HH1a-07  Palm Projector

Group member
Wan Yee Har  05012931
Lo Kwok Hang  05147889
Wong Ka Lim  05198175

Supervisor
Dr. H. C. Huang
Project Overview

Projector is widely used in our daily life. Whenever we have a presentation, projector is the main interface we need. However, most of the normal projectors are large and not easy to carry. That’s why our project is launched. We need to design a palm projector.

Background Information

In this year, 3M Precision Optics (3MPO) has just released its new Micro Projector that aims to be integrated into virtually any mobile platform. It had also released a pico-projector. Besides, there are many other high-tech. companies (e.g. Hitachi) are developing similar kinds of products.

With technologies similar to projector and micro-display, some amazing products can be developed. One of those is Personal Eyewear. In Consumer Electronics Show 2008 (CES), a large international exhibition, many companies showed their new products on personal eyewear. It has no doubt that normal projector technology will be replaced. Our project aims to enhance the design of the palm projector which expands the market of projector.
Major Objectives

1. To study, solder and debug the power board and video board of the prototype of the palm projector.
2. To design PCB layout and make PCB of:
   i) LED driver for the LED, Luxeon K2
   ii) Power system
   iii) Recharging unit
3. To finalize the palm projector.

Overview of the system

In this project, we mainly focus on the part of power unit. It’s because a good power unit can increase the portability of the palm projector.

DC power and the battery are the main power supply of the system. Power input switching circuit is needed. Charging board leads the DC power goes to the battery and charging them without over charged and explode. Battery will not supply power unless there is no domestic power connected. Since LED driver and Video board need different voltage, Voltage
LED driver
A steady current supply is important as it can ensure the brightness and, protect the LED, Luxeon K2. We chose an IC, LM3405 which is a current mode control switching buck regulator for driving high power LEDs.

Power system
Power input switching
DC power supplier is not the only source for the palm projector; batteries can also be plugged in to let it operate. In order to choose which kind of power source to supply the projector, a power input switching is configured and implemented.

Voltage Regulator
The video board needs three different values of voltage input, 15V, 3.3V and 1.8V. Therefore, apart from battery charging part, voltage regulator is the main component.

Battery recharging
LM3405A ICs are used to generate a constant current source and BQ2002T as a management of charging.

Lithium rechargeable battery is used. Each battery is 3.7V which can generate enough current for our device. It can last about an hour for the projector.