

Large Area Flexible OLED Display and Technical Challenges

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Large area flexible OLED display provides various electronic applications such as curved, rollable, and commercial displays because of its thin and light properties and design freedom [1]. In this work, the world 1st 18-inch flexible OLED display of bottom emission type is introduced. The panel fabrication process will be explained with some key technologies. To realize bottom emission structure as shown in Figure 1 (a), a transparent plastic substrate with thermally stable property was developed. With considering compatibility with TFT processes on a transparent substrate, we employed amorphous indium gallium zinc oxide (a-IGZO) TFTs. The electrical characteristics of TFTs on transparent substrates show excellent transfer characteristics as shown in Figure 1 (b), even after detaching carrier glass; called LASER release process [2].

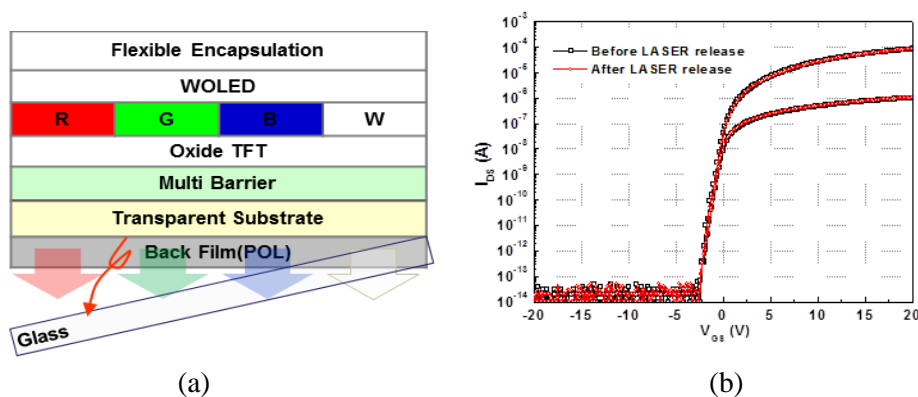


Fig. 1. A schematic of the panel structure of bottom emission type (a) and transfer characteristics of a-IGZO TFTs on the transparent substrate before and after LASER release process (b)

After a fabrication of coplanar type TFT, the R,G,B,W pixels were defined on TFTs and then the flexible encapsulation process was employed on OLED layer to passivate it. After scribing each cell, COF/FPC bonding process was done. LASER release and back film lamination process were performed. In this work, some challenging technologies will be discussed in detail.

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