KX1400
Audio Playback IC

FEATURES

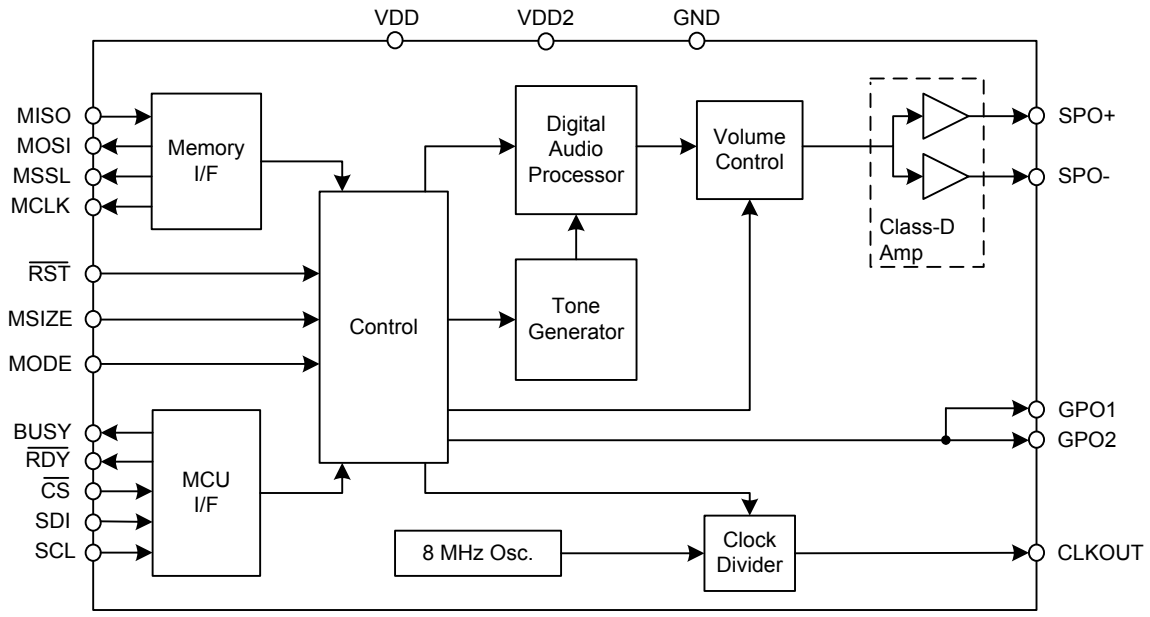
- Plays Pre-recorded 8 KHz Audio Data
- Operates Stand-alone or as MCU Peripheral
- On-chip Tone Generator
- Built-in Digital Audio Processor
- Integrated Class-D Speaker Driver
- No External Low-pass Filter Required
- Digital Volume Control
- On-chip Oscillator – No XTAL Required
- Plays up to 4096 Pre-recorded Audio Phrases
- Configurable General-purpose Clock Output
- Two General-purpose Digital Outputs
- Low-power Standby State (1 µA Typ.)
- Operating Voltage: 2.7V – 5.5V
- Operating Temperature: -40°C to 85°C
- Packages:
  - 20-pin SOIC (KX1400EW)
  - 24-pin 4X4mm QFN (KX1400EG)

GENERAL DESCRIPTION

The KX1400 is an audio playback IC designed to play 8KHz audio data directly to an external speaker via an on-chip digital audio processor and class-D driver. Both 12-bit PCM and 4-bit IMA ADPCM data formats are supported. It also has a built-in tone generator capable of generating tones at 4096 different frequencies. The on-chip audio processor eliminates the need for an external low-pass filter in most cases. The KX1400 utilizes low power CMOS technology and provides a stand-by power-savings state, making it well suited for battery powered applications.

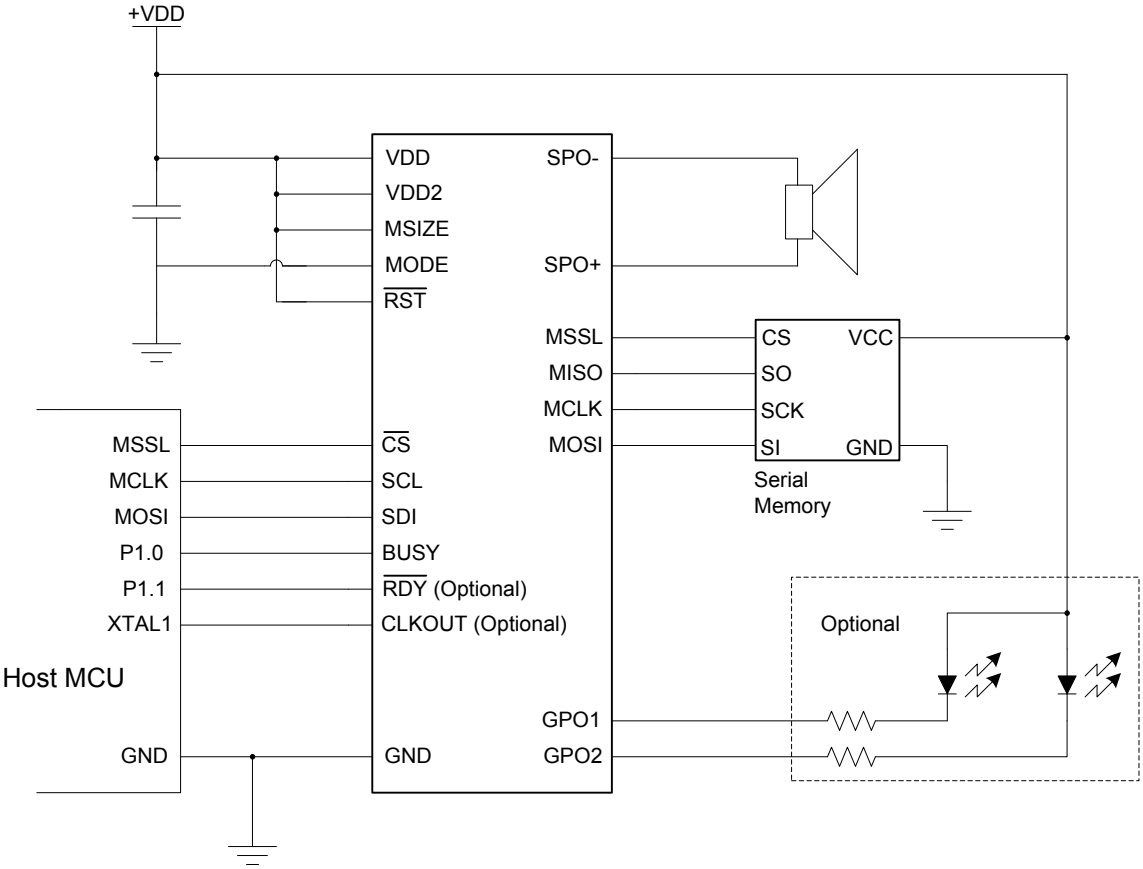
The KX1400 operates in either a stand-alone mode or interfaced to a microcontroller (MCU) host. Audio data is provided to the KX1400 from either a user-programmed external serial memory or from the host MCU. Under MCU control, the user can select phrases or tone sequences to play from the external memory, play tone sequences via commands, or stream audio data directly to the on-chip audio processor. In stand-alone mode no MCU is required; on reset, the KX1400 plays a single phrase from external memory and then returns to a stand-by power-saving state.

FUNCTIONAL BLOCK DIAGRAM



EXAMPLE APPLICATION CIRCUIT

This example circuit shows the KX1400 in host-controlled operation with audio data stored in external serial memory. Commands are sent from the MCU to play tones and to play audio phrases from the external memory. Audio data and commands can also be stored in the MCU's data memory and transmitted to the KX1400, eliminating the need for an external memory IC.



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