AMBE-2000™ and AMBE-2020™ Vocoder Chips

Digital Voice System’s AMBE™ series of Vocoder Chips is comprised of the AMBE-2000™ (full-duplex) and AMBE-2020™ (half-duplex) vocoder chips. These DSP based voice codecs are high performance, extremely flexible voice compression solutions that provide exceptional voice quality at rates as low as 2000 bps.

Both chips implement DVSI’s patented AMBE® Voice Compression Algorithm. The field-proven success of this technology has resulted in it being recognized as the standard in communication 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 DSP 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 these vocoder chips as a way to provide the latest AMBE® Voice Compression Technology with no licensing fees, royalties or the engineering expense typically associated with custom DSP software implementation. With off-the-shelf availability these DSPs provide low-risk, cost-effective voice compression.

The AMBE-2000™ and the AMBE-2020™ Vocoder Chips support bit rates from 2000 to 9600 bps, formed from the combination of compressed speech data and Forward Error Correction (FEC) data. Both chips 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™ and AMBE-2020™ Vocoder Chips provide exceptional robustness to background noise and bit errors. Offering block and convolution codes with up to four bits of soft decision decoding, these chips 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 result in the successful development and deployment of wireless communication systems in the most demanding environments.

The AMBE-2000™ and AMBE-2020 Vocoder Chips also include a number of advanced features, including, 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.

Features

- Full or Half-Duplex Operation
- 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 < rate < 1) with up to 4 bits of soft decision decoding
- High performance Voice Activity Detection (VAD) and 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 consumer 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 MultiMux™ Vocoder Board
The AMBE-2000™ and AMBE-2020™ Vocoder Chips are 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 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. The channel data is decoded by the Vocoder Chip, then reconstructed into a digital speech signal and sent to the D/A. The AMBE-2000™ Vocoder Chip is full-duplex; encoding and decoding channel data simultaneously. The AMBE-2020™ is half-duplex and is only capable of encoding or decoding at one time.

Both Vocoder Chips employ DVSI’s 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, an operational mode that provides a seamless migration path into systems already using DVSI’s AMBE-1000™ Vocoder Chip exists.

The value of DVSI’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, making the DVSI vocoder the logical choice without the need for additional comparison tests. Additionally, DVSI’s Voice Compression technology has been implemented worldwide for more than 15 years. This field proven technology offers a security that can play a key role in making any communication system an overall success.

DVSI’s dedicated staff combine years of experience in vocoder technology, with expertise in Digital Signal Processing, computer software generation and hardware development. For more information regarding our high-performance, extremely flexible voice compression solutions, contact DVSI today.