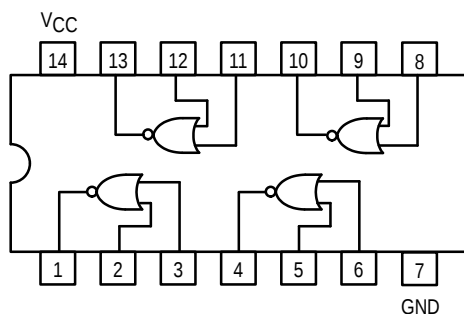


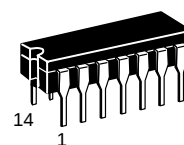


# QUAD 2-INPUT NOR BUFFER

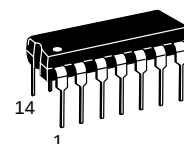


**SN54/74LS28**

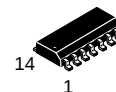
**QUAD 2-INPUT NOR BUFFER**  
**LOW POWER SCHOTTKY**



**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   |
| I <sub>OH</sub> | Output Current — High               | 54, 74   |             |            | -1.2        | mA   |
| I <sub>OL</sub> | Output Current — Low                | 54<br>74 |             |            | 12<br>24    | mA   |

# SN54/74LS28

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

| Symbol          | Parameter                               |        | Limits |       |      | Unit | Test Conditions                                                                                                    |                                                                                                             |
|-----------------|-----------------------------------------|--------|--------|-------|------|------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|                 |                                         |        | Min    | Typ   | Max  |      |                                                                                                                    |                                                                                                             |
| V <sub>IH</sub> | Input HIGH Voltage                      |        | 2.0    |       |      | V    | Guaranteed Input HIGH Voltage for All Inputs                                                                       |                                                                                                             |
| V <sub>IL</sub> | Input LOW Voltage                       | 54     |        |       | 0.7  | V    | Guaranteed Input LOW Voltage for All Inputs                                                                        |                                                                                                             |
|                 |                                         | 74     |        |       | 0.8  |      |                                                                                                                    |                                                                                                             |
| V <sub>IK</sub> | Input Clamp Diode Voltage               |        |        | −0.65 | −1.5 | V    | V <sub>CC</sub> = MIN, I <sub>IN</sub> = −18 mA                                                                    |                                                                                                             |
| V <sub>OH</sub> | Output HIGH Voltage                     | 54     | 2.5    | 3.5   |      | V    | V <sub>CC</sub> = MIN, I <sub>OH</sub> = MAX, V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> per Truth Table |                                                                                                             |
|                 |                                         | 74     | 2.7    | 3.5   |      | V    |                                                                                                                    |                                                                                                             |
| V <sub>OL</sub> | Output LOW Voltage                      | 54, 74 |        | 0.25  | 0.4  | V    | I <sub>OL</sub> = 12 mA                                                                                            | V <sub>CC</sub> = V <sub>CC</sub> MIN, V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> per Truth Table |
|                 |                                         | 74     |        | 0.35  | 0.5  | V    | I <sub>OL</sub> = 24 mA                                                                                            |                                                                                                             |
| I <sub>IH</sub> | Input HIGH Current                      |        |        |       | 20   | μA   | V <sub>CC</sub> = MAX, V <sub>IN</sub> = 2.7 V                                                                     |                                                                                                             |
|                 |                                         |        |        |       | 0.1  | mA   | V <sub>CC</sub> = MAX, V <sub>IN</sub> = 7.0 V                                                                     |                                                                                                             |
| I <sub>IL</sub> | Input LOW Current                       |        |        |       | −0.4 | mA   | V <sub>CC</sub> = MAX, V <sub>IN</sub> = 0.4 V                                                                     |                                                                                                             |
| I <sub>OS</sub> | Short Circuit Current (Note 1)          |        | −30    |       | −130 | mA   | V <sub>CC</sub> = MAX                                                                                              |                                                                                                             |
| I <sub>CC</sub> | Power Supply Current Total, Output HIGH |        |        |       | 3.6  | mA   | V <sub>CC</sub> = MAX                                                                                              |                                                                                                             |
|                 | Power Supply Current Total, Output LOW  |        |        |       | 13.8 |      |                                                                                                                    |                                                                                                             |

Note 1: Not more than one output should be shorted at a time, nor for more than 1 second.

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

| Symbol    | Parameter         |  | Limits |     |     | Unit | Test Conditions                                                        |  |
|-----------|-------------------|--|--------|-----|-----|------|------------------------------------------------------------------------|--|
|           |                   |  | Min    | Typ | Max |      |                                                                        |  |
| $t_{PLH}$ | Propagation Delay |  |        | 12  | 24  | ns   | $V_{CC} = 5.0 \text{ V}$<br>$C_L = 45 \text{ pF}$ , $R_L = 667 \Omega$ |  |
| $t_{PHL}$ | Propagation Delay |  |        | 12  | 24  | ns   |                                                                        |  |