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# **PRODUCT INFORMATION**

*Vol. 59*

## **CCD Camera Signal-Processing IC Developed**

**Extensive functionality, from the CCD drive timing generator to signal processing, integrated on a single chip**

**LC99001**

### **Overview**

Demand for miniature digital cameras is growing steadily due to their use in video conferencing and video telephone and due to their incorporation in mobile equipment, and even toys. Since images are indispensable resources for the development of the information society, digital imaging technology is becoming increasingly important. In particular, convenient, miniature, and low cost imaging interfaces are strongly desired for personal computer applications.

To respond to these needs, Sanyo has developed and is now releasing the LC99001 signal-processing IC that integrates a color CCD camera CCD controller (LC99057) and a color digital signal processor (LC99067) on a single chip.

By integrating all processing from the CCD drive timing generator to signal processing on a single chip, the LC99001 allows the mounting area to be reduced by 25%, and thus can contribute to miniaturization and lower production costs in end products. This product also supports use in personal computer applications by allowing intermittent reads from the CPU, and also provides an operating mode that operates in synchronization with an external timing signal.

This device is controlled over an I<sup>2</sup>C bus, which allows the image quality (brightness and color) to be adjusted and various settings, such as noise suppression parameters and the operating mode, to be set freely.

A compact CCD color camera system can be constructed from three chips: a CCD (either the 300,000-pixel LC9998GL or the 250,000-pixel LC9997GL), the LC99001, and a CCD driver (the LC89901V).

### **Features**

- Supports camera miniaturization and reduced costs by providing color digital signal processing on a single chip.
- Provides a full complement of synchronization modes for easy connection with personal computers and other devices.

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- Includes an I<sup>2</sup>C bus interface for easy image quality adjustment

## **Specifications**

- Includes a timing generator that generates all pulses required for CCD drive.
- Provides CDS, AGS, and other analog signal-processing functions.
- Built-in 8-bit A/D converter
- Luminance and chrominance signal processing circuits
- Electronic iris and AGC control circuits
- Automatic white balance circuit
- A full complement of synchronization modes for easy connection with CPUs and interface ICs
- Provides an FIFO buffer for asynchronous readout of data in line units using an external clock.
- Provides both 4:4:4 and 4:2:2 8-bit digital signal outputs.
- All parameters can be controlled, and data can be read out, over the I<sup>2</sup>C bus.
- Extensive set of power saving modes
- Supply voltage: 3.0 to 3.6 V/4.75 to 5.25 dual-voltage power supply
- Package: 100-pin SQFP flat package (lead pitch: 0.5 mm)

## **Sample Availability**

Sample of the LC99001 is available in April 1998; production quantities will be anticipated in November 1998.

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