

immediately after the deposition. It is important to use materials that do not generate abnormality in peeling due to annealing in forming the peeled layer and the irradiation of laser light and have tensile stress in the range of 1 to 1×10^{10} (Dyne/cm²) after the peeled layer is formed. Typically, nitrides or metals are preferable. A representative example is a single layer formed of an element selected from W, WN, TiN and TiW, an alloy material or compound material having a principal component of the elements, or a laminated layer of these. In addition, it is fine to use sputtering for the first material layer **312**.

[0057] For the substrate **311**, glass, silica and ceramics can be used. Furthermore, it is acceptable to use a semiconductor substrate typically silicon, or a metal substrate typically stainless steel. Here, a glass substrate (#1737) having a thickness of 0.7 mm is used.

[0058] Subsequently, a second material layer **313** is deposited over the first material layer **312**. As for the second material layer **313**, it is important to use materials that do not generate abnormality in peeling due to annealing in forming the peeled layer and the irradiation of laser light and have compressive stress in the range of 1 to 1×10^{10} (Dyne/cm²) after the peeled layer is formed. For the second material layer **313**, oxides are preferable. A representative example is silicon oxide, silicon oxide nitride, metal oxide materials or a laminated layer of these. Moreover, it is fine to deposit the second material layer **313** by sputtering. When the second material layer **313** is deposited by sputtering, a rare gas typically argon gas is introduced into a chamber to have a slight amount of a rare gas element contained in the second material layer **313**.

[0059] In the first material layer **312** and the second material layer **313**, it is acceptable that the film thickness of each layer is properly set in the range of 1 to 1000 nm to adjust the internal stress in the first material layer **312** and the internal stress in the second material layer **313**.

[0060] In addition, in FIGS. 3A to 3E, the embodiment is shown for simplifying the processes in which the first material layer **312** is formed as contacting with the substrate **311**. However, it is fine that an insulating layer or metal layer to be a buffer layer is disposed between the substrate **311** and the first material layer **312** to enhance the adhesion to the substrate **311**.

[0061] Then, a peeled layer **314a** containing TFTs is formed over the second material layer **313**. The peeled layer **314a** includes TFTs in a pixel portion(part) (an n-channel TFT and a p-channel TFT), drive circuit TFTs disposed around the pixel portion (an n-channel TFT and a p-channel TFT), and wiring lines. Subsequently, an insulating film for covering each of the TFTs is formed, and then the cathode or the anode electrically connected to the TFTs disposed in the pixel portion is formed. After that, an insulator called a bank is formed on both ends so as to cover the end part of the cathode or the anode. Furthermore, it is fine to properly form a passivation film (protection film) formed of a nitride film so as to cover the TFTs as necessary. Moreover, as the process of forming the peeled layer **314a**, annealing can be performed as resistible by the substrate **311**. Besides, even though the internal stress in the second material layer **313** is varied from the internal stress in the first material layer **312**, annealing treatment in the process of fabricating the peeled layer **314a** will not cause film removal.

[0062] Then, a peeled layer **314b** containing an organic light emitting diode is formed over the peeled layer **314a** containing the TFTs. That is, an EL layer (organic compound material layer) is formed over the cathode or the anode covered with the bank. It is acceptable that the anode is disposed over the EL layer when the under layer of the EL layer is formed into the cathode, whereas the cathode is disposed over the EL layer when the under layer of the EL layer is formed into the anode.

[0063] As the EL layer, layers for injecting, transferring and recombining electron and hole carriers, that is, a light emitting layer, a carrier transport layer and a carrier injection layer are combined freely. As the organic EL materials, the low-weight molecular type, the polymer type and those combining both can be used. In addition, as the EL layer, such thin films can be used that the thin films are formed of light emitting materials capable of obtaining light emission from the singlet excitation state or triplet excitation state (generally, the former is fluorescence, and the latter is phosphorescence). For film deposition methods, the dry process such as vacuum evaporation and electron beam (EB) evaporation are general in the low weight molecular type materials, whereas the wet process such as spin coating and ink jet printing are general in the polymer type materials. Furthermore, inorganic materials such as silicon carbide can be used as the carrier transport layer and the carrier injection layer. For the organic EL materials and the inorganic materials, publicly known materials can be used. Moreover, the EL layer is formed into a thin film layer of about 100 nm in total. To this end, the surface formed as the cathode or the anode needs to enhance the flatness.

[0064] Besides, as the materials used for the cathode, it is preferable to use metals having a small work function (alkali metals and alkaline earth metals) and alloys containing these. For example, in the organic light emitting diode using an aluminium alloy (AlLi alloy) containing a slight amount of Li (lithium) for the cathode, which is one of alkali metals, the light emitting characteristics are generally excellent and the reduction in luminance is small even though lighting for long hours. Alternatively, when a single metal (Al, for example) having a work function not so small is laminated over an ultrathin film (about one nanometer) formed of oxides and fluorides of alkali metals and oxides and fluorides of alkaline earth metals, the excellent device characteristics can be similarly obtained. For example, when the structure is used in which Al is laminated over an ultrathin film of LiF instead of the AlLi alloy as the cathode, the similar characteristics can be obtained as well.

[0065] In addition, as the conductive film used for the anode, materials having a work function greater than that of the materials for forming the cathode are used. Particularly, for transparent conductive films, the tin oxide (SnO₂) type, zinc oxide (ZnO) type and indium oxide (In₂O₃) type of materials, typically ITO (indium oxide-tin oxide alloy) and IZO (indium oxide-zinc oxide alloy) are widely used. Furthermore, materials having sheet resistance lower than that of ITO, specifically platinum (Pt), chromium (Cr), tungsten (W) and nickel (Ni) can be used as well.

[0066] The steps described above, the peeled layer is formed in which the layer **314b** containing the organic light emitting diode is laminated with the layer **314a** containing the TFTs to be connected to the organic light emitting diode.