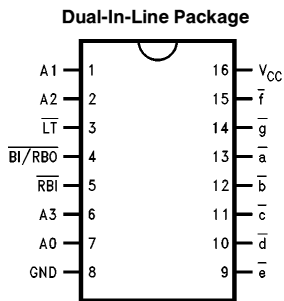


DM54LS447/DM74LS447 BCD to 7-Segment Decoder/Driver with Open-Collector Outputs

General Description

The 'LS447 is the same as the 'LS247 except that the Output OFF Voltage, V_{OH} is specified as 7.0V rather than 15V, with the same I_{OH} limit of 250 μ A. For all other information please refer to the 'LS247 data sheet.

Connection Diagram



TL/F/10187-1

Order Number DM54LS447J, DM54LS447W, DM74LS447M or DM74LS447N
See NS Package Number J16A, M16A, N16E or W16A

DM54LS447/DM74LS447 BCD to 7-Segment Decoder/Driver with Open-Collector Outputs

Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	
DM54LS	−55°C to +125°C
DM74LS	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	DM54LS447			DM74LS447			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			0.7			0.8	V
I_{OH}	High Level Output Current ($\overline{BI}/\overline{RBO}$)			−50			−50	μA
I_{OL}	Low Level Output Current			12			24	mA
T_A	Free Air Operating Temperature	−55		125	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	$V_{CC} = \text{Min}, I_I = -18 \text{ mA}$			−1.5	V
V_{OH}	High Level Output Voltage	$V_{CC} = \text{Min}, I_{OH} = \text{Max}, V_{IL} = \text{Max} (\overline{BI}/\overline{RBO})$	DM54 2.4			V
			DM74 2.4	3.4		
I_{OFF}	High Level Output Current	Segment Outputs, $V_O = 7.0V (\overline{a}-\overline{g})$			250	μA
V_{OL}	Low Level Output Voltage	$V_{CC} \text{ Min}, I_{OL} = \text{Max}, V_{IH} = \text{Min}$	DM54		0.4	V
			DM74	0.35	0.5	
		$I_{OL} = 12 \text{ mA}, V_{CC} = \text{Min}$	DM74	0.25	0.4	
I_I	Input Current @ Max Input Voltage	$V_{CC} = \text{Max}, V_I = 7V$ $V_I = 10V (\text{DM54})$			0.1	mA
I_{IH}	High Level Input Current	$V_{CC} = \text{Max}, V_I = 2.7V$			20	μA
I_{IL}	Low Level Input Current	$V_{CC} = \text{Max}, V_I = 0.4V$	Others		−0.4	mA
			$\overline{BI}/\overline{RBO}$ Inputs		−1.2	mA
I_{OS}	Short Circuit Output Current	$V_{CC} = \text{Max}$ (Note 2)	DM54	−0.3	−2.0	mA
			DM74	−0.3	−2.0	
I_{CC}	Supply Current	$V_{CC} = \text{Max}$			13	mA

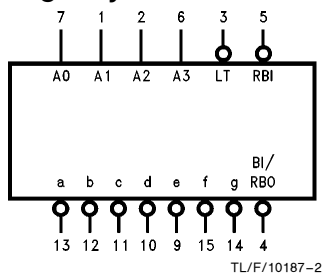
Note 1: All typicals are at $V_{CC} = 5V, T_A = 25^\circ C$.

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

Switching Characteristics at $V_{CC} = 5V, T_A = 25^\circ C$

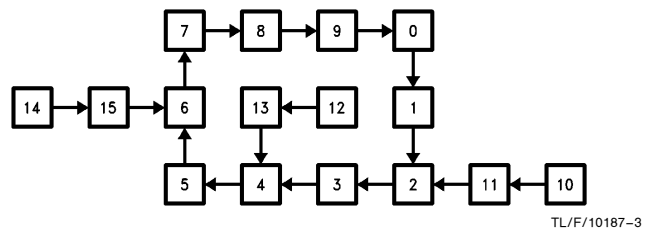
Symbol	Parameter	$R_L = 2 \text{ k}\Omega, C_L = 15 \text{ pF}$		Units
		Min	Max	
t_{PLH} t_{PHL}	Propagation Delay		100 100	ns

Logic Symbol



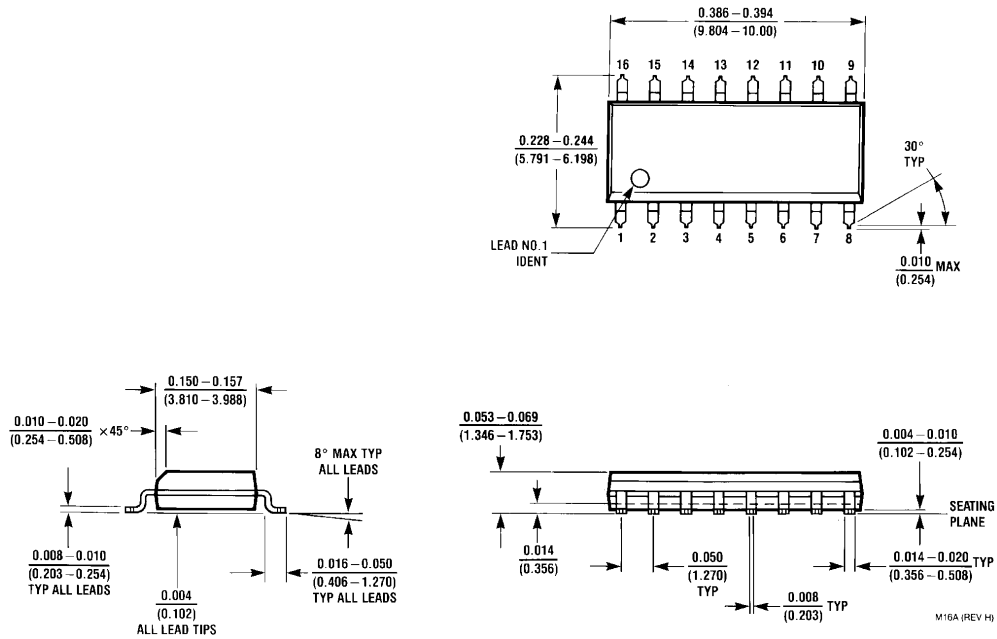
V_{CC} = Pin 16
GND = Pin 8

State Diagram

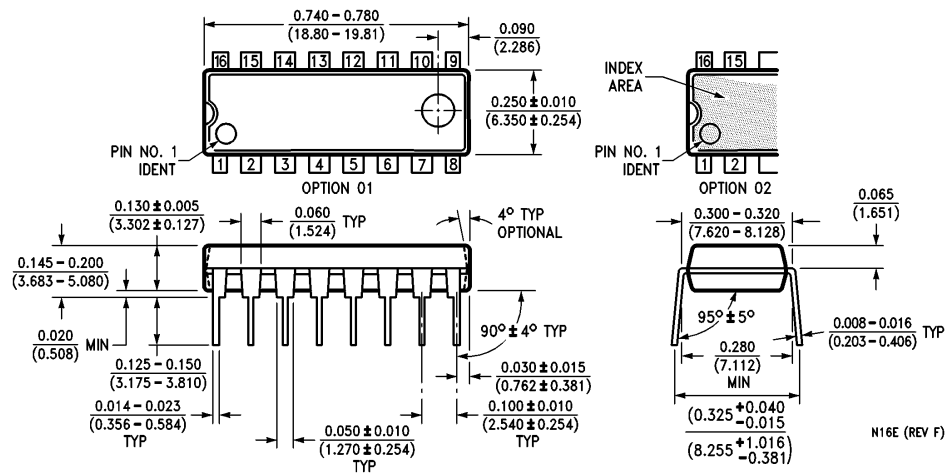


J16A (REV L)

Physical Dimensions inches (millimeters) (Continued)

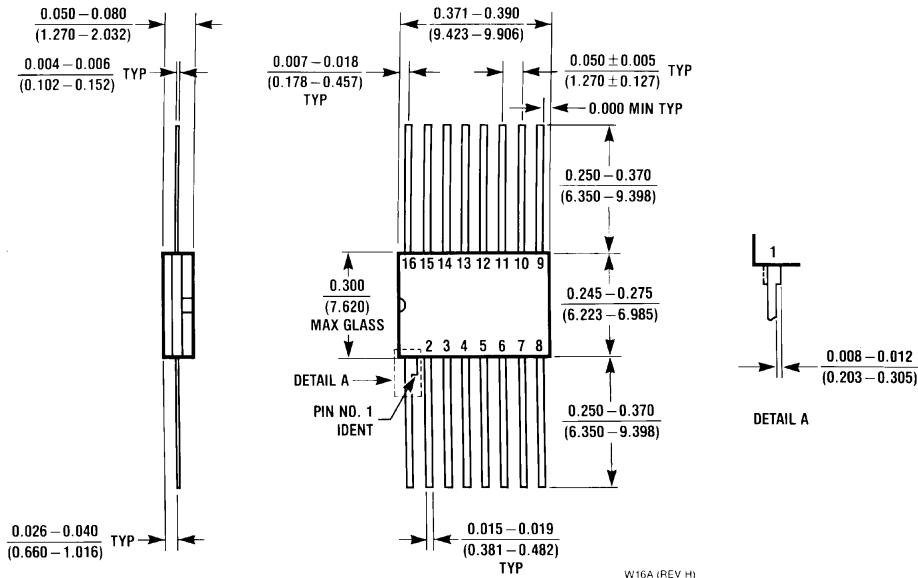


16-Lead Small Outline Molded Package (M)
Order Number DM74LS447M
NS Package Number M16A



16-Lead Molded Dual-In-Line Package (N)
Order Number DM74LS447N
NS Package Number N16E

Physical Dimensions inches (millimeters) (Continued)



16-Lead Ceramic Flat Package (W)
Order Number DM54LS447W
NS Package Number W16A

LIFE SUPPORT POLICY

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.



National Semiconductor Corporation
1111 West Bardin Road
Arlington, TX 76017
Tel: 1(800) 272-9959
Fax: 1(800) 737-7018

National Semiconductor Europe
Fax: (+49) 0-180-530 85 86
Email: cnjwge@tevm2.nsc.com
Deutsch Tel: (+49) 0-180-530 85 85
English Tel: (+49) 0-180-532 78 32
Français Tel: (+49) 0-180-532 93 58
Italiano Tel: (+49) 0-180-534 16 80

National Semiconductor Hong Kong Ltd.
19th Floor, Straight Block,
Ocean Centre, 5 Canton Rd.
Tsimshatsui, Kowloon
Hong Kong
Tel: (852) 2737-1600
Fax: (852) 2736-9960

National Semiconductor Japan Ltd.
Tel: 81-043-299-2309
Fax: 81-043-299-2408