

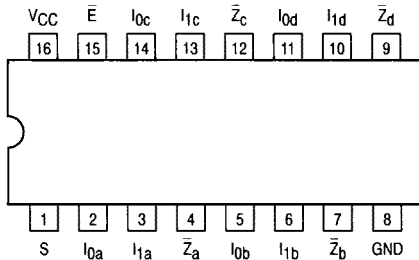


# QUAD 2-INPUT MULTIPLEXER

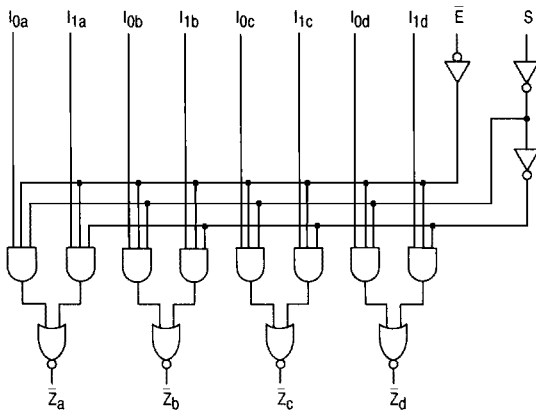
The MC74F158A is a high-speed quad 2-input multiplexer. It selects four bits of data from two sources using the common Select and Enable inputs. The four buffered outputs present the selected data in the inverted form. The F158A can also generate any four of the 16 different functions of two variables.

- AC Enhanced Version of the F158

CONNECTION DIAGRAM DIP (TOP VIEW)



LOGIC DIAGRAM



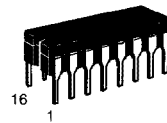
FUNCTION TABLE

Inputs				Output
$\bar{E}$	S	$I_0$	$I_1$	Z
H	X	X	X	H
L	L	L	X	H
L	L	H	X	L
L	H	X	L	H
L	H	X	H	L

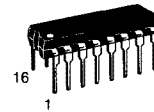
H = HIGH Voltage Level; L = LOW Voltage Level; X = Don't Care

## MC74F158A

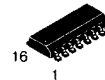
### QUAD 2-INPUT MULTIPLEXER FAST™ SHOTTKY TTL



J SUFFIX  
CERAMIC  
CASE 620-09



N SUFFIX  
PLASTIC  
CASE 648-08

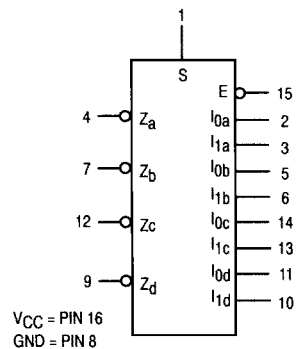


D SUFFIX  
SOIC  
CASE 751B-03

#### ORDERING INFORMATION

MC74FXXXJ Ceramic  
MC74FXXXN Plastic  
MC74FXXXD SOIC

LOGIC SYMBOL



# MC74F158A

## GUARANTEED OPERATING RANGES

Symbol	Parameter		Min	Typ	Max	Unit
V <sub>CC</sub>	Supply Voltage	74	4.5	5.0	5.5	V
T <sub>A</sub>	Operating Ambient Temperature Range	74	0	25	70	°C
I <sub>OH</sub>	Output Current — High	74			-1.0	mA
I <sub>OL</sub>	Output Current — Low	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	74	2.7	3.4	V	I <sub>OH</sub> = -1.0 mA	V <sub>CC</sub> = 4.75 V
		74	2.5				V <sub>CC</sub> = 4.50 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>IN</sub> = 2.7 V	V <sub>CC</sub> = MAX
				100	μA	V <sub>IN</sub> = 7.0 V	
I <sub>IL</sub>	Input LOW Current			-0.6	mA	V <sub>IN</sub> = 0.5 V	V <sub>CC</sub> = MAX
I <sub>OS</sub>	Output Short Circuit Current (Note 2)	-60		-150	mA	V <sub>OUT</sub> = 0 V	V <sub>CC</sub> = MAX
I <sub>CC</sub>	Power Supply Current (Note 3)		10	15	mA	V <sub>CC</sub> = MAX, V <sub>IN</sub> = HIGH	

### 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.
- I<sub>CC</sub> measured with outputs open and 4.5 V applied to all inputs.

## AC CHARACTERISTICS

Symbol	Parameter	74F		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> = 0°C to 70°C V <sub>CC</sub> = 5.0 V ±10% C <sub>L</sub> = 50 pF		
		Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay	3.0	8.5	3.0	9.5	ns
t <sub>PHL</sub>	S to $\bar{Z}$	2.5	6.5	2.5	7.0	
t <sub>PLH</sub>	Propagation Delay	2.5	6.0	2.5	7.0	ns
t <sub>PHL</sub>	$\bar{E}$ to $\bar{Z}_n$	2.0	6.0	2.0	6.5	
t <sub>PLH</sub>	Propagation Delay	2.0	5.9	2.0	7.0	ns
t <sub>PHL</sub>	I <sub>n</sub> to $\bar{Z}$	1.0	4.0	1.0	4.5	

## FUNCTIONAL DESCRIPTION

The F158A quad 2-input multiplexer selects four bits of data from two sources under the control of a common Select input (S) and presents the data in inverted form at the four outputs. The Enable input ( $\bar{E}$ ) is active LOW. When  $\bar{E}$  is HIGH, all of the outputs ( $\bar{Z}$ ) are forced HIGH regardless of all other inputs. The F158A is the logic implementation of a 4-pole, 2-position switch where the position of the switch is determined by the logic levels supplied to the Select input.

A common use of the F158A is the moving of data from two groups of registers to four common output busses. The particular register from which the data comes is determined by the state of the Select input. A less obvious use is as a function generator. The F158A can generate four functions of two variables with one variable in common. This is useful for implementing gating functions.