

### A<sup>2</sup>B 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 I<sup>2</sup>S/TDM to I<sup>2</sup>S/TDM

Clock synchronous, phase aligned in all nodes

Low latency slave to slave communication

Control and status information I<sup>2</sup>C to I<sup>2</sup>C

GPIO over distance

Bus power or local power slave nodes

Configurable with SigmaStudio graphical software tool

Qualified for automotive applications

### A<sup>2</sup>B TRANSCEIVER FEATURES

Configurable as A<sup>2</sup>B bus master or slave (AD2428W)

I<sup>2</sup>C interface

8-bit to 32-bit multichannel I<sup>2</sup>S/TDM interface

I<sup>2</sup>S/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 I<sup>2</sup>S 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

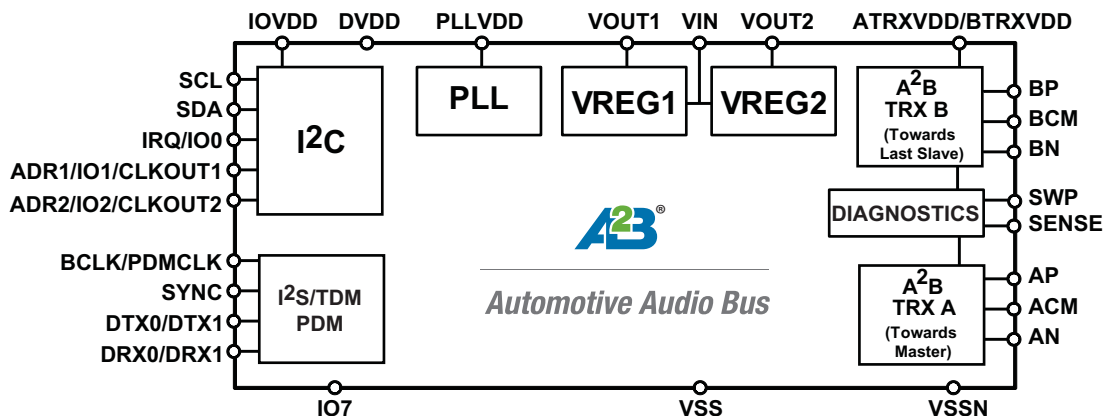


Figure 1. Functional Block Diagram

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## GENERAL DESCRIPTION

The Automotive Audio Bus (A<sup>2</sup>B<sup>®</sup>) provides a multichannel, I<sup>2</sup>S/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. A<sup>2</sup>B 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.

A<sup>2</sup>B 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 A<sup>2</sup>B chip is programmable over a control bus (I<sup>2</sup>C) for configuration and read back. An extension of this control bus is embedded in the A<sup>2</sup>B data stream, which grants direct access of registers and status information on slave transceivers as well as I<sup>2</sup>C to I<sup>2</sup>C 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 I<sup>2</sup>S/TDM interface. It also provides a PDM interface for direct connection of up to four PDM digital microphones.

Finally, the transceiver also supports an A<sup>2</sup>B 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 A<sup>2</sup>B 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 <sup>2</sup> 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

I<sup>2</sup>C refers to a communications protocol originally developed by Philips Semiconductors (now NXP Semiconductors).