

## TRANSCODER – C6424

### GSM / ITU Wireless Voice

#### TARGET APPLICATIONS

*VoIP Transcoding*

#### OVERVIEW

*Adaptive Digital's GSM / ITU*

*Wireless Voice Transcoding*

*Chip provide a complete high-*

*density solution for*

*simultaneously converting*

*multiple voice channels*

*between the wireless and fixed*

*line networks.*

*The Transcoder chip combine*

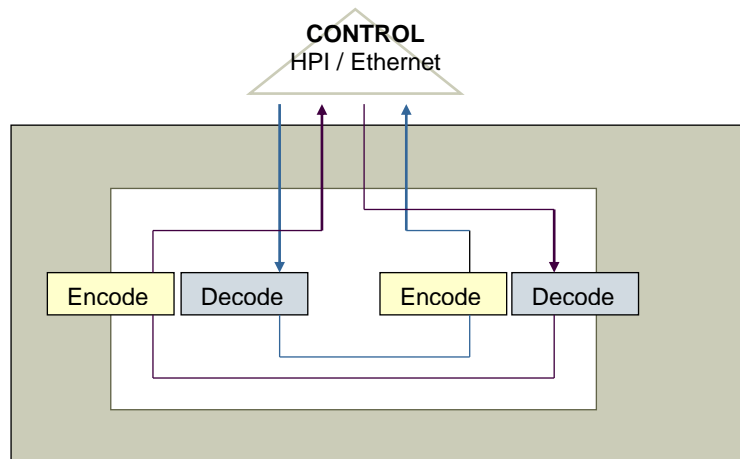
*Adaptive Digital's field-proven*

*DSP software with Texas*

*Instruments Incorporated (TI)*

*high performance fixed-point*

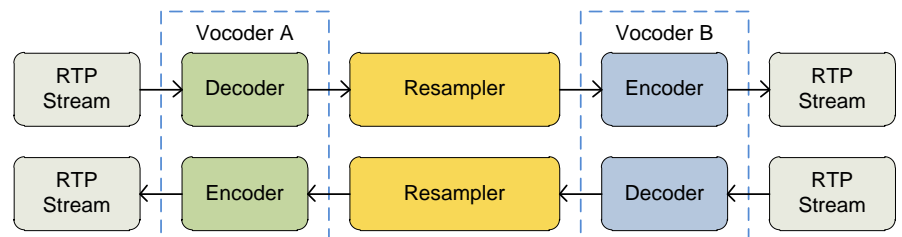
*TMS320C6424™ DSP.*



Chip Block diagram

#### SOFTWARE FEATURES

- G.711 with appendices 1(Packet Loss Concealment) and 2 (silence suppression, voice activity detection (VAD), discontinuous transmission (DTX), and comfort noise generation (CNG))
- G.729 AB
- DTMF Detect
- T-38 Fax Relay
- G.168 EC
- Tone Generate
- Supports TDM to Packet Channel
- Tone Relay
- Automatic Gain Control (AGC)
- Transcoding
- RTP payload formatting

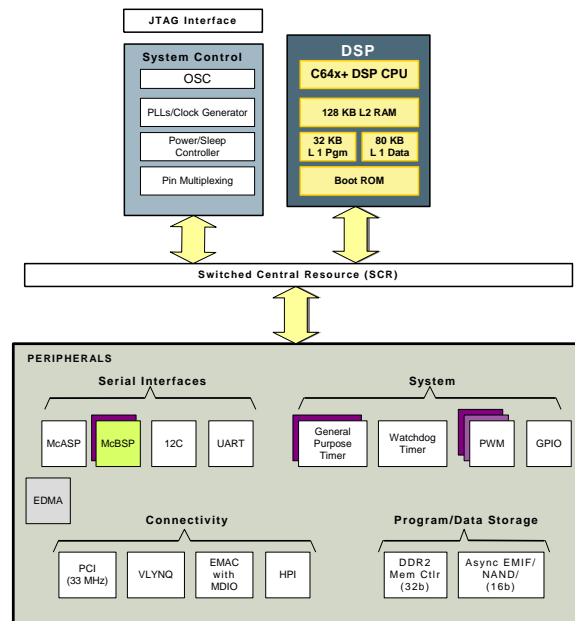


### Optional Software Features

- G.723.1A
- G.726
- G.728
- Conferencing
- GSM AMR
- MELP
- Channel types: TDM to TDM, Packet to Packet, TDM
- Conference, Packet Conference, Conference
- Composite

### HARDWARE FEATURES

- High-Performance
  - 400-/500-/600-/700-MHz, C64x+™Clock Rate
- Eight 32-Bit C64x+™ Instructions/Cycle
  - 2.5-, 2-, 1.67-, 1.43-ns Instruction Cycle Time
- 16-Bit Host-Port Interface (HPI)
- Enhanced Direct-Memory-Access (EDMA) Controller (64 Independent Channels)
- C64x+ L1/L2 Memory Architecture
- Two Multichannel Buffered Serial Ports
- 10/100 Mb/s Ethernet MAC (EMAC)
- Multichannel Audio Serial Port (McASP0)
- IEEE-1149.1 (JTAG™) Boundary-Scan-Compatible
- On-Chip ROM Bootloader
- Up to 111 General-Purpose I/O (GPIO) Pins
- Port count: 64
- 3.3-V and 1.8-V I/O, 1.2-V Internal
- 3.3-V and 1.8-V I/O, 1.05-V Internal
- 2 64-bit timers



Hardware Block diagram

The MDG-C6424 solution is based upon the TI TMS320C6424 DSP. The C6424 device is based on the third-generation high-performance, advanced VelociTI™ very-long-instruction-word (VLIW) architecture developed by Texas Instruments (TI), making these DSPs an excellent choice for digital signal processor applications.

### ADDITIONAL HARDWARE FEATURES

- 64-bit Watchdog Timer
- 2 UARTS
- 1 I2C Bus Controller
- 1 McASP
- 32-bit PCI Interface
- 3 PWM outputs
- VLYNQ Interface

## SPECIFICATIONS

Application	Product Number/Silicon	Channel Count	Description
GSM / ITU Wireless Voice Transcoder	TMS320C6424V	16	C64x+ core 400-, 500-, 600-MHz C64x+™ Clock Rate 1, 16-Bit Host-Port Interface (HPI) 10/100 Mb/s EMAC2 McBSPs

## DETAILED DESCRIPTION

The chip is a complete solution designed to enable designers to increase the value of their end product thus providing a superior voice experience to the customer.

Codec transcoding provides a means to convert traffic so that two VoIP networks using different codecs can exchange traffic without making codec format changes on their individual network devices. Transcoding efficiently and effectively interconnects traffic thereby allowing each provider's network to use its codec of choice.

Supporting multiple codecs is one of the most challenging aspects effecting VoIP services across telephone, cable, cellular, Wi-Fi, and Internet networks. As VoIP networks, usage, and applications expand, the need to translate traffic from one codec type to another becomes more and more important to ensure global connectivity. Transcoding is the ability to adapt digital files so that content can be viewed on different playback devices. Working like an interpreter, a transcoder translates files to a suitable format for the end user.

### Channel Types

There are several types of channels: TDM to Packet, Packet to Packet, TDM to Conference, Packet to Conference, and Conference Composite.

A TDM channel is typically associated with one of the following types of telephone interfaces:

- FX0
- FXS
- T1/E1 time slot (DS0)

Each channel in a DSP is dynamically setup as any type. Frame sizes, vocoder types, and tone detection types are selected when a channel is setup.

All channels (except for the conference composite channel type) are designed to operate as full duplex channels. A full duplex channel may be configured to operate as a half duplex by setting the end points of one-half of the full duplex channel to NULL end-points.

### HOST API

The Transcoder-C6424 APIs are the interface between a user's application program and Transcoder-C6424 DSP cores. The APIs execute in a host control processor connected to the DSP via either Ethernet or the DSP's Host Port Interface

(HPI). The APIs support multiple DSP cores/chips and use a DSP Identifier to select a particular core. The association between a DSP Identifier and a particular DSP core/chip is made by the user modified Transcoder-C6424 support functions.

The APIs are provided as ANSI “C” source code. The APIs will work with any host application regardless of the operating system being used.

#### REFERENCES

1. Adaptive Digital Technologies [PRODUCT] Users Guide
2. Texas Instruments [TMS320C6424] Fixed-Point Digital Signal Processor (literature number [SPRS347C])

#### Deliverables

The deliverable items are platform dependent. In general, there is a single DSP-downloadable binary image along with host API software in C source code format. Also included in the deliverables is product documentation, which includes a users guide and usually includes release notes. Sample/test code may be included as well.

*Adaptive Digital is a member of the Texas Instruments Developer Network, and ARM Connected Community.*

#### CONTACT INFORMATION

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