

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

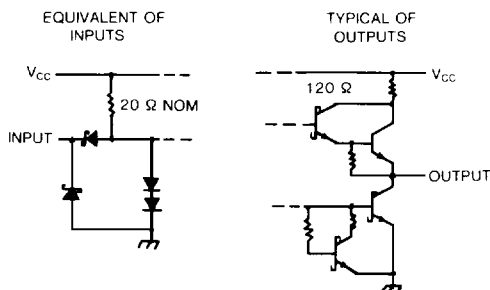
Description

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.

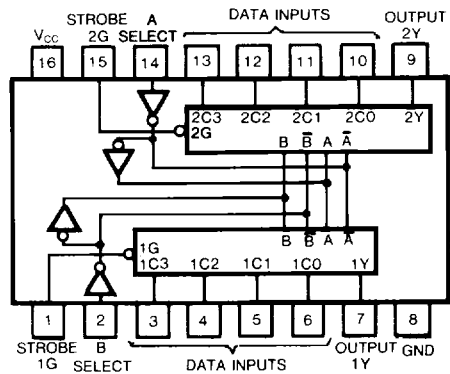
Function Table

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

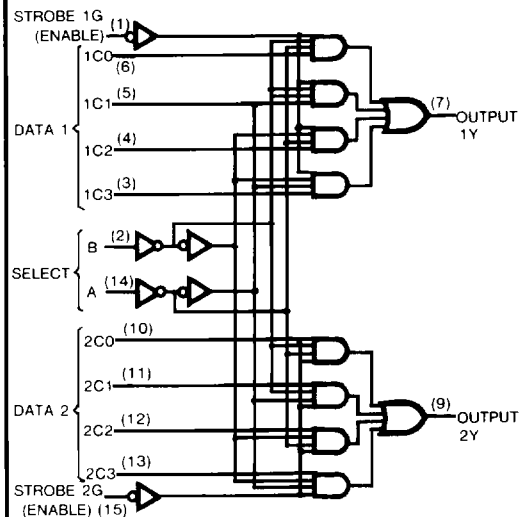


Pin Configuration



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°C to 125°C
74LS 0°C to 70°C
- Storage temperature range -65°C to 150°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	μA
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	$V_{CC} = \text{Min}, V_{IL} = \text{Max}, V_{IH} = \text{Min}$	54,74		0.25	0.4	V
		$I_{OL} = 4\text{mA}$			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	μA	
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.