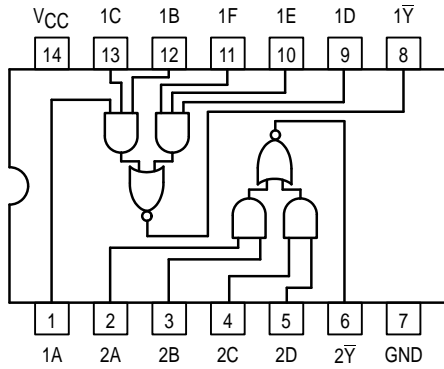




# DUAL 2-WIDE 2-INPUT, 2-WIDE 3-INPUT AND-OR-INVERT GATE

CONNECTION DIAGRAM

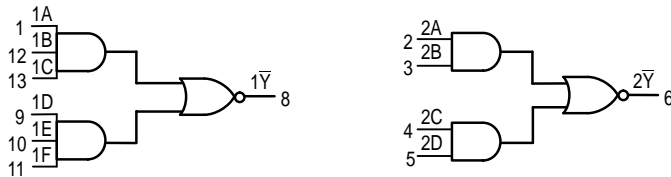


FUNCTION TABLE

| For 3-Input Gates      |   |   |        |   |   |        | For 2-Input Gates      |   |   |   |        |
|------------------------|---|---|--------|---|---|--------|------------------------|---|---|---|--------|
| Inputs                 |   |   | Inputs |   |   | Output | Inputs                 |   |   |   | Output |
| A                      | B | C | D      | E | F | 1Ȳ    | A                      | B | C | D | 2Ȳ    |
| H                      | H | H | X      | X | X | L      | H                      | H | X | X | L      |
| X                      | X | X | H      | H | H | L      | X                      | X | H | H | L      |
| All other combinations |   |   |        |   |   | H      | All other combinations |   |   |   | H      |

H = HIGH Voltage Level  
L = LOW Voltage Level  
X = Don't Care

LOGIC SYMBOL



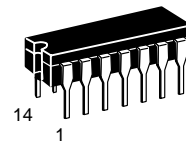
GUARANTEED OPERATING RANGES

| 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   |

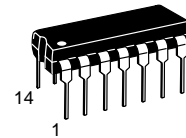
**MC54/74F51**

**DUAL 2-WIDE 2-INPUT, 2-WIDE 3-INPUT AND-OR-INVERT GATE**

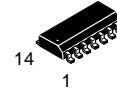
**FAST™ SCHOTTKY TTL**



**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

# MC54/74F51

## 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                   |                          |
| V <sub>IL</sub> | Input LOW Voltage                     |                  |     | 0.8  | V    | Guaranteed Input LOW Voltage                    |                          |
| V <sub>IK</sub> | Input Clamp Diode Voltage             |                  |     | -1.2 | V    | V <sub>CC</sub> = MIN, I <sub>IN</sub> = -18 mA |                          |
| V <sub>OH</sub> | Output HIGH Voltage                   | 54, 74           | 2.5 |      | V    | I <sub>OH</sub> = -1.0 mA                       | V <sub>CC</sub> = 4.50 V |
|                 |                                       | 74               | 2.7 |      | V    | I <sub>OH</sub> = -1.0 mA                       | V <sub>CC</sub> = 4.75 V |
| V <sub>OL</sub> | Output LOW Voltage                    |                  |     | 0.5  | V    | I <sub>OL</sub> = 20 mA                         | V <sub>CC</sub> = MIN    |
| 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                     |                  |     | -0.6 | mA   | V <sub>CC</sub> = MAX, V <sub>IN</sub> = 0.5 V  |                          |
| I <sub>OS</sub> | Output Short Circuit Current (Note 2) | -60              |     | -150 | mA   | V <sub>CC</sub> = MAX, V <sub>OUT</sub> = 0 V   |                          |
| I <sub>CC</sub> | Total Supply Current                  | I <sub>CCH</sub> | 1.8 | 3.0  | mA   | V <sub>IN</sub> = GND                           | V <sub>CC</sub> = MAX    |
|                 |                                       | I <sub>CCL</sub> | 5.5 | 7.5  |      | V <sub>IN</sub> = 4.5 V                         |                          |

### NOTES:

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

## AC ELECTRICAL CHARACTERISTICS

| Symbol           | Parameter                        | 54/74F   |     |     | 54F   |     | 74F  |     | Unit |
|------------------|----------------------------------|--|-----|-----|---|-----|--|-----|------|
|                  |                                  | T <sub>A</sub> = +25°C<br>V <sub>CC</sub> = +5.0 V<br>C <sub>L</sub> = 50 pF |     |     | T <sub>A</sub> = -55°C to +125°C<br>V <sub>CC</sub> = 5.0 V ± 10%<br>C <sub>L</sub> = 50 pF |     | T <sub>A</sub> = 0°C to +70°C<br>V <sub>CC</sub> = 5.0 V ± 10%<br>C <sub>L</sub> = 50 pF |     |      |
|                  |                                  | Min  | Typ | Max | Min   | Max | Min  | Max |      |
| t <sub>PLH</sub> | Propagation Delay                | 2.0  |     | 5.5 | 1.5   | 7.5 | 1.5  | 6.5 | ns   |
| t <sub>PHL</sub> | A, B, C, D, E, F, to n $\bar{Y}$ | 1.0  |     | 4.0 | 1.0   | 5.5 | 1.0  | 4.5 |      |