Optical & IC Products

Featuring High Performance Portfolio

SEMTECH

- FiberEdge™ TIAs, Laser and Modulator Drivers
- PON-X® TIAs, Laser and Modulator Drivers

- Single-Lane ClearEdge® CDRs
- Dual-Lane ClearEdge CDRs
- Quad-Lane Tri-Edge™ CDRs
- Multi-Lane Signal Conditioners

- ROSAs
- Limiting Amplifiers
- Transceiver ICs
- Optical Reference Design Kits

semtech.com

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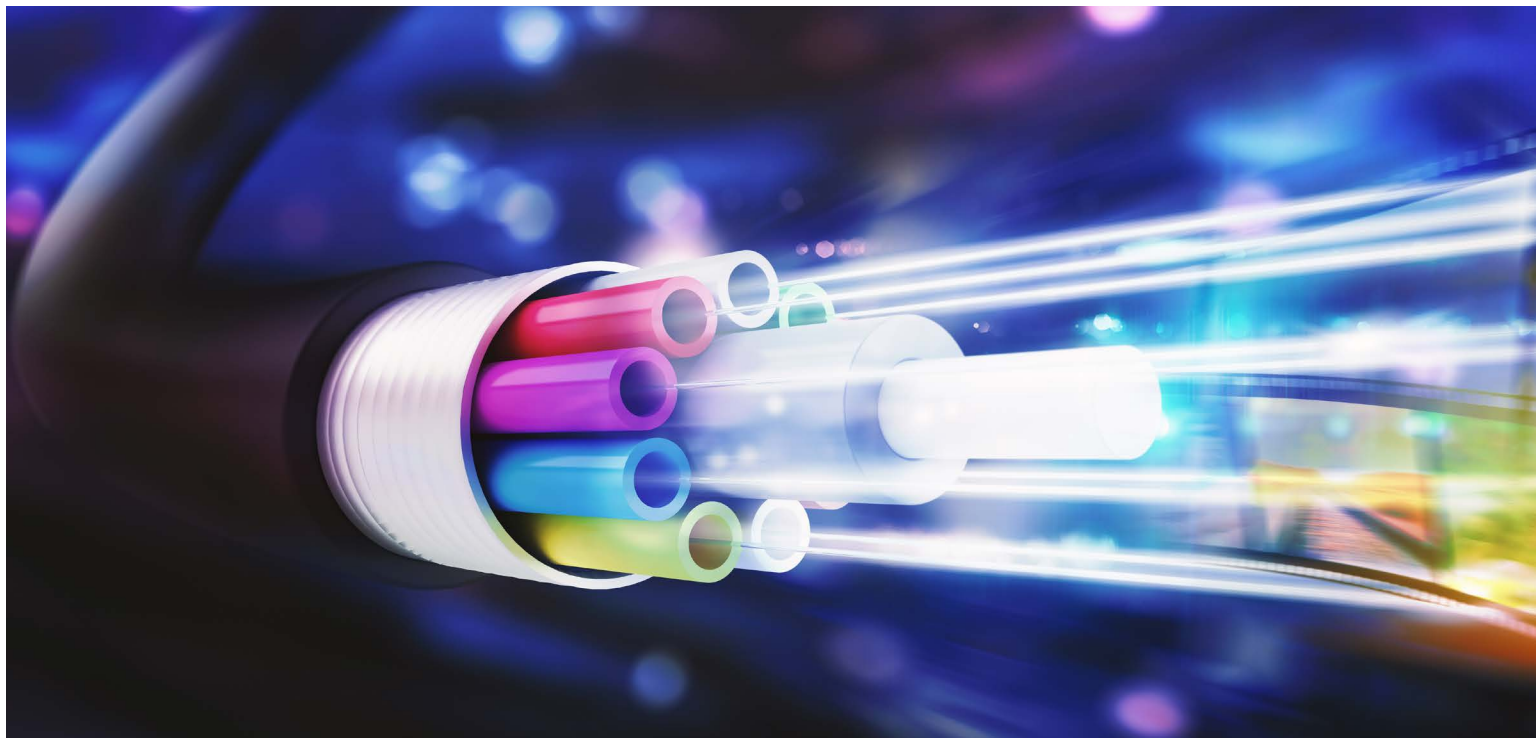
High-Performance

Optical & 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.

Semtech is an active contributor to networking standards development and has shipped over 2 billion optical ICs. This combination of real-world experience and industry leadership enables us to deliver best-in-class solutions for our customers' designs.

Semtech offers one of the industry's most comprehensive portfolios of optical transceiver IC products ranging from 100Mbps to over 100Gbps, supporting key industry standards such as Fibre Channel, InfiniBand®, Ethernet, CPRI, PON, OTN, SONET, and PCI Express®. Semtech is also investing in leading-edge technologies to enable communication systems at 800Gbps and beyond.

For our optical component and module customers, this highly differentiated set of products provides a unique roadmap that improves performance and reliability, while simplifying design, lowering costs and speeding 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.

Semtech Solutions

Enabling High Performance, High-Speed

- Class leading IC solutions for 10G to 800G applications, including SFP28, QSFP28, CFPx, FRx, DRx, SRx, and AOCs
- Full portfolio of integrated solutions for all PON applications and complete reference designs
- Semtech's ClearEdge® and Tri-Edge™ CDR with low power, reference-free technology
- FiberEdge™ Transimpedence Amplifiers (TIAs) that exceed the IEEE Stressed Receiver Sensitivity (SRS) specifications
- FiberEdge™ Laser Drivers featuring high bandwidth, low noise and THD
- Receive Optical Sub-Assembly (ROSA) based on Semtech's Rchip technology
- Industry's first single-chip 10G PON OLT transceivers for XGSPON and 10GEPON applications
- Industry's first quad CDRs enabling long reach Infiniband® QDR, 40GbE and 100GbE applications
- Full portfolio of integrated solutions to address all SFP+ and XFP modules
- Dual-lane CDRs (Tx/Rx) with integrated DML or EML driver
- Protocol-independent repeaters/redrivers
- Limiting Amplifiers (LA) that provide wideband, low noise post-amplification
- SFP+ reference design kits for optical modules to decrease design time

Building the Future Together

As networking requirements continue to evolve, so will Semtech, by 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 supplier and providing innovative approaches that deliver unrivaled performance for the most sophisticated applications.

Technology Leadership for the Future of Optical Communications

PAM4

- Chipsets for both 28 and 56 Gbaud applications
- Industry leading linear performance
- Data Center and Wireless markets served

Tri-Edge™ & ClearEdge® CDRs

- Market leader in CDRs
- Reference-free operation
- Integrated solutions enable best performance, lowest power and ultra-low latency

TIAs

Industry leading performance and proven reliability

Laser Drivers & Limiting Amplifiers

High performance and discrete integrated solutions for single- and multi-channel applications

ROSAs

Best-in-class sensitivity, based on Semtech's patented Rchip technology

Data Center

- 56 & 28 Gbaud PAM4 for SRx modules and AOCs
- n x 25Gbps NRZ solutions

5G Wireless

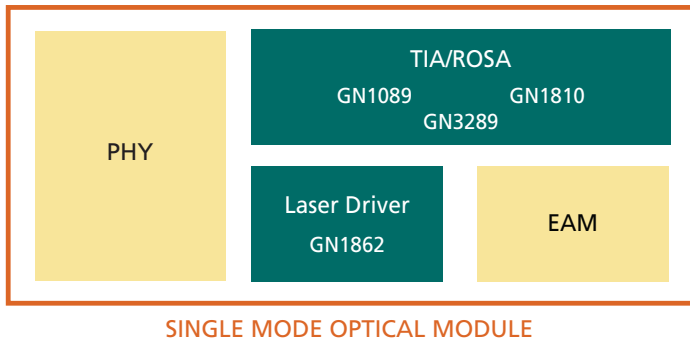- Market leading 10Gbps & 25Gbps solutions for SFP28 modules

PON/FTTH

- Industry's first fully integrated 10G PON OLT solutions
- Highly integrated chipset solutions for 10G PON ONU

PAM4 Connected Data Center

Over the past several years, PAM4 has emerged as the leading technology for implementation of a new generation of Data Center and Wireless optical links.
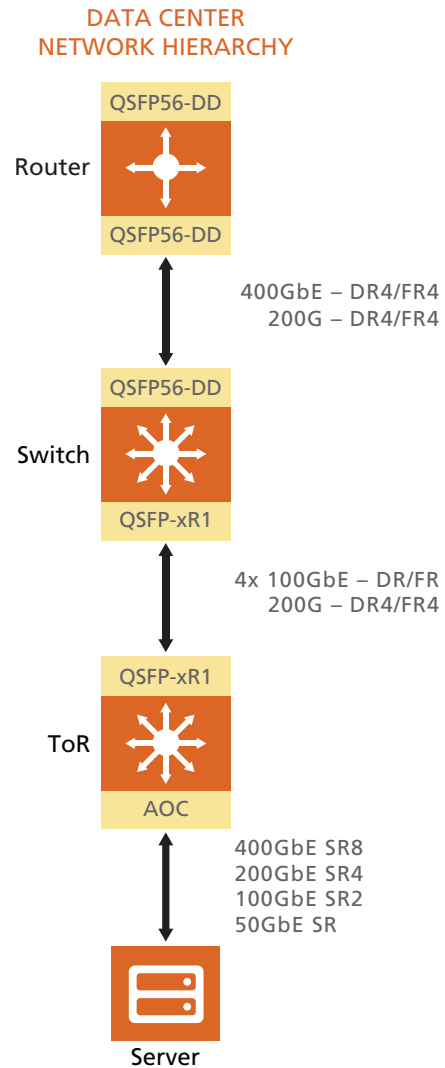
Standards such as IEEE 802.3bs and 802.3cd provide a common understanding of link requirements enabling interoperability that will drive the PAM4 communications market to scale, thereby reducing costs. Concurrently, applications such as machine learning and 4K video apply continuous pressure on service providers to supply more and more bandwidth. Semtech is uniquely positioned to meet the challenges of this market by providing its customers a wide range of solutions specifically tailored to individual application needs.

DATA CENTER NETWORK HIERARCHY

PHY	TIA/ROSA
	GN1089 GN1810
	GN3289
	Laser Driver EAM
	GN1862

SINGLE MODE OPTICAL MODULE

Comprised of Semtech's market-leading, linear, Physical Media Dependent (PMD) FiberEdge™™ products and advanced physical layer devices, our chipsets for single mode applications set the standard for data center applications. Semtech delivers 100Gbps, single lambda solutions that exceed stringent IEEE, OIF and MSA standards with world class electronics specifically designed and orchestrated for optimal performance.

CDRs + TIAs	PIN Diodes
GN2559	
CDRs + VCSEL Drivers	VCSELs
GN2558	

MULTI-MODE OPTICAL MODULE / AOC
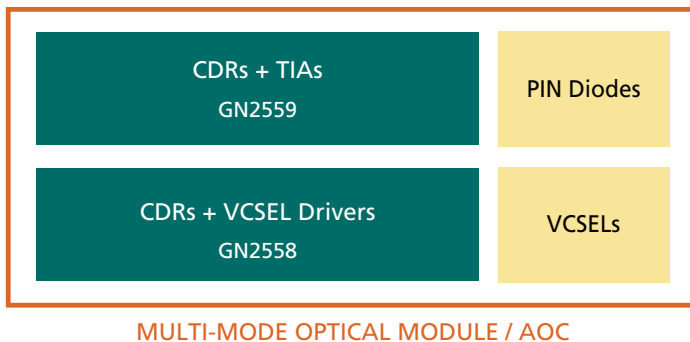
Leveraging its dominant 25Gbps ClearEdge® CDR and PMD technologies, Semtech's highly integrated, 56Gbps PAM4 devices provide an optimal mix of low power, high performance and cost effectiveness required to meet the demands of the multi-mode market. Whether utilized in Active Optical Cables (AOCs) or in standard optical transceivers, Semtech's easy to design in multi-mode PAM4 solutions are the ideal electronics solution for multi-mode optical links.

Router
QSFP56-DD
QSFP56-DD

400GbE – DR4/FR4
200G – DR4/FR4

Switch
QSFP56-DD
QSFP-xR1

4x 100GbE – DR/FR
200G – DR4/FR4

ToR
QSFP-xR1
AOC

400GbE SR8
200GbE SR4
100GbE SR2
50GbE SR

Server

New Products

GN2146: Low-Power Bi-Directional 24-28Gbps ClearEdge® CDR with EML/MZM Driver

- Fully integrated EML/MZM driver and industry-leading ClearEdge® CDR
- Enables <1.5W SFP28 20km DWDM or Tunable modules
- Fully monolithic integrated EML/MZM Driver and ClearEdge® CDR with integrated Bias T components to allow easier layout
- Industry's smallest die size of 5mm x 4mm FC-LFBGA package (including passives) and ultra-low power 550mW at 2VppSE (4VppD) swing

GN2152: Low-Power Bi-Directional 24-28Gbps ClearEdge® CDR with DML Driver

- Fully integrated DML driver and industry-leading ClearEdge® CDR
- Enables <1W SFP28 300m/10km modules
- Proprietary DML compensation technology maximizes performance with multiple DML laser vendors including low bandwidth lasers

GN1196/GN28L55A: 10Gbps LR Chipset with Digital Diagnostic

- MCU Free operation
- Full suite of flexible Digital Diagnostics modes
- Advanced eye-shaping features
- Industrial best 10Gbps Sensitivity CMOS TIA with the lowest power consumption

GN7155B/7055B: XGPON OLT chipset

- 10G EML/CDR with dual rate 2.5G burst mode limiting amplifier
- GN7055B: High sensitivity 10G/2.5G burst mode TIA

GN28L97B: XGPON ONU Combo IC

- 10G Rx, 2.5G dual loop Tx with programmable eye-shaping
- Highly integrated, low BOM cost and compact size

GN1862: FiberEdge™ 56GB Linear EML Driver

- Bare die for CoB applications
- 2.0 Vppse output; 10 dB of gain
- 48GHz BW
- 2% THD

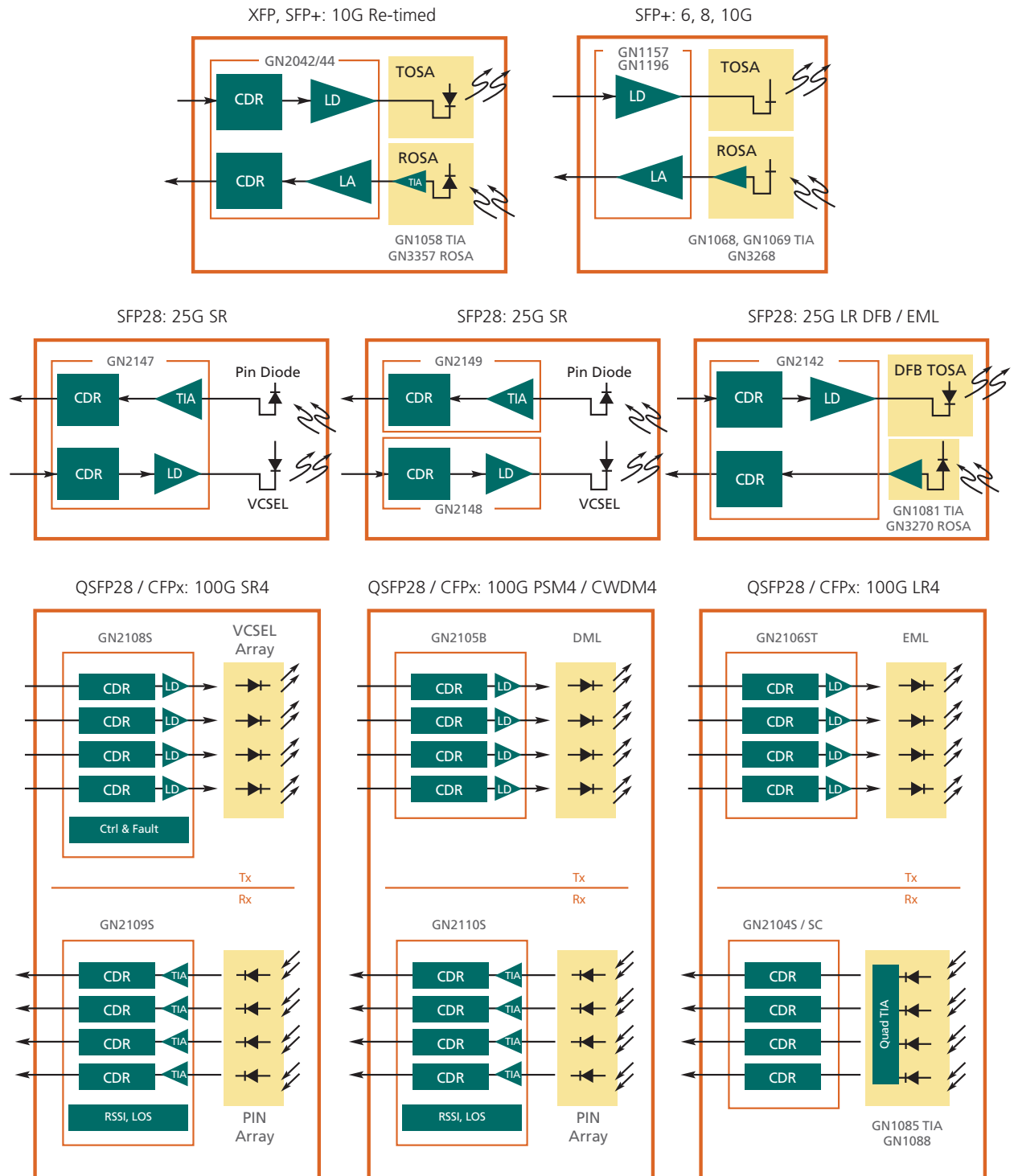## GN2558: Tri-Edge™ PAM4 4x56G CDR + VCSEL Driver

- Low power consumption
- Low latency analog CDR
- Four independent transmit channels
- 200GBASE-SR4 Optical Transceiver Modules
- 200G & 400G QSFP-DD Optical Transceiver Modules
- 200G & 400G OSFP Optical Transceiver Modules
- 200G-AUI-4 and 400G-AUI-8 chip to module and CEI 56G VSR re-timed interfaces

GN2559: Tri-Edge™ PAM4 4x56G CDR + TIA

- Low power consumption
- Low latency analog CDR
- Four independent receive channels
- 200G & 400G QSFP-DD Optical Transceiver Modules
- 200G & 400G OSFP Optical Transceiver Modules
- 200G-AUI-4 and 400G-AUI-8 chip to module and CEI 56G VSR re-timed interfaces

Optical Applications

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

XFP, SFP+: 10G Re-timed

SFP+: 6, 8, 10G

SFP28: 25G SR

SFP28: 25G SR

SFP28: 25G LR DFB / EML

QSFP28 / CFPx: 100G SR4

QSFP28 / CFPx: 100G PSM4 / CWDM4

QSFP28 / CFPx: 100G LR4

Tri-Edge® CDRs

Semtech's Tri-Edge technology offers the only analog CDR solution for optical modules capable of meeting the low power, low cost requirements needed for data center PAM4 optical interconnects. Tri-Edge also offers significant latency improvements over DSP which are key to HPC and AI data centers demanding the lowest latency. The products are fully compliant to the Open Eye MSA and address a full range of needs for a data center, from 500m to 10km, SR, TOR and Tier 1, in a range of laser and module types.

GN2538

The GN2538 Tri-Edge CDR is a dual PAM4 CDR re-timer with integrated VCSEL array driver designed for 53.125Gbps signal conditioning within next-gen pluggable optical modules and Active Optical Cables (AOC). This PAM4 CDR includes proprietary VCSEL compensation to enable a wide range of VCSEL options with fully adaptive input equalization and fast startup to streamline system bring up.

GN2539

The GN2539 Tri-Edge CDR is a dual PAM4 CDR with an integrated transimpedance amplifier (TIA) array. This PAM4 CDR includes configurable output equalization enabling robust electrical interfaces compliant to OIF VSR and IEEE XLAUI specifications. The GN2539 linear TIA and CDR provides superior receiver performance with fast adaptation and startup.

GN2558

The GN2558 Tri-Edge CDR is a quad PAM4 CDR re-timer with integrated VCSEL array driver designed for 53.125Gbps signal conditioning within next-gen pluggable optical modules and Active Optical Cables. This PAM4 CDR includes proprietary VCSEL compensation to enable a wide range of VCSEL options with fully adaptive input equalization and fast startup to streamline system bring up.

GN2559

The GN2559 Tri-Edge CDR is a quad PAM4 CDR with an integrated array. This PAM4 CDR includes configurable output equalization enabling robust electrical interfaces compliant to OIF VSR and IEEE XLAUI specifications. The GN2559 linear TIA and CDR provides superior receiver performance with fast adaptation and startup.

ClearEdge® CDRs

Semtech's multi-lane signal conditioners, based on our reference-free ClearEdge CDR platform with integrated drivers and TIAs, offer the lowest power, smallest footprint solutions for XFP, re-timed SFP+, 25G and 100G modules, in addition to AOCs.

ENABLING NEXT-GENERATION 100G MARKETS

Semtech's 100G ClearEdge CDR portfolio integrates our proven Quad 24G-28G CDRs with VCSEL, DML or EML drivers for transmit with TIAs for receive, targeting both short reach and long reach modules. Our proven integration and the industry's lowest power and superior performance simplifies 100G designs and lowers cost.

ENABLING SFP28 AND 25GBPS AOCs

The GN2147 dual CDR with integrated VCSEL driver and TIA enables high-performance and low cost SFP28 SR

modules and AOCs. The single chip design and advanced transmit compensation provides for low cost solutions using a single lens design as well as low bandwidth VCSELs for exceptional BOM savings.

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.

ClearEdge® CDRs

Part Number	Data Rate (Gbps)	Lanes	Laser Driver	TIA	Slice Level Adjust	Pin Compatibility	Package	Applications
GN2017A*	9.95–11.7 14.025	2 (1Rx + 1Tx)	VCSEL	–	No	GN2010X	QFN-32	16G FC, 10G FCoE
GN2040*	9.95–11.3	2 (1Rx + 1Tx)	DML	–	Yes	GN204x	QFN-32	XFP and SFP+, 10GbE, OC-192 and DWDM
GN2042*	9.95–11.3	2 (1Rx + 1Tx)	DML	–	Yes	GN2044	QFN-32	XFP and SFP+, 10GbE and OC-192 Enables 1W Re-timed SFP+10km
GN2044*	9.95–11.3	2 (1Rx + 1Tx)	EML	–	Yes	GN1444, GN2042	QFN-32	XFP and SFP+ 10GbE, OC-192 and DWDM Enables 1.5W Retimed SFP+ 40/80km
GN2044S*	9.95–11.3	2 (1Rx + 1Tx)	EML	–	Yes	GN1444S	QFN-32	Tunable SFP+, OC-192 and DWDM Enables 1.5W Retimed TSFP+
GN2104S/SC*	24–28	4	–	–	Yes	–	FC-CSP	100Gbps Ethernet, Infiniband EDR
GN2105B*	24–28	4	DML	–	Yes	–	FC-BGA	100Gbps Ethernet, PSM4, CWDM4, CLR4
GN2106ST*	24–28	4	EML	–	Yes	–	BGA	100Gbps Ethernet/OTN, Infiniband EDR
GN2108S*	24-28	4	VCSEL	–	Yes	–	Die	100Gbps Ethernet SR4
GN2109S/10S*	24–28	4	–	Yes	Yes	GN2109S	Die	100Gbps Ethernet/OTN PSM4, CWDM4, CLR4
GN2146*	24–28	2 (Rx + Tx)	EML/ MZM	–	–	FC-BGA	–	SFP28 300m/10km
GN2147*	24–28.1	2 (Rx + Tx)	VCSEL	Yes	–	–	Die	25Gbps AOC
GN2148*	24–28.1	1 Tx	VCSEL	–	–	–	Die	SFP28 SR
GN2149*	24–28.1	1 Rx	–	Yes	–	–	Die	SFP28 SR
GN2152*	24–28	2 (Rx + Tx)	DML	–	–	CSP	CSP	SFP28 LR

* Please contact your sales representative for more details.

Transceiver ICs (LD & LA)

High performance laser drivers and limiting amplifiers for optical communications.

GN28L95

Combined 10Gbps limiting post amplifier and 2.5Gbps burst mode laser driver for cost critical 10GEPON and XG-PON asymmetric applications. GN28L95 features robust automatic ER control and integrated APD controller.

GN28L96

10G PON combo for next-generation systems. The GN28L96 integrates a 10G burst mode laser driver with dual loop ER control and a 10G limiting amplifier. GN28L96 targets low cost for BoB ONU and module applications.

GN1158/GB1196

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

GN28L97B

GN28L97B is an integrated 2.5G burst mode laser driver and 10G limiting post amplifier targeting low cost BoB XGPON ONU module and applications.

GN7153B

GN7153B is an integrated 10G EML laser driver and dual rate 10G/2.5G burst mode limiting amplifier with built-in AC-coupling discharge circuit.

GN1444/44S

The GN1444 and GN44S are highly integrated, low power, small footprint transceivers that are ideal for SFP+ ER optical modules.

GN7154

GN7154 is an integrated 10G EML driver and dual rate 10G/1G burst mode limiting amplifier for 10GEPON OLT applications.

GN7155B

GN7155B is an integrated 10G EML laser driver and 2.5G burst mode limiting amplifier for XGPON OLT applications

Transceiver IC (LD and LA)

Part Number	Overview	Data Rate (Gbps)	Max Mod/ Bias Current (mA)	Supply (V)	Package	Applications
GN1444S*	EML Laser Driver + Receive LA	to 11.3	2.5Vpp /120mA	1.8 and 3.3	QFN-32	10GbE, OC-192
GN1157	DML Laser Driver + Receive LA	to 11.3	90/120	3.3 (Optional 2.8)	QFN-28	10GbE LR SFP+, CPRI
GN1157B*	DML Laser Driver + Receive LA	to 12.5	90/120	2.4 and 3.3	QFN-28	10GbE LR SFP+, CPRI
GN1158	VCSEL Laser Driver + Receive LA	to 11.3	20/15	3.3 (Optional 2.8)	QFN-28	10GbE SR SFP+
GN1159*	1.0 to 12.5Gbps LRTransceiver Chip with Digital Diagnostics	to 12.5	90/120	2.4 and 3.3	QFN-32	10GbE LR SFP+, CPRI
GN1196*	1.0 to 12.5Gbps LR Transceiver Chip with Digital Diagnostics	to 12.5	100/120	2.4 and 3.3	QFN-32	10GbE LR SFP+, CPRI
GN25L95	Burst Mode DFB + Receive LA	to 2.5	90/100	3.3	QFN-28	EPON, GPON, BOSA-on-Board
GN25L95C	SFP Burst Mode DFB + Receive LA	3.1G to 125M	90/100	3.3	QFN-28	Single and multi-rate SFP
GN25L96	Programmable Burst Mode DFB + Receive LA	to 2.5	90/100	3.3	QFN-28	EPON, GPON, BOSA-on-Board, SFP
GN25L98	Burst Mode DFB + Receive LA + APD Controller	to 2.5	90/100	3.3	QFN-28	EPON, GPON, BOSA-on-Board
GN28L95	2.5Gbps Burst Mode DFB + 10Gbps Receive LA	Rx 10.3, Tx 2.5G	100/85	3.3	QFN-32	10GbE EPON, XGS-PON (Asymmetric)
GN28L96	10Gbps Burst Mode DFB + 10Gbps Receive LA	10.3	100/85	3.3	QFN-32	10GbE EPON, XG-PON (Symmetric)
GN28L97B	10Gb/s Limiting Post Amplifier & 2.5Gbps Burst Mode Laser Driver	10.3	100/120	3.3	QFN-32	10Gbps Asymmetric PON Applications
GN7153B	10G EML Driver CDR/Burst-mode LAM Combo	to 10.3	100/140	1.8 and 3.3	QFN-32	10GbE XG-PON, XGSPON
GN7154	10GEPON OLT Combo	to 10.3	100/140	1.8 and 3.3	QFN-32	10G EPON XFP and SFP+ OLT modules
GN7155B	10G EML Driver CDR/2.5G Burst-mode LAM Combo	to 10.3	100/140	1.8 and 3.3	QFN-32	OLT modules for XGPON

Please contact your sales representative for more details.

TIAs

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

Semtech offers a portfolio of fully integrated 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 155Mbps to 100Gbps.

FEATURES

- Wideband, low noise
- 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 – EPON, GPON, 10GEPON, XGPON, and XGSPON
- 6G and 1–12G CPRI modules for wireless front haul
- 100Gbps client side modules
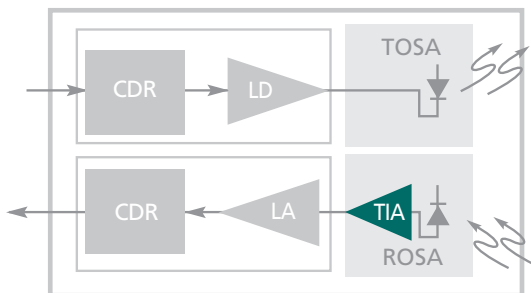
GN1081, GN1084, GN1085, GN1088

1 x 28Gbps and 4 x 28Gbps limiting TIA optimized for 100GBASE-LR4 applications.

GN7069

10Gbps limiting TIA designed for APD applications such as 5GHz WiFi immune 10G PON ONU's.

GN7055, GN7056

Limiting TIA designed specifically for XGSPON and 10G EPON OLT applications.

GN1090

Quad 14.5Gbps array receiver for parallel and multi-channel datacom and 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.

GN28L55A

Industrial lowest sensitivity and power 10Gbps CMOS TIA for Telecom and Data Center.

GN25L54

2.5Gbps Super TIA for GPON ONU with low cost build.

NT24L55

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

NT24L50

1.25Gbps high sensitivity TIA with automatic gain control for FTTH and Datacom Fiber transceiver applications.

NT23L50

622Mbps high sensitivity TIA for FTTH and Telecom Fiber transceiver applications.

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 200Mbps.

TIAs

Part Number	Overview	Data Rate (Gbps)	Gain (kΩ)	BW (GHz)	Supply (V)	Noise	Applications
GN1068	14G Limiting	to 14.3	6.75	12	3.3	1.2µA	CPRI, 10GBASE-SR/LR/ER and 16G FC
GN1069	12.5G Limiting	to 12.5	9	11.5	3.3	0.86µA	-
GN1081*	28G Limiting	28	6	22	3.3	1.78µA	25Gbps and 100Gbps Ethernet/OTN, Infiniband EDR
GN1084*	25G Limiting	25	6	22	3.3	2.3µA	25Gbps and 100Gbps Ethernet
GN1085*	Quad 28G Limiting	28	6	22	3.3	1.78µA	100Gbps Ethernet/OTN, Infiniband EDR
GN1088*	Quad 28G Limiting	28	5	23	3.3	-	-
GN1090	Quad 10G limiting	to 14.3	*	*	3.3	0.9µA	40Gbps Ethernet, Infiniband, QSFP+
GN25L53	3.1Gbps AGC TIA	3.1	5.5	1.9	3.3	335nA	CPRI, GPON, OC-48 (APD)
GN25L54	2.5Gbps High Sensitivity AGC TIA	2.5	42	1.4	3.3	80nA	GPON (PD)
GN7055	Multi-rate PON Burst Mode TIA	10.3/ 2.5/ 1.25	3.6/ 4.6/ 11.5	8.7/ 2.2/ 1.14	3.3	*	10G XGS-PON / 10G EPON / 2.5G XG-PON / 1.25 EPON
GN7069	10G Limiting	to 11.3	8	10	3.3	0.9µA	APD ROSAs for 10G PON ONU
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
GN7056	Multi rate PON Burst Mode TIA	10.3/ 1.25	3.5/12.2	8.9/1.7	3.3v	*	10GbE EPON OLT
NT20R67	155Mbps AGC TIA	0.155	63	0.165	3.3/5.0	11nA	OC-3, Fast Ethernet
NT20067	155Mbps AGC TIA	0.155	23	0.165	3.3/5.0	11nA	OC-3, Fast Ethernet
NT24L50	1.25Gbps AGC TIA	1.25	25	0.75	3.3	92nA	GbE, EPON
NT24L55	1.25Gbps High Sensitivity AGC TIA	1.25	46	0.75	3.3	74nA	EPON
NT25L51	2.5Gbps AGC TIA	2.5	8	1.7	3.3	230nA	OC-48, GPON (APD)
NT28L52	10G Limiting	to 10.3	2.35	7	3.3	1.2µA	PON, 10GBASE-SR

* Please contact your sales representative for more details.

Laser Drivers & Limiting Amplifiers

High performance laser drivers and limiting amplifiers for optical communications.

APPLICATIONS

- 100Gbps Ethernet
- 6Gbps and 10Gbps CPRI modules for wireless front haul
- 40G QSFP+ modules
- 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/SDH
- 11.3Gbps Fibre Channel with Forward Error Correction

LIMITING AMPLIFIERS

NT24L73

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

LASER DRIVERS

GN1185

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

NT20042

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

NT22L33

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

GN1190

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

GN7151

GN7151 is a 10G EML driver integrating ClearEdge reference free CDR to deliver best-in class eye quality and enabling lower power modules for 10G PON OLT applications

LIMITING AMPLIFIERS

Part Number	Overview	Data Rate (Gbps)	Gain (dB)	BW	Supply (V)	Noise Figure (uV)	Applications
NT20045	200Mbps 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

LASER DRIVERS

Part Number	Overview	Data Rate (Gbps)	Max Mod/Bias Current (mA)	Supply (V)	Pkg	Applications
GN1185*	Quad DFB driver	25-28	55m/70	2.3/3.3	Bare Die	100GbE Ethernet active TOSA
GN1190	Quad VCSEL Driver	to 14.3	12/12	3.3	Bare Die	40Gbps Ethernet, Infiniband, QSFP+
GN7151	10Gbps EML Laser Driver	to 11.3	140	1.7 and 3.3V	QFN-32	10GEPON, XGPON, XGSPON OLT
NT20042	300Mbps 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	QFN-24 (4mm)	OC-3, OC-12, GbE

*Please contact your sales representative for more details.*

ROSAs

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

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-LR
- 10GBASE-ER
- 10GBASE-LRM
- OC-192 SR-1
- OC-192 IR-2
- 10G EPON
- Low OSNR DWDM
- 8GFC and 10GFC
- 25G Ethernet
- 28GBd and 56GBd PAM4

GN3289
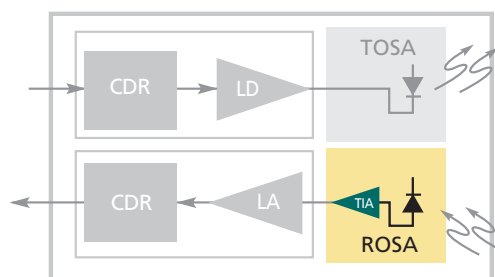
ROSAs and Super High Gain ROSAs								
Part Number	Overview	Data Rate (Gbps)	Gain (kΩ)	Supply	RSSI	Unstressed Sensitivity	Comments	ORL
GN3055*	10km Super High Gain Rchip	to 11.3	35	+3.3V ±10%	Yes	-21dBm	Eliminates LA in SFP+	-14dB
GN3255*	40km Super High Gain Rchip	to 11.3	35	+3.3V ±10%	Yes	-21dBm	EliminatesLA in SFP+	-27dB
GN3068*	10km Low Power Limiting	to 11.3	7	+3.3V ±10%	Yes	-21dBm	94mW 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
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	-27dBm	Ideal for non-retimed SFP+	-27dB
GN3270*	25G Limiting PIN ROSA	28	6	+3.3V ±10%	Yes	-14dBm	SFP28 LR applications	-27dB
GN3289*	56GBd Linear AGC ROSA	to 100	5	+3.3V ±10%	Yes	-7.7dBm OMA	100Gbps Ethernet operation using PAM4 modulation	-27dB

Please contact your sales representative for more details.

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 resetting crosstalk and jitter budgets.

HIGH LEVEL OF INTEGRATION AND SMALL FOOTPRINT

Semtech's backplane and 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 ClearEdge® CDR technology allows for an optimal solution to drive long, dense backplanes or cables at high speeds.

LOW POWER

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

RESET THE JITTER AND CROSSTALK BUDGETS

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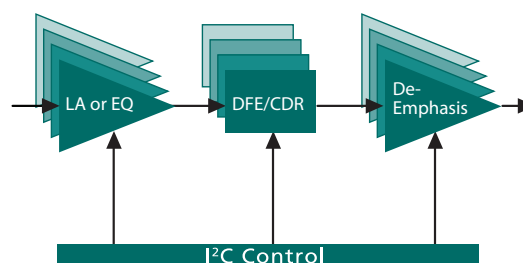
Multi-Lane Signal Conditioners

Part Number	Data Rate (Gbps)	Lanes	CDR	Ref Clock	Input Stage	De-em-phasis	Supply (V)	Pkg	Applications
GN1406	2.5, 3.125, 5.0, 6.25	4	Yes	Req.	Equalizer	Yes	1.2 1.8	QFN-56	PCIe Gen 1/2, SNAP-12, POP-4/LX-4/CX-4/KX-4, XAUI/RXAUI and Rapid I/O
GN1407	1–8	4	No	Not Req.	Equalizer	No	1.2 1.8	QFN-56	PCIe Gen 1/2/3, SNAP-12, POP-4/LX-4/CX-4/KX-4, XAUI/RXAUI and Rapid I/O
GN2402*	10.3125	4	Yes	Not Req.	Equalizer	Yes	3.3	QFN-44	nx10G Backplanes,10G/40G Linecards,10G/40G Active cables
GN2404 Family*	1.25–12.8	4	Yes	Req.	Adaptive Equalizer DFE	Yes	0.9 1.8	BGA-144	>nx10G Backplanes,10G/40G Linecards, 10G-KR, 40G-KR4, 40G-CR4, Crosspoint Switching, CPRI
GN2405A/5S*	9.95–11.3	4	Yes	Not Req.	Equalizer	Yes	3.3	QFN-48	nx10G Backplanes 10G/40G Linecards 10G/40G Active cables
GN2406/6S*	9.95–10.95	4	Yes	Not Req.	Limiting Amp	Yes	3.3	QFN-48	10G/40G Linecards
GN2408 Family*	1.25–12.8	8	Yes	Req.	Adaptive Equalizer DFE	Yes	0.9 1.8	BGA-144	>nx10G Backplanes,10G/40G Linecards, 10G-KR, Crosspoint Switching, CPRI
GN2412 Family*	1.25–12.8	12	Yes	Req.	Adaptive Equalizer DFE	Yes	0.9 1.8	BGA-144	>nx10G Backplanes,10G/40G/100G Linecards, 10G-KR, 40G-KR4, 40G-CR4, Crosspoint Switching, CPRI
GN2504*	25.6–28.1	4	Yes	Not Req.	Adaptive Equalizer	Yes	1.8	QFN-54	25G/50G/100G Linecards, nx28G Backplanes, 25G/50G/100G Active Copper Cables
GT1706 Family*	1.25–14.5	6	Yes	Req.	Adaptive Equalizer	Yes	0.9 1.8	BGA-144	HD/3G/4K/8K Video Broadcast testing Fibre Channel/Infiniband/Ethernet Link Testing BERT Developments
GX4002	9.9–11.3, 14.025	2	Yes	Not Req.	Equalizer	Yes	3.3	QFN-32	nx10G Backplanes,10G/40G Linecards, Infiniband FDR, 16G Fibre Channel, Crosspoint Switching

Please contact your sales representative for more details.

Optical Module Reference Design Kits

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 offer training through schematics, layout files and a design guide, as well as prompt support from our experienced applications engineers, reducing both design costs and time-to-market. This type of system is currently executed in the FTTx market, as the ability to reuse the 10G symmetric SFP+ design to address the 10G asymmetric market is incorporated.

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 10GbE SR and LR applications.

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

GN1196 RDK

GN28L96 RDK (GN28L96-10GS-OAM)
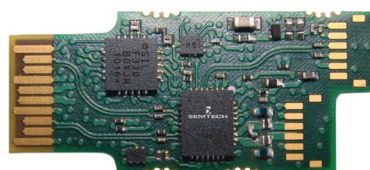
OPTICAL MODULE REFERENCE DESIGN KITS

Part Number	Parts Demonstrated	Data Rate (Gbps)	Connector Type	Wavelength (nm)	Applications
GN28L96-10GS-OAM	GN28L96	10.3	SFP+	1577/1270	10G PON
RDK-SFP+GN1196-00	GN1196	1-11.3	SFP+	1310	1-GbE LR, OC-192
RDK-GN28L97B-BOB00	GN28L97B	2.5G Tx, 10G Rx	-	1577/1270	10G PON

Design files and results available upon request.

SEMTECH

200 Flynn Road, Camarillo, California 93012 • phone: (805) 498-2111

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Click to View Pricing, Inventory, Delivery & Lifecycle Information:

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[GN3357-3EB9AT6E3](#) [GN3357-3EB9AU2E3](#) [GN3268-3EH8AN3E3](#) [GN3268-3EB7AS9E3](#) [GN3357-3EB9AQ9E3](#)
[GN3357-3EB9AU4E3](#) [GN3255-3EB7AM6E3](#) [GN3255-3EB7AM2E3](#) [GN3268-3EB7AM6E3](#) [GN3357-3EB9AN4E3](#)
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[GN3257-3EB9AT5E3](#)