PRODUCT INFORMATION

Vol. 81

Time Code Reception IC Developed

IC optimal for radio controlled clocks that automatically correct their time setting according to time standard broadcasts

LA1650/C

Overview

Clocks are indispensable in our daily lives, and due to the widespread use of microcontrollers in home appliances, built-in clock functions are now taken for granted. Most contemporary clocks are quartz clock driven by a crystal oscillator and provide high-precision timekeeping.

However, there is a tendency for large time discrepancies to appear in clocks used in severe environments, such as clocks in cars. Thus we find it necessary to reset clocks frequently. Furthermore, since quartz clocks require a power supply these clocks must be reset occasionally, for example when changing the battery in a battery powered clock, when a home appliance is unplugged, or after a power outage. Setting the time requires determining the time from a TV, radio, or telephone company's time service and directly entering the time by hand. This is an annoying operation.

There is now a product, called the radio controlled clock, that automatically sets its own time. These clocks receive standard radio time codes broadcast from the town of Sanwamachi in Ibaraki Prefecture, and use built-in functions to automatically set themselves to the exactly correct time. However, this radio broadcast is an experimental system and can only be received in a limited area. There are also radio controlled clocks that use the GPS (global positioning system) used in car navigation systems and other products, but GPS reception requires complex circuits that make these clocks expensive.

Recently, a long-wave standard radio facility was completed in Fukushima Prefecture, and began real standard radio broadcasting on June 10 (Time Day) 1999. Since this signal is broadcast with a significantly increased output power, the reception area has increased to now cover essentially all of Japan except Okinawa. The full-scale operation of this standard broadcast means that it is now extremely likely that demand for radio controller clocks that include a function for automatically setting their own time will grow rapidly.

Sanyo has now developed the LA1650/C time code reception IC that receives this standard radio broadcast and includes a function for automatically correcting the time kept by a quartz clock mechanism. This IC, when combined with an existing quartz clock mechanism and an antenna, can

easily implement a radio controlled clock that does not require that the time be reset when replacing batteries or on power outages.

The LA1650/C takes full advantage of Sanyo's semiconductor technology that has a proven track record in home and car tuner ICs. Despite its low-power operation, the LA1650/C can implement a highly sensitive receiver. It supports a wide supply voltage range, from 1.2 to 6.5 V, and can be used in products from household clocks that operate on a single dry cell, to telephones, cameras, and car clocks. Furthermore, it can convert any quartz clock product into a radio controlled clock and free users from the bother of resetting these clocks. The LA1650/C also supports daylight saving time, whose introduction is under consideration in Japan.

The LA1650/C will first be provided in a DIP-18 package, but will also support supply as a bare chip product to respond to a wide range of equipment design needs from equipment manufacturers.

Features

- Low-voltage drive (Vcc ≥ 1.2 V)
- Low current drain (500 µA for @ 10 dB µV input)
- Standby function (Standby current: ≤ 1 µA)
- High sensitivity reception (Reception sensitivity: Vin = 10 dB µV

Functions and Specifications

- RF amplifier, rectifier circuit, detector circuit, time code output
- Supply voltage range: 1.2 to 6.5 V (single-voltage power supply)
- Operating temperature: –25 to +75°C
- Package: DIP-18 (LA1650), chip (LA1650C)

Sample Availability

Sample of the LA1650/C will be available in June 1999; production quantities will be anticipated in September 1999.

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