CHIPS.

Newsletter
November 2018

Know the true value of time; snatch, seize and enjoy every moment of it. No idleness, no laziness, no procrastination: never put off until tomorrow what you can do today.

Lord Chesterfield

CEO's Note

Dear Readers,

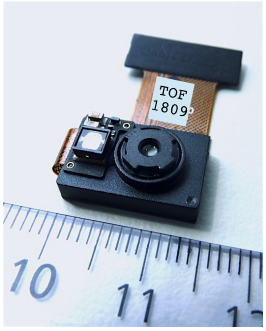
Still today, even experts cannot believe that ESPROS combined high performance CCD and CMOS on the same silicon substrate. And solid state of course, no wafer stacking or the like. Precisely tuned CMOS processes allow this tremendous combination. Tremendous because of almost endless application possibilities. Be it mass spectroscopy, ultra high speed science imaging, spectrometry, ultra fast imaging, TDI imaging, etc. We have customers which do things which seemed to be impossible a few years ago. Of course, our focus is TOF and LiDAR imaging, which also utilizes this powerful combination of CMOS and CCD. Recently, we successfully implemented a CCD imager with a CCD shift speed of 250 MHz (!) and on the same substrate high voltage CCD diver, control logic and 48 columns ADCs with a sampling rate of 125Msps each. A tremendous data rate of more than 30Gbps are generated which are pre-processed on-chip for to compress the data to 1.6Gbps. Needless to say that we are very proud about this achievement. I would like to express my deepest gratitude to all the contributors in the company for their endurance and patience to make this happen.

And needless to say that we are overwhelmed with inquiries and purchase orders! We try to catch up with the demand and we do it with big pleasure.

Beat De Coi

Face ID based on epc660 chip

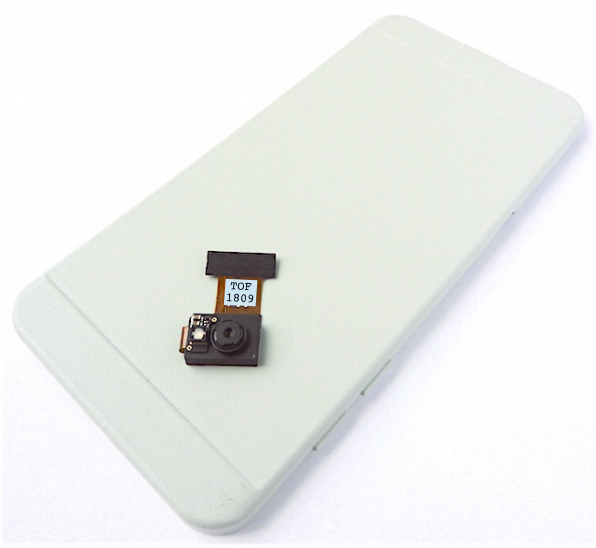
Our face has more than two dimensions - there is one more. This is the big opportunity for the new 3D imager technology to give the application ***Face ID*** an entirely new parameter, ***the living depth***, to make it much, much stronger. It offers new keys of strength and important benefits for additional security. First, imaging data has the mandatory synchronization to the illuminating system in a 3D TOF camera system. The data must match the camera's dynamic and sequence. It needs a true 3D image obtained by the camera. Or better to say true 3D video! Due to run-time acquisition, the security algorithm can check if the 3D image is a static mask or a living face. This interpretation can be done based on the acquired time-domain data. To fake such a dataset becomes quite hard!



Key factors for mobile applications

The USPs of the epc660 chip - very high NIR sensitivity (>80% @ 850nm) as well as the capability of suppressing strong ambient light in the charge domain - make it in a favorite choice for miniaturized mobile applications. High sensitivity means saving battery power and allows eye-safe operation due to fact that the active illumination can be designed to be less powerful. Ambient light acceptance is a key factor and a challenge for devices although they are used outdoor in a full sunlight environment.

The slim bare-die chip-scale package with an overall thickness of 0.23mm with solder balls (CSP) allows to design modules for the thinnest mobile applications. The package allows to scale down the whole the complete module not just in size but also in cost.



3D TOF camera module for mobile applications using the epc660 chip

The essence of image processing

3D TOF imaging to its best needs careful designed image processing. Like every image of an imager, there are many impurities like DSNU, PRNU, DRNU, non-linearities, temporal noise etc. which have to be filtered by image processing. Thus, the final benefit lies in the image processing. It is essential and it is a key factor. Even with a well designed and calibrated camera module, the task is not really done. The raw data output from the camera, the point cloud, needs additional image processing and correction on-the-fly to achieve most reliable results.

The image processing It reduces / improves distance response noise uniformity (DRNU), accuracy, distance noise, edge quality, bad pixels, etc. Usually, this is done by spatial filtering in the image domain (e.g. Median or Gauss filters) and temporal filtering in the time domain (e.g. adaptive Kalman filters). The images above show the same data set before (left) and after (right) filtering.

The pictures show raw 3D TOF data on the left side and filtered 3D TOF data on the right side which is the fused with the grayscale image, also obtained with the 3D TOF imager

Increased Dicing Capacity, Quality and Yield

Fully automatic dual spindle dicing saw in our Production

In September, a new, fully automatic dicing saw "DISCO DFD6341" was installed in our back end processing line. The DFD6341 is the latest fully automatic dual spindle dicing saw from Disco for ø200mm wafers. It incorporates the throughput enhancement technologies pioneered by Disco for ø300 mm wafers.

A new axis mechanism increases the X-axis feed speed to 1,000 mm/sec. Improved acceleration and deceleration performance for each axis increases the distance where the axis moves at the maximum speed for substantially improved throughput.

Optimization of the parts used increases the speed of the major transport units. A shorter distance between the spindles allows for less processing time during dual cut.

The dicing saw exhibits a new feature that separates the TAIKO ring from the membrane of our TOF imager wafers, increasing the reliability of the dicing of our imager chips. Furthermore, the advanced optical alignment and saw line inspection systems, and the more accurate dicing blade height monitoring, results in faster and more autonomous processing of our wafers. Compared to the existing dicing equipment, the process times are reduced massively. Our dicing capacity with the existing and new equipment is thus more than doubled. In conclusion, we can now provide higher dicing capacity with increased quality and yield.

++ Be part of our team and click here for our current job opportunities +