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(54) Title: EIGHT–BIT MICROCONTROLLER HAVING A RISC ARCHITECTURE

(57) Abstract

An eight–bit RISC based microcontroller (Fig. 1) includes an eight–bit register file (20) having a dedicated arithmetic logic unit (ALU2), in addition to a general purpose eight–bit ALU (22). The register file further includes means for combining (16) a pair of registers to provide a logical sixteen–bit register for indirect addressing. The dedicated ALU is a sixteen–bit ALU which provides certain arithmetic functions for the register pair, thus alleviating the computational burdens that would otherwise be imposed on the general purpose eight–bit ALU. A further feature of the invention is the inclusion of a paging register (RAMP x, y, z) which is combined with the contents (14') of the logical sixteen–bit register to provided an even greater addressing range. Yet another feature of the eight–bit microcontroller of the present invention is the means (134) for directly reading and writing to any bit position within the register file with a single instruction. This avoids having to perform various load, shift and/or masking operations needed by prior art microcontrollers.

