Interfacing DVSI's AMBE-2000™ and AMBE-2020™ Vocoder Chips with the Texas Instruments PCM3500 Codec

The Texas Instruments PCM3500 codec chip presents a simple low cost solution for use with DVSI's AMBE-2000™ or AMBE-2020™ vocoder chips. This application note provides information on alternative methods of interfacing these components.

**PCM3500**

The block diagram in Figure 1 shows a sample interface between the PCM3500 codec and DVSI's AMBE-2000™ vocoder chip. The AMBE-2000™ or AMBE-2020™ CODEC_SEL bits (see AMBE-2000™ or AMBE-2020™ users manual) must be set for use with a generic 16 bit linear codec (CODEC_SEL1,0 – 00).

There are two advantages to using the PCM3500 codec. The first is the single supply design. The PCM3500 supports a single power supply design from +2.7 v to +3.6 v. The second advantage lies in its simplicity. There are no complicated configuration schemes associated with the codec. For configuration information, please see the PCM3500 data sheet and the reference circuit in Figure 2.
Figure 2

Page 2 of 3

AMBE-2000™ and AMBE-2020™ Vocoder Chip Interface Applications Note

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Notes On Analog Circuit Design

The example circuit assumes that a telephone handset is going to be used in the circuit. Typically, handset microphones have a very small gain and the output is at moderately low levels (on the order of 50 millivolts peak to peak). The PCM3500 Voice Codec is designed for an analog input voltage of 2 volts peak to peak. The analog input in the reference design is amplified (Gain = 22) in order to bring the handset voltage to the level expected by the ADC.

The output section is designed using a low pass filter design with a gain of 1. The filter is designed to allow the maximum amount of the voice signal to pass unimpeded. The output of the PCM3500 should be filtered for maximum voice quality.

Capacitors C13 and C14 are for creating a very low noise DC bias signal. If a low noise DC bias is available elsewhere in the circuit, they are not needed.

For optimum performance, the analog circuit should be adjusted for whatever input (and output) device is used. Please reference the PCM3500 data sheet for the analog requirements.

Application Information

It is strongly recommended that the user review the Application Information provided in the Texas Instruments PCM3500 data sheet before finalizing any design.

Additional Reference Material

AMBE-2000™ or AMBE-2020™ vocoder chip Users Manual
http://www.dvsinc.com/literature.htm

Application Report – Understanding Data Converters:

PCM3500 Data Sheet

PCM3500 Evaluation Board