

PRML Read Channel

Marvell combines the latest in Digital Signal Processing (DSP) techniques with a flexible architecture to address the read channel requirements of mobile, PC desktop and high-performance storage applications. The 88C4200 family operates from 60 to 500 Mbps (Megabits per second) data transfer rate, and incorporates selectable data detection features that can be optimized for either high bit densities of mobile applications or high noise environments of desktop and enterprise disk drives.

The Marvell 88C4200 is a fully integrated Partial Response, Maximum Likelihood (PRML) read channel, applying advanced, next-generation mixed-signal analog and digital architectures to low-cost 0.25 micron CMOS device technology. The results are low power consumption and high reliability in a cost effective solution.

The 88C4200 incorporates a selectable noise-predictive Viterbi detector, to ensure reliable data recovery in noisy environments under a variety of both high and low user bit densities. A highly efficient 32/34 encoder/decoder, in addition to 8/9, 16/17 and 16/18 Trellis modes, utilizes precious disk space effectively while maintaining flexibility. Integrated into the 88C4200 device is a fully synchronous

digital servo detector and modulator that allows for more efficient position control encoding to reduce servo overhead. Robust timing recovery features such as separate gain, timing loop and filter settings for data and servo means highly reliable operation in all varieties of customer applications.

The Marvell Advantage

The 88C4200 combines Marvell's innovations in mixed-signal Digital Signal Processing techniques to state-of-the-art storage subsystems. Our third generation integrated read channel implemented in low-cost all-CMOS design, the 88C4200 is the ideal solution for all disk drive applications.

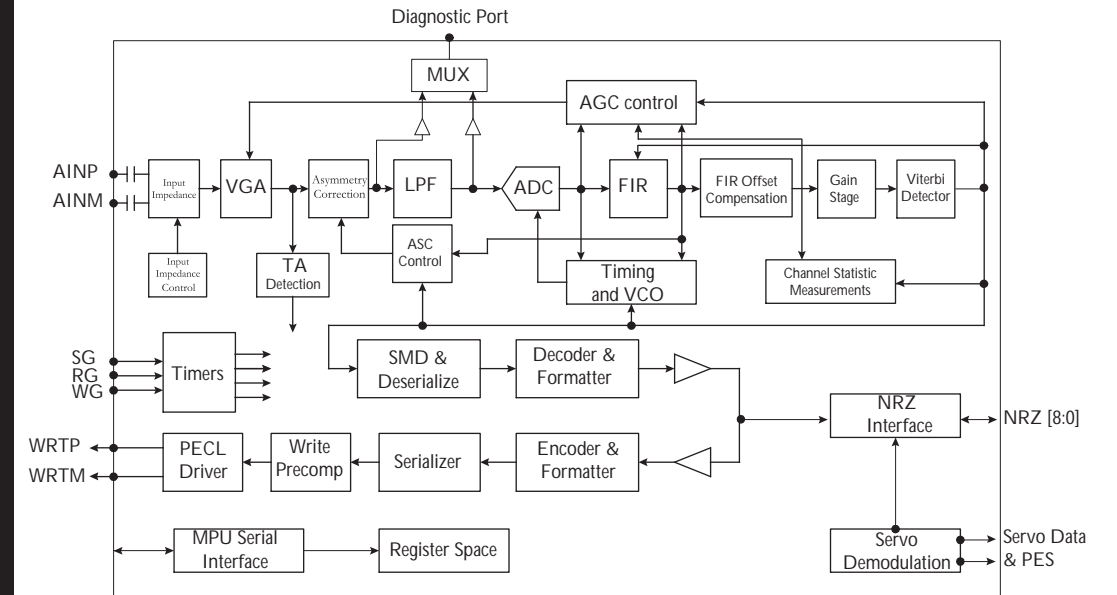
As with all Marvell read channel devices, the 88C4200 is accompanied by a complete set of hardware and software tools to assist drive engineers with optimizing read channel configuration features. Marvell's world-wide field applications engineers work closely with drive-maker manufacturing teams to deliver new products quickly.

Marvell utilizes recognized world-leading semiconductor foundry and packaging services to reliably deliver high-volume and low-cost solutions.

www.marvell.com



88C4200 Block Diagram



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Features

General

- Data transfer rate:
88C4200: 100 to 500 Mbps
88C4210: 60 to 300 Mbps
88C4220: 100 to 350 Mbps
- 8/9, 16/17, 16/18 Trellis and 32/34 encoder/decoder
- High-speed serial interface
- 0.25 micron CMOS technology

- 100-pin LQFP, 64-pin LQFP, .7mm UTBGA

Power

- 3.3V supply with option of 2.5V internal regulator for digital blocks
- Register programmable power management for active, idle, and deep sleep modes

Data

- Selectable Noise Predictive or PR4 detection modes
- 4-byte sync-mark detection in 16/17, 16/18 and 32/34 modes
- Channel Statistics for equalization, error rate detection quality prediction

Servo

- Digital synchronous servo

Benefits

- Broad range of performance applications
- Supports new and legacy encoding schemes for backward compatibility
- Simplifies channel setup and control
- High-volume, cost effective semiconductor technology
- Flexibility for various disk drive applications.
- 3.3V only system design
- Efficient power consumption control
- Improved data detection error rates under real world noise conditions
- Robust data retrieval
- Easy channel initialization and features for S.M.A.R.T. drive compliance
- Lower servo system overhead

