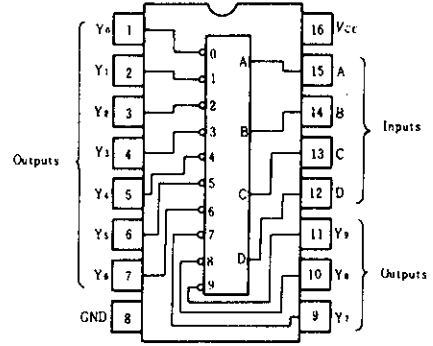


HD74LS145 • BCD-to-Decimal Decoders/Drivers (with 15V outputs)

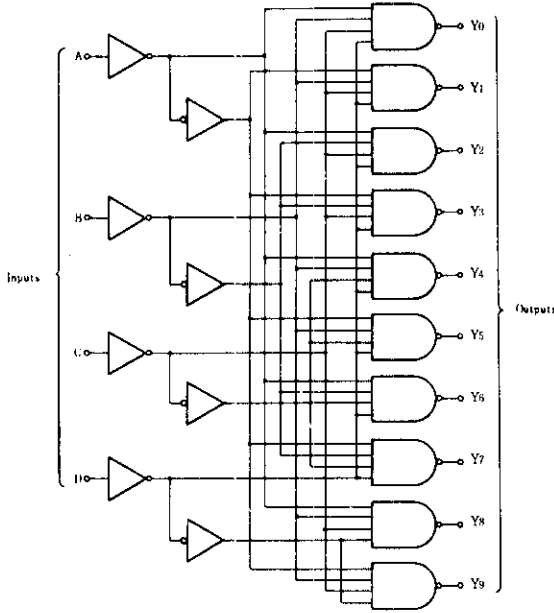
This BCD-to-decimal decoder/driver consists of eight inverters and ten four-input NAND gates. The inverters are connected in pairs to make BCD input data available for decoding by the NAND gates. Full decoding of valid BCD input logic ensures that all outputs remain off for all invalid binary input conditions. This decoder features high-performance, n-p-n output transistors designed for use as indicator/relay drivers or as open-collector logic-circuit drivers.

■ PIN ARRANGEMENT



(Top View)

■ BLOCK DIAGRAM



■ FUNCTION TABLE

No.	Inputs				Outputs									
	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
1	L	L	L	H	H	L	H	H	H	H	H	H	H	H
2	L	L	H	L	H	H	L	H	H	H	H	H	H	H
3	L	L	H	H	H	H	H	L	H	H	H	H	H	H
4	L	H	L	L	H	H	H	H	L	H	H	H	H	H
5	L	H	L	H	H	H	H	H	H	L	H	H	H	H
6	L	H	H	L	H	H	H	H	H	H	L	H	H	H
7	L	H	H	H	H	H	H	H	H	H	H	L	H	H
8	H	L	L	L	H	H	H	H	H	H	H	H	L	H
9	H	L	L	H	H	H	H	H	H	H	H	H	H	L
INVALID	H	L	H	L	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	L	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	L	H	H	H	H	H	H	H	H	H	H

HD74LS145

RECOMMENDED OPERATING CONDITIONS

Item	Symbol	min	typ	max	Unit
Off-state output voltage	$V_{O(off)}$	—	—	15	V
Low level output current	I_{OL}	—	—	80	mA

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	
Off-state output current	$I_{O(off)}$	$V_{CC} = 4.75\text{V}$, $V_{IH} = 2\text{V}$, $V_{IL} = 0.8\text{V}$, $V_{O(off)} = 15\text{V}$	—	—	250	μA	
On-state output voltage	$V_{O(on)}$	$V_{CC} = 4.75\text{V}$, $V_{IH} = 2\text{V}$, $V_{IL} = 0.8\text{V}$	$I_{OL} = 12\text{mA}$	—	—	0.4	V
			$I_{OL} = 24\text{mA}$	—	—	0.5	
			$I_{OL} = 80\text{mA}$	—	—	3.0	
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	
Supply current **	I_{CC}	$V_{CC} = 5.25\text{V}$	—	7	13	mA	
Input clamp voltage	V_{IK}	$V_{CC} = 4.75\text{V}$, $I_{IK} = -18\text{mA}$	—	—	-1.5	V	

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

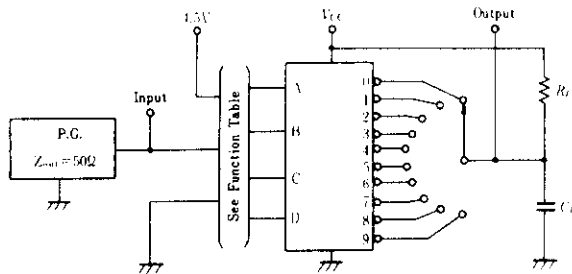
** I_{CC} is measured with all outputs open and all inputs grounded.

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

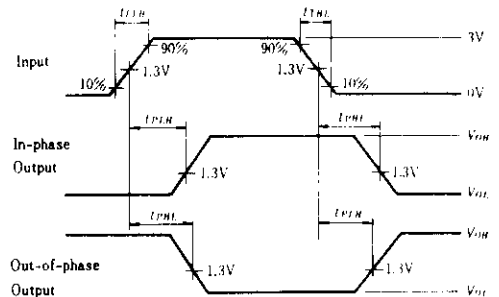
Item	Symbol	Test Conditions	min	typ	max	Unit
Propagation delay time	t_{PLH}	$C_L = 45\text{pF}$, $R_L = 665\Omega$	—	—	50	ns
	t_{PHL}		—	—	50	

TESTING METHOD

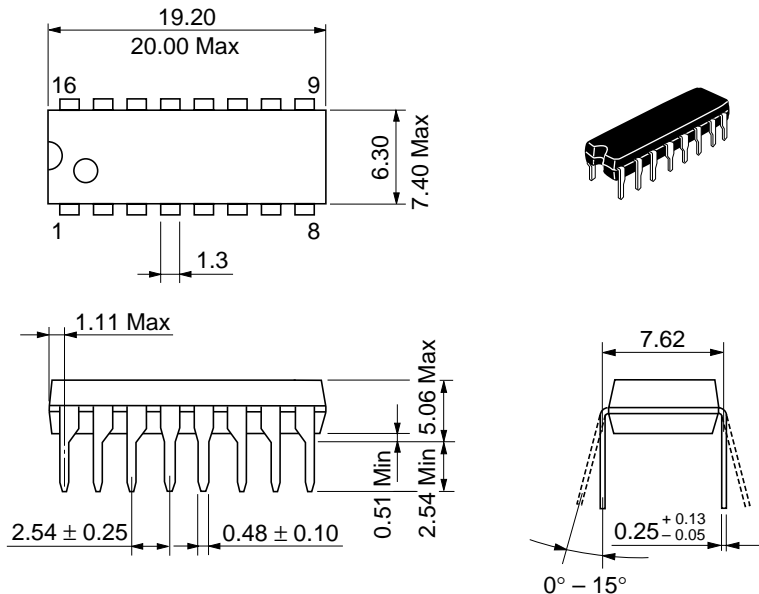
1) Test Circuit



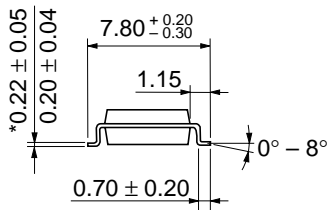
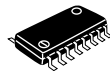
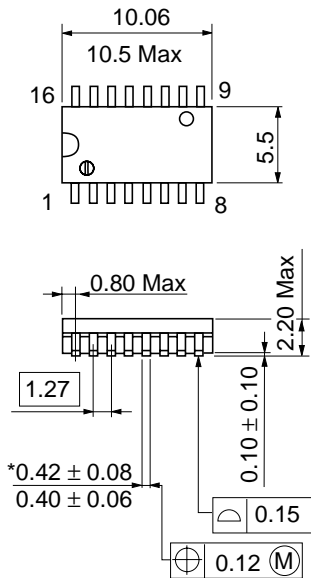
Waveform



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

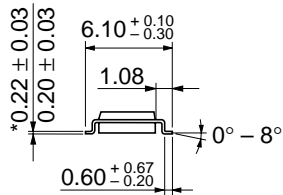
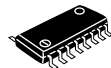
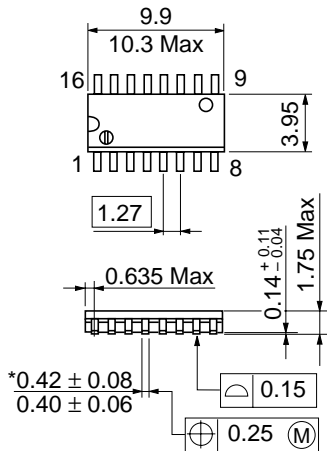


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JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g



*Dimension including the plating thickness
Base material dimension

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JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.15 g

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