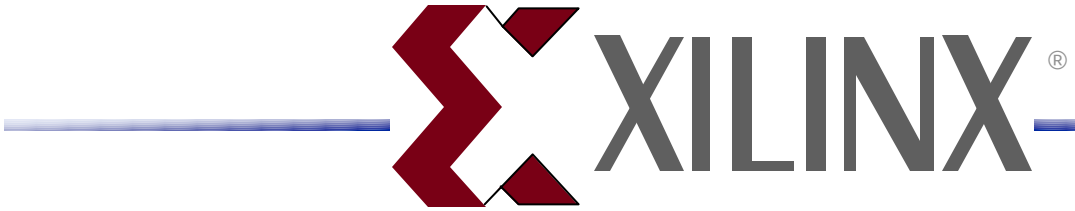


High Performance 32 Channel ADPCM Codec

LogiCORE Products

32 Channel ADPCM Codec Core

- Agenda
  - Introduction
  - ADPCM Overview
  - Typical applications
  - Detailed features
  - Example applications
  - Pricing

32 Channel ADPCM Codec ADPCM32 Core

- Communications speech compression coder/decoder LogiCORE Product
- Low cost, fixed function netlist core
  - Virtex-E
  - Virtex
  - SpartanII
  - Future families
- Downloadable over the Internet
- Licensed from Integrated Silicon Systems, Ltd. (ISS)

Powered by ISS

ADPCM Overview

- Adaptive Differential Pulse Code Modulation (ADPCM)
  - a very popular waveform coding technique.
- Telecommunication main application
  - speech compression for transmission, storage and reconstruction
  - reduce the bit data rate while maintaining good voice quality
  - technique can apply to all waveforms which need high-quality audio, image and modem data

ADPCM Overview

- ADPCM digital transcoding process
  - PCM input bit flow is 64 kbit/s (8 kHz sampling x 8-bit PCM word)
  - process in real-time to produce a 40, 32, 24 or 16 kbit/s (8 kHz * 5, 4, 3 or 2-bit ADPCM word)

International Telecommunications Union
(ITU) ADPCM Standards
G.726 - 40, 32, 24, 16 kbps
G.723 - 40, 32, 24 kbps
G.721 - 32 kbps

- ADPCM encoded voice traffic can be interchanged between packet voice, PSTN, and PBX networks

ADPCM32 Applications

- Applications
  - Wireless Local Loops (WLL) and Radio Local Loops
  - Digital cordless and PCS communication systems
    - DECT, WDCT, CT2 and PHS all specify that G.726 to be used for 32-Kbps voice channels
  - 2.4 GHz/WDCT cordless phones base stations
    (Worldwide Digital Cordless Telecommunications)
  - Satellite communications
  - Access concentrators
  - Internet phone systems
    - VoIP
    - Voice over ATM/Frame Relay

ADPCM32 Applications

- Applications cont.
  - Computer Telephony systems
    - PBXs
    - Voice mail systems
    - H100/H110 CT
  - Video conferencing systems
    - H.323
  - Digital audio storage
  - Commercial aircraft telephony

ADPCM32 Core Features

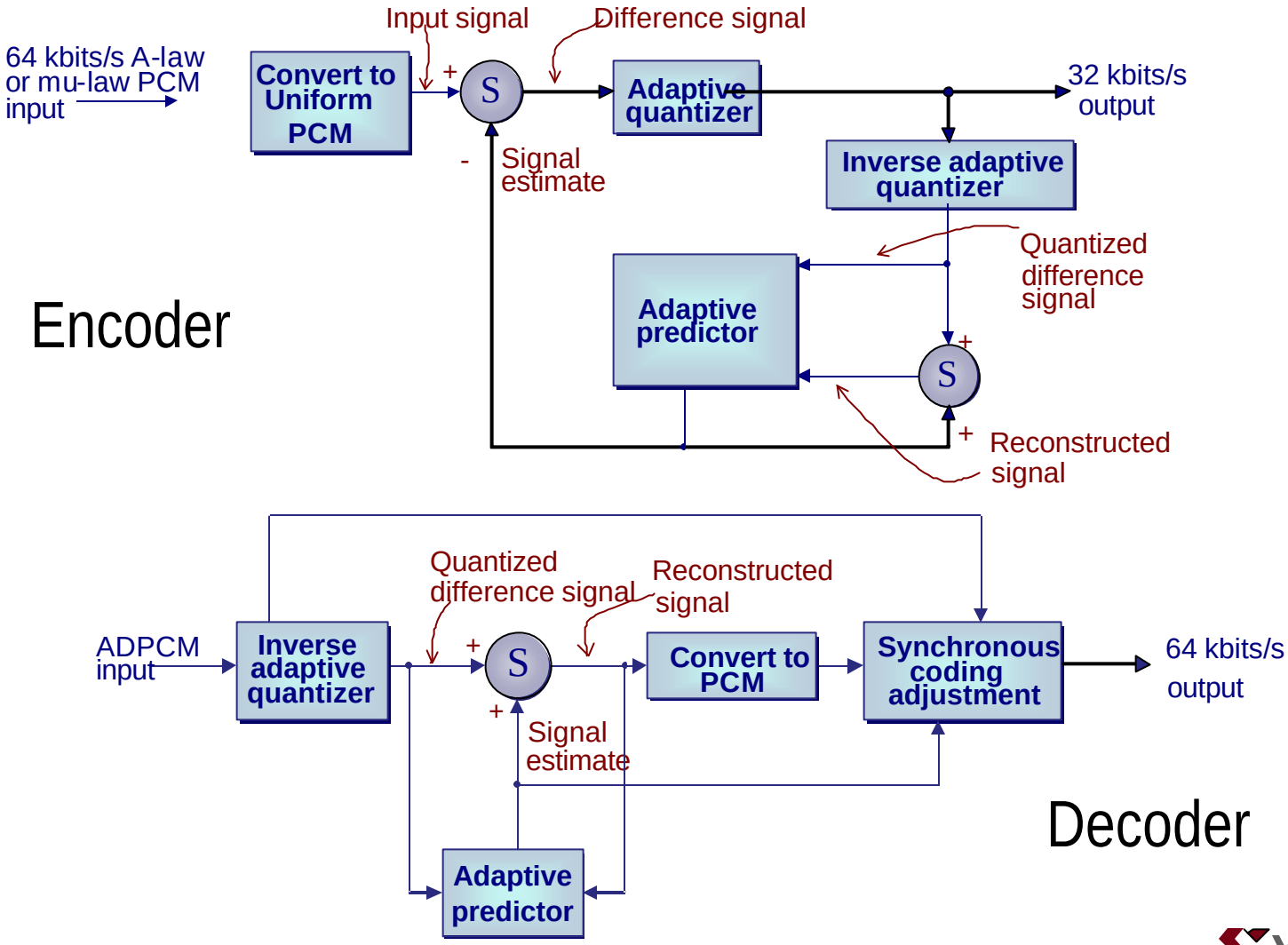
- Fully Compliant with ITU G.726, G.721and G.723
- 32 duplex channels or up to 64 independent single mode channels
- Accepts A-, μ -law and uniform PCM data and 2-5 bit ADPCM data
- On line configurable compression rate between 40,32,24 and 16 kbits/s
- On-line configurable for μ-law and A-law encoding or decoding on a channel to channel basis
- Burst and continuous mode operation
- Global and individual channel reset
- Coding of each data sample complete in 16 cycles
- Optimized for Virtex, Virtex-E and Spartan-II architectures

Example Implementations

Target Device	Virtex xcv200-6	Virtex E xcv200e-8	Spartan II xc2s150-6
Size	1822 Slices	1804 Slices	1728 Slices
Speed	16.6 MHz	21.3 MHz	17.8 MHz

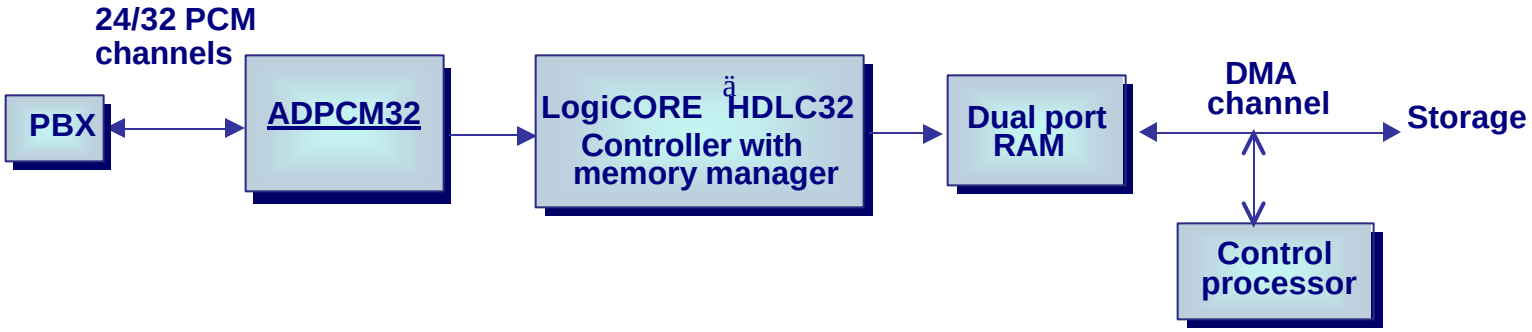
- Obtainable without stringent place and route constraints

ADPCM32 Block Diagram



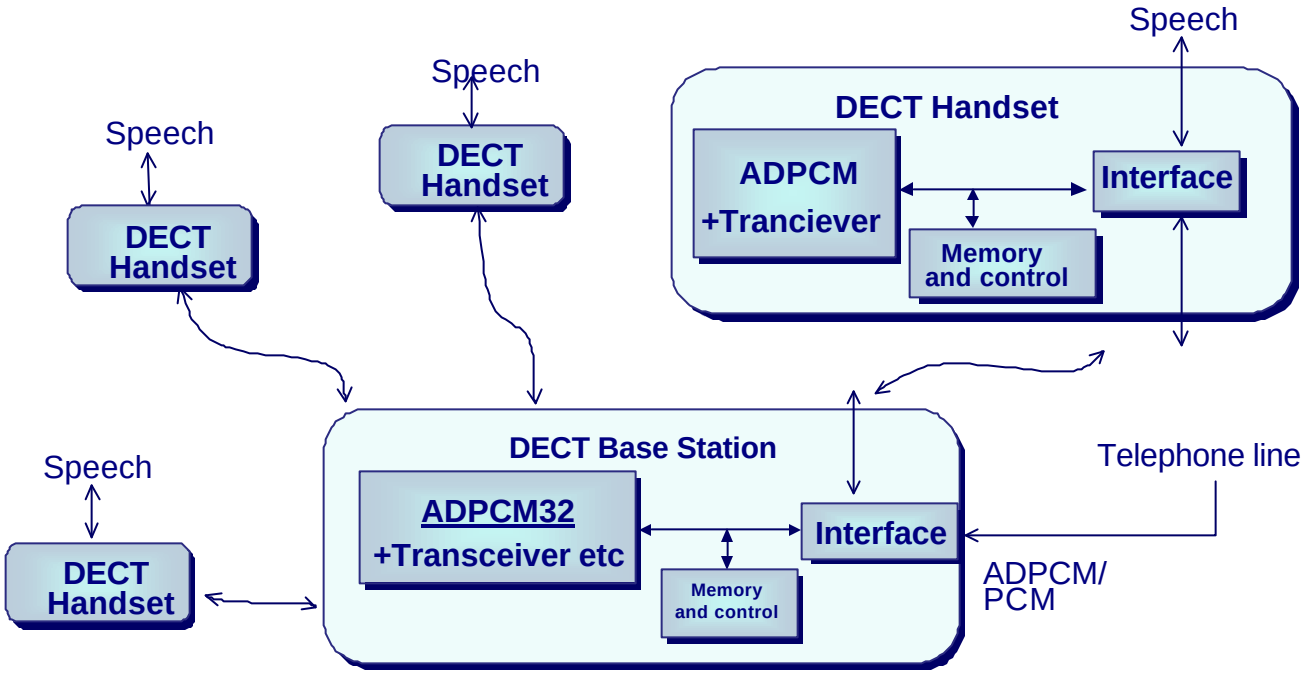
Example Application

- Digital voicemail phone system



Example Application

- DECT phone system



DECT used in a cordless Office

Pricing & Availability

- DO-DI-ADPCM32
  - Contact your local sales person
  - Single use license
- Product available for purchase as of June 26

Summary

- LogiCORE ADPCM32 provides a high performance solution with a simple interface
- Compliance with all relevant standards
- Downloadable over the Internet
- Easy integration into Xilinx tools flow
- Available through Xilinx Coregen