Design Study of LED Tail Lamp for Conveying Driver ’s Intention

雷浩宇、楊旻洲

E-mail: 9607755@mail.dyu.edu.tw

ABSTRACT

Because of less energy consumption, LED has been widely used as light source for vehicle tail lamp. However, most car manufacturers simply replace the traditional bulb by LED without taking advantage of LED ’ s flexibility of arrangement and colorchanging attribute. This research tries to apply the color-changing LED to enhance the indication of tail lamp for various driving conditions. Static field tests were carried out to evaluate the reaction time of posterior car drivers to brake-lamp with different colors of reflector and lamp lens. Size effect of brake lamp on reaction time was also investigated. Preference of subjects on relative proportion of turn signal, brake lamp, backup lamp, and parking lamp were evaluated to decide the size of each lamp. The result show that black reflector with clear lens can best help reduce the reaction time of posterior car drivers. Larger brake lamp has similar effect. As for the new design concept of tail lamp, most subjects preferred the adaptable lighting modes to the traditional one.

Keywords : car, tail lamp, brake lamp, LED, reaction time

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