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BREAKTHROUGHS

Company Debuts World's Smallest Color SVGA Display

[Daniel Grace](#)

By incorporating single-crystal silicon transistors, Kopin Corp. has developed what it claims is the world's smallest color SVGA display. The CyberDisplay SVGA LVS measures 0.44 in. diagonal—the same size as the company's current VGA display—but with a higher resolution of 640×480 pixels. Endoscopic and vision-aid systems are among the display's potential medical applications.

The display uses the same design architecture as large LCDs, but with a pixel size of $11.25 \mu\text{m}$ square—1000 times smaller than the pixels used by flat-screen televisions. Single-crystal silicon transistor technology, as contrasted with the polysilicon transistor technology used in such everyday small displays as cell phones, provides high pixel density, allowing for sharp color images despite the small pixel size. A planar multimetal layering process, a nanotechnology process for liquid-crystal alignment, and a cell-gap liquid-crystal assembly process further enabled development.

Previously, the company's smallest color SVGA display had been 0.59 in. diagonal. Power consumption has also been reduced compared with the company's previous small SVGA model, down to 70 mW from 100 mW. Low power consumption is essential with a display of this size, notes Hong Choi, chief technical officer. "A display this small is designed to be optically magnified by an eyewear device in order for the image to be vivid," he says. "For such a device to be practical, it must be battery operated, so the display can't consume very much power."

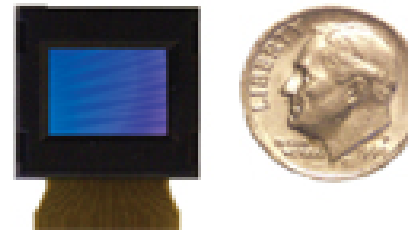
A device incorporating the display would function similarly to a microscope, with the user looking through a lens that enlarges the subject—the subject in this case being the display. Such a device could be incorporated in endoscopic systems, according to Choi. "In today's systems, the image from inside the body is displayed on a monitor that the surgeon must occasionally glance up to, and continuously glancing up and down takes up time and also increases the chance for error," Choi says. "A high-resolution eyewear device would allow the surgeon to see clear, detailed images inside of the body without having to move his head." Choi adds that the display's small size would enable such a device to be light and unobtrusive, allowing the surgeon to simply shift his or her eyeline below the device (like with a pair of spectacles) in order to see the operating field in plain view.

In the past, Kopin's products have been used primarily in the consumer and military markets, but the company is aiming to increase its presence in the medical device sector, according to Choi.

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www.kopin.com

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