

## FEATURES

- 4 bit to 32 bit serial transmit & receive
- Full and Half duplex support
- Software programmable Master or Slave mode
- Software programmable SCLK rate for Master mode
- Quad-bit mode operation
- separate SCLK input for Master Mode
- 64 word Tx and Rx FIFOs
- Asynchronous Slave Interface
- AMBA APB interface
- Interrupt control
- LSB or MSB mode
- Up to 4 slaves under Master control
- DMA Interface

## LICENSED IP PACKAGE INCLUDES

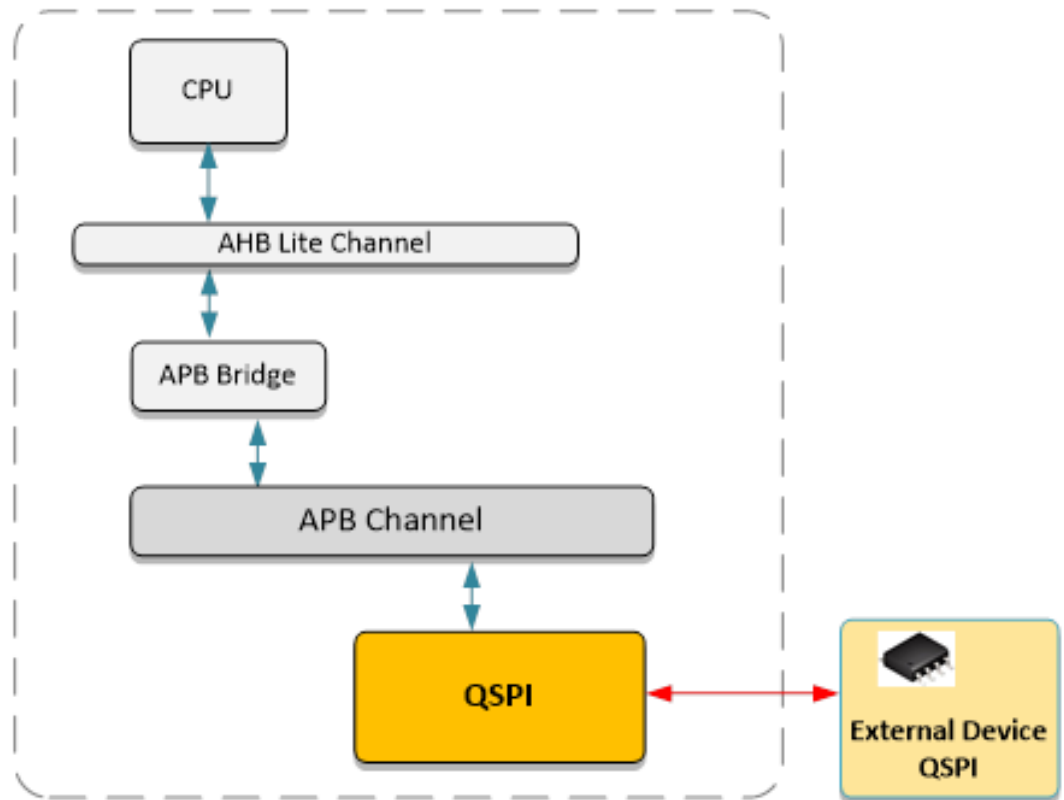
- Verilog Source
- Complete Test Environment
- AHB Bus Functional Model
- C-Sample Code

## DESCRIPTION

The Quad Serial Peripheral Interface module either controls a serial data link as a master, or reacts to a serial data link as a slave.

The IPC-QSPI-APB bus controller can be configured under software control to be a master or slave device. Reading and writing the core is done on the AMBA APB bus interface. The core operates in various data modes from 4 bits to 32 bits (8 modes are supported in multiples of 4 data bits). The data is then serialized and then transmitted, either LSB or MSB first, using the standard 4-wire SPI bus interface or the extended Quad mode bus.

## GENERAL USE



You may also be interested in:

## AMBA® Subsystems

- Low Power Subsystem (simple AHB system)
- Low Power / Performance Subsystem (includes AHB Multi-matrix Fabric)
- Custom Performance Subsystem (includes AXI Multi-layer Fabric)

## IP Cores

### Infrastructure Cores

AHB Multi-Matrix Fabric  
AHB/AHBLite Channel  
AHB Arbiter  
AXI Multi-Layer Fabric  
AXI to AHBLite Bridge  
AXI to APB Bridge  
AHB to ABP Bridge  
APB Channel

### AXI Cores

AXI Multi-Layer Fabric  
AXI to AHBLite Bridge  
AXI to APB Bridge  
AXI External Bus Interface  
(Memory/Flash Controller)  
AXI Internal Memory Controller  
AXI QSPI with Execute in Place (XIP)

### AHB Cores

AHB Channel  
AHB Multi-Matrix Fabric  
AHB to ABP Bridge  
AHB Arbiter  
AHB QSPI with Execute in Place (XIP)  
AHB External Bus Interface  
AHB Internal SRAM Controller  
AHB Interrupt Controller  
AHB DMA Controller  
AHB DMA 4 Channel Controller  
AHB TFT LCD Controller  
AHB DES/TDES Encryption/Decryption

**AHB Serial Flash Controller**  
**Octal, Quad, Dual and Single Modes**

**Serial to AHB Bridge**  
**SPI slave to AHB Master**  
**Monitor/Control**

### APB Cores

APB Channel  
APB Quad SPI Controller  
APB General Purpose IO  
APB Timer  
APB UART  
APB I2C (Master and Slave)  
APB SPI  
APB Watchdog Timer  
APB Pulse Width Modulator  
APB Real Time Clock

### General

DES – Digital Encryption Standard  
Triple DES (Low Gates)  
Triple DES (pipelined)  
ADC Interface (semi-custom)  
Mixed-Signal Interfaces (semi-custom)  
Power Management Unit (semi-custom)

**AES Encryption Core**

For more information contact



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