# Expertise with Storage Memories

Aftek Limited

## Technology

- High-speed volatile memory
  - SDRAM
  - DDR II SDRAM
- Flash memory
- USB mass storage
- SRAM
- SD card
- CompactFlash
- PCI-IDE (ATA)

## About Aftek

Aftek Limited is a full spectrum technology services company from India. Over last 20 years Aftek has gained significant exposure to variety of technologies. Rich technological capabilities, focused investments in Research & Development and industry exposure enables us to reach beyond the basic IT services to design and deliver projects, products and implement end-to-end solutions to customers in variety of industries. Our service spectrum covers key services as Hardware Development, Firmware Development, Embedded Systems, Application Development, Application Maintenance, and Testing Services.

## Overview

Data storage technologies have been developing at a furious pace with numerous dimensions to their evolution. Trends indicate that the next generation of data storage solutions is expected to be application centric rather than generic. Aftek pays special attention to mission-critical applications, identifying performance needs of specific sectors and customizing existing platforms to suit applications.

## Expertise

Aftek has worked with various high speed volatile memories (SDRAM, DDR II SDRAM), flash memory, USB mass storage, MMC, SD card, CompactFlash, PCI-IDE (ATA) while designing various systems for customers. Following is a summary of our expertise

### High-Speed Volatile Memory

✓ SDRAM We have worked with 16-bit and 32-bit SDRAM up to 512 MB.

- We consider factors like optimal termination value, topology, trace length calculations for positive setup and hold margin, optimal trace separation for minimization of crosstalk and ground bounce.
- Additional factors taken into account are Latency, clock speed, bus width, memory size.

✓ DDR II SDRAM We have developed systems based on 16-bit DDR II SDRAM up to 1 GB.

**Key factors that are considered while designing are as follows**:

- Optimal termination value, signal topology, trace separation for minimization of crosstalk, trace length matching for byte lane is determined through simulation for each signal group.
- Proper routing order is maintained within the DDR II SDRAM interface to allow clock tuning for other signal group.
- Isolation of reference voltage and termination voltage from noisy aggressors.

### Flash Memory

We have worked with both NOR flash as well as NAND flash up to 64 MB.

### USB Mass Storage

Interfacing USB mass storage device such as USB pen-drive, USB hard-drive in security based products. Following are some of the key factors that we take into account

- Routing of DP/DM traces close together for noise rejection on differential signals
- Keeping differential signal traces of matched length and as short as possible to minimize EMI problems

### SRAM

We have used SRAM up to 2MB for various power efficient devices. We consider factors like decoupling capacitors, crosstalk, reflection and termination while designing.

### SD Card (SD/MMC, microSD)

We have designed MultiMediaCard (MMC) and Secure Digital (SD) card slots in a variety of electronic products for our customers. Following are some of the key factors we consider while designing a card slot into a product

- Timeout delays, bus type selection and block mode selection
- Timing issues need special consideration while integrating within the products

### CompactFlash

We have developed systems with provision for CompactFlash card as they are available at higher storage capacities and are used for storing data which can later be interfaced with other systems (PC).

### PCI-IDE (ATA)

We have used PCI-IDE interfaces compatible with ATA-6. We consider factors like burst bus mastering and power management while designing.



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