May 16th, 2008

Cypress & MIS develop 3D-WLP CMOS imagers with TSV to enter Medical vision market

During last IntertechPIRA conference on CMOS image sensors in London, Cypress Semiconductor and MIS (Micro-imaging solutions) presented a low cost, high resolution CMOS image sensors encapsulated in a 3D WLP that can be easily integrated into disposable vision systems such as endoscopes or be used as "vision-assistance" to any endoscopic hand instrument (e.g. Clip appliers, linear staplers, vein harvesters, etc.). MIS's patented WL-CSP image sensor format allows pixel counts on the order of 2 to 5 times of what the nearest competitor can offer.

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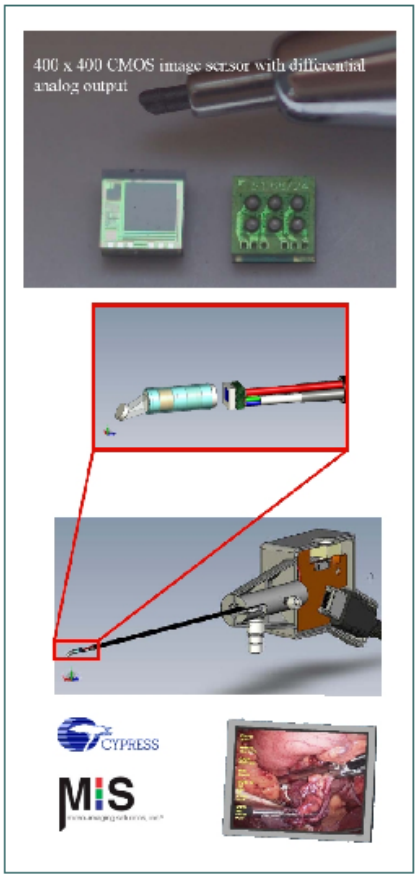
Endoscope systems are typically manufactured by players like Olympus (JP) and use high performance CCD sensors from Sony or Panasonic. However, low cost CMOS imagers are today entering the market place as they can now fit into ultra small WLP packages and target less-invasive surgical procedures applications. As color CMOS imagers can be manufactured in high-volumes CMOS fabs at very low costs (around 1/20th the cost of CCD's at this chip size level: 1x1mm2), this allows CMOS based cameras to be used as "single-use disposables" or as very low-cost reposable systems when incorporated into medical or industrial endoscopes and surgical instruments. Actually, the main driver for the adoption of CMOS imagers in endoscope applications (including laparoscopes, arthroscopes, urological rigid scopes, ENT rigid scopes, rigid bronchoscopes, and rigid hysteroscopes) is that cost of ownership associated with today's rigid and reusable endoscopes is mostly attributable to scope backup, repair, refurbishment, sterilization, and OR downtime. On average, these costs contribute an additional 650% to the reusable rigid endoscope purchase cost over lifespan of the device. Therefore, medical facilities may find it less expensive to purchase disposable endoscopes based on CMOS sensor technology.



MIS tiny WLCSP CMOS image sensor device for bio endoscopy applications

Technology details:

MIS' CMOS camera systems are located at the distal tip of the endoscope, thus outperform all CCD based rod-lens systems which are priced between $15,000 to $50,000 per unit. This technology also has applications in low-cost, high-resolution intraoral cameras for dentistry and opens completely new fields for endoscopic procedures in veterinary medicine. A veterinarian will soon be able to purchase a complete high-resolution, soakable 30° video-endoscope system with camera control module and light source for around $1000 per sytem. Instead of placing the video processing circuitry on the same plane as the pixel array like most camera on chip (SOC) designers used to do, MIS has remoted all of the video processing and most of the timing/control circuitry away from the image plane. The video processing circuitry can be stacked directly behind the imager or it can be placed several meters "downstream" and be connected to the imager via RF or a disconnectable cable as well. An additional benefit to remoting the processing circuitry is a significant reduction in video noise levels. In either case, the imager package will consist only of the pixel array and some timing and control circuitry in order to make the imager package as small as possible. The patented format allows MIS to design the CMOS pixel array into a very small WLP package that can then be placed at the distal tip of an endoscope or other small-diameter enclosure. Since the CMOS imager package contains the full pixel array, resolution does not suffer as a result of the ultra-small size of the WLCSP imager. In regards to the first picture of the WLP imager shown, we could guess that Cypress & MIS developed a similar Opto-WLP packaging technology like Schott Electronic Packaging recently presented that features "Through silicon vias" (TSV) to reduce form factor while opening the possibility to stack the device directly onto the read-out circuit chip.

Sources:

http://www.micro-imaging.us/