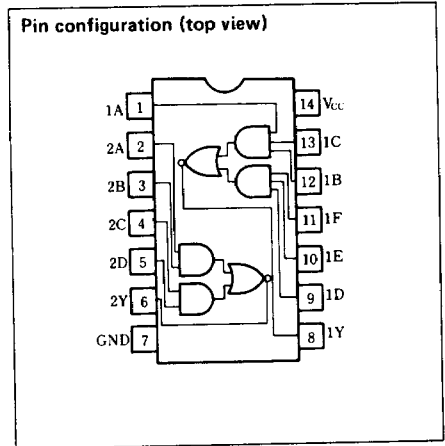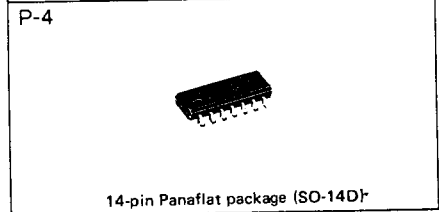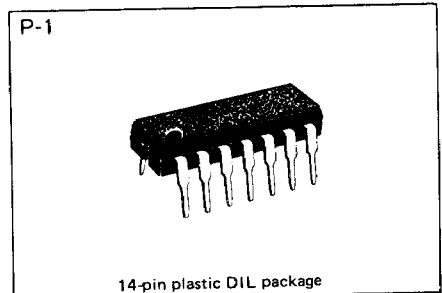# DN74LS51   DN74LS51

2-wide 3-input, 2-wide 2-input AND-OR-INVERT Gates

■ Description

DN74LS51 contains two 2-input and two 3-input AND-OR-INVERT gates.

■ Features

- Low power consumption (P_d = 5.5mW typical)
- High speed (t_{pd} = 12ns typical)
- Low output impedance
- Wide operating temperature range (Ta = −20 to +75°C)

P-1

14-pin plastic DIL package

P-4

14-pin Panaflat package (SO-14D)

Pin configuration (top view)

1A	1	14 Vcc
2A	2	13 1C
2B	3	12 1B
2C	4	11 1F
2D	5	10 1E
2Y	6	9 1D
GND	7	8 1Y

■ Recommended operating conditions

Parameter	Sym	Min	Typ	Max	Unit
Supply voltage	Vcc	4.75	5.00	5.25	V
Output current	IOH			−400	μA
	IOL			8	mA
Operating temperature range	Topr	−20	25	75	℃

■ **DC characteristics** (Ta = −20 ~ +75℃)

| Parameter	Sym	Test conditions		Min	Typ*	Max	Unit
Input voltage	V_{IH}			2.0			V
	V_{IL}					0.8	V
Output voltage	V_{OH}	$V_{CC}=4.75V$, $V_{IL}=0.8V$ $I_{OH}=-400\mu A$		2.7	3.4		V
	V_{OL1}	$V_{CC}=4.75V$ $V_{IH}=2V$	$I_{OL}=4mA$		0.25	0.4	V
	V_{OL2}		$I_{OL}=8mA$		0.35	0.5	V
Input current	I_{IH}	$V_{CC}=5.25V$ $V_I=2.7V$				20	μA
	I_{IL}	$V_{CC}=5.25V$ $V_I=0.4V$				−0.4	mA
	I_I	$V_{CC}=5.25V$ $V_I=7V$				0.1	mA
Output short circuit current**	I_{OS}	$V_{CC}=5.25V$, $V_O=0V$		−15		−100	mA
Input clamp voltage	V_{IK}	$V_{CC}=4.75V$ $I_I=-18mA$				−1.5	V
Supply current	I_{CCH}	$V_{CC}=5.25V$,			0.8	1.6	mA
	I_{CCL}	$V_{CC}=5.25V$,			1.4	2.8	mA

* When constant at V_{CC} = 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** ($V_{CC}=5V$, Ta = 25℃)

Parameter	Sym	Test conditions	Min	Typ	Max	Unit
Propagation delay time	t_{PLH}	$C_L=15pF$, $R_L=2k\Omega$		12	20	ns
	t_{PHL}			12.5	20	ns

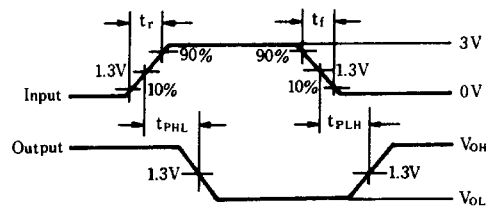※ Switching parameter measurement information

1. Measurement circuit
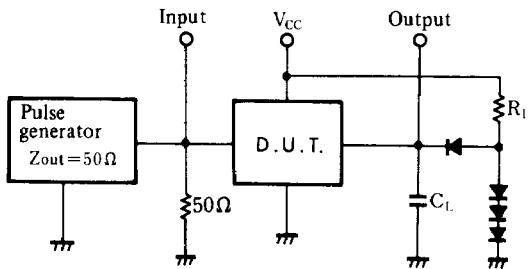
2. Waveforms

Notes
1. C_L includes probe and tool floating capacitance.
2. Diodes are all MA161 or equivalent.

Notes
1. Input waveform: $t_r \leqq 15ns$, $t_f \leqq 6ns$, PRR = 1MHz, duty cycle = 50%.