Next Generation Automotive Network FlexRay™ ASSP
MB88121A

New ASSP supporting FlexRay, the next generation automotive network version 2.1, is best fit for adopting new network technology to existing design assets. FUJITSU will provide comprehensive technical support with collaboration from FUJITSU MICROELECTRONICS SOLUTIONS LIMITED and FUJITSU MICROELECTRONICS EUROPE GmbH.

Overview

Automotive networks increase their importunateness in complex automotive electronic control units. CAN (Controller Area Network) has already been adopted as the de facto standard in body, power train and chassis systems. It has been enabled the efficient communication between those ECUs, and achieves advanced system control. However, consumer demand in comfort system and OEM’s safety system requirement is increase its demand in an automotive network system that is demanding next generation network. And, thus, an industrial consortium FlexRay has formed in 1999, and

Figure 1 In-Vehicle Network

| Information system network MOST, IDB-1394 |
| X-by-Wire system network FlexRay |
| Control system network CAN |
| Low-speed control system network LIN |

Figure 2 FUJITSU’s FlexRay Roadmap

[Diagram showing FlexRay architecture level and timeline from 1999 to 2006]
develops new standard FlexRay with alliances. FlexRay is a high-speed and highly reliable network, widely getting attention from European and Japanese OEMs and suppliers.

**Fig.1** presents typical schematic of the in-vehicle network. FlexRay is a network that realizes high-speed and high reliability data communication with transmission speed up to 10Mbps.

**Fig.2** presents FUJITSU’s FlexRay roadmap.

FUJITSU joined FlexRay Consortium in 2002. In November 2004, FUJITSU has licensed the FlexRay IP from Bosch. In February 2005, FUJITSU introduced a starter kit mounting FlexRay IP on a FPGA; many customers have already evaluated FlexRay through this kit. FlexRay ASSP, MB88121A featuring protocol version 2.1 in November 2005 which will be followed by MB88121B in 2Q 2006, providing fully tested ERAY core from BOSCH.

**Product Features**

New ASSP MB88121A embeds FlexRay IP Version 2.1 licensed from Robert Bosch GmbH. It has optimal specifications based on understanding of communication protocol and application requirements. This ASSP can be connecting not only to FUJITSU’s MCUs but also to general MCUs via flexible external bus interface.

FUJITSU commits developing a product with any future updated version of FlexRay IP and improves host I/F functions. This ASSP MB88121A is an optimal FlexRay network supporting product for mass production and enables customer to fully utilize the CAN-base design assets to adopt new technology.

**Table 1** provides an overview of this product and **Fig.3** presents its external package dimensions.

**Table 1** Overview

<table>
<thead>
<tr>
<th>Clock</th>
<th>Internal clock: 80MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation voltage</td>
<td>Vcc=5.0V±10%, 3.3V±10%, 1.8V±10% there will be device with single supply voltage in 1H 2006.</td>
</tr>
<tr>
<td>Protocol version</td>
<td>Protocol version 2.1</td>
</tr>
<tr>
<td>Host interface</td>
<td>Parallel host I/F Maximum frequency 33MHz Serial I/F (in planning)</td>
</tr>
<tr>
<td>Package</td>
<td>LQFP-64 (48-pin in planning)</td>
</tr>
</tbody>
</table>

**FlexRay Partnership Chain**

FUJITSU worldwide supporting structure delivers a total solution for FlexRay that enables customers to adopt new technology smoothly regardless of the country as well.

**Fig.4** illustrates the FlexRay partnership chain of FUJITSU. FUJITSU will provide comprehensive support for our customers, as well as keep partnership with FlexRay supporting companies to provide system level solution.

FUJITSU is committing to support FlexRay standard, and provides total solution from development environment, physical transceivers and software beyond FlexRay controller ASSP.

**NOTES**

**[3SOFT]**
3SOFT is a leading company in providing software solutions to the preinstalled software system market. It provides OSEKtime for the distributed application of FlexRay.

**[Austriamicrosystems]**
Austriamicrosystems is a semiconductor manufacturer that has dealt with ASIC as a standard product with a mixed signal base. It has provided low-price, high-quality and value-added ICs for use in the consumer product and communication fields as well as in industrial applications and vehicle mounting since its establishment in 1981.

**[DECOMSYS]**
DECOMSYS is a manufacturer of FlexRay standard tools, headquartered in Austria. It has provided a series of FlexRay tool chains, including communication schedule preparation software, to various customers since its establishment in 1999.

**[TZM]**
TZ Mikroelektronik, founded in 1991, was among the pioneers in the field of the bus system FlexdRay. Besides innovative hardware platforms such as FlexCard, FlexXcon, FlexNode, software utilities like FlexConfig, testing and training services are also part of the portfolio.

**[Vector]**
Vector is the leading manufacturer of software tools and software components for networking of electronic systems based on CAN, FlexRay, LIN, MOST as well as multiple CAN based protocols.

* FlexRay is a trademark of DaimlerChrysler AG.
**Figure 3** External Package Dimensions

64-pin plastic LQFP (FPT-64P-M03)

Unit: mm (inch)  
* Values in parentheses are reference values.

**Figure 4** FUJITSU’s Cooperation FlexRay Partnerships

Collaboration with leading Tools and Software suppliers  
provides the best solution for your FlexRay application

**FlexRay Silicion**  
FUJITSU  
- MB88121A  
- MB914XX

**Software**  
3SOFT  
- OSEKTime  
- COMMSTACK

**Physical Layer**  
austriamicrosystems  
- AS8221  
- FlexPL-Moduls

**Tools**  
DECOSYS  
- BUSDOCTOR  
- DESIGNER  
- FlexConfig  
- DENoe/FlexRay