

DM74145 BCD to Decimal Decoders/Drivers

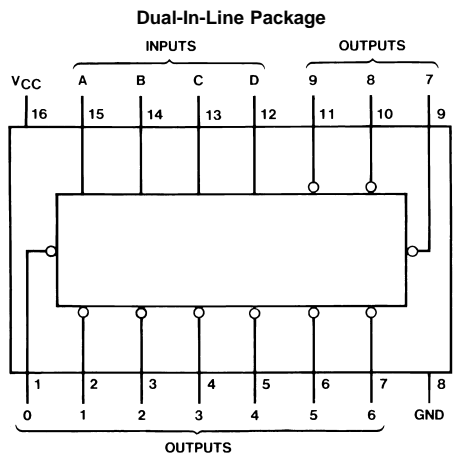
General Description

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

Connection Diagram



DS006544-1

Order Number DM54145J, DM54145W or DM74145N
See Package Number J16A, N16E or W16A

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)

Absolute Maximum Ratings (Note 1)

Supply Voltage

7V

Input Voltage

5.5V

Operating Free Air Temperature Range

DM54

DM74

Storage Temperature Range

–55°C to +125°C

0°C to +70°C

–65°C to +150°C

Recommended Operating Conditions

Symbol	Parameter	DM54145			DM74145			Units
		Min	Nom	Max	Min	Nom	Max	
V _{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V _{IH}	High Level Input Voltage	2			2			V
V _{IL}	Low Level Input Voltage			0.8			0.8	V
V _{OH}	High Level Output Voltage			15			15	V
I _{OL}	Low Level Output Current			20			20	mA
T _A	Free Air Operating Temperature	–55		125	0		70	°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" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

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} = Min, I _I = –12 mA			–1.5	V
I _{CEX}	High Level Output Current	V _{CC} = Min, V _{OH} = Max V _{IL} = Max, V _{IH} = Min			250	μA
V _{OL}	Low Level Output Voltage	V _{CC} = Min, I _{OL} = Max V _{IH} = Min, V _{IL} = Max			0.4	V
		I _{OL} = 80 mA V _{CC} = Min		0.5	0.9	
I _I	Input Current @ Max Input Voltage	V _{CC} = Max, V _I = 5.5V			1	mA
I _{IH}	High Level Input Current	V _{CC} = Max, V _I = 2.4V			40	μA
I _{IL}	Low Level Input Current	V _{CC} = Max, V _I = 0.4V			–1.6	mA
I _{CC}	Supply Current	V _{CC} = Max	DM54	43	62	mA
		(Note 3)	DM74	43	70	

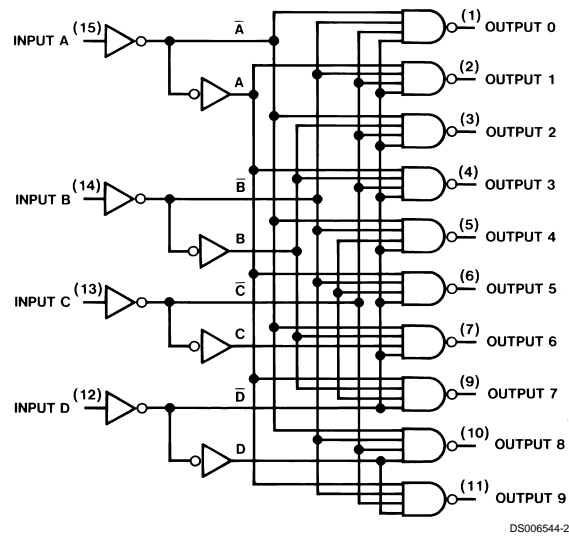
Switching Characteristicsat V_{CC} = 5V and T_A = 25°C (See Section 1 for Test Waveforms and Output Load)

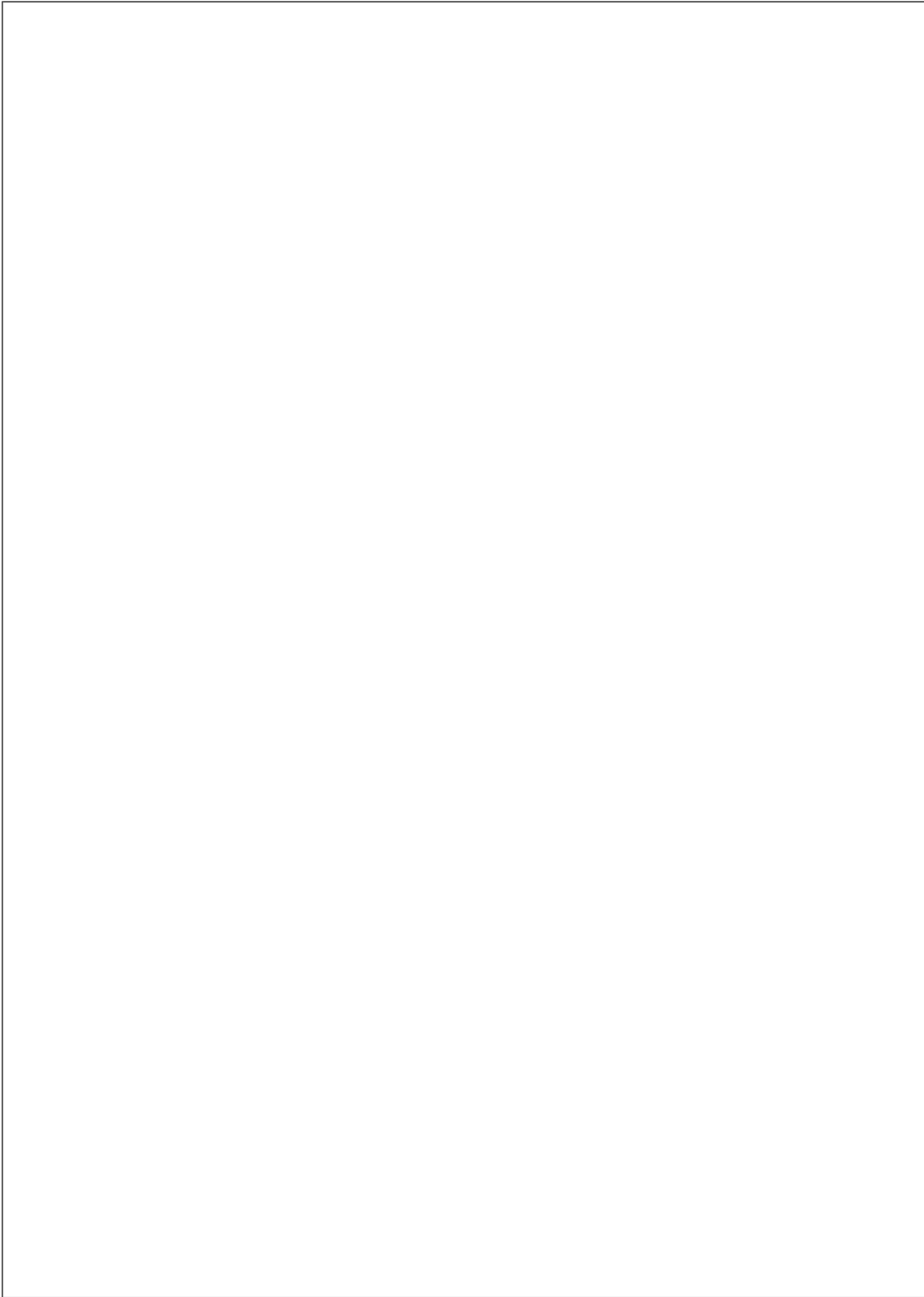
Symbol	Parameter	Conditions	Min	Max	Units
t _{PLH}	Propagation Delay Time Low to High Level Output	C _L = 15 pF R _L = 100Ω		30	ns
t _{PHL}	Propagation Delay Time High to Low Level Output			30	ns

Note 2: All typicals are at V_{CC} = 5V, T_A = 25°C.

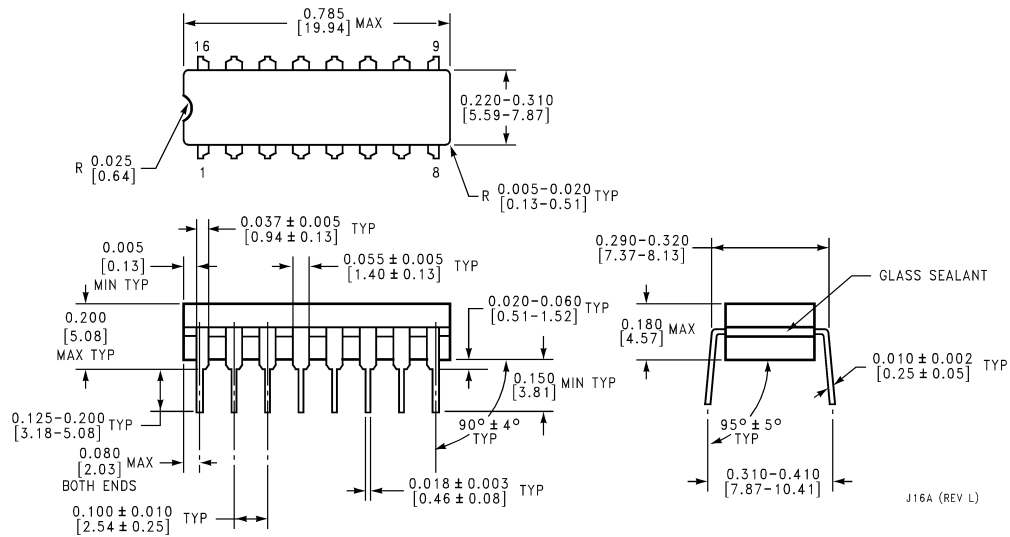
Note 3: I_{CC} is measured with all outputs open and all inputs grounded.

Logic Diagram

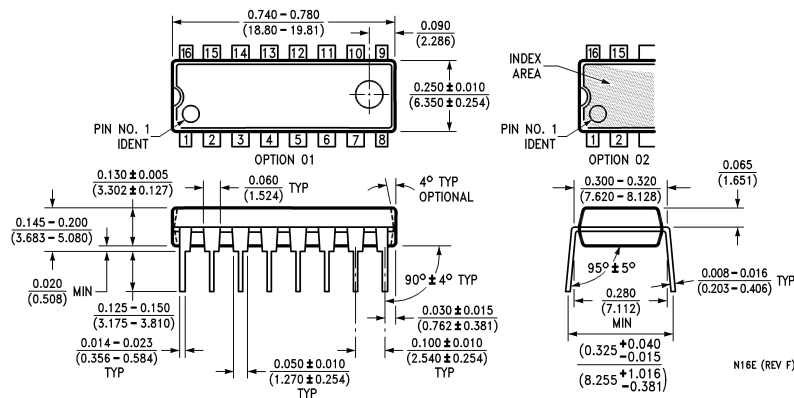




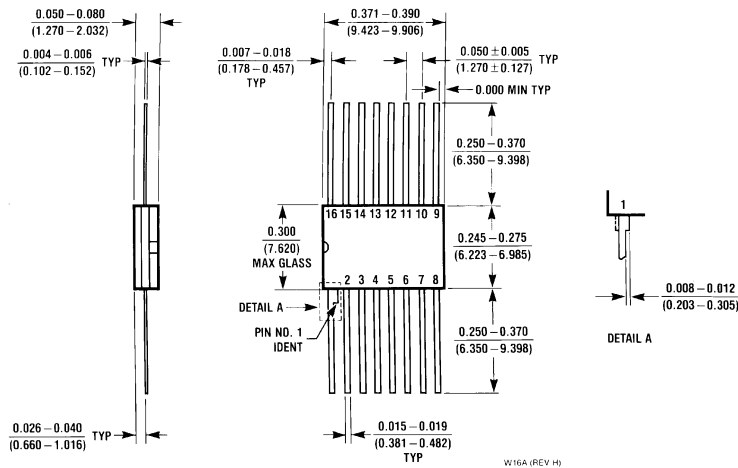
Physical Dimensions inches (millimeters) unless otherwise noted



16-Lead Ceramic Dual-In-Line Package (J)
Order Number DM54145J
Package Number J16A



16-Lead Molded Dual-In-Line Package (N)
Order Number DM74145N
Package Number N16E

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)

16-Lead Ceramic Flat Package (W)
Order Number DM54145W
Package Number W16A

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