UAPC-2110 Digital Audio Interface Transmitter

Features

- **Compliant with the AMBA Specification (Rev 2.0)**
- **Provide I^2S standard data transfer format**
- **Provide MSB extended output format**
- **Provide Left-justified output format**
- **Provide Right-justified output format**
- **Support multiple sample precision selection**
- **Software programmable clock frequency**
- **Software programmable enable bit**
- **Software programmable mute bit**
- **Support both dual channel and single channel (monophonic) data transfer**
- **Interrupt driven for data request**
- **Support Direct Memory Access (DMA)**

Overview

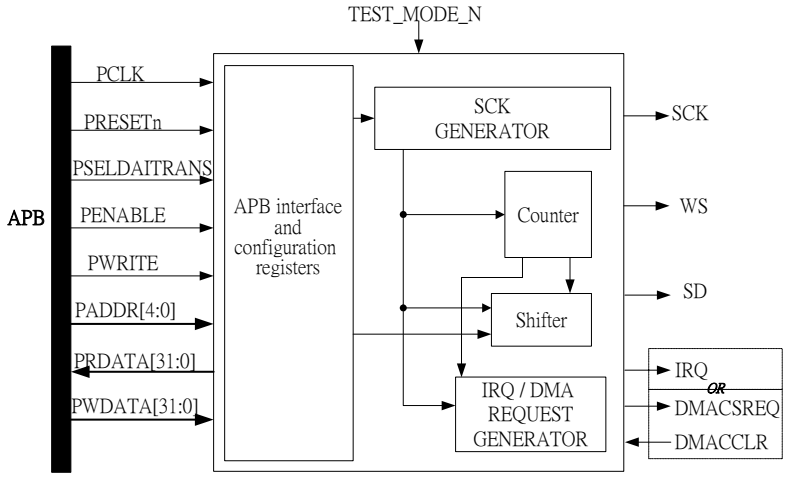
The DAI (Digital audio interface) transmitter provides transmitting function of digital audio interface. It supports four serial data output formats, with precision range from 16 to 24 bits/word.

The DAI transmitter supports dual channel data transfer. It can also support monophonic output sequences by setting the configuration registers through APB interface.

The DAI transmitter provides programmable clock divider for getting appropriate output clock frequency.

The DAI transmitter is a synthesizable soft IP core that connects to AMBA™APB bus for easy SOC integration. Resulting from a disciplined IP authoring process and going through a functional verification, this core is extremely robust. Its full-scan feature boosts the fault coverage to over 99%.

Block Diagram



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Description

The DAI transmitter is an AMBA compliant SOC peripheral. It is a slave module when connected to an AMBA system.

The DAI transmitter provides four output formats to transfer data. They are I^2S, MSB-extended, left-justified and right-justified formats. The output sample precision can be selected from: 16, 18, 20, 24 bits/word in 32 slots mode and 16 bits/word in packet mode. The DAI transmitter supports dual channel data transfer. It can also support monophonic output sequences. The other output format controlling bits are: output sequence order (MSB first or LSB first), transmitter serial clock polarity (falling edge or rising edge), word select signal polarity (low level for left channel, high for right channel, or reversed). The DAI transmitter provides the programmable clock divider for getting appropriated output clock frequency. All the modes or function controls above can be chosen by setting the configuration registers through the APB interface.

The digital audio interface is a simple 3-line bus: continuous serial clock (sck), word select (ws) and serial data (sd) for two time-multiplexed data channels. The output interrupt signal is pulled up to request the next data. The DAI transmitter also supports the DMA request interface to update data registers. The DAI transmitter only needs simple software control flows to handle the data transfer. The DAI transmitter can be connected to the APB bus of an AMBA system for easy integration into SOC implementations.

Deliverables

- Verilog RTL code
- Verification suite
- Synthesis scripts for Synopsys Design Compiler, Power Compiler and DFT Compiler
- Comprehensive document set including Datasheet, User's Manual, Integration Guide, Verification Guide, and Test Guide

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