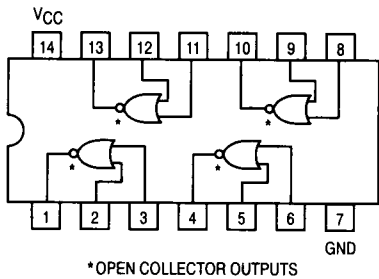




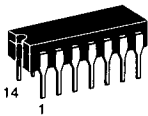
# QUAD 2-INPUT NOR BUFFER



\* OPEN COLLECTOR OUTPUTS

SN54/74LS33

QUAD 2-INPUT NOR BUFFER  
LOW POWER SCHOTTKY



J SUFFIX  
CERAMIC  
CASE 632-08



N SUFFIX  
PLASTIC  
CASE 646-06



D SUFFIX  
SOIC  
CASE 751A-02

## ORDERING INFORMATION

|           |         |
|-----------|---------|
| SN54LSXXJ | Ceramic |
| SN74LSXXN | Plastic |
| SN74LSXXD | SOIC    |

## GUARANTEED OPERATING RANGES

| Symbol          | Parameter                           |          | Min         | Typ        | Max         | Unit |
|-----------------|-------------------------------------|----------|-------------|------------|-------------|------|
| V <sub>CC</sub> | Supply Voltage                      | 54<br>74 | 4.5<br>4.75 | 5.0<br>5.0 | 5.5<br>5.25 | V    |
| T <sub>A</sub>  | Operating Ambient Temperature Range | 54<br>74 | -55<br>0    | 25<br>25   | 125<br>70   | °C   |
| V <sub>OH</sub> | Output Voltage — High               | 54, 74   |             |            | 5.5         | V    |
| I <sub>OL</sub> | Output Current — Low                | 54<br>74 |             |            | 12<br>24    | mA   |

# SN54/74LS33

## DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

| Symbol   | Parameter                                  |        | Limits |       |      | Unit          | Test Conditions                                   |
|----------|--------------------------------------------|--------|--------|-------|------|---------------|---------------------------------------------------|
|          |                                            |        | Min    | Typ   | Max  |               |                                                   |
| $V_{IH}$ | Input HIGH Voltage                         |        | 2.0    |       |      | V             | Guaranteed Input HIGH Voltage for All Inputs      |
| $V_{IL}$ | Input LOW Voltage                          | 54     |        |       | 0.7  | V             | Guaranteed Input LOW Voltage for All Inputs       |
|          |                                            | 74     |        |       | 0.8  |               |                                                   |
| $V_{IK}$ | Input Clamp Diode Voltage                  |        |        | -0.65 | -1.5 | V             | $V_{CC} = \text{MIN}$ , $I_{IN} = -18 \text{ mA}$ |
| $I_{OH}$ | Output HIGH Current                        | 54, 74 |        |       | 250  | $\mu\text{A}$ | $V_{CC} = \text{MIN}$ , $V_{OH} = \text{MAX}$     |
| $V_{OL}$ | Output LOW Voltage                         | 54, 74 |        | 0.25  | 0.4  | V             | $I_{OL} = 12 \text{ mA}$                          |
|          |                                            | 74     |        | 0.35  | 0.5  | V             | $I_{OL} = 24 \text{ mA}$                          |
| $I_{IH}$ | Input HIGH Current                         |        |        |       | 20   | $\mu\text{A}$ | $V_{CC} = \text{MAX}$ , $V_{IN} = 2.7 \text{ V}$  |
|          |                                            |        |        |       | 0.1  | mA            | $V_{CC} = \text{MAX}$ , $V_{IN} = 7.0 \text{ V}$  |
| $I_{IL}$ | Input LOW Current                          |        |        |       | -0.4 | mA            | $V_{CC} = \text{MAX}$ , $V_{IN} = 0.4 \text{ V}$  |
| $I_{CC}$ | Power Supply Current<br>Total, Output HIGH |        |        |       | 3.6  | mA            | $V_{CC} = \text{MAX}$                             |
|          | Total, Output LOW                          |        |        |       | 13.8 |               |                                                   |

## AC CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

| Symbol    | Parameter                       |  | Limits |     |     | Unit | Test Conditions                                                        |
|-----------|---------------------------------|--|--------|-----|-----|------|------------------------------------------------------------------------|
|           |                                 |  | Min    | Typ | Max |      |                                                                        |
| $t_{PLH}$ | Turn-Off Delay, Input to Output |  |        | 20  | 32  | ns   | $V_{CC} = 5.0 \text{ V}$ , $R_L = 667 \Omega$<br>$C_L = 45 \text{ pF}$ |
| $t_{PHL}$ | Turn-On Delay, Input to Output  |  |        | 18  | 28  | ns   |                                                                        |