

OLEDs: EMPOWERING MOBILE PHONE DISPLAYS

This is what the future looks like, if current research in the field of Organic Light Emitting Diodes (OLEDs) gains momentum.

The OLED is a flat display technology, developed by placing a series of organic thin films between two conductors. When electrical current is applied, a bright light is emitted. The result is bright, clear, high-resolution images and excellent video display due to a faster refresh rate.

The OLED Advantage

OLEDs have a host of advantages over today's flat-panel technology (liquid crystal displays [LCDs] or plasma). They emit light and do not require a backlight. This means that OLEDs can be made very thin and are power efficient as compared to LCDs. They can be used to create white-light too. The OLED screens produce bright, clear images.

Colours on OLEDs are brilliant with greater saturation, hence resulting in sharper images. Since they are also better at displaying videos due to a faster refresh rate of their screens, there are no trails on the screen. Not just that, the best active-matrix models can display more colors than LCDs. OLEDs offer lighter and more durable mobile screens and operate in a broader temperature range.

Today one can find small (up to 3 or 4 inch) organic displays in many devices -- cellphones, A/V players, car audio systems, digital cameras and PDAs. Some models of cellphones use OLED screens for their outer display. The main attraction is their low power consumption and brightness.

OLEDs are actually prototypes than real interoperable commercial products. Building large sized OLED displays is not easy, and it will take some time before companies are able to do it economically. One of the main challenges in OLED displays is the lifetime, especially of the blue color, which is problematic for larger screens.

A Beginning

In 1997, the first commercial OLED display was introduced by Pioneer Electronics as the

Imagine having a mobile phone, which has a detachable screen that you can fold or roll out and take anywhere.

front panel of a car stereo. This marked the entry of OLED technology into the display arena. The last three years have seen a lot of development in OLED display manufacturing. Samsung SDI began mass-production of Active Matrix OLED (AMOLED) panels.

In November 2007, Sony commercialised the world's first OLED TV. This year, LG Display, CMEL and other companies proactively developed their own AMOLED TVs, which are beginning to show excellent results.

Viewers demand more data and information (including entertainment) displayed on larger screens and want portability. Therefore, display manufacturers are being forced to develop lighter weight, ultra thin and performing systems in larger sizes. The demand is for 10" to 42" televisions and smaller sizes for other applications. In this segment, flat panel displays based on LCD seem to have greater acceptability.

The Road Ahead

We are hoping OLED based displays will develop into a matured display technology and challenge other flat panel displays. Due to distinct advantages over LCDs, OLEDs are being explored for a variety of applications like mobile phone displays, PDAs, automotive displays and even televisions.

And the Finance Minister's Budget wish list in 2006 suggests that the government is ready through liberalising regulatory frameworks to encourage developers to make India a preferred destination for manufacturing high technology IT products including OLED/LCD/flat panel displays.

Research conducted across a cross-section of potential markets for OLEDs seemed to indicate that there is a high demand and acceptability for OLED based displays.

Though the major OLED application will be on mobile phones, interoperable OLED TV production has started and is gaining momentum. Samtel is a front-runner in indigenising the technology and harnessing it for making prototypes of TVs, which are flexible, less than a quarter-inch thick, consumes less power than most TVs on the market today and can be rolled up when you're not using it.

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(Disclaimer: the views and opinions expressed in this article are those of the author and do not reflect the stance of the magazine)

