polyimide. Other types of photosensitive layers are also useful. The thickness of the layer is typically less than 0.5 mm. The dielectric layer is patterned to form isolation pillars on the substrate, isolating the cathode materials. These pillars also support the layers above it and improve the flexibility of the device by about 10 to 30 percent.

[0020] If a resist is used, the resist is patterned by selectively exposing it to radiation through a mask and developing it to remove the exposed or unexposed portions, depending on whether a positive or negative active resist is used. If a non-photosensitive layer is used, a resist layer is deposited and patterned to serve as an etch mask for patterning the non-photosensitive layer using, for example, an anisotropic etch such as a reactive ion etch (RIE).

[0021] One or more organic functional layers **460** are formed on the substrate, covering the conductive layer. In one embodiment, the functional organic layers comprise a conjugated polymer or a low molecular material such as $Alq_3$. Other types of functional organic layers are also useful. Typically, the thickness of the organic layers is about 2-200 nm. The organic layer is then patterned, removing portions thereof to expose the anode for bond pad connections.

[0022] A second conductive layer **440** is deposited over the substrate to serve as the cathode. The second conductive layer comprises a conductive material such as Ca, Mg, Ba, Ag or a mixture thereof. The top electrode strips are typically orthogonal to the bottom electrode strips. Forming top electrode strips that are diagonal to the bottom electrode strips is also useful. The intersections of the top and bottom electrode strips form organic LED pixels.

[0023] A flat lid **450** is mounted on the substrate to encapsulate the device according to one embodiment. The lid layer comprises preferably of metal (e.g. stainless steel alloy, aluminium alloy). Typically, the thickness of the lid layer 0.04-0.4 mm. The lid should have higher stiffness and ductility than the substrate, and good resistance against oxidation and chemicals. The thickness of the lid and substrate stack is preferably less than 0.6 mm so that it can be easily integrated into the chip card.

[0024] Various techniques can be used attach the lid to the substrate. In one embodiment, an adhesive **430** is used to mount the lid layer. Adhesives such as self-hardening adhesives, UV or thermal curable adhesives, or hot melt adhesives are useful. Other techniques that employ low temperature solder materials, ultrasonic bonding, or welding techniques using inductance or laser welding are also useful.

[0025] In another embodiment shown in **FIG. 5, a** stamped metal lid **510** containing a cavity **530** can be used to encapsulate the device. The cavity can accommodate some desiccant material **520** (e.g. getter or scavenger) to absorb residual moisture and oxygen. Alternatively, the cover lid can extend the actual outer dimensions of the substrate to facilitate integration of the display into the chip card by mechanical interlocking. The metal lid can be shaped (e.g. rounded, flat or wedge-shaped) to avoid high stress at the edge of the display. Referring to **FIG. 6***a*, a wedge-shaped metal lid **610** is used to encapsulate the device. The fabricated device **600** is integrated into the flexible chip card as shown in **FIG. 6***b*.

[0026] In another embodiment shown in **FIG. 7, a** thin and flexible cover **720** (e.g. glass with thickness of 0.05 mm) is used first to encapsulate the device. A flat metal reinforcement **710** is subsequently mounted on the thin cover.

[0027] While the invention has been particularly shown and described with reference to various embodiments, it will be recognized by those skilled in the art that modifications and changes may be made to the present invention without departing from the spirit and scope thereof. The scope of the invention should therefore be determined not with reference to the above description but with reference to the appended claims along with their full scope of equivalents.

What is claimed is:

**1**. A device comprising:

a substrate including a device region; and

a support lid on the substrate, the lid encapsulating the device and reducing the substrate's susceptibility to breakage.

**2**. The device of claim 1 wherein the device comprises an OLED device.

**3**. The device of claim 2 wherein the device is integrated into a flexible surface.

**4**. The device of claim 3 wherein the area occupied by the display comprises a small fraction of the total area of the flexible surface.

**5**. The device of claim 4 wherein the flexible surface comprises a chip card.

**6**. The device of claim 5 wherein the substrate comprises a brittle material.

**7**. The device of claim 6 wherein the substrate comprises transparent material.

**8**. The device of claim 7 wherein the substrate comprises glass.

**9**. The device of claim 7 wherein the support lid comprises a material more ductile and stiff than the substrate.

**10**. The device of claim 9 wherein the lid material comprises metal.

**11**. The device of claim 10 wherein the lid comprises a thickness of about 0.04 mm to 0.4 mm.

**12**. The device of claim 11 wherein the substrate comprises a thickness of less than 0.4 mm.

**13**. The device of claim 12 wherein the device comprises a thickness of less than 0.6 mm.

**14**. The device of claim 13 wherein the substrate material comprises glass.

**15**. The device of claim 14 wherein the lid comprises different shapes.

**16**. The device of claim 15 wherein the lid comprises a thin and flat shape.

**17**. The device of claim 16 wherein the lid comprises a shape that extends the outer dimensions of the substrate.

**18**. The device of claim 17 wherein the lid comprises a round shape.

**19**. The device of claim 17 wherein the lid comprises a wedge shape.

**20**. The device of claim 15 wherein the lid comprises a stamped shape, the lid forming a cavity over the substrate.

**21**. The device of claim 20 wherein desiccant material is deposited in the cavity, absorbing residual moisture and oxygen.

**22**. The device of claim 1 wherein the device is integrated into a flexible surface.