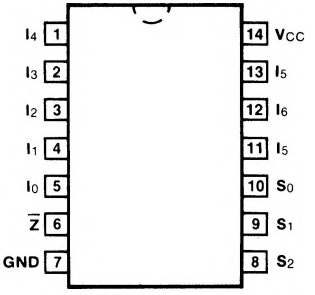
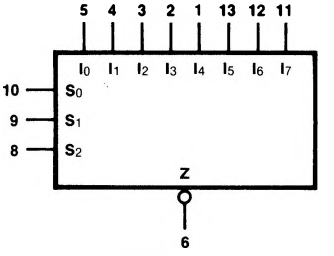
54/74152A
54LS/74LS152
8-INPUT MULTIPLEXER

CONNECTION DIAGRAM
PINOUT A



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.

LOGIC SYMBOL



VCC = Pin 14
GND = Pin 7

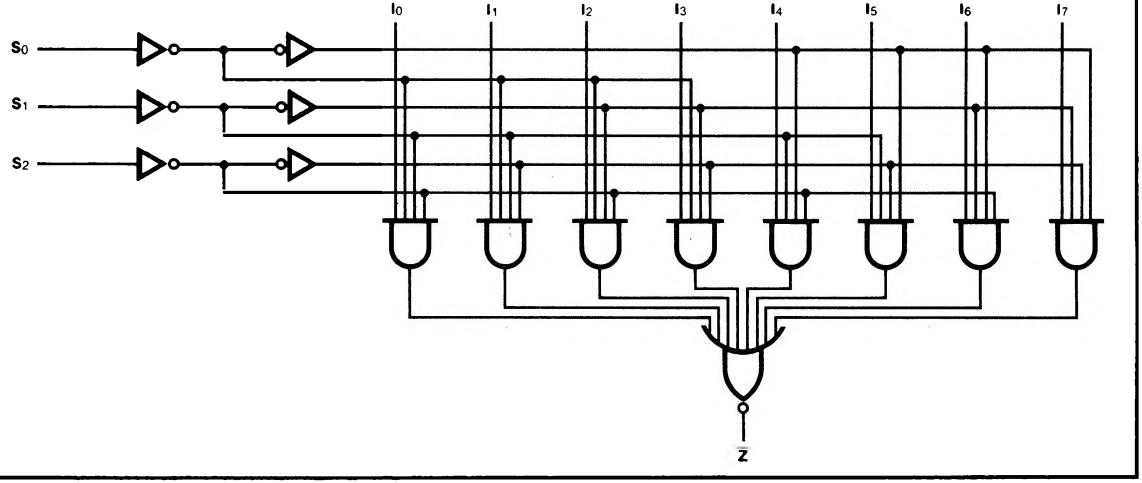
ORDERING CODE: See Section 9

PKGS	PIN OUT	COMMERCIAL GRADE	MILITARY GRADE	PKG TYPE
		VCC = +5.0 V ±5%, TA = 0° C to +70° C	VCC = +5.0 V ±10%, TA = -55° C to +125° C	
Flatpak (F)	A	74152AFC, 74LS152FC	54152AFM, 54LS152FM	3I

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
$I_0 - I_7$	Data Inputs	1.0/1.0	0.5/0.25
$S_0 - S_2$	Select Inputs	1.0/1.0	0.5/0.25
$\overline{Z}$	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:

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

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} = Max
		XC	-18	-55	-20	-100		
I_{CC}	Power Supply Current			43		9.0	mA	V_{CC} = Max

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

SYMBOL	PARAMETER	54/74		54/74LS		UNITS	CONDITIONS
		C_L = 15 pF, R_L = 400 Ω		C_L = 15 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