

# GD54/74LS153

## DUAL 4-LINE TO 1 – LINE DATA SELECTORS/MULTIPLEXERS

### Feature

- Permits Multiplexing from N Lines to 1 Line
- Performs Parallel-to-Serial Conversion
- Strobe (Enable) Line Provided for Cascading (N Lines to n Lines)
- High-Fan-Out, Low-Impedance, Totem Pole Outputs
- Fully Compatible with Most TTL and DTL Circuits

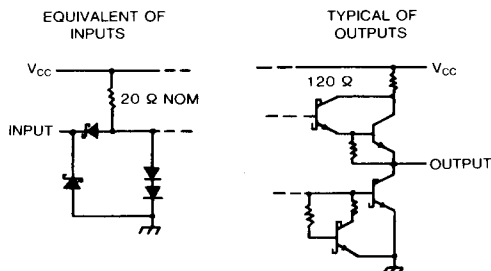
### Description

This monolithic data selectors/multiplexers contains inverters and drivers to supply fully complementary, on-chip binary decoding data selection to the AND/OR invert gates. Separate strobe inputs are provided for each of the two four line sections.

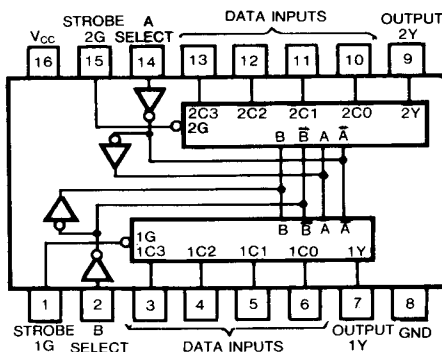
### Function Table

SELECT INPUTS		DATA INPUTS				STROBE	OUTPUT
B	A	C0	C1	C2	C3	G	Y
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

### Schematics of Inputs and Outputs

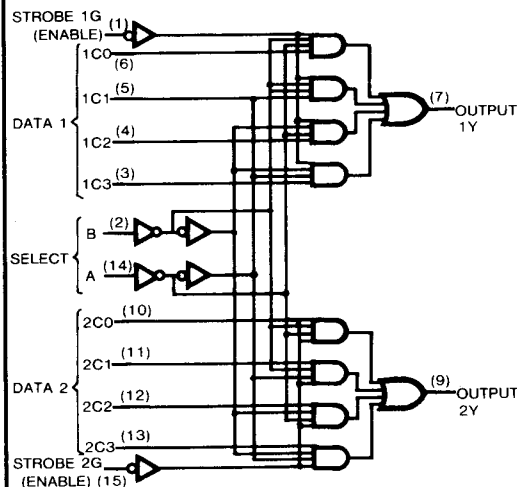


### Pin Configuration



Suffix-Blank: Plastic Dual In Line Package  
 Suffix-J : Ceramic Dual In Line Package

### Functional Block Diagram



**Absolute Maximum Ratings**

- Supply voltage,  $V_{CC}$  ..... 7V
- Input voltage ..... 7V
- Operating free-air temperature range 54LS .....  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$   
74LS .....  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$
- Storage temperature range .....  $-65^{\circ}\text{C}$  to  $150^{\circ}\text{C}$

**Recommended Operating Conditions**

SYMBOL	PARAMETER		MIN	NOM	MAX	UNIT
$V_{CC}$	Supply voltage	54	4.5	5	5.5	V
		74	4.75	5	5.25	
$I_{OH}$	High-level output current	54, 74			-400	$\mu\text{A}$
$I_{OL}$	Low-level output current	54			4	mA
		74			8	
$T_A$	Operating free-air temperature	54	-55		125	$^{\circ}\text{C}$
		74	0		70	

**Electrical Characteristics** over recommended operating free-air temperature range (unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP (Note 1)	MAX	UNIT
$V_{IH}$	High-level input voltage		2			V
$V_{IL}$	Low-level input voltage	54		0.7		V
		74		0.8		
$V_{IK}$	Input clamp voltage	$V_{CC} = \text{Min}, I_I = -18\text{mA}$			-1.5	V
$V_{OH}$	High-level output voltage	$V_{CC} = \text{Min}, V_{IL} = \text{Max}$	54	2.5	3.4	V
		$I_{OH} = \text{Max}, V_{IH} = \text{Min}$	74	2.7	3.4	
$V_{OL}$	Low-level output voltage	$V_{CC} = \text{Min}, I_{OL} = 4\text{mA}$	54, 74	0.25	0.4	V
		$V_{IL} = \text{Max}, V_{IH} = \text{Min}, I_{OL} = 8\text{mA}$	74	0.35	0.5	
$I_I$	Input current at maximum input voltage	$V_{CC} = \text{Max}, V_I = 7\text{V}$			0.1	mA
$I_{IH}$	High-level input current	$V_{CC} = \text{Max}, V_I = 2.7\text{V}$			20	$\mu\text{A}$
$I_{IL}$	Low-level input current	$V_{CC} = \text{Max}, V_I = 0.4\text{V}$			-0.4	mA
$I_{OS}$	Short-circuit output current	$V_{CC} = \text{Max}$ (Note 2)	-20		-100	mA
$I_{CCL}$	Supply current	$V_{CC} = 5.25\text{V}$ (Note 3)		7.4	12	mA

Note 1: All typical values are at  $V_{CC} = 5\text{V}$ ,  $T_A = 25^{\circ}\text{C}$ .

Note 2: Not more than one output should be shorted at a time, and duration should not exceed one second.

Note 3:  $I_{CCL}$  is measured with the outputs open and all inputs grounded.

**Switching Characteristics,  $V_{CC} = 5\text{V}$ ,  $T_A = 25^{\circ}\text{C}$** 

SYMBOL	FROM (INPUT)	TO (OUTPUT)	TEST CONDITION#	MIN	TYP	MAX	UNIT
$t_{PLH}$	Data	Y	$C_L = 15\text{ pF}, R_L = 2\text{ k}\Omega$	10	15		ns
$t_{PHL}$	Data	Y		17	26		ns
$t_{PLH}$	Select	Y		19	29		ns
$t_{PHL}$	Select	Y		25	38		ns
$t_{PLH}$	Strobe	Y		16	24		ns
$t_{PHL}$	Strobe	Y		21	32		ns

#For load circuit and voltage waveforms, see page 3-11.