

Patent Disclosure - Forming an optical lens for a light emitting diode using a laminated polymers film
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Invention

A method for manufacturing an optical lens for a light emitting diode using a vacuum laminated polymer material.

Background

A light emitting diode is a single source of light which in conventional applications is encapsulated in a dome of optically clear or tinted epoxy which protects the diode and radiates the light emission from the component. The encapsulating dome may add height or a radiant characteristic to the diode which is not desirable. The IntraGlobal method for creating an LED lens using a vacuum laminated polymers material reduces the height of the dome. The film lens is employed to refract the emitted photons in a manner which contains the photons within the sub surface of the film and causes the illumination of the LED to be dispersed within the horizontal plane of the laminated material.

The laminated polymer material is formulated to provide a variety of different illuminating characteristics to the resident LED's which are encapsulated by the film. The most basic mitigating attribute of the film would be an added filler of phosphor which would change the blue spectrum of an LED to the appearance of white light. Fillers and formulations can also add an appearance of a fluid and uniform light over planarized surfaces and these surfaces can be electronically manipulated for unique lighting effects.

Method

An LED is mounted in substrate material which has a conductive layer of copper or similar electrical current carrying metal on each side of the substrate (**fig 01**). The diode is affixed in the substrate and connected to the power and ground planes resident on the substrate by employing a MicroSite™ assembly technique. Having assembled the LED device in this manner, the diode may be illuminated by introducing electrical current to the power and ground terminals.

Upon the surface of the LED substrate is laminated the photo imageable lens material(**fig 02**). The pattern of the lens shape is exposed by UV light on to the film material (**fig 03**)and the material is processed in a manner which permanently adheres the shape of the lens to the substrate. (**fig 04**)

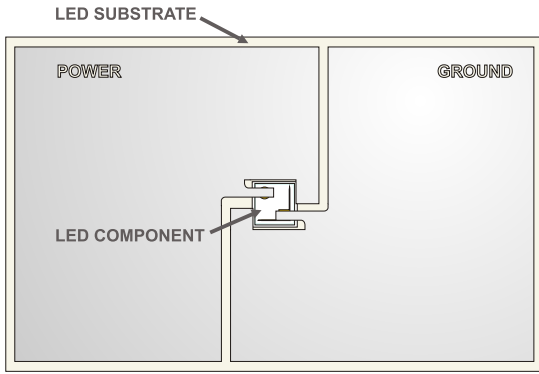


fig 01

LED IS MOUNTED IN THE SUBSTRATE

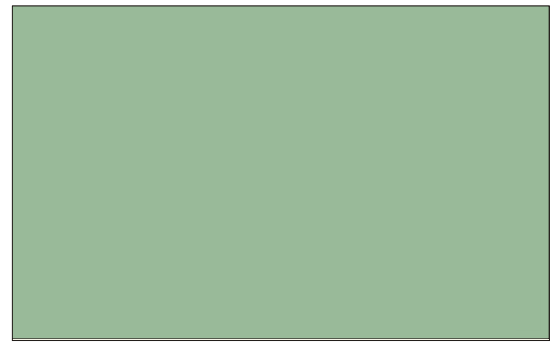


fig 02

MASKING MATERIAL LAMINATED ON SUBSTRATE

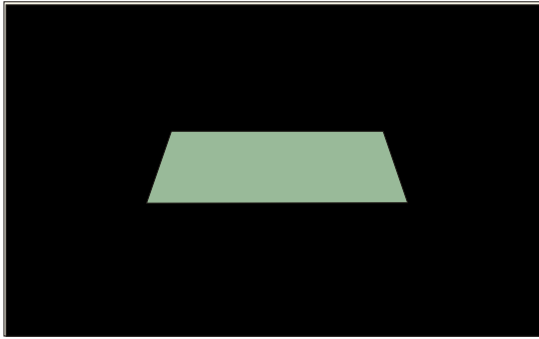


fig 03

LENS IS FORMED BY USING PHOTO IMAGING MASK

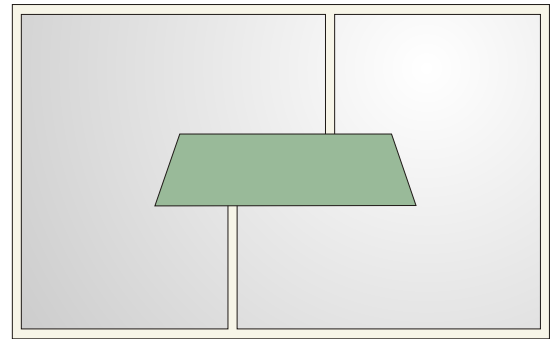


fig 04

MATERIAL IS PROCESSED TO FORM A PERMANENT LENS ENCAPSULATING THE LED