

AMBE-2000™ Vocoder Chip



Features

- AMBE+™ Vocoder - Toll quality @ 4.0 kbps
- User selectable bit rate (2.0 kbps to 9.6 kbps)
- Integrated convolutional and block code Forward Error Correction (FEC)
- Viterbi Decoder ($1/4 \leq \text{rate} < 1$) with up to 4 bits of soft decision decoding
- High performance Voice Activity Detection (VAD) with adaptive Comfort Noise Insertion (CNI)
- DTMF & North American call progress tone detection, transmission and regeneration
- Low delay (~52 ms)
- Echo Cancellation (16 ms)

Benefits

Low Cost

- Ideal for wireless products
- No licensing fees or royalties
- Low power consumption (65 mw @ 3.3v)
- Single IC Solution (100 pin TQFP)

Simple Integration

- Flexible A/D-D/A interface that works with most low cost codecs
- User selectable speech and FEC rates for flexibility in system design
- Serial channel interface with independent Encoder and Decoder rates
- Built on the success of DVSI's AMBE-1000™ Vocoder Chip
- Inter-operates with DVSI's 16 channel Computer Telephony MultiMux™ Vocoder Board

Digital Voice System's AMBE-2000™ Vocoder Chip is an extremely flexible, high performance voice compression solution that provides exceptional voice quality at rates as low as 2000 bps. The AMBE-2000™ Vocoder Chip is a low cost, DSP based voice codec for full or half-duplex, real and non-real time voice compression applications.

The AMBE-2000™ Vocoder Chip implements DVSI's patented AMBE® Voice Compression Algorithm. The field-proven success of this technology has resulted in it being recognized as the standard for voice quality in communications systems around the globe. Satellite systems such as Iridium, ICO, Inmarsat, Thuraya, ACeS, Optus and AMSC/TMI use this technology because of its superior voice quality at low bit rates.

DVSI has packaged this advanced vocoder technology onto a proprietary chip from the world's leading DSP manufacturer. This single chip solution achieves a level of performance and reliability typically associated only with customized ASICs but without the risks and high development costs.

DVSI developed the AMBE-2000™ Vocoder Chip to offer the latest AMBE® Voice Compression Technology with no licensing fees, royalties or engineering expense typically associated with custom DSP software implementation. With off-the-shelf availability this DSP provides low risk cost effective voice compression.

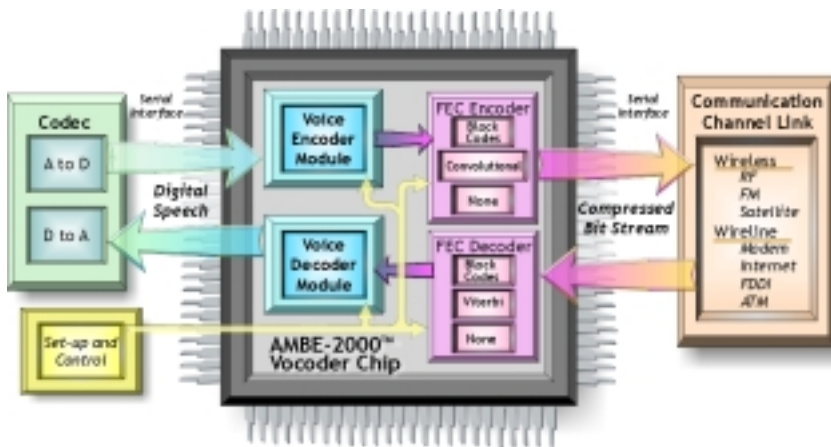
The AMBE-2000™ Vocoder Chip supports bit rates from 2000 to 9600 bps, formed from the combination of compressed speech data and Forward Error Correction (FEC) data. The AMBE-2000™ can change speech and/or FEC rates within one frame for on-the-fly flexibility.

With variable rate high performance FEC built-in, the AMBE-2000™ Vocoder Chip provides exceptional robustness to background noise and bit errors. Offering block and convolution codes with up to four bits of soft decision decoding, the AMBE-2000™ Vocoder Chip can achieve peak performance in degraded channel conditions that include significant bit errors. The Viterbi decoder offers rates as low as $R=1/4$ for intelligible speech at up to 20% BER. This level of performance can lead to the successful development and deployment of wireless communication systems in the most demanding environments.

The AMBE-2000™ Vocoder Chip also includes a number of advanced features such as automatic Voice/Silence detection (VAD), adaptive comfort noise generation, DTMF and North American call progress tone detection and signaling, 16 ms echo cancellation and low power consumption.

The AMBE-2000™ Vocoder Chip is easily configured to transmit and receive digitized speech to and from most linear, a-law, or u-law A/D-D/A codecs through its serial interface. The digitized speech from the external A/D is converted into compressed digital data (encoded) by the AMBE-2000™ Vocoder Chip and output to the channel interface.

The serial channel interface may use a processor, controller, modem or similar device to handle the transmission of the compressed voice data across a channel. Simultaneously, the AMBE-2000™ Vocoder Chip receives data from the other side of the channel. This data is (decoded) by the AMBE-2000™ Vocoder Chip, then reconstructed into a digital speech signal and sent to the D/A. The encoder and decoder functions are fully asynchronous for maximum flexibility.



The AMBE-2000™ Vocoder Chip employs DVSİ's latest AMBE+™ voice coder technology providing toll quality speech at rates as low as 4.0 kbps. Along with improved performance and enhancements such as convolutional FEC coding, exists an operational mode that provides a seamless migration path into systems already using DVSİ's AMBE-1000™ Vocoder Chip.

The AMBE-2000™ Vocoder Chip offers the affordability, mobility and power efficiency required by virtually all personal communication devices. The chip is designed to be fully interoperable with DVSİ's MultiMux™ Vocoder Board which provides sixteen full duplex channels of voice compression. The integration of these two devices creates a complete system for an endless array of computer telephony and wireless communication applications.

The value of DVSİ's AMBE® Voice Compression Technology goes beyond low bit rate and voice quality. It has been thoroughly evaluated and tested by international manufacturers under various conditions using a variety of languages. This assures the user is getting the best vocoder available and makes the DVSİ vocoder the logical choice without the need for additional comparison tests. Plus the fact, that DVSİ's Voice Compression technology has been implemented worldwide for more than ten years delivers the added security of a field proven technology that can play a key role in making any communication system an overall success.

AMBE® Voice Compression is a registered trademark of Digital Voice Systems, Inc.

Specifications

Electrical

Supply: 3.3 Volts

CMOS I/O Levels: 2.5 V ≤ High ≤ 3.6 V
-0.3 V ≤ Low ≤ 0.8 V

Power Consumption

Operating: 65 mW (typical)

Sleep: 33 mW (interface streams active)

3.3 mW (clocks inactive)

Physical

Package: 100 pin TQFP (industrial grade)

Temperature Range:

-40°C to 85°C (Operation)

-55°C to 150°C (Storage)

Humidity: <95% RH

Serial Interfaces

Codec (passive):

8 bit ulaw @ 8 kHz.

8 bit alaw @ 8 kHz.

16 bit linear* @ 8 kHz.

16 bit linear* @ 32 kHz.

(*recommended for optimum performance)

Channel (active or passive):

Packetized or

Unformatted (1, 2, 3, 4 bit per baud)

Specifications subject to change without notice.

Contact DVSİ

The dedicated staff at DVSİ bring years of experience in vocoder technology including Digital Signal Processing, computer software generation and hardware development. DVSİ's expertise and unique technology offers significant benefits.

For more information on how to get the best quality voice compression, contact DVSİ today.



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