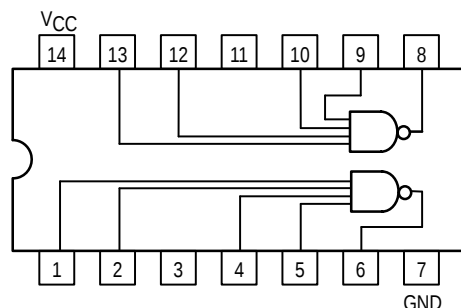


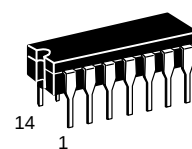


# DUAL 4-INPUT NAND GATE

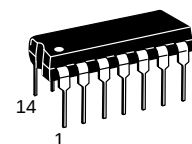


**MC54/74F20**

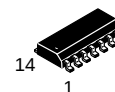
**DUAL 4-INPUT NAND GATE**  
**FAST™ SCHOTTKY TTL**



**J SUFFIX**  
CERAMIC  
CASE 632-08



**N SUFFIX**  
PLASTIC  
CASE 646-06



**D SUFFIX**  
SOIC  
CASE 751A-02

## ORDERING INFORMATION

|          |         |
|----------|---------|
| MC54FXXJ | Ceramic |
| MC74FXXN | Plastic |
| MC74FXXD | SOIC    |

## GUARANTEED OPERATING RANGES

| Symbol          | Parameter                           |        | Min | Typ | Max  | Unit |
|-----------------|-------------------------------------|--------|-----|-----|------|------|
| V <sub>CC</sub> | Supply Voltage                      | 54, 74 | 4.5 | 5.0 | 5.5  | V    |
| T <sub>A</sub>  | Operating Ambient Temperature Range | 54     | -55 | 25  | 125  | °C   |
|                 |                                     | 74     | 0   | 25  | 70   |      |
| I <sub>OH</sub> | Output Current — High               | 54, 74 |     |     | -1.0 | mA   |
| I <sub>OL</sub> | Output Current — Low                | 54, 74 |     |     | 20   | mA   |

# MC54/74F20

## 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                          |
| $V_{IL}$ | Input LOW Voltage                          |        |     | 0.8  | V             | Guaranteed Input LOW Voltage                           |
| $V_{IK}$ | Input Clamp Diode Voltage                  |        |     | -1.2 | V             | $V_{CC} = \text{MIN}$ , $I_{IN} = -18 \text{ mA}$      |
| $V_{OH}$ | Output HIGH Voltage                        | 54, 74 | 2.5 |      | V             | $I_{OH} = -1.0 \text{ mA}$ , $V_{CC} = 4.50 \text{ V}$ |
|          |                                            | 74     | 2.7 |      | V             | $I_{OH} = -1.0 \text{ mA}$ , $V_{CC} = 4.75 \text{ V}$ |
| $V_{OL}$ | Output LOW Voltage                         |        |     | 0.5  | V             | $I_{OL} = 20 \text{ mA}$ , $V_{CC} = \text{MIN}$       |
| $I_{IH}$ | 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                          |        |     | -0.6 | mA            | $V_{CC} = \text{MAX}$ , $V_{IN} = 0.5 \text{ V}$       |
| $I_{OS}$ | Output Short Circuit Current (Note 2)      | -60    |     | -150 | mA            | $V_{CC} = \text{MAX}$ , $V_{OUT} = 0 \text{ V}$        |
| $I_{CC}$ | Power Supply Current<br>Total, Output HIGH |        |     | 1.4  | mA            | $V_{CC} = \text{MAX}$ , $V_{IN} = \text{GND}$          |
|          | Total, Output LOW                          |        |     | 5.1  | mA            | $V_{CC} = \text{MAX}$ , $V_{IN} = \text{Open}$         |

### NOTES:

1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.
2. Not more than one output should be shorted at a time, nor for more than 1 second.

## AC CHARACTERISTICS

| Symbol           | Parameter         | 54/74F                   |     | 54F                              |     | 74F                           |     | Unit |
|------------------|-------------------|--------------------------|-----|----------------------------------|-----|-------------------------------|-----|------|
|                  |                   | T <sub>A</sub> = +25°C   |     | T <sub>A</sub> = −55°C to +125°C |     | T <sub>A</sub> = 0°C to 70°C  |     |      |
|                  |                   | V <sub>CC</sub> = +5.0 V |     | V <sub>CC</sub> = 5.0 V ± 10%    |     | V <sub>CC</sub> = 5.0 V ± 10% |     |      |
|                  |                   | C <sub>L</sub> = 50 pF   |     | C <sub>L</sub> = 50 pF           |     | C <sub>L</sub> = 50 pF        |     |      |
|                  |                   | Min                      | Max | Min                              | Max | Min                           | Max |      |
| t <sub>PLH</sub> | Propagation Delay | 2.4                      | 5.0 | 2.0                              | 7.0 | 2.4                           | 6.0 | ns   |
| t <sub>PHL</sub> | Propagation Delay | 1.5                      | 4.3 | 1.5                              | 6.5 | 1.5                           | 5.3 | ns   |