CAN FLEXIBLE DATA-RATE IP CORE

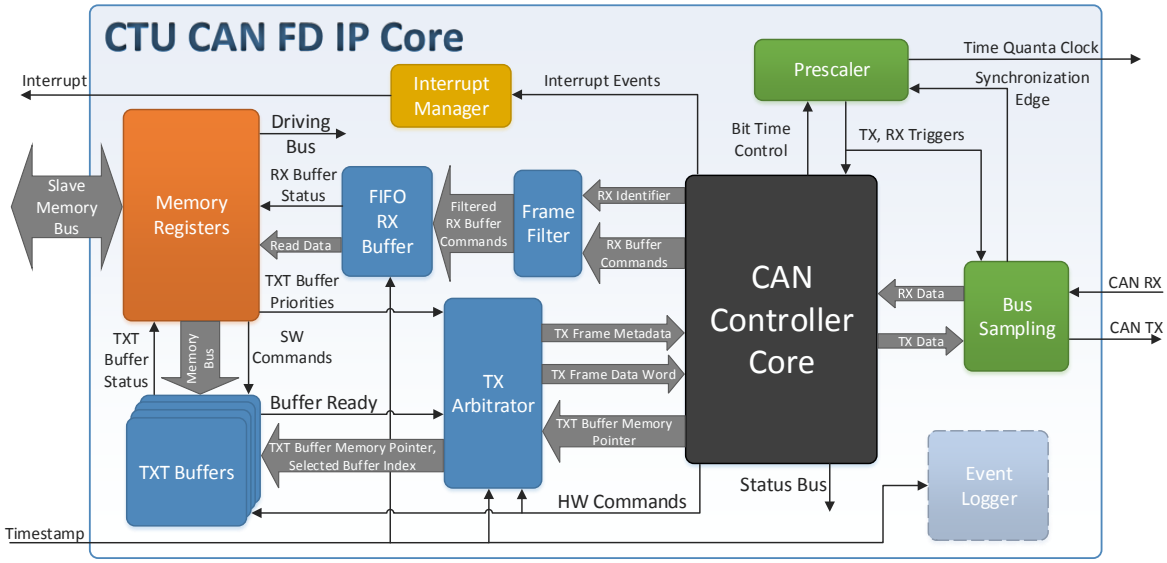
PRODUCT BRIEF v2.1

Overview

CAN Flexible Data-Rate IP Core connects functionality of CAN 2.0, CAN FD 1.0 and ISO CAN FD specification in a light - weight IP Core. It is a soft-core IP Core written in VHDL, with no vendor specific libraries needed. The main target of usage are FPGA applications, and the core RTL is freely available under MIT License in Gitlab repository of CTU FEE. It is optimized for inference of native hardware blocks such as SRAM memories and DSP blocks. Generic settings achieve high level of flexibility before synthesis.

The IP Core is accessed as a slave memory mapped peripheria via Avalon bus or APB. Easy manipulation with the core is achieved by using hardware buffers for CAN frames. One FIFO RX buffer is available, and 4 TX buffers are available. Timestamps can be captured for various events on the CAN bus and transmission of CAN frames can be triggered by external timestamp. Three Bit filters and one Range filter is available for HW filtration of received CAN frames. The Core was synthesized in low-end Xilinx and Altera FPGAs with maximal operating frequencies above 100 MHz.

CTU CAN FD also contains a Linux SocketCAN driver. The design contains its own testing framework which is based on Vunit test framework and simulated via GHDL or Modelsim. At the moment the development team of CTU CAN FD is working on ISO conformance testing to guarantee proper operation in commercial applications.



Features

- CAN 2.0, CAN FD 1.0 and ISO CAN FD
- RTL VHDL
- Pre-synthesis configurable features
- Avalon compatible memory bus, APB
- Timestamping and transmission at given time
- Optional event and error logging
- Fault confinement state manipulation
- Transceiver delay measurement
- Size of 1700-2300 ALMs (Intel) , 2500 - 3300 LUTs (Xilinx)
- 3 500 - 138 000 SRAM memory bits (Intel), 2.5 - 6 BRAMS (Xilinx)
- Synchronization output with time quantum
- Filtering of received frames
- Listen-only mode, Self-test mode, Acknowledge forbidden mode
- Up to 14 Mbit in "Data" Bit-Rate (with 100 MHz Core clock)
- Linux SocketCAN driver available