National Semiconductor

February 1992

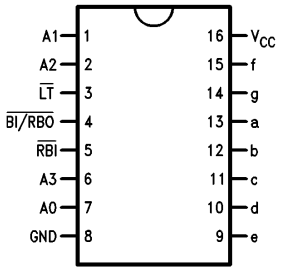
DM74LS248
BCD to 7-Segment Decoder with 2 kΩ Pull-Up Resistors

General Description

The 'LS248 has active HIGH outputs with internal 2 kΩ pull-up resistors. It has the same electrical characteristics and pin connections as the 'LS48. The only difference is that the 'LS248 will light the top bar (segment a) for numeral 6 and the bottom bar (segment d) for numeral 9. For detailed description and specifications please refer to the 'LS48 data sheet.

Connection Diagram

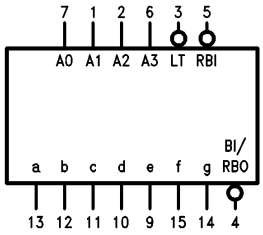
Dual-In-Line Package



TL/F/10181–1

Order Number DM74LS248M or DM74LS248N
See NS Package Number M16A or N16E

Logic Symbol



TL/F/10181–2

V_{CC} = Pin 16
GND = Pin 8

Pin Names	Description
A0–A3	BCD Inputs
$\overline{RBI}$	Ripple Blanking Input (Active LOW)
$\overline{LT}$	Lamp Test Input (Active LOW)
$\overline{BI/RBO}$	Blanking Input (Active LOW) or Ripple Blanking Output (Active LOW)
a–g	Segment Outputs (Active HIGH)

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Absolute Maximum Ratings (Note)

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	0°C to +70°C
Storage Temperature Range	−65°C to +150°C

Note: *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.*

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
I_{OH}	High Level Output Voltage			−0.1	mA
I_{OL}	Low Level Output Current			6	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 1)	Max	Units
V_I	Input Clamp Voltage	V_{CC} = Min, I_I = −18 mA			−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max, V_{IL} = Max	2.4			
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max, V_{IH} = Min			0.5	V
		I_{OL} = 3.2 mA, V_{CC} = Min			0.4	
I_I	Input Current @ Max Input Voltage	V_{CC} = Max, V_I = 7V			0.1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.7V			20	μA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V			−0.4	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 2)	−0.3		−2.0	mA
I_{CC}	Supply Current	V_{CC} = Max			38	mA
I_{OFF}	Output High Current	Segment Inputs, V_O = 0.85V	−1.3			μA

Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

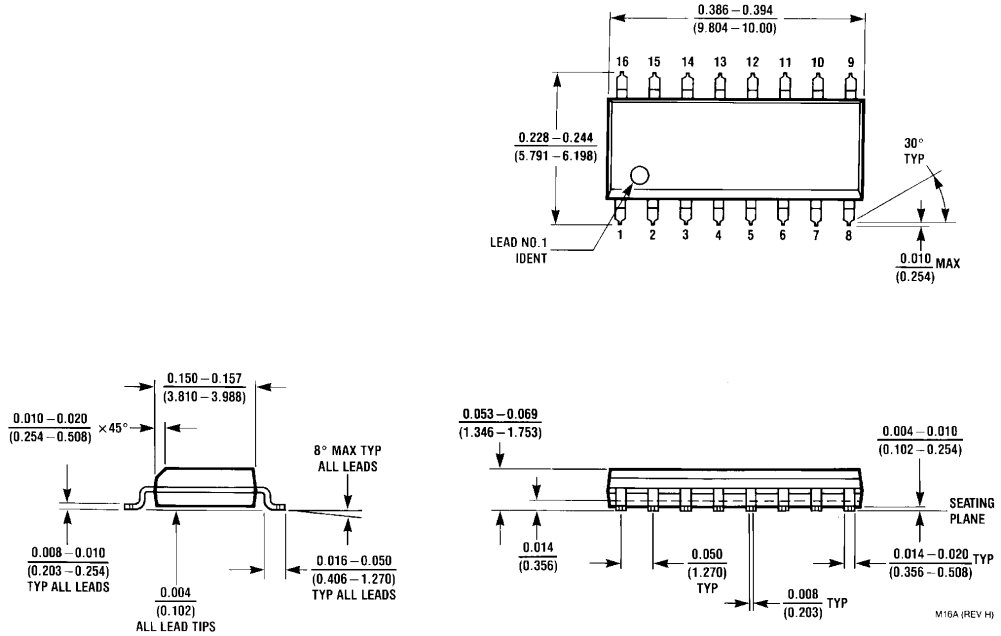
Note 2: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Switching Characteristics

V_{CC} = +5.0V, T_A = +25°C

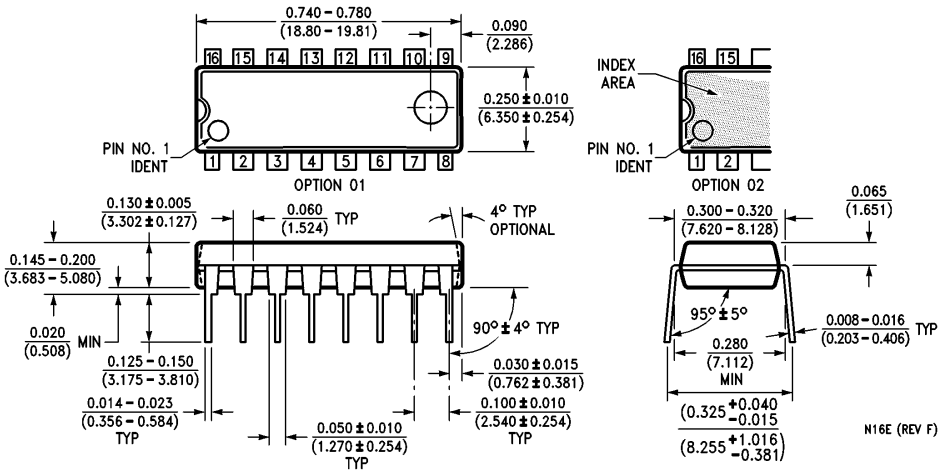
Symbol	Parameter	R_L = 2 kΩ, C_L = 15 pF		Units
		Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output		100	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		100	ns

Physical Dimensions inches (millimeters)



16-Lead Small Outline Molded Package (M)
Order Number DM74LS248M
NS Package Number M16A

Physical Dimensions inches (millimeters) (Continued)



16-Lead Molded Dual-In-Line Package (N)
Order Number DM74LS248N
NS Package Number N16E

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