EPSON

TV Watch

December 1982

Power consumption: Approximately 520 mW with the television on
Battery life: (2 AA size dry-cell alkali batteries) approx. 5 hours continuous use
Receiver weight: Approximately 140 mg (batteries and accessories excluded)
Dimensions: (W) 74.5 x (D) 19 x (H) 125 mm
Display dimensions: TV unit -1.2-inches (H) 16.8 x (W) 25.2 mm
Watch - (H) 4.7 x (W) 25.0 mm
Display: TV unit - Field-effect guest-host liquid crystal
Watch - Field-effect nematic liquid crystal

Product Features

The TV Watch was the first product of its kind in the world. The highlight of the product was its active-matrix liquid crystal display. The display, which was developed by modifying an LCD that was being used on digital watches, featured a new liquid crystal panel that enabled the display of moving images. Semiconductor technology that was being used to manufacture Epson's* original CMOS LSIs was combined with liquid crystal technology that the company was developing to create all the drivers and control circuits in silicon. The key technology of this new LCD was a driver LSI fabricated on a single-crystal silicon wafer. The driver LSI measured 16.8 x 25.2 mm and had 31,920 pixels built in. Transistors and control circuits integrated on the wafer were able to control the relative brightness or darkness of each pixel 60 times per second light, thus creating gray scales.
The display had many outstanding characteristics. Not only was it highly compact, it operated at low power even while offering high resolution and good visibility in daylight. The TV Watch was equipped with what was, at the time, the world's smallest and lightest television. The television consumed less power than any previous TV; it could be used continuously for up to five hours with two AA size dry-cell alkali batteries. Users could view any Japanese TV channel or listen to FM radio. The product consisted of three separate units: the picture display, a pocket tuner, and headphones. Naturally, it was also equipped with a fully functional watch, which featured a time display, calendar, alarm and stopwatch.

Background

In 1973, the company was gearing up for the visual information revolution that was said to be approaching. It had already announced the Seiko Quartz LC V.F.A. 06LC digital watch that year and was conducting research and development on active-matrix liquid crystal panels that would be capable of displaying moving images on personal mobile devices. This development effort played extensively on the legacy of its watch business: technologies for diminishing product size, increasing component densities, slimming profiles, and saving energy. The result was an active-matrix liquid crystal that was ideal for use as a display on mobile devices. The first product to use this active-matrix liquid crystal panel was the TV Watch, the development of which was announced in June 1982.

Impact

Epson's active-matrix LCD business can be traced back to the development of the TV Watch.
The TV Watch attracted a high level of interest around the world when its development was announced. The announcement was widely reported in newspapers and on television, and was considered a groundbreaking product for its ability to provide users not only with the accurate time but with an assortment of other information. Marketed under the Seiko brand, the TV watch was put on the market in December 1982, and it won the Nikkei Award for Superior Products and Services that year. Furthermore, it was recognized by the 1984 Guinness Book of Records as the world's smallest television.
In 1983, taking advantage of the technology acquired during the development of the TV Watch, Epson succeeded in creating the world's first color liquid crystal display. This color LCD was subsequently used on Epson's Color Pocket TV.

*Then known as Suwa Seikosha Co., Ltd.