



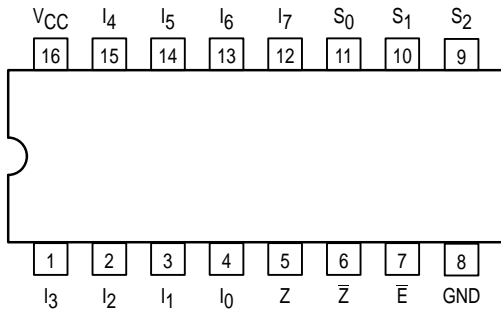
# 8-INPUT MULTIPLEXER

The MC54/74F151 is a high-speed 8-input digital multiplexer. It provides in one package, the ability to select one line of data from up to eight sources. The F151 can be used as a universal function generator to generate any logic function of four variables. Both asserted and negated outputs are provided.

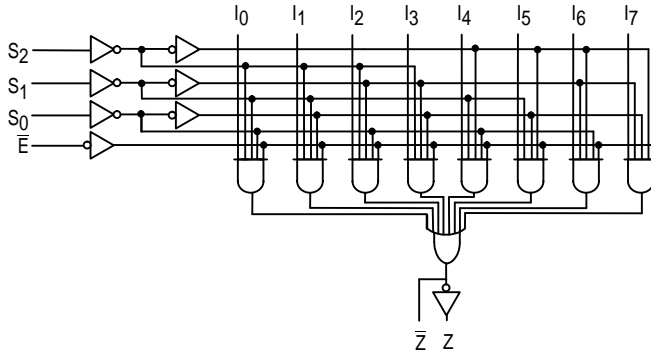
The F151 is a logic implementation of a single pole, 8-position switch with the switch position controlled by the state of three Select inputs,  $S_0, S_1, S_2$ . The Enable input ( $\bar{E}$ ) is active LOW. The logic function provided at the output is:

$$Z = \bar{E} \cdot (I_0 \cdot \bar{S}_0 \cdot \bar{S}_1 \cdot \bar{S}_2 + I_1 \cdot S_0 \cdot \bar{S}_1 \cdot \bar{S}_2 + I_2 \cdot \bar{S}_0 \cdot S_1 \cdot \bar{S}_2 + I_3 \cdot S_0 \cdot S_1 \cdot \bar{S}_2 + I_4 \cdot \bar{S}_0 \cdot \bar{S}_1 \cdot S_2 + I_5 \cdot S_0 \cdot \bar{S}_1 \cdot S_2 + I_6 \cdot \bar{S}_0 \cdot S_1 \cdot S_2 + I_7 \cdot S_0 \cdot S_1 \cdot S_2)$$

CONNECTION DIAGRAM DIP (TOP VIEW)



LOGIC DIAGRAM



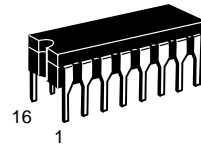
FUNCTION TABLE

Inputs				Outputs	
$\bar{E}$	$S_2$	$S_1$	$S_0$	$\bar{Z}$	Z
H	X	X	X	H	L
L	L	L	L	$\bar{I}_0$	$I_0$
L	L	L	H	$\bar{I}_1$	$I_1$
L	L	H	L	$\bar{I}_2$	$I_2$
L	L	H	H	$\bar{I}_3$	$I_3$
L	H	L	L	$\bar{I}_4$	$I_4$
L	H	L	H	$\bar{I}_5$	$I_5$
L	H	H	L	$\bar{I}_6$	$I_6$
L	H	H	H	$\bar{I}_7$	$I_7$

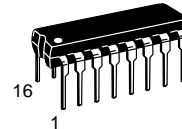
H = HIGH Voltage Level; L = LOW Voltage Level; X = Don't Care

## MC54/74F151

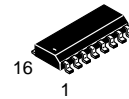
### 8-INPUT MULTIPLEXER FAST™ SHOTTKY TTL



J SUFFIX  
CERAMIC  
CASE 620-09



N SUFFIX  
PLASTIC  
CASE 648-08

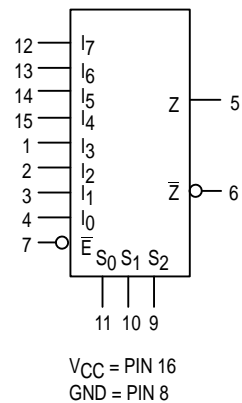


D SUFFIX  
SOIC  
CASE 751B-03

#### ORDERING INFORMATION

MC54FXXXJ Ceramic  
MC74FXXXN Plastic  
MC74FXXXD SOIC

#### LOGIC SYMBOL



# MC54/74F151

## 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

## 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	I <sub>IN</sub> = -18 mA	V <sub>CC</sub> = MIN
V <sub>OH</sub>	Output HIGH Voltage	54, 74	2.5	3.4	V	I <sub>OH</sub> = -1.0 mA	V <sub>CC</sub> = 4.50 V
		74	2.7	3.4	V	I <sub>OH</sub> = -1.0 mA	V <sub>CC</sub> = 4.75 V
V <sub>OL</sub>	Output LOW Voltage		0.35	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	
				100	μA	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>	Power Supply Current		13.5	21	mA	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 4.5 V	

### 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.

## AC CHARACTERISTICS

Symbol	Parameter	54/74F		54F		74F		Unit
		T <sub>A</sub> = +25°C V <sub>CC</sub> = +5.0 V C <sub>L</sub> = 50 pF		T <sub>A</sub> = -55°C to +125°C V <sub>CC</sub> = 5.0 V ±10% C <sub>L</sub> = 50 pF		T <sub>A</sub> = 0°C to 70°C V <sub>CC</sub> = 5.0 V ±10% C <sub>L</sub> = 50 pF		
		Min	Max	Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay	4.0	8.0	3.5	10	3.5	9.0	ns
t <sub>PHL</sub>	S <sub>n</sub> to $\bar{Z}$	3.2	6.1	3.0	8.0	3.2	7.0	
t <sub>PLH</sub>	Propagation Delay	4.5	13	3.0	17.5	4.0	14	ns
t <sub>PHL</sub>	S <sub>n</sub> to Z	4.5	9.0	4.0	11.5	4.0	10.5	
t <sub>PLH</sub>	Propagation Delay	3.0	6.1	2.5	7.5	2.5	7.0	ns
t <sub>PHL</sub>	$\bar{E}$ to $\bar{Z}$	3.0	8.5	2.5	10.5	2.5	10	
t <sub>PLH</sub>	Propagation Delay	5.0	9.5	3.0	14.5	4.0	11	ns
t <sub>PHL</sub>	$\bar{E}$ to Z	3.5	7.0	3.0	9.5	3.5	8.0	
t <sub>PLH</sub>	Propagation Delay	2.5	5.7	2.5	7.5	2.5	6.5	ns
t <sub>PHL</sub>	I <sub>n</sub> to $\bar{Z}$	1.5	4.0	1.5	6.0	1.5	5.0	
t <sub>PLH</sub>	Propagation Delay	3.0	9.5	2.5	11.5	2.5	11	ns
t <sub>PHL</sub>	I <sub>n</sub> to Z	3.0	6.5	3.0	8.0	3.0	7.5	