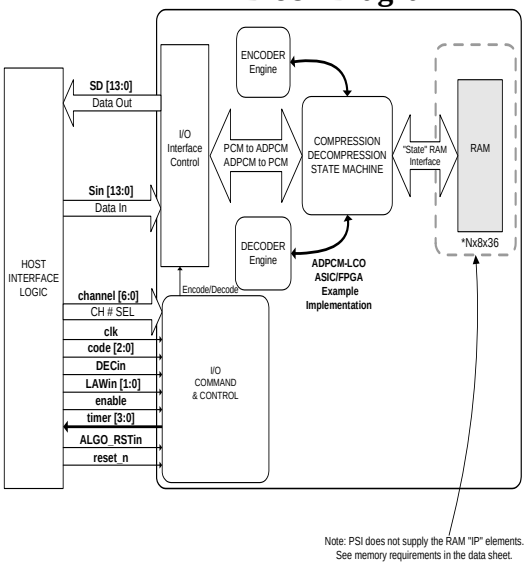
ADPCM Voice Compression logic Core

(LCO) Low Channel-Count Optimized

Description

The Pinpoint Solutions Inc, ADPCM-LCO is a hardware optimized CMOS soft logic core, designed to perform the task of small-scale voice compression as a co-processing system element. The design is a unique realization of the G.726 and G.727 algorithms that is optimized for a very small gate count in processing up to 64 full duplex digital voice channels. The product supports the ADPCM standard for digital voice compression as defined in the ITU-T G.726 and ITU-T G.727 specifications. The true benefit of using the core is to significantly reduce transport or storage bandwidth requirements. The core is designed to offload the internal voice processing tasks from RISC or DSP centric architectures. Flexibility is key to the usage of this core for final implementation as an ASIC, FPGA or element in a SOC design.

Block Diagram



Product features:

- Processes 1 to 64 full duplex, 128 half duplex voice channels. (Small gate count design)
- Simple synchronous bus interface.
- No register based configuration or core setup is required.
- Sequential channel processing, addressed channel operation.
- Channel by channel, frame by frame encode/decode, and code format.
- Implements ITU-T G.726 and G.727 specifications. (40, 32, 24, 16 fixed-rate codes)
- A-law, μ-law, Linear code format selection on a per channel basis.
- Two cycle encoding/decoding of voice samples

Key Benefits of Implementation:

- FPGA or ASIC Implementation.
- Lower power consumption.
- Scaleable channel count design.
- Reduced board space.
- Cost reduction (channel associated cost).
- DSP/CPU Task offloading.

Applications:

- (IAD) Integrated Access Devices.
  - Voice/Data multiplexers.
  - Channel Bank Voice Concentrators.
- Voice over IP/DSL (Packet/Cell/Frame)
- Voice Storage (selected record and playback).
- Wireless: DECT and Cellular.
- Voice Gateways.
  - Videoconferencing.
- (SOHO) Small Office Home Office.
  - DSL Modems.
  - Cable Modem.
- (CO) Central office equipment.
  - DSLAM.
  - Cable Modem Head End equipment.
  - Large scale Voice Concentrators.
- Computer Telephony Integration.
  - Voice mail.
  - WAN voice processing.
- PBX (Private Branch Exchange).

Specifications:

Host Interface: Synchronous parallel

Internal Ram requirements per channel:

Nx8x36 bits per half-duplex channel

Operating frequency:

16.384MHz processing 128 channels (64 full-duplex)

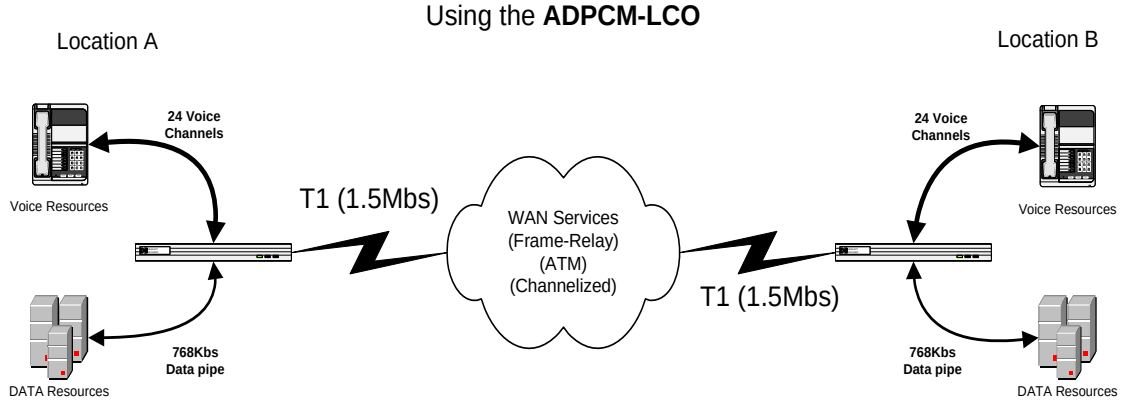
Standards compliance: ITU-T G.726, & G.727

Compression code rates: 40, 32, 24, 16Kbs

Deliverables

- Test bench for the logic core, and control scripts to run Verilog simulations to exercise the ITU standard vectors for the all G.726 & G.727 rates.
- Synthesis script/shell to assist in synthesis of the core.
- Test bench core coverage analysis document.
- Verilog RTL soft-logic core.

Integrated Access Device (Voice / Data Multiplexer)
Using the **ADPCM-LCO**



*Note: Application based on 32Kbps voice algorithm.

PSI Reference Documents

ADPCM-LCO Data sheet
Application notes
Reference design (demo board) users manual
White papers

Options core include:

- Scalable encoding/decoding channel counts.
- Auto-channel processing mode.
- Custom Interface options.
- FPGA specific targeting.
- Asynchronous bus interface.
- VHDL testbench.

Product Information

Upon request, PSI will provide complete quotation for this product including: pricing, deliverables list, and licensing agreements.

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