Status of Organic Light Emitting Diodes

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ABSTRACT

This paper discusses the status of Organic Light Emitting Diodes (OLED).

Keywords

Organic, Light, Emitting, Diode, Status

1. INTRODUCTION

OLEDs contain a film layer of organic compounds that are deposited in rows and columns. Each pixel is able to emit a different color. Advantages of such displays can be illustrated with their implementation in cell phone displays, computer monitors, television screens, advertising billboards and monitors, PDAs, and more.

2. IMPLEMENTATIONS

The Optimus Maximus keyboard uses OLEDs as its keys. This allows for the keys to be easily reassigned and lit in dark environments. GE debuted the first roll-able OLED display in 2008. Sony released a 0.2mm thick, 3.5 inch display in April of 2008. Sony's Walkman X series implements a 3 inch OLED touch screen display. Samsung released a 4.3mm 31 inch OLED display in January of 2008 and in October of 2008 a 40 inch Full HD OLED display[1].

3. ADVANTAGES

The manner in which OLEDs are adhered to a suitable substrate is simply through printing. Literally, an inkjet printer could adhere them to a surface. For this reason, they have more versatility than regular LEDs, LCD technology, and plasma displays[3].

OLEDs don't just improve the ways of old technology, they also open the doors to new implementations. Printing OLEDs directly to t-shirts and other fabrics is one such example. OLEDs are also flexible and able to withstand bending, so rolling a display up for easy storage is yet another advantage.

Of course, OLEDs are organic, so they have environmental advantages as well. Less energy power consumption, cheaper cost, and easily attainable material are just a few more advantages gained from the use of OLED displays. Even with these features, OLEDs don't sacrifice refresh rate or vibrant displays.

Though OLEDs require less power, this does not imply that their vibrance is any less. In fact, OLEDs have a better ability to display higher contrasts, improve color visibility, and project brighter. They also have a wider array of displayable colors. Since OLEDs, unlike LCDs, do not require a backlight, their colors are visible and untainted even at wider viewing angles.

4. DISADVANTAGES

The largest deterrence in widespread acceptance of OLED displays is the lifetime. Different colors diodes die quicker than others, blue dying the fastest. On average, OLED displays have an estimated lifespan of 14,000 hours contrasted with an LCDs lifespan averaging about 60,000 hours[2]. Additionally, unreliable color displays after about 10,000 hours is likely considering different colors die out quicker than others and will start to dim at that point.

5. CONCLUSIONS

After releasing an ultra-thin 12.1 inch OLED laptop display prototype with a promised 1280x768 resolution and infinite contrast ratio, Samsung stated that they expect OLED displays to be used in PC notebooks as early as 2010. Given its advantages, price saving promises, and minimal number of disadvantages, it's no surprise. If they don't catch on by 2010, OLEDs seem to be a likely candidate for future displays in the very near future.

6. REFERENCES

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