OLEDs Replacing LCDs in Mobile Phones

EDN Staff - April 07, 2005

Thanks to the rising use of organic light-emitting diodes (OLED) as an alternative to LCDs in mobile-phone displays, worldwide OLED panel market revenue expanded to $408 million in 2004, up 63 percent from $251 million in 2003, iSuppli Corp. said today.

The firm expects that number to grow to $615 million this year, up 50.7 percent from last year.

Thirty-one million OLED panels were sold in 2004, nearly double from 16.8 million in 2003, and El Segundo, Calif.-based iSuppli expects unit sales to nearly double again to reach 60 million this year.

Long term, the OLED market is forecast to rise to 341 million units valued at $2.9 billion in 2011, representing a compound annual growth rate of 34 percent in units and 29 percent in value from 2005 to 2011.

Among OLED vendors, rapid sales growth in 2004 for these displays allowed Samsung SDI to leverage strong presence in the mobile-phone business to take the top rank for the global OLED panel market, garnering 44 percent of unit sales. The company replaced Pioneer of Japan as the leading OLED supplier. Samsung’s OLED shipments were boosted by internal sales to its mobile-phone business.

In 2004, 89 percent of OLED panel market revenue was derived from sales to the mobile-phone market. Mobile phones are expected to remain the largest application for OLEDs during this decade, iSuppli reported.

OLEDs are currently being utilized as the main display of mobile phones, as opposed to being a secondary display, as has been the case until recently. Mobile phones also are increasingly using color OLED panels.

For the number two OLED vendor spot, Taiwan’s RiTdisplay edged out Pioneer with 22 percent of sales. RiTdisplay has made a rapid entry into the nascent market for OLED displays in MP3 players than its competitors. Pioneer slid to third place with 20 percent of OLED sales.

iSuppli also said makers of passive matrix OLEDs have cut prices of their products facing increasingly stiff competition from TFT-LCDs in the mobile-phone display market, but rising sales to the MP3 market have helped offset the impact of the price reductions.

MP3 player panels accounted for 3 percent of OLED market revenue in 2004, but iSuppli suspects this could rise to as much as 15 percent this year. More than 50 MP3 player models now use OLED panels, iSuppli noted, with RiTdisplay being the largest supplier. Other MP3 player panel suppliers include Univision, Samsung SDI, Teco and Pioneer.
The MP3 player has replaced the mobile-phone subdisplay as the entry application for simple OLEDs that support area-color or four-color display. In particular, flash-memory-based MP3 players that have 2- to 4-line displays are taking advantage of OLEDs’ high contrast and superior color compared to STN-LCDs. Hard-disk-drive-based MP3 players tend to have 1- to 2-inch graphic displays, some high-end players of this type also are switching to OLEDs.

iSuppli has found that efforts to commercialize large-scale active-matrix OLEDs (AMOLEDs) are being slowed by the need to compete with rapid price declines in TFT-LCDs. Further, deposition equipment for both small-molecule and polymer types of OLEDs has required significant modification and development in order to support processes for mass production. Many companies cannot yet supply large quantities of AMOLEDs for mobile-phone main displays, and will thus begin by serving the markets for low-volume products such as portable media players.

Finally, iSuppli pointed out that OLEDs are well suited for use as television displays due to their fast speed, good color, excellent viewing angle and high contrast ratio.

OLEDs may appear in televisions smaller than 5-inches in diagonal size by 2006 with TVs larger than 9-inches probably not employing OLEDs until at least 2008. Shipments of OLEDs for large-screen televisions probably will not exceed 1 million units until after 2011, iSuppli concluded.