



**MOTOROLA**

# MC54/74HC182

## Product Preview

### CARRY LOOKAHEAD GENERATOR

The MC54/74HC182 is identical in pinout to the LS182. The device inputs are compatible with standard CMOS outputs; with pullup resistors, they are compatible with LSTTL outputs.

The HC182 is a high-speed Carry Lookahead Generator. It is used with the HC181 or LS181 4-Bit Arithmetic Logic Unit to provide high speed lookahead over word lengths of more than four bits. The device accepts up to four pairs of active-low Carry Propagate (P0, P1, P2, P3) and Carry Generate (G0, G1, G2, G3) signals and an active-high Carry Input and provides anticipated active-high carries ( $C_{n+x}$ ,  $C_{n+y}$ ,  $C_{n+z}$ ) across four groups of binary adders. The HC182 also has active-low Carry Propagate (P) and Carry Generate (G) outputs which may be used for further levels of lookahead.

The logic equations provided at the outputs are:

$$P = P_3 + P_2 + P_1 + P_0$$

$$G = G_3 \cdot P_3 + G_3 \cdot G_2 \cdot P_2 + G_3 \cdot G_2 \cdot G_1 \cdot P_1 + G_3 \cdot G_2 \cdot G_1 \cdot G_0$$

$$C_{n+x} = \overline{G_0} + \overline{P_0} \cdot \text{Carry In}$$

$$C_{n+y} = \overline{G_1} + \overline{P_1} \cdot \overline{G_0} + \overline{P_0} \cdot \text{Carry In}$$

$$C_{n+z} = \overline{G_2} + \overline{P_2} \cdot \overline{G_1} + \overline{P_2} \cdot \overline{P_1} \cdot \overline{G_0} + \overline{P_2} \cdot \overline{P_1} \cdot \overline{P_0} \cdot \text{Carry In}$$

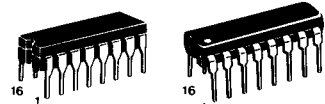
Also, the HC182 can be used with binary ALUs in an active-low or active-high input operand mode. The connections to and from the ALU to the carry lookahead generator are identical in both cases.

- Provides Carry Lookahead Across a Group of Four ALUs
- Multi-Level Lookahead for High-Speed Arithmetic Operation Over Long Word Lengths
- Low Power Consumption Characteristic of CMOS Devices
- Output Drive Capability: 10 LSTTL Loads Minimum
- Operating Speeds Similar to LSTTL
- Wide Operating Voltage Range: 2 to 6 Volts
- Low Input Current: 1  $\mu\text{A}$  Maximum
- Low Quiescent Current: 80  $\mu\text{A}$  Maximum (74HC Series)
- High Noise Immunity Characteristic of CMOS Devices
- Diode Protection on All Inputs

### HIGH-PERFORMANCE CMOS

LOW-POWER COMPLEMENTARY MOS  
SILICON-GATE

### CARRY LOOKAHEAD GENERATOR



**J SUFFIX**  
CERAMIC PACKAGE  
CASE 620

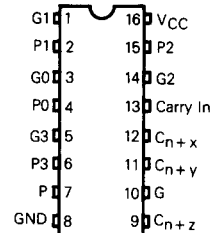
**N SUFFIX**  
PLASTIC PACKAGE  
CASE 648

#### ORDERING INFORMATION

54 Series: -55°C to +125°C  
MC54HCXXXJ (Ceramic Package Only)

74 Series: -40°C to +85°C  
MC74HCXXXN (Plastic Package)  
MC74HCXXXJ (Ceramic Package)

#### PIN ASSIGNMENT



This document contains information on a product under development. Motorola reserves the right to change or discontinue this product without notice.

BLOCK DIAGRAM

