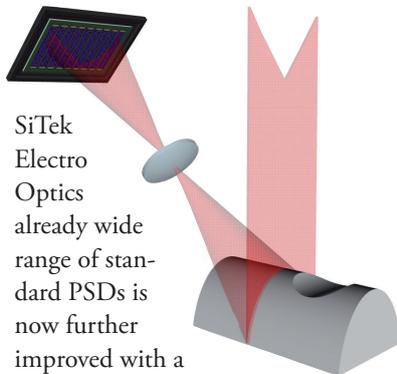


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## High Speed Contour Measurement with SiTek PSD-Array



SiTek Electro Optics already wide range of standard PSDs is now further improved with a new type of PSD detector, a PSD array. The PSD array consists of 16 parallel one-dimensional PSD elements on the same chip, each element with a length of 2,5 mm.

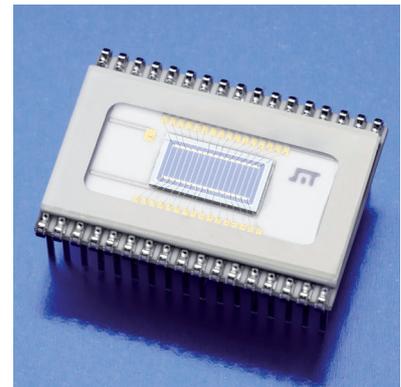
As with many 1-dimensional PSDs the PSD array might be of most use in triangulation applications. However, by using a laser line or multiple light spots instead of a single spot it is possible to gather information not only about the height at a certain position but also about the contour of the illuminated object. The possibility to read out all 16 PSD elements in parallel together with the fact that the performance of the PSD array has been optimized for high speed operation with a rise time of each element of less than 100 ns makes the PSD array suitable for applications like high speed 3D contour measurements and measurements of parallel, moving objects such as cantilevers.

To ensure high sensitivity the design of the array has been

optimized with a gap between the elements of only 10  $\mu\text{m}$ . This gives a fill factor of more than 97 %, still with a cross talk less than 1 % and a non-linearity value in line with SiTek's other one-dimensional PSDs.

In order to preserve the excellent performance also under stray light conditions the PSD array has been designed with SiTek's unique built in stray light elimination feature. This patented design eliminates the decrease in speed and linearity which otherwise might occur when operating a PSD under stray light conditions.

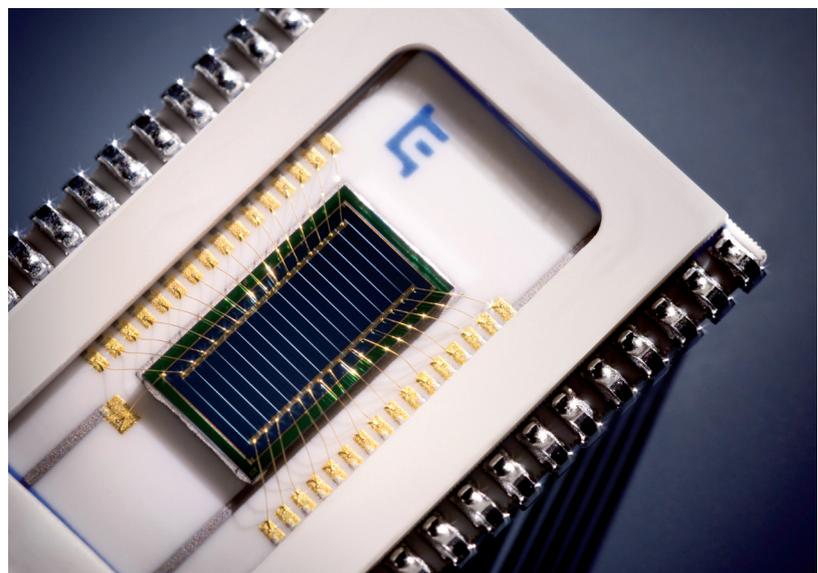
The PSD array is assembled in a 34 pin dual in line type ceramic



**Broadened standard range**

package with a protective window. In order to minimize the size of the package a pin pitch of 1,27 mm has been used giving a package size of only 21,6 x 15,0 mm<sup>2</sup>!

As with all of our standard PSDs, the PSD array can be customized for optimized performance under certain conditions. Such customization could for example be a different size or number of segments, enhanced UV or YAG reponse or an SMD type package. The standard PSD-array is now available from stock and SiTek are ready for any incoming request.



# New distributor in the United Kingdom

SiTek now announces a new distributor for The United Kingdom. We welcome Laser Components (UK) Ltd. to the team and would also like to thank BFI Optilas for many years of cooperation. Laser Components (UK) will represent the complete line of SiTek products and we are looking forward to a fruitful and long lasting cooperation. Please do not hesitate to contact Mr. Tony Wright for further information or questions, [twright@lasercomponents.co.uk](mailto:twright@lasercomponents.co.uk).



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Goldlay House, 114 Parkway  
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Phone: +44 1245 491 499  
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## Lean at SiTek

Ever since the start of the company over 30 years ago customer focus has been a guiding star for SiTek.

With the focus on custom designed products, continuous improvements within the Production area have been a natural ingredient in order to implement and adjust different process steps to best fit the customers request on the product. To further increase the pace in this continuous improvement work the Production Department have introduced a program for Lean Production as an accelerator.

To learn more about Lean, a so called "Lean Game" was carried out. It simulates an enterprise and clearly shows how Lean principals and methods work. The purpose of the Game is also to show that Lean is all about working smarter – not running faster!

SiTek's production flow was analyzed to look for value, waste and areas to improve.



A Value Stream Map was constituted and the flow of a typical SiTek product was then reviewed by walking the process from order to delivery, step by step.

A Continues Improvement group was formed to bring up ideas of improvements which were added to a PDCA (plan, do, check and act) board. New actions were taken to improve and secure routines to increase and maintain the high quality in each process step.

It is with great satisfaction SiTek already can see the fruit of the Lean introduction and the applicability of this tool in the challenge of an ever increasing demand for more complex products without renouncing the short lead times.

## SiTek reinforce the sales in Asia

*SiTek are very pleased to announce the addition of two new distributors, Otron Electronic Technology. Ltd., in China, and Unice E-O Services Inc in Taiwan.*

*SiTek welcomes these great players who both will be the representing the complete line of SiTek products.*



### **Otron Electronic Technology. Ltd.**

Room 1603, Building Huayi,  
No.2020 West Zhongshan Road,  
Xuhui District Shanghai China

Contact person: Mr. Frank Shuai  
E-mail: [frank.shuai@e-otron.com](mailto:frank.shuai@e-otron.com)  
Web site: [www.e-otron.com](http://www.e-otron.com)

Phone: +86 21 22818310  
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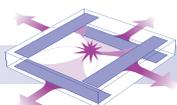


### **Unice E-O Services Inc.**

3F, No25-2 Ji Lin Road, Chung Li  
(Chungli Industrial Park)  
Taiwan R.O.C.

Contact person: Mr. Johnny Chang  
E-mail: [johnnyc@email.unice.com.tw](mailto:johnnyc@email.unice.com.tw)  
Web site: [www.unice.com.tw](http://www.unice.com.tw)

Phone: +886 3 462 6569  
Telefax: +886 3 462 5586

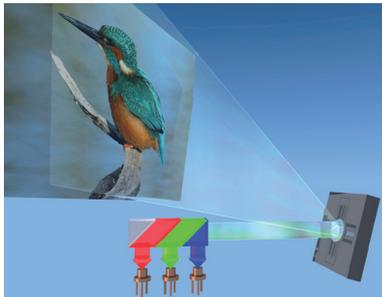


# Wafer level testing of MEMS mirrors with PSD

*After a dip due to the telecom crash almost 10 years ago the interest for very small scanning mirrors, so called MEMS (Micro-Electro-Mechanical Systems) mirrors, has increased dramatically the last few years. These mirrors can now not only be found in telecom applications but have found its way into several other fields such as bar code scanners, optical spectrometers, confocal microscopes and displays.*

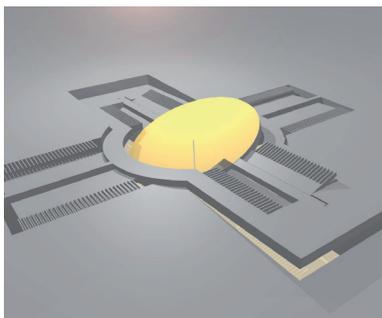


A recent product which is about to reach the market are projectors with small enough footprint to be incorporated in a mobile phone. Such a projector can be realized by a laser-projection display system which basically consists of three laser sources (red, green and blue), some optics and a double axis scanning micro mirror. By exact and rapid control of the micro mirror the laser beams can project large moving images despite the very compact design.



## *High performance devices*

At Fraunhofer-ISIT such scanning micro mirrors are developed and manufactured applying standard MEMS technology. The scanners comprise gimbal mounted MEMS mirrors of 1mm diameter with elastic torsion suspensions. Oscillations of the MEMS mirror are driven by



electrostatic actuation of stacked vertical comb-drives either in quasi-static or in resonant operation.

Outstanding features of the scanners are high scan frequencies of up to 100 kHz, scan angles of up to 100 degrees and very high oscillatory stability.

## *Hermetical package*

The scanning mirrors are hermetically packaged in a vacuum environment on wafer level using a patented fabrication process.

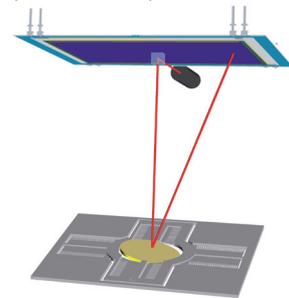
Actuating the scanning mirrors in a local vacuum environment offers significant advantages over former atmospheric pressure actuation concepts. Gas damping is almost completely reduced enabling the large angle scanning and high scan frequencies even at low electrostatic driving voltages. The hermetic packaging also offers a durable protection against contamination by particles, fluids or gases, something that makes the scanners not only useful for micro-projection displays but also in more harsh environments like in endoscopes to be sterilized by autoclave treatment or in automotive MEMS scanner applications, where hermetic encapsulation is a precondition.

## *Wafer level testing*

In order to ensure that the MEMS scanners meet the specifications of customers, Fraunhofer-ISTS has developed a post processing wafer level test system based on SiTeks PSD 2L45\_SU24.

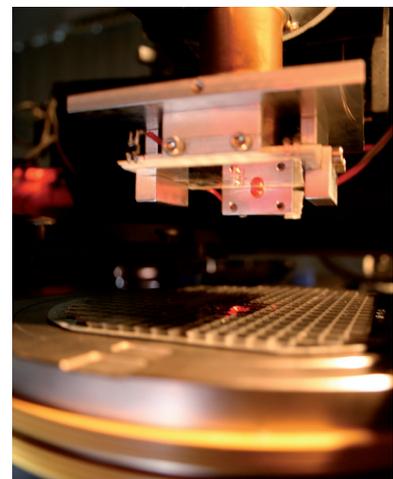
A laser beam is projected onto a MEMS mirror via a beam splitter

which is fixed on the PSD surface. The mirror reflects the beam onto the PSD where the frequencies and amplitudes of the two scanning directions are measured. Also the nonlinear behaviour of the torsion suspensions and the oscillatory stability can be analysed.



By using the large and fast 2L45, a PSD with an active area of 45 x 45 mm<sup>2</sup>, the MEMS mirrors can be characterized over their entire scan angle region at high speed.

This test system has been installed as a module on a commercially available wafer prober and enables the reliability and high speed required for semi-automatic wafer-level testing in production.



# Meet us at S.E.E. 13<sup>th</sup>-15<sup>th</sup> April

We welcome you to S.E.E. Scandinavian Electronic Event at Stockholm International Fairs between 13<sup>th</sup> - 15<sup>th</sup> April. We will be at your service in booth **C07:35** these days and we will be pleased to tell you more about our products, Position Sensing Detectors (PSDs), and how you can use their unique qualities when there is a use for non-contact measurement. Take the chance to see the products live, and let us explain how we can customize the PSD for your application. You will also have the possibility to see different applications showing how fast and accurate you can measure with our products.

Let us present our latest development, the PSD array, which consists of 16 parallel one-dimensional PSD elements on the same chip. The PSD array is suitable for applications like high speed 3D contour measurements and measurements of parallel moving objects such as cantilevers.

With soon 35 years of experience within the PSD technology SiTek has gathered a large amount of knowledge and we can support you to find the best solution for your application.

**Please be welcome to booth C07:35**

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## Coming exhibitions

At the following exhibitions our distributors will be attending and you are very welcome to visit their booth and experience our products. For further information please contact our distributors directly or us.

Country/ City	Distributor	Exhibition/Date
<b>Japan</b> Yokohama	Autex Inc. <a href="http://www.autex-inc.co.jp">www.autex-inc.co.jp</a>	<b>Laser Expo</b> 21-23 April, 2010
<b>United Kingdom</b> Birmingham	Laser Components UK <a href="http://www.lasercomponents.com">www.lasercomponents.com</a>	<b>VTX (Medtec)</b> 27-28 April, 2010
<b>Germany</b> Nuremberg	Laser Components <a href="http://www.lasercomponents.com">www.lasercomponents.com</a>	<b>Sensor+Test</b> 18-20 May, 2010
<b>USA</b> San Jose	On-Trak <a href="http://www.on-trak.com">www.on-trak.com</a>	<b>Cleo</b> 18-20 May, 2010
<b>Taiwan</b> Taipei	Unice E-O Service Inc <a href="http://www.unice.com.tw">www.unice.com.tw</a>	<b>Opto Taiwan</b> 9-11 June, 2010
<b>Germany</b> Frankfurt	Laser Components <a href="http://www.lasercomponents.com">www.lasercomponents.com</a>	<b>Optatec</b> 15-18 June, 2010
<b>United Kingdom</b> Telford	Laser Components UK <a href="http://www.lasercomponents.com">www.lasercomponents.com</a>	<b>Photonex</b> 3-4 November, 2010
<b>Germany</b> Munich	Laser Components <a href="http://www.lasercomponents.com">www.lasercomponents.com</a>	<b>Electronica</b> 9-12 November, 2010
<b>Italy</b> Milano	Crisel Instruments <a href="http://www.criselinstruments.it">www.criselinstruments.it</a>	<b>Hi.TechExpo</b> 17-19 November, 2010
<b>The Netherlands</b> Veldhoven	Promis Electro Optics <a href="http://www.gotoPEO.com">www.gotoPEO.com</a>	<b>Precisiebeurs</b> 1-2 December, 2010