

AVAS solution based on SPC582B60E1 Chorus family MCU and FDA903D Class D audio amplifier



Features

- Embeds two [FDA903D](#) class D automotive grade audio amplifiers and an [SPC582B60E1](#) Chorus family MCU with 1 Mb flash
- Supports audio stream via I²S interface
- Configurable through dedicated I²C bus
- Supports CAN bus interface for remote control and diagnostics
- Dedicated DC diagnostic interrupt pin to signal malfunctions
- Dedicated MUTE pin
- Open load in play detection
- Short to V_{CC}/GND diagnostics
- Output voltage and current detection
- Thermal protection
- Compact size: 110 mm x 90 mm
- WEEE and RoHS compliant
- Included in [AutoDevKit](#) initiative

Description

The [AEK-AUD-C1D9031](#) is a very compact AVAS solution based on [SPC582B60E1](#) Chorus family MCU and [FDA903D](#) Class D audio amplifiers that emits warning sounds to alert pedestrians of the presence of e-vehicles.

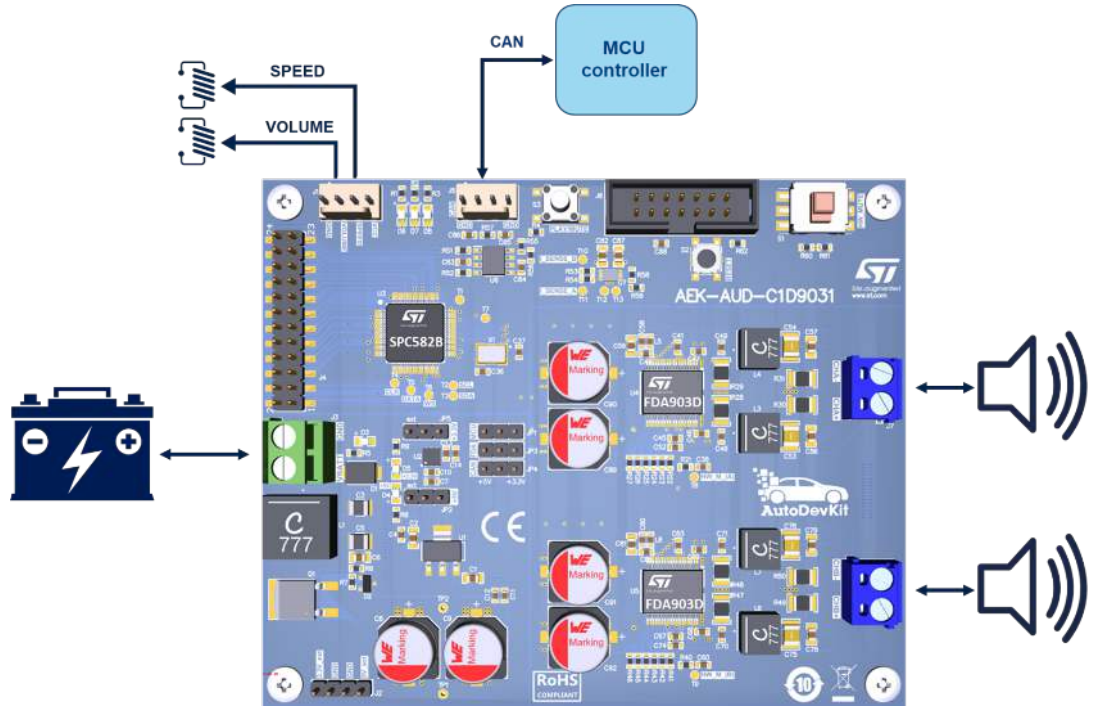
The [AEK-AUD-C1D9031](#) integrates two audio amplifiers in stereo mode or two separate audio channels. The board compact size allows the designer to strategically place different modules around the vehicle to ensure that warning sounds can be heard along the entire vehicle length. All the modules can be controlled by a central MCU via CAN interface.

The embedded [SPC582B60E1](#) microcontroller monitors and controls the two Class-D [FDA903D](#) power amplifiers driving the loudspeakers; the MCU sends the audio samples via I²S bus and programs the amplifiers via I²C interface.

| Product summary | |
|---|--|
| AVAS solution based on SPC582B60E1 Chorus family MCU and FDA903D Class D audio amplifier | AEK-AUD-C1D9031 |
| 32-bit power architecture MCU for automotive general purpose applications - Chorus family | SPC582B60E1 |
| Class D digital input automotive power amplifier | FDA903D |
| AutoDevKit library plugin for SPC5-STUDIO | STSW-AUTODEVKIT |
| Applications | In-Vehicle Infotainment Acoustic Vehicle Alerting System (AVAS) |

1 Block diagram

Figure 1. AEK-AUD-C1D9031 block diagram



2 Schematic diagrams

Figure 2. AEK-AUD-C1D9031 circuit schematic (1 of 6)

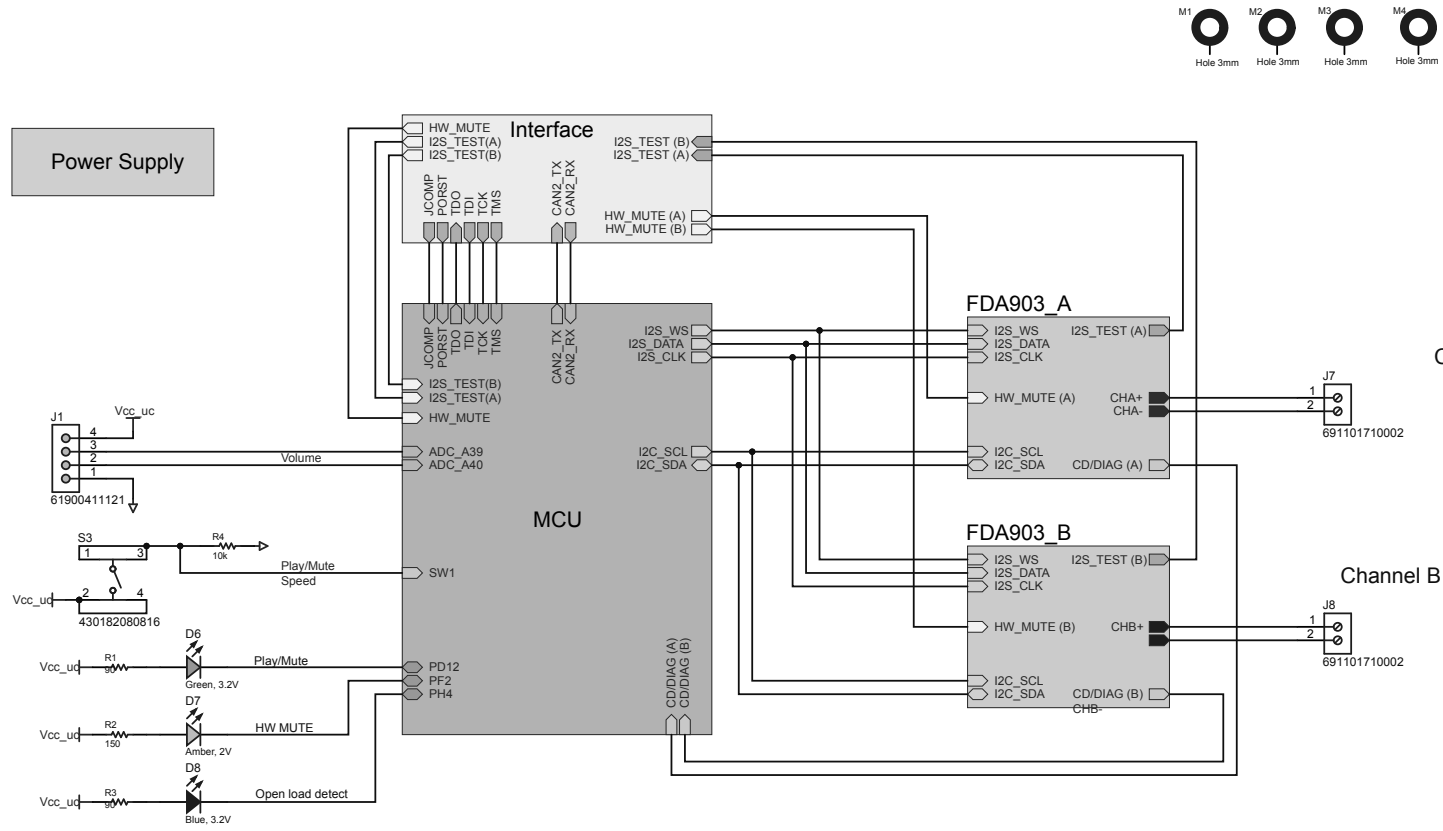
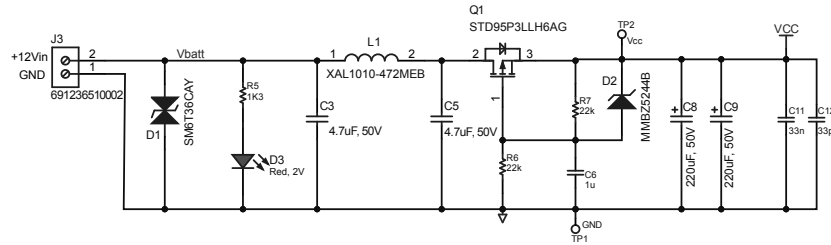
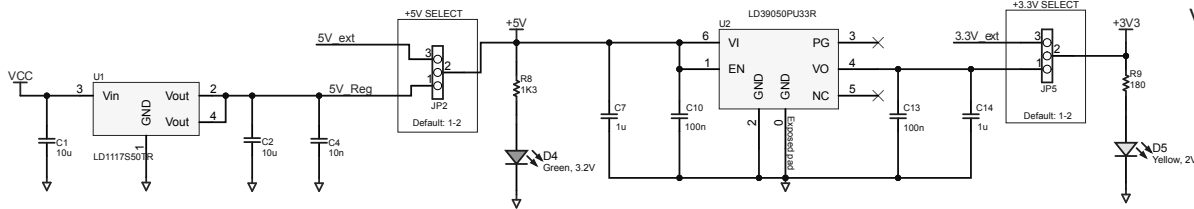


Figure 3. AEK-AUD-C1D9031 circuit schematic (2 of 6)

Main Power



Voltage regulator



Voltage selector

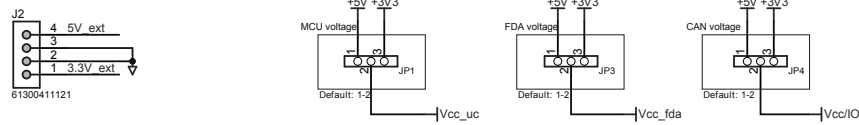


Figure 4. AEK-AUD-C1D9031 circuit schematic (3 of 6)

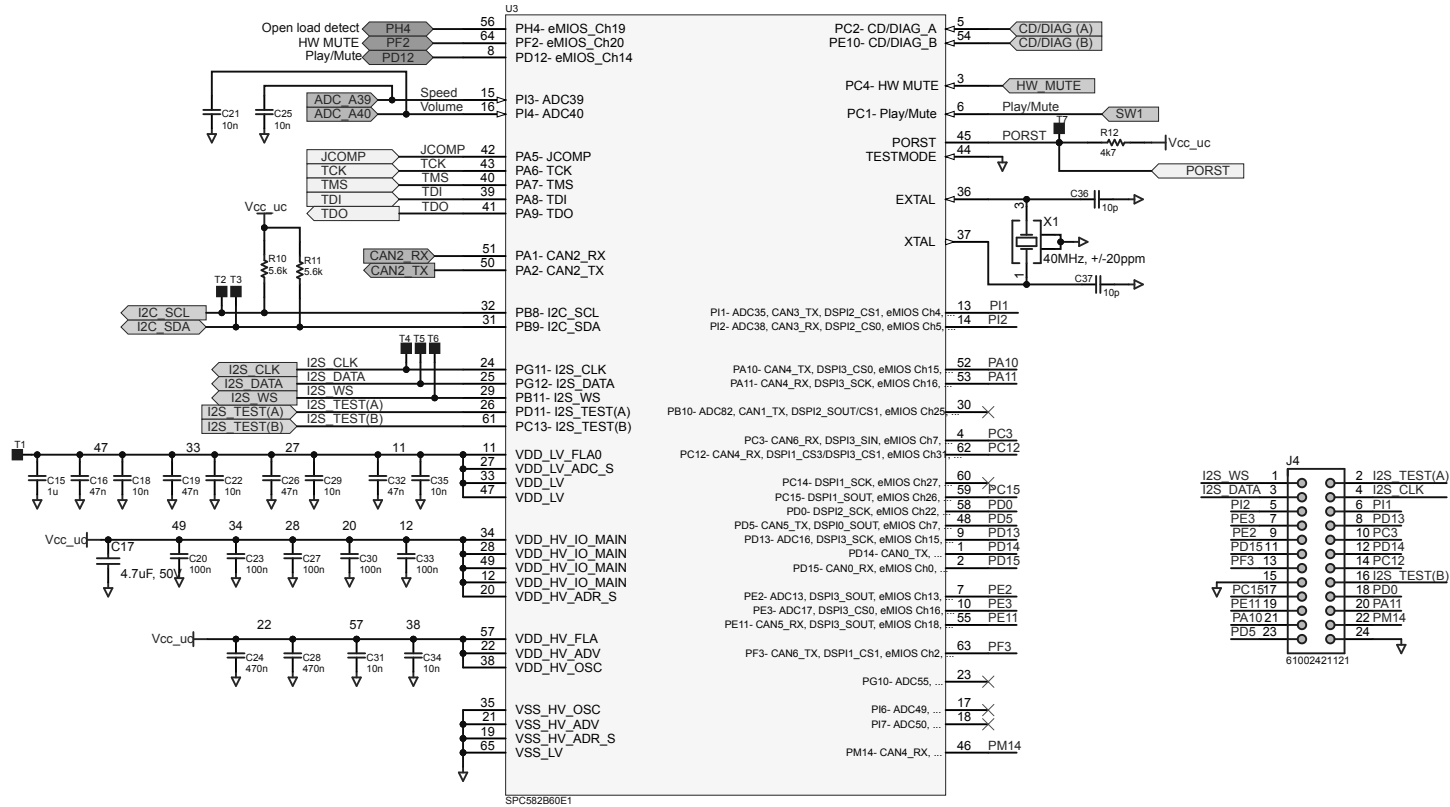


Figure 5. AEK-AUD-C1D9031 circuit schematic (4 of 6)

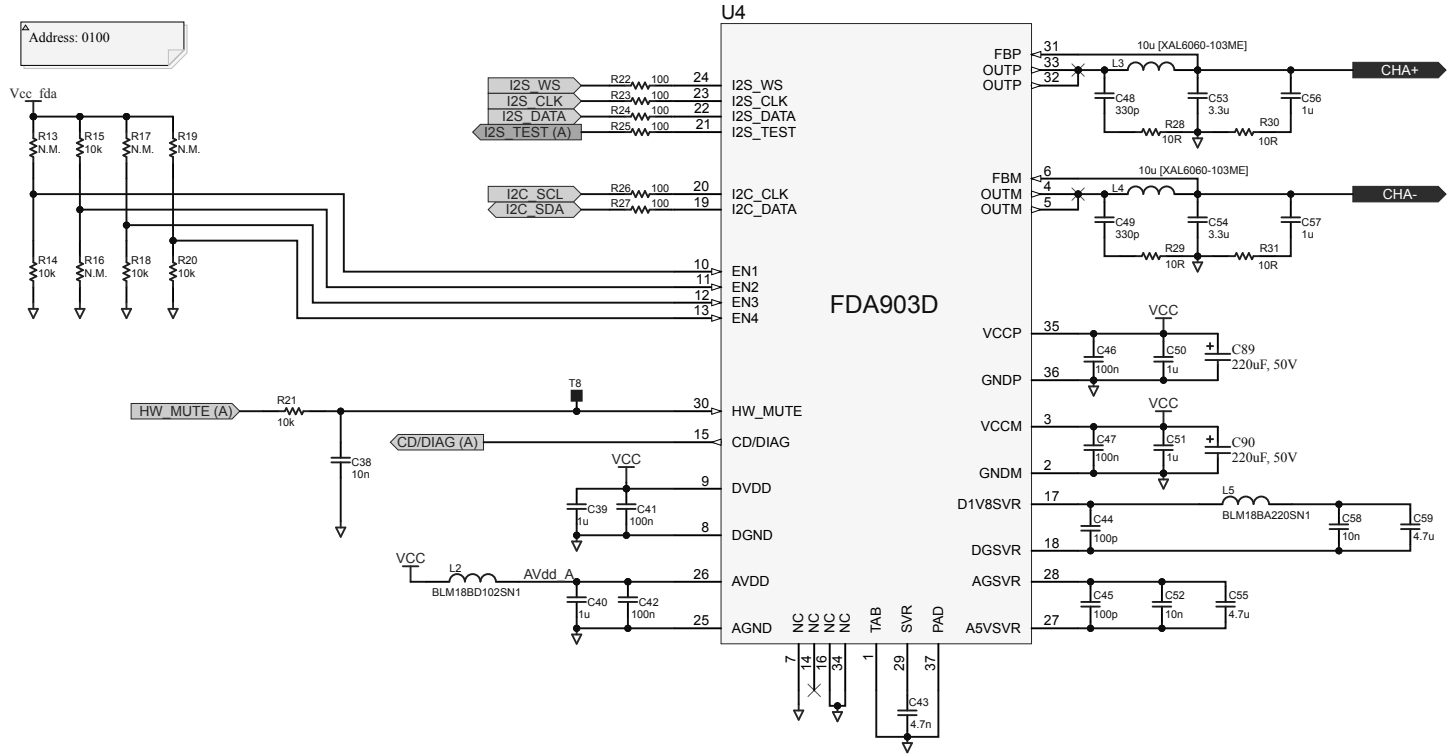


Figure 6. AEK-AUD-C1D9031 circuit schematic (5 of 6)

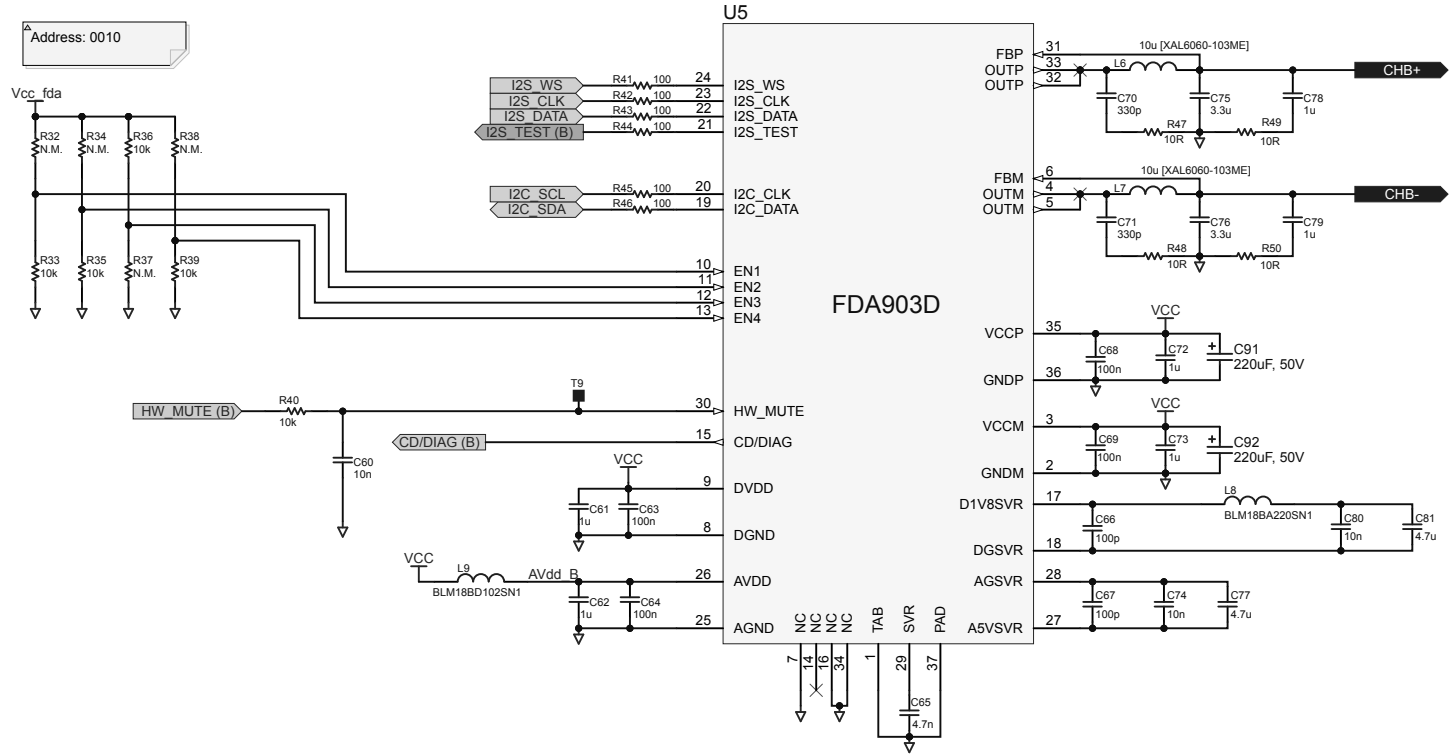
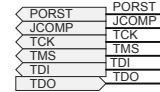
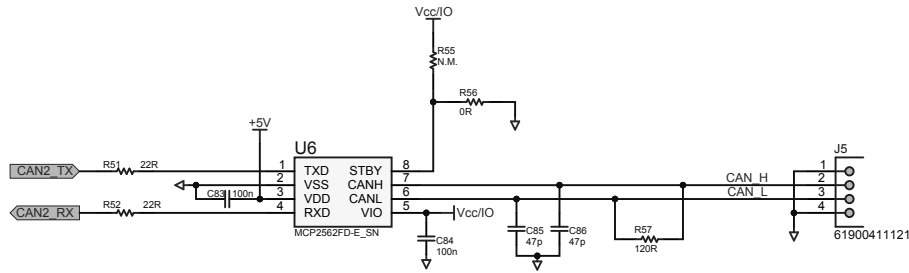
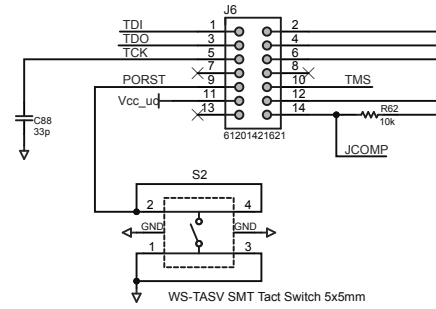


Figure 7. AEK-AUD-C1D9031 circuit schematic (6 of 6)

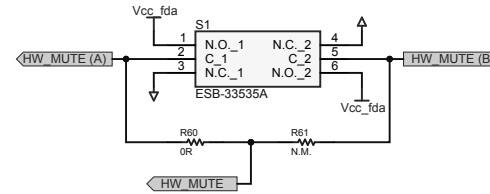
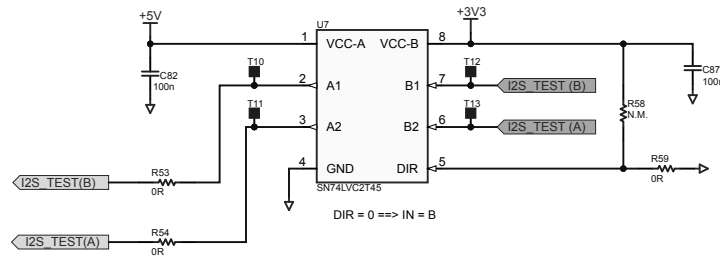
CAN Interface



JTAG interface



I2S Transceiver & Translation Level



Revision history

Table 1. Document revision history

| Date | Version | Changes |
|-------------|---------|------------------|
| 04-Feb-2021 | 1 | Initial release. |

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