TZA1047

Analog processor for PC-hosted DVD+R/RW and CD-R/RW recorders

The Philips TZA1047 analog processor offers on-chip features and programming options that enhance reliability and performance in high-speed DVD/CD recorders. As part of the Philips DVD+RW chipset, the TZA1047 brings industry-leading speed and accuracy to computing applications.

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The TZA1047 is a flexible analog processor for use in the optical bit engine of a DVD/CD-recordable system. It provides RF functionality and a sophisticated servo processor. On its own, the TZA1047 can support write performance of 12x DVD+R/+RW and 48x CD, and read performance of 20x DVD and 56x CD. When configured with the Philips DVD+RW chipset, the TZA1047 contributes to write performance of 8x DVD+R, 4x DVD+RW, 32x CD-R, and 12x CD-RW, and read performance of 16x DVD-ROM and 48x CD. Designed in accordance with the DVD+RW standard, the TZA1047 is compatible with other DVD and CD formats, including DVD-R/RW, Blu-Ray, and DVD-ROM, as well as CD-ROM and CD-DA.

Key features

> Delivers industry-leading performance as part of the Philips DVD+RW chipset:
  - Writes at 8x DVD+R, 4x DVD+RW, 32x CD-R, and 12x CD-RW
  - Reads at 16x DVD-ROM, DVD+R, DVD+RW, DVD-R, DVD-RW; and 48x CD-ROM, CD-DA, CD-R, CD-RW
> High-bandwidth RF signal path with programmable equalization and filtering
> Sophisticated servo processor with normalization
> RF measurement circuit for real-time fingerprint compensation on RW media
> Robust push-pull processor
> 64-pin LQFP package
> Complete reference design available, including modular software

Target applications

The TZA1047 is designed for use in desktop, notebook, and laptop PCs that integrate a DVD+RW recorder. It can also be used in desktop and portable PC peripherals. Wide interoperability with other standards makes it ideal for double-writer and combination applications.

Functional overview

The TZA1047 can receive input from many standard optical pickup units (OPUs) with either voltage or current outputs. It outputs via a seamless interface to a Nexperia PNX7850 DVD+RW processor. A programmable RF equalizer function offers bandwidth equivalent to 20x DVD and 56x CD. A programmable noise filter in the RF amplifier improves signal quality; RF gain is programmable. Fast AGC is possible through the PNX7850 processor when the TZA1047 is configured as part of the Philips DVD+RW chipset. A differential RF signal input and output supports high-speed operation with minimal interference. For fast recovery from disc defects, programmable DC offset cancellation in the RF path allows DC coupling to the PNX7850 processor.

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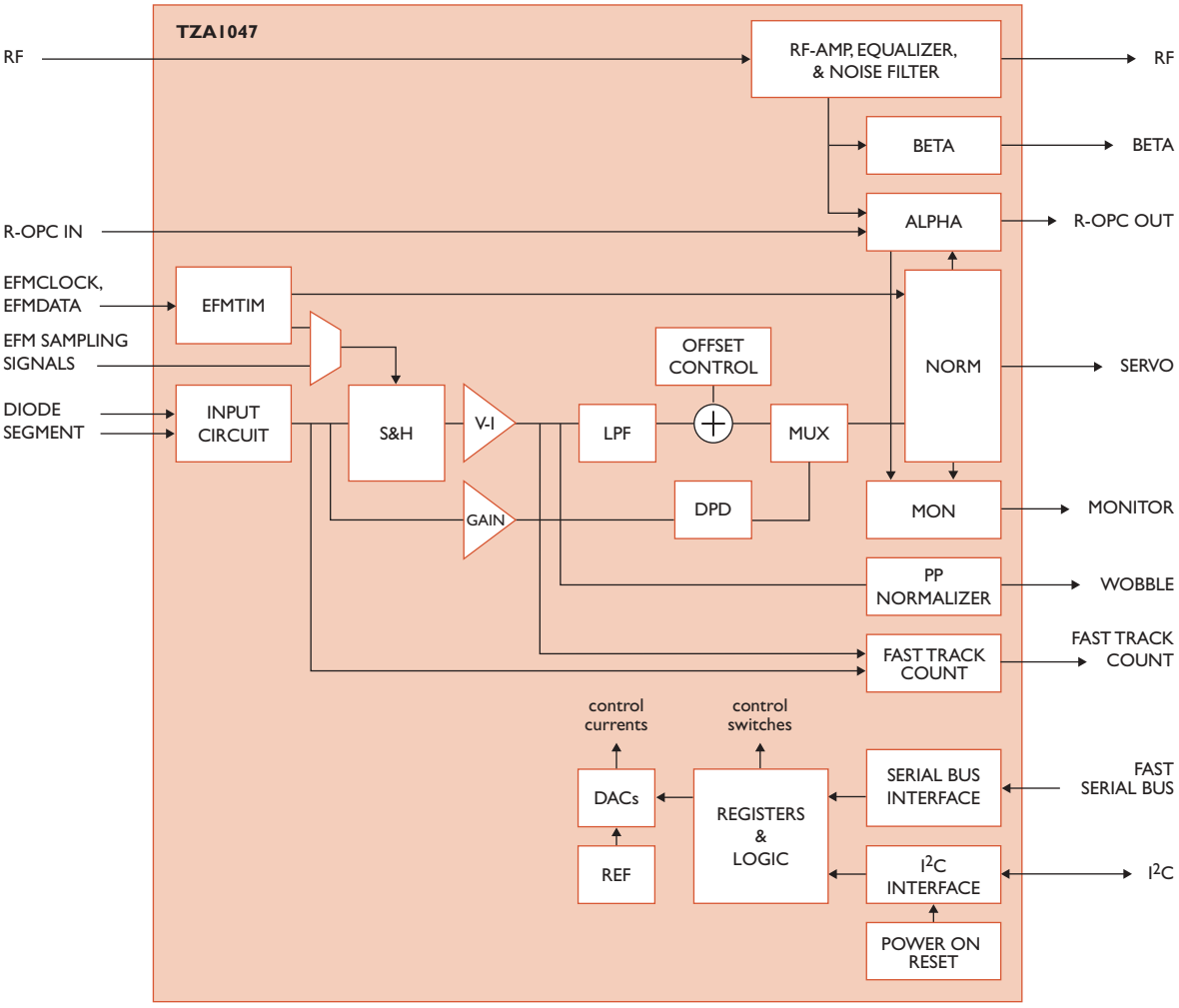

TZA1047 block diagram

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The servo processor is fully programmable and supports several modes for the generation of focus error, tracking error, etc. The servo signals can be sampled or averaged. The EFM sampling signals can be supplied externally or by an on-chip EFM signal decoder. Servo outputs are programmable for direct, unprocessed currents or for normalized error signals. There is a programmable DPD circuit for DVD-ROM radial tracking and a versatile Fast Track Count (FTC) function with programmable filtering. A robust push-pull signal channel (wobble) reads address information on recordable and re-writable media.

For real-time correction of defects on RW media (such as fingerprints), the TZA1047 can be used to sample and measure the RF signal from the photo diode IC in the OPU. This is especially helpful with discs that have been handled, as the laser strength can be increased to the point of writing through a fingerprint.

The TZA1047 is programmed via an I^2C interface. A dedicated fast serial bus provides real-time control of RF gain, as well as offset and push-pull amplitude.

Philips DVD+RW chipset

The TZA1047 is available as part of a Philips DVD+RW chipset that includes the Nexperia PNX7850 processor and the TZA1042 laser power controller. The chipset brings industry-leading speed and accuracy to computer and consumer applications such as home video recording, creating digital photo albums on DVD, PC data backup, and data archiving.

Philips Nexperia ATAPI DVD+RW Recording Engine reference design

For speeding time-to-market, the Nexperia ATAPI DVD+RW Recording Engine reference design is a comprehensive solution that offers high-performance hardware and easy-to-use software. Based on the Philips DVD+RW chipset, the reference design includes a working DVD mechanism with an OPU manufactured by Philips. Industry-standard development tools complete the package. Optional software for telemetry and tuning is also available.

Systems based on the reference design are able to create 4.7-GB video or data DVDs in fewer than eight minutes for 8x DVD+R recording - twice the speed of existing DVD recorders. These same systems are able to store the equivalent of up to seven data CDs on a single disc, making it easy to transfer multi-gigabyte files between PCs. A firmware upgrade increases these systems to 24x CD-RW and makes them compatible with the Dual-layer DVD+R standard.

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