

AD242x(W)

Enhanced Automotive Audio Bus Transceivers

Overview

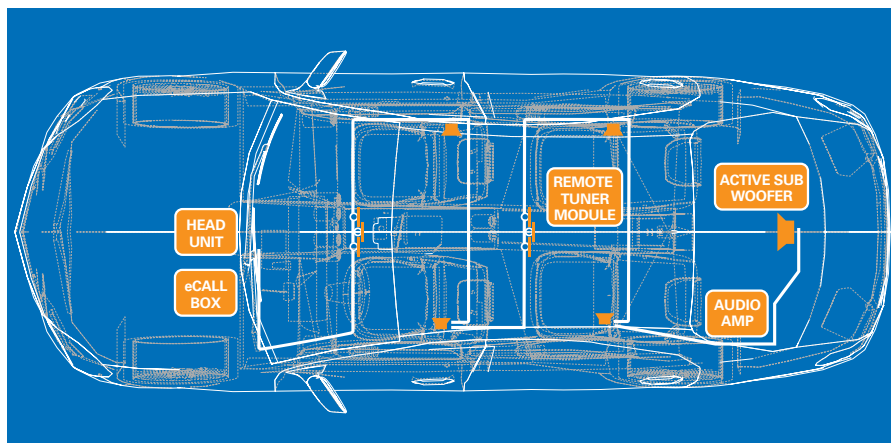
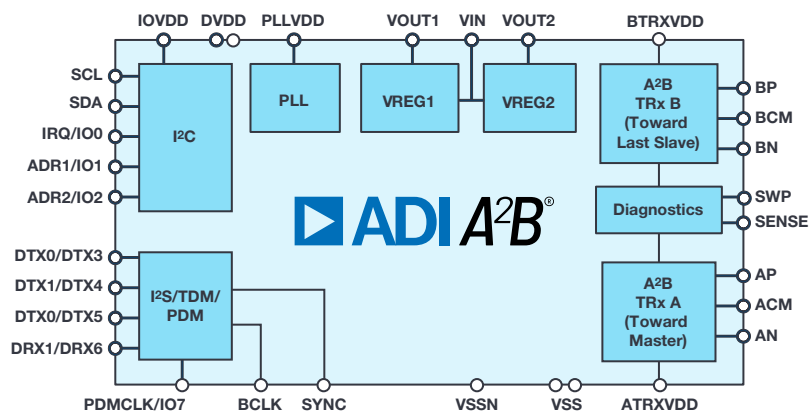
Automotive Audio Bus[®] technology provides a multichannel, I²S/TDM link over distances of up to 15 meters between nodes. It embeds bidirectional synchronous data, clock, control data, and power onto a single, differential wire pair. A²B[®] supports a direct point-to-point connection and allows multiple daisy-chained nodes at different locations to contribute or consume time division multiplexed channel content. A²B is a single master, multiple slave system where the transceiver at the host controller is the master. It generates clock, synchronization, and framing for all slave nodes. The master A²B transceiver is programmable over a control bus (I²C) for configuration and readback. An extension of this control bus is embedded in the A²B data stream, allowing direct access of registers and status information on slave transceivers, as well as I²C-to-I²C communication over distance.

Target Applications Include

- ▶ Audio ECU communication links
- ▶ Active noise cancellation (ANC)
- ▶ Road noise cancellation (RNC)
- ▶ Microphone arrays for hands-free, in-car communications and eCall systems

Simple and Cost-Effective Architecture for Emerging Applications

- ▶ Digital audio; single, low cost, unshielded twisted pair (UTP) wire transports audio, control, clock, and power



Features and Benefits

High bandwidth (50 Mbps) digital bus	Support for up to 32 upstream and downstream channels
Data, control, clock, plus power on a single wire pair	System cost reduction using low cost, UTP cable
Single master, multiple slave, line topology	Daisy-chaining supported with zero processor overhead
Bus power capability	Eliminates the need for local power supplies
Embedded diagnostics	Easy system-level fault detection and correction
Fully configurable via SigmaStudio® graphical design environment	Fast time to market
Synchronous delivery of data with predictable low latency	Two sample bus latency (<50 µs) for all nodes

Evaluation Board Ordering Guide

Model	Description
EVAL-AD2428WB1BZ	Bus-powered slave evaluation board; stereo in, stereo out, and stereo microphones
EVAL-AD2428WC1BZ	Bus-powered slave evaluation board with four microphones
EVAL-AD2428WD1BZ	Master or local power slave evaluation board with SigmaDSP® ADAU1452; stereo in, stereo out, and three microphones
EVAL-AD2428WG1BZ	Local power slave evaluation board; stereo in, stereo out

Product Comparison Guide

Feature	AD2420(W)	AD2426(W) ¹	AD2427(W) ¹	AD2428(W) ¹	AD2429(W)
Master capable	No	No	No	Yes	Yes
Functional TRx blocks	A only	A only	A and B	A and B	B only
I ² S/TDM support	No	No	No	Yes	Yes
PDM microphone inputs	2 mics	4 mics	4 mics	4 mics	4 mics
Maximum node-to-node cable length	5 m	15 m	15 m	15 m	5 m

¹ All products are RoHS-compliant. W = qualified for automotive applications.

SigmaStudio Graphical Design Environment

- ▶ Visual bus setup and stream-based network design
- ▶ Intuitive graphical user interface to configure the bus
- ▶ Export/import of streams, nodes, and bus configuration
- ▶ Extensive debug and tracing support
- ▶ Bus bandwidth utilization calculation
- ▶ Bit error rate test (BERT)
- ▶ Line diagnostics
- ▶ Firmware driver generation

Multifunction Evaluation Systems

- ▶ Proof of concept
- ▶ Test and verification
- ▶ Debug, EMC testing

To learn more about the breakthrough Automotive Audio Bus technology, visit analog.com/a2b.

