

ADSP-1008A

FEATURES

8 × 8-Bit Parallel Multiplication/Accumulation
100mW Power Dissipation with TTL-Compatible
1.5 Micron CMOS Technology
55ns Multiply/Accumulate Time
Improved TDC1008J4 Second Source
Twos-Complement or Unsigned Magnitude
Available in Hermetically-Sealed 48-Pin Ceramic DIP or
48-Pin Plastic DIP
Single +5V Power Supply
Specified from -55°C to +125°C Ambient

APPLICATIONS

Matrix Manipulations
Fourier Transformations
Digital Filtering
Image Processing

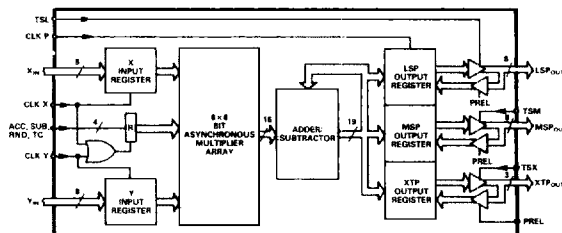
GENERAL DESCRIPTION

The ADSP-1008A is a TTL compatible high-speed low-power 8 × 8-bit multiplier accumulator (MAC) that is pin for pin compatible with TRW's TDC1008J4. The ADSP-1008A is a very fast (55ns) 8 × 8 MAC, with low power consumption (100mW max). Low power dissipation prevents the existence of a large temperature differential between the device's junction temperature and the ambient temperature. Thus, unlike existing bipolar and ECL devices, it is safe to both specify and operate the ADSP-1008A over the full MIL temperature range (-55°C to +125°C ambient) without impairing its useful life.

The low power is obtained by using CMOS technology. The high speed is obtained by the use of three time-saving techniques. A modified Booth algorithm reduces time-consuming operations. Feed-forward carry organization is used. Finally, a conditional sum adder speeds the final adder stage of the multiplier.

The ADSP-1008A has two 8-bit input buses, two 8-bit product buses and a 3 bit extra product bus. All inputs are diode protected. The independent input registers are D-type positive edge triggered flip-flops as are the product registers. Each product register has its own three state output control which, when combined with the independent input clocks, allows the ADSP-1008A to operate on an 8-bit bus.

ADSP-1008A FUNCTIONAL BLOCK DIAGRAM



The ADSP-1008A has a RND control which rounds the product to the 11 most significant bits by adding a 1 to the MSB of the LSP. The preload control is used in conjunction with the three state control to initialize the contents of the output registers. The ACC and SUB controls are used to determine whether a multiply/add, a multiply/subtract, or a straight multiply is performed. The TC control is used to distinguish between two's complement or unsigned magnitude inputs.

The ADSP-1008A is available in a hermetically-sealed 48-pin ceramic DIP or 48-pin plastic DIP.