Flexible Substrate

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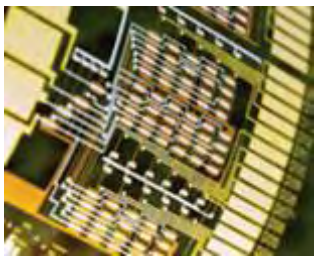
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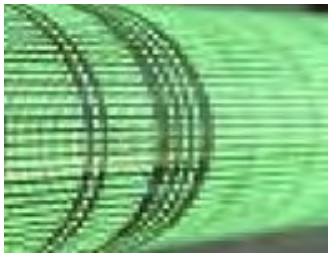
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Lights, touch, and e-Readers…

by Mark Fihn

It seems that e-readers are finally gaining a small measure of success, primarily utilizing the electrophoretic display technology from E Ink. While the solutions are all currently built on a glass substrate, the EPD technology lends itself to implementation on a flexible substrate as well.

For e-Readers, the typical thinking is that long battery life and sunlight readability are requirements (enabling a portable solution that can be read outdoors, without the worry about frequently recharging batteries. The thinking is that for reading, users do not require color or full-motion video. It's not clear yet if these basic specifications are real, or if they just happen to mesh well with the capabilities of EPDs.

In the past few days, I came across press releases for two new products designed for the Amazon Kindle, which has reportedly now shipped to more than 500,000 enthusiasts. The first press release was from Periscope, who just released a Lighted Folio – a single compact Kindle cover that also features a built-in retractable reading light, notepad holder, and pen slot. Periscope's literature says, "Ideal for reading at home or on the road, consumers simply slip their Kindle into the custom designed holder, pull up the retractable, twin LED reading light, and begin reading in any low light environment – in bed, on a bus, train, or airplane, as well as in a car or conference room." The Periscope light is powered by three "AA" batteries that last at least 40 hours. A mini-travel 110-220V AC adapter is available for purchase separately. www.periscopelight.com.

A few days later, I read about a new night light from M-Edge Accessories, who unveiled their updated Executive Jacket for the Amazon Kindle with a specially designed, integrated booklight: the M-Edge e-Luminator. M-Edge CEO Patrick Mish says, "The primary complaint we receive from Kindle users is that the device is difficult to read in low light situations. Previously, users were forced to purchase a traditional booklight, which can be awkward to use, bulky to store, and can damage the jacket or e-reader. We worked to solve this problem by offering an attractive alternative that seamlessly integrates with our Executive Jackets." The M-Edge e-Luminator utilizes a super-bright LED light and optical grade lens that spreads light evenly across the Kindle screen. A long lasting A23 battery powers the device. http://www.buymedge.com

On the left is the Periscope Lighted Folio for Kindle; on the right is the M-Edge e-Luminator

I can't help wondering about these external lights. If they are truly quite popular, it suggests that backlit or emissive display solutions might be better options. Perhaps transflective LCDs would allow for sunlight readability. Carrying around external lighting, battery system, and maybe even another A/C adaptor just doesn't seem very user friendly.

Both of these external lighting solutions use additional batteries beyond the batteries already in the e-reader, which will help conserve battery life of the e-reader. We imagine that before long, there will be similar solutions that draw power from the system battery, perhaps via a USB connection – diminishing one of the advantages claimed by EPD enthusiasts.

A similar power consumption concern has to do with touch input for e-readers. I personally believe that to be enormously successful, particularly in the education marketplace, e-readers must enable some sort of annotation capability. As such, I think that e-readers need to be touch enabled. But adding touch also creates another demand on the system battery. Some experts report that it's possible for the touch-screen solution to actually consume more power than the EPD itself.

No doubt e-reader makers will continue to push suppliers to lower power consumption with enhanced performance. If light sources, touch screens, are gaining in popularity, there are certain to be noticeable hits to battery life. Video and color may stir up the EPD market even more, which if so is likely to speed up development of EPDs on flexible substrates as a way to fend off the inexorable march of LCDs into almost all market segments.

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