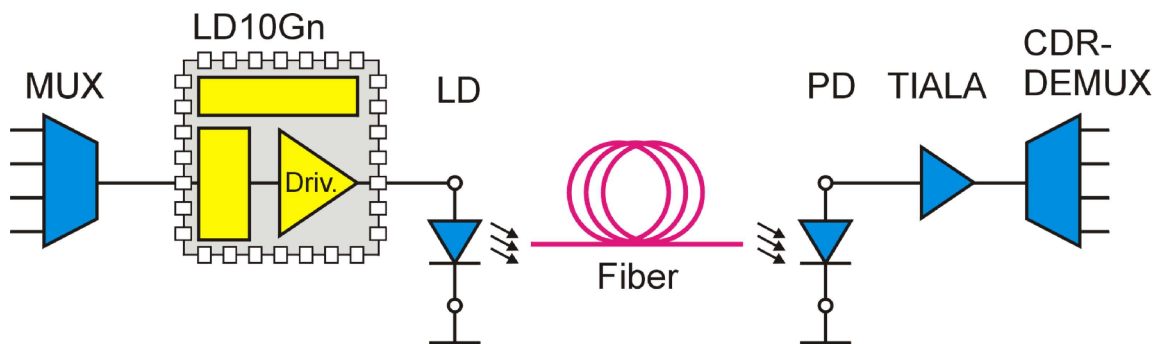


## LD10Gn IP-Core Product Brief

### General Description:

The LD10Gn is a laser driver for n-side-down laser diodes. N-side-down means that the laser diode is driven at the anode with grounded cathode, as opposed to most usual designs. To our knowledge the LD10Gn is the world's first n-side-down laser driver for data rates of up to 10.7 Gbit/s. It is fabricated in a 0.25  $\mu\text{m}$  SiGe technology and operates from a 3.3 V supply with a maximum laser current of 100 mA.



N-side-down operation usually requires a driver circuit with integrated pnp-type bipolar transistors and cut-off frequencies around 20 GHz. Such transistors are difficult to fabricate in Silicon bipolar or BiCMOS technologies so that usually only fast npn-type bipolar transistors are available. **advICo** developed a novel circuit technique by which n-side-down laser diodes can be driven with an npn-only driver. This patent pending technique was used for the development of the LD10Gn.

Additional features of the IC are optional retiming of input data, power control, failure flags for laser and monitor diode, programmable threshold and modulation currents and the possibility of direct bonding of the driver die to the laser die without external damping network or decoupling capacitors.

The circuit is available as IP-Core for a 0.25  $\mu\text{m}$  SiGe BiCMOS technology.

### Applications:

The chip is intended for use in fiber-optic modules with a direct connection between laser and driver chip.

**Features:**

- **Single +3.3 V supply**
- **Max. laser current 100 mA**
- **No external transformers or inductors in the data path**
- **Operation without external damping circuitry possible**
- **Differential ECL clock and data inputs, 50  $\Omega$  terminated to VCC**
- **3.3 V CMOS/TTL compatible control inputs and outputs**
- **Optional data retiming with MSDFF ( $f_{clk}=f_{bit}$ )**
- **Both manual setting or regulation of optical “0” and “1” power**
- **Failure flags for laser and monitor diode**
- **Optional tuning of rise/fall time**
- **Turn-on and turn-off control inputs**
- **Max. monitor diode current 0.7 mA**
- **Rise/fall time (20-80%) 30 ps**