

HLC10V0: Low Power, Combined VCSEL/LASER Driver & Post Amplifier in CMOS

Benefits and Features

- 200 mW chip power dissipation enables sub 0.4W SFP+ SR for high density applications
- Supports both VCSEL and FP/DFB lasers for short reach and long reach applications
- 1.25 Gbps to 11.3 Gbps operation
- Integrated auto-ranging ADC for digital monitor reporting supporting SFF-8431/8472
- I²C interface & on-chip NVM for IC settings

Transmitter

- LASER: 100 mA bias, 80 mA mod (25Ω TOSA)
- VCSEL: 16 mA bias, 16 mA mod (100 Ω TOSA)
- Integrated Digital Automatic Power Control
- Input Equalization

Receiver

- Input Sensitivity: 5 mVp-p Typical
- Programmable Output Pre-Emphasis
- RSSI and OMA based LOS/SD

Applications

- 10GbE SR/LR Transceivers
- 10Gbps SFP+ Active Optical Cables
- 2/4/8xFC/10xFC Transceivers
- CPRI/OBSAI 3G/6G/10G Wireless Base Station
- OC-192 SONET Transceivers

General Description

The HLC10V0 is a monolithic 11.3Gbps VCSEL & LASER driver combined together with an 11.3Gbps limiting post amplifier manufactured in an advanced CMOS process and supplied in a compact 4mm x 4 mm QFN28 package.

The HLC10V0's transmitter section includes an integrated digital APC loop, active back termination and adjustable Input equalisation easing module design and offering excellent system interoperability. Digitally configured waveform shaping and Bias/Mod adjustment, stored in Non-Volatile Memory (NVM) provide reliable optical performance across extremes of operating temperature and voltage.

The HLC10V0's receiver limiting amplifier section has high sensitivity supporting a wide range of ROSAs, together with digitally configurable output pre-emphasis for excellent system performance.

Featuring on-chip ADC and a flexible temperature sensor scheme the HLC10V0 requires only a low cost digital-only microcontroller for complete SFF-8431/8472 functionality. A complete SFP+ SR/LR solution can be realized when combined with the HLR10G0 10 Gbps transimpedance amplifier.

The HLC10V0 dissipates typically 200 mW and operates from -40 to +95 °C.

Block Diagram

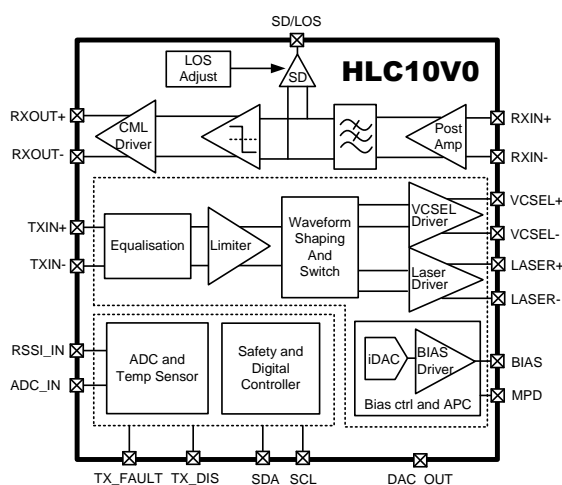


Figure 1 – HLC10V0 Functional Block Diagram

Package

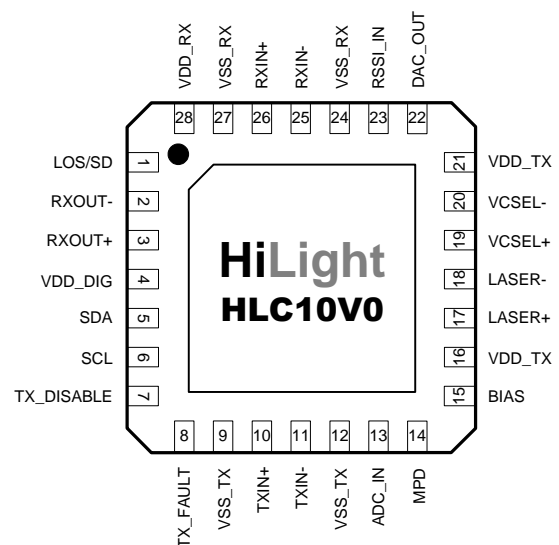


Figure 2 – HLC10V0 4mm x 4mm QFN 28 Package

Applications Example: VCSEL based SFP+ Transceiver for 10GbE SR

Examples of using the HLC10V0 in conjunction with the HLR10G0 TIA to implement a 10 Gbps SFP+ optical transceiver module for both 10GbE SR.

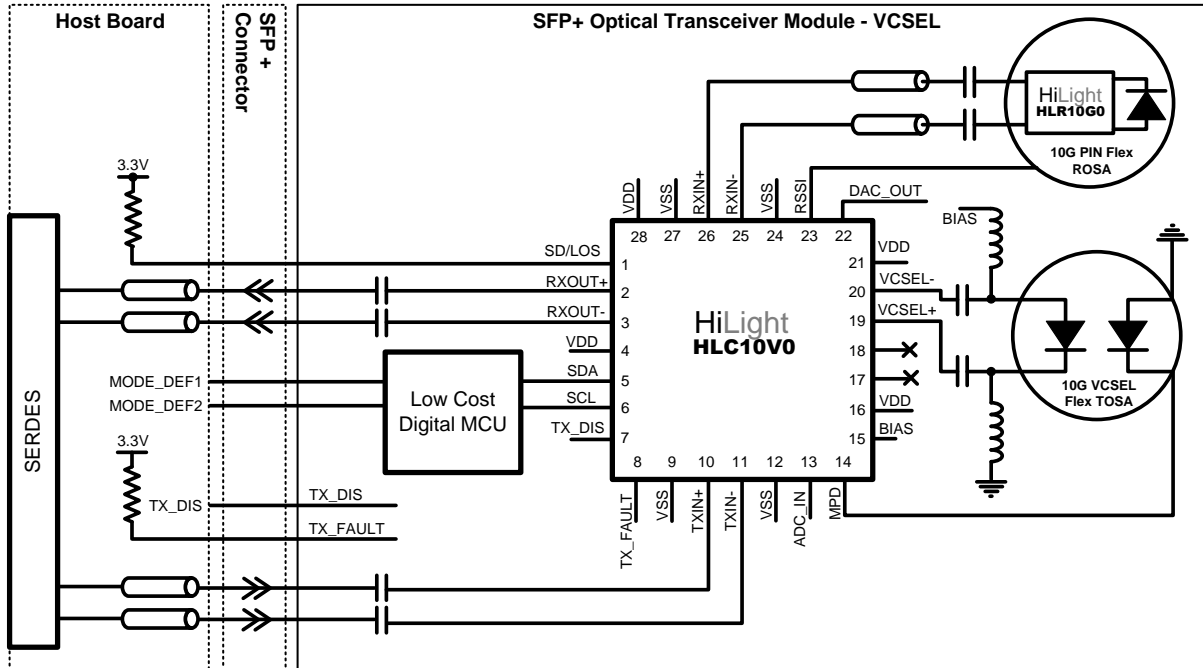


Figure 3 – VCSEL based SFP+ SR transceiver application example

Ordering Information

Part Number	Description	Package/Delivery	MOQ
HLC10V0-QFN	1.25 to 11.3 Gbps Combined VCSEL /LASER Driver & Limiting Amplifier	4 mm x 4 mm QFN 28 Supplied in Trays	490
HLC10V0-QFN-TR	1.25 to 11.3 Gbps Combined VCSEL /LASER Driver & Limiting Amplifier	4 mm x 4 mm QFN 28 Supplied on Tape & Reel	2500

Smaller quantities for sampling purposes are available on request

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