

## DS8874 9-Digit Shift Input LED Driver

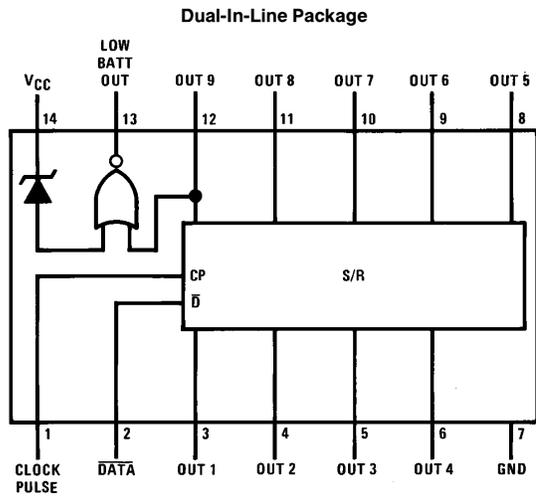
### General Description

The DS8874 is a 9-digit LED driver which incorporates a shift register input decoding circuit and a low battery indicator. Outputs will sink 110 mA at less than 0.5V drop when sequentially selected. When the  $V_{CC}$  supply falls below 6.5V typical, segment current will be furnished at digit 9 time to indicate a low battery condition. Pin 13 is generally connected to the decimal point segment on the display so that when a low battery condition exists, the left-most decimal point lights up.

### Features

- 110 mA digit sink
- Low battery indicator
- Minimum number of connections
- MOS compatible inputs

### Connection Diagram

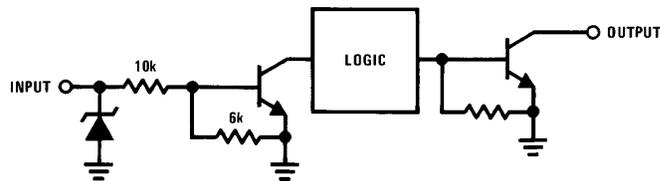


TL/F/5843-1

Top View

Order Number DS8874N  
See NS Package Number N14A

### Equivalent Schematic



TL/F/5843-2

## Absolute Maximum Ratings (Note 1)

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

|                           |                 |
|---------------------------|-----------------|
| Supply Voltage            | 10V             |
| Input Voltage             | 3V              |
| Output Voltage            | 10V             |
| Storage Temperature Range | -65°C to +150°C |

|  |         |
|--|---------|
| Maximum Power Dissipation* at 25°C             | 1280 mW |
| Molded Package                                 |         |
| Lead Temperature (Soldering, 4 sec.)           | 260°C   |
| *Derate molded package 10.24 mW/°C above 25°C. |         |

## Operating Conditions

|                             | Min | Max | Units |
|-----------------------------|-----|-----|-------|
| Supply Voltage ( $V_{CC}$ ) | 6.0 | 9.5 | V     |
| Temperature ( $T_A$ )       | 0   | +70 | °C    |

## Electrical Characteristics (Notes 2 and 3)

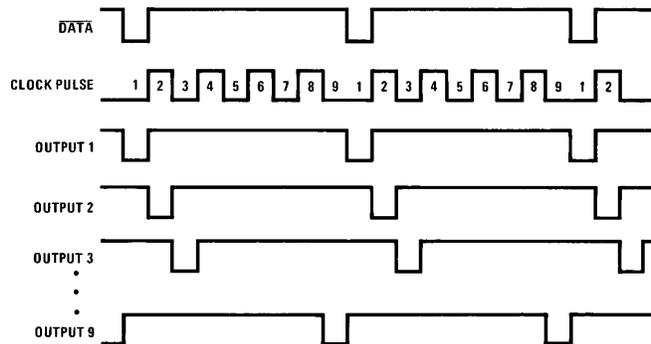
| Symbol    | Parameter                  | Conditions   | Min | Typ  | Max | Units   |
|-----------|----------------------------|--|-----|------|-----|---------|
| $I_{IH}$  | Logical "1" Input Current  | $V_{CC} = \text{Max}, V_{IN} = 3V$                                     |     | 0.25 | 0.4 | mA      |
| $I_{IL}$  | Logical "0" Input Current  | $V_{CC} = \text{Max}, V_{IN} = 0.8V$                                   |     | 0.05 | 0.1 | mA      |
| $V_{CCL}$ | Decimal Point "ON"         | $V_{dp} = 2.3V, I_{dp} = -4 \text{ mA}, O9 = V_{OL}$                   |     |      | 6.0 | V       |
| $V_{CCH}$ | Decimal Point "OFF"        | $V_{dp} = 1V, I_{dp} = -10 \mu A, O9 = V_{OL}$                         | 7.0 |      |     | V       |
| $I_{OH}$  | Logical "1" Output Current | $V_{CC} = \text{Max}, \text{Output Not Selected}$                      |     |      | 100 | $\mu A$ |
| $V_{OL}$  | Logical "0" Output Voltage | $V_{CC} = \text{Min}, \text{Output Selected}, I_{O1} = 80 \text{ mA}$  |     | 0.45 | 1   | V       |
|           |                            | $V_{CC} = \text{Max}, \text{Output Selected}, I_{O1} = 110 \text{ mA}$ |     | 0.6  | 1.5 | V       |
| $I_{CC}$  | Supply Current             | $V_{CC} = \text{Max}, \text{One Output Selected}$                      |     | 13   | 19  | mA      |

**Note 1:** "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. They are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual device operation.

**Note 2:** Unless otherwise specified min/max limits apply across the 0°C to +70°C range. All typicals are given for  $T_A = 25^\circ C$ .

**Note 3:** All currents into device pins shown as positive, out of device pins as negative, all voltages referenced to ground unless otherwise noted. All values shown as max or min on absolute value basis.

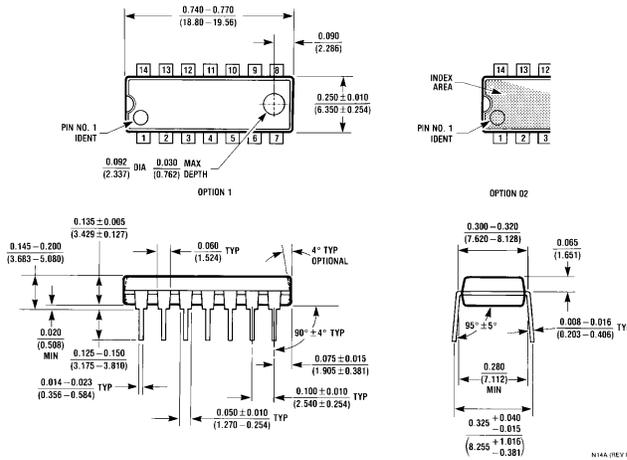
## Timing Diagram (Upper Level More Positive)



TL/F/5843-4



**Physical Dimensions** inches (millimeters)



**Molded Dual-In-Line Package (N)**  
**Order Number DS8874N**  
**NS Package Number N14A**

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