FlexRay Adapter

Features

- Compliant to FlexRay Protocol specification v2.1 RevA
- Support of Single Communication channel-A
- Cold start node
- Up to 5Mbps data rate
- 16 frames TX / RX buffer
- Configurable payload length in the Static/Dynamic segment
- Frame ID, Cycle count based Message Filtering
- 16-bit generic CHI Interface, optional AHB interface
- Interface to PDIUSBD12 USB chip (Full speed 12 Mbps)
- Interface to TJA1080 FlexRay Transceiver

Description

The FlexRay Communication System is designed to provide high-speed deterministic distributed control for advanced automotive applications. Its dual-channel (10 Mbps per channel) architecture offers system-wide redundancy that meets the reliability requirements of emerging safety systems, such as brake-by-wire. Some of the basic characteristics of the FlexRay protocol are synchronous and asynchronous frame transfer, guaranteed frame latency and jitter during synchronous transfer, prioritization of frames during asynchronous transfer, multi-master clock synchronization, error detection and signaling, error containment on the physical layer through the use of a bus guardian device, and scalable fault tolerance.

FlexRay Adapter

FlexRay Adapter shown in Figure 1 consists of the following functional blocks

- FlexRay controller
- D12 controller (PDIUSBD12)
- Cortex M1 processor

FlexRay Controller Configuration and Data Flow are controlled by the Cortex M1 Processor via USB interface.

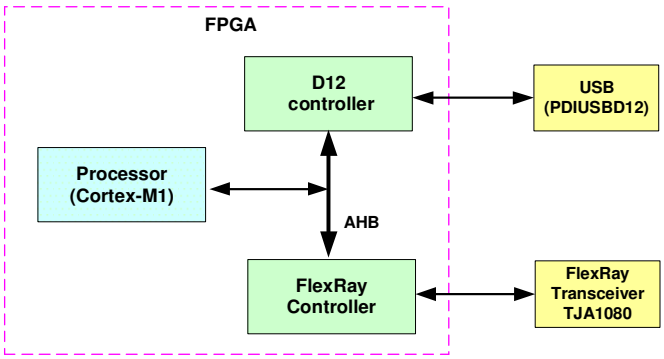

Figure 1. FlexRay Adapter Block Diagram

FlexRay Controller

FlexRay controller (Figure 2) implements necessary logic to communicate with the processor to send and receive messages on the FlexRay bus.

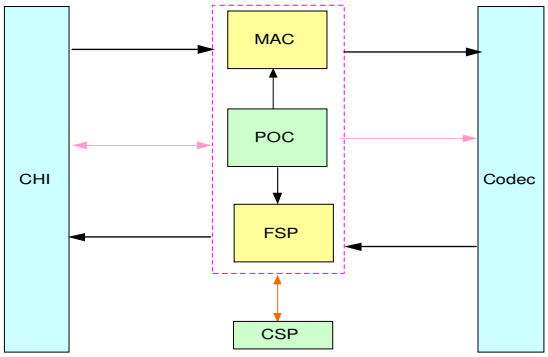

Figure 2. FlexRay Controller Block Diagram

Deliverables

1. Verilog HDL RTL Code.
2. Test Environment in Specman
3. Coverage, Net list reports.
4. Windows based USB Application, Driver
5. User manual
6. Application notes

Target Device Details for cold Start Node

Make	Device	Versatile Count		Frequency
		Without Debug Mode	With Debug Mode	
Actel	A3PE1500 STD	20262	23434	33 MHz

Target Device Details for Non-cold Start Node

Make	Device	Versatile Count		Frequency
		Without Debug Mode	With Debug Mode	
Actel	A3P1000 -2	18500	21718	38 MHz

Note: Versatile count includes Cortex M1 Processor and other interfaces. Versatile count only for the FlexRay Cold start IP is 15440 & FlexRay Non-Cold start IP is 13585.

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