

## MM74C908 Dual CMOS 30-Volt Relay Driver

### General Description

The MM74C908 is a general purpose dual high voltage driver capable of sourcing a minimum of 250 mA at  $V_{OUT} = V_{CC} - 3V$ , and  $T_J = 65^\circ C$ .

The MM74C908 consists of two CMOS NAND gates driving an emitter follower Darlington output to achieve high current drive and high voltage capabilities. In the "OFF" state the outputs can withstand a maximum of  $-30V$  across the device. These CMOS drivers are useful in interfacing

normal CMOS voltage levels to driving relays, regulators, lamps, etc.

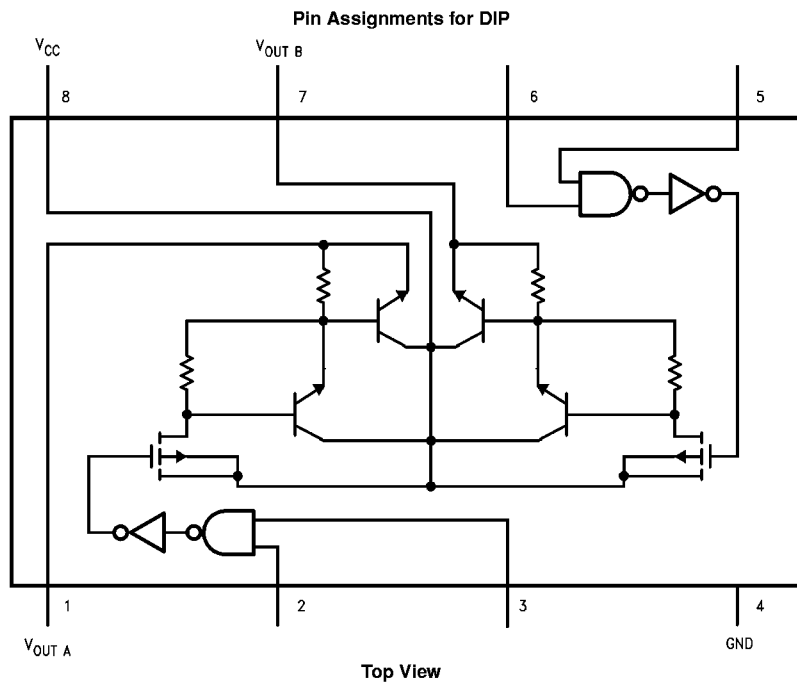
### Features

- Wide supply voltage range: 3V to 18V
- High noise immunity:  $0.45 V_{CC}$  (typ.)
- Low output "ON" resistance:  $8\Omega$  (typ.)
- High voltage:  $-30V$
- High current: 250 mA

### Ordering Code:

Order Number	Package Number	Package Description
MM74C908N	N08E	8-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

### Connection Diagram



Absolute Maximum Ratings (Note 1)		Lead Temperature (T <sub>L</sub> )	260°C
Voltage at any Input Pin	-0.3V to V <sub>CC</sub> +0.3V	(Soldering, 10 seconds)	
Voltage at any Output Pin	32V	Power Dissipation (P <sub>D</sub> )	Refer to Maximum Power Dissipation vs Ambient Temperature Graph
Operating Temperature Range	-40°C to +85°C		
Operating V <sub>CC</sub> Range	4V to 18V		
Absolute Maximum V <sub>CC</sub>	19V		
I <sub>SOURCE</sub>	500 mA		
Storage Temperature Range (T <sub>S</sub> )	-65°C to +150°C		

**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 Electrical Characteristics table provides conditions for actual device operation.

## DC Electrical Characteristics

Min/Max limits apply across temperature range, unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>CMOS TO CMOS</b>						
V <sub>IN(1)</sub>	Logical "1" Input Voltage	V <sub>CC</sub> = 5V V <sub>CC</sub> = 10V	3.5 8.0			V V
V <sub>IN(0)</sub>	Logical "0" Input Voltage	V <sub>CC</sub> = 5V V <sub>CC</sub> = 10V			1.5 2.0	V V
I <sub>IN(1)</sub>	Logical "1" Input Current	V <sub>CC</sub> = 15V, V <sub>IN</sub> = 15V		0.005	1.0	μA
I <sub>IN(0)</sub>	Logical "0" Input Current	V <sub>CC</sub> = 15V, V <sub>IN</sub> = 0V	-1.0	-0.005		μA
I <sub>CC</sub>	Supply Current	V <sub>CC</sub> = 15V, Outputs Open Circuit		0.05	15	μA
	Output "OFF" Voltage	V <sub>IN</sub> = V <sub>CC</sub> , I <sub>OUT</sub> = -200 μA		-30		V
<b>CMOS/LPTTL INTERFACE</b>						
V <sub>IN(1)</sub>	Logical "1" Input Voltage	V <sub>CC</sub> = 4.75V	V <sub>CC</sub> - 1.5			V
V <sub>IN(0)</sub>	Logical "0" Input Voltage	V <sub>CC</sub> = 4.75V			0.8	V
<b>OUTPUT DRIVE</b>						
V <sub>OUT</sub>	Output Voltage	I <sub>OUT</sub> = -300 mA, V <sub>CC</sub> ≥ 5V, T <sub>J</sub> = 25°C I <sub>OUT</sub> = -250 mA, V <sub>CC</sub> ≥ 5V, T <sub>J</sub> = 65°C I <sub>OUT</sub> = -175 mA, V <sub>CC</sub> ≥ 5V, T <sub>J</sub> = 150°C	V <sub>CC</sub> - 2.7 V <sub>CC</sub> - 3.0 V <sub>CC</sub> - 3.15	V <sub>CC</sub> - 1.8 V <sub>CC</sub> - 1.9 V <sub>CC</sub> - 2.0		V V V
R <sub>ON</sub>	Output Resistance	I <sub>OUT</sub> = -300 mA, V <sub>CC</sub> ≥ 5V, T <sub>J</sub> = 25°C I <sub>OUT</sub> = -250 mA, V <sub>CC</sub> ≥ 5V, T <sub>J</sub> = 65°C I <sub>OUT</sub> = -175 mA, V <sub>CC</sub> ≥ 5V, T <sub>J</sub> = 150°C		6.0 7.5 10	9.0 12 18	Ω Ω Ω
	Output Resistance Coefficient			0.55	0.80	%/°C
θ <sub>JA</sub>	Thermal Resistance	(Note 2)		100	110	°C/W
	MM74C908	(Note 2)		45	55	°C/W

**Note 2:** θ<sub>JA</sub> measured in free air with device soldered into printed circuit board.

## AC Electrical Characteristics (Note 3)

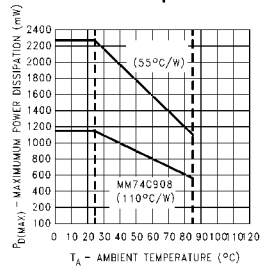
Symbol	Parameter	Conditions	Min	Typ	Max	Units
t <sub>pd1</sub>	Propagation Delay to a Logical "1"	V <sub>CC</sub> = 5V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 50 pF, T <sub>A</sub> = 25°C V <sub>CC</sub> = 10V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 50 pF, T <sub>A</sub> = 25°C		150 65	300 120	ns ns
t <sub>pd0</sub>	Propagation Delay to a Logic "0"	V <sub>CC</sub> = 5V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 50 pF, T <sub>A</sub> = 25°C V <sub>CC</sub> = 10V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 50 pF, T <sub>A</sub> = 25°C		2.0 4.0	10 20	μs μs
C <sub>IN</sub>	Input Capacitance	(Note 4)		5.0	(Note 4)	pF

**Note 3:** AC Parameters are guaranteed by DC correlated testing.

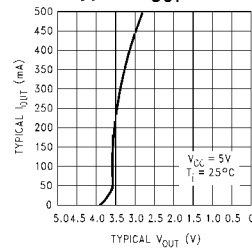
**Note 4:** Capacitance is guaranteed by periodic testing.

## Typical Performance Characteristics

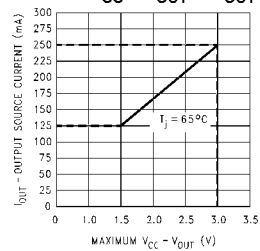
Maximum Power Dissipation vs Ambient Temperature



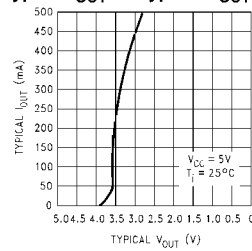
Typical I<sub>OUT</sub> vs Typical V<sub>OUT</sub>



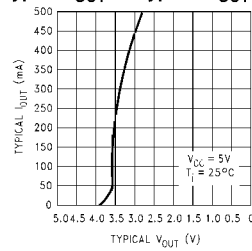
Maximum V<sub>CC</sub> - V<sub>OUT</sub> vs I<sub>OUT</sub>



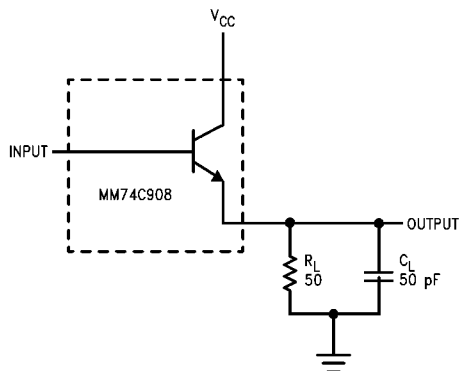
Typical I<sub>OUT</sub> vs Typical V<sub>OUT</sub>



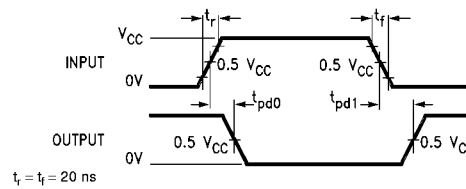
Typical I<sub>OUT</sub> vs Typical V<sub>OUT</sub>



## AC Test Circuit

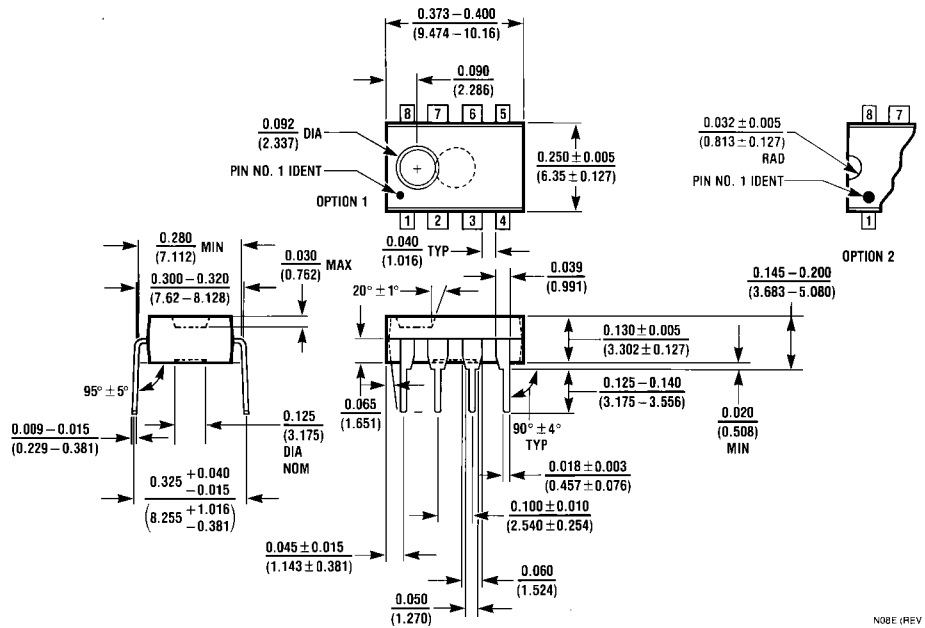


## Switching Time Waveforms





**Physical Dimensions** inches (millimeters) unless otherwise noted



**8-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide Package Number N08E**

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