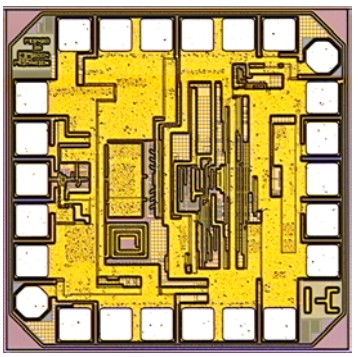
PX6420

Multi-Rate TIA/LA Optical Receiver

Product Brief

September 2004



Features

- Integrated transimpedance and limiting amplifier for serial optical receiver applications
- Receiver sensitivity 20 μA_{pp} for 10^{-12} BER at 10 Gb/s
- Receive signal strength indicator (RSSI) for digital diagnostics and active alignment
- Loss of signal indicator (LOS)
- Optional squelch circuit disables output at low input levels
- Back-terminated 50-ohm CML output providing 250 mVpp differential amplitude
- No external passives required for photodiode bias network
- Single +3.3 V supply dissipating 115 mW

Applications

- 850 nm and 1310 nm receive optical sub-assemblies (ROSA)
- XFP, X2, XPAC, XENPAC optical modules
- 10GbE, 10GFC, 8GFC, 4GFC, OC-192 VSR
- Proprietary back plane optics

Description

The growing use of the Internet has created increasingly higher demand for multi-Gb/s I/O performance. The demand and availability of 10 Gb/s+ WAN bandwidth fuels the growth of native 10 Gb/s infrastructures within MAN and enterprise datacenters.

The Primarion® PX6420 10 Gb/s receiver is a single channel TIA/LA optical receiver designed for various 10 Gb/s PMD applications. It consists of a transimpedance amplifier and an AC-coupled differential limiting amplifier.

The transimpedance amplifier achieves a nominal bandwidth of 8 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 CML output that can be used to drive 10 Gb/s Serdes or other CML compatible circuits.

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

Figure 1: 10 Gb/s differential data output using a PRBS23 optical data input pattern

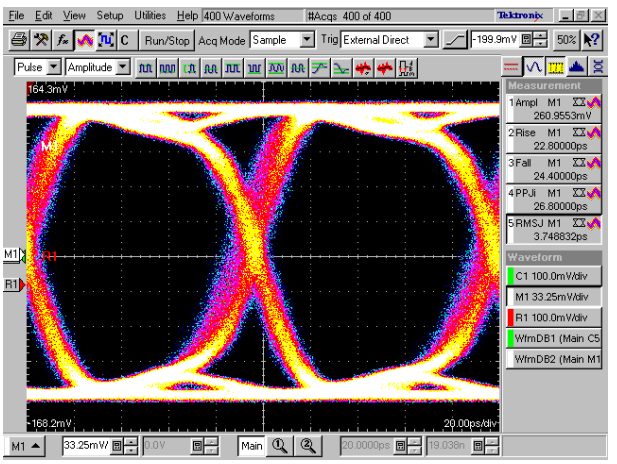


Figure 2: Diagram shows a typical bonding configuration for the PX6420 mounted on a TO-46 header. The figure shows a photodiode attached directly on the PX6420 IC. Also shown are two microwave chip capacitors used for VCC decoupling. Capacitor values of 200 fF are typical but vary by application environment.

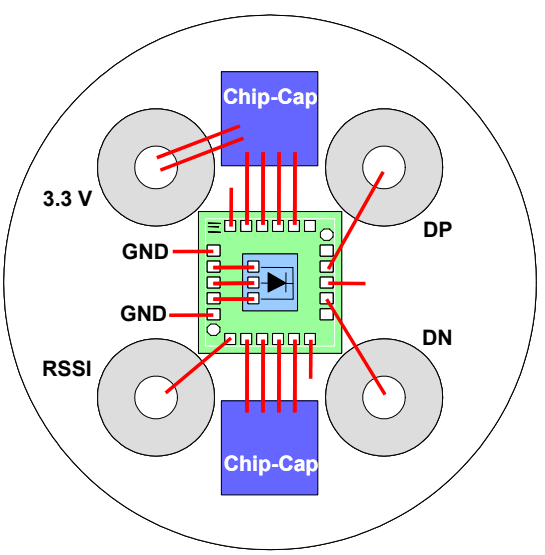
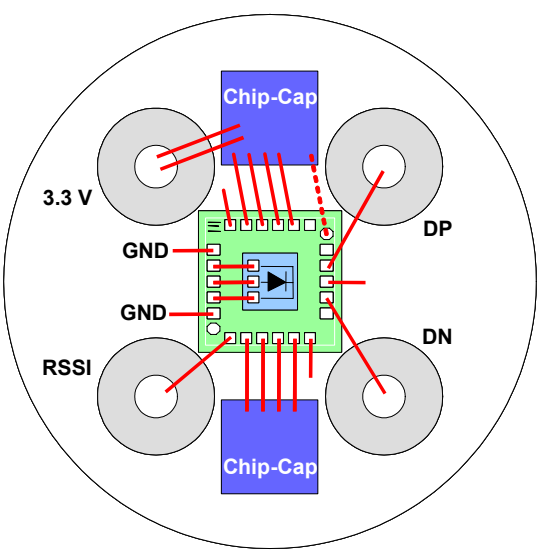


Figure 3: Similar configuration as Figure 2. Sq_En connected to VCC disables the limiting amplifier when LOS is asserted.



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