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NTE7445
Integrated Circuit
TTL, BCD–toDecimal Decoder/Driver
16–Lead DIP Type Package

Features:

- Full Decoding of Input Logic
- 80mA Sink–Current Capability
- All Outputs are off for Invalid BCD Input Conditions

Description:

The NTE7445 is a monolithic BCD–to–decimal decoder/driver in a 16–Lead 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 TTL inputs and high–performance, NPN output transistors designed for use as an indicator/relay driver or as an open–collector logic–circuit driver. Each of the high–breakdown output transistors (30 volts) will sink up to 80 milliamperes of current. Each input is one normalized Series 74 load. Inputs and outputs are entirely compatible for use with TTL or DTL logic circuits, and the outputs are compatible for interfacing with most MOS integrated circuits. Power dissipation is typically 215 milliwatts.

Absolute Maximum Ratings: (T_A = 0 to +70°C unless otherwise specified)

Supply Voltage (Note 1), V_{CC} 7V
Input Voltage, V_I 5.5V
Maximum Current Into Any Output (Off–State) 1mA
Operating Ambient Temperature Range . . . . . 0°C to +70°C
Storage Temperature Range . . . . . –65°C to +150°C

Note 1. Voltage values are with respect to network GND terminal.

Recommended Operating Conditions:

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	4.75	5.0	5.25	V
Off–State Output Voltage		–	–	30	V
Operating Ambient Temperature	T_A	0	–	70	°C

Electrical Characteristics: (T_A = 0 to +70°C, Note 2 unless otherwise specified)

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} = Min, I_I = −12mA		–	–	−1.5	V
On−State Output Voltage	$V_{O(on)}$	V_{CC} = Min, V_{IH} = 2V, V_{IL} = 800mV	$I_{O(on)}$ = 80mA	–	0.5	0.9	V
			$I_{O(on)}$ = 20mA	–	–	0.4	V
Off−State Output Current	$I_{O(off)}$	V_{CC} = Min, V_{IH} = 2V, V_{IL} − 800mV, $V_{O(off)}$ = 30V		–	–	250	μA
Input Current at Max. Input Voltage	I_I	V_{CC} = Max, V_I = 5.5V		–	–	1	mA
High−Level Input Current	I_{IH}	V_{CC} = Max, V_I = 2.4V		–	–	40	μA
Low−Level Input Current	I_{IL}	V_{CC} = Max, V_I = 0.4V		–	–	−1.6	mA
Supply Current	I_{CC}	V_{CC} = Max, Note 3		–	43	70	mA

Note 2. All typical values are at V_{CC} = 5V, T_A = +25°C. For conditions shown as Min or Max, use the appropriate value specified under recommended operating conditions for the application type.

Note 3. I_{CC} is measured with all inputs grounded and outputs open.

Switching Characteristics: (V_{CC} = 5V, T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time, Low−to−High Level Output	t_{PLH}	C_L = 15pF, R_L = 100Ω	–	–	50	ns
Propagation Delay Time, High−to−Low Level Output	t_{PHL}		–	–	50	ns

Functional 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

H = High Level (Off), L = Low Level (On)

Pin Connection Diagram