# **DS8870 Hex LED Digit Driver**

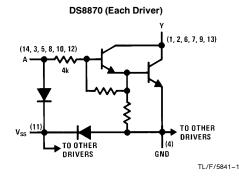
## **General Description**

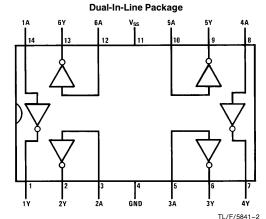
The DS8870 is an interface circuit designed to be used in conjunction with MOS integrated circuits and common-cathode LED's in serially addressed multi-digit displays. The number of drivers required for this time-multiplexed system is minimized as a result of the segment-address-and-digit-scan method of LED drive.

### **Features**

- Sink capability per driver—350 mA
- MOS compatibility (low input current)
- Low standby power
- High-gain Darlington circuits

## **Schematic and Connection Diagrams**





Order Number DS8870J or DS8870N See NS Package Number J14A or N14A

### **Absolute Maximum Ratings** (Note 1)

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

−5V to V<sub>SS</sub> Input Voltage Range (Note 4) Collector Output Voltage 10V Collector Output to Input Voltage 10V

Voltage at  $V_{\mbox{SS}}$  Terminal with Respect to Any Other Device Terminal

Collector Output Current Each Collector Output 350 mA 600 mA All Collector Outputs

Continuous Total Dissipation 800 mW Operating Temperature Range  $0^{\circ}$  to  $+70^{\circ}$ C -65°C to +150°C Storage Temperature

Maximum Power Dissipation\* at 25°C

1308 mW Cavity Package Molded Package 1207 mW

Lead Temperature (Soldering, 4 seconds) 260°C

\*Derate cavity package 8.72 mW/°C above 25°C; derate molded package 9.66 mW/°C above 25°C.

## **Electrical Characteristics** $V_{SS} = 10V$ (Notes 2 and 3)

Symbol	Parameter	Conditions	Min	Тур	Max	Units
V <sub>OL</sub>	Low Level Output Voltage	Input = 6.5V through $k\Omega$ , $I_{OUT}$ = 350 mA, $T_A$ = 25°C		1.2	1.4	٧
V <sub>OL</sub>	Low Level Output Voltage	Input = 6.5V through 1 k $\Omega$ , I <sub>OUT</sub> = 350 mA			1.6	٧
I <sub>OH</sub>	High Level Output Current	$V_{OH} = 10V, I_{IN} = 40 \mu A$			200	μΑ
Гон	High Level Output Current	$V_{OH} = 10V, V_{IN} = 0.5V$			200	μΑ
II	Input Current at Maximum Input Voltage	$V_{IN} = 10V, I_{OL} = 20 \mu A$		2.2	3.3	mA
I <sub>SS</sub>	Current into V <sub>SS</sub> Terminal				1	mA

10V

## Switching Characteristics $V_{SS} = 7.5V$ , $T_A = 25^{\circ}C$

Symbol	Parameter	Conditions	Min	Тур	Max	Units
t <sub>PLH</sub>	Propagation Delay Time, Low-to-High Level Output	$\begin{aligned} \text{V}_{\text{IH}} &= 7.5 \text{V}, \text{R}_{\text{L}} = 39 \Omega, \\ \text{C}_{\text{L}} &= 15 \text{ pF} \end{aligned}$		300		ns
t <sub>PHL</sub>	Propagation Delay Time, High-to-Low Level Output	$V_{IH} = 7.5V$ , $R_L = 39\Omega$ , $C_L = 15 pF$		30		ns

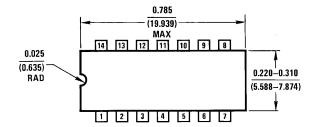
Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual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

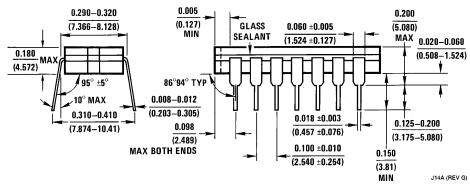
Note 2: Unless otherwise specified min/max limits apply across the  $0^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  temperature range.

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.

Note 4: The input is the only device terminal which may be negative with respect to ground.

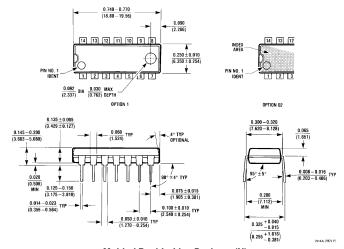






Ceramic Dual-In-Line Package (J) Order Number DS8870J NS Package Number J14A

## Physical Dimensions inches (millimeters) (Continued)



Molded Dual-In-Line Package (N) Order Number DS8870N NS Package Number N14A

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