

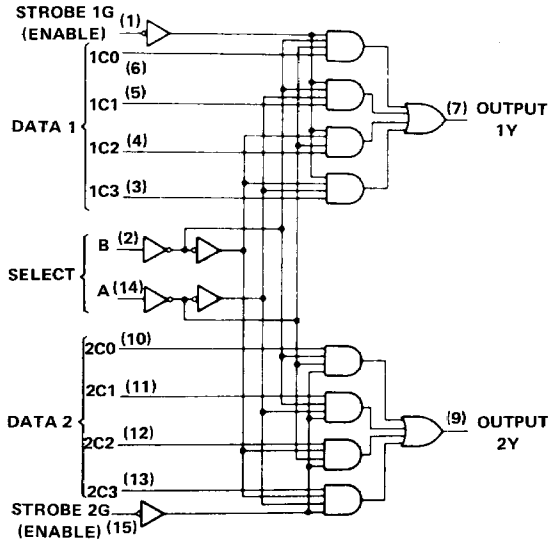
**FEATURES**

- Permits multiplexing from N lines to 1 line
- Performs parallel-to-serial conversion
- Strobe (Enable) line provided for cascading (N lines to n lines)
- Non-inverting

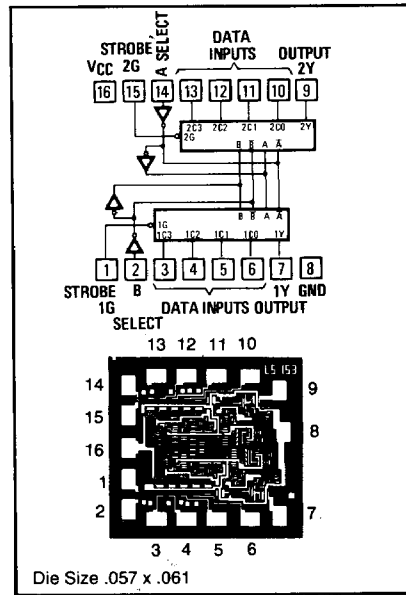
**DESCRIPTION**

The LS153 is a high speed Dual 4-Line-to-1-Line Multiplexer with common select inputs and separate strobe (enable) inputs for each half. Each half can select one bit of four and present it at the output in non-inverted form.

**LOGIC DIAGRAM**



**PIN-OUT DIAGRAM**



**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

Select inputs A and B are common to both sections.  
H = high level, L = low level, X = don't care

# Dual 4-Line-To-1-Line Multiplexer

LS153

## Recommended Operating Conditions

	9LS/54LS			9LS/74LS			Unit
	Min	Nom	Max	Min	Nom	Max	
Supply voltage, $V_{CC}$	4.5	5	5.5	4.75	5	5.5	V
High-level output current, $I_{OH}$			-400			-400	$\mu$ A
Low-level output current, $I_{OL}$			4			8	mA
Operating free-air temperature, $T_A$	-55		125	0		70	$^{\circ}$ C

## Electrical Characteristics Over Recommended Free-Air Temperature Range (Unless Otherwise Noted)

Parameter	Test Conditions*	9LS/54LS			9LS/74LS			Unit	
		Min	Typ**	Max	Min	Typ**	Max		
$V_{IH}$		2			2			V	
$V_{IL}$				0.7			0.8	V	
$V_I$	$V_{CC}=\text{MIN}, I_I=-18\text{mA}$			-1.5			-1.5	V	
$V_{OH}$	$V_{CC}=\text{MIN}, V_{IH}=2\text{V}, V_{IL}=V_{IL\text{max}}, I_{OH}=-400\mu\text{A}$	2.5	3.4		2.7	3.4		V	
$V_{OL}$	$V_{CC}=\text{MIN}, V_{IH}=2\text{V}, V_{IL}=V_{IL\text{max}}$							V	
				$I_{OL}=4\text{mA}$	0.25	0.4	0.25	0.4	mA
				$I_{OL}=8\text{mA}$			0.35	0.5	
$I_I$	$V_{CC}=\text{MAX}, V_I=7.0\text{V}$			0.1			0.1	mA	
$I_{IH}$	$V_{CC}=\text{MAX}, V_I=2.7\text{V}$			20			20	$\mu$ A	
$I_{IL}$	$V_{CC}=\text{MAX}, V_I=0.4\text{V}$			-0.4			-0.4	mA	
$I_{OS}^{\dagger}$	$V_{CC}=\text{MAX}$	-15		-100	-15		-100	mA	
$I_{CCL}^{\dagger\dagger}$	$V_{CC}=\text{MAX}$		6.2	10		6.2	10	mA	

\*For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

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

$\dagger$ Not more than one output should be shorted at a time.

$\dagger\dagger I_{CCL}$  is measured with the outputs open and all inputs grounded.

## Switching Characteristics, $V_{CC}=5\text{V}$ Over Recommended Free-Air Temperature Range

Parameter	From (input)	To (output)	$-55^{\circ}\text{C}$			$+25^{\circ}\text{C}$			$+125^{\circ}\text{C}$			Unit
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
<b>Test Conditions: <math>C_L = 15\text{pF}, R_L = 2\text{k}\Omega</math> (See Fig. A, page 2-174)</b>												
$t_{PLH}$	Data	Y		8	13		8	13		11	16	ns
$t_{PHL}$	Data	Y		13	18		14	18		17	22	ns
$t_{PLH}$	Select	Y		15	21		17	22		22	28	ns
$t_{PHL}$	Select	Y		17	23		16	21		21	26	ns
$t_{PLH}$	Strobe	Y		14	20		16	21		21	26	ns
$t_{PHL}$	Strobe	Y		17	23		16	21		20	25	ns
<b>Test Conditions: <math>C_L = 50\text{pF}, R_L = 2\text{k}\Omega</math> (See Fig. A, page 2-174)</b>												
$t_{PLH}$	Data	Y		10	15		10	15		15	22	ns
$t_{PHL}$	Data	Y		17	23		17	22		22	27	ns
$t_{PLH}$	Select	Y		18	24		19	24		25	30	ns
$t_{PHL}$	Select	Y		22	27		19	25		24	30	ns
$t_{PLH}$	Strobe	Y		17	23		18	23		23	28	ns
$t_{PHL}$	Strobe	Y		21	27		20	24		23	28	ns

Note: AC specification shown under  $-55^{\circ}\text{C}$  and  $+125^{\circ}\text{C}$  are for 9LS devices only. All 50pF specifications are for 9LS only.