

Perseverance is not a long race; it is many short races one after another!

(Walter Elliott)

CEO's Note

Dear Readers,

Doing things in parallel is always quite a difficult job. If, however, these parallel projects are completely different but also strongly depend on each other, then it becomes a nightmare. It is especially difficult when the projects should also be finished at the same time. Where to start, what to do first, and which tasks are independent are the crucial questions. Such questions have been on my desk since we actually ran three very complex but completely different projects together. All of them needed each other but nothing was there in 2007. The three projects were: first, developing a completely novel photonic semiconductor technology, second, developing chips using this techno-

logy, and third, designing, planning and building a semiconductor fab which allows us to produce the chips. My team has done a tremendous job in the last 5+ years. The technology is performing as expected, the first chip designs are alive on silicon and at least some of the process steps of our fab are already producing a respectful volume. What a great achievement! We really can state that we went into the right direction. Now, our investment in terms of sweat, time and money is paying back. I would like to use this opportunity to thank all the contributors to this extraordinary achievement.

Beat De Coi

epc610 Evaluation Kit

As our new TOF chip family becomes available soon, so will also an appropriate evaluation kit for our customers. The epc610 evaluation kit is a fully assembled and tested circuit for evaluation of the epc600 TOF Range Finder and the epc610 TOF Camera chips. The hardware consists of a mainboard that can be combined with different epc600 and epc610 camera modules. A software suite facilitates the operation of the modules and provides a platform for customers to develop their applications.

and flexible hardware environment for the design engineer. It supports all available camera modules and works with both the epc600 TOF Range Finder and the epc610 TOF Camera Chip. For a controller, we decided on the widely used STM32 ARM Cortex micro controller. A USB interface hooks the mainboard up to a PC/MAC, where the captured image data can be visualized and further processed.

The kit comes as a complete ready-to go package. It contains the mainboard, one camera module, PC/MAC software, and the necessary cabling. Additional camera modules with either the epc600 or the epc610 and varying optics (aperture angles) can be ordered separately. The kits can be ordered as of now.



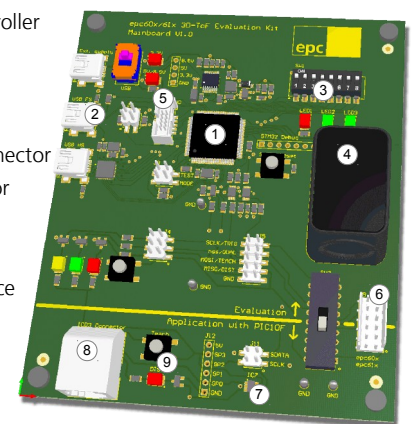
epc600/610 camera module

The heart of the evaluation kit is the mainboard, which actually consists of two independent systems. The smaller section is fitted with a tiny PIC10F206 controller. This section was designed to provide an example to our customers of how little is actually necessary to build a complete TOF

range finder or an optical proximity switch with background suppression. The controller evaluates the signal coming from the epc600 chip and is used for calibration and compensation purposes (e.g. temperature). A push-button serves to set a distance threshold for background suppression.

The second section of the evaluation kit is the actual development environment. This section provides a powerful

- ① STM32 ARM Cortex controller
- ② USB connectors
- ③ Dip switch and LED bank
- ④ Camera module
- ⑤ 10 pin Cortex debug connector
- ⑥ Camera module connector
- ⑦ PIC10F206 controller
- ⑧ ICD3 debug interface
- ⑨ Push-button / LED interface



Evaluation kit mainboard

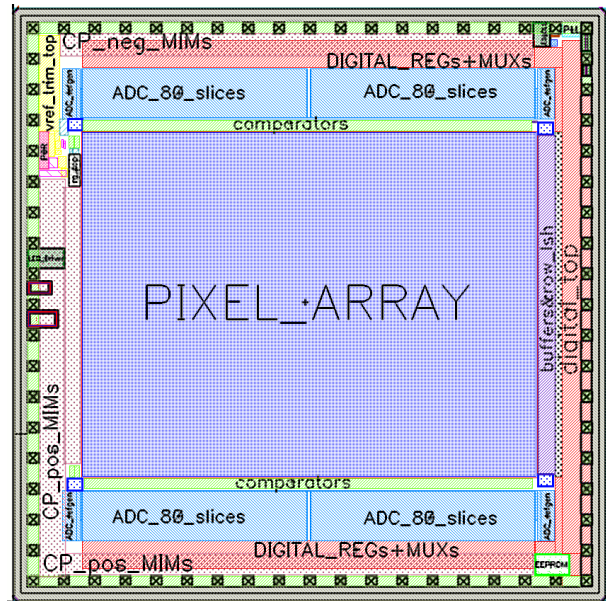
epc660 – The new benchmark in TOF imaging

epc is continuously working on expanding its TOF imager product line. Within the next few years, we will offer a complete family of imagers and camera-on-chip products to cover a broad range of industrial applications. With the next family member – the epc660 – we decided to step right to the top end of the resolution range. The epc660 TOF imager will have a pixel field with a whopping QVGA (320x240 pixels) resolution.

The epc660 features a 20x20µm pixel size. This pixel size and a modular architecture allow for a small chip size that can be competitively priced. And with the small chip size, we enable our customers also to cut cost on their lens and system design and to come up with very compact and cost-effective camera systems. The pixel architecture also lays base for a platform concept that will allow us to derive further imagers with different resolutions in a very efficient way. More members of the epc6xx family are already in the development pipeline.

Our new flagship TOF imager has a footprint of only 9x9 millimeters. The symmetrical floorplan contains the actual pixel field in the center of the chip. The distance data is delivered over a digital TOF-camera interface to an external controller. As with the epc610, the complex demodulation of the returned light is completely done on-chip. A set of user-selectable measurement modes and features are implemented. The user can switch to an accurate mode when distance resolution is key. On the other hand, the speed mode allows frame rates of up to 70 full distance frames per second. Resolution reduction modes for even more speed, binning for increased sensitivity and ROI functionality complete the feature list of this nifty device.

As with all epc TOF devices, the LED controller and driver are fully integrated on the chip. For the majority of the applications this internal driver is sufficiently powered to provide the LED current needed for the active scene illumination. Due to the superior performance of our underlying ESPROS Photonic CMOS™ process, the required illu-



Floorplan epc660

mination power is orders of magnitude lower when compared to current state-of-the-art TOF camera systems. Consequently, only a fraction of the LED's are required.

The epc660 TOF imager is scheduled for market introduction in 2013. It will open a broad range of applications where resolution is key. Volumetric mapping of objects in the millimeter range at a fraction of the price of current systems allows for completely new approaches in logistics or manufacturing. Near field surveillance tasks with high spatial resolution like in vehicle collision avoidance systems or robotic control systems are further fields of interest. Not to speak of touch-less man-machine interfaces, these days known as gesture control. We believe that the epc660 will define the benchmark in the industry for high-resolution TOF imaging. And it will soon be supported by more TOF products to match the user requirements in an optimal way.

Distributors wanted!

epc is currently looking for distributors to help expand our business in the industry. We are seeking partners with strong FAE skills that have the drive and know-how to sell our standard product portfolio to industrial customers.

Do you have a proven track record? Do you know your customers and the technical challenges that they are faced with in their projects? Are you able to support them with active solution finding based on a strong and expanding product portfolio? Then you should have a closer look at our products. And if you seek the challenge of building up markets with an innovative Swiss semiconductor company backing you then you might want to get in contact with us.

We are looking forward to hearing from you!

+++ interesting job opportunities on www.espros.ch +++