National Semiconductor

June 1986

DS8863/DS8963 MOS-to-LED 8-Digit Driver

General Description

The DS8863 and DS8963 are designed to be used in conjunction with MOS integrated circuits and common-cathode LED's in serially addressed multi-digit displays.

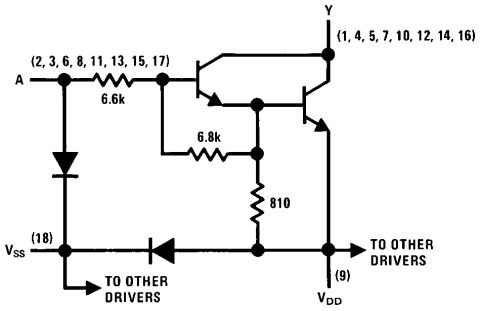
The DS8863 is an 8-digit driver. Each driver is capable of sinking up to 500 mA.

The DS8963 is identical to the DS8863 except it is intended for operation at up to 18V.

Features

- 500 mA sink capability per driver, DS8863, DS8963
- MOS compatibility (low input current)
- Low standby power
- High gain Darlington circuits

Schematic and Connection Diagrams



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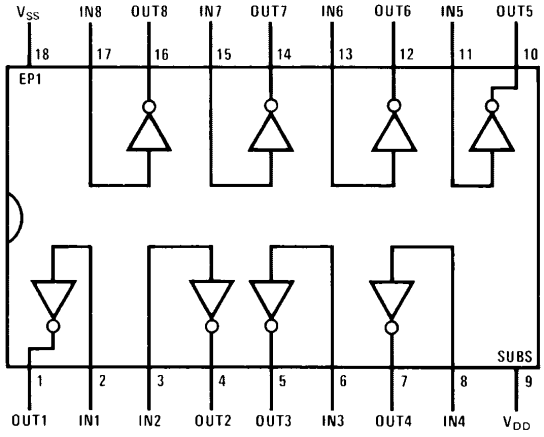
Dual-In-Line Package



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Top View

Order Number DS8863N or DS8963N
See NS Package Number N18A

RRD-B30M105/Printed in U. S. A.

Absolute Maximum Ratings

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

	DS8863	DS8963
Input Voltage Range (Note 1)	−5V to V_{SS}	−5V to V_{SS}
Collector (Output) Voltage (Note 2)	10V	18V
Collector (Output)-to-Input Voltage	10V	18V
Emitter-to-Ground Voltage ($V_I \geq 5V$)		
Emitter-to-Input Voltage		
Voltage at V_{SS} Terminal With Respect to Any Other Device Terminal	10V	18V

	DS8863	DS8963
Collector (Output) Current		
Each Collector (Output)	500 mA	500 mA
All Collectors (Output)	600 mA	600 mA
Continuous Total Dissipation	800 mW	800 mW
Operating Temperature Range	0°C to +70°C	0°C to +70°C
Storage Temperature Range	−65°C to +150°C	
Maximum Power Dissipation at 25°C		
Molded Package	1563 mW†	1563 mW†
Lead Temperature (Soldering, 4 sec.)	260°C	260°C

†Derate molded package 12.5 mW/°C above 25°C.

Electrical Characteristics $V_{SS} = 10V$, $T_A = 0°C$ to $+70°C$ unless otherwise noted

Symbol	Parameter	Conditions		Min	Typ	Max	Units
V_{OL}	Low Level Output Voltage	$V_{IN} = 7V$, $I_{OUT} = 500$ mA	$T_A = 25°C$			1.5	V
						1.6	V
I_{OH}	High Level Output Current	$V_{OH} = 10V$*	$I_{IN} = 40\ \mu A$			250	μA
			$V_{IN} = 0.5V$			250	μA
I_I	Input Current at Maximum Input Voltage	$V_{IN} = 10V$, $I_{OL} = 20$ mA				2	mA
I_{SS}	Current into V_{SS} Terminal					1	mA

*18V for the DS8963

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

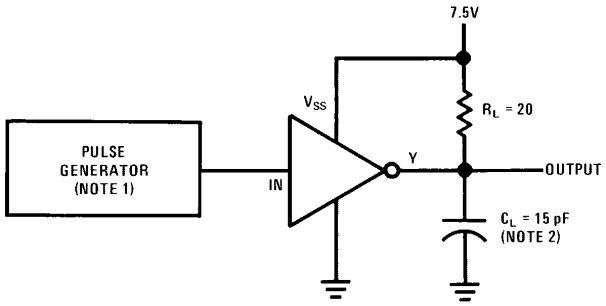
Symbol	Parameter	Conditions	Min	Typ	Max	Units
t_{PLH}	Propagation Delay Time, Low-to-High Level Output	$V_{IH} = 8V$, $R_L = 20\Omega$, $C_L = 15$ pF		300		ns
t_{PHL}	Propagation Delay Time, High-to-Low Level Output			30		ns

Note 1: The input is the only device terminal which may be negative with respect to ground.

Note 2: Voltage values are with respect to network ground terminal unless otherwise noted.

AC Test Circuits and Waveforms

DS8863



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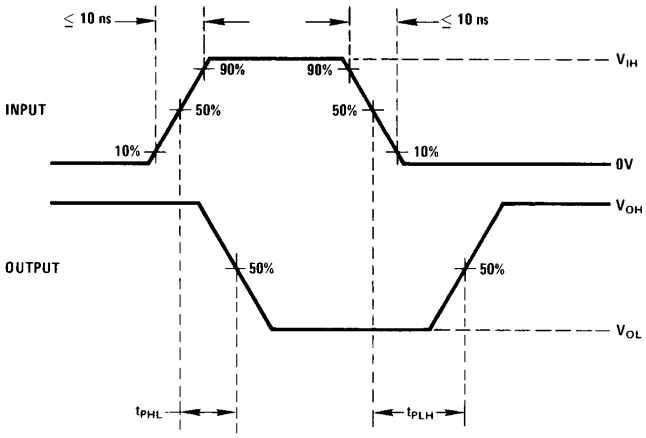

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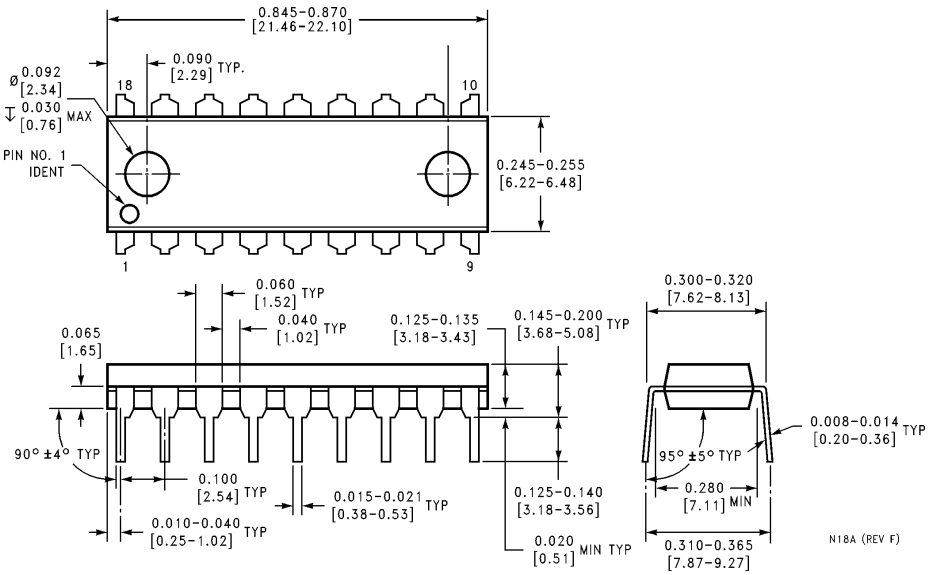
Note 1: The pulse generator has the following characteristics: $Z_{OUT} = 50\Omega$, PRR = 100 KHz, $t_W = 1\mu s$.

Note 2: C_L includes probe and jig capacitance.

Physical Dimensions inches (millimeters)



Molded Dual-In-Line Package (N)
Order Number DS8863N or DS8963N
NS Package Number N18A

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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