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## Introduction

The basic structure of organic light-emitting diodes (OLEDs) was reported by Tang and Van Slyke at Eastman Kodak in 1987 [1]. This was a groundbreaking study and was later referred to as the “first OLED paper.” Now, almost 30 years later, there is a large market for OLED devices. The first OLED product was developed by Pioneer for car audio. Then the first mass production of AMOLED by SK display (a joint manufacturing venture by Eastman Kodak and Sanyo Electric) for Kodak’s LS633 digital camera (Figure 1.1) accelerated the use of OLED for display applications.

This was followed by the widescale development of many other OLED-based products, including cellular phones (Figure 1.2), smart watches (Figure 1.3), audio players (Figure 1.4), and portable global positioning satellite (GPS) devices, which now provide high-resolution displays in brilliant, multitone colors.

Larger-display products have also been introduced on the market, such as those shown in Figure 1.5. Much larger prototypes have also been developed (Figure 1.6). Because of their superior features such as slim flat-screen design and aesthetically pleasing screen image, and due to high-contrast image signal emission and very good response time, the current state of the art of OLED television technology that has debuted in the marketplace is indeed groundbreaking [2].

The main objective of this book is to explain the basics and application of this promising technology from various perspectives.



**Figure 1.1** The first active-matrix OLED display product on the market (Kodak LS633 digital camera).



**Figure 1.2** Example of a cellular phone using active-matrix OLED (AMOLED) (Galaxy S7 smartphone by Samsung).

**Figure 1.3** Example of a smart watch using active-matrix OLED (AMOLED) (Apple Watch Series 2 by Apple).



**Figure 1.4** Example of an audio player using active-matrix OLED (AMOLED) (Sony Walkman NW-X-1050).



## References

- 1 C. W. Tang and S. A. Van Slyke, Organic electroluminescent diodes, *Appl. Phys. Lett.* **51**(12):913–915 (1987).
- 2 T. Tsujimura, W. Zhu, S. Mizukoshi, N. Mori, M. Yamaguchi, K. Miwa, S. Ono, Y. Maekawa, K. Kawabe, M. Kohno, and K. Onomura, Advancements and outlook of high performance active-matrix OLED displays, *SID 2007 Digest*, 2007, p. 84.

