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NTE74LS145 Integrated Circuit TTL – BCD-to-Decimal Decoder/Driver

Description:

The NTE74LS145 is a monolithic BCD-to-decimal decoder/driver in a 16-Lead plastic DIP type package consisting 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, NPN output transistors designed for use as indicator/relay drivers or as open-collector logic-circuit drivers. Each of the high-breakdown output transistors (15V) will sink up to 80mA of current. Power dissipation is typically 35mW.

Features:

- Full Decoding of Input Logic
- 80mA Sink Current Capability
- All Outputs are Off for Invalid BCD Input Conditions
- Low Power Dissipation: 35mW (typ)

Absolute Maximum Ratings: (Note 1)

Supply Voltage, V_{CC} 7V
 DC Input Voltage, V_{IN} 5.5V
 Maximum Current into Any Output (Off-State) 1mA
 Operating Temperature Range, T_A 0°C to +70°C
 Storage Temperature Range, T_{stg} -65°C to +150°C

Note 1. Unless otherwise specified, all voltages are referenced to GND.

Recommended Operating Conditions:

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	4.75	5.0	5.25	V
Off-State Output Voltage	$V_{O(off)}$	-	-	15	V
Operating Temperature Range	T_A	0	-	+70	°C

Electrical Characteristics: (Note 2, Note 3)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
High Level Input Voltage	V_{IH}		2	-	-	V	
Low Level Input Voltage	V_{IL}		-	-	0.8	V	
Input Clamp Voltage	V_{IK}	$V_{CC} = \text{Min}, I_I = -12\text{mA}$	-	-	-1.5	V	
Off-State Output Current	$I_{O(\text{off})}$	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}, V_{O(\text{off})} = 15\text{V}$	-	-	250	μA	
On-State Output Voltage	$V_{O(\text{on})}$	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}$	$I_{O(\text{on})} = 80\text{mA}$	-	0.5	0.9	V
			$I_{O(\text{on})} = 20\text{mA}$	-	-	0.4	V
Input Current at Maximum Input Voltage	I_I	$V_{CC} = \text{MAX}, V_I = 5.5\text{V}$	-	-	1	mA	
High-Level Input Current	I_{IH}	$V_{CC} = \text{MAX}, V_I = 2.4\text{V}$	-	-	40	μA	
Low-Level Input Current	I_{IL}	$V_{CC} = \text{MAX}, V_I = 0.4\text{V}$	-	-	-1.6	mA	
Supply Current	I_{CC}	$V_{CC} = \text{MAX}, \text{Note 4}$	-	43	70	mA	

Note 2. For conditions shown as MIN or MAX, use the appropriate value specified under “Recommended Operation Conditions”.

Note 3. All typical values are at $V_{CC} = 5\text{V}, T_A = +25^\circ\text{C}$.

Note 4. I_{CC} is measured with all inputs grounded and output open.

Switching Characteristics: ($V_{CC} = 5\text{V}, T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time, Low-to-High Level Output	t_{PLH}	$R_L = 100\Omega, C_L = 15\text{pF}$	-	-	50	ns
Propagation Delay Time, High-to-Low Level Output	t_{PHL}		-	-	50	ns

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 = HIGH Level (Off)

L = LOW Level (On)

Pin Connection Diagram

