

DS75491 MOS-to-LED Quad Segment Driver

DS75492 MOS-to-LED Hex Digit Driver

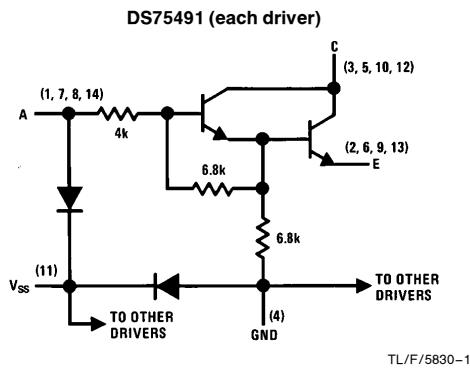
General Description

The DS75491 and DS75492 are interface circuits designed to be used in conjunction with MOS integrated circuits and common-cathode LEDs 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.

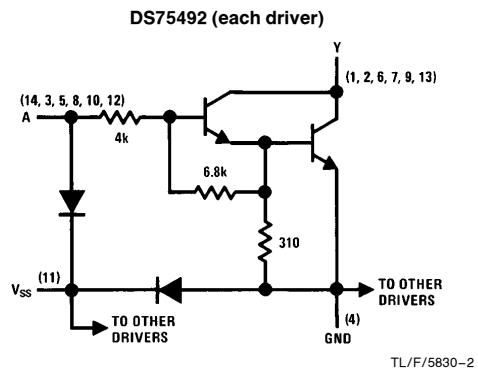
Features

- 50 mA source or sink capability per driver (DS75491)
- 250 mA sink capability per driver (DS75492)
- MOS compatibility (low input current)
- Low standby power
- High-gain Darlington circuits

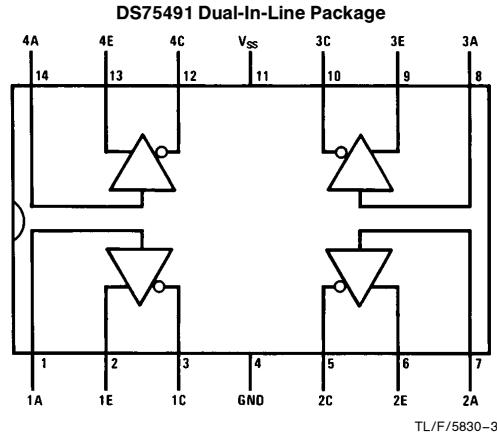
Schematic and Connection Diagrams



TL/F/5830-1

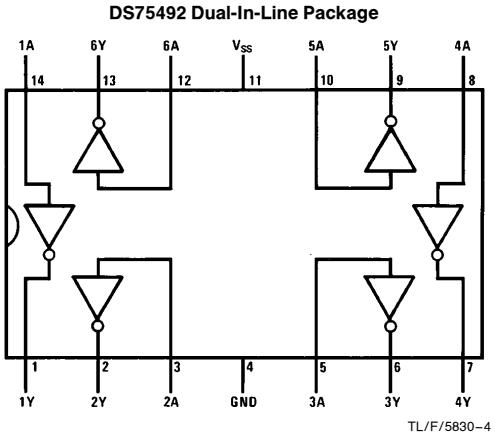


TL/F/5830-2



Top View

**Order Number DS75491N, DS75492M or DS75492N
See NS Package Number M14A or N14A**



Top View

Absolute Maximum Ratings (Note 1)

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

DS75491 DS75492

			DS75491	DS75492
Input Voltage Range (Note 4)	–5V to V _{SS}		Continuous Total Dissipation	600 mW
Collector Output Voltage (Note 5)	10V	10V	Operating Temperature Range	0°C to +70°C
Collector Output to Input Voltage	10V	10V	Storage Temperature Range	–65°C to +150°C
Emitter to Ground Voltage (V _I ≥ 5V)	10V		Lead Temp. (Soldering, 10 sec)	300°C
Emitter to Input Voltage	5V		Maximum Power Dissipation at 25°C	300°C
Voltage at V _{SS} Terminal with Respect to any Other Device Terminal	10V	10V	Molded Package	1207 mW*
Collector Output Current			*Derate molded package 9.66 mW/°C above 25°C.	1280 mW†
Each Collector Output	50 mA	250 mA		
All Collector Outputs	200 mA	600 mA	†Derate molded package 10.24 mW/°C above 25°C.	

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

Symbol	Parameter	Conditions		Min	Typ	Max	Units
DS75491							
V _{CE} ON	“ON” State Collector Emitter Voltage	Input = 8.5V through 1 kΩ, V _E = 5V, I _C = 50 mA	T _A = 25°C		0.9	1.2	V
			T _A = 0–70°C			1.5	V
I _C OFF	“OFF” State Collector Current	V _C = 10V, V _E = 0V	I _{IN} = 40 μA		100	μA	
			V _{IN} = 0.7V		100	μA	
I _I	Input Current at Maximum Input Voltage	V _{IN} = 10V, V _E = 0V, I _C = 20 mA		2.2	3.3	mA	
I _E	Emitter Reverse Current	V _{IN} = 0V, V _E = 5V, I _C = 0 mA			100	μA	
I _{SS}	Current Into V _{SS} Terminal				1	mA	
DS75492							
V _{OL}	Low Level Output Voltage	Input = 6.5V through 1 kΩ, I _{OUT} = 250 mA	T _A = 25°C		0.9	1.2	V
			T _A = 0–70°C			1.5	V
I _{OH}	High Level Output Current	V _{OH} = 10V	I _{IN} = 40 μA		200	μA	
			V _{IN} = 0.5V		200	μA	
I _I	Input Current at Maximum Input Voltage	V _{IN} = 10V, I _{OL} = 20 mA		2.2	3.3	mA	
I _{SS}	Current Into V _{SS} Terminal				1	mA	

Switching Characteristics V_{SS} = 7.5V, T_A = 25°C

Symbol	Parameter	Conditions		Min	Typ	Max	Units
DS75491							
t _{PLH}	Propagation Delay Time, Low-to-High Level Output (Collector)	V _{IH} = 4.5V, V _E = 0V, R _L = 200Ω, C _L = 15 pF		100			ns
t _{PHL}	Propagation Delay Time, High-to-Low Level Output (Collector)			20			ns
DS75492							
t _{PLH}	Propagation Delay Time, Low-to-High Level Output	V _{IH} = 7.5V, R _L = 39Ω, C _L = 15 pF		300			ns
t _{PHL}	Propagation Delay Time, High-to-Low Level Output			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°C to +70°C temperature range for the DS75491 and DS75492.

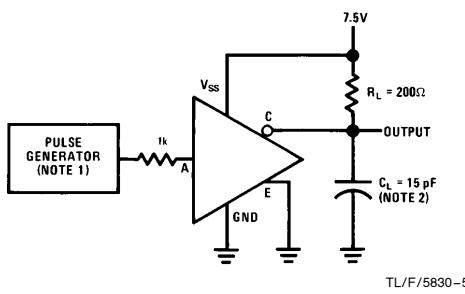
Note 3: All currents into device pins shown as positive, out of device pins as negative, all voltages referenced to ground unless otherwise noted. All values shown as max or min on absolute value basis.

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

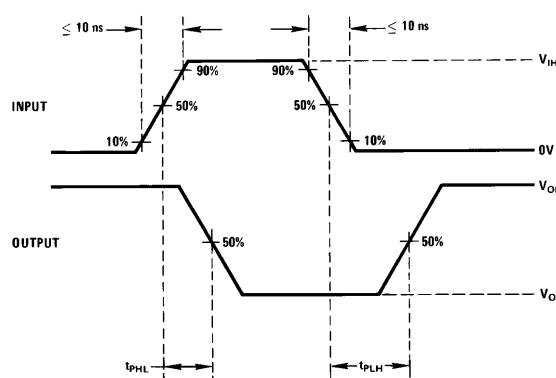
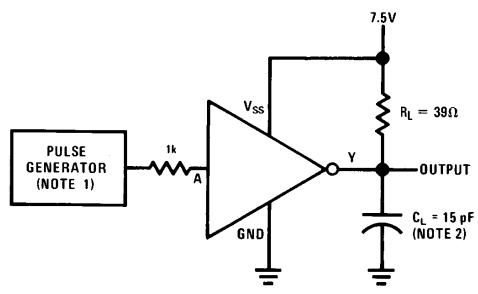
Note 5: Voltage values are with respect to network ground terminal unless otherwise noted.

AC Test Circuits and Switching Time Waveforms

DS75491



DS75492

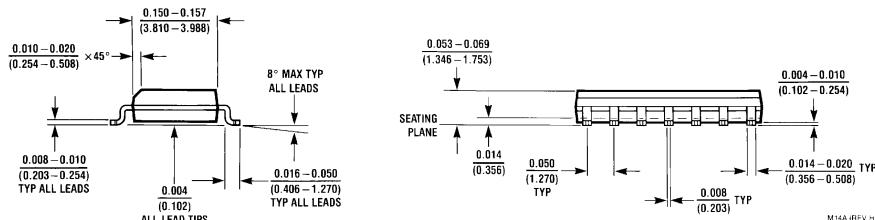
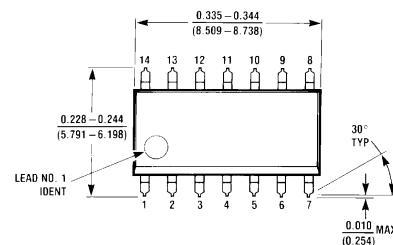


Note 1: The pulse generator has the following characteristics: $Z_{OUT} = 50\Omega$, $PRR = 100\text{ kHz}$, $t_W = 1\text{ }\mu\text{s}$.

Note 2: C_L includes probe and jig capacitance.

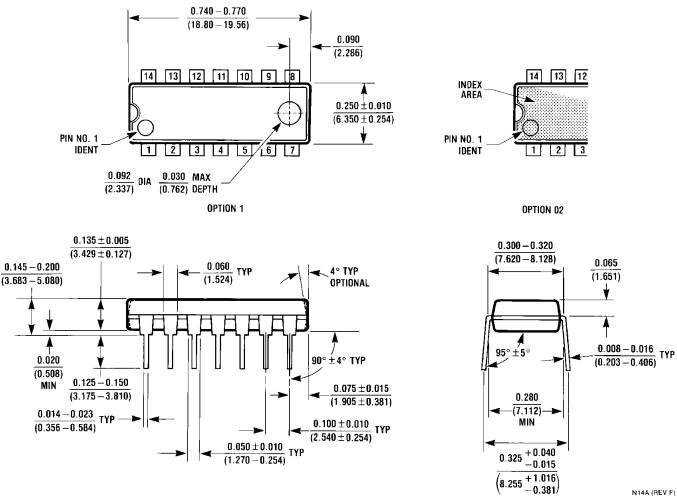
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Physical Dimensions inches (millimeters)



14-Lead (0.150" Wide) Molded Small Outline Package, JEDEC
Order Number DS75492M
NS Package Number M14A

Physical Dimensions inches (millimeters) (Continued)



Molded Dual-In-Line Package (N)
Order Number DS75491N or DS75492N
NS Package Number N14A

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