SANYO

PRODUCT INFORMATION

OCTOBER 1, 1997

Product Line Responding to a Broad Set of Needs

Development of a Decoder for an FM Multiplex Receiver

LC72709E, LC72708E, LC72707E Series

Overview

The DARC (DAta Radio Channel) system, an FM multiplex transmission method developed by NHK and suited to mobile reception, began transmissions on October 1, 1994 piggybacked on the FM Tokyo. The DARC method is known for its superiority in mobile reception and for its high transmission rates, and is currently finding broad acceptance throughout the world. The DARC method was recommended as Rec. 1194 of standard FM subcarrier system by ITU-R in 1995.

As examples of applications using the DARC method within Japan there are the “Visual Radio” service, the traffic information services of the Vehicle Information and Communication System (VICS), and the Differential Global Positioning System (DGPS) data service.

In the United States, Digital DJ Inc. in the state of California, as a high-speed FM multiplex system, has begun providing regional services.

In Europe DARC is under investigation as a high-speed transmission system to coexist with the RDS (Radio Data System), and currently the SWIFT (System for Wireless Infotainment Forwarding and Teledistribution) project is underway to establish the system.

In the various Asian countries (excluding Japan), Australia, and other countries studies regarding the DARC system are also in progress. Sanyo has planned a full product lineup for compatibility with the DARC Systems that are anticipated to expand throughout the entire world. At this time, three decoder LSIs, the LC72708E, the LC72709E, and the LC72707E have been developed for various applications.

The LC72708E is an LSI equipped with a VICS service receiver circuit. A band-pass filter, an MSK demodulator, a sync regenerator, an error corrector, and frame memory are all combined into a single chip, making it possible to structure an extremely compact FM multiplex receiver system. The chip can also process the data of “Visual Radio” service except VICS service.

The LC72709E is able to process all the FM multiplexing methods recommended by the ITU-R. This is an LSI for DARC receivers that are to be globally compatible. This LSI can be used for both the Japanese “Visual Radio” and for the European SWIFT project-compatible services.

The LC72707E is an LSI that is able to receive the DDJ services. A portion of the DDJ services

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requires a special data processing function. This LSI is equipped with that data processing function, and is also able to receive other general service information as well.

Features

The LC72708E

- On-board VICS receiver circuits
- Band-pass filter
- MSK demodulator
- Sync regenerator function
- Error correction (product code {272, 190})
- Able to process non-VICS data as well

The LC72709E

- This LSI is for receiving DARC signals with global compatibility. (This LSI is able to process all FM multiplexing formats recommended by the ITU-R.)

Specifications

All Chips

- MSK digital demodulation
- Block and frame sync regeneration circuit
- Error correction using the (272, 190) code
- Internal frame memory for correcting product code.
- CCB microcontroller interface (using a Sanyo-proprietary bus format)
- Package: QFP-44 (a 44-pin flat package)

The LC72708E and LC72709E

- Internal band-pass filter using SCF (switched capacitor filter)
- Operating supply voltage: 4.5 to 5.5 V
- Operating temperature range: –40 to +85°C

The LC72707E

- Operating supply voltage: 2.7 to 5.5 V
- Operating temperature range:–40 to +85°C

Notes and Cautions in Use

- DARC is a registered trademark of NHK Engineering Service (NHK-ES). A contract with NHK-ES is required before manufacturing or selling electronic devices that use DARC technology.
- A contract with the VICS centre is required in order to obtain a sample LC72708E VICS LSI.
- A contract with the Digital DJ, Inc. is required before obtaining an LC72707E DDJ LSI sample.

Sample Availability

Samples of the LC72709E, LC72708E, and LC72707E are available in October 1997; production quantities are anticipated towards the end of 1998.