Winbond WTS701
Single-Chip, Text-To-Speech Processor

Winbond’s WTS701 single-chip, Text-To-Speech (TTS) processor converts ASCII text to a natural sounding voice. It is designed to read email, SMS messages, instant messages, Web pages, news, weather, sports and stock quotes, e-commerce and directions or other driver information sent with the aid of a GPS location device or other network.

A unique feature of the chip is that it does not use speech synthesis, but instead uses real human voices. This eliminates the synthetic sound quality found in other TTS processors. This level of performance is unprecedented in a low-resource, single-chip embedded environment.

The WTS701 is platform independent and will connect to any baseband DSP or host controller using a simple serial interface, providing a short time to market. It may also be used in learning aids, products for the visually impaired, e-books, toys and other entertainment devices and to replace long duration announcement systems.

The WTS701 is especially useful for mobile devices, handsets, handsets and wireless accessories. The technology enables a next-generation interface for users. The WTS701 can be used to read e-mail, messages, and relay web-based content to the user, eliminating problems caused by small displays. It provides a safe and convenient communication for mobile users. As the WTS701 is a feature chip independent of the appliance’s native processor, it can perform either on or off-the-air text reading. The small size and low power consumption enables the WTS701 to be easily integrated into a mobile device accessory, with minimal effect on power consumption and development time.

Applications for WTS701
• Automotive applications
  – Telematics and driver information systems
  – Network-enabled car stereo
  – GPS systems
• Accessories for cellular phones, PDAs, smart pagers
• Products for the visually impaired and other disabilities
• Learning aids
• Messaging functionality
  – Transportation systems
  – Industrial systems
  – Caller ID and telephony devices
  – Help/instruction manual reader

Benefits
• Single-chip solution
  – Eliminates the need to integrate additional memories or other components
  – Optimal for portable products
  – Small footprint
  – Low power consumption
• Simple integration
  – No Text-To-Speech software porting or development required
  – The Text-To-Speech algorithm is implemented internally in the WTS701 device requiring simple SPI control interface only
  – Offers an extremely short development cycle and fast time to market
• Voice quality
  – Provides recognizable sounding voice
• Digital PCM audio output
  – Fits into wireless base band application easily by sharing the CODEC bus
• Perfect solution for long duration messaging applications, replacing expensive DSP, memory, audio CODEC and analog components
• Excellent solution for dynamic text sent over a network, adding the capability of converting the data to speech

![Diagram of WTS701 Interface](image)
**WTS701 Features**

**Device Characteristics:**
- +2.7V to 3.3V power supply
- Low power consumption:
  - 35mA active and 1µA standby
- 3V/5V logic tolerance
- 56 Pin TSOP package
- Industrial temperature range:
  - -40°C to +85°C

**Device Management:**
- Accepts ASCII or Unicode streaming text
- 256 character sentence buffer
- Playback of Phonetic Alphabet
- Variable speed playback
- Supports power down
- Supports Pause and Continue text conversion commands
- Supports Stop and Finish text conversion commands
- Language programmable

**Peripheral Control:**
- 16-bit linear PCM slave interface output support
- SPI serial port for control commands and status report to system host controller
- Hardware handshake control signals
- Analog audio output with 8Ω speaker driver and digital volume control
- Analog audio input for playing external audio to the speaker

**Text-To-Speech Algorithm:**
- High quality speech synthesis using speech element concatenation
- Winbond’s standard 100-year speech retention
- Real time conversion for streaming text
- General text preprocessing and normalization
- User customization for special characters such as SMS icons or chat emoticons
- User customization for application-specific abbreviations

**Language Support:**
- Supports English (U.S.)
- Supports Mandarin (Beijing dialect)
- Other languages in development or in planning stages

---

**Evaluation System**

- Simple board enabling all chip features operation with an easy connection to PC parallel port
- Other reference designs available

**Selection Guide**

<table>
<thead>
<tr>
<th>Language</th>
<th>Voice</th>
<th>Package Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>E – English</td>
<td>F – Female</td>
<td>T – TSOP 56-leads</td>
</tr>
<tr>
<td>M – Mandarin</td>
<td>M – Male</td>
<td></td>
</tr>
</tbody>
</table>

---

**To order products or for more information:**

Winbond Electronics Corporation America
2727 N. First Street
San Jose, CA  95134
Tel: 1-800-677-0769 (U.S. Only), 408-943-6666
Fax: 408-544-1789
e-mail: info@winbond-usa.com
Web: www.winbond-usa.com

Winbond is a registered trademark of Winbond Electronics Corporation.
All other trademarks and logos are the properties of their respective owners. Winbond TTSPB1-1001