

4581B

4-BIT ARITHMETIC LOGIC UNIT

DESCRIPTION — The 4581B is a 4-Bit Arithmetic Logic Unit which can perform all of the possible 16 logic operations on two variables and a variety of 16 arithmetic operations.

Controlled by the four Instruction Inputs (I_0 - I_3) and the Mode Control Input (M), the 4581B can perform a total of 32 logic and arithmetic operations on either active HIGH or active LOW operands (See Truth Table).

With the Mode Control Input (M) HIGH all internal carries are inhibited and the device performs logic operations on the individual Data Inputs ($\overline{A_0}$ - $\overline{A_3}$ and $\overline{B_0}$ - $\overline{B_3}$). With the Mode Control Input (M) LOW, the carries are enabled and the device performs arithmetic operations on the Data Inputs ($\overline{A_0}$ - $\overline{A_3}$ and $\overline{B_0}$ - $\overline{B_3}$). The 4581B incorporates full internal carry lookahead and provides for either ripple carry between devices using the Carry Output (C_{n+4}), or for carry lookahead between packages using the Carry Propagate (P) and Carry Generate (\overline{G}) Outputs. Carry Propagate (P) and Carry Generate (\overline{G}) are not affected by the Carry Input (C_n). When speed requirements are not stringent, the 4581B can be used in a simple ripple carry mode by connecting the Carry Output (C_{n+4}) of one device to Carry Input (C_n) of the next device. For higher speed operation the 4581B is used in conjunction with the 4582B, Carry Lookahead Block. One 4582B is required for each group of four 4581's. Carry lookahead can be provided at various levels and offers high speed capabilities over longer word lengths.

The A Equals B Comparator Output (A=B) from the 4581B goes HIGH when all four Data Outputs ($\overline{O_0}$ - $\overline{O_3}$) and HIGH and can be used to indicate logic equivalence over four bits when the unit is in the subtract mode. The A=B Output can also be used with the Carry Output (C_{n+4}) to indicate $A > B$ or $A < B$.

- PROVIDES 16 ARITHMETIC OPERATIONS INCLUDING ADD, SUBTRACT, COMPARE, AND DOUBLE
- PROVIDES ALL 16 LOGIC OPERATIONS OF TWO VARIABLES INCLUDING EXCLUSIVE OR, COMPARE, AND NAND, OR, AND NOR.
- FULL LOOKAHEAD FOR HIGHER SPEED ARITHMETIC OPERATION ON LONG WORDS
- EXPANDABLE IN MULTIPLES OF FOUR BITS

PIN NAMES

$\overline{A_0}$ - $\overline{A_3}$	Data Inputs (Active LOW)
$\overline{B_0}$ - $\overline{B_3}$	Data Inputs (Active LOW)
I_0 - I_3	Instruction Inputs
M	Mode Control Input
C_n	Carry Input
$\overline{O_0}$ - $\overline{O_3}$	Data Outputs (Active LOW)
A=B	A Equals B Comparator Output
\overline{G}	Carry Generate Output (Active LOW)
P	Carry Propagate Output (Active LOW)
C_{n+4}	Carry Output



