PRODUCT INFORMATION

Vol.87

AV Coupler™ Receiver IC Developed

Easy implementation of cordless infrared optical communication systems

LA9520V

Overview

Optical data transmission systems that transmit signals across distances using infrared light have been used in remote controls and cordless headphones as an easy means to implement cordless communication. Now, optical transmission of both audio and video signals has been achieved as well. This technology is seen as a mean for avoiding the difficulties of connecting AV equipment with cables, and many applications have been developed. Products that include this functionality, in particular, video cameras, have been well received not only in the Japanese market, but in the US and European markets as well. Other applications include games, portable DVD players, and digital cameras, and, for example, it is now possible to connect the output of these devices to wall-mounted TV screens. Thus IR communication systems can be incorporated in equipment that outputs composite video and stereo audio signals. AV product manufacturers are now aggressively developing new products that incorporate this function, and the market is expected to grow rapidly.

Sanyo has now developed the LA9520V AV Coupler™ receiver IC that receives optically transmitted infrared signals. This chip, in combination with the LA9511W optical transmission IC which is already available in production quantities, forms a complete system in which both optical transmission and reception have been implemented in single chips.

Previously, AV coupler™ receivers were implemented with discrete devices and required a printed circuit board area of about 10 cm^2. Therefore, it was not possible to use AV coupler™ receivers in portable equipment. Also, the cost increased since a number of components were required for the recevier circuit.

The LA9520V receives wireless transmissions using 850 nm infrared light for signals that conform to the frequency allocations in the applicable EIAJ standards. In particular it uses 4.3 and 4.8 MHz for the left and right channel audio carrier frequencies, and 11.8 MHz (sync tip) to 13.5 MHz (white peak) for the video frequencies, and can receive video in either the NTSC or PAL format. Except for the output level and muting level adjustments, the LA9520V is completely adjustment free. The LA9520V provides an output level adjustment function that allows the left and right output levels to be adjusted using an electronic level control by applying voltages to input pins. It also allows the

output stage no input/weak input muting function operating point to be set with an electronic level control.

The development of this single-chip receiver makes it far easier to implement AV coupler™ systems. It also allows these systems to be miniaturized enough to be practical in portable equipment and contributes significantly to reducing total system costs by reducing the number of components required.

Features

- Input Block
  - — Excellent current-voltage conversion bandwidth characteristics
  - — Wide ALC operating range achieved by including an ALC function in the preamplifier.
- Audio Block
  - — Built-in 4.3 and 4.8 MHz audio demodulation circuits.
  - — Adjustable operating level muting function that mutes the output stage when there is no input signal.
  - — The output amplifier output left and right channel levels can be adjusted by voltages applied to input pins. This supports the use of an electronic level control function.
- Video Block
  - — Video demodulator
  - — Video amplifier supports 75 Ω drive and supports output level adjustment with an electronic volume control.
  - — Muting function that mutes the output stage when no input signal is present. The muting operating level can be adjusted from an input pin.
  - — Built-in filters for suppression of spurious high-frequency components

Specifications

- Operating supply voltage range: 4.5 to 5.5 V
- Electrical characteristics (provisional)

  Supply voltage: Vcc = 5 V (Ta = 25°C)

  Typical operating conditions
  - — Audio carrier frequencies: Left channel: 4.3 MHz, Right channel: 4.8 MHz
  - — Video carrier frequencies: 11.8 to 13.5 MHz
  - — Audio demodulated output level: 260 mV rms (1 kHz, degree of modulation: ±22.5 kHz)
  - — Video demodulated output level: 1 Vpp (for an NTSC composite video signal with a 2 MHz modulation)
- Package: SSOP-36

PRODUCT INFORMATION

Sample Availability

The LA9520V will be available in sample quantities by mid September 1999, and in production quantities (100,000 units per month) by April 2000.

SEPTEMBER 8, 1999