CHIPS.

Newsletter
January 2013

There is nothing so useless as doing efficiently that which should not be done at all.
(Peter Ferdinand Drucker)

CEO's Note

Dear Readers,

A year of success is behind us. Not only, that we could increase sales by 37% to a new record, we could also achieve several design-wins from extremely demanding markets like medical, industry, space, and, particle physics. A statement of one of our customers tells the story right away: "I'm now 30 years in this industry and I dreamt about optical semiconductor performance like epc's OHC15L process. No one listened but finally epc made that my dreams came true." Yes, we know that the first reaction from visitors of our website is that 'this is not possible', or that 'this is just theoretical matter'. However, once they see the hardware running, they are convinced. Thus, challenge us, we're ready!

Beat De Coi

Our Growing Distributor Network

In 2012, we started an initiative to build up a worldwide network of distributing partners. Since our product portfolio consists of rather complex devices that require a high degree of technical sales competence, our search profile is accordingly specific. Our partners must have a sound understanding of applied optoelectronics. They need to know the applications and the associated problems. They must be able to support customers by actively providing solutions to their technical challenges.

By this date, our family has already a few members and we are positive that the growth will continue.

Distributor in Switzerland:
Ineltro AG; www.ineltro.ch

Roland Gruber (Ineltro), Enrico Marchesi (epc), André Spring, Andres Kammermann (Ineltro)

Distributor in Italy:
Kevin Schurter SPA; www.schurter.it

Beat DeCoi (epc) and Antonello Martegani (Kevin Schurter)

Distributor in Austria:
Tecams Handelsagentur; www.tecams.at

Distributor in Israel:
E.D.E Electronics Ltd.; www.ede.co.il

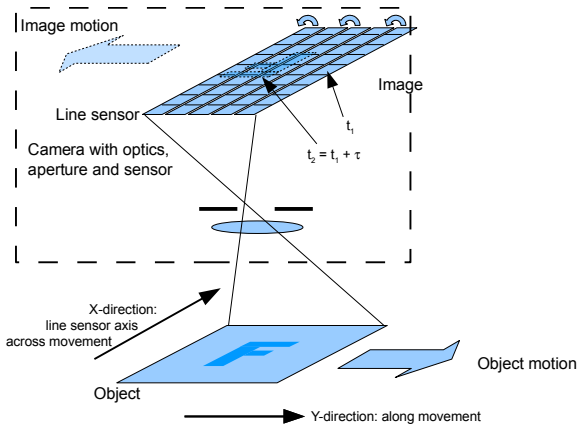
Want to join the family? We are looking for partners in France, BeNeLux, Scandinavia, Eastern Europe and the Americas. If you have a dedicated design-in profile and a strong market focus on optoelectronics, please inquire!

New TDI Imager in Development

epc is currently developing a performance TDI imager. TDI stands for time-delayed integration which is the extension of a line imager. A line imager has only one row of pixels (sometimes also called columns). If the target moves at a constant speed under the line camera, a 2-dimensional picture will be acquired if the single lines that are continuously recorded are concatenated. Picture it like a carpet that is woven line by line. While this may sound strange to people that are used to point&shoot cameras, these

sensors are very common for inspection tasks, since objects on a conveyor belt move at a constant speed.

One drawback, however, is the fixed maximum integration time. since you cannot integrate longer than it takes to make the object move by one pixel pitch. Even worse, if one is to increase the lateral resolution by increasing the pixel count and decreasing the pixel pitch, the maximum integration time will be reduced by that same amount – or the object (e.g. on a conveyor belt) has to move slower which in turn would deteriorate throughput.

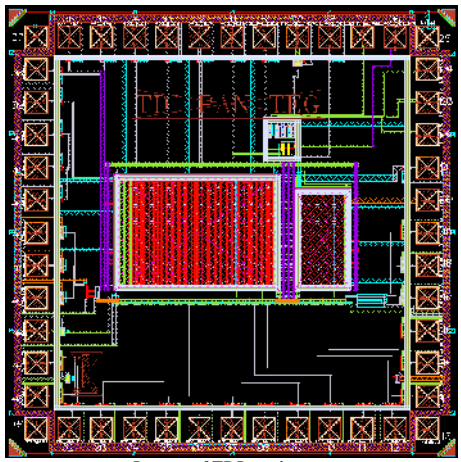


Principle of TDI Sensor

The solution to overcome this dilemma is time-delayed integration. On the the pixel level, several rows of pixels are staggered and the signal charge is shifted from one row to the next at exactly the right speed (vertical movement of the charge), as does the image of the moving object on the sensor. During the consecutive shifting, more and more charge coming from the same the location on the object will be accumulated in each line. By that, the integration time can be increased by the factor of the rows available, e.g. 32 or 128 rows. At the bottom of the TDI sensor, still only one line per cycle has to be converted. That means there is no bandwidth increase for the output chain needed if the accumulation takes place in the charge domain.

This apparently simple concept is very difficult to implement in CMOS technology since a true charge handling over several stages is normally not provided. This is where our ESPROS Photonic CMOS™ process plays its strengths. In a pure CCD process, the core pixels could be implemented straightforward (in-fact a 2D CCD array does the job), but there is no performance analog circuitry available to gather, multiplex and amplify the incoming lines on one or few output pads at the required speed.

In close cooperation with a very ambitious customer, epc engineers created an implementation of the TDI concept in the ESPROS Photonic CMOS™ process. The challenging requirements were assessed using device simulation and optimum structures were selected for the test-chip, which is currently in production.



Layout of TDI test imager

PDK available for Tanner

Our Process Development Kit (PDK) has been developed for Cadence® design tools. These tools provide a very powerful and complete environment for analog mixed signal ASIC design. Yet, a multitude of small and mid size design companies does not necessarily require the full coverage. For such companies, Tanner EDA has a competitive offer and is therefore well introduced in the marketplace.

In order to provide broad access to our ESPROS Photonic CMOS™ process we have migrated our PDK to the Tanner design environment. The Tanner foundry kit covers the full analog reference flow, containing:

- Schematic entry
- Physical block layout
- Chip assembly
- Layer stream out
- All necessary verification steps (simulation, DRC, LVS, LPE)

The PDK runs under Tanner HiPerSilcon V16 and provides full OpenAccess data base compatibility. This allows easy interchange of design libraries between different design environments.

As with all our design libraries, we have a no-charge policy for the tools in order to get our customers jump-started without the hassle of up front tool investments

Don't hesitate to get in touch with us if you want to learn more about designing with ESPROS Photonic CMOS™.