

# DN74LS54 DN74LS54

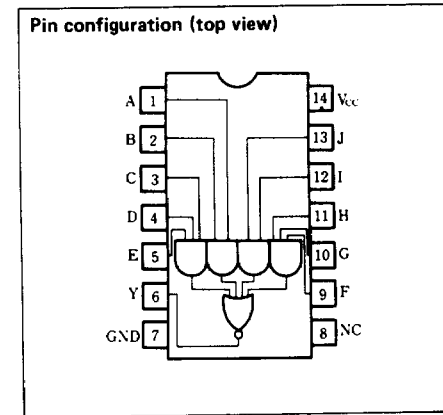
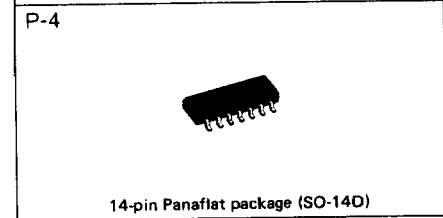
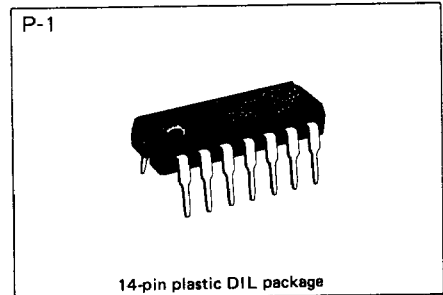
## 4-wide AND-OR-INVERT Gates

### ■ Description

DN74LS54 contains four 2-input and four 3-input AND-OR-INVERT gates.

### ■ Features

- Low power consumption ( $P_d = 4.5\text{mW}$  typical)
- High speed ( $t_{pd} = 12\text{ns}$ )
- Low output impedance
- Wide operating temperature range ( $T_a = -20$  to  $+75^\circ\text{C}$ )



4R

### ■ Recommended operating conditions

Parameter	Sym	Min	Typ	Max	Unit
Supply voltage	$V_{CC}$	4.75	5.00	5.25	V
Output current	$I_{OH}$			-400	$\mu\text{A}$
	$I_{OL}$			8	mA
Operating temperature range	$T_{opr}$	-20	25	75	$^\circ\text{C}$

12K

■ DC characteristics (Ta = -20 ~ +75°C)

Parameter	Sym	Test conditions	Min	Typ*	Max	Unit
Input voltage	V <sub>IH</sub>		2.0			V
	V <sub>IL</sub>				0.8	V
Output voltage	V <sub>OH</sub>	V <sub>CC</sub> =4.75V, V <sub>IL</sub> =0.8V I <sub>OH</sub> =-400μA	2.7	3.4		V
	V <sub>OL1</sub>	V <sub>CC</sub> =4.75V		0.25	0.4	V
	V <sub>OL2</sub>	V <sub>IH</sub> =2V	I <sub>OL</sub> =4mA I <sub>OL</sub> =8mA		0.35	0.5
Input current	I <sub>IH</sub>	V <sub>CC</sub> =5.25V V <sub>I</sub> =2.7V			20	μA
	I <sub>IL</sub>	V <sub>CC</sub> =5.25V V <sub>I</sub> =0.4V			-0.4	mA
	I <sub>I</sub>	V <sub>CC</sub> =5.25V V <sub>I</sub> =7V			0.1	mA
Output short circuit current**	I <sub>OS</sub>	V <sub>CC</sub> =5.25V, V <sub>O</sub> =0V	-15		-100	mA
Input clamp voltage	V <sub>IK</sub>	V <sub>CC</sub> =4.75V I <sub>I</sub> =-18mA			-1.5	V
Supply current	I <sub>CCH</sub>	V <sub>CC</sub> =5.25V,		0.8	1.6	mA
	I <sub>CCL</sub>	V <sub>CC</sub> =5.25V,		1.0	2.0	mA

\* When constant at V<sub>CC</sub> = 5V, Ta = 25°C.

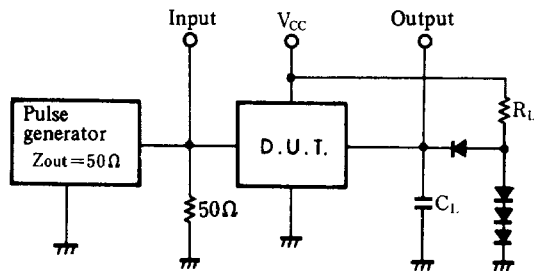
\*\* Only one output at a time short circuited to GND. Also, short circuit time to GND within 1 second.

■ Switching characteristics (V<sub>CC</sub>=5V, Ta=25°C)

Parameter	Sym	Test conditions	Min	Typ	Max	Unit
Propagation delay time	t <sub>PLH</sub>	C <sub>L</sub> = 15pF, R <sub>L</sub> = 2kΩ		12	20	ns
	t <sub>PHL</sub>			12.5	20	ns

※ Switching parameter measurement information

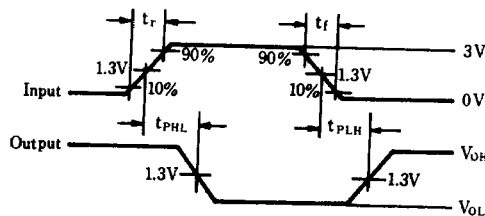
1. Measurement circuit



Notes

- C<sub>L</sub> includes probe and tool floating capacitance.
- Diodes are all MA161 or equivalent.

2. Waveforms



Notes

- Input waveform: tr ≤ 15ns, tf ≤ 6ns, PRR = 1MHz, duty cycle = 50%.