

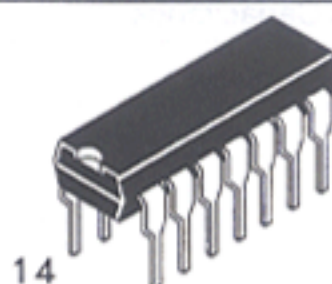
DV74ACT00 Available Q2, 1995

Quad 2-Input NAND Gate

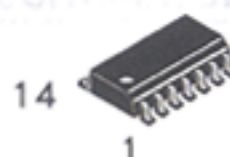
This device contains four independent gates, each of which performs the logic NAND function.

- Advanced very high speed CMOS
- Outputs source/sink 24 mA
- Transmission line driving 50 ohms
- ACT has TTL compatible inputs
- AC device operation guaranteed from 2 to 6 volts
- DC & AC Parameters guaranteed over -40 to $+85^{\circ}\text{C}$

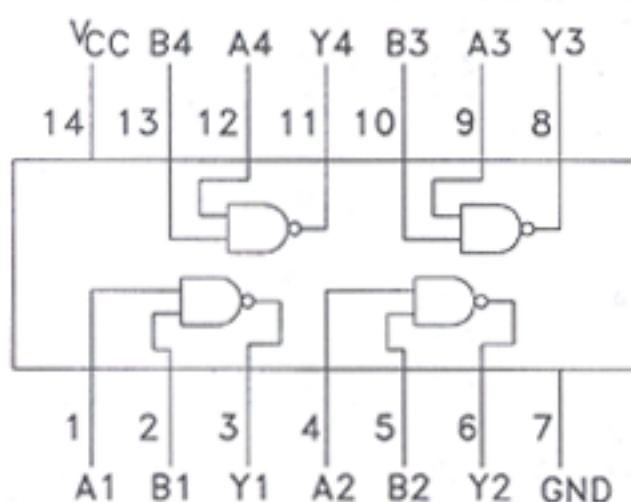
DV74AC00
DV74ACT00



N Suffix
Plastic DIP
AVG-001 Case



D Suffix
Plastic DIP
AVG-002 Case



TRUTH TABLE
 $Y = \overline{AB}$

Inputs		Outputs
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

H=High Logic Level
L=Low Logic Level
X=Don't care

ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

Symbol	Parameter	AC00, ACT00	Unit
V _{CC}	DC Supply Voltage (Referenced to GND)	-0.5 to $+7.0$	V
V _{IN}	DC Input Voltage (Referenced to GND)	-0.5 to $V_{CC} + 0.5$	V
V _{OUT}	DC Output Voltage (Referenced to GND)	-0.5 to $V_{CC} + 0.5$	V
I _{IN}	DC Input Current, per Pin	± 20	mA
I _{OUT}	DC Output Sink/Source Current, per Pin	± 50	mA
I _{CC}	DC V _{CC} or GND Current per Output Pin	± 50	mA
T _{stg}	Storage Temperature	-65 to $+150$	$^{\circ}\text{C}$

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter		Min	Typ	Max	Unit
V _{CC}	Supply Voltage	'AC	2.0	5.0	6.0	V
		'ACT	4.5	5.0	5.5	
V _{IN} , V _{OUT}	DC Input Voltage, Output Voltage, (Ref. to GND)		0		V _{CC}	V
t _r , t _f	Input Rise and Fall Time (Note 1) AC Devices	V _{CC} @ 3.0 V			150	ns/V
		V _{CC} @ 4.5 V			40	ns/V
		V _{CC} @ 5.5 V			25	ns/V

GUARANTEED OPERATING CONDITIONS (continued)

Symbol	Parameter		Min	Typ	Max	Unit
t_r, t_f	Input Rise and Fall Time (Note 2) ACT Devices	$V_{CC} @ 4.5 V$			10	ns/V
		$V_{CC} @ 5.5 V$			8.0	ns/V
T_A	Operating Ambient Temperature Range		-40	25	85	°C
C_{IN}	Input Capacitance $V_{CC} = 5.0 V$	$V_{CC} = 5.0 V$		4.5		pF
C_{PD}	Power Dissipation Capacitance	$V_{CC} = 5.0 V$		30		pF

1. V_{IN} from 30% to 70% V_{CC}

2. V_{IN} from 0.8 to 2.0 V

AC — 00

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} (V)	AC00			Unit
				TA = +25°C		TA = −40 to +85°C	
				Typ	Guaranteed Limits		
V _{IH}	Minimum High Level Input Voltage	V _{OUT} = 0.1V or V _{CC} − 0.1 V	3.0 4.5 5.5	1.5 2.25 2.75	2.1 3.15 3.85	2.1 3.15 3.85	V
V _{IL}	Maximum Low Level Input Voltage	V _{OUT} = 0.1V or V _{CC} − 0.1 V	3.0 4.5 5.5	1.5 2.25 2.75	0.9 1.35 1.65	0.9 1.35 1.65	V
V _{OH}	Minimum High Level Output Voltage	I _{OUT} = −50 μA	3.0 4.5 5.5	2.99 4.49 5.49	2.9 4.4 5.4	2.9 4.4 5.4	V
		V _{IN} = V _{IL} or V _{IH} −12mA I _{OH} −24mA −24mA	3.0 4.5 5.5		2.56 3.86 4.86	2.46 3.76 4.76	V
V _{OL}	Maximum Low Level Output Voltage	I _{OUT} = 50 μA	3.0 4.5 5.5	0.002 0.001 0.001	0.1 0.1 0.1	0.1 0.1 0.1	V
		V _{IN} = V _{IL} or V _{IH} 12mA I _{OL} 24mA 24mA	3.0 4.5 5.5		0.36 0.36 0.36	0.44 0.44 0.44	V
I _{IN}	Maximum Input Leakage Current	V _{IN} = V _{CC} or GND	5.5		±0.1	±1.0	μA
I _{CC}	Maximum Quiescent Supply Current	V _{IN} = V _{CC} or GND	5.5		4.0	40	μA

AC CHARACTERISTICS over full operating conditions

Symbol	Parameter	V _{CC} ±10% (V)	AC00				Unit
			T _A = +25°C C _L = 50 pF		T _A = - 40°C to +85°C C _L = 50 pF		
			Min	Max	Min	Max	
t _{PLH}	Propagation Delay	3.3 5.0	2.0 1.5	9.5 8.0	2.0 1.5	10.0 8.5	ns
t _{PHL}	Propagation Delay	3.3 5.0	1.5 1.5	8.0 6.5	1.0 1.0	8.5 7.0	ns

Symbol	Parameter	Conditions	V _{CC} (V)	ACT00			Unit
				TA = +25°C		TA = -40 to +85°C	
				Typ	Guaranteed Limits		
V _{IH}	Minimum High Level Input Voltage	V _{OUT} = 0.1V or V _{CC} - 0.1 V	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0	V
V _{IL}	Maximum Low Level Input Voltage	V _{OUT} = 0.1V or V _{CC} - 0.1 V	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8	V
V _{OH}	Minimum High Level Output Voltage	I _{OUT} = -50 μA	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4	V
		V _{IN} = V _{IL} or V _{IH} I _{OH} -24mA -24 mA	4.5 5.5		3.86 4.86	3.76 4.76	V
V _{OL}	Maximum Low Level Output Voltage	I _{OUT} = 50 μA	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1	V
		V _{IN} = V _{IL} or V _{IH} I _{OL} 24mA 24 mA	4.5 5.5		0.36 0.36	0.44 0.44	V
I _{IN}	Maximum Input Leakage Current	V _{IN} = V _{CC} or GND	5.5		±0.1	±1.0	μA
ΔI _{CC} T	Additional Max I _{CC} /Input	V _{IN} = V _{CC} - 2.1 V	5.5	0.6		1.5	mA
I _{CC}	Maximum Quiescent Supply Current	V _{IN} = V _{CC} or GND	5.5		4.0	40	μA

Symbol	Parameter	V _{CC} ±10% (V)	ACT00				Unit	
			T _A = +25°C C _L = 50 pF		T _A = -40°C to +85°C C _L = 50 pF			
			Min	Max	Min	Max		
t _{PLH}	Propagation Delay	5.0	1.5	9.0	1.0	9.5	ns	
t _{PHL}	Propagation Delay	5.0	1.5	7.0	1.0	8.0	ns	

The diagram shows two waveforms: "Data Input" and "Output". The "Data Input" waveform is a square wave switching between V_H and GND. The "Output" waveform is an inverted square wave switching between GND and V_H . Vertical dashed lines indicate the timing of signal transitions. Horizontal arrows labeled t_f and t_r represent the input signal's fall and rise times, respectively. Horizontal arrows labeled t_{PLH} and t_{PHL} represent the output signal's propagation delays from low-to-high and high-to-low, respectively. The threshold voltage V_T is marked on both waveforms.

DV74AC00, DV74ACT00