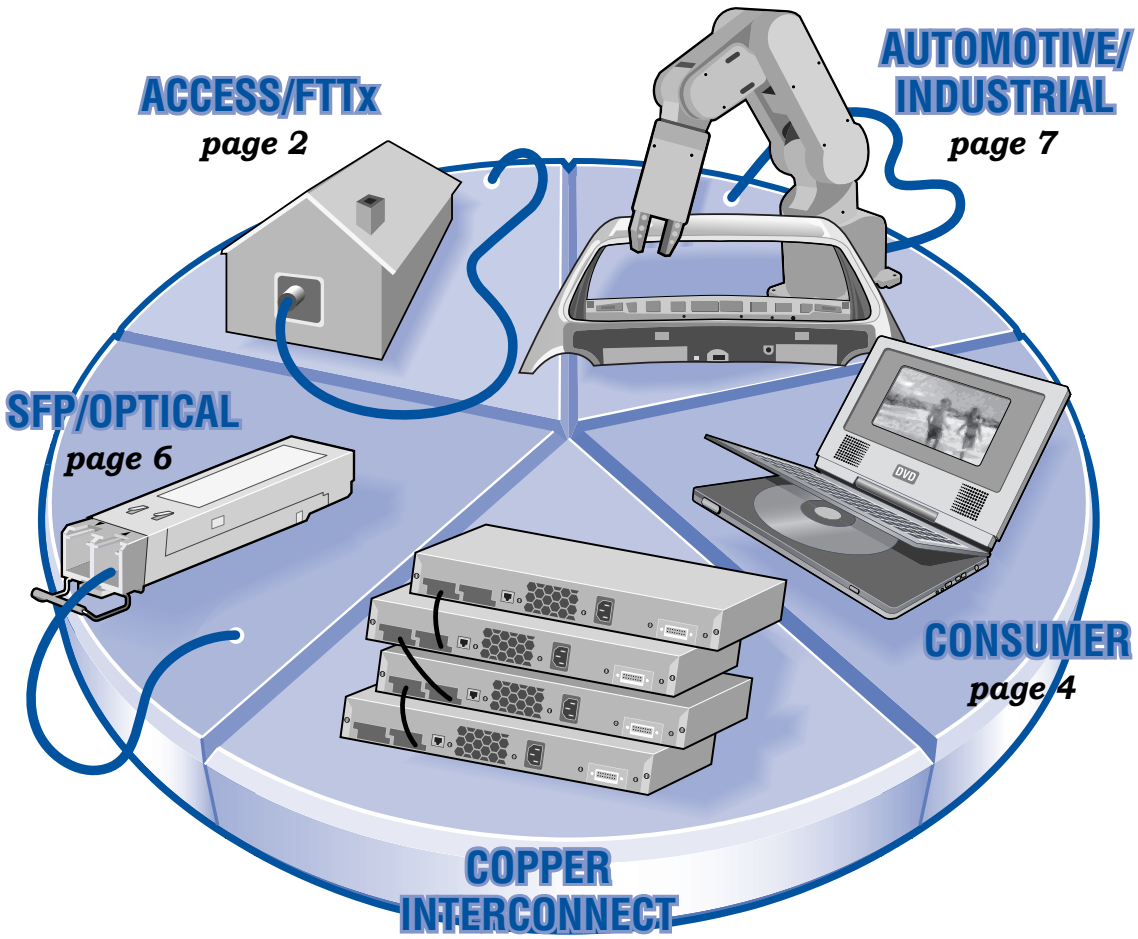
FIBER TELECOM DATACOM

ANALOG DESIGN SOLUTIONS

Data Sheets • Applications Notes • Free Samples

7th EDITION

High-Performance PMD Products Enable Low-Cost Applications



Also Inside:

MAXIM

Maxim's PMD Expertise Enables Fast, Burst-Mode FTTx Designs (continued on next page)

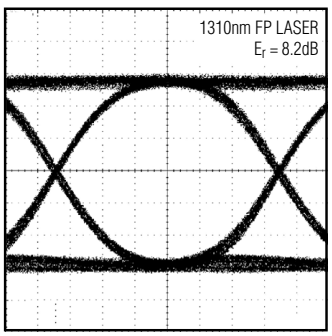
GPON Burst-Mode Receiver Chipset

MAX3737—+3.3V Multirate Laser Driver

- 47mA Power-Supply Current
- 85mA Modulation Current
- 100mA Bias Current
- Automatic Power Control (APC)
- Modulation Compensation
- On-Chip Temperature Compensation
- Ground-Referenced Current Monitors
- Laser Safety, Shutdown, and Alarm Outputs

Excellent Performance from 155Mbps to 2.7Gbps

MAX3737
OPTICAL EYE DIAGRAM
(1.25Gbps, 2^7 - 1 PRBS, 940MHz FILTER)



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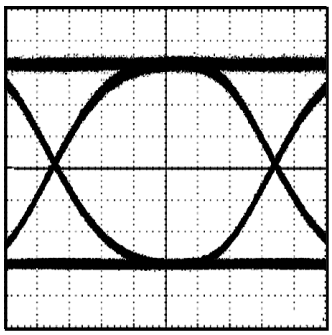
MAX3737
OPTICAL EYE DIAGRAM
(155Mbps, 2^7 - 1 PRBS,
117MHz FILTER, C_{APC} = 0.1µF)



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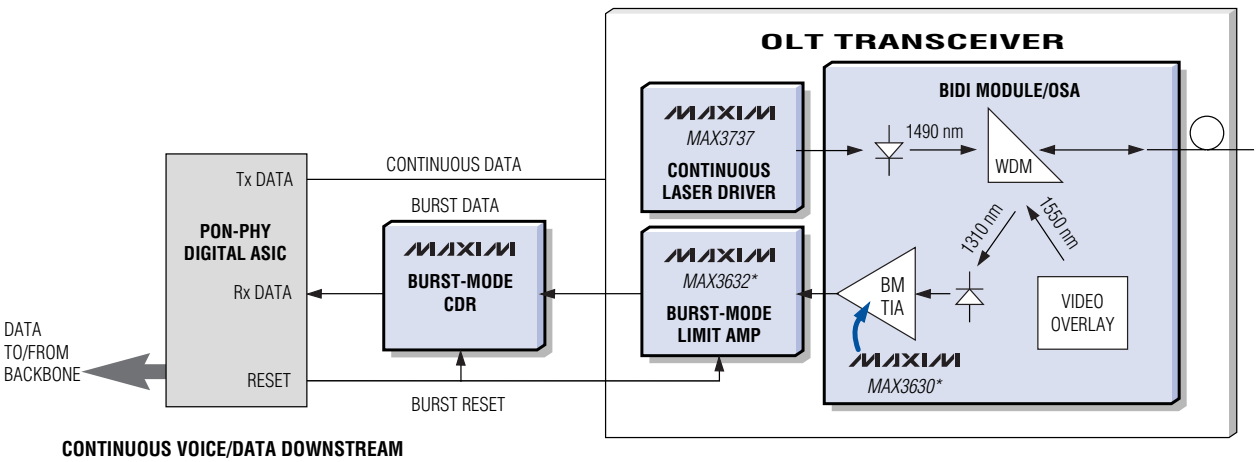
Complete Head-End (OLT) Solution



MAX3632*—Burst-Mode Limiting Amplifier

- DC-Coupling Saves External Components
- Operates with Maxim's Burst-Mode Transimpedance Amplifier
- Reset Input Establishes Burst Timing
- 4mm x 4mm TQFN

MAX3630*—Burst-Mode TIA

- DC-Coupling Saves External Components
- Operates with Maxim's Burst-Mode Limiting Amplifier
- <20ns ATC Settling Time at 622Mbps

*Future product—contact factory for availability.

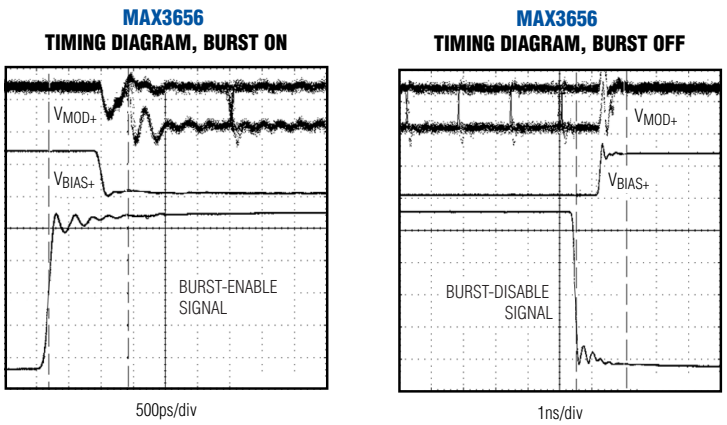
Maxim's PMD Expertise Enables Fast, Burst-Mode FTTx Designs (continued from previous page)

Complete ONT Solution

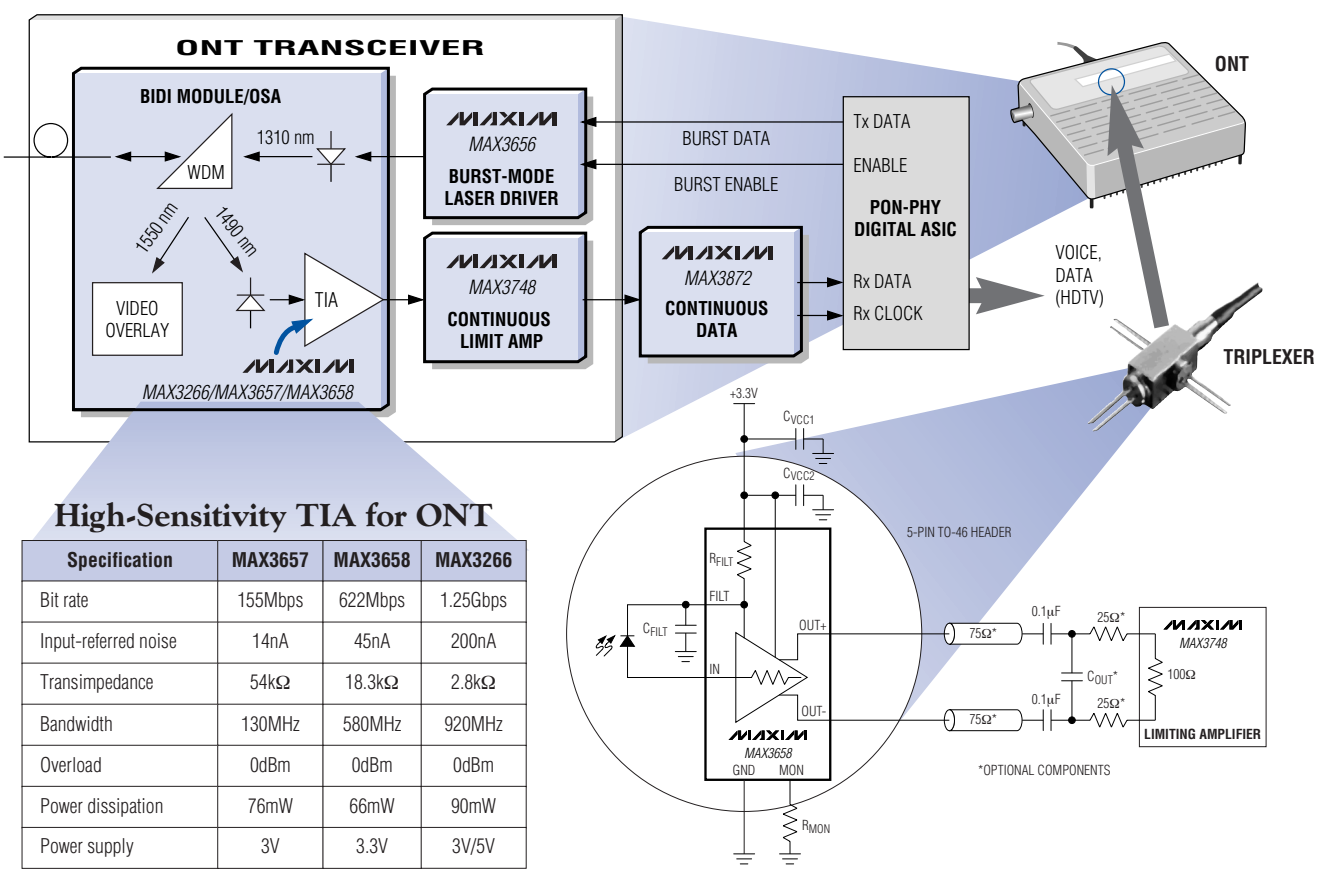
MAX3656—+3.3V Burst-Mode Laser Driver

- 155Mbps to 2.5Gbps
- <2ns Burst-Enable/Disable Delay
- Infinite Bias-Current Hold Time Between Bursts
- DC-Coupled Operation
- 40mA Typical Supply Current
- Programmable Bias Current from 1mA to 70mA
- Programmable Modulation Current from 10mA to 85mA
- APC Loop Initialization in Three Bursts

Fast Burst On/Off Time



Home/Office Configuration (ONT)



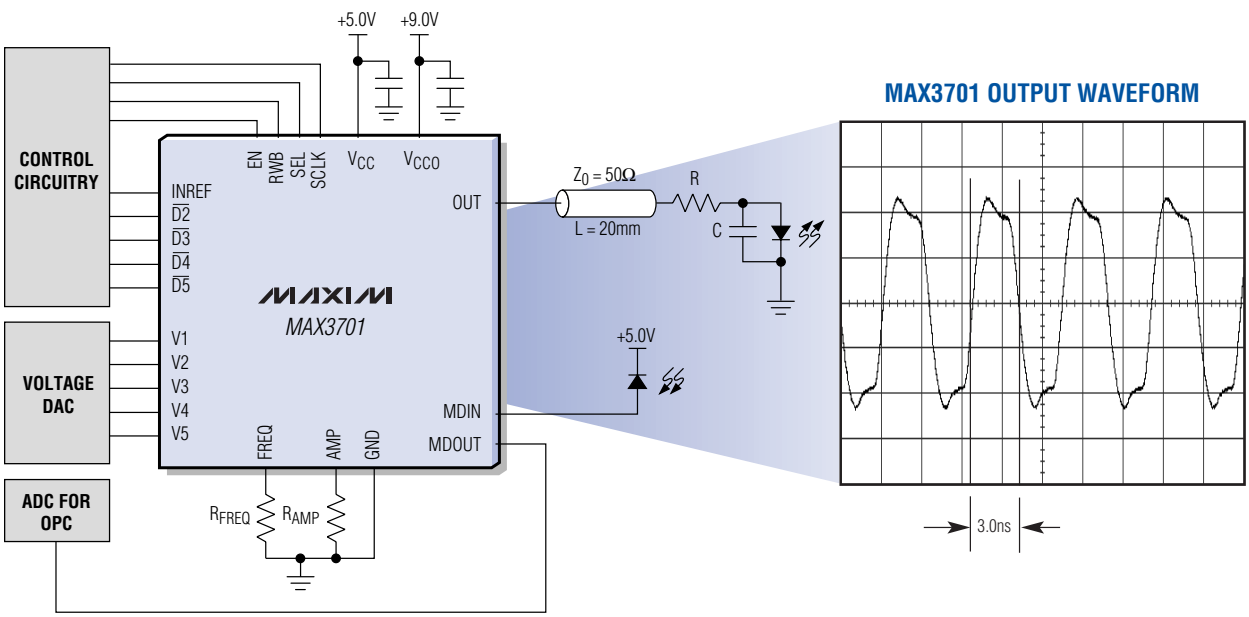
High-Sensitivity TIA for ONT

Specification	MAX3657	MAX3658	MAX3266
Bit rate	155Mbps	622Mbps	1.25Gbps
Input-referred noise	14nA	45nA	200nA
Transimpedance	54kΩ	18.3kΩ	2.8kΩ
Bandwidth	130MHz	580MHz	920MHz
Overload	0dBm	0dBm	0dBm
Power dissipation	76mW	66mW	90mW
Power supply	3V	3.3V	3V/5V

Drive Blue Lasers at 2x with No Active External Components

Less than 1.0ns Output Rise and Fall Time with Less than 10% Output Aberrations

The MAX3701 is a single-output laser driver designed to drive a common-cathode blue laser at 2x. It includes a programmable current source for laser bias control and four programmable data channels for programming write-current levels. Integrated into the MAX3701 is a programmable RF-current source with amplitude control. A transimpedance amplifier and sample/hold circuit are integrated on-chip for use with a monitor photodiode as part of an optical power-control loop. The four input channels can write at speeds up to 400Mbps. The MAX3701 can be used in red or blue optical-disc applications employing multiple formats.



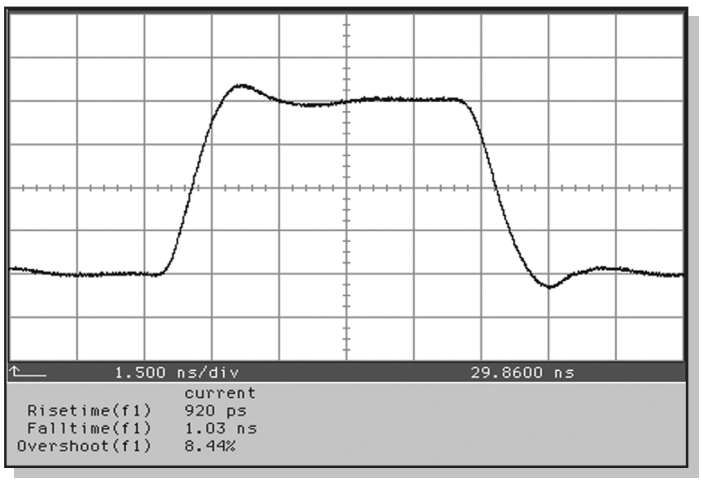
- Read/Write Common-Cathode Laser
- 200mA Maximum Drive Current
- <1.0ns Rise/Fall Time
- Sample/Hold Circuit with Preamp
- Single-Ended CMOS Control Interface
- Single-Ended High-Speed Inputs
- Five-Level Output Programmability
- No External Active Components Required

Part	Pin-Package	Price† ($)
MAX3701CTJ	32-QFN	1.95

†10,000 direct. Prices provided are for design guidance and are FOB USA. International prices will differ due to local duties, taxes, and exchange rates. Not all packages are offered in 1k increments, and some may require minimum order quantities.

er for DVD-Writer Applications

Interfacing the MAX3701 to a Blue/Violet Laser Diode—Application Brief



Optical Output of a Blue/Violet Laser Driven by the MAX3701

Optical measurements of the MAX3701 driving a blue/violet laser diode were performed prior to its release. These measurements verified that the MAX3701 is capable of driving the blue/violet laser with rise/fall times of ≤1ns and overshoot of <9%, as shown in the optical output diagram.

Below is an outline of the detailed information that can be found in the complete version of HFDN-28.0 (high-frequency design note). This design note details how optical measurements were performed, and provides guidelines for interfacing the MAX3701 with the blue/violet laser.

Optical-Evaluation Printed Circuit Board

- **Materials and Layout of the MAX3701 Optical Evaluation Board**
- **Schematic Diagram of the Laser Interface**
- **Connections and Geometry of Transmission Lines**

Performance Optimization

- **Parasitic Elements**
- **Reducing Overshoot and Ringing on Rising and Falling Edges**
- **Minimizing Inductance**

Optical Test Equipment

- **Optical Test-Equipment Setup**
- **Mounting Information, Including Thermal Heat Sink**
- **Fiber-Optic Patch-Cable Alignment**
- **Optical-to-Electrical Converter**
- **Oscilloscope-Recorded Waveforms of Blue/Violet Laser-Driver Optical Output**

Decreasing the Rise/Fall Times

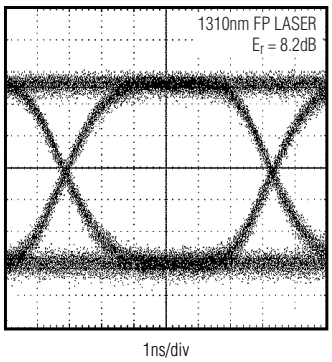
- **Optical Rise and Fall Times Limitations**
- **Analysis and Performance Relationships**

To Request a Complete Version of HFDN-28.0, Go to:
www.maxim-ic.com/MAX3701

High-Performance, Lowest Cost Chipset for 155Mbps, 3V Optical Modules

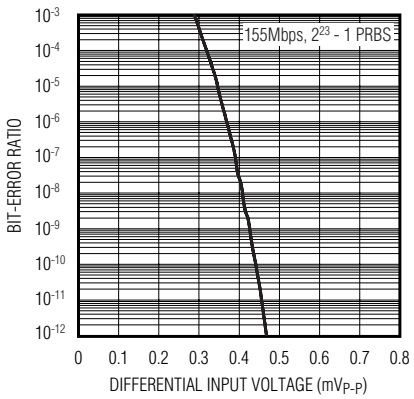
Less than 50ps Deterministic Jitter at Laser Driver Output

MAX3646
OPTICAL EYE DIAGRAM
(155Mbps, 2^7 - 1 PRBS, 117MHz FILTER)



500µV Input Sensitivity

MAX3645
BIT-ERROR RATIO vs.
DIFFERENTIAL INPUT VOLTAGE



MAX3646—3V, 155Mbps Laser Driver

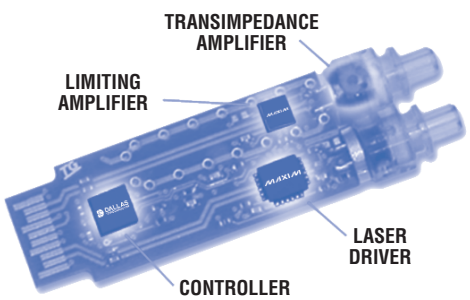
- Extinction Ratio Control
- On-Chip Thermal Compensation
- Meets all SFF/SFP Requirements
- 85mA Modulation Current

MAX3645—155Mbps Limiting Amplifier

- Pin Compatible to MC2045
- Adds Only 30ps Jitter
- 700ps Edge Transition Time
- Stable LOS over Supply

Part	Description	Data Rate (Mbps)	Temp Range (°C)	Pin-Package
MAX3646	+3.3V multirate laser driver with ERC	155–622	-40 to +85	24-QFN (4mm x 4mm)
MAX3645	3V/5V 200Mbps limiting amplifier	Up to 200	-40 to +85	16-QSOP/SO
MAX3657	3V TIA	155	-40 to +85	Die, 12-QFN (3mm x 3mm)

Chipset Price $2.50†



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- Application Notes
- Complete Reference Designs
- Design Support and SPICE Models
- Free Samples and Evaluation Kits

Visit Our Website at: www.maxim-ic.com/sfp

†100k-up recommended resale. Prices provided are for design guidance and are FOB USA. International prices will differ due to local duties, taxes, and exchange rates. Not all packages are offered in 1k increments, and some may require minimum order quantities. Chipset price includes the MAX3646, the MAX3645, and the MAX3657.

FUTURE PRODUCTS

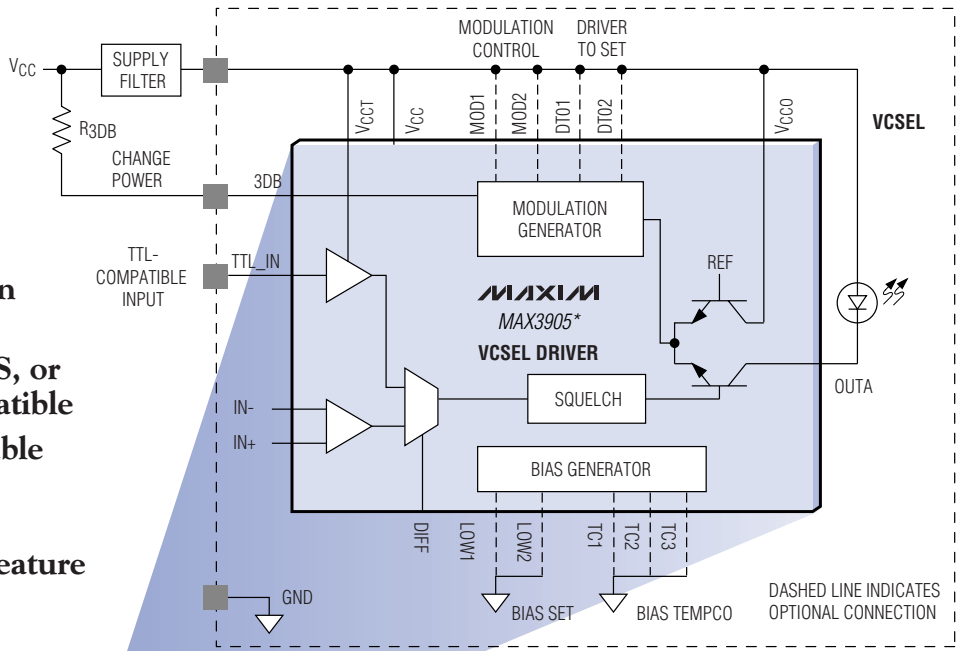
Robust ICs Power Automotive Optical Networks

Compatible with Industrial Standards Using Plastic or Silica Fiber at Data Rates Up to 150Mbps

These rugged ICs use Maxim's proprietary gold-plating process for resistance to metal migration. They readily operate up to +125°C.

MAX3905*—Transmitter for VCSEL Optics

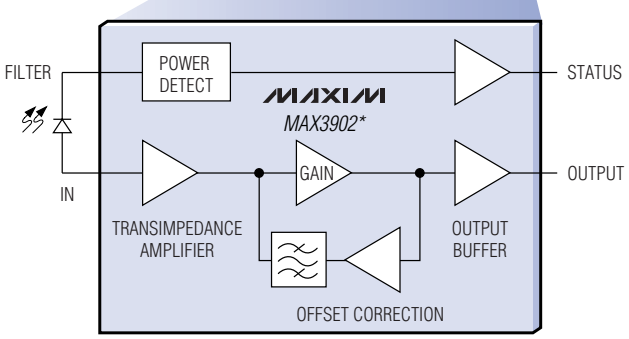
- +3.3V or +5.0V Supply Voltage
- -40°C to +140°C Operating Junction Temperature
- TTL/CMOS, LVDS, or PECL Data Compatible
- Wirebond-Adjustable VCSEL Low and High Currents
- Output Squelch Feature



DIE SIZE 1.78mm x 1.63mm

UP TO 150Mbps ON LOW-COST FIBER!

DIE SIZE 1.5mm x 1.5mm



MAX3902*—High-Gain Receiver

- -40°C to +140°C Operating Junction Temperature
- +3.3V or +5.0V Supply Voltage
- 2.0µA Sensitivity
- 1mA Peak-to-Peak Overload
- Input Power Detect with Power-Reducing Standby Mode

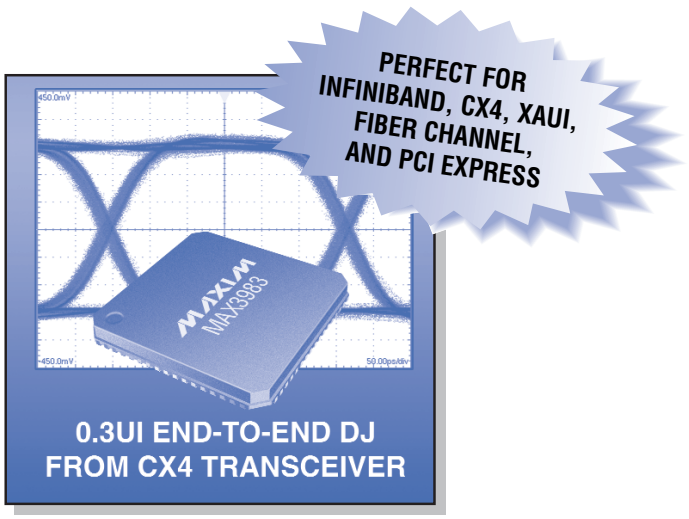
*Future product—contact factory for availability.

MAXIM

Cable Transceiver Simplifies InfiniBand and CX4 Copper Interconnects

The MAX3983 cable transceiver extends the interconnection distance for 4x copper InfiniBand (IB) and 10Gbase-CX4 Ethernet links. This device has four transmit paths that include PCB receivers and cable drivers, and four receive paths that include cable receivers and PCB drivers. Selectable preemphasis and receive equalization enable up to 0.5m on FR4 I/O and up to 20m on cable-side I/O. Signal detection on all eight inputs and internal loopback enable system diagnostic testing. The MAX3983 is packaged in a 10mm x 10mm, 68-pin QFN and operates from 0°C to +85°C.

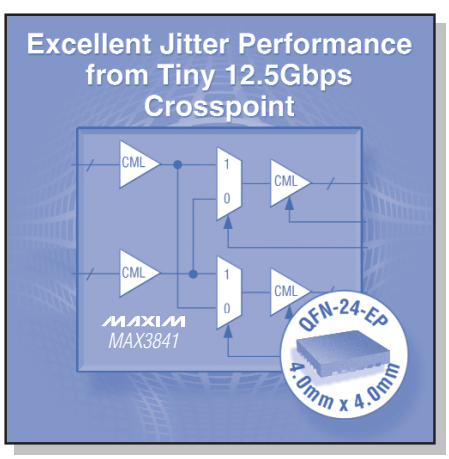
- **Span 20m with 24AWG, 15m with 28AWG**
- **Span 0.5m of FR4 on Each Host**
- **1.6W Total Power with 3.3V Supply**
- **Selectable Output Preemphasis**
- **Input Equalization**
- **Signal Detect for Each Channel**
- **Output Disable**



12.5Gbps Crosspoint Switch Outperforms Competition

The MAX3841 is the industry's highest performance, lowest power, 12.5Gbps, 2 x 2 crosspoint-switch IC. This device is ideal for high-speed serial-data loopback, redundancy, and switching for serial OC-192 and 10GbE applications, or other applications up to 12.5Gbps. In addition to functioning as a 2 x 2 switch, the MAX3841 can be configured as a 2:1 multiplexer, 1:2 buffer, or dual 1:1 buffer.

Specification	MAX3841	Competition
Maximum data rate	12.5Gbps	10.7Gbps
Maximum supply current	<90mA	<130mA
Random jitter	<0.7ps	<2ps
Channel-to-channel skew	<12ps	<20ps
Propagation delay	<140ps	<285ps
Output rise/fall time	<30ps	<60ps



For More Information on Maxim's Equalization Solutions, Go to: www.maxim-ic.com/signalintegrity

ICs for Optoelectronic Applications

Part	Supply Voltage (V)	Data Rate (bps)	Max Modulation Current (mA)	Max Bias Current (mA)	Pin-Package	EV Kit	Features	Applications
LASER DIODE DRIVERS								
MAX3261	5.0	1.25G	30	60	32-TQFP	Yes	Automatic power control, temperature-compensated reference voltage	Fibre Channel, 622Mbps ATM/SDH/SONET
MAX3263	5.0	155M	30	60	24-SSOP	—	Automatic power control, temperature-compensated reference voltage	155Mbps ATM/SDH/SONET
MAX3273	3.3	2.5G	60	100	24-QFN, Dice	Yes	100mW power, automatic average power control with failure monitor, selectable data-retiming latch	2.488Gbps SDH/SONET
MAX3286	3.0 to 5.5	1.25G	30	100	32-TQFP	Yes	Configurable for common-cathode or common-anode laser	Gigabit Ethernet, Fibre Channel
MAX3287	3.0 to 5.5	1.25G	30	100	16-TSSOP	Yes	Configured for common-cathode laser and photodiode	Gigabit Ethernet, Fibre Channel
MAX3288	3.0 to 5.5	1.25G	30	100	16-TSSOP	Yes	Configured for common-cathode laser without photodiode	Gigabit Ethernet, Fibre Channel
MAX3289	3.0 to 5.5	1.25G	30	100	16-TSSOP	Yes	Configured for common-anode laser and photodiode	Gigabit Ethernet, Fibre Channel
MAX3296	3.0 to 5.5	2.5G	30	100	32-TQFP	Yes	Configurable for common-cathode or common-anode laser	2x Gigabit Ethernet, 2Gbps Fibre Channel, 2.5Gbps ATM
MAX3297	3.0 to 5.5	2.5G	30	100	16-TSSOP	Yes	Configured for common-cathode laser and photodiode	2x Gigabit Ethernet, 2Gbps Fibre Channel, 2.5Gbps ATM
MAX3298	3.0 to 5.5	2.5G	30	100	16-TSSOP	Yes	Configured for common-cathode laser without photodiode	2x Gigabit Ethernet, 2Gbps Fibre Channel, 2.5Gbps ATM
MAX3299	3.0 to 5.5	2.5G	30	100	16-TSSOP	Yes	Configured for common-anode laser and photodiode	2x Gigabit Ethernet, 2Gbps Fibre Channel, 2.5Gbps ATM
MAX3646	2.97 to 3.63	155M to 622M	85	100	24-QFN	Yes	Extinction ratio control, on-chip thermal compensation, SFF-8472 compliant	125Mbps Ethernet, 155Mbps/622Mbps SONET
MAX3656	3.3	155M to 2.5G	70	85	24-QFN	Yes	Burst-mode driver from 155Mbps to 2.5Gbps, burst enable/disable <2ns, automatic power control	APON/EPON/GPON
MAX3663	3.1 to 5.5	622M	75	80	32-QFN	Yes	Automatic power control, bias-current and modulation-current monitors, true 3V operation	155Mbps/622Mbps PON, ATM
MAX3667	3.1 to 5.25	622M	60	90	32-TQFP	Yes	Automatic power control, true 3V operation	622Mbps SDH/SONET
MAX3668	3.1 to 5.5	622M	75	80	32-TQFP	Yes	Automatic power control, true 3V operation	622Mbps SDH/SONET
MAX3669	3.1 to 5.5	622M	75	80	32-TQFP, Dice	Yes	Automatic power control, bias-current and modulation-current monitors, true 3V operation	622Mbps SDH/SDNET
MAX3701	5.0	Up to 600M	200	200	32-QFN	Yes	Read/write operation for common-cathode blue laser, 0.9ns rise/fall time, 1nA/$\sqrt{Hz}$ oscillator output noise	1x and 2x high-capacity blue DVDs
MAX3735/5A	2.97 to 3.63	155M to 2.7G	85	100	24-QFN	Yes	90mW power, automatic power control, integrated safety features, SFP and SFF-8472 compliant	Multirate, SONET, Fibre Channel, Gigabit Ethernet
MAX3736	2.97 to 3.63	155M to 2.2G	85	100	16-QFN	Yes	70ps edge transition times, low 90mW power consumption, integrated safety features, SFP and SFF-8472 compliant	Multirate, SONET, Fibre Channel, Gigabit Ethernet
MAX3737	3.3	155M to 2.7G	85	100	32-QFN	Yes	Automatic power control, integrated safety features, on-chip thermal compensation, SFP and SFF-8472 compliant	Multirate, SONET, Fibre Channel, Gigabit Ethernet
MAX3738	2.97 to 3.63	1G to 2.7G	85	100	24-QFN	Yes	Extinction ratio control, on-chip thermal compensation, SFF-8472 compliant	Multirate, SONET, Fibre Channel, Gigabit Ethernet
MAX3740	2.97 to 3.63	1G to 3.2G	15	15	24-QFN	Yes	110mW power, automatic power control, integrated safety features, SFP and SFF-8472 compliant, common cathode or differential configuration, optional peaking current	Multirate short wave, OC48 short wave, Fibre Channel, Gigabit Ethernet, VCSEL transmitters
MAX3741	2.97 to 3.63	1G to 3.2G	15	15	16-QFN	Yes	135mW power, common cathode or differential configuration, optional peaking current	Multirate short wave, OC48 short wave, Fibre Channel, Gigabit Ethernet, VCSEL transmitters

ICs for Optoelectronic Applications (continued)

Part	Supply Voltage (V)	Data Rate (bps)	Max Modulation Current (mA)	Max Bias Current (mA)	Pin-Package	EV Kit	Features	Applications
LASER DIODE DRIVERS (CONTINUED)								
MAX3766	5	622M	60	80	20-QSOP, Dice	Yes	Up to 1.25Gbps operation, automatic power control, modulation-current temperature compensation	SDH/SONET, ATM, PONS, Fibre Channel, Gigabit Ethernet
MAX3850	3.3	2.7G	60	100	32-QFN	Yes	DC-coupled laser driver, 35mA supply current, automatic average power control	SDH/SONET, ATM, DWDM, PONS
MAX3863	3.3 to 5.0	2.7G	80	100	32-QFN	Yes	High-bias current, automatic power control	2.5Gbps/2.7Gbps DWDM
MAX3865	3.3 or 5.0	2.5G	60	100	32 QFN	Yes	Automatic modulation control and automatic power control	2.5Gbps SDH/SONET
MAX3867	3.1 to 5.5	2.5G	60	100	48-TQFP, Dice	Yes	Automatic power control, true 3V operation	2.5Gbps SDH/SONET
MAX3869	3.1 to 5.5	2.5G	60	100	32-TQFP-EP, Dice	Yes	Automatic power control, bias- and modulation-current monitors, true 3V operation	2.5Gbps SDH/SONET
MAX3905*	3.3 or 5.0	Up to 150M	—	—	Dice	Yes	Wirebond-adjustable VCSEL low and high currents, output squelch, -40°C to +140°C operating junction temperature	Plastic or silica fiber communications, industrial and automotive fiber networks
MAX3930/1/2	5.0 or -5.0	10G	100	100	Dice	Yes	Pulse-width adjustment, bias- and modulation-current monitors	10Gbps SDH/SONET, WDM
MAX3966	3.0 to 5.5	266M	130	—	16-QSOP, 24-QSOP	—	Programmable pre-bias voltage	FDDI, 266Mbps Fibre Channel
MAX3996	3.0 to 5.5	2.5G	30	60	20-QFN	Yes	155mW power, automatic power control, integrated safety features, SFP and SFF MSA compliant, temperature compensation of modulation current	VCSEL transmitters, 10GbE, Fibre Channel, Gigabit Ethernet

Part	Supply Voltage (V)	Data Rate (Gbps)	Max Modulation Current (mA)	Max EAM Bias Current (mA)	Pin-Package	EV Kit	Features	Applications
MODULATOR DRIVERS								
MAX3935	-5.2	10	100	40	32-QFN, Dice	Yes	EAM driver, pulse-width adjustment, bias- and modulation-current monitors	10Gbps SDH/SONET
MAX3940	+5.0 or -5.2	10	120	50	Dice	Yes	Integrated bias T, input retiming, pulse-width adjustment, polarity control, on-chip 50Ω input/output termination	OC192 SONET/10.3Gbps Ethernet IR optical links
MAX3941/2	+5.0 or -5.2	10	120	50/—	24-QFN	Yes	Integrated bias T, input retiming, pulse-width adjustment, polarity control, on-chip 50Ω input/output termination	OC192 SONET/10.3Gbps Ethernet IR optical links

Part	Supply Voltage (V)	Analog Bandwidth (MHz)	Transim-pedance (Ω)	Max Input Current (µA)	Input Noise (nA)	Supply Current (mA)	Pin-Package	EV Kit	Features	Applications
TRANSIMPEDANCE PREAMPLIFIERS										
MAX3266	3.0 to 5.5	920	2800	1000	200	26	Dice, 8-SO	Yes	Internal compensation, differential outputs, 30mil x 50mil die size	Gigabit Ethernet, Fibre Channel
MAX3267	3.0 to 5.5	1900	1900	1000	485	26	Dice, 8-SO	Yes	Internal compensation, differential outputs, 30mil x 50mil die size	2x Gigabit Ethernet, 2Gbps Fibre Channel, 2.5Gbps ATM
MAX3271	3.0 to 3.6	2000	2800	2000	495	25	Dice	Yes	Single 3.3V supply, 83mW power, 30mil x 50mil die size, on-chip filter resistor to bias photodiode	Gigabit Ethernet, Fibre Channel SDH/SONET, system interconnects
MAX3275/7	3.3	2300	3300	2000	300	25	Dice	Yes	83mW power, 24mil x 47mil die size, on-chip filter resistor to bias photodiode	Dual-rate Fibre Channel, Gigabit Ethernet
MAX3630*	3.3	—	—	—	—	—	Dice	Yes	—	GPON OLT
MAX3657	3.3	130	54k	2000	14	23	Dice, 8-QFN	Yes	-38dBm sensitivity	155Mbps PON, ATM
MAX3658	3.3	580	18k	2000	45	20	Dice, 8-QFN	Yes	-32dBm sensitivity	622Mbps PON, ATM
MAX3665	3.0 to 3.6	470	8000	450	55	21	Dice, 8-µMAX	Yes	Single 3.3V supply, low power, -40°C to +85°C operation	622Mbps SDH/SONET
MAX3724/5	3.3	2300	3500	2000	300	28	Dice	Yes	Up to 3.2Gbps operation, 90mW power, 30mil x 50mil die size, on-chip filter resistor, integrated receive power monitor, allows SFF-8472 in 4-pin TO46 header	Up to 3.2 optical receivers, Fibre Channel, Gigabit Ethernet

*Future product—contact factory for pricing and availability. Specifications are preliminary.

ICs for Optoelectronic Applications (continued)

Part	Supply Voltage (V)	Analog Bandwidth (MHz)	Transim-pedance (Ω)	Max Input Current (µA)	Input Noise (nA)	Supply Current (mA)	Pin-Package	EV Kit	Features	Applications
TRANSIMPEDANCE PREAMPLIFIERS (CONTINUED)										
MAX3744/5	3.3	2300	3300	2000	300	27	Dice	Yes	90mW power, 30mil x 50mil die size, on-chip filter resistor, integrated receive power monitor. Allows SFF-8472 in 4-pin TO46 header.	Up to 2.7Gbps SONET, Fibre Channel, Gigabit Ethernet
MAX3760	5.0	560	6500	1000	73	30	Dice, 8-SO	—	No external compensation capacitors, differential outputs	622Mbps ATM/SDH/SONET
MAX3864	3.0 to 5.5	2000	2750	2000	490	34	Dice	Yes	Single supply, -40°C to +85°C operation, >0dBm overload	2.488Gbps SDH/SONET
MAX3866	3.1 to 5.5	1800	—	—	433	50	Dice	Yes	Single 3.3V or 5V supply, -40°C to +85°C operation, includes limiting postamp	2.488Gbps SDH/SONET
MAX3902*	3.3 or 5.0	—	—	1000	—	—	Dice	Yes	2.0µA sensitivity, input power detect with standby mode, -40°C to +140°C operating junction temperature	Plastic or silica fiber communications, industrial and automotive fiber networks
MAX3963	5.0	180	22k	60	21	12	Dice, 8-SO	—	60mW typical power dissipation	FDDI, 155Mbps ATM
MAX3910	+5.0 or -5.2	9100	1650	3500	1100	110	Dice	Yes	950µA linear range, 15.5µA sensitivity, output offset adjust	Up to 10.7Gbps SDH/SONET
MAX3970	3.0 to 3.6	9000	590	2000	1100	45	Dice	Yes	Signal strength indicator, -18dBm sensitivity, 150mW power consumption	10Gbps Ethernet, OC-192 SDH/SONET

Part	No. of Channels	Data Rate per Channel (Gbps)	Supply Voltage (V)	Supply Current per Channel (mA)	Input Noise (nA)	Analog Bandwidth (MHz)	Trans-impedance (kΩ)	Pin-Package	EV Kit	Features	Applications
MULTICHANNEL TRANSIMPEDANCE AMPLIFIERS											
MAX3825	4	2.5	3.0 to 3.6	35	460	2400	3.6	Dice	Yes	Internal compensation capacitors, 250µm pad pitch, differential outputs	2.5Gbps SDH/SONET interconnects

Part	Supply Voltage (V)	Data Rate (Gbps)	Supply Current (mA)	I/O Levels	Pin-Package	EV Kit	Features	Applications
AUTOMATIC GAIN-CONTROL AMPLIFIERS								
MAX3861	3.3 to 5.0	2.7	72	CML	24-QFN	Yes	3.4GHz small-signal bandwidth, external-output amplitude control, 0.26mV input noise	2.7Gbps DWDM, 2.5Gbps SDH/SONET

Part	Data Rate (bps)	Supply Voltage (V)	Input Sensitivity (mV)	Edge Speed (ps, max)	Pin-Package	EV Kit	Features	Applications
LIMITING AMPLIFIERS								
MAX3262	1G	5.0	6	250	24-SSOP	—	Programmable LOS threshold	Gigabit Ethernet, Fibre Channel
MAX3264	1.25G	3.0 to 5.5	5	300	16-TSSOP	Yes	CML data output	Gigabit Ethernet, Fibre Channel
MAX3265	2.5G	3.0 to 5.5	10	150	16-TSSOP, 10-µMAX	Yes	CML data output	2x Gigabit Ethernet, 2Gbps Fibre Channel, 2.5Gbps ATM
MAX3268	1.25G	3.0 to 3.6	5	300	10-µMAX	Yes	PECL data output	Gigabit Ethernet, Fibre Channel
MAX3269	2.5G	3.0 to 3.6	10	150	10-µMAX	Yes	PECL data output	2x Gigabit Ethernet, 2Gbps Fibre Channel, 2.5Gbps ATM
MAX3272	2.5G	3.3	10	100	20-QFN, Dice	Yes	Low 11ps DJ, CML outputs, programmable signal-detect function, 115mW power consumption.	Gigabit Ethernet, Fibre Channel, ATM, system interconnects
MAX3274/6	1.0625G/ 2.125G	3.3	10	100	16-QFN	Yes	4th-order Bessel-Thompson filter, low-jitter squelch control, 100Ω/150Ω output terminations, programmable LOS	Dual-rate Fibre Channel, Gigabit Ethernet
MAX3632*	1.25G	3.3	—	—	20-QFN, Dice	—	—	GPON OLT
MAX3645	125M to 200M	3.3 or 5.0	500µV	700	16-SO, 16-QSOP	Yes	Pin compatible to MC2045, compatible to 4B/5B coding, stable LOS over supply	125Mbps Ethernet, 155Mbps SONET, FTTx

*Future product—contact factory for pricing and availability. Specifications are preliminary.

ICs for Optoelectronic Applications (continued)

Part	Data Rate (bps)	Supply Voltage (V)	Input Sensitivity (mV)	Edge Speed (ps, max)	Pin-Package	EV Kit	Features	Applications
LIMITING AMPLIFIERS (CONTINUED)								
MAX3746	155M to 3.2G	3.3	3	70	16-QFN	Yes	Pin compatible to MAX3748A, low 60mW power consumption, provides RSI signal when used with MAX3744 or MAX3724	Up to 3.2 optical receivers, Fibre Channel, Gigabit Ethernet
MAX3747	155M to 3.2G	+3.3	3	70	10-µMAX	Yes	Pin compatible to SY88993V, chatter free LOS with programmable threshold, >57dB gain	Up to 3.2 optical receivers, Fibre Channel, Gigabit Ethernet
MAX3748	155M to 3.2G	3.3	5	86	16-QFN	Yes	Low 8.5ps DJ, CML outputs, programmable signal detect, 105mW power, DC-coupling to TIA, receive power monitor output	Gigabit Ethernet, Fibre Channel, SONET, multirate
MAX3761	622M	5.0	4	250	20-QSOP	Yes	PECL data output, TTL LOS	622Mbps ATM
MAX3762	622M	5.0	4	250	20-QSOP	Yes	PECL data output, PECL LOS	622Mbps ATM
MAX3765	2.5G	3.0 to 5.5	10	150	10-µMAX-EP	Yes	Low 11ps DJ, CML outputs, programmable signal-detect function	Gigabit Ethernet, Fibre Channel, ATM, system interconnects
MAX3964/5	155M	3.0 to 5.5	2	2200	20-QSOP	—	Loss-of-signal detector with programmable threshold	125Mbps FDDI receivers, 155Mbps LAN ATM
MAX3968	266M	3.0 to 5.5	2	1200	20-QSOP	—	Loss-of-signal detector with programmable threshold	266Mbps Fibre Channel, ESCON
MAX3971/1A	10.3G	3.3 to 3.6	9.5	30	Dice, 20-QFN	Yes	CML data output, 3.4ps DJ, output disable	10.3Gbps Ethernet, OC-192 VSR

Part	No. of Channels	Data Rate per Channel (Gbps)	Supply Voltage (V)	Supply Current per Channel (mA)	Input Sensitivity (mV)	Edge Speed (ps, max)	Pin-Package	EV Kit	Features	Applications
MULTICHANNEL LIMITING AMPLIFIERS										
MAX3822	4	2.5	3.0 to 3.6	53	20	120	48-TQFP-EP, Dice	Yes	Loss-of-power indicator, differential CML outputs	2.5Gbps optical system interconnects

Part	Supply Voltage (V)	Input Data Rate (bps)	Output Data Rate (Mbps)	Supply Current (mA)	Clock and Data Inputs	Data Outputs and Synchronization Inputs	EV Kit	Features	Applications
DESERIALIZERS									
MAX3680	3.0 to 3.6	622M	77	50	Differential PECL	TTL	Yes	1:8 deserializer, single 3.3V supply, low power, -40°C to +85°C operation	622Mbps SDH/SONET
MAX3681	3.0 to 3.6	622M	155	80	Differential PECL	LVDS	Yes	1:4 deserializer, single 3.3V supply, low power, LVDS outputs, -40°C to +85°C operation	622Mbps SDH/SONET
MAX3880	3.0 to 3.6	2.5G	155	275	Differential CML	LVDS	Yes	1:16 deserializer with clock recovery, single 3.3V supply, low power, LVDS outputs, -40°C to +85°C operation	2.5Gbps SDH/SONET
MAX3881	3.0 to 3.6	2.5G	155	160	Differential CML	Single-ended PECL	Yes	1:16 deserializer, single 3.3V supply, low power, single-ended PECL outputs, -40°C to +85°C operation	2.5Gbps SDH/SONET
MAX3882	3.3	2.5G/2.7G	622/667	185	CML	LVDS	Yes	1:4 deserializer with CDR, selectable 2.5Gbps and 2.7Gbps input data rates	2.5/2.7Gbps DWDM, 2.5 Gbps SDH/SONET
MAX3885	3.0 to 3.6	2.5G	155	200	Differential CML	LVDS	Yes	1:16 deserializer, single 3.3V supply, low power, LVDS outputs, -40°C to +85°C operation	2.5Gbps SDH/SONET
MAX3950	3.0 or 3.6	10.7G	622/667	270	Differential CML	LVDS	Yes	1:16 deserializer, single 3.3V supply, low power, LVDS outputs, -40°C to +85°C operation	10Gbps SDH/SONET, WDM
MAX3953	3.3	9.95G/10.3G	622/644	475	CML	LVDS	Yes	1:16 deserializer with clock recovery	10Gbps Ethernet

ICs for Optoelectronic Applications (continued)

Part	Supply Voltage (V)	Input Data Rate (bps)	Output Data Rate (bps)	Supply Current (mA)	Clock and Data Inputs	Data Output	EV Kit	Features	Applications
SERIALIZERS									
MAX3690	3.0 to 3.6	77M	622	60	TTL	Differential PECL	Yes	8:1 serializer, single 3.3V supply, low power, TTL inputs, -40°C to +85°C operation	622Mbps SDH/SONET
MAX3693	3.0 to 3.6	155M	622M	65	LVDS	Differential PECL	Yes	4:1 serializer, single 3.3V supply, low power, LVDS inputs, -40°C to +85°C operation, multiple reference-clock frequencies	622Mbps SDH/SONET
MAX3890	3.0 to 3.6	155M	2.5G	150	LVDS	Differential PECL	Yes	16:1 serializer, single 3.3V supply, low power, LVDS inputs, -40°C to +85°C operation	2.5Gbps SDH/SONET
MAX3891	3.0 to 3.6	155M	2.5G	150	Single-ended PECL	Differential PECL	Yes	16:1 serializer, single 3.3V supply, low power, single-ended PECL inputs, -40°C to +85°C operation	2.5Gbps SDH/SONET
MAX3892	3.3	622M/667M	2.5G/2.7G	138	LVDS	CML	Yes	4:1 serializer with integrated clock generation, LVDS inputs, -40°C to +85°C operation	2.5/2.7Gbps DWDM, 2.5Gbps SDH/SONET
MAX3952	3.3	9.95G/10.3G	622M/644M	350	LVDS	CML	Yes	16:1 serializer, -40°C to +85°C operation, integrated PRBS-7 pattern generator	10Gbps Ethernet

Part	Supply Voltage (V)	Data Rate (bps)	I/O Levels	Bellcore Jitter Tolerance	Pin-Package	EV Kit	Features	Applications
CLOCK RECOVERY AND DATA RETIMING ICs								
MAX3676	3.0 to 5.5	622M	PECL	Surpasses specification	32-TQFP	Yes	Single 3.3V or 5V supply, includes limiting postamp, -40°C to +85°C operation, meets SONET receiver and regenerator specifications	622Mbps SDH/SONET
MAX3872	3.3	Multirate	CML	Surpasses specification	32-QFN	Yes	Low power, multirate input data: OC-3, OC-12, OC-48, OC-48 with (FEC) and Gigabit Ethernet (1.25Gbps/2.5Gbps)	SDH/SONET, DWDM, Gigabit Ethernet
MAX3873	3.3	2.5G/2.7G	CML	Surpasses specification	20-QFN	Yes	Ultra-low power, low-jitter operation, compact 4mm x 4mm package, selectable CML levels	2.5Gbps system interconnect
MAX3874	3.3	2.5G/2.7G	CML	Surpasses specification	32-QFN	Yes	Ultra-low-power, low-jitter operation	2.5Gbps/2.7Gbps SDH/SONET
MAX3875/5A/6	3.0 to 5.5	2.5G	PECL/ CML	Surpasses specification	32-TQFP	Yes	Single 3.3V or 5V supply, -40°C to +85°C operation, meets all Bellcore jitter specifications	2.5Gbps SDH/SONET
MAX3877/ MAX3878	3.0 to 5.5	2.5G	CML	Surpasses specification	32-TQFP-EP	Yes	Vertical threshold adjust	2.5Gbps SDH/SONET, WDM

System Interconnect Products

Part	Data Rate (bps)	Supply Voltage (V)	Supply Current (mA)	I/O Levels	EV Kit	Features	Applications
CROSSPOINT SWITCHES							
MAX3640	622M	3.3	78	LVDS	Yes	Dual 4x2 switch power-down for deselected outputs	622Mbps SDH/SONET
MAX3840	2.5G	3.3	130	CML	Yes	Dual 2x2 switch	2.5Gbps SDH/SONET
MAX3841	Up to 12.5G	3.3	65	CML	Yes	2x2 switch, interface I/O to different supplies	OC192 SONET, 10GbE, high-performance switching

Part	Supply Voltage (V)	Data Rate (Mbps)	Deterministic Jitter (ps)	Power (mW)	Pin-Package	EV Kit	Features	Applications
SIGNAL REDUNDANCY								
MAX3781/3	3.0 to 3.6	2750	11	950	48-TQFP-EP	Yes	Dual-channel 2:1 mux and 1:2 fanout buffer, power-down mode for unused outputs, loopback (MAX3783)	Data rates up to 2.75Gbps, channel redundancy, system interconnects

Part	Data Rate (Gbps)	No. of Channels	Supply Voltage (V)	Supply Current (mA)	I/O Levels	Features	Applications
EQUALIZERS							
MAX3784	Up to 5	1	3.3	56	CML	PCB equalizer	Gigabit Ethernet
MAX3785	Up to 6.4	1	1.8	35	CML	PCB equalizer, 1.5mm x 1.5mm size	SDH/SONET, Gigabit Ethernet
MAX3800	Up to 3.2	1	3.3	65	CML	Adaptive cable equalizer and coaxial cable driver transceiver	High-speed communications links, SDH/SONET transmission equipment
MAX3801	Up to 3.2	1	3.3 or 5.0	36	CML	Adaptive cable equalizer	High-speed communications links, SDH/SONET transmission equipment
MAX3802	Up to 3.2	4	3.3	220	CML	Quad independent adaptive cable equalizer and driver	High-speed communications links, SDH/SONET
MAX3803	Up to 3.2	1	3.3	45	CML	PCB equalizer, 2mm x 2.5mm size, DC-couple from 1.2V to 3.3V	SDH/SONET, Gigabit Ethernet
MAX3804	Up to 12.5	1	3.3	35	CML	Settable receive equalizer, DC-couple from 1.8V to 3.3V	SDH/SONET, Gigabit Ethernet
MAX3805	Up to 10.7	1	3.3	41	CML	Adaptive receive equalizer, DC-couple from 1.8V to 3.3V	SDH/SONET
MAX3980	3.125	4	3.3	212	CML output	4-channel, 40in PCB equalizer	10Gbps Ethernet XAUI
MAX3981	3.125	4	3.3	212	CML output	4-channel, 10m cable equalizer	10Gbps Ethernet XAUI
MAX3983	2.5 to 3.2	4	3.3	365	CML	4-channel copper cable signal conditioner, transmit and receive equalization	10Gbps Ethernet XAUI, 10Gbase-CX4, 4x InfiniBand

Part	Supply Voltage (V)	Serial Data Rate (Gbps)	Parallel Channel Rate (bps)	Supply Current (mA)	Pin-Package	EV Kit	Features	Applications
SYSTEM INTERCONNECT TRANSCEIVERS								
MAX3831	3.0 to 3.6	2.5	622M	440	64-TQFP-EP	Yes	Four-channel interconnect mux/demux with loss-of-frame indicator and built-in self-test, PCLK out = 622MHz	2.5Gbps SDH/SONET backplanes, intrarack/subrack interconnects
MAX3832	3.0 to 3.6	2.5	622M	480	64-TQFP-EP	Yes	Four-channel interconnect mux/demux with loss-of-frame indicator and built-in self-test, PCLK out = 155MHz	2.5Gbps SDH/SONET backplanes, intrarack/subrack interconnects
MAX3780	3.3	2.5	1.25G	665	100-TQFP	Yes	Quad cable transceiver with transmit FIFO and preemphasis, receive equalization, and clock recovery	Serial cable communications up to 10m and fiber-optic links, Gigabit Ethernet
MAX3782	3.3	1.25	1.25G	440	68-QFN	Yes	Dual transceiver with transmit FIFO and receive clock recovery	Gigabit Ethernet

Part	Clock Frequency (MHz)	Supply Voltage (V)	Supply Current (mA)	Jitter Transfer Bandwidth (Hz)	Intrinsic Jitter (ps)	I/O Levels	Pin-Package	EV Kit	Features	Applications
REFERENCE CLOCK GENERATOR										
MAX3670	155 to 670	3.3 or 5.0	48	15 to 20,000	<0.4	PECL	32-QFN	Yes	FEC-rate compatible, dividable main and optional output frequency, LOL indicator	SDH/SONET transponder modules, reference clock jitter filter
MAX3672	155 to 670	3.3 or 5.0	45	30 to 10,000	<0.4	PECL	Dice	Yes	FEC-rate compatible, dividable main and optional output frequency, LOL indicator	SDH/SONET transponder modules, reference clock jitter filter

Storage Area Network Products

Part	Supply Voltage (V)	Data Rate (Mbps)	Deterministic Jitter (ps)	Power (mW)	Pin-Package	EV Kit	Features	Applications
PORT BYPASS CIRCUITS								
MAX3750	3.0 to 3.6	2125	10	190	16-QSOP	Yes	Internal transmission-line terminations, output driver tolerates mismatched loads, low power	Fibre Channel arbitrated loop, mass storage systems
MAX3751	3.0 to 3.6	1063	10	180	16-QSOP	Yes	Internal transmission-line terminations, output driver tolerates mismatched loads, low power	Fibre Channel arbitrated loop, mass storage systems
DATA REPEATERS								
MAX3770	3.0 to 3.6	2125	15	215	16-TSSOP	Yes	No external reference clock needed, signal lock indicator, 0.7UI jitter tolerance	Fibre Channel arbitrated loop, mass storage systems
MAX3772–MAX3775	3.3	1.0625/2.125	48 (max at 2Gbps)	290	16-QSOP-EP	Yes	No reference clock required, frequency lock indicator, 0.7UI jitter tolerance, 100Ω/150Ω input/output port impedances	Dual-rate Fibre Channel, storage area networks
PORT BYPASS CIRCUITS WITH DATA REPEATERS								
MAX3752	3.0 to 3.6	2125	12	825	48-TQFP-EP	Yes	Quad-port bypass, internal transmission-line terminations, 0.7UI jitter tolerance	Fibre Channel arbitrated loop, mass storage systems
MAX3754	3.0 to 3.6	1062.5/2125	37/28	810	48-TQFP-EP	Yes	Quad-port bypass circuit, 0.7UI jitter tolerance, 150Ω differential L-port impedances	Fibre Channel arbitrated loop, mass storage systems
MAX3755	3.0 to 3.6	1062.5/2125	37/28	1000	48-TQFP-EP	Yes	Quad-port bypass circuit, 0.7UI jitter tolerance, 100Ω differential L-port impedances	Fibre Channel arbitrated loop, mass storage systems

Part	Data Rate (Gbps)	Supply Voltage (V)	Residual Jitter (ps)	Pin-Package	Features	Applications
SATA SIGNAL REDUNDANCY						
MAX3786	1.5	3.3	<50	32-QFN	SATA OOB signaling support, receive equalization and transmit preemphasis, loopback	Serial-ATA storage systems