

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

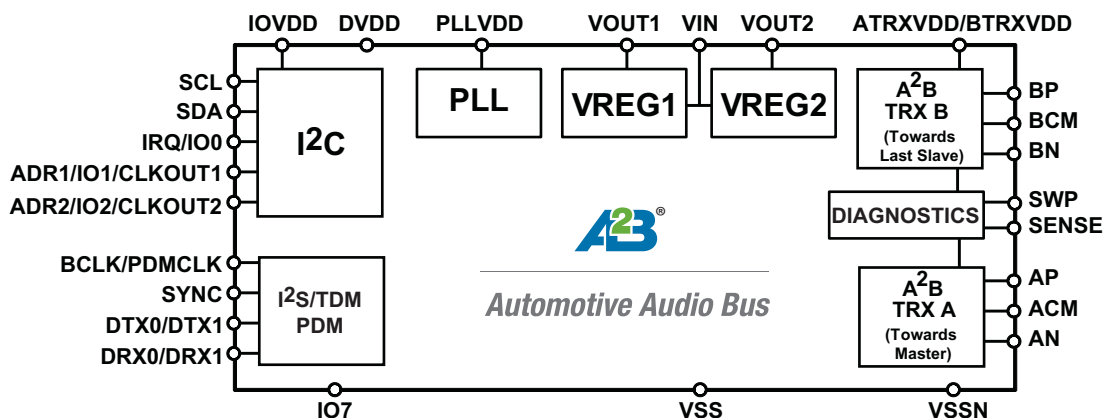


Figure 1. Functional Block Diagram

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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).

