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Fact Sheet

MFR4310

Freescale's Stand-Alone FlexRay™ Controller

Overview

FlexRay networking is a next-generation automotive communication protocol featuring high bandwidth, determinism and fault tolerance. The MFR4310 stand-alone FlexRay controller eases the integration of FlexRay communication into applications using MCUs without an embedded FlexRay controller. The MFR4310 controller is optimized for communicating directly with Freescale's S12X family of 16-bit MCUs, and the MPC500 and MPC5500 families of 32-bit MCUs.

Applications

- Suspension control
- Active rollover prevention
- Advanced braking
- Lane departure warning/Lane change assist
- Parking maneuver assistance
- Adaptive cruise control/Pre-crash detection
- Advanced Safety and Radar
- Powertrain

MFR4310 Block Diagram

Voltage Regulator	
Oscillator	Clk+Res Mod Ext Clk Int
Asynchronous Interface	S12 Interface
FlexRay™ Host Interface	
Receiver A	Receiver B
Transmitter A	Transmitter B
TCU	Debug

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Specifications

- Conforms to FlexRay Communications System Protocol Specification V2.1A
- Variable bit rate support: 2.5, 5, 8 or 10 Mbps
- 128 configurable message buffers
- Message buffer header, status and payload data are stored in 6 KB of on-chip system memory
- Two independent message buffer segments with configurable size of payload data section
- Transmit message buffers configurable with state/event semantics
- Individual message buffer reconfiguration supported
- 2 independent receive FIFOs
- 4 configurable slot error counters
- 4 dedicated slot status indicators
- 1 absolute timer
- 1 timer that can be configured to absolute or relative

Design Challenges/Development Support

The FlexRay Communications System is designed to provide high-speed deterministic distributed control for advanced automotive applications. Its dual-channel architecture offers system-wide redundancy that meets the reliability requirements of emerging safety systems, such as brake-by-wire. With 10 Mbps throughput per channel, the FlexRay system can also be employed as a vehicle-wide network backbone, working in conjunction with already well-established systems, such as CAN and LIN. It can drive down costs by reducing the number of parallel CAN networks used to solve bandwidth bottlenecks.

Development Tools

Part Number	Description
MFR4310FRDC	The MFR4310FRDCis a daughter card containing an MFR4310, which plugs directly onto the HCS12X EVB, and a number of other Freescale EVBs with the required adaptor board. This makes it easy to integrate FlexRay communication into existing development platforms.
4310STARTERKIT	The 4310STARTERKIT for FlexRay MFR4310 microcontroller is a development kit which has everything included to get you up-and-running very quickly and easily with Freescale's FlexRay MFR4310 stand-alone communication controller. It includes a complete 2-node system based on the S12XDP512 host microcontrollers and the MFR4310FRDC daughter card.

Applications

Target Application	Design Considerations	Freescale Recommended Product Families
X-by-Wire Main Controller	Computing power Advanced safety features	MPC5561, MPC5567, MFR4310
X-by-Wire Satellite Nodes	Small footprint Low cost Advanced safety features	S12XF-family, MFR4310
Powertrain	Computing power Advanced timing features (eTPU)	MPC5567, MFR4310
Gateway	CAN, LIN, FlexRay communications Low power	MPC5514G, MPC5516G, MPC5517G, MFR4310

Learn More: Learn More: For more information about our FlexRay solutions, please visit **http://www.freescale.com/flexray.**

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