DN74LS20

Dual 4-input Positive NAND Gates

■ Description

DN74LS20 contains two 4-input positive isolation NAND gate circuits.

■ Features

- Low power consumption (P_d = 4mW typical)
- High speed (t_{pd} = 10ns typical)
- Low output impedance
- Wide operating temperature range (Ta = −20 to +75°C)

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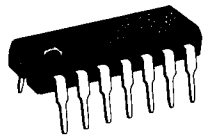

14-pin plastic DIL package

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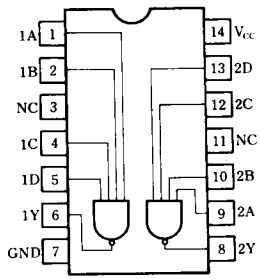
14-pin Panaflat package (SO-14D)

Pin configuration (top view)



■ 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	μA
	I_{OL}			8	mA
Operating temperature range	Topr	−20	25	75	℃

■ DC characteristics ($Ta = -20 \sim +75℃$)

Parameter	Sym	Test conditions		Min	Typ*	Max	Unit
Input voltage	V_{IH}			2.0			V
	V_{IL}					0.8	V
Output voltage	V_{OH}	$V_{CC}=4.75V$, $V_{IL}=0.8V$ $I_{OH}=-400\mu A$, $V_{IH}=2.0V$		2.7	3.4		V
	V_{OL1}	$V_{CC}=4.75V$	$I_{OL}=4mA$		0.25	0.4	V
	V_{OL2}	$V_{IH}=2V$, $V_{IL}=0.8V$	$I_{OL}=8mA$		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}	$V_{CC}=5.25V$,			0.4	0.8	mA
	I_{CCL}	$V_{CC}=5.25V$,			1.2	2.2	mA

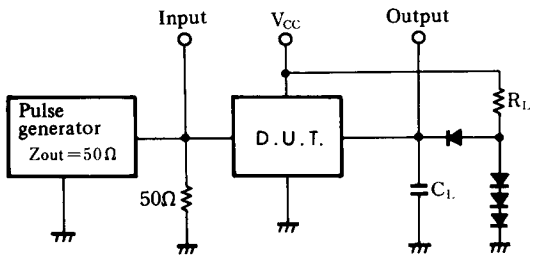
* When constant at V_{CC} = 5V, Ta = 25°C.
** Only one output at a time short circuited to GND. Also, short circuit time to GND within 1 second.

■ Switching characteristics ($V_{CC}=5V$, $Ta=25℃$)

Parameter	Sym	Test conditions	Min	Typ	Max	Unit
Propagation delay time	t_{PLH}	$C_L=15pF$, $R_L=2k\Omega$		9	15	ns
	t_{PHL}			10	15	ns

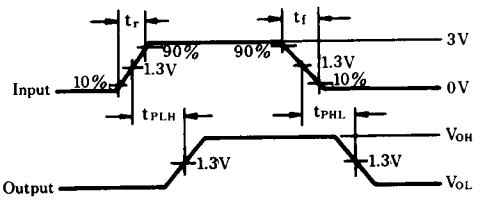
※ Switching parameter measurement information

1. Measurement circuit



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

2. Waveforms



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