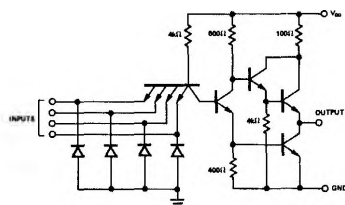


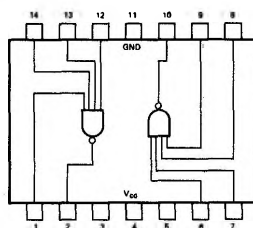
**SCHEMATIC (each gate)**



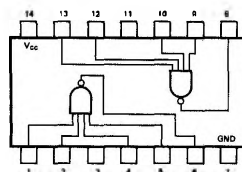
**NOTE:** Component values shown are nominal.

## PIN CONFIGURATIONS

**W PACKAGE**



### A.F PACKAGE



## RECOMMENDED OPERATING CONDITIONS

|                                                              | MIN  | NOM | MAX  | UNIT |
|--------------------------------------------------------------|------|-----|------|------|
| Supply Voltage $V_{CC}$ : S5440 Circuits                     | 4.5  | 5   | 5.5  | V    |
| N7440 Circuits                                               | 4.75 | 5   | 5.25 | V    |
| Normalized Fan-Out from Output, N                            |      |     | 30   |      |
| Operating Free-Air Temperature Range, $T_A$ : S5440 Circuits | -55  | 25  | 125  | °C   |
| N7440 Circuits                                               | 0    | 25  | 70   | °C   |

**ELECTRICAL CHARACTERISTICS** (over recommended operating free-air temperature range unless otherwise noted)

| PARAMETER           |                                                                                             | TEST CONDITIONS*                                     |                                                  | MIN        | TYP** | MAX        | UNIT     |
|---------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------|-------|------------|----------|
| V <sub>in(1)</sub>  | Logical 1 input voltage required at all input terminals to ensure logical 0 level at output | V <sub>CC</sub> = MIN                                |                                                  | 2          |       |            | V        |
| V <sub>in(0)</sub>  | Logical 0 input voltage required at any input terminal to ensure logical 1 level at output  | V <sub>CC</sub> = MIN,                               |                                                  |            |       | 0.8        | V        |
| V <sub>out(1)</sub> | Logical 1 output voltage                                                                    | V <sub>CC</sub> = MIN,<br>I <sub>load</sub> = -1.2mA | V <sub>in</sub> = 0.8V,                          | 2.4        | 3.3   |            | V        |
| V <sub>out(0)</sub> | Logical 0 output voltage                                                                    | V <sub>CC</sub> = MIN,<br>I <sub>sink</sub> = 48mA   | V <sub>in</sub> = 2V,                            |            | 0.28  | 0.4        | V        |
| I <sub>in(0)</sub>  | Logical 0 level input current (each input)                                                  | V <sub>CC</sub> = MAX,                               | V <sub>in</sub> = 0.4V                           |            |       | -1.6       | mA       |
| I <sub>in(1)</sub>  | Logical 1 level input current (each input)                                                  | V <sub>CC</sub> = MAX,<br>V <sub>CC</sub> = MAX,     | V <sub>in</sub> = 2.4V<br>V <sub>in</sub> = 5.5V |            |       | 40<br>1    | μA<br>mA |
| I <sub>OS</sub>     | Short circuit output current†                                                               | V <sub>CC</sub> = MAX,                               | S5440<br>N7440                                   | -20<br>-18 |       | -70<br>-70 | mA<br>mA |

## ELECTRICAL CHARACTERISTICS (Cont'd)

| PARAMETER   |                                | TEST CONDITIONS*       |               | MIN | TYP** | MAX | UNIT |
|-------------|--------------------------------|------------------------|---------------|-----|-------|-----|------|
| $I_{CC(0)}$ | Logical 0 level supply current | $V_{CC} = \text{MAX},$ | $V_{in} = 5V$ |     | 17    | 27  | mA   |
| $I_{CC(1)}$ | Logical 1 level supply current | $V_{CC} = \text{MAX},$ | $V_{in} = 0$  |     | 4     | 6.8 | mA   |

SWITCHING CHARACTERISTICS,  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ ,  $N = 30$ 

| PARAMETER |                                           | TEST CONDITIONS |                   | MIN | TYP | MAX | UNIT |
|-----------|-------------------------------------------|-----------------|-------------------|-----|-----|-----|------|
| $t_{pd0}$ | Propagation delay time to logical 0 level | $C_L = 15pF,$   | $R_L = 133\Omega$ |     | 8   | 15  | ns   |
| $t_{pd1}$ | Propagation delay time to logical 1 level | $C_L = 15pF,$   | $R_L = 133\Omega$ |     | 13  | 22  | ns   |

\* For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

\*\* All typical values are at  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ .

† Not more than one output should be shorted at a time.