

3 Gbps Laser Driver

CX02066

3.3 Volt Highly Integrated, Programmable Laser Driver IC for SONET/SDH Applications

Mindspeed Technologies[™] 3 Gbps laser driver delivers industry-leading power-consumption figures in small form-factor BCC packages. Ideal for datacom and telecom modules, it enables a progression path into OC-48 applications with a low external component count.

The CX02066 is a highly integrated, programmable laser driver intended for short-reach SONET/SDH applications with forward error correction (FEC). The versatile CX02066 can be used in lower data-rate access rings (OC-12 and lower), as well as in metro link add/drop multiplexers operating at OC-48.

Using differential PECL data and clock inputs, the CX02066 supplies the bias and modulation current for driving an edge-emitting laser. The modulation output can be DC-coupled to the laser diode, giving a significant power savings over AC-coupled operation.

The CX02066 includes automatic power control (APC) to maintain a constant average laser output power over temperature and life. In addition, the modulation current is temperature-compensated to minimize variation in extinction ratio over temperature. Output flags indicate laser end-of-life as well as failure of the APC circuitry to maintain average output power.

The CX02066 laser driver consists of a high-speed modulation driver and a laser bias generator with mean power control (MPC). It is optimized for high-speed,

KEY FEATURES

- High-speed operation; suitable for applications up to 3 Gbps
- DC- or AC-coupled modulation drive consumes significantly less power than competing solutions at 3.3 volts
- Minimal external component count
- Differential data and clock inputs minimize pattern-dependent jitter
- Bias and modulation current monitor
- Automatic laser power control, with programmable temperature compensation and 'slow-start'

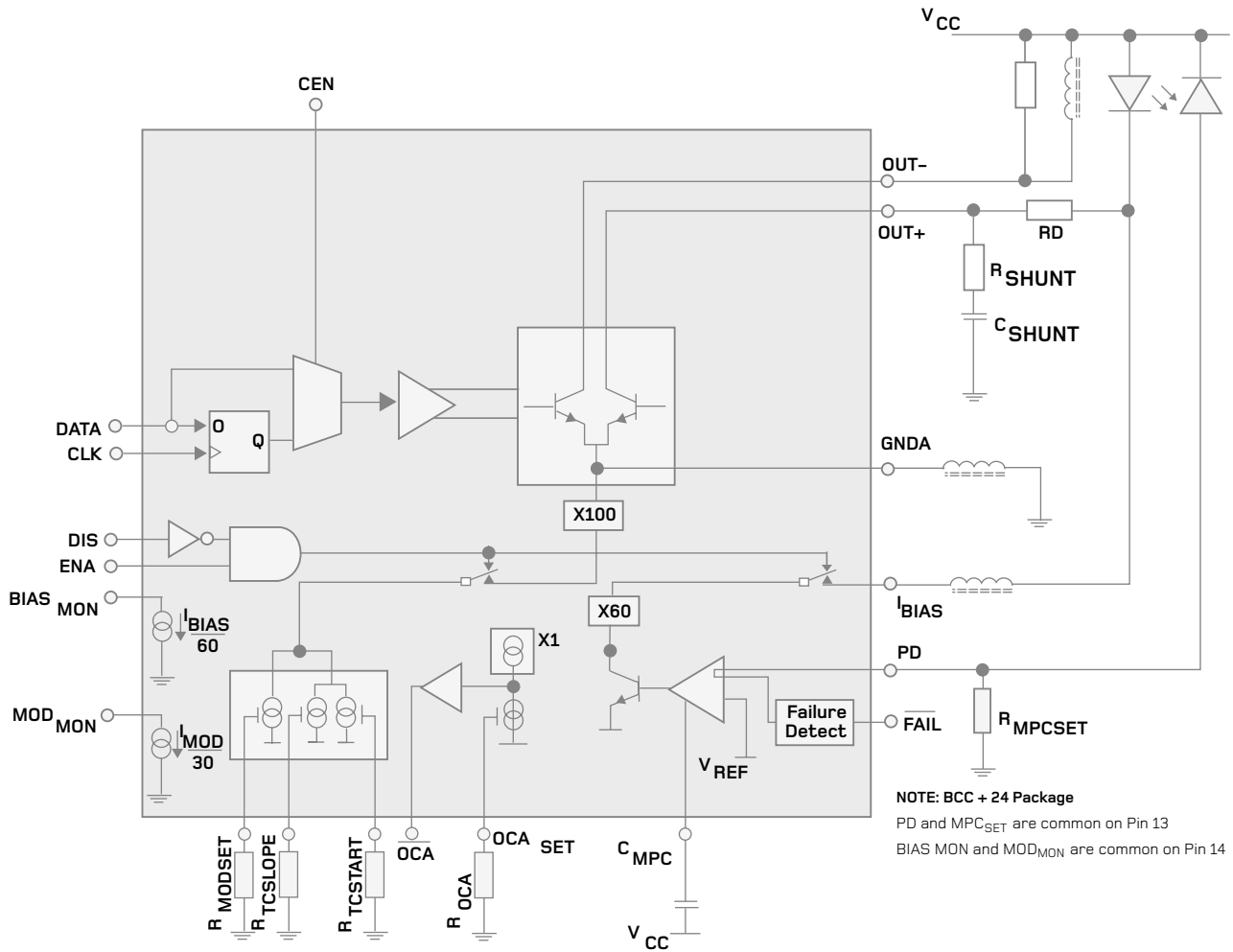
low-power operation with a 3.3 V supply. To minimize the pattern-dependent jitter of the input signal, the device accepts an input clock signal for data retiming.

To maintain constant average optical power, the CX02066 incorporates a control loop to compensate for the changes in laser threshold current over temperature and lifetime.

The modulator output stage is designed to drive up to 85 mA into a 25 Ω load, in AC-coupled or DC-coupled mode. The DC-coupled mode significantly reduces power consumption. Unlike many competing devices, the CX02066 is capable of operating in this mode at 3.3 V, further reducing power consumption.

A monitor photodiode mounted in the laser package is used to convert the optical power into a photocurrent. The MPC loop adjusts the laser bias current so that the voltage at PD is matched to an on-chip reference voltage.





CX02066 functional block diagram

Product Highlights

Features

- High-speed operation; suitable for applications up to 3 Gbps
- Typical rise/fall times < 90 ps
- DC- or AC-coupled modulation drive
- Differential data and clock inputs minimize pattern-dependent jitter
- Independently programmable laser bias and modulation currents

- Bias current to 100 mA and modulation current to 85 mA at $V_{CC} = 3.3$ V
- Automatic laser power control, with programmable temperature compensation and 'slow-start'
- Bias and modulation current monitor
- Operates with +3.3 V supply
- Functionally compatible with MAX3869
- Available in die form, BCC+24 or TQFP32

Applications

- Short-reach SONET/SDH
- Metro-reach SONET/SDH
- Datacom modules
- Telecom modules
- Add/drop multiplexers

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