Epson® Speech/Audio Companion Chip

Multilingual Text-to-Speech Synthesis
MP3 and AAC Audio Decode
ADPCM Voice Record and Playback
Single Chip Solution with integrated DAC and ADC
Introduction

The S1V30100 Speech / Audio Companion Chip provides a cost effective integrated solution for adding speech and audio processing applications to a range of portable devices. Applications provided include multi-lingual TTS (Text-to-Speech), Voice Record and Playback, and MP3 and AAC Audio Decode. The S1V30100’s highly integrated design includes DAC and ADC for reduced overall system cost and time-to-market. All applications are controlled over a single serial interface (UART or SPI) allowing control from a wide range of hosts and rapid integration into existing products.

Applications

- Speech enabled portable devices
- Assistive applications for visually / speech impaired
- Educational toys
- Automotive navigation systems

Features

- Multi-lingual unconstrained TTS system
  - Five languages in single chip package
  - Languages can be changed and upgraded in-system
  - Change pitch and speaking rate within sentence
  - Nine pre-defined voices, support for downloadable speaker definitions
- Voice Record and Playback
  - Recording and Playback of speech samples
- Audio decode
  - MP3 and AAC audio decoding
- Integrated mono-ADC and stereo-DAC
  - Direct access to ADC and DAC via I2S interfaces.
- User storage area
  - TTS user dictionary files
  - Compressed speech files
  - Frequently used TTS text data files
  - In-system upgrade capability from host
- Application storage area
  - Stores TTS language-specific definitions
  - Stores additional EPSON supplied applications
  - In-system upgrade capability from host
- Full customer support
  - Application and TTS language updates
  - Easy to use PC-hosted Evaluation / Development Kit

Technical Data

- Supply voltages: 1.8 V (core) and 3.3 V (IO)
- High-quality 16-bit voiceband Mono ADC
  - Sampling Rate (fs): 8 kHz
  - Resolution: 16 bits
  - Operating Voltage: 1.8 V
  - Programmable Gain Amplifier (PGA): -18 dB to +12 dB in 1 dB steps
  - Microphone pre-amplifier: +12 dB to +30 dB in 6 dB steps
- High-quality 16-bit stereo audio DAC
  - Sampling Rate (fs): 8, 11.025, 12, 16, 22.05, 24, 32, 44.1, 48 kHz
  - Resolution: 16 bits
  - Operating Voltage: 1.8 V
  - Programmable Gain Amplifier (PGA): -18 dB to +12 dB, in 1 dB steps
  - Headphone and Auxiliary outputs
- Intelligent power management features
- GPIO controllable by host
- Host interfaces – UART and SPI (Slave)
- TTS
  - Fonix DECtalk® Version 5
    - Real time synthesis
    - Industry leading intelligibility
    - Multiple voices, all selectable by the user
    - Change of voice and speaking rate
    - Language coverage: US English, French, German, Castillian Spanish, Latin American Spanish
- Voice Record and Playback
  - ITU G.726 compliant ADPCM codec
  - Supported bit rates: 40 kbps, 32 kbps, 24 kbps
- Audio decoding algorithm support
  - MP3 Audio Decoding: MPEG1/2 layer III
  - AAC Audio Decoding: AAC-LC (2-channel)

Product Codes

- S1V30100A00200

Package

160-pin PFBGA10UX160 (10 x 10 mm)
S1V30200 Audio Decoder

MP3, AAC & aacPlus Audio Decode
SPI Streaming Interface
I²S Digital Audio Output
Space Saving PFBGA Package
**Introduction**

The EPSON S1V30200 Audio Decoder Chip is a single-chip solution for stereo decode of MP3, AAC and aacPlus content. The decoder applications are controlled over a single serial interface (SPI) allowing control from a wide range of hosts and rapid integration into existing products. Output Audio Data is generated using the industry standard I2S interface.

**Applications**

- Mobile Handsets (ringtones and music playback)
- Portable Music Players
- Automotive Audio Systems

**Features**

- Wide Range of Integrated Audio Decoders:
  - MP3 stereo decode
  - AAC-LC stereo decode
  - aacPlus (High Efficiency AAC-LC) stereo decode
- Integrated Post Processing Algorithms:
  - Speaker Equalisation
  - Digital Volume Control
  - Stereo-Mix-To-Mono Features
- Interfaces:
  - SPI Slave Interface for Control by Host Processor
  - PS Interfaces for Audio Data Input / Output
- Full Customer Support
  - Easy to use PC-hosted Evaluation / Development Kit

**Technical Data**

- Supply Voltage of 1.8 V (core) and 2.9 V (IO)
- 100-pin PFBGA package (7 mm x 7 mm)
- MP3 Technical Features:
  - MPEG1/2 Layer III (2-channel)
  - Sampling rates:
    - 48 kHz, 44.1 kHz, 32 kHz, 24 kHz, 22.05 kHz, 16 kHz
    - Supports all MPEG1/2 bit-rates (range: 8 kbps to 320 kbps), including VBR
- AAC-LC Technical Features:
  - AACLC 2-channel (Low Complexity Profile)
  - Sampling rates:
    - 48 kHz, 44.1 kHz, 32 kHz, 24 kHz, 22.05 kHz, 16 kHz, 12 kHz, 11.025 kHz, 8 kHz
    - Supports all MPEG AAC-LC bit-rates (range: 8 kbps to 288 kbps per audio channel)
- aacPlus Technical Features:
  - aacPlus (2-channel High Efficiency AAC-LC)
  - Sampling rates:
    - 48 kHz, 44.1 kHz, 32 kHz, 24 kHz, 22.05 kHz, 16 kHz, 12 kHz, 11.025 kHz, 8 kHz
    - Supports all MPEG High Efficiency AAC-LC bit-rates (range: 8 kbps to 64 kbps per audio channel)

**Product Codes**

- S1V30200

**Package**

- 100-pin PFBGA7UX100 Package (7 mm x 7 mm)