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
- Phantom power or local power slave nodes
- Configurable with SigmaStudio graphical software tool
- Qualified for automotive applications

ADDITIONAL TRANSCEIVER FEATURES

Configurable as A²B bus master or slave (AD2425W)
- 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

APPLICATIONS

Automotive audio communication link
- Active noise cancellation
- Microphone arrays for hands free and in car communication

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 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 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.

Table 1. Product Comparison Guide

<table>
<thead>
<tr>
<th>Feature</th>
<th>AD2421W</th>
<th>AD2422W</th>
<th>AD2425W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master capable</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Functional TRX blocks</td>
<td>A only</td>
<td>A + B</td>
<td>A + B</td>
</tr>
<tr>
<td>I²S/TDM support</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>PDM microphone inputs</td>
<td>4 mics</td>
<td>4 mics</td>
<td>4 mics</td>
</tr>
<tr>
<td>Maximum node to node cable length</td>
<td>15 m</td>
<td>15 m</td>
<td>15 m</td>
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</table>

FUNCTIONAL BLOCK DIAGRAM

The A²B and the A²B logos are registered trademarks of Analog Devices, Inc.
I²C refers to a communications protocol originally developed by Philips Semiconductors (now NXP Semiconductors).