Development and Prototyping of a Solid State Lighting Product for Architectural and Accent Applications

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ABSTRACT

Far from being simply a necessary appliance to extend our day, artificial light has a great influence on human behaviour and wellbeing, perception of the surroundings and comfort. The energy needed for lighting is also a significant impact on our natural resources. For these two broad reasons lighting systems that improve the human visual and perceptual experience and reduce energy use are of widespread value.

This work covers research into the application of LED technology as the next generation of mainstream lighting. It looks at the reasons why this technology is set to become the dominant way in which we light our lives, and the technical hurdles that are slowing this shift in lighting.

It also presents the development, testing and prototyping of such an LED lighting product for use in the architectural market. This niche application is where LED lighting is currently most suited, due to the compactness, colour adjustability and lower colour rendering required. Establishing the technology here will help to gain consumer appreciation and acceptance of this beneficial and useful new paradigm in lighting.

The design incorporates a shape that is pleasing to the eye with a simple oval profile. It was designed to be subtle and compact, blending into the ceiling as cleanly as possible. Practical testing on the finished prototype showed it to produce a wide range of colours and colour temperatures, while maintaining a safe LED temperature. The simplicity also makes the unit competitive in terms of cost.

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