



Totally Logical

Z89321/371

16-BIT DIGITAL SIGNAL PROCESSORS

FEATURES

Device	DSP ROM [KW]	OTP [KW]	DSP RAM [Words]	MIPS
Z89321	4		512	20
Z89371		4	512	20

- 0°C to 70°C Standard Temperature Range
-40°C to +85°C Extended Temperature Range
- 4.5 to 5.5 Volt Operating Range

DSP Core

- 16-Bit Fixed Point DSP with 24-Bit ALU and Accumulator
- Single-Cycle Multiply and ALU Operations
- Six-Level Hardware Stack
- Six Data RAM Pointers and Sixteen Program Memory Pointers
- RISC Processor with 30 Instruction Types

GENERAL DESCRIPTION

The Z893x1 products are high-performance Digital Signal Processors (DSPs) with a modified Harvard architecture featuring separate program and dual data memory banks. The design has been optimized for processing power with a minimum of silicon area.

The Z893x1 16/24-Bit architecture accommodates advanced signal processing algorithms. The operating performance and efficient architecture provide deterministic instruction execution. Compression, filtering, frequency detection, audio, voice detection/synthesis, and other vital algorithms can all be implemented.

Six data RAM pointers provide circular buffer capabilities and simultaneous dual operand fetching. Three vectored in-

Device	40-Pin DIP	44-Pin PLCC	44-Pin PQFP
Z89321	X	X	X
Z89371	X	X	X

Internal Peripherals

- 13-Bit General-Purpose Timer
- Dual Channel 8/16/64-Bit CODEC Interface with optional Hardware μ -Law Compression

External Peripheral Interface

- 16-Bit Tri-Stated External Data Bus
- 3-Bit Latched External Address Bus
- Wait-State Generator
- Three Vectored Interrupts

errupts are complemented by a six-level stack. A 13-bit Timer is available for general-purpose use. A CODEC Interface allows high-speed transfer rates to accommodate digital audio and voice data. A dedicated Counter/Timer provides the necessary timing signals for the CODEC Interface.

The Z893x1 CODEC Interface is compatible with 8-bit PCM and 16/64-bit CODECs used in digital audio applications, and serial A/D and D/A converters. A Wait-State Generator is provided to accommodate slow external peripherals.

For prototypes, low volume, or special production runs, the Z89371 is a one-time programmable (OTP) device.