

Communication Protocol for Next-Generation Automobiles

Approach to FlexRay™

“FlexRay™,” a communication protocol for next-generation automobiles, is receiving considerable attention as a high-function system in which automobile safety, comfort, and convenience are pursued. This article introduces this product, which we are currently developing with many partners.

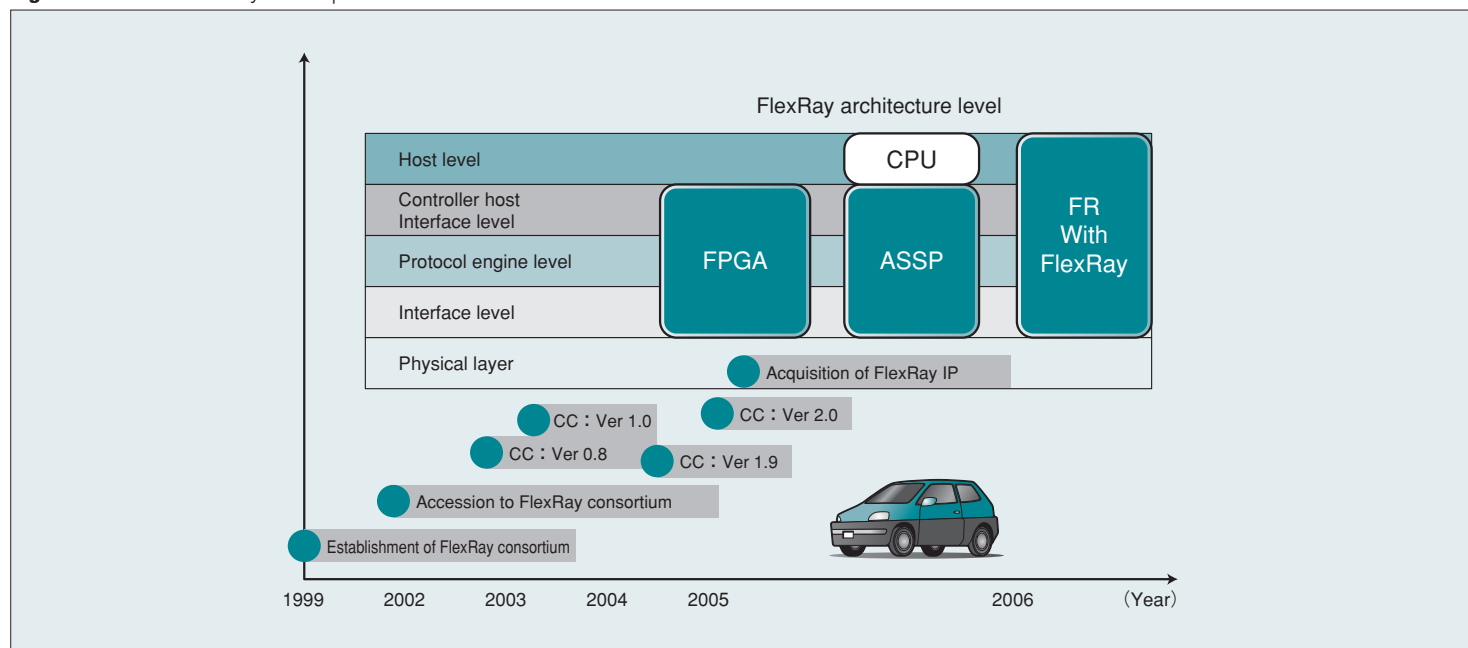
Overview

In recent years, a CAN (Controller Area Network) has been adopted as the standard network for the connection of automobile control units and has led to the realization of advanced systems by sharing various types of information.

However, the wave of automobile evolution is astonishingly fast, and FlexRay is already being considered for next-generation automobiles in the pursuit for further comfort and safety.

FUJITSU has devoted its efforts to developing built-in CAN microcontrollers and has created many models. This led to the adoption of our built-in CAN microcontrollers by a great

Figure 1 FUJITSU's FlexRay Roadmap



number of our customers. Based on this experience, we are currently working on FlexRay.

Fig.1 presents FUJITSU's roadmap in regard to FlexRay.

Our involvement with FlexRay started with our participation in the 2002 FlexRay Consortium. Full-scale FlexRay product development was started in January 2005 when we obtained the FlexRay IP. In June, we introduced "FLEXRAY-FPGA-EVA-KIT-369," a evaluation board mounting FlexRay IP on FPGA; many customers have already purchased it. We are currently developing ASSP to be introduced in 3Q, 2005. Subsequently, we plan to develop a one-chip MCU mounting FlexRay IP with a target release of 2006.

Features of the FlexRay™ Evaluation Board

The FlexRay Evaluation board, "FLEXRAY-FPGA-EVA-KIT-369," (**Photo1**) mounts FlexRay IP on FPGA, and it has an optimal specification for understanding communication protocol and evaluating communication.

This product is composed of a CPU control board, a FlexRay IP-mounted FPGA board, and a sample program.

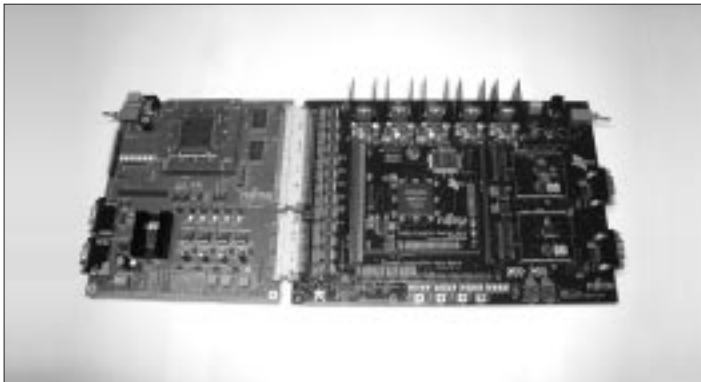
Fig.2 presents a block diagram.

Hardware configuration

The hardware includes two boards: a CPU control board and an FPGA board. The CPU control board mounts a 32-bit, FR family MB91F369GA; it controls the FPGA. The FPGA board addresses the FlexRay controller by FPGA and is capable of rapid version upgrading even if the FlexRay standard is modified in the future.

Although the physical layer mounts a RS485 driver, it is also possible to mount a FlexRay driver.

Photo 1 FlexRay Evaluation board "FLEXRAY-FPGA-EVA-KIT-369"



Software development environment

A sample program that can be used to check FlexRay operation is included. FlexRay communication can be realized as soon as the product is purchased by operating this sample program.

FUJITSU's FlexRay™ Partnership Chain

Our FlexRay has reinforced our partnership chain and together we provide a total solution for FlexRay. We will support our customers' FlexRay system development in cooperation with the partners listed in **Fig.3**. *

NOTES

* FlexRay is a trademark of DaimlerChrysler AG.

Figure 2 FlexRay Evaluation board "FLEXRAY-FPGA-EVA-KIT-369" Block Diagram

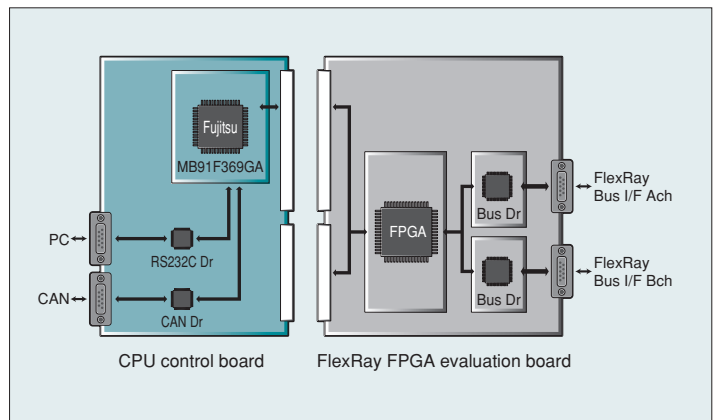


Figure 3 FUJITSU's FlexRay Partnership Chain

