
- Single BOM can accommodate many different BOSA suppliers
- Programmable APD fault detection, shutdown and recovery

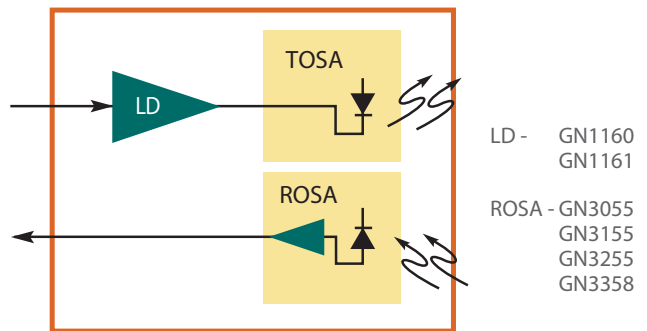
Optical Applications

Semtech products offer a comprehensive selection of optical transceiver ICs and components for all 1-10GbE, CPRI, OC-192 and 100G module form factors.

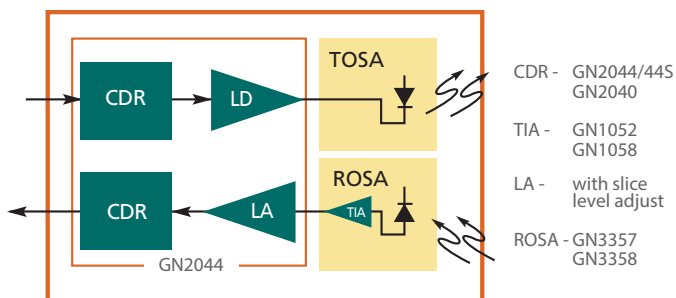
10G XFP Retimed SFP+ Module for ≤ 40 Km Applications



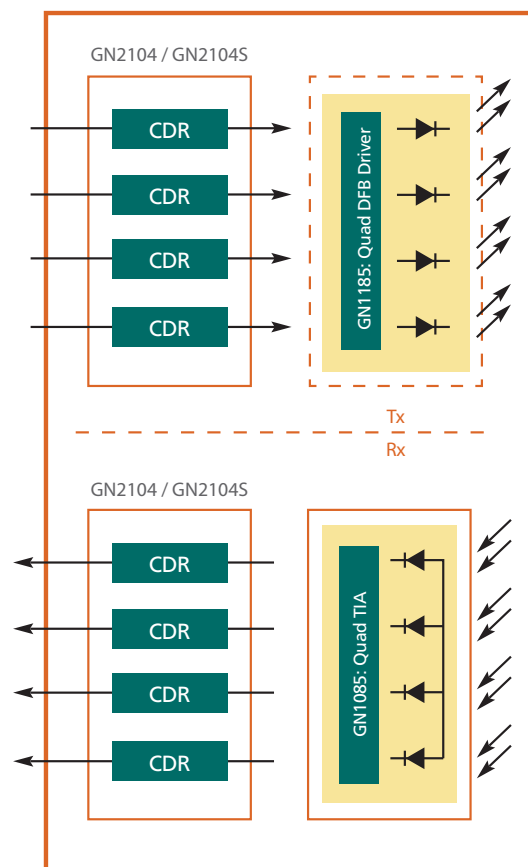
Lowest power, LA Free SFP+ Architecture



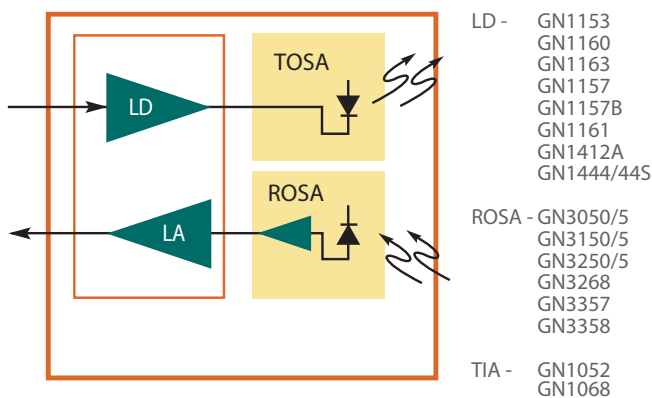
10G XFP Module for ≤ 80 Km Applications



CFP4 / QSFP28: 100GbE LR4



6/8/10G SFP+ Module Applications



Laser Drivers and Limiting Amplifiers

High performance laser drivers and limiting amplifiers for optical communication.

APPLICATIONS:

- 10G EPON, XG-PON1 and XG-PON2
- 8G Fibre Channel
- 9.95Gbps OC-192 and 10.70Gbps OC-192 with FEC
- 10.3Gbps Ethernet
- 10.52Gbps Fibre Channel
- 11.1Gbps Ethernet over SONET
- 11.3Gbps Fibre Channel with Forward Error Correction
- 40G QSFP+ modules
- 6Gbps and 10 Gbps CPRI modules for wireless front haul
- 100 Gbps Ethernet

LASER DRIVERS:

GN1185

High performance Quad 25 - 28Gbps DML driver for active TOSAs targeting 100GE applications.

NT20042

Low cost 3.3V / 5.0 V 300 Mb/s LED driver for SONET, ESCON and Fast Ethernet applications over optical fiber.

NT22L33

3.3V/ 5.0V CMOS laser driver for data rates of 125Mb/s to 1.25Gbps.

GN1160, GN1161, GN1163

Very low power laser drivers for DFB/VCSEL applications. RSSI feature for compatibility with our high gain ROSA's, enabling SFP+ modules without limiting amplifiers.

GN1190

Quad VCSEL driver for parallel and multi-channel datacom & telecom modules. Low power consumption, 210mW typical for 4 channels. Use with GN1090 quad TIA.

LIMITING AMPLIFIERS:

NT20045

Low cost 3.0V to 5.5V, 200 Mb/s limiting amplifier for SONET, SDH, ESCON and Fast Ethernet applications over optical fiber.

NT24L73

1.25Gbps CMOS limiting amplifier with CML data outputs and signal status in an MSOP package.

GN1250L

A limiting amplifier that provides wideband, low noise postamplification, aimed primarily at OC-192 and SDH STM-64 systems.

LASER DRIVERS							
Part Number	Overview	Data Rate (Gbps)	Max Mod / Bias Current (mA)	Supply (V)	Pkg	Applications	
NT20042	300Mb/s LED Driver	0.3	100	3.3/5.0	QSOP 16	OC-3, Fast Ethernet	
NT22L33	1.25Gbps FP/DFB Laser Driver	1.25	70/80	3.3/5.0	4mm, 24QFN	OC-3, OC-12, GbE	
GN1160	DFB driver	to 11.3	90/ 120	3.3 (Opt. 2.8)	28 QFN	10GE SFP+ 10GBASE-LR	
GN1163	DFB driver	to 11.9	90/120	3.3 (Opt. 2.8)	24 QFN	QSFP+ 10GBASE-LR	
GN1161	VCSEL driver	to 11.3	20/15	3.3 (Opt. 2.8)	28 QFN	10GE SFP+ 10GBASE-SR	
GN1190	Quad VCSEL Driver	to 14.3	12/12	3.3	Bare Die	40Gbps Ethernet, Infiniband, QSFP+	
GN1185	Quad DFB driver	25-28	55m/70	2.3/3.3	Bare Die	100GE Ethernet active TOSA	

LIMITING AMPLIFIERS							
Part Number	Overview	Data Rate (Gbps)	Gain (dB)	BW	Supply (V)	Noise Figure (uV)	Applications
NT20045	200Mb/s Limiting Amp	0.2	60	0.125	3.3/5.0	80	OC-3, Fast Ethernet
NT24L73	1.25Gbps Limiting Amp	1.25	46	0.938	3.3	300	OC-3, OC-12, GbE

TIA's

Wideband, low noise transimpedance amplifiers (TIAs) for your optical communication applications.

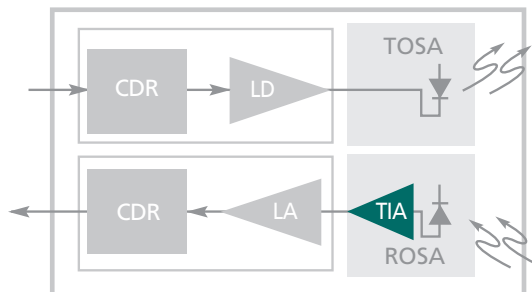
Semtech offers a portfolio of fully integrated Silicon Germanium (SiGe) BiCMOS and pure CMOS transimpedance amplifiers providing wideband, low noise pre-amplification of a current signal from a PIN photodiode or APD. Semtech's TIAs offer best-in-class performance in limiting, linear or automatic gain control versions for use in high performance optical receivers operating from 155Mb/s to 28Gbps.

FEATURES

- Wideband, low noise TIAs
- Limiting, linear and AGC versions
- Fully integrated on-chip de-coupling for low cost and best performance

APPLICATIONS

- ITU/IEEE-based transmission systems
- 10G and 100G Ethernet
- SONET/SDH based transmission systems, test equipment and optical modules from OC-3 to OC-192
- 8G and 16G Fibre Channel
- Serial data systems up to 28Gbps
- PON/FTTH systems – BPON, EPON, GPON, 10GEPON and XG-PON
- 6G and 1-12G CPRI modules for wireless front haul
- 100Gbps Client side modules



NT20R67

Low cost 3.3V to 5.0V CMOS PIN TIA with automatic gain control and more than 43dB dynamic range for Optical Fiber applications up to 200Mb/s.

NT23L50

622Mb/s high sensitivity TIA for FTTH and Telecom Fiber transceiver applications.

NT24L50

1.25Gbps high sensitivity TIA with automatic gain control for FTTH and datacom fiber transceiver applications.

NT24L55

Super high sensitivity, high performance CMOS 1.25 Gbps TIA with 35dB of dynamic operating range designed for FTTH applications such as GePON transceivers and long haul telecom/datacom applications.

NT25L51

2.5Gbps CMOS TIA for FTTH and Telecom Fiber transceiver applications with automatic gain control enabling over 27dB of dynamic operating range.

NT25L59

2.5Gbps high sensitivity CMOS TIA for GPON with automatic gain control enabling over 30dB of dynamic operating range.

GN1090

Quad 14.5Gbps array receiver for parallel & multi-channel datacom & telecom modules. Advanced receiver design for excellent optical performance and very low power consumption (240mW total for 4 channels). Use with GN1190 Quad VCSEL driver.



GN1056

10Gbps linear TIA for high performance APD applications such as ultra-long haul telecom and submarine applications.

GN1058

10Gbps high gain TIA optimized for applications requiring AGC, such as 10GBASE-LRM and DWDM receivers for low OSNR environments.

GN7068

10Gbps limiting TIA designed for APD applications such as ROSAs for 10G PON OLT's and 10GBASE-ZR transceivers modules.

GN1068

14Gbps multi-rate limiting TIA providing high gain and wideband performance for use in Ethernet and emerging 16G Fibre Channel applications.

GN7050, GN7051, GN7052, GN7053

Limiting TIA's designed specifically for 1G EPON, 1G GPON, 2.5G XG-PON and 10G EPON OLT applications.

GN1081, GN1084, GN1085

1x28Gbps and 4x28Gbps limiting TIA optimized for 100GBASE-LR4 applications.

TIAs							
Part Number	Overview	Data Rate (Gbps)	Gain (kΩ)	BW (GHz)	Supply (V)	Noise	Applications
NT20R67	155Mb/s AGC TIA	0.155	63	0.165	3.3/5.0	11 nA	OC-3, Fast Ethernet
NT20067	155Mb/s AGC TIA	0.155	23	0.165	3.3/5.0	11 nA	OC-3, Fast Ethernet
NT23L50	622Mb/s AGC TIA	0.622	50	0.32	3.3	60 nA	OC-12, BPON
NT24L50	1.25Gbps AGC TIA	1.25	25	0.75	3.3	92 nA	GbE, EPON
NT24L55	1.25Gbps High Sensitivity AGC TIA	1.25	46	0.75	3.3	74 nA	EPON
NT25L51	2.5Gbps AGC TIA	2.5	8	1.7	3.3	230 nA	OC-48, GPON (APD)
GN25L53	3.1Gbps AGC TIA	3.1	5.5	1.9	3.3	335 nA	CPRI, GPON, OC-48 (APD)
NT25L59	2.5Gbps High Sensitivity AGC TIA	2.5	29	1.5	3.3	108 nA	GPON (PD)
NT28L52	10G Limiting	to 10.3	2.35	7	3.3	1.2 μA	PON, 10GBASE-SR
GN1056	10G Linear	to 11.3	500/1	12	3.3	1μA	OC-192
GN1058	10G Linear AGC	to 11.3	4	12	3.3	1μA	10GBASE-LRM & DWDM
GN7068	10G Limiting	to 11.3	3	12	3.3	1μA	APD ROSAs for 10G PON ONU & 10GBASE-ZR
GN1068	14G Limiting	to 14.3	6.75	12	3.3	1.2μA	CPRI, 10GBASE-SR/LR/ER & 16G FC
GN1090	Quad 10G Limiting	to 14.3	*	*	3.3	0.9μA	40Gbps Ethernet; Infiniband; QSFP+
GN7050	1.25G Burst mode Limiting	1.25	13	1.0	3.3	*	1G EPON OLT
GN7052	Tri-rate PON TIA	1.25/ 2.5 / 10.3	13/ 1.2/ 2.3	1.1/ 2.5/ 8.7	3.3	*	1.25G EPON/ 2.5G XG-PON / 10G EPON OLT
GN7053	1G GPON Burst mode Limiting	1.25	1.25	1.5	3.3	*	1G GPON OLT
GN1081	28G Limiting	100	6	22	3.3	1.78μA	SFP28, 100GBASE-LR4 QSFP28
GN1084	25G Limiting	100	6	22	3.3	2.3μA	SFP28 and QSFP28
GN1085	Quad 28G Limiting	100	6	22	3.3	1.78μA	100GBASE-LR4

* Please contact your sales representative for a detailed datasheet.

Transceiver ICs (LD & LA)

High performance laser drivers and limiting amplifiers for optical communication.

GN25L98

2.5Gbps CMOS burst mode laser driver and limiting post amplifier with automatic ERC control and integrated APD controller.

NT28L90

Combined 10Gbps limiting post amplifier and 2.5Gbps burst mode laser driver for cost critical 10GEPON and XG-PON asymmetric applications. The NT28L90 features Tx & Rx sleep control, TX_SD output and Tx Power burst monitoring.

GN25L96

2.5Gbps CMOS programmable burst mode laser driver and post amplifier optimized for wide laser compatibility and SuperTIA sensitivity

GN7354 & GN7355

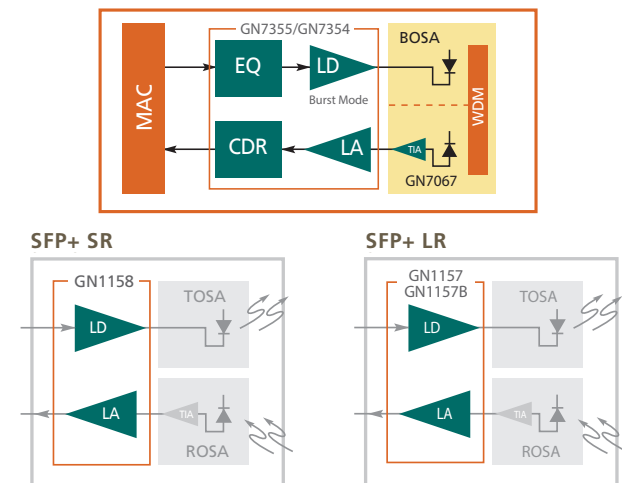
10G EPON transceiver for next generation PON systems. The GN7355 combines a 10G burst mode laser driver with a receive CDR and is targeted at 10G EPON symmetric applications. The GN7354 is a pin-for-pin compatible, de-rated version of the GN7355 intended to address the 1.25Gbps and 2.5Gbps transmit data rate, and cost pressures of the 10Gbps asymmetric EPON and XG-PON applications.

GN1411A/12B/44/44S

The GN1411A/GN1412A are highly-integrated, low-power, small footprint transceivers that are ideal for SFP+ LR/ER optical modules.

GN1157/57B/58

Semtech's latest, lowest power transceiver IC's for SFP+ LR/ SR applications with integrated APC and advanced eye shaping features.



TRANSCEIVER IC (LD&LA)						
Part Number	Overview	Data Rate (Gbps)	Max Mod / Bias Current (mA)	Supply (V)	Pkg.	Applications
GN25L95	Burst Mode DFB + Receive LA	to 2.5G	90mA /100mA	3.3	28 QFN	EPON, GPON, BOSA-on-Board
NT25L90/91	2.5Gbps Burst Mode LDD & LA	2.5	90mA /100mA	3.3	28 QFN	EPON, GPON, BOSA-on-Board
NT28L90	2.5Gbps Burst Mode DFB + 10 Gbps Receive LA	Rx: 10.3 Tx: 2.5	90mA /100mA	3.3	28 QFN	10GEPON, XG-PON1 (Asymmetric)
GN7354	Burst Mode DFB + Receive LA & CDR	Rx: 10.3 Tx: to 2.5	90mA /90mA	3.3 (3.3 or 5 output stage)	32 QFN	10GEPON, XG-PON (Asymmetric)
GN7355	Burst Mode DFB + Receive LA & CDR	10.3	90mA /90mA	3.3 + 5 output stage (optional 3.3 V)	32 QFN	10GEPON, XG-PON (Symmetric)
GN1412B	EML Laser Driver + Receive LA	to 11.3G	2.5Vpp / 120mA	3.3	32 QFN	10GbE, OC-192
GN1444S	EML Laser Driver + Receive LA	to 11.3G	2.5Vpp /120mA	1.8 & 3.3	32 QFN	10GbE, OC-192
GN1157	DML Laser Driver + Receive LA	to 11.3G	90mA /120mA	3.3 (Optional 2.8)	28 QFN	10GbE LR SFP+, CPRI
GN1157B	DML Laser Driver + Receive LA	to 12.5G	90mA/120mA	2.4 & 3.3	28 QFN	10GbE LR SFP+, CPRI
GN1158	VCSEL Laser Driver + Receive LA	to 11.3G	20mA /15mA	3.3 (Optional 2.8)	28 QFN	10GbE SR SFP+

Optical Module CDRs

Semtech's dual-lane signal conditioners, with integrated VCSEL, DML or EML driver, offer the lowest power, smallest footprint solution for XFP, retimed SFP+ and 100G modules.

ENABLING NEXT-GENERATION 100G ETHERNET

The GN2104, GN2104S and GN2106A enable next-generation of 100G CFP4 and QSFP28 module form factors, targeting 500m to 10km reach applications. The GN2108 and GN2109 enable the next generation 100G QSFP28 modules targeting 10m to 300m reach applications over multi-mode fiber. Semtech's latest 100G CDR portfolio includes devices that integrate Quad 25G - 28G CDRs with laser drivers for Transmit applications, and TIA interfaces for Receive applications. The innovative offerings build upon Semtech's proven CDR technology and enable solutions for Short Reach and Extended Reach applications. The high level of integration coupled with industry's lowest power and superior performance simplifies the overall module designs and saves cost.

ENABLING SFP+ SONET

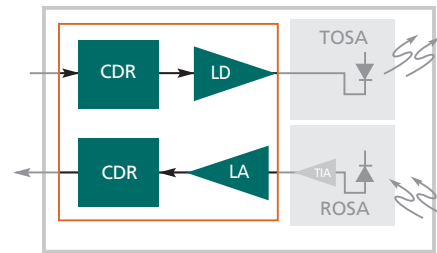
The GN2042 and GN2044 enable a SONET compliant module in an SFP+ form factor. The integration of the laser driver enables the lowest power solution for SFP+. The high level of integration also delivers a small footprint solution to fit within the form factor. The reference clock free architecture simplifies the overall module design and saves cost.

FEATURE SET FOR DWDM AND TUNABLE APPLICATIONS

The GN2040 family has a rich feature set to enable optimal performance in DWDM and Tunable applications. The features include slice level adjust, programmable peaking on the receive path input and sampling clock phase adjust.

LOW COST, SMALL FOOTPRINT SOLUTION

By integrating the limiting amplifier, laser driver and receive and transmit CDR, the GN2042, GN2044 and GN2017A provide an optimal path for lower cost designs. The integrated APC loop and small number of external components also save cost. The high level of integration in a small, 5mmx5mm 32-QFN package enables use in very high density designs. For designs requiring even smaller packages, such as Tunable SFP+ applications, the GN2044S offers an even smaller 4mmx4mm 32-QFN package with all the same benefits.



OPTICAL MODULE CDRs							
Part Number	Data Rate (Gbps)	Lanes	Laser Driver	Slice Level Adjust	Pin Compatibility	Pkg	Applications
GN2042	9.95 - 11.3	2 (1Rx + 1Tx)	DML	Yes	GN2044	32 QFN	XFP & SFP+ 10 GbE & OC-192 Enables 1W Retimed SFP+ 10km
GN2044	9.95 - 11.3	2 (1Rx + 1Tx)	EML	Yes	GN1444, GN2042	32 QFN	XFP & SFP+ 10 GbE, OC-192 & DWDM Enables 1.5W Retimed SFP+ 40/80km
GN2044S	9.95 - 11.3	2 (1Rx + 1Tx)	EML	Yes	GN1444S	32 QFN	Tunable SFP+, OC-192 & DWDM Enables 1.5W Retimed TSFP+
GN2040	9.95 - 11.3	2 (1Rx + 1Tx)	DML	Yes	GN204x	32 QFN	XFP and SFP+ 10 GbE, OC-192 and DWDM
GN2017A	9.95 - 11.7 14.025	2 (1Rx + 1Tx)	VCSEL	No	GN2010X	32 QFN	16G FC, 10G FCoE
GN2425A	25 - 28	2 (2Tx)	—	Yes	—	32 QFN	100Gbps Ethernet / OTN, Infiniband EDR
GN2426A	25 - 28	2 (2Rx)	—	Yes	—	32 QFN	100Gbps Ethernet / OTN, Infiniband EDR
GN2104 GN2104S	25 - 28	4	—	Yes	—	54 QFN	100Gbps Ethernet / OTN, Infiniband EDR
GN2106 GN2016A	25 - 28	4	EML	Yes	—	58 QFN	100Gbps Ethernet / OTN, Infiniband EDR

ROSAs

Best-in-class receive optical sub-assemblies (ROSAs) based on patented Rchip technology.

Semtech's complete line of PIN and APD ROSA products spans 850 nanometer (nm) to 1550nm including limiting, linear and automatic gain control (AGC) functionality. Our PIN ROSAs operate at $+3.3V \pm 10\%$ and from -40°C to $+85^{\circ}\text{C}$, with highly accurate RSSI functionality and industry best dynamic range. The ROSA products feature patented Rchip packaged in a fully compliant SC or LC type optical subassembly and are available with optional flex circuits.

Super High Gain Rchip ROSAs deliver $35k\Omega$ of gain that eliminates the cost and power of the limiting amplifier for SFP+ applications.

FEATURES:

- Best-in-class stressed receiver sensitivity
- High gain to ensure exceptional crosstalk performance within the module
- Patented Rchip technology to ensure maximum module manufacturing yield
- Super High Gain delivers most integrated, lowest power SFP+ solution

APPLICATIONS:

- | | |
|---------------|----------------|
| • 10GBASE-SR | • 10G EPON |
| • 10GBASE-LR | • 80km |
| • 10GBASE-ER | • DWDM |
| • 10GBASE-LRM | • 8GFC & 10GFC |
| • OC-192 SR-1 | • 25G Ethernet |
| • OC-192 IR-2 | |

GN3050

10 km limiting ROSA provides excellent performance achieving -21dBm unstressed sensitivity. Ideal for 10GBASELR and SR-1

GN3250

10/40 km XMD compatible limiting ROSA provides excellent -21dBm unstressed sensitivity and high ORL for 10GBASE-ER and IR-2 applications

GN3052

AGC ROSA for 10GbE LRM and linear applications
Interoperability with all leading EDC solutions for LRM

GN3352

11.3Gbps APD ROSA with AGC TIA is ideal for both 80km limiting and DWDM applications requiring excellent OSNR performance

GN3357

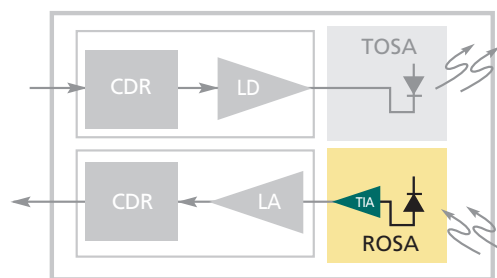
11.3Gbps APD ROSA with high gain AGC TIA for DWDM and 80km applications

GN3257

10/40 km linear AGC ROSA offering excellent performance in low-OSNR environments, coupled with low power consumption

GN3268

10/40 km XMD compatible low power (94 mW) limiting ROSA

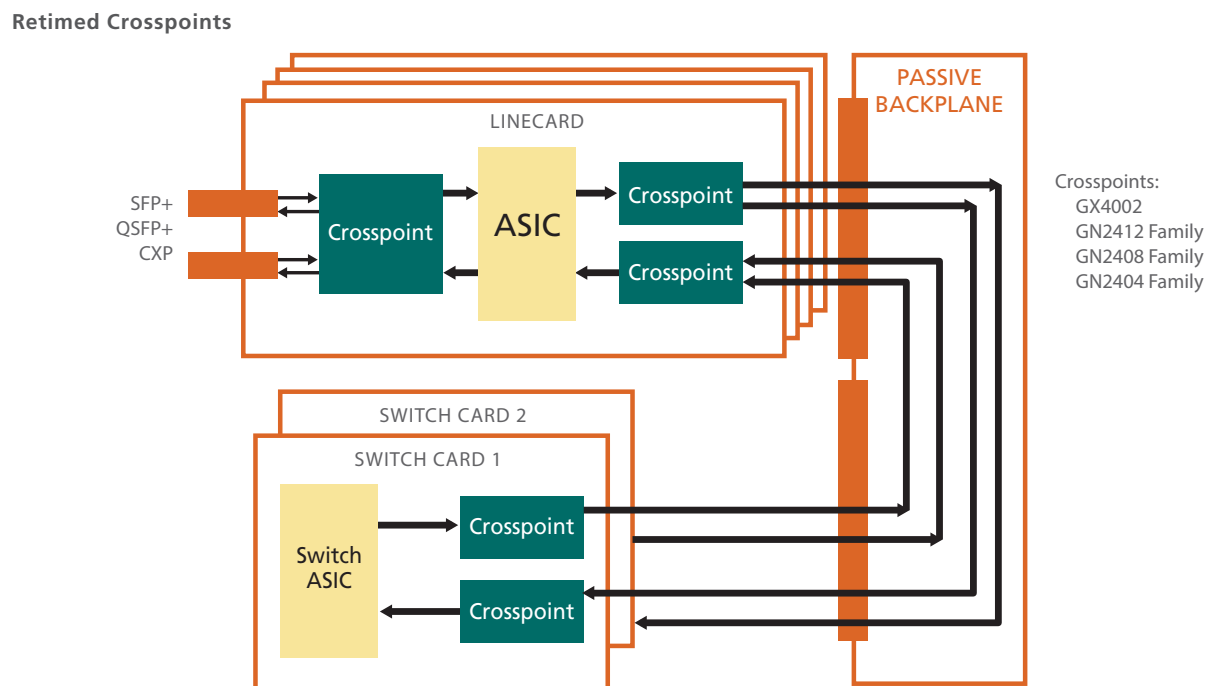
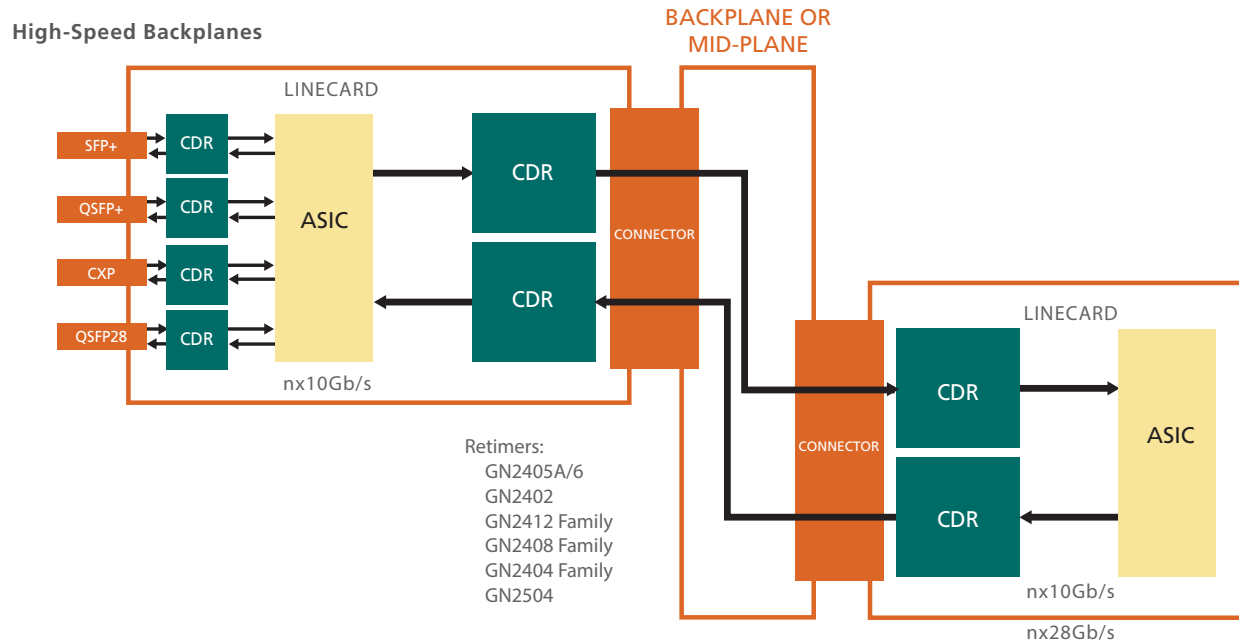


ROSAs & SUPER HIGH GAIN ROSAs

Part Number	Overview	Data Rate (Gbps)	Gain (kΩ)	Supply	RSSI	Unstressed Sensitivity	Comments	ORL
GN3150	SR Rchip Limiting	to 11.3	10	+3.3V ± 10%	Yes	-15dBm OMA	-13.5dBm OMA (Stressed sens.)	-14dB
GN3050	10km Rchip Limiting	to 11.3	10	+3.3V ± 10%	Yes	-21dBm	-16.8dBm OMA (Stressed sens.)	-14dB
GN3250	40km Rchip Limiting	to 11.3	10	+3.3V ± 10%	Yes	-21dBm	-16.0dBm OMA (Stressed sens.)	-27dB
GN3052	LRM Rchip AGC	to 11.3	9	+3.3V ± 10%	Yes	-17dBm OMA	-12dBm OMA (Stressed sens.)	-14dB
GN3155	SR Super High Gain Rchip	to 11.3	35	+3.3V ± 10%	Yes	-15dBm OMA	Eliminates LA in SFP+	-14dB
GN3055	10km Super High Gain Rchip	to 11.3	35	+3.3V ± 10%	Yes	-21dBm	Eliminates LA in SFP+	-14dB
GN3255	40km Super High Gain Rchip	to 11.3	35	+3.3V ± 10%	Yes	-21dBm	Eliminates LA in SFP+	-27dB
GN3068	10km Low Power Limiting	to 11.3	7	+3.3V ± 10%	Yes	-21dBm	94 mW power dissipation	-14dB
GN3268	40km Low Power Limiting	to 11.3	7	+3.3V ± 10%	Yes	-21dBm	94mW power dissipation	-27dB
GN3257	PIN with AGC	to 11.3	8.5	+3.3V ± 10%	Yes	-19dBm	–	-27dB
GN3352	APD with AGC	to 11.3	4	+3.3V ± 10%	VAPD	-27dBm	–	-27dB
GN3357	High Gain APD with AGC	to 11.3	8.5	+3.3V ± 10%	VAPD	-27dBm	–	-27dB
GN3358	High Gain APD Rchip	to 11.3	13	+3.3V ± 10%	VAPD	-28dBm	Ideal for Non-Retimed SFP+	-27dB
GN3368	Limiting APD RChip	to 11.3	4	+3.3V ± 10%	VAPD	-27dBm	–	-27dB
GN3270	25G Limiting PIN ROSA	28	6	+3.3V ± 10%	Yes	-14dBm	SFP28 LR applications	-27dB

Copper Applications

Semtech offers a comprehensive selection of IC solutions for high speed serial line card and back-plane communication applications.



Backplane & Linecard Signal Conditioners

Semtech's multi-channel signal conditioners enhance the reach and robustness of high-speed serial links by compensating for transmission losses and re-setting the crosstalk and jitter budgets.

HIGH LEVEL OF INTEGRATION AND SMALL FOOTPRINT

Semtech's backplane & linecard signal conditioners are ideal for small form factor modules or dense backplane /linecard applications.

FULL PORTFOLIO

Semtech products offer solutions for Ethernet, Infiniband®, Fibre Channel® and PCI Express®. Solutions are available with and without CDR functionality.

DRIVE LONG BACKPLANES OR CABLES

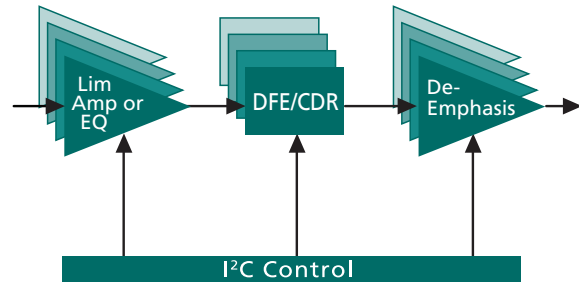
A combination of Equalizer, DFE and CDR technology allows for an optimal solution to drive long, dense backplanes or cables at high speeds.

LOW POWER

Semtech's CDR products require the lowest power in the industry, a key factor as densities increase.

RESET THE JITTER AND CROSSTALK BUDGETS

Using CDRs will reset the jitter budget, substantially increasing the robustness of the system and allowing for design flexibility. Using CDRs in multi-channel systems will also reset the crosstalk budget, an increasing concern at higher data rates.



MULTI-LANE SIGNAL CONDITIONERS

Part Number	Data Rate (Gbps)	Lanes	CDR	Ref Clock	Input Stage	De-emphasis	Supply (V)	Pkg	Applications
GN2504	25.6 - 28.1	4	Yes	Not Req.	Adaptive Equalizer	Yes	1.8	54 QFN	25G/50G/100G Linecards, nx28G Backplanes, 25G/50G/100G Active Copper Cables
GN2415	1.2 - 15.0	8	Yes	Req.	Adaptive Equalizer DFE	Yes	0.9 1.8	144 BGA	16G Fiber Channel, >nx12.5G Backplanes
GT1706 family	1.25 - 14.5	6	Yes	Req.	Adaptive Equalizer	Yes	0.9 1.8	144 BGA	HD/3G/4K/8K Video Broadcast testing Fibre Channel/Infiniband/Ethernet Link Testing BERT Developments
GN2412 family	1.25 - 12.8	12	Yes	Req.	Adaptive Equalizer DFE	Yes	0.9 1.8	144 BGA	> nx10G Backplanes, 10G/40G/100G Linecards, 10G-KR, 40G-KR4, 40G-CR4, Crosspoint Switching, CPRI
GN2408 family	1.25 - 12.8	8	Yes	Req.	Adaptive Equalizer DFE	Yes	0.9 1.8	144 BGA	>nx10G Backplanes, 10G/40G Linecards, 10G-KR, Crosspoint Switching, CPRI
GN2404 family	1.25 - 12.8	4	Yes	Req.	Adaptive Equalizer DFE	Yes	0.9 1.8	144 BGA	>nx10G Backplanes, 10G/40G Linecards, 10G-KR, 40G-KR4, 40G-CR4, Crosspoint Switching, CPRI
GN2402	10.3125	4	Yes	Not Req.	Equalizer	Yes	3.3	44 QFN	nx10G Backplanes, 10G/40G Linecards, 10G/40G Active cables
GX4002	9.95 - 11.3, 14.025	2	Yes	Not Req.	Equalizer	Yes	3.3	32 QFN	nx10G Backplanes, 10G/40G Linecards, Infiniband FDR, 16G Fibre Channel, Crosspoint Switching
GN2405A/6S	9.95 - 11.3	4	Yes	Not Req.	Equalizer	Yes	3.3	48 QFN	nx10G Backplanes 10G/40G Linecards 10G/40G Active cables
GN2406/6S	9.95 - 10.95	4	Yes	Not Req.	Limiting Amp	Yes	3.3	48 QFN	10G/40G Linecards
GN1407	1 - 8	4	No	Not Req.	Equalizer	No	1.2 1.8	56 QFN	PCIe Gen 1/2/3, SNAP-12, POP-4/LX-4/CX-4/KX-4, XAUI/RXAUI and Rapid I/O
GN1406	2.5 3.125 5.0, 6.25	4	Yes	Req.	Equalizer	Yes	1.2 1.8	56 QFN	PCIe Gen 1/2, SNAP-12, POP-4/LX-4/CX-4/KX-4, XAUI/RXAUI and Rapid I/O

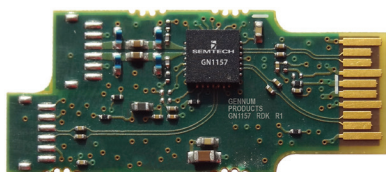
Optical Module Reference Design Kit

Improve the performance and time to market of your SFP+ design with Semtech Optical Module Reference Design Kits.

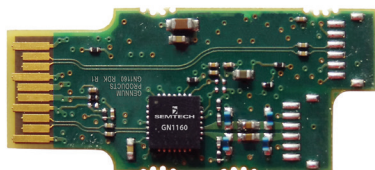
FAST TIME TO MARKET

Semtech's reference design kits include schematics, layout files and a design guide as well as attentive support from experienced applications engineers. This reduces both design costs and decreases time to market. This is further realized in the FTTx market where it is possible to re-use the 10G symmetric SFP+ design to address the 10G asymmetric market.

GN1157B RDK (RDK-GN1157B-SFP+00)



GN1160/GN3055 RDK (RDK-SFP+-Optical04)

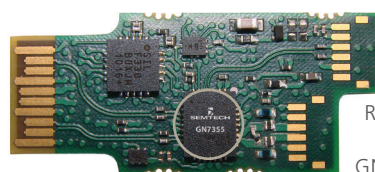


BROAD RANGE OF REFERENCE DESIGNS AVAILABLE

Reference design kits are offered to cover a wide variety of SFP+ applications, including symmetrical and asymmetrical PON, and 10 GbE SR and LR applications.

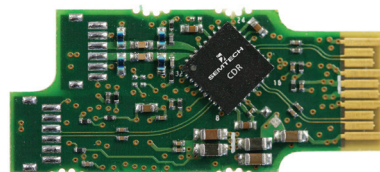
For ethernet SFP+, designs are available for both the traditional architecture (including a limiting amplifier in the receive chain), as well as a new LA-free architecture enabled by Semtech's High Gain ROSA portfolio.

GN7354/7355 RDK, RDK-SFP+-PON-S00, RDK-SFP+-PON-A00



Rx CDR+ Tx Burst Mode
DML driver
GN7355 - Symmetric PON
GN7354 - Asymmetric PON

RDK-SFP++LR



OPTICAL REFERENCE DESIGN KITS

Part Number	Parts Demonstrated	Data Rate (Gbps)	Connector Type	Wavelength (nm)	Applications
RDK-SFP++LR	GN3068/GN3268, GN2010D/ GN2042	9.95 - 11.3	SFP+	1310	10GbE LR, OC-192
RDK-SFP++ER	GN3268, GN2010EA/GN2044	9.95 - 11.3	SFP+	1550	10Gb ER, OC-192
RDK-SFP+-PON-S00	GN7355	10.3	SFP+	1577/ 1270	10G EPON
RDK-SFP+-PON-A00	GN7354	10/1.25 10/2.5	SFP+	1577/1310 1577/ 1270	10G EPON Asym. XG-PON1
RDK-SFP+-Optical02	GN1157	1 - 11.3	SFP+	1310	10GbE LR & CPRI
RDK-GN1157B-SFP+00	GN1157B	1-12.5	SFP+	1310	10GbE LR & CPRI
RDK-SFP+-Optical03	GN1158	1 - 11.3	SFP+	850	10GbE SR
RDK-SFP+-Optical04	GN1160 & GN3055	1 - 11.3	SFP+	1310	10GbE LR
RDK-SFP+-Optical05	GN1161 & GN3155	1 - 11.3	SFP+	850	10GbE SR

Design files and results available upon request.



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