National Semiconductor

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# DS75494 Hex Digit Driver

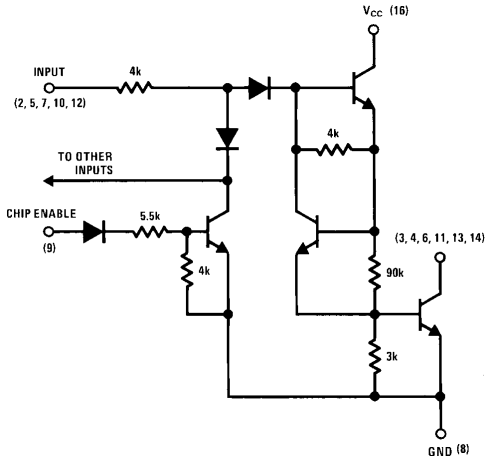
## General Description

The DS75494 is a hex digit driver designed to interface between most MOS devices and common cathodes configured LED's with a low output voltage at high operating currents. The enable input disables all the outputs when taken high.

## Features

- 150 mA sink capability
- Low voltage operation
- Low input current for MOS compatibility
- Low standby power
- Display blanking capability
- Low voltage saturating outputs
- Hex high gain circuits

## Schematic and Connection Diagrams

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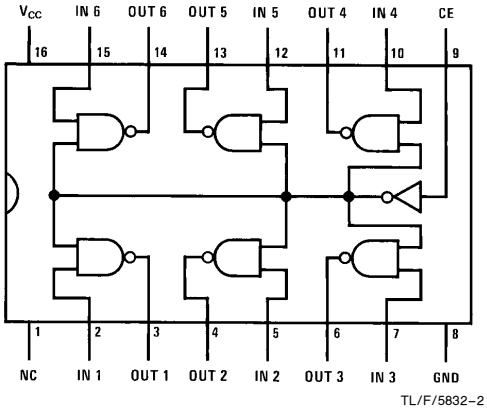
**Dual-In-Line Package**

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**Top View**

**Order Number DS75494N**
**See NS Package Number N16A**

## Truth Table

| Enable | $V_{IN}$ | $V_{OUT}$ |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | X | 1 |

X = don't care

## 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 | 10V |
| Output Voltage | 10V |
| Storage Temperature Range | −65°C to +150°C |
| Maximum Power Dissipation* at 25°C | |
| Cavity Package | 1433 mW |
| Molded Package | 1362 mW |
| Lead Temperature (Soldering 4 seconds) | 260°C |

*Derate molded package 10.9 mW/°C above 25°C.

## Operating Conditions

| | Min | Max | Units |
|---|---|---|---|
| Supply Voltage, $V_{CC}$ | 3.2 | 8.8 | V |
| Temperature, $T_A$ | | | |
| DS75494 | 0 | +70 | °C |

## Electrical Characteristics (Notes 2 and 3)

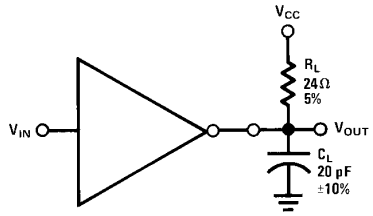
| Symbol | Parameter | Conditions | | | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|---|---|
| $I_{IH}$ | Logical "1" Input Current | $V_{CC}$ = Min, $V_{IN}$ = 8.8V | $V_{CE}$ = 8.8V through 100k | | | | 2.0 | mA |
| | | | $V_{CE}$ = 8.8V | | | | 2.7 | mA |
| $I_{IL}$ | Logical "0" Input Current | $V_{CC}$ = Max, $V_{IN}$ = −5.5V | | | | | −20 | μA |
| $I_{OH}$ | Logical "1" Output Current | $V_{CC}$ = Max, $V_{OH}$ = 8.8V | $V_{IN}$ = 8.8V through 100k, $V_{CE}$ = 0V | | | | 400 | μA |
| | | | $V_{IN}$ = 8.8V, $V_{CE}$ = 6.5V through 1.0k | | | | 400 | μA |
| $V_{OL}$ | Logical "0" Output Voltage | $V_{CC}$ = Min, $I_{OL}$ = 150 mA, $V_{IN}$ = 6.5V through 1.0k, $V_{CE}$ = 8.8V through 100k | | DS75494 | | 0.25 | 0.35 | V |
| $I_{CC}$ | Supply Currents | $V_{CC}$ = Max | One Driver "ON", $V_{IN}$ = 8.8V | DS75474 | | | 8.0 | mA |
| | | | All Other Pins to GND | $V_{CE}$ = 6.5V through 1.0k | | | 100 | μA |
| | | | | $V_{IN}$ = 8.8V through 100k | | | 100 | μA |
| | | | All Other Pins to GND | | | | 40 | μA |
| $t_{OFF}$ | Output "OFF" Time | $C_L$ = 20 pF, $R_L$ = 24Ω, $V_{CC}$ = 4.0V, See AC Test Circuits | | | | 0.04 | 1.2 | μs |
| $t_{ON}$ | Output "ON" Time | $C_L$ = 20 pF, $R_L$ = 24Ω, $V_{CC}$ = 4.0V, See AC Test Circuits | | | | 13 | 100 | ns |

**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 for the DS75494.

**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.

## AC Test Circuit and Switching Time Waveforms

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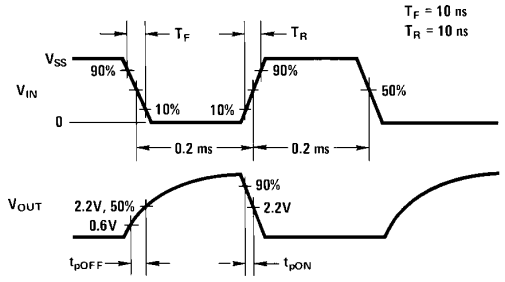


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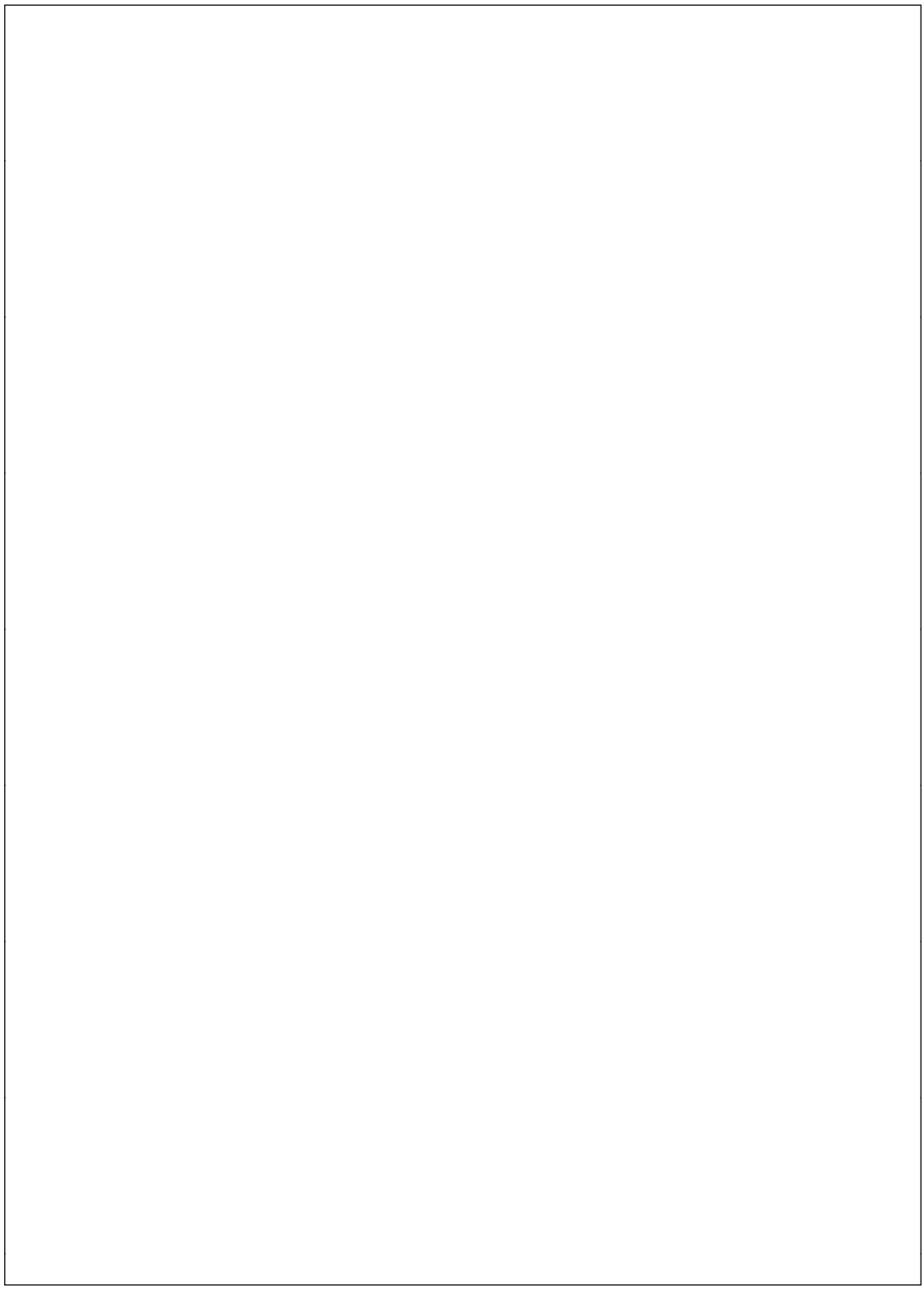
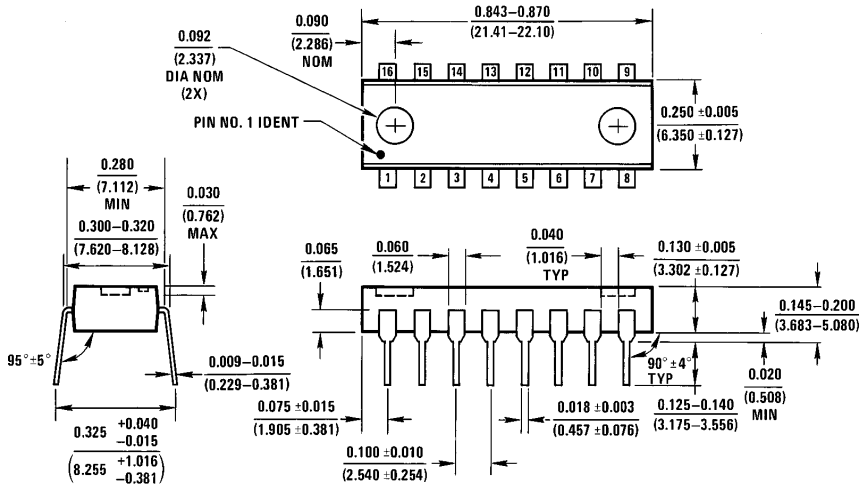


## Physical Dimensions inches (millimeters)




N16A (REV E)

**Molded Dual-In-Line Package (N)**
**Order Number DS75494N**
**NS Package Number N16A**

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