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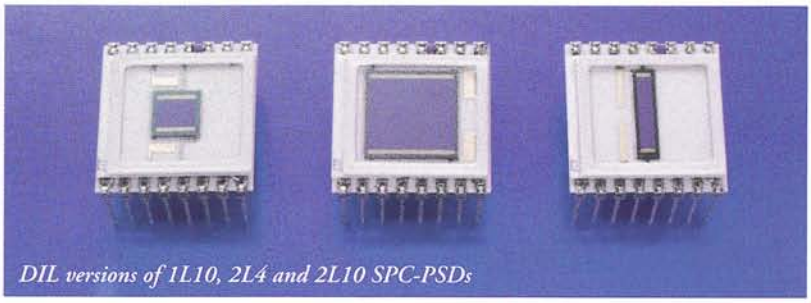
SiTek ELECTRO OPTICS 30 years

SPC-PSDs in DIL package



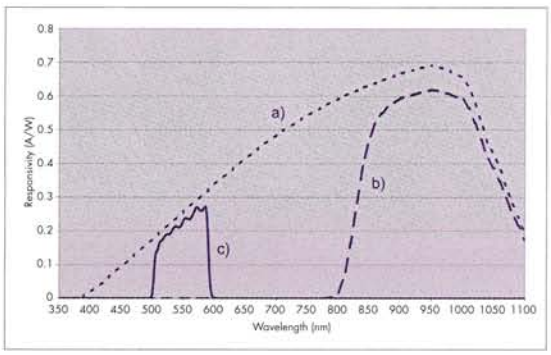
DIL versions of 1L10, 2L4 and 2L10 SPC-PSDs

SiTek has now further broadened the range of SPC-PSDs, this time by adding DIL (dual in line) package versions. All the SPC-PSDs (1L2.5, 1L5, 1L10, 2L2, 2L4 and 2L10) are now also available with DIL pins for hole mount. As all SiTek PSDs, these are compatible with the RoHS directive.

PSDs with optical filters

Optical filters are often an important part of an optical measurement system. SiTek offers the possibility to mount such filters directly onto the package on all our PSDs.

For some applications background light, such as sun light might seriously affect the measurement results. This is often solved by using a combination of modulated light/electrical filters and optical filters. The modulated light/electrical filters are used to extract the light source signal while the optical filter reduces the level, and hence the noise contribution from the background light. In fact, by adding a relatively simple longpass filter with a cut off frequency of 830 nm, 75 % of the sun light in the PSD sensitive wavelength region will be removed. Using a narrow bandpass filter will of course give an even larger reduction.



PSD responsivity curves for a PSD, a) without any filter, b) with a longpass filter, c) with an interference bandpass filter

The best result is achieved if the optical filter replaces the standard window on the PSD, i.e. if the filter is mounted directly onto the package. This way both transmission loss and internal reflections can be minimized, something that enhances the over all performance of the measurement system. Often a smaller filter size can also be used than if the filter is mounted further away from the PSD.

SiTek can provide PSDs with filters of any kind. It might be interference band pass filters with a very narrow pass band for extreme applications or ND (Neutral density or gray) filters for an equal light reduction over the entire wavelength region. Each filter can be custom designed to provide the best PSD performance for any situation.

SiTek PSDs with optical filters

SiTek anniversary

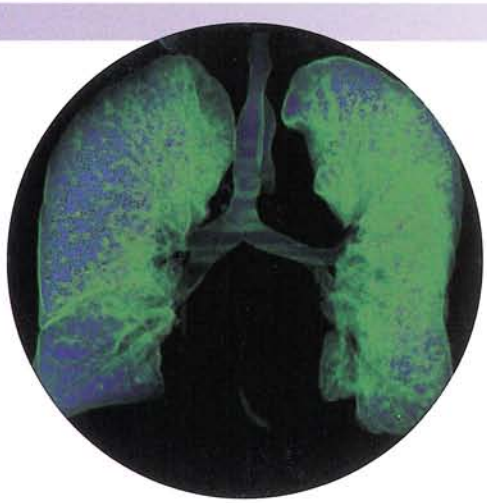
The weather was wonderful when SiTek, together with customers, partners and suppliers, celebrated the company's 30th anniversary. The celebration included a beautiful boat trip to the famous seaside restaurant Jungman Jansson, where a delicious dinner consisting of lobster, grilled filet of halibut and, of course, an anniversary cake was served.

The dinner finished with a spectacular fireworks display and the atmosphere was fantastic when the rockband plaid. You could see many happy faces dancing in the crowed, into the early hours of the morning.

Distributor seminar

At the 30 year anniversary, distributors from around the world gathered for one day to t alk about PSD technology. Interesting discussions during the day will surely strengthen our bonds.

Improved Cancer treatment with PSD



Patient safety has become increasingly important in healthcare, and is crucial with regard to radiation treatment for cancer. As radiation to some extent also affects healthy tissue surrounding tumours, there is a risk of side effects.

At the Proton Medical Research Center at the University of Tsukuba, Japan, a PSD-based system has been developed to increase the precision of radiation treatment for patients with lung or liver cancer.

Radiation treatment is one of the commonest methods of treating cancer, and roughly one in two patients receives radiation treatment at some stage. Treatment usually involves external radiation, which means use of equipment that radiates the body from the outside. With this treatment it is very important to concentrate the radiation on the tumour so that the healthy surrounding tissue is damaged as little as possible. This is particularly complicated in radiation treatment of lung and liver cancer, as the tumour moves when the patient breathes.

Respiration-controlled radiation system – using a PSD

To facilitate radiation treatment of patients with lung or liver cancer, radiation takes place when patients are holding their breath and lying relatively still. The method is not 100% reliable, as many patients find it hard to lie motionless.

To increase the precision of this type of radiation treatment and reduce damage to healthy surrounding tissue, a group of Japanese researchers have developed a respiration-controlled system that registers when the patient's chest is still. Thanks to this technology you can precisely concentrate the dose of radiation on the tumour without patients needing to hold their breath.

The researchers realised that there is a link between the movement of the chest during respiration and the way the internal organs move. By positioning an omnidirectional IR LED on the patient's chest and using a PSD camera, every change in position of the chest – and thus the tumour – is registered. The tumour's position can be read with great precision, and radiation takes place during the final phase of expiration, when the patient's organs are moving the least.

Stringent requirements for the sensor equipment

During the development of the respiration-controlled system the keywords when choosing the sensor were reliability, stability and easy setting. To meet these requirements a PSD camera made by the Japanese manufacturer TNK was used. Like an ordinary camera, this camera has a lens system and the heart of the system is a SiTek PSD mounted on the focal plane. The camera is also equipped with sophisticated electronics to process the signals that are sent, e.g. to a computer. By modulating the light from one or more IR LEDs the camera can detect their positions with high resolution, despite strong background lighting.

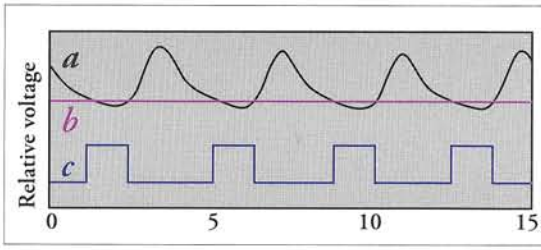
Greater precision leads to safer treatment

The clinical studies performed using the PSD-based equipment showed a decrease in radiation of the healthy tissue surrounding the tumour. With this method it was possible to decrease the safety margin to 5-10 mm, despite the actual target of the radiation moving two to three times more during treatment.

PSD-controlled radiation is now a routine treatment at the Tsukuba University Hospital, and over 200 patients with lung or liver cancer have been treated.

◀ *Measurement of chest movements during radiation.*

▼ *PSD camera from TNK containing a SiTek PSD.*



a) Chest movements during respiration
b) Threshold level for radiation
c) Radiation control signal

Source: S.D. Minohara et al. Int. J. Radiation Oncology Biol. Phys. Vol. 47, No. 4, pp. 1097-1103, 2000.

Professor Torkel Wallmark in memorial

Professor Wallmark passed away earlier this year at the age of 88.

Torkel Wallmark was one of the true pioneers in the field of integrated circuits and semiconductor devices, holding several patents in this field.

In the 50's he made the first type of Position Sensing Detector out of Germanium with four point shaped Indium contacts. This detector was very non-linear but could be used for feed-back applications.

Professor Wallmark was a driving force in starting SiTek in 1976 when Göran Petersson and Lars-Erik Lindholm (then PhD. students at The Department of Solid State Electronics at Chalmers University of Technology where Professor Wallmark was department head) were developing a new type of PSD, that was to be known as the SiTek PSD.

Professor Wallmark was a member of the SiTek board during the start-up phase and organized with Chalmers University that a formal agreement was written to allow the newborn company to use the Department lab facilities.

His valuable contributions to the technology of PSDs will continue to live and grow into the future with us here at SiTek.

I, **Sigurgeir (Sigge) Kristjansson**, has joined SiTek on the research and development side. While burning through shoe leather playing football, I discovered an interest for Physics during my teenage years on the outskirts of Reykjavik, Iceland. Very early on, my interests were strongly bent towards Optics.

After Physics studies at San Jose State University in the Silicon Valley and a few years of science work at the University of Iceland I joined Professor Anders Larsson's group at Chalmers University of Technology here in Göteborg. I finished my PhD in 2001 with my thesis titled: "Grating-Coupled Surface-Emitting Laser – Circular and Unstable Resonator Geometries".

After five more years in Silicon Valley, spent on research and development at Melles Griot and Nova Crystals on lasers as well as APD and PIN detectors, me, my wife and our two kids are back in Sweden again and I am very excited about the research and development work that now awaits at SiTek.

New employees

My name is **Nicole Andersson** and I am working in SiTeks administration department.

My work at SiTek consists of a large variety of tasks and includes everything from answering the phone to annual reports.

I was born in Holland, but moved to Sweden 1988 to live with my Swedish boyfriend. We are now married and have two sons, 9 and 12 years old. I've been working as a nurse both in Holland and Sweden, but decided to re-educate into a new professional direction because I found it more interesting to work with accounting. In my spare time I like to go for a walk with friends, picking mushrooms and reading. My favourite activity during the summer is taking a swim in a small lake close by.

I felt welcome from the start at SiTek and enjoy working here very much. The work itself is fun and inspiring, and the good team spirit makes it a pleasure to go to work!

Coming exhibitions

Country	Company	Website	Exhibition	City	Date
Sweden	SiTek	www.sitek.se	Electronics/EP	Stockholm	28-30 Jan-08
Japan	Autex Inc	www.autex-inc.co.jp	Micromachine	Tokyo	25-27 Juli-07
United Kingdom	BFI Optilas Ltd	www. bfioptilas.com	Photonex	Stoneleigh Park	17-18 Oct-07
The Netherlands	Promis Electro Optics	www. gotoPEO.com	Precisiebeurs	Koningshof, Veldhoven	28-29 Nov-07
USA	On-trak	www. on-trak.com	Photonics West	San Jose	22-24 Jan-08
Germany	Laser Components	www. lasercomponents.com	Sensor	Nuremberg	6-8 May-08
Germany	Laser Components	www. lasercomponents.com	Optatec	Frankfurt	17-20 June-08

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