

# HD74LS145

## BCD-to-Decimal Decoder / Driver (with 15 V outputs)

REJ03D0436-0300

Rev.3.00

Jul.13.2005

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.

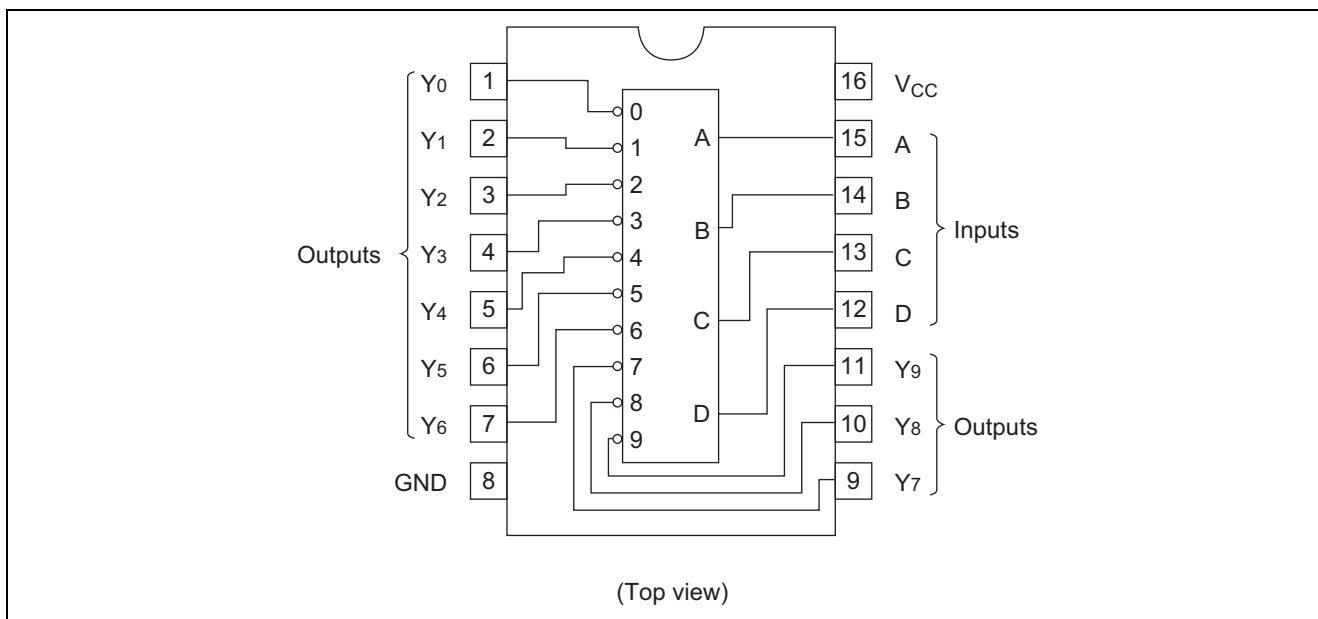
### Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS145P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74LS145FPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)

Note: Please consult the sales office for the above package availability.

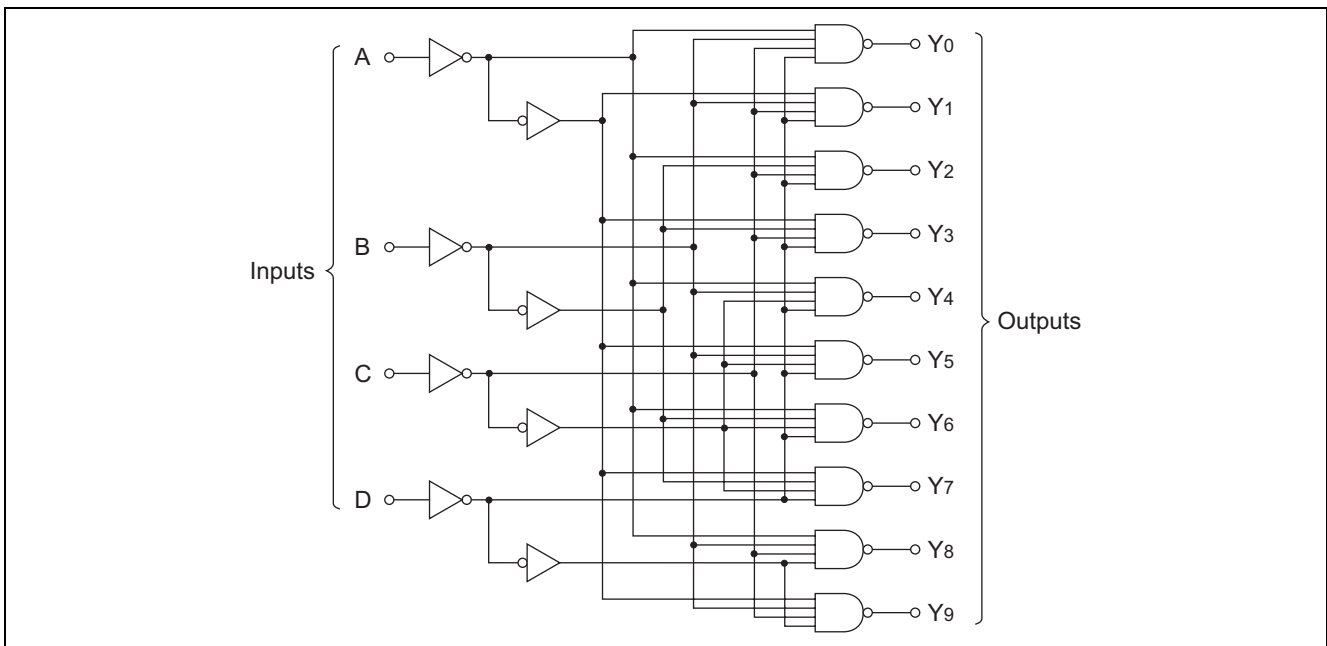
### Pin Arrangement



**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
	H	H	H	H	H	H	H	H	H	H	H	H	H	H

**Block Diagram**



**Absolute Maximum Ratings**

Item	Symbol	Ratings	Unit
Supply voltage	$V_{CC}$	7	V
Input voltage	$V_{IN}$	7	V
Power dissipation	$P_T$	400	mW
Storage temperature	$T_{stg}$	-65 to +150	°C

Note: Voltage value, unless otherwise noted, are with respect to network ground terminal.

## Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	$V_{CC}$	4.75	5.00	5.25	V
Off-state output voltage	$V_{O(off)}$	—	—	15	V
Low level output current	$I_{OL}$	—	—	80	mA
Operating temperature	$T_{opr}$	-20	25	75	°C

## Electrical Characteristics

(Ta = -20 to +75 °C)

Item	Symbol	min.	typ.*	max.	Unit	Condition
Input voltage	$V_{IH}$	2.0	—	—	V	
	$V_{IL}$	—	—	0.8	V	
Off-state output current	$I_{O(off)}$	—	—	250	μA	$V_{CC} = 4.75\text{ V}$ , $V_{IH} = 2\text{ V}$ , $V_{IL} = 0.8\text{ V}$ , $V_{O(off)} = 15\text{ V}$
On-state output voltage	$V_{O(on)}$	—	—	0.4	V	$V_{CC} = 4.75\text{ V}$ , $V_{IH} = 2\text{ V}$ , $V_{IL} = 0.8\text{ V}$
		—	—	0.5		
		—	—	3.0		
Input current	$I_{IH}$	—	—	20	μA	$V_{CC} = 5.25\text{ V}$ , $V_I = 2.7\text{ V}$
	$I_{IL}$	—	—	-0.4	mA	$V_{CC} = 5.25\text{ V}$ , $V_I = 0.4\text{ V}$
	$I_I$	—	—	0.1	mA	$V_{CC} = 5.25\text{ V}$ , $V_I = 7\text{ V}$
Supply current**	$I_{CC}$	—	7	13	mA	$V_{CC} = 5.25\text{ V}$
Input clamp voltage	$V_{IK}$	—	—	-1.5	V	$V_{CC} = 4.75\text{ V}$ , $I_{IN} = -18\text{ mA}$

Notes: \*  $V_{CC} = 5\text{ V}$ ,  $T_a = 25^\circ\text{C}$ \*\*  $I_{CC}$  is measured with all outputs open and all inputs grounded.

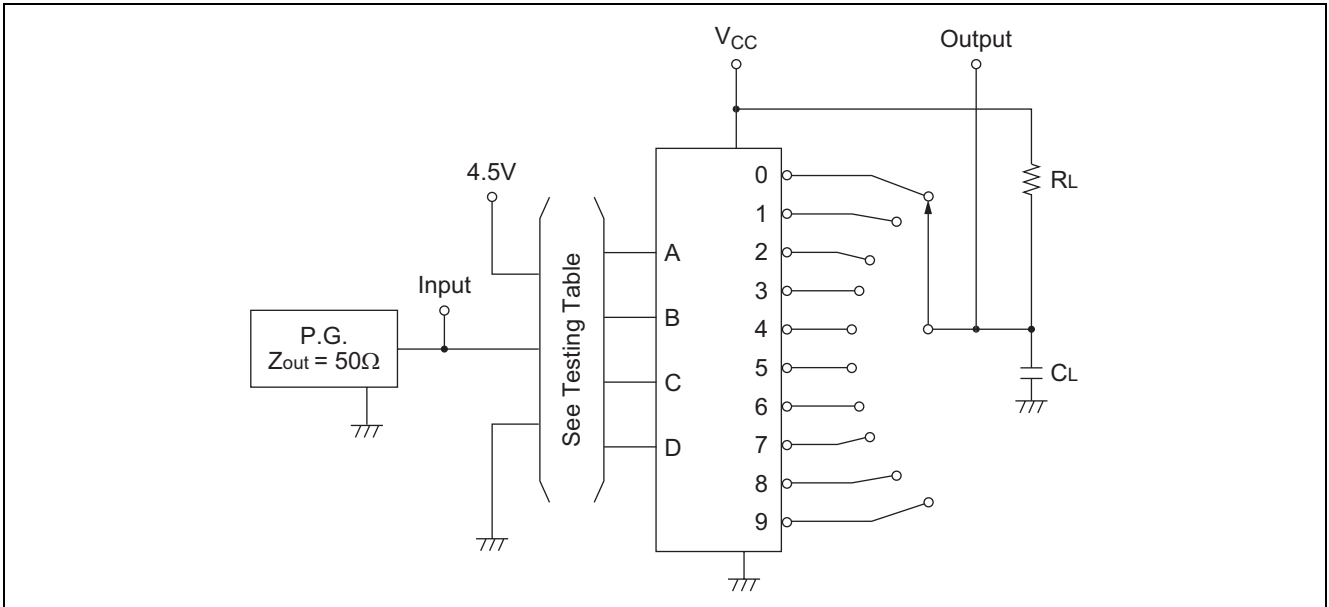
## Switching Characteristics

(V<sub>CC</sub> = 5 V, Ta = 25°C)

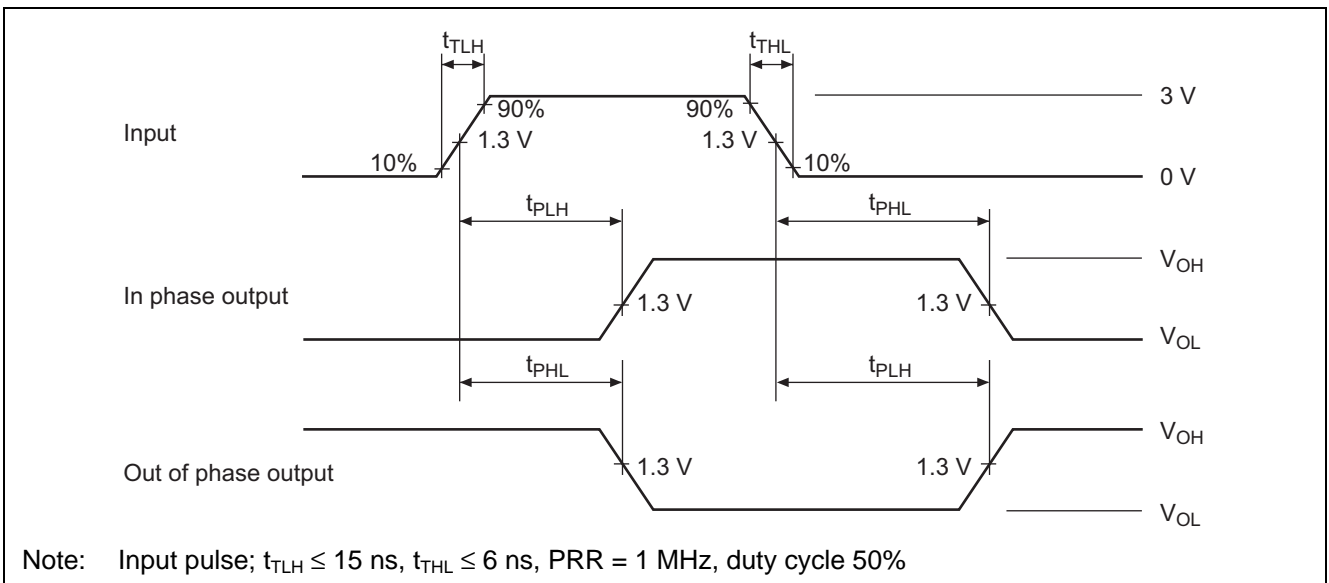
Item	Symbol	min.	typ.	max.	Unit	Condition
Propagation delay time	$t_{PLH}$	—	—	50	ns	$C_L = 45\text{ pF}$ , $R_L = 665\ \Omega$
	$t_{PHL}$	—	—	50		

## Testing Method

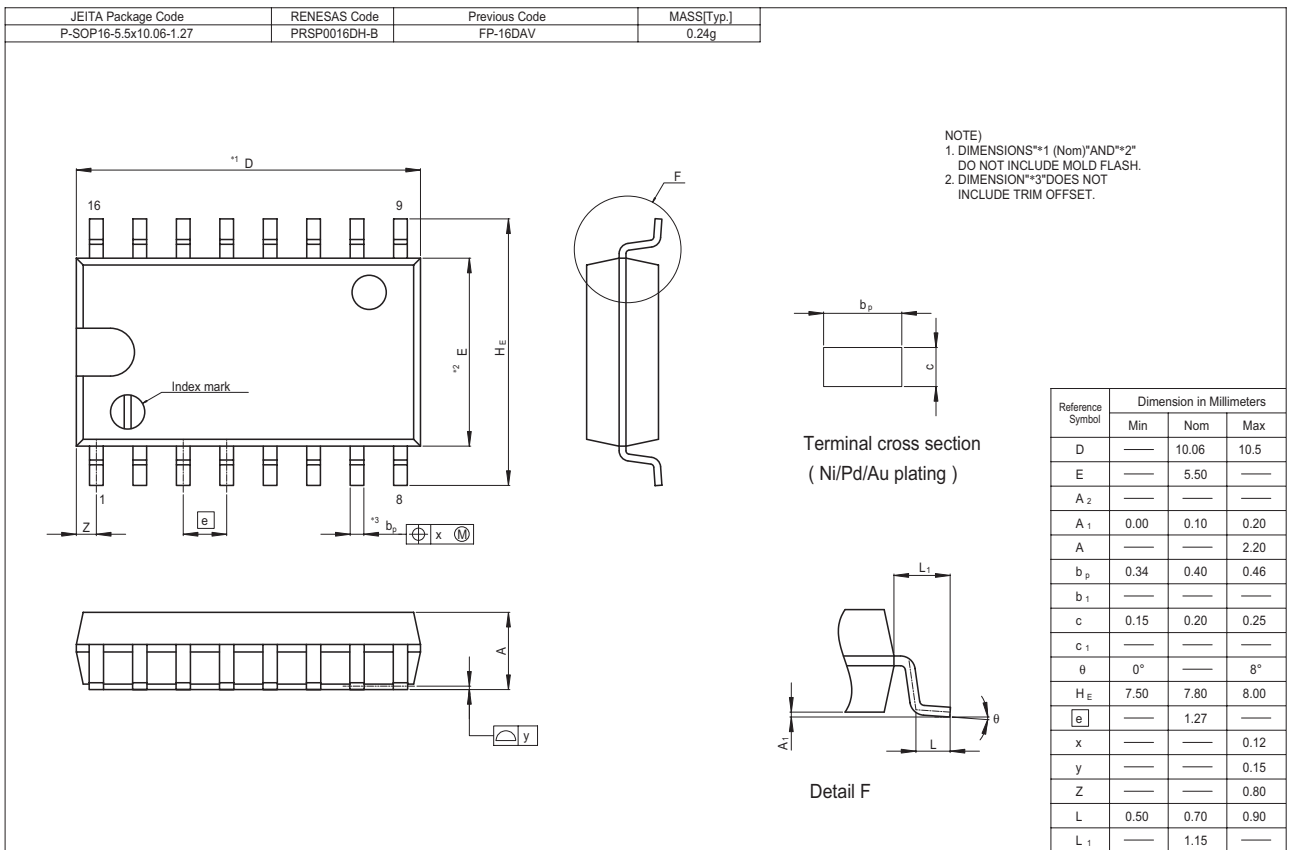
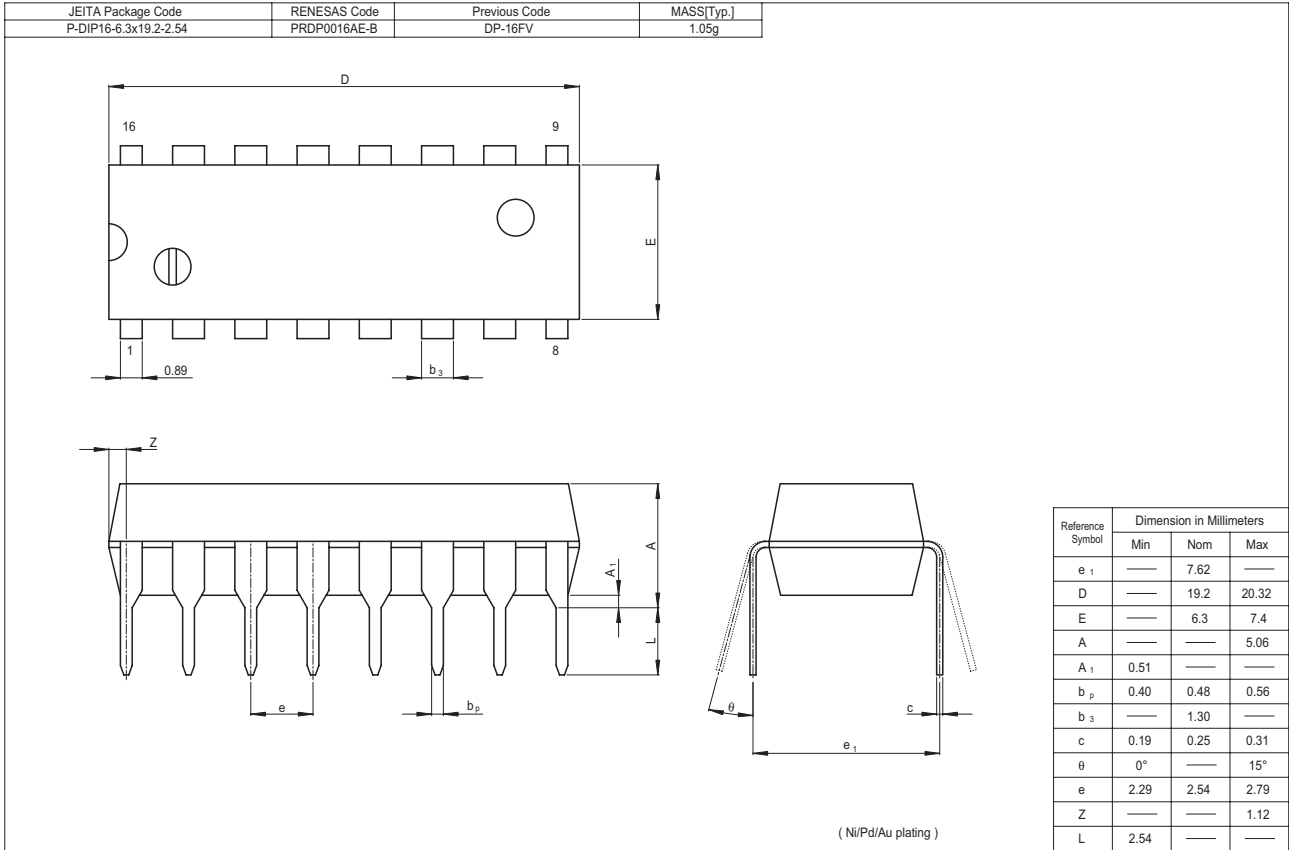
### Test Circuit



### Waveform



Package Dimensions



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