

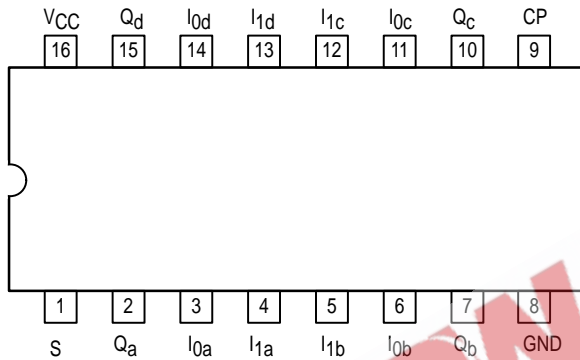


QUAD 2-PORT REGISTER

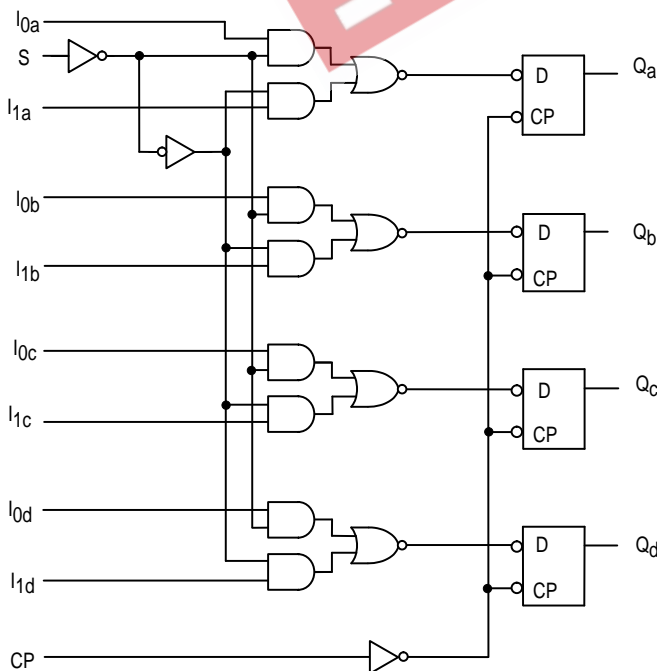
The MC54/74F399 is the logical equivalent of a quad 2-input multiplexer feeding into four edge-triggered flip flops. A common Select input determines which of the two 4-bit words is accepted. The selected data enters the flip-flops on the rising edge of the clock. The MC54/74F399 is the 16-pin version of the MC54/74F398, with only the Q outputs of the flip-flops available.

- Select Inputs from Two Data Sources
- Fully Positive Edge-Triggered Operation

CONNECTION DIAGRAM (TOP VIEW)



LOGIC DIAGRAM

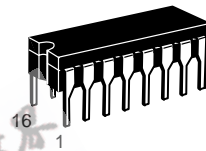


NOTE:
This diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

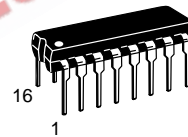
MC54/74F399

QUAD 2-PORT REGISTER

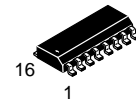
FAST™ SCHOTTKY TTL



J SUFFIX
CERAMIC
CASE 620-09



N SUFFIX
PLASTIC
CASE 648-08

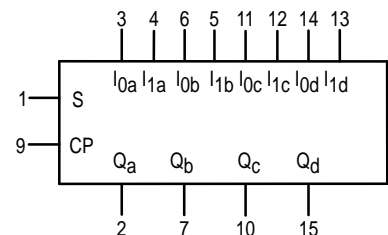


D SUFFIX
SOIC
CASE 751B-03

ORDERING INFORMATION

| | |
|-----------|---------|
| MC54FXXXJ | Ceramic |
| MC74FXXXN | Plastic |
| MC74FXXXD | SOIC |

LOGIC SYMBOL



VCC = PIN 16
GND = PIN 8

MC54/74F399

FUNCTIONAL DESCRIPTION

The MC54/74F399 is a high-speed quad 2-port register. It will select four bits of data from either of two sources (Ports) under control of a common Select input (S). The selected data is transferred to a 4-bit output register synchronous with the LOW-to-HIGH transition of the Clock input (CP). The 4-bit D-

type output register is fully edge-triggered. The Data inputs (I_{0x} , I_{1x}) and Select input (S) must be stable only a setup time prior to and hold time after the LOW-to-HIGH transition of the Clock input for predictable operation.

FUNCTION TABLE

| Inputs | | | Output |
|--------|-------|-------|--------|
| S | I_0 | I_1 | Q |
| l | l | X | L |
| l | h | X | H |
| h | X | l | L |
| h | X | h | H |

H = HIGH Voltage Level

L = LOW Voltage Level

h = HIGH Voltage Level one setup time prior to the LOW-to-HIGH clock transition

l = LOW Voltage Level one setup time prior to the LOW-to-HIGH clock transition

X = Don't Care

GUARANTEED OPERATING RANGES

| Symbol | Parameter | Min | Typ | Max | Unit | |
|----------|-------------------------------------|--------|-----|-----|------|----|
| V_{CC} | Supply Voltage | 54, 74 | 4.5 | 5.0 | 5.5 | V |
| T_A | Operating Ambient Temperature Range | 54 | -55 | 25 | 125 | °C |
| | | 74 | 0 | 25 | 70 | |
| I_{OH} | Output Current — High | 54, 74 | | | -1.0 | mA |
| I_{OL} | Output Current — Low | 54, 74 | | | 20 | mA |

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 | $I_{IN} = -18$ mA | $V_{CC} = \text{MIN}$ |
| V_{OH} | Output HIGH Voltage | 54, 74 | 2.5 | 3.4 | V | $I_{OH} = -1.0$ mA | $V_{CC} = 4.5$ V |
| | | 74 | 2.7 | 3.4 | V | $I_{OH} = -1.0$ mA | $V_{CC} = 4.75$ V |
| V_{OL} | Output LOW Voltage | | 0.35 | 0.5 | V | $I_{OL} = 20$ mA | $V_{CC} = \text{MIN}$ |
| I_{IH} | Input HIGH Current | | | 20 | μA | $V_{IN} = 2.7$ V | $V_{CC} = \text{MAX}$ |
| | | | | 100 | μA | $V_{IN} = 7.0$ V | |
| I_{IL} | Input LOW Current | | | -0.6 | mA | $V_{IN} = 0.5$ V | $V_{CC} = \text{MAX}$ |
| I_{OS} | Output Short Circuit Current (Note 2) | -60 | | -150 | mA | $V_{OUT} = 0$ V | $V_{CC} = \text{MAX}$ |
| I_{CC} | Power Supply Current | | 22 | 34 | mA | $V_{CC} = \text{MAX}$ | $V_{IN} = \text{GND}$ $CP = \sqrt{\quad}$ |

NOTES:

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

MC54/74F399

AC CHARACTERISTICS

| Symbol | Parameter | 54/74F | | | 54F | | 74F | | Unit |
|------------------|-------------------------|---|-----|-----|---|------|---|------|------|
| | | T _A = +25°C V _{CC} = +5.0V C _L = 50 pF | | | T _A = -55°C to +125°C V _{CC} = 5.0 V ± 10% C _L = 50 pF | | T _A = 0°C to 70°C V _{CC} = 5.0 V ± 10% C _L = 50 pF | | |
| | | Min | Typ | Max | Min | Max | Min | Max | |
| f _{max} | Maximum Clock Frequency | 100 | 140 | | 80 | | 100 | | MHz |
| t _{PLH} | Propagation Delay | 3.0 | 5.7 | 7.5 | 3.0 | 9.5 | 3.0 | 8.5 | ns |
| t _{PHL} | CP to Q | 3.0 | 6.8 | 9.5 | 3.0 | 11.5 | 3.0 | 10.0 | |

AC OPERATING REQUIREMENTS

| Symbol | Parameter | 54/74F | | | 54F | | 74F | | Unit |
|--------------------|-------------------------|---|-----|-----|---|-----|---|-----|------|
| | | T _A = +25°C V _{CC} = +5.0V | | | T _A = -55°C to +125°C V _{CC} = 5.0 V ± 10% | | T _A = 0°C to 70°C V _{CC} = 5.0 V ± 10% | | |
| | | Min | Typ | Max | Min | Max | Min | Max | |
| t _S (H) | Setup Time, HIGH or LOW | 3.0 | | | 4.5 | | 3.0 | | ns |
| t _S (L) | I _n to CP | 3.0 | | | 4.5 | | 3.0 | | |
| t _H (H) | Hold Time, HIGH or LOW | 1.0 | | | 1.5 | | 1.0 | | ns |
| t _H (L) | I _n to CP | 1.0 | | | 1.5 | | 1.0 | | |
| t _S (H) | Setup Time, HIGH or LOW | 7.5 | | | 9.5 | | 8.5 | | ns |
| t _S (L) | S to CP | 7.5 | | | 9.5 | | 8.5 | | |
| t _H (H) | Hold Time, HIGH or LOW | 0 | | | 0 | | 0 | | ns |
| t _H (L) | S to CP | 0 | | | 0 | | 0 | | |
| t _w (H) | CP Pulse Width | 4.0 | | | 4.0 | | 4.0 | | ns |
| t _w (L) | HIGH or LOW | 5.0 | | | 7.0 | | 5.0 | | |