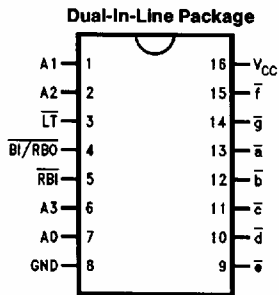


## DM54LS347/DM74LS347 BCD to 7-Segment Decoder/Driver

### General Description

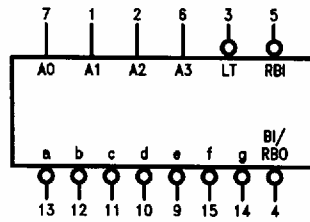
The 'LS347 is the same as the 'LS47 except that the Output OFF Voltage,  $V_{OH}$ , is specified as 7.0V rather than 15V, with the same  $I_{OH}$  limit of 250  $\mu$ A. For all other information please refer to the 'LS47 data sheet.

### Connection Diagram



TL/F/10184-1

### Logic Symbol



TL/F/10184-2

$V_{CC}$  = Pin 16  
GND = Pin 8

Order Number DM54LS347J, DM54LS347W,  
DM74LS347M or DM74LS347N  
See NS Package Number J16A, M16A, N16E or W16A

| 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<br>Ripple Blanking Output (Active LOW) |
| $\overline{a-g}$    | *Segment Outputs (Active LOW)   |

\*OC—Open Collector

### 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                      | DM54LS347 |     |     | DM74LS347 |     |      | Units |
|-----------------|--------------------------------|-----------|-----|-----|-----------|-----|------|-------|
|                 |                                | Min       | Nom | Max | Min       | Nom | Max  |       |
| V <sub>CC</sub> | Supply Voltage                 | 4.5       | 5   | 5.5 | 4.75      | 5   | 5.25 | V     |
| V <sub>IH</sub> | High Level Input Voltage       | 2         |     |     | 2         |     |      | V     |
| V <sub>IL</sub> | Low Level Input Voltage        |           |     | 0.7 |           |     | 0.8  | V     |
| I <sub>OH</sub> | High Level Output Voltage      |           |     | -50 |           |     | -50  | μA    |
| I <sub>OL</sub> | Low Level Output Current       |           |     | 12  |           |     | 24   | mA    |
| T <sub>A</sub>  | 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 <sub>I</sub>   | Input Clamp Voltage               | V <sub>CC</sub> = Min, I <sub>I</sub> = -18 mA                      |              |              | -1.5 | V     |
| V <sub>OH</sub>  | High Level Output Voltage         | V <sub>CC</sub> = Min, I <sub>OH</sub> = Max, V <sub>IL</sub> = Max | DM54<br>2.5  |              |      | V     |
| V <sub>OL</sub>  | Low Level Output Voltage          | V <sub>CC</sub> = Min, I <sub>OL</sub> = Max, V <sub>IH</sub> = Min | DM54         |              | 0.4  | V     |
|                  |                                   |   | DM74         |              | 0.5  |       |
|                  |                                   | I <sub>OL</sub> = 4 mA, V <sub>CC</sub> = Min                       | DM74         |              | 0.4  |       |
| I <sub>I</sub>   | Input Current @ Max Input Voltage | V <sub>CC</sub> = Max, V <sub>I</sub> = 7V<br>V <sub>I</sub> = 10V  | DM74<br>DM54 |              | 0.1  | mA    |
| I <sub>IH</sub>  | High Level Input Current          | V <sub>CC</sub> = Max, V <sub>I</sub> = 2.7V                        |              |              | 20   | μA    |
| I <sub>IL</sub>  | Low Level Input Current           | V <sub>CC</sub> = Max, V <sub>I</sub> = 0.4V                        | Other Input  |              | -0.4 | mA    |
|                  |                                   |   | BI/RBO Input |              | -1.2 | mA    |
| I <sub>OS</sub>  | Short Circuit Output Current      | V <sub>CC</sub> = Max (Note 2)                                      | DM54         | -0.3         | -2.0 | mA    |
|                  |                                   |   | DM74         | -0.3         | -2.0 |       |
| I <sub>CC</sub>  | Supply Current                    | V <sub>CC</sub> = Max   |              |              | 13   | mA    |
| I <sub>OFF</sub> |                                   | Segment Outputs, V <sub>O</sub> = 7V                                |              |              | 250  | μA    |

### Switching Characteristics

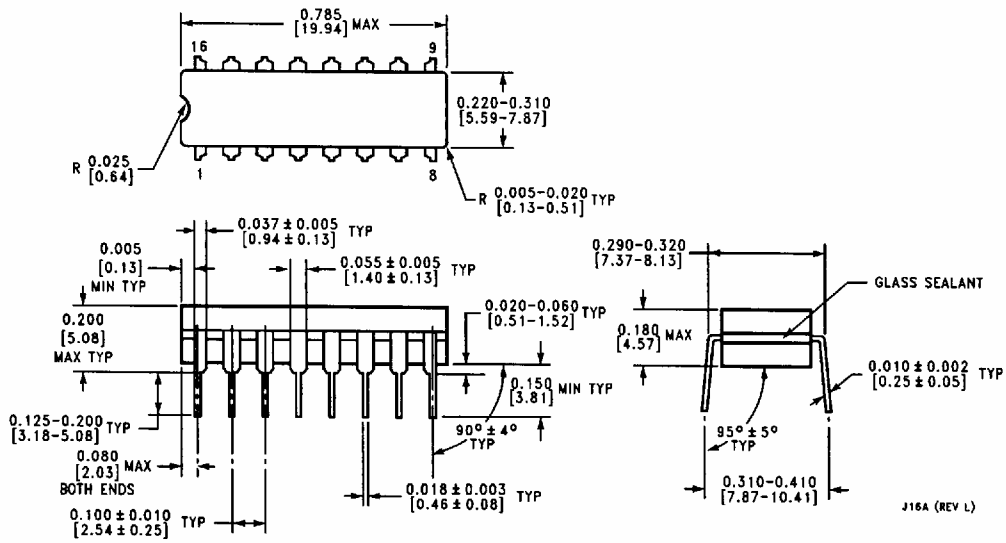
at V<sub>CC</sub> = 5V and T<sub>A</sub> = 25°C:

| Symbol           | Parameter                                  | C <sub>L</sub> = 15 pF |     | Units |
|------------------|--|------------------------|-----|-------|
|                  |  | Min                    | Max |       |
| t <sub>PLH</sub> | Propagation Delay<br>A <sub>n</sub> to a-g |                        | 100 | ns    |
| t <sub>PHL</sub> |  |                        | 100 | ns    |
| t <sub>PLH</sub> | Propagation Delay<br>RBI to a-g            |                        | 100 | ns    |
| t <sub>PHL</sub> |  |                        | 100 | ns    |

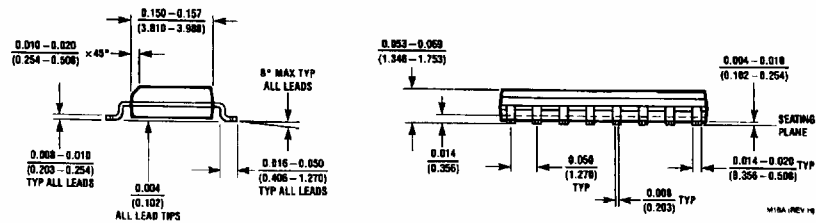
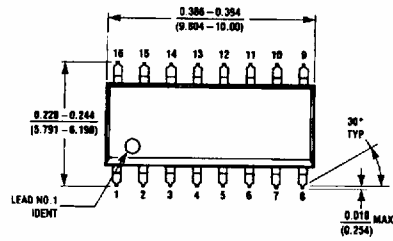
Note 1: All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

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

**Physical Dimensions** inches (millimeters)

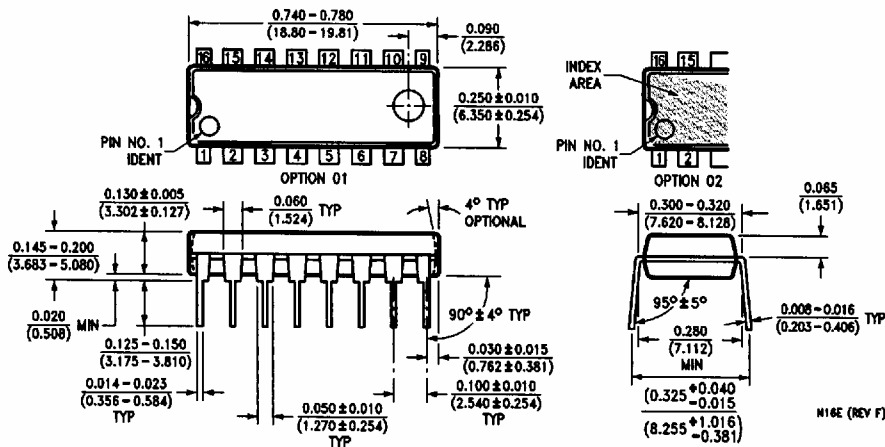


**16-Lead Ceramic Dual-in-Line Package (J)**  
**Order Number DM54LS347J**  
**NS Package Number J16A**

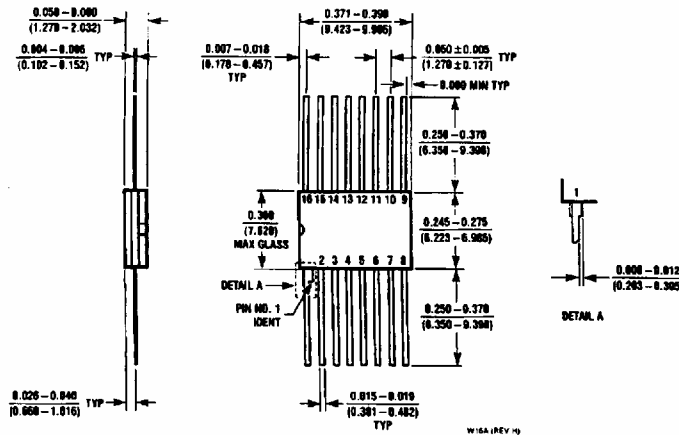


**16-Lead Small Outline Molded Package (M)**  
**Order Number DM74LS347M**  
**NS Package Number M16A**

**Physical Dimensions** inches (millimeters) (Continued)



**16-Lead Molded Dual-In-Line Package (N)**  
**Order Number DM74LS347N**  
**NS Package Number N16E**



**16-Lead Ceramic Flat Package (W)**  
**Order Number DM54LS347W**  
**NS Package Number W16A**

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