SANYO

PRODUCT INFORMATION

Vol.171

Direct PWM Variable Speed Fan Motor Driver IC Developed

Easily implements variable speed control of PC cooling fan and cooling water pump motors, and can also be used in fuel and air pumps in fuel cells

LB11860T, LB11861/M/H

Overview

The personal computer market is expected to grow by over 110% relative to the previous year in both quarters of the second half of 2003, and continued growth is forecast for 2004. While desktop PCs are, of course, showing brisk sales, it is the notebook personal computer that is the driving force behind this growth.

While trends such as the increasingly widespread availability of broadband networks and the increasing use of multimedia are seen as forming the background for this growth, the increasingly high level of personal computer use is naturally driving demand for higher functionality.

The radically higher operating speeds in CPUs and video cards is resulting in increasing amounts of heat generated by this high-speed operation. At the same time, there are also strong demands for miniaturization and quieter operation. Thus conventional air cooling methods are now reaching the limits of their applicability.

Currently, both notebook and desktop personal computers often use three or more cooling fans to cool the interior of the computer. Although increased cooling capacity in each fan is desired, the market desires fan motor drivers that implement the following responses to the increases in noise and power associated with increasing the number of fans.

- Fan motor speed control based on the amount of work performed (amount of heat generated) by the CPU
- Support for water cooling, which can achieve quieter operation and increased cooling efficiency.
- Support for quieter operation, higher speeds, and higher efficiency (for lower current drain)

SANYO develops motor driver products to respond to the above market needs based on the following standpoints.

— High efficiency and low power provided by single-phase bipolar drive

— Reduced switching noise and reduced loss provided by soft switching during phase switching

— Variable speed function provided by direct PWM drive using external signals

— Extensive product lineup to support a wide range of supply voltage and motor current ratings and fan motor sizes

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SANYO's recently developed LB11860T and LB11861/M/H are the industry's first motor drivers that adopt the external signal direct PWM control method, and can achieve radical simplification of the external circuits required with conventional thermistor based applied voltage speed control method commonly adopted by personal computer manufacturers.

The LB11861/M/H support a circuit structure that adds a heat dispersion resistor and thus reduces the thermal load on the driver IC itself. This allows the implementation fan motor drive circuits with even larger margins.

These ICs can be used not only for air cooling fan motors, but for the water recirculating pump motor used in water cooling systems as well. These ICs provide both quieter operation and the variable speed functionality that is critically important for water cooling system pumps. This year, 2003, has been referred to as "year one" of the water cooling age, and water cooling systems are expected to be standard by 2005.

These SANYO technologies can support use in the fluid transport and gas transport pumps for use in the fuel cells now being tested and studied by a variety of companies, and SANYO is planning to released these ICs for use in other new fields as well.

Common Functions

- Single phase bipolar drive fan motor driver
- External signal input based direct PWM drive with variable speed functionality
- Built-in soft switching function for low loss, high efficiency, and high speed
- Motor constraint protection and auto-start functions
- FG and RD outputs (speed operation signals)
- Hall effect sensor bias voltage
- Kickback suppression function

Specifications

LB11860T (5 V device for notebook personal computers)

- Operating supply voltage: Up to 7 V (VCC = 3 to 6 V)
- Output current: Up to 0.6 A
- PWM oscillator frequency: 16 to 50 kHz standard
- Package: MSOP-10 ultraminiature package for notebook personal computers

LB11861 (12 V device for desktop personal computers)

- Operating supply voltage: Up to 15 V (VCC = 5 to 13.8 V)
- Output current: Up to 1.5 A
- PWM oscillator frequency: 16 to 50 kHz standard
- Package: The LB11861 is provided in 3 different packages to match application size and current needs. (MFP-10S, HSSOP-14, HSSOP-16)

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Sample Availability

The LB11860T and LB11861/M/H will be available in sample quantities in December 2003 and in production quantities in the second quarter of 2004.

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