Powerful mini-LEDs for thin touchscreens

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The ChipLED can be used for example in multi-touch displays as installed in everything from tablet PCs to all-in-one PCs. Items can not only be selected and moved, they can also been zoomed. Credit: OSRAM

Osram Opto Semiconductors has developed an infrared light-emitting diode (IRED) for use in very thin optical touchscreens. Called the SFH 4053, the small new lamps are housed in a frame surrounding a display. The lamps create a veritable web of light that overlays the display. If a user touches the screen, the motion interferes with the light grid at that particular location, enabling the system to recognize that it is being touched. The new system takes up only 0.45 millimeters of the frame's height and can be easily incorporated into a tablet PC. Despite its small size, the diode is powerful enough to light up a laptop display, for example.

An optical touchscreen's components are mounted in a frame known as a

"bezel," which surrounds the display and is between 0.5 and one millimeter thick. Rows of IREDs and detectors located opposite to each other create an invisible, infrared grid. If a user taps the display, his or her finger will interrupt the light ray and the signal to the corresponding receptors will cease. Larger displays, such as those used in notebook and all-in-one (AiO) computers are flooded with infrared light from two corners. Camera sensors located next to the IREDs only receive a signal if a finger reflects the light emitted on the display. Although this method requires few components, it does need IREDs with a very high radiant flux. The stronger an infrared LED is, the larger a touchscreen can be made with the same number of components.

Osram Opto Semiconductors is a division of the Siemens subsidiary Osram. For the new IRED, the company uses a small chip LED housing that measures only 0.5 x 1 millimeter, making it one of the thinnest on the market. The LED emits light at a wavelength of 850 nanometers, which is invisible to the human eye but can be easily detected by infrared receptors and camera sensors. Due to the use of highly efficient thin-film chip technology, the IRED needs little electricity to emit lots of light and therefore helps to prolong the intervals between battery-charging for portable devices. The lamp has a radiant flux of 35 mW during continuous operation with a current of 70 mA. The output can be several times higher in pulse mode.

Source: Siemens AG