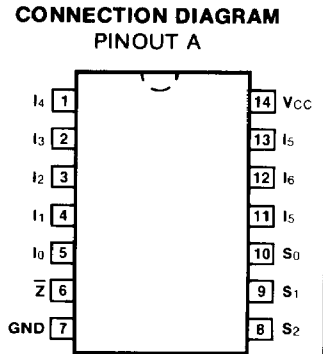


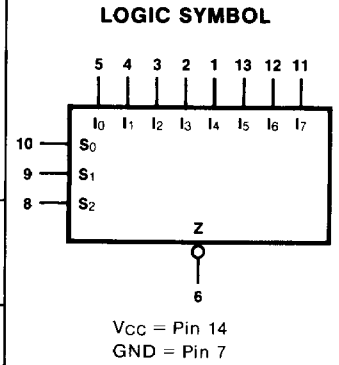
6/0169  
**54/74152A**  
**54LS/74LS152** 010170  
**8-INPUT MULTIPLEXER**



**DESCRIPTION** — The '152 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 '152 can be used as a universal function generator to generate any logic function of four variables. It is supplied in Flatpak only; for Dual In-line Package applications use the 'LS151.

**ORDERING CODE:** See Section 9

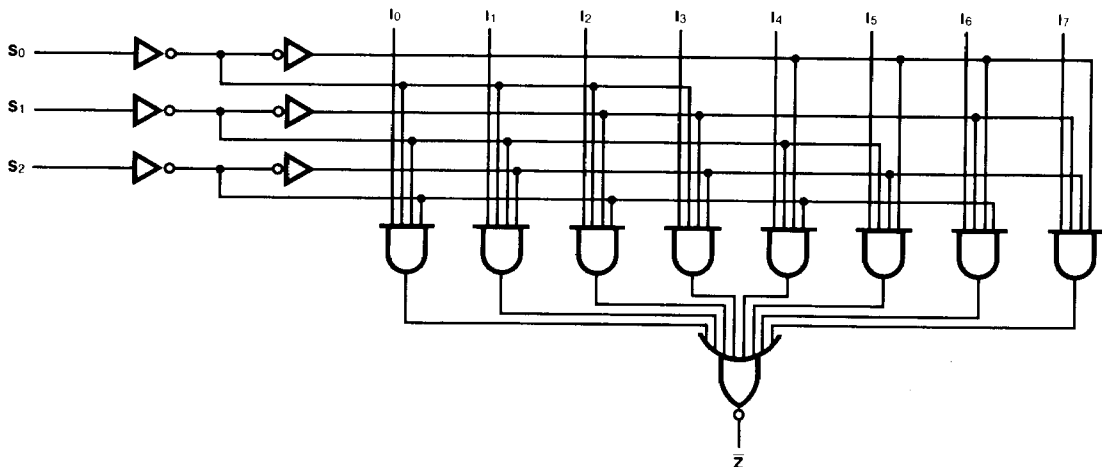
PKGS	PIN OUT	COMMERCIAL GRADE	MILITARY GRADE	PKG TYPE
		V <sub>CC</sub> = +5.0 V ±5%, T <sub>A</sub> = 0° C to +70° C	V <sub>CC</sub> = +5.0 V ±10%, T <sub>A</sub> = -55° C to +125° C	
Flatpak (F)	A	74152AFC, 74LS152FC	54152AFM, 54LS152FM	31



**INPUT LOADING/FAN-OUT:** See Section 3 for U.L. definitions

PIN NAMES	DESCRIPTION	54/74 (U.L.) HIGH/LOW	54/74LS (U.L.) HIGH/LOW
I <sub>0</sub> — I <sub>7</sub>	Data Inputs	1.0/1.0	0.5/0.25
S <sub>0</sub> — S <sub>2</sub>	Select Inputs	1.0/1.0	0.5/0.25
Z̄	Inverted Data Output	20/10	10/5.0 (2.5)

**LOGIC DIAGRAM**



**FUNCTIONAL DESCRIPTION** — The '152 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:

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

The '152 provides the ability, in one package, to select from eight sources of data or control information.

**TRUTH TABLE**

INPUTS			OUTPUT
$S_2$	$S_1$	$S_0$	$\bar{Z}$
L	L	L	$\bar{I}_0$
L	L	H	$\bar{I}_1$
L	H	L	$\bar{I}_2$
L	H	H	$\bar{I}_3$
H	L	L	$\bar{I}_4$
H	L	H	$\bar{I}_5$
H	H	L	$\bar{I}_6$
H	H	H	$\bar{I}_7$

H = HIGH Voltage Level  
L = LOW Voltage Level

**DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE** (unless otherwise specified)

SYMBOL	PARAMETER	54/74		54/74LS		UNITS	CONDITIONS	
		Min	Max	Min	Max			
$I_{OS}$	Output Short Circuit Current	XM	-20	-55	-20	-100	mA	$V_{CC} = \text{Max}$
		XC	-18	-55	-20	-100		
$I_{CC}$	Power Supply Current	43		9.0		mA	$V_{CC} = \text{Max}$	

**AC CHARACTERISTICS:**  $V_{CC} = +5.0V$ ,  $T_A = +125^\circ C$  (See Section 3 for waveforms and load configurations)

SYMBOL	PARAMETER	54/74		54/74LS		UNITS	CONDITIONS
		$C_L = 15 \text{ pF}$ $R_L = 400 \Omega$		$C_L = 15 \text{ pF}$			
		Min	Max	Min	Max		
$t_{PLH}$ $t_{PHL}$	Propagation Delay $S_n$ to $\bar{Z}$	26 30		23 32		ns	Figs. 3-1, 3-20
$t_{PLH}$ $t_{PHL}$	Propagation Delay $I_n$ to $\bar{Z}$	14 14		21 20		ns	Figs. 3-1, 3-4