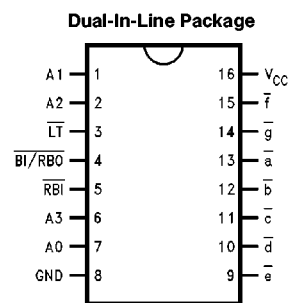


DM54LS447/DM74LS447 BCD to 7-Segment Decoder/Driver with Open-Collector Outputs

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} = Min, I _I = -18 mA			-1.5	V
V _{OH}	High Level Output Voltage	V _{CC} = Min, I _{OH} = Max, V _{IL} = Max ($\overline{BI}/\overline{RBO}$)	DM54 2.4	3.4		V
I _{OFF}	High Level Output Current	Segment Outputs, V _O = 7.0V ($\overline{a-g}$)			250	μA
V _{OL}	Low Level Output Voltage	V _{CC} Min, I _{OL} = Max, V _{IH} = Min	DM54 DM74	0.35	0.4	V
		I _{OL} = 12 mA, V _{CC} = Min	DM74	0.25	0.4	
I _I	Input Current @ Max Input Voltage	V _{CC} = Max, V _I = 7V V _I = 10V (DM54)			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	Others $\overline{BI}/\overline{RBO}$ Inputs		-0.4 -1.2	mA
I _{OS}	Short Circuit Output Current	V _{CC} = Max (Note 2)	DM54 DM74	-0.3 -0.3	-2.0 -2.0	mA
I _{CC}	Supply Current	V _{CC} = Max			13	mA

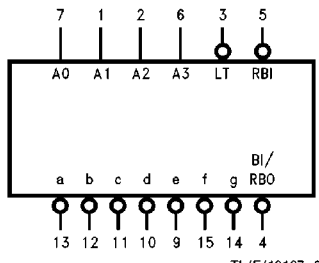
Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

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

Switching Characteristics at V_{CC} = 5V, T_A = 25°C

Symbol	Parameter	R _L = 2 kΩ, C _L = 15 pF		Units
		Min	Max	
t _{PLH} t _{PHL}	Propagation Delay		100	ns

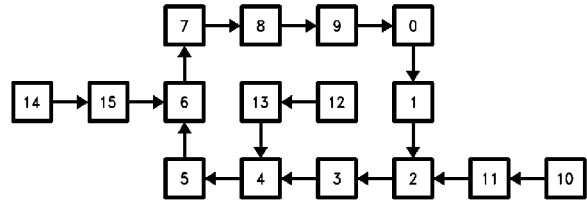
Logic Symbol



TL/F/10187-2

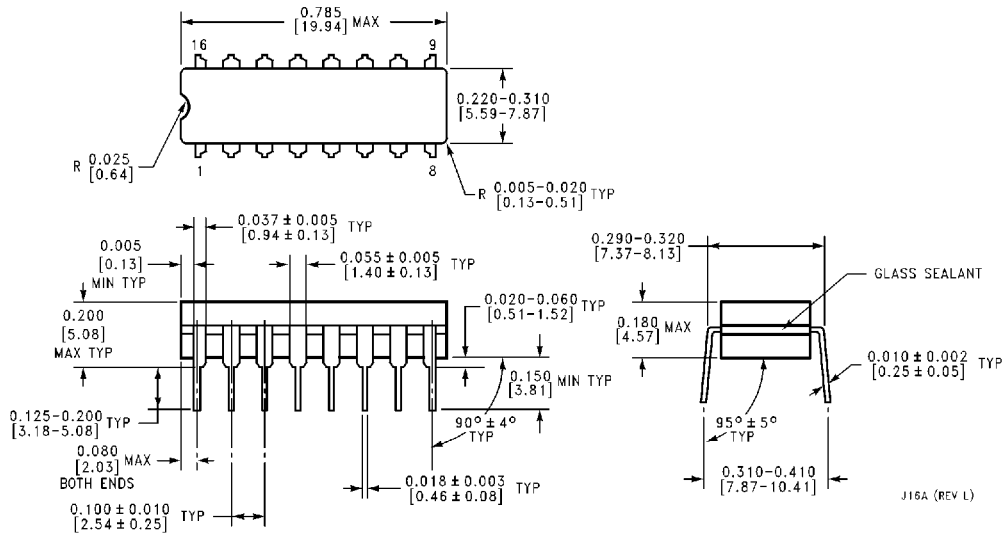
V_{CC} = Pin 16
GND = Pin 8

State Diagram



TL/F/10187-3

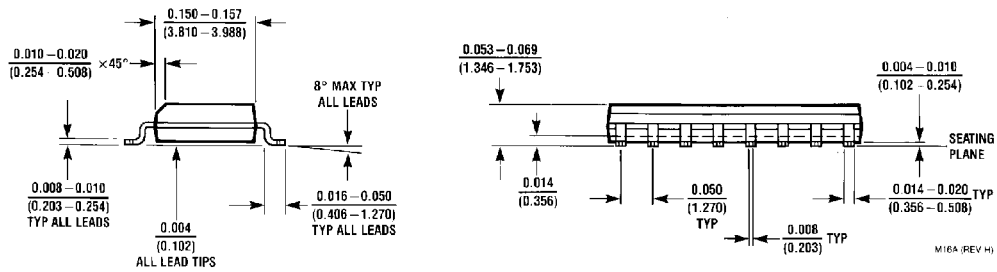
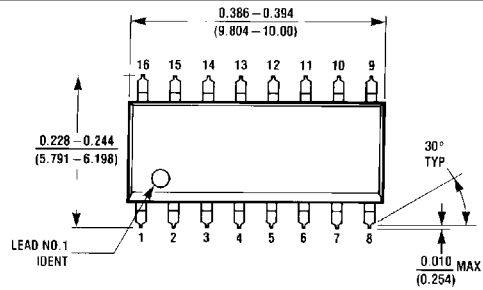
Physical Dimensions inches (millimeters)



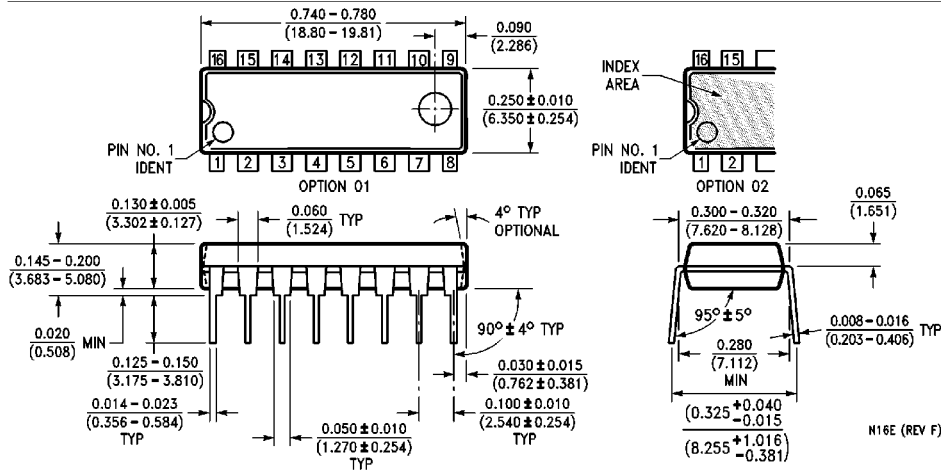
16-Lead Ceramic Dual-In-Line Package (J)
Order Number DM54LS447J
NS Package Number J16A

J16A (REV L)

Physical Dimensions inches (millimeters) (Continued)

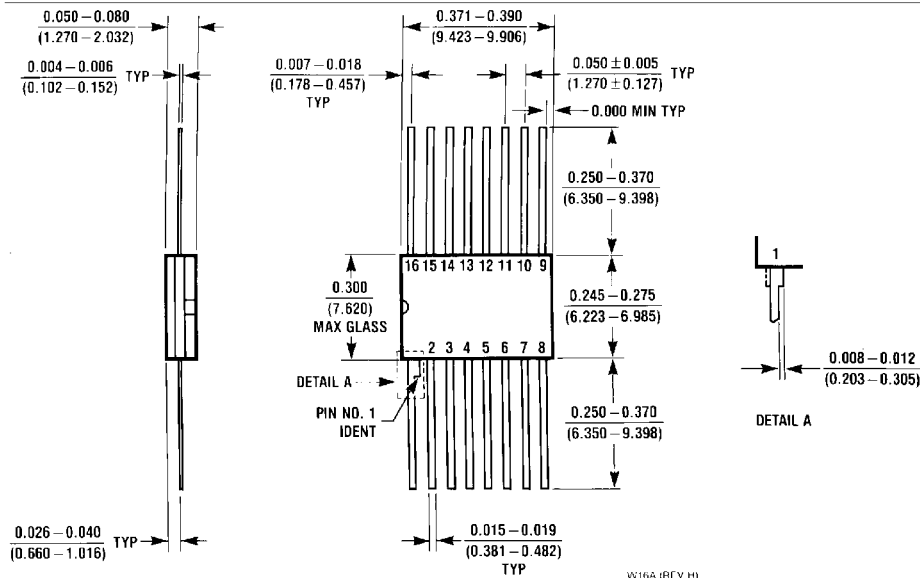


16-Lead Small Outline Molded Package (M)
Order Number DM74LS447M
NS Package Number M16A



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

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
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.
 13th 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

National does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and National reserves the right at any time without notice to change said circuitry and specifications.