

**The one who has the fools
against him, deserves trust.**

(Jean Paul)

Theory and Practice

The Swiss “education gurus” have decided to align our higher education system with the Bologna model. Why this was done is incomprehensible to me personally. The only reason that struck me from the numerous discussions, was to safeguard the mobility of the students, i.e., that they can complete their first year in Vienna, their second year in Zurich and their third year in New York. With all due respect: do you know of anyone who actually wants to do this? Ok, there are always exceptions, people who have this as a goal. However, usually a student’s key concern is not about securing an international university place. The concern is very simple, namely: “How do I finance my studies?”

There are many young people who are not in a position to finance their studies on their own. In general, scholarships are very hard to obtain, and if the parents have even a small income, then this is already too much to receive a scholarship. So these people then look for a ‘backdoor’ by studying at evening schools. Their education takes place in the evenings and at weekends and they work a normal schedule during the day. Naturally, the course of studies takes longer as insufficient time can be set aside per-week compared with full-time studies. Nevertheless, many people take on this enormous strain in order to obtain their graduation certificate. With the Bologna model, this will no longer be possible! At least not in its current form. One no longer speaks of evening schools but of part-time study courses. It sounds completely



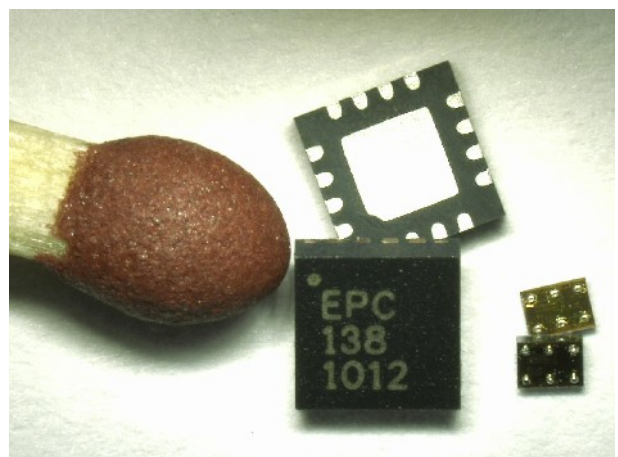
harmless, but unfortunately, it is not at all. As already outlined, evening classes mean that the course of studies can be attended parallel to regular work. Part-time study courses now mean that the study courses are attended in blocks ranging from a few weeks to half a year. At first glance, this seems well ordered and thus focus is protected. However, I do not know of one single employer who would want to approve this when he knows in advance that someone will be regularly absent. Murphy’s Law tells you that employees will not be at work when they are urgently needed for their project. Theory and wishful thinking clash again in a real-world situation. Indeed, a couple of education theorists thought up a model, which, in practice, is completely ineffectual. But regrettably, it is like that in education: the teachers and professors are always the smartest in their environment - the teachers are always ahead of the students, aren’t they? Hence logically, this leads to the point that they believe that this advance applies to everything and everyone and not just within their specialist area. If someone is in the position to solve a complicated differential equation that does not mean, by any stretch of the imagination, that they can rationally solve a non-mathematically formulated problem with healthy common-sense!

Beat De Coi

epc13x Production in Full Swing

The epc13x product family is monolithically integrated high-sensitivity photo-diode amplifiers for light-barrier, light-curtain and similar applications. It amplifies current pulses from reverse-biased PIN photodiodes (e.g., epc300) and discriminates the amplified input light pulse before driving the open-drain output stage. The device is controlled by an internal digital controller, which does not require any external clock signal. The device’s power supply can be connected in anti-polar mode to decrease the wiring effort in matrix-operated light-curtain products. The device has been optimized to utilize the least amount of external components. This device enables the design of short to long-range light barriers from a few millimeters up to tens of meters. Various models are available within the epc13x family, e.g., with light-reserve output, fast response time, very-high photo-sensitivity, or analog output.

Production recently began and is currently running at a volume of approximately 200,000 chips per month. The chips are on an 8 mm tape on reels containing 3,000 or 10,000 pieces. Datasheets and free samples are available upon request at sales@espros.ch. High volume prices can be as low as CHF 0.42!



epc138 as a family member of the epc13x family in a QFN16 (3x3mm) and as a 6-bump CSP package (0.86x1.28mm). Both packages are quite small but compatible with standard SMD equipment. However, the most cost effective solution is the CSP6 version.

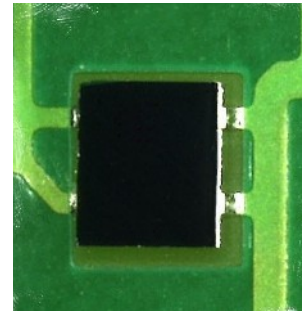
>>> epc138: CHF 0.34 @10k, CSP6 <<<

epc3xx Photodiode Array with QE>90%

The new epc3xx PIN-photodiode array range exhibits a quantum efficiency of more than 90% in the near-infrared domain, combined with a stunningly low dark current of less than 2pA/mm². This makes this low-cost device ideal for long-range light barriers, light curtains, leveling meters, TOF-based range meters, etc. This photodiode is available in various configurations, e.g., as a dual photodiode with dimensions of 1x1 mm, up to an array of 2 by 8 diodes in a package of 2x4 mm. Customer-specific versions consisting of, for example, 20 by 2 photodiodes in a package of 10x2 mm, are also possible. A single photodiode achieves a bandwidth of more than 700 MHz (response time <1.5 ns) and is therefore ideally suited for high modulation frequency-hungry applications such as TOF range finders, optical communications, light curtains, and the like.

This photodiode array comes in chip-scale packages with a thickness of approx. 80 µm where the whole die area on the backside is photosensitive. Thus, this packaging makes it ideal for saving as much PCB space as possible.

The microscope-taken image to the right shows the epc301 model soldered to a PCB. The epc301 consists of two individual photo diodes in a package of only 1x1 mm. The two photodiodes can be used as individual devices, e.g., for triangulation applications. They can also be used in parallel, as demonstrated in the picture, in order to expand the photosensitive area. Data sheets and free samples are available upon request at sales@espros.ch. High volume prices can be as low as CHF 0.23!



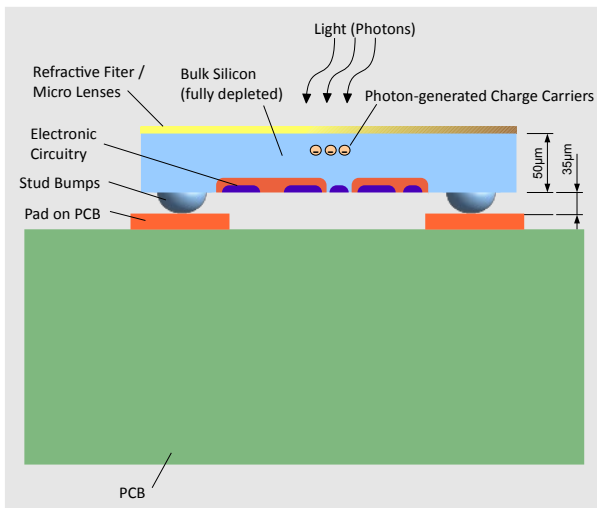
Microscope photo of an epc301 Photodiode in a CSP4 package with a size of 1x1 mm and 50 µm thickness. This package is fully compatible with standard SMD equipment.

>>> epc300: CHF 0.45 @10k, CSP4 <<<

New Dicing Tool Arrives

ESPROS Photonics Corp. specializes in very high-performance photosensors combined with powerful electronic circuitry on the same chip. The electronics circuitry is found on the front of the chip whereas the photosensitive part is located on the back. As the electronics part is also the side with the pad area, the chip can be soldered directly onto the PCB using standard SMT equipment. Thus, the photosensitive side of the device is illuminated from the top. This concept enables the production of parts offering very-high performance yet at the lowest possible cost. However, using the concept of backside illumination, very thin and fully-depleted chips are required. epc chips are grinded to a thickness of only 50 µm, making the wafer handling during production quite challen-

ging. Thus, dicing, testing and tape-to-reel processes are



Photonics chip in a CSP package based on epc's OHC015 technology attached to an SMD board



New dicing machine in our cleanroom in Sargans

among our key production capabilities.

On February 11, 2010, our new dicing machine was delivered to our temporary facility in Sargans. The tool was installed and the first test runs have already been made. This tool allows us to dice all kinds of wafers, including glass wafers with optical filters on top. Not alone that, flexibility is increased while the lead-time is simultaneously reduced.

Martin Dürmüller, Vice President of Operations, said that this is an important milestone in epc's history of back-end manufacturing. "It allows us to be faster, more flexible and cheaper. And, with its dual-spindle concept, the dicing time of one wafer is cut by half! We are looking forward to a high workload on this machine so we can order a second one," he says with a glint in his eye.

+++ test engineer, IP manager, sales engineer, etc. +++ interesting job opportunities on www.espros.ch +++ have a look! +++