

54/74154  
54LS/74LS154

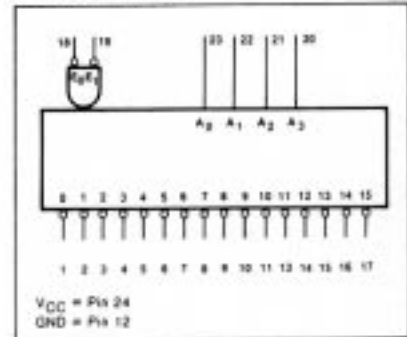
DESCRIPTION

The "154" is a 4-line to 16-line Decoder/Demultiplexer with a 2-input enable gate. It is designed to accept 4-bits of binary data and provide 1-of-16 mutually exclusive active LOW outputs. The enable can be used as a data input to demultiplex up to 16-bits of serial data.

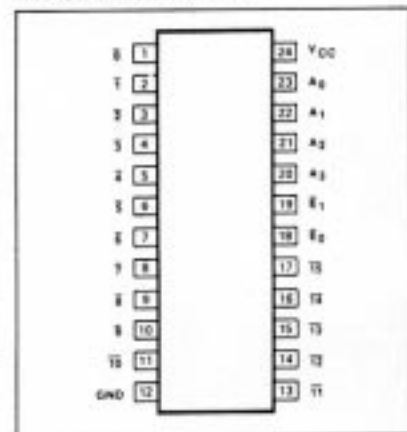
FEATURES

- 16-line demultiplexing capability
- Mutually exclusive outputs
- 2-input enable gate for strobing or expansion

LOGIC SYMBOL



PIN CONFIGURATION



ORDERING CODE (See Section 9 for further Package and Ordering Information)

PACKAGES	COMMERCIAL RANGES $V_{CC}=5V \pm 5\%$ ; $T_A=0^\circ C$ to $+70^\circ C$		MILITARY RANGES $V_{CC}=5V \pm 10\%$ ; $T_A=-55^\circ C$ to $+125^\circ C$	
	Plastic DIP	N74154N	• N74LS154N	
Ceramic DIP	N74154F	• N74LS154F	S54154F	• S54LS154F
Flatpak			S54154W	• S54LS154W

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE <sup>(a)</sup>

PINS	DESCRIPTION		54/74	54S/74S	54LS/74LS
$A_0 - A_3$	Address inputs	$I_H$ ( $\mu A$ )	40		20
		$I_L$ (mA)	-1.6		-0.36
$\bar{E}_0, \bar{E}_1$	Enable (active LOW) inputs	$I_H$ ( $\mu A$ )	40		20
		$I_L$ (mA)	-1.6		-0.36
$\bar{O} - \bar{15}$	Active LOW outputs	$I_{OH}$ ( $\mu A$ )	-800		-400
		$I_{OL}$ (mA)	16		4/8(a)

NOTE

a. The dashed numbers indicate different parametric values for Military/Commercial temperature ranges respectively.

**FUNCTIONAL DESCRIPTION**

The "154" decoder accepts four active HIGH binary address inputs and provides 16 mutually exclusive active LOW outputs. The 2-input enable gate can be used to strobe the decoder to eliminate the normal decoding "glitches" on the outputs, or it can be used for expansion of the decoder. The enable gate has two AND'ed inputs which must be LOW to enable the outputs.

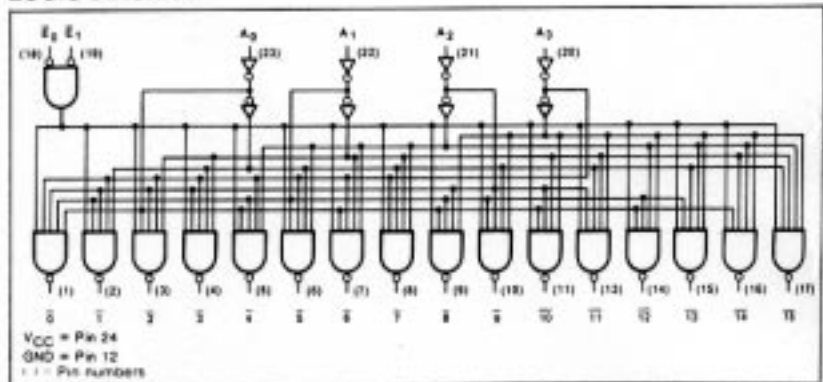
The "154" can be used as a 1-of-16 demultiplexer by using one of the enable inputs as the multiplexed data input. When the other enable is LOW, the addressed output will follow the state of the applied data.

**TRUTH TABLE**

INPUTS					OUTPUTS																	
$\bar{E}_0$	$\bar{E}_1$	A <sub>3</sub>	A <sub>2</sub>	A <sub>1</sub>	A <sub>0</sub>	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
L	H	X	X	X	X	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
H	L	X	X	X	X	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
H	H	X	X	X	X	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	L	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	L	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	H	L	L	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	H	H	L	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H
L	L	L	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H
L	L	L	H	L	L	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H
L	L	L	H	L	H	L	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H
L	L	L	H	L	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H
L	L	L	H	L	L	L	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H
L	L	L	H	L	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H
L	L	L	H	L	L	L	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H
L	L	L	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H
L	L	L	H	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H
L	L	L	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H
L	L	L	H	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H
L	L	L	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L
L	L	L	H	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L

H = HIGH voltage level  
 L = LOW voltage level  
 X = Don't care

**LOGIC DIAGRAM**



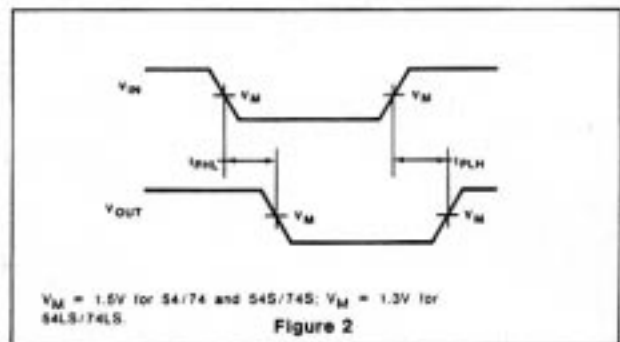
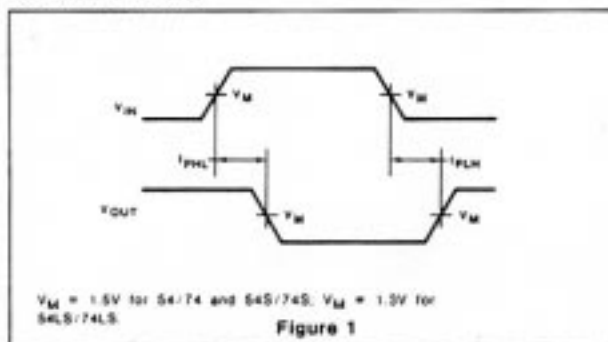
DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE<sup>(b)</sup>

PARAMETER	TEST CONDITIONS	54/74		54S/74S		54LS/74LS		UNIT
		Min	Max	Min	Max	Min	Max	
$I_{CC}$ Supply current	$V_{CC} = \text{Max}$	Mil		49			14	mA
		Com		56			14	mA

AC CHARACTERISTICS:  $T_A = 25^\circ\text{C}$  (See Section 4 for test circuits and conditions)

PARAMETER	TEST CONDITIONS	54/74		54S/74S		54LS/74LS		UNIT
		$C_L = 15\text{pF}$ $R_L = 400\Omega$				$C_L = 15\text{pF}$ $R_L = 2\text{k}\Omega$		
		Min	Max	Min	Max	Min	Max	
$t_{PLH}$ Propagation delay $t_{PHL}$ Address to output	Figure 1		36				36	ns
			33				33	ns
$t_{PLH}$ Propagation delay $t_{PHL}$ Enable to output	Figure 2		30				30	ns
			27				27	ns

## AC WAVEFORMS



## NOTE

b. For family dc characteristics, see inside front cover for 54/74 and 54H/74H, and see inside back cover for 54LS/74LS specification.