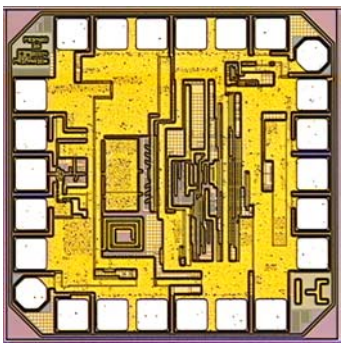
PX5420

Multi-Rate TIA/LA Optical Receiver

Product Brief

September 2004



Features

- Integrated transimpedance and limiting amplifier for serial optical receiver applications
- Receiver sensitivity 10 μA_{pp} for 10^{-12} BER at 4.25 Gb/s
- Receive signal strength indicator (RSSI)
- Loss of signal indicator (LOS)
- Selectable squelch circuit disables output at low input levels
- Back-terminated 50-ohm CML output
- Selectable 250 mV or 650 mV differential output amplitude
- No external passives required for photodiode bias network
- Single +3.3 V supply dissipating 100 mW

Applications

- Receive optical sub-assemblies (ROSA)
- 4GFC, 2GFC, 1GFC, OC-48, GbE
- SFP/SFF and proprietary optical modules

Description

The growing use of serial optical modules in datacenter LAN and SAN infrastructures have created a need for multi gigabit optical modules. The introduction of 4 Gb/s Fiber Channel standard for SANs is leading the data rate requirements for current 1 Gb/s and 2 Gb/s optical modules while demanding full backward compatibility. The Zarlink PX5420 multi-rate TIA/LA optical receiver provides the performance and feature set required by competitive SFF and SFP optical modules.

The Zarlink PX5420 optical receiver is a single channel TIA/LA optical receiver designed for various applications to 4.25 Gb/s. It consists of a transimpedance amplifier (TIA) and an AC-coupled differential limiting amplifier (LA).

The transimpedance amplifier achieves a nominal bandwidth of 3 GHz over a wide range of photodiode input capacitance. A photodiode bias current monitor allows for a simple alignment procedure.

The transimpedance amplifier is AC-coupled internally to a high-gain, high-bandwidth, limiting amplifier. The limiting amplifier provides a differential back-terminated current-mode logic (CML) output that can be used to drive a 4.25 Gb/s intra module post amplifier or directly drive to the edge of the module.

Full diagnostics are delivered through loss of signal, squelch, and received signal strength indicator circuits.

Figure 1: 4.25 Gb/s differential data output using a PRBS23 data pattern

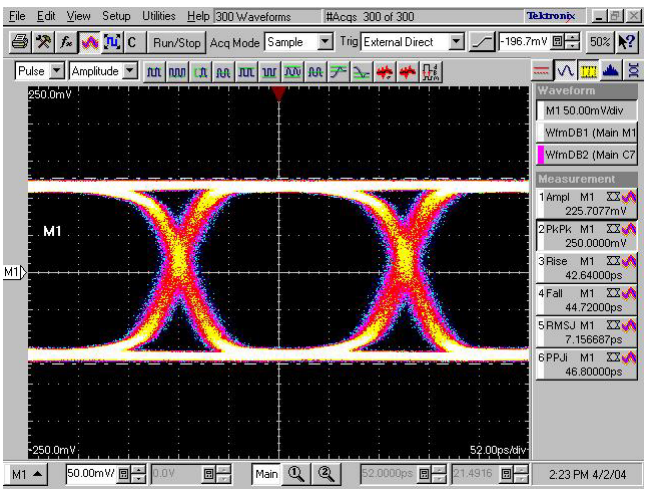


Figure 2: Diagram shows a typical bonding configuration for the PX5420 mounted on a TO-46 header. The figure shows a photodiode attached directly on the PX5420 IC. Also shown are two microwave chip capacitors. A single capacitor connected to a 3.3 V supply is required. The second capacitor (not connected to an external supply) is recommended but not required. Capacitor values of 200 fF are typical but vary by application environment.

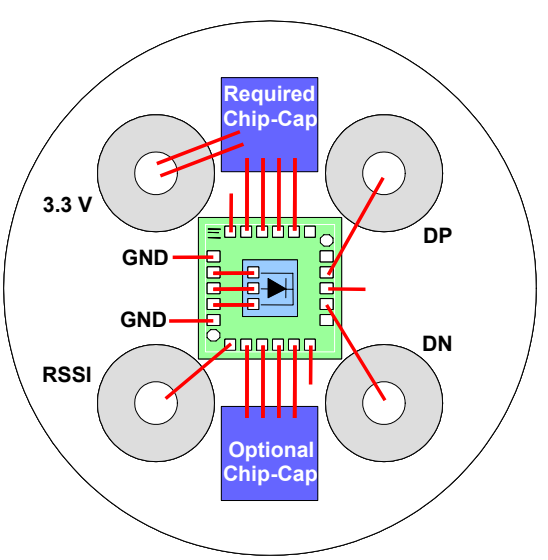
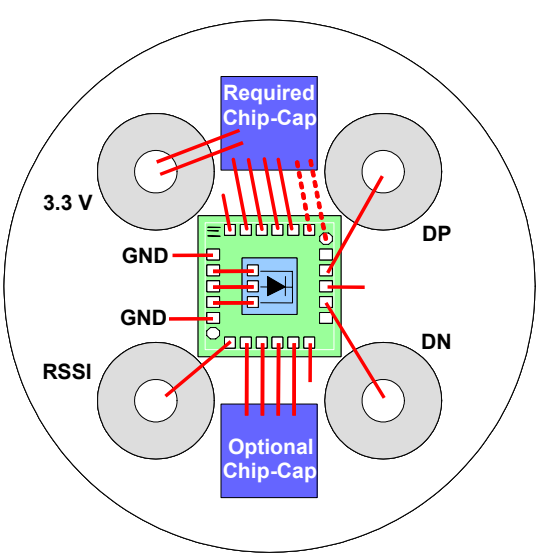


Figure 3: Similar configuration as Figure 2. OAC pad connected to VCC providing increased output amplitude. Sq_En (also connected to VCC) disables the limiting amplifier when LOS is asserted.



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