



## 1.0 to 11.3Gb/s Multi-Rate SR Transceiver Chip

### Features

- Power Dissipation 180mW typical ( $I_{BIAS} = 0\text{mA}$ ,  $I_{MOD} = 0\text{mA}_{ppd}$ )
- VCSEL Laser Driver:
  - ◆ Maximum bias current = 15mA
  - ◆ Maximum modulation current into 50Ω differential TOSA = 20mA<sub>pp</sub>
  - ◆ Tx DJ = 5ps<sub>pp</sub>; Tx RJ = 0.5ps<sub>rms</sub>
  - ◆ Integrated closed loop Automatic Power Control (APC)
  - ◆ Compatible with micro controller based modulation current/temperature look-up table
  - ◆ Programmable Tx eye shaping features and input equalization
  - ◆ Programmable rise/fall times
  - ◆ Laser safety features
  - ◆ Switchable Tx polarity invert
- Limiting Amplifier Receiver:
  - ◆ Rx sensitivity at 11.317Gb/s = 5mV<sub>ppd</sub>
  - ◆ Rx DJ = 4ps<sub>pp</sub>; Rx RJ = 0.7ps<sub>rms</sub>
  - ◆ Programmable bandwidth
  - ◆ Rx output pre-emphasis and squelch
  - ◆ Programmable Rx output swing
  - ◆ Programmable rise/fall times
  - ◆ Adjustable loss of signal detect threshold
  - ◆ Switchable Rx polarity invert
- Measurement of digital diagnostic and monitoring parameters
- 2-wire serial interface for host communication
- Software selectable power-down modes
- 3.3V or 2.5V CMOS inputs and open drain outputs for control and status lines

### Applications

This specification defines a multi-rate transceiver IC for use in a wide range of SR Ethernet and Fibre Channel applications from 1.0Gb/s to 11.3Gb/s. This includes 1Gb/s and 10Gb/s Ethernet data rates as defined by IEEE 802.3 and 1,2,4,8 and 10Gb/s Fibre Channel data rates.

### Description

The GN1158 is a multi-rate transceiver IC designed specifically for datacom and telecommunication applications.

The transmit VCSEL laser driver is an advanced design that is focused on delivering excellent optical performance while still achieving low power. Programmable equalisation is available to optimise jitter. The Tx output has programmable rise/fall times to allow optimization for different bit rates.

The GN1158 features an integrated automatic power control loop that adjusts bias current to compensate for laser aging and environment change. The GN1158 is compatible with an external micro controller look-up table to control modulation current and extinction ratio over temperature and life.

The receive side features a limiting amplifier with automatic input offset control. The Rx Output features pre-emphasis to optimize eye shape through the module connector and FR4 transmission lines.

To allow optimization for different bit rates, the Limiting Amplifier has programmable bandwidth and the Rx output has programmable rise/fall times.

Digital diagnostic and monitoring parameters are measured by an integrated ADC and are communicated via the 2-wire serial interface.