

DM7445 BCD to Decimal Decoders/Drivers

General Description

These BCD-to-decimal decoders/drivers consist 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 BCD input logic ensures that all outputs remain OFF for all invalid (10–15) binary input conditions. These decoders feature high-performance, NPN output transistors designed for use as indicator/relay drivers, or as open-collector logic-circuit drivers. The high-breakdown output transistors are compatible for interfacing with most MOS integrated circuits.

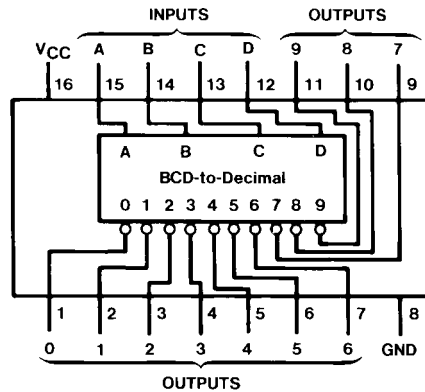
Features

- Full decoding of input logic
- 80 mA sink-current capability
- All outputs are off for invalid BCD input conditions

Ordering Code:

Order Number	Package Number	Package Description
DM7445	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

Connection Diagram

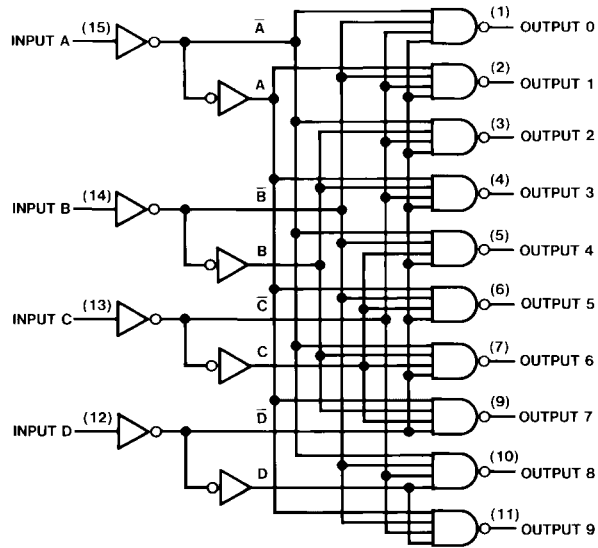


Function Table

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
I	H	L	H	L	H	H	H	H	H	H	H	H	H	H
N	H	L	H	H	H	H	H	H	H	H	H	H	H	H
V	H	H	L	L	H	H	H	H	H	H	H	H	H	H
A	H	H	L	H	H	H	H	H	H	H	H	H	H	H
L	H	H	H	L	H	H	H	H	H	H	H	H	H	H
I	H	H	H	H	H	H	H	H	H	H	H	H	H	H
D														

H = HIGH Level (OFF)
L = LOW Level (ON)

Logic Diagram



Absolute Maximum Ratings(Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Output Voltage	30V
Operating Free Air Temperature Range	0°C to +70°C
Storage Temperature Range	-65°C to +150°C

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Recommended Operating Conditions

Symbol	Parameter	Min	Nom	Max	Units
V_{CC}	Supply Voltage	4.75	5	5.25	V
V_{IH}	HIGH Level Input Voltage	2			V
V_{IL}	LOW Level Input Voltage			0.8	V
V_{OH}	HIGH Level Output Voltage			30	V
I_{OL}	LOW Level Output Current			20	mA
T_A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 2)	Max	Units
V_I	Input Clamp Voltage	$V_{CC} = \text{Min}, I_I = -12 \text{ mA}$			-1.5	V
I_{CEX}	HIGH Level Output Current	$V_{CC} = \text{Min}, V_O = 30V$ $V_{IL} = \text{Max}, V_{IH} = \text{Min}$			250	μA
V_{OL}	LOW Level Output Voltage	$V_{CC} = \text{Min}, I_{OL} = \text{Max}$ $V_{IH} = \text{Min}, V_{IL} = \text{Max}$ $I_{OL} = 80 \text{ mA}$ $V_{CC} = \text{Min}$		0.2	0.4	V
I_I	Input Current @ Max Input Voltage	$V_{CC} = \text{Max}, V_I = 5.5V$			1	mA
I_{IH}	HIGH Level Input Current	$V_{CC} = \text{Max}, V_I = 2.4V$			40	μA
I_{IL}	LOW Level Input Current	$V_{CC} = \text{Max}, V_I = 0.4V$			-1.6	mA
I_{CC}	Supply Current	$V_{CC} = \text{Max}$ (Note 3)		43	70	mA

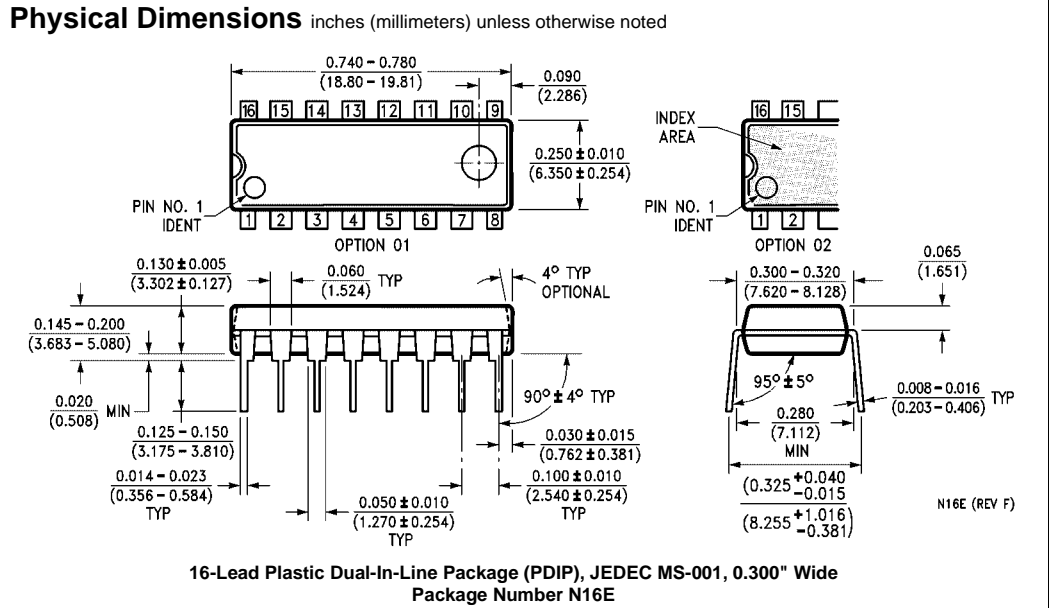
Note 2: All typicals are at $V_{CC} = 5V, T_A = 25^\circ\text{C}$.

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

Switching Characteristics

at $V_{CC} = 5V$ and $T_A = 25^\circ\text{C}$

Symbol	Parameter	Conditions	Min	Max	Units
t_{PLH}	Propagation Delay Time LOW-to-HIGH Level Output	$C_L = 15 \text{ pF}$ $R_L = 100\Omega$		49.5	ns
t_{PHL}	Propagation Delay Time HIGH-to-LOW Level Output			49.5	ns



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