

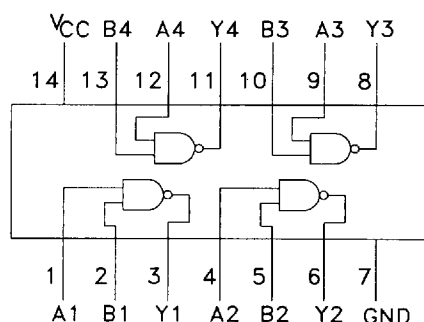
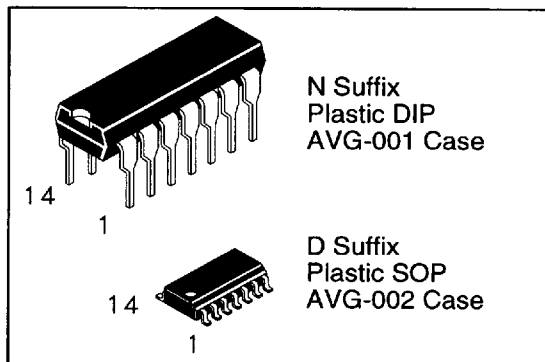
DV74HCT132 Available Q2, 1995

Quad 2-Input NAND Gate with Schmitt-Trigger Input

The DV74HC132A is identical in pinout to the LS132. The inputs are compatible with standard CMOS outputs; with pullup resistors, they are compatible with TTL FAMILY outputs. This device is used in applications to "square up" slow input rise and fall times. Excellent in noisy environments due to the hysteresis voltage of the Schmitt trigger.

- **Output Drive Capability: 10 LSTTL Loads**
- **Outputs Directly Interface to CMOS, NMOS, and TTL**
- **Operating Voltage Range: 2 to 6 V for HC devices**
- **Low Input Current: 1 μ A**
- **DC, AC parameters guaranteed from -55°C to 125°C**

DV74HC132A
DV74HCT132A



TRUTH TABLE

Inputs		Output
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

H = High Logic Level
L = Low Logic Level

ABSOLUTE MAXIMUM RATINGS

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

Symbol	Maximum Rating Parameters	Value	Unit
V _{CC}	DC Supply Voltage (Referenced to GND)	-0.5 to +7.0	V
V _{IN}	DC Input Voltage (Referenced to GND)	-1.5 to V _{CC} +1.5	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 Current, per Pin	± 25	mA
I _{CC}	DC Supply Current, V _{CC} and GND Pins	± 50	mA
P _D	Power Dissipation in Still Air Plastic DIP SOP Package	750 500	mW
T _{STG}	Storage Temperature Range	-65°C to +150	°C
T _L	Lead Temperature, 1 mm from Case for 10 Seconds	260	°C

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage HC(HCT) Referenced to GND	2.0(4.5)	6.0(5.5)	V
V _{IN} , V _{OUT}	DC Input Voltage, Output Voltage (Referenced to GND)	0	V _{CC}	V
T _A	Ambient Temperature	-55	+125	°C
t _r - t _f	Input Rise and Fall Time		No limit*	ns

*When V_{IN} ≈ 50% V_{CC}, I_{CC} > 1mA

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} V	25°C	-40°C to +85°C	-55°C to +125°C	Unit
V _{T+} MAX	Maximum Positive-Going Input Threshold Voltage	V _{OUT} = 0.1 V I _{OUT} ≤ 20 μA	2.0 4.5 6.0	1.5 3.15 4.2	1.5 3.15 4.2	1.5 3.15 4.2	V
V _{T+} Min	Minimum Positive-Going Input Threshold Voltage	V _{OUT} = 0.1 V I _{OUT} ≤ 20 μA	2.0 4.5 6.0	1.0 2.3 3.0	0.95 2.25 2.95	0.95 2.25 2.95	V
V _{T-} MAX	Maximum Negative-Going Input Threshold Voltage	V _{OUT} = V _{CC} -0.1 V I _{OUT} ≤ 20 μA	2.0 4.5 6.0	0.9 2.0 2.6	0.95 2.05 2.65	0.95 2.05 2.65	V
V _{T-} Min	Minimum Negative-Going Input Threshold Voltage	V _{OUT} = V _{CC} -0.1 V I _{OUT} ≤ 20 μA	2.0 4.5 6.0	0.3 0.9 1.2	0.3 0.9 1.2	0.3 0.9 1.2	V
V _H MAX	Maximum Hysteresis Voltage	V _{OUT} = 0.1 or V _{CC} -0.1 V I _{OUT} ≤ 20 μA	2.0 4.5 6.0	1.2 2.25 3.0	1.2 2.25 3.0	1.2 2.25 3.0	V
V _H Min	Minimum Hysteresis Voltage	V _{OUT} = 0.1 or V _{CC} -0.1 V I _{OUT} ≤ 20 μA	2.0 4.5 6.0	0.2 0.4 0.5	0.2 0.4 0.5	0.2 0.4 0.5	V
V _{OH}	Minimum High Level Output Voltage	V _{IN} ≤ V _T -min I _{OUT} ≤ 20 μA	2.0 4.5 6.0	1.9 4.4 5.9	1.9 4.4 5.9	1.9 4.4 5.9	V
		V _{IN} ≤ V _T -min I _{OUT} < 4.0 mA I _{OUT} < 5.2 mA	4.5 6.0	3.98 5.48	3.84 5.34	3.7 5.2	
V _{OL}	Maximum Low Level Output Voltage	V _{IN} ≥ V _T + max I _{OUT} ≤ 20 μA	2.0 4.5 6.0	0.1 0.1 0.1	0.1 0.1 0.1	0.1 0.1 0.1	V
		V _{IN} > V _T + max I _{OUT} < 4.0 mA I _{OUT} < 5.2 mA	4.5 6.0	0.26 0.26	0.33 0.33	0.40 0.40	V
I _{IN}	Maximum Input Leakage Current	V _{IN} = V _{CC} or GND	6.0	± 0.1	± 1.0	± 1.0	μA
I _{CC}	Maximum Quiescent Supply Current	V _{IN} = V _{CC} or GND I _{OUT} = 0 μA	6.0	1	10	40	μA

SWITCHING CHARACTERISTICS over full operating conditions (C_L=50 pF, Input t_r=t_f=6ns)

Symbol	Parameter	Vcc V	Guaranteed Limit			Unit
			25°C to – 55°C	≤85°C	≤125°C	
t _{PLH} , t _{PHL}	Propagation Delay Time, Input A To Output Y	2.0	125	155	190	ns
		4.5	25	31	38	
		6.0	21	26	32	
t _{TLH} , t _{THL}	Output Transition Time, Any Output	2.0	75	95	110	ns
		4.5	15	19	22	
		6.0	13	16	19	
C _{IN}	Maximum Input Capacitance		10	10	10	pF
C _{PD}	Power Dissipation Capacitance (Per Buffer) Used to determine the no-load dynamic power consumption, P _D = C _{PD} V _{CC} ² f + I _{CC} V _{CC}	Typical @ 25°C, V _{CC} = 5 V				pF
		24				

DC ELECTRICAL CHARACTERISTICS

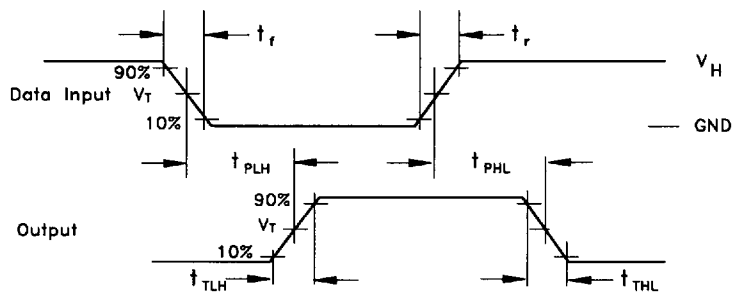
Symbol	Parameter	Conditions	V _{CC} V	25°C to –55°C		≤85°C		≤125°C		Unit
				Min	Max	Min	Max	Min	Max	
V _{T+} MAX	Maximum Positive-Going Input Threshold Voltage	V _{OUT} = 0.1 V or V _{CC} –0.1V I _{OUT} ≤ 20 μA	4.5 5.5		1.9 2.1		1.9 2.1		1.9 2.1	V
V _{T+} Min	Minimum Positive-Going Input Threshold Voltage	V _{OUT} = 0.1 V or V _{CC} –0.1V I _{OUT} ≤ 20 μA	4.5 5.5	1.2 1.4		1.2 1.4		1.2 1.4		V
V _{T–} MAX	Maximum Negative-Going Input Threshold Voltage	V _{OUT} = V _{CC} –0.1 V I _{OUT} ≤ 20 μA	4.5 5.5		1.2 1.4		1.2 1.4		1.2 1.4	V
V _{T–} Min	Minimum Negative-Going Input Threshold Voltage	V _{OUT} = 0.1 V or V _{CC} –0.1 V I _{OUT} ≤ 20 μA	4.5 5.5	0.5 0.6		0.5 0.6		0.5 0.6		V
V _H MAX	Maximum Hysteresis Voltage	V _{OUT} = 0.1 or V _{CC} –0.1 V I _{OUT} ≤ 20 μA	4.5 5.5		1.4 1.5		1.4 1.5		1.4 1.5	V
V _H Min	Minimum Hysteresis Voltage	V _{OUT} = 0.1 or V _{CC} –0.1 V I _{OUT} ≤ 20 μA	4.5 5.5	0.4 0.4		0.4 0.4		0.4 0.4		V
V _{OH}	Minimum High Level Output Voltage	V _{IN} ≤ V _{T–} –min I _{OUT} ≤ 20 μA	4.5 5.5	4.4 5.4		4.4 5.4		4.4 5.4		V
		V _{IN} ≤ V _{T–} –min I _{OUT} ≤ 4mA	4.5	3.98		3.84		3.7		
V _{OL}	Maximum Low Level Output Voltage	V _{IN} ≥ V _{T–} –min I _{OUT} ≤ 20 μA	4.5 5.5		0.1 0.1		0.1 0.1		0.1 0.1	V
		V _{IN} ≥ V _{T–} –min I _{OUT} ≤ 4.0 mA	4.5		0.26		0.33		0.40	V
I _{IN}	Maximum Input Leakage Current	V _{IN} = V _{CC} or GND	5.5		± 0.1		± 1.0		± 1.0	μA
I _{CC}	Maximum Quiescent Supply Current	V _{IN} = V _{CC} or GND I _{OUT} = 0 μA	5.5		1.0		10		40	μA
ΔI _{CC}	Additional Quiescent Supply Current	V _{IN} =2.4V, Any One Input V _{IN} =V _{CC} or GND, Other Inputs I _{OUT} =0μA	5.5		≥ –55°C		25°C to 125°C			mA
					2.9		2.4			

SWITCHING CHARACTERISTICS over full operating conditions

Symbol	Parameter	Test Conditions	Temperature Limits						Unit
			25°C to –55°C		≤85°C		≤125°C		
			Min	Max	Min	Max	Min	Max	
t _{PLH} , t _{PHL}	Propagation Delay Time, Input A To Output Y	V _{CC} =5.0V ± 10% C _L =50pF, Input t _r = t _f = 6.0 ns	.	25	.	31	.	38	ns
t _{TLH} , t _{THL}	Output Transition Time, Any Output	V _{CC} =5.0V ± 10% C _L =50pF, Input t _r = t _f = 6.0 ns		15		19		22	ns

CPD	Power Dissipation Capacitance (Per Inverter) Used to determine the no-load dynamic power consumption: P _D =CPD V _{CC} ² f + I _{CC} V _{CC}	Typical @ 25°C, V _{CC} =5V	pF
		27	

SWITCHING WAVEFORM



Input and Output Threshold Voltage: $V_T = 50\% V_{CC}$ for HC,
1.3V for HCT, $V_H = V_{CC}$ for HC, 3V for HCT