Using DVSI’s AMBE-2000™ and AMBE-2020™ Vocoder Chips with the Texas Instruments’ TLV320AIC10 General Purpose CODEC

The Texas Instruments’ TLV320AIC10 codec presents a simple low cost solution for use with DVSI’s AMBE-2000™ or AMBE-2020™ vocoder chips. This application note provides information on interfacing these components. Figure 1 shows a sample block diagram interface, between the TLV320AIC10 codec and DVSI’s AMBE-2000™ vocoder chip.

Figure 1: AMBE-2000™ and TLV320AIC10 sample block diagram

Configuration:

To configure the AMBE-2000™ for operation with the TLV320AIC10, set the CODEC_SEL pins on the AMBE-2000™ vocoder chip to work with a generic 16 bit linear 8 kHz codec as follows:

CODEC_SEL [1-0] (pins 85,84) = 00b
Initialization Procedure:

The control registers in the TLV320AIC10 codec must be initialized for proper operation. The recommended procedure is to initialize the TLV320AIC10 by writing data to its 4 control registers through the DCSI port, while the AMBE-2000™ is held in reset. The timing for the DCSI port is shown in Figure 2.

Note that the Device Address (D14-D12) is normally set to 0 unless multiple codec devices are used in cascade. Be sure that the stop bit is at least 2 clock pulses long between data words as shown in the timing diagram. Shift the control words into the device 1 bit at a time at the rate of SCLK.

Various configuration data can be used to control the operation of the TLV320AIC10 codec (see the data sheet for more information), however for reference the AMBE-2000™ has been tested with the TLV320AIC10 configured using the register values shown in Table 1. Once the TLV320AIC10 is configured, the AMBE-2000™ should be taken out of reset to begin communication with the codec.

The logic connected to the DCSI port does not have to be disabled. The user can make adjustments to the configuration as needed (for example ADC and DAC gain). A reset to the TLV320AIC10 codec will reset all of the internal registers. As a result, the TLV320AIC10 must be reconfigured following a reset.

Figure 2: TLV320AIC10 configuration timing via DCSI port
<table>
<thead>
<tr>
<th>Register Address (D11-D9)</th>
<th>Configuration Data (D7-D0)</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x1</td>
<td>0x11</td>
<td>D4=1: select AUXP AND AUXM for ADC (Handset) D5=0: enable antialiasing filter D0=1: select 16 BIT data Format for DAC</td>
</tr>
<tr>
<td>0x2</td>
<td>0x08</td>
<td>D7=0: select normal Operation D4-D0=8: set Frequency Divider N=8</td>
</tr>
<tr>
<td>0x3</td>
<td>0x01</td>
<td>D7-D6=0: default operation D0=1: 16-Bit data format for ADC</td>
</tr>
<tr>
<td>0x4</td>
<td>0x00</td>
<td>D7-D4=0: ADC input gain = 0 dB D3-D0=0: DAC output gain = 0 dB Gain values can be adjusted as needed.</td>
</tr>
</tbody>
</table>

Table 1: Recommended TLV320AIC10 Configuration Data

Reference Materials:


