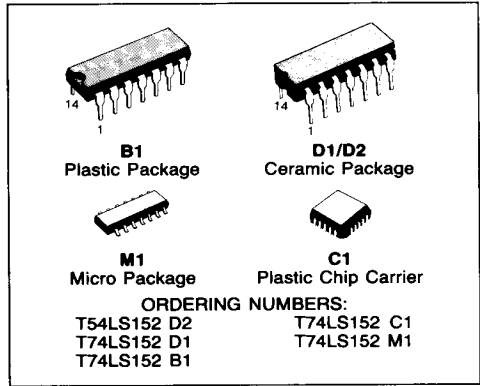




8-INPUT MULTIPLEXER

DESCRIPTION

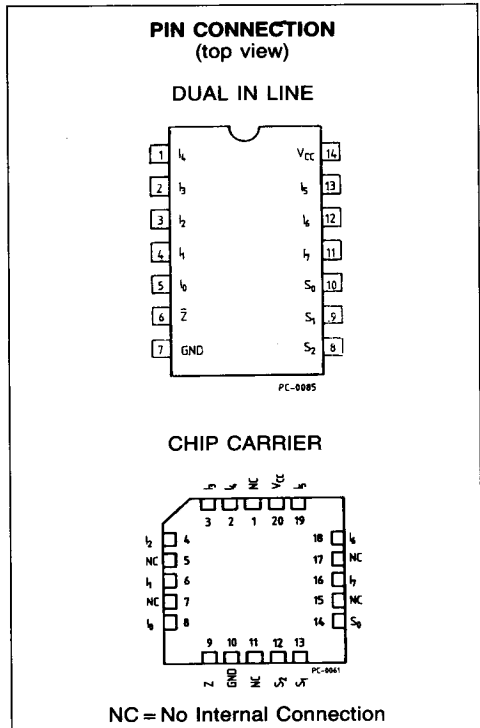
The T54LS152/T74LS152 is a MSI high speed 8-Input Digital Multiplexer. It provides, in one package, the ability to select one bit of data from up to eight sources. It can be used as a universal function generator to generate any logic function of four variables.



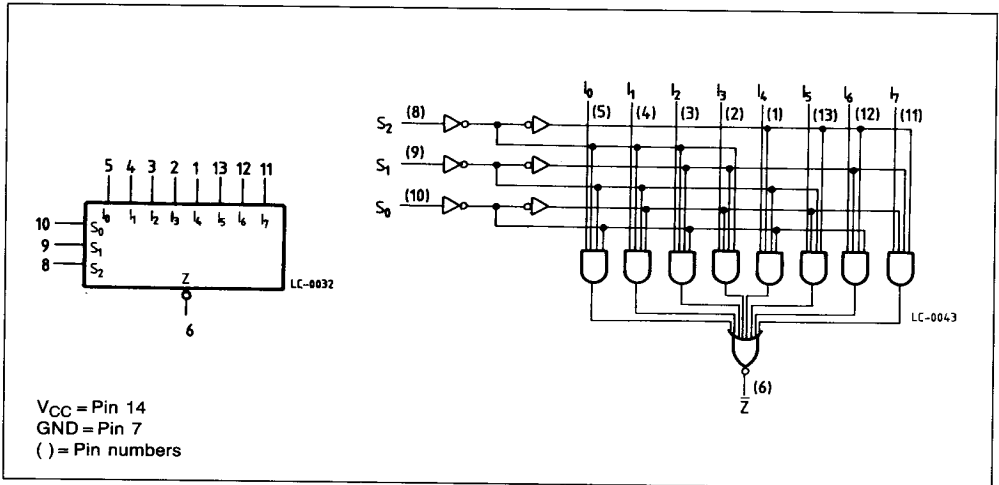
- SCHOTTKY PROCESS FOR HIGH SPEED
- MULTIFUNCTION CAPABILITY
- ON-CHIP SELECT LOGIC DECODING
- INPUT CLAMP DIODES LIMIT HIGH SPEED TERMINATION EFFECTS
- FULLY TTL AND CMOS COMPATIBLE

PIN NAMES

S_0 - S_2	Select Input
I_0 - I_7	Multiplexer Inputs
\bar{Z}	Complementary Multiplexer



LOGIC SYMBOL AND LOGIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	- 0.5 to 7	V
V_I	Input Voltage, Applied to Input	- 1.5 to 15	V
V_O	Output Voltage, Applied to Output	- 0.5 to 5.5	V
I_I	Input Current, Into Inputs	- 30 to 5	mA
I_O	Output Current, Into Outputs	60	mA

Stresses in excess of those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions in excess of those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

GUARANTEED OPERATING RANGES

Part Numbers	Supply Voltage			Temperature
	Min	Typ	Max	
T54LS152D2	4.5 V	5.0 V	5.5 V	-55°C to +125°C
T74LS152XX	4.75 V	5.0 V	5.25 V	0°C to +70°C

XX = package type.

FUNCTIONAL DESCRIPTION

This device is a logical 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 logic function provided at the output is:

This device provides the ability, in one package, to select from eight sources of data or control information.

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

TRUTH TABLE

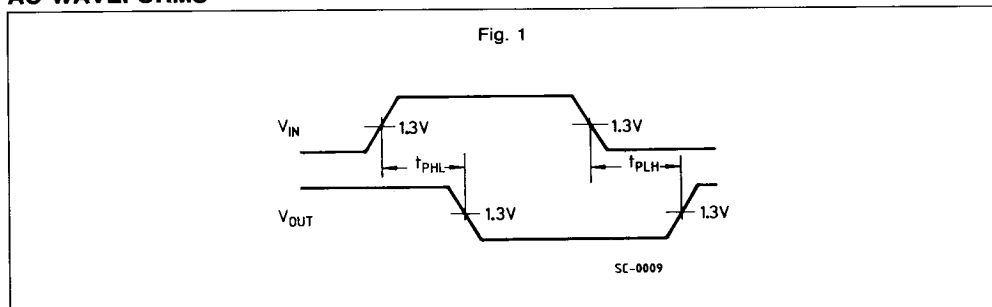
S_2	S_1	S_0	I_0	I_1	I_2	I_3	I_4	I_5	I_6	I_7	\bar{Z}
L	L	L	L	X	X	X	X	X	X	X	H
L	L	L	H	X	X	X	X	X	X	X	L
L	L	H	X	L	X	X	X	X	X	X	H
L	L	H	X	H	X	X	X	X	X	X	L
L	H	L	X	X	L	X	X	X	X	X	H
L	H	L	X	X	H	X	X	X	X	X	L
L	H	H	X	X	X	L	X	X	X	X	H
L	H	H	X	X	X	H	X	X	X	X	L
H	L	L	X	X	X	X	L	X	X	X	H
H	L	L	X	X	X	X	H	X	X	X	L
H	L	H	X	X	X	X	X	L	X	X	H
H	L	H	X	X	X	X	X	H	X	X	L
H	H	L	X	X	X	X	X	X	L	X	H
H	H	L	X	X	X	X	X	X	H	X	L
H	H	H	X	X	X	X	X	X	X	L	H
H	H	H	X	X	X	X	X	X	X	H	L

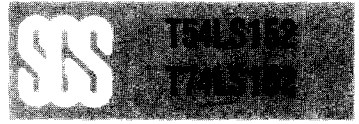
H = HIGH Voltage Level

L = LOW Voltage Level

X = Don't Care

AC WAVEFORMS





DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE

Symbol	Parameter		Limits			Test Conditions (Note 1)	Units
			Min.	Typ.	Max.		
V _{IH}	Input HIGH Voltage		2.0			Guaranteed input HIGH Threshold Voltage for all Inputs	V
V _{IL}	Input LOW Voltage	54			0.7	Guaranteed input LOW Threshold Voltage for all Inputs	V
		74			0.8		
V _{CD}	Input Clamp Diode Voltage			-0.65	-1.5	V _{CC} = MIN, I _{IN} = -18mA	V
V _{OH}	Output HIGH Voltage	54	2.5	3.4		V _{CC} = MIN, I _{OH} = -400µA, V _{IN} = V _{IH} or V _{IL} per Truth Table	V
		74	2.7	3.4			
V _{OL}	Output LOW Voltage	54,74		0.25	0.4	V _{CC} = MIN V _{IN} = V _{IH} or V _{IL} per Truth Table	V
		74		0.35	0.5		
I _{IH}	Input HIGH Current				20 0.1	V _{CC} = MAX, V _{IN} = 2.7V V _{CC} = MAX, V _{IN} = 7.0V	µA mA
I _{IL}	Input LOW Current				-0.4	V _{CC} = MAX, V _{IN} = 0.4V	mA
I _{OS}	Output Short Circuit Current (Note 2)		-20		-100	V _{CC} = MAX, V _{OUT} = 0V	mA
I _{CC}	Power Supply Current			6.0	9.0	V _{CC} = MAX	mA

AC CHARACTERISTICS: T_A = 25°C

Symbol	Parameter		Limits			Test Conditions	Units
			Min.	Typ.	Max.		
t _{PLH} t _{PHL}	Propagation Delay, Select to \bar{Z} Output			14 20	23 32	Fig. 1	V _{CC} = 5.0V C _L = 15pF
t _{PLH} t _{PHL}	Propagation Delay, Data to \bar{Z} Output			13 12	21 20	Fig. 1	

Notes:

- 1) Conditions for testing, not shown in the Table, are chosen to guarantee operation under "wrost case" conditions.
- 2) Not more than one output should be shorted at a time.
- 3) Typical values are at V_{CC} = 5.0V, T_A = 25°C