CompactSPEECH™

ISD-T267SC CompactSPEECH™ Digital Speech Processor with Caller ID Support and Multiple Supplier Flash Support

GENERAL DESCRIPTION

The ISD-T267SC is a member of Information Storage Device's CompactSPEECH Digital Speech Processor family. This processor provides Digital Telephone Answering Device (DTAD) functionality to embedded systems.

The CompactSPEECH processor interfaces with Toshiba's TC58A040F, Samsung's KM29N040T, and BMI's BM29FS040 Flash memory devices to provide a cost-effective solution for DTAD and integrated DTAD applications.

The CompactSPEECH processor integrates the functions of a traditional Digital Signal Processing (DSP) chip and the CR16A, a 16-bit general-purpose RISC core implementation of the CompactRISC™ architecture. It contains system support functions such as Interrupt Control Unit, Codec interface, MICROWIRE interfaces to a microcontroller and Flash memory, WATCHDOG timer, and a Clock Generator.

The CompactSPEECH processor operates as a slave peripheral that is controlled by an external microcontroller via a serial MICROWIRE interface. In a typical DTAD environment, the microcontroller controls the analog circuits, buttons and display, and activates the CompactSPEECH processor by sending it commands. The CompactSPEECH processor executes the commands and returns status information to the microcontroller.

The CompactSPEECH firmware implements voice compression and decompression, tone detection and generation, message storage management, speech synthesis for time-and-day stamp, and supports user-defined voice prompts in various languages.

The CompactSPEECH Caller ID feature complies with the Bellcore standard, used in the US, French, Spanish, Japanese and Dutch standards. It implements the receiver side for data transmitted from the central office to the subscriber.

The CompactSPEECH Processor applies echo-cancellation techniques to support high-quality DTMF tone detection during message playback.

The CompactSPEECH processor can synthesize messages in various languages via the International Vocabulary Support (IVS) mechanism. The ISD-T267SC can store vocabularies on either Flash memory or Expansion ROM memories. DTAD manufacturers can thus create machines that "speak" in different languages, simply by using other vocabularies. For more details about IVS, refer to the *IVS User's Manual*.

FEATURES

- Selectable speech compression rate of 5.2 Kbit/s and 7.3 Kbit/s, plus silence compression with each rate

- Up to 16 minutes recording on a 4-Mbit Flash memory devices (more than 1 hour total recording time on four devices)

- Automatic storage of Caller ID data of InComing Messages (ICM)

- Call screening (input signal echoed to codec output)

- Supports Samsung, Toshiba, and BMI Flash memory devices

- Supports the US (Bellcore), French, Spanish, Japanese and Dutch Caller ID standards.

- Supports long-frame and short-frame codecs

- Interface to μ-Law codec

- Multi-lingual speech synthesis using International Vocabulary Support (IVS)

- Vocabularies available in: English, Japanese, Mandarin, German, French and Spanish

- Supports external vocabularies, using Flash memory devices or expansion ROM

- DTMF generation and detection

- Telephone line functions, including busy and dial tone detection

- Single tone generation

- DTMF detection during OutGoing Message playback

- MICROWIRE slave interface to an external microcontroller

- Supports up to four 4-Mbit Flash memory devices

- MICROWIRE master interface to Flash memory devices

- The number of messages that can be stored is limited only by memory size

- Direct access to message memory

- Programmable message tag for message categorization, e.g., Mailboxes, InComing Messages (ICM), OutGoing Messages (OGM)

- Digital volume control

- Variable speed playback

- Real-time clock: Day of Week, Hours, Minutes

- Designed around the CR16A, a 16-bit general-purpose RISC core implementation of the CompactRISC architecture

- 16-bit architecture and implementation, 20.48 MHz operation

- On-chip DSP Module (DSPM) for high-speed DSP operations

- On-chip codec clock generation and interface

- Power-down mode

- Stores caller numbers

- Storage and management of messages

- Skip forward or backward during message playback

- Supports prerecorded vocabularies on Flash memory

- Available in PLCC 68-pin, and PQFP 100-pin packages

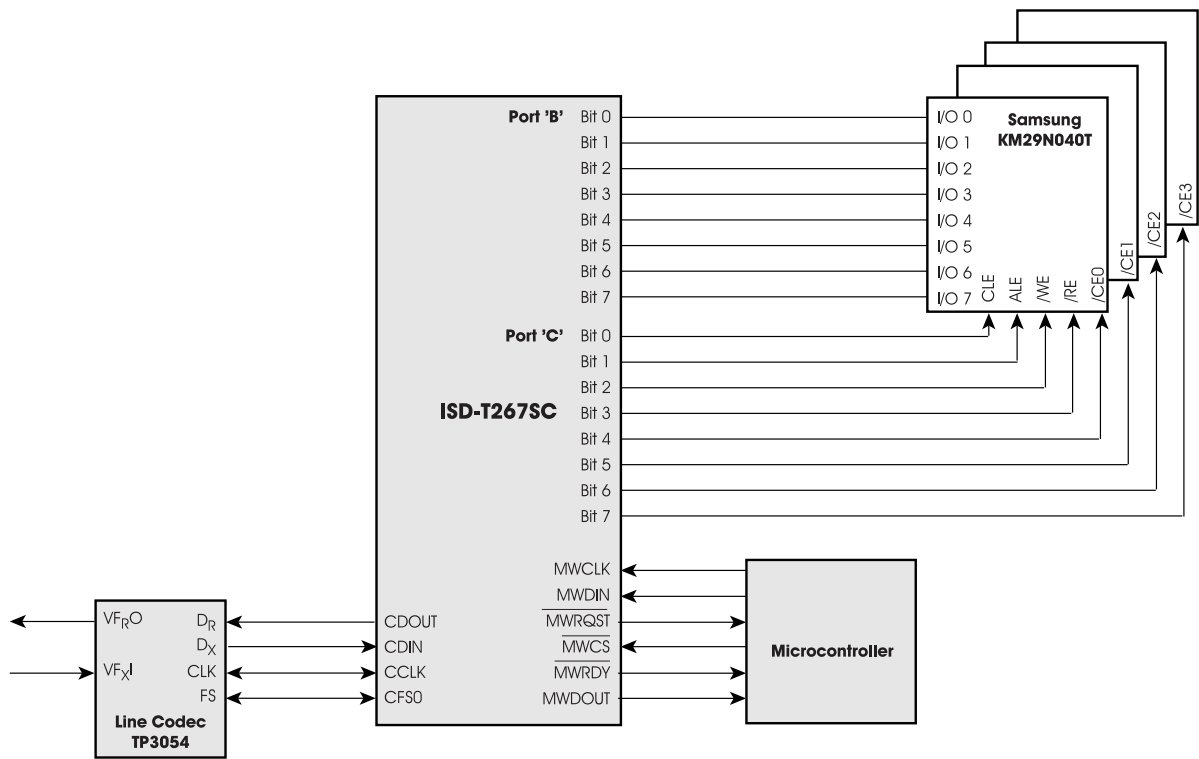**Figure i: Block Diagram—ISD-T267SC Basic Configuration with Samsung Flash**

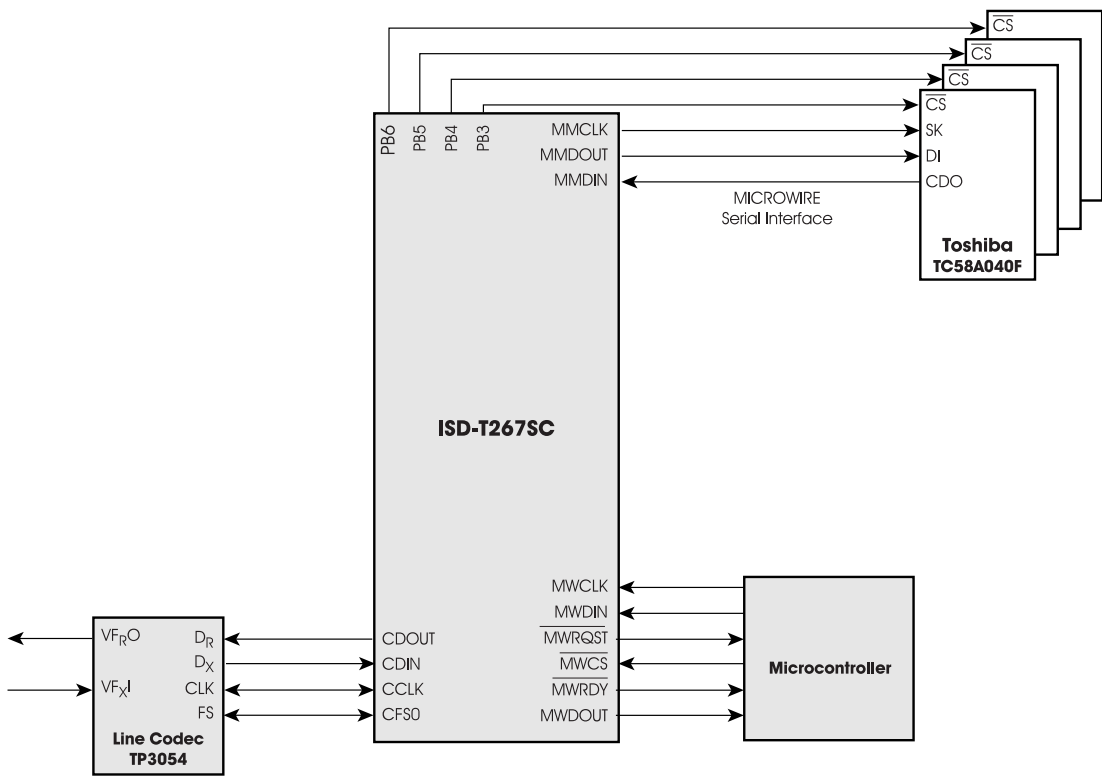**Figure ii: Block Diagram—ISD-T267SC Basic Configuration with the Toshiba Flash**

Figure iii: Block Diagram—ISD-T267SC Basic Configuration with BMI Flash