Power Management scheme for two batteries

Supervised by
Prof. Ki Wing Hung

Presented by
Leung Ka Wai 03712214
Yeung Man Hong Brian 03714212
**Introduction**

Today, the electronic market becomes a multi-media world. Many of the products are all on electronic devices. MP3 player, harddisk, LCD TV, etc, are popular portable electronics. All of these portable devices require a battery to operate. Some of the portable devices consume lots of batteries. In a large portion, these batteries have been discovered to be not fully utilized, which means the devices do not work very effectively with the existing batteries.

To solve this problem, some battery management schemes have been published. These schemes point out about the charging effect of the battery. Specific charging and discharging mechanisms have been applied on the new generation battery charging machines. However, these new machines have high manufacturing cost. Few people use them and few machines are deployed in notebook computers.

In this project, Power Management Scheme (PMS) with two batteries, a high efficiency boost converter and a batteries management scheme were designed. This scheme draws out the remaining energy in the batteries in high current portable devices.

**Aim and objectives**

The aim uses two low voltage batteries to operate the hard disk. Three stages are considered in BMS, which are start-up stage (stage1), the stage which using both batteries (stage2) and steady stage (stage3). A start-up battery produced a large power for the hard disk starting. After the start-up stage, the hard disk is operated by the main battery.

A controllable part is designed by P-channel MOS implementation which can be operating in a low voltage input. Also, a boost converter is built for step-up the input voltage for the hard disk.

![Schematic diagram](image)

The schematic for the controllable part
The block diagram description for the difference stages:

Stage 1 – the startup stage

Stage 2 – the stage which using both batteries

Stage 3 – the steady stage
The result of the hard disk by using a single battery:

Current waveform of a hard-disk under normal operation by using a single battery

The result of BMS for the difference stages:

Fig 6.9 Waveforms of BMS with a resistive load

The result states clearly BMS’s operation with a hard disk drive is same as the expected result that is the normal operation of a hard disk by using a single battery.