

Z89341/42/43

WAVE SYNTHESIS CHIP SET

FEATURES

- 4-Channel, 16-Bit Linear PCM Sound Generator
- Output Sampling Rates 20 kHz to 44.1 kHz
- Variable Playback Sampling Rates 0 Hz to 44.1 kHz
- Supports 16-, 18-, and 20-Bit DACs – greater than 96 dB Dynamic Range
- Polyphonic – Over 100 Notes
- Multi-Timbral – Over 100 Simultaneous Sounds
- Audio Bandwidth 0 to 20,000 Hz – High Cymbals, Strings, etc., Sounds are Crisp and Clear
- Supports PCM Sampling, Wavetable Synthesis, and Additive Synthesis
- 8-Bit Logarithmic Amplitude Control – Allows Easy Control of Amplitude Envelopes, Attacks, Delays, and Releases
- 21-Bit Logarithmic Frequency Control for High Accuracy
- Direct Support 4M X 16 Sample ROM
- Direct Interface with PC ISA Bus or Z89331 (16-Bit PC ISA Bus Controller)

GENERAL DESCRIPTION

The Z89341, Z89342, and Z89343 chip set is a high-performance programmable sound generator for musical instruments, MIDI sound modules, PC audio application, multimedia application, and Karaoke machines.

The Z89341 provides a 16-bit data bus which can directly interface with PC ISA bus or Z89331 (16-bit PC ISA Bus Interface Controller) and two 1024 X 8 SRAM interface for system buffering. The on-board control unit provides phase accumulator looping control, zero crossing detection, amplitude processing ramp and step control, data transfer control and configuration control. Figures 1 and 3 show the block diagram and pin assignments of Z89341.

The Z89342 provides 22-bit address bus and 16-bit data bus to connect to a Z89343–4M X 16 wavetable ROM. The on-board wave generation unit provides a patented 2 X 16 X 8 bit interpolator, 12 X 16 two's complement scalar, four 22-Bit accumulators with clipping circuitry, 100 general-purpose oscillators, and DAC interface (supports 16-, 18-, and 20-bit DACs). This 44.1 kHz sample rate wave generation unit can provide CD-quality sound output.

Figures 2 and 4 show the block diagram and pin assignments of Z89342. The Z89343 is a wavetable ROM. This ROM can store over 100 different voices for the playback.

The Z89342 has 100 general-purpose oscillators. Any oscillator can be split into two half-speed oscillators that can operate at half the sampling rate to allow over 100 notes playing simultaneously. All these oscillators are independent and can address any location of data storage any time. The Z89341 and Z89342 have the wavetable and additive synthesis algorithms on-board. This chip set is also capable of linear PCM sampling techniques of sequences up to 64K samples in length, with looping. A patented looping algorithm renders loops inaudible for harmonic sounds such as piano, guitar, brass, and woodwinds, etc. The Z89341 and Z89342 can operate at sample rates from 20 kHz to 44.1 kHz, and offer channels of 16- to 20-bit data output. Frequency, amplitude, and sample data of each oscillator can be programmed through the ISA bus interface of Z89341. Figure 5 shows the application block diagram.

GENERAL DESCRIPTION (Continued)

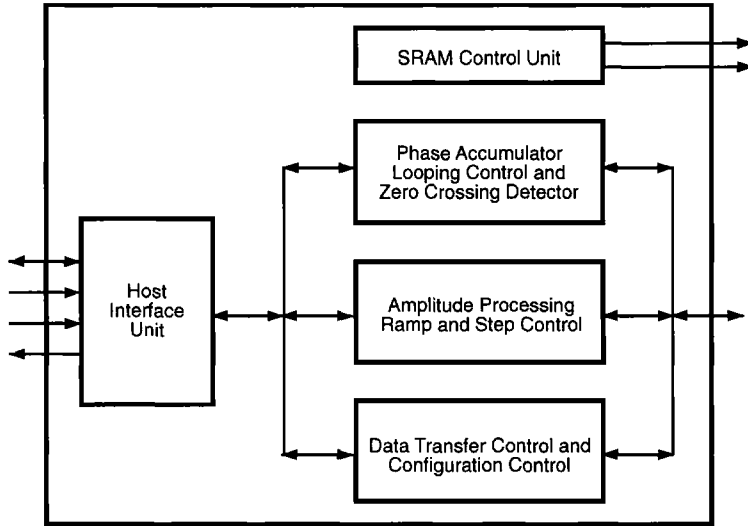


Figure 1. Z89341 Block Diagram

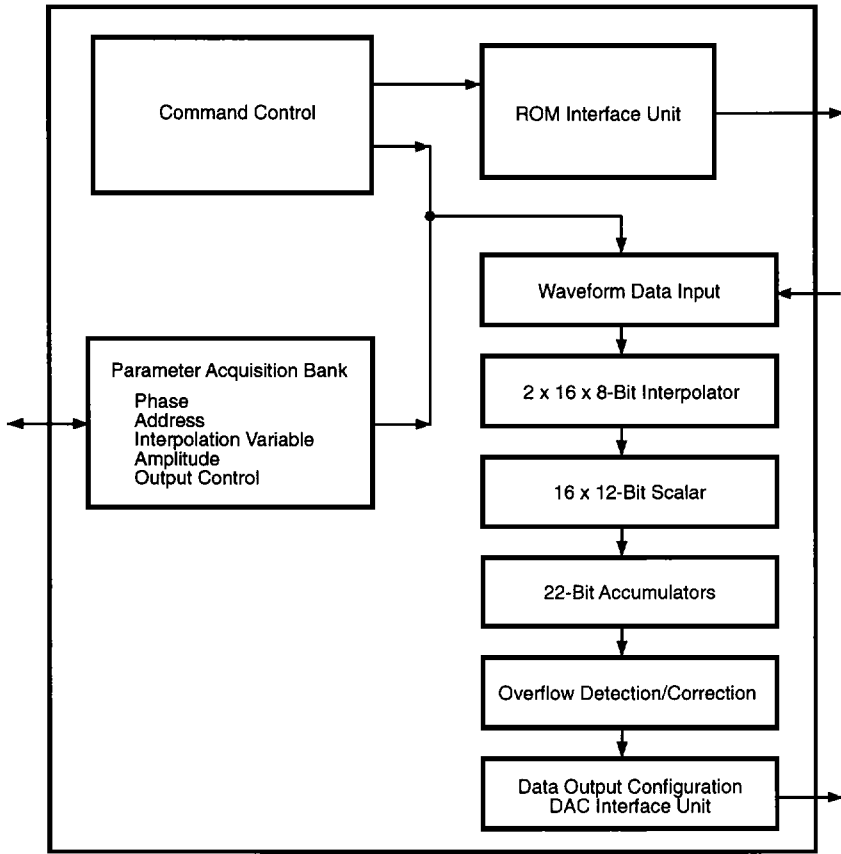
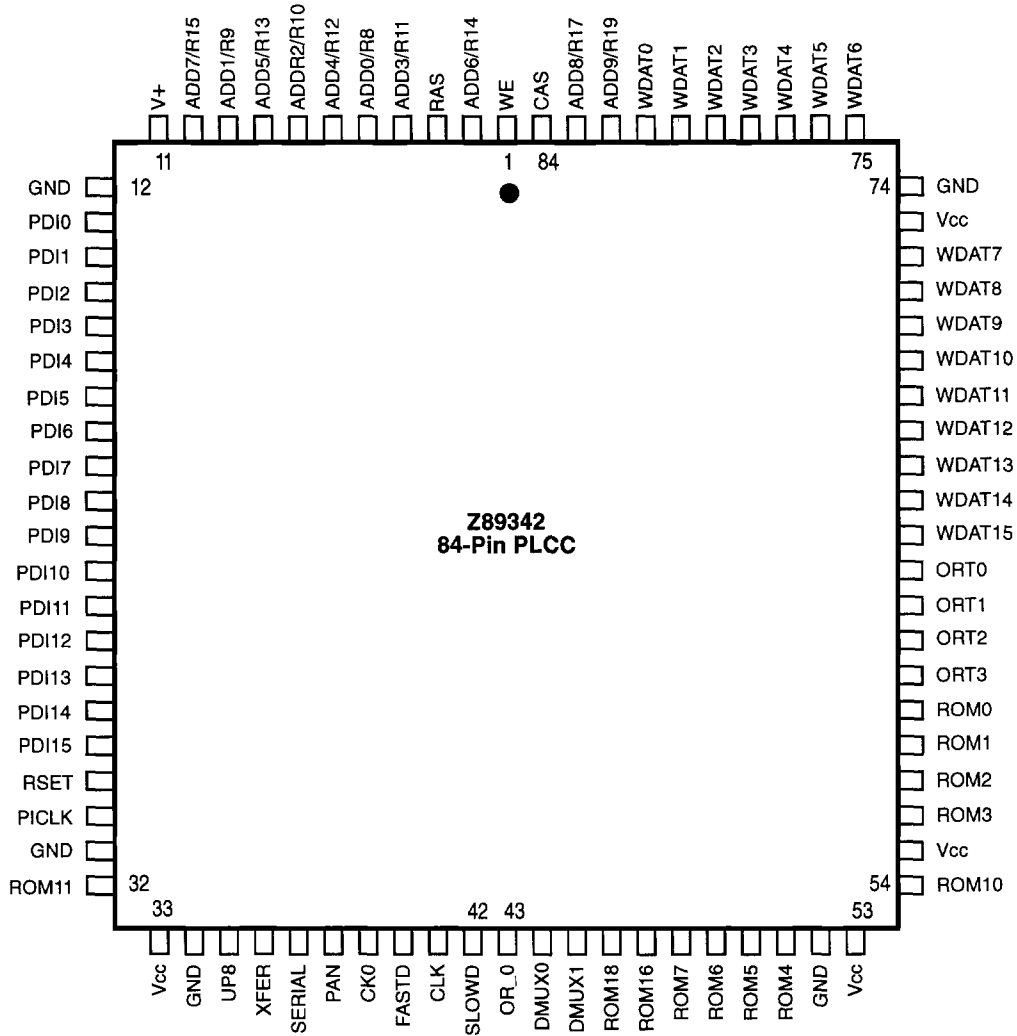


Figure 2. Z89342 Block Diagram



5

Figure 4. Z89342 Pin Assignment

GENERAL DESCRIPTION (Continued)

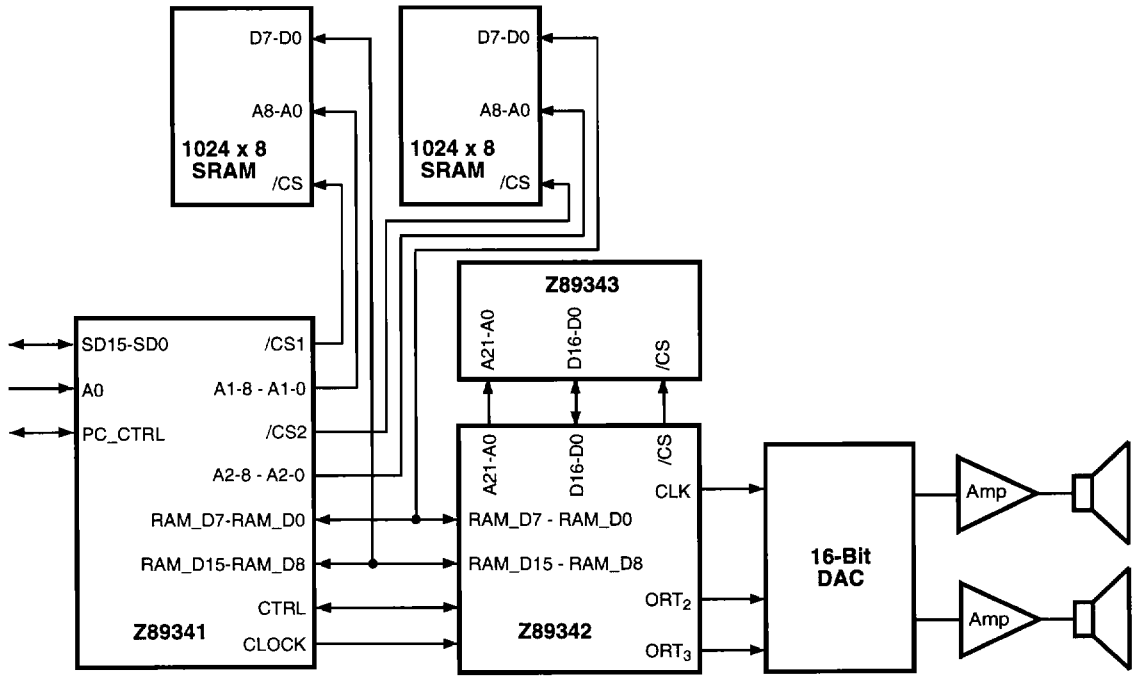


Figure 3. Application Block Diagram of Z89341, Z89342, and Z89343