

## SPXXHC80 SPXXHC82 SPXXHC298

### Features

- Utilizes SPI's Selective Oxidation, Silicon-Gate CMOS Process.
- Speed, function and pin-out compatible to 74LS series Logic.
- High Noise Immunity.
- Low quiescent power consumption.
- Wide power supply range.
- Operates over  $V_{CC}$  range of 2.0 to 6.0 Volts.
- Symmetric current drive.
- All Inputs are fully buffered.
- All devices have Input Protection diodes to  $V_{CC}$  and ground.
- All devices have Logic Input voltage levels consistent with CMOS.

All devices contain diodes to protect inputs against damage due to high static voltages or electric fields; however, it is advised that precautions be taken not to exceed the maximum recommended input voltages. All unused inputs must be connected to an appropriate logic voltage level (either  $V_{CC}$  or GND).

## 54/74 Series Adders/Registers

### Ordering Information

| Plastic DIP,<br>Industrial Temp Range | Ceramic DIP,<br>Industrial Temp Range | Ceramic DIP,<br>Military Temp Range |
|---------------------------------------|---------------------------------------|-------------------------------------|
| SP74HCXXXN                            | SP74HCXXXJ                            | SP54HCXXXJ                          |

### Absolute Maximum Ratings

| Parameter                                                       | Min  | Max            | Units |
|-----------------------------------------------------------------|------|----------------|-------|
| $V_{CC}$ DC Supply Voltage                                      | -0.5 | +7.0           | V     |
| $V_I, V_O$ Input or Output Voltage                              | -0.5 | $V_{CC} + 0.5$ | V     |
| $I_L$ DC Current Per Pin Any Input or Output                    | —    | 25             | mA    |
| $I_{CC}$ DC Current Drain, $V_{CC}$ or GND                      | —    | 50             | mA    |
| $T_S$ Storage Temperature                                       | -65  | +150           | °C    |
| $P_D$ Power Dissipation (Note 1)                                | —    | 500            | mW    |
| $T_L$ Lead Temperature (1/16" from mounting surface for 10 sec) | —    | +300           | °C    |

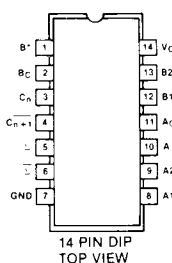
Note 1: Derate at 12mW/°C over +45 to +85°C for Plastic "N" Package.

### Recommended Operating Conditions

| Parameter                                | SP74HCXXX |          | SP54HCXXX |          | Units |
|------------------------------------------|-----------|----------|-----------|----------|-------|
|                                          | Min       | Max      | Min       | Max      |       |
| $V_{CC}$ DC Supply Voltage Range         | 2.0       | 6.0      | 2.0       | 6.0      | V     |
| $V_I, V_O$ Input Voltage, Output Voltage | 0         | $V_{CC}$ | 0         | $V_{CC}$ | V     |
| $T_A$ Operating Temperature Range        | -40       | +85      | -55       | +125     | °C    |

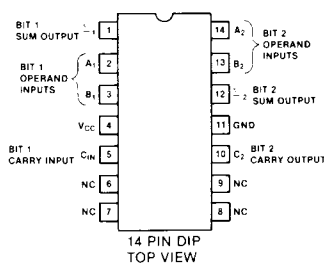
### SPXXHC80

Gated Full Adder



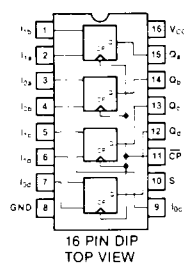
### SPXXHC82

2-Bit Full Adder



### SPXXHC298

Quad 2-Port Register



## DC Electrical Characteristics

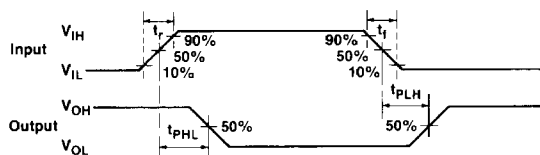
| Symbol          | Parameter                         | Conditions                                                                | V <sub>CC</sub> | Typ<br>T = 25 °C        | Guaranteed Limits       |                          | Units |
|-----------------|-----------------------------------|---------------------------------------------------------------------------|-----------------|-------------------------|-------------------------|--------------------------|-------|
|                 |                                   |                                                                           |                 |                         | SP74HC<br>-40 to +85 °C | SP54HC<br>-55 to +125 °C |       |
| V <sub>IH</sub> | Minimum High Level Input Voltage  | V <sub>O</sub> = 0.1V or V <sub>CC</sub> - 0.1V<br>I <sub>O</sub> ≤ 20 μA | 2.0V            |                         | 1.5                     | 1.5                      | V     |
|                 |                                   |                                                                           | 4.5V            |                         | 3.15                    | 3.15                     |       |
|                 |                                   |                                                                           | 6.0V            |                         | 4.2                     | 4.2                      |       |
| V <sub>IL</sub> | Maximum Low Level Input Voltage   | V <sub>O</sub> = 0.1V or V <sub>CC</sub> - 0.1V<br>I <sub>O</sub> ≤ 20 μA | 2.0V            |                         | 0.3                     | 0.3                      | V     |
|                 |                                   |                                                                           | 4.5V            |                         | 0.9                     | 0.9                      |       |
|                 |                                   |                                                                           | 6.0V            |                         | 1.2                     | 1.2                      |       |
| V <sub>OH</sub> | Minimum High Level Output Voltage | I <sub>OH</sub> = 20 μA<br>V <sub>I</sub> = V <sub>CC</sub> or GND        | 2.0V            | 2.0                     | 1.9                     | 1.9                      | V     |
|                 |                                   |                                                                           | 4.5V            | 4.5                     | 4.4                     | 4.4                      |       |
|                 |                                   |                                                                           | 6.0V            | 6.0                     | 5.9                     | 5.9                      |       |
|                 |                                   | I <sub>OH</sub> = *<br>V <sub>I</sub> = V <sub>CC</sub> or GND            | 4.5V            |                         | 3.7                     | 3.7                      | V     |
|                 |                                   |                                                                           | 6.0V            |                         | 5.2                     | 5.2                      |       |
| V <sub>OL</sub> | Maximum Low Level Output Voltage  | I <sub>OL</sub> = 20 μA<br>V <sub>I</sub> = V <sub>CC</sub> or GND        | 2.0V            | 0                       | 0.1                     | 0.1                      | V     |
|                 |                                   |                                                                           | 4.5V            | 0                       | 0.1                     | 0.1                      |       |
|                 |                                   |                                                                           | 6.0V            | 0                       | 0.1                     | 0.1                      |       |
|                 |                                   | I <sub>OL</sub> = *<br>V <sub>I</sub> = V <sub>CC</sub> or GND            | 4.5V            | 0.1                     | 0.3                     | 0.4                      | V     |
|                 |                                   |                                                                           | 6.0V            |                         | 0.3                     | 0.4                      |       |
| I <sub>IN</sub> | Input Leakage Current             | V <sub>I</sub> = V <sub>CC</sub> or GND<br>V <sub>CC</sub> = 2.0 to 6.0V  |                 |                         | ±1.0                    | ±1.0                     | μA    |
| I <sub>CC</sub> | Maximum Quiescent Supply Current  | V <sub>I</sub> = V <sub>CC</sub> or GND<br>I <sub>O</sub> = 0 μA          |                 |                         |                         |                          | μA    |
|                 |                                   |                                                                           |                 | T <sub>A</sub> = 25 °C  | 5.0V                    | 2.0                      |       |
|                 |                                   |                                                                           |                 | T <sub>A</sub> = 85 °C  | 5.0V                    | 20.0                     |       |
|                 |                                   |                                                                           |                 | T <sub>A</sub> = 125 °C | 5.0V                    | 40.0                     |       |

\* 4mA STD outputs 6mA Bus-Drivers

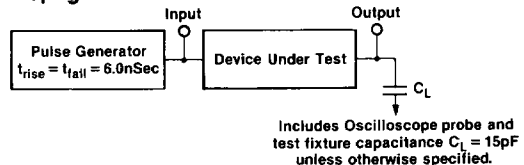
## AC Electrical Characteristics (V<sub>CC</sub> = 5.0V, t<sub>r</sub> = t<sub>f</sub> = 6ns, T<sub>A</sub> = 25 °C, unless otherwise specified)

| Device Typ | Symbol                              | Parameter                            | Conditions                                     | Typ      | Guaranteed Limit | Units |
|------------|-------------------------------------|--------------------------------------|------------------------------------------------|----------|------------------|-------|
| 80         | t <sub>PHL</sub> , t <sub>PLH</sub> | A <sub>C</sub> to Σ                  | C <sub>L</sub> = 15pF<br>C <sub>L</sub> = 50pF | 23<br>25 |                  | ns    |
|            | t <sub>PHL</sub> , t <sub>PLH</sub> | B <sub>C</sub> to Σ                  | C <sub>L</sub> = 15pF<br>C <sub>L</sub> = 50pF | 33<br>35 |                  | ns    |
|            | t <sub>PHL</sub> , t <sub>PLH</sub> | B <sub>C</sub> to C <sub>N</sub> + 1 | C <sub>L</sub> = 15pF<br>C <sub>L</sub> = 50pF | 22<br>25 |                  | ns    |
|            | t <sub>PHL</sub> , t <sub>PLH</sub> | C <sub>N</sub> to C <sub>N</sub> + 1 | C <sub>L</sub> = 15pF<br>C <sub>L</sub> = 50pF | 19<br>21 |                  | ns    |
|            | C <sub>IN</sub>                     | Input Capacitance                    |                                                | 2        |                  | pF    |
|            |                                     |                                      | C <sub>L</sub> = 15pF                          | 17       |                  |       |
| 82         | t <sub>PHL</sub> , t <sub>PLH</sub> | IC <sub>0</sub> to Σ <sub>1</sub>    | C <sub>L</sub> = 15pF<br>C <sub>L</sub> = 50pF | 19       |                  | ns    |
|            | t <sub>PHL</sub> , t <sub>PLH</sub> | C <sub>0</sub> to Σ <sub>2</sub>     | C <sub>L</sub> = 15pF<br>C <sub>L</sub> = 50pF | 32<br>35 |                  | ns    |
|            | t <sub>PHL</sub> , t <sub>PLH</sub> | C <sub>0</sub> to C <sub>2</sub>     | C <sub>L</sub> = 15pF<br>C <sub>L</sub> = 50pF | 30<br>33 |                  | ns    |
|            | t <sub>PHL</sub> , t <sub>PLH</sub> | B <sub>2</sub> to Σ <sub>2</sub>     | C <sub>L</sub> = 15pF<br>C <sub>L</sub> = 50pF | 21<br>23 |                  | ns    |
|            | C <sub>IN</sub>                     | Input Capacitance                    |                                                | 2        |                  | pF    |
|            |                                     |                                      | C <sub>L</sub> = 15pF                          | 20       |                  |       |
| 298        | t <sub>PHL</sub> , t <sub>PLH</sub> | Clock to Q <sub>n</sub>              | C <sub>L</sub> = 15pF<br>C <sub>L</sub> = 50pF | 23       |                  | ns    |
|            | C <sub>IN</sub>                     | Input Capacitance                    |                                                | 2        |                  | pF    |

## AC Waveforms



## Propagation Time Test Circuit



Copyright © Each Manufacturing Company.

All Datasheets cannot be modified without permission.

This datasheet has been download from :

[www.AllDataSheet.com](http://www.AllDataSheet.com)

100% Free DataSheet Search Site.

Free Download.

No Register.

Fast Search System.

[www.AllDataSheet.com](http://www.AllDataSheet.com)