

HiLight Semiconductor Ltd
Delta House
Southampton University Science Park
Southampton
SO16 7NS
UK

Contact: Christian Rookes
VP Marketing
christian.rookes@hilight-semi.com
Tel: +44 (0)7866 432638

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Albis Optoelectronics and HiLight Semiconductor demonstrate a high performance, cost effective receiver solution for 10G-PON ONUs

Albis and HiLight are promoting their latest 10G APD and CMOS TIA-receiver products by jointly demonstrating high levels of performance achieved with this unique APD-TIA combination.

The combined performance of Albis' APD10F1 and HiLight's SLR10G2 delivers world class **sensitivity levels of -34 dBm (@ BER 1E-3) and -28 dBm (@ BER 1E-12)** in a straightforward TO-can build with negligible optical sensitivity penalties in the presence of localised high power WiFi signal sources. Measurement results show less than 1 dB penalty for 5~6 GHz WiFi and almost zero penalty for 2.4 GHz WiFi.

In this setup, the active noise cancellation circuitry of the TIA enables the usage of only minimal external APD supply components within the BOSA TO-can. The bias of APD10F1 came straight from the SLR10G2 TIA die, thus eliminating the need for costly biasing circuitry and significantly reducing TO-can BOM costs. The SLR10G2 and APD10F1 can be assembled in a standard side-by-side format within the TO-can package and do not require any complex two-stage build processes such as mounting the APD on-top-of the TIA-LA die.

Albis' APD10F1 is the most recent addition to its successful 10G APD family. It demonstrates low excess noise and achieves **record sensitivity levels of -34.5 dBm (@ BER 5E-5) and -31.0 dBm (@ BER 1E-12) simultaneously** when paired with HiLight's HLR11G1, another low noise 10G TIA product targeting datacom and telecom applications. The APD can be operated at a low bias voltage of typically 30 V and has an excellent gain-bandwidth product of 90 GHz, making it a perfect candidate for single-mode 10GBASE-ER as well as XG-PON / XGS-PON applications.

APD10F1 is a topside illuminated 10 Gbps photodiode chip with a large dual pad layout allowing placement of multiple wire bonds on one pad. The pad metallization is optimized for wire-bonding with the pads positioned to enable easy and direct bonding to most common TIA layouts. In addition, the ultra-small chip footprint saves valuable space in compact packages such as TO-46 and reduces chip cost. The APD10F1 chip is fully qualified and available in high volumes.

“Over the past 15 years we have continuously refined our APD product offering and driven performance to the physical limits in order to achieve best in class sensitivities and an unsurpassed dynamic range” states Vincent Grundlehner, CEO of Albis Optoelectronics. “The combination of our low noise, high responsivity APD10F1 and HiLight’s SLR10G2 TIA-receiver, results in a simplification of the FTTx receiver design while at the same time improving the performance.”

HiLight’s SLR10G2 TIA-receiver IC for APD BOSAs is HiLight’s first product in a line of new chipset solutions for PON FTTx. The SLR10G2 is a 10Gbps combined transimpedance amplifier (TIA) and limiting amplifier (LA) in a single monolithic chip designed to be used with a wide range of avalanche photodiodes (APDs) for cost critical 10G-PON ONU applications.

The SLR10G2 features **patent pending** active noise suppression circuitry within the TIA-LA front-end which minimises any sensitivity penalty due to local WiFi antenna or similar RF noise sources often found within consumer ONU boxes.

The SLR10G2 receiver chip works extremely well with existing 10G-PON Combo transceivers, such as HiLight’s HLC10P5 and HLC10P6 Combo ICs.

In fully limiting mode, the SLR10G2 data outputs maintain a typical 280mVpp output swing from overload to sensitivity – a major technical accomplishment for a 10G APD TO-can receiver – that can further reduce the effects of external noise sources on optical sensitivity outside of the BOSA package. HiLight’s research shows that that no external metal faraday cage is required over the BOSA in ONU designs offering a further BOM cost saving on the main ONU PCB board. The SLR10G2 can also operate in a more traditional TIA like mode.

A GPON 2.5Gbps optimised version of the SLR10G2 is also available for new GPON ONU and PON Stick designs.

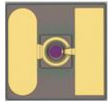
The SLR10G2 is sold as bare die with dimensions of just 0.83 mm x 1.05 mm, easily fitting within a standard 5-pin TO-can. The chip is powered from a +3.3V V_{DD} supply and operates over a wide industrial temperature range of -40°C to +95°C.

The SLR10G2 is sampling now. Interested customers should contact their local HiLight sales representative.

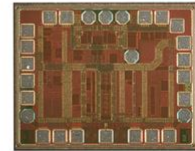
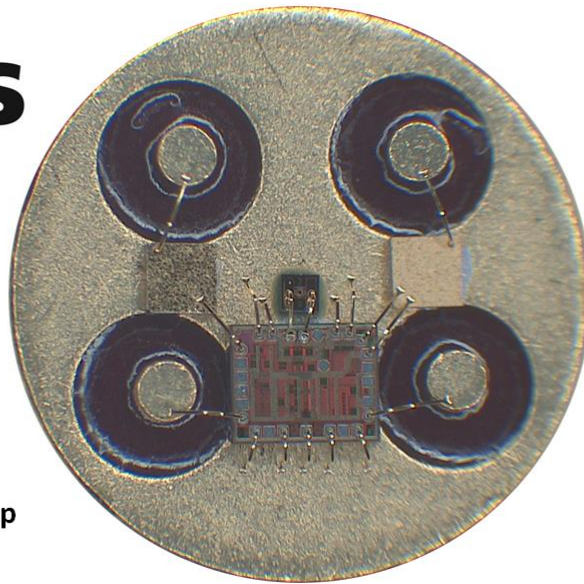
Christian Rookes, VP Marketing at HiLight, commented “The SLR10G2 chip receiver is the most advanced, highest performance solution for 10G-PON ONUs and will provide exceptional levels of sensitivity performance margin in the noisiest of environments; What’s more the SLR10G2 is designed on the same low-cost CMOS process as the established HLR2S50, HLR10G0 and HLR10G1 TIAs, around 100 Million of which have already shipped to customers worldwide.”



HiLight
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Albis' APD10F1 APD chip



HiLight's SLR10G2 TILA

Albis' APD10F1 APD chip and HiLight's SLR10G2 TIA within a TO-can

About Albis Optoelectronics AG:

Albis Optoelectronics AG is a designer, developer and manufacturer of high-speed photodiode chips. Since 20 years the company offers a diversified product portfolio consisting of InP and GaAs based PIN photodiodes, APDs and high-speed detector modules for datacom and telecom applications. These photodiode products are completely manufactured in-house in fully owned cleanroom facilities in Rueschlikon, Switzerland.

To date, the company has already shipped more than 35 million photodiodes to a global customer base.

About HiLight Semiconductor Co. Ltd:

HiLight Semiconductor Ltd is a Venture Capital backed, Fabless chip company specialising in deep sub-micron CMOS, the company designs and supplies the world's highest performance PMD and PHY ICs for high speed fiber-optics based communications and networking/Datacentre applications.

The company has already shipped over 150 Million ICs to date.