

A²B BUS FEATURES

Line topology

Single master, multiple slave

Up to 15 m between nodes and up to 40 m overall cable length

Communication over distance

Synchronous data

Multichannel I²S/TDM to I²S/TDM

Clock synchronous, phase aligned in all nodes

Low latency slave to slave communication

Control and status information I²C to I²C

GPIO over distance

Bus power or local power slave nodes

Configurable with SigmaStudio graphical software tool

Qualified for automotive applications

A²B TRANSCEIVER FEATURES

Configurable as A²B bus master or slave (AD2428W)

I²C interface

8-bit to 32-bit multichannel I²S/TDM interface

I²S/TDM/PDM programmable data rate

Up to 32 upstream and 32 downstream channels

PDM inputs for 4 high dynamic range microphones on masters or slaves

Support for receiving I²S data on nodes with up to 4 PDM microphones

Unique ID register for each transceiver

Support for crossover or straight-through cabling

Programmable settings to optimize EMC performance

APPLICATIONS

Automotive audio communication link

Active noise cancellation

Microphone arrays for hands free and in car communication

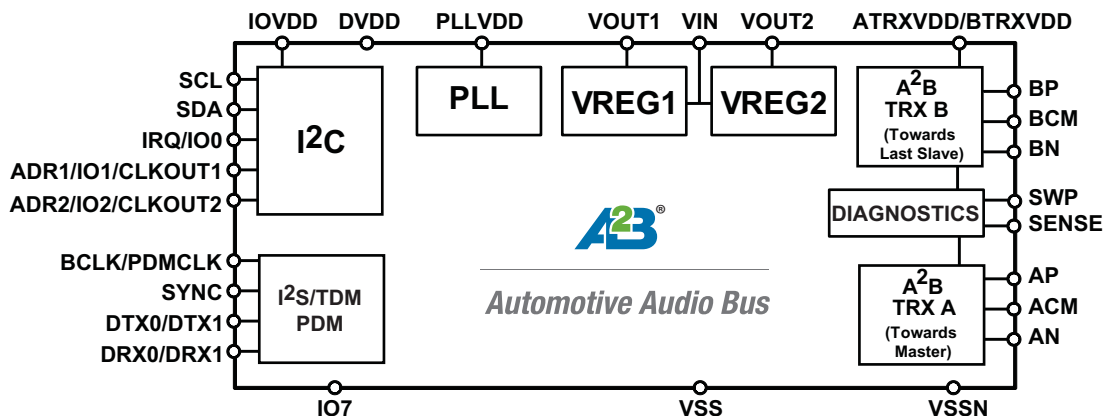


Figure 1. Functional Block Diagram

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GENERAL DESCRIPTION

The Automotive Audio Bus (A²B[®]) provides a multichannel, I²S/TDM link over distances of up to 15 m between nodes. It embeds bidirectional synchronous pulse-code modulation (PCM) data (for example, digital audio), clock, and synchronization signals onto a single differential wire pair. A²B supports a direct point to point connection and allows multiple, daisy-chained nodes at different locations to contribute and/or consume time division multiplexed channel content.

A²B is a single-master, multiple-slave system where the transceiver chip at the host controller is the master. The master generates clock, synchronization, and framing for all slave nodes. The master A²B chip is programmable over a control bus (I²C) for configuration and read back. An extension of this control bus is embedded in the A²B data stream, which grants direct access of registers and status information on slave transceivers as well as I²C to I²C communication over distance.

The transceiver can connect directly to general-purpose digital signal processors (DSPs), field-programmable gate arrays (FPGAs), application specific integrated circuits (ASICs), microphones, analog-to-digital converters (ADCs), digital-to-analog converters (DACs), and codecs through a multichannel I²S/TDM interface. It also provides a PDM interface for direct connection of up to four PDM digital microphones.

Finally, the transceiver also supports an A²B bus powering feature, where the master node supplies voltage and current to the slave nodes over the same daisy-chained, twisted pair wire cable as used for the communication link.

Complete technical specifications are available for the A²B transceiver. Contact your nearest Analog Devices sales office to complete the nondisclosure agreement (NDA) required to receive additional product information.

Table 1. Product Comparison Guide

| Feature | AD2426W | AD2427W | AD2428W |
|-------------------------------|---------|---------|---------|
| Master capable | No | No | Yes |
| Functional TRX blocks | A only | A + B | A + B |
| I ² S/TDM support | No | No | Yes |
| PDM microphone inputs | 4 mics | 4 mics | 4 mics |
| Max node to node cable length | 15 m | 15 m | 15 m |

I²C refers to a communications protocol originally developed by Philips Semiconductors (now NXP Semiconductors).