



ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748-5089
<http://www.nteinc.com>

NTE74LS445

Integrated Circuit

TTL – BCD-to-Decimal Decoder/Driver

with Open Collector Outputs

Description:

The NTE74LS445 is a monolithic BCD-to-Decimal Decoder/Driver in a 16-Lead plastic DIP type package that 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, NPN output transistors designed for use as indicator/relay drivers or as open-collector logic-circuit drivers. Each of the output transistors will sink up to 80mA of current. Each input is one Series 74LS standard load. Inputs and outputs are entirely compatible for use with TTL logic circuitry, and the outputs are compatible for interfacing with most MOS integrated circuits. Power dissipation is typically 35mW.

Features:

- Low Voltage Version of NTE74LS145
- Full Decoding of Input Logic
- Sink Current Capability: 80mA
- All Outputs are Off for Invalid BCD Input Condition
- Low Power Dissipation: 35mW (Typ)

Absolute Maximum Ratings: (Note 1)

Supply Voltage, V_{CC}	7V
Input Voltage	7V
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	$V_{O(off)}$	–	–	7	ζ
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}	$V_{CC} = \text{MIN}, I_I = -18\text{mA}$	–	–	–1.5	V
Off-State Output Current	$I_{O(off)}$	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, V_{IL} = \text{MAX}, V_{OH} = 7\text{V}$	–	–	250	μA
On-State Output Voltage	$V_{O(on)}$	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, V_{IL} = \text{MAX}$				
		$I_{OL} = 12\text{mA}$	–	0.25	0.4	V
		$I_{OL} = 24\text{mA}$	–	0.35	0.5	V
		$I_{OL} = 80\text{mA}$	–	2.3	3.0	V
Input Current	I_I	$V_{CC} = \text{MAX}, V_I = 7\text{V}$	–	–	0.1	mA
High Level Input Current	I_{IH}	$V_{CC} = \text{MAX}, V_I = 2.7\text{V}$	–	–	20	μA
Low Level Input Current	I_{IL}	$V_{CC} = \text{MAX}, V_I = 0.4\text{V}$	–	–	–0.4	mA
Supply Current	I_{CC}	$V_{CC} = \text{MAX}, \text{Note 4}$	–	7	13	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 outputs 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	t_{PLH}	$R_L = 665\Omega, C_L = 45\text{pF}$	–	–	50	ns
	t_{PHL}		–	–	50	ns

Function Tables:

No.	Inputs				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
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

H = HIGH Level (off), L = LOW Level (on)

Pin Connection Diagram

