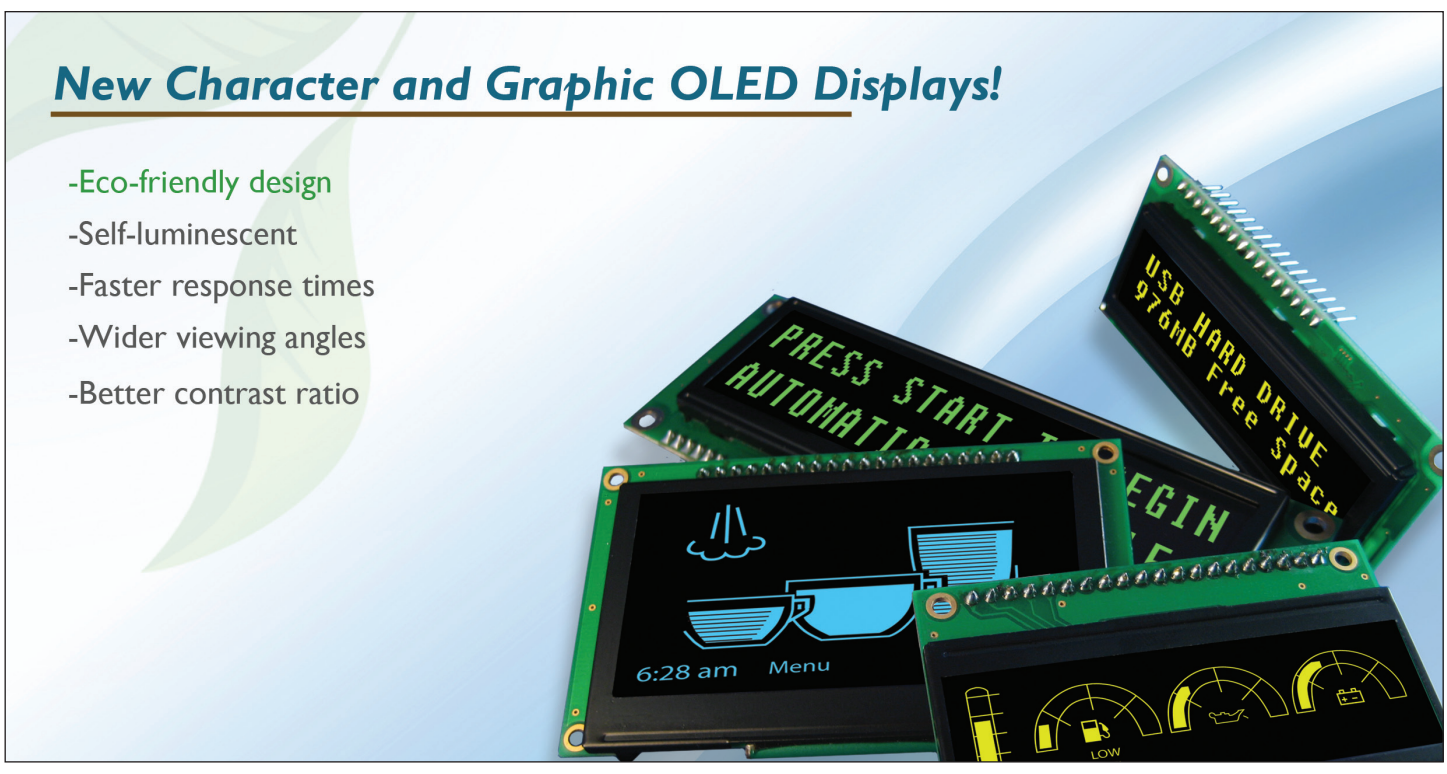
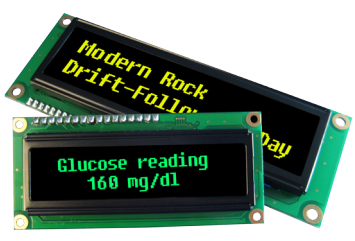


Newhaven Display Character and Graphic OLED Displays

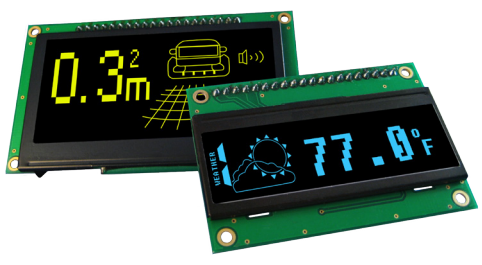
The new OLED (Organic Light Emitting Diode) is a brighter, higher contrast display that has faster response times, wider viewing angles, and consumes less power than conventional VFD, LED or LCD Displays. OLED displays are self-illuminating and require no backlight for maximum visibility in all environments. This also allows OLEDs to be significantly thinner than standard VFD, LED or LCD displays. Newhaven Display offers Character and Graphic type OLED displays as complete, easy-to-use modules.



Examples of Character OLED Displays

Newhaven Display's Character OLED modules come in standard sizes and can be used as compatible replacements for LCD or VFD modules. They use serial or parallel MPU interface, have LCD compatible instructions and 4 built-in font tables.

Newhaven Display's Graphic OLED modules are easy to use, all-in-one designs. Most Graphic OLED displays require multiple high-voltage power supplies and external logic components. Newhaven Display's custom designed module boards for each Graphic OLED allow the user to have just one interface supply. The Graphic OLED module board has all the required external logic components, making it fast and easy to start using the displays.



Examples of Graphic OLED Displays

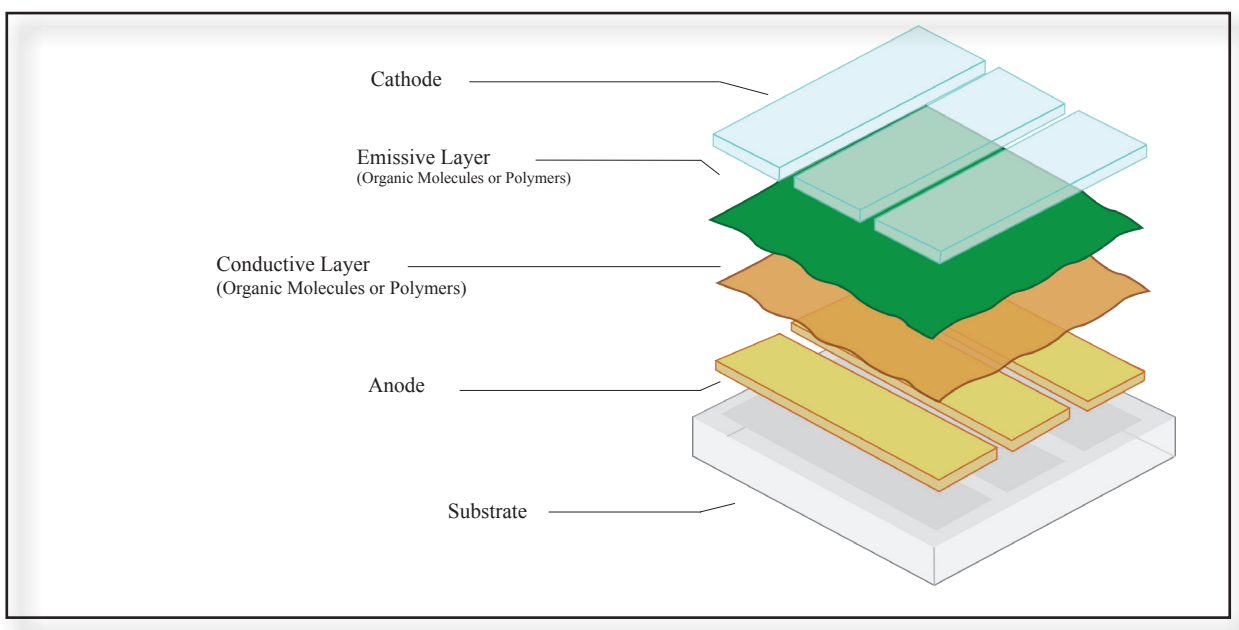
Compatible Displays		
Character OLED Models	Character LCD Models	VFD Module Models
NHD-0216KZW NHD-0216SZW NHD-0220DZW NHD-0420DZW	NHD-0216K1Z NHD-0216SZ NHD-0220DZ NHD-0420DZ	M0216SD-162SDAR2-1 M0216MD-162MDBR2-J M0220SD-202SDAR1 M0420SD-204SDAR1-3

Newhaven Display's Character OLEDs are compatible displays with some of our Character LCD displays and VFD displays. Above is a chart indicating which LCD Character and VFD displays the Character OLEDs can replace.

Features:

- Fast response time: 10µs
- Wide viewing angle: Up to 160°
- Thin designs
- Self-illuminated; no Backlight necessary
- Low power consumption
- High Brightness
- High Contrast ratio: 2000:1
- Wide Operation Temperature: -40°C to +80°C
- Serial or Parallel MPU interface
- Character Module OLEDs include 4 built-in Font Tables
- Graphic Module OLEDs include required external logic and voltages
- RoHS Compliant

OLED TECHNOLOGY



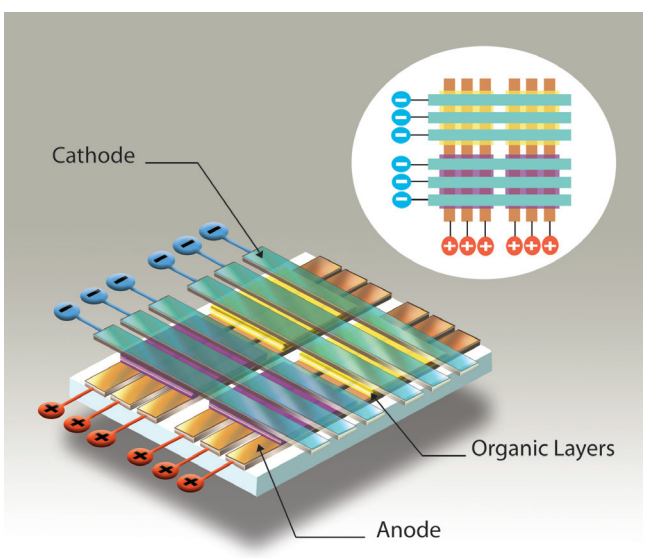
OLED Display Structure

OLED Displays (Organic Light Emitting Diode) provide brighter, higher contrast displays, have faster response times, wider viewing angles and and use less power than the conventional LEDs or LCD displays.

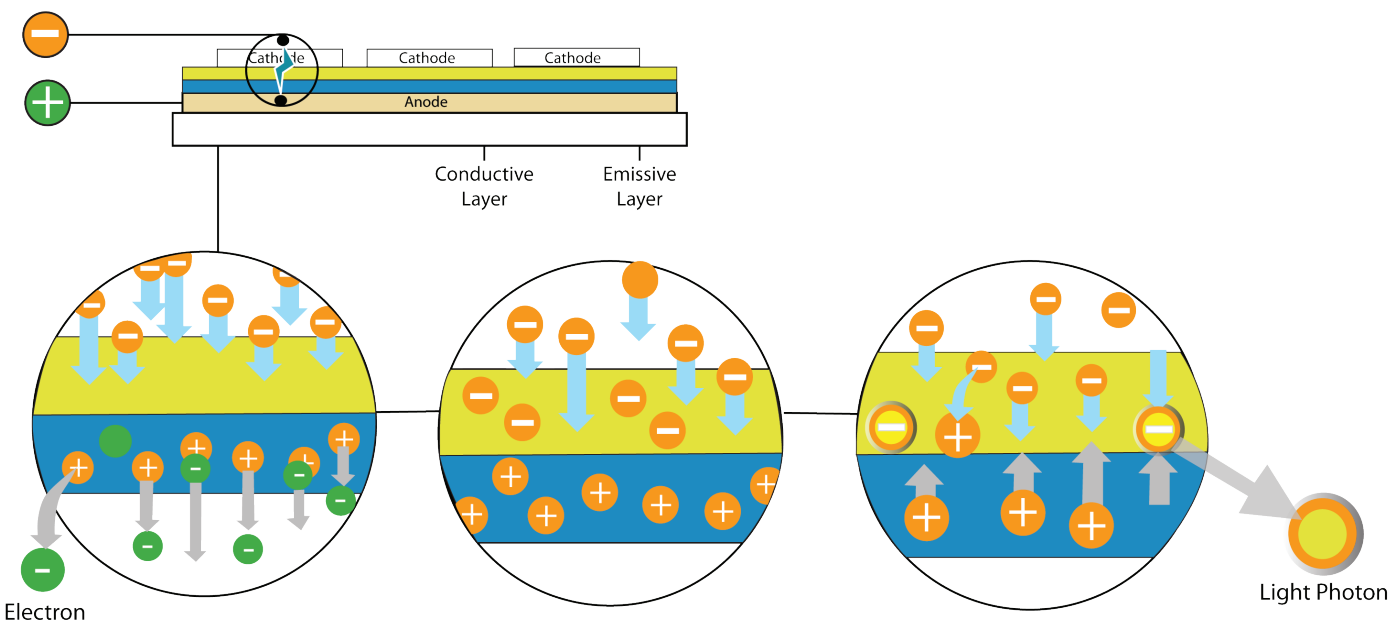
OLED Displays are made up of a layer of organic material placed between two conductors. These two conductors (an anode and a cathode) are then between a glass top plate (seal) and a glass bottom plate (substrate). When an electric current is applied to the two conductors, the organic material produces a bright, electro-luminescent light. When energy passes from the negatively charged layer (cathode) to the other (anode) layer, it stimulates the organic material between the two, which in turn emits light that's visible throught the outermost layer of glass.

How OLEDs Produce Color

In order for OLED displays to produce color, an electric current is needed to stimulate the relevant pixels on the OLED display. The pixels are created by the arrangement of the cathodes and anodes; which are arranged perpendicular to eachother. Where these two intersect, is where the light is emitted. The electic current applied tot he selected strips of anodes and cathodes determin which pixels get turned on and which pixels remain off. The brightness of each pixel is proportional to the amount of applied current.



How OLEDs Emit Light



1. Electrical current flows from the Cathode to the Anode through the organic layers, giving electrons to the emissive layer and removing electrons from the conductive layer.

2. Removing electrons from the conductive layer leaves holes that need to be filled with the electrons in the emissive layer.

3. The holes jump to the emissive layer and recombine with the electrons. As the electrons drop into the holes, they release their extra energy as light.