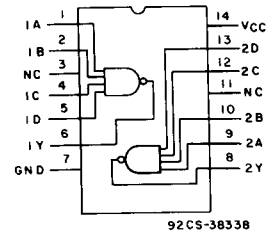


# CD54HC20/3A CD54HCT20/3A

## Dual 4-Input NAND Gate

The RCA-CD54HC20 and CD54HCT20 logic gates utilize silicon-gate CMOS technology to achieve operating speeds similar to LSTTL gates with the low power consumption of standard CMOS integrated circuits. All devices have the ability to drive 10 LSTTL loads. The 54HCT logic family is functionally as well as pin compatible with the standard 54LS logic family.



92CS-38338

**FUNCTIONAL DIAGRAM**

### Package Specifications

See Section 11, Fig. 10

### Static Electrical Characteristics (Limits with black dots (•) are tested 100%)

CHARACTERISTICS		TEST CONDITIONS							LIMITS	UNITS	
		HC/HCT				V <sub>IN</sub>		MIN.			MAX.
		V <sub>DD</sub>	V <sub>O</sub>	I <sub>O</sub>	V <sub>CC</sub> or GND	V <sub>IL</sub> or V <sub>IH</sub>	V <sub>IL</sub> or V <sub>IH</sub>				
Quiescent	25°C	6	—	—	6, 0	—	—	—	2•	μA	
Device Current I <sub>CC</sub>	-55°C	6	—	—	6, 0	—	—	—	40•		
	+125°C	6	—	—	6, 0	—	—	—	40•		

The complete static electrical test specification consists of the above by-type static tests combined with the standard static tests in the beginning of this section.

### HCT INPUT LOADING TABLE

INPUT	UNIT LOAD*
All	0.15

\*Unit load is ΔI<sub>CC</sub> limit specified in Static Characteristics Chart, e.g., 360 μA max. @ 25°C.

### Switching Speed (Limits with black dots (•) are tested 100%.)

#### SWITCHING CHARACTERISTICS (C<sub>L</sub> = 50 pF, Input t<sub>r</sub>, t<sub>f</sub> = 6 ns)

CHARACTERISTIC	SYMBOL	V <sub>CC</sub> V	25°C				-55°C to +125°C				UNITS
			HC		HCT		54HC		54HCT		
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Propagation Delay Input to Output	t <sub>PLH</sub>	2	—	100	—	—	—	150	—	—	ns
	t <sub>PHL</sub>	4.5	—	20•	—	28•	—	30•	—	42•	
Transition Times	t <sub>TLH</sub>	2	—	75	—	—	—	110	—	—	
	t <sub>THL</sub>	4.5	—	15	—	15	—	22	—	22	
	t <sub>PHL</sub>	6	—	13	—	—	—	19	—	—	
Input Capacitance	C <sub>I</sub>	—	—	10	—	10	—	10	—	10	pF

### Burn-In Test-Circuit Connections (Use Static II for /3A burn-in and Dynamic for Life Test.)

Static	STATIC BURN-IN I			STATIC BURN-IN II		
	OPEN	GROUND	V <sub>CC</sub> (6V)	OPEN	GROUND	V <sub>CC</sub> (6V)
CD54HC/HCT20	3,6,8,11	1,2,4,5,7,9,10,12,13	14	3,6,8,11	7	1,2,4,5,9,10,12-14
Dynamic	OPEN	GROUND	1/2 V <sub>CC</sub> (3V)	V <sub>CC</sub> (6V)	OSCILLATOR	
	CD54HC/HCT20	3,11	7	6,8	14	50 kHz 25 kHz 12,13

NOTE: Each pin except V<sub>CC</sub> and Gnd will have a resistor of 2k-47k ohms.