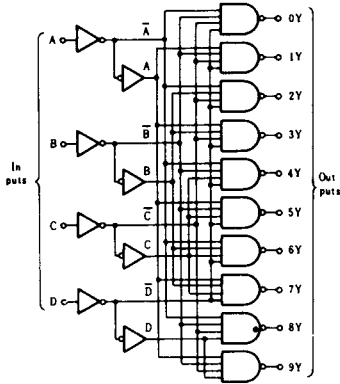


HD74LS42 • BCD-to-Decimal Decoder

This monolithic decimal decoder consists of eight inverters and ten four-input NAND gates. The inverters are connected in pairs to make BCD input data available for decoding by NAND gates. Full decoding of valid input logic ensures that all outputs remain off for all invalid input conditions.

■ BLOCK DIAGRAM

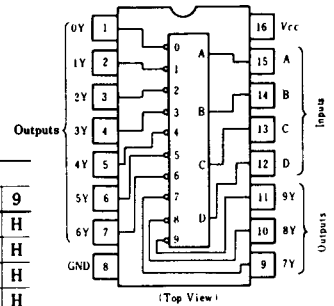


■ FUNCTION TABLE

No.	BCD Input				Decimal Output										
	D	C	B	A	0	1	2	3	4	5	6	7	8	9	
0	L	L	L	L	L	H	H	H	H	H	H	H	H	H	H
1	L	L	L	H	H	L	H	H	H	H	H	H	H	H	H
2	L	L	H	L	H	H	L	H	H	H	H	H	H	H	H
3	L	L	H	H	H	H	L	H	H	H	H	H	H	H	H
4	L	H	L	L	H	H	H	L	H	H	H	H	H	H	H
5	L	H	L	H	H	H	H	L	H	H	H	H	H	H	H
6	L	H	H	L	H	H	H	H	L	H	H	H	H	H	H
7	L	H	H	H	H	H	H	H	H	L	H	H	H	H	H
8	H	L	L	L	H	H	H	H	H	H	H	L	H	H	H
9	H	L	L	H	H	H	H	H	H	H	H	H	L	H	H
INVALID	H	L	H	L	H	H	H	H	H	H	H	H	H	H	H
	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H
	H	H	L	L	H	H	H	H	H	H	H	H	H	H	H
	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H
	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H
	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H

H; high level, L; low level

■ PIN ARRANGEMENT



■ ELECTRICAL CHARACTERISTICS ($T_a = -20 \sim +75^\circ\text{C}$)

Item	Symbol	Test Conditions	min	typ*	max	Unit
Input voltage	V_{IH}		2.0	—	—	V
	V_{IL}		—	—	0.8	V
Output voltage	V_{OH}	$V_{CC} = 4.75\text{V}$, $V_{IH} = 2\text{V}$, $V_{IL} = 0.8\text{V}$, $I_{OH} = -400\mu\text{A}$	2.7	—	—	V
	V_{OL}	$V_{CC} = 4.75\text{V}$, $V_{IH} = 2\text{V}$, $V_{IL} = 0.8\text{V}$			0.5	V
		$I_{OL} = 8\text{mA}$	—	—	0.4	
		$I_{OL} = 4\text{mA}$	—	—	—	
Input current	I_{IH}	$V_{CC} = 5.25\text{V}$, $V_I = 2.7\text{V}$	—	—	20	μA
	I_{IL}	$V_{CC} = 5.25\text{V}$, $V_I = 0.4\text{V}$	—	—	-0.4	mA
	I_I	$V_{CC} = 5.25\text{V}$, $V_I = 7\text{V}$	—	—	0.1	mA
Short-circuit output current	I_{OS}	$V_{CC} = 5.25\text{V}$	-20	—	-100	mA
Supply current	I_{CC}^{**}	$V_{CC} = 5.25\text{V}$	—	7	13	mA
Input clamp voltage	V_{IK}	$V_{CC} = 4.75\text{V}$, $I_{IN} = -18\text{mA}$	—	—	-1.5	V

* $V_{CC} = 5\text{V}$, $T_a = 25^\circ\text{C}$

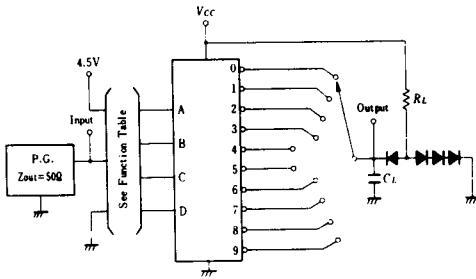
** I_{CC} is measured with all outputs open and all inputs grounded.

■ SWITCHING CHARACTERISTICS ($V_{CC}=5V$, $T_a=25^{\circ}C$)

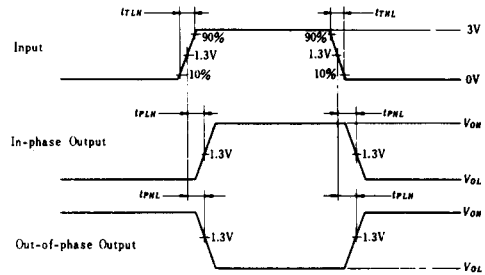
Item	Symbol	Test Conditions	min	typ	max	Unit
Propagation delay time	2 Stage	$C_L=15pF$, $R_L=2k\Omega$	—	15	25	ns
	3 Stage		—	20	30	
	2 Stage		—	15	25	ns
	3 Stage		—	20	30	

■ TESTING METHOD

1) Test Circuit



Waveform



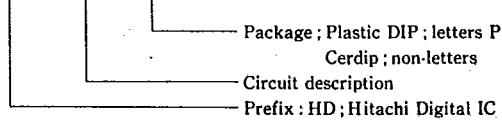
Input pulse: $t_{TLH} \leq 15ns$, $t_{THL} \leq 6ns$, $PRR=1MHz$,
duty cycle 50%.

PACKAGING INFORMATION

T-90-20

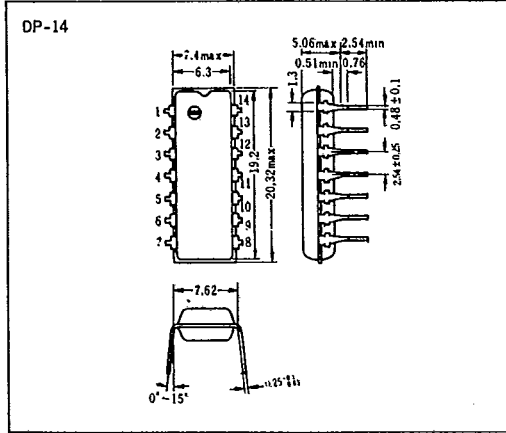
Factory orders for circuits described in this databook should include a three-part type number as explained in the following example.

HD 74LS00 P

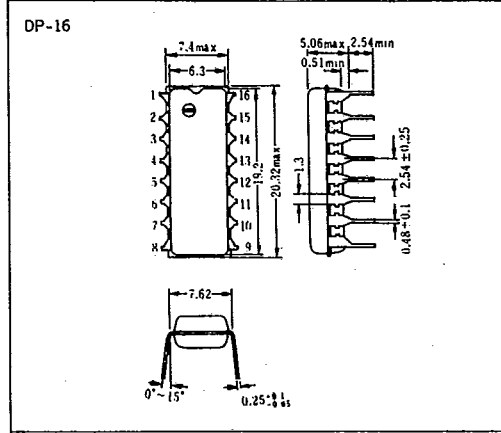


■ Plastic DIP

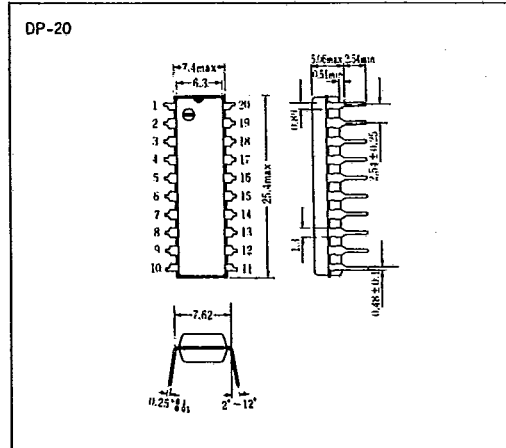
● 14 Pin



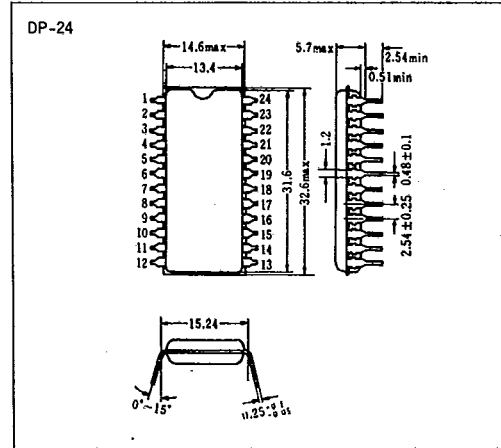
● 16 Pin



● 20 Pin



● 24 Pin

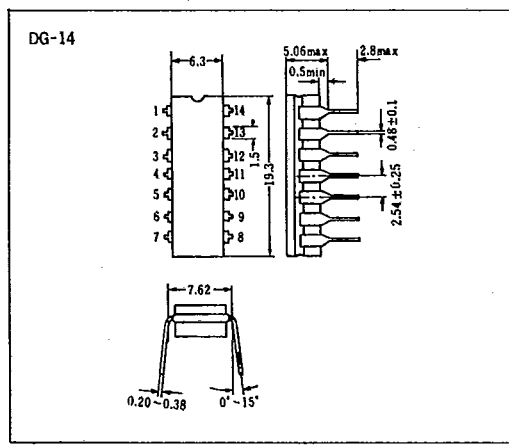


T-90-20

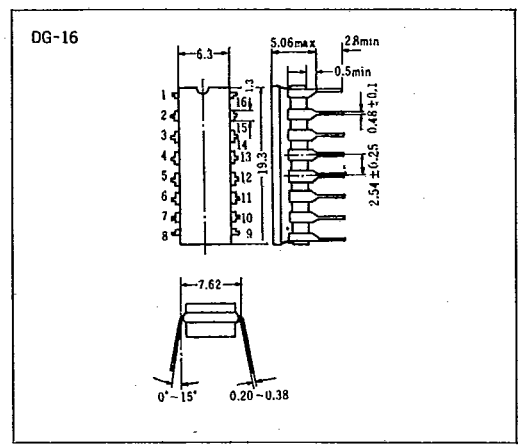
PACKAGING INFORMATION

■ Cerdip

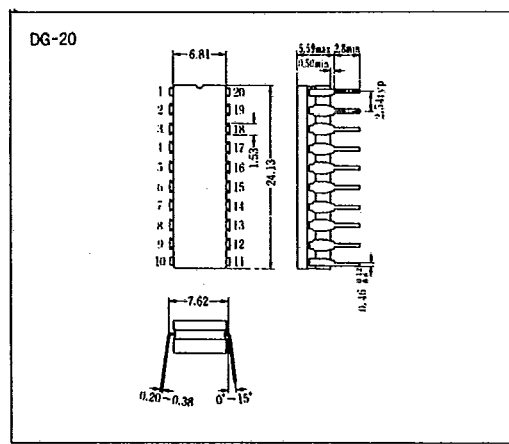
● 14 Pin



● 16 Pin



● 20 Pin



● 24 Pin

