# Flash TAD Chip for an all Digital Telephone Answering Device with Caller ID Detection

## General Description

The D6301A/B chips are digital speech/signal processing subsystems that implements all functions of TRUESPEECH® speech compression and voice prompts, telephone line signal processing, flash memory management, and True FULL Duplex SpeakerPhone™ for an all digital answering machine. The D6301A/B are fully controlled by the system Host through a simple interface protocol. The Host processor provides activation and control of all system functions such as speech recording and playback, DTMF and call progress tone detection, DTMF and tone generation, and voice prompting.

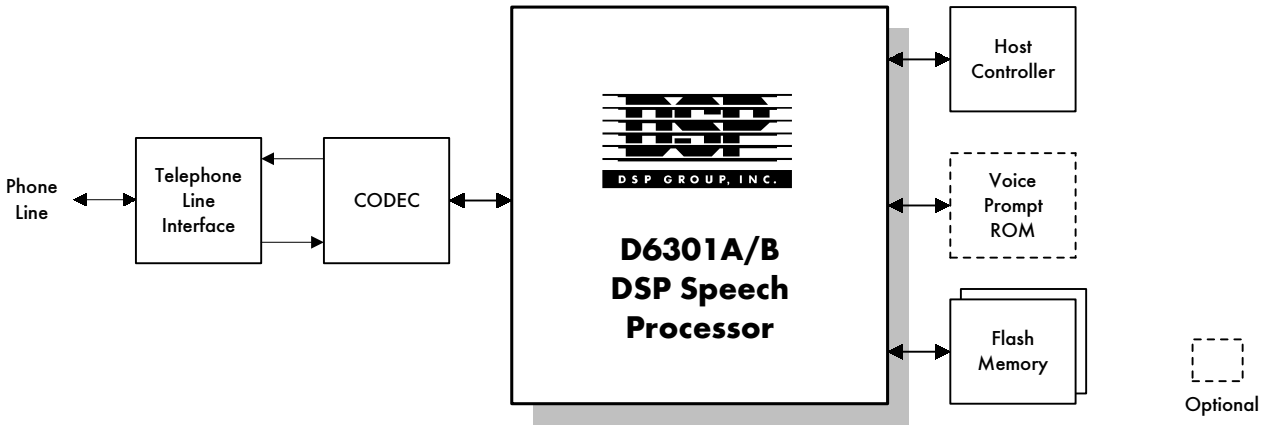


*Figure 1. D6301A/B System Block Diagram*

## Key Features

- High-quality, variable low rate TRUESPEECH digital speech compression allowing 15-17 minutes of recording time per each 4 Mbit Flash Memory
- Flexible storage of incoming messages (ICM) and outgoing messages (OGM), supporting multiple OGMs and multiple mailboxes.
- TRUESPEECH natural-sound voice prompting for Day/Time stamp and voice instructions
- DTMF generation and detection with near-end echo cancellation for superior performance
- Supports "offset playback" for jumps within a message
- Extended DTMF detection (A, B, C, D)
- Easy Host software conversion from the D6305B
- Caller ID and Call Waiting CID detection (both Bell 202 and V.23 ) (D6301B only)
- Supports 4 Mb or 16 Mb Flash memory devices: Samsung KM29N040*, KM29N1600T** and KM29N16TS
- Programmable sensitivity of the DTMF, VOX, CPT, and CAS detectors
- Digital volume control
- Selectable sampling rate
- Selectable Slave or Master Codec mode
- µ-law and A-law codec support
- Supports time stamp (message tag) modification

* May have up to 3 bad sectors
** May have up to 10 bad sectors

## Device Configuration and System Components

### STANDARD COMPONENTS

- D6301A/B-11 Digital Telephone Answering Device (TAD) processor (80-pin PQFP) — 1

### ADDITIONAL SYSTEM COMPONENTS

These are supplied by the customer according to DSP Group's specifications

- Codec — 1

One of the following:

- Samsung KM29N040 (44-pin TSOP II) 4 Mb per device*, up to four devices per system, or
- Samsung KM29N1600T (44-pin TSOP II) 16 Mb, single device, or
- Samsung KM29N16TS (44-pin TSOP II) 16 Mb, single device

* Optionally, the system will support a 32K or 64K x 8 EPROM/ROM (access time 300 ms or less) for voice prompt storage. This option is only available in systems with a single 4 Mbit flash memory device or no flash.

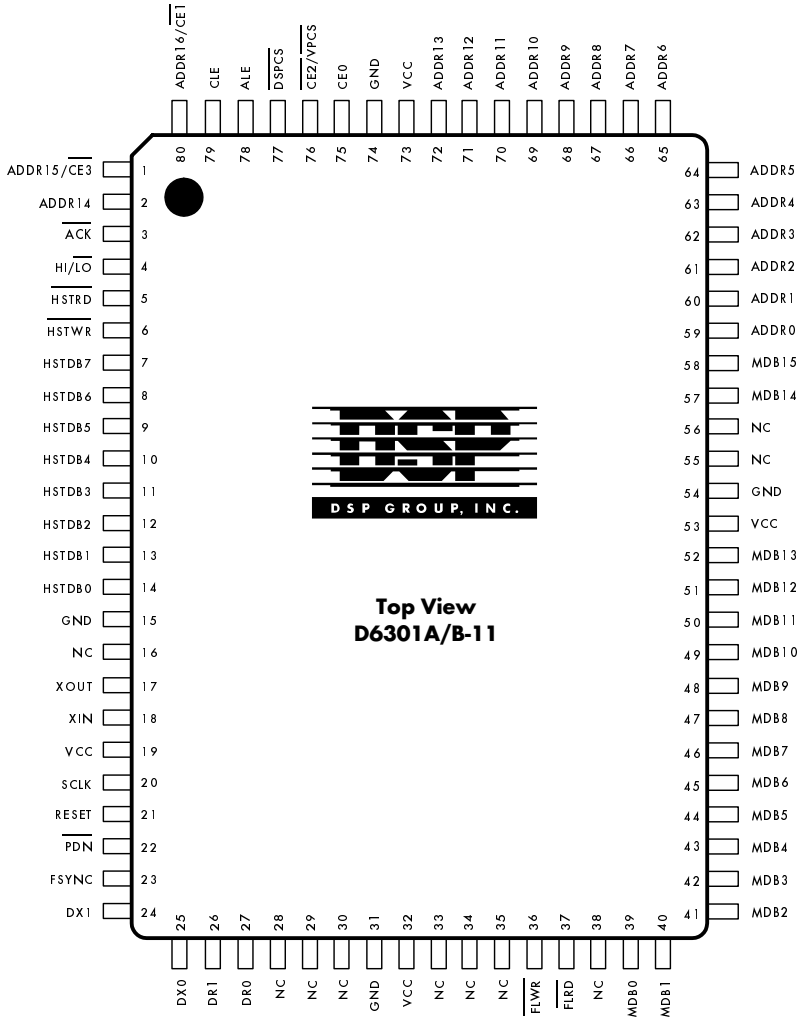


*Figure 2. D6301A/B-11 Pin Diagram*

## System Functions

All of the speech and signal processing tasks are done by the D6301A/B. This allows the use of a very low cost microcontroller to be used for basic control of the system. The Host needs to send high level commands to perform functions such as Record Message, Playback, or Delete Message. The operation is performed by the D6301A/B which reports the status of the operation to the Host. All memory interface and management is performed of by the D6301A/B, requiring the Host to only handle control functions. A summary of the functions performed by the D6301A/B and Host Controller are shown in Figure 3, below.

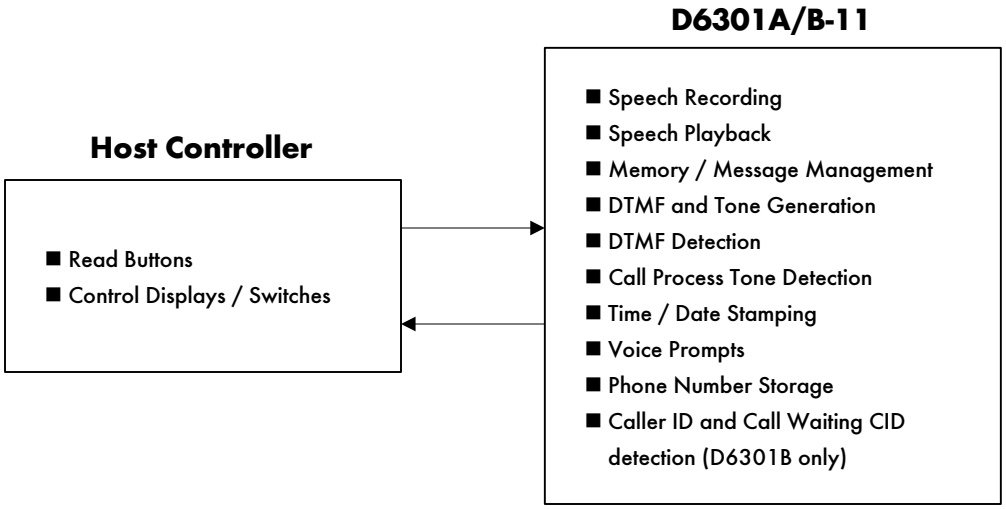


*Figure 3. System Functions*

## Simple Hardware Interface

The hardware interface between the D6301A/B and the Host Controller is simple, requiring only an 8-bit parallel port and 4 handshake lines. The Host writes high level commands to the D6301A/B, and the D6301A/B responds with status information. Once a command is issued, the D6301A/B uses the ACK pin to indicate that the status is available to be read. The hardware interface between the D6301A/B and Host is shown in Figure 4 below.

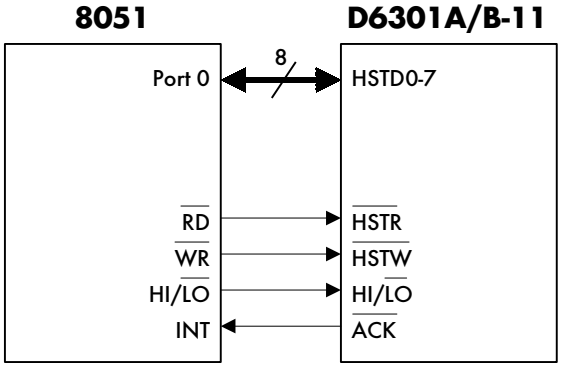


*Figure 4. D6301A/B - Host Interface*

## Benefits of the D6301A

- High-quality, variable low rate TRUESPEECH digital speech compression allows 15-17 minutes of recording time in only 4 Mbits of memory.
- Flash Memory support.
  - — Allows use of readily available memory.
  - — Reduces the system cost by eliminating the need for battery back-up in power failure situations.
  - — Allows storage of voice prompts in Flash memory eliminating the need for external ROM.
- Allows flexibility in design for features such as multiple mailboxes and multiple OGM's, enabling the design of a product that is truly a Personal Voice Mail System.
- TRUESPEECH natural sounding voice prompts and time/date stamping allow design of a high quality and professional sounding product.
- The Host-selectable sensitivity of the VOX, DTMF, CPT, and CAS detectors, as well as different codec interface configurations make for flexibility in design for various countries and different applications.
- The Caller ID and Call Waiting CID feature eliminates the need for any extra components to include these increasingly important feature in your design.


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PO-12/96

Printed in USA