HD-TechDat

Please use the new Frame Layout

Hitachi Microdrive

Featured Models:

- **Hitachi 8GB Microdrive 3K8-8 HMS361008M5CE00**
- **Hitachi 6GB Microdrive 3K6-6 HMS360606D5CF00**
- **Hitachi 4GB Microdrive 3K4-4 HMS360404D5CF00**

For other manufacturers, see the **Microdrive History** .

Hitachi Microdrive Product Line

Hitachi took over the whole harddisk product line from IBM, including the Microdrive segment.

The first Hitachi Microdrive series (datasheet PDF from August 2003, specifications PDF from October 2003) was the **Hitachi Microdrive 3K4** series with two models:

- **Hitachi 2GB Microdrive 3K4-2 HMS360402D5CF00** and
- **Hitachi 4GB Microdrive 3K4-4 HMS360404D5CF00**.

The second generation, **Hitachi Microdrive 3K6** (datasheet PDF from November 2004, specifications PDF from February 2005), was available in three capacities:

- **Hitachi 3GB Microdrive 3K6-3 HMS360603D5CF00**,
- **Hitachi 4GB Microdrive 3K6-4 HMS360604D5CF00** and
- **Hitachi 6GB Microdrive 3K6-6 HMS360606D5CF00**,

either as "Removable" or "Embedded" configuration.

For the third generation, (Codename "Mikey", preview PDF from December 2004), CF compatibility was dropped, leading to the reduced footprint of 40 Ũ 30 mmē and the new 35-pin ZIF connector. The preview document mentions a capacity of 8-10GB.

The Hitachi Microdrive 3K8 series was originally announced as HMS3608 models (datasheet PDF from August 2005) with capacities of 6GB and 8GB and three interfaces:

- Hitachi 6GB Microdrive 3K8-6 HMS360806M5CE00 and
- Hitachi 8GB Microdrive 3K8-8 HMS360808M5CE00 (ZIF-PATA),
- Hitachi 6GB Microdrive 3K8-6 HMS360806M5CA00 and
- Hitachi 8GB Microdrive 3K8-8 HMS360808M5CA00 (CE-ATA),
- Hitachi 6GB Microdrive 3K8-6 HMS360806M5CM00 and
- Hitachi 8GB Microdrive 3K8-8 HMS360808M5CM00 (ATA on MMC).

The most recent Datasheet from September 2006 shows HMS3610 models, indicating that a maximum capacity of 10GB was planned, but the series name was still kept as 3K8. A specification document from May 2006 lists an additional 4GB ZIF-PATA model, so the final lineup for the **Hitachi Microdrive 3K8** series might have been like this:

- **Hitachi 4GB Microdrive 3K8-4 HMS361004M5CE00**,
- **Hitachi 6GB Microdrive 3K8-6 HMS361006M5CE00** and
- **Hitachi 8GB Microdrive 3K8-8 HMS361008M5CE00** (ZIF-PATA),
- **Hitachi 6GB Microdrive 3K8-6 HMS361006M5CA00** and
- **Hitachi 8GB Microdrive 3K8-8 HMS361008M5CA00** (CE-ATA),
- **Hitachi 6GB Microdrive 3K8-6 HMS361006M5CM00** and
- **Hitachi 8GB Microdrive 3K8-8 HMS361008M5CM00** (ATA on MMC).

Hitachi 8GB Microdrive 3K8-8

Quick links: **Harddisk**   ·   **Performance**   ·   **Enclosure**

Hitachi 8GB Microdrive 3K8-8 HMS361008M5CE00 Harddisk

The 3K8 series is the third generation Microdrive series from Hitachi. This series has the reduced footprint of 40Ũ30mmē and the tiny 35-pin ZIF-ATA connector. The **Hitachi Microdrive 3K8-8 HMS361008M5CE00** is the highest capacity model from Hitachi. Seagate used the same form factor and interface for their 12GB **ST612712DE** .
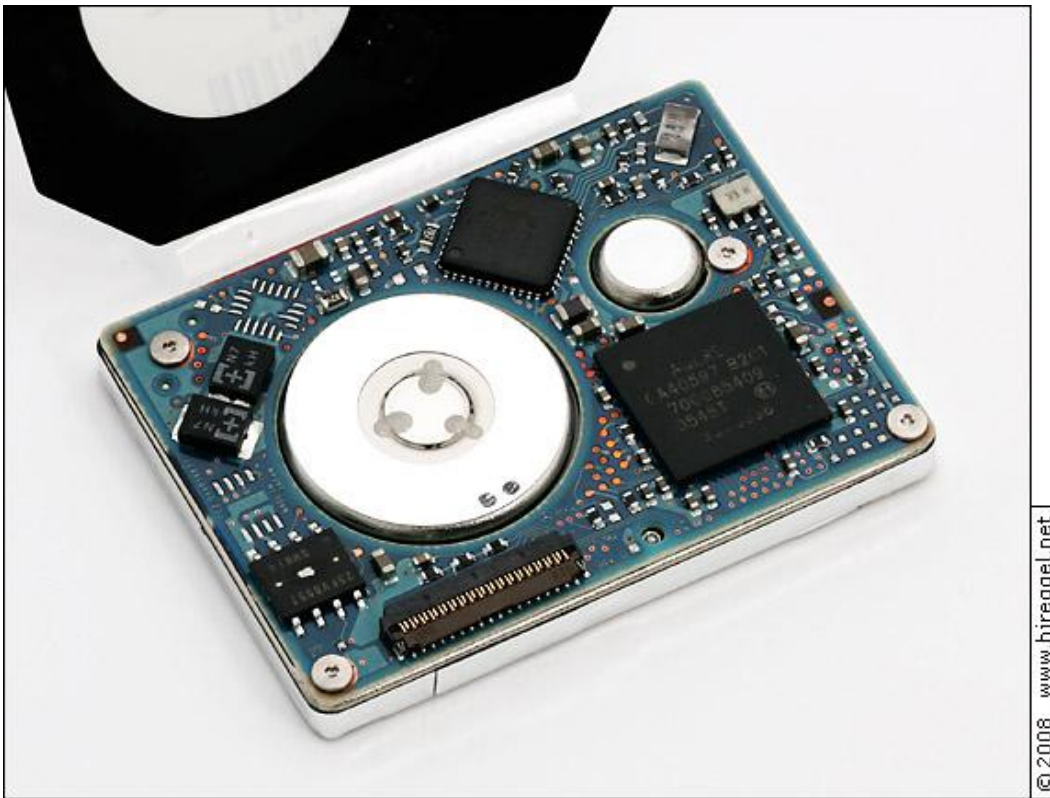

Hitachi 8GB Microdrive HMS361008, Top

Hitachi 8GB Microdrive HMS361008, Bottom

Unlike for most other models, the PCB of the 3K8 series is mounted with the component side towards the outside, and only the label sticker as protection. That makes it easy to take a peek at the electronics.
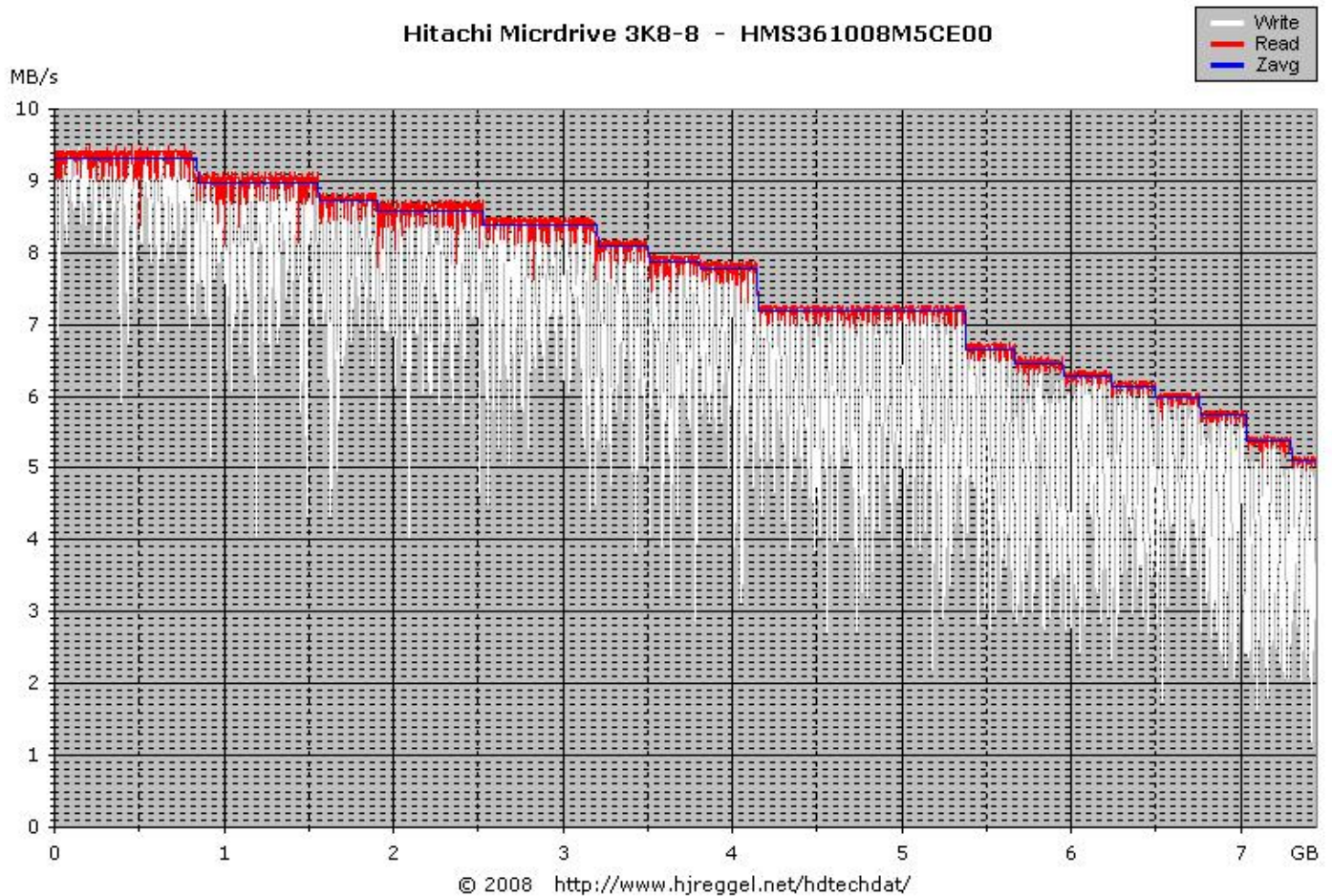
Hitachi 8GB Microdrive HMS361008

Hitachi 8GB Microdrive 3K8-8 HMS361008M5CE00 Performance

The graph below was taken through the supplied USB bridge with Genesys GL811E controller.

There seems to be a timing problem when writing through the USB bridge. The **Seagate ST1.3 12GB** shows a perfect graph using the same bridge. Currently, I have no adapter to test the ZIF-35 drives in native ATA mode.

Enclosure: ExcelStor GStor Mini 8GB

The harddisk is from an **ExcelStor GStor Mini 8GB** (GSMS7008), a harddisk based USB key. Given the fact that it holds a 40Ũ30Ũ5mmǵ Microdrive, and features a swing-out USB plug, the size of 60.0Ũ36.8Ũ11.8mmǵ is very small. The enclosure seems to be a generic design with branding option, see the **Verbatim Store'n'Go** for more photos.

ExcelStor GStor Mini 8GB Enclosure

Below you can see what's inside. The PCB with the components adds about 2.4mm height, the rubber frame adds about 1.5mm height. The rubber is actually designed for the Seagate ST1.3, and it does not fit perfectly on the Hitachi drive.

USB Plug, PCB and Microdrive with Shock Protection

Hitachi 6GB Microdrive 3K6-6

Quick links: **Harddisk** · **Performance**

Hitachi 6GB Microdrive 3K6-6 HMS360606D5CF00 Harddisk

This is a "white label" (OEM) **Hitachi 6GB Microdrive 3K6-6 HMS360606D5CF00**. This version has serious restrictions, and does not even work in PCMCIA-ATA mode. As expected, it works fine with ATA hosts and regular card readers.

The disk reports a size of **6,144,284,672 Bytes** (**5.72GB**) with **12,000,556 sectors**. This size can't be mapped to regular CHS values, the reported mapping of CHS 11905/16/63 can address 12,000,240 sectors with 316 sectors (158kB) unusable space. Supported ATA modes are **PIO-4, MDMA-2 and UDMA-2**. As part of the CF+ specification, the disk reports a maximum power requirement of 256mA.

Hitachi 6GB Microdrive HMS360606, Top

Hitachi 6GB Microdrive HMS360606, Bottom

This seems to be the first version having the PCB mounted with the component side up. Below you can see what's underneath the top label.

Hitachi 6GB Microdrive HMS360606, Main PCB

Hitachi 6GB Microdrive 3K6-6 HMS360606D5CF00 Performance

There were at least two different formatting schemes used for the HMS360606D5CF00, one using 15 media zones, and one using 14 media zones. But there is only a small difference in the data rates. The diagrams below were taken on an ICH6R ATA port using a CF-ATA adapter. With a transfer size of 4MB, 1465 samples were taken.

15 Media Zones Model

Below is the read/write diagram for the 15 media zones version. The sustained read rate goes down from 8.98MB/s to 4.66MB/s with an average sustained read rate of 6.90MB/s.
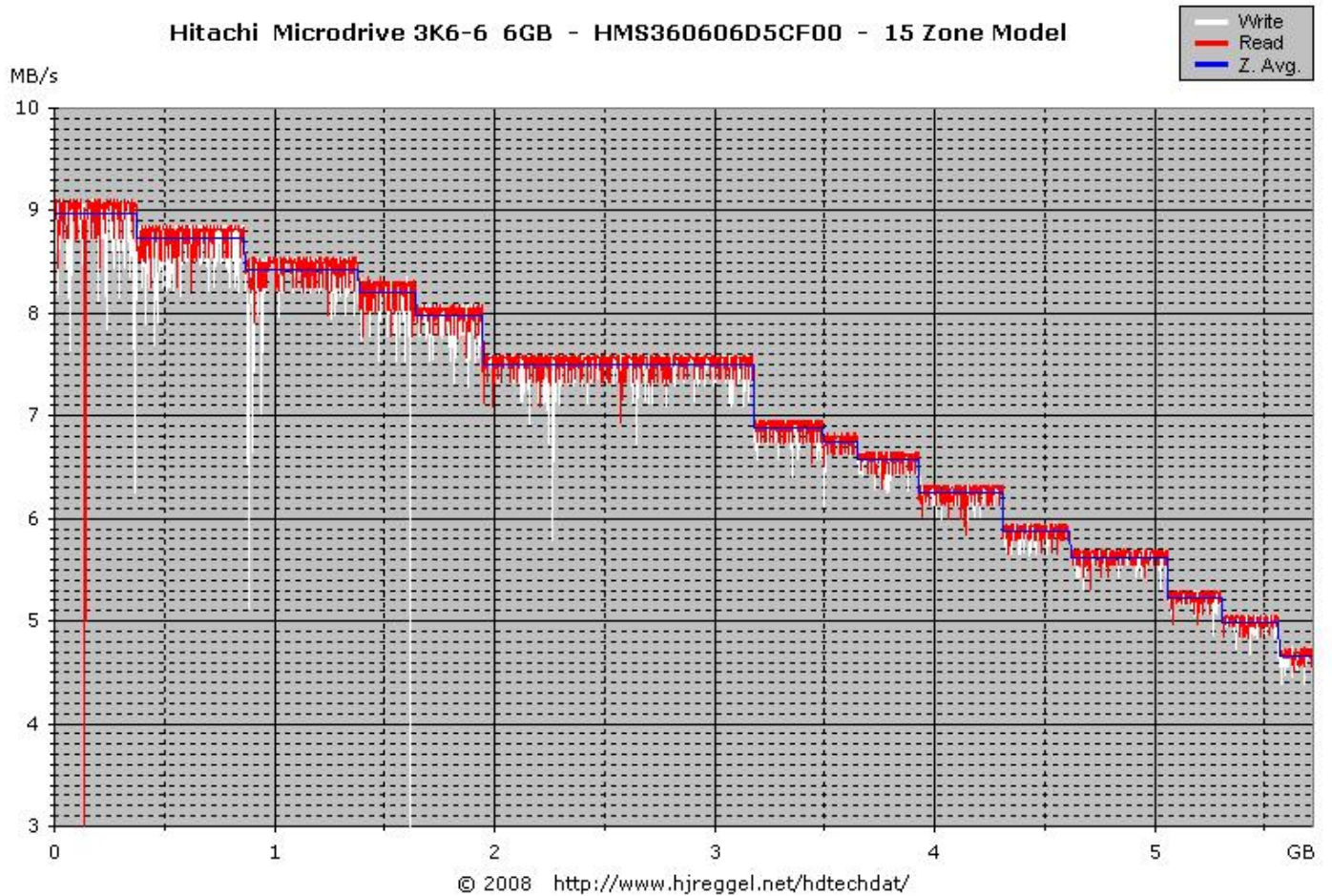
14 Media Zones Model

Below is the read/write diagram for the 14 media zones version. The sustained read rate goes down from 8.76MB/s to 4.45MB/s with an average sustained read rate of 6.68MB/s.

Hitachi Microdrive 3K6-6 6GB - HMS360606D5CF00 - 14 Zone Model
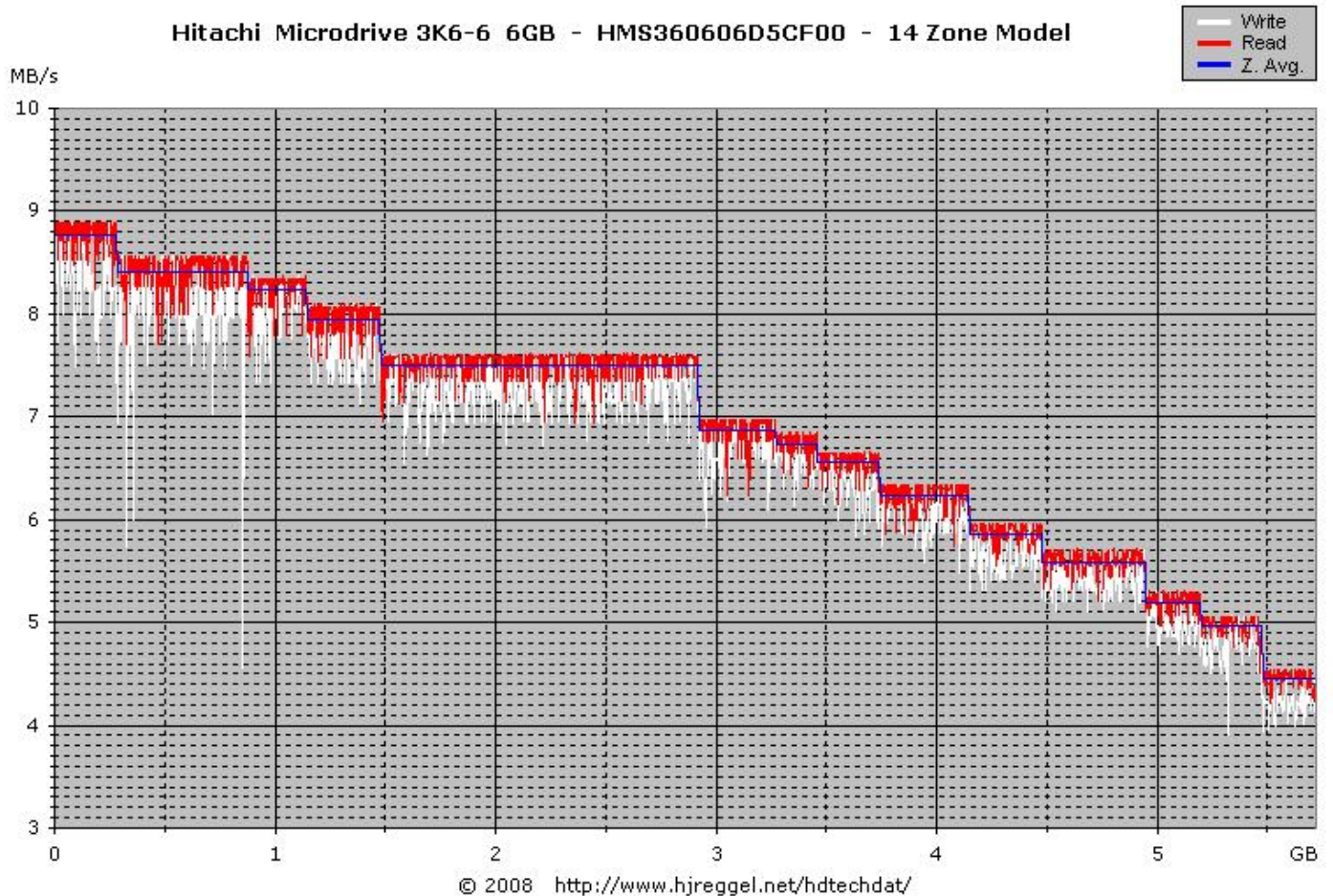
Hitachi 4GB Microdrive 3K4-4

Quick links: **Harddisk** · **Performance**

Hitachi 4GB Microdrive 3K4-4 HMS360404D5CF00

The first batches of the 4GB Microdrive were completely sold to Creative for their mp3 player model "MuVoē". This device was sold at about 60% of the announced price of the retail model of the Microdrive, while only a few overpriced 2GB models were available on the market. When the news spread that the Microdrive could easily be "ripped" from the MuVoē, most people bought the mp3 player just to get the Microdrive. Some even started a small business selling the ripped drives and empty shells, some succeeded in mounting one of their old CF cards to still have an mp3 player with reduced storage capacity. However, later batches of the Microdrive were patched, so that they would not work in digital cameras.

This is a Hitachi 4GB Microdrive 4K4-4 HMS360404D5CF00 from a Creative Nomad MuVoē mp3 player from May 2004 that still worked with digital cameras. The Disk reports a size of **4,095,737,856 Bytes** (**3.81GB**) and a mapping of CHS 7936/16/63 (7,999,488 sectors). Supported ATA modes are **PIO-4**, **MDMA-2** and **UDMA-2**. As part of the CF+ specification, the disk reports a maximum power requirement of 256mA.
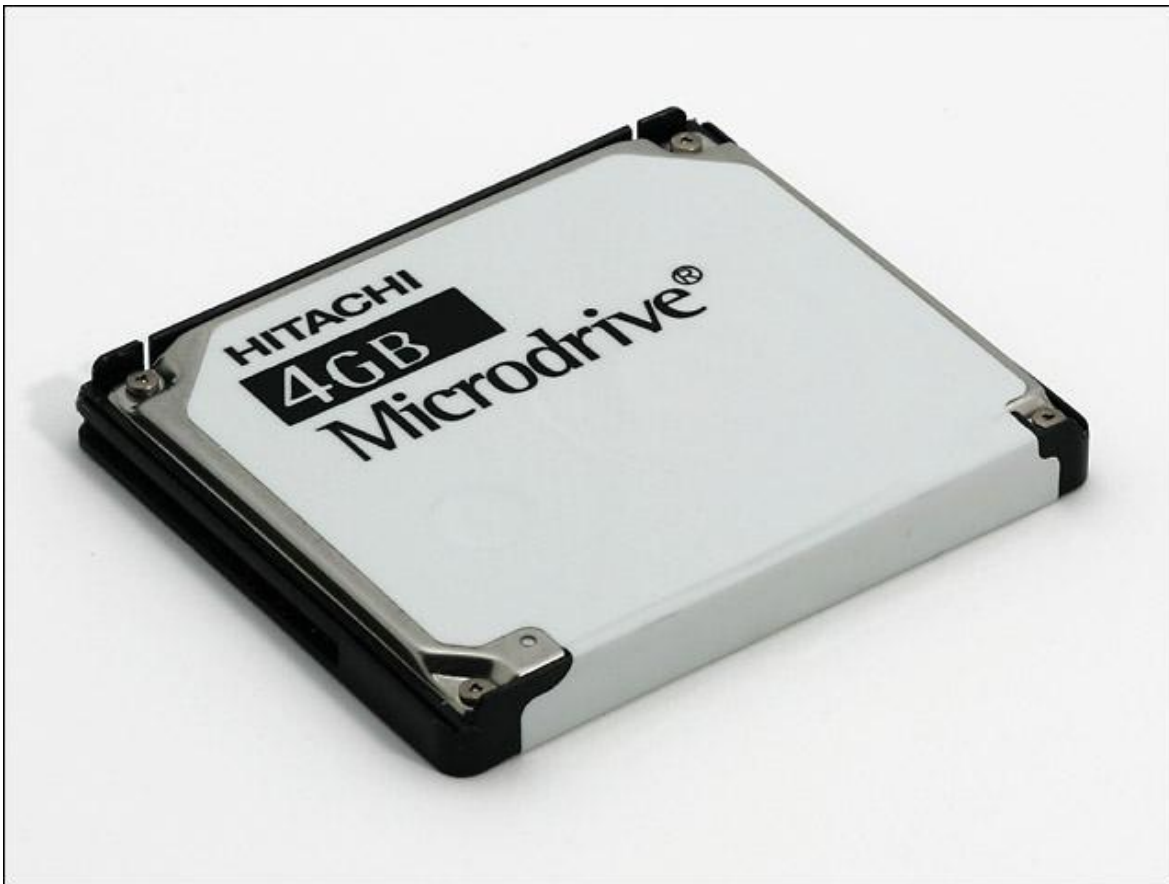
Hitachi 4GB Microdrive HMS360404

Hitachi 4GB Microdrive HMS360404

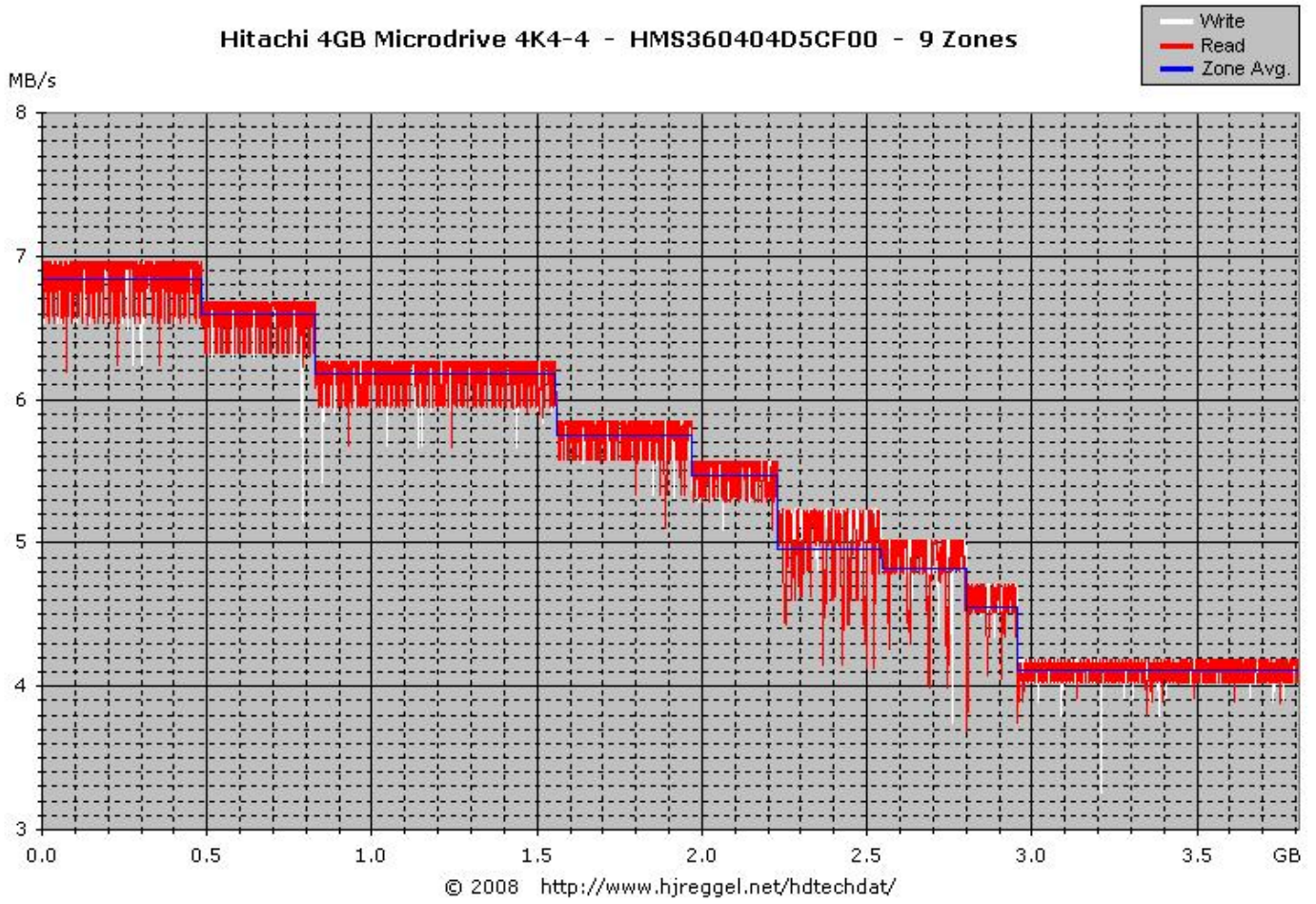## Hitachi 4GB Microdrive 3K4-4 HMS360404D5CF00

There were at least two different formatting schemes used for the HMS360404D5CF00, one using 9 media zones, and one using 11 media zones. But there is only a small difference in the data rates. The diagrams below were taken on an ICH6R ATA port using a CF-ATA adapter. With a transfer size of 2MB, 1953 samples were taken.

Below is the read/write diagram for the 11 media zones version. The sustained read rate goes down from 6.79MB/s to 4.12MB/s with an average sustained read rate of 5.33MB/s. With this formatting scheme, zones 1-3 show slightly irregular data rates.
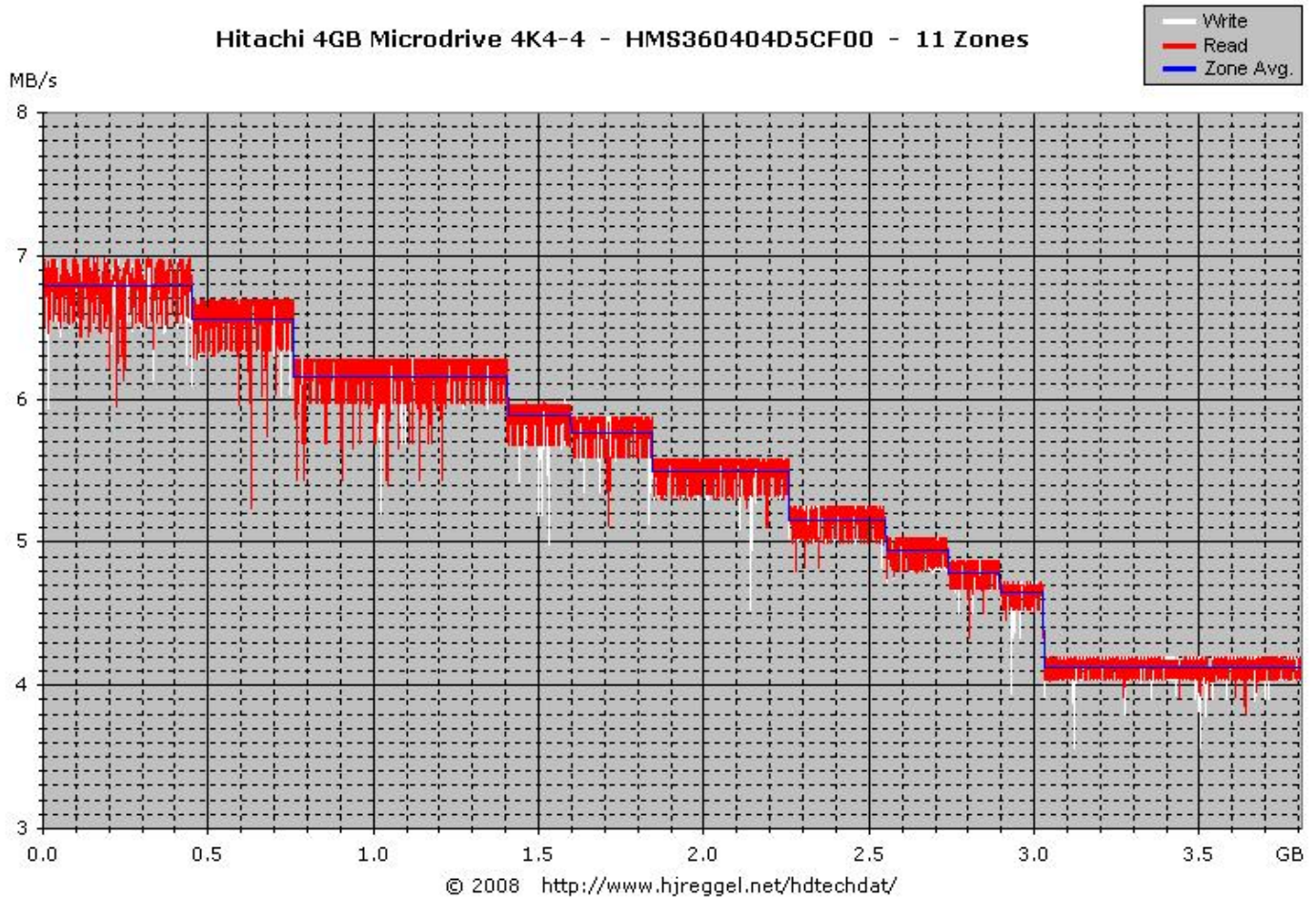
Below is the diagram for the 9 media zones version. The sustained read rate goes down from 6.84MB/s to 4.11MB/s with an average sustained read rate of 5.30MB/s. The slightly irregular read rate for zones 6-8 can be observed through different interfaces, and seems to be caused by the disk itself.

Hitachi 4GB Microdrive 4K4-4 - HMS360404D5CF00 - 9 Zones

© 2008 http://www.hjreggel.net/hdtechdat/

Hans-Jürgen Reggel · http://www.hjreggel.net/hdtechdat/ · 2008-07-07 ~ 2008-10-23