

## Application Note

# CS4201/CS4202 TWO CHANNEL AUDIO DESIGN

### 1. INTRODUCTION

This application note describes how to create a two channel AC '97 audio sub-system on a PC motherboard, with buffered Line Outputs, that can accommodate either the CS4201 or CS4202 audio codec.

### 2. CS4201/CS4202 DUAL DESIGN

Figure 1 illustrates a circuit that accommodates both CS4201 and CS4202 codecs, and Table 1 summarizes the population options. The only changes necessary in a two-channel motherboard application are to pins 32, 33, and 34. On the CS4201, these pins form the external connections to the analog 3D filter. Pin 32 is tied to a 0.01 uF capacitor, and a 1000 pF capacitor is connected between pins 33 and 34.

The CS4202 implements 3D spatialization in software, therefore filter capacitors C9 and C10 should not be populated. For CS4202 two channel applications not using headphone sense, pin 32 should be tied to ground through a pull down resistor for software compatibility. See the application note AN215 for more information on implementing the CS4202 with headphone sense.

The audio driver will read the state of pin 33 on the CS4202 to detect two channel vs. six channel implementation. For two-channel operation, this pin is tied to +3.3V through a pull-up resistor. For more information on implementing six channel dual CS4201/CS4202 designs, see the application note AN214.

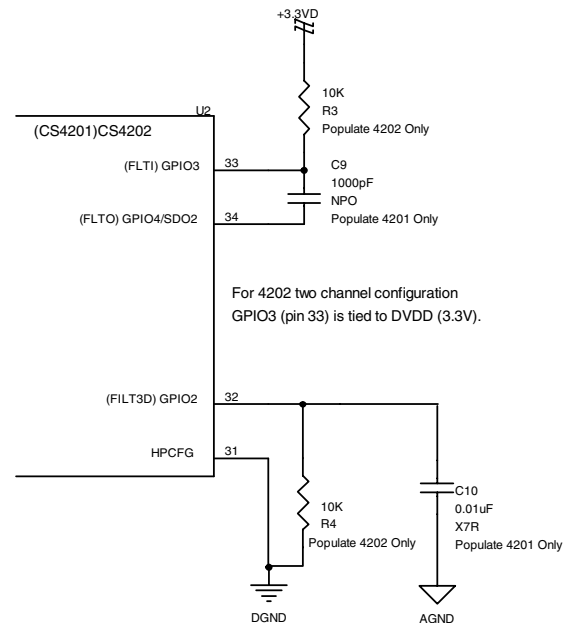


Figure 1. CS4201/CS4202 Dual Design

Codec	Populate	Don't Populate
CS4201	C9, C10	R3, R4
CS4202	R3, R4	C9, C10

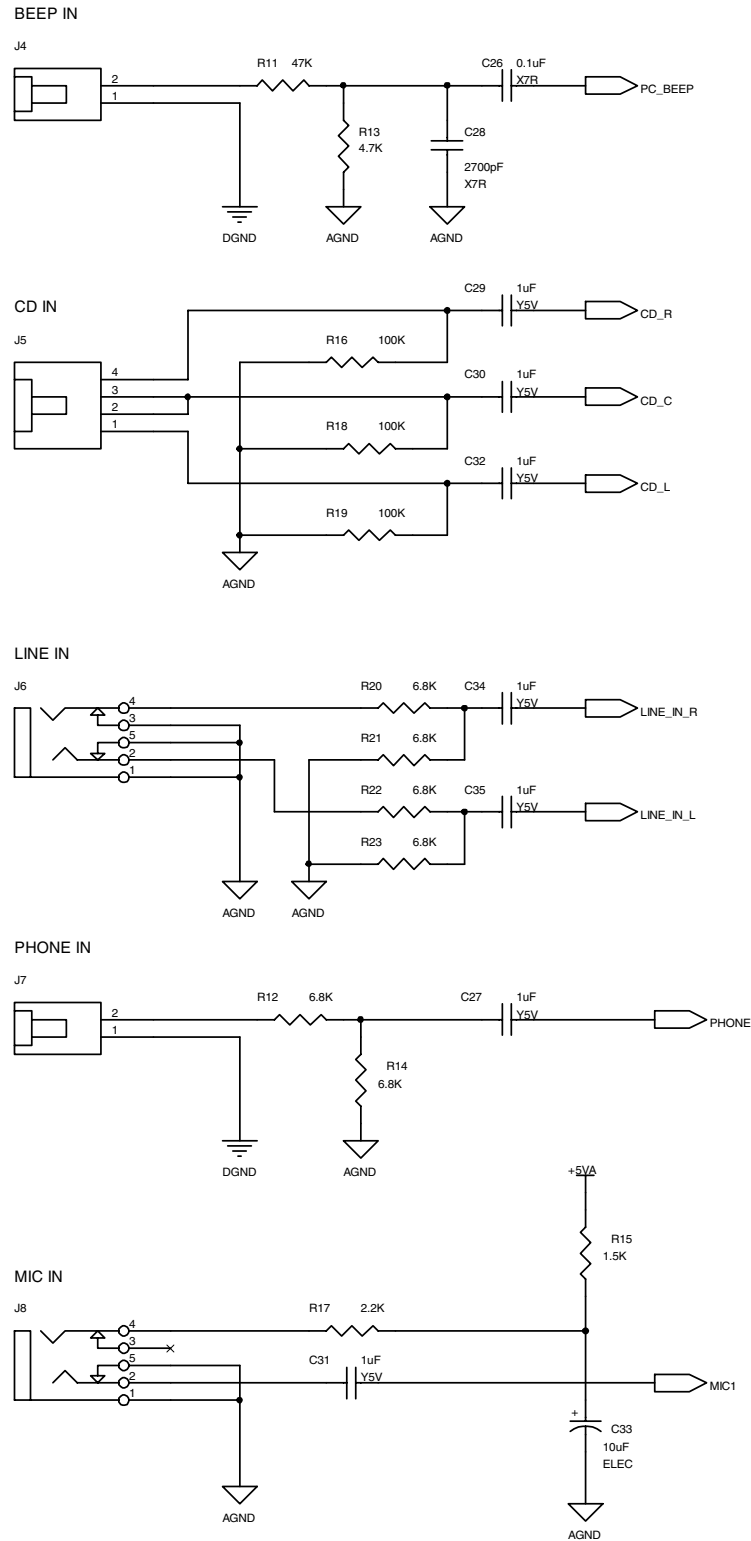
Table 1. Population Options for Figure 1

### 2.1 Software Audio Drivers

The CS4202 requires a PW6000 (or newer) Windows WDM audio driver. This driver is backward compatible with the CS4201 and supports Windows 98se, ME, 2000, and XP.

### 3. TYPICAL APPLICATION

Figures 2, 3, and 4 in the following schematics shows a typical CS4201/CS4202 two channel audio motherboard application.



**Figure 2. Audio Inputs**

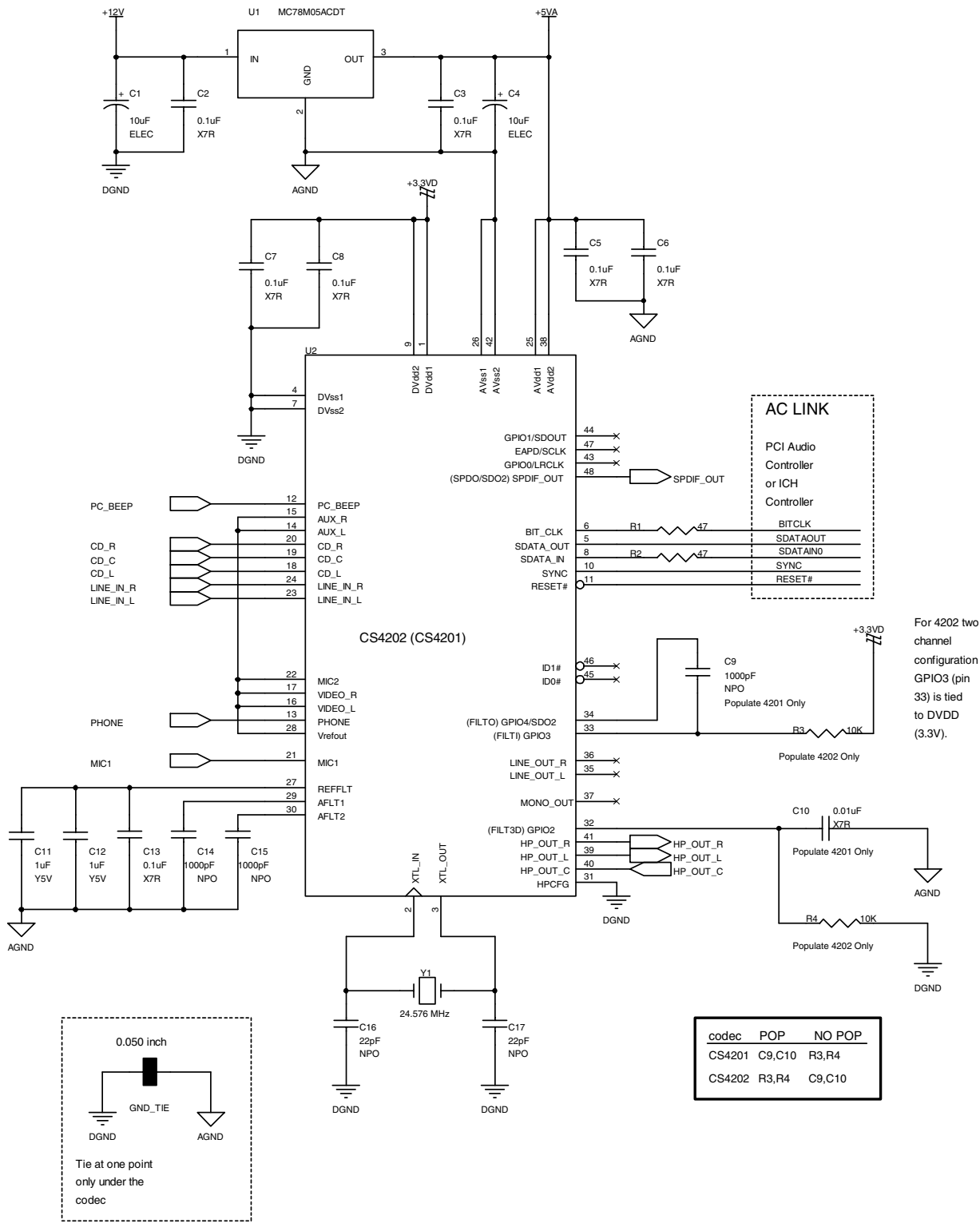
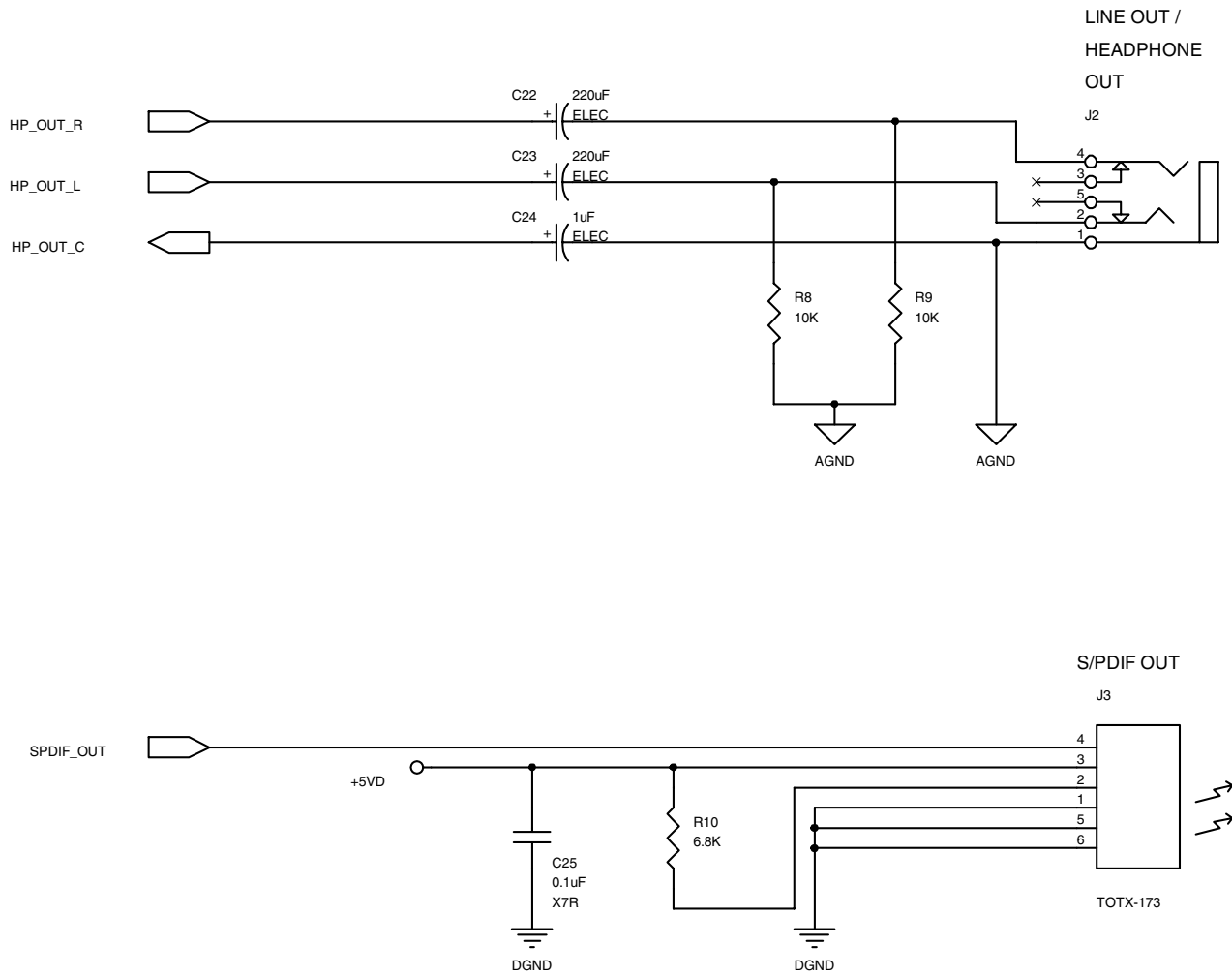


Figure 3. CS4201 / CS4202



**Figure 4. Analog and Digital Audio Outputs**

• **Notes** •

---



***CIRRUS LOGIC***<sup>®</sup>